**SSW 567 - Assignment 7 Part 2**

**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 8:**

•Run the test cases, document results, write appropriate bug reports etc.

•Create a negative test strategy. Include a FMEA analysis.

•Include a few of the interesting negative tests (NOT INPUT VALIDATION) in your test architecture.Run them, document results, write appropriate bug reports, etc.

. Now go back to the team that put the bugs into your software. How many did you find? How many other bugs did you find? Using the capture/recapture technique, how many bugs to project are still there?

**Results**

***Test Cases from Week 7 – testing Group 2 code***

At startup – there is 1 Error in SimCardDispenser.java: “The type SimCashDispenser” is already defined.

There are also 45 warnings.

Exception text immediately following each test case

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 | Blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.inquiry(SimulatedBank.java:201)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:56)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 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 | After choosing account # 1, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.NullPointerException  at banking.Message.toString(Message.java:91)  at atm.physical.Log.logSend(Log.java:33)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:60)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 1.1.1.3 | Perform balance inquiry of account # 2 | Choose to do another transaction, Choose Balance Inquiry option, then account # 2 (savings) | $1000 | After choosing account # 2, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.inquiry(SimulatedBank.java:201)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:56)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 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 | After choosing account # 2, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.NullPointerException  at banking.Message.toString(Message.java:91)  at atm.physical.Log.logSend(Log.java:33)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:60)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 1.1.2.1 | Access account # 1 and attempt to withdrawal invalid amount (greater amount than account # 1 balance) [NEG] | Choose to do another transaction, Choose withdrawal, Choose account # 1, Choose option # 4 ($100) | Message: Insufficient cash available | After choosing account # 1, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.NullPointerException  at banking.Message.toString(Message.java:91)  at atm.physical.Log.logSend(Log.java:33)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:60)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 1.1.2.2 | Access account # 2 and attempt to withdrawal invalid amount (greater amount than account # 2 balance) [NEG] | [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** | After choosing account # 1, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.NullPointerException  at banking.Message.toString(Message.java:91)  at atm.physical.Log.logSend(Log.java:33)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:60)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 2.1.1.1 | Perform balance inquiry of account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 | After choosing account # 1, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.inquiry(SimulatedBank.java:201)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:56)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 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 | After entering $30.00, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.initiateDeposit(SimulatedBank.java:114)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:44)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 2.1.1.3 | Perform balance inquiry of account # 2 | Choose to do another transaction, Choose Balance Inquiry option, then account # 2 (Savings) | $1000 | After choosing account # 2, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.inquiry(SimulatedBank.java:201)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:56)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 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 | After entering $30.00, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.initiateDeposit(SimulatedBank.java:114)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:44)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 2.1.2.1 | Access account # 1 and attempt to deposit invalid amount (0) [NEG] | Choose to do another transaction, Choose deposit (#2), Choose account # 1, Hit enter | A tone will sound, no change to the UI | Tone sounds, no change to UI |
| 2.1.2.2 | Access account # 1 and attempt to deposit exceeding maximum (what is maximum?) [NEG] | [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 | After entering large amount, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.NumberFormatException: For input string: "10000000000000000000"  at java.lang.NumberFormatException.forInputString(Unknown Source)  at java.lang.Integer.parseInt(Unknown Source)  at java.lang.Integer.parseInt(Unknown Source)  at atm.physical.CustomerConsole.readAmount(CustomerConsole.java:110)  at atm.transaction.Deposit.getSpecificsFromCustomer(Deposit.java:46)  at atm.transaction.Transaction.performTransaction(Transaction.java:108)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 2.1.2.3 | Access account # 2 and attempt to deposit invalid amount (0) [NEG] | Choose deposit (#2), Choose account # 2 (savings), Hit enter | A tone will sound, no change to the UI | Tone sounds, no change to UI |
| 2.1.2.4 | Access account # 2 and attempt to deposit exceeding maximum (what is maximum?) [NEG] | [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 | After entering large amount, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.NumberFormatException: For input string: "1000000000000"  at java.lang.NumberFormatException.forInputString(Unknown Source)  at java.lang.Integer.parseInt(Unknown Source)  at java.lang.Integer.parseInt(Unknown Source)  at atm.physical.CustomerConsole.readAmount(CustomerConsole.java:110)  at atm.transaction.Deposit.getSpecificsFromCustomer(Deposit.java:46)  at atm.transaction.Transaction.performTransaction(Transaction.java:108)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 3.1.1.1 | Perform balance inquiry for account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 | After choosing account # 1, blank green screen, blank receipt screen. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.inquiry(SimulatedBank.java:201)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:56)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 3.1.1.2 | Perform balance inquiry for account # 2 | Choose to do another transaction, Choose Balance Inquiry, Choose account #2 (savings) | $1000 | After choosing account # 2, blank green screen, blank receipt screen. Forced to close application. [see above for error message] |
| 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 | Total Bal: 100.20  Available: 100.20  (understandable that the amounts are different since the preceding test cases did not run correctly)  Green screen asks if I want another transaction |
| 3.1.1.4 | Perform balance inquiry for account # 1 (verify) | Choose to do another transaction, Choose Balance Inquiry, Choose checking (# 1) | $80.00 | Blank green screen, receipt screen same as 3.1.1.3. Forced to close application. |
| Exception in thread "Thread-2" java.lang.ArrayIndexOutOfBoundsException: -1  at simulation.SimulatedBank.inquiry(SimulatedBank.java:201)  at simulation.SimulatedBank.handleMessage(SimulatedBank.java:56)  at simulation.Simulation.sendMessage(Simulation.java:200)  at atm.physical.NetworkToBank.sendMessage(NetworkToBank.java:65)  at atm.transaction.Transaction.performTransaction(Transaction.java:122)  at atm.Session.performSession(Session.java:89)  at atm.ATM.run(ATM.java:124)  at java.lang.Thread.run(Unknown Source) | | | | |
| 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 | Total Bal: 1000.20  Available: 1000.20  (understandable that the amounts are different since the preceding test cases did not run correctly)  Green screen asks if I want another transaction |
| 3.1.1.6 | Perform balance inquiry for account # 2 (verify) | Choose to do another transaction, Choose Balance Inquiry, Choose savings(# 2) | $1000.00 | After choosing account # 2, blank green screen, blank receipt screen. Forced to close application. [see above for error message] |
| 3.1.2.1 | Transfer invalid amount (exceeding balance) from account # 1 to account # 2 [NEG] | Choose to do another transaction, Choose Transfer, Choose account #1 (checking), choose account #2 (savings), Enter 111.10, hit enter | Message: Insufficient available balance | (entered 10000.00)  Transfer amount stated on receipt is $100. Total Bal: $230.80, Available: $230.80 |
| 3.1.2.2 | Transfer invalid amount (exceeding balance) from account # 2 to account # 1 [NEG] | Choose to do another transaction, Choose Transfer, Choose account #2 (savings), choose account #1 (checking), Enter 1030.00, hit enter | Message: Insufficient available balance | (entered 10000.00)  Receipt states transfer amount is $100.00. Total Bal: $969.20, Available: $969.20 |
| 3.1.3.1 | Attempt to transfer from invalid account type (account type not on card) to valid account type (account type on card) [NEG] | Choose to do another transaction, Choose Transfer, Choose 3 (Money Market), Choose 1 (Checking), Enter 20.00 | Message: Invalid from account type | Message: Invalid to 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) [NEG] | Choose to do another transaction, Choose Transfer, Choose 1 (Checking), Choose 3 (Money Market), Enter 20.00 | Message: Invalid to account type | Message: invalid from account type |

Negative Test Strategy:

* Exploitation of weaknesses and risk areas
  + Includes tests to find failures once a new exploit or weakness has been found, and diagnostic negative tests.
  + Remember that faults appear in clusters….when you find a weakness, expose it, and look for other problems nearby.

We found a weakness in Group 2 code when testing invalid transfers on card 1.

Added the following test cases for card 2 to see if it made any difference:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 3.1.3.1 [card 2] | Attempt to transfer from invalid account type (account type not on card) to valid account type (account type on card) [NEG] | Choose to do another transaction, Choose Transfer, Choose 2 (Savings), Choose 1 (Checking), Enter 20.00 | Message: Invalid from account type | Message: Invalid to account type |
| 3.1.3.2 [card 2] | Attempt to transfer to invalid account type (account type not on card) from valid account type (account type on card) (also valid amount) [NEG] | Choose to do another transaction, Choose Transfer, Choose 1 (Checking), Choose 2 (Savings), Enter 20.00 | Message: Invalid to account type | Message: Invalid from account type |

The same errors were found.

***Test Results with Group 1 Injected Bugs***

For the project with Group 1’s injected bugs:

A bug was discovered while trying to ‘insert card’ to initiate the transaction. This required our team to debug and fix this bug before we can proceed with our testing. During the debugging, we discovered that a bug was injected in ATM.java where the ‘state’ variable was never set to ‘SERVING\_CUSTOMER\_STATE’ even after the card has been inserted.

The test results below are shown after this bug has been remedied.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output |
| 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 | Failed – Insufficient cash available. No observable error / exception  **Note:** The failure caused by Test 1.1.1.1 prevented continuation of the test. Require restarting and proceeding to Test Case 1.1.1.2 directly. |
| 1.1.1.3 | Perform balance inquiry of account # 2 | Choose to do another transaction, Choose Balance Inquiry option, then account # 2 (savings) | $1000 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output |
| 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 | Failed – Insufficient cash available. No observable error / exception.  **Note:** The failure caused by Test 1.1.1.3 prevented continuation of the test. Require restarting and proceeding to Test Case 1.1.1.2 directly |
| 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 | Passed |
| 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** | Failed – Insufficient cash available message appears during the 1st withdrawn request. |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 2.1.1.1 | Perform balance inquiry of account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output |
| 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 | Failed – Once ‘Deposit’ is chosen as the transaction, the display went blank and all buttons and selects are no longer usable.  **Note:** The failure caused by Test 2.1.1.1 prevented continuation of the test. Require restarting and proceeding to Test Case 2.1.1.2 directly |
| 2.1.1.3 | Perform balance inquiry of account # 2 | Choose to do another transaction, Choose Balance Inquiry option, then account # 2 (Savings) | $1000 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output  **Note:** The failure caused by Test 2.1.1.2 prevented continuation of the test. Require restarting and proceeding to Test Case 2.1.1.3 directly |
| 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 | Failed – once ‘Deposit’ is chosen as the transaction, the display went blank and all buttons and selects are no longer usable.  **Note:** The failure caused by Test 2.1.1.3 prevented continuation of the test. Require restarting and proceeding to Test Case 2.1.1.4 directly |
| 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 | Failed – once ‘Deposit’ is chosen as the transaction, the display went blank and all buttons and selects are no longer usable.  **Note:** The failure caused by Test 2.1.1.4 prevented continuation of the test. Require restarting and proceeding to Test Case 2.1.2.1 directly |
| 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 | Failed – once ‘Deposit’ is chosen as the transaction, the display went blank and all buttons and selects are no longer usable.  **Note:** The failure caused by Test 2.1.2.1 prevented continuation of the test. Require restarting and proceeding to Test Case 2.1.2.2 directly |
| **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 | Failed – once ‘Deposit’ is chosen as the transaction, the display went blank and all buttons and selects are no longer usable. |
| 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 | Failed – once ‘Deposit’ is chosen as the transaction, the display went blank and all buttons and selects are no longer usable.  **Note:** The failure caused by Test 2.1.2.3 prevented continuation of the test. Require restarting and proceeding to Test Case 2.1.2.4 directly |
| **CLOSE APPLICATION AND REOPEN** | | | | |
| 3.1.1.1 | Perform balance inquiry for account # 1 | Choose Balance Inquiry option, then account # 1 (Checking) | $100 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output |
| 3.1.1.2 | Perform balance inquiry for account # 2 | Choose to do another transaction, Choose Balance Inquiry, Choose account #2 (savings) | $1000 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output  **Note:** The failure caused by Test 3.1.1.1 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.1.2 directly |
| 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 | Failed – once the amount to be transferred (20.00) is entered, the display went blank and all buttons and selects are no longer usable  **Note:** The failure caused by Test 3.1.1.2 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.1.3 directly |
| 3.1.1.4 | Perform balance inquiry for account # 1 (verify) | Choose to do another transaction, Choose Balance Inquiry, Choose checking (# 1) | $80.00 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output  **Note:** The failure caused by Test 3.1.1.3 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.1.4 directly |
| 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 | Failed – once the amount to be transferred (20.00) is entered, the display went blank and all buttons and selects are no longer usable  **Note:** The failure caused by Test 3.1.1.4 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.1.5 directly |
| 3.1.1.6 | Perform balance inquiry for account # 2 (verify) | Choose to do another transaction, Choose Balance Inquiry, Choose savings(# 2) | $1000.00 | Failed – Balance was not shown. Null exception thrown in Transaction.java as part of console output  **Note:** The failure caused by Test 3.1.1.5 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.1.6 directly |
| 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 | Failed – once the amount to be transferred (20.00) is entered, the display went blank and all buttons and selects are no longer usable  **Note:** The failure caused by Test 3.1.1.6 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.2.1 directly |
| 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 | Failed – once the amount to be transferred (1030.00) is entered, the display went blank and all buttons and selects are no longer usable  **Note:** The failure caused by Test 3.1.2.1 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.2.2 directly |
| 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 | Failed – once the amount to be transferred (20.00) is entered, the display went blank and all buttons and selects are no longer usable  **Note:** The failure caused by Test 3.1.2.2 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.3.1 directly |
| 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 | Failed – once the amount to be transferred (20.00) is entered, the display went blank and all buttons and selects are no longer usable  **Note:** The failure caused by Test 3.1.3.1 prevented continuation of the test. Require restarting and proceeding to Test Case 3.1.3.2 directly |

FMEA Analysis (are we only looking at ATM software?):

* Identify and list all components and their failure modes (how they can fail), considering all possible operating modes.
* For each failure mode, determine the possible effects (e.g., impact) on all other components as well as the effect on the overall system.
* Then calculate the probabilities and the seriousness of the results of the failure modes.

Identify and list all components:

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **How it can fail** | **Possible effects** | **Probabilities / Seriousness of the results of the failure modes** |
| Green entry pane | Blank |  |  |
| not accept entry |  |  |
| White receipt pane | Blank |  |  |
| display incorrect amounts |  |  |
| Number pad | Not operate at all |  |  |
| not operate correctly |  |  |
| ON/OFF button | Not operate at all |  |  |
| not operate correctly |  |  |
| Show Log / Hide Log button | Does not show log |  |  |
| Does not hide log |  |  |
| Entry screen for $20 cash dispenser | Does not accept entered value and does not move on to ATM window |  |  |
| Insert Card Click Button | Does not allow user to enter card # when clicked |  |  |
| Withdrawal view of $ in green | Does not appear |  |  |

Discussion / comparison with other team:

**Lessons Learned**

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**Honor Pledge**

We pledge on our honor that we have not given or received any unauthorized assistance on this assignment/examination. We further pledge that we have not copied any material from a book, article, the Internet or any other source except where I have expressly cited the source.