

# Math 4981 Spring 2021

## Cryptology HW 1

### Due Thursday, January 21

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. What can you tell about the message “YOROYDYOROY” without actually deciphering it? What does this tell you about the strength of a monoalphabetic cipher?
5. Decrypt the ciphertext message: “YOROYDYOROY”
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 OBNNO 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	NG RI BU BR
Frequency	7 7 6 5