Programming Methodology Aug-Dec 2021

CASE STUDY-2

ATM

A local bank intends to install a new automated teller machine(ATM) to allow users (i.e.,bank customers) to perform basic financial transactions. Each user can have only one account at the bank. ATM users should be able to view their account balance, withdraw cash(i.e., take money out of an account) and deposit funds(i.e.,place money into an account) etc.

The user interface of the automated teller machine contains the following hardware components:

- a screen that displays messages to the user
- A keypad that receives numeric input from the user
- A cash dispenser that dispenses cash to the user and
- A deposit slot that receives deposit envelopes from the user.

The cash dispenser begins each day loaded with a certain amount. [Note: certain elements of the ATM described here do not accurately mimic those of a real ATM. For example, a real ATM typically contains a device that reads a user's account number from an ATM card, whereas this ATM asks the user to type an account number using the keypad. A real ATM also usually prints a receipt at the end of a session, but all output from this ATM appears on the screen].

The bank wants you to develop software to perform the financial transactions initiated by bank customers through the ATM. The bank will integrate the software with the ATM's hardware at a later time. The software should encapsulate the functionality of the hardware devices (e.g.,cash dispenser, deposit slot) within software components ,but it need not concern itself with how these devices perform their duties.The ATM hardware has not been developed yet,so instead of writing your software to run on the ATM,you should develop a first version of the software to run on a personal computer. This version should use the computer's monitor to simulate the ATM's screen,and the computer's key-board to simulate the ATM's keypad.

We make the simplifying assumption that the bank trusts the ATM to access and manipulate the information in the database without significant security measures.]

Upon first approaching the ATM, the user should experience the following sequence of events

1. The screen displays a welcome message and prompts the user to enter an account number.
2. The user enters a five-digit account number,using the keypad.
3. The screen prompts the user to enter the PIN associated with the specified account number.
4. The user enters a five-digit PIN,using the keypad.
5. If the user enters a valid account number and the correct PIN for that account, the screen displays the main menu. If the user enters an invalid account number or an

incorrect PIN, the screen displays an appropriate message,then theATM returns to Step 1 to restart the authentication process.

In similar ways, define other functionalities likes:

1. View my balance
2. Withdrawal amount
3. Deposit funds

And many more...

General Constraints:

Implementation of all OOPs concepts in each and every class used in this case study

- Abstraction
- Encapsulation
- Polymorphism
- Interfaces

Constraints:

1. OTP(to send otp after entering PIN for double verification)
2. ATM PIN(VARIABLE LENGTH)
3. CARDLESS ATM
4. DEPOSIT: should also accept coins of all denominations.
5. Should be able to update their basic profile at ATM's and restrict changes in important info.