

This document contains a paper backup of binary data



```

Identifier:          Sample backup of random_testfile
Size of binary data: 4096 bytes
Date of backup:      2021-01-03
Backup created on:    kongo.eli.rumia.org

Block size of backup: 1500 bytes
Blocks used:          3
CRC32 checksum:       0x915389a9
MD5 hash:             179f13a3194c6379edfc0ee502a9e880
  
```

To restore this backup, follow one of the following restore methods:

1) Read the QR-Codes with PaperStorage

Scan all pages (including this one) with any kind of scanner / scanning app available to you and save the resulting scans as images on your computer. Install Python and the PaperStorage module (available on pip, 'python -m pip install paperstorage[full]') on your computer and start the restore process by typing 'python -m paperstorage --interactiverestore' into a terminal.

2) Read the QR-Codes manually

Every page (except this first one) contains a QR-Code with one data block. Use any QR-Reader available to you to save the data blocks as plain text files. The first four characters of every data block contain the block id (starting from 0), the following four characters contain a document id, both Base64 encoded big endian integers. The remaining string is the binary data of the data block, also encoded in Base64. Concatenate the binary data in the correct order to restore the original file. The following shell script restores a backup from JPEG or PNG scans of a backup using zbar:

```

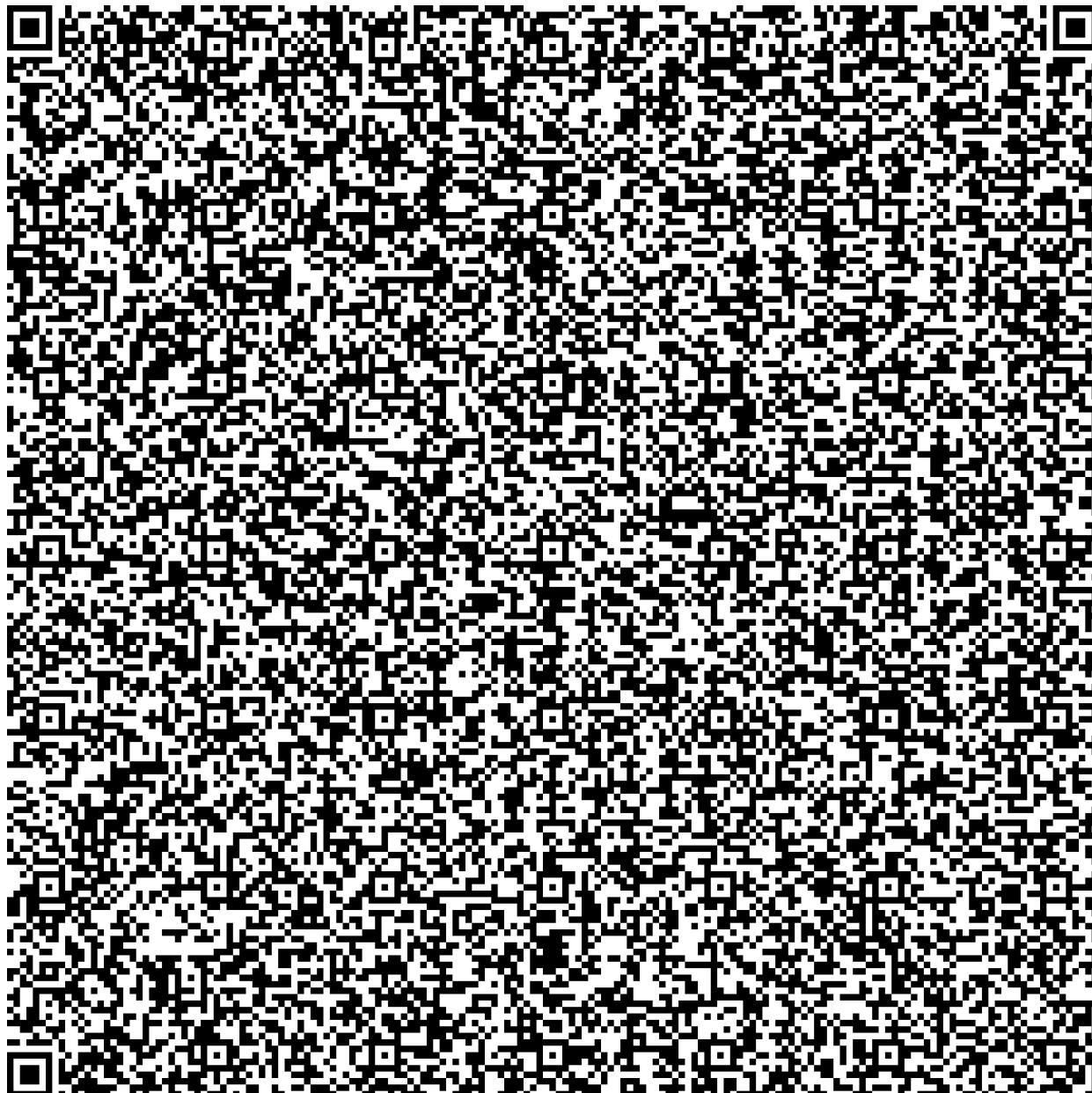
for i in *.jpg,png; do block=$(zbarimg --raw --quiet $i); if [ "$block" = "" ]; then \
echo "image $i not readable!"; continue; fi; echo $block | tail -c +9 | base64 -d > "${echo $block | \
head -c 4 | base64 -d | od --endian big -A n -t u2 -w2 | xargs}.hcbpbblock"; done; \
for i in *.hcbpbblock; do cat $i >> restored_backup; rm -f $i; done;
  
```

3) Manual backup restoration

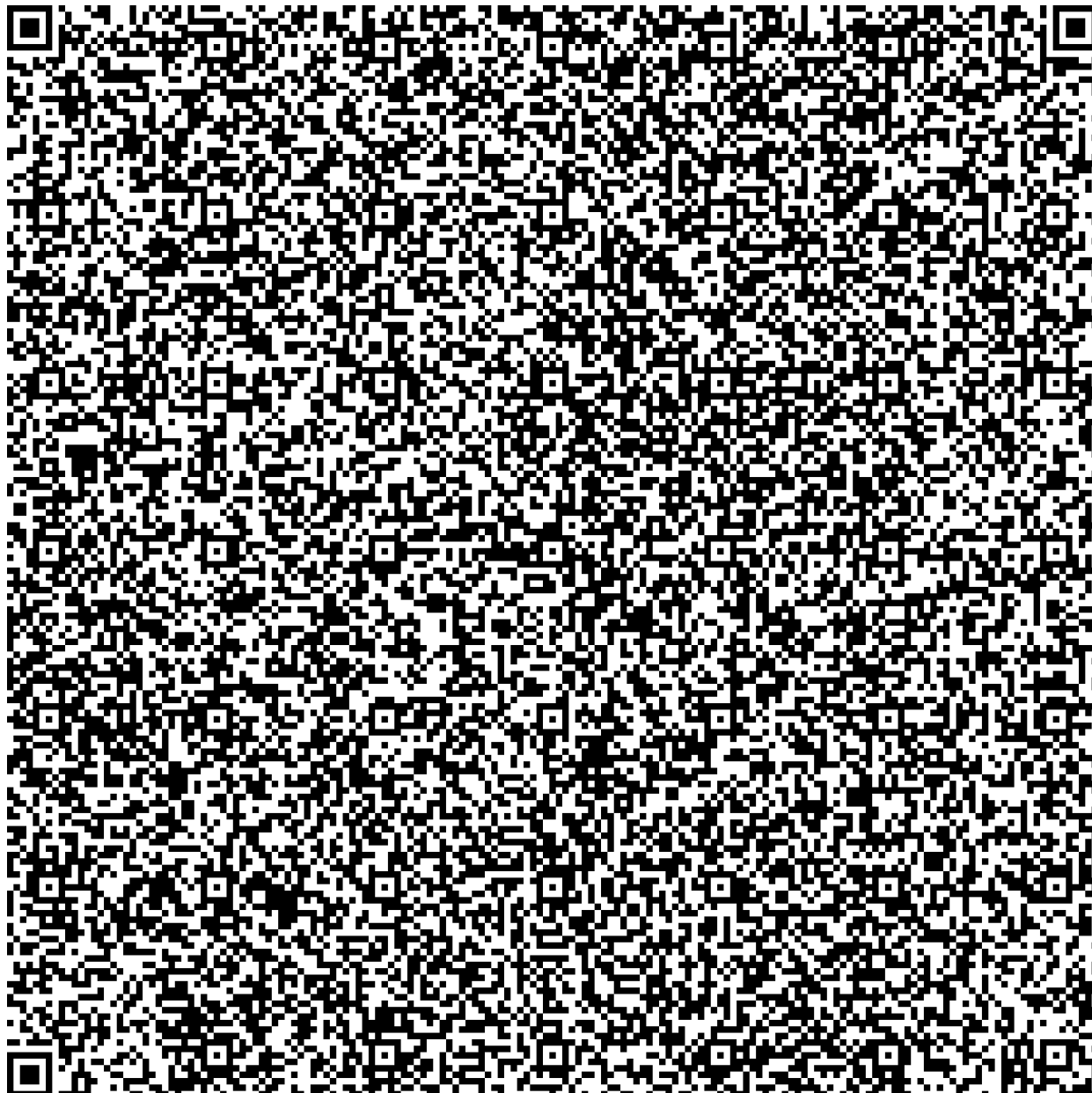
Each page also contains the binary data encoded in Base32, below the QR-Code. Each line contains a line number, up to 80 characters of base32 encoded data (splitted into 8 character chunks for enhanced readability). The last five characters are a Base85 encoded CRC32 checksum of the decoded binary data of the line, allowing the verification of each line. Only the Base32 encoded binary data is necessary to restore the original file. The following python script can be used to manually restore a backup from the Base32 data:

```

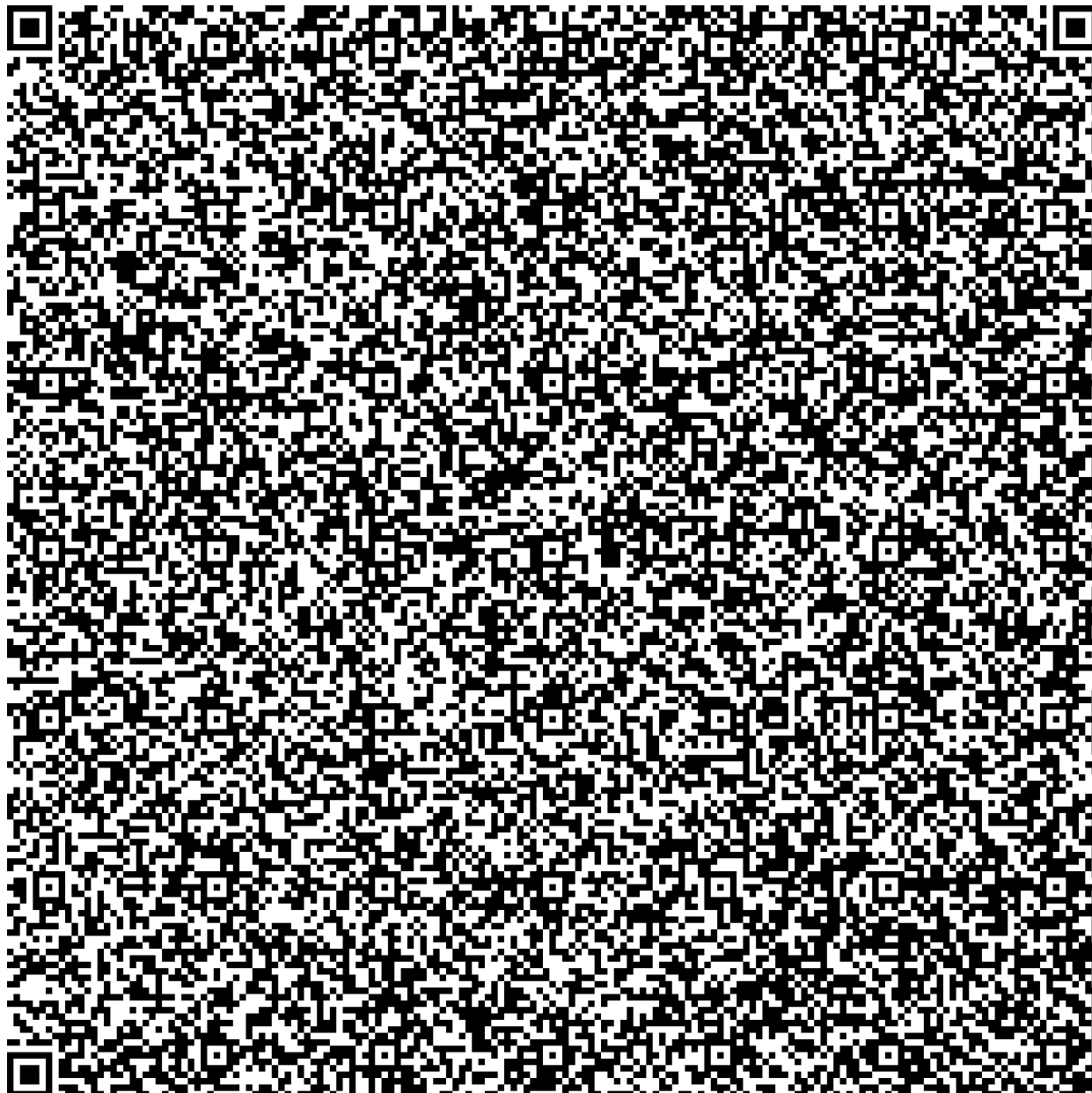
import base64, sys, math, binascii
from base64 import b85encode, b32decode
dS, bS, eD = int(input('size of binary data: '), int(input('block size used for backup: ')), ''
rB = (dS // bS)
if (dS % bS != 0): rB += 1
for i in range(rB):
    print(f'page {i + 2} of {rB + 1}')
    if (((dS - (bS * i)) // bS) >= 1): rB, pD = math.ceil((bS * 8 + 4) / 5), ''
    else: rB, pD = math.ceil(((dS - (bS * i)) * 8 + 4) / 5), ''
    for n in range(math.ceil((rB - 1) / 80)):
        lD, nL = '', False
        while (not nL):
            lD = input(f'input line {n + 1} of {math.ceil((rB - 1) / 80)}: ').upper().replace(' ', '')
            try:
                c32 = b85encode(binascii.crc32(b32decode(lD)).to_bytes(4, byteorder='big'))
            except (binascii.Error):
                print('invalid line, restart')
                continue
            if (input(f'crc32 is {c32.decode("utf-8")}, ok? ') != 'no'): nL = True
        pD += lD
    eD += pD
(open(input('enter filename: '), 'wb+').write(base64.b32decode(eD)))
  
```



```
01 43USRNND PSQST3M5 LTELJLLX YTWI7EB7 CO6WXOSI 4ZNIVDNY YG3TZVCR UABZN55I HZY7DD37 EWAWSC5W v&$$p
02 QUZSK500 EIHM4OG5 NRWRB5YM XDATK4DC 73F625CA MHUHAH DU ERLMPDIF ILUZXTIE UKZ446MW B2FB5HHE KZJF&
03 CASXLF44 DIEPOQY7 DNFNVAXJ EH4SHLLK 6BKVZIXV TWQSETDD F3ESBRDL OPJGUEM2 WRXHIKG2 LWIYCEHR DoW2Q
04 RPC56UPO NVN KU37B C3FSP23N Q4G7Y7JP TQBC4CR5 5RNUIMBV GNQDXDYL LHASOCZN RKWMBHIW XMAEFHHX fml(l
05 22J3KY7D EKGIOX4W RP5MDT43 RM3Z3PU6 4YJWGHIO KLV63RO3 RWHFHKU7 IVGKJT4K WZK2DL6D N3RC234R RxE+k
06 ZOC6EZf2 HBWBFABF NUD2WEBO CTPGPH4K 6OF6AT3R 3IGMUQ53 675ATP6D XUAEXORW QVG3XQEO VXD6SUBO Vnj)v
07 NDXJBFRC 35M5XJYF 2ZRFGPWV SM4JRAIJ UJYF4IO4 27NEMDY2 VNQXTEEV E3TQJZPZ OUC3KW6O FAYEPLVN T3<Av
08 L4QTRJBZ 6S54DDFV K5SFJG3N XMGVWTJ6 VKAXWETW YA7WOPVC YU3IF342 BLEIGCWQ 6BRORRGL L63MOBNE Ptg4N
09 YBLR3V66 STMZFWUA K64EO5V5 G5BLGCTI JLD BRJOJ 27JIYFI7 2OOSD4WC QDKVQNRV MEK3T4DY 72JNNQFE BgCWu
10 32IFDL7U LCVRUWSG 25K4ALYQ 4GMR7B45 3TNV3HHC 2JFOEZEE R2FY4EJN XAIQ2SF7 CAENXJYQ P2T2LSTZ bNVsE
11 YAPKMHF6 M2ZKACX7 A3YXGVRQ DLXFWULS QH63AQWQ 5LSOFY3R F5S6WP7N K2Q6HUXN H3YUKZ2Y 6IUQGVFY D~isl
12 W2MV43CJ TOLF27OP 33F4SND3 WTBIJNB Y 6TAPJWBH SNL702CJ MFPXBAH5 SDYU3ZBD ZIXH36X7 NRA4GZ6S )w7;!
13 UY4EXS2T YVUU336U RN3PIISN X3R2YZEZ WFHX7KOG 56Q2QJK4 7CVK5WLK BMJSHSYV Q6B3Y352 6A06U2DS fP04n
14 RWSDSKX5 SQNJZV5E Q2WNY6F4 QRAJ553B IXPKKQTK JQNMYPDR 36SBCXJZ 6SIAMDR L TERC0YVV UGTMIH77 eZoHg
15 Q6HGWMZC X3BT6BFU 5JQZPOHE PCA2MLG7 Q73H6HVE DN236ITQ U6NWSKRN CI5IWLH DIEPARVQ L4MZKOW !!~uM
16 22YHKZ4Y XBJJX5X5 MGYXY6DT ZVDWFPB3 FUHFNAFI PIUO ODC EQ6ANIE5 DNSH427S Y6PTJNQ N FXFLNOTB z8B%D
17 TMBPWX3T NJVHCWQ7 ZHYS3CJC RMEN2HBQ G6MAYKKT IIS0ZVBN 2CVMHRF6 WXIJQU7O MLYYWIDV TYQJQEXD ^$E%^
18 N2N6GLQ7 65SYUOWW CWP7PXWR KAX254QJ SA4FOEU3 6ESSERX4 C5XENLR3 JKDLXT2K B6EW25EZ ZYPDN7I2 Np(X7
19 PW7XT2FW GS6LBI7L UMJ72TAS LBL63GK4 3DYHOFZJ 5OJJQQBV AWQPQH X I6BBKURH DB2B7WMU 3LUOERWT AaUPz
20 5LMTYTET PI6AG5DW 52YMRQEG PHIHL7FD DFI2GSJK FS2NMLR4 NWBJFXDN OZFN5EOC PGSWOQWY ADYADZ2N &t%ZT
21 RGABZFGY 2M43FBFL EY04W2EV YQYZN4ZL 37BTOEOT FDWPOMLW UZ4QG7YJ IHGT7RAX ABIURWBL QQ5Y7AB3 -vEd+
22 OK3FI556 GB2ZN625 3RMWVNZD OIBP2FLY MTY73QZ4 W7QDF3NT JSZOS2D5 OCTSTUHM NXEMMXB2 E3MJZYKZ -YAQJ
23 T4SP6VNU TFXFKK4U LPAT3KVQ QIVG3XS3 N3VEY67C 7GJEB3MK KNZZ6CYL JRA5IB6Z M7HU7A57 4VRWC4QW X1$RM
24 6EKZY57S IK3DHQXW CY7PCIXT WS5NTSFB 6T2T5CLT RCYWY7LB NAEUHRQB KZQTWNV6 UCJDHLEZ 60LJQISD SJ*E6
25 VIUXGE63 MJNRQHK7 ATVT2OUL E5NB3SYV LCRIIDAD BHKW4ION 6ENFY5YH HJSL2FCD EN743SMG U3PGI6S5 >Pb)N
26 4WMBMC7S FGQOS35S EG3V4FBC K4UVYB7C 07AJNIPP ZCGSL65Z SKJDVQ42 R5DCQG67 PFPYOSCD XXASWUXB ^@{^=
27 SXF5TMVJ G50AJEVD AXTLOTZH J3MNSOMU IB67AUQG 6DK7PBXR AUJ7QMKP EHJTNXC4 2PILZNMK IUST407B Yxb=f
28 K3LVAB65 PYTMG2P5 2HBXQXFL ZE5IUBAX ZKALZNL Y DY5RGBIL YPPFHOEY NFDQLLBI GNDLTUNL PDXFES35 kt>nY
29 CGVKEJQ5 DOVJSYRU 7BU7S2IH JBLTYRIY J5CZZ37A GUHSUXFT AWLQPV6L A7LL2VTX XMMIUL5B XZR7NSQV 3V>QJ
30 5U4CB2AH VQRSMILI 3LNIQY4I CFNEKODJ S4ANTQLB CSLHJ5V2 RJ2WKL3H MUQ32CNJ CMSDXBMH OE2EUQF3 1Wdx3
```



```
01 LU6B23IJ 2UJP3FRM 4ON5DLNC YUSJSLJR LUFPURON WNAQUYUZ SWXR4ULS W5JOZTES QUR27OST 34HA3FBC CLFNb
02 NXGMJYFS KWPPSBGE LSNCWGDK WI6ILKNK NFGJDGZK IASTJM4D 4DVYHGV4 MFAIPL2R ITPHU6N6 AXO3YEJF g4TpL
03 6SZ54AOW KXM4KUBP ZQI2RG6L B7GMRK2X C3FYLUOQ E6NCUST3 UF6HDF7X 56OFUZOM JD4J576U JO3PVQSZ NPy@A
04 E37BR3CT 35QEPG57 EKTXPZNV HGHPWYRL NFD3Y25V UI45DWOR WOSH4ONV RL6RKYZV IJQEDHCV 4AEWJVL5 QZ+|5
05 3DAYC77V Z5JYZGCS WT5WQ2C4 VUXSMN6F RWLWF7BF 5BL6MVLU L4XDPVZ5 ID4VCPCA QMOPBDPW VBjGTvMA XR-cQ
06 X4BDZIJ6 TIVKZVO7 MQUI6V5U JDBH63YL EVN36MDA RAI4JFJT 6LKT7NEV GWTNIQGD NGKSVSZ5 5DH7Z2TC y06T_
07 VDX3J5EC LIJBIJ6M DGXYXELT XL6XGG36 5ECGAQG2 T7SBUYHE HUOOHHLN BY43LDPB 6L3T6ADS MPSZCQP3 T4JsI
08 JD5USTOV VCVUZVLM DLW5MMQ4 FDOOCWIQ 4K2RNPBK 3U4BSRJP GBXWYIXS GWTX7P6K 32Y4M6U2 B23GUUDS X*bf>
09 SB546U4F 2XI2GLE2 5UEZ2W3F HNKCMI3F Z75AO7DG FAK6FRVP YK3TUFNZ MBUTLTQQ PFUCPTJ3 OTZTMAER T<Mn+
10 ZHFHAU6B 0267X6E3 TGC3EF4N EU7T4GLI B7Z62SBP BRX5GFQL HLW7LTPB 5N667A4M WOP7O6PB NZH3LVAO KW^JM
11 RW27PU6U OCB32FB6 TXQIDH3Y I5PC43CE NICE6GRA DPOICQJH FWWKTP5G OBXIW4RE QNVD4I53 PFAJLEFA $;o>-
12 R2QOIS4I T3DY3V5O 7QYVAAL2 BCVBGF5M C5B46N52 NYW6FM74 3DMW7MRD HTUAYB42 4203QRJA UAAFHUZ4 d>JEK
13 X7NRYI5N SENHYSZV GLQPAMLY DLCVRIMI XDFWP4L4 GRFZLBZZ 3QYLR544 WO3BYTJY 2BYX6DAR ZGCR2YVV JUjEt
14 ZXHC5LZV 3TQGMXND QB5MLRSN IAARIUPP ZOJ2RJQ4 V7QK7LUQ JAE3ZTKI B6MM7P6Q 3ZJUSQD RUY5CQAN DdQ&o
15 NUQ656EL 66SXCHNN SNFK54QV Q7COQEMV 54QYRWOD HPJPR2PD K4LMWBAO JZRDF2KK VRLQCBPO ZQOET34T hUQtN
16 DUNENLXP 6YZNJ6TX QALOEM36 HSPJHNI3 72FLNFEA TH7JUBAT ANCQXUDS WRW5H3AH RXHYMFOD CEXD6CKH {QWWA
17 JM36MEQW OYGD2IDF TZBUYKMC J7BRKBCQ WINKCPC6 VYSQ4AGF H6LJ5433 ZT6WGC2D MLVSMG7Z MFQ2B5PK 18hhp
18 VIDGIAAY EWAKVH33 JIXNIZO2 NIPTW5A5 XZEOGDLY DJ2ON467 5JIVSUL7 2CDBJAJK PWN72EZ4 L5I5GEJS N_cwr
19 X5ITHM6Y V3UNYHV6 LEOPZQAU 4YU5EYSE 25XX4TSK 4HMGNSK6 VFER53P5 46IPWOYW ZSHCQR6T NSM6NWUW EVu^9
20 ULP6NEB7 PH7ZOKWY QQNYO56R 7MYG4GZG CQESEXQE 5MHCRP3G MEERLOQT IQAJEXEG IF5IQSPZ FSZU47RK 5oRN|
21 BMGYKUN5 DEONXJW4 ZELWDKQD BVKQU3RO 65TYHT4F MFZF4POJ 5CYPRTVC BAVN5MXA Y6XGJFYQ 5LTWE7WK Ne6rv
22 EFOWRFAQ U4JH5CBL LIPZHYUL LG4UQPUK UDQKIOTI QDO5AORI UXI3U27T H4EVUS7I UXCQRNWK PWHEMCS4 #P{0J
23 QVMYGTMT BJQUXMR3 TY243SFC JWVJN7AY HMN644NJ R6LFRYRF 6AGEZXZD BWGVRC3D U4JB05XC IAYIXLJN 5e?3j
24 XDEF7FLA 2US3G2RO AGBUTREI CURRFJD6 72CZ5JW5 B4XDQA3G PGQPJRUI WQEQC7HL HKM6IJDH O5ORVYXD C_z{7
25 6I2RETFE PEI5KW4G NWIIT735 BZNLOYIZ BCEQ3MFP YISW5EPF SFYNV43Q EFBYVVJE KFQRNLWW EKA2DDB3 =XvQB
26 JKA2XSG7 FSPC6BVU UIE2LPY2 J5Z3IR4H NCCRYJOL HKI6H5KA JYEHK4LO YN2RETHB KF7KSBU KJUITXOT s)Aiu
27 PI43HYM7 KZYWGPF7 BAVVJ3GH 5BSJAP5E C27UTJRQ V3X6ML3M TX3TPQQP YZA56VYP CS6UXUW4 K5T3JT37 (N?Yk
28 VTQFBOVE KMSRV3SN DUJ27SMV KYPHMZOI QKHA7KZP RUKVM6HZ 7XZ4T2M6 7BMJ4MFV RP472GEL XQOI7XPD 9eDvY
29 5Y6URN4Z ECLMXRQY BTW3XSW2 XBQIYHG3 EVFGMYAB I4XWAPJV PKPSXXII UFE2B776 WAGOUW4K ZZ75WR2R I{TxS
30 3LERFZDE S7RUWVVW XFQSSIQZ H6RPV27H 6O6PWKMQ Q5G2VTOZ WHL2GM5Z V6EZYRFH MPAWTEPO HJPGULSV @xe6G
```



01	ALJNIBAK	PALBG3O3	RFYB3Z6O	2QOJPIVN	FSEDCQNH	QKZGC7Q4	YD56GLWT	5KFZ2ISF	OKSMUBQJ	FLYLEVIZ	N__RN	
02	43FVZIW	H	3HYLEGG	G3DYTTDK	DNA26LNN	6M6G7KLP	WNOOAZNS	4I26L7E6	KFFFGGHX	AW3KFEKT	EZJT6W7P	dziQ~
03	EBRRB74T	LHUL55AU	XD	XGM7SD	QRIPN2PC	KYO6GLRN	4ZZI6UFA	S3IBHXTR	NW6V4UDR	2QZEACXA	HNDWHZBM	b+_dw
04	7ORITKED	4TWUQXD5	AEBVD5QP	SGF4SPQO	AJVZHDCC	CSW4NZTV	GDO7GVQO	VAJGLUVB	5GNKIQV3	YR3LQYJG	JdD1d	
05	HJBAJXKF	VDDWVBPG	GZKCFP5Q	Q2V3EGLN	CEDBB46C	GPD3AHET	CQQQVPWR	MBQLO36X	JAU2IKOT	K56GK7H4	pyrkI	
06	QIIHVKIE	DPWST7NW	LXT2R2W2	J6DXCL2Z	TRO7WCYC	WSODDJQW	HYUTHQ2R	DL4NOL6R	ALH4SURN	ZSELOO6F	v#k2>	
07	53QGJAQU	H4JWAITJ	Z2IZM32L	KF6S3IAR	KXMRVMVG	3YL727CC	Y2SCVFO2	5PPQ62WX	6DGYHQLT	SBVPCSUZ)Mn3	
08	W3CA2DUN	SZT6TPMW	FTTGXWCK	WHLRYC4B	XFxE4J7N	K22CA3WF	MHCQSQUW	YGKXNLWH	PAWIEKO2	ZS7TH5CS	j; &Zb	
09	P7CFHGWR	RKK4JFMJ	SZJASBMR	GBJPPC2M	5NHOXLPF	P7OXIXEC	FYYFNUQ4	4DFKMYSJ	4GHP3PGY	LSVBPQR	^K6O^	
10	TKBGH3N5	3TN7K6P4	O7NMJAOE	HYEP3EGO	BIQHBLRC	EIHMTUS	JW4ER6NS	JUXFYATL	CWZO2YR	FSLFQEKW	>p8FE	
11	S6E6BOQV	VYX2FMQY	ABNMS665	IAEXX7IH	AOAILAUJ	7L7SBLMG	SMNTXSQO	4KKI2XKH	3LU7H5UK	D72Z65P2	w`M(1	
12	2UZSDGMM	CIBKR7JQ	SNUQBLGC	T3SXLJNE	HYT3I6ZD	7IUEJ5LU	EAJUJEAJ	36WIAMCT	3UURLA2C	HXEFGFPY	PT_40	
13	VDWAJ2EO	BJ34VEZS	GKX65ANG	LVGXWPYD	JZY5MT5J	VJDXCZED	WOQZ2PMC	XAITXSKG	ICQVZAPI	IKRTGIO5	8%emX	
14	GC6DHKBZ	NQ5VQC7R	462MU3WO	OKS62HR4	7QTROCXH	ALIEN5U7	KF5JJPZ5	LT2H7TMU	FHIPTAYT	WQ4GVK4Y	t0`Kw	
15	HFZS46O2	Q6B4MJWM	CPTY5QXC	YCOG3SML	4KT3E756	PHLEC45W	X6U5BNRX	J33C7YOE	RK35GTI7	FESB2VWR	!mTAN	
16	BTDUQP33	ZDDX2UQM	WL3FKS5B	NILUH3TS	XLOIM2DK	QUM7IBJY	DOHNUWBH	HCUJCMF4	NAGT5QXI	KFSVUIDL	Jq?L{	
17	JY36QVWX	YUCLLVR3	RQLBXE7J	ISUL3V3J	X6GDT3VR	YY4D47QL	ZOW242TB	37E7BDDN	5P62FJGQ	IGDOQCG3	xd#19	
18	Q3R2QFND	MY5ZR4S6	C7TQPZJD	CLH2XEMF	LQCI7MSU	7A22RROR	UQPKSQEM	X7STWMHQ	7SHDQIMV	HYKXTGMO	+t9%1	
19	JCE3LCVK	RF3JWHHA	T7MLJ2IB	FQDME2DZ	GQREW4Y5	ZYLKOGAC	ZAK75I5M	BT6A6MIM	Y5JG3POI	P4E5FWHL	u5x5!	
20	OXJKOQVJ	3JIKGI7J	TIOCDFM2	IL6K7GHJ	WOHB3LD2	SRTGL6W4	SAYS2I1J	YWZFM3HK	VSEPHOHC	XHGHPJWV	^gyeS	
21	PQO6BPBX	N4JW7V4F	5KGQOEPO	HOJQX6IV	43KLX57V	NOCE6EHO	6N3N2XG4	YBHNAMAQ	RYY4AT7G	D5UP7QRJ	uT`I}	
22	RVQHf3GS	UO4NBRsq	NTKXKV3T	IJ4V3ZJ7	I2WEUV73	RHVNW3KY	YOS34PSG	OJj5X4YG	Q3YNBRH6	TQ=====	&_f53	