**USC UPSTATE**

**CSCI 455: Computer Security**

**Spring 2019**

**Lab 1**

**Problem 1**

Suppose that FJAV is the ciphertext of a *common English word* produced by the Shift Cipher, but the secret key is unknown. Can you determine the secret key and the plaintext (i.e. the original English word)? If so, give the secret key and the plaintext, and describe how you find them. If you choose to write a program to solve this problem, please attach your code and the screenshot of your output here.

**The secret text is warm. The key is 17.**

**Problem 2**

The following text is generated by applying encryption using a substitution cipher. The plain text message is written in English. Write a program to help you obtain the plain text. Attach your code and screenshots of your output here.

ZYEMOUSOUSIZWYIXOKSOTZQSOBSYLSWDKHTMOWARMSKSRRSILISFESWBHSTOISQISRRZWSOIRYRMSOUSIODSTLYISWDKHTMOWAWYEWBYXXYWSWDKHTMGYIATOISQISTSWRRMSYRMSIRSVRTGHKKWYRJSTYSOTZOWAXOZJSMOIARYAYJISONHWDRMHTBHQMSIJZMOWATMYEKAWYRJSAHLLHBEKRRYAYMYGSUSIRMHTSVSIBHTSOTNTZYERYGIHRSOQIYDIOXRMORORROBNTBHQMSITOERYXORHBOKKZOWAJISONTRMSXGHRMYEROETSIMOUHWDRYPEXQHWOWAXONSOBMOWDSOTHXQKSJIERSLYIBSOQQIYOBMHTWYRWSBSTTOIHKZRMSWHBSTRGOZRYAYWSRMHTRMSRIHBNRYAYHWDRMHTGHKKJSRYASRSBRGMSWRMSTEJTRHRERHYWHTWYRIHDMROWARYLHWAOJSRRSIYWSETHWDRMSLISFESWBHSTRYDEHASZYEDYYAKEBN

Hint: The following table contains the frequencies (as a percentage) of each letter in common English texts.

e 12.7 t 9.1 a 8.2 o 7.5 i 7.0 n 6.7 s 6.3 r 6.0 h 6.1 d 4.3

l 4.0 c 2.8 u 2.8 m 2.4 w 2.4 f 2.2 g 2.0 y 2.0 p 1.9 b 1.5

v 1.0 k 0.8 j 0.2 x 0.2 q 0.1 z 0.1