BSc (Hons) in Computing Year 2

Higher Certificate in Computing (Applications and Support Year 2)

DATA STRUCTURES AND ALGORITHMS – Assignment (50%)

Friday 26th March 2021, 23.55 (Week 9)

This assignment consists of two parts:

- **Part 1: Online Moodle quiz, 20 minutes duration available on Friday 26th March 2021**
- **Part 2: A practical exercise that requires a NetBeans application to be implemented. The solution must be submitted online on Moodle by Friday 26th March 23.00**.

MARKING SCHEME

ASSIGNMENT_MARK = 30% * PART1_MARK + 70% * PART2_MARK

PART 1 (20 minutes)

Answer online ALL questions part of the QUIZ available on the module's Moodle page.

PART 2

The practical exercise involves development of a NetBeans Java application that provides the solution to a problem description. A zip file with the entire project code must be submitted online on Moodle before the deadline.

National Covid-19 Vaccination Programme requires a software application to manage how people will be vaccinated by General Practitioner doctors (GPs). GPs will get access to this application. Each GP will be able to vaccinate in his/her medical clinic all the people that are registered with him/her.

In the 1st phase, the GP contacts each person registered with him/her and creates a list of people that confirmed that they want to be vaccinated.

In the 2nd phase, a priority value is allocated to each person from the list according to the following rule. Priority 10 represents the highest priority given.

- Priority 10: People aged 90 and older
- Priority 9: People aged 80 and older
- Priority 8: People aged 70 and older
- Priority 7: People aged 65-69
- Priority 6: People aged 18-64 with medical condition(s)
- Priority 5: People aged 55-64
- Priority 4: People aged 45-54
- Priority 3: People aged 30-44
- Priority 2: people aged 18-29
- Priority 1: People aged under 18

In the 3rd Phase, people are scheduled to come to the GP office and get the vaccine. The scheduling process is done based on the priority value. E.g. All people with priority 10 will be the first ones to be scheduled in the same day. Once a person was selected to be scheduled, the person will be removed from the list.

Implement a Java application that supports this vaccination event. The application must have a GUI that enables the following operations:

- Add a new person that wants to be vaccinated into the system proving the person's name, person's age and if the person has a medical condition or not (Y/N)
- List details of all people that want to be vaccinated
- Display how many people have registered for the vaccine
- Allocate priorities to each person from the list according to the above rule. GUI must have a button that does this task in one click
- Identify the next group of people to be scheduled for a vaccine. Once a group of people were identified, they will be removed from the list.

It is necessary to:

- Identify the most suitable Data Structure(s) to be used as a solution to store the details of people that want to be vaccinated. Implement the data structure(s) in your application **(10%).**
- Design and develop a GUI for the application **(20%).**
- Implement a Java application that supports the above operations, making use of the identified data structure(s). **(50%).**
- Test the application to make sure it works correct. Error handing must be performed just in case there is no data in the system!! **(20%).**

NOTE

At least one data structure you have studied during this module, must be used to store the people that want to be vaccinated and to support the above operations.