CS1073 Assignment #6 - Winter 2024

Due: Thursday, March 28th by 12:00 NOON in the Desire2Learn dropbox. (See submission instructions below).

The purpose of this assignment is to allow you to gain practice with GUIs and event-driven programming. It also gives you a chance to review some of the earlier course topics (e.g. inheritance, etc.)

If you have questions about the assignment, you should first go to a scheduled help session. (Locations and times for all help sessions can be found on D2L). If you have attended a help session and the issue is unresolved, you may contact your course instructor. You are NOT to discuss this assignment with anyone else (including your classmates).

I. Creating a Character Counting Application:

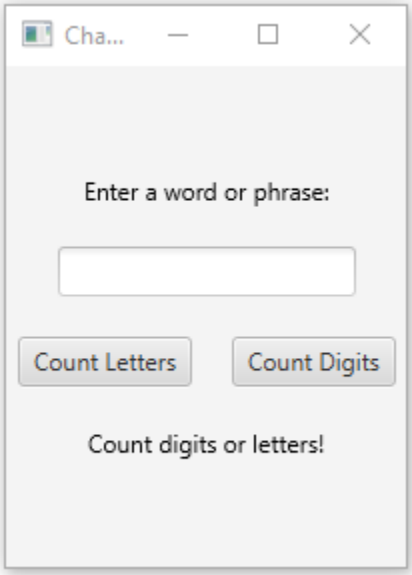
Create a graphical application (using JavaFX) that determines & displays either the number of alphabetic letters OR the number of digits in an input string. The user should be able to enter a textual string and then press one of 2 buttons to have the GUI display either the number of alphabetic characters (a-z) or the number of digits (0-9) in that input string.

Side note: You may simply use a FlowPane to arrange the components. Choose a reasonable starting width and height for the Scene so that everything is visible (i.e. nothing is cut off) when the GUI is first displayed.

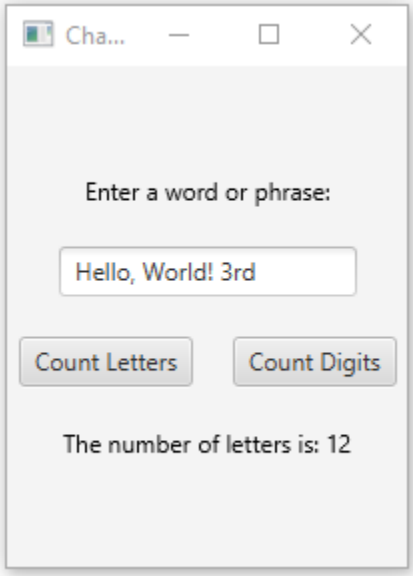
Please note:

- The case of the letters should not matter. (Capital letters and lower-case letters should be treated the same.)
- All non-letter characters (numbers, spaces, punctuation characters, etc.) should simply be ignored. Your solution should only consider either the letters or digits.
- Only the English alphabet, (sometimes called the “Latin alphabet”), should be considered. This means that letters with accents will also be ignored.

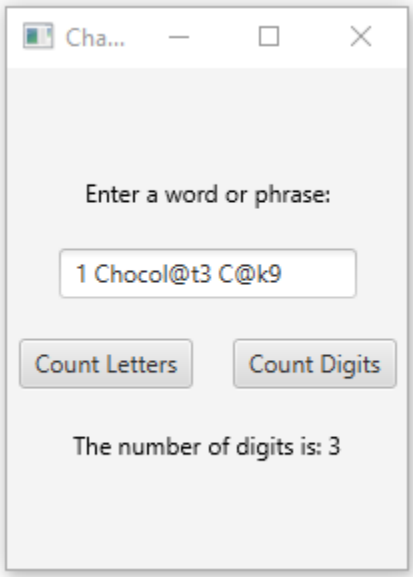
Please follow these sample screen shots (see next 2 pages):



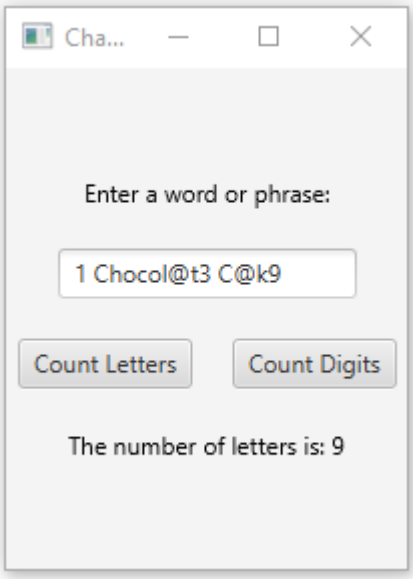
(GUI appearance when first loaded - no user interaction yet).



(User enters input String and presses the "Count Letters" button).



(User enters another input String and presses the "Count Digits" button).



(User presses the "Count Letters" button).

You do not need to write full javadoc comments for this question, but you should include a javadoc comment at the start of the class with an @author tag.

Test your program thoroughly. Once you are sure that the application is working correctly, run it again and capture 4 screenshots: one screenshot before any user interaction, three showing the output for different input strings that contain letters and digits and other characters. Make sure that you have clear filenames for each of these output images before adding them to your .zip archive. Similarly, provide descriptive labels (captions) for each output image when you add them to your report.

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II. An Application for a Hotel Room Booking:

Hotels R Us is a hotel chain that has hired you to create an application that allows guests to book rooms. Guests can book either a Suite or Standard room. To book a room the guest making the booking must provide their name, the number of nights, the number of guests (total) staying in the room, and the number of beds (total) required. Suites have two double beds plus a pull-out couch included in the base price, but each additional bed has a cost of $15/night. Suites have a base nightly rate of $380 which includes a complimentary breakfast for all guests. The check-out time for Suites is 12 noon. When booking a suite, guests will receive a free perk. The perk is determined randomly at the time the booking is made and will be either a bottle of champagne, box of chocolates, or fruit basket. Standard rooms have two double beds included and each additional bed has a cost of $20/night. Standard rooms have a base nightly rate of $225 and each guest is charged $9.75/night for breakfast. The check-out time for Standard rooms is either 10am or 11am; this is determined randomly at the time the booking is made.

a) Create three classes, Room, Standard, and Suite using the description above. Every room booking must include the name of the guest making the booking, the number of guests (total), the number of beds (total), and the number of nights. All room types **must** have a method to calculate the total cost of the booking based on the information given by the guest, and all room types **must** have a method to retrieve the check-out time. Write full Javadoc comments for these classes.

b) In order to ensure that your classes from part a) are working properly, it is recommended that you test those classes using a text-based driver before moving on to part c) and creating a GUI. Make sure that the cost of both standard rooms and suites are calculated properly. (Note: This text-based driver will not be submitted as part of your assignment and will not be marked, but it is helpful & we strongly suggest that you do it.)

c) Next, create a GUI front-end (in JavaFX) to get the following information from the guest: name, number of guests (i.e. the total number of people who will be staying in the room), number of beds, and number of nights. Guests will then click on the appropriate button (Suite or Standard) to indicate which type of room they want to book. You will then display either their perk or a message to let them know that breakfast is included in their cost, their check-out time, and total cost in the GUI. Also provide a reset button which will clear all the text fields and reset the text to the opening messages.

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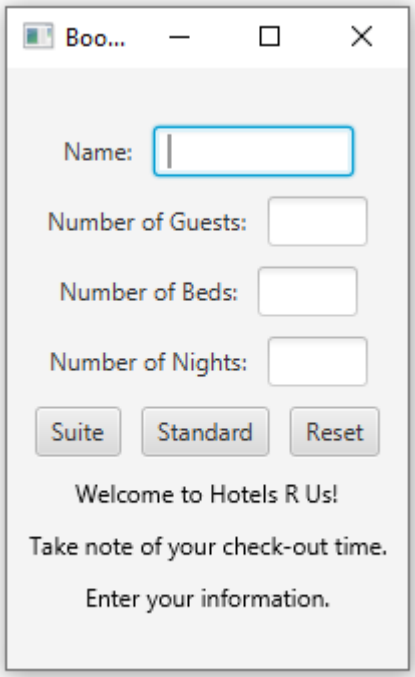
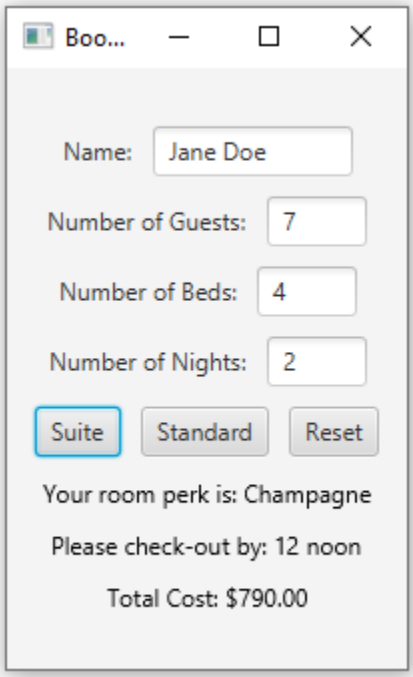
Note: For this question, you may simply use a FlowPane to arrange the components. Choose a reasonable starting width and height for the Scene so that everything is visible (i.e. nothing is cut off) when the GUI is first displayed.

Include at least 5 screenshots: one screenshot before any user interaction, three showing the output for different types of rooms with different information, and one showing the reset button works. Make sure that you have clear filenames for each of these output images before adding them to your .zip archive. Similarly, provide descriptive labels (captions) for each output image when you add them to your report.

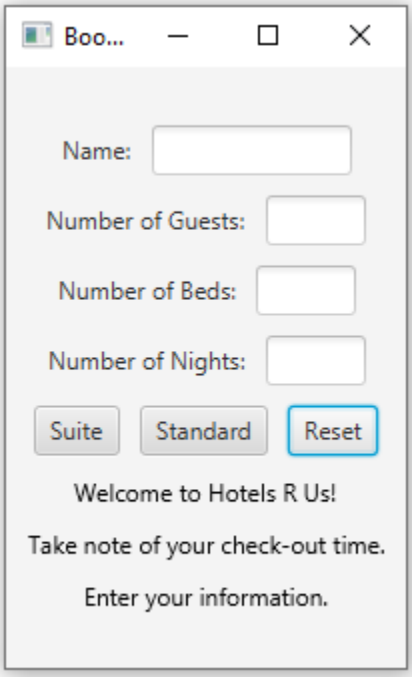
Please follow these sample screen shots (below & on the next page):



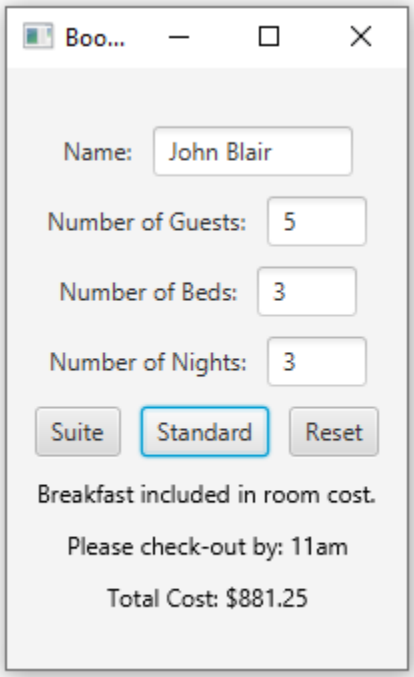
(GUI appearance when first loaded - no user interaction yet).



(User enters booking data and presses the "Suite" button).



(User presses the "Reset" button)



(User enters booking data and presses the "Standard" button).

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For this assignment, only an electronic submission is required.

Your electronic submission (submitted via Desire2Learn) will consist of two files:

i. a written report. This should begin with a title page; your title page should include: the course (CS 1073), your section (FR01A, FR02A, FR03A, FR04A, FR05A or FR06A), the assignment number, your full name, and your UNB student number. That should be followed by the sections below, with each part clearly identified with a section heading. Include:

   a. the source code for Part I,

   b. the sample output for Part I,

   c. the source code for Part II, and

   d. the sample output for Part II.

   This written report should be prepared using a word processor. (Copy & paste your java source code & output into the report document and add appropriate headings.) The report document should then be stored as a SINGLE pdf file and submitted to the appropriate drop box on Desire2Learn. (This pdf will allow the marker to write comments directly on your work to give you better feedback.)

   Note: Please name this report as follows: **YourName_As6_Report.pdf**

ii. an archive file (.zip or .tar) that contains all of your work for this assignment. Make sure that your archive includes the complete source code (.java files - in case the marker wishes to compile & run your code) and the output files (screen captures). This archive should be submitted as a single file to the appropriate drop box on Desire2Learn.

   Note: Please name this archive file as follows:
   YourName_As6_Archive.zip or **YourName_As6_Archive.tar**