

## HW 2 CMSC 389. DUE Jan 5

1. (0 points) Write your name! READ the notes online english.pdf. It is on the course website, or on the syll on Elms.
2. (15 points)
  - (a) Alice wants to use a KEYWORD SHIFT CIPHER with keyword *Phong* and shift 1. Write the table of what *a* maps to, what *b* maps to, etc. Show your work.
  - (b) Alice wants to send the message *Justin*. What does Alice send?
3. (20 points) (READ ABOUT KEYWORD MIXED CIPHER IN ciphers.pdf NOTES.)
  - (a) Alice wants to use a KEYWORD MIXED CIPHER with keyword *Phong*. Write the table of what *a* maps to, what *b* maps to, etc. Show your work.
  - (b) Alice wants to send the message *Justin*. What does Alice send?
4. (15 points) Write a program in psuedocode that will scan a text ONCE and compute the vector of probabilities of letters.
5. (15 points) Write a program in psuedocode that will, given a text that has been coded by an AFFINE CIPHER outputs the original text (so in English). You will need to write a new version of IS-ENGLISH? and DECODE from the notes. You can assume that if a text is coded with AFFINE then  $d(\vec{q}, \vec{p}) \sim 0.44$ .
6. (15 points)

STUDENT: Your method of decoding Shift Cipher is B\*L\*S\*I\*T! Just find the letter that occurs the most often and assume its *e* and go from there.

TEACHER: Okay, code that up and see how well it works.

So, help out this obnoxious student. Write pseudocode (like whats in english.pdf) that, given a text that IS a SHIFTED text finds the most freq letter and uses that to output the DECODED text.
7. (20 points)

STUDENT: Your method of decoding Affine Cipher is B\*L\*S\*I\*T! Just find the two letters that occurs the most often, assume they are *e* and *t* and use those... somehow.

TEACHER: Okay, code that up and see how well it works.

So, help out this obnoxious student. Write pseudocode (like whats in english.pdf) that, given a text that IS an AFFINE-coded text finds the TWO most freq letters and uses them to output the DECODED text. You can assume that if a text is coded with AFFINE then  $d(\vec{q}, \vec{p}) \sim 0.44$ .