

# Math 401 Fall 2019

## Cryptology HW 1

### Due Thursday, September 5

1. Encrypt the plaintext message “GO HANG A SALAMI” using a Caesar cipher with a shift (to the right) of 7.
2. The following ciphertext has been encrypted with a Caesar cipher (with an unknown-to-you shift). Decrypt the message.

XBPAPHPVCPWDV

For the next two problems, use the following symmetric cipher table:

Plaintext	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ciphertext	O W M R X G Q U D V F I Y S L E H J T Z K N A P B C
Ciphertext	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Plaintext	W Y Z I P K F Q L R U O C V A X G D N S H J B E M T

3. Encrypt the following plaintext message: “A MAN A PLAN A CANAL PANAMA”
4. Decrypt the following ciphertext message: “YOROYDYOROY”
5. What can you tell about the message in the previous problem without actually deciphering it? What does this tell you about the strength of a monoalphabetic cipher?
6. Decrypt the following message, which was encrypted with a monoalphabetic substitution cipher:

KZRNK GJKIP ZBOOB XLCRG BXFAU GJBNG RIXRU XAFGJ BXRME MNKNG BURIX KJR XR SBUER  
 ISATB UIBNN RTBUM NBIGK EBIGR OCUBR GLUBN JBGRL SJGLN GJBOR ISLRS BAFFO AZBUN  
 RFAUS AGGBI NGLXM IAZRX RMNVL GEANG CJRUE KISRM BOOAZ GLOKW FAUKI NGRIC BEBRI  
 NJAWB OBNN O ATBZJ KOBRC JKIRR NGBUE BRINK XKBAF QBROA LNM RG MALUF BBG

Letter	A B C D E	F G H I J	K L M N O	P Q R S T	U V W X Y	Z
Frequency	16 32 5 - 7	8 22 - 16 11	13 10 8 20 12	1 1 28 7 3	14 1 2 10 -	6

Letter	B R G N A	I U K O J	L X M F S	E Z C T W	P V Q
Frequency	32 28 22 20 16	16 14 13 12 11	10 10 8 8 7	7 6 5 3 2	1 1 1

Bigram	N G R I B U B R
Frequency	7 7 6 5