

INFSCI 0017 – Fundamentals of Object-Oriented Programming (Fall 2018)

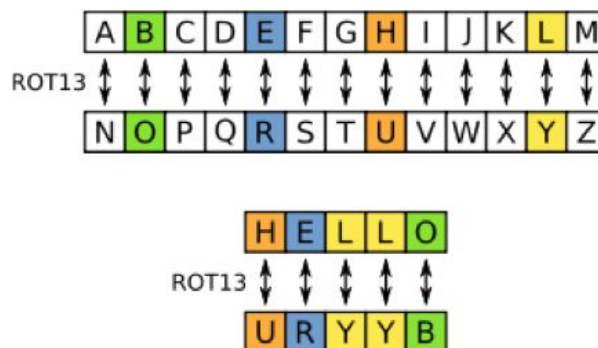
Assignment 1

General aspects

- Create a new Java project in Eclipse named **YourPittID_Assignment1**. For example, if your Pitt ID is abc123, your project should be named *abc123_Assignment3*.
- Within your project, create a new package named **edu.pitt.is17.assignment1**
- Do not use numeric or String literals – all numbers or Strings must be assigned to variables or constants! Any fixed factor or fixed String used in a computation should be defined as **constant**.
- Write meaningful comments for every variable and every step in your solutions – make sure to explain what each variables represents. The goal is to make you explicitly reflect about every step in your program.
- Follow the **name conventions** for naming your classes, variables and constants.

The problem: crypto me

Rot 13 is a simple cipher algorithm that takes advantage of the ASCII code associated to each character. Consider that character letter 'A' (uppercase) has the code 65, 'B' is 66, 'C' is 67, and so on until 'Z' which has the code 90 (see the ASCII table below). Rot13 simply adds 13 to the code of each letter, and if the sum goes beyond the 'Z' (90), then continues on the 'A' (65). For example to cipher the letter 'R' (82), it sums 13 going beyond 'Z' by 5 and count 5 from 'Z' to 'A', 'B' up to 'E' ($82 + 13 = 95$, 'Z' is 90, so continues counting 5 more from 'A', 'A' count as 1). Since here are 26 letters in the alphabet, the cipher approach is completely reversible. As you can see in the figure at the side, the letters 'A' to 'M' have a mapping to the letters 'N' to 'Z' and vice versa.



source: <http://en.wikipedia.org/wiki/ROT13>

If this explanation is still confusing, please read the Wikipedia article:
<http://en.wikipedia.org/wiki/ROT13>

You need to implement a program that allow the user to encode and decode strings using Rot13.

A) Implement the method:

```
public static String rot13(String input)
```

This method has to perform the encryption as described before. Use a **for** or **while** loop to go through the characters in order and convert them by adding 13 to the ASCII code of each character. TIP: in each iteration, you can have something like this:

```
char a = input.charAt(i);
```

```
a = (char) (a + 13);
```

Of course you will have to check in which half of the alphabet the char a is before adding 13, because if the letter is in the second half ($a \geq 'n'$) then you better subtract 13.

B) Implement the method

```
public static String breakLines(int maxLength, String text)
```

- This method breaks the text (parameter text) into lines of no more than maxLength size.
 - TIP 1: you can use '\n' as a new line character. To add it, you will need to break the string first and then concatenate it together again putting '\n' in between.
 - TIP 2: the length of the text divided by maxLength gives you how many times you will have to break a new line. Use a for loop iterating that number of times to do the process.
- You can break the text in any position, not necessarily a blank space. For example, the first break goes in the character at position maxLength.

C) Make a program that ask the user to input a text and apply rot13 to it.

- Use JOptionPane to get the input and to display the output
- If the text to display has more than 50 characters, break it into separate lines (each line of no more than 50 characters). **USE THE METHOD *breakLines()*.**
- Make the program keep asking the user to input until the user input 'Q' or 'q', which should terminate the program. TIP: use a while or a do-while loop.

Assignment 1 is due on Friday, October 12th before midnight. Use CourseWeb to submit.