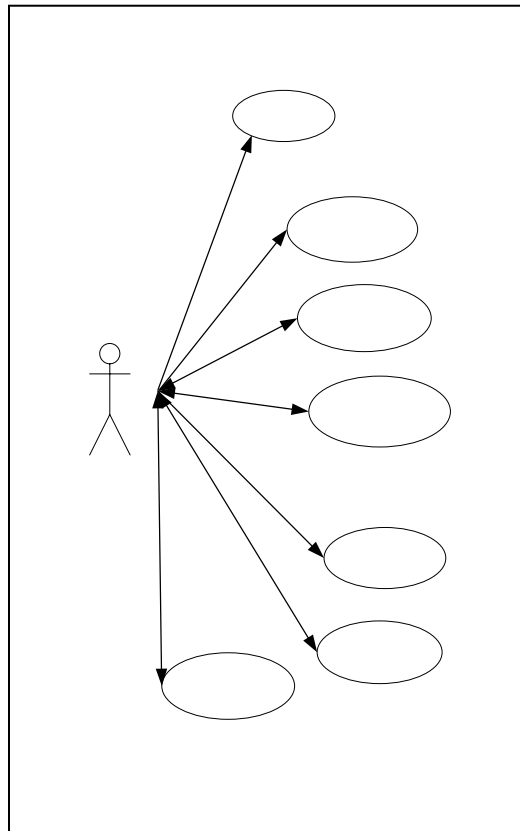**Use Case Diagram**

Create Account

    Create a user account and set all balances to 0

    Exception

        Out of memory

Deposit Checking

    Enter an amount into the checking component

    Exception

        The amount entered is negative

Balance Checking

    Return the balance in the checking component

    Exception

        None

Withdraw Checking

    Withdraw an amount from the checking component

    Exception

The amount withdrawn is negative

The amount withdrawn exceeds the current balance

Deposit Savings

Enter an amount into the savings component

Exception

The amount entered is negative

Balance Savings

Return the balance in the savings component

Exception

None

Withdraw Savings

Withdraw an amount from the savings component

Exception

The amount withdrawn is negative

The amount withdrawn exceeds the current balance

Class Diagram

The account is a composition of instances of a checking and a savings account class.

Private:

The instances of the checking and saving accounts

Public:

The public portions of the account class use accessor functions to access the private savings and checking portions of the account to make deposits, withdrawals, and to check the balance in either component.

Exception management in each component is managed by the specific component.

The checking class maintains and manages access to the checking balance

Private:

The checking balance

Public:

The public portion of the checking class provides the access functions to the checking balance to permit deposits, withdrawals, and balance check. These accessors ensure that amounts and access methods comply with requirements
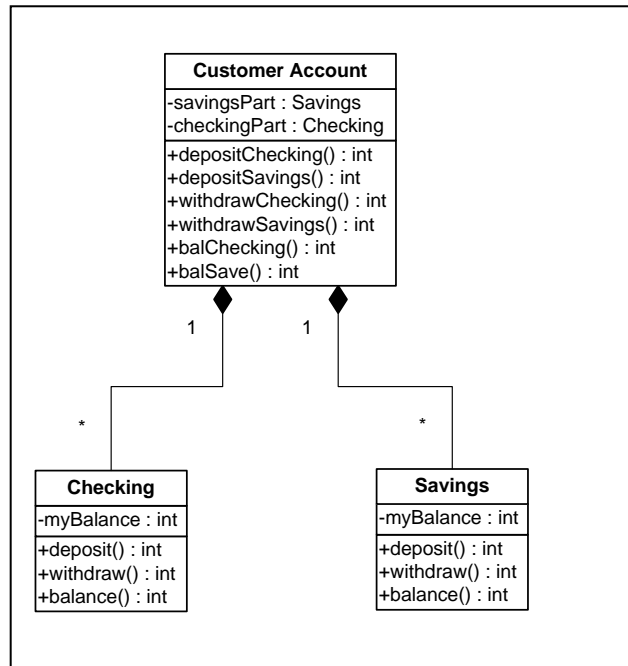
The savings class maintains and manages access to the savings balance

Private:

The savings balance

Public:

The public portion of the savings class provides the access functions to the savings balance to permit deposits, withdrawals, and balance check. These accessors ensure that amounts and access methods comply with requirements

Test Plan

1. Test that the account can be created.
2. Test that deposits, withdrawals, and balance check can be made from the checking portion of the account.
3. Test that negative deposits and those that exceed the current balance are blocked.
4. Test that deposits, withdrawals, and balance check can be made from the savings portion of the account.
5. Test that negative deposits and those that exceed the current balance are blocked.

Test Cases

1. Create a new account.
2. Deposit a positive amount into the checking portion and verify that it succeeded.
3. Deposit a negative amount into the checking portion and verify that it failed.
4. Withdraw from the checking portion until the balance reaches zero and confirm that further withdrawals are blocked.
5. Deposit a positive amount into the savings portion and verify that it succeeded.
6. Deposit a negative amount into the savings portion and verify that it failed.

7. Withdraw from the savings portion until the balance reaches zero and confirm that further withdrawals are blocked.

8. Verify that an account instance can be printed to stdout using an overloaded insertion operator.