

**CIS 3362 Homework #2: Substitution Code Breaking, Vigenere**  
**Due: Check WebCourses for the due date.**

**Directions: To be done in pairs. If you can't find someone to work with, you must submit individually. When you submit, please CLEARLY mark both group members on each document you submit.**

1) Decode the following message, which was encrypted using the substitution cipher. Make sure to discuss all the steps you took, the key you arrived at, and the decoded message.

zjslyoajjzzafxosfojlycsbjnywpzovypxzufxoajzpzzjgstysojptsfo  
ajdjsgpsvoajsgkcoufxoaysyeofsyjrjbbpsdfsbybclnvgxfcwtpvrjszft  
yoajsgjafwyvfcpxyxydpjsgoajzjuvfcpxyvfcapiydfsyypgffdqfkdylw  
ayxjsgoaykpjzlzckzocojfsljwayxpsdwxfkpkbvcscdyxzopsdrapojty  
psokvoxjpbpsdyxxfxpsdoayuplooaopofsllypuyrbyooyxzupbbjsofwbply  
oayxyzofuoaytmcjlnbvdfzfpzrybb

2) Decode the following message, which was encrypted using the substitution cipher. Make sure to discuss all the steps you took, the key you arrived at, and the decoded message.

1xmgcsggwmcbrc1wofjdlofjqbd1qlavfgxbwbvftfjrlwabqcgcmedllcsj  
seklojsgcalhfsls1kkbqsgchobrgmgvjsglfjrqboj1xxwbqowbd1klsjng  
ksbkenjcowkbijqgchnjsgkgcjnloflwoqbcbntbvogkwlcnsbqjcbrls1tw  
vjbxvjwvjkglxgyjgcijqtwn1xxobvgkwaeogclckgjcoognjwlklsjngkwr  
jqjhjcjqlxgwowwoestgchn1ctsgddjqjcoobvgkwbdkbeqwjlwtbelxxmcb  
rlxmgcsggwofjdgqwoobrqgojlabedqjpejcktlclxtwgwobaqjlmweawog  
oeogbckgfvjqwwekflwofgwbcjfbvjdexxttbeewjsfgwojlkfgchwrjxx

3) Calculate the index of coincidence of both of the ciphertexts above. Please write a program to do so, include it, and show the letter frequencies the program calculated (as numbers, not percentages.) Express the index of coincidence as both a fraction and a decimal. Are you surprised by the results?

4) Decode the following ciphertext that was encoded using the Vigenere cipher with a keyword from this wordlist:

<https://www.ef.com/wwen/english-resources/english-vocabulary/top-1000-words/>

To help you automate your task, I will guarantee that the substring "fast" will appear somewhere in the plaintext.

Here is the ciphertext:

uaztkwfmazkohrispmazekvlrwtiexfofekmrcbnoaaaaxaqnmqrrajmzkvgm  
lvszsrtbmqngigpwilparqsgtbplmteztuxtipbbhrrzijxngptuetegxbfmt  
vcgpxcfvmnghkgutuxdtrxzjavnimrgiyyeeparqtnixsazqrghowomcaqrg  
edxuwgaqsyocidcbndpeomvmqjbxleutfgxfhyeghorspvdqtuiyaupylfiyl  
hihierrafthioehlqiuaabismixzybuysrijparqszsfsf1