

LAB 1

Cracking codes

EXPERIMENT 1.1. Open Mathematica and compute $2+2$. Hint: Shift+Enter.

EXPERIMENT 1.2. Try out the `StringReplace` command:

(a) What does `StringReplace["asdf", {"a"->"b"}]` do?

(b) Why doesn't `StringReplace["asdf", {"S"->"B"}]` change anything?

(c) How do you change two letters?

PROBLEM 1.3. Use `StringReplace` to decode the following text encoded with a Caesar cipher. Write down the formula for the cipher and the author of the text.

QNaN RB SJVNB QNWAH CAXCCNA FQNW QN FJB JKXDC OXDA HNJAB XUM.
DY DWCRU CQRB CRVN, QN QJM QJM J QJYH URON, URERWP YNJLNODUUH FRCQ
QRB VXCQNA JWM OJCQNA RW J KNJDCRODU QXDBN KNBRMN CQN BNJ. CQNaN
FNAN JUFJHB YUNWCH XO XCQNA LQRUMANW OXA QRV CX YUJH FRCQ, JWM CQNaN
FJB J BJWMH KNJLQ OXA QRV CX ADW JKXDC XW, JWM CQN XLNJW CX YJMMUN
RW. RC FJB CQN YNAONLC URON OXA J BVJUJ KXH.

CQNW, XWN MJH, SJVNB VXCQNA JWM OJCQNA FNWC CX UXWMXW CX MX
BXVN BQXYRWP, JWM CQNaN J CNAARKUN CQRWP QJYNNWNM. KXCQ XO CQNV
BDMNNUH PXC NJCNW DY (RW ODUU MJHURPQC, VRWM HXD, JWM XW J LAXFMNM
BCANN) KH JW NWXAVXDB JWPAH AQRWXLNAXB FQRLQ QJM NBLJYNM OAXV CQN
UXWMXW IXX.

PROBLEM 1.4. Use `StringReplace` to decode the following text encoded with an Affine cipher (a cipher of the form $ax + b$). Write down the formula for the cipher and the author of the text.

Y EAPZ ZI GDAAB EYZF WQ MSW YP WQ WISZF CPH PIE ZFANAG MSW YP
 WQ FCYN CPH EFAP Y MIZ ISZ IT VAH ZFYG WINPYPM Y ZNYBBAH IP ZFA
 GKCZAVICNH CPH VQ WYGZCKA Y HNIBBAH WQ GEACZAN YP ZFA GYPK EFYDA
 ZFA ECZAN ECG NSPPYPM CPH Y OISDH ZADD YZ ECG MIYPM ZI VA C ZANNYVDA,
 FINNYVDA, PI MIIH, LANQ VCH HCQ.

PROBLEM 1.5. Use `StringReplace` to decode the following text encoded with a substitution cipher. Write down the author of the text.

THJFN ITY ENCJRRJRC BM CNB DNKS BJKNO ML YJBBJRC ES WNK YJYBNK
 MR BWN ETRA, TRO ML WTDJRC RMBWJRC BM OM: MRFN MK BIJFN YWN WTO
 VNNVNO JRBM BWN EMMA WNK YJYBNK ITY KNTJRC, EZB JB WTO RM VJFBZKNY
 MK FMRDNKYTBJMRY JR JB, TRO IWTB JY BWN ZYN ML T EMMA, BWMZCW THJFN,
 IJBWMZB VJFBZKNY MK FMRDNKYTBJMRY?

YM YWN ITY FMRYJONKJRC, JR WNK MIR GJRO (TY INHH TY YWN FMZHO,
 LMK BWN WMB OTS GTON WNK LNNH DNKS YHNNVS TRO YBZVJO), IWNBWNK BWN
 VHNTYZKN ML GTAJRC T OTJYS-FWTJR IMZHO EN IMKBW BWN BKMZEHN ML CNBBJRC
 ZV TRO VJFAJRC BWN OTJYJNY, IWNR YZOOMRHS T IWJBN KTEEJB IJBW VJRA
 NSNY KTR FHMYN ES WNK.