βeta

– news from computer science and engineering –

#include <**women**>

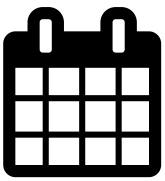
page 3–4

---

and...

catch up on
technology news

page 2

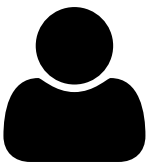


find out
what's on

page 6

brain-bending
puzzles

page 7



hoodies
are in!

page 8

issue 108 — 29 July 2015 — 15s2 week 1

βeta

CSESoc βeta, issue 108

A fortnightly publication from CSESoc's Beta team.
Find us online at **www.csesoc.unsw.edu.au**
Got some good content? Email **beta@cse.unsw.edu.au**

βeta Head
Jashank Jeremy

Puzzle Wrangler **News Chaser**
Emily Saunders Walmsley Timothy Humphries

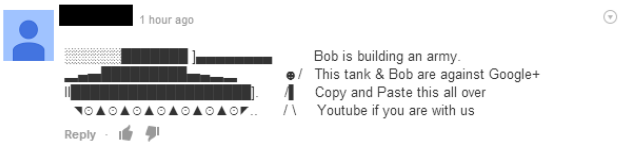
Contributors
Jake Bloom Lavender Chan Shariq Nabi David Sison
Christy Shen Octavia Soegyono John Wiseheart
Colin Xu

In This Issue

The News

We need to put all of the computers into the sea, urgently. I hope you all disabled Flash and removed your JVM over the break.

End of forced Google+ integration. After years of YouTube comment spam (Bob's Army, et al) whining about the forced use of Google+ to log into various products, Google have yielded and will formally end the integration. Gmail and Hangouts have already had it turned off for a while, and YouTube is up next. Google+ will remain as a less prominent corner of the wider Google empire.



Android SMS/MMS attack. Researchers from security firm Zimperium have discovered a vulnerability affecting most Android installations, estimated at 950 million devices. Remote code execution can be triggered by SMS or MMS messaging, and there is no need for the user to interact. Phones could be exploited while the user sleeps using only their phone number, leaving a totally compromised phone with no evidence of attack.

Hacking Team fallout. Hacking Team, an Italian malware vendor and international oppression squad, got thoroughly owned over the break. All of their oday exploits made it out, and all their emails were uploaded to Wikileaks. The sudden release of so many vulnerabilities at once put the world's infrastructure at extreme risk, in too many ways to list in this little column. Several are still unpatched. Encase your servers in concrete and hurl them into the Pacific.

Mozilla, Google almost kill Flash. Most relevant to eta's handful of readers are three Flash odays. These were weaponised within days, and despite patches, running Flash on untrusted sites or without SSL is a very risky activity. Most browsers allow you to 'click to enable', which helps somewhat. Mozilla and Google have taken another tactic, blocking all vulnerable versions entirely. Nobody needs Flash anymore—delete it.

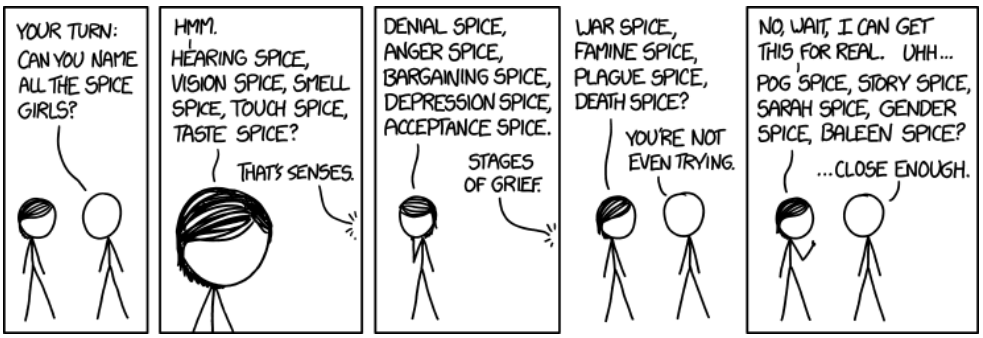
Charlie Jeep attack. Prominent security researcher Charlie Miller is in the headlines again after remotely killing a Jeep that was in motion on an American highway. Newer American vehicles tend to be connected to the internet, complete with that trademark automotive sector lack of subsystem isolation or critical system redundancy. Fiat Chrysler have recalled 1.4 million vehicles, and are rolling out a patch campaign by—wait for it—mailing millions of USB sticks containing new firmware to customers. No danger to Australia, unless we too slap modems into our cars and ask people to plug untrusted devices into them.

LastPass and OPM breaches. Cheer up, it's not all bad. Some people still manage to stay safe online in 2015, probably. No idea who. LastPass and a huge US government contractor, OPM, also got hosed over the break. OPM held the very confidential contents of background checks for federal employees, including those seeking clearances, and that info is certain to be used for espionage. Stay offline. Airgap everything. Stop using the tubes. Live in a Faraday cage. These are your options.

■ *Timothy Humphries*

Because we're running low on content, as usual,
enjoy some assorted detritus from the Internet.

(As usual, it's an xkcd.)



The Earth's five major mass extinctions were the Posh Extinction, the Sporty Extinction, the Scary Extinction, the Ginger Extinction, and the Baby Extinction.

xkcd 1554 // Randall Munroe // CC-BY-NC 2.5

Did you know?

PostgreSQL can store JSON more reliably and faster than MongoDB.

BSD Unixes (including Mac OS X) have a "status" signal traditionally bound to `^T`,
which the kernel traps to return data about the foreground process on a terminal,
and which applications can trap to return additional data.

Oh, and don't forget to check out the Beta website,
where we've also found some archived issues.

(If you have PDFs of Beta from 2012 or before,
we'd love to have them for completeness.
Send them in to <`csesoc.beta.head@csesoc.unsw.edu.au`>.
We may be able to get you a prize.)

and now, on with the show…

#include <women>

or, "You're a perv, Jake, and you only want more women in Computing so you can sleep with them."

Okay, I'm exaggerating, but that's what it feels like when somebody insinuates I have an ulterior motive behind my opinions on women in computing. As a straight, white, Australian, cis-gendered male, I've had things pretty easy and I try my absolute best not to take it for granted. I do believe that we should be encouraging more women to take up studies in Computer Science, because currently there's such a disparity in participation between men and women in CS. It does get annoying when people ask me if I'm being ironic when they see the `#include <women>` sticker on my phone, because—to quote every twelvie on Tumblr ever—you know my name, not my story.

So let me tell you my story.

In January 1996, at about 3am one morning, a couple in labour at the old Women's Hospital in Paddington gave birth to their first child. At 3pm, the new mother had a shower, put on a black dress and went to work to send some emails, sign some documents and have a meeting or two. The new father, not knowing what to do, lay down in the hospital bed with his newborn son and turned the TV on. There was a replay of a footy game showing, which they watched together. The newborn, unsurprisingly, was me.

When my mum arrived at her office, 12 hours after I was born, her co-workers were shocked. Her maternity leave wasn't due to start for another two weeks as I was born early, but whenever somebody told her to go home, she just said, "No, I've had my baby and I'm back at work now". My mum ended up taking six months off when I was born and hated every second of it, because she wasn't working. When my younger brother was born, she went back to work after two weeks.

That's the way it's been for the last 19½ years though. My mum is a career person, not a family person, and I respect her so much because of it. She's fought hard to get to where she is now, and she doesn't take no for an answer. (That's cliché, but it's the truth. Never get into a negotiation with her. You will lose.) I thought my workload last semester was tough. But my mum recently held down a full time job structuring billion dollar loans between banks while studying for her fourth degree at a fourth university in a third different faculty. She also managed the renovation of our family home, chaired a 'Women in Finance' networking program, and also ran marathons in her spare time, all while having to deal with three boys at home. She's an amazing woman and one of my biggest role models.

My father runs a company that imports and sells maternity and pharmaceutical products to supermarkets and pharmacy's in Australia. It's an industry that does lend itself to employing more women (I mean, I would trust a woman over a man if I was buying a breast pump, but that's just me), however he's always been proud to say that he employs plenty of committed, hard working women.

So maybe now you can understand why I am fully in favour of getting more women involved in computing. There's no creepy perverted motive, and it's most definitely *not* ironic. The way I was raised was that women are just good as men, or trans gender, or however you identify. My family has always been fairly clear on that, and it's one of the reasons I'm so proud to be a part of the Bloom clan. It's one of the reasons that I'm so disappointed at the skew towards males in Computer Science. I'm not going to pretend that I'm smart enough to know the exact reasons why, and I'm not going to pretend that I'm smart enough to know how to fix it properly, but if I was put in charge tomorrow, this would be my thought process.

The issue with a lot of "solutions" to this problem is that they are stop-gap and don't accomplish much. It could be compared to the issue of the South African national Rugby team, which, in order to diversify Rugby in the country, recently imposed a quota of seven non-white players that must be included in the squad. This doesn't really help much at all, in fact it could weaken the team as selectors rush to pick players to fill the quotas instead of the best players for the job.

The same general idea exists in computing. We can't go slapping quotas on female/non-male employees, because then we aren't hiring the best people for the job. No little girl in school is going to look to her future and say, "one day, I'm going to fill a quota". It's devaluing the profession, it's devaluing women and it doesn't really fix the root of the problem either. Also, unlike a national rugby team, the interest probably isn't there if a massive company decided they were going to hire 50% women. There's a danger that they would actually run out of women to hire, which probably isn't an issue if you're selecting a rugby team. For whatever reason, national Rugby is seen as more glamourous than a career in software development.

Which brings me to my second point. Every company in the world will need developers in the future, even if it's only web developers to maintain a website for a small business. We're going to be just as important as doctors and lawyers in 10 years—the New York stock exchange just crashed and they had to call some developers to fix it. The balance of power in the world is shifting, and we're going to be the beneficiaries.

Companies are literally falling over each other to book in tech events at CSESoc to try and attract the best talent. "I have an interview with Google," is a phrase that is embarrassingly common at CSESoc, yet collects a fun double take from anybody outside the community. It's mathsy, and a lot like taking drugs (see my previous article) and involves plenty of problem solving and design. It pays well and has very little unemployment, with plenty of scope to start your own business.

We are in such an amazing industry, yet from the outside people see us as nerdy, boring and awkward.

When people make assumptions about what we do based on (unwatchable crap) TV shows like 'The IT Crowd' or 'The Big Bang Theory' (ugh) it hurts.

When somebody posts on the UNSW sub-reddit asking for good electives to meet girls, it hurts.

I once met a girl at a Roundhouse party, and when I told her I was studying Comp Sci, she said, "Oh yeah? How many girls

do you know, like two?" and it hurt. (I calmly and soberly reminded her that she was studying Mechanical Engineering, but even so…)

IT has both huge marketing and image problems, to the extent that if you haven't done any programming before coming to University, you're unlikely to even try it out. Law, Medicine, Accounting, and Engineering students will jump straight into their degree with very little experience in their field at all. The image of the industry will need to change from a sloppy, awkward neckbearded guy, to what it actually should be: a diverse representation of amazing, talented people.

The reason this image doesn't exist is because when you think of role models in the tech industry, you think of Jobs, Zuckerberg, Wozniak and Gates. They're all white American males, who are mostly seen as being socially awkward, even if it isn't the case (Woz, Zuck) or an absolute slave driver (Jobs). Mark Zuckerberg had a movie based around him being mean to others, and his girlfriend famously said to him, "You'll go through life thinking that girls don't like you because you're a nerd… it won't be true. It will be because you're an arsehole."

Men in IT have these role models to look up to, to judge their "success" against. Women in IT have… Margaret Hamilton, who you'll know from Tumblr reblogs as being the Senior Developer on a small project called Apollo 11, and creator of the term "Software Engineer". What you probably didn't know is that she founded her own company called Higher Order Software, is currently CEO of Hamilton Technologies, and has 130 publications over 60 major projects. Without her, the crew of Apollo 11 would have died—look it up, I'm not kidding—and we wouldn't have priority scheduling in Operating Systems, and would probably all be called "code typers".

There's also Anita Borg (thanks Google) who started the Institute for Women and Technology—but she also completed a PhD dissertation on Synchronisation in Operating Systems. If you want to know how terrifying a world without synchronisation would be, I suggest you take our Operating Systems course. Oh, and Anita also forced Mattel to remove a Barbie doll that said, "Math Class is Tough!".

These female roll models are far less known than their male counterparts, despite equaling or surpassing them in levels of success. They should be mentioned in the same breath as Jobs and Gates, along with Sheryl Sandberg and Nicola Mendelsohn of Facebook, Dorcas Muthoni who transformed governments in Africa, Elizabeth Feinler who helped develop Arpanet (later called the Internet), or Ada Lovelace who wrote what is recognised to be the first ever computer program in 1840, making her the first ever programmer.

Side-note: why the f*** are we not taught that the first ever programmer was a woman???????

At this point I need to stop and take a breath, and say that we are now all part of the problem or part of the solution. If you don't believe that this is a genuine problem facing the industry, then you're part of the problem. As I said earlier, I don't have all the answers, but this is my best attempt.

It's not going to be overnight, but in a few years time, I believe that we can achieve 50/50 enrollment in Computer Science degrees. In the short term, Lovelace, Feinler, Muthoni, Hamilton, and Borg should become household names, as instantly recognised as Jobs, Gates, Zuckerberg.

It's important to have strong, empowering role models to inspire the next generation of women who are considering their career options. Write bestsellers about them or make movies about them—either way, get these women out of obscurity and into the mass consciousness. We need girls and boys at school to be saying, "I want to help take mankind to the moon like Margaret Hamilton," or, "I want to be a pioneer like Ada Lovelace". The achievements of Jobs and Zuckerberg were built on top of the work done by these women, and it's time that they were celebrated as such.

Secondly, and in the longer term, we need to focus on High Schools. Countries typically seen as having high living standards (such our Scandinavian mates) are putting programming into the school curriculum. While that may or may not have an effect, what needs to happen is that every student in Australia who takes three or four unit maths needs to understand that Computer Science is an achievable, rewarding and reliable career option for them. There are plenty of people out there who are good at maths that don't want to be Accountants and haven't even considered IT as a career path. Even Richard Buckland was an actuary before he became a Computer Scientist!

We need to shove ourselves in math student's collective faces, show them how much fun we have, how well we are paid, our inspiring role models and how closely related Mathematics and Computer Science is. Once that happens, we need to keep that association in the public mind. When a student is in year 12 and says, "I really like maths" the first words out of a Career Counsellor's mouth should be, "have you considered going into programming?".

Finally—and this is the most important of all—we need to do something about the image of the industry. Make Computer Science a place where women are accepted and valued just as equally as every other person. How do we achieve this? Bear with me here.

Every single person in IT needs to stop being a dickhead.

It's so simple and effective it's almost beautiful. They should have sent a poet. Now I'm not saying that every person in IT is a dickhead. None of my friends are, and you'd have to look hard in CSE to find one. What I am saying is that there are some dickheads out there in the industry, who, for whatever reason, think it's their right to put down other people. And we all act like a dickhead from time to time, myself included, because nobody is perfect.

But what needs to happen is that we need to start thinking long and hard about the things we say and the people we say it to so that any sort of casual sexism, racism or xenophobia is wiped out. I was at a formal dinner once where the guy sitting next to me was insistent that, on the basis of evidence of there being so few women in computing, men are intrinsically better at it and more suited to it.

Bullshit.

Maybe 90% of people aren't sexist and see the world the same way as I do. Maybe the other 10% are unreasonable and will never have their minds changed. For us 90% of people (lets call this group, "decent human beings"), it's about not being careless. The odd casually sexist remark does more damage than we realise, and for us, it's now about really trying hard not to slip up and say something that could be sexist.

For the decent human beings among us, when somebody makes a joke about how few women are in computing, we need to stop them and say "Actually, IT is a really diverse and rewarding profession. Yes, gender equality isn't what it should be, but we're a very accepting bunch" and then back up those words with actions.

Eventually, we can change the image of our profession, but it starts with you and me, and it's a responsibility we all have—we owe it to the strong female programmers who have come before us, and we owe it to the strong female programmers who will come after us. If we can stop ourselves from being dickheads, we can create a healthier, happier community that is more accepting for all.

And when that happens, the other 10% of non-decent human beings will start to fade.

■ *Jake Bloom*

Upcoming Events

every Wednesday CSESoc's Weekly Barbecue social
1–2p, Physics Lawn

Come on down to the Physics Lawn for your weekly dose of free barbecue, on a brand new day! Don't forget to pick up your copy of CSESoc **βeta**, and make some new friends!

29 July Microsoft Tech Talk tech
2p, K17 Seminar Room

Come and join us for a tech talk held by Mike Swafford, Partner Group Engineering Manager at Microsoft, for a behind-the-scenes look at what it takes to keep the Office 365 solution humming smoothly, and how running the service helps improve the Exchange product.

For more details, head to
`csesoc.unsw.edu.au/blog/microsoft-tech-talk`

30 July Palantir Event careers
12–2p, Tyree Room

Join Palantir Technologies to learn how Palantir's software is deployed at public institutions, private enterprises, and in the non-profit sector to address the challenges of responsibly making sense of complex, diverse data, to further the goal that, with the right technology and enough data, people can still solve hard problems and change the world for the better.

For more details, head to
`csesoc.unsw.edu.au/blog/palantir-event`

I want to do a patterned floral planting in my garden;
an A-pollen-ian gasket, perhaps?

There's quite a stigma attached
to identifying plants by their flowers.

Welcome to Unswot

In the rapidly innovating IT world, fast-moving startups are cropping up in abundance. Unswot is a UNSW-based startup which seeks to bring back intellectual chats over coffee, but with a modern technological twist.

Unswot aims to bring the human element back into conversation, reversing the conventional lecture, tutorial or seminar. It's a platform for academics to discover, host, and participate in informal, face-to-face discussions—'Unswots'—designed to promote discourse on a spectrum of creative, unconventional and thought-provoking topics. Pilot topics have ranged from the Rwandan genocide, to anti-piracy laws and the international community; hosts simply post their topic of interest on the Unswot website, and can connect with people of similar interests, whilst enjoying free coffee at various on-campus cafes.

With this promising new startup hot on our hands, the Unswot team have curated some of the most engaging tech Unswots for the next fortnight. Join the conversation at `unswot.com`!

3 August How Google's 'Project Ara' is going to affect the smartphone industry
1p, Stellini Kanin Mungkarndee

Ever wanted to 'build' your own unique smartphone? Google's Project Ara promises just that, and approaching its release date, now's a good time to discover how it will change the smartphone industry.

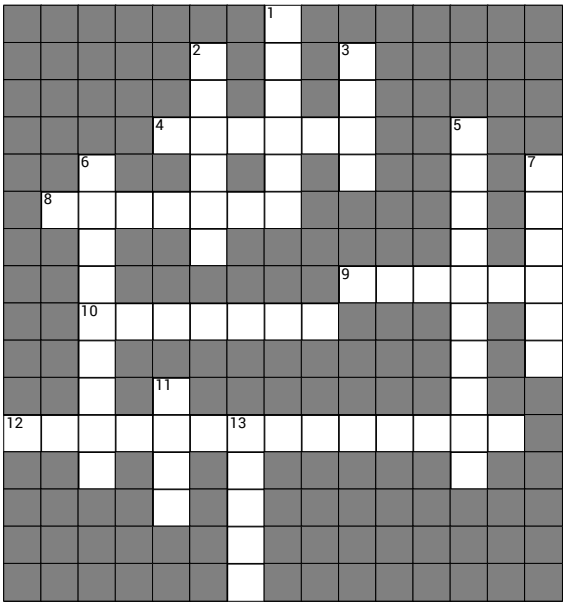
6 August Will lawyers ever be replaced by computers?
1p, Stellini Leo Dong

With the increasing automation and decline of many job sectors, what could happen to lawyers? What are their contemporary functions, and their future roles?

■ *Shariq Nabi* ■ *Colin Xu* ■ *Christy Shen*

Puzzles

Crossword



Across. **4** Measure of stability that will haunt your waking hours **8** Less exciting now they're not to concerts **9** Backups with a side of fish **10** Ability to handle growth **12** Git is used for this

Down. **1** "_____ Ain't Gonna Insist On Sainthood" **2** Automation, with you pulling the strings **3** Like 2, with more food involved **5** Virtual machine, first released in 2007 **6** Network analyser in the form of an aquatic predator **7** 3 with a pricetag **11** Lag, outside gaming **13** Proxy server, engine in disguise

Takuzu

0	1	0		0	1	0		1	0
	0		0		0			0	0
0	1		0	0		0	0		1
	0	0			0		0	0	1
0			0		0			0	0
0	0		1	0		0	0	1	
	0	0	1	1	0	0		1	0
		0	0		0		0	0	
0	1		0	0		0		0	
1	0	0		0	1		0		0

Brain Teasers

A. Can we assume without loss of generality that a computer program has access to its own source code?

B. A downstairs panel contains three on-off switches. One of them controls the electricity for the basement, in which there are several lights and your server racks, the other two are duds (you really need to get them fixed). Using only one trip to the basement, how do you determine which switch controls the electricity?

Bonus. What's tiny and yellow and very, very, dangerous?

Issue 107 Solutions

Brain Teasers

A. 19

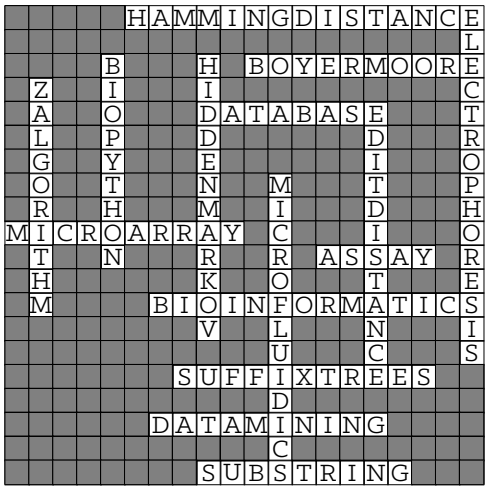
B. ATGCATGAT

C. Yes, an inductive proof shows this. Let the base case be an odd integer n where $n^2 \mod 8 = 1$; does $(n+2)^2$ also yield 1 under modulo 8?

Takuzu

1	1	0	1	0	0	1	1	0	0
1	0	1	0	1	0	0	1	0	1
0	1	1	0	0	1	0	0	1	1
1	0	0	1	0	1	1	0	1	0
1	0	0	1	1	0	0	1	0	1
0	1	1	0	1	1	0	0	1	0
0	0	1	1	0	1	1	0	0	1
1	0	0	1	0	0	1	1	0	1
0	1	0	0	1	1	0	1	1	0
0	1	1	0	1	0	1	0	1	0

Crossword



■ *Emily Saunders Walmsley*

This Edition of βeta Sponsored By...

Hoodie Update

'Code, Sleep, Eat' hoodies have arrived!

Those who preordered should have received an email with details on payment and collection.

If you haven't preordered, stay tuned for an update soon on when they can be purchased.

■ *Lavender Chan*

The Last Word

Well, here we are: the end of another week's Beta. I hope you enjoyed it, and hey, we did too. Oh, and there was a bit of a gap there—I hope you all enjoyed the break between semesters, and hope you're all pumped for semester two.

Personally, I'm looking forward to COMP2041. I've been told by many people that it's a fun course… but everyone seems to hate on Perl. I love Perl! It was one of the first languages I learned, some fifteen-odd years ago, after C and Lisp, and I've used it a lot since. I moved to Ruby because it was so like Perl, and Perl taught me how to use Awk and `sed(1)`.

I have, however, a significant distaste for Python. Yes, it's a nice, shiny language; as a friend put it, it's the closest thing you'll get to executable pseudo-code; in my opinion, it's ex-cruciatingly painful to use. Across the Python 2 to 3 gap, there are some very peculiar changes that I cannot fathom; regular expressions, for example, on string from process pipes, don't always work, due to Unicode.

On a similar, but different, note, if you consider the pipelining 'filter' paradigm as isomorphic to a composition of functions, an exercise for the enterprising reader is to construct a functional programming language with a POSIXly correct Bourne shell, or failing that, Ksh or Zsh. No, Bash is not a POSIXly correct Bourne shell. **growl**

Anyhow, that's enough of me rambling on. If you've stumbled across anything interesting, or you're keen to get involved, join the team via the CSESoc website, or send in an article—`beta@cse.unsw.edu.au`. We'd love to hear from you, and hey, your article will very likely end up in print.

Catch you next week!

■ *Jashank Jeremy*