Practicum Case	
COMP6048 | COMP6048001 | COMP6048016 | COMP6048049 Data Structures	
Computer Science	**O221-COMP6048-AM01-03**
Valid on *Even Semester 2021/2022*	**Revision 00**

Learning Outcomes

- LO1 – Explain the concept of data structures and its usage in computer science
- LO2 – Illustrate any learned data structures and its usage in application
- LO3 – Apply data structures using C

Topic

- Session 3 – Doubly Linked List & Queue

Sub Topics

- Push Head, Mid, and Tail
- Pop Head, Mid, and Tail
- Search
- Queue, Circular Queue, and Priority Queue

Soal
Case

Bluejack Hospital

Bluejack Hospital is one of the oldest hospitals in your town. To register a new patient, the patient registrar uses a traditional method by writing the patient data manually using pen and paper. Sometimes the patient registrar having a hard time sorting the patient based on their priority. To improve the hospital services the company hires you as a junior programmer to create a simple program using C programming language and **priority queue data structures**. The criteria are:

- The program consists of **3 menus**, there are:
  1. **Insert**
  2. **View**
  3. **Next Queue**
  4. **Exit**

```
Bluejack Hospital
=================
1. Insert
2. View
3. Next Queue
4. Exit
>> ▬
```

Figure 1. Main Menu

- If user chooses **Insert** (**Menu 1**), then:
  - The program will ask user to input the following data
    - **Name**
      - Validate the inputted name must be **between 4 and 25 characters**.
    - **Age**
      - Validate the inputted age must be **at least 0**.
    - **Description/Symptoms**
      - Validate the inputted description/symptoms must be **at least 6 characters**.
    - **Code**
      - Validate the inputted code must be "**Red**", "**Yellow**" or "**Green**" (**case sensitive**).

- The color of the code represents the **patient's priority**. The color "**Red**" represents the number **3** which means the patient needs to be **served first if possible**. The color "**Yellow**" represents the number **2** which means the patient needs to be **served after code** "**Red**". And the last color is "**Green**" which represents number **1** which means the patient can be **served after code** "**Yellow**".

➢ After that, **record** all the inputted data to the **priority queue data structure** with code as its priority**.**

```
Input patient name[4-25]: Mr.
Input patient name[4-25]: Mrs. Taylor
Input patient age[>= 0]: -1
Input patient age[>= 0]: 50
Input description[>= 6 characters]: test
Input description[>= 6 characters]: Hard to breathe and chest pain
Input code[Red|Yellow|Green]: Purple
Input code[Red|Yellow|Green]: yellow
Input code[Red|Yellow|Green]: Red

Insert success !
```

Figure 2. Insert Menu

- If user chooses **View** (**Menu 2**), then:

➢ Validate if there's **no data**, show "**There is no queue yet!**" message.

```
There is no queue yet !

Press Enter to continue ...
```

Figure 3. There is No Queue Message (**View**)

➢ Otherwise, **show all the data** in the **priority queue**.

```
Patient List:
-------------------------------------------------------------------------------------------------------
|No  | Name                  | Age  | Description                                          | Code    |
-------------------------------------------------------------------------------------------------------
|1   | Mr. Budi              | 34   | Serious injury from car accident                     | Red     |
|2   | Mrs. Taylor           | 50   | Hard to breathe and chest pain                       | Red     |
|3   | Mr. John              | 45   | GERD                                                 | Yellow  |
|4   | Mrs. Carolina         | 28   | Nausea, vomiting, sweating, and difficulties walking | Yellow  |
|5   | Mr. Doe               | 23   | Cough and fever                                      | Green   |
-------------------------------------------------------------------------------------------------------

Press Enter to continue ...
```

Figure 4. View All Patient

- If user chooses **Next Queue** (**Menu 3**), then:
  - Validate if there's **no data**, show "**There is no queue yet!**" message

```
There is no queue yet !

Press Enter to continue ...
```

Figure 5. There is No Queue Message (Next Queue)

  - Otherwise, **remove the frontmost queue** based on its **priority** and **show the data**

```
The next patient is:
Name            : Mr. Budi
Age             : 34
Description     : Serious injury from car accident
Code            : Red

Press Enter to continue ...
```

Figure 6. Remove the Frontmost Queue

- If user chooses **Exit** (**Menu 4**), then **terminate** the program.

Please run the EXE file to see the sample program