# Object-Oriented and State-Based Testing - Project Report

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CS 589 – Software Testing & Analysis | Fall 2021 | Illinois Institute of Technology

12/2/21

## TABLE OF CONTENTS

# OBJECT-ORIENTED AND STATE-BASED TESTING

## GOAL

The goal of this project is to test and *account* class that exhibits state behavior specified by the given source code of the class *account* and EFSM model given below:



Figure 1: EFSM of ACCOUNT
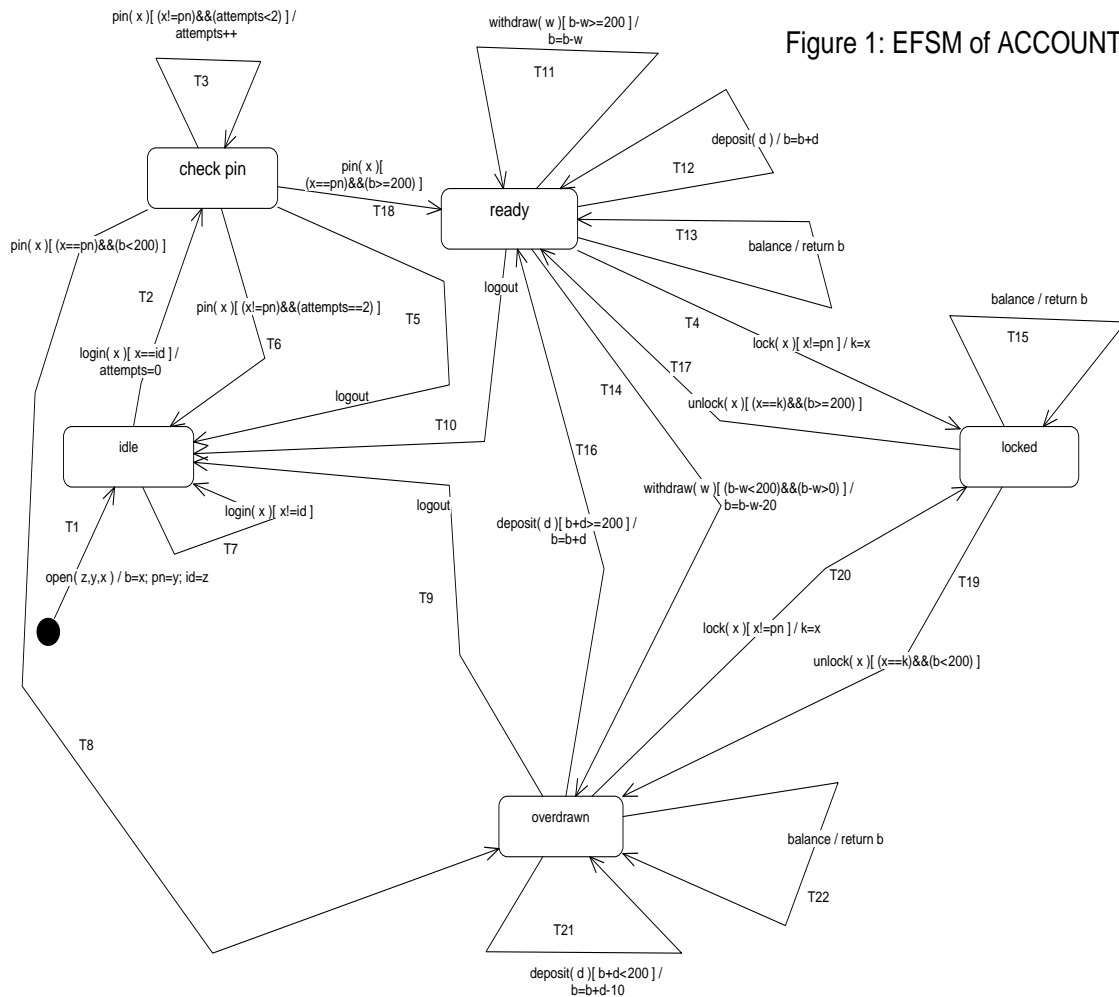
**Figure 1: EFSM of *Account* class**

**Figure 2: Java Code of *Account* class**

```
1  //***********************************************
2  //************* CLASS ACCOUNT ******************
3  //***********************************************
4
5
6
7  public class account
8  {
9       private int x0;
10      private int x1;
11      private int x2;
12      private int x3;
13      private int x4;
14      private int x5;
15      private int x6;
16      private int x7;
17      private int x8;
18      private int x9;
19
20  public final int show_balance()
21  {
22      return x1;
23  } //testing oriented method
24
25  public account()
26  {
27      x2 = 0;
28      x4 = -1;
29      x6 = 20;
30      x7 = 200;
31      x9 = 0;
32      x0 = 3;
33  }
34  public final int open(int z, int y, int x)
35  {
36      if ((x > 0) && (x4 == -1) && (y > 0) && (z > 0))
37      {
38          x1 = x;
39          x3 = y;
40          x5 = z;
41          x4 = 0;
42          return 0;
43      };
44      return -1;
45  }
46  public final int pin(int x)
47  {
48      if (x4 != 1)
49      {
50          return -1;
51      }
52      if (x == x3)
53      {
54          x4 = 2;
55          return 0;
56      }
57      else
```

```
 58        {
 59             x9++;
 60        }
 61        if (x9 >= x0)
 62        {
 63             x4 = 0;
 64        }
 65        return -1;
 66 }
 67 public final int logout()
 68 {
 69        if ((x4 == 0) || (x2 == 1))
 70        {
 71             return -1;
 72        }
 73        x4 = 0;
 74        return 0;
 75 }
 76 public final int login(int x)
 77 {
 78        if (x4 != 0)
 79        {
 80             return -1;
 81        }
 82        if (x5 == x)
 83        {
 84             x4 = 1;
 85             x9 = 0;
 86             return 0;
 87        }
 88        return -1;
 89 }
 90 public final int balance()
 91 {
 92        if (x4 != 2)
 93        {
 94             return -1;
 95        }
 96        return x1;
 97 }
 98 public final int lock(int x)
 99 {
100        if (x4 != 2)
101        {
102             return -1;
103        }
104        if (x == x3)
105        {
106             return -1;
107        }
108        if (x2 == 0)
109        {
110             x2 = 1;
111             x8 = x;
112             return 0;
113        }
114        else
```

```
115      {
116           return -1;
117      }
118 }
119 public final int unlock(int x)
120 {
121      if (x4 != 2)
122      {
123           return -1;
124      }
125      if ((x2 == 1) && (x == x8))
126      {
127           x2 = 0;
128      return 0;
129      }
130      else
131      {
132           return -1;
133      }
134 }
135 public final int deposit(int d)
136 {
137      if (x4 != 2)
138      {
139           return -1;
140      }
141      if (x2 == 1)
142      {
143           return -1;
144      };
145      if ((x1 + d < x7) && (d>0))
146      {
147           x1 = x1 + d - x6;
148           return 0;
149      }
150      else
151      {
152           if (d > 0)
153           {
154           x1 = x1 + d;
155           return 0;
156           }
157      }
158  return -1;
159 }
160 public final int withdraw(int w)
161 {
162 if (x4 != 2)
163 {
164      return -1;
165 }
166 if (x2 == 1)
167 {
168      return -1;
169 };
170 if ((x1 > w) && (w > 0))
171 {
```

```
172     if (x1 < x7)
173     {
174         return -1;
175     }
176     else
177     {
178         x1 = x1 - w;
179     };
180     if (x1 < x7)
181     {
182         x1 = x1 - x6;
183     }
184   return 0;
185 }
186 return -1;
187 }
188 }
```

In this project, the goal is to test the provided implementation (source code) of the account class. To test the *account* class, we are supposed to implement a testing environment that should contain a class driver to execute test cases. The following testing methods should be used:

1. **Model-based testing of the *Account* class:** Use the provided EFSM model to test the *account* class. Design test cases for the *account* class so that all 2-transition sequences testing criterion (all transition-pairs) is satisfied based on the provided EFSM, i.e., all 2- transition sequences are exercised during testing.
2. **Default (ghost) transition testing of the *Account* class:** Design a set of additional test cases so each default (ghost) transition in the EFSM is tested.
3. **Multiple-condition Testing of the *Account* Class:** Use multiple-condition testing to design additional test cases to test predicates of conditional statements in operations/methods. Notice that if a predicate contains only a simple condition, the multiple-condition testing is equivalent to the branch testing for this predicate.

In the testing environment, we must introduce "testing-oriented" methods (in the *account* class) that will be used to watch the "internal states" of an *account* object to determine the correctness/incorrectness of the results for the test cases.

## DESCRIPTIOIN OF *ACCOUNT* CLASS

An account requires a minimum balance of 200. If a balance is below a minimum balance in the account, a fee is imposed on each transaction (withdraw, deposit). Before any account transactions can be performed on the account, operation *login()* must be issued followed by *pin()* operation. The *pin()* operation must contain the valid pin # (parameter x) that must be the same as the pin # provided in the *open()* operation (parameter y). It is allowed a maximum of 3 attempts to "provide" an invalid pin. An account can be locked. When an account is locked, no transaction can be performed on the account (except *unlock()* and *balance()* operations). For the simplicity of implementation, all deposit and withdrawal transactions are performed in the whole dollar amounts only (no cents).

The EFSM model for the *account* class is provided above. Notice that the EFSM model specifies the expected behavior of the account class.

## OPERATION SUPPORTED BY THE *ACCOUNT* CLASS*:*

The following operations are supported by the *account* class:

| Class *Account*: | |
|---|---|
| **Operation** | **Description** |
| **account()** | Constructor |
| **int open(int z, int y, int x)** | Sets balance to the value of x, pin number to the value of y, and an account # to the value of z |
| **int login(int x)** | Allows to login to the account, where x is an account # |
| **int logout()** | Allows to logout from the account |
| **int pin(int x)** | Provides pin # (parameter x) |
| **int deposit (int d)** | Deposits amount d to the account |
| **int withdraw (int w)** | Withdraws amount w from the account |
| **int balance ()** | Returns the value of the account balance |
| **int lock (int x)** | Locks an account where x is the lock # |
| **int unlock (int x)** | Unlocks an account when x equals to the correct lock # |

Unless stated differently, each method (operation) returns 0 when the operation is successfully completed; otherwise, negative value -1 is returned.

## TESTING

### DRIVER CLASS FOR TESTING

To test the *account* class, a test driver class named "TestDriver" and a few testing-oriented methods in *account* class such as *show_balance(), getCurrentState(), getLockedStatus()* and *getNumbeOfUnsuccessfulLoginAttemts().* The file named "TestDriver.java" and updated "account.java" is provided and has been submitted in blackboard. The test cases are performed as below:

### 1. MODEL-BASED TESTING OF THE *ACCOUNT* CLASS

#### INBOUND AND OUTBOUND TRANSITION FOR EACH STATE

To start with model-based testing, firstly we have found the Inbound and Outbound Transition for each state as given below:

| State | Inbound Transition | Outbound Transition |
|---|---|---|
| **IDLE** | T1, T5, T6, T7, T9, T10 | T2, T7 |
| **CHECK PIN** | T2, T3 | T3, T5, T6, T8, T18 |
| **READY** | T11, T12, T13, T16, T17, T18 | T4, T10, T11, T12, T13, T14 |
| **OVERDRAWN** | T8, T14, T19, T21, T22 | T9, T16, T20, T21, T22 |
| **LOCKED** | T4, T15, T20 | T15, T17, T19 |

## TRANSITION-PAIR FOR IDLE STATE

Using the above inbound and outbound transition we have found the below transition pair. For each transition-pair which test case in the test suite (TS.txt file) executes and covers that transition-pair is also provided. All the test case given are described later in this report.

| Transition-pair | | Covered by Test Case Number |
|---|---|---|
| **Inbound** | **Outbound** | |
| T1 | T2 | TestCase#2 |
| T1 | T7 | TestCase#1 |
| T5 | T2 | TestCase#2 |
| T5 | T7 | TestCase#1 |
| T6 | T2 | TestCase#2 |
| T6 | T7 | TestCase#1 |
| T7 | T2 | TestCase#1 |
| T7 | T7 | TestCase#1 |
| T9 | T2 | TestCase#2 |
| T9 | T7 | TestCase#2 |
| T10 | T2 | TestCase#3 |
| T10 | T7 | TestCase#1 |

## TRANSITION-PAIR FOR CHECK PIN STATE

Using the above inbound and outbound transition we have found the below transition pair. For each transition-pair which test case in the test suite (TS.txt file) executes and covers that transition-pair is also provided.

| Transition-pair | | Covered by Test Case Number |
|---|---|---|
| **Inbound** | **Outbound** | |
| T2 | T3 | TestCase#1 |
| T2 | T5 | TestCase#1 |
| T2 | T6 | Impossible |
| T2 | T8 | TestCase#2 |
| T2 | T18 | TestCase#1 |
| T3 | T3 | TestCase#1 |

| Transition-pair | | Covered by Test Case Number |
| --- | --- | --- |
| Inbound | Outbound | |
| T3 | T5 | TestCase#2 |
| T3 | T6 | TestCase#1 |
| T3 | T8 | TestCase#2 |
| T3 | T18 | TestCase#3 |

## TRANSITION-PAIR FOR READY STATE

Using the above inbound and outbound transition we have found the below transition pair. For each transition-pair which test case in the test suite (TS.txt file) executes and covers that transition-pair is also provided.

| Transition-pair | | Covered by Test Case Number |
| --- | --- | --- |
| Inbound | Outbound | |
| T11 | T4 | TestCase#3 |
| T11 | T10 | TestCase#5 |
| T11 | T11 | TestCase#1 |
| T11 | T12 | TestCase#3 |
| T11 | T13 | TestCase#1 |
| T11 | T14 | TestCase#5 |
| T12 | T4 | TestCase#1 |
| T12 | T10 | TestCase#5 |
| T12 | T11 | TestCase#3 |
| T12 | T12 | TestCase#1 |
| T12 | T13 | TestCase#3 |
| T12 | T14 | TestCase#3 |
| T13 | T4 | TestCase#3 |
| T13 | T10 | TestCase#1 |
| T13 | T11 | TestCase#1 |
| T13 | T12 | TestCase#1 |
| T13 | T13 | TestCase#1 |
| T13 | T14 | TestCase#1 |
| T16 | T4 | TestCase#5 |
| T16 | T10 | TestCase#3 |
| T16 | T11 | TestCase#3 |
| T16 | T12 | TestCase#3 |
| T16 | T13 | TestCase#1 |
| T16 | T14 | TestCase#2 |
| T17 | T4 | TestCase#1 |
| T17 | T10 | TestCase#5 |
| T17 | T11 | TestCase#5 |
| T17 | T12 | TestCase#3 |

| Transition-pair | | Covered by Test Case Number |
|---|---|---|
| Inbound | Outbound | |
| T17 | T13 | TestCase#1 |
| T17 | T14 | TestCase#3 |
| T18 | T4 | TestCase#5 |
| T18 | T10 | TestCase#5 |
| T18 | T11 | TestCase#5 |
| T18 | T12 | TestCase#5 |
| T18 | T13 | TestCase#1 |
| T18 | T14 | TestCase#3 |

## TRANSITION-PAIR FOR **OVERDRAWN** STATE

Using the above inbound and outbound transition we have found the below transition pair. For each transition-pair which test case in the test suite (TS.txt file) executes and covers that transition-pair is also provided.

| Transition-pair | | Covered by Test Case Number |
|---|---|---|
| Inbound | Outbound | |
| T8 | T9 | TestCase#4 |
| T8 | T16 | TestCase#3 |
| T8 | T20 | TestCase#2 |
| T8 | T21 | TestCase#2 |
| T8 | T22 | TestCase#2 |
| T14 | T9 | TestCase#3 |
| T14 | T16 | TestCase#3 |
| T14 | T20 | TestCase#1 |
| T14 | T21 | TestCase#3 |
| T14 | T22 | TestCase#2 |
| T19 | T9 | TestCase#3 |
| T19 | T16 | TestCase#3 |
| T19 | T20 | TestCase#2 |
| T19 | T21 | TestCase#1 |
| T19 | T22 | TestCase#1 |
| T21 | T9 | TestCase#2 |
| T21 | T16 | TestCase#2 |
| T21 | T20 | TestCase#2 |
| T21 | T21 | TestCase#2 |
| T21 | T22 | TestCase#1 |
| T22 | T9 | TestCase#1 |
| T22 | T16 | TestCase#1 |
| T22 | T20 | TestCase#1 |
| T22 | T21 | TestCase#1 |

| Transition-pair | | Covered by Test Case Number |
|---|---|---|
| Inbound | Outbound | |
| T22 | T22 | TestCase#1 |

## TRANSITION-PAIR FOR LOCKED STATE

Using the above inbound and outbound transition we have found the below transition pair. For each transition-pair which test case in the test suite (TS.txt file) executes and covers that transition-pair is also provided.

| Transition-pair | | Covered by Test Case Number |
|---|---|---|
| Inbound | Outbound | |
| T4 | T15 | TestCase#1 |
| T4 | T17 | TestCase#1 |
| T4 | T19 | Impossible |
| T15 | T15 | TestCase#1 |
| T15 | T17 | TestCase#1 |
| T15 | T19 | TestCase#1 |
| T20 | T15 | TestCase#1 |
| T20 | T17 | Impossible |
| T20 | T19 | TestCase#1 |

## NON-EXECUTABLE TRANSITION PAIR

### TRANSITION PAIR T2-T6 (CHECK PIN STATE)

After T2 transition the system is in CHECK PIN state then *attempt = 0*, so it is never possible to take T6 transition path just after T2 transition.

### TRANSITION PAIR T4-T19 (LOCKED STATE)

After T4 transition the system is in LOCKED state then it is a precondition that balance $b \geq 200$, so it was in READY state before and it is never possible to take T19 transition just after T4, unlocking and moved to OVERDRAWN state.

### TRANSITION PAIR T20-T17 (LOCKED STATE)

After T20 transition the system is in LOCKED state then it is a precondition that balance $b < 200$, so it was in OVERDRAWN state and it is never possible to take T17 transition just after T20, unlocking and moved to READY state.

## 2. DEFAULT (GHOST) TRANSITION TESTING OF THE ACCOUNT CLASS

The default transitions for each state are given below:

## DEFAULT TRANSITION FOR IDLE STATE

| Transition Operation | Covered by Test Case# |
|---|---|
| open(z, y, x) | TestCase#6 |
| logout() | TestCase#6 |
| pin(x) | TestCase#6 |
| deposit(d) | TestCase#6 |
| withdraw(w) | TestCase#6 |
| balance() | TestCase#6 |
| lock(x) | TestCase#6 |
| unlock(x) | TestCase#6 |

## DEFAULT TRANSITION FOR CHECK PIN STATE

| Transition Operation | Covered by Test Case# |
|---|---|
| open(z, y, x) | TestCase#7 |
| login(x) | TestCase#7 |
| deposit(d) | TestCase#7 |
| withdraw(w) | TestCase#7 |
| balance() | TestCase#7 |
| lock(x) | TestCase#7 |
| unlock(x) | TestCase#7 |

## DEFAULT TRANSITION FOR READY STATE

| Transition Operation | Covered by Test Case# |
|---|---|
| open(z, y, x) | TestCase#8 |
| login(x) | TestCase#8 |
| pin(x) | TestCase#8 |
| withdraw(w)[b-w<=0] | TestCase#8 |
| lock(x)[x==pn] | TestCase#8 |
| unlock(x) | TestCase#8 |

## DEFAULT TRANSITION FOR OVERDRAWN STATE

| Transition Operation | Covered by Test Case# |
|---|---|
| **open(z, y, x)** | TestCase#9 |
| **login(x)** | TestCase#9 |
| **pin(x)** | TestCase#9 |
| **withdraw(w)** | TestCase#9 |
| **lock(x)[x==pn]** | TestCase#9 |
| **unlock(x)** | TestCase#9 |

## DEFAULT TRANSITION FOR LOCKED STATE

| Transition Operation | Covered by Test Case# |
|---|---|
| **open(z, y, x)** | TestCase#10 |
| **login(x)** | TestCase#10 |
| **logout()** | TestCase#10 |
| **pin(x)** | TestCase#10 |
| **deposit(d)** | TestCase#10 |
| **withdraw(w)** | TestCase#10 |
| **lock(x)** | TestCase#10 |
| **Unlock(x)[x!=k]** | TestCase#10 |

## NON-EXECUTABLE DEFAULT TRANSITION

There are no non-executable transition pair

## 3. MULTIPLE-CONDITION TESTING OF THE ACCOUNT CLASS

For multi-condition testing truth tables for each method are listed below with test case numbers, which covers them.

## MULTIPLE-CONDITION TESTING FOR *OPEN(Z, Y, X)*

### TRUTH TABLE 1 FOR *OPEN(Z, Y, X)*

| x>0 | x4 == -1 | y>0 | z>0 | Covered by Test Case# |
|---|---|---|---|---|
| **T** | T | T | T | TestCase#1 |
| **T** | T | T | F | TestCase#11 |
| **T** | T | F | T | TestCase#11 |

| x>0 | x4 == -1 | y>0 | z>0 | Covered by Test Case# |
|-----|----------|-----|-----|----------------------|
| T | T | F | F | TestCase#11 |
| T | F | T | T | TestCase#6 |
| T | F | T | F | TestCase#7 |
| T | F | F | T | TestCase#8 |
| T | F | F | F | TestCase#9 |
| F | T | T | T | TestCase#11 |
| F | T | T | F | TestCase#11 |
| F | T | F | T | TestCase#11 |
| F | T | F | F | TestCase#11 |
| F | F | T | T | TestCase#10 |
| F | F | T | F | TestCase#11 |
| F | F | F | T | TestCase#11 |
| F | F | F | F | TestCase#11 |

## MULTIPLE-CONDITION TESTING FOR *PIN(X)*

### TRUTH TABLE 1 FOR *PIN(X)*

| x4!=1 | Covered by Test Case# |
|-------|----------------------|
| T | TestCase#6 |
| F | TestCase#1 |

### TRUTH TABLE 2 FOR *PIN(X)*

| x == x3 | Covered by Test Case# |
|---------|----------------------|
| T | TestCase#1 |
| F | TestCase#1 |

### TRUTH TABLE 3 FOR *PIN(X)*

| x9 >= x0 | Covered by Test Case# |
|----------|----------------------|
| T | TestCase#1 |
| F | TestCase#1 |

## MULTIPLE-CONDITION TESTING FOR *LOGOUT()*

## TRUTH TABLE 1 FOR *LOGOUT()*

| x4 == 0 | x2 == 1 | Covered by Test Case# |
|---------|---------|-----------------------|
| T | T | Impossible |
| T | F | TestCase#6 |
| F | T | TestCase#10 |
| F | F | TestCase#1 |

## MULTIPLE-CONDITION TESTING FOR *LOGIN(X)*

## TRUTH TABLE 1 FOR *LOGIN(X)*

| x4 != 0 | Test# |
|---------|-------|
| T | TestCase#7 |
| F | TestCase#1 |

## TRUTH TABLE 2 FOR *LOGIN(X)*

| x5 == x | Covered by Test Case# |
|---------|-----------------------|
| T | TestCase#1 |
| F | TestCase#1 |

## MULTIPLE-CONDITION TESTING FOR *BALANCE()*

## TRUTH TABLE 1 FOR *BALANCE()*

| x4 != 2 | Covered by Test Case# |
|---------|-----------------------|
| T | TestCase#6 |
| F | TestCase#1 |

## MULTIPLE-CONDITION TESTING FOR *LOCK(X)*

## TRUTH TABLE 1 FOR *LOCK(X)*

| x4 != 2 | Covered by Test Case# |
|---------|------------------------|
| T | TestCase#6 |
| F | TestCase#1 |

## TRUTH TABLE 2 FOR *LOCK(X)*

| x == x3 | Covered by Test Case# |
|---------|------------------------|
| T | TestCase#8 |
| F | TestCase#1 |

## TRUTH TABLE 3 FOR *LOCK(X)*

| x2 == 0 | Covered by Test Case# |
|---------|------------------------|
| T | TestCase#1 |
| F | TestCase#10 |

## MULTIPLE-CONDITION TESTING FOR *UNLOCK(X)*

## TRUTH TABLE 1 FOR *UNLOCK(X)*

| x4 != 2 | Covered by Test Case# |
|---------|------------------------|
| T | TestCase#6 |
| F | TestCase#1 |

## TRUTH TABLE 2 FOR *UNLOCK(X)*

| x2 == 1 | x == x8 | Covered by Test Case# |
|---------|---------|------------------------|
| T | T | TestCase#1 |
| T | F | TestCase#10 |
| F | T | TestCase#7 |
| F | F | TestCase#8 |

## MULTIPLE-CONDITION TESTING FOR *DEPOSIT(D)*

## TRUTH TABLE 1 FOR *DEPOSIT(D)*

| x4 != 2 | Covered by Test Case# |
|---|---|
| T | TestCase#6 |
| F | TestCase#1 |

## TRUTH TABLE 2 FOR *DEPOSIT(D)*

| x2 == 1 | Covered by Test Case# |
|---|---|
| T | TestCase#10 |
| F | TestCase#1 |

## TRUTH TABLE 3 FOR *DEPOSIT(D)*

| x1 + d < x7 | d > 0 | Covered by Test Case# |
|---|---|---|
| T | T | TestCase#1 |
| T | F | TestCase#11 |
| F | T | TestCase#1 |
| F | F | TestCase#11 |

## TRUTH TABLE 4 FOR *DEPOSIT(D)*

| d > 0 | Covered by Test Case# |
|---|---|
| T | TestCase#1 |
| F | TestCase#11 |

## MULTIPLE-CONDITION TESTING FOR *WITHDRAW(W))*

## TRUTH TABLE 1 FOR *WITHDRAW(W)*

| x4 != 2 | Covered by Test Case# |
|---|---|
| T | TestCase#6 |
| F | TestCase#1 |

## TRUTH TABLE 2 FOR *WITHDRAW(W)*

| x2 == 1 | Covered by Test Case# |
|---|---|
| T | TestCase#10 |
| F | TestCase#1 |

## TRUTH TABLE 3 FOR *WITHDRAW(W)*

| x1 > w | w > 0 | Covered by Test Case# |
|---|---|---|
| T | T | TestCase#1 |
| T | F | TestCase#8 |
| F | T | TestCase#11 |
| F | F | TestCase#11 |

## TRUTH TABLE 4 FOR *WITHDRAW(W)*

| x1 < x7 | Covered by Test Case# |
|---|---|
| T | TestCase#9 |
| F | TestCase#1 |

## TRUTH TABLE 5 FOR *WITHDRAW(W)*

| x1 < x7 | Covered by Test Case# |
|---|---|
| T | TestCase#1 |
| F | TestCase#1 |

## NON-EXECUTABLE MULTI-CONDITION

In *logout()* the combination of *(x4 == 0 )* → *True* and *(x2 == 1)* → *False* is impossible for execution because *x4 = 0* when the system is in *IDLE* state and *x2 = 1* when the system is in *LOCKED* state. The system cannot be present in two states at the same time. The truth table for this can be found in section Truth Table 1 for *logout()*.

## TEST SUIT

The test suit is created and stored in TS.txt. The detailed instruction to execute the test cases are given later in this report in the section Instruction to Execute Test Cases.

```
Test#1: open 100 123 200 login 150 login 140 login 100 pin 1 pin
2 pin 3 login 150 login 100 logout login 140 login 100 pin 123
balance balance deposit 50 deposit 50 lock 321 balance balance
unlock 321 lock 321 unlock 321 balance withdraw 10 withdraw 10
balance withdraw 100 lock 321 balance unlock 321 balance balance
deposit 20 balance lock 321 unlock 321 balance deposit 100 balance
logout login 140
Test#2: open 100 123 190 login 100 pin 123 balance logout login
135 login 100 pin 123 deposit 10 deposit 10 lock 321 unlock 321
deposit 10 deposit 100 withdraw 100 balance logout login 100 pin
1 logout login 100 pin 2 pin 2 pin 2 login 100 pin 2 pin 123 lock
321 unlock 321 lock 321 unlock 321 deposit 10 logout
Test#3: open 100 123 190 login 100 pin 123 deposit 100 logout
login 100 pin 2 pin 123 withdraw 100 deposit 10 lock 321 unlock
321 deposit 100 deposit 10 balance lock 321 unlock 321 withdraw
100 deposit 100 withdraw 10 deposit 10 withdraw 10 lock 321 unlock
321 deposit 10 withdraw 100 logout login 100 pin 123 logout
Test#4: open 100 123 190 login 100 pin 123 logout
Test#5: open 100 123 300 login 100 pin 123 lock 321 unlock 321
withdraw 10 withdraw 100 deposit 100 lock 321 unlock 321 logout
login 100 pin 123 deposit 10 logout login 100 pin 123 withdraw 10
logout login 100 pin 123 logout
Test#6: open 100 123 200 open 100 123 200 logout pin 123 deposit
100 withdraw 100 balance lock 321 unlock 321
Test#7: open 100 123 200 login 100 open −100 123 200 login 100
deposit 100 withdraw 100 balance lock 321 unlock 0
Test#8: open 100 123 200 login 100 pin 123 open 100 −123 200 login
100 pin 123 withdraw 0 lock 123 unlock 123
Test#9: open 100 123 190 login 100 pin 123 open −100 −123 200
login 100 pin 123 withdraw 100 lock 123 unlock 321
Test#10: open 100 123 190 login 100 pin 123 lock 321 open 100 123
−200 login 100 logout pin 123 deposit 100 withdraw 100 lock 321
unlock 12
Test#11: open −100 123 200 open 100 −123 200 open −100 −123 200
open 100 123 −200 open −100 123 −200 open 100 −123 −200 open −100
−123 −200 open 100 123 190 open −100 123 −200 open 100 −123 −200
open −100 −123 −200 login 100 pin 123 withdraw 200 withdraw −10
deposit 0 deposit 100 deposit −10

$$
```

## TEST CASE EXECUTION, TEST RESULTS AND CORRECTNESS

## TESTCASE#1

### TEST CASE

**From TS.txt**
Test#1: open 100 123 200 login 150 login 140 login 100 pin 1 pin 2 pin 3 login 150 login 100 logout login 140 login 100 pin 123 balance balance deposit 50 deposit 50 lock 321 balance balance unlock 321 lock 321 unlock 321 balance withdraw 10 withdraw 10 balance withdraw 100 lock 321 balance unlock 321 balance balance deposit 20 balance lock 321 unlock 321 balance deposit 100 balance logout login 140

**As method call**
Test#1: open(100,123,200), login(150), login(140), login(100), pin(1), pin(2), pin(3), login(150), login(100), logout(), login(140), login(100), pin(123), balance(), balance(), deposit(50), deposit(50), lock(321), balance(), balance(), unlock(321), lock(321), unlock(321), balance(), withdraw(10), withdraw(10), balance(), withdraw(100), lock(321), balance(), unlock(321), balance(), balance(), deposit(20), balance(), lock(321), unlock(321), balance(), deposit(100), balance(), logout(), login(140)

### TRANSITION TRAVERSED

T1, T7, T7, T2, T3, T3, T6, T7, T2, T5, T7, T2, T18, T13, T13, T12, T12, T4, T15, T15, T17, T4, T17, T13, T11, T11, T13, T14, T20, T15, T19, T22, T22, T21, T22, T20, T19, T22, T16, T13, T10, T7

### OUTPUT OF *ACCOUNT* CLASS

```
        CS 589; Fall 2021
           PROJECT
        Sukanta Sharma
          A2042623

_____
_____


Press Enter key to continue...
```

```
Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____
Enter Account#:

100
Enter PIN:

123
Enter initial balance:

200

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
        q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

150

                  The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

140

                  The value returned by the method is: -1 (FAILED)
```

```
Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

               The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
```

```
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

1

```
                    The value returned by the method is: -1 (FAILED)
```

Press Enter key to continue...

Driver for the Account
```
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing-Oriented Methods
```
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

2

```
                 The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____
Enter PIN:

3

                 The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

6

Your choice is : 6


```
_____
Class: Account
Type: Class Method
Method: LOGIN
_____
```

Enter Account#:

150

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
```
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing-Oriented Methods
```
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

6

Your choice is : 6


```
_____
Class: Account
Type: Class Method
Method: LOGIN
_____
```

Enter Account#:

100

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

8

Your choice is : 8




_____
Class: Account
Type: Class Method
Method: LOGOUT
_____

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
_____

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

140

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...





Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:
```

```
100
```

```
                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:
```

```
7
```

```
Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____
Enter PIN:
```

```
123
```

```
                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

             The value returned by the method is: Balance = 200 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

```
                The value returned by the method is: Balance = 200 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver

Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

50

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

50

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...





Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

4

Your choice is : 4




_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:
```

321

```
                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

            The value returned by the method is: Balance = 300 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

                The value returned by the method is: Balance = 300 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321
```

The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT


Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver


Enter your choice:

4

Your choice is : 4




_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321

              The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT


Testing-Oriented Methods
_____

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

5

Your choice is : 5

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: UNLOCK
————————————————————————————————————————————————————
```

Enter Lock#:

321

                    The value returned by the method is: 0 (SUCCESS)

Press Enter key to continue...

Driver for the Account
```
————————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing-Oriented Methods
```
————————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

3

Your choice is : 3

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: BALANCE
————————————————————————————————————————————————————
```

The value returned by the method is: Balance = 300 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing—Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

10

            The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing—Oriented Methods
_____

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

10

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...





Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____
```

```
              The value returned by the method is: Balance = 280 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
              0. OPEN
              1. DEPOSIT
              2. WITHDRAW
              3. BALANCE
              4. LOCK
              5. UNLOCK
              6. LOGIN
              7. PIN
              8. LOGOUT

Testing—Oriented Methods
_____
              a. SHOW BALANCE
              b. SHOW STATE
              c. SHOW LOCKED STATUS
              d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


              q. Quit Account Driver

Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

100

              The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
              0. OPEN
              1. DEPOSIT
              2. WITHDRAW
              3. BALANCE
              4. LOCK
              5. UNLOCK
              6. LOGIN
              7. PIN
              8. LOGOUT

Testing—Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

Enter your choice:

4

Your choice is : 4

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: LOCK
————————————————————————————————————————————————————
```

Enter Lock#:

321

```
                The value returned by the method is: 0 (SUCCESS)
```

Press Enter key to continue...

```
Driver for the Account
————————————————————————————————————————————————————

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
————————————————————————————————————————————————————

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

Enter your choice:

3

Your choice is : 3

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: BALANCE
————————————————————————————————————————————————————
```

The value returned by the method is: Balance = 160 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing—Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


                q. Quit Account Driver

Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____
Enter Lock#:

321

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing—Oriented Methods
_____

```
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

              The value returned by the method is: Balance = 160 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

              The value returned by the method is: Balance = 160 (SUCCESS)
```

```
Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

1

Your choice is : 1





_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

20

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...





Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
```

```
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

               The value returned by the method is: Balance = 160 (SUCCESS)


Press Enter key to continue...





Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver


Enter your choice:

4

Your choice is : 4




_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321
               The value returned by the method is: 0 (SUCCESS)
```

Press Enter key to continue...

Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing—Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver

Enter your choice:

5

Your choice is : 5

_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

                  The value returned by the method is: 0 (SUCCESS)

Press Enter key to continue...

Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing—Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE

```
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

                  The value returned by the method is: Balance = 160 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

100

                  The value returned by the method is: 0 (SUCCESS)
```

```
Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

3

Your choice is : 3




─────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: BALANCE
─────────────────────────────────────────────────────────

                The value returned by the method is: Balance = 260 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
        q. Quit Account Driver

Enter your choice:

8

Your choice is : 8




────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGOUT
────────────────────────────────────────────────────────────

                 The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGIN
────────────────────────────────────────────────────────────

Enter Account#:

140
                 The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                THANK YOU!!!


_____
```

# CORRECTNESS

| Function Called | Transition | Expected Result | | | | Produced Result | | |
|---|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | | State After Transition | Balance | No. of Unsuccessful Attempt |
| **OPEN 100 123 200** | T1 | IDLE | 200 | 0 | | IDLE | 200 | 0 |
| **LOGIN 150** | T7 | IDLE | 200 | 0 | | IDLE | 200 | 0 |
| **LOGIN 140** | T7 | IDLE | 200 | 0 | | IDLE | 200 | 0 |
| **LOGIN 100** | T2 | CHECK PIN | 200 | 0 | | CHECK PIN | 200 | 0 |
| **PIN 1** | T3 | CHECK PIN | 200 | 1 | | CHECK PIN | 200 | 1 |

| Function Called | Transition | Expected Result | | | | Produced Result | | |
|---|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | | State After Transition | Balance | No. of Unsuccessful Attempt |
| PIN 2 | T3 | CHECK PIN | 200 | 2 | | CHECK PIN | 200 | 2 |
| PIN 3 | T6 | IDLE | 200 | 2 | | IDLE | 200 | 3 |
| LOGIN 150 | T7 | IDLE | 200 | 2 | | IDLE | 200 | 3 |
| LOGIN 100 | T2 | CHECK PIN | 200 | 0 | | CHECK PIN | 200 | 0 |
| LOGOUT | T5 | IDLE | 200 | 0 | | IDLE | 200 | 0 |
| LOGIN 140 | T7 | IDLE | 200 | 0 | | IDLE | 200 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 200 | 0 | | CHECK PIN | 200 | 0 |
| PIN 123 | T18 | READY | 200 | 0 | | READY | 200 | 0 |
| BALANCE | T13 | READY | 200 | 0 | | READY | 200 | 0 |
| BALANCE | T13 | READY | 200 | 0 | | READY | 200 | 0 |
| DEPOSIT 50 | T12 | READY | 250 | 0 | | READY | 250 | 0 |
| DEPOSIT 50 | T12 | READY | 300 | 0 | | READY | 300 | 0 |
| LOCK 321 | T4 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| BALANCE | T15 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| BALANCE | T15 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| UNLOCK 321 | T17 | READY | 300 | 0 | | READY | 300 | 0 |
| LOCK 321 | T4 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| UNLOCK 321 | T17 | READY | 300 | 0 | | READY | 300 | 0 |
| BALANCE | T13 | READY | 300 | 0 | | READY | 300 | 0 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| WITHDRAW 10 | T11 | READY | 290 | 0 | READY | 290 | 0 |
| WITHDRAW 10 | T11 | READY | 280 | 0 | READY | 280 | 0 |
| BALANCE | T13 | READY | 280 | 0 | READY | 280 | 0 |
| WITHDRAW 100 | T14 | OVERDRAWN | 160 | 0 | OVERDRAWN | 160 | 0 |
| LOCK 321 | T20 | LOCKED | 160 | 0 | LOCKED | 160 | 0 |
| BALANCE | T15 | LOCKED | 160 | 0 | LOCKED | 160 | 0 |
| UNLOCK 321 | T19 | OVERDRAWN | 160 | 0 | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 160 | 0 | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 160 | 0 | OVERDRAWN | 160 | 0 |
| DEPOSIT 20 | T21 | OVERDRAWN | 170 | 0 | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 170 | 0 | OVERDRAWN | 160 | 0 |
| LOCK 321 | T20 | LOCKED | 170 | 0 | LOCKED | 160 | 0 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 0 | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 170 | 0 | OVERDRAWN | 160 | 0 |
| DEPOSIT 100 | T16 | READY | 270 | 0 | READY | 260 | 0 |
| BALANCE | T13 | READY | 270 | 0 | READY | 260 | 0 |
| LOGOUT | T10 | IDLE | 270 | 0 | IDLE | 260 | 0 |
| LOGIN 140 | T7 | IDLE | 270 | 0 | IDLE | 260 | 0 |

As from the above table we can see that expected results are not matched with produced result. Hence the test case is **FAILED**. The contradicting operations are highlighted in RED color in the above table. This test case is also mentioned later in this report in the section List of Failed Test Cases

## TESTCASE#2

### TEST CASE

**From TS.txt**
Test#2: open 100 123 190 login 100 pin 123 balance logout login 135 login 100 pin 123 deposit 10 deposit 10 lock 321 unlock 321 deposit 10 deposit 100 withdraw 100 balance logout login 100 pin 1 logout login 100 pin 2 pin 2 pin 2 login 100 pin 2 pin 123 lock 321 unlock 321 lock 321 unlock 321 deposit 10 logout

**As method call**
Test#2: open(100,123,190), login(100), pin(123), balance(), logout(), login(135), login(100), pin(123), deposit(10), deposit(10), lock(321), unlock(321), deposit(10), deposit(100), withdraw(100), balance(), logout(), login(100), pin(1), logout(), login(100), pin(2), pin(2), pin(2), login(100), pin(2), pin(123), lock(321), unlock(321), lock(321), unlock(321), deposit(10), logout()

### TRANSITION TRAVERSED

T1, T2, T8, T22, T9, T7, T2, T8, T21, T21, T20, T19, T21, T16, T14, T22, T9, T2, T3, T5, T2, T3, T3, T6, T2, T3, T8, T20, T19, T20, T19, T21, T9

### OUTPUT OF *ACCOUNT* CLASS

```
        CS 589; Fall 2021
           PROJECT
        Sukanta Sharma
           A2042623

_____
_____


Press Enter key to continue...




Driver for the Account
_____
```

```
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
——————————————————————————————————————————————————————

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




——————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: OPEN
——————————————————————————————————————————————————————

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

190

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
——————————————————————————————————————————————————————

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
——————————————————————————————————————————————————————

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

```
Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                  The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                  The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
─────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3




─────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: BALANCE
─────────────────────────────────────────────────────────────

            The value returned by the method is: Balance = 190 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

```
Enter your choice:

8

Your choice is : 8




_____
Class: Account
Type: Class Method
Method: LOGOUT
_____

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

          q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

135
                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
─────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




─────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGIN
─────────────────────────────────────────────────────────────

Enter Account#:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
─────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

```
Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                 The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

10

                 The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

1

Your choice is : 1
```

```
_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

10

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
        q. Quit Account Driver

Enter your choice:

4

Your choice is : 4




_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

                The value returned by the method is: 0 (SUCCESS)
```

Press Enter key to continue...

Driver for the Account
────────────────────────────────────────────────────────
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing-Oriented Methods
────────────────────────────────────────────────────────
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


                q. Quit Account Driver

Enter your choice:

1

Your choice is : 1

────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: DEPOSIT
────────────────────────────────────────────────────────
Enter Deposit Amount:

10

                    The value returned by the method is: 0 (SUCCESS)

Press Enter key to continue...

Driver for the Account
────────────────────────────────────────────────────────
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing-Oriented Methods
────────────────────────────────────────────────────────
                a. SHOW BALANCE
                b. SHOW STATE

```
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

Enter your choice:

1

Your choice is : 1

```
_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____
```

Enter Deposit Amount:

100

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
```
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing-Oriented Methods
```
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

Enter your choice:

2

Your choice is : 2

```
_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____
```

Enter Withdraw Amount:

100

The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

                The value returned by the method is: Balance = 220 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE

```
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

8

Your choice is : 8




_____
Class: Account
Type: Class Method
Method: LOGOUT
_____

              The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...





Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

              The value returned by the method is: 0 (SUCCESS)
```

Press Enter key to continue...

Driver for the Account
───────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
───────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

7

Your choice is : 7


───────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: PIN
───────────────────────────────────────────────────────

Enter PIN:

1

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...


Driver for the Account
───────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
───────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE

```
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

8

Your choice is : 8




_____
Class: Account
Type: Class Method
Method: LOGOUT
_____


                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                    The value returned by the method is: 0 (SUCCESS)
```

```
Press Enter key to continue...




Driver for the Account
―――――――――――――――――――――――――――――――――――――――――――――
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
―――――――――――――――――――――――――――――――――――――――――――――
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

7

Your choice is : 7




―――――――――――――――――――――――――――――――――――――――――――――
Class: Account
Type: Class Method
Method: PIN
―――――――――――――――――――――――――――――――――――――――――――――
Enter PIN:

2

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
―――――――――――――――――――――――――――――――――――――――――――――
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
―――――――――――――――――――――――――――――――――――――――――――――
        a. SHOW BALANCE
        b. SHOW STATE
```

```
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

2

```
                    The value returned by the method is: -1 (FAILED)
```

Press Enter key to continue...

Driver for the Account
_____
```
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT
```

Testing-Oriented Methods
_____
```
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

2

```
                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT


Testing-Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


                q. Quit Account Driver


Enter your choice:

6

Your choice is : 6
```

```
_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT


Testing-Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

2

The value returned by the method is: −1 (FAILED)

Press Enter key to continue...

Driver for the Account
```
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing−Oriented Methods
```
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

123

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

4

Your choice is : 4




─────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOCK
─────────────────────────────────────────────────────────────
Enter Lock#:

321

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

```
Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver


Enter your choice:

5

Your choice is : 5
```

```
_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver


Enter your choice:

4

Your choice is : 4
```

```
_____
Class: Account
Type: Class Method
Method: LOCK
```

---

Enter Lock#:

321

The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN

```
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

10

                  The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

8

Your choice is : 8
```

_____

```
Class: Account
Type: Class Method
Method: LOGOUT
_____

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                        THANK YOU!!!
_____
```

# CORRECTNESS

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| **OPEN 100 123 190** | T1 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| **LOGIN 100** | T2 | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| PIN 123 | T8 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| BALANCE | T22 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| LOGOUT | T9 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| LOGIN 135 | T7 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |
| PIN 123 | T8 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| DEPOSIT 10 | T21 | OVERDRAWN | 190 | 0 | READY | 200 | 0 |
| DEPOSIT 10 | T21 | OVERDRAWN | 190 | 0 | READY | 210 | 0 |
| LOCK 321 | T20 | LOCKED | 190 | 0 | LOCKED | 210 | 0 |
| UNLOCK 321 | T19 | OVERDRAWN | 190 | 0 | READY | 210 | 0 |
| DEPOSIT 10 | T21 | OVERDRAWN | 190 | 0 | READY | 220 | 0 |
| DEPOSIT 100 | T16 | READY | 290 | 0 | READY | 320 | 0 |
| WITHDRAW 100 | T14 | OVERDRAWN | 170 | 0 | READY | 220 | 0 |
| BALANCE | T22 | OVERDRAWN | 170 | 0 | READY | 220 | 0 |
| LOGOUT | T9 | IDLE | 170 | 0 | IDLE | 220 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 0 |
| PIN 1 | T3 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 1 |
| LOGOUT | T5 | IDLE | 170 | 0 | IDLE | 220 | 1 |
| LOGIN 100 | T2 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 0 |

| | | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| Function Called | Transi tion | State After Transition | Bala nce | No. of Unsuccessful Attempt | State After Transition | Bala nce | No. of Unsuccessful Attempt |
| PIN 2 | T3 | CHECK PIN | 170 | 1 | CHECK PIN | 220 | 1 |
| PIN 2 | T3 | CHECK PIN | 170 | 2 | CHECK PIN | 220 | 2 |
| PIN 2 | T6 | IDLE | 170 | 2 | IDLE | 220 | 3 |
| LOGIN 100 | T2 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 0 |
| PIN 2 | T3 | CHECK PIN | 170 | 1 | CHECK PIN | 220 | 1 |
| PIN 123 | T8 | OVERDRAWN | 170 | 1 | READY | 220 | 1 |
| LOCK 321 | T20 | LOCKED | 170 | 1 | LOCKED | 220 | 1 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 1 | READY | 220 | 1 |
| LOCK 321 | T20 | LOCKED | 170 | 1 | LOCKED | 220 | 1 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 1 | READY | 220 | 1 |
| DEPOSIT 10 | T21 | OVERDRAWN | 170 | 1 | READY | 230 | 1 |
| LOGOUT | T9 | IDLE | 170 | 1 | IDLE | 230 | 1 |

As from the above table we can see that expected results are not matched with produced result. Hence the test case is **FAILED**. The contradicting operations are highlighted in RED color in the above table. This test case is also mentioned later in this report in the section List of Failed Test Cases

## TESTCASE#3

## TEST CASE

**From TS.txt**
```
Test#3: open 100 123 190 login 100 pin 123 deposit 100 logout login 100 pin 2
pin 123 withdraw 100 deposit 10 lock 321 unlock 321 deposit 100 deposit 10
balance lock 321 unlock 321 withdraw 100 deposit 100 withdraw 10 deposit 10
withdraw 10 lock 321 unlock 321 deposit 10 withdraw 100 logout login 100 pin
123 logout
```

**As method call**
Test#3: open(100,123,190), login(100), pin(123), deposit(100), logout(),
login(100), pin(2), pin(123), withdraw(100), deposit(10), lock(321),
unlock(321), deposit(100), deposit(10), balance(), lock(321), unlock(321),
withdraw(100), deposit(100), withdraw(10), deposit(10), withdraw(10),
lock(321), unlock(321), deposit(10), withdraw(100), logout(), login(100),
pin(123), logout()

## TRANSITION TRAVERSED

T1, T2, T8, T16, T10, T2, T3, T18, T14, T21, T20, T19, T16, T12, T13, T4, T17,
T14, T16, T11, T12, T11, T4, T17, T12, T14, T9, T2, T8, T9

## OUTPUT OF *ACCOUNT* CLASS

```
                CS 589; Fall 2021
                    PROJECT
                 Sukanta Sharma
                    A2042623


_____
_____


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0
```

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

190

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

6

Your choice is : 6
```

```
_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
──────────────────────────────────────────────────────────
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
──────────────────────────────────────────────────────────
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver


Enter your choice:

7

Your choice is : 7
```

```
──────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: PIN
──────────────────────────────────────────────────────────

Enter PIN:

123

              The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
──────────────────────────────────────────────────────────
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
──────────────────────────────────────────────────────────
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
        q. Quit Account Driver

Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

100

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

8

Your choice is : 8




_____
Class: Account
Type: Class Method
Method: LOGOUT
_____

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




─────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGIN
─────────────────────────────────────────────────────────
Enter Account#:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
            q. Quit Account Driver

Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

2

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver

Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                The value returned by the method is: 0 (SUCCESS)
```

```
Press Enter key to continue...




Driver for the Account
_____
              0. OPEN
              1. DEPOSIT
              2. WITHDRAW
              3. BALANCE
              4. LOCK
              5. UNLOCK
              6. LOGIN
              7. PIN
              8. LOGOUT

Testing—Oriented Methods
_____
              a. SHOW BALANCE
              b. SHOW STATE
              c. SHOW LOCKED STATUS
              d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


              q. Quit Account Driver

Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

100

              The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
              0. OPEN
              1. DEPOSIT
              2. WITHDRAW
              3. BALANCE
              4. LOCK
              5. UNLOCK
              6. LOGIN
              7. PIN
              8. LOGOUT

Testing—Oriented Methods
_____
              a. SHOW BALANCE
              b. SHOW STATE
```

```
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

10

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

4

Your choice is : 4




_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321
```

```
                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing-Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

1

Your choice is : 1

```
_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____
```

Enter Deposit Amount:

100

The value returned by the method is: 0 (SUCCESS)

Press Enter key to continue...

```
Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver
```

Enter your choice:

1

Your choice is : 1

```
_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____
```

Enter Deposit Amount:

10

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

3

Your choice is : 3




_____
Class: Account
Type: Class Method
Method: BALANCE
_____

                The value returned by the method is: Balance = 270 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
_____

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

4

Your choice is : 4




_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:
```

```
321
                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
—————————————————————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
—————————————————————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

2

Your choice is : 2
```

```
—————————————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: WITHDRAW
—————————————————————————————————————————————————————————————————

Enter Withdraw Amount:

100
                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
—————————————————————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing—Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW

———————————————————————————————————————————————————
Enter Withdraw Amount:

10

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
———————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
———————————————————————————————————————————————————
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

1

Your choice is : 1




———————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: DEPOSIT
———————————————————————————————————————————————————

Enter Deposit Amount:

10

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
———————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN

```
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

10

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

4

Your choice is : 4



_____
```

```
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

5

Your choice is : 5
```

```
_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
```

```
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
————————————————————————————————————————————————————————

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

1

Your choice is : 1




————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: DEPOSIT
————————————————————————————————————————————————————————

Enter Deposit Amount:

10

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
————————————————————————————————————————————————————————

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
————————————————————————————————————————————————————————

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2
```

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: WITHDRAW
————————————————————————————————————————————————————

Enter Withdraw Amount:

100

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
————————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
————————————————————————————————————————————————————
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

8

Your choice is : 8
```

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: LOGOUT
————————————————————————————————————————————————————

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
————————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
```

```
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                 The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

7

Your choice is : 7
```

```
_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

8

Your choice is : 8
```

```
_____
Class: Account
Type: Class Method
Method: LOGOUT
_____

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
```

```
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT


Testing-Oriented Methods
_____

          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                    THANK YOU!!!
_____
```

## CORRECTNESS

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| **OPEN 100 123 190** | T1 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| **LOGIN 100** | T2 | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |
| **PIN 123** | T8 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| **DEPOSIT 100** | T16 | READY | 290 | 0 | READY | 290 | 0 |
| **LOGOUT** | T10 | IDLE | 290 | 0 | IDLE | 290 | 0 |
| **LOGIN 100** | T2 | CHECK PIN | 290 | 0 | CHECK PIN | 290 | 0 |
| **PIN 2** | T3 | CHECK PIN | 290 | 1 | CHECK PIN | 290 | 1 |
| **PIN 123** | T18 | READY | 290 | 1 | READY | 290 | 1 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| WITHDRAW 100 | T14 | OVERDRAWN | 170 | 1 | OVERDRAWN | 170 | 1 |
| **DEPOSIT 10** | **T21** | **OVERDRAWN** | **170** | **1** | **OVERDRAWN** | **160** | **1** |
| LOCK 321 | T20 | LOCKED | 170 | 1 | LOCKED | 160 | 1 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 1 | OVERDRAWN | 160 | 1 |
| DEPOSIT 100 | T16 | READY | 270 | 1 | READY | 260 | 1 |
| DEPOSIT 10 | T12 | READY | 280 | 1 | READY | 270 | 1 |
| BALANCE | T13 | READY | 280 | 1 | READY | 270 | 1 |
| LOCK 321 | T4 | LOCKED | 280 | 1 | LOCKED | 270 | 1 |
| UNLOCK 321 | T17 | READY | 280 | 1 | READY | 270 | 1 |
| WITHDRAW 100 | T14 | OVERDRAWN | 160 | 1 | OVERDRAWN | 150 | 1 |
| DEPOSIT 100 | T16 | READY | 260 | 1 | READY | 250 | 1 |
| WITHDRAW 10 | T11 | READY | 250 | 1 | READY | 240 | 1 |
| DEPOSIT 10 | T12 | READY | 260 | 1 | READY | 250 | 1 |
| WITHDRAW 10 | T11 | READY | 250 | 1 | READY | 240 | 1 |
| LOCK 321 | T4 | LOCKED | 250 | 1 | LOCKED | 240 | 1 |
| UNLOCK 321 | T17 | READY | 250 | 1 | READY | 240 | 1 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| **DEPOSIT 10** | T12 | READY | 260 | 1 | READY | 250 | 1 |
| **WITHDRAW 100** | T14 | OVERDRAWN | 140 | 1 | OVERDRAWN | 130 | 1 |
| **LOGOUT** | T9 | IDLE | 140 | 1 | IDLE | 130 | 1 |
| **LOGIN 100** | T2 | CHECK PIN | 140 | 0 | CHECK PIN | 130 | 0 |
| **PIN 123** | T8 | OVERDRAWN | 140 | 0 | OVERDRAWN | 130 | 0 |
| **LOGOUT** | T9 | IDLE | 140 | 0 | IDLE | 130 | 0 |

As from the above table we can see that expected results are not matched with produced result. Hence the test case is **FAILED**. The contradicting operations are highlighted in RED color in the above table. This test case is also mentioned later in this report in the section

## TESTCASE#4

## TEST CASE

**From TS.txt**
```
Test#4: open 100 123 190 login 100 pin 123 logout
```

**As method call**
```
Test#4: open(100,123,190), login(100), pin(123), logout()
```

## TRANSITION TRAVERSED

```
T1, T2, T8, T9
```

## OUTPUT OF *ACCOUNT* CLASS

```
CS 589; Fall 2021
    PROJECT
Sukanta Sharma
   A2042623
```

_____
_____


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

190

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK

```
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
————————————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: LOGIN
————————————————————————————————————————————————————————

Enter Account#:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
————————————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
————————————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

7

Your choice is : 7
```

```
─────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: PIN
─────────────────────────────────────────────────────────

Enter PIN:

123

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

8

Your choice is : 8




─────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGOUT
─────────────────────────────────────────────────────────

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
```

```
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                    THANK YOU!!!
_____
```

## CORRECTNESS

| Function Called | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| **OPEN 100 123 190** | IDLE | 190 | 0 | IDLE | 190 | 0 |
| **LOGIN 100** | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |
| **PIN 123** | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| **LOGOUT** | IDLE | 190 | 0 | IDLE | 190 | 0 |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#5

## TEST CASE

**From TS.txt**

Test#5: open 100 123 300 login 100 pin 123 lock 321 unlock 321 withdraw 10 withdraw 100 deposit 100 lock 321 unlock 321 logout login 100 pin 123 deposit 10 logout login 100 pin 123 withdraw 10 logout login 100 pin 123 logout

**As method call**
Test#5: open(100,123,300), login(100), pin(123), lock(321), unlock(321), withdraw(10), withdraw(100), deposit(100), lock(321), unlock(321), logout(), login(100), pin(123), deposit(10), logout(), login(100), pin(123), withdraw(10), logout(), login(100), pin(123), logout()

## TRANSITION TRAVERSED

T1, T2, T18, T4, T17, T11, T14, T16, T4, T17, T10, T2, T18, T12, T10, T2, T18, T11, T10, T2, T18, T10

## OUTPUT OF *ACCOUNT* CLASS

```
CS 589; Fall 2021
    PROJECT
 Sukanta Sharma
   A2042623
```

## CORRECTNESS

| Function Called | Expected Result | | | Produced Result | | |
| --- | --- | --- | --- | --- | --- | --- |
| | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| **OPEN 100 123 300** | IDLE | 300 | 0 | IDLE | 300 | 0 |
| **LOGIN 100** | CHECK PIN | 300 | 0 | CHECK PIN | 300 | 0 |
| **PIN 123** | READY | 300 | 0 | READY | 300 | 0 |
| **LOCK 321** | LOCKED | 300 | 0 | LOCKED | 300 | 0 |
| **UNLOCK 321** | READY | 300 | 0 | READY | 300 | 0 |
| **WITHDRAW 10** | READY | 290 | 0 | READY | 290 | 0 |
| **WITHDRAW 100** | OVERDRAWN | 170 | 0 | OVERDRAWN | 170 | 0 |

| Function Called | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| DEPOSIT 100 | READY | 270 | 0 | READY | 270 | 0 |
| LOCK 321 | LOCKED | 270 | 0 | LOCKED | 270 | 0 |
| UNLOCK 321 | READY | 270 | 0 | READY | 270 | 0 |
| LOGOUT | IDLE | 270 | 0 | IDLE | 270 | 0 |
| LOGIN 100 | CHECK PIN | 270 | 0 | CHECK PIN | 270 | 0 |
| PIN 123 | READY | 270 | 0 | READY | 270 | 0 |
| DEPOSIT 10 | READY | 280 | 0 | READY | 280 | 0 |
| LOGOUT | IDLE | 280 | 0 | IDLE | 280 | 0 |
| LOGIN 100 | CHECK PIN | 280 | 0 | CHECK PIN | 280 | 0 |
| PIN 123 | READY | 280 | 0 | READY | 280 | 0 |
| WITHDRAW 10 | READY | 270 | 0 | READY | 270 | 0 |
| LOGOUT | IDLE | 270 | 0 | IDLE | 270 | 0 |
| LOGIN 100 | CHECK PIN | 270 | 0 | CHECK PIN | 270 | 0 |
| PIN 123 | READY | 270 | 0 | READY | 270 | 0 |
| LOGOUT | IDLE | 270 | 0 | IDLE | 270 | 0 |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#6

## TEST CASE

**From TS.txt**
```
Test#6: open 100 123 200 open 100 123 200 logout pin 123 deposit 100 withdraw
100 balance lock 321 unlock 321
```

**As method call**

Test#6: open(100,123,200), open(100,123,200), logout(), pin(123), deposit(100), withdraw(100), balance(), lock(321), unlock(321)

## TRANSITION TRAVERSED

T1

## OUTPUT OF *ACCOUNT* CLASS

```
                CS 589; Fall 2021
                    PROJECT
                 Sukanta Sharma
                   A2042623


_____
_____



Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
```

```
Enter PIN:

123
Enter initial balance:

200

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0
```

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

200

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
```

```
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT


Testing—Oriented Methods
————————————————————————————————————————————————————————————————
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver


Enter your choice:

8

Your choice is : 8




————————————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: LOGOUT
————————————————————————————————————————————————————————————————

              The value returned by the method is: —1 (FAILED)


Press Enter key to continue...




Driver for the Account
————————————————————————————————————————————————————————————————
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT


Testing—Oriented Methods
————————————————————————————————————————————————————————————————
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver


Enter your choice:

7

Your choice is : 7
```

```
————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: PIN
————————————————————————————————————————————————————————

Enter PIN:

123

                The value returned by the method is: −1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
————————————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
————————————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

1

Your choice is : 1
```

```
————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: DEPOSIT
————————————————————————————————————————————————————————

Enter Deposit Amount:

100

                The value returned by the method is: −1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
————————————————————————————————————————————————————————
```

```
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

100

                 The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3
```

```
_____
Class: Account
Type: Class Method
Method: BALANCE
_____

                    The value returned by the method is: Balance = -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

4

Your choice is : 4
```

```
_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
```

```
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
```

```
Quitting Account Driver...
_____
                      THANK YOU!!!
_____
```

## CORRECTNESS

| Function Called | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| OPEN 100 123 200 | IDLE | 200 | 0 | 0 | IDLE | 200 | 0 | 0 |
| OPEN 100 123 200 | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| LOGOUT | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| PIN 123 | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| DEPOSIT 100 | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| WITHDRAW 100 | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| BALANCE | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| LOCK 321 | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |
| UNLOCK 321 | IDLE | 200 | 0 | -1 | IDLE | 200 | 0 | -1 |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#7

## TEST CASE

**From TS.txt**
```
Test#7: open 100 123 200 login 100 open −100 123 200 login 100 deposit 100
withdraw 100 balance lock 321 unlock 0
```

**As method call**
```
Test#7:  open(100,123,200),   login(100),   open(−100,123,200),   login(100),
deposit(100), withdraw(100), balance(), lock(321), unlock(0)
```

## TRANSITION TRAVERSED

## T1, T2

## OUTPUT OF *ACCOUNT* CLASS

```
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                   PROJECT
                 Sukanta Sharma
                   A2042623

_____
_____


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

200

            The value returned by the method is: 0 (SUCCESS)

Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing—Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6
```

```
_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing—Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
```

```
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

-100
Enter PIN:

123
Enter initial balance:

200

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...





Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____
```

```
Enter Account#:

100

                 The value returned by the method is: −1 (FAILED)


Press Enter key to continue...




Driver for the Account
──────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing−Oriented Methods
──────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

1

Your choice is : 1




──────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: DEPOSIT
──────────────────────────────────────────────────────────────

Enter Deposit Amount:

100

                 The value returned by the method is: −1 (FAILED)


Press Enter key to continue...




Driver for the Account
──────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
```

```
        8. LOGOUT

Testing-Oriented Methods
——————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2
```

```
——————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: WITHDRAW
——————————————————————————————————————————————————

Enter Withdraw Amount:

100

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
——————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
——————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

3

Your choice is : 3
```

```
——————————————————————————————————————————————————
Class: Account
```

```
Type: Class Method
Method: BALANCE
_____

                        The value returned by the method is: Balance = −1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver

Enter your choice:

4

Your choice is : 4
```

```
_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321
                        The value returned by the method is: −1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
```

```
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

0

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                THANK YOU!!!


_____
```

## CORRECTNESS

| Function Called | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| OPEN 100 123 200 | IDLE | 200 | 0 | 0 | IDLE | 200 | 0 | 0 |
| LOGIN 100 | CHECK PIN | 200 | 0 | 0 | CHECK PIN | 200 | 0 | 0 |
| OPEN - 100 123 200 | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |
| LOGIN 100 | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |
| DEPOSIT 100 | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |
| WITHDRAW 100 | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |
| BALANCE | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |
| LOCK 321 | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |
| UNLOCK 0 | CHECK PIN | 200 | 0 | -1 | CHECK PIN | 200 | 0 | -1 |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#8

## TEST CASE

**From TS.txt**
Test#8: open 100 123 200 login 100 pin 123 open 100 −123 200 login 100 pin 123
withdraw 0 lock 123 unlock 123

**As method call**
Test#8:    open(100,123,200),    login(100),    pin(123),    open(100,−123,200),
login(100), pin(123), withdraw(0), lock(123), unlock(123)

## TRANSITION TRAVERSED

T1, T2, T18

## OUTPUT OF *ACCOUNT* CLASS

```
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                          PROJECT
                       Sukanta Sharma
                          A2042623


_____
_____


Press Enter key to continue...
```

```
Driver for the Account
_____

          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____

          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

          q. Quit Account Driver

Enter your choice:

0

Your choice is : 0
```

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

200

               The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
──────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
──────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




──────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGIN
──────────────────────────────────────────────────────

Enter Account#:

100

                 The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
──────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
──────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:
```

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:
```

123

```
                    The value returned by the method is: 0 (SUCCESS)
```

Press Enter key to continue...

```
Driver for the Account
_____

          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____

          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

          q. Quit Account Driver

Enter your choice:
```

0

Your choice is : 0

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:
```

100
```
Enter PIN:
```

-123
```
Enter initial balance:
```

200

```
                    The value returned by the method is: -1 (FAILED)
```

Press Enter key to continue...

Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing-Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


                q. Quit Account Driver

Enter your choice:

6

Your choice is : 6

_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                    The value returned by the method is: -1 (FAILED)

Press Enter key to continue...

Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing-Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE

```
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

Enter your choice:

7

Your choice is : 7

```
_____
Class: Account
Type: Class Method
Method: PIN
_____
```

Enter PIN:

123

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...

Driver for the Account
```
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT
```

Testing-Oriented Methods
```
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver
```

Enter your choice:

2

Your choice is : 2

```
_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____
```

Enter Withdraw Amount:

0

```
                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing-Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


                q. Quit Account Driver

Enter your choice:

4

Your choice is : 4
```

```
_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

123

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT

Testing-Oriented Methods
_____
```

```
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

123

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...





Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                THANK YOU!!!


_____
```

# CORRECTNESS

| Function Called | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| OPEN 100 123 200 | IDLE | 200 | 0 | 0 | IDLE | 200 | 0 | 0 |
| LOGIN 100 | CHECK PIN | 200 | 0 | 0 | CHECK PIN | 200 | 0 | 0 |
| PIN 123 | READY | 200 | 0 | 0 | READY | 200 | 0 | 0 |
| OPEN 100 -123 200 | READY | 200 | 0 | -1 | READY | 200 | 0 | -1 |
| LOGIN 100 | READY | 200 | 0 | -1 | READY | 200 | 0 | -1 |
| PIN 123 | READY | 200 | 0 | -1 | READY | 200 | 0 | -1 |
| WITHDRAW 0 | READY | 200 | 0 | -1 | READY | 200 | 0 | -1 |
| LOCK 123 | READY | 200 | 0 | -1 | READY | 200 | 0 | -1 |
| UNLOCK 123 | READY | 200 | 0 | -1 | READY | 200 | 0 | -1 |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#9

### TEST CASE

**From TS.txt**
Test#9: open 100 123 190 login 100 pin 123 open −100 −123 200 login 100 pin 123 withdraw 100 lock 123 unlock 321

**As method call**
Test#9: open(100,123,190), login(100), pin(123), open(−100,−123,200), login(100), pin(123), withdraw(100), lock(123), unlock(321)

### TRANSITION TRAVERSED

T1, T2, T8

### OUTPUT OF *ACCOUNT* CLASS

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```
            PROJECT
         Sukanta Sharma
          A2042623


_____
_____


Press Enter key to continue...
```

```
Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing—Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

0

Your choice is : 0
```

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

190

            The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

        0. OPEN
```

```
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
──────────────────────────────────────────────────────

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6
```

```
──────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGIN
──────────────────────────────────────────────────────

Enter Account#:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
──────────────────────────────────────────────────────

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
──────────────────────────────────────────────────────

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

7

Your choice is : 7
```

```
————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: PIN
————————————————————————————————————————————————————

Enter PIN:

123

                 The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
————————————————————————————————————————————————————

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
————————————————————————————————————————————————————

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: OPEN
————————————————————————————————————————————————————

Enter Account#:

-100
Enter PIN:

-123
Enter initial balance:

200

                 The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

            q. Quit Account Driver

Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
        q. Quit Account Driver


Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                The value returned by the method is: −1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing−Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

100

                The value returned by the method is: −1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
——————————————————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing—Oriented Methods
——————————————————————————————————————————————————————————————
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

4

Your choice is : 4
```

```
——————————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: LOCK
——————————————————————————————————————————————————————————————

Enter Lock#:

123

                  The value returned by the method is: —1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
——————————————————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT


Testing—Oriented Methods
——————————————————————————————————————————————————————————————
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
```

```
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

          q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

321

              The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

          q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                    THANK YOU!!!
_____
```

# CORRECTNESS

| Function Called | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| **OPEN 100 123 190** | IDLE | 190 | 0 | 0 | IDLE | 190 | 0 | 0 |
| **LOGIN 100** | CHECK PIN | 190 | 0 | 0 | CHECK PIN | 190 | 0 | 0 |
| **PIN 123** | OVERDRAWN | 190 | 0 | 0 | OVERDRAWN | 190 | 0 | 0 |
| **OPEN -100 -123 200** | **OVERDRAWN** | **190** | **0** | **-1** | **OVERDRAWN** | **190** | **0** | **-1** |
| **LOGIN 100** | **OVERDRAWN** | **190** | **0** | **-1** | **OVERDRAWN** | **190** | **0** | **-1** |
| **PIN 123** | **OVERDRAWN** | 190 | **0** | **-1** | **OVERDRAWN** | 190 | **0** | **-1** |
| **WITHDRAW 100** | **OVERDRAWN** | **190** | **0** | **-1** | **OVERDRAWN** | **190** | **0** | **-1** |
| **LOCK 123** | **OVERDRAWN** | 190 | **0** | **-1** | **OVERDRAWN** | 190 | **0** | **-1** |
| **UNLOCK 321** | **OVERDRAWN** | **190** | **0** | **-1** | **OVERDRAWN** | **190** | **0** | **-1** |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#10

## TEST CASE

**From TS.txt**
```
Test#10: open 100 123 190 login 100 pin 123 lock 321 open 100 123 -200 login
100 logout pin 123 deposit 100 withdraw 100 lock 321 unlock 12
```

**As method call**
```
Test#10: open(100,123,190), login(100), pin(123), lock(321), open(100,123,-
200), login(100), logout(), pin(123), deposit(100), withdraw(100), lock(321),
unlock(12)
```

## TRANSITION TRAVERSED

```
T1, T2, T8, T20
```

## OUTPUT OF ACCOUNT CLASS

```
            CS 589; Fall 2021
                PROJECT
             Sukanta Sharma
                A2042623
```

_____
_____


Press Enter key to continue...




Driver for the Account
_____

            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
_____

            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

190

            The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____

```
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
────────────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: LOGIN
────────────────────────────────────────────────────────────

Enter Account#:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
────────────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
────────────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

7

Your choice is : 7
```

```
_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

4

Your choice is : 4
```

```
_____
Class: Account
Type: Class Method
Method: LOCK
_____

Enter Lock#:

321

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT


Testing-Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


                q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

-200

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
                0. OPEN
                1. DEPOSIT
                2. WITHDRAW
                3. BALANCE
                4. LOCK
                5. UNLOCK
                6. LOGIN
                7. PIN
                8. LOGOUT


Testing-Oriented Methods
_____
                a. SHOW BALANCE
                b. SHOW STATE
                c. SHOW LOCKED STATUS
                d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
        q. Quit Account Driver


Enter your choice:

6

Your choice is : 6




_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver


Enter your choice:

8

Your choice is : 8




_____
Class: Account
Type: Class Method
Method: LOGOUT
_____

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

7

Your choice is : 7




─────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: PIN
─────────────────────────────────────────────────────────

Enter PIN:

123

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS
```

```
          q. Quit Account Driver

Enter your choice:

1

Your choice is : 1




————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: DEPOSIT
————————————————————————————————————————————————————

Enter Deposit Amount:

100

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
————————————————————————————————————————————————————
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
————————————————————————————————————————————————————
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

          q. Quit Account Driver

Enter your choice:

2

Your choice is : 2




————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: WITHDRAW
————————————————————————————————————————————————————

Enter Withdraw Amount:

100

                    The value returned by the method is: -1 (FAILED)
```

Press Enter key to continue...

Driver for the Account
————————————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
————————————————————————————————————————————————————————
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver

Enter your choice:

4

Your choice is : 4

————————————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: LOCK
————————————————————————————————————————————————————————

Enter Lock#:

321

                  The value returned by the method is: —1 (FAILED)

Press Enter key to continue...

Driver for the Account
————————————————————————————————————————————————————————
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing—Oriented Methods
————————————————————————————————————————————————————————
            a. SHOW BALANCE
            b. SHOW STATE

```
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

5

Your choice is : 5




_____
Class: Account
Type: Class Method
Method: UNLOCK
_____

Enter Lock#:

12

                 The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                 THANK YOU!!!
_____
```

# CORRECTNESS

| Function Called | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|
| | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| OPEN 100 123 190 | IDLE | 190 | 0 | 0 | IDLE | 190 | 0 | 0 |
| LOGIN 100 | CHECK PIN | 190 | 0 | 0 | CHECK PIN | 190 | 0 | 0 |
| PIN 123 | OVERDRAWN | 190 | 0 | 0 | OVERDRAWN | 190 | 0 | 0 |
| LOCK 321 | LOCKED | 190 | 0 | 0 | LOCKED | 190 | 0 | 0 |
| OPEN 100 123 -200 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| LOGIN 100 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| LOGOUT | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| PIN 123 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| DEPOSIT 100 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| WITHDRAW 100 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| LOCK 321 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |
| UNLOCK 12 | **LOCKED** | **190** | **0** | **-1** | **LOCKED** | **190** | **0** | **-1** |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## TESTCASE#11

## TEST CASE

**From TS.txt**
Test#11: open −100 123 200 open 100 −123 200 open −100 −123 200 open 100 123 −200 open −100 123 −200 open 100 −123 −200 open −100 −123 −200 open 100 123 190 open −100 123 −200 open 100 −123 −200 open −100 −123 −200 login 100 pin 123 withdraw 200 withdraw −10 deposit 0 deposit 100 deposit −10

**As method call**
Test#11:    open(−100,123,200),    open(100,−123,200),    open(−100,−123,200), open(100,123,−200), open(−100,123,−200), open(100,−123,−200), open(−100,−123,−200), open(100,123,190), open(−100,123,−200), open(100,−123,−200), open(−100,−123,−200), login(100), pin(123), withdraw(200), withdraw(−10), deposit(0), deposit(100), deposit(−10)

## TRANSITION TRAVERSED

`T1, T2, T8, T16`

## OUTPUT OF *ACCOUNT* CLASS

```
              CS 589; Fall 2021
                  PROJECT
               Sukanta Sharma
                  A2042623


_____
_____


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

-100
Enter PIN:

123
Enter initial balance:

200
```

```
                     The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____
          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____
Enter Account#:

100
Enter PIN:

-123
Enter initial balance:

200

                     The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
```

```
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

-100
Enter PIN:

-123
Enter initial balance:

200

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

0

Your choice is : 0
```

```
——————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: OPEN
——————————————————————————————————————————————————

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

-200

                  The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
——————————————————————————————————————————————————
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
——————————————————————————————————————————————————
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0
```

```
——————————————————————————————————————————————————
Class: Account
Type: Class Method
Method: OPEN
——————————————————————————————————————————————————

Enter Account#:

-100
Enter PIN:

123
Enter initial balance:

-200

                  The value returned by the method is: -1 (FAILED)
```

```
Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




─────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: OPEN
─────────────────────────────────────────────────────────────

Enter Account#:

100
Enter PIN:

-123
Enter initial balance:

-200

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
```

```
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




─────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: OPEN
─────────────────────────────────────────────────────────

Enter Account#:

-100
Enter PIN:

-123
Enter initial balance:

-200

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
─────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
─────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

0

Your choice is : 0
```

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

123
Enter initial balance:

190

                    The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

0

Your choice is : 0
```

```
_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

-100
Enter PIN:

123
Enter initial balance:

-200

                    The value returned by the method is: -1 (FAILED)
```

```
Press Enter key to continue...




Driver for the Account
_____

          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT

Testing-Oriented Methods
_____

          a. SHOW BALANCE
          b. SHOW STATE
          c. SHOW LOCKED STATUS
          d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


          q. Quit Account Driver

Enter your choice:

0

Your choice is : 0




_____
Class: Account
Type: Class Method
Method: OPEN
_____

Enter Account#:

100
Enter PIN:

-123
Enter initial balance:

-200

               The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____

          0. OPEN
          1. DEPOSIT
          2. WITHDRAW
          3. BALANCE
          4. LOCK
          5. UNLOCK
          6. LOGIN
          7. PIN
          8. LOGOUT
```

```
Testing-Oriented Methods
───────────────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

0

Your choice is : 0




───────────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: OPEN
───────────────────────────────────────────────────────────────
Enter Account#:

-100
Enter PIN:

-123
Enter initial balance:

-200

                   The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
───────────────────────────────────────────────────────────────
            0. OPEN
            1. DEPOSIT
            2. WITHDRAW
            3. BALANCE
            4. LOCK
            5. UNLOCK
            6. LOGIN
            7. PIN
            8. LOGOUT

Testing-Oriented Methods
───────────────────────────────────────────────────────────────
            a. SHOW BALANCE
            b. SHOW STATE
            c. SHOW LOCKED STATUS
            d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


            q. Quit Account Driver


Enter your choice:

6

Your choice is : 6
```

```
_____
Class: Account
Type: Class Method
Method: LOGIN
_____

Enter Account#:

100

                  The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS

        q. Quit Account Driver

Enter your choice:

7

Your choice is : 7




_____
Class: Account
Type: Class Method
Method: PIN
_____

Enter PIN:

123

                  The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...




Driver for the Account
_____
```

```
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2




_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

200

                The value returned by the method is: -1 (FAILED)


Press Enter key to continue...




Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

2

Your choice is : 2
```

```
_____
Class: Account
Type: Class Method
Method: WITHDRAW
_____

Enter Withdraw Amount:

-10

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
_____
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver

Enter your choice:

1

Your choice is : 1
```

```
_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

0

                    The value returned by the method is: -1 (FAILED)


Press Enter key to continue...
```

```
Driver for the Account
───────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
───────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

1

Your choice is : 1
```

```
───────────────────────────────────────────────────────────
Class: Account
Type: Class Method
Method: DEPOSIT
───────────────────────────────────────────────────────────

Enter Deposit Amount:

100

                The value returned by the method is: 0 (SUCCESS)


Press Enter key to continue...
```

```
Driver for the Account
───────────────────────────────────────────────────────────
        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT


Testing-Oriented Methods
───────────────────────────────────────────────────────────
        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:
```

```
1

Your choice is : 1




_____
Class: Account
Type: Class Method
Method: DEPOSIT
_____

Enter Deposit Amount:

-10
                   The value returned by the method is: -1 (FAILED)

Press Enter key to continue...




Driver for the Account
_____

        0. OPEN
        1. DEPOSIT
        2. WITHDRAW
        3. BALANCE
        4. LOCK
        5. UNLOCK
        6. LOGIN
        7. PIN
        8. LOGOUT

Testing-Oriented Methods
_____

        a. SHOW BALANCE
        b. SHOW STATE
        c. SHOW LOCKED STATUS
        d. SHOW NUMBER OF UNSECCESSFUL LOGIN ATTEMPTS


        q. Quit Account Driver


Enter your choice:

q

Your choice is : q
Quitting Account Driver...
_____
                   THANK YOU!!!
_____
```

## CORRECTNESS

| Function Called | Transition | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| **OPEN - 100 123 200** | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |

| Function Called | Transition | Expected Result | | | | Produced Result | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value | State After Transition | Balance | No. of Unsuccessful Attempt | Return Value |
| OPEN 100 -123 200 | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |
| OPEN -100 -123 200 | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |
| OPEN 100 123 -200 | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |
| OPEN -100 123 -200 | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |
| OPEN 100 -123 -200 | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |
| OPEN -100 -123 -200 | | START | 0 | 0 | -1 | START | 0 | 0 | -1 |
| OPEN 100 123 190 | T1 | IDLE | 190 | 0 | 0 | IDLE | 190 | 0 | 0 |
| OPEN -100 123 -200 | | IDLE | 190 | 0 | -1 | IDLE | 190 | 0 | -1 |
| OPEN 100 -123 -200 | | IDLE | 190 | 0 | -1 | IDLE | 190 | 0 | -1 |
| OPEN -100 -123 -200 | | IDLE | 190 | 0 | -1 | IDLE | 190 | 0 | -1 |
| LOGIN 100 | T2 | CHECK PIN | 190 | 0 | 0 | CHECK PIN | 190 | 0 | 0 |
| PIN 123 | T8 | OVERDRAWN | 190 | 0 | 0 | OVERDRAWN | 190 | 0 | 0 |
| WITHDRAW 200 | | OVERDRAWN | 190 | 0 | -1 | OVERDRAWN | 190 | 0 | -1 |
| WITHDRAW -10 | | OVERDRAWN | 190 | 0 | -1 | OVERDRAWN | 190 | 0 | -1 |
| DEPOSIT 0 | | OVERDRAWN | 190 | 0 | -1 | OVERDRAWN | 190 | 0 | -1 |
| DEPOSIT 100 | T16 | READY | 290 | 0 | 0 | READY | 290 | 0 | 0 |
| DEPOSIT -10 | | READY | 290 | 0 | -1 | READY | 290 | 0 | -1 |

As from the above table we can see that expected results are matched with produced result. Hence the test case is **PASSED**.

## LIST OF FAILED TEST CASES

## TESTCASE#1

### INCORRECT PRODUCED OUTPUT AND EXPECTED CORRECT OUTPUT

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| OPEN 100 123 200 | T1 | IDLE | 200 | 0 | IDLE | 200 | 0 |
| LOGIN 150 | T7 | IDLE | 200 | 0 | IDLE | 200 | 0 |
| LOGIN 140 | T7 | IDLE | 200 | 0 | IDLE | 200 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 200 | 0 | CHECK PIN | 200 | 0 |
| PIN 1 | T3 | CHECK PIN | 200 | 1 | CHECK PIN | 200 | 1 |
| PIN 2 | T3 | CHECK PIN | 200 | 2 | CHECK PIN | 200 | 2 |
| PIN 3 | T6 | IDLE | 200 | 2 | IDLE | 200 | 3 |
| LOGIN 150 | T7 | IDLE | 200 | 2 | IDLE | 200 | 3 |
| LOGIN 100 | T2 | CHECK PIN | 200 | 0 | CHECK PIN | 200 | 0 |
| LOGOUT | T5 | IDLE | 200 | 0 | IDLE | 200 | 0 |
| LOGIN 140 | T7 | IDLE | 200 | 0 | IDLE | 200 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 200 | 0 | CHECK PIN | 200 | 0 |
| PIN 123 | T18 | READY | 200 | 0 | READY | 200 | 0 |
| BALANCE | T13 | READY | 200 | 0 | READY | 200 | 0 |
| BALANCE | T13 | READY | 200 | 0 | READY | 200 | 0 |
| DEPOSIT 50 | T12 | READY | 250 | 0 | READY | 250 | 0 |
| DEPOSIT 50 | T12 | READY | 300 | 0 | READY | 300 | 0 |

| Function Called | Transi tion | Expected Result | | | | Produced Result | | |
|---|---|---|---|---|---|---|---|---|
| | | State After Transition | Bala nce | No. of Unsuccessful Attempt | | State After Transition | Bala nce | No. of Unsuccessful Attempt |
| LOCK 321 | T4 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| BALANCE | T15 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| BALANCE | T15 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| UNLOCK 321 | T17 | READY | 300 | 0 | | READY | 300 | 0 |
| LOCK 321 | T4 | LOCKED | 300 | 0 | | LOCKED | 300 | 0 |
| UNLOCK 321 | T17 | READY | 300 | 0 | | READY | 300 | 0 |
| BALANCE | T13 | READY | 300 | 0 | | READY | 300 | 0 |
| WITHDRA W 10 | T11 | READY | 290 | 0 | | READY | 290 | 0 |
| WITHDRA W 10 | T11 | READY | 280 | 0 | | READY | 280 | 0 |
| BALANCE | T13 | READY | 280 | 0 | | READY | 280 | 0 |
| WITHDRA W 100 | T14 | OVERDRAWN | 160 | 0 | | OVERDRAWN | 160 | 0 |
| LOCK 321 | T20 | LOCKED | 160 | 0 | | LOCKED | 160 | 0 |
| BALANCE | T15 | LOCKED | 160 | 0 | | LOCKED | 160 | 0 |
| UNLOCK 321 | T19 | OVERDRAWN | 160 | 0 | | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 160 | 0 | | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 160 | 0 | | OVERDRAWN | 160 | 0 |
| DEPOSIT 20 | T21 | OVERDRAWN | 170 | 0 | | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 170 | 0 | | OVERDRAWN | 160 | 0 |

| Function Called | Transi tion | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Bala nce | No. of Unsuccessful Attempt | State After Transition | Bala nce | No. of Unsuccessful Attempt |
| LOCK 321 | T20 | LOCKED | 170 | 0 | LOCKED | 160 | 0 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 0 | OVERDRAWN | 160 | 0 |
| BALANCE | T22 | OVERDRAWN | 170 | 0 | OVERDRAWN | 160 | 0 |
| DEPOSIT 100 | T16 | READY | 270 | 0 | READY | 260 | 0 |
| BALANCE | T13 | READY | 270 | 0 | READY | 260 | 0 |
| LOGOUT | T10 | IDLE | 270 | 0 | IDLE | 260 | 0 |
| LOGIN 140 | T7 | IDLE | 270 | 0 | IDLE | 260 | 0 |

As from the above table we can see that expected results are not matched with produced result. Hence the test case is **FAILED**. The contradicting operations are highlighted in RED color in the above table. The transition *T6* and *T21* have bug in the source code. The cause of failure is given later in this report in the section of Cause of Failure.

## TESTCASE#2

### INCORRECT PRODUCED OUTPUT AND EXPECTED CORRECT OUTPUT

| Function Called | Transi tion | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Bala nce | No. of Unsuccessful Attempt | State After Transition | Bala nce | No. of Unsuccessful Attempt |
| OPEN 100 123 190 | T1 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |
| PIN 123 | T8 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| BALANCE | T22 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| LOGOUT | T9 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| LOGIN 135 | T7 | IDLE | 190 | 0 | IDLE | 190 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |
| PIN 123 | T8 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| DEPOSIT 10 | T21 | OVERDRAWN | 190 | 0 | READY | 200 | 0 |
| DEPOSIT 10 | T21 | OVERDRAWN | 190 | 0 | READY | 210 | 0 |
| LOCK 321 | T20 | LOCKED | 190 | 0 | LOCKED | 210 | 0 |
| UNLOCK 321 | T19 | OVERDRAWN | 190 | 0 | READY | 210 | 0 |
| DEPOSIT 10 | T21 | OVERDRAWN | 190 | 0 | READY | 220 | 0 |
| DEPOSIT 100 | T16 | READY | 290 | 0 | READY | 320 | 0 |
| WITHDRAW 100 | T14 | OVERDRAWN | 170 | 0 | READY | 220 | 0 |
| BALANCE | T22 | OVERDRAWN | 170 | 0 | READY | 220 | 0 |
| LOGOUT | T9 | IDLE | 170 | 0 | IDLE | 220 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 0 |
| PIN 1 | T3 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 1 |
| LOGOUT | T5 | IDLE | 170 | 0 | IDLE | 220 | 1 |
| LOGIN 100 | T2 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 0 |
| PIN 2 | T3 | CHECK PIN | 170 | 1 | CHECK PIN | 220 | 1 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| PIN 2 | T3 | CHECK PIN | 170 | 2 | CHECK PIN | 220 | 2 |
| PIN 2 | T6 | IDLE | 170 | 2 | IDLE | 220 | 3 |
| LOGIN 100 | T2 | CHECK PIN | 170 | 0 | CHECK PIN | 220 | 0 |
| PIN 2 | T3 | CHECK PIN | 170 | 1 | CHECK PIN | 220 | 1 |
| PIN 123 | T8 | OVERDRAWN | 170 | 1 | READY | 220 | 1 |
| LOCK 321 | T20 | LOCKED | 170 | 1 | LOCKED | 220 | 1 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 1 | READY | 220 | 1 |
| LOCK 321 | T20 | LOCKED | 170 | 1 | LOCKED | 220 | 1 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 1 | READY | 220 | 1 |
| DEPOSIT 10 | T21 | OVERDRAWN | 170 | 1 | READY | 230 | 1 |
| LOGOUT | T9 | IDLE | 170 | 1 | IDLE | 230 | 1 |

As from the above table we can see that expected results are not matched with produced result. Hence the test case is **FAILED**. The contradicting operations are highlighted in RED color in the above table. The transition *T6* and *T21* have bug in the source code. The cause of failure is given later in this report in the section of Cause of Failure.

## TESTCASE#3

### INCORRECT PRODUCED OUTPUT AND EXPECTED CORRECT OUTPUT

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| OPEN 100 123 190 | T1 | IDLE | 190 | 0 | IDLE | 190 | 0 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| LOGIN 100 | T2 | CHECK PIN | 190 | 0 | CHECK PIN | 190 | 0 |
| PIN 123 | T8 | OVERDRAWN | 190 | 0 | OVERDRAWN | 190 | 0 |
| DEPOSIT 100 | T16 | READY | 290 | 0 | READY | 290 | 0 |
| LOGOUT | T10 | IDLE | 290 | 0 | IDLE | 290 | 0 |
| LOGIN 100 | T2 | CHECK PIN | 290 | 0 | CHECK PIN | 290 | 0 |
| PIN 2 | T3 | CHECK PIN | 290 | 1 | CHECK PIN | 290 | 1 |
| PIN 123 | T18 | READY | 290 | 1 | READY | 290 | 1 |
| WITHDRAW 100 | T14 | OVERDRAWN | 170 | 1 | OVERDRAWN | 170 | 1 |
| **DEPOSIT 10** | **T21** | **OVERDRAWN** | **170** | **1** | **OVERDRAWN** | **160** | **1** |
| LOCK 321 | T20 | LOCKED | 170 | 1 | LOCKED | 160 | 1 |
| UNLOCK 321 | T19 | OVERDRAWN | 170 | 1 | OVERDRAWN | 160 | 1 |
| DEPOSIT 100 | T16 | READY | 270 | 1 | READY | 260 | 1 |
| DEPOSIT 10 | T12 | READY | 280 | 1 | READY | 270 | 1 |
| BALANCE | T13 | READY | 280 | 1 | READY | 270 | 1 |
| LOCK 321 | T4 | LOCKED | 280 | 1 | LOCKED | 270 | 1 |
| UNLOCK 321 | T17 | READY | 280 | 1 | READY | 270 | 1 |
| WITHDRAW 100 | T14 | OVERDRAWN | 160 | 1 | OVERDRAWN | 150 | 1 |

| Function Called | Transition | Expected Result | | | Produced Result | | |
|---|---|---|---|---|---|---|---|
| | | State After Transition | Balance | No. of Unsuccessful Attempt | State After Transition | Balance | No. of Unsuccessful Attempt |
| DEPOSIT 100 | T16 | READY | 260 | 1 | READY | 250 | 1 |
| WITHDRAW 10 | T11 | READY | 250 | 1 | READY | 240 | 1 |
| DEPOSIT 10 | T12 | READY | 260 | 1 | READY | 250 | 1 |
| WITHDRAW 10 | T11 | READY | 250 | 1 | READY | 240 | 1 |
| LOCK 321 | T4 | LOCKED | 250 | 1 | LOCKED | 240 | 1 |
| UNLOCK 321 | T17 | READY | 250 | 1 | READY | 240 | 1 |
| DEPOSIT 10 | T12 | READY | 260 | 1 | READY | 250 | 1 |
| WITHDRAW 100 | T14 | OVERDRAWN | 140 | 1 | OVERDRAWN | 130 | 1 |
| LOGOUT | T9 | IDLE | 140 | 1 | IDLE | 130 | 1 |
| LOGIN 100 | T2 | CHECK PIN | 140 | 0 | CHECK PIN | 130 | 0 |
| PIN 123 | T8 | OVERDRAWN | 140 | 0 | OVERDRAWN | 130 | 0 |
| LOGOUT | T9 | IDLE | 140 | 0 | IDLE | 130 | 0 |

As from the above table we can see that expected results are not matched with produced result. Hence the test case is **FAILED**. The contradicting operations are highlighted in RED color in the above table. The transition *T6* and *T21* have bug in the source code. The cause of failure is given later in this report in the section of Cause of Failure.

## CAUSE OF FAILURE

### TRANSITION – *T6*

According to given Figure 1: EFSM of *Account* class T6 will be executed if number of unsuccessful login attempts is 2. It  will be moved to IDLE state, so the number of unsuccessful attempts will be 2 after this transition but in the

given code it is being incremented always if given pin is incorrect. EFSM figure does not mention about incrementing number of attempts in transition T6. The below code is for *pin()* method from *account* class.

```
/**
 * provides pin # (parameter x)
 *
 * @param x PIN
 * @return the value returned by the method 0 --> Successful, -1 --> ERROR
 */
public final int pin(int x) {
    if (x4 != 1) { // Check if the current state is CHECK PIN
        return -1;
    }
    if (x == x3) {
        x4 = 2;
        return 0;
    } else {
        x9++;
    }
    if (x9 >= x0) {
        x4 = 0;
    }
    return -1;
}
```

Figure 3: *pin()* method from *account* class

## TRANSITION – *T21*

According to given Figure 1: EFSM of *Account* class T21 will be executed if it is already in OVERDRAWN state while depositing an amount such that after deposit the final balance will be less than $200. In such situation a $10 fee will be imposed but in the given code a $20 fee (stored in constant variable named *x6*) has been imposed here. The below code is for *variable declaration of x6, account() constructor* for variable initialization with $20 fee and *deposit()* method of account class and the portion of the and the line is highlighted that has the bug.

```
/**
 * Transaction Fee
 */
private int x6;
```

Figure 4:Variable declaration of *x6*

```
/**
 * Constructor for parameters initialization
 */
public account() {
    x2 = 0;
    x4 = -1;
    x6 = 20;
    x7 = 200;
    x9 = 0;
    x0 = 3;
}
```

**Figure 5:** *account()* **constructor for variable initialization with $20 fee**

```
/**
 * deposits amount d to the account
 *
 * @param d Amount to deposit
 * @return the value returned by the method 0 --> Successful, -1 --> ERROR
 */
public final int deposit(int d) {
    if (x4 != 2) {
        return -1;
    }
    if (x2 == 1) {
        return -1;
    }
    ;
    if ((x1 + d < x7) && (d > 0)) {
        x1 = x1 + d - x6; // TODO BUG
        return 0;
    } else {
        if (d > 0) {
            x1 = x1 + d;
            return 0;
        }
    }
    return -1;
}
```

**Figure 6:** *deposit()* **method of** *account* **class**

## INSTRUCTION TO EXECUTE TEST CASES

The submission is given as zip file named "CS589ProjectSubmission_Sukanta.zip". After extracting the zip, there are 6 items in the folder:

- Account class $\rightarrow$ account.java
- Driver class $\rightarrow$ TestDriver.java
- Test suit $\rightarrow$ TS.txt
- Test suite checker $\rightarrow$ test_suite_checker.exe
- Test Executable jar file $\rightarrow$ TestDriver_Sukanta.jar
- Test Executable exe file $\rightarrow$ TestDriver_Sukanta.exe
- Project Report $\rightarrow$ Project_Report_Sukanta.pdf

## MINIMUM SYSTEM REQUIREMENT

To run the test, suit a system is required with JRE installed of minimum version of JRE SE 1.7.0.

## VALIDATE TEST SUITE

To validate the test case run "test_suite_checker.exe" and press enter key to continue. It will verify the test suit and if there are no error exits, we can proceed with testing.
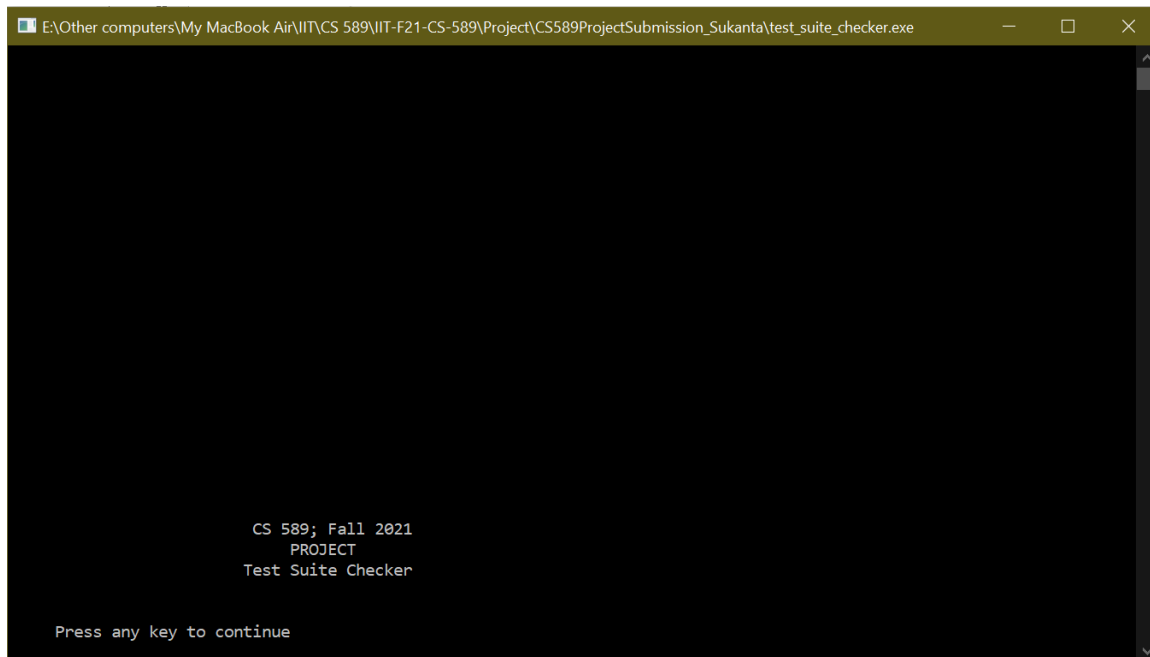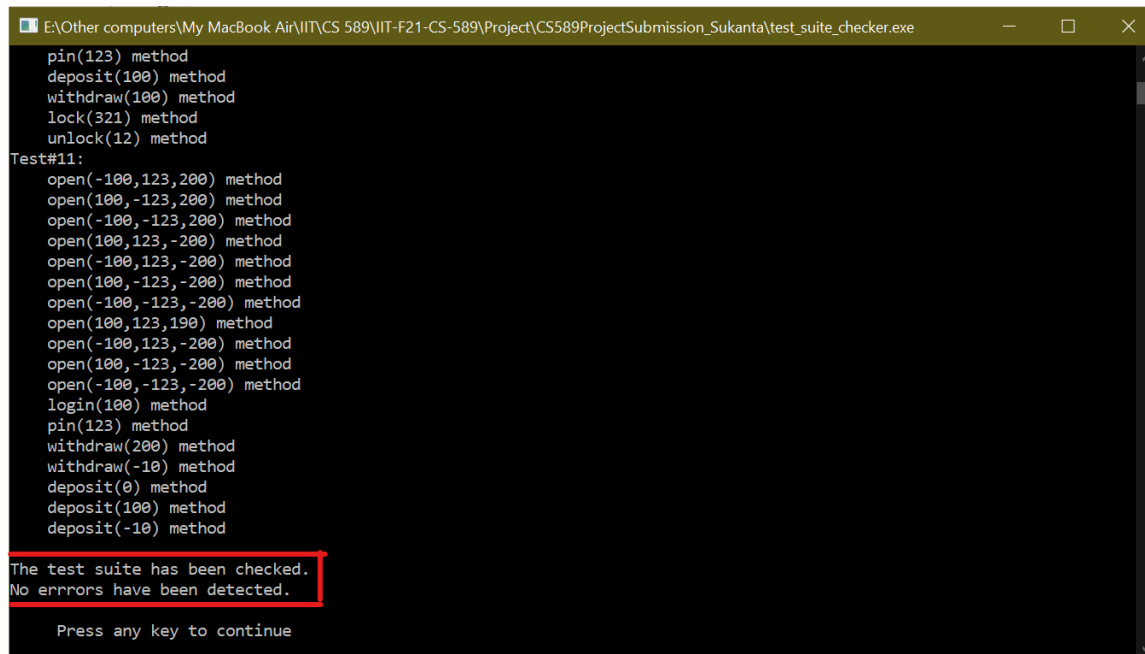


**Figure 7:Test suite checker**

**Figure 8: Test suite checker with no errors detected**

There are no error in the test suit, so we can start with testing. Extract
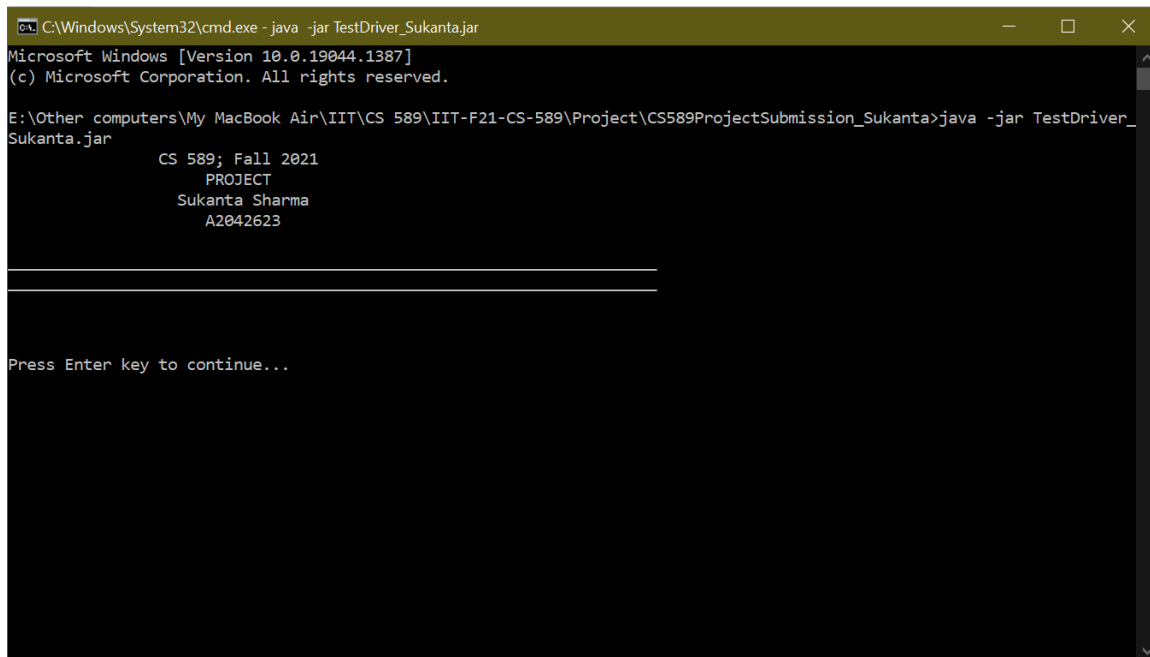
## EXECUTION ON WINDOWS SYSTEM

The test driver can be run on Windows machine using the following method:

1. Open command prompt in the folder location and execute the command "java -jar TestDriver_Sukanta.jar".

**Figure 9:Run Executable JAR file in Windows**

2.  Run "TestDriver_Sukanta.exe"



**Figure 10: Run executable exe file in Windows**

Press enter key to continue.
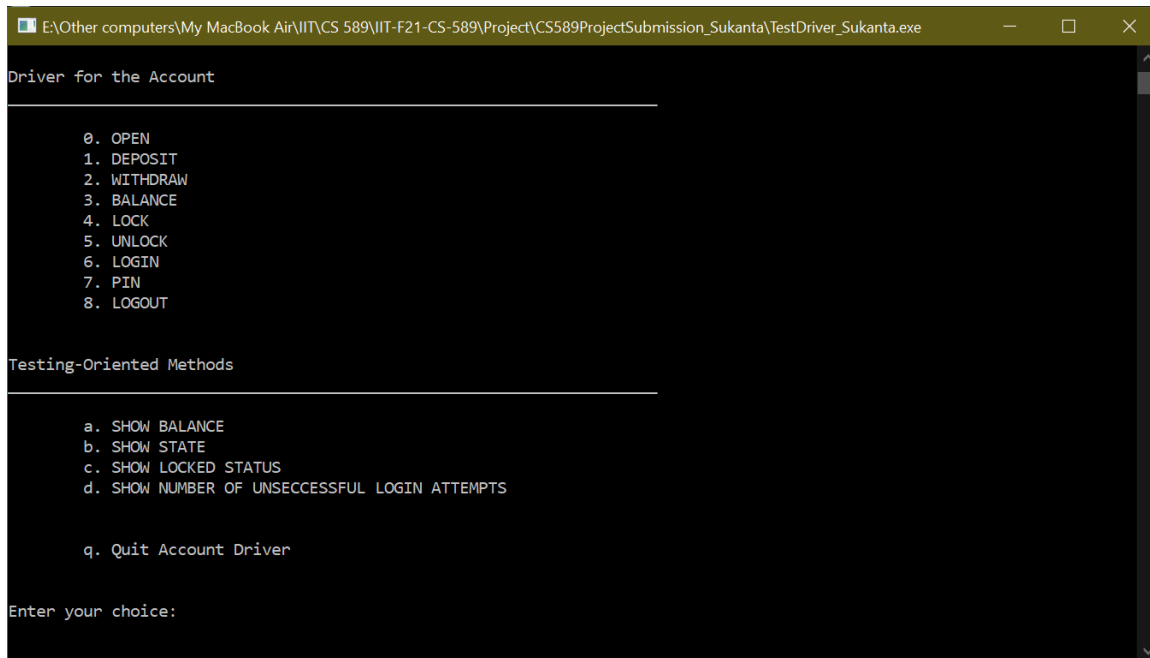
**Figure 11: Test Environment Menu in Windows**

## EXECUTION ON MAC/NON-WINDOWS SYSTEM

Open terminal in the same folder and run the command "java -jar TestDriver_Sukanta.jar"
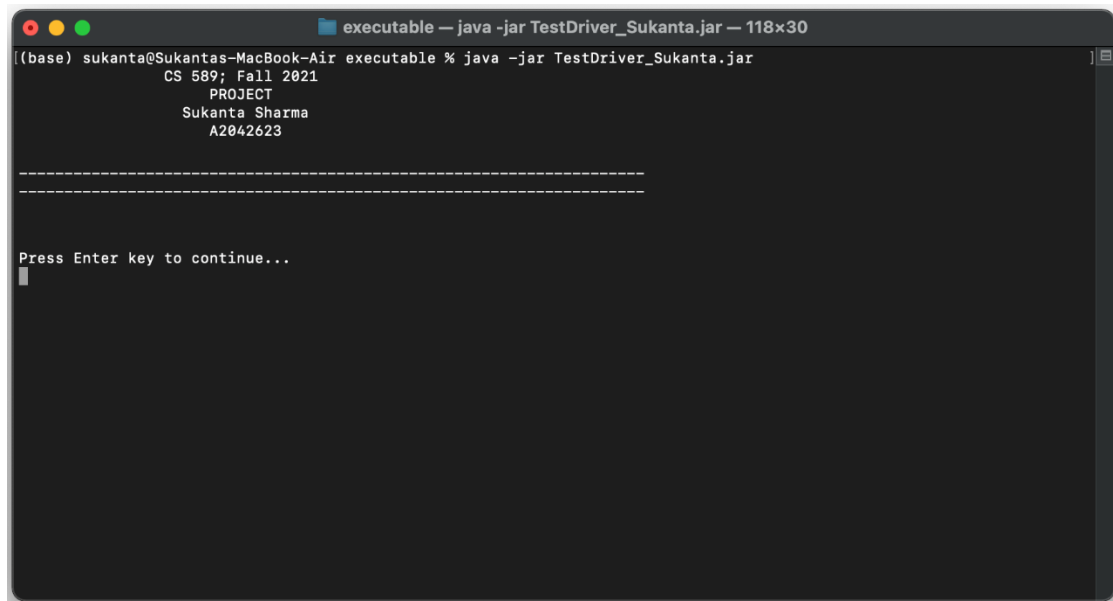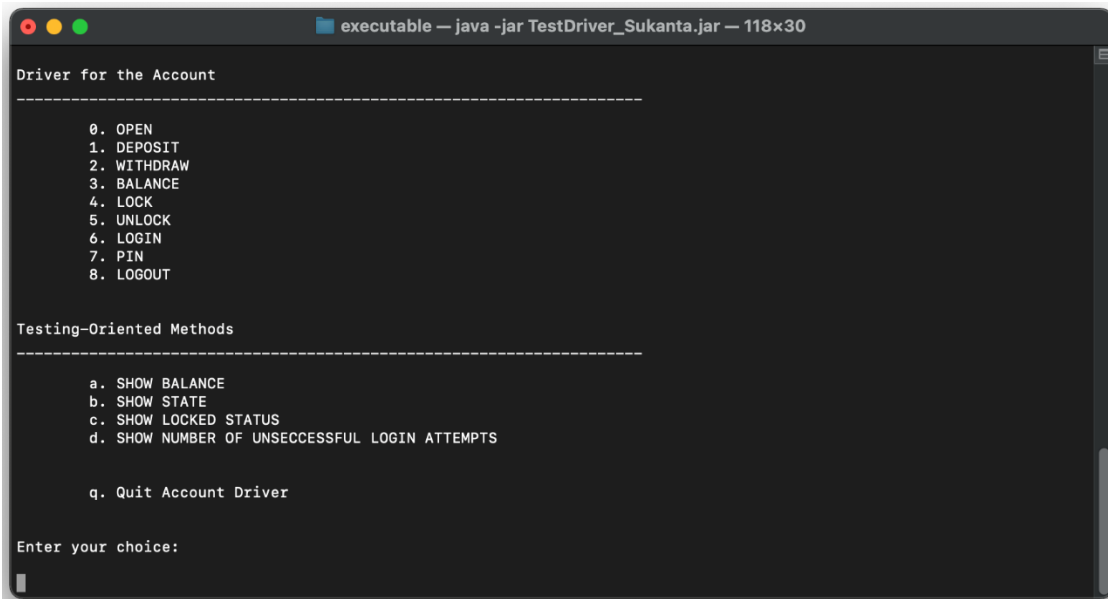


**Figure 12:Run executable JAR in MAC**

Press enter key to continue

**Figure 13:Test environment menu in MAC**

## CONCLUSION

The implementation of testing environment was second most time-consuming part after the test case writing. Testing-oriented methods helped me to get the values of variables at any given point in time. The environment gives the performed test case and results at each step. This part we have semi-automated to speed up with the testing and verification part. To automate more, we can create a data set with operation and expected results and we can design a testing environment such that it accepts the given dataset as input, and it can compare the produced results with the given expected results and prompt for failed/passed test cases. Although, we need to still investigate the code to detect and fix the bug if any.