Fundamental Structures Lab 09
(Due Date: 04/04/2016 4:30 pm)

Background on Caesar cipher

It is a type of substitution cipher where each letter in the plaintext (a sentence that needs to be encrypted) is replaced by another letter which is shift of fixed number of positions in the alphabet. While constructing encrypted text (Encoded text of the plaintext), the alphabet set is wrapped around once we reach the end of alphabet list. E.g., with a right shift of 3, 'a', 'b', 'z' of the plaintext would be replaced by D, E, C in the the encrypted (cipher) text. The numbers corresponding to the alphabet set are 0,1,2. . . 25.

Algorithm to encrypt:

1. Input a string without space
2. Read every character from the input string and find the corresponding numbers from the alphabet set
3. Input a key (any integer) and save it to 'k'
4. Encrypted character of a given plaintext character 'x' is the character (x + k) mod 26
5. Repeat this for every plaintext character
6. In the above discussed example, key is 3.

Algorithm to decrypt:

1. Input the above encrypted text
2. Use the key from the above encryption step
3. Decrypted character of the given encrypted character 'X' is character (X - k) mod 26
4. Repeat this for every encrypted character

Program 1 - 25 pts

Write a program to compute encryption for any user input string with user input key using the above algorithm. For simplicity you can assume that the key is 2.

Sample example:

1. Plaintext: runnow
2. r is 17, the encrypted character for r is (17+2) mod 26 = 19. So encrypted character in the alphabet set at 19th position, which is 'T'.
3. Repeat this for every character
4. Encrypted text: TWPPQY

Program 2 - 25 pts

Write a program to compute decryption for the above decrypted text with the same key.

Sample example:

1. Plaintext: TWPPQY
2. T is 19, the decrypted character for T is (19 - 2) mod 26 = 17. So decrypted character in the alphabet set at 17th position, which is 'r'.
3. Repeat this for every character
4. Decrypted text: runnow

Submission Example

Extraction of LastnameFirstnameLab01.zip

```
/Documents
    LastnameFirstnameLab01.zip
    /LastnameFirstnameLab01
        /prog1
            prog1.cpp
        /prog2
            prog2.cpp
            A2Output.txt
       /Bonus
           bonus.cpp
```

Important reminder: Minimum penalty of plagiarism is failing (F) grade in the course.