**Summary:**

My test plan consisted of testing the 5 major functions of the bank, opening an account, depositing, withdrawing, transferring, and showing history. Different situations such as trying to run the functions with unknown users, improper account ID and fund lengths, and negative numbers were tested. The program stated that the input will always be well-formatted so the amount of arguments isn’t something that needs to be accounted for.

**Opening Account:**

The main three cases tested for in this function are trying to open an account, trying to open an account which already exists, and trying to make an account with an account ID that’s too short/long.

*Input:*

O Cash Johnny 1001

O Smith Derek 1001

O McGilton Matthew 101

O McGilton Matthew 10001

*Output:*

ERROR: Account 1001 is already open. Transaction refused.

ERROR: Account IDs must be 4 numbers long. Account creation refused.

ERROR: Account IDs must be 4 numbers long. Account creation refused.

Processing Done. Final Balances

Johnny Cash Account ID: 1001

Money Market: $0

Prime Money Market: $0

Long-Term Bond: $0

Short-Term Bond: $0

500 Index Fund: $0

Capital Value Fund: $0

Growth Equity Fund: $0

Growth Index Fund: $0

Value Fund: $0

Value Stock Index: $0

**Depositing:**

The cases being tested with the depositing function are incorrect inputs for the ID and fund, giving an unknown user, and giving a negative value.

*Input:*

O Cash Johnny 1001

D 10010 100

D 1001 100

D 100110 100

D 10010 -100

D 99990 100

*Output:*

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transaction refused.

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transaction refused.

ERROR: Cannot deposit negative amounts. Transaction refused.

ERROR: Account with that ID doesn't exist. Transaction refused.

Processing Done. Final Balances

Johnny Cash Account ID: 1001

Money Market: $100

Prime Money Market: $0

Long-Term Bond: $0

Short-Term Bond: $0

500 Index Fund: $0

Capital Value Fund: $0

Growth Equity Fund: $0

Growth Index Fund: $0

Value Fund: $0

Value Stock Index: $0

**Withdrawing:**

The cases being tested for this function are trying to withdraw when balance is too low, the case for money markets and bonds taking from each other, account ID and fund being too long/short, unknown user given, and number being negative.

*Input:*

O Cash Johnny 1001

D 10010 500

D 10012 500

W 1001 500

W 100110 500

W 10010 9999999

W 10010 -500

W 10011 500

W 10013 500

W 99990 500

*Output:*

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transaction refused.

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transaction refused.

ERROR: Not enough funds to withdraw 9999999 from Johnny Cash Money Market.

ERROR: Cannot withdraw negative amounts. Transaction refused.

ERROR: Not enough funds to withdraw -500 from Johnny Cash Money Market.

ERROR: Account with that ID doesn't exist. Transaction refused.

Processing Done. Final Balances

Johnny Cash Account ID: 1001

Money Market: $0

Prime Money Market: $0

Long-Term Bond: $0

Short-Term Bond: $0

500 Index Fund: $0

Capital Value Fund: $0

Growth Equity Fund: $0

Growth Index Fund: $0

Value Fund: $0

Value Stock Index: $0

**Transferring:**

The cases in transferring are like the ones in withdrawing because it’s essentially withdrawing from one account and depositing into another, so there’s a lot of overlap. For this reason, I only included the unique cases which would be making sure the transfers can’t be negative, and that the ID and funds are correctly inputted on both accounts.

*Input:*

O Cash Johnny 1001

O Ross Bob 2002

D 10010 500

D 20020 500

T 1001 500 2002

T 10010 500 2002

T 1001 500 20020

T 10010 -500 20020

T 10010 500 20029

*Output:*

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transferal refused.

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transferal refused.

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transferal refused.

ERROR: Cannot withdraw negative amounts. Transaction refused.

Processing Done. Final Balances

Johnny Cash Account ID: 1001

Money Market: $0

Prime Money Market: $0

Long-Term Bond: $0

Short-Term Bond: $0

500 Index Fund: $0

Capital Value Fund: $0

Growth Equity Fund: $0

Growth Index Fund: $0

Value Fund: $0

Value Stock Index: $0

Bob Ross Account ID: 2002

Money Market: $500

Prime Money Market: $0

Long-Term Bond: $0

Short-Term Bond: $0

500 Index Fund: $0

Capital Value Fund: $0

Growth Equity Fund: $0

Growth Index Fund: $0

Value Fund: $0

Value Stock Index: $500

**History:**

The history function is fairly straightforward, so I mainly tested to see if failed transactions show that they failed, how it reacts to unknown users, and that it properly works for ID and ID+fund.

*Input:*

O Cash Johnny 1001

D 10010 100

D 1001 100

D 100110 100

D 10010 -100

D 99990 100

W 10010 -100

W 10010 100

H 1001

*Output:*

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transaction refused.

ERROR: Account IDs must be 4 numbers long and fund must be from 0 to 9. Transaction refused.

ERROR: Cannot deposit negative amounts. Transaction refused.

ERROR: Account with that ID doesn't exist. Transaction refused.

ERROR: Not enough funds to withdraw -100 from Johnny Cash Money Market.

Transaction History for Johnny Cash by fund.

Money Market: $0

D 10010 100

D 10010 -100 (Failed)

W 10010 -100 (Failed)

W 10010 100

Processing Done. Final Balances

Johnny Cash Account ID: 1001

Money Market: $0

Prime Money Market: $0

Long-Term Bond: $0

Short-Term Bond: $0

500 Index Fund: $0

Capital Value Fund: $0

Growth Equity Fund: $0

Growth Index Fund: $0

Value Fund: $0

Value Stock Index: $0