ATM Simulation Program…!

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Course: BCA

College: JUNCR

Introduction:

This project is an advanced ATM simulation system developed using the C programming language. The system emulates essential ATM functionalities including PIN registration, secure login, multi-language interface, and transaction tracking. Users can register a secure 4-digit PIN, perform deposits, withdrawals, check their balance, and view a mini statement of the last 3 transactions.

The interface supports dual-language functionality (English and Hindi), offering an intuitive and user-friendly experience. The system includes safeguards such as withdrawal limits and input validation, providing a realistic simulation of ATM usage.

Features & Functionality:

1. **Language Selection:**

- The program supports both English and Hindi. The user selects the preferred language at startup.

2. **User Registration and Login:**

- New users can register a 4-digit PIN.
- Existing users must authenticate using the registered PIN.
- Maximum 3 login attempts are allowed.

3. **Check Balance:**

- Displays the current account balance in the selected language.

4. **Withdraw Money:**

- Allows users to withdraw money.
- Ensures the amount does not exceed the available balance.
- A maximum of 3 withdrawals are allowed per session.

5. **Deposit Money:**

- Users can deposit money which is then added to their balance.

6. **Mini Statement:**

- Shows the last 3 transactions (deposit or withdrawal).

7. **Error Handling:**

- Handles invalid inputs gracefully.

8. **Session Management:**

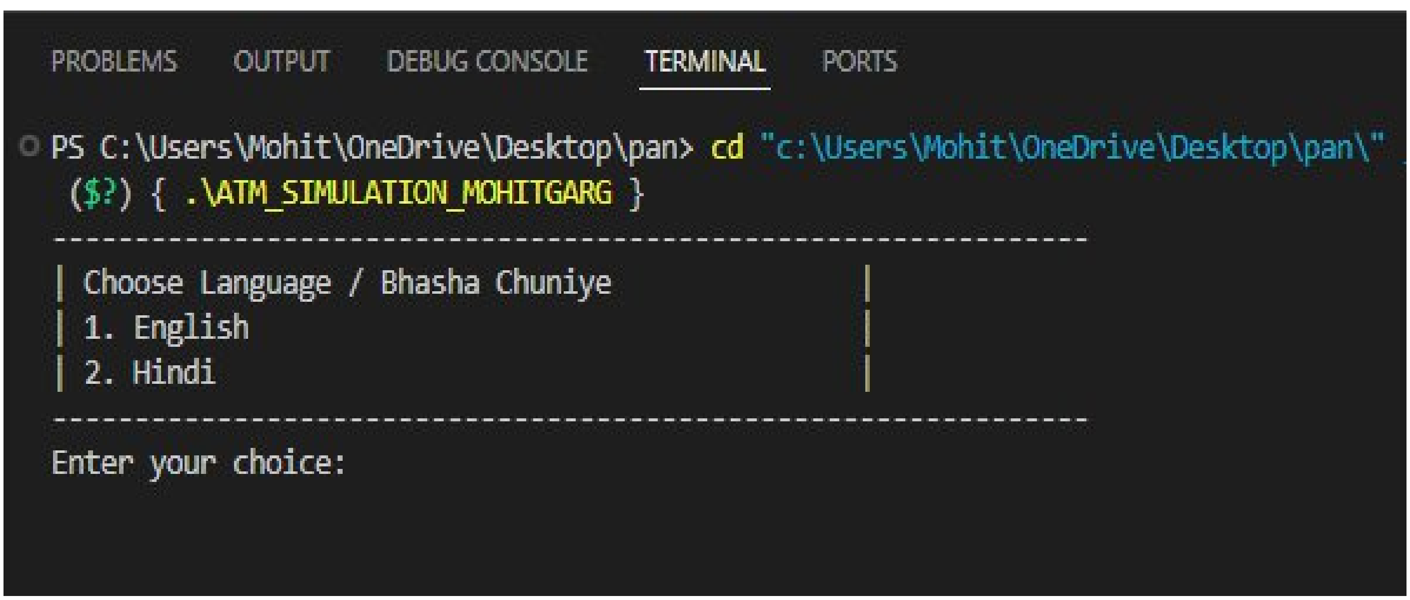
- Secure login with exit on exceeding incorrect attempts.

Code Walkthrough:

The program uses modular functions to handle each functionality:

1. registerPIN() – Registers a 4-digit PIN after confirmation.
2. authenticateUser() – Verifies PIN with a maximum of 3 attempts.
3. checkBalance() – Displays the user's balance.
4. depositMoney() – Accepts amount and adds to the balance.
5. withdrawMoney() – Deducts amount if valid and within limits.
6. addTransaction() – Stores transaction message in a mini statement buffer.
7. showMiniStatement() – Displays the last 3 transactions.
8. showMenu() – Shows main menu with user options in selected language.
9. selectLanguage() – Allows the user to choose between English and Hindi.

Some Outputs:



```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

PS C:\Users\Mohit\OneDrive\Desktop\pan> cd "c:\Users\Mohit\OneDrive\Desktop\pan\"
 ($?) { .\ATM_SIMULATION_MOHITGARG }
----------------------------------------------------------------
| Choose Language / Bhasha Chuniye                  |
| 1. English                                        |
| 2. Hindi                                          |
----------------------------------------------------------------
Enter your choice: 1

Welcome to Smart ATM!

1. Register (New User)
2. Login
Choose an option: 1

Set your 4-digit ATM PIN:
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

PS C:\Users\Mohit\OneDrive\Desktop\pan> cd "c:\Users\Mohit\OneDrive\Desktop\pan\"
 ($?) { .\ATM_SIMULATION_MOHITGARG }
----------------------------------------------------------------
| Choose Language / Bhasha Chuniye                  |
| 1. English                                        |
| 2. Hindi                                          |
----------------------------------------------------------------
Enter your choice: 1

Welcome to Smart ATM!

1. Register (New User)
2. Login
Choose an option: 1

Set your 4-digit ATM PIN: 8909
Confirm your PIN: 8909
PIN registered successfully.
Enter your PIN: 8909
PIN verified. Welcome!
----------------------------------------------------------------
|                 ATM MAIN MENU                     |
| 1. Check Balance                                  |
| 2. Deposit Money                                  |
| 3. Withdraw Money                                 |
| 4. Mini Statement                                 |
| 5. Exit                                           |
----------------------------------------------------------------
Enter your choice:
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
------------------------------------------------------------------
|                   ATM MAIN MENU                                |
| 1. Check Balance                                               |
| 2. Deposit Money                                               |
| 3. Withdraw Money                                              |
| 4. Mini Statement                                              |
| 5. Exit                                                        |
------------------------------------------------------------------
Enter your choice: 1

Your balance: Γé╣10000.00
------------------------------------------------------------------
|                   ATM MAIN MENU                                |
| 1. Check Balance                                               |
| 2. Deposit Money                                               |
| 3. Withdraw Money                                              |
| 4. Mini Statement                                              |
| 5. Exit                                                        |
------------------------------------------------------------------
Enter your choice: 3
Enter amount to withdraw: Γé╣5000
Please collect your cash. Balance: Γé╣5000.00
```

```
------------------------------------------------------------------
|                   ATM MAIN MENU                                |
| 1. Check Balance                                               |
| 2. Deposit Money                                               |
| 3. Withdraw Money                                              |
| 4. Mini Statement                                              |
| 5. Exit                                                        |
------------------------------------------------------------------
Enter your choice: 4

Last 3 Transactions:
Withdraw: -Γé╣5000.00
------------------------------------------------------------------
|                   ATM MAIN MENU                                |
| 1. Check Balance                                               |
| 2. Deposit Money                                               |
| 3. Withdraw Money                                              |
| 4. Mini Statement                                              |
| 5. Exit                                                        |
------------------------------------------------------------------
Enter your choice: 5
Thank you! Visit again.
```

Challenges & Solutions:

- Challenge 1: Implementing user authentication with limited attempts.
- Solution: Used a loop with counter logic to restrict login attempts to 3.
- Challenge 2: Maintaining a mini statement with only the latest 3 transactions.
- Solution: Implemented a circular array-style logic where old entries are pushed out.
- Challenge 3: Managing multilingual interface with proper message consistency.
- Solution: Used conditional language flags and message formatting functions.

Conclusion:

This updated ATM simulation system provides a feature-rich and interactive platform for understanding the core mechanics of ATM software. The combination of multilingual support, transaction security, and a user-friendly interface ensures accessibility and realism. Through modular coding practices, the system remains clean, easy to update, and serves as a strong foundation for further ATM-based projects or enhancements.