GUI Programming 2021 – Year 2
Labwork 7: (5% - or 50 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 – Simple Single Internal Frame (10 points)

Create a class called **Lab7Part1**. Create a JFrame that contains a JInternalFrame. The internal frame should contain two JPanels with their backgrounds set to different colours. Set the layout on the content pane of the Internal frame so that the two different colour panels take up EXACTLY half of the internal frame.

- Create and set the JDesktopPane and add frame to desktop (2 points)
- Create the internal frame and make visible within the frame (2 points)
- Add the panels to the internal frame (2 points)
- Set the layout of the internal frame content pane (2 points)
- Show the 50/50 panels in the frames (2 points)

Part 2 – Multiple Internal Frames (10 points)

Create a Java program called **Lab7Part2**. Create a JFrame that launches thirty internal frames (**JInternalFrame**). Set the location of each subsequent frame so that it is 5 greater in the x-direction and 5 extra in the y-direction. Marks will be awarded for using a **loop** AND a **method** to achieve the creation of the internal frames.

- Create and set the JDesktopPane and add frames to desktop (2 points)
- Create the thirty frames with different locations (cascade-like) (4 points)
- Use a loop to create the frames (2 points)
- Use a method to generate frames (2 points)

Part 3 – Internal Frame Containing Components

Create a class called **Lab7Part3**. Create a JFrame that contains a JInternalFrame. The internal frame should contain a JPanel with a JButton. The JButton when pushed will change the JFrame and the Internal frame titles. Make the layout of the button look reasonable (i.e., no giant button please). When the JButton is pushed change BOTH the internal frame title and the external frame title to "The title changed by pushing the Internal Frame button".

- Create and set the JDesktopPane and add frame to desktop (2 points)
- Create the internal frame and make visible within the frame (2 points)
- Add the panel and the button to internal frame (reasonable layout) (2 points)
- Add listener and handler to the button (2 points)
- Change both frame titles with button push (2 points)

Part 4 – Launching Internal frames from menus\buttons (10 points)

Create a JFrame class called **Lab7Part4**. Create a JFrame application that includes a **JMenu** called "Apps". Add two **JMenuItem** objects to the "Apps" menu called "Font App" and "Image App". Implement listeners and handler methods so that when the "Font App" is selected a **JInternalFrame** is launched to display two different types of font inside labels (choose whatever font you wish, at least two fonts must be shown). Also, implement listeners and handler methods so that when "Image App" is selected an internal frame is launched to display an image with a label (choose any image to display, within reason!).

- Create the JDesktopPane (1 point)
- Create JMenu and JMenuItems (2 points)
- Add listeners to the menu items (2 points)
- Launch "Font App" and "Image App" (1 point)
- Build "Font App" (2 points)
- Build "Image App" (2 points)

Part 5 – A suite of game applications using internal frames (20 points)

Create a class called **Lab7Part5**. Create a **JFrame** that acts like a gaming application to supply two games "X's and O's" and "Sudoku" (note the games do not need to work fully but the interface should attempt to look like the game in each case). Create a **JMenu** called "Select" and add two **JMenuItem**'s called "Sudoku" and "X's and O's". Each menu item must launch a separate **JInternalFrame** for each game. Marks will be awarded for use of methods to modularize the code.

- Create JDesktopPane (1 point)
- Create JMenu and JMenuItems (2 points)
- Add listeners to the menu items (2 points)
- Build the "Sudoku" frame and launch (Should look convincing) (6 points)
- Build "X's and O's" frame and launch (Should look convincing) (6 points)
- Use of methods to modularize code (3 points)