TOPIC:ATM MACHINE

AISSCE
Computer Science Practical Examination
2024-25

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Board Roll number:

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CERTIFICATE

This is to certify that Swarnali Shome a bonafide student of <school>, class 12 has successfully completed her Computer Science Investigatory Project "Atm Machine" in the computer lab during the year 2024-25 as per <exam> Guidelines for the <exam> .It's further certified that this project is an individual work of the candidate.

External Examiner: Internal Examiner:

Date: Date:

ACKNOWLEDGEMENT

I express my sincere gratitude towards my computer teacher Mrs.Dhrita Adhya who had given us the opportunity and space to explore new avenues for the computer project and for standing with us throughout our endeavours; <institution> for providing us with a platform to illustrate our creativities; my friends for their unconditional support and cooperation. The book and websites need special mentions here as they laid the foundation for our projects. And of course, my parents, without their guidance and perseverance, the project would never have been possible.

OBJECTIVE OF THE PROJECT

The main objective of this project is to develop a simulated Automated Teller Machine (ATM) system that allows users to perform basic banking transactions such as account creation, balance inquiry, cash withdrawal, cash deposit, and transaction history viewing.

It can provide several functions such as:

- Implementing core banking functions such as account creation, balance inquiry, cash withdrawal, cash deposit, and transaction history viewing.

- Using SQL databases to store and manage account information, transaction records, and user details in order to ensure data persistence and integrity.

- Provide a practical demonstration on how python can effectively integrate with SQL databases to create a robust application.

- Explaining the concept of an automated teller machine to people.

- Handling any unwanted exceptions such as incorrect pin, low balance alerts etc.

Examples of online ATM are mobile banking apps, Paytm's Bank etc.

What Is An Online ATM?

An Automated Teller Machine (ATM) is an electronic device that allows customers to perform banking transactions without a teller.

Online ATM, also known as a virtual ATM, is a digital platform that provides banking services similar to those of a physical ATM, but accessible via the internet through web or mobile applications. It provides several functions such as cash deposits, cash withdrawals, bill payments etc.

Examples are: Paytm's Bank, net banking apps etc.

ATM Menu:

1. Create Account

2. Check Balance

3. Deposit Money

4. Withdraw Money

5. Change PIN

6. Exit

Enter your choice: 1

Enter your name: Olivia

Set a 4-digit PIN: 1999

ATM Menu:

1. Create Account

2. Check Balance

3. Deposit Money

4. Withdraw Money

5. Change PIN

6. Exit

Enter your choice: 3

Enter your account number: 3

Enter your PIN: 1999

Enter amount to deposit: 70000

Deposit successful!

ATM Menu:

1. Create Account

2. Check Balance

3. Deposit Money

4. Withdraw Money

5. Change PIN

6. Exit

Enter your choice: 6

Thank you for using the ATM!

SCOPE OF THE PROJECT

The scope of this project are given below:

- Efficiency in handling unexpected exceptions such as insufficient balance, incorrect pin etc.

- User interactive: the user can choose to perform their desired operation from the menu.

- This project can be developed for educational purposes, demonstrating key concepts of database management, security, and user interface design, or as a prototype for real-world banking applications.

- It helps us to understand the python sql connectivity and their application in handling real life situations.

LIMITATIONS OF THE PROJECT

Despite having various advantages it has some limitations too. These are:

1. There is lack of real time customer support unlike real world bank system.

2. This project is just a simple demonstration and cannot be used to handle complex problems.

3. The project might not be optimised for accessibility, such as for differently abled users or for different devices like mobile phones and tablets.

PYTHON AND SQL MODULES/CONCEPTS USED:

The python modules used are:

I. mysql.connector

SQL concepts required are:

1. Database basics
2. CRUD(Create Read Update Delete) operations
3. Table creation and manipulation, data types in sql
4. Dealing with error handling

Python concepts:The python concepts required are:

- Importing modules
- mysql.connector module functions
- User defined functions
- Loops
- Built in python functions

HARDWARE AND SOFTWARE INFORMATION

Software information:

This project was done in Visual Studio Code Text editor with Python 3.12 version and MySQL server version 9.0.1.

The sql commands were executed on MySQLWorkbench Version 8.0

Hardware information :
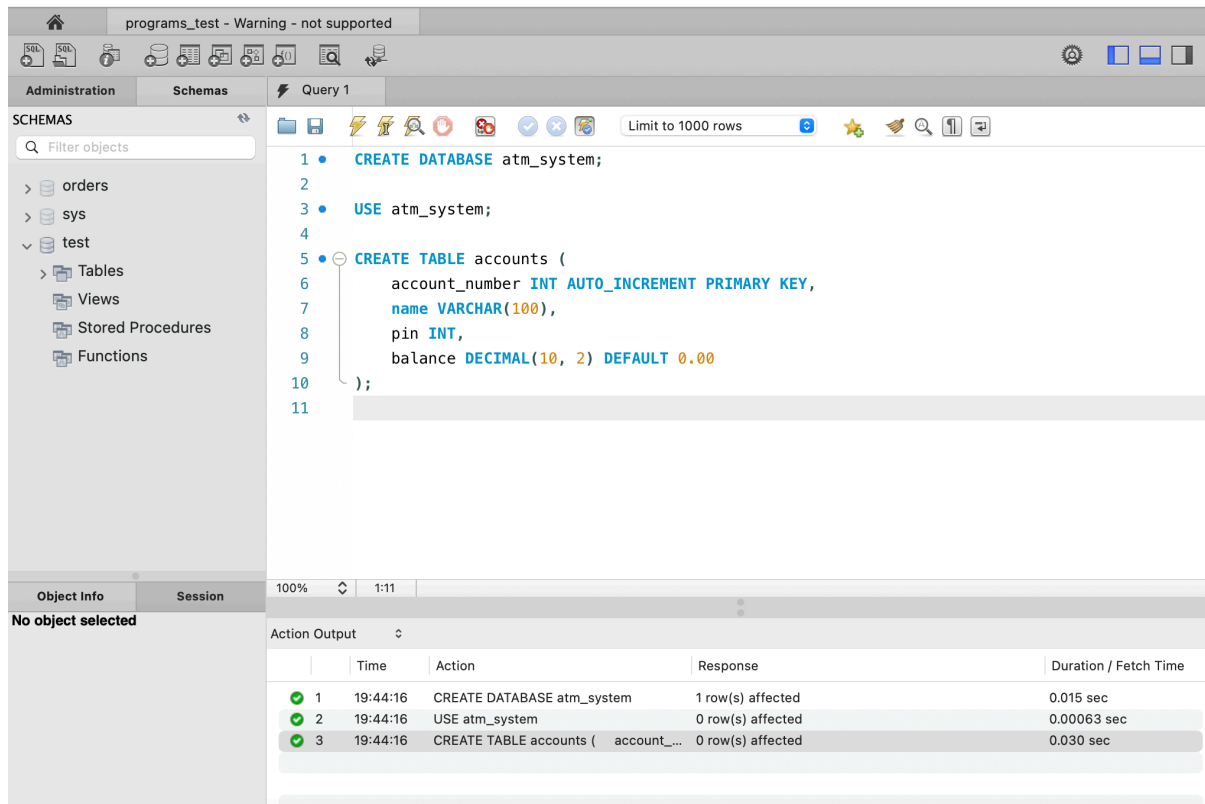
Pc: MacBook Air

Operating System: MacOS Ventura
Version: 13.5.1
Processor: 1.1 GHz Dual-Core Intel Core i3
Memory:8 GB

SOURCE CODE FOR THE PROJECT

Sql query:

Python code:

```python
import mysql.connector

# Establish connection to the MySQL database
def connect_to_database():
    return mysql.connector.connect(
        host="localhost",
        user="root",
        password="computer@13#",
        database="atm_system"
    )

# Function to create a new account
def create_account():
    name = input("Enter your name: ")
    pin = int(input("Set a 4-digit PIN: "))

    db = connect_to_database()
    cursor = db.cursor()

    cursor.execute("INSERT INTO accounts (name, pin) VALUES (%s, %s)", (name, pin))
    db.commit()

    print("Account created successfully!")
    db.close()

# Function to check balance
def check_balance(account_number, pin):
    db = connect_to_database()
    cursor = db.cursor()

    cursor.execute("SELECT balance FROM accounts WHERE account_number = %s AND pin = %s", (account_number, pin))
    result = cursor.fetchone()

    if result:
```

```python
35            print(f"Your current balance is: ₹{result[0]}")
36        else:
37            print("Invalid account number or PIN.")
38        db.close()
39
40    # Function to deposit money
41    def deposit(account_number, pin):
42        amount = float(input("Enter amount to deposit: "))
43
44        db = connect_to_database()
45        cursor = db.cursor()
46
47        cursor.execute("UPDATE accounts SET balance = balance + %s WHERE account_number = %s AND pin = %s", (amount,
              account_number, pin))
48        db.commit()
49
50        if cursor.rowcount > 0:
51            print("Deposit successful!")
52        else:
53            print("Invalid account number or PIN.")
54        db.close()
55
56    # Function to withdraw money
57    def withdraw(account_number, pin):
58        amount = float(input("Enter amount to withdraw: "))
59
60        db = connect_to_database()
61        cursor = db.cursor()
62
63        cursor.execute("SELECT balance FROM accounts WHERE account_number = %s AND pin = %s", (account_number, pin))
64        result = cursor.fetchone()
65
66        if result and result[0] >= amount:

67            cursor.execute("UPDATE accounts SET balance = balance - %s WHERE account_number = %s AND pin = %s", (amount,
                  account_number, pin))
68            db.commit()
69            print("Withdrawal successful!")
70        else:
71            print("Insufficient balance or invalid credentials.")
72        db.close()
73
74    # Function to change PIN
75    def change_pin(account_number, old_pin):
76        new_pin = int(input("Enter new 4-digit PIN: "))
77
78        db = connect_to_database()
79        cursor = db.cursor()
80
81        cursor.execute("UPDATE accounts SET pin = %s WHERE account_number = %s AND pin = %s", (new_pin, account_number,
              old_pin))
82        db.commit()
83
84        if cursor.rowcount > 0:
85            print("PIN changed successfully!")
86        else:
87            print("Invalid account number or PIN.")
88        db.close()
89
90    # Main menu
91    def main_menu():
92        while True:
93            print("\nATM Menu:")
94            print("1. Create Account")
95            print("2. Check Balance")
96            print("3. Deposit Money")
```

```python
            print("4. Withdraw Money")
            print("5. Change PIN")
            print("6. Exit")

            choice = int(input("Enter your choice: "))

            if choice == 1:
                create_account()
            elif choice in [2, 3, 4, 5]:
                account_number = int(input("Enter your account number: "))
                pin = int(input("Enter your PIN: "))

                if choice == 2:
                    check_balance(account_number, pin)
                elif choice == 3:
                    deposit(account_number, pin)
                elif choice == 4:
                    withdraw(account_number, pin)
                elif choice == 5:
                    change_pin(account_number, pin)
            elif choice == 6:
                print("Thank you for using the ATM!")
                break
            else:
                print("Invalid choice. Please try again.")

# Run the program
if __name__ == "__main__":
    main_menu()
```

OUTPUT FOR THE SOURCE CODE:

```
PROBLEMS    OUTPUT    PORTS    TERMINAL    DEBUG CONSOLE          >_ Python: demo  + ∨  ▯  🗑  ⋯  ∨

● swarnalishome@Swarnalis-MacBook-Air ~ % /usr/local/bin/python3 "/Users/swarnalishome/Desktop/Python Projects /demo.py"

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 1
Enter your name: harry
Set a 4-digit PIN: 1994
Account created successfully!

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 3
Enter your account number: 2
Enter your PIN: 1994
Enter amount to deposit: 20000
Deposit successful!

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 2
Enter your account number: 1
Enter your PIN: 1989
Your current balance is: ₹13000.00

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 4
Enter your account number: 1
Enter your PIN: 1989
Enter amount to withdraw: 1000
Withdrawal successful!
```

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```
ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 5
Enter your account number: 1
Enter your PIN: 1312
Enter new 4-digit PIN: 1222
Invalid account number or PIN.

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 5
Enter your account number: 1
Enter your PIN: 1989
Enter new 4-digit PIN: 1312
PIN changed successfully!

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 6
Thank you for using the ATM!
swarnalishome@Swarnalis-MacBook-Air ~ %
```

Handling incorrect pin/account number situations:

```
ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 2
Enter your account number: 8
Enter your PIN: 3445
Invalid account number or PIN.

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 3
Enter your account number: 234
Enter your PIN: 2
Enter amount to deposit: 12333
Invalid account number or PIN.



ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 5
Enter your account number: 1
Enter your PIN: 5555
Enter new 4-digit PIN: 6666
Invalid account number or PIN.

ATM Menu:
1. Create Account
2. Check Balance
3. Deposit Money
4. Withdraw Money
5. Change PIN
6. Exit
Enter your choice: 6
Thank you for using the ATM!
```
swarnalishome@Swarnalis-MacBook-Air ~ % ⬜

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BIBLIOGRAPHY

Some information and ideas were taken from:

- https://github.com/Vikranth3140/ATM-Management-System
- https://github.com/AkunoCode/Python-ATM-GUI
- NCERT Computer Science Class 12
- NCERT Computer Science Class 11