

# CS3052 - Computer Security

## Continuous assessment 02

### Protection of information based on sensitivity and privilege levels

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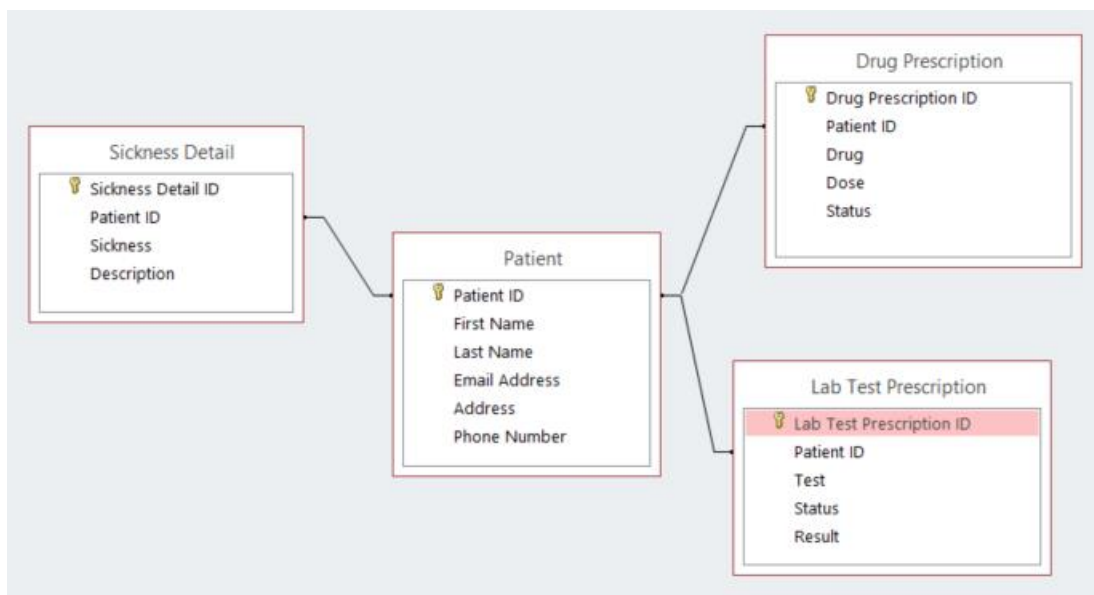
Index No : 180607R

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## Program Description

- The “Medical Data Processing System” handles data in a Medical Center.
- The System has 4 types of users:
  - Doctors
  - Pharmacists
  - Lab Technicians
  - Patients
- User data is stored in the “*config.txt*” file. Each record in the file contains a name, email, hashed password and a privilege level of a user.
- A Microsoft Access database was used to store the Patient data. It is stored in the “*db*” folder under the name “*MedicalDataProcessingSystemDB.accdb*”.
- The database has 4 tables:
  - Patient table
  - Sickness Detail table
  - Drug Prescription table
  - Lab Test Prescription table
- The tables have the following fields and relationships:



```

-----Log-in Menu-----
0 - Exit
1 - Log in
2 - Sign up
Select : █

```

### Logging in

- A user can log into the system by entering “1” in the Login Menu, then entering his/ her email and password. Passwords are hashed using the

```
hashed_pw = hashlib.md5(password.encode())
```

Method. For this, “hashlib” library is imported in the source code.

### User Sign-up

- A new user can register in the system entering “2” in the Login Menu.
- Then he/ she can choose what the user type is. Next, enter name, email and password. The password will be hashed, and this info will be saved in the “*config.txt*” file.

### User functionalities

- Privilege levels for the user types are defined as follows:

User Type	Privilege level
Doctor	4
Pharmacist	3
Lab Technician	2
Patient	1

- Based on the user types, the users have different levels of access to the data.
- When each user logs in, the permitted functionalities are showed in the terminal
- A doctor can view, create and delete records from all 4 tables. However he cannot enter some fields like the Status of a Drug Prescription record, the Status of a Lab Test Prescription record, and the Result of a Lab Test Prescription record. They will be set to default values when a doctor creates a record.
- A Pharmacist only has view permissions to the Patient table. He can view the Drug Prescription table, and update the Status field from “Prescribed” to “Issued”. He doesn’t have any permissions for the other tables.
- A Lab Technician only has view permissions to the Patient table. He can view the Lab Test Prescription table, and update the Status field from “Pending” to “Done”. He can also update the Result field of the Lab Test Prescription table. He doesn’t have any permissions for the other tables.
- A Patient only has permission to view his record from the 4 tables. He doesn’t have any other access to any of the tables.

- The complete functionalities of the users are as follows:
  - A doctor can:
    - View all Patients
    - View a patient
    - Register a Patient
    - Delete a Patient
    - View all Sickness Details
    - View Sickness Details of a Patient
    - Add Sickness Detail
    - Remove Sickness Detail
    - View all Drug Prescriptions
    - View Drug Prescriptions of a Patient
    - Add Drug Prescription
    - Remove Drug Prescription
    - View all Lab Test Prescriptions
    - View Lab Test Prescriptions of a Patient
    - Add Lab Test Prescription
    - Remove Lab Test Prescription
  - A Pharmacist can:
    - View all Patients
    - View a patient
    - View all Drug Prescriptions
    - View Drug Prescriptions of a Patient
    - Update Drug Prescription as issued
  - A Lab Technician can:
    - View all Patients
    - View a patient
    - View all Lab Test Prescriptions
    - View Lab Test Prescriptions of a Patient
    - Mark Lab Test as Done
    - Enter Lab Test Result
  - A Patient can:
    - View his/her Details
    - View his/her Sickness Details
    - View his/her Drug Prescriptions
    - View his/her Lab Test Prescriptions

## Doctor functionalities

```

-----Log-in Menu-----
0 - Exit
1 - Log in
2 - Sign up
Select : 1
-----Enter your credentials-----
Email: doctor1@medcenter.com
Password: password
Login Successful
Your privilege level : 4
-----Doctor Main Menu-----
0 - Log out
1 - View all Patients
2 - View a patient
3 - Register a Patient
4 - Delete a Patient
5 - View all Sickness Details
6 - View Sickness Details of a Patient
7 - Add Sickness Detail
8 - Remove Sickness Detail
9 - View all Drug Prescriptions
10 - View Drug Prescriptions of a Patient
11 - Add Drug Prescription
12 - Remove Drug Prescription
13 - View all Lab Test Prescriptions
14 - View Lab Test Prescriptions of a Patient
15 - Add Lab Test Prescription
16 - Remove Lab Test Prescription
Select : 

```

- View all Patients

```

Select : 1
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 1 | Harry | Potter | harrypotter@gmail.com | 4 Privet Drive, Little Whinging, Surrey | 712345678 |
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
| 4 | Rubeus | Hagrid | rubeushagrid@gmail.com | Hagrid's Hut, Hogwarts Grounds, Highlands, Scotland | 774876098 |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | Lovegood House, Ottery St. Catchpole, Devon, England | 770234567 |
| 9 | Ron | Weasley | ronweasley@gmail.com | Ottery St Catchpole, Devon, West Country, England, Great Britain | 781239876 |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | Granger Residence, Hampstead Garden Suburb, North West London | 719843096 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : 

```

- View a patient

```

Select : 2
Enter patient Id : 2
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : 

```

- Register a Patient

```
Select : 3
Enter patient First Name : Gowantha
Enter patient Last Name : Charithal
Enter patient Email : gowantha@abc.com
Enter patient Address : 62, Akmeemana, Galle
Enter patient Phone Number : 710837236
Data Inserted
Enter any key to View Main Menu
Select :
```

- Delete a Patient

```
Select : 4
```

Patient ID	First Name	Last Name	Email Address	Address	Phone Number
1	Harry	Potter	harrypotter@gmail.com	4 Privet Drive, Little Whinging, Surrey	712345678
2	Draco	Malfoy	dracomalfoy@gmail.com	Malfoy Manor, Wiltshire, England	718765432
4	Rubeus	Hagrid	rubeushagrid@gmail.com	Hagrid's Hut, Hogwarts Grounds, Highlands, Scotland	774876098
3	Luna	Lovegood	lunalovegood@gmail.com	Lovegood House, Ottery St. Catchpole, Devon, England	770234567
9	Ron	Weasley	ronweasley@gmail.com	Ottery St Catchpole, Devon, West Country, England, Great Britain	781239876
10	Hermione	Granger	hermoinegranger@gmail.com	Granger Residence, Hampstead Garden Suburb, North West London	719843096
11	Gowantha	Charithal	gowantha@abc.com	62, Akmeemana, Galle	710837236

```
Enter Patient ID to delete : 11
Data Deleted
Enter any key to View Main Menu
Select :
```

- View all Sickness Details

```
Select : 5
```

Patient ID	First Name	Last Name	Email Address	Sickness Detail ID	Sickness	Description
1	Harry	Potter	harrypotter@gmail.com	1	Common Cold	Came up with a bad common cold
2	Draco	Malfoy	dracomalfoy@gmail.com	3	Diarrhea	Ate junk food and now has diarrhea
3	Luna	Lovegood	lunalovegood@gmail.com	4	Covid-19	Infected with covid 19
3	Luna	Lovegood	lunalovegood@gmail.com	7	Osteoporosis	Weak Bones
9	Ron	Weasley	ronweasley@gmail.com	8	Depression	Has given up on life
10	Hermione	Granger	hermoinegranger@gmail.com	9	Schizophrenia	Critical

```
Enter any key to View Main Menu
Select :
```

- View Sickness Details of a Patient

```
Select : 6
Enter patient Id : 2
```

Patient ID	First Name	Last Name	Email Address	Sickness Detail ID	Sickness	Description
2	Draco	Malfoy	dracomalfoy@gmail.com	3	Diarrhea	Ate junk food and now has diarrhea

```
Enter any key to View Main Menu
Select :
```

- Add Sickness Detail

```
Select : 7
Enter Patient ID : 10
Enter Sickness : Cancer
Enter description : Phase 1 Lung Cancer
Data Inserted
Enter any key to View Main Menu
Select :
```

- Remove Sickness Detail

```
Select : 8
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Sickness Detail ID | Sickness | Description |
+-----+-----+-----+-----+-----+-----+-----+
| 1 | Harry | Potter | harrypotter@gmail.com | 1 | Common Cold | Came up with a bad common cold |
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 3 | Diarrhea | Ate junk food and now has diarrhea |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | 4 | Covid-19 | Infected with covid 19 |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | 7 | Osteoporosis | Weak Bones |
| 9 | Ron | Weasley | ronweasley@gmail.com | 8 | Depression | Has given up on life |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | 9 | Schizophrenia | Critical |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | 10 | Cancer | Phase 1 Lung Cancer |
+-----+-----+-----+-----+-----+-----+-----+
Enter Sickness Detail ID to delete : 10
Data Deleted
Enter any key to View Main Menu
Select :
```

- View all Drug Prescriptions

```
Select : 9
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Drug Prescription ID | Drug | Dose | Status |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Pepto-Bismol | 5 ml / day | Issued |
| 4 | Rubeus | Hagrid | rubeushagrid@gmail.com | 2 | Alendronate | 2 times a day | Issued |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | 6 | Alendronate | Once a day | Prescribed |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | 7 | Morphine | 30 ml/hr | Prescribed |
+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select :
```

- View Drug Prescriptions of a Patient

```
Select : 10
Enter patient Id : 2
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Drug Prescription ID | Drug | Dose | Status |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Pepto-Bismol | 5 ml / day | Issued |
+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select :
```

- Add Drug Prescription

```
Select : 11
Enter Patient ID : 9
Enter Drug : Piriton
Enter Dosage : 20 ml/ day
Data Inserted
Enter any key to View Main Menu
Select :
```

- Remove Drug Prescription

```
Select : 12
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Drug Prescription ID | Drug | Dose | Status |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Pepto-Bismol | 5 ml / day | Issued |
| 4 | Rubeus | Hagrid | rubeushagrid@gmail.com | 2 | Alendronate | 2 times a day | Issued |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | 6 | Alendronate | Once a day | Prescribed |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | 7 | Morphine | 30 ml/hr | Prescribed |
| 9 | Ron | Weasley | ronweasley@gmail.com | 8 | Piriton | 20 ml/ day | Prescribed |
+-----+-----+-----+-----+-----+-----+-----+
Enter Drug Prescription ID to delete : 8
Data Deleted
Enter any key to View Main Menu
Select :
```



- View all Lab Test Prescriptions

Select : 13

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola
3	Luna	Lovegood	lunalovegood@gmail.com	2	PCR test	Done	Positive for Covid-19
10	Hermione	Granger	hermoinegranger@gmail.com	5	Platelet count test	Pending	None

Enter any key to View Main Menu  
Select :

- View Lab Test Prescriptions of a Patient

Select : 14  
Enter patient Id : 2

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola

Enter any key to View Main Menu  
Select :

- Add Lab Test Prescription

Select : 15  
Enter Patient ID : 9  
Enter Test : PCR test  
Data Inserted  
Enter any key to View Main Menu  
Select :

- Remove Lab Test Prescription

Select : 16

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola
3	Luna	Lovegood	lunalovegood@gmail.com	2	PCR test	Done	Positive for Covid-19
10	Hermione	Granger	hermoinegranger@gmail.com	5	Platelet count test	Pending	None
9	Ron	Weasley	ronweasley@gmail.com	6	PCR test	Pending	None

Enter Lab Test Prescription ID to delete : 6  
Data Deleted  
Enter any key to View Main Menu  
Select :

## Pharmacist functionalities

```

-----Log-in Menu-----
0 - Exit
1 - Log in
2 - Sign up
Select : 1
-----Enter your credentials-----
Email: pharma1@medcenter.com
Password: cpass
Login Successful
Your privilege level : 3
-----Pharmacist Main Menu-----
0 - Log out
1 - View all Patients
2 - View a patient
3 - View all Drug Prescriptions
4 - View Drug Prescriptions of a Patient
5 - Update Drug Prescription as issued
Select : █

```

- View all Patients

```

Select : 1
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 1 | Harry | Potter | harrypotter@gmail.com | 4 Privet Drive, Little Whinging, Surrey | 712345678 |
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
| 4 | Rubeus | Hagrid | rubeushagrid@gmail.com | Hagrid's Hut, Hogwarts Grounds, Highlands, Scotland | 774876098 |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | Lovegood House, Ottery St. Catchpole, Devon, England | 770234567 |
| 9 | Ron | Weasley | ronweasley@gmail.com | Ottery St Catchpole, Devon, West Country, England, Great Britain | 781239876 |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | Granger Residence, Hampstead Garden Suburb, North West London | 719843096 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

- View a patient

```

Select : 2
Enter patient Id : 2
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

- View all Drug Prescriptions

```

Select : 3
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Drug Prescription ID | Drug | Dose | Status |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Pepto-Bismol | 5 ml / day | Issued |
| 4 | Rubeus | Hagrid | rubeushagrid@gmail.com | 2 | Alendronate | 2 times a day | Issued |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | 6 | Alendronate | Once a day | Prescribed |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | 7 | Morphine | 30 ml/hr | Prescribed |
+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

- View Drug Prescriptions of a Patient

```
Select : 4
Enter patient Id : 2
```

Patient ID	First Name	Last Name	Email Address	Drug Prescription ID	Drug	Dose	Status
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Pepto-Bismol	5 ml / day	Issued

```
Enter any key to View Main Menu
Select :
```

- Update Drug Prescription as issued

```
Select : 5
```

Patient ID	First Name	Last Name	Email Address	Drug Prescription ID	Drug	Dose	Status
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Pepto-Bismol	5 ml / day	Issued
4	Rubeus	Hagrid	rubeushagrid@gmail.com	2	Alendronate	2 times a day	Issued
3	Luna	Lovegood	lunalovegood@gmail.com	6	Alendronate	Once a day	Prescribed
10	Hermione	Granger	hermoinegranger@gmail.com	7	Morphine	30 ml/hr	Prescribed

```
Enter Drug Prescription Id : 6
Data Inserted
Enter any key to View Main Menu
Select : q
-----Pharmacist Main Menu-----
0 - Log out
1 - View all Patients
2 - View a patient
3 - View all Drug Prescriptions
4 - View Drug Prescriptions of a Patient
5 - Update Drug Prescription as issued
Select : 3
```

Patient ID	First Name	Last Name	Email Address	Drug Prescription ID	Drug	Dose	Status
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Pepto-Bismol	5 ml / day	Issued
4	Rubeus	Hagrid	rubeushagrid@gmail.com	2	Alendronate	2 times a day	Issued
3	Luna	Lovegood	lunalovegood@gmail.com	6	Alendronate	Once a day	Issued
10	Hermione	Granger	hermoinegranger@gmail.com	7	Morphine	30 ml/hr	Prescribed

```
Enter any key to View Main Menu
Select :
```

## Lab Technician functionalities

```

-----Log-in Menu-----
0 - Exit
1 - Log in
2 - Sign up
Select : 1
-----Enter your credentials-----
Email: labtech@medcenter.com
Password: pwd
Login Successful
Your privilege level : 2
-----Lab Technician Main Menu-----
0 - Log out
1 - View all Patients
2 - View a patient
3 - View all Lab Test Prescriptions
4 - View Lab Test Prescriptions of a Patient
5 - Mark Lab Test as Done
6 - Enter Lab Test Result
Select : 

```

- View all Patients

```

Select : 1
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 1 | Harry | Potter | harrypotter@gmail.com | 4 Privet Drive, Little Whinging, Surrey | 712345678 |
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
| 4 | Rubeus | Hagrid | rubeushagrid@gmail.com | Hagrid's Hut, Hogwarts Grounds, Highlands, Scotland | 774876098 |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | Lovegood House, Ottery St. Catchpole, Devon, England | 770234567 |
| 9 | Ron | Weasley | ronweasley@gmail.com | Ottery St Catchpole, Devon, West Country, England, Great Britain | 781239876 |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | Granger Residence, Hampstead Garden Suburb, North West London | 719843096 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : 

```

- View a patient

```

Select : 2
Enter patient Id : 2
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : 

```

- View all Lab Test Prescriptions

```

Select : 3
+-----+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Lab Test Prescription ID | Test | Status | Result |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Complete blood count test | Done | Positive for Ebola |
| 3 | Luna | Lovegood | lunalovegood@gmail.com | 2 | PCR test | Done | Positive for Covid-19 |
| 10 | Hermione | Granger | hermoinegranger@gmail.com | 5 | Platelet count test | Pending | None |
+-----+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : 

```

- View Lab Test Prescriptions of a Patient

```
Select : 4
Enter patient Id : 2
```

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola

```
Enter any key to View Main Menu
Select :
```

- Mark Lab Test as Done

```
Select : 5
```

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola
3	Luna	Lovegood	lunalovegood@gmail.com	2	PCR test	Done	Positive for Covid-19
10	Hermione	Granger	hermoinegranger@gmail.com	5	Platelet count test	Pending	None

```
Enter Lab Test Prescription Id : 5
Data Inserted
Enter any key to View Main Menu
Select :
```

- Enter Lab Test Result

```
Select : 6
```

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola
3	Luna	Lovegood	lunalovegood@gmail.com	2	PCR test	Done	Positive for Covid-19
10	Hermione	Granger	hermoinegranger@gmail.com	5	Platelet count test	Done	None

```
Enter Lab Test Prescription Id : 5
Enter Lab Test Result : Critical
Data Inserted
Enter any key to View Main Menu
Select : q
```

```
-----Lab Technician Main Menu-----
0 - Log out
1 - View all Patients
2 - View a patient
3 - View all Lab Test Prescriptions
4 - View Lab Test Prescriptions of a Patient
5 - Mark Lab Test as Done
6 - Enter Lab Test Result
Select : 3
```

Patient ID	First Name	Last Name	Email Address	Lab Test Prescription ID	Test	Status	Result
2	Draco	Malfoy	dracomalfoy@gmail.com	1	Complete blood count test	Done	Positive for Ebola
3	Luna	Lovegood	lunalovegood@gmail.com	2	PCR test	Done	Positive for Covid-19
10	Hermione	Granger	hermoinegranger@gmail.com	5	Platelet count test	Done	Critical

```
Enter any key to View Main Menu
Select :
```

## Patient functionalities

```

-----Log-in Menu-----
0 - Exit
1 - Log in
2 - Sign up
Select : 1
-----Enter your credentials-----
Email: dracomalfoy@gmail.com
Password: password
Login Successful
Your privilege level : 1
-----Patient Main Menu-----
0 - Log out
1 - View my Details
2 - View my Sickness Details
3 - View my Drug Prescriptions
4 - View my Lab Test Prescriptions
Select : █

```

- View my Details

```

Select : 1
+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Address | Phone Number |
+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | Malfoy Manor, Wiltshire, England | 718765432 |
+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

- View my Sickness Details

```

Select : 2
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Sickness Detail ID | Sickness | Description |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 3 | Diarrhea | Ate junk food and now has diarrhea |
+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

- View my Drug Prescriptions

```

Select : 3
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Drug Prescription ID | Drug | Dose | Status |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Pepto-Bismol | 5 ml / day | Issued |
+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

- View my Lab Test Prescriptions

```

Select : 4
+-----+-----+-----+-----+-----+-----+-----+
| Patient ID | First Name | Last Name | Email Address | Lab Test Prescription ID | Test | Status | Result |
+-----+-----+-----+-----+-----+-----+-----+
| 2 | Draco | Malfoy | dracomalfoy@gmail.com | 1 | Complete blood count test | Done | Positive for Ebola |
+-----+-----+-----+-----+-----+-----+-----+
Enter any key to View Main Menu
Select : █

```

## Python Code for Medical Data Processing System

medicalDataProcessingSystem.py

```
import pyodbc
import os
import hashlib
from prettytable import PrettyTable

#User class to save details of the current User
class User:
    def __init__(self, name, email, privilegeLvl):
        self.name = name
        self.email = email
        self.privilegeLvl = privilegeLvl

#login function
def login(email, pwd):

    #file read function
    configFile = open('config.txt', 'r')
    lines = configFile.readlines()
    configFile.close()
    count = 0
    login = False
    for line in lines:
        count += 1
        #seperate each data in a row
        data = line.strip().split(",")
        if(data[1] == email and data[2] == pwd.hexdigest()):
            login = True
            print("Login Successful")
            user = User(data[0], data[1], data[3])
            return user
    if(not login):
        print("Invalid email/password")
        return False

#-----Database Dccess functions-----

#Patient Database Access functions

def registerPatientDb(firstName, lastName, email, address, phoneNum):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdB)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdB;'

```

```

    conn = pyodbc.connect(con_str)

    cursor = conn.cursor()
    myUser = (
        (firstName, lastName, email, address, phoneNum),
    )
    cursor.executemany('INSERT INTO Patient ([First Name], [Last Name], [Email
Address], [Address], [Phone Number]) VALUES (?, ?, ?, ?, ?)', myUser)
    conn.commit()
    print('Data Inserted')

except pyodbc.Error as e:
    print("Error in connection", e)

def deletePatientDb(patientId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('DELETE FROM Patient WHERE Patient.[Patient ID] = ?', (patientId))
        conn.commit()
        print('Data Deleted')

    except pyodbc.Error as e:
        print("Error in connection", e)

def viewAllPatientsDb():
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT * FROM Patient')

        patients = []
        for row in cursor.fetchall():
            patients.append(row)
        return patients

    except pyodbc.Error as e:
        print("Error in connection", e)

def viewPatientDb(patientId):

```



```

    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT * FROM Patient WHERE [Patient].[Patient ID] = ?',
(patientId))

        patients = []
        for row in cursor.fetchall():
            patients.append(row)
        return patients

    except pyodbc.Error as e:
        print("Error in connection", e)

def getMyIdDb(email):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT [Patient].[Patient ID] FROM Patient WHERE [Patient].[Email
Address] = ?', (email))

        myId = []
        for row in cursor.fetchall():
            myId.append(row)
        return myId

    except pyodbc.Error as e:
        print("Error in connection", e)

#Drug Prescription Database Access functions

def addDrugPrescriptionDb(patientId, drug, dose):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        drugPrescriptionRecord = (

```

```

        (patientId, drug, dose, 'Prescribed'),
    )
    cursor.executemany('INSERT INTO [Drug Prescription] ([Patient ID], [Drug], [Dose],
[Status]) VALUES (?, ?, ?, ?)', drugPrescriptionRecord)
    conn.commit()
    print('Data Inserted')

except pyodbc.Error as e:
    print("Error in connection", e)

def removeDrugPrescriptionDb(drugPrescriptionId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('DELETE FROM [Drug Prescription] WHERE [Drug Prescription].[Drug
Prescription ID] = ?', (drugPrescriptionId))
        conn.commit()
        print('Data Deleted')

    except pyodbc.Error as e:
        print("Error in connection", e)

def viewAllDrugPrescriptionsDb():
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT Patient.[Patient ID], Patient.[First Name], Patient.[Last
Name], Patient.[Email Address], [Drug Prescription].[Drug Prescription ID], [Drug
Prescription].Drug, [Drug Prescription].Dose, [Drug Prescription].Status FROM Patient
INNER JOIN [Drug Prescription] ON Patient.[Patient ID] = [Drug Prescription].[Patient
ID];')

        drugPrescriptions = []
        for row in cursor.fetchall():
            drugPrescriptions.append(row)
        return drugPrescriptions

    except pyodbc.Error as e:
        print("Error in connection", e)

```

```

def viewPatientDrugPrescriptionsDb(patientId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT Patient.[Patient ID], Patient.[First Name], Patient.[Last Name], Patient.[Email Address], [Drug Prescription].[Drug Prescription ID], [Drug Prescription].Drug, [Drug Prescription].Dose, [Drug Prescription].Status FROM Patient INNER JOIN [Drug Prescription] ON Patient.[Patient ID] = [Drug Prescription].[Patient ID] WHERE Patient.[Patient ID] = ?;', (patientId))

        drugPrescriptions = []
        for row in cursor.fetchall():
            drugPrescriptions.append(row)
        return drugPrescriptions

    except pyodbc.Error as e:
        print("Error in connection", e)

def issueDrugPrescriptionDb(drugPrescriptionId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        newStatus = 'Issued'
        cursor.execute('UPDATE [Drug Prescription] SET [Drug Prescription].[Status] = ? WHERE [Drug Prescription].[Drug Prescription ID] = ?', (newStatus, drugPrescriptionId))
        conn.commit()
        print('Data Inserted')

    except pyodbc.Error as e:
        print("Error in connection", e)

#Lab Test Prescription Database Access functions

def addLabTestPrescriptionDb(patientId, test):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

```

```

        cursor = conn.cursor()
        labTestPrescriptionRecord = (
            (patientId, test, 'Pending'),
        )
        cursor.executemany('INSERT INTO [Lab Test Prescription] ([Patient ID], [Test],
[Status]) VALUES (?, ?, ?)', labTestPrescriptionRecord)
        conn.commit()
        print('Data Inserted')

    except pyodbc.Error as e:
        print("Error in connection", e)

def removeLabTestPrescriptionDb(labTestPrescriptionId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('DELETE FROM [Lab Test Prescription] WHERE [Lab Test
Prescription].[Lab Test Prescription ID] = ?', (labTestPrescriptionId))
        conn.commit()
        print('Data Deleted')

    except pyodbc.Error as e:
        print("Error in connection", e)

def viewAllLabTestPrescriptionsDb():
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT Patient.[Patient ID], Patient.[First Name], Patient.[Last
Name], Patient.[Email Address], [Lab Test Prescription].[Lab Test Prescription ID], [Lab
Test Prescription].Test, [Lab Test Prescription].Status, [Lab Test Prescription].Result
FROM Patient INNER JOIN [Lab Test Prescription] ON Patient.[Patient ID] = [Lab Test
Prescription].[Patient ID];')

        labTestPrescriptions = []
        for row in cursor.fetchall():
            labTestPrescriptions.append(row)
        return labTestPrescriptions

    except pyodbc.Error as e:

```

```

        print("Error in connection", e)

def viewPatientLabTestPrescriptionsDb(patientId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT Patient.[Patient ID], Patient.[First Name], Patient.[Last
Name], Patient.[Email Address], [Lab Test Prescription].[Lab Test Prescription ID], [Lab
Test Prescription].Test, [Lab Test Prescription].Status, [Lab Test Prescription].Result
FROM Patient INNER JOIN [Lab Test Prescription] ON Patient.[Patient ID] = [Lab Test
Prescription].[Patient ID] WHERE Patient.[Patient ID] = ?;', (patientId))

        labTestPrescriptions = []
        for row in cursor.fetchall():
            labTestPrescriptions.append(row)
        return labTestPrescriptions

    except pyodbc.Error as e:
        print("Error in connection", e)

def labTestPrescriptionMarkDoneDb(labTestPrescriptionId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        newStatus = 'Done'
        cursor.execute('UPDATE [Lab Test Prescription] SET [Lab Test
Prescription].[Status] = ? WHERE [Lab Test Prescription].[Lab Test Prescription ID] = ?',
(newStatus, labTestPrescriptionId))
        conn.commit()
        print('Data Inserted')

    except pyodbc.Error as e:
        print("Error in connection", e)

def addLabTestPrescriptionResultDb(labTestPrescriptionId, result):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

```

```

        cursor = conn.cursor()
        cursor.execute('UPDATE [Lab Test Prescription] SET [Lab Test
Prescription].[Result] = ? WHERE [Lab Test Prescription].[Lab Test Prescription ID] = ?',
(result, labTestPrescriptionId))
        conn.commit()
        print('Data Inserted')

    except pyodbc.Error as e:
        print("Error in connection", e)

#Sickness Detail Database Access functions

def addSicknessDetailDb(patientId, sickness, description):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        sicknessDetailRecord = (
            (patientId, sickness, description),
        )
        cursor.executemany('INSERT INTO [Sickness Detail] ([Patient ID], [Sickness],
[Description]) VALUES (?, ?, ?)', sicknessDetailRecord)
        conn.commit()
        print('Data Inserted')

    except pyodbc.Error as e:
        print("Error in connection", e)

def removeSicknessDetailDb(sicknessDetailId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('DELETE FROM [Sickness Detail] WHERE [Sickness Detail].[Sickness
Detail ID] = ?', (sicknessDetailId))
        conn.commit()
        print('Data Deleted')

    except pyodbc.Error as e:
        print("Error in connection", e)

```

```

def viewAllSicknessDetailsDb():
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT Patient.[Patient ID], Patient.[First Name], Patient.[Last
Name], Patient.[Email Address], [Sickness Detail].[Sickness Detail ID], [Sickness
Detail].Sickness, [Sickness Detail].Description FROM Patient INNER JOIN [Sickness Detail]
ON Patient.[Patient ID] = [Sickness Detail].[Patient ID];')

        sicknessDetails = []
        for row in cursor.fetchall():
            sicknessDetails.append(row)
        return sicknessDetails

    except pyodbc.Error as e:
        print("Error in connection", e)

def viewPatientSicknessDetailsDb(patientId):
    try:
        con_str = r'DRIVER={Microsoft Access Driver (*.mdb,
*.accdb)};DBQ='+os.path.dirname(os.path.abspath(__file__))+'\\db\\MedicalDataProcessingSystemDB.accdb;'
        conn = pyodbc.connect(con_str)

        cursor = conn.cursor()
        cursor.execute('SELECT Patient.[Patient ID], Patient.[First Name], Patient.[Last
Name], Patient.[Email Address], [Sickness Detail].[Sickness Detail ID], [Sickness
Detail].Sickness, [Sickness Detail].Description FROM Patient INNER JOIN [Sickness Detail]
ON Patient.[Patient ID] = [Sickness Detail].[Patient ID] WHERE Patient.[Patient ID] = ?;',
(patientId))

        sicknessDetails = []
        for row in cursor.fetchall():
            sicknessDetails.append(row)
        return sicknessDetails

    except pyodbc.Error as e:
        print("Error in connection", e)

#-----Data Functions-----

#Patient Data functions

#function to register a patient

```

```

def registerPatient(firstName, lastName, email, address, phoneNum):
    registerPatientDb(firstName, lastName, email, address, phoneNum)

#function to delete a patient
def deletePatient(patientId):
    deletePatientDb(patientId)

#function to view all patients
def viewAllPatients():
    rows = viewAllPatientsDb()
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address",
"Address", "Phone Number"])
    for row in rows:
        table.add_row([row[0],row[1],row[2],row[3],row[4],row[5]])
    print(table)

#function to a single patient
def viewPatient(patientId):
    rows = viewPatientDb(patientId)
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address",
"Address", "Phone Number"])
    for row in rows:
        table.add_row([row[0],row[1],row[2],row[3],row[4],row[5]])
    print(table)

#get the patient id for an email
def getMyId(email):
    myId = getMyIdDb(email)
    try:
        return myId[0][0]
    except:
        return None

#Drug Prescription Data functions

#function to add a drug prescription
def addDrugPrescription(patientId, drug, dose):
    addDrugPrescriptionDb(patientId, drug, dose)

#function to remove a drug prescription
def removeDrugPrescription(drugPrescriptionId):
    removeDrugPrescriptionDb(drugPrescriptionId)

#function to view all drug prescriptions
def viewAllDrugPrescriptions():
    rows = viewAllDrugPrescriptionsDb()
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address", "Drug
Prescription ID", "Drug", "Dose", "Status"])

```



```

    for row in rows:
        table.add_row([row[0], row[1], row[2], row[3], row[4], row[5], row[6],
row[7]])
    print(table)

#function to view all drug prescriptions of a patient
def viewPatientDrugPrescriptions(patientId):
    rows = viewPatientDrugPrescriptionsDb(patientId)
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address", "Drug
Prescription ID", "Drug", "Dose", "Status"])
    for row in rows:
        table.add_row([row[0], row[1], row[2], row[3], row[4], row[5], row[6],
row[7]])
    print(table)

#function to change the state of a drug prescription record from Prescribed to Issued
def isseDrugPrescription(drugPrescriptionId):
    isseDrugPrescriptionDb(drugPrescriptionId)

#Lab Test Prescription Data functions

#function to add a lab test prescription
def addLabTestPrescription(patientId, test):
    addLabTestPrescriptionDb(patientId, test)

#function to remove a lab test prescription
def removeLabTestPrescription(labTestPrescriptionId):
    removeLabTestPrescriptionDb(labTestPrescriptionId)

#function to view all lab test prescriptions
def viewAllLabTestPrescriptions():
    rows = viewAllLabTestPrescriptionsDb()
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address", "Lab
Test Prescription ID", "Test", "Status", "Result"])
    for row in rows:
        table.add_row([row[0], row[1], row[2], row[3], row[4], row[5], row[6],
row[7]])
    print(table)

#function to view all lab test prescriptions of a patient
def viewPatientLabTestPrescriptions(patientId):
    rows = viewPatientLabTestPrescriptionsDb(patientId)
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address", "Lab
Test Prescription ID", "Test", "Status", "Result"])
    for row in rows:
        table.add_row([row[0], row[1], row[2], row[3], row[4], row[5], row[6],
row[7]])
    print(table)

```

```

#function to change the state of a lab test prescription record from Pending to Done
def labTestPrescriptionMarkDone(labTestPrescriptionId):
    labTestPrescriptionMarkDoneDb(labTestPrescriptionId)

#function to add the result of a lab test prescription
def addLabTestPrescriptionResult(labTestPrescriptionId, result):
    addLabTestPrescriptionResultDb(labTestPrescriptionId, result)

#Sickness Detail Data functions

#function to add a sickness detail
def addSicknessDetail(patientId, sickness, description):
    addSicknessDetailDb(patientId, sickness, description)

#function to remove a sickness detail
def removeSicknessDetail(sicknessDetailId):
    removeSicknessDetailDb(sicknessDetailId)

#function to view all sickness details
def viewAllSicknessDetails():
    rows = viewAllSicknessDetailsDb()
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address",
"Sickness Detail ID", "Sickness", "Description"])
    for row in rows:
        table.add_row([row[0], row[1], row[2], row[3], row[4], row[5], row[6]])
    print(table)

#function to view all sickness details of a patient
def viewPatientSicknessDetails(patientId):
    rows = viewPatientSicknessDetailsDb(patientId)
    table = PrettyTable(["Patient ID", "First Name", "Last Name", "Email Address",
"Sickness Detail ID", "Sickness", "Description"])
    for row in rows:
        table.add_row([row[0], row[1], row[2], row[3], row[4], row[5], row[6]])
    print(table)

#-----Program-----

while(True):
    #Log-in interface
    print("-----Log-in Menu-----")
    print("0 - Exit")
    print("1 - Log in")
    print("2 - Sign up")
    select = input("Select : ")
    if(select == "0"):

```

```

break

#Log in as an existing user
elif(select == "1"):
    print("-----Enter your credentials-----")
    email = input("Email: ")
    password = input("Password: ")
    # hash the password with md5
    hashed_pw = hashlib.md5(password.encode())
    user = login(email,hashed_pw)

    if(user): # check whether the login is success
        print('Your privilege level :',user.privilegeLvl)
        loggedIn = True

    while(loggedIn):

        #-----if the user is a Doctor-----
        if (user.privilegeLvl == '4'):
            #Doctor Main Menu
            print("-----Doctor Main Menu-----")
            print("0 - Log out")
            print("1 - View all Patients")
            print("2 - View a patient")
            print("3 - Register a Patient")
            print("4 - Delete a Patient")
            print("5 - View all Sickness Details")
            print("6 - View Sickness Details of a Patient")
            print("7 - Add Sickness Detail")
            print("8 - Remove Sickness Detail")
            print("9 - View all Drug Prescriptions")
            print("10 - View Drug Prescriptions of a Patient")
            print("11 - Add Drug Prescription")
            print("12 - Remove Drug Prescription")
            print("13 - View all Lab Test Prescriptions")
            print("14 - View Lab Test Prescriptions of a Patient")
            print("15 - Add Lab Test Prescription")
            print("16 - Remove Lab Test Prescription")
            select2 = input("Select : ")

            if(select2 == "0"):
                loggedIn = False
                continue

            elif(select2 == "1"):
                viewAllPatients()
                print("Enter any key to View Main Menu")

```

```

        select3 = input("Select : ")
        continue

    elif(select2 == "2"):
        patientId = int(input("Enter patient Id : "))
        viewPatient(patientId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "3"):
        firstName = input("Enter patient First Name : ")
        lastName = input("Enter patient Last Name : ")
        email = input("Enter patient Email : ")
        address = input("Enter patient Address : ")
        phoneNum = int(input("Enter patient Phone Number : "))
        registerPatient(firstName, lastName, email, address, phoneNum)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "4"):
        viewAllPatients()
        patientId = int(input("Enter Patient ID to delete : "))
        deletePatient(patientId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "5"):
        viewAllSicknessDetails()
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "6"):
        patientId = int(input("Enter patient Id : "))
        viewPatientSicknessDetails(patientId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "7"):
        patientId = int(input("Enter Patient ID : "))
        sickness = input("Enter Sickness : ")
        description = input("Enter description : ")
        addSicknessDetail(patientId, sickness, description)
        print("Enter any key to View Main Menu")

```

```

        select3 = input("Select : ")
        continue

    elif(select2 == "8"):
        viewAllSicknessDetails()
        sicknessDetailId = int(input("Enter Sickness Detail ID to delete :
"))

        removeSicknessDetail(sicknessDetailId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "9"):
        viewAllDrugPrescriptions()
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "10"):
        patientId = int(input("Enter patient Id : "))
        viewPatientDrugPrescriptions(patientId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "11"):
        patientId = int(input("Enter Patient ID : "))
        drug = input("Enter Drug : ")
        dose = input("Enter Dosage : ")
        addDrugPrescription(patientId, drug, dose)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "12"):
        viewAllDrugPrescriptions()
        drugPrescriptionId = int(input("Enter Drug Prescription ID to
delete : "))

        removeDrugPrescription(drugPrescriptionId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "13"):
        viewAllLabTestPrescriptions()
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

```

```

elif(select2 == "14"):
    patientId = int(input("Enter patient Id : "))
    viewPatientLabTestPrescriptions(patientId)
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

elif(select2 == "15"):
    patientId = int(input("Enter Patient ID : "))
    test = input("Enter Test : ")
    addLabTestPrescription(patientId, test)
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

elif(select2 == "16"):
    viewAllLabTestPrescriptions()
    labTestPrescriptionId = int(input("Enter Lab Test Prescription ID
to delete : "))

    removeLabTestPrescription(labTestPrescriptionId)
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

#-----if the user is a Pharmacist-----
elif (user.privilegeLvl == '3'):
    #Pharmacist Main Menu
    print("-----Pharmacist Main Menu-----")
    print("0 - Log out")
    print("1 - View all Patients")
    print("2 - View a patient")
    print("3 - View all Drug Prescriptions")
    print("4 - View Drug Prescriptions of a Patient")
    print("5 - Update Drug Prescription as issued")
    select2 = input("Select : ")

    if(select2 == "0"):
        loggedIn = False
        continue

    elif(select2 == "1"):
        viewAllPatients()
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

```

```

elif(select2 == "2"):
    patientId = int(input("Enter patient Id : "))
    viewPatient(patientId)
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

elif(select2 == "3"):
    viewAllDrugPrescriptions()
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

elif(select2 == "4"):
    patientId = int(input("Enter patient Id : "))
    viewPatientDrugPrescriptions(patientId)
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

elif(select2 == "5"):
    viewAllDrugPrescriptions()
    drugPrescriptionId = int(input("Enter Drug Prescription Id : "))
    isseDrugPrescription(drugPrescriptionId)
    print("Enter any key to View Main Menu")
    select3 = input("Select : ")
    continue

#-----if the user is a Lab Technician-----
elif (user.privilegeLv1 == '2'):
    #Lab Technician Main Menu
    print("-----Lab Technician Main Menu-----")
    print("0 - Log out")
    print("1 - View all Patients")
    print("2 - View a patient")
    print("3 - View all Lab Test Prescriptions")
    print("4 - View Lab Test Prescriptions of a Patient")
    print("5 - Mark Lab Test as Done")
    print("6 - Enter Lab Test Result")
    select2 = input("Select : ")

    if(select2 == "0"):
        loggedIn = False
        continue

    elif(select2 == "1"):
        viewAllPatients()

```

```

        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "2"):
        patientId = int(input("Enter patient Id : "))
        viewPatient(patientId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "3"):
        viewAllLabTestPrescriptions()
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "4"):
        patientId = int(input("Enter patient Id : "))
        viewPatientLabTestPrescriptions(patientId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "5"):
        viewAllLabTestPrescriptions()
        labTestPrescriptionId = int(input("Enter Lab Test Prescription Id
: "))

        labTestPrescriptionMarkDone(labTestPrescriptionId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "6"):
        viewAllLabTestPrescriptions()
        labTestPrescriptionId = int(input("Enter Lab Test Prescription Id
: "))

        result = input("Enter Lab Test Result : ")
        addLabTestPrescriptionResult(labTestPrescriptionId, result)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

#-----if the user is a Patient-----
elif (user.privilegeLvl == '1'):
    myId = getMyId(user.email)
    if myId == None:

```



```

        print("Couldn't find any patient records for the email",
user.email)

        break
    #Patient Main Menu
    print("-----Patient Main Menu-----")
    print("0 - Log out")
    print("1 - View my Details")
    print("2 - View my Sickness Details")
    print("3 - View my Drug Prescriptions")
    print("4 - View my Lab Test Prescriptions")
    select2 = input("Select : ")

    if(select2 == "0"):
        loggedIn = False
        continue

    elif(select2 == "1"):
        viewPatient(myId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "2"):
        viewPatientSicknessDetails(myId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "3"):
        viewPatientDrugPrescriptions(myId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

    elif(select2 == "4"):
        viewPatientLabTestPrescriptions(myId)
        print("Enter any key to View Main Menu")
        select3 = input("Select : ")
        continue

#Register a new User
elif(select == "2"):
    #User Sign-up interface
    print("-----New User Sign-up-----")
    print("1 - Patient Sign-up")
    print("2 - Lab Technician Sign-up")
    print("3 - Pharmacist Sign-up")
    print("4 - Doctor Sign-up")

```

```
#select the type of user
select2 = input("Select : ")
if (select2 == '1'):
    privilegelvl = 1
elif (select2 == '2'):
    privilegelvl = 2
elif (select2 == '3'):
    privilegelvl = 3
elif (select2 == '4'):
    privilegelvl = 4
name = input("Enter Name : ")
email = input("Enter Email : ")
password = input("Enter Password : ")
hashed_password = hashlib.md5(password.encode())

#write the user credentials into the config.txt file
f = open("config.txt", "a")
userRecord = name + "," + email + "," + hashed_password.hexdigest() + "," +
str(privilegelvl)
f.write(userRecord)
f.write("\n")
f.close()
print("User Registered")
print("Now you can log in using the credentials")
```

## Annexes

### **config.txt**

Dr Dakshitha,doctor1@medcenter.com,5f4dcc3b5aa765d61d8327deb882cf99,4  
 Draco Malfoy,dracomalfoy@gmail.com,5f4dcc3b5aa765d61d8327deb882cf99,1  
 Geeth,labtech@medcenter.com,9003d1df22eb4d3820015070385194c8,2  
 Charuka Rathnayaka,pharma1@medcenter.com,827d043606ac6fb18e465b87ffa05e89,3  
 Harry Potter,harrypotter@gmail.com,899b172c0a47c4139407bb89b8205436,1  
 Luna Lovegood,lunalovegood@gmail.com,f8bf9e5b72e3d4e017d483787baa3d4b,1  
 Rubeus Hagrid,rubeushagrid@gmail.com,74b91298945992e3a5760e7885686e4a,1  
 Ruchika Dilith,doctor2@gmail.com,74b91298945992e3a5760e7885686e4a,4  
 Nuvindu Nirmana,labtech2@medcenter.com,b5997cee0d1ef3e5f3f6dc7a8b3ad7d7,2  
 Mahesh Jayawardana,prama2@medcenter.com,fc695527ce186f3a87ac588d9cc8339d,3