

# **Product Requirements**

**Team MATI**

## **Brief problem statement**

The ATM machine program aims to provide users with a convenient and secure way to perform banking transactions such as cash withdrawals, balance inquiries, and deposits. It should ensure that transactions are properly authenticated and adhere to certain limits and restrictions.

## **System requirements**

- The program should be developed in C language.
- It should have the ability to read and write account information from/to a file.
- The program should implement features such as cash withdrawal, balance inquiry, deposit (cash and check), and transaction history.
- There should be limits on withdrawal and deposit amounts, and appropriate error handling for exceeding these limits.
- The program should maintain a transaction history for each account

## **Users profile**

The ATM machine program is targeted towards bank customers of all age groups who will be using the system in self-service mode. The users are expected to have basic familiarity with using computers and software applications, including keyboard input and interacting with graphical user interfaces. While some users may be highly experienced with ATMs and banking transactions, others may be first-time users or have limited experience.

To accommodate users with varying levels of familiarity, the system should have a user-friendly interface with clear instructions and intuitive navigation. Visual cues and prompts should be provided to guide users through the different operations and options available. Additionally, the system should provide appropriate error messages and prompts to help users rectify any mistakes or incorrect inputs.

Security and privacy are paramount for banking transactions. Users should be aware of the importance of protecting their account ID and PIN and should follow security guidelines. The system should emphasize the need for secure PIN entry and implement measures such as limited login attempts to prevent unauthorized access.

Overall, the system should cater to users of different backgrounds and levels of computer literacy, providing a seamless and secure banking experience.

**Feature requirements (user stories)**

No	User Story Name	Description	Release
1.	<i>Cash Withdrawal</i>	As a bank customer, I want to be able to withdraw cash from my account using the ATM machine. This should include inputting the withdrawal amount and verifying if it is within the available balance and withdrawal limit. Upon successful withdrawal, the system should deduct the amount from the account balance and provide a confirmation message. In case of insufficient funds or exceeding the withdrawal limit, appropriate error messages should be displayed.	R1
2.	<i>Balance Inquiry</i>	As a bank customer, I want to be able to check my account balance using the ATM machine. This should display the current balance on the screen after entering the account ID and PIN for authentication. The system should provide a clear and readable display of the account balance.	R1e
3.	<i>Cash Deposit</i>	As a bank customer, I want to be able to deposit cash into my account using the ATM machine. This should include inputting the deposit amount and verifying if it is within the deposit limit. Upon successful deposit, the system should add the amount to the account balance and provide a confirmation message. If the deposit exceeds the limit, appropriate error messages should be displayed.	R1
4.	<i>Check Deposit</i>	As a bank customer, I want to be able to deposit checks into my account using the ATM machine. This should include inputting the deposit amount and verifying if it is within the deposit limit. Upon successful deposit, the system should add the amount to the account balance and provide a confirmation message. If the deposit exceeds the limit, appropriate error messages should be displayed.	R2

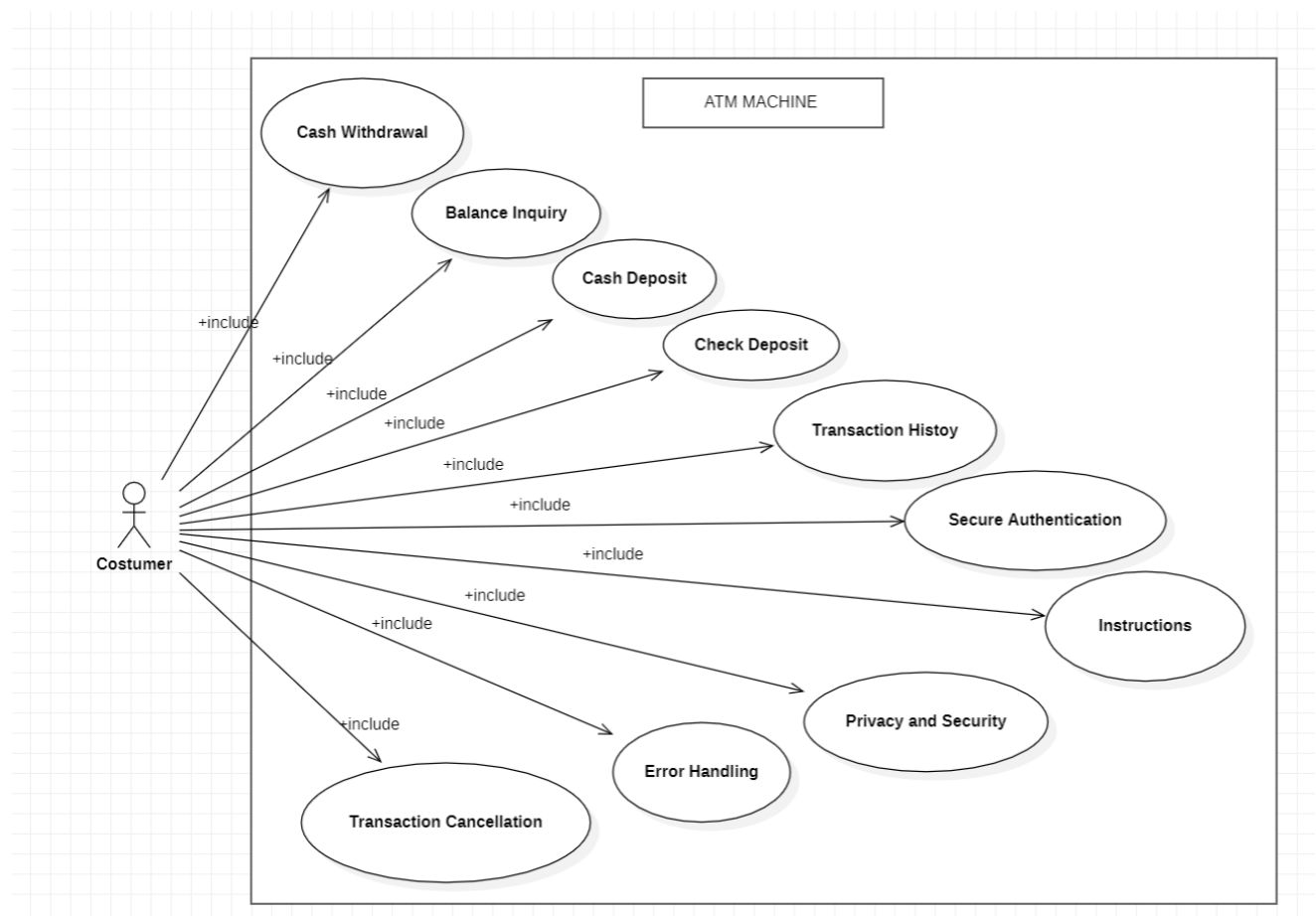
5.	<i>Transaction History</i>	As a bank customer, I want to be able to view my transaction history using the ATM machine. This should display a list of the latest transactions, including the amount, transaction type (withdrawal or deposit), and payment method (cash or check). The system should allow me to choose to view all transactions or specify the number of transactions to display.	R2
6.	<i>Secure Authentication</i>	As a bank customer, I want the ATM machine to provide a secure authentication process. This should include entering my account ID and PIN to access my account. The system should verify the entered credentials and allow access only if they match the stored information. It should also implement security measures such as limiting the number of PIN entry attempts and displaying appropriate error messages for incorrect credentials.	R1
7.	<i>Instructions</i>	As a bank customer, I want the ATM machine to display clear and user-friendly instructions on the screen. The system should provide step-by-step guidance for different operations and options, ensuring that users can easily understand and follow the instructions. Visual cues and prompts should be used to aid navigation and minimize confusion.	R1
8.	<i>Privacy and Security</i>	As a bank customer, I want the ATM machine to ensure the privacy and security of my transactions. The system should protect my account information, such as hiding the entered PIN and displaying only the necessary transaction details. It should also log out automatically after a period of inactivity and securely store sensitive data.	R1
9.	<i>Error Handling</i>	As a bank customer, I want the ATM machine to provide error handling for exceptional cases. This should include displaying informative error messages when there are network connectivity issues, system errors, or invalid inputs. The system should gracefully handle these situations and guide users on how to proceed or resolve the issue.	R1

10.	<i>Transaction Cancellation</i>	As a bank customer, I want the ATM machine to provide a cancel option for ongoing transactions. This should allow me to abort a transaction in progress and return to the main menu without affecting the account balance or transaction history.	R2
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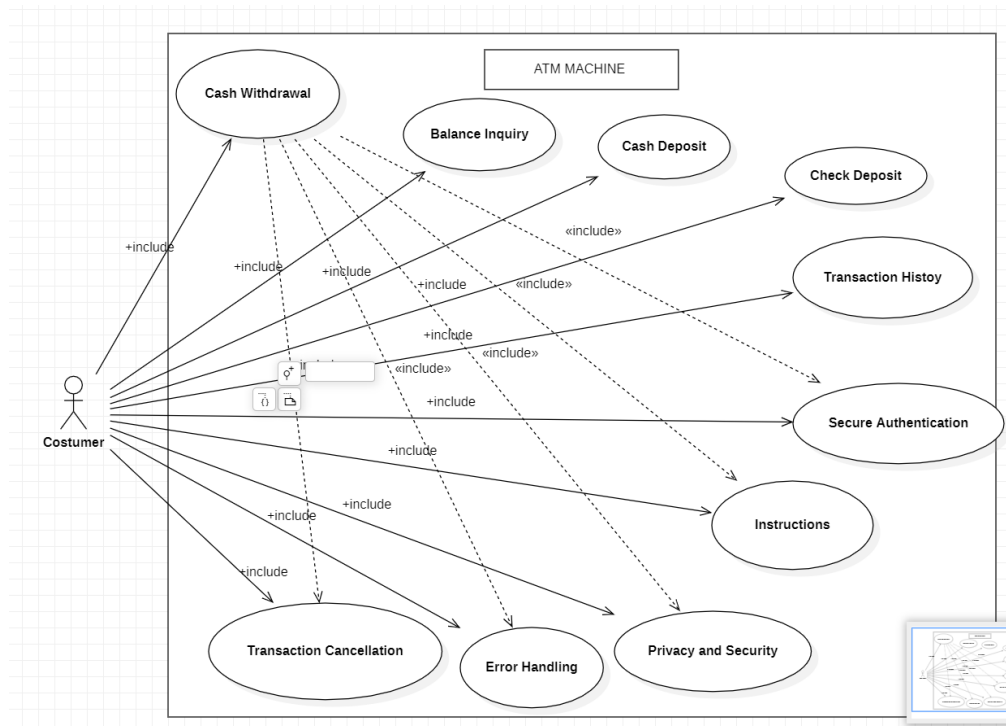
## Use case diagram

We have decided to separate the use case diagrams due to them being very crowded and difficult to understand. In this way we represent the relationships with a better visualization.

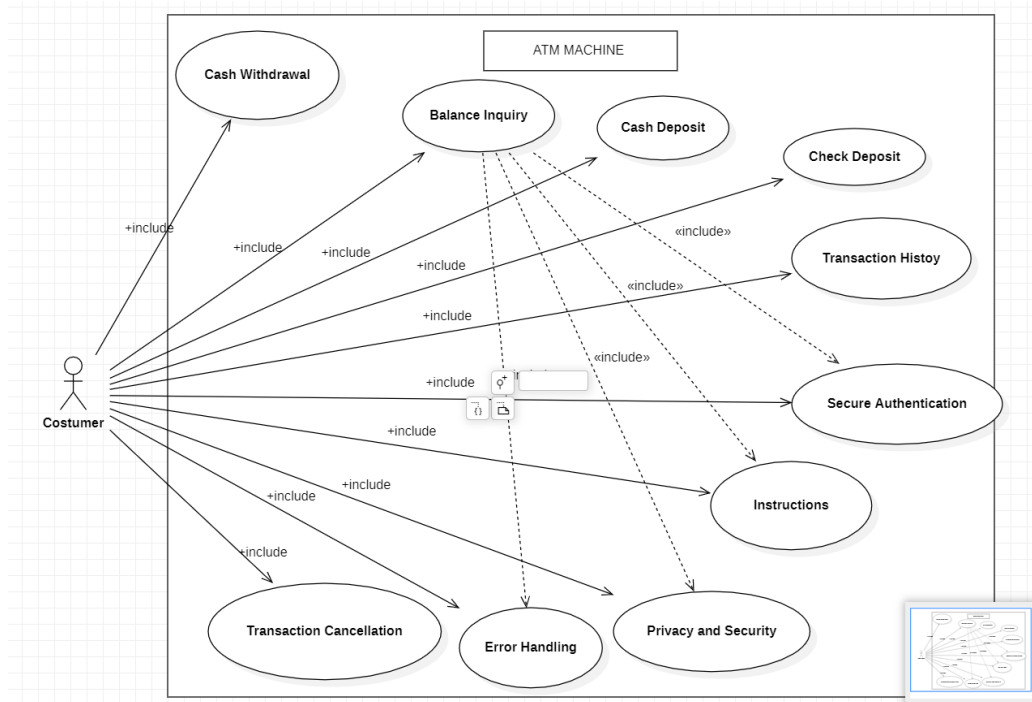
*First Diagram (relationship between the costumer and all atm machine features)*



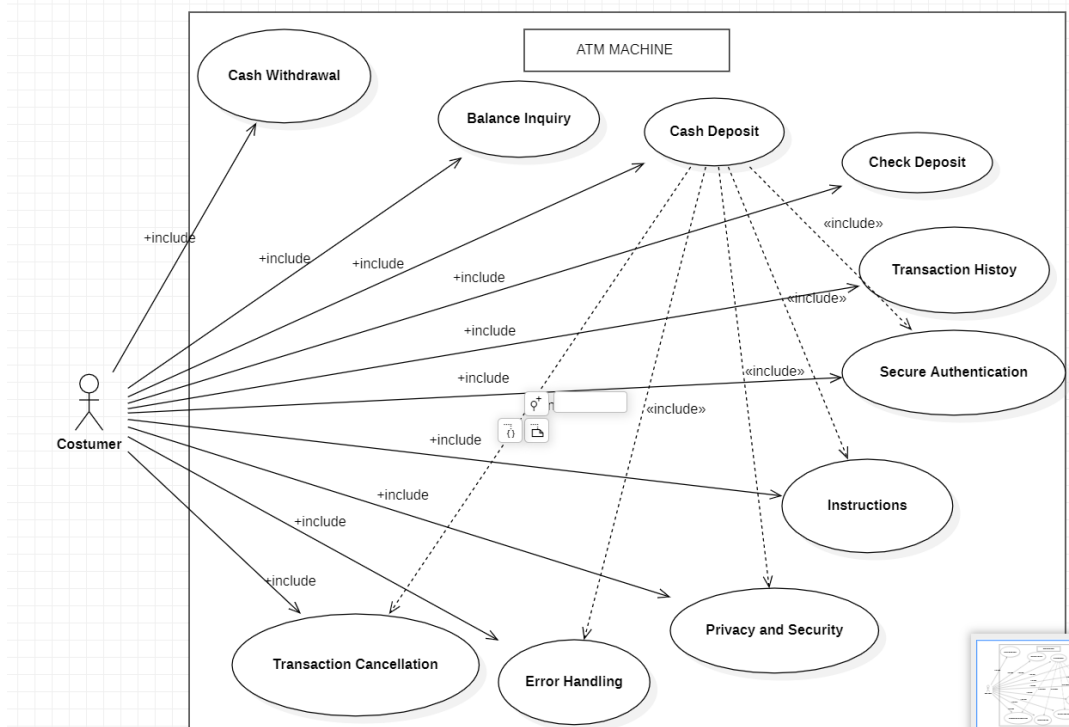
**Second Diagram** (relationship between Cash Withdrawal with Secure Authentication, Instructions, Privacy and Security, Error Handling as well as Transaction Cancellation)



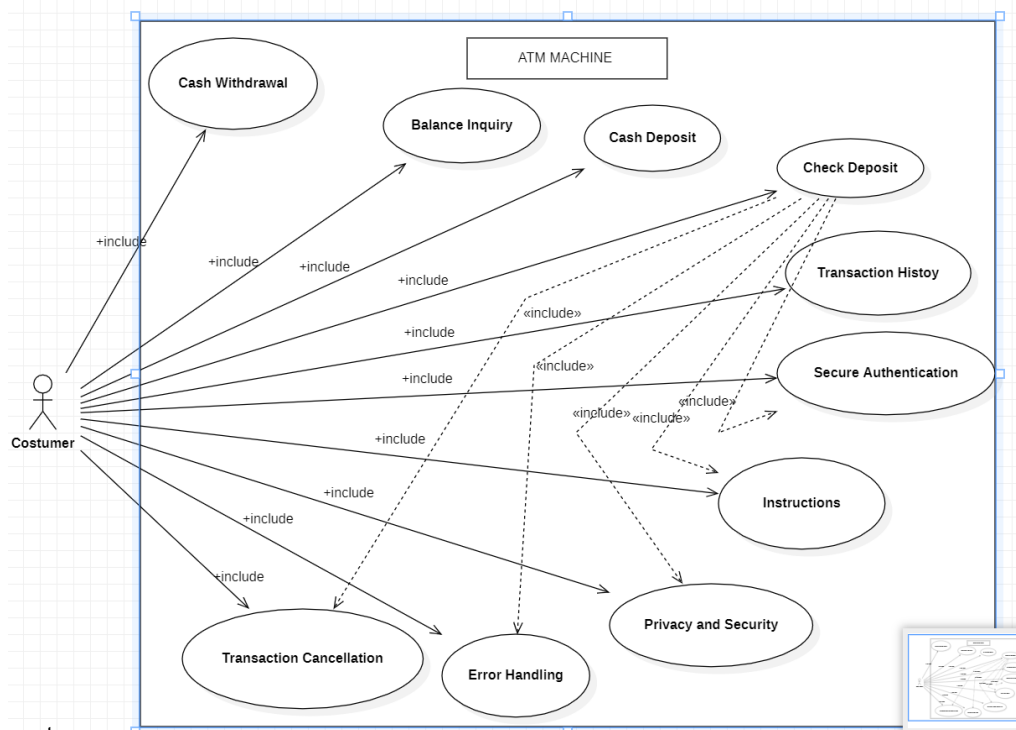
**Third Diagram** (relationship between Balance Inquiry and Secure Authentication, Instructions, Privacy and Security, Error Handling as well as Transaction Cancellation)



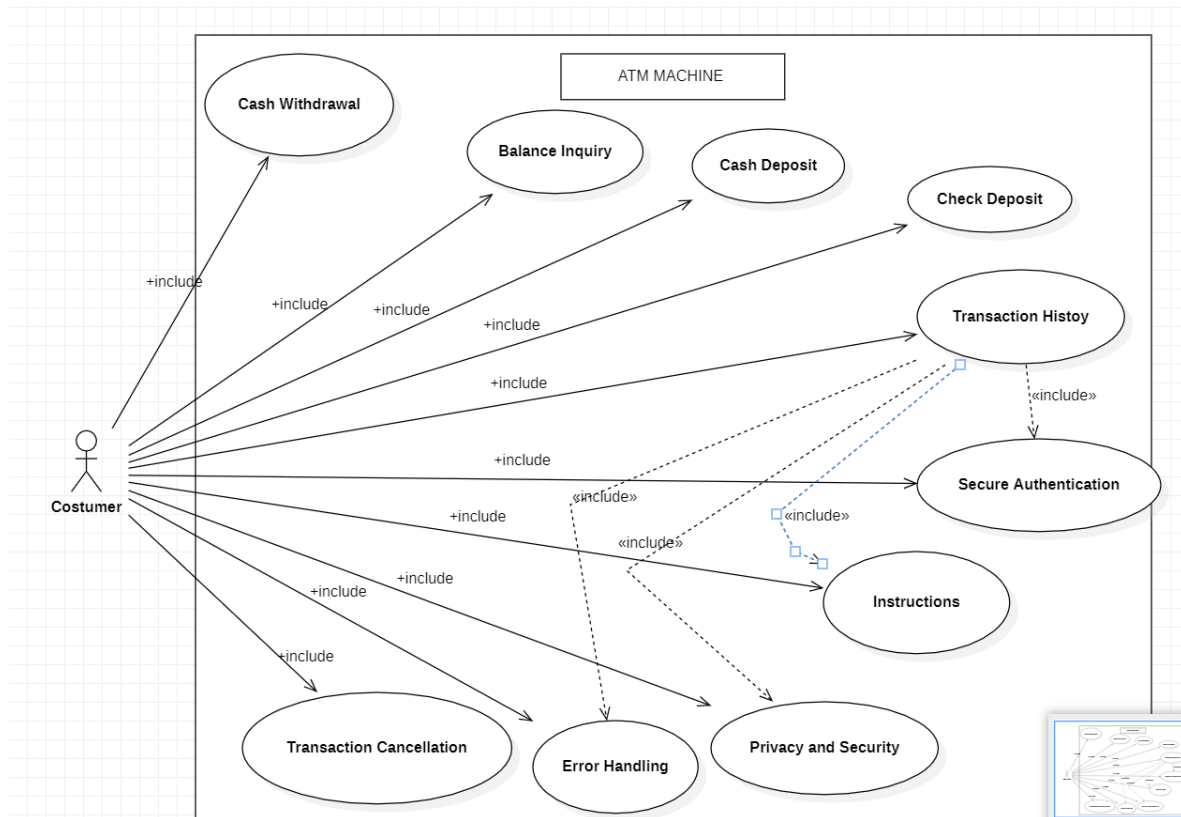
**Fourth Diagram** (relationship between Cash Deposit and Secure Authentication, Instructions, Privacy and Security, Error Handling as well as Transaction Cancellation)



**Fifth Diagram** (relationship between Check Deposit and Secure Authentication, Instructions, Privacy and Security, Error Handling as well as Transaction Cancellation)



**Sixth Diagram** (relationship between Transaction History and Secure Authentication, Instructions, Privacy and Security as well as Error Handling)



## Use case description

<b>Use Case Number:</b>	UC-01
<b>Use Case Name:</b>	Perform ATM Transactions
<b>Overview:</b>	This use case describes the steps involved in performing various transactions using an ATM machine, such as cash withdrawal, balance inquiry, and deposit.
<b>Actor(s):</b>	<i>Customer</i>



<b>Pre condition(s):</b>	The customer must have a valid account ID and PIN.
<b>Scenario Flow:</b>	<p><b><i>Main (success) Flow:</i></b></p> <ol style="list-style-type: none"> <li>1. The customer enters their ID.</li> <li>2. The system verifies the ID and prompts the customer to enter their PIN.</li> <li>3. The customer enters their PIN.</li> <li>4. The system verifies the PIN.</li> <li>5. If the PIN is incorrect, the system allows two more attempts.</li> <li>6. If the PIN is still incorrect after three attempts, the system locks the account.</li> <li>7. If the PIN is correct, the system presents the main menu to the customer.</li> <li>8. The customer selects an option from the menu.</li> <li>9. If the option is a cash withdrawal: <ol style="list-style-type: none"> <li>a. The system prompts the customer to enter the withdrawal amount.</li> <li>b. The customer enters the amount.</li> <li>c. The system checks if the amount is within the withdrawal limit and the available balance.</li> <li>d. If the amount is valid, the system deducts the amount from the customer's account balance.</li> <li>e. The system displays a success message.</li> </ol> </li> <li>10. If the option is a balance inquiry: <ol style="list-style-type: none"> <li>a. The system displays the customer's current account balance.</li> </ol> </li> <li>11. If the option is a deposit: <ol style="list-style-type: none"> <li>a. The system presents the deposit options (cash or check).</li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li><i>b.</i> The customer selects a deposit option.</li> <li><i>c.</i> The system prompts the customer to enter the deposit amount.</li> <li><i>d.</i> The customer enters the amount.</li> <li><i>d.</i> The system checks if the amount is within the deposit limit.</li> <li><i>e.</i> If the amount is valid, the system adds the amount to the customer's account balance.</li> <li><i>f.</i> The system displays a success message.</li> </ul> <p><i>12.</i> If the option is a transaction history:</p> <ul style="list-style-type: none"> <li><i>a.</i> The system presents the transaction history options (display all transactions, display first 'x' transactions, display last 'x' transactions).</li> <li><i>b.</i> The customer selects a transaction history option.</li> <li><i>c.</i> The system retrieves and displays the requested transaction history.</li> </ul> <p><i>13.</i> The customer selects another option or chooses to close the session.</p> <p><i>14.</i> If the customer chooses to close the session, the system displays a goodbye message.</p>
	<p><b><i>Alternate Flows:</i></b></p> <ul style="list-style-type: none"> <li><i>1.</i> If the customer enters an incorrect ID:             <ul style="list-style-type: none"> <li><i>a.</i> The system displays an error message and the flow terminates.</li> </ul> </li> <li><i>2.</i> If the customer enters an incorrect PIN:             <ul style="list-style-type: none"> <li><i>a.</i> The system allows two more attempts.</li> <li><i>b.</i> If the PIN is still incorrect after three attempts:                 <ul style="list-style-type: none"> <li><i>i.</i> The system locks the account and displays a maximum attempted message.</li> </ul> </li> </ul> </li> </ul>

	<p><i>ii.</i> The flow terminates.</p> <ol style="list-style-type: none"> <li>3. If the withdrawal amount exceeds the available balance:           <ol style="list-style-type: none"> <li><i>a.</i> The system prompts the customer to enter a new withdrawal amount.</li> <li><i>b.</i> The flow continues from step 9b.</li> </ol> </li> <li>4. If the withdrawal amount exceeds the withdrawal limit:           <ol style="list-style-type: none"> <li><i>a.</i> The system displays an error message and prompts the customer to enter a new withdrawal amount.</li> <li><i>b.</i> The flow continues from step 9b.</li> </ol> </li> <li>5. If the deposit amount exceeds the deposit limit:           <ol style="list-style-type: none"> <li><i>a.</i> The system displays an error message and prompts the customer to enter a new deposit amount.</li> <li><i>b.</i> The flow continues from step 11c.</li> </ol> </li> <li>6. If the customer selects an invalid option from the main menu:           <ol style="list-style-type: none"> <li><i>a.</i> The system displays an error message and prompts the customer to enter a valid option.</li> <li><i>b.</i> The flow continues from step 8.</li> </ol> </li> <li>7. If the customer selects an invalid option from the transaction history options:           <ol style="list-style-type: none"> <li><i>a.</i> The system displays an error message and prompts the customer to enter a valid option.</li> <li><i>b.</i> The flow continues from step 12b</li> </ol> </li> </ol>
<b>Post Condition:</b>	The customer completes the desired transactions successfully, or the session is closed.