Design Requirements

Saturday, January 27, 2024   1:24 PM

R1: Each user has a single account at the bank that they can access by inserting their card into the ATM.

R2: The main components of the ATM system that facilitate interactions between the user and the machine are listed below:

Card reader: To read the user's ATM card

Keypad: To enter information such as the user's PIN

Screen: To display messages to the user, such as prompts or error messages

Cash dispenser: To dispense cash to the user

Printer: To print receipts for the user

Network infrastructure: To connect with the bank's computer system in order to access account information and complete transactions

R3: The ATM system must authenticate the user based on the PIN they enter to ensure that only authorized users can access their accounts.

R4: All transactions are possible after the successful authentication of the ATM card.

R5: The user can have two types of accounts: checking and saving, and can perform the following operations on the ATM:

Balance inquiry

Cash withdrawal

Funds/money transfer

R6: At the end of a transaction, the user has the option to either start another transaction or end the session.

Components of ATM System

User:
- Data: ATM Card
- Data: Bank Account

ATM Card:
- Data: card number
- Data: cardholder name
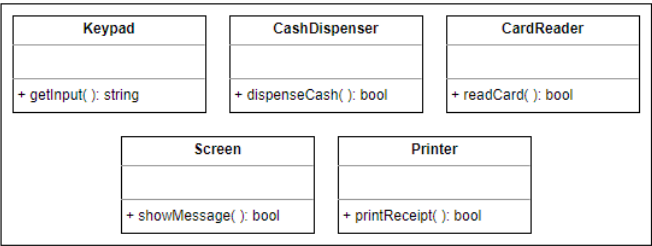- Data: card expiration date
- Data: car pin/password

Bank Account:
- Data: account number
- Data: routing number
- Data: balance
- Data: withdraw limit
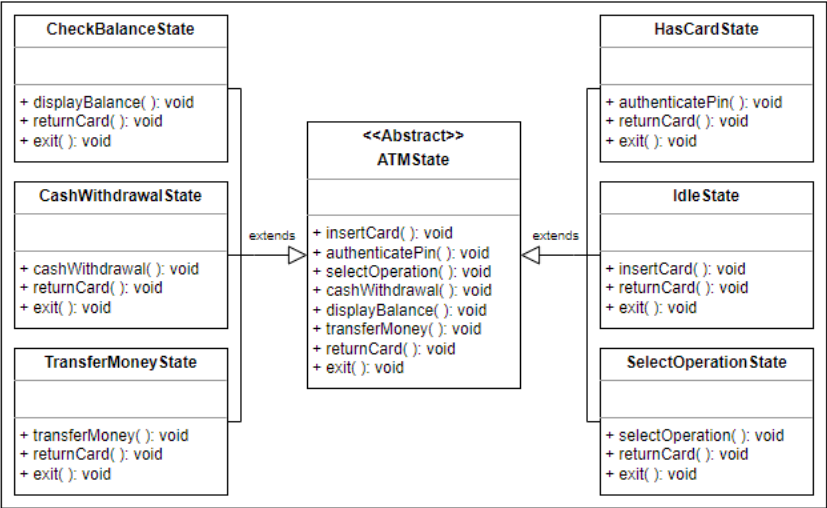- Method: get remaining balance

Bank:
- Data: name
- Data: code
- Method: add ATM
- Method: remove ATM

Card reader, cash dispenser, keypad, screen, printer

Keypad	CashDispenser	CardReader
+ getInput( ): string	+ dispenseCash( ): bool	+ readCard( ): bool

Screen	Printer
+ showMessage( ): bool	+ printReceipt( ): bool

ATM State:

CheckBalanceState
+ displayBalance( ): void + returnCard( ): void + exit( ): void

CashWithdrawalState
+ cashWithdrawal( ): void + returnCard( ): void + exit( ): void

TransferMoneyState
+ transferMoney( ): void + returnCard( ): void + exit( ): void

extends

<<Abstract>> ATMState
+ insertCard( ): void + authenticatePin( ): void + selectOperation( ): void + cashWithdrawal( ): void + displayBalance( ): void + transferMoney( ): void + returnCard( ): void + exit( ): void

extends

HasCardState
+ authenticatePin( ): void + returnCard( ): void + exit( ): void

IdleState
+ insertCard( ): void + returnCard( ): void + exit( ): void

SelectOperationState
+ selectOperation( ): void + returnCard( ): void + exit( ): void

Components of ATM System

ATM:
- Data: ATM object
- Data: current state
- Data: all available balance
- Data: number of 100, 50, 20 bills
- Method: display current state
- Method: initialize ATM

Entire System: