Software Engineering II

Lab Assignment I

Cipher Tool

In this assignment, you will create a java program for a cipher tool that:

- Takes as input:
    a. A ***message*** to be encoded: This message should not be empty and contains at least one letter (If the input message does not satisfy these conditions an error message should be displayed accordingly.)
    b. A ***shiftNumber***: This input should be an integer in the range (0-25) inclusive. (Similarly, if the input shift number is out of these bounds, an error message should be displayed)
    c. A ***rotateNumber***: This input should be >=0 (Similarly, if the input shift number is out of these bounds, an error message should be displayed)
- Returns as output:
    a. The cipher encoded text which is generated as follows:
        i. All letters (a-z, A-Z) will be shifted by the number of characters specified in the *shiftNumber* as in **Caesar Cipher (Hint: lookup on how the Caesar Cipher works**) and all the other characters should remain unchanged. Additionally, Capitalization should be preserved, for example, "**Cat"** with *shiftNumber =1* should give "**Dbu"**
        j. All characters will be rotated right by the number of characters specified in the r*otateNumber,* with letters from the end wrapping around the front. For example, "**Cat"** with r*otateNumber=1* will be "**tCa".**
        k. The encoded text should be displayed using the below message "Your cipher encoded message is ……". If the inputs are invalid, the output should be set to an empty string and the corresponding error message should be displayed.

Error Messages

If the user provides an invalid input. The following error messages should be displayed.

1. **"At least one letter should be provided"** → When the message is an empty string or contains no alphabets.
2. **"The Shift should be between 0 and 25"** → When the input shift is out of the *shiftNumber* bounds.
3. **"Rotation should be greater than or equal zero"** → when the input *rotateNumber<0*
4. **"No Encryption Applied"** → when both rotate and shift equals to zero.

Some Test Cases are shown below:

message = " Up with the White and Gold!", shift=25, rotate=0 → " To vhsg sgd Vghsd zmc Fnkc!"

message = " 123AbcCat123", shift=0, rotate=3 → "123123AbcCat"

message = "35505!"shift=5, rotate=0 → Error message : **At least one letter should be provided**

message = "valid message invalid shift"shift=30, rotate=0 → Error message : **The Shift should be between 0 and 25**

message = " zero shift and rotate", shift=0, rotate=0 → Error message **"No Encryption Applied"**

message = "Cat", shift =1, rotate=1 → uDb.

Instructions:

- In your project, you are required to create two separate classes, the main class and the cipher coder class. Each class should be in a separate .java file.
- Based on the problem description, in the cipher coder class, determine the required attributes and methods.
- In the main class, you should prompt the user for the input message, shift number, and rotate number, and pass these arguments to the object you created for the cipher coder.
- In the main method code that you will submit, you should test all the cases above
- For each character in the message, you should check whether it is a letter or not. Additionally, if it is a letter you should check if this letter is upper case or lower case as upper case should be preserved (Please look up on how these 2 checks should be done in Java).

Submission Instructions

1) Please name your project (FirstnameLastNameAssignmentOne).
2) Zip the project folder and upload the zip file on moodle.
3) The deadline for submitting this assignment is at the next class time.