



# **INDIVIDUAL ASSIGNMENT**

**TECHNOLOGY PARK MALAYSIA**

**CT025-3-2 PCPP**

**PROGRAMMING CONCEPTS IN C++**

**UC2F1811IS**

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## 1.0 Introduction

The Pharmacy Management System (PMS) helps to perform the administrative activities for the Pharmacy shop. With this new system, the pharmacy staff will find easier to perform all the operations which are needed for their daily business transactions. Admin users will have the responsibility to add, delete, search and modify records related to medicine. Customers can search for a particular medicine availability and the respective details regarding that medicine. The developer created the application using C++ and Object-Oriented Concepts to achieve all the required functionalities. This report also shows all the design solutions and explanation of the system as well.

## 2.0 Design Solution

### 2.1 Use Case Diagram

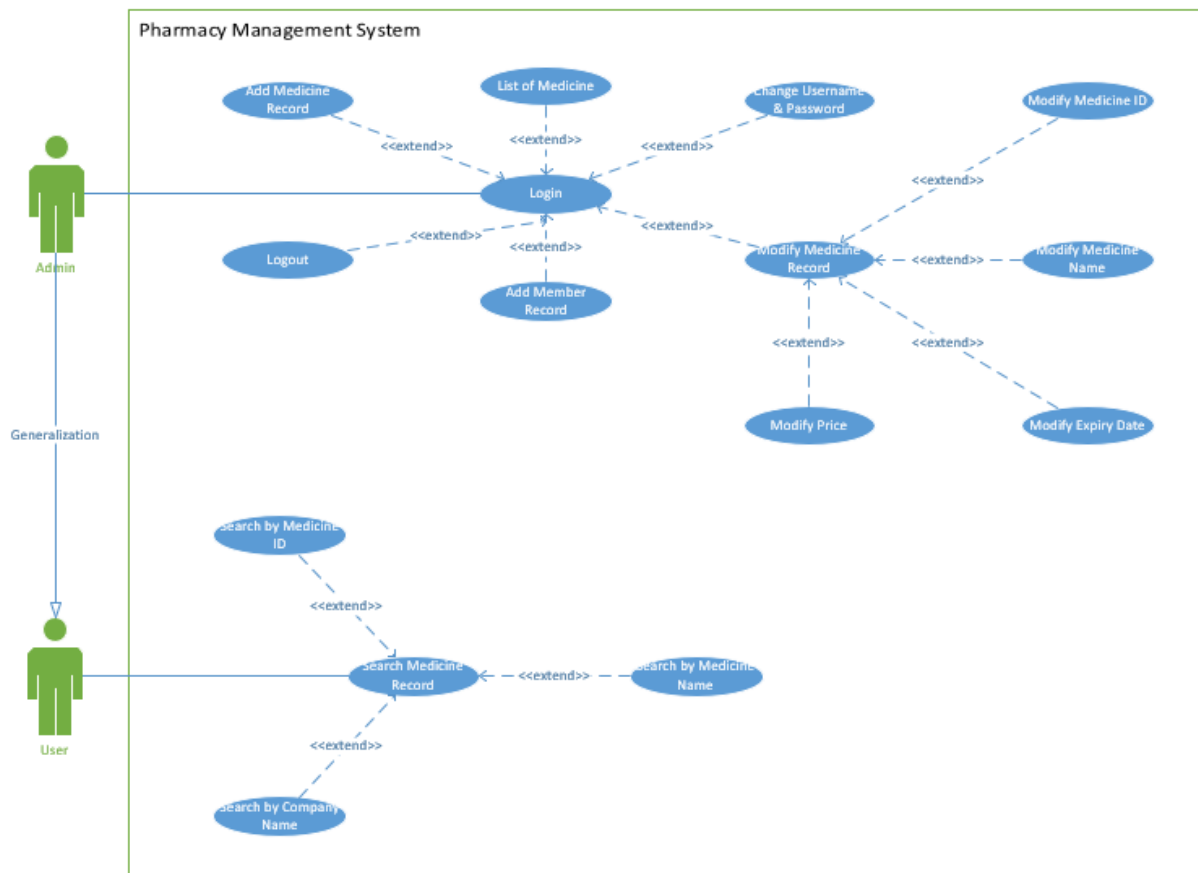


Figure 1 shows the Use Case Diagram of the PMS

## 2.2 Class Diagram

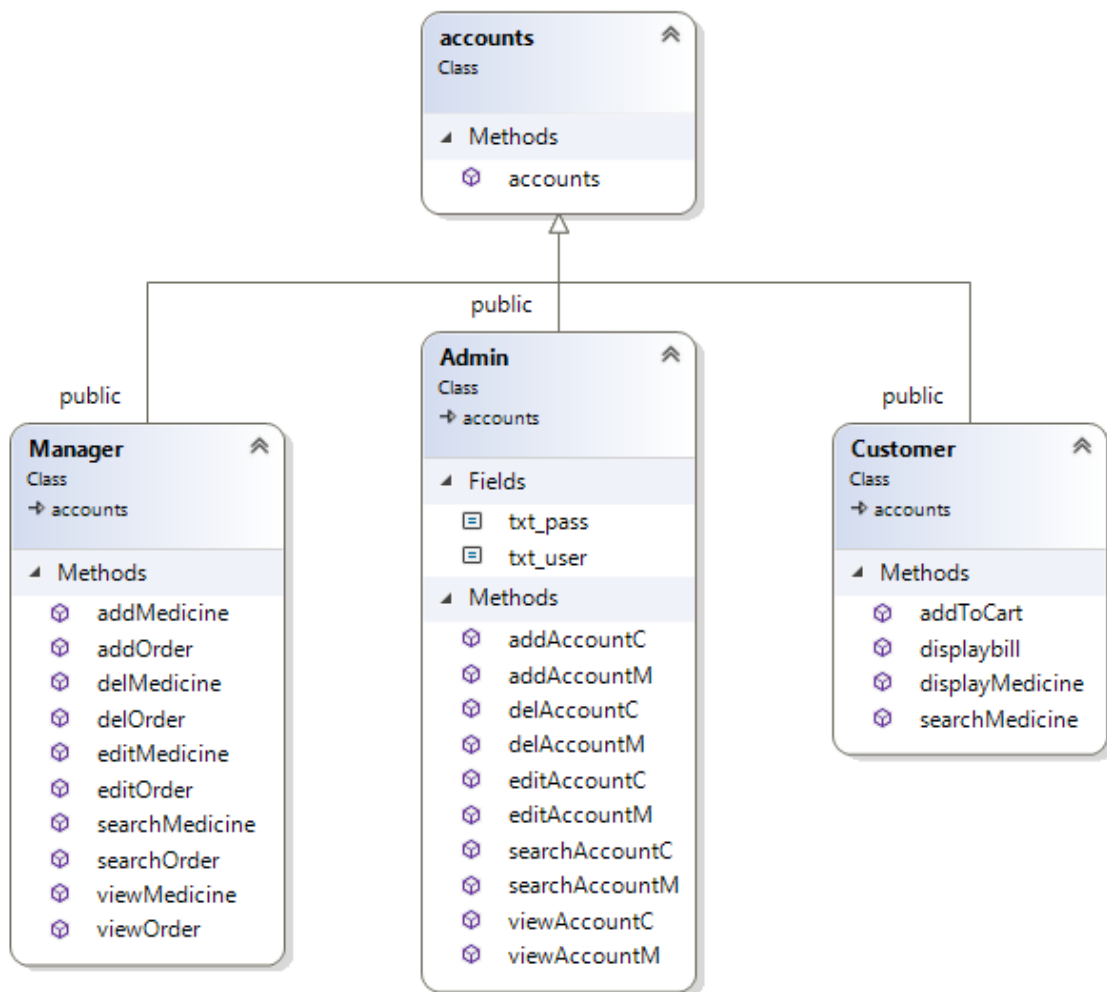


Figure 2 shows the Class Diagram of PMS

## 2.3 Activity Diagram

### 2.3.1 Admin Login

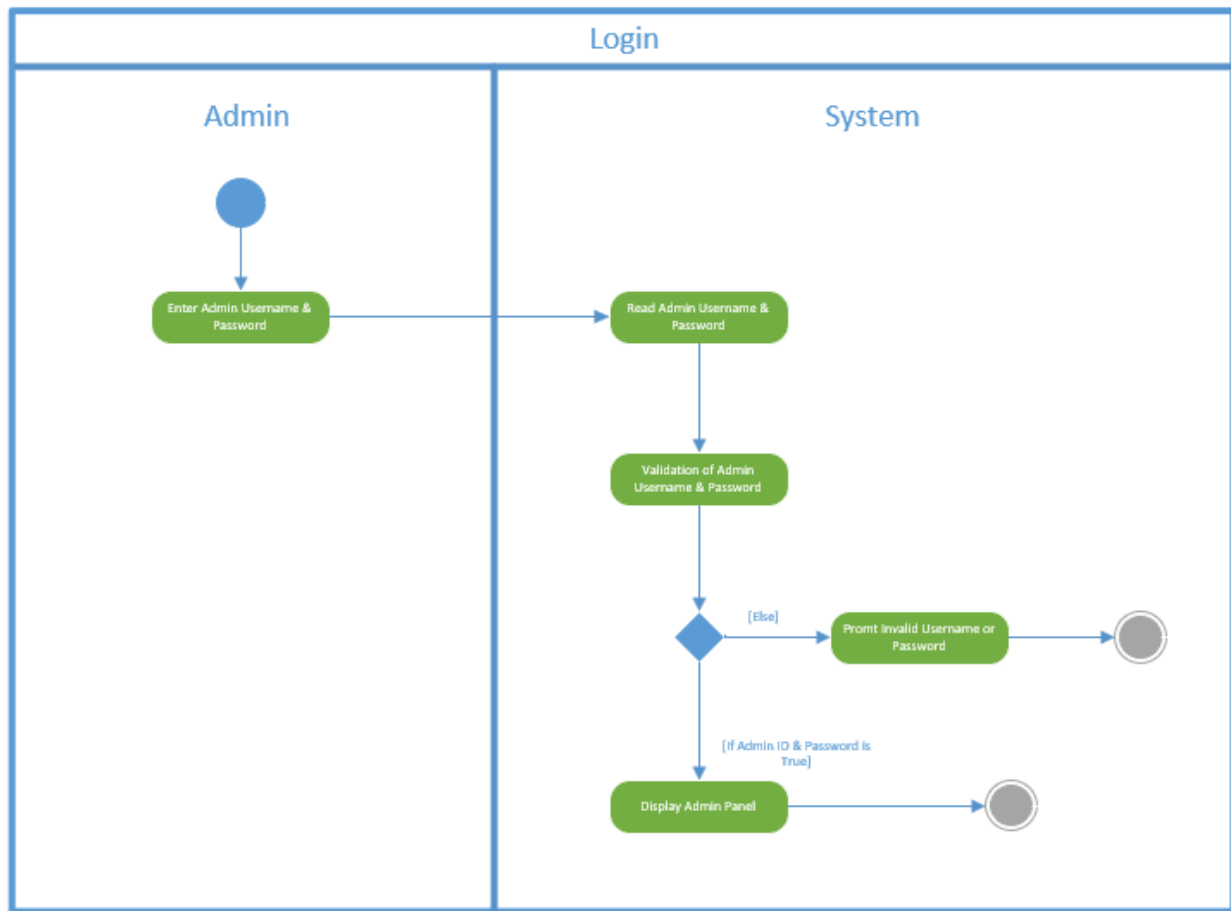


Figure 3 shows Activity Diagram of Admin Login

### 2.3.2 Add Medicine Record

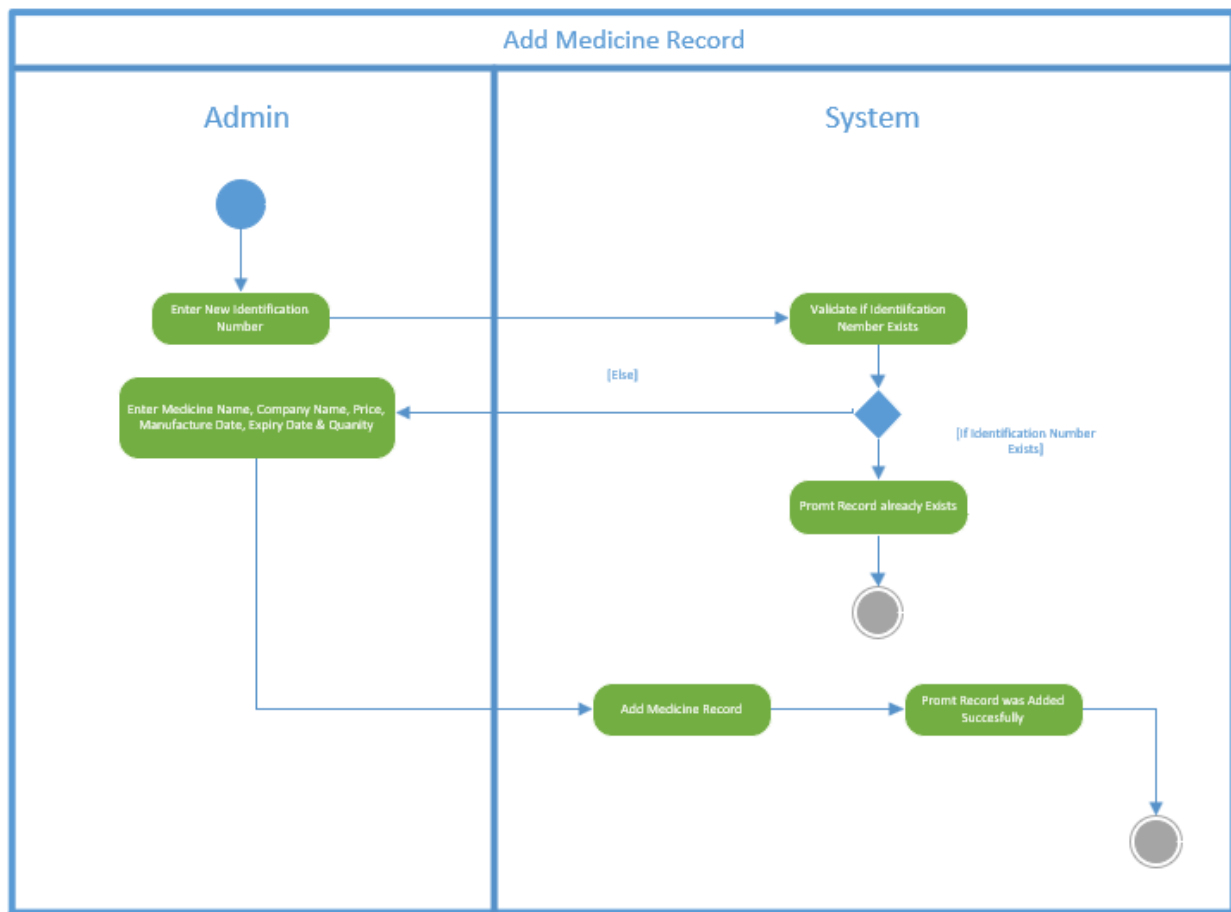


Figure 4 shows Activity Diagram of Adding Medicine Record



### 2.3.3 Modify Medicine Record

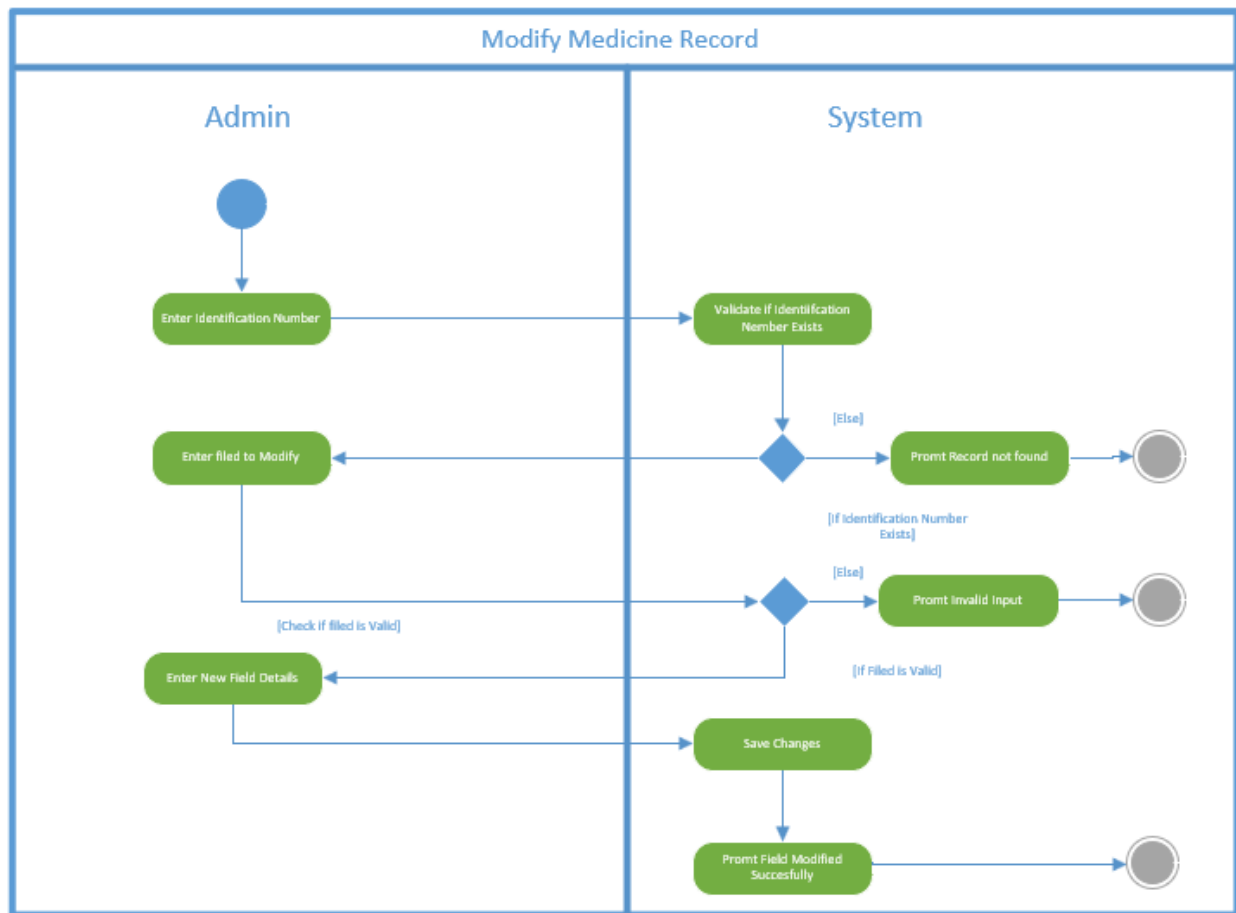


Figure 5 shows Activity Diagram of Modifying Medicine Record

### 2.3.4 Delete Medicine Record

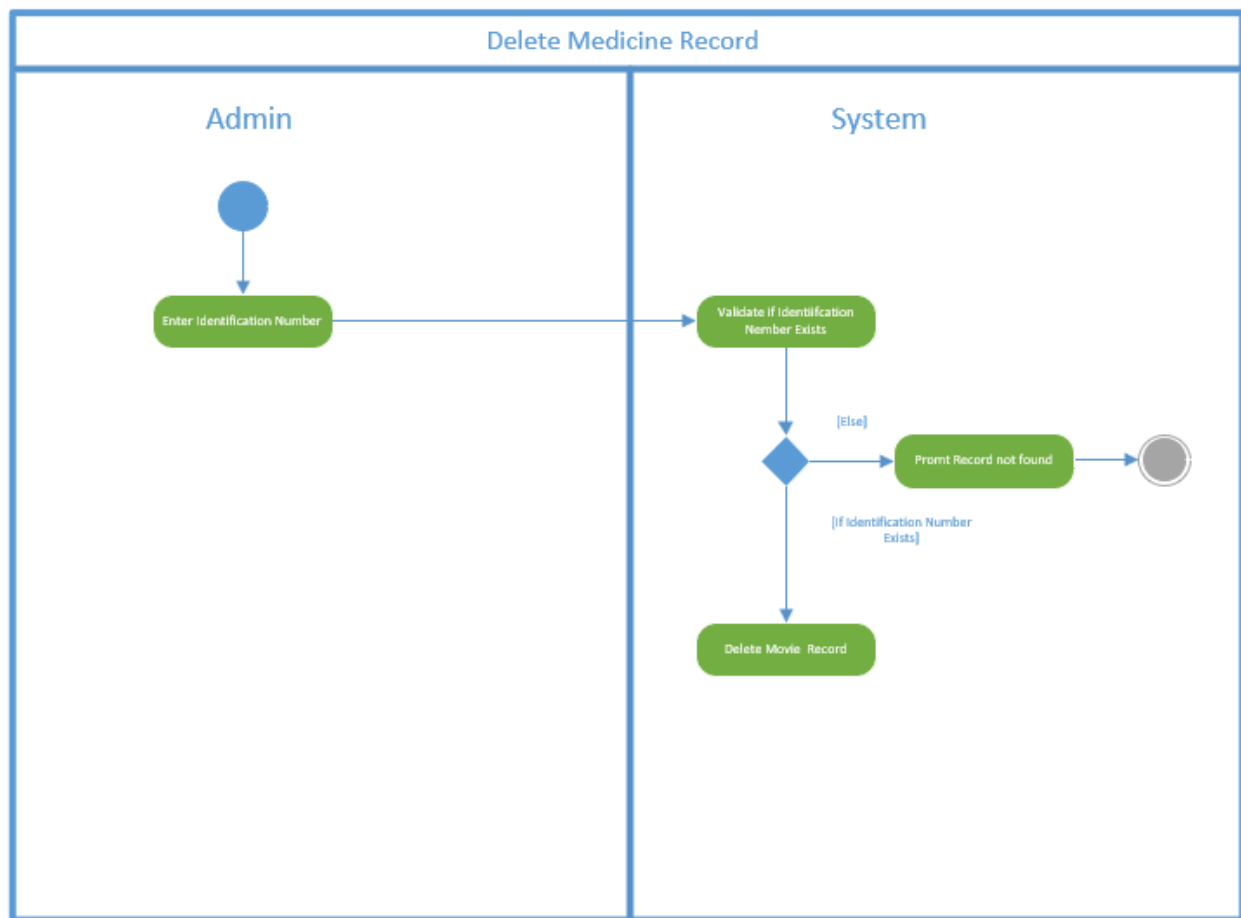


Figure 6 shows Activity Diagram of Deleting Medicine Record

### 2.3.5 Search Medicine Record

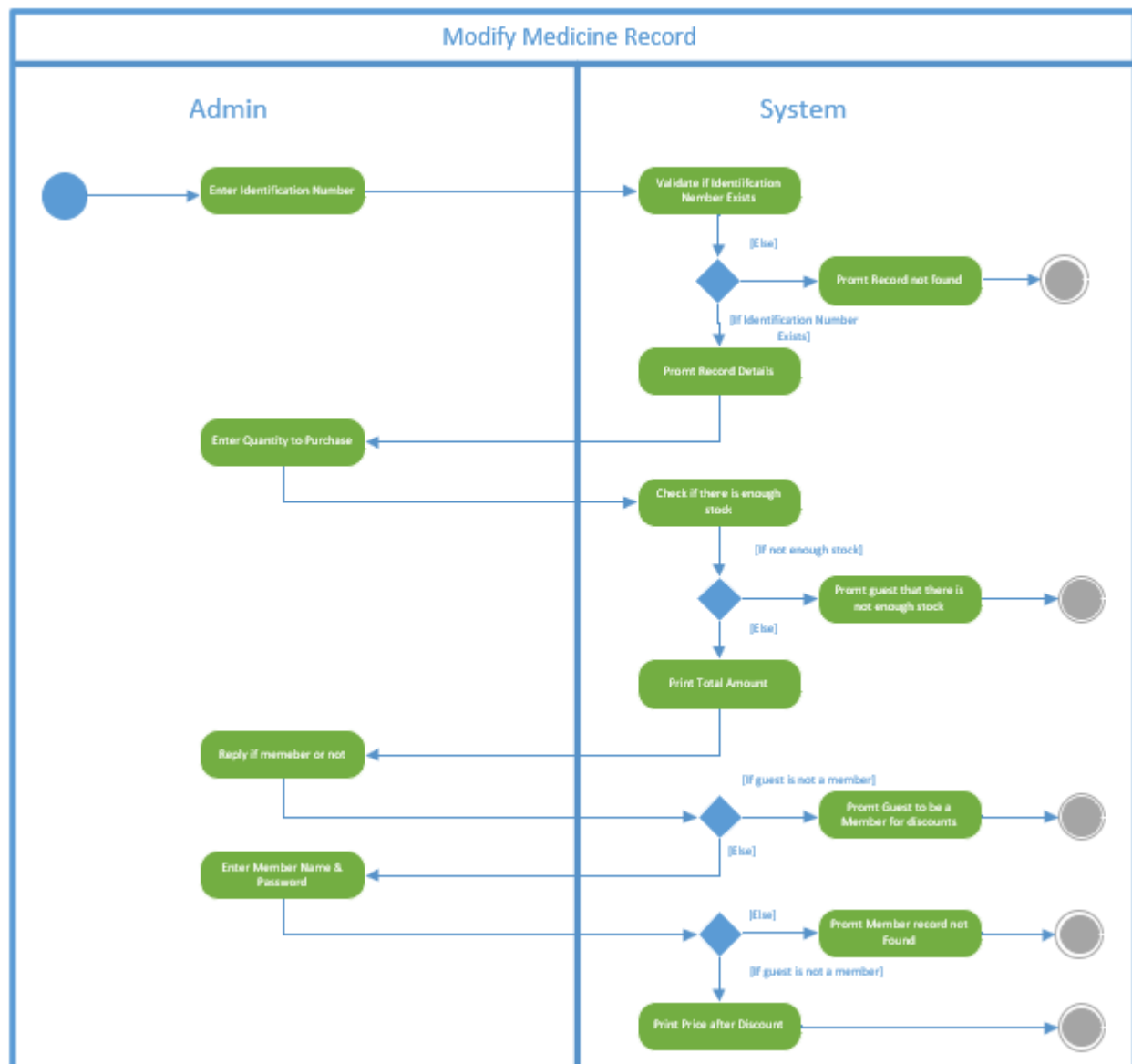


Figure 7 shows Activity Diagram of Searching Medicine Record

## 3.0 Object-Oriented Concepts

### 3.1 Class & Object

The building block of C++ that leads to Object Oriented programming is a Class. It is a user defined data type, which holds its own data members and member functions, which can be accessed and used by creating an instance of that class. An Object is an instance of a Class. When a class is defined, no memory is allocated but when it is instantiated memory is allocated (GeeksforGeeks, 2019). **Figure 8** shows class & object implementation in PMS.

```

19 class Admin : public accounts
20 {
21     public:
22         const string txt_user = "adminUser.txt";
23         const string txt_pass = "adminPass.txt";
24
25     void addAccountM()
26     {
27         string username, password;
28         fstream File1, File2;
29         File1.open("managerUser.txt", ios::app);
30         File2.open("managerPass.txt", ios::app);
31         cout << "Please Enter Username: " << endl;
32         cin >> username;
33         cout << "Please Enter Password: " << endl;
34         cin >> password;
35         File1 << endl << username;
36         File2 << endl << password;
37     }

```

Figure 8 shows Class & Object

### 3.2 Inheritance

In the programming world, the word inheritance basically means the same thing. There is a parent class or base class, which denotes a class from which a child class or a derived class inherits its features from (Goswami, 2018). **Figure 9** shows the parent class “accounts” and “Admin” as sub-class. Thus, “Admin” can access all the features of the class “accounts”.

```

19 class Admin : public accounts
20 {
21     public:
22         const string txt_user = "adminUser.txt";
23         const string txt_pass = "adminPass.txt";
24
25     void addAccountM()
26     {
27         string username, password;
28         fstream File1, File2;
29         File1.open("managerUser.txt", ios::app);
30         File2.open("managerPass.txt", ios::app);
31         cout << "Please Enter Username: " << endl;
32         cin >> username;
33         cout << "Please Enter Password: " << endl;
34         cin >> password;
35         File1 << endl << username;
36         File2 << endl << password;
37     }

```

Figure 9 shows Inheritance

## 3.2 Exception Handling

An exception is a problem that arises during the execution of a program. A C++ exception is a response to an exceptional circumstance that arises while a program is running, such as an attempt to divide by zero. Exceptions provide a way to transfer control from one part of a program to another. C++ exception handling is built upon three keywords: **try**, **catch**, and **throw** (Tutorialspoint, 2019). **Figure 10** shows exception handling.

```
int medicine::totalmedrecords()
{
    std::ifstream file;

    try
    {
        file.open("MedList.txt");

        int number_of_lines = 0;
        std::string fileline;

        while (std::getline(file, fileline))
            ++number_of_lines;

        medrec = number_of_lines / 8;
        file.close();
        return medrec;
    }
    catch (std::ifstream::failure e) {
        std::cerr << "\nUnable to search for medicine records";
        return 0;
    }
}
```

*Figure 10 shows Exception Handling*

## 4.0 Additional Features

### 4.1 Modify Username & Password for Admin

```

90 void editAccountM()
91 {
92     // deleting username
93     // uinput is the username input
94
95     string username, user, uinput;
96     cout << "Enter Username Of Account You Wish To Edit: ";
97     cin >> user;
98
99     // ufile for usernames file
100
101     ifstream ufile;
102     ufile.open("managerUser.txt");
103     ofstream temp;
104     temp.open("temp.txt");
105     while (getline(ufile, username))
106     {
107         if (username != user)
108         {
109             temp << username << endl;
110         }
111         else
112         {
113             cout << "Enter New Username: ";
114             cin >> uinput;
115             temp << uinput << endl;
116         }
117     }
118     ufile.close();
119     temp.close();
120     remove("managerUser.txt");
121     rename("temp.txt", "managerUser.txt");
122

```

*Figure 11 shows code of Modify Admin Username & Password*

**Figure 11** shows part of the “editAccountM()” function which is responsible for changing the Admin username and password. The Admin will be asked to provide the current username and password for verification. If the current username and password is correct, the system will ask for the new username and password. The new username and password will be saved to the managerUser.txt file and will be used for verification on the next Admin login.

## 4.2 List of Medicine Record

**Figure 12** shows the code used to provide updates of the total medicine records. The managerMedicine.txt file is read, and the list of medicine is displayed.

```

647 class Customer : public accounts
648 {
649 public:
650 void displayMedicine()
651 {
652     string medicineID; //uinput is the username input
653     ifstream file; //ufile for usernames file
654     file.open("managerMedicine.txt");
655     ofstream temp;
656     temp.open("temp.txt");
657     while (getline(file, medicineID))
658     {
659         cout << medicineID << endl;
660     }
661 }

```

*Figure 12 shows List of Medicine Records*

## 4.3 Search Medicine by Medicine ID

**Figure 13** shows the search function to search by Medicine Identification Number. The managerMedicine.txt is read and the medicine is displayed.

```

662 void searchMedicine()
663 {
664     string medicineID, ID; //uinput is the username input
665     int p;
666     cout << "Please Enter Medicine ID ";
667     cin >> ID;
668     ifstream file; //ufile for usernames file
669     file.open("managerMedicine.txt");
670     ofstream temp;
671     temp.open("temp.txt");
672     while (getline(file, medicineID))
673     {
674         p = medicineID.find_first_of(",");
675         if (ID == medicineID.substr(0, p))
676         {
677             cout << medicineID << endl;
678         }
679     }
680     file.close();
681     temp.close();
682     remove("managerMedicine.txt");
683     rename("temp.txt", "managerMedicine.txt");
684 }

```

*Figure 13 shows Search Function*

## 4.4 Add To Cart

**Figure 14** shows the Add to Cart Function Code. It helps the Customer to add medicine in their card.

```

685 void addToCart()
686 {
687     string medicineID, ID, Price, temp;
688     int p = 0; // This is to find the price of the product
689     fstream File, File2;
690     cout << "Please Enter Medicine ID: " << endl;
691     cin >> medicineID;
692     File.open("managerMedicine.txt");
693     File2.open("customerCart.txt", ios::app);
694     while (getline(File, ID))
695     {
696         p = ID.find_first_of(",");
697         if (medicineID == ID.substr(0, p))
698         {
699             temp = ID.substr(ID.find(".") + 1, ID.length());
700             File2 << temp << endl;
701         }
702     }
703     File.close();
704 }
705
706

```

*Figure 14 shows the Add to Cart Function*

## 4.5 Display Bill

**Figure 15** shows the code for the Display Bill Function. Customer can see the total bill for their Medicine.

```

707 void displaybill()
708 {
709     string medicinePrice; // uinput is the username input
710     int price = 0, sum = 0;
711     ifstream file; // ufile for usernames file
712     file.open("customerCart.txt");
713     ofstream temp;
714     temp.open("temp.txt");
715     while (getline(file, medicinePrice))
716     {
717         stringstream convert(medicinePrice);
718         convert >> price;
719         sum = price + sum;
720     }
721     cout << "Your Total Is: RM " << sum << endl;
722 }
723

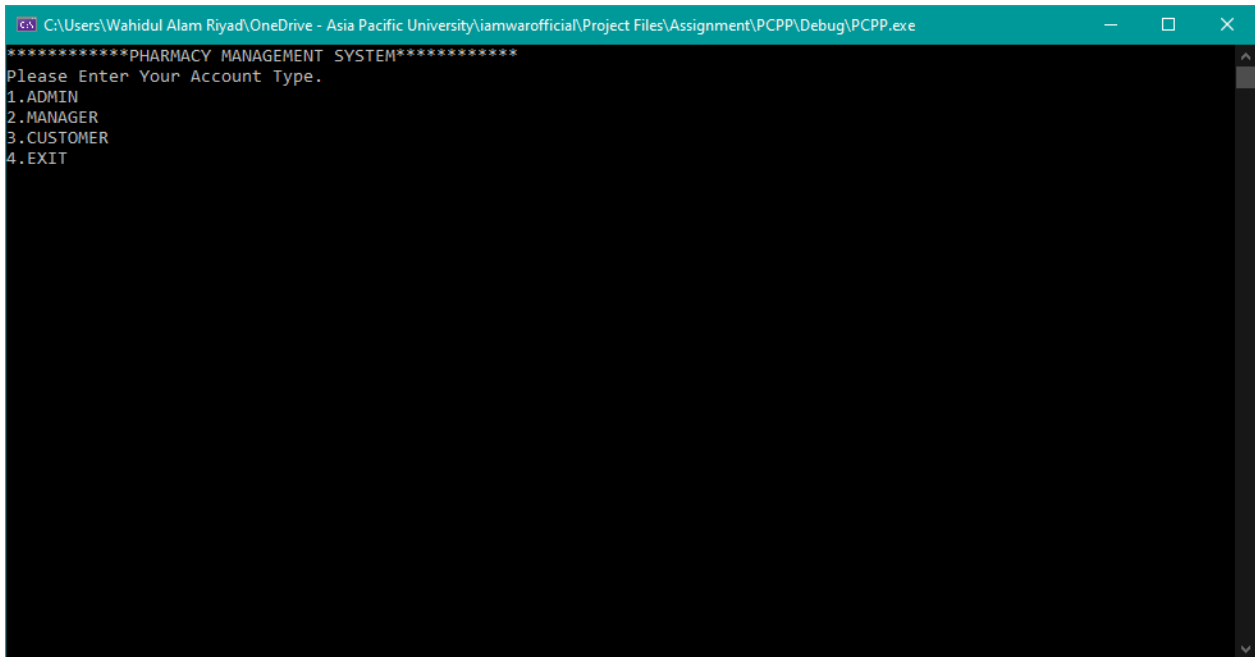
```

*Figure 15 shows the Display Bill*



## 5.0 Screenshots of System Output

### 5.1 Main Panel

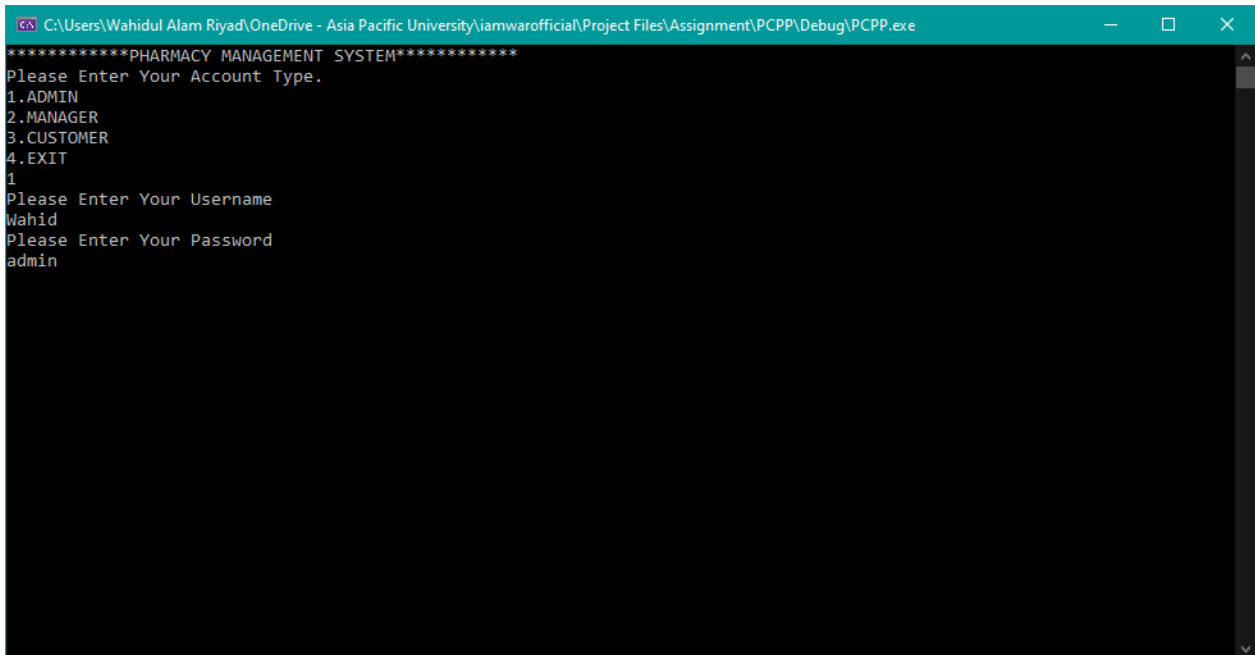


*Figure 16 shows Main Panel*

**Figure 16** shows the Main Panel of PMS. Four options are available in this screen. Admin to create New Managers and New Customers. Manager to create new Order and new Medicine Record. Customer can Display Medicine and use Add to Cart Function to add Medicine in their list and Display Bill as well.

## 5.2 Admin

### 5.2.1 Admin Login

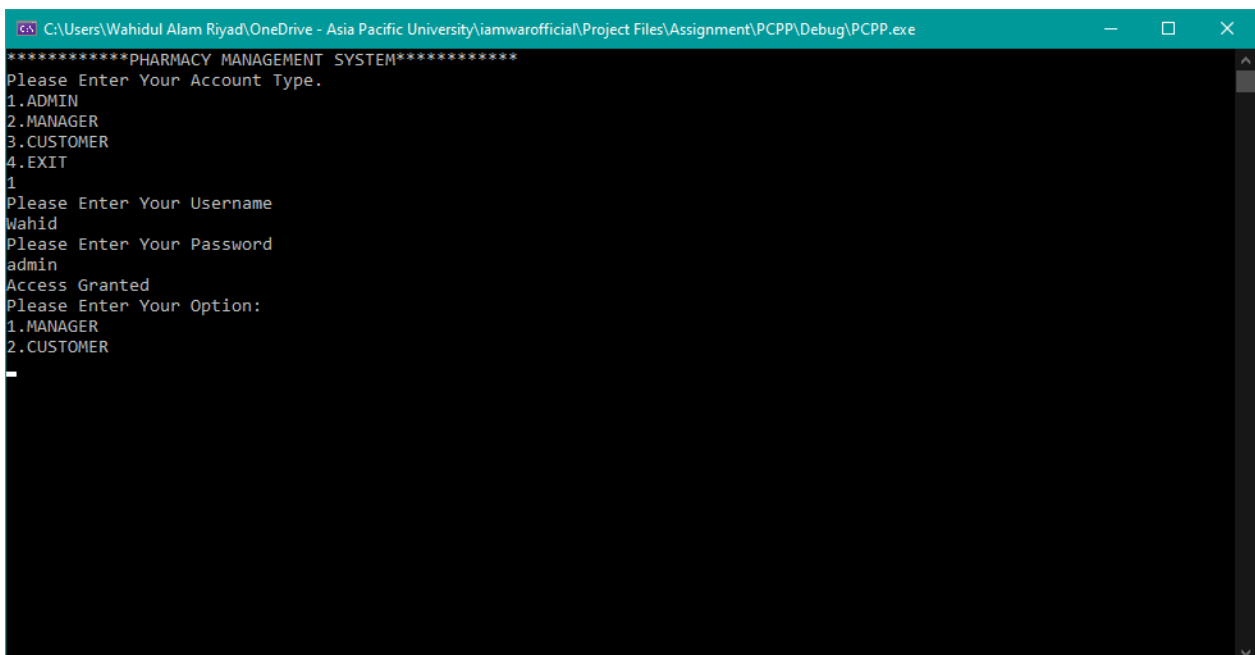


```
C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
1
Please Enter Your Username
Wahid
Please Enter Your Password
admin
```

*Figure 17 shows Admin Login*

**Figure 17** shows Admin Login where the Username and Password is key in.

### 5.2.2 Admin Panel



```
C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
1
Please Enter Your Username
Wahid
Please Enter Your Password
admin
Access Granted
Please Enter Your Option:
1.MANAGER
2.CUSTOMER
-
```

*Figure 18 shows Admin Panel*

**Figure 18** shows Admin Panel where it can lead to Manager and Customer Login Panel.

### 5.2.3 Add Medicine

```

C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
Please Enter Your Option:
1.ORDERS
2.MEDICINE
2
Please Enter Your Option:
1.ADD
2.DELETE
3.EDIT
4.VIEW
5.SEARCH
6.CANCEL
1
Please Enter Medicine ID:
Med1
Please Enter Medicine Name:
Paracetamol
Please Enter Medicine Manufacture Date:
21Jul2018
Please Enter Medicine Expiry Date:
21Jul2020
Please Enter Medicine Price:
10
Please Enter Order ID: D1
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
  
```

*Figure 19 shows Add Medicine Record*

**Figure 19** shows how to add medicine record by filling the necessary details such as Medicine ID, Medicine Name, Date of Expiry and many more.

### 5.2.4 Delete Medicine

```

C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
2
Please Enter Your Username
A1
Please Enter Your Password
Z1
Access Granted
Please Enter Your Option:
1.ORDERS
2.MEDICINE
2
Please Enter Your Option:
1.ADD
2.DELETE
3.EDIT
4.VIEW
5.SEARCH
6.CANCEL
2
Please Enter Medicine ID: Med1
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
  
```

*Figure 20 shows Delete Medicine*

**Figure 23** shows how to delete medicine by key in Medicine ID.

### 5.2.5 Modify Medicine

```
Enter option number : 3
```

```
Enter Drug Identification Number : MAL19926350AC_
```

*Figure 21 shows Enter Option*

```
Record found.
```

```
Please enter option number of field to modify.
```

```
1) Price
```

```
2) Quantity
```

```
3) Batch Number
```

```
4) Manufacture & Expiry Date
```

```
Enter any other number to cancel modification
```

```
Enter option number : _
```

*Figure 22 shows Modify Panel*

```
Record found.
```

```
Please enter option number of field to modify.
```

```
1) Price
```

```
2) Quantity
```

```
3) Batch Number
```

```
4) Manufacture & Expiry Date
```

```
Enter any other number to cancel modification
```

```
Enter option number : 1
```

```
Current Price (RM) : 35.60
```

```
Enter new Price (RM) : 38.80
```

```
Price was modified successfully.
```

*Figure 23 shows Edit of Medicine Record*

**Figure 21, Figure 22 & Figure 23** shows how to edit medicine by choosing the option number.

### 5.2.6 Search Medicine by Identification Number

```

C:\WINDOWS\system32\cmd.exe
2.MANAGER
3.CUSTOMER
4.EXIT
2
Please Enter Your Username
A1
Please Enter Your Password
Z1
Access Granted
Please Enter Your Option:
1.ORDERS
2.MEDICINE
2
Please Enter Your Option:
1.ADD
2.DELETE
3.EDIT
4.VIEW
5.SEARCH
6.CANCEL
5
Please Enter Medicine ID Med1
Med1, Paracetamol, 21Jul2018, 21Jul2020, RM 10
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
  
```

Figure 24 shows Search Medicine by Medicine ID

**Figure 24** shows just by entering Medicine ID we can find the Medicine Record.

### 5.2.7 Search Medicine by Medicine Name

```

Enter option number : 5

Enter Medicine Name : Natopherol

Record found :

Registration Number      : MAL19926350AC
Medicine Name           : Natopherol Bio-Enhanced
Company Name            : AstraZeneka Sdn Bhd
Batch Number            : 12
Price (RM)              : 35.60
Manufacture Date (MM/YYYY) : 03/2016
Expiry Date (MM/YYYY)    : 06/2018
Quantity                 : 60
  
```

Figure 25 shows Search by Medicine Name

**Figure 25** shows how to search medicine by entering medicine name.

### 5.2.8 Search Medicine by Company Name

```

Enter option number : 6

Enter Company Name : Astra

Record found :

Registration Number      : MAL19926350AC
Medicine Name           : Natopherol Bio-Enhanced
Company Name            : AstraZeneka Sdn Bhd
Batch Number            : 12
Price (RM)              : 35.60
Manufacture Date (MM/YYYY) : 03/2016
Expiry Date (MM/YYYY)    : 06/2018
Quantity                : 60
  
```

Figure 26 shows Search Medicine by Company Name

Figure 24 shows how to search medicine by using Company Name

### 5.2.9 List of Medicine based on Expiry Date

```

Medicine(s) are displayed from the earliest to latest Expiry Date.

Registration Number      : MAL19926350AC
Medicine Name           : Natopherol Bio-Enhanced
Company Name            : AstraZeneka Sdn Bhd
Batch Number            : 16
Price (RM)              : 38.80
Manufacture Date (MM/YYYY) : 05/2017
Expiry Date (MM/YYYY)    : 10/2019
Quantity                : 53

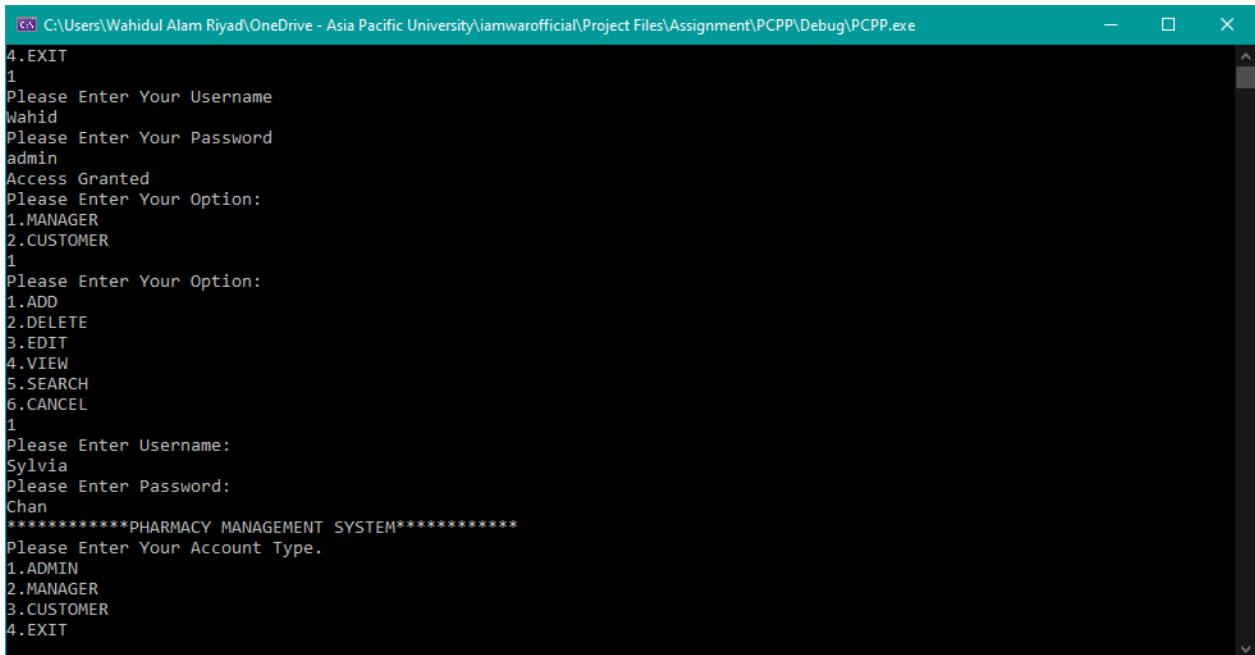
Registration Number      : MAL19936482XC
Medicine Name           : Paracetamol
Company Name            : Xamarin Sdn Bhd
Batch Number            : 35
Price (RM)              : 67.30
Manufacture Date (MM/YYYY) : 02/2016
Expiry Date (MM/YYYY)    : 07/2020
Quantity                : 35

Registration Number      : MAL19837528AC
Medicine Name           : Panadol Actifast
Company Name            : Pharmaceutics Sdn Bhd
Batch Number            : 56
Price (RM)              : 23.20
Manufacture Date (MM/YYYY) : 06/2017
Expiry Date (MM/YYYY)    : 08/2022
Quantity                : 80
  
```

Figure 27 shows list of Medicine based on Expiry Date

**Figure 27** shows the list of medicine that will expire first to medicine that will expire last.

### 5.2.10 Add Member



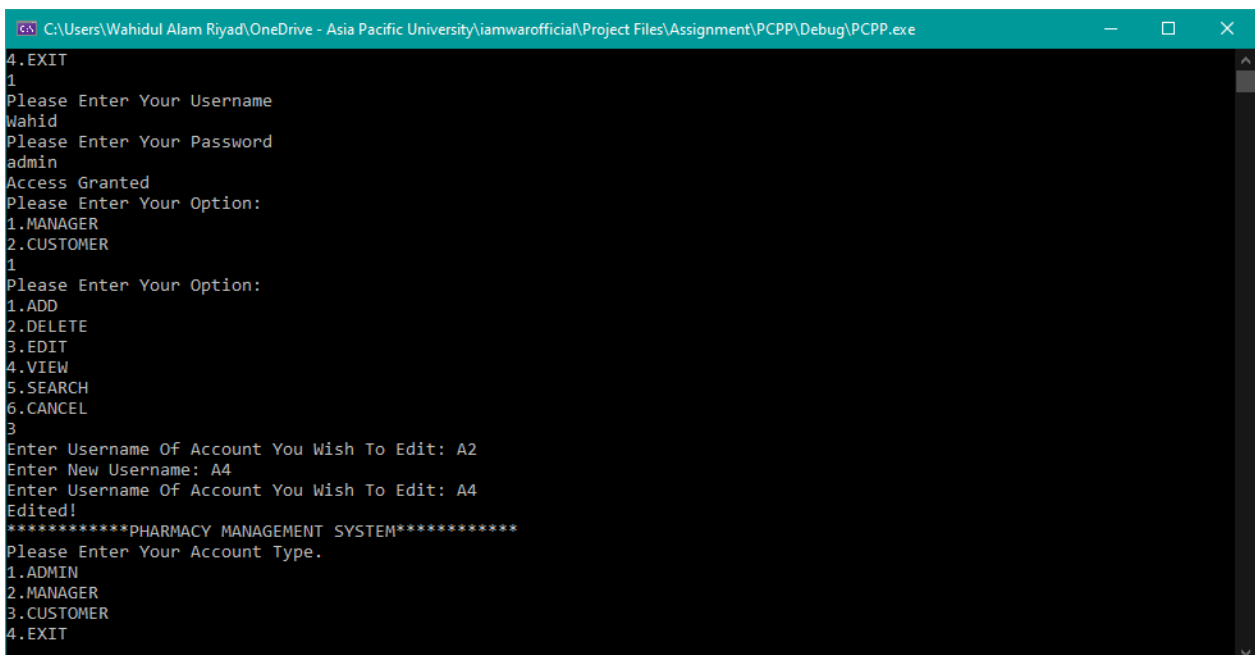
```

C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
4.EXIT
1
Please Enter Your Username
Wahid
Please Enter Your Password
admin
Access Granted
Please Enter Your Option:
1.MANAGER
2.CUSTOMER
1
Please Enter Your Option:
1.ADD
2.DELETE
3.EDIT
4.VIEW
5.SEARCH
6.CANCEL
1
Please Enter Username:
Sylvia
Please Enter Password:
Chan
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
  
```

*Figure 28 shows Addition of New Member Username & Password*

**Figure 28** shows by entering new username and password we can add new member.

### 5.2.11 Change Username & Password



```

C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
4.EXIT
1
Please Enter Your Username
Wahid
Please Enter Your Password
admin
Access Granted
Please Enter Your Option:
1.MANAGER
2.CUSTOMER
1
Please Enter Your Option:
1.ADD
2.DELETE
3.EDIT
4.VIEW
5.SEARCH
6.CANCEL
3
Enter Username Of Account You Wish To Edit: A2
Enter New Username: A4
Enter Username Of Account You Wish To Edit: A4
Edited!
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
  
```

*Figure 29 shows Edit Username & Password*

**Figure 29** shows how to edit Username & Password of a Manager.

## 5.3 Customer

### 5.3.1 Customer Panel

```

C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
3
Please Enter Your Username
S1
Please Enter Your Password
X1
Access Granted
Please Enter Your Option:
1.DISPLAY MEDICINE
2.SEARCH
3.ADD TO CART
4.DISPLAY BILL
5.EXIT

```

Figure 30 shows Customer Panel

**Figure 30** shows the Customer Panel where the user can display bill, search, add to cart and display medicine.

### 5.3.2 Search Medicine by Identification Number

```

C:\Users\Wahidul Alam Riyad\OneDrive - Asia Pacific University\iamwarofficial\Project Files\Assignment\PCPP\Debug\PCPP.exe
Med1, Paracetamol, 21Jul2018, 21Jul2020, RM 10
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT
3
Please Enter Your Username
S1
Please Enter Your Password
X1
Access Granted
Please Enter Your Option:
1.DISPLAY MEDICINE
2.SEARCH
3.ADD TO CART
4.DISPLAY BILL
5.EXIT
2
Please Enter Medicine ID Med1
Med1, Paracetamol, 21Jul2018, 21Jul2020, RM 10
*****PHARMACY MANAGEMENT SYSTEM*****
Please Enter Your Account Type.
1.ADMIN
2.MANAGER
3.CUSTOMER
4.EXIT

```

Figure 31 shows Search Medicine by Medicine ID



**Figure 31** shows how to search medicine by Medicine ID from Customer Panel.

### 5.3.3 Search Medicine by Medicine Name

```
Enter option number : 2

Enter Medicine Name : Bio

Record found :

Registration Number      : MAL19926350AC
Medicine Name            : Natopherol Bio-Enhanced
Company Name             : AstraZeneka Sdn Bhd
Batch Number            : 16
Price (RM)               : 38.80
Manufacture Date (MM/YYYY) : 05/2017
Expiry Date (MM/YYYY)    : 10/2019
Quantity                 : 53
```

*Figure 32 shows Search Medicine by Medicine Name*

**Figure 32** shows how to search medicine by medicine name from Customer Panel.

### 5.3.4 Search Medicine by Company Name

```
Enter option number : 3

Enter Company Name : Zeneka

Record found :

Registration Number      : MAL19926350AC
Medicine Name            : Natopherol Bio-Enhanced
Company Name             : AstraZeneka Sdn Bhd
Batch Number            : 16
Price (RM)               : 38.80
Manufacture Date (MM/YYYY) : 05/2017
Expiry Date (MM/YYYY)    : 10/2019
Quantity                 : 53
```

*Figure 33 shows Search Medicine by Company Name*

**Figure 33** shows Search Medicine by Company Name from Customer Panel.

## 6.0 Limitations & Conclusion

The Pharmacy Management System (PMS) developed may be able to search for medicine records based on keywords of medicine name and company name, but only the most relevant record is displayed. The record may not be what the Admin or Customer is searching for and the system does not display other possible search results. Besides that, only 200 records can be sorted based on expiry dates to prevent the system from using too much RAM (Random Access Memory). Many Object-Oriented Concepts were learnt during this assignment. This system can help in the future for any pharmaceutical department.

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