

**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.

zjslyoajzjzzafxosfojlycsbjnywpzovypxzufxoajzpzzjgstysojptsfo  
ajdjsgpsvoajsgkcoufxoaysyeofsyjrjbbpsdfsymbclnvgxfcwtpvrjszft  
yoajsgjafwyvfcpxyxypdjsgoajzjuvfcpxyvfcapiydfsypgffdqfkdyljw  
ayxjsgoaykpszjlzckzojocojfsljwayxpsdwxfkpkbvcsdyxzopsdrapopty  
psokvoxjpbpsdyxxfxpsdoayuploapoofslypuyrbyooyxzupbbjsofwbpjy  
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.

lxmgcsggwmcbrcclwofjdlofjqbdlqlavfgxbwbvftfjrlwabqcgcmcdllcsj  
seklojsgcalhfslslkbbqsgchobrgmgvjsglfjrqbajlxxwbqowbdlklsjng  
ksbkenjcowkbijqgchnjsgkgcjlnoflwoqcbntbvogkwlcnsbjqcbrrsltw  
vjbvxjwvjkgxlgyjgcijqtnlxxobvgkwaeogclckgjcoognjwlklsjngkwr  
jqjhjcjqlxgwowwoestgchnlctsgddjqjcoobvgkwbdkbeqjwlwtbelxxmcb  
rlxmgcsggwofjdgqwoobrqqojlabeodqjpejcktlclxtwggwobaqjlmweawog  
oeogbckgvfjqwwekflwofgwbcbjfbvjdexxttbeewjsfgwojlkfgchwrjxx

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:

uaztkwfmazkohrispmazekvlrwtiexfofekmrcbnoaaaaxa qnmqrrajmzkvgm  
lvzsrtbm qngigp wilparqsgt bplmtetzuxt ipbbhrrz i jxngptuetegxbfmt  
vcgpxcfvmnghkgutuxdtrxz javnimrgiiyx eeparqtnixsazqrghowomcaqrg  
edxuwgaqsyocidcbndpeomvmqjbxleutfgxfhyeghorspvdqtuiyaupylfiyl  
hihierrafthioehlqi uabismixzybuysrijparqs zsfvl