GUI Programming 2021 to 2022 – Year 2

Topic: Return to Java Programming

Labwork 1: (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 – Selection (10 points)

Create a Java source file called **Lab1Part1**. Write an IF statement that determines an age-range of a human. You can base the age range on any range you wish (as long as there are at least THREE categories). To guide you this age-range can be used:

0-17: Pre-adult (Child)
18 and over: Adult
50 and over: Middle aged
65 and over: Senior
80 and over: Elderly

The operation of the application is simple. You may either hard-code a variable with the input age OR you can input the age from the keyboard. NOTE: YOU DO NOT HAVE TO USE YOUR REAL AGE FOR THIS EXERCISE (YOU CAN KEEP THAT TO YOURSELF IF YOU WISH! ☺). Then simply output the correct age range as a String, e.g., 65 outputs "Senior".

Finally, implement a similar age check to the above IF statement using SWITCH. Note: With the SWITCH you will have to modify the programme so that it checks for the entry point to each classification (Otherwise you'd have to have a very long switch statement!), e.g.:

age=0 state "A child is born"
age=18 state "You are now an adult"
age=50 state "You are now middle aged"
age=65 "You are now a Senior"
age=80 state "You are now Elderly".
All other ages: "You are not at a change point"

- Variables or input of age (2 points)
- If statement to check your age (4 points)
- Switch statement to output age range (4 points)

Part 2 – Java Revision - Iteration and Arrays (10 points)

Create a class called **Lab1Part2**. Write a **main method** and in the main method create an array of characters (type **char**) composed of all the letters of the town you live in (use something like Swords, Blanch etc., not just Dublin) or the name of a pet. Create a **for loop** to print out all of the ASCII values associated with EACH character of the town name or pet name (e.g., R = 125, a = 97 etc.)

Required activities and marking guideline:

- Write main method (2 points)
- Create array (2 points)
- Fill the array (2 points)
- Write **for** loop to print ASCII values (4 points)

Part 3 – Two dimensional array (10 points)

Create a class called **Lab1Part3**. Create a two-dimensional array that shows a grid of the rainfall and temperature where you live in the next 5 days. The output should look similar to the following:

Day 1: 10.1 mm 10.5 C
Day 2: 0.5 mm 12.5 C

Required activities and marking guideline:

- Create the array of arrays (two-dimensional) (4 points)
- Fill the array with all data (3 points)
- Use a loop to output data in readable\neat format (3 points)

Part 4 Java Revision (Methods, Parameters, Return types) (20 points)

Create a class called **Lab1Part4**. Create **TWO methods** in the class called **halfMyAge** and **printMyNameInReverse**.

The **halfMyAge** method must take one integer as a **parameter** and **return** the input age halved **(use return statement in method!!)**. This method will replace the usual void statement with the correct return type.

The **printMyNameInReverse** method should take **TWO parameters** of type String, one representing your first name and one parameter representing your second name (surname); this method must then output the name in reverse using System.out (John Doe is reversed to Doe John).

Test the methods you have written by calling them in the code with sample data (you can try your own name and age [either real age or made-up age!]).

Required activities and marking guideline:

- Create the **halfMyAge** method with **parameters** and **return** type (7 points)
- Create the **printMyNameInReverse** method with two parameters (7 points)
- Test method call for **halfMyAge** (works correctly?) (3 points)
- Test method call for **printMyNameInReverse** (works correctly?) (3 points)