CS 103 Assignment 3

You have 4 tasks in this assignment . A code base is provided to you, you just need to implement the functions.

Q1

Write a method **calculateGaussian** that takes 3 parameters **(x,** μ, σ**)** and then calculates the following equation (*Gaussian Distribution*) and returns the $y$value:

$$y = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$\begin{aligned} \mu &= \text{Mean} \\ \sigma &= \text{Standard Deviation} \\ \pi &\approx 3.14159\cdots \\ e &\approx 2.71828\cdots \end{aligned}$$

You can use **`Math.PI`** and **`Math.E`** for π and e respectively

Q2

a- Write a method **extractNumber** that takes a "structured" String as input and extracts the ***double*** typed number after ":" character in the String and returns that number as **Integer**.
i.e. extractNumber(**"Number of students in class A is: 123"**) *should return 123*.

Hint: You can convert a String to Integer with Integer.parseInt() method.
i.e. **int** number = Integer.*parseInt*(**"123"**)

b- Write another method **compareNumbers** that takes two "structured" Strings as input and returns the bigger number that is extracted.
*i.e. compareNumbers***("Number of students in class B is: 45", "Number of students in class C is: 63")** *should return 63.*

Q3

Write a method that takes 3 parameters (text, keyword, index) and moves the keyword to the specified index in the text and returns the modified String. If the keyword is not found in the text, function should return "Not Found".

i.e. ***moveToIndex*****("Take me home right now"**, **"home"**, 4**)** should return “Takehome me right now”

moveToIndex**("Take me home right now"**, **"right"**, 4**)** should return “Takeright me home now”

moveToIndex**("Take me home right now"**, **"Im not here"**, 4**)** should return “Not Found”

Q4

a) Write a method replaceCharAt that takes three parameters String s, int pos, String c.

This method should replace the character at position pos with the String c and return the modified String.

For example: replaceCharAt(“ABCDEFG”, 3, “**”) should return “ABC**EFG”

b) The method in part (a) should help you in solving part (b). In part (b), write a method evaluateString that takes a String s, where String s represents a Boolean expression (for example: “F&!F|T&!F”. Your method should evaluate that string-represented Boolean expression and return the correct result as Boolean.
Hint: Priority in evaluating Boolean expressions is ! > & > |
So do **NOT** attempt solving it using a single for loop.
You better evaluate negations first (!), then AND operations (&), then OR operations (|)
Example:
evaluateString(“F&!F|T&!F”) should return true, and print the following
F&!F|T&!F
F&T|T&T
F|T
T