ATM System Specifications and Bug Reporting

AIM

To study Automated Teller Machine (ATM) system specifications, and identify its potential bugs to enhance reliability and security.

DESCRIPTION :

An ATM system is crucial for providing banking services such as cash withdrawals, deposits, balance inquiries, and fund transfers to users efficiently and securely. Ensuring the reliability and security of ATM systems is vital for both banks and customers.

In This experiment we are listing the specifications of an ATM system and highlight potential bugs that could affect its performance. By identifying and addressing these bugs, we can enhance the overall functionality and security of the ATM system.

System Specifications

1. User Authentication
Card Insertion and Recognition
PIN Entry and Verification

2. Account Management
Balance Inquiry
Mini-Statement Printing
Fund Transfer between Accounts

3. Transaction Processing
Cash Withdrawal
Cash Deposit
Check Deposit

4. User Interface
Display Screen
Keypad for Input
Receipt Printer

Potential Bugs in ATM System

Identifying potential bugs in an ATM system is crucial for ensuring its reliability and security. Bugs can appear in various parts of the system, such as user authentication, account management, transaction processing, the user interface, security measures, and maintenance procedures.

By examining each of these areas, we can find issues that might cause errors, security breaches, or user frustration. Addressing these bugs through careful testing and regular maintenance helps keep the ATM system running smoothly and securely for all users.

1. User Authentication Bugs

- **Card Recognition Failures**
  - ATM fails to recognize card insertion intermittently.
  - ATM accepts damaged or expired cards without flagging errors.
- **PIN Verification Issues**
  - Incorrect PIN entries are not properly counted, allowing more than three attempts before locking the account.
  - Delay in processing PIN entry leading to timeout errors.

2. Account Management Bugs

- **Balance Inquiry Issues**
  - Balance inquiry shows incorrect balance due to synchronization issues with the bank's main server.
- **Mini-Statement Errors**
  - Mini-statement does not print correctly or includes transactions that don't belong to the account.
- **Fund Transfer Problems**

- o Incorrect handling of fund transfer requests leading to wrong account debits or credits.

3. Transaction Processing Bugs

- **Cash Withdrawal Errors**
    - o Cash withdrawal amount is debited from the account but the cash is not dispensed.
    - o Incorrect currency denomination dispensed.
- **Cash Deposit Issues**
    - o Cash deposit fails to update the account balance even though the machine accepts the money.
- **Check Deposit Failures**
    - o Check deposit fails to process due to scanner issues or software errors.

4. User Interface Bugs

- **Display Screen Problems**
    - o Display screen freezes or goes blank during a transaction.
    - o Incorrect or misleading information displayed.
- **Keypad Malfunctions**
    - o Keypad buttons are unresponsive or register multiple presses for a single press.
- **Receipt Printer Issues**
    - o Receipt printer jams frequently or prints illegible receipts.

5. Security Bugs

- **Data Encryption Problems**
    - o Encryption keys are not properly rotated, making data susceptible to breaches.
- **Timed Logout Failures**
    - o Timed logouts do not trigger, leaving the session active indefinitely.
- **Anti-Skimming Device Issues**
    - o Anti-skimming device fails to detect skimming attempts or generates false positives.

6. Maintenance Bugs

- **Software Update Problems**
    - o Software updates cause system crashes or unintended behavior.
- **Error Reporting Issues**
    - o Error reporting logs are not properly generated, making it difficult to diagnose issues.
- **Cash Replenishment Errors**
    - o Cash replenishment triggers false low-cash alerts or fails to trigger actual low-cash conditions.

Bug Reporting Form

Bug ID	Bug Description	Steps to Reproduce	Expected Result	Actual Result	Status
001	Card not recognized	1. Insert a valid ATM card. 2. Observe the card recognition process.	The ATM should recognize the card and proceed to the next step.	The ATM does not recognize the card and displays an error message.	Fail
002	Incorrect PIN entry count	1. Enter an incorrect PIN three times. 2. Observe account lock behavior.	The ATM should lock the account after three incorrect PIN attempts.	The ATM allows more than three incorrect attempts before locking the account.	Fail
003	Balance inquiry shows incorrect balance	1. Insert card and enter PIN. 2. Select 'Balance Inquiry'.	The displayed balance should match the actual balance in the bank's database.	The displayed balance does not match the actual balance in the database.	Fail
004	Mini-statement printing error	1. Insert card and enter PIN. 2. Request mini-statement.	The mini-statement should print recent transaction details accurately.	The mini-statement prints with missing or incorrect transaction details.	Fail
005	Fund transfer to wrong account	1. Insert card and enter PIN. 2. Select 'Fund Transfer' and enter account details.	Funds should be transferred to the correct account.	Funds are transferred to an incorrect account.	Fail
006	Cash withdrawal amount debited but not dispensed	1. Insert card and enter PIN. 2. Select 'Cash Withdrawal' and enter amount.	The requested amount should be dispensed and the account debited accordingly.	The account is debited but the cash is not dispensed.	Fail
007	Cash deposit not reflected in balance	1. Insert card and enter PIN. 2. Select 'Cash Deposit' and insert cash.	The deposited cash should be reflected in the account balance immediately.	Cash is accepted but the account balance is not updated.	Fail
008	Check deposit scanner error	1. Insert card and enter PIN. 2. Select 'Check Deposit' and insert check.	The check should be scanned and deposited correctly, updating the account balance.	The check is not scanned properly, and the deposit is not processed.	Fail

Bug ID	Bug Description	Steps to Reproduce	Expected Result	Actual Result	Status
009	Display screen freezes	1. Perform any transaction. 2. Observe the display screen.	The display screen should remain responsive throughout the transaction.	The display screen freezes during the transaction.	Fail
010	Keypad unresponsive	1. Attempt to enter PIN or other information. 2. Observe keypad responsiveness.	The keypad should respond accurately to each press.	Keypad buttons do not respond or register multiple presses for a single press.	Fail
011	Receipt printer jams	1. Perform any transaction that requires a receipt. 2. Observe the receipt printing process.	The receipt printer should print a clear and legible receipt without jamming.	Receipt printer jams or prints illegible receipts.	Fail
012	Encryption keys not rotated	1. Review security settings (observed during security audit).	Encryption keys should be rotated regularly to ensure data security.	Encryption keys are not properly rotated, posing a security risk.	Fail
013	Timed logout not working	1. Leave the ATM session idle for the set timeout period.	The ATM should automatically log out the user after the period of inactivity.	The ATM does not log out automatically after the period of inactivity.	Fail
014	Anti-skimming device fails	1. Insert a card with a skimming attempt setup. 2. Observe the anti-skimming device.	The anti-skimming device should detect and prevent skimming attempts.	Anti-skimming device does not detect the skimming attempt or generates false positives.	Fail
015	Software update causes system crash	1. Install the latest software update. 2. Observe system behavior post-update.	The ATM system should function normally after the update.	The ATM system crashes or shows unintended behavior after the update.	Fail
016	Error logs not generated	1. Perform actions that should generate error logs (e.g., transaction errors).	Error logs should be generated to help diagnose issues.	Error logs are not generated, making it difficult to diagnose issues.	Fail
017	False low-cash alert	1. Observe cash levels and the low-cash alert system.	The ATM should trigger a low-cash alert only when the cash level is actually low.	ATM triggers low-cash alert even when sufficient cash is available.	Fail

Bug ID	Bug Description	Steps to Reproduce	Expected Result	Actual Result	Status
018	Actual low-cash condition not alerted	1. Observe cash levels and the low-cash alert system.	The ATM should trigger a low-cash alert when the cash level is actually low.	ATM does not trigger low-cash alert when cash levels are low.	Fail

RESULT:

By thoroughly studying the ATM system specifications and identifying potential bugs, we can ensure the ATM system operates reliably and securely. Conducting comprehensive testing based on the recommendations will help in providing a smooth and secure experience for users.