GUI Programming 2021 – Year 2
Labwork 4: (6% - or 60 points out of 500 points for labwork this semester)

IMPORTANT NOTES:

- **NO COPYING PERMITTED AND ZERO MARKS WILL APPLY TO COPIED WORK. FURTHER ACTION MAY BE TAKEN AGAINST STUDENTS THAT HAVE BEEN FOUND TO COPY WORK.**
- **ASSESSMENT WILL INVOLVE ONE-TO-ONE QUESTIONS ABOUT YOUR SUBMITTED WORK. A COMPLETED SELF-ASSESSMENT SHEET WILL BE USED TO GUIDE THE ASSESSMENT. USE COMMENTS IN YOUR CODE TO ENSURE YOU DON'T FORGET WHY YOU WROTE CODE YOU MAY LATER BE ASKED ABOUT.**
- **ALL WORK MUST BE SUBMITTED TO MOODLE BY DATES SPECIFIED (SUBMISSION DEADLINES WILL BE POSTED ON MOODLE).**
- **MANY OF THE TASKS ASSIGNED BELOW CAN BE COMPLEX AND\OR THE DESCRIPTIONS MAY REQUIRE FURTHER CLARIFICATIONS. PLEASE USE THE AVAILABLE LAB TIMES TO ASK FOR CLARIFICATIONS AND ADVICE\HINTS ON THE TASKS BELOW.**
- **YOU CAN USE A SIMPLE JAVA ENABLED TEXT EDITOR IF YOU WISH, e.g., TEXTPAD or NOTEPAD. HOWEVER, I SUPPORT THE MOVING ON TO A MORE ADVANCED IDE AT THIS POINT ALSO (e.g., Eclipse or IntelliJ or NetBeans).**

Part 1 – A simple button with a listener (10 points)

Create a class called **Lab4Part1**. Create a JFrame that contains a JLabel with the text "How are you?" and a JButton with the text "Translate to X" (where X is a language of your choice and you will translate "How are you?", e.g., could become "Conas atá tú?" in Irish). Both of these components should be in a JPanel. Implement the action listener and corresponding event handler so that when the button is pressed the text in the label changes from "How are you?" to the equivalent of "How are you?" in the other language.

- Create the Label and button and add to panel and frame (2 points)
- Add the panel to the Frame (remember content pane!) (1 point)
- Add listeners to the frame and button (3 points)
- Implement the handler method (actionPerformed) (2 points)
- Set the new text of the label when the button is pushed (test it!) (2 points)

Part 2 – Button with listeners combined with JList (10 points)

Create a Java program called **Lab4Part2**. Create a JFrame with a **JList** called **colourSelector** and a **JButton** called **changeColour** (set the text of the button to "Change Colour"). Implement event handling so that when the changeColour button is pushed the background colour of the panel (the components should be in a panel within the frame) is changed to the colour currently selected in the colourSelector JList (clue: *getSelectedValue* method of JList gets the value chosen).

- Create the JList with three colours of your choice (2 points)
- Create the JButton and set the text (2 points)
- Add the components to the panel (and to Frame) (2 points)
- Add the listeners (2 points)
- Get the background colour change to work (test it!) (2 points)

Part 3 – JComboBox with listeners (10 points)

Create a JFrame class called **Lab4Part3**. Create a JFrame with a **JComboBox** to contain a list of five sports teams or books\films of your choice. Add a JLabel to the GUI also at the top of the GUI and add one JTextArea to the bottom of the GUI. Set the top label text to "Please choose your favourite team\book\movie:". Set the bottom textarea's initial text to "Response will appear here". Use panels to organize the components. Implement listeners for the JComboBox (can use ActionListener) so that once the user selects their favourite thing the bottom textarea displays the team\book\movie selected.

- Create the JComboBox with the items listed (3 points)
- Create and add the JLabel and JTextArea (2 points)
- Add the ActionListener and the event handler method to Combo (3 points)
- Get the text area to display selection from ComboBox (2 points)

Part 4 – A simple window listener response (10 points)

Create a JFrame class called **Lab4Part4**. Create a JFrame one JLabel at the top that contains the text ("Events appear here"). Implement the WindowListener interface (and the seven handler methods – leave all blank except the ONE event you wish to handle). In the windowDeiconified event handler method set the label above so the it says ""You minimized the window and then reopened". Run the program and minimize the frame then reopen it (maximize or deiconify) and you should see the message in the label has changed….if not try and fix the code to get this to work.

- Create the JLabel with the initial message and add to frame (2 points)
- Add window listeners and implement blank methods (seven) (4 points)
- Add the windowListener to frame and implement text change (4 points)

Part 5 – First full working GUI – Mobile top-up (20 points)

Create a class called **Lab4Part5**. Create a JFrame to model a simple Mobile top-up system. The GUI should provide a Top-up button, a Make-call button and a Send-text button that will reduce or add to the balance of the phone (you can use your own pricing system). At all times the balance should be visible on the screen using a label and the balance should not be allowed go below zero. It is up to you to design the layout of the GUI some marks will be awarded for the quality of the 'look' of the GUI.

- Look and design of the GUI\Layout (3 points)
- Add labels to instruct and guide the user (2 points)
- Implementation of the event listeners and handlers (all buttons) (4 points)
- Send-text reduces the balance and updates correctly (3 points)
- Make-call reduces the balance and updates displayed balance (3 points)
- Top-up values works correctly (3 points)
- System fully working (e.g. zero balance deal with) (2 points)