**qwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmrtyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnmqwertyuiopasdfghjklzxcvbnm**

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| **Software Testing**  Assignment 2  10/12/2020  Malik Jibran(BSE 181029) , Usama Altaf Kiyani(BSE181047) |

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# Problem Statement:

Design the software to support a computerized banking network .Each bank provides its own computers to maintain its own accounts and processes transactions. The systems that automate the process of withdrawing and depositing money . And authorize the user before any transaction.

# Case Study :

„ The project entitled ATM system has a drastic change to that of the older version of banking system, customer feel inconvenient with the transaction method as it was in the hands of the bank employees .In our ATM system, the above problem is overcome here, the transactions are done in person by the customer thus makes the customers feel safe and secure. Thus the application of our system helps the customer in checking the balance and transaction of the amount by validating the pin number therefore ATM system is more user friendly.

Case study specifies the purpose of the ATM system and what it must do. A local bank intends to install a new automated teller machine (ATM) to allow users (i.e., bank customers) to perform basic transactions. Each user can have only one account at the bank. ATM users view their account balance , withdraw cash , deposit funds .„It consist of 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 dispenser asks the user to enter the amount above 500.

# Identify the functions:

## Card Authorization: (Pin,Card)

* Before any transactions take place the customer must insert their card into the system and enter their Personal Identification Number (PIN).
* If the number entered matches the number on the card the customer is allowed to continue with their transaction. If the customer fails to enter the correct PIN their card will be confiscated and a message is sent to the bank's main computer. The customer is allowed three attempts to enter their PIN.

## Cash Withdrawal: (Balance)

* Before allowing the withdrawal, the system should check the customer's balance to ensure that funds are available to cover it.
* If not, the system should offer any funds that are available (if any) or otherwise refuse the withdrawal. Each transaction should be recorded by the bank's main computer and the customer's accounts updated.
* A receipt for the transaction may be requested.

## Display Balance:

* The customer should be able to check the balance in their account. This must be retrieved from the bank's main computer.
* A printout of the balance and available funds may be requested.

# Black box Testing:

## BVA:

* Test the correct pin.
* Test the incorrect pin.
* Check the amount within the available amount.
* Check the amount more than the available amount.
* Request balance display on screen.
* Request the printout.

## Implement test cases:

## Card authorization:

OBJECTIVE: To test the PIN verification procedure

TEST 1: Enter the correct PIN

EXPECTED OUTCOME: Successful PIN validation

TEST 2: Enter 1 incorrect PIN and then the correct PIN

EXPECTED OUTCOME: Successful PIN validation

TEST 2: Enter 2 incorrect PINs and then the correct PIN

EXPECTED OUTCOME: Successful PIN validation

TEST 3: Enter 3 incorrect PINs

EXPECTED OUTCOME: Unsuccessful PIN validation - retain card, notify bank

## Cash Withdrawal:

OBJECTIVE: To test the cash withdrawal procedure

TEST 1: Request less than available funds, accept available

EXPECTED OUTCOME: Available cash dispensed, accounts updated

TEST 2: Request more than available funds, refuse available

EXPECTED OUTCOME: No cash dispensed

TEST 3: Request funds with none available

EXPECTED OUTCOME: No cash dispensed

## Display Balance:

OBJECTIVE: To test the balance checking procedure

TEST 1: Request balance on screen

EXPECTED OUTCOME: The balance is retrieved and displayed on the screen

TEST 2: Request printout of balance

EXPECTED OUTCOME: The balance is retrieved and a printout is dispensed

1. Strong robust equivalence class partitioning:

A user ID consists of two characters < 1 alpha char> < 1 digit>

* The < 1 alpha char> consists of the characters A..Z or a..z
* < 1 digit> consists of the characters 0..9

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test cases | System Action | Test Data Input | Pass Criteria | Pass/Fail |
| 1 | When system asks for the user Id | R6 | Accept user id and continue |  |
| 2 | When system asks for the user Id | xyz | Reject user id with error message ”only 2 characters” |  |
| 3 | When system asks for the user Id | 6R | Reject userID with error |  |
| 4 | When system asks for the user Id |  | Reject userID |  |
|  |  |  |  |  |

# Test cases for all three functions:

## Cash withdrawal:

1. Verify the cash withdrawal functionality by inserting invalid numbers like 10, 20, 50 etc.
2. Verify the cash withdrawal functionality by entering an amount that is available in atm and not exceeding the limit.
3. Verify the cash withdrawal functionality by entering an amount greater than per transaction limit.

## Card Authorization:

The pin is **“ab12”**

Verify by entering 2 digits and then 2 letters.

Verify be entering the right pin.

Verify by entering the pin consist of 3 digits.

## Displaying Message:

1. Verify the message when there is no cash in the ATM.
2. Verify the messages after a transaction.
3. Verify if a user will get a correct message if a card is inserted incorrectly

## 3a:Causes and Effects of ATM system:

C1: The ATM can dispense only multiples of 500.

E1: The user can have only cash multiple of 500

C2: The card inserted into the ATM is valid.

E2:The card will be accepted, and transaction happen.

C3: The requested amount can’t be more than 25000.

E3: The ATM will dispense only under or equal to 25000.

C4: The pin consists of two letters and two digits “ab12”

E4: Only then the transaction happen.

3b:

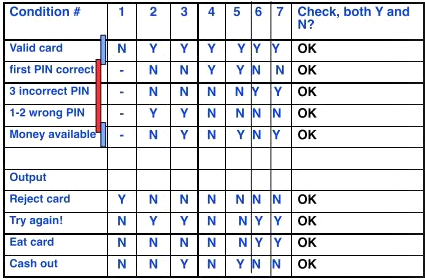
C1 E1

C2

E4

C4

**3c: Decision table:**

****

**3d:Identify test cases:**

* To test the PIN verification procedure
* Verify the cash withdrawal functionality by inserting invalid numbers like 10, 20, 50 etc.
* Verify the message when there is no cash in the ATM.
* Request less than available funds, accept available

**3e:**

|  |  |  |
| --- | --- | --- |
| **Serials** | **Test Cases** | **Responses** |
| **1** | Verify the cash withdrawal functionality by inserting invalid numbers like 10, 20, 50 etc | Atm will not dispense the money. |
| **2** | Verify the message when there is no cash in the ATM | The message will be that no money in ATM. |
| **3** | Request less than available funds, accept available | Money will be dispensed. |
| **4** | Verify be entering the right pin | The ATM will proceed the process. |