SCHOOL OF COMPUTING

SECR2043-06
(OPERATING SYSTEMS)

PROJECT TITLE
VACCINE REGISTRATION SYSTEM

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1. INTRODUCTION

The Covid-19 epidemic has a big impact on people all across the world and it causes a dramatic loss in human life. Currently, the covid-19 vaccination program is carrying on to reduce the transmission of the disease. The real-world application proposed in this project is the Vaccine Registration System. The target users of the system are the persons who registered for the vaccination program and the administrator of the program. The main purpose of this system is to provide a computerized and systematic platform for Malaysia citizens to register for the vaccine.

In this project, the algorithm applied is the Non Preemptive Priority Scheduling Algorithm. A Java Program is generated for coding the simulation implementation of the Non Preemptive Priority Scheduling Algorithm. Based on the Non Preemptive Priority scheduling implemented, the users that register for the vaccine are scheduled according to the priority number assigned to them. Once the users get scheduled, it will run till the completion. Generally, the lower the priority number, the higher is the priority of the users in the queue for the registration of the vaccine.

For the people who want to register for the program need to fill up some basic personal and health information. The registered users will be categorized into different priority levels based on their occupations, age, and state of health. Based on the details, the system will sort them into the queue according to their priority level. For the administrator of this program, they can retrieve the data for the vaccination based on the priority list generated by the system.
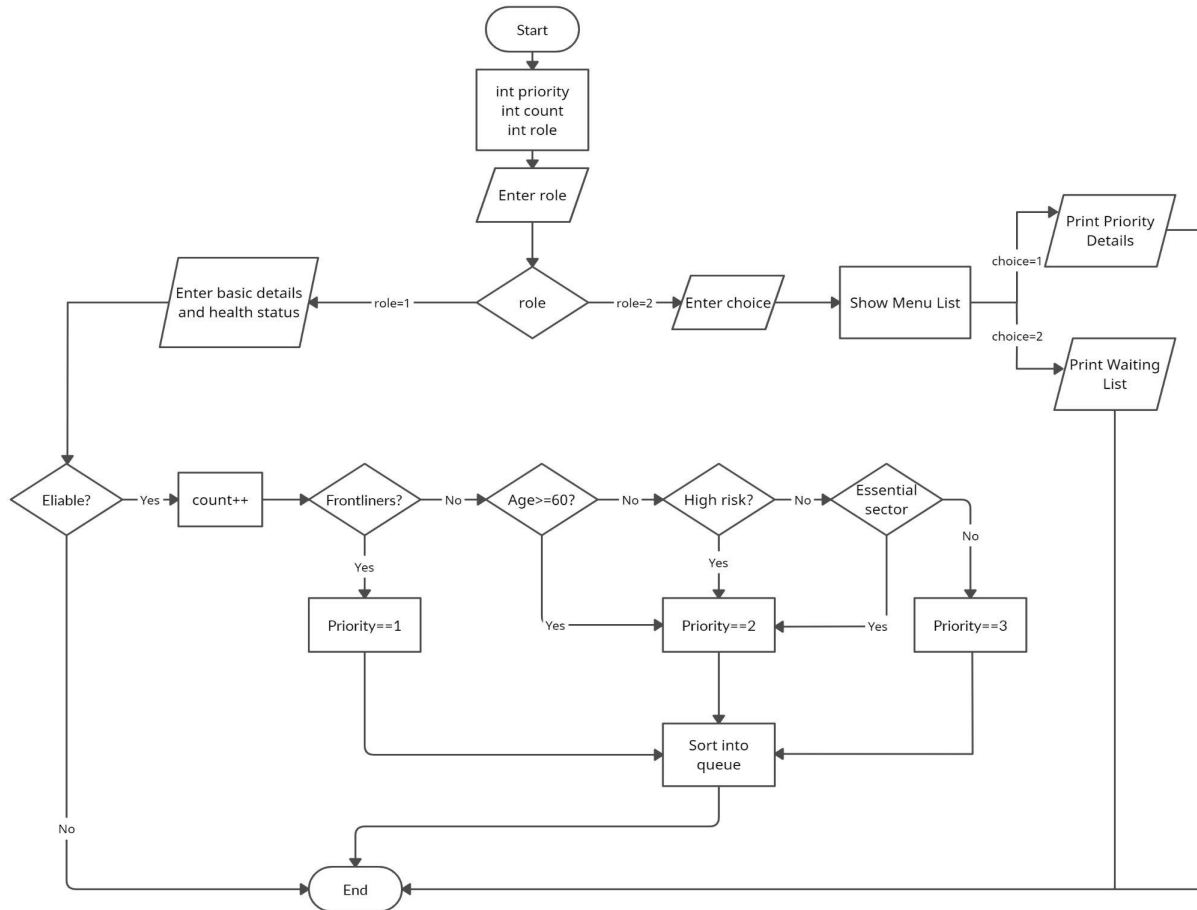
2. DISCUSSION

2.1 CONCEPT

Figure 1: Flow Chart to Assign Priority

Flowchart Description:

First, the user of the program needs to choose their role as admin or the normal user. For the normal user, they need to fill up their basic details in order to assign them into different categories. There are three priority levels in this system: 1,2 and 3.

In order to assign them to the queue, the priority level will be compared. The priority level=1 is considered the highest priority. Besides, a count variable will be assigned to every user to record their registration order. The first person who registered will have a count number=1, the second person who registered will have a

count number=2. It allowed the system to arrange the users with the same priority with the first come first serve algorithm by comparing the count number. For instance, when compared to individuals with the same priority, the individual who registered first (with a lower count number) will be put at the front of the line.

For the other user, which is admin is required to input the choice and the system will display the menu list. If the admin input choice is 1, the system will print the priority details, else if the input choice is 2 and the system will print the waiting list.

2.2 IMPLEMENTATION OF ALGORITHM

Priority Scheduling Algorithm is proposed as the algorithm to assign different priority levels to the registered user. The priority number for the highest priority is 1, while the lowest priority is 3. In the java program designed, the *index* variable index is used to define the position of the user in the queue that registers for the vaccine. The function of arrangePriority() is used to rearrange the waiting list according to the user priority, while the *count* variable is the total number of users in the queue that registered for the vaccine.

The person with the same priority level will be arranged into the queue by using the first come first serve algorithm. The priority occupation is the people who worked as the front liners such as doctor, nurse, and pharmacist as well as front liners for essential services. Next, the person with the high-risk group, poor health status and OKU will be considered with priority = 2. For example, the high-risk group including the person with a low immunity system(immunocompromised), HIV infection, a blood disorder, and more. Moreover, the priority of the users will also be divided by using their age. The person below 18 years old will be filtered out from the queue. Meanwhile, the vaccination program is only allowed for people who are above 18 years old. The priority senior citizens are the ones who are aged 60 years and above. The remainder of the people is assigned with priority = 3.

2.3 EXAMPLE OUTPUT

a) Main menu

```
=============          Vaccine Registration System          =============
                       LOGIN AS
                       1. ADMIN
                       2. USER
                       3. EXIT

CHOICE : 1



=============    ADMIN MENU      =============
        1. View the Priority Details
        2. View the Waiting List
        3. Back to Main Menu
```

b) Admin menu - View Priority Details

```
=============    ADMIN MENU      =============
        1. View the Priority Details
        2. View the Waiting List
        3. Back to Main Menu
CHOICE : 1


===== View the Priority Details ======
Priority         Description
1                Frontliners including healthcare workers, defence, security and essential services personnel
2                Senior Citizens(60 and above), High Risk Group with chronic disease, People with Disabilities(OKU)
3                Adult population ages 18 years
```

c) Admin menu - View Waiting List

```
=============    ADMIN MENU      =============
        1. View the Priority Details
        2. View the Waiting List
        3. Back to Main Menu
CHOICE : 2


====== View the Waiting List ======
Name                    Phone        IC              Age Job Category  Job Position      Priority     Priority Count
Lim Ah Meng             016-1234567  690315-07-5239  52  Medical       Doctor            1            1
Fatimah binti Ahmad     012-3456789  560719-02-5688  65  Education     Retired Teacher   2            2
Siti A/P Vizaah         017-2345678  780623-01-5876  43  Service       Service Staff     2            3
Arifah bin Ali          017-5678901  890102-01-5599  32  Sales         Manager           3            4
```

d) Admin menu - Back to main menu

```
=============    ADMIN MENU      =============
        1. View the Priority Details
        2. View the Waiting List
        3. Back to Main Menu
CHOICE : 3


=============          Vaccine Registration System          =============
                       LOGIN AS
                       1. ADMIN
                       2. USER
                       3. EXIT
```

e) User menu - User 1: Register for vaccine (Adult population ages 18 years)

```
=============    USER MENU    =============
        1. Register for vaccine
        2. View My Registration
        3. BACK TO MAIN MENU
CHOICE : 1


======== YOUR PERSONAL DETAILS ========
ENTER YOUR NAME        : Arifah bin Ali
ENTER YOUR PHONE NO  : 017-5678901
ENTER YOUR IC (xxxxxx-xx-xxxx): 890102-01-5599
ENTER YOUR AGE: 32
======== JOB DETAILS ========
ENTER YOUR JOB CATEGORY: Sales
ENTER YOUR JOB POSITION: Manager
Are you frontliner?(1-Yes, 2-No): 2
======== HEALTH STATUS ========
Do you have any chronic disease?(1-Yes, 2-No): 2
Do you have any disabilities(OKU)(1-Yes, 2-No): 2
Calculated priority =3
Thank you for your registration :)
```

f) User menu - User 2: Register for vaccine (Senior Citizens(60 and above), High Risk Group with chronic disease)

```
=============    USER MENU    =============
        1. Register for vaccine
        2. View My Registration
        3. BACK TO MAIN MENU
CHOICE : 1


======== YOUR PERSONAL DETAILS ========
ENTER YOUR NAME        : Fatimah binti Ahmad
ENTER YOUR PHONE NO  : 012-3456789
ENTER YOUR IC (xxxxxx-xx-xxxx): 560719-02-5688
ENTER YOUR AGE: 65
======== JOB DETAILS ========
ENTER YOUR JOB CATEGORY: Education
ENTER YOUR JOB POSITION: Retired Teacher
Are you frontliner?(1-Yes, 2-No): 2
======== HEALTH STATUS ========
Do you have any chronic disease?(1-Yes, 2-No): 1
Do you have any disabilities(OKU)(1-Yes, 2-No): 2
Calculated priority =2
Thank you for your registration :)
```

g) User menu - User 3: Register for vaccine (Frontliner)

```
==============    USER MENU      ==============
         1. Register for vaccine
         2. View My Registration
         3. BACK TO MAIN MENU
CHOICE : 1


======== YOUR PERSONAL DETAILS ========
ENTER YOUR NAME       : Lim Ah Meng
ENTER YOUR PHONE NO   : 016-1234567
ENTER YOUR IC (xxxxxx-xx-xxxx): 690315-07-5239
ENTER YOUR AGE: 52
======== JOB DETAILS ========
ENTER YOUR JOB CATEGORY: Medical
ENTER YOUR JOB POSITION: Doctor
Are you frontliner?(1-Yes, 2-No): 1
======== HEALTH STATUS ========
Do you have any chronic disease?(1-Yes, 2-No): 2
Do you have any disabilities(OKU)(1-Yes, 2-No): 2
Calculated priority =1
Thank you for your registration :)
```

h) User menu - User 4: Register for vaccine (People with Disabilities(OKU))

```
==============    USER MENU      ==============
         1. Register for vaccine
         2. View My Registration
         3. BACK TO MAIN MENU
CHOICE : 1


======== YOUR PERSONAL DETAILS ========
ENTER YOUR NAME       : Siti A/P Vizaah
ENTER YOUR PHONE NO   : 017-2345678
ENTER YOUR IC (xxxxxx-xx-xxxx): 780623-01-5876
ENTER YOUR AGE: 43
======== JOB DETAILS ========
ENTER YOUR JOB CATEGORY: Service
ENTER YOUR JOB POSITION: Service Staff
Are you frontliner?(1-Yes, 2-No): 2
======== HEALTH STATUS ========
Do you have any chronic disease?(1-Yes, 2-No): 2
Do you have any disabilities(OKU)(1-Yes, 2-No): 1
Calculated priority =2
Thank you for your registration :)
```

i)   User menu - Register for vaccine (User Not Eligible- Population below 18 years old)

```
==============    USER MENU      ==============
        1. Register for vaccine
        2. View My Registration
        3. BACK TO MAIN MENU
CHOICE : 1



======== YOUR PERSONAL DETAILS ========
ENTER YOUR NAME        : Chong Yi Ling
ENTER YOUR PHONE NO   : 017-8912345
ENTER YOUR IC (xxxxxx-xx-xxxx): 040322-01-5890
ENTER YOUR AGE: 17
Sorry! You are not eligible for this registration program currently. :(
```

j)   User menu - View My Registration

```
=============    USER MENU      =============
        1. Register for vaccine
        2. View My Registration
        3. BACK TO MAIN MENU
CHOICE : 2



==== View My Registration Profile ====
ENTER YOUR IC (xxxxxx-xx-xxxx):890102-01-5599
 Name                          Phone      IC           Age Job Category    Job Position
Arifah bin Ali                017-5678901 890102-01-5599  32  Sales          Manager
You are positioned 4 in the queue.
Please be patient. Thank You.
```

k)   User menu - Back to main menu

```
==============    USER MENU      ==============
        1. Register for vaccine
        2. View My Registration
        3. BACK TO MAIN MENU
CHOICE : 3
THANK YOU! BYE BYE.



==============              Vaccine Registration System        ==============
                LOGIN AS
                1. ADMIN
                2. USER
                3. EXIT
```

l) Main menu - Exit

```
=============          Vaccine Registration System          =============
                      LOGIN AS
                      1. ADMIN
                      2. USER
                      3. EXIT

CHOICE : 3
THANK YOU! BYE BYE.
```

3. CONCLUSION

In conclusion, this project report explained the implementation of the Process Scheduling - Non Preemptive Priority Scheduling Algorithm in the proposed Vaccine Registration System. The proposed Vaccine Registration System is applying the concept of Priority Scheduling Algorithm which makes the system more productive since the system will help to reschedule for the vaccine registration waiting in the queue based on the user's priority. The person with the highest priority always be at the front of the queue, and for the persons with the same priority First Come First Serve Algorithm will be applied to break the tie. All in all, Priority Scheduling is suitable and appropriate for designing the proposed Vaccine Registration System since it is the most equitable way for vaccine distribution among the community. And it is important to have a clear set of rules and strategies that show the most equitable vaccine allocation since the pandemic is still controlling.