Soal Praktikum *Practicum Case*	
COMP6362004 Data Structures	
Teknik Informatika *Computer Science*	**O222-COMP6362004-AM01-03**
Periode Berlaku Semester Genap 2022/2023 ***Valid on*** *Even Semester Year 2022/2023*	**Revisi 00** *Revision 00*

Learning Outcomes

- LO1 – explain the concept of data structures and its usage in computer science
- LO2 – illustrate any learned data structure 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

Patient Priority Queue

Sunib 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 Patient**
  2. **View List**
  3. **Next Queue**
  4. **Exit**

```
Sunib Patient Entry
====================
[1] Insert Patient
[2] View List
[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**.
    - **ID**
      - Validate the inputted ID **must be 5 characters** and there is **no duplicate ID** in the current queue. User are allowed to input the same ID after being shown in the **Next Queue**.
    - **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. Laras
Input patient age[>= 0]: -1
Input patient age[>= 0]: 24
Input patient ID[5]: BN123
Input description[>= 6 characters]: Hard to breathe, chest pain
Input code[Red|Yellow|Green]: Blue
Input code[Red|Yellow|Green]: red
Input code[Red|Yellow|Green]: Red

Insert success !
Press any key to continue . . .
```

Figure 2. Insert Menu

```
Input patient name[4-25]: Mr. Jovan
Input patient age[>= 0]: 25
Input patient ID[5]: BN123
ID already exist!
Input patient ID[5]: BN
Input patient ID[5]: BN224
Input description[>= 6 characters]: Cough, Muscles aches
Input code[Red|Yellow|Green]: Yellow

Insert success !
Press any key to continue . . .
```

Figure 3. Insert Menu with ID validation

- 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 any key to continue . . .
```

Figure 4. There is No Queue Message (**View**)

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

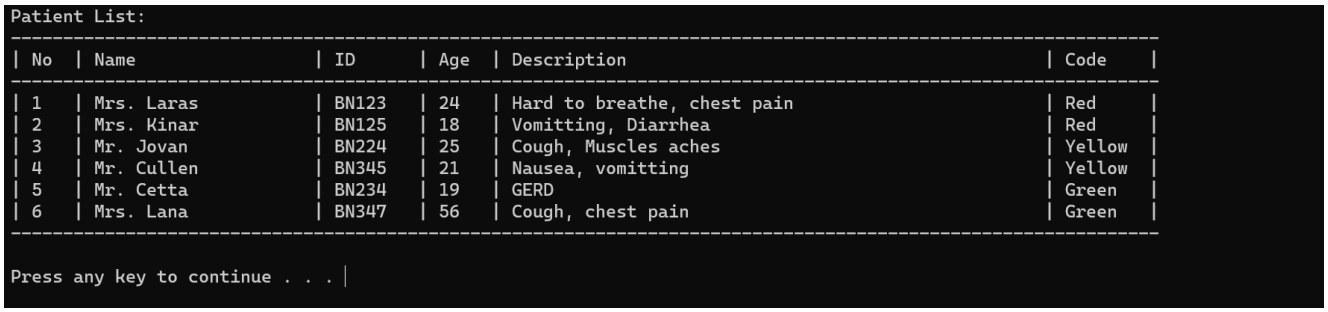

Figure 5. View All Patient

- If user chooses **Next Queue** (**Menu 3**), then:

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

Figure 3. There is No Queue Message (Next Queue)

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

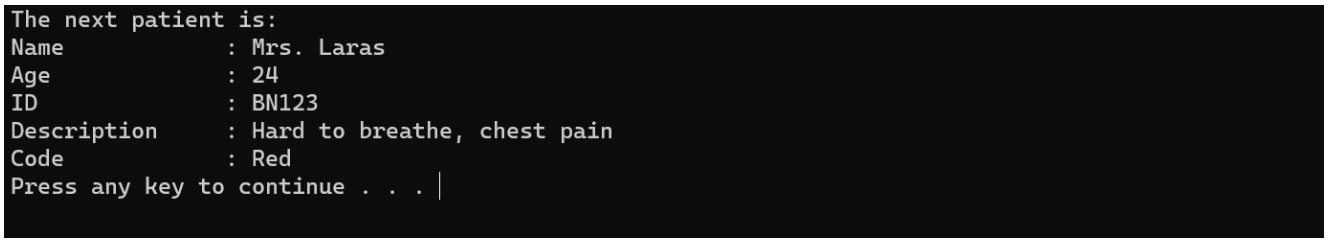

Figure 4. Remove the Frontmost Queue

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

Please run the EXE file to see the sample program