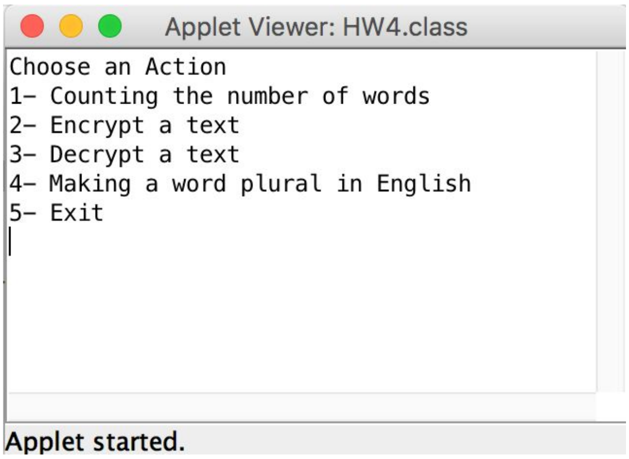
CS101 Homework 4 : Cipher
Deadline 14 April, 2016 till 23:55

In this homework, you will work on strings. You will implement a program that has a menu for 4 different actions: 1) Given a word and a text finding out how many times does the text contain this word, 2) and 3) A cipher that will encrypt/decrypt the given string, 4) Creating a regular plural word and 5) Exit the program. Your program will print out a menu that will print the possible options after every action and at start up. The menu structure should be as given below :



```
Choose an Action
1- Counting the number of words
2- Encrypt a text
3- Decrypt a text
4- Making a word plural in English
5- Exit
```

The user will choose an option from the menu. For example, if the user enters 2, you will encrypt a given text. Counting the number of the words option will get an input string and print out the number of words on the screen. Making a regular plural word in English will get an input string which is **singular(you do not need to check if the input word is singular)**. You may follow these rules :

a) If the word ends in s, x, z, ch or sh add es to the word.
e.g. : box -> boxes

b) If the word ends in y and the y is preceded by a consonant, change the y to ies.
e. g. : duty -> duties

c) In all other cases, add just an s.
e. g. : geek -> geeks

To encrypt or decrypt a text, you will implement a cipher phase: You will write a code that will encrypt and decrypt a given string according to the given **key** which is an **integer**. Your cipher will apply the following transformation to the given string. This is an extension of the Ceasar Cipher :

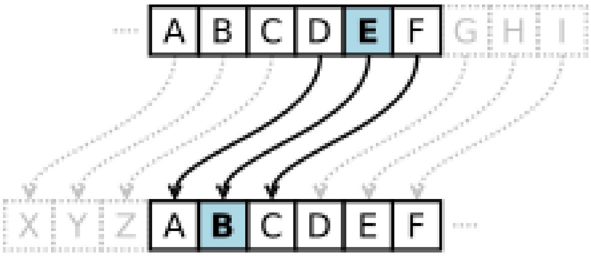
1. Reverse the given string e.g. dude -> edud

2. Cipher the reversed string.
   1. Encrypt only characters with double index e.g. in edud only e and u characters will be encrypted (indices 0 and 2 in “edud”).
   2. Use Ceasar Cipher to encrypt a character :

Ceasar cipher shifts the given character by a value of **key (which is the input to the cipher).** For example with a key of 1:

d -> c , f -> e , h -> g , a -> z

Following image illustrates Ceasar cipher with a key of 3 :



i.e. d -> a, e -> b, f -> c

For decryption phase you will have to undo each operation one by one in order to obtain the true string which is encrypted by your algorithm**(ignore uppercase part for decryption)**.

Encryption Example for key of 1 :

dude- > edud -> ddtd -> DDTD

Decryption Example for key of 1 :

ruhltj -> suiluj -> julius

IMPORTANT :
When Cipher phase is chosen (2 or 3 in menu) your program should **first** ask for the text, **then** ask for the key !

Coding Instructions :

- Submit a file named **Cipher.java** to the LMS **submissions with different names will be disregarded!**

- **Everything should be implemented in methods e.g one method for menu print another method for count words etc..**

- Make sure your program **compiles and runs before submitting otherwise you will get 0 from your homework (no exceptions).**

- **Do not use any structure that is not mentioned in class. If you would like to use such structure consult to your instructor.**

- The first lines of your code must include your name, surname, student number,and department as a comment. An example comment is as follows:

  ```
  /* John Smith S0001 Department of Computer Science */
  ```

- Submit .java files only. Do NOT submit .rar, .zip, .doc, .class, etc. files.

- **IMPORTANT : Add comments to your code that briefly explains what your code does such as :**

  ```
  int x;   // x holds the number of square
  ```