**Computer Science Project**

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**CODE:**

from pymysql import TIMESTAMP, cursors

import pymysql as sql

import os

import time

while True:  # Connecting to the databases

    try:

        # Password of the sql server

        passcode = input('Enter the password of your sql server: ')

        # Connecting to the user databases

        user\_db = sql.connect(host='localhost', user='root',

                              passwd=passcode, db='users')

        # Creating a user cursor to handle all queries in the user database

        user\_cursor = user\_db.cursor()

        try:  # Creating the table if it doesn't exist

            user\_cursor.execute("""create table users(

                                username char(20) primary key,

                                password char(20)

                            );""")

        except:

            pass

        try:

            user\_cursor.execute("""create table messaginggroups(

                                groupname char(20) primary key,

                                password char(20)

                            );""")

        except:

            pass

        # Once all the setup is done and the programming will be executed properly

        print("Successfully connected to the database")

        time.sleep(1.5)

        break

    except sql.err.OperationalError:

        print('INCORRECT PASSWORD')

def hazh(x):  # Hashing function that is used to store passowrds

    sume = sumo = suma = pr4 = pr3 = 0

    ods = evs = prall = 1

    for i in range(0, len(x), 2):

        sume += ord(x[i])

    for i in range(1, len(x), 2):

        sumo += ord(x[i])

    for i in range(len(x)):

        prall \*= ord(x[i])+i

    for i in range(0, len(x), 4):

        pr4 += (ord(x[i]) \* ord(x[i-1]) \* ord(x[i-2]) \* ord(x[i-3]))

    for i in range(0, len(x), 3):

        pr3 += (ord(x[i]) \* ord(x[i-1]) \* ord(x[i-2]))

    for i in range(1, len(x), 2):

        ods \*= ord(x[i])

    for i in range(0, len(x), 2):

        evs \*= ord(x[i])

    # for i in range(0,len(x),2):

    prs = hex(sume\*sumo)[-1:-3:-1]

    suma = (sume+sumo)\*len(x) - sume

    suma = hex(suma)[-1:-3:-1]

    if ods > evs:

        oediff = ods-evs

    else:

        oediff = ods + evs

    while not oediff % 16:

        oediff //= 16

    oediff = hex(oediff)[-1:-3:-1]

    while not prall % 16:

        prall //= 16

    prall = hex(prall)[-1:-5:-1]

    pr43 = hex(pr4 % pr3)[-1:-3:-1]

    result = prall+suma+oediff+prs+pr43

    return result

def clear\_shell():  # A function that clears the terminal

    if os.name == 'nt':

        os.system('cls')

    elif os.name == 'posix':

        os.system('clear')

    return None

def retrieve\_user\_list():  # This is used to retrieve the users every time they are updated

    record\_tuples = user\_cursor.execute('select \* from users;')

    record\_tuples = user\_cursor.fetchall()

    \_user = {}

    for i in record\_tuples:

        \_user[i[0]] = i[1]

    return \_user

def retrieve\_group\_list():  # This is used to retrieve the groups every time they are updated

    record\_tuples = user\_cursor.execute('select \* from messaginggroups;')

    record\_tuples = user\_cursor.fetchall()

    \_group = {}

    for i in record\_tuples:

        \_group[i[0]] = i[1]

    return \_group

def create\_account():  # Creating an account ie tables for the inbox and outbox

    global user\_list

    username = input("Enter the username: ")

    if username in user\_list:

        print('This username already exists')

        return create\_account()

    else:

        password = hazh(input("Enter your password: "))

        user\_cursor.execute(

            f"insert into users values('{username}','{password}')")

        user\_cursor.execute(f"""create table {username}\_inbox (

                            sender char(20) not null,

                            message text

                            );""")

        user\_cursor.execute(f"""create table {username}\_outbox (

                            sender char(20) not null,

                            message text

                            );""")

        user\_db.commit()

        user\_list = retrieve\_user\_list()

        print("Account created successfully")

        time.sleep(1.5)

    return username

def login(username):  # Auth function

    password = hazh(input("Enter your password: "))

    if not password == user\_list[username]:

        print("Incorrect password...")

        return login(username)

    else:

        return True

def check\_user\_in\_group(user, group):

    user\_cursor.execute(f"select \* from {group}")

    records = user\_cursor.fetchall()

    for i in records:

        if i[0] == user:

            return True

    return False

def send\_message(username):  # Sends a message from {username} to {receiever}

    receiver = input("To(username/groupname): ")

    if receiver not in user\_list and receiver not in group\_list:

        print("This receiver does not exist")

        return send\_message()

    else:

        if receiver in group\_list and not check\_user\_in\_group(username, receiver):

            print("You are not in this group, so you can't send messages in it.")

            time.sleep(1.5)

            return None

        message = input("Message: ")

        user\_cursor.execute(

            f"insert into {receiver}\_inbox values('{username}','{message}');")

        user\_cursor.execute(

            f"insert into {username}\_outbox values('{receiver}','{message}');")

        user\_db.commit()

        print("Message sent successfully")

        time.sleep(1.5)

        return True

def check\_inbox(username):  # To check the inbox of {username}

    # If it is not an individual user and it is a group

    if not username in user\_list and username in group\_list:

        # Then ask for a password

        password = hazh(input("Enter the password of the group: "))

        # Return the function if the password is incorrect

        if not password == group\_list[username]:

            print("Incorrect password...")

            return check\_individual\_outbox(username)

    messages = user\_cursor.execute(f"select \* from {username}\_inbox;")

    messages = user\_cursor.fetchall()

    if not len(messages):

        print("NO MESSAGES FOUND")

        return None

    for i in messages:

        print(f"{i[0]}: {i[1]}")

        print("\n")

        print("----------------------")

    return None

def check\_individual\_outbox(username):  # To check the outbox of {username}

    messages = user\_cursor.execute(f"select \* from {username}\_outbox;")

    messages = user\_cursor.fetchall()

    for i in messages:

        print(f"{i[0]}: {i[1]}")

        print("\n")

        print("----------------------")

    return None

def erase\_inbox(username):  # Erasing all the messages from the inbox of a user

    user\_cursor.execute(f"drop table {username}\_inbox;")

    user\_cursor.execute(f"""create table {username}\_inbox (

                            sender char(20) not null,

                            message text

                            );""")

    user\_db.commit()

    return None

def create\_group(username):  # Creating a group

    global group\_list

    groupname = input("Enter the name of the group: ")

    if groupname in group\_list:

        print("This group name already exists")

        return create\_group(username)

    else:

        # The variable admin isn't really required but I still made it coz why not when a statement makes more sense?

        # That statement is the one where the adming is automatically added to the group no matter what

        admin = username

        grouppassword = input("Enter the group password: ")

        user\_cursor.execute(

            f"insert into messaginggroups values('{groupname}','{grouppassword}')")

        # Creating a table for the list of users

        user\_cursor.execute(f"""create table {groupname}(

                                        group\_member char(20) primary key

                                        );

                                        """)

        # Creating a table for the messages

        user\_cursor.execute(f"""create table {groupname}\_inbox(

                                        sender char(20) not null,

                                        message text

                                        );

                                        """)

        # Adding the admin to thr group no matter what

        user\_cursor.execute(f"insert into {groupname} values('{admin}');")

        # In case the user doesn't input a number for the no\_of\_group\_members

        while True:

            try:

                no\_of\_group\_members = int(

                    input("How many group\_members do you want in the group? "))

                print("If you want to stop entering usernames at a point, type 'exit'")

                break

            except:

                print("Enter an integer")

        i = 1

        while i <= no\_of\_group\_members:

            group\_member = input(f"Enter usename {i}")

            if group\_member == 'exit':

                break

            elif not group\_member in user\_list:

                print("This user does not exist")

            else:

                try:  # Checking if the user has entered a duplicate username

                    user\_cursor.execute(

                        f"insert into {groupname} values('{group\_member}');")

                    i += 1

                except:

                    print("This user is already in the group")

                else:  # If the user has been added to the table successfully:

                    user\_cursor.execute(

                        f"insert into {group\_member}\_inbox values('{admin}','You have been added to a group called {groupname} and the password is {grouppassword}');")

        user\_db.commit()

        # Retrieving the group\_list again because a new group has just been created

        group\_list = retrieve\_group\_list()

        return True

def delete\_account(username):  # Deleting the account of the user from this messagin service completely

    global user\_list

    print('\n\n')

    print("THIS WILL PERMANENTLY DELETE YOUR ACCOUNT FROM THIS SERVICE")

    print("THIS CHANGE WILL BE IRREVERSIBLE")

    print('\n\n')

    print("Are you sure you want to delete the account ?")

    choice = input(

        f"Confirm by typing in '{username}:{user\_list[username]}' or type anything else to cancel: ")

    # If the user chooses to delete the account

    if choice == f"{username}:{user\_list[username]}":

        # Deleting the record from the users table

        user\_cursor.execute(

            f"delete from users where username = '{username}';")

        user\_cursor.execute(f"drop table {username}\_inbox;")

        user\_cursor.execute(f"drop table {username}\_outbox;")

        for i in group\_list:

            # Deletes the record of the user if they are in the group

            try:

                user\_cursor.execute(

                    f"delete from {i} where group\_member = '{username}';")

            except:

                pass

        user\_list = retrieve\_user\_list()

        user\_db.commit()

        return True

    # If the user chooses not to delete the account

    else:

        return False

def view\_all\_users(username):  # Viewing a list of all users except the current user themself

    print("\n\n")

    a = 1

    for i in user\_list:

        if not i == username:

            print(f"{a}. {i}")

            a+=1

    return None

def login\_menu(username):  # Menu of all tasks that a user can perform

    clear\_shell()

    print("These are all the tasks you can perform")

    print("1.Send a message")

    print("2.Check your individual inbox")

    print("3.Log out")

    print("4.Erase all messages in your inbox")

    print("5.Check your outbox")

    print("6.Create a group")

    print("7.Check your group inbox")

    print("8.View a list of all users")

    print("9.Delete account")

    choice = input("Enter your choice: ")

    if choice == '1':

        send\_message(username)

    elif choice == '2':

        check\_inbox(username)

    elif choice == '3':

        return None

    elif choice == '4':

        erase\_inbox(username)

    elif choice == '5':

        check\_individual\_outbox(username)

    elif choice == '6':

        create\_group(username)

    elif choice == '7':

        groupname = input("Enter the name of the group:")

        check\_inbox(groupname)

    elif choice == '8':

        view\_all\_users(username)

    elif choice == '9':

        if delete\_account(username):

            print("Account successfully deleted...")

            time.sleep(1.5)

            return None

        else:

            print("Deletion aborted")

    else:

        print("Enter a valid option")

    input("Press enter to continue...")

    return login\_menu(username)

def Menu():  # Main/Initial Menu

    clear\_shell()

    print("Choose what you want to do: ")

    print("1.Create an account")

    print("2.Login")

    print("3.Exit")

    response = input("Enter your response: ")

    if response == "1":

        login\_menu(create\_account())

    elif response == "2":

        username = input("Enter your username: ")

        if username not in user\_list:

            print("This username doesn't exist...")

            print("Try creating an account: ")

        else:

            if (login(username)):

                login\_menu(username)

    elif response == "3":

        user\_cursor.close()

        user\_db.close()

        exit()

    else:

        print("Invalid response")

    input("Press Enter to continue...\n\n")

    Menu()

if \_\_name\_\_ == "\_\_main\_\_":

    user\_list = retrieve\_user\_list()

    group\_list = retrieve\_group\_list()

    Menu()

**OUTPUT:**

Choose what you want to do:

1.Create an account

2.Login

3.Exit

Enter your response: 2

Enter your username: SPARTACUS

Enter your password: Nothing

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 1

To(username/groupname): lingling

Message: Hello how are you?

Message sent successfully

Press enter to continue...

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 3

Press Enter to continue...

Choose what you want to do:

1.Create an account

2.Login

3.Exit

Enter your response: 2

Enter your username: lingling

Enter your password: 40hrs

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 2

SPARTACUS: Hello how are you?

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Press enter to continue...

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 6

Enter the name of the group: Group1

Enter the group password: Group123

How many group\_members do you want in the group? 2

If you want to stop entering usernames at a point, type 'exit'

Enter usename 1SPARTACUS

Enter usename 2Davie

This user does not exist

Enter usename 2UGN

This user does not exist

Enter usename 2exit

Press enter to continue...

Choose what you want to do:

1.Create an account

2.Login

3.Exit

Enter your response: 2

Enter your username: SPARTACUS

Enter your password: Nothing

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 2

lingling: You have been added to a group called UGN2 and the password is Nothing

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lingling: You have been added to a group called Group1 and the password is Group123

Press enter to continue...

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 1

To(username/groupname): Group1

Message: Hello everyone!

Message sent successfully

Press enter to continue...

Choose what you want to do:

1.Create an account

2.Login

3.Exit

Enter your response: 2

Enter your username: lingling

Enter your password: 40hrs

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 7

Enter the name of the group:Group1

Enter the password of the group: Group123

SPARTACUS: Hello everyone!

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Press enter to continue...

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 8

1. SPARTACUS

Press enter to continue...

These are all the tasks you can perform

1.Send a message

2.Check your individual inbox

3.Log out

4.Erase all messages in your inbox

5.Check your outbox

6.Create a group

7.Check your group inbox

8.View a list of all users

9.Delete account

Enter your choice: 9

THIS WILL PERMANENTLY DELETE YOUR ACCOUNT FROM THIS SERVICE

THIS CHANGE WILL BE IRREVERSIBLE

Are you sure you want to delete the account ?

Confirm by typing in 'lingling:810b66c2e782' or type anything else to cancel: lingling:810b66c2e782

Account successfully deleted...

Press Enter to continue...

Choose what you want to do:

1.Create an account

2.Login

3.Exit

Enter your response: 3