**SSW 567 - Assignment 7**

**Group 5**

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**Assignment Description**

This document contains the projects for weeks 7 and 8.  
I put them together so you can see what you need to do for week 8, which may influence what you do in week 7. Please write the results up in the standard manner we have been using.

AT THE END -- I want you to analyze which kind of tests found what kind of bugs -- was it FMEA? was it scenario? what was the relationship between test technique and finding the defects?????

Objectives:

The objectives of this assignment are for you to

•Create a test architecture

•Create and run scenarios, soap operas, and negative tests.

• See the result from capture/ recapture. .

Assignment:

Use the [ATM Simulation by Russell C. Bjork (Links to an external site.)](http://www.math-cs.gordon.edu/courses/cs211/ATMExample/" \t "_blank) on the web or YOU CAN TEST WHATEVER PROGRAM YOU WANT! You need to have access to the source code and to be able to compile and run it. Feel free to pick a game or a program you previously wrote.

WEEK 7:

•If you pick your own system, please describe it for me – what is it supposed to do?

•Create test objectives.

•Create 3 simple scenarios and a soap opera scenario

•Create a test architecture, etc. to support the scenario testing. Create the appropriate test cases, suites cases, etc. from these and put them under change control. Create a mapping from the scenarios to the test objectives. Analyze the coverage of test objectives and the coverage of the scenarios (e.g., number of test objectives tested)

. Work with one or more other teams. You are to put in at least 5 bugs into their system (make sure you know the bugs you put in) and they are to put at least 5 into yours.

**Results**

We have decided upon 4 test objectives that are based on the requirements our system testing:

1. Customer must be able to make cash withdrawal
2. Customer must be able to make a deposit
3. Customer must be able to make a transfer between any 2 accounts linked to the card
4. Customer must be able to make a balance inquiry of any account linked to the card

We are utilizing the ATM Java Application (not the Java Applet).

**TEST ARCHITECTURE**

|  |  |  |  |
| --- | --- | --- | --- |
| Scenarios | Test Suites | Tests | Test Cases |
| 1. Withdrawal Funds |  |  |  |
|  | 1.1 Withdrawal Funds Card # 1 |  |  |
|  |  | 1.1.1 Withdrawal valid amount |  |
|  |  |  | 1.1.1.1 Perform balance inquiry of account # 1 |
|  |  |  | 1.1.1.2 Access account # 1 and withdrawal valid amount |
|  |  |  | 1.1.1.3 Perform balance inquiry of account # 2 |
|  |  |  | 1.1.1.4 Access account # 2 and withdrawal valid amount |
|  |  | 1.1.2 Withdrawal invalid amount |  |
|  |  |  | 1.1.2.1 Access account # 1 and attempt to withdrawal invalid amount (greater amount than account # 1 balance) |
|  |  |  | 1.1.2.2 Access account # 2 and attempt to withdrawal invalid amount (greater amount than account # 2 balance) |
|  | 1.2 Withdrawal Funds Card # 2 |  |  |
|  |  |  | 1.2.1 Access account # 1 and withdrawal valid amount |
|  |  |  | 1.2.2 Access account # 2 and withdrawal valid amount |
|  |  |  | 1.2.3 Access account # 1 and attempt to withdrawal invalid amount (greater amount than account balance) |
|  |  |  | 1.2.4 Access account # 2 and attempt to withdrawal invalid amount (greater amount than account balance) |
| 1. Deposit Funds |  |  |  |
|  | 2.1 Deposit Funds Card # 1 |  |  |
|  |  | 2.1.1 Deposit valid amount |  |
|  |  |  | 2.1.1.1 Perform balance inquiry of account # 1 |
|  |  |  | 2.1.1.2 Access account # 1 and deposit valid amount |
|  |  |  | 2.1.1.3 Perform balance inquiry of account # 2 |
|  |  |  | 2.1.1.4 Access account # 2 and deposit valid amount |
|  |  | 2.1.2 Deposit invalid amount |  |
|  |  |  | 2.1.2.1 Access account # 1 and attempt to deposit invalid amount (0) |
|  |  |  | 2.1.2.2 Access account # 1 and attempt to deposit exceeding maximum (what is maximum?) |
|  |  |  | 2.1.2.3 Access account # 2 and attempt to deposit invalid amount (0) |
|  |  |  | 2.1.2.4 Access account # 2 and attempt to deposit exceeding maximum (what is maximum?) |
|  | 2.2 Deposit Funds Card # 2 |  |  |
|  |  |  | 2.1.1 Access account # 1 and deposit valid amount |
|  |  |  | 2.1.2 Access account # 1 and attempt to deposit invalid amount (0) |
|  |  |  | 2.1.3 Access account # 1 and attempt to deposit exceeding maximum (what is maximum?) |
|  |  |  | 2.1.4 Access account # 2 and deposit valid amount |
|  |  |  | 2.1.5 Access account # 2 and attempt to deposit invalid amount (0) |
|  |  |  | 2.1.3 Access account # 2 and attempt to deposit exceeding maximum (what is maximum?) |
| 1. Transfer Funds |  |  |  |
|  | 3.1 Transfer Funds Card 1 |  |  |
|  |  | 3.1.1 Transfer valid amount |  |
|  |  |  | 3.1.1.1 Perform balance inquiry for account # 1 |
|  |  |  | 3.1.1.2 Perform balance inquiry for account # 2 |
|  |  |  | 3.1.1.3 Transfer valid amount from account # 1 to account # 2 |
|  |  |  | 3.1.1.4 Perform balance inquiry for account # 1 (verify) |
|  |  |  | 3.1.1.5 Transfer valid amount from account # 2 to account # 1 |
|  |  |  | 3.1.1.6 Perform balance inquiry for account # 2 (verify) |
|  |  | 3.1.2 Transfer invalid amount |  |
|  |  |  | 3.1.2.1 Transfer invalid amount (exceeding balance) from account # 1 to account # 2 |
|  |  |  | 3.1.2.2 Transfer invalid amount (exceeding balance) from account # 2 to account # 1 |
|  |  | 3.1.3 Transfer to/from invalid account type |  |
|  |  |  | 3.1.3.1 Attempt to transfer from invalid account type (account type not on card) to valid account type (account type on card) |
|  |  |  | 3.1.3.2 Attempt to transfer to invalid account type (account type not on card) from valid account type (account type on card) (also valid amount) |
|  | 3.2 Transfer Funds Card 2 |  |  |
|  |  |  | 3.2.1 Transfer valid amount from account # 1 to account # 2 |
|  |  |  | 3.2.2 Transfer valid amount from account # 2 to account # 1 |
|  |  |  | 3.2.3 Transfer invalid amount (exceeding balance) from account # 1 to account # 2 |
|  |  |  | 3.2.4 Transfer invalid amount (exceeding balance) from account # 2 to account # 1 |
|  |  |  | 3.2.5 Attempt to transfer from invalid account type (account type not on card) to valid account type (account type on card) |
|  |  |  | 3.2.6 Attempt to transfer to invalid account type (account type not on card) from valid account type (account type on card) (also valid amount) |
|  |  |  |  |

Note 1: For complete testing, both cards would be tested. We have only included the 1st card in the test case detail below. Yellow shaded above is for card 2.

Note 2: It is assumed that the operator had successfully turned the ATM on (pre-condition). The customer then enters # of $20 bills, inserts their card, enters card # and PIN number before beginning test cases

Note 3: The balance inquiry objective is met within the scenarios for the other 3 test cases

Note 4: The test architecture along with the associated tests suites, tests and test cases are configuration managed in the group repository in Git

***Test Case Detail***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case ID | Test Objective | Inputs | Expected Results | Actual Results |
| 1.1.1.1 | Perform balance inquiry of account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 |  |
| 1.1.1.2 | Access account # 1 and withdrawal valid amount | Choose to do another transaction, Choose withdrawal, Choose account # 1 (checking), Choose option 1 ($20) | $20 in green text gets larger at bottom left of screen; Balance shows as $80 |  |
| 1.1.1.3 | Perform balance inquiry of account # 2 | Choose to do another transaction, Choose Balance Inquiry option, then account # 2 (savings) | $1000 |  |
| 1.1.1.4 | Access account # 2 and withdrawal valid amount | Choose to do another transaction, Choose withdrawal, Choose account # 2 (Savings), Choose option 1 ($20) | $20 in green text gets larger at bottom left of screen; Balance shows as $980 |  |
| 1.1.2.1 | Access account # 1 and attempt to withdrawal invalid amount (greater amount than account # 1 balance) | Choose to do another transaction, Choose withdrawal, Choose account # 1, Choose option # 4 ($100) | Message: Insufficient cash available |  |
| 1.1.2.2 | Access account # 2 and attempt to withdrawal invalid amount (greater amount than account # 2 balance) | [Choose $20]Choose to do another transaction, Choose withdrawal, Choose account # 2 (Savings), Choose option # 5 ($200) (Repeat 4 more times) | [$20 in green text gets larger at bottom left of screen; Balance shows as $60]  Message: Insufficient cash available **\* Note that this seems to not be working in current application. Insufficient funds message occurs after 1st withdrawal** |  |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 2.1.1.1 | Perform balance inquiry of account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 |  |
| 2.1.1.2 | Access account # 1 and deposit valid amount | Choose to do another transaction, Choose deposit (# 2), Choose account # 1 (checking), Enter $30.00, Click to insert envelope | Total Balance shows as $130, Available balance shows as $100 |  |
| 2.1.1.3 | Perform balance inquiry of account # 2 | Choose to do another transaction, Choose Balance Inquiry option, then account # 2 (Savings) | $1000 |  |
| 2.1.1.4 | Access account # 2 and deposit valid amount | Choose to do another transaction, Choose deposit (# 2), Choose account # 2 (savings), Enter $30.00, Click to insert envelope | Total Balance shows as $1030, Available balance shows as $1000 |  |
| 2.1.2.1 | Access account # 1 and attempt to deposit invalid amount (0) | Choose to do another transaction, Choose deposit (#2), Choose account # 1, Hit enter | A tone will sound, no change to the UI |  |
| 2.1.2.2 | Access account # 1 and attempt to deposit exceeding maximum (what is maximum?) | [Enter 1.00, hit enter, click to insert envelope]  Choose to do another transaction, Choose deposit (# 2), Choose account # 1, Enter 1000000000000.00 | [Total balance shows as $131, Available balance shows as $100]  Green screen is blank |  |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 2.1.2.3 | Access account # 2 and attempt to deposit invalid amount (0) | Choose deposit (#2), Choose account # 2 (savings), Hit enter | A tone will sound, no change to the UI |  |
| 2.1.2.4 | Access account # 2 and attempt to deposit exceeding maximum (what is maximum?) | [Enter 1.00, hit enter, click to insert envelope]  Choose to do another transaction, Choose deposit (# 2), Choose account # 2, Enter 1000000000000.00 | [Total balance shows as $1001, Available balance shows as $1000]  Green screen is blank |  |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 3.1.1.1 | Perform balance inquiry for account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 |  |
| 3.1.1.2 | Perform balance inquiry for account # 2 | Choose to do another transaction, Choose Balance Inquiry, Choose account #2 (savings) | $1000 |  |
| 3.1.1.3 | Transfer valid amount from account # 1 to account # 2 | Choose to do another transaction, Choose Transfer, Choose account # 1 (checking), Choose account # 2 (savings), Enter 20.00, hit enter | Total Balance $1020, Available Balance $1020 |  |
| 3.1.1.4 | Perform balance inquiry for account # 1 (verify) | Choose to do another transaction, Choose Balance Inquiry, Choose checking (# 1) | $80.00 |  |
| 3.1.1.5 | Transfer valid amount from account # 2 to account # 1 | Choose to do another transaction, Choose Transfer, Choose account #2 (savings), Choose account #1 (checking), Enter 20.00 | Total Balance shows as $100, Available balance shows as $100 |  |
| 3.1.1.6 | Perform balance inquiry for account # 2 (verify) | Choose to do another transaction, Choose Balance Inquiry, Choose savings(# 2) | $1000.00 |  |
| 3.1.2.1 | Transfer invalid amount (exceeding balance) from account # 1 to account # 2 | Choose to do another transaction, Choose Transfer, Choose account #1 (checking), choose account #2 (savings), Enter 111.10, hit enter | Message: Insufficient available balance |  |
| 3.1.2.2 | Transfer invalid amount (exceeding balance) from account # 2 to account # 1 | Choose to do another transaction, Choose Transfer, Choose account #2 (savings), choose account #1 (checking), Enter 1030.00, hit enter | Message: Insufficient available balance |  |
| 3.1.3.1 | Attempt to transfer from invalid account type (account type not on card) to valid account type (account type on card) | Choose to do another transaction, Choose Transfer, Choose 3 (Money Market), Choose 1 (Checking), Enter 20.00 | Message: Invalid from account type |  |
| 3.1.3.2 | Attempt to transfer to invalid account type (account type not on card) from valid account type (account type on card) (also valid amount) | Choose to do another transaction, Choose Transfer, Choose 1 (Checking), Choose 3 (Money Market), Enter 20.00 | Message: Invalid to account type |  |

SOAP OPERA:  
Customer accesses ATM with inquiry of Savings account #1 balance, then requests withdrawing money from Savings account #1 but the withdrawn transaction had to be cancelled by the ATM system due to insufficient fund in Savings account #1. Customer then transfers money from Savings account #2 to Saving Account #1 before withdrawing money from Savings Account #1. After the money is withdrawn from Saving Account #1, customer inquiries balance in the Checking account #3. The inquiry transaction had to be cancelled and customer had to be notified due to lack of paper from the ATM system thus the Checking account #3 info can’t be provided. The ATM system notifies the operator that additional paper has to be loaded into the system. Customer then deposits the money withdrawn into the Checking account #3 before concludes the ATM session.

**Lessons Learned**

To complete and flesh out an entire test architecture is not a simple task. It is quite important to be very organized about it and methodical. When writing test cases, there is the decision to make about how they will be tested together or left to stand on their own. It makes a complete difference in how to write them. Our test case detail is broken up in logical places where the application has reached a state that cannot continue.

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