Optional Extra-credit Project – CS125 (earn up to 10 points as extra in the credit)

Due: *10:00 pm, Thursday, 12/1, 2022*

Part I: Use of recursive method (3 points for students who need recursion/extra-credit)

Description:

Code a class called RecursiveMultiply using JavaFX or Swing GUI in which it will accept two integer arguments entered from user; pass these integers to a recursive method that returns the multiplication result of these two integers. The multiplication can be performed as repeated addition, for example, if two integers are 8 and 4:

8 * 4 = 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4

You will code the application with GUI (JavaFX or Swing) and recursion to display the result in a non- editable text field, based on the user's entry from two text fields, while an OK button is pressed. You will also code other two buttons (Clear and Exit) to perform the correct event handling and will utilize the exception handling code as you did in your Lab 4 with some proper modification to verify if data entered in the text fields are valid (numerical and positive integer data only).

You will make your own decision if there is any explanation that is not described in this specification.

Finally, code a driver program that will test your class RecursiveMultiply.

Part II: **GUI and animation (6 points – this is a challenge coding which is beyond the coverage of this course; it's OK if you cannot do it)**

Write a Java application using JavaFX or Swing GUI that can display a moving banner cross a window. In the layout you decide in the screen, there will be a text field the user can enter the content of the marques and OK button will send the entered content to display. There will be also a color chooser the user can change the color of the marques, and a combo box or list view the user can select the size of fonts for the marques (at least 5 different fonts ranged from 20 to 36). It's up to you to decide which JavaFX controls you use to accomplish the color chooser. You may consider using a comb box or list with at least 5 colors to be chosen if you feel difficulty to use JColorChooser. Finally, there will be another button to exit the execution of the program.

Specification for Part I and II:

1. Document all of your source code. You must provide the project info at the top of your program including your name, the class title, class #, due day, the description of the project shown in the spec of your lab 1 to lab 5.

2. The specification of this project is mainly based on the description above. You will make decision if there is any thing is not mentioned in the description, and use your imagination and be creative.

Part III: **Exercises in Chapter 14 – Recursion (1 points)**, including ***all even-numbered M/C and T/F questions, all even-numbered Predict Output, and all even-numbered Algorithm Workbench*** in this chapter. Save it as a text file and submit it as you did in your labs.

Submission Requirements (the same as you submit your labs):

Steps to make your project as a zipped Eclipse file for your lab submission

Step 1. Highlight the project you are going to submit, click on **File** menu, and click on Property as shown in Figure 1.

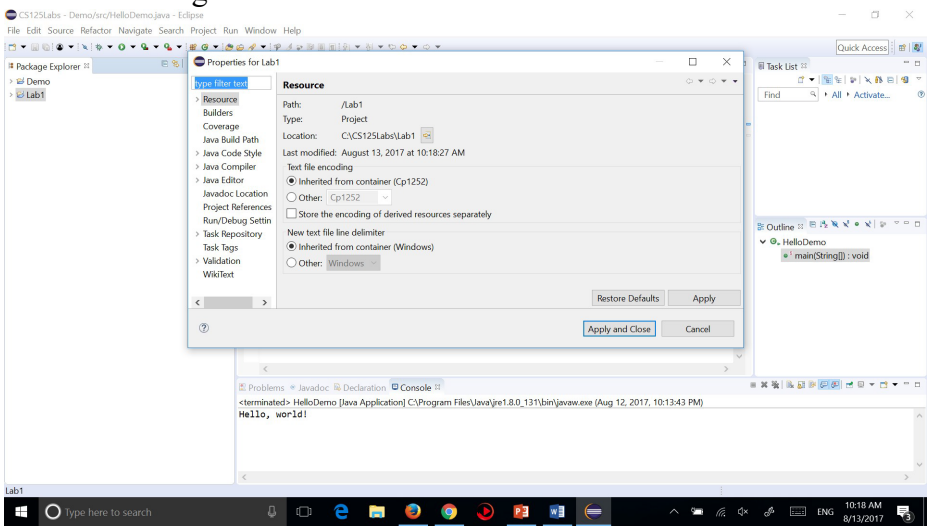

Figure 1 Property window shows the location of your project

Step 2. Click on the icon beside the location path and it will navigate to the directory your project located in your computer.
Step 3. Highlight the folder, copy and paste it to another location in your computer.
Step 4. Navigate to the folder you have done the optional extra-credit exercises, copy and paste this folder into this submission folder. Omit this step if you choose not to do these exercises.

Step 5. Make right mouse button click, select **Send to** and select **Compressed (zipped) folder** as shown in Figure 2.

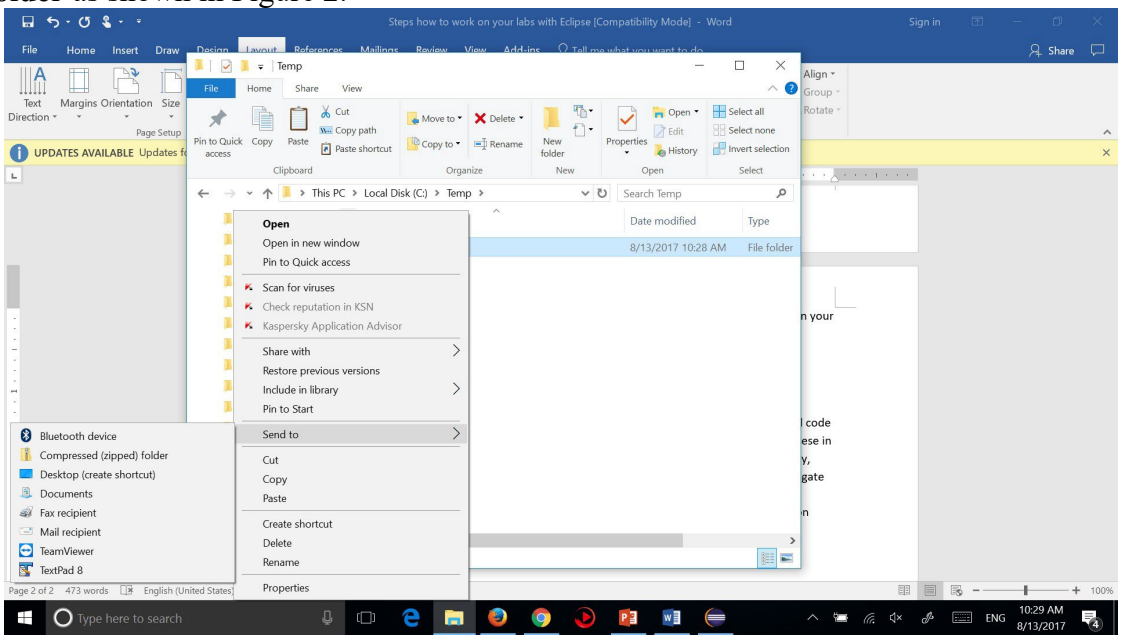

Figure 2 Steps to make a zipped file in Windows OS

A zipped file called Lab1.zip will be created and ready for your submission in canvas. Mac users may refer to steps to make a zipped file and requirement is the same.

Step 6. To test if your submission is a correct zipped Eclipse project that can be imported, opened, and run for grading, click on File, Switch Workspace, Other…, Type a new workspace name, say, Test, Eclipse will create a new window as a workspace for you, close the welcome window, then click on File, Import…, click on General, Existing Projects into Workspace, click on Next, choose Select Archive File:, browse to the folder you have saved your submission file, highlight the zipped file, then Open, and click Finish. Your zipped Eclipse project as you lab should be displayed in the Eclipse window, if you did your zipped file correctly.