



**School of Computing  
Faculty of Engineering  
UNIVERSITI TEKNOLOGI MALAYSIA**

**DATA STRUCTURE & ALGORITHMS  
(SECJ2013)**

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**Mini PROJECT Documentation  
Patient Appointment System**

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**SECTION 01**

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## **PART 1: INTRODUCTION**

### **1.1 Synopsis Project**

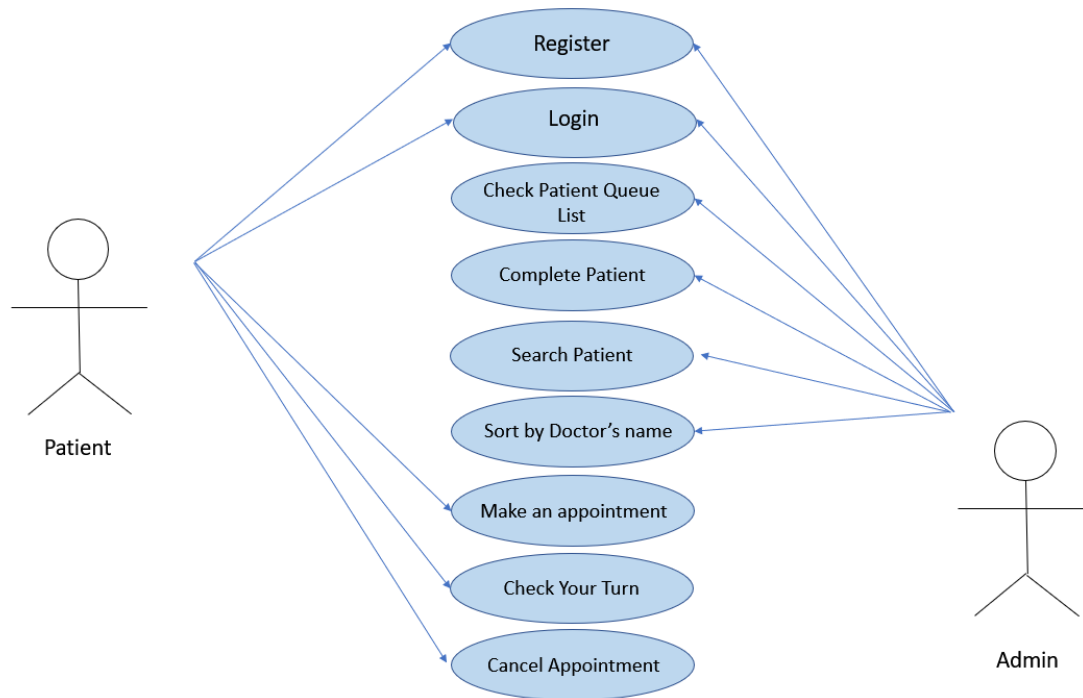
The patient appointment system is designed for two user groups, which are admin and patient. This program is developed by implementing the insertion sorting, sequential searching as well as the linked list and queue concepts in data structure and algorithms. For the first-time user of this system, both admin and patient, they need to do registration by using their ic number, username and password. There will be only one account for each ic number, so if the ic number is already registered in the system, the user will be informed as registered status and directed back to the login and register interface. If a user has registered themselves in the system before, they will be able to login by using their registered information. To be noted here, the admin is required to enter an admin key before they perform any action to verify their role as an admin. After login, the users are able to perform actions based on the role they chose. For admin, they are able to view the whole patient queue list, delete the patient who already completed the appointment, search one patient in the appointment queue list and sort the patients based on the doctor's name of their appointment. For patients, they can make an appointment through the system, check their turn and cancel their appointment.

### **1.2 Objective of the Project**

1. To develop a patient appointment system based on real-life situation
2. To make use of linked list, queue, sorting and searching technique in data structure and algorithm
3. To show how data structure concepts are able to be applied in a patient appointment system

## PART 2: SYSTEM ANALYSIS AND DESIGN

### 2.1 Use Case Diagram



### Use Case Description for Patient Appointment System

The system users are admin and patient.

Actor	Task
Admin	An admin is able to perform the functions <b>Register, Login, Check Patient Queue List, Complete Patient, Search Patient</b> and <b>Sort by Doctor's Name</b> .
Patient	A patient is able to perform the functions <b>Register, Login, Make an Appointment, Check Your Turn</b> and <b>Cancel Appointment</b> .

### Describe Description for Each Use Cases

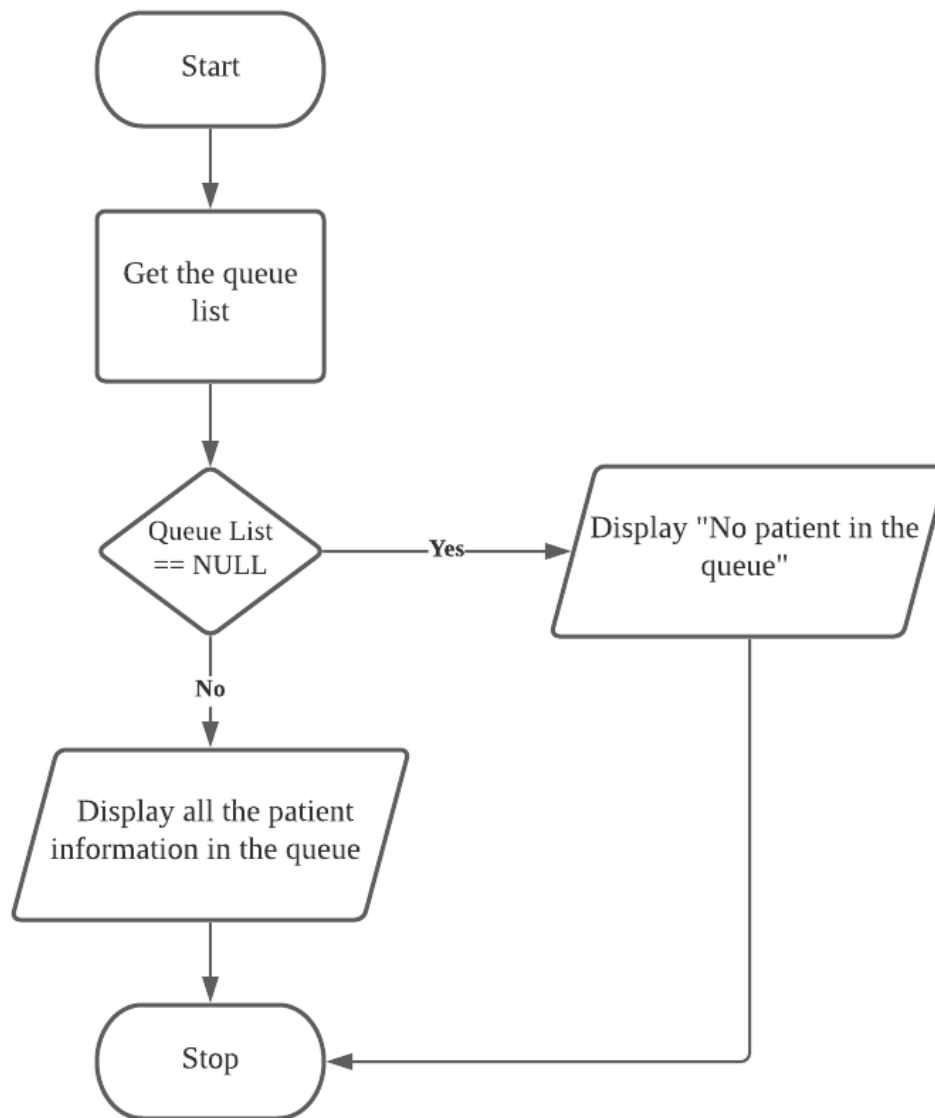
The system has 10 main use cases.

Use Case	Purpose
Register	Register the users in the system. Make sure one account for one ic number.
Login	Verify the users before they can perform any action in the system.
Check Patient Queue List	For the admin to check the whole queue list of the patient and the information of each of the patients.
Complete Patient	For the admin to delete the patient in the queue once the patient has completed the appointment. It will delete the first patient in the queue.
Search Patient	For the admin to search the information of specific patients in the appointment queue by entering the ic number of the patient.
Sort by Doctor's Name	For the admin to sort the patient based on the doctor they have the appointment with. This can ease the admin in managing the patients and arranging the schedule of doctors.
Make an Appointment	For the patient to make an appointment through the system. The patients need to input the information like their ic number, name, contact number, email address and doctor's name they wish to meet with. The information of the patient will be updated in the appointment queue list according to the order they do the appointment.
Check Your Turn	For the user to check there are how many patients before reaching their turn. The patients are required to enter their ic number and the system will display how many patients they still need to wait in the queue.
Cancel Appointment	For the user to cancel their appointment. The patients need to input their ic number to cancel their appointment. After the appointment is cancelled, the information of the particular patient will disappear from the appointment queue list.

## 2.2 Flowchart

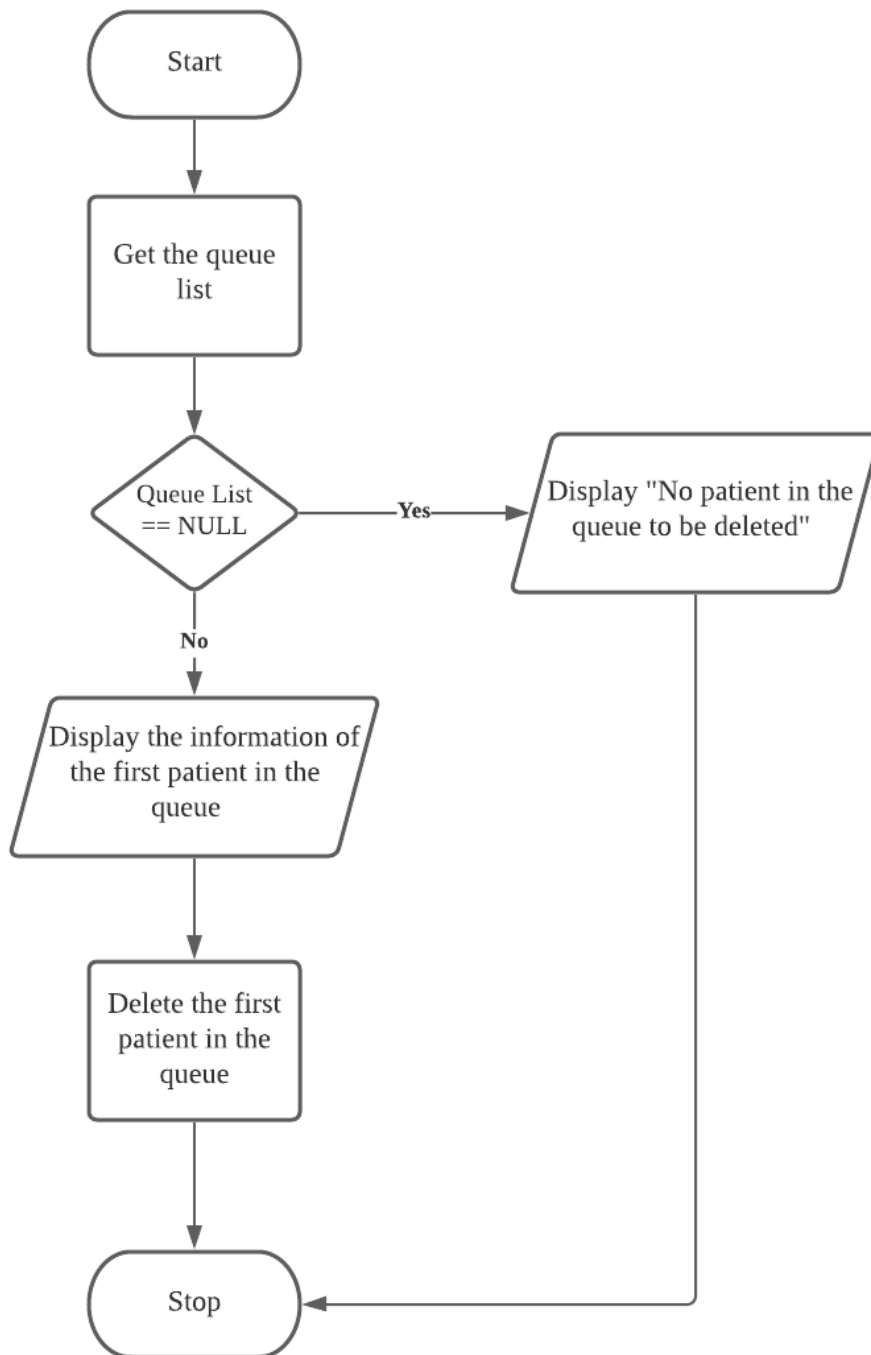
### Flowchart 1: Check Patient Queue List

Prepared by: Chong Kah Wei



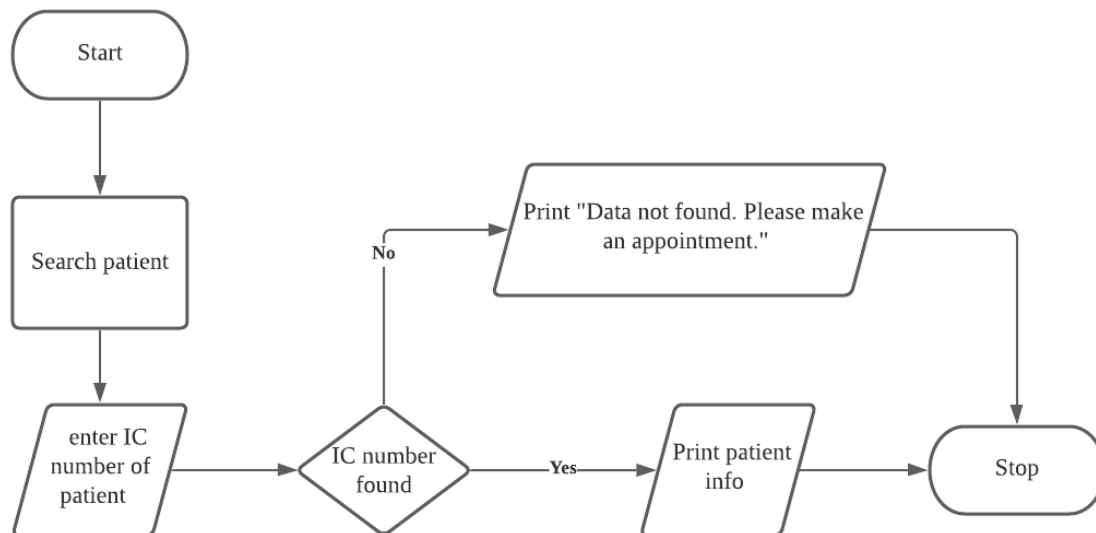
## Flowchart 2: Complete Patient

Prepared by: Chong Kah Wei



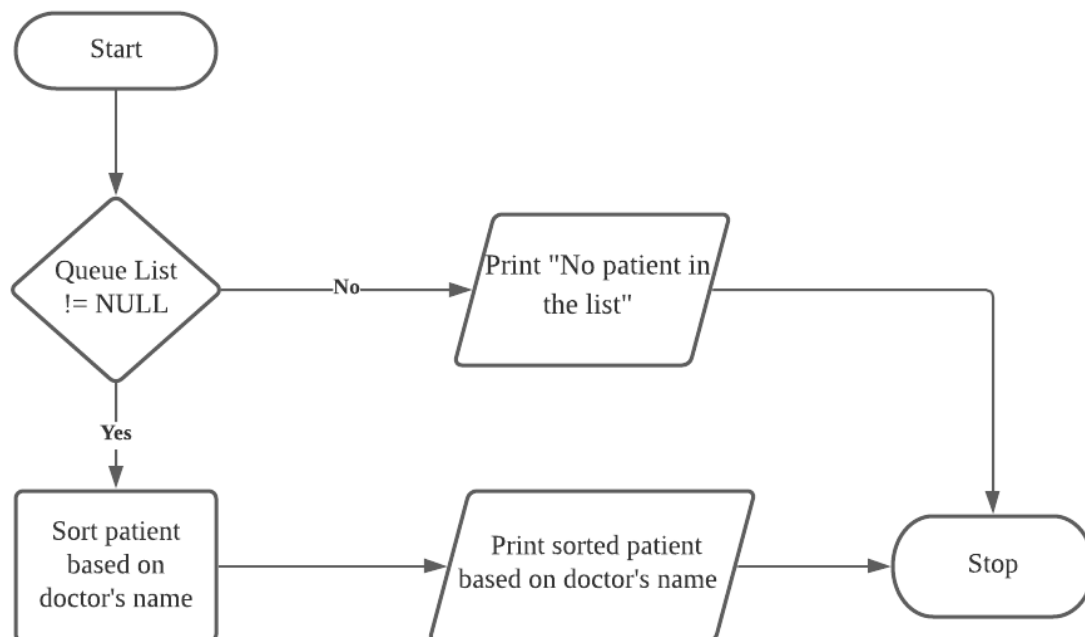
### Flowchart 3: Search patient

Prepared by: Goh Yitian



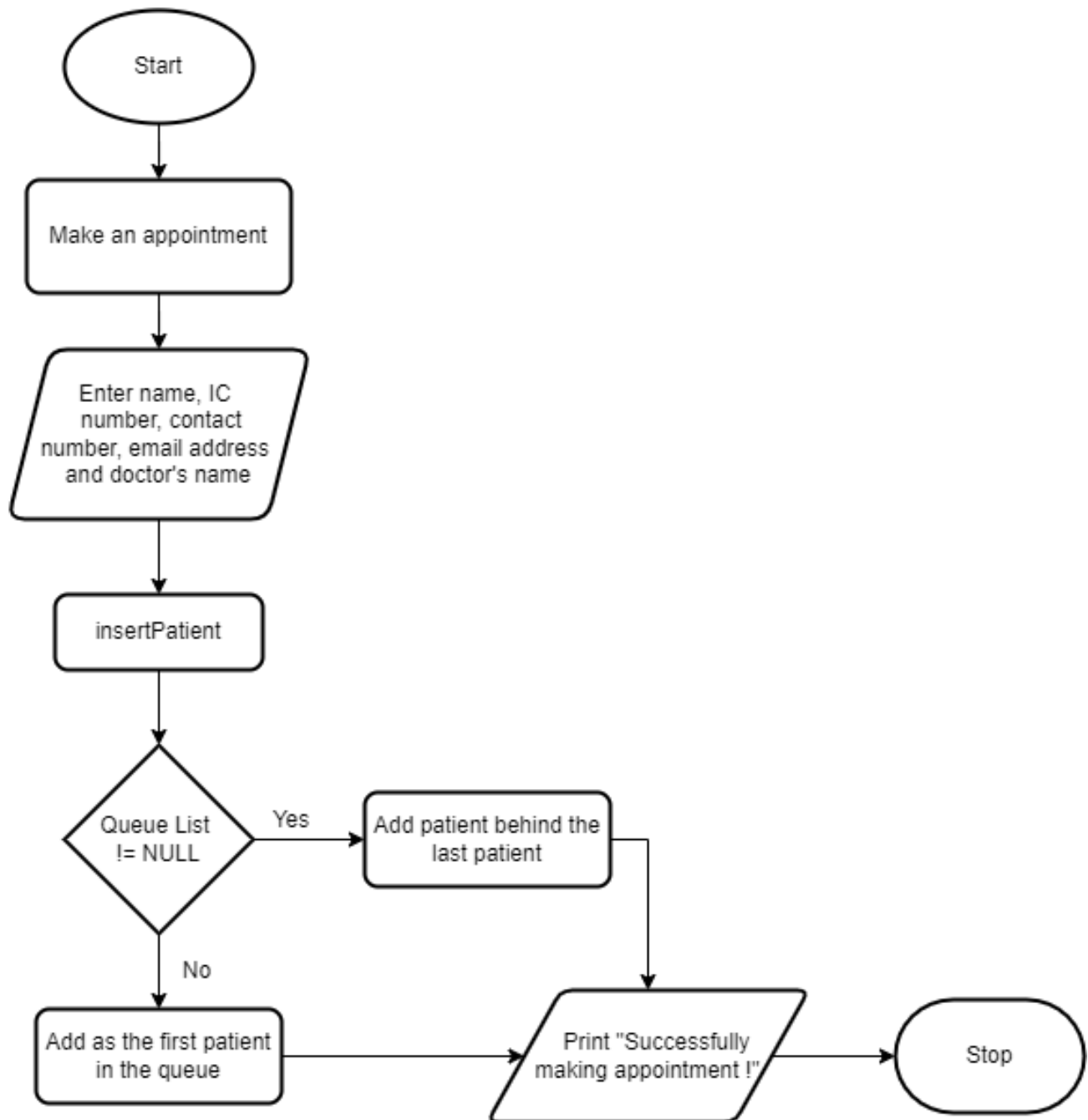
### Flowchart 4: Sort patient by doctor's name

Prepared by: Goh Yitian



### Flowchart 5: Make an appointment

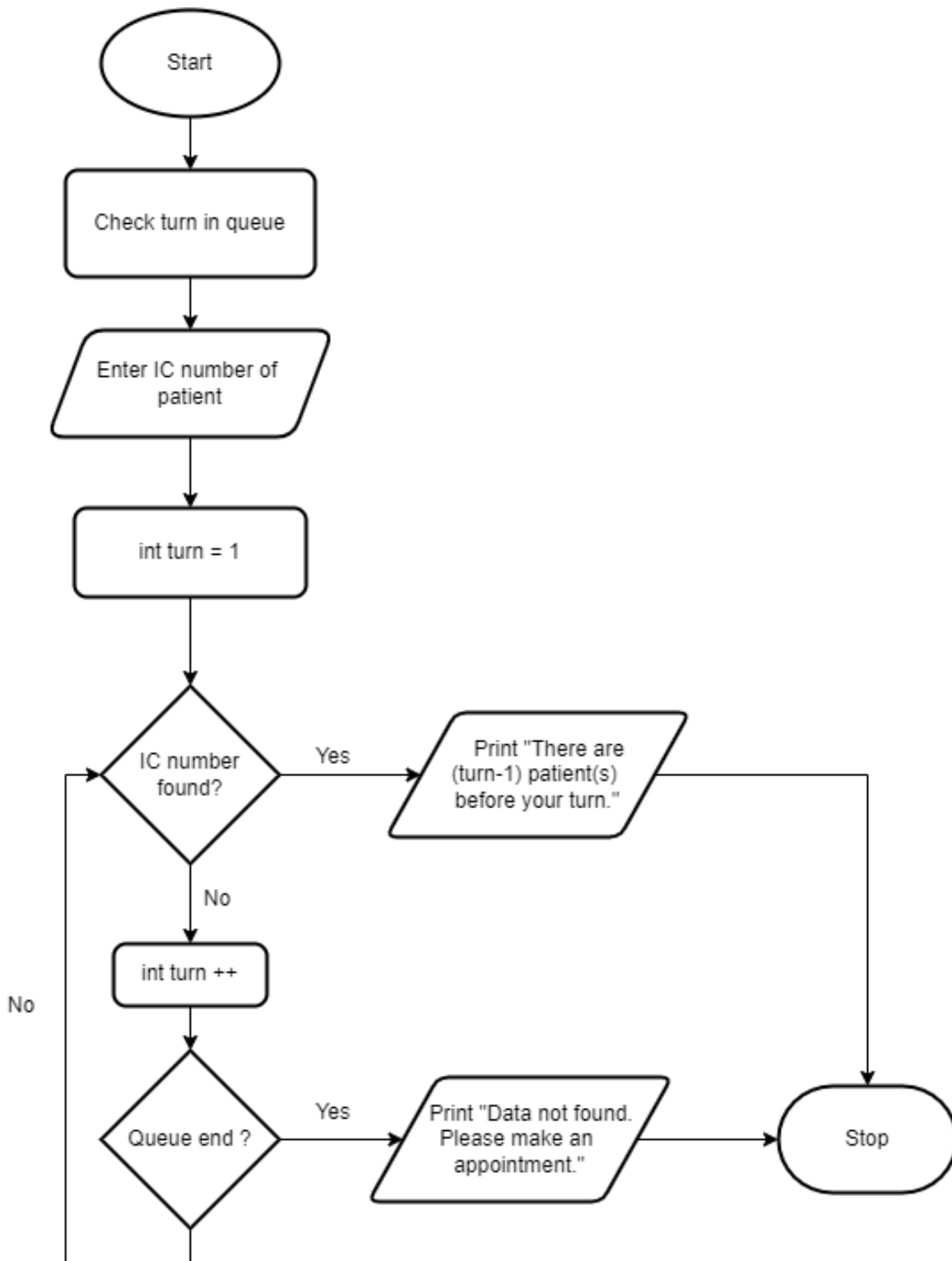
Prepared by: Heong Yi Qing





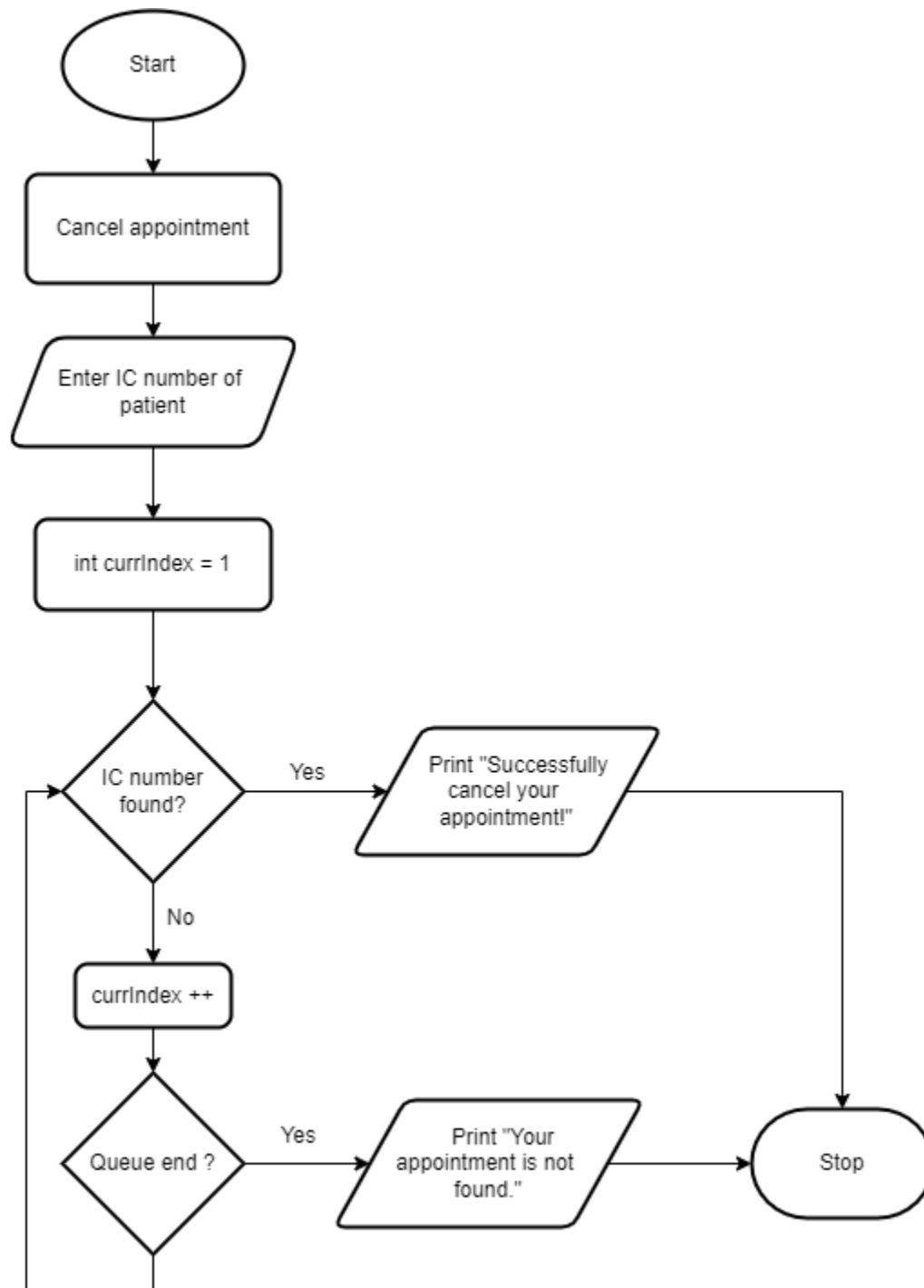
## Flowchart 6: Check patient's turn

Prepared by: Heong Yi Qing

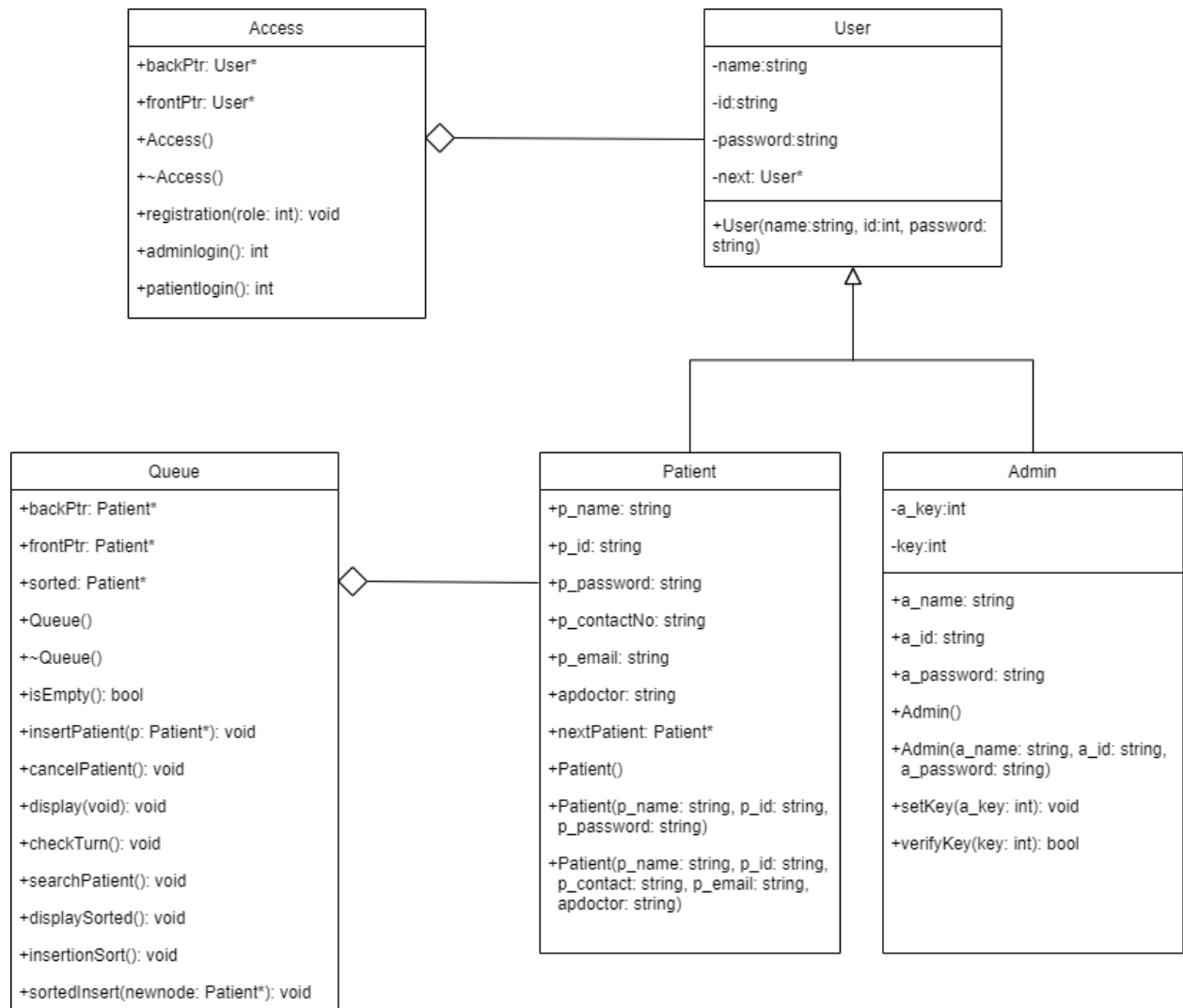


## Flowchart 7: Cancel appointment

Prepared by: Heong Yi Qing



## 2.3 Class Diagram



## PART 3: SYSTEM PROTOTYPE

Prepared by: Heong Yi Qing

There are two user interfaces in the patient appointment system, which are the admin and patient. In the prototype, the first step is to choose the role.

```
Choose Your Role
1. Admin
2. Patient
3. Exit System
Enter role: █
```

If the user is admin, the user needs to enter the admin key to continue.

```
Choose Your Role
1. Admin
2. Patient
3. Exit System
Enter role: 1

Please enter the admin key: 123456
Admin key is verified.

Press <enter> to continue
```

After the admin key is verified, the user is required to press enter to continue and then the user is required to login or register. For a first time user, the user needs to register first by entering the information then only can login to the system.

```
-ADMIN INTERFACE-
Choose Action
1. Register
2. Login
Enter action: 1

-REGISTRATION-
Please fill in the information.
Name:
ID (Your IC Number):
Password:
Successfully register!

Press <enter> to continue
█
```

```
-ADMIN INTERFACE-  
Choose Action  
1. Register  
2. Login  
Enter action:  
2  
  
-ADMIN LOGIN-  
Please fill in the information.  
Enter ID (Your I/c No):  
Enter Username:  
Enter Password:  
Successfully login!  
  
Press <enter> to continue
```

After logging in successfully, the user can see the menu for admin is displayed in the system, there are four functions and one exit in the admin menu. This menu will be shown until the user selects the fifth function, exit.

```
Choose Action  
1. Check Patient Queue List  
2. Complete Patient  
3. Search Patient  
4. Sort by Doctor's name  
5. Exit  
Enter action: _
```

The first function is to check the patient queue list. All the information of the patient will be displayed accordingly referring to the queue.

```
Enter action: 1

Queue #1
Patient name: Patient1
Patient id: 123
Patient contact number: 016123123123
Patient email address: patient1@gmail.com
Patient appointment doctor: Dr.Chong

Queue #2
Patient name: patient2
Patient id: 456
Patient contact number: 016456456456
Patient email address: patient2@gmail.com
Patient appointment doctor: Dr.Chong

Queue #3
Patient name: patient3
Patient id: 789
Patient contact number: 016789789789
Patient email address: patient3@gmail.com
Patient appointment doctor: Dr.Chong

Queue #4
Patient name: patient4
Patient id: 000
Patient contact number: 016000000000
Patient email address: patient4@gmail.com
Patient appointment doctor: Dr.Chong

Press <enter> to continue
```

The second function is complete patient, which means the patient is done meeting the doctor and now needs to be deleted from the queue. The first patient in the queue will be deleted.

```
Enter action: 2

Delete Customer Queue #1
Patient name: Patient1
Patient id: 123
Patient contact number: 016123123123
Patient email address: patient1@gmail.com
Patient appointment doctor: Dr.Chong

The first patient has completed the appointment. The queue list is updated.

Press <enter> to continue
```

Next, the admin also can search patients with this system by searching the patient's id number. The information of the patient is displayed in the system.

```
Enter action: 3

Please enter IC number of patient:000

-----Patient Info-----
Patient name: patient4
Patient id: 000
Patient contact number: 016000000000
Patient email address: patient4@gmail.com
Patient appointment doctor: Dr.Chong

Press <enter> to continue
```

The fourth function that is available for the admin is sorting the patient by doctor's name. This list is not according to the queue.

```
Enter action: 4

Sorted #1
Patient appointment doctor: Dr.Chong
Patient name: Patient6
Patient id: 987
Patient contact number: 016987987987
Patient email address: patient6@gmail.con

Sorted #2
Patient appointment doctor: Dr.Chong
Patient name: patient4
Patient id: 000
Patient contact number: 016000000000
Patient email address: patient4@gmail.com

Sorted #3
Patient appointment doctor: Dr.Chong
Patient name: patient3
Patient id: 789
Patient contact number: 016789789789
Patient email address: patient3@gmail.com

Sorted #4
Patient appointment doctor: Dr.Chong
Patient name: patient2
Patient id: 456
Patient contact number: 016456456456
Patient email address: patient2@gmail.com

Sorted #5
Patient appointment doctor: Dr.Goh
Patient name: Patient5
Patient id: 123
Patient contact number: 016123123123
Patient email address: patient5@gmail.com

Press <enter> to continue
```

Then, if the user selects 5, which is exit, a greeting sentence will be displayed and then after pressing enter, user can see the interface of choosing role again.

```
Choose Action
1. Check Patient Queue List
2. Complete Patient
3. Search Patient
4. Sort by Doctor's name
5. Exit
Enter action: 5

Thank you for using this system.

Press <enter> to continue
```

```
Choose Your Role
1. Admin
2. Patient
3. Exit System
Enter role: █
```

Now, if the user chooses 2, the role selected is patient. The user is also required to choose login or register on the next page.

```
-PATIENT INTERFACE-
Choose Action
1. Register
2. Login
Enter action:
```

The user can register before logging in to the system if the user is using it for the first time.

```
Enter action: 1

-REGISTRATION-
Please fill in the information.
Name: patient1
ID (Your IC Number): 123
Password: 123456
Successfully register!

Press <enter> to continue
```

```
Enter action: 2

-PATIENT LOGIN-
Please fill in the information.
Enter ID (Your I/c No): 123
Enter Username: patient1
Enter Password: 123456
Successfully login!

Press <enter> to continue
█
```



After logging in successfully, the patient menu is shown in the system. There are three functions available for the patients, which are checking the patient's turn in the queue, making an appointment and cancelling the appointment.

```
Choose Action
1. Make an Appointment
2. Check Your Turn
3. Cancel Appointment
4. Exit
Enter action: █
```

Users can make appointment by entering the information.

```
-MAKE APPOINTMENT_
Please enter you information
Name: Patient1
ID (IC number): 123
Contact number: 016123123123
Email address: patient1@gmail.com
Doctor's name': Dr.Chong
Successfully making appointment!

Press <enter> to continue
```

The second function is to check the patient's turn in the queue. The system will display the number of patients before the turn.

```
Enter action: 2

-CHECK YOUR TURN-
Please enter your IC number:123
There are 3 patient(s) before your turn.

Press <enter> to continue
```

The last function is to cancel the appointment made. This action will remove the patient from the queue.

```
Enter action: 3

-CANCEL APPOINTMENT-
Please enter your IC number:789
Successfully cancel your appoitment!

Press <enter> to continue
```

Lastly, the patient can select exit to go back to the role selecting interface. The system will continue until the user selects the exit system.

```
Choose Your Role
1. Admin
2. Patient
3. Exit System
Enter role: 3

Exiting the system...

-----
Process exited after 2631 seconds with return value 0
Press any key to continue . . .
```

#### PART 4: DEVELOPMENT ACTIVITIES

Meeting Date	Members Participate in the meeting	Activity	Task for each member	Task Achieved (yes/ no)
14/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Discuss and decide the topic of the project	Discuss and decide the topic together	Yes
16/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Discuss the data structure concepts need to be implemented in the project	Discuss the data structure concepts and functions together	Yes
17/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Decided to have 4 functions for admin and 3 functions for patient	Chong Kah Wei- check patient queue list, complete patient Heong Yi Qing- patient functions Goh Yitian- sorting and searching patient	Yes

23/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Compile the works together	Compile the program and debug the errors together	Yes
24/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Divide the job for reports and presentations	Chong Kah Wei- Introduction, Use case Diagram, Flowchart Heong Yi Qing- System Prototype, Class Diagram, Flowchart Goh Yitian- Development Activity, Flowchart, Appendix	Yes
25/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Complete the presentation slides and video, check the whole report	Record the presentation and compile demo video	Yes
26/1/2022	Chong Kah Wei Heong Yi Qing Goh Yitian	Double check the works for each other	Double check the works for each other and compile it for submission	Yes

## PART 5: APPENDIX

[Source code link](#)

[Youtube link](#)