Users are identified with their user type (staff and patient) and the username. In staff there are several users: reception, pharmacy, lab, nurse and doctor.

All users have their own medical details record including personal details, sickness details, drugs prescription and lab test prescription.

Any user can edit and read their personal details.

Patient user can read his medical details and can’t edit them.

In the staff category,

Reception user can read personal and sickness details of any user and can’t edit anything.

Pharmacy user can read personal, sickness, drugs details of any user and can’t edit anything.

Lab user can read personal, sickness and reports of any user and can edit test prescription of any user.

Nurse user can read personal, sickness, drugs and test sections of any user and can write sickness details.

Doctor user can read personal, sickness, drugs and test sections of any user and can write sickness and drugs sections of any user.

Username format for patient – patient1@abc

Username format for staff - reception1@reception, pharmacy1@pharmacy, lab1@lab, nurse1@nurse, doc1@doc

Staff users are identified from the username format.

Assumption: For the staff, usernames were given with a key, before from the hospital administration.

Test run 1

Register as a patient

username: patient2

password: abc

Login

Trying to read patient 1 personal details

Reads his details

Writes to his details

Reads his details

Exit

E:\Programming\python>python Csec.py

function (register, login, details or 0) :

register

/\*\*\*\*\*\*\*\*\*\*\*User Registration\*\*\*\*\*\*\*\*\*/

username: patient2

password

confirm\_password

user\_type (staff or patient): patient

Registration Successfull

/\*\*\*\*\*\*\*\*\*\*\*User Login\*\*\*\*\*\*\*\*\*/

Login Successful

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient1

Records Found

Enter the section you want(personal, sickness, drugs, lab): personal

Enter the process you want(read, write): read

You do not have permission

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient2

Records Found

Enter the section you want(personal, sickness, drugs, lab): personal

Enter the process you want(read, write): read

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient2

Records Found

Enter the section you want(personal, sickness, drugs, lab): personal

Enter the process you want(read, write): write

Enter details:

info1, info2

, info1, info2

Updated Successfully

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient2

Records Found

Enter the section you want(personal, sickness, drugs, lab): personal

Enter the process you want(read, write): read

, info1, info2

function (register, login, details or 0) :

0

Bye

Test run 2

Try to register as doc1 which is existing

Register as doc2 with hospital username

username: doc2@doc

key = given key

password: a

Read patient 2 personal details

Writes drug details to patient2 details

Reads patient 2 drug details

exit

E:\Programming\python>python Csec.py

function (register, login, details or 0) :

register

/\*\*\*\*\*\*\*\*\*\*\*User Registration\*\*\*\*\*\*\*\*\*/

username: doc1

Records Found

username: doc2

password

confirm\_password

user\_type (staff or patient): staff

staff username(username@doc|nurse|lab|pharmacy|reception): doc1@doc

Records Found

staff username(username@doc|nurse|lab|pharmacy|reception): doc2@doc

Key: given key

Registration Successfull

/\*\*\*\*\*\*\*\*\*\*\*User Login\*\*\*\*\*\*\*\*\*/

Login Successful

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient2

Records Found

Enter the section you want(personal, sickness, drugs, lab): personal

Enter the process you want(read, write): read

, info1, info2

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient2

Records Found

Enter the section you want(personal, sickness, drugs, lab): drugs

Enter the process you want(read, write): write

Enter details:

drug1, drug2

, drug1, drug2

Updated Successfully

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient2

Records Found

Enter the section you want(personal, sickness, drugs, lab): drugs

Enter the process you want(read, write): read

, drug1, drug2

function (register, login, details or 0) :

0

Bye

Test run 3

login as reception user

username: recception1

password: a

reads his sickness details

Tries to write into his sickness details

exit

E:\Programming\python>python Csec.py

function (register, login, details or 0) :

login

/\*\*\*\*\*\*\*\*\*\*\*User Login\*\*\*\*\*\*\*\*\*/

username: reception1@reception

password

Login Successful

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient1

Records Found

Enter the section you want(personal, sickness, drugs, lab): sickness

Enter the process you want(read, write): read

sick1,sick2

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient1

Records Found

Enter the section you want(personal, sickness, drugs, lab): sickness

Enter the process you want(read, write): write

You do not have permission to do this

function (register, login, details or 0) :

0

Bye

Test run 4

login as a lab user

username: lab1@lab

password: a

writes to patient 1 lab details

reads patient 1 lab details

E:\Programming\python>python Csec.py

function (register, login, details or 0) :

login

/\*\*\*\*\*\*\*\*\*\*\*User Login\*\*\*\*\*\*\*\*\*/

username: lab1@lab

password

Login Successful

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient1

Records Found

Enter the section you want(personal, sickness, drugs, lab): lab

Enter the process you want(read, write): write

Enter details:

lab1 , lab2

Updated Successfully

function (register, login, details or 0) :

details

/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/

Enter the username of the patient: patient1

Records Found

Enter the section you want(personal, sickness, drugs, lab): lab

Enter the process you want(read, write): read

, lab1 , lab2

function (register, login, details or 0) :

0

Bye

config file

[User patient1]

username = patient1

hashed\_password = $1$WHPN.v/g$CxJDUSvJBzQaWC5ngqNi./

user\_type = patient

privilege\_level = 0

[User doc1]

username = doc1@doc

hashed\_password = $1$HMc8Qxmp$5LhnmlYfJY0AG2/rVccjl0

user\_type = staff

privilege\_level = 5

[User nurse1]

username = nurse1@nurse

hashed\_password = $1$Q41Fj41o$j7YU4K3kLOQ8Z6vC2AoJS.

user\_type = staff

privilege\_level = 4

[User lab1]

username = lab1@lab

hashed\_password = $1$4TsLYVkw$jOtydmasrBKs5b6Bg8/810

user\_type = staff

privilege\_level = 3

[User pharmacy1]

username = pharmacy1@pharmacy

hashed\_password = $1$J3Wmg0WO$qAfAWfExGg17B1dRe9tHe.

user\_type = staff

privilege\_level = 2

[User reception1]

username = reception1@reception

hashed\_password = $1$HFvl3e73$hn6w.VGJL4kaHtzcCSyf7/

user\_type = staff

privilege\_level = 1

[User patient2]

username = patient2

hashed\_password = $1$1WL8.lfw$2JKbFn3uMoKt5C48idJg51

user\_type = patient

privilege\_level = 0

[User doc2]

username = doc2@doc

hashed\_password = $1$ksa1Rr0W$lGN9TXeDHFIuX2hZzhyqn.

user\_type = staff

privilege\_level = 5

Data file

[User patient1]

personal\_details = info1, info2

sickness\_details = sickness1, sickness2

drug\_prescription = drug1, drug2

lab\_test\_prescription = lab1, lab2, lab1, lab2

[User doc1]

personal\_details =

sickness\_details =

drug\_prescription =

lab\_test\_prescription =

[User nurse1]

personal\_details =

sickness\_details =

drug\_prescription =

lab\_test\_prescription =

[User lab1]

personal\_details =

sickness\_details =

drug\_prescription =

lab\_test\_prescription =

[User pharmacy1]

personal\_details =

sickness\_details =

drug\_prescription =

lab\_test\_prescription =

[User reception1]

personal\_details =

sickness\_details =

drug\_prescription =

lab\_test\_prescription =

[User patient2]

personal\_details = , info1, info2

sickness\_details =

drug\_prescription = , drug1, drug2

lab\_test\_prescription =

[User doc2]

personal\_details =

sickness\_details =

drug\_prescription =

lab\_test\_prescription =

code

from configparser import ConfigParser

import getpass

from passlib.hash import md5\_crypt

func = 1

config\_filename = 'config.ini'

datafile\_filename = 'data.ini'

config\_parser = ConfigParser()

def open\_config(config\_filename):

    config\_file = open(config\_filename, 'a')

    return config\_file

def register(username, hashed\_password, user\_type):

    config\_file = open\_config(config\_filename)

    data\_file = open\_config(datafile\_filename)

    config\_parser = ConfigParser()

    if user\_type == 'staff':

        if username.split('@')[-1] == 'reception':

            # can read peronal and sickness and write none,personal of himself

            privilege\_level = 1

        elif username.split('@')[-1] == 'pharmacy':

            # can access peronal, sickness, drugs,personal of himself

            privilege\_level = 2

        elif username.split('@')[-1] == 'lab':

            # can read peronal, sickness, reports and write reports,personal of himself

            privilege\_level = 3

        elif username.split('@')[-1] == 'nurse':

            # can read peronal, sickness, drugs, reports and write personal of himself

            privilege\_level = 4

        elif username.split('@')[-1] == 'doc':

            # can read peronal, sickness, drugs, reports and write sickness, drugs,personal of himself

            privilege\_level = 5

    elif user\_type == 'patient':

        # can read peronal, sickness, drugs, reports and write personal of himself

        privilege\_level = 0

    config\_parser['User'+' ' + username.split('@')[0]] = {'username': username,

                                                          'hashed\_password': hashed\_password,

                                                          'user\_type': user\_type,

                                                          'privilege\_level': privilege\_level}

    config\_parser.write(config\_file)

    config\_file.close()

    config\_parser['User'+' ' + username.split('@')[0]] = {'personal\_details': '',

                                                          'sickness\_details': '',

                                                          'drug\_prescription': '',

                                                          'lab\_test\_prescription': ''}

    config\_parser.write(data\_file)

    data\_file.close()

    return True

def check\_username(username, user\_type):

    if username == '':

        print('Invalid Username')

        return True

    config\_parser.read(config\_filename)

    section = 'User' + ' ' + username.split('@')[0]

    # print(section)

    if section in config\_parser.sections():

        print('Records Found')

        return True

    else:

        if user\_type == 'staff':

            if username.split('@')[-1] in ['doc', 'nurse', 'lab', 'pharmacy', 'reception']:

                return False

            else:

                print('Invalid Username')

                return True

        if user\_type == 'patient':

            if username.split('@')[-1] in ['doc', 'nurse', 'lab', 'pharmacy', 'reception']:

                return True

            else:

                print('You can not use this username')

                return False

def validate\_user(key):

    given\_key = 'given key'

    if key == given\_key:

        return False

    else:

        return True

def login(username, password):

    config\_parser.read(config\_filename)

    section = 'User' + ' ' + username.split('@')[0]

    if section in config\_parser.sections():

        hashed\_password = config\_parser.get(section, 'hashed\_password')

        if md5\_crypt.verify(password, hashed\_password):

            print('Login Successful')

            return section, True

        else:

            print('Inavlid Credentials')

            return None, False

    else:

        print('No Records Found')

        return None, False

def patient\_details(current\_user):

    if current\_user == None:

        print('You should login to continue')

        return False

    data\_file = open\_config(datafile\_filename)

    config\_parser = ConfigParser()

    config\_parser.read(config\_filename)

    privilege\_level = config\_parser.get(current\_user, 'privilege\_level')

    # print(privilege\_level)

    current\_username = config\_parser.get(current\_user, 'username')

    personal\_details = ''

    sickness\_details = ''

    drug\_prescription = ''

    lab\_test\_prescription = ''

    while True:

        print('Enter the username of the patient: ', end='')

        patient\_username = input().strip().split('@')[0]

        # print('patient\_username')

        if check\_username(patient\_username, 0):

            user = 'User' + ' ' + patient\_username.split('@')[0]

            username = config\_parser.get(user, 'username')

            break

        else:

            print('No Records')

    config\_parser = ConfigParser()

    config\_parser.read(datafile\_filename)

    print('Enter the section you want(personal, sickness, drugs, lab): ', end='')

    section = input().strip()

    print('Enter the process you want(read, write): ', end='')

    process = input().strip()

    if section == 'personal':

        if process == 'write':

            if username == current\_username:

                print('Enter details: ')

                personal\_details\_old = config\_parser.get(

                    user, 'personal\_details')

                personal\_details = input().strip()

                personal\_details = personal\_details\_old + ', ' + personal\_details

                config\_parser.set(user, 'personal\_details', personal\_details)

                print(config\_parser.get(user, 'personal\_details'))

                print('Updated Successfully')

            else:

                print('You do not have permission to do this')

        if process == 'read':

            # print('here')

            if username == current\_username or privilege\_level == '1' or privilege\_level == '2' or privilege\_level == '3' or privilege\_level == '4' or privilege\_level == '5':

                personal\_details = config\_parser.get(user, 'personal\_details')

                print(personal\_details)

            else:

                print('You do not have permission')

    elif section == 'sickness':

        if process == 'write':

            if privilege\_level == '5':

                print('Enter details: ')

                sickness\_details\_old = config\_parser.get(

                    user, 'sickness\_details')

                sickness\_details = input().strip()

                sickness\_details = sickness\_details\_old + ', ' + sickness\_details

                config\_parser.set(user, 'sickness\_details', sickness\_details)

                print(config\_parser.get(user, 'sickness\_details'))

                print('Updated Successfully')

            else:

                print('You do not have permission to do this')

        elif process == 'read':

            if username == current\_username or privilege\_level == '1' or privilege\_level == '2' or privilege\_level == '3' or privilege\_level == '4' or privilege\_level == '5':

                sickness\_details = config\_parser.get(user, 'sickness\_details')

                print(sickness\_details)

            else:

                print('You do not have permission')

    elif section == 'drugs':

        if process == 'write':

            if privilege\_level == '5':

                print('Enter details: ')

                drug\_prescription\_old = config\_parser.get(

                    user, 'drug\_prescription')

                drug\_prescription = input().strip()

                drug\_prescription = drug\_prescription\_old + ', ' + drug\_prescription

                config\_parser.set(user, 'drug\_prescription', drug\_prescription)

                print(config\_parser.get(user, 'drug\_prescription'))

                print('Updated Successfully')

            else:

                print('you do not have permission')

        elif process == 'read':

            drug\_prescription = config\_parser.get(user, 'drug\_prescription')

            if username == current\_username or privilege\_level == '5' or privilege\_level == '4' or privilege\_level == '2':

                print(drug\_prescription)

            else:

                print('you do not have permission')

    elif section == 'lab':

        if process == 'write':

            if privilege\_level == '3':

                print('Enter details: ')

                lab\_test\_prescription\_old = config\_parser.get(

                    user, 'lab\_test\_prescription')

                lab\_test\_prescription = input().strip()

                lab\_test\_prescription = lab\_test\_prescription\_old + ', ' + lab\_test\_prescription

                config\_parser.set(

                    user, 'lab\_test\_prescription', lab\_test\_prescription)

                (config\_parser.get(user, 'lab\_test\_prescription'))

                print('Updated Successfully')

            else:

                print('you do not have permission')

        elif process == 'read':

            lab\_test\_prescription = config\_parser.get(

                user, 'lab\_test\_prescription')

            if username == current\_username or privilege\_level == '5' or privilege\_level == '4' or privilege\_level == '3':

                print(lab\_test\_prescription)

            else:

                print('you do not have permission')

    else:

        return False

    config\_parser.write(open('data.ini', 'w'))

    data\_file.close()

    return True

while (func != 0):

    print("function (register, login, details or 0) :")

    func = input().strip()

    logged = False

    if func == "register":

        print('/\*\*\*\*\*\*\*\*\*\*\*User Registration\*\*\*\*\*\*\*\*\*/')

        print('username: ', end='')

        username = input().strip()

        password = ''

        confirm\_password = 'aa'

        user\_type = 'none'

        user = '0'

        while True:

            if check\_username(username, user\_type):

                print('username: ', end='')

                username = input().strip()

            else:

                break

        password = getpass.getpass(prompt='password')

        confirm\_password = getpass.getpass(prompt='confirm\_password')

        while True:

            if password != confirm\_password:

                password = getpass.getpass(prompt='password')

                confirm\_password = getpass.getpass(prompt='confirm\_password')

                print('Not matching')

            else:

                break

        hashed\_password = md5\_crypt.hash(password)

        print('user\_type (staff or patient): ', end='')

        user\_type = input().strip()

        if user\_type == 'staff':

            while True:

                print(

                    'staff username(username@doc|nurse|lab|pharmacy|reception): ', end='')

                username = input().strip()

                if check\_username(username, user\_type):

                    continue

                else:

                    print('Key: ', end='')

                    key = input().strip()

                    if validate\_user(key):

                        continue

                    else:

                        break

                    break

        register = register(username, hashed\_password, user\_type)

        if register:

            print('Registration Successfull')

        else:

            print('Can not regiter')

        print('/\*\*\*\*\*\*\*\*\*\*\*User Login\*\*\*\*\*\*\*\*\*/')

        user, logged = login(username, password)

        print('/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/')

        patient\_details(user)

    elif func == "login":

        while True:

            print('/\*\*\*\*\*\*\*\*\*\*\*User Login\*\*\*\*\*\*\*\*\*/')

            print('username: ', end='')

            username = input().strip()

            password = getpass.getpass(prompt='password')

            user, logged = login(username, password)

            if logged:

                break

            else:

                continue

        print('/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/')

        patient\_details(user)

    elif func == "details":

        print('/\*\*\*\*\*\*\*\*\*\*\*Patient Details\*\*\*\*\*\*\*\*\*/')

        if (logged == '1'):

            print('login first')

        else:

            patient\_details(user)

    elif func == '0':

        print('Bye')

        break

    else:

        print('Wrong Input')