

## PROBLEM 1:

## TEST CASE TABLE:

|    | A                | B             | C               | D     | E                | F            | G           | H     |
|----|------------------|---------------|-----------------|-------|------------------|--------------|-------------|-------|
| 1  | Inputs           |               |                 |       | Expected Outputs |              |             |       |
| 2  | Test Case Number | cruiseEngaged | Distance (feet) | timer | Red Light        | Yellow Light | Green Light | timer |
| 3  | 1                | TRUE          | 500.1           | 0     | FALSE            | FALSE        | TRUE        | 0     |
| 4  | 2                | FALSE         | 500.1           | 0     | FALSE            | FALSE        | FALSE       | 0     |
| 5  | 3                | TRUE          | 150.0           | 0     | FALSE            | TRUE         | FALSE       | 0     |
| 6  | 4                | TRUE          | 75.1            | 0     | TRUE             | TRUE         | FALSE       | 0     |
| 7  | 5                | TRUE          | 49.9            | 1     | FALSE            | FALSE        | FALSE       | 0     |
| 8  | 6                | TRUE          | 50.0            | 1     | TRUE             | FALSE        | FALSE       | 1     |
| 9  | 7                | TRUE          | 49.9            | 0     | TRUE             | FALSE        | FALSE       | 1     |
| 10 | 8                | TRUE          | 500.0           | 0     | FALSE            | TRUE         | FALSE       | 0     |
| 11 | 9                | TRUE          | 149.9           | 0     | TRUE             | TRUE         | FALSE       | 0     |
| 12 | 10               | TRUE          | 75.0            | 0     | TRUE             | FALSE        | FALSE       | 0     |
| 13 | 11               | TRUE          | 0.0             | 0     | TRUE             | FALSE        | FALSE       | 1     |
| 14 | 12               | TRUE          | 2,000.0         | 0     | FALSE            | FALSE        | TRUE        | 0     |

## JUNIT,JACOCO COVERAGE:

The screenshot displays the JUnit test results and JaCoCo coverage for the `Problem1Class.java` file. The test results show 12/12 runs completed successfully with 0 errors and 0 failures. The coverage report indicates that 18.8% of the code is covered, with 124 instructions covered and 534 instructions missed.

**JUnit Test Results:**

- Runs: 12/12
- Errors: 0
- Failures: 0
- Finished after 0.053 seconds
- Test Suite: Homework5.Problem1ClassTest [Runner: JUnit 4] (0.000 s)
- Test Case: testDetermine (0.000 s)
- Test Results:
  - [0] 1,TRUE,500.10,0,FALSE,FALSE,TRUE,0 (testDetermine) (0.000 s)
  - [1] 2,FALSE,500.10,0,FALSE,FALSE,FALSE,0 (testDetermine) (0.000 s)
  - [2] 3,TRUE,150.00,0,FALSE,TRUE,FALSE,0 (testDetermine) (0.000 s)
  - [3] 4,TRUE,75.10,0,TRUE,TRUE,FALSE,0 (testDetermine) (0.000 s)
  - [4] 5,TRUE,49.90,1,FALSE,FALSE,FALSE,0 (testDetermine) (0.000 s)
  - [5] 6,TRUE,50.00,1,TRUE,FALSE,FALSE,1 (testDetermine) (0.000 s)
  - [6] 7,TRUE,49.90,0,TRUE,FALSE,FALSE,1 (testDetermine) (0.000 s)
  - [7] 8,TRUE,500.00,0,FALSE,TRUE,FALSE,0 (testDetermine) (0.000 s)
  - [8] 9,TRUE,149.90,0,TRUE,TRUE,FALSE,0 (testDetermine) (0.000 s)
  - [9] 10,TRUE,75.00,0,TRUE,FALSE,FALSE,0 (testDetermine) (0.000 s)
  - [10] 11,TRUE,0.00,0,TRUE,FALSE,FALSE,1 (testDetermine) (0.000 s)
  - [11] 12,TRUE,2000.00,0,FALSE,FALSE,TRUE,0 (testDetermine) (0.000 s)

**JaCoCo Coverage Report:**

| Element   | Coverage | Covered Instru... | Missed Instru... | Total Instructio... |
|-----------|----------|-------------------|------------------|---------------------|
| Homework5 | 18.8 %   | 124               | 534              | 658                 |

**Problem1Class.java Code:**

```

package Homework5;

public class Problem1Class {

    boolean redLight, yellowLight, greenLight;
    int timer;

    public void setWarnings (boolean cruiseEngaged, double distance) {
        redLight=yellowLight=greenLight=false;
        if (cruiseEngaged) {
            greenLight=(distance > 500.0);
            yellowLight=(distance <= 500.0) && (distance > 75.0);
            redLight=(distance < 150.0) && ((distance >= 50.0) || (timer != 1));
            timer = (distance >= 50.0) ? timer+1 : 0;
        }
    }

    public boolean isRedLight() {
        return redLight;
    }

    public void setRedLight(boolean redLight) {
        this.redLight = redLight;
    }

    public boolean isYellowLight() {
        return yellowLight;
    }

    public void setYellowLight(boolean yellowLight) {
        this.yellowLight = yellowLight;
    }

    public boolean isGreenLight() {
        return greenLight;
    }

    public void setGreenLight(boolean greenLight) {
        this.greenLight = greenLight;
    }

    public int getTimer() {
        return timer;
    }

    public void setTimer(int timer) {
        this.timer = timer;
    }
}

```

## PIT SUMMARY:

Problems @ Javadoc Declaration Console PIT Mutations PIT Summary Coverage

### Problem1Class.java

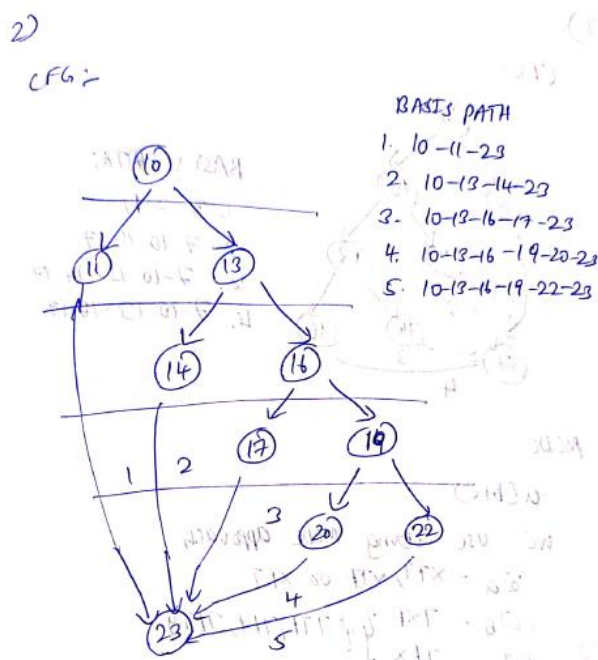
```

1 package Homework5;
2
3 public class Problem1Class {
4
5     boolean redLight, yellowLight, greenLight;
6     int timer;
7
8     public void setWarnings (boolean cruiseEngaged, double distance) {
9         // redLight=yellowLight=greenLight=false;
10        if (cruiseEngaged) {
11            greenLight= (distance > 500.0);
12            yellowLight=(distance <= 500.0) && (distance > 75.0);
13            redLight=(distance < 150.0) && ((distance >= 50.0) || (timer != 1));
14            timer = (distance >= 50.0) ? timer: timer+1 ? 0:1;
15        }
16    }
17
18    public boolean isRedLight() {
19        return redLight;
20    }
21 }

```

## PROBLEM 2:

### BASIS PATH AND CFG:



MCDL expr.  $(a+b+cd)$

CoIa:  $\{FFFF, FFFT, FFTF, FTFF\}$

CoIb:  $\{FFFF, FFFT, FTF, FTFF\}$

CoIc:  $\{FFFT, FFFT, FTF, FTFF\}$

CoId:  $\{FFFT, FFFT, FTF, FTFF\}$

BS =  $\{FFFT, FFFT, FTF, FTFF\}$

UC Sols:

UC1:  $\{FFFT, FFFT, FTF, FTFF, FTF, FTFF\}$   
 UC2:  $\{FFFT, FFFT, FTF, FTFF, FTF, FTFF\}$   
 UC3:  $\{FFFT, FFFT, FTF, FTFF, FTF, FTFF\}$   
 UC4:  $\{FFFT, FFFT, FTF, FTFF, FTF, FTFF\}$

## TEST CASE TABLE:

|    | A         | B        | C                | D           | E           | F        | G                | H        | I            | J                      | K            |
|----|-----------|----------|------------------|-------------|-------------|----------|------------------|----------|--------------|------------------------|--------------|
| 1  | Test Case | Inputs   |                  |             |             |          | Expected Outputs |          |              | Basis Path             | MDC          |
| 2  | Number    | Cart     | First Time Buyer | Gold Status | Bonus Point | Tax Rate | discount         | Total    | Member Bonus |                        |              |
| 3  | 1         | 249.99   | TRUE             | FALSE       | 251         | 0.0825   | 0.000            | 270.614  | TRUE         | 10-11-23               | stmt 25 TFFT |
| 4  | 2         | 750.00   | TRUE             | FALSE       | 251         | 0.0825   | 0.050            | 771.281  | TRUE         | 10-13-14-23            | -            |
| 5  | 3         | 1199.99  | TRUE             | FALSE       | 251         | 0.0825   | 0.075            | 1201.565 | TRUE         | 10-13-16-17-23         | -            |
| 6  | 4         | 1750.00  | TRUE             | FALSE       | 251         | 0.0825   | 0.100            | 1704.938 | TRUE         | 10-13-16-19-20-23      | -            |
| 7  | 5         | 1750.01  | TRUE             | FALSE       | 251         | 0.0825   | 0.125            | 1657.588 | TRUE         | 10-13-16-19-22-25      | -            |
| 8  | 6         | 0.00     | TRUE             | FALSE       | 251         | 0.0825   | 0.000            | 0.000    | TRUE         | Cart-Bv                | -            |
| 9  | 7         | 10000.00 | TRUE             | FALSE       | 251         | 0.0825   | 0.125            | 9471.875 | TRUE         | Cart-Bv                | -            |
| 10 | 8         | 250.00   | TRUE             | FALSE       | 251         | 0.0825   | 0.050            | 257.004  | TRUE         | Missing Bv             | -            |
| 11 | 9         | 750.01   | TRUE             | FALSE       | 251         | 0.0825   | 0.075            | 750.994  | TRUE         | Missing Bv             | -            |
| 12 | 10        | 1200.00  | TRUE             | FALSE       | 251         | 0.0825   | 0.100            | 1169.100 | TRUE         | Missing Bv             | -            |
| 13 | 11        | 249.99   | TRUE             | FALSE       | 0           | 0.0825   | 0.000            | 270.614  | TRUE         | Missing Bonus Point EV | -            |
| 14 | 12        | 249.99   | TRUE             | FALSE       | 999         | 0.0825   | 0.000            | 270.614  | TRUE         | Missing Bonus Point EV | -            |
| 15 | 13        | 2500.01  | FALSE            | FALSE       | 251         | 0.0825   | 0.125            | 2367.978 | TRUE         | Missing Bv             | stmt 25 FFFT |
| 16 | 14        | 2500.00  | FALSE            | FALSE       | 251         | 0.0825   | 0.125            | 2367.969 | FALSE        | Missing Bv             | stmt 25 FFFT |
| 17 | 15        | 2500.01  | FALSE            | FALSE       | 250         | 0.0825   | 0.125            | 2367.978 | FALSE        | Missing Bv             | stmt 25 FFFT |
| 18 | 16        | 2500.01  | TRUE             | FALSE       | 250         | 0.0825   | 0.125            | 2367.978 | TRUE         | Missing Bv             | stmt 25 TFFT |
| 19 | 17        | 2500.00  | FALSE            | TRUE        | 251         | 0.0825   | 0.125            | 2367.969 | TRUE         | Missing Bv             | stmt 25 FTFT |
| 20 | 18        | 2500.01  | FALSE            | TRUE        | 250         | 0.0825   | 0.125            | 2367.978 | TRUE         | Missing Bv             | stmt 25 FTFT |

## JUNIT,JACOCO COVERAGE:

Finished after 0.076 seconds

Runs: 18/18    Errors: 0    Failures: 0

Homework5.Problem2ClassTest (Runner: JUnit 4) (0.001 s)

testfor2 (0.001 s)

- [0] 1,249.99,TRUE,FALSE,251,0.0825,0.000,270.614,TRUE,10-11-23,TFFT (testfor2) (0.000 s)
- [1] 2,750.00,TRUE,FALSE,251,0.0825,0.050,771.281,TRUE,10-13-14-23,- (testfor2) (0.000 s)
- [2] 3,1199.99,TRUE,FALSE,251,0.0825,0.075,1201.565,TRUE,10-13-16-17-23,- (testfor2) (0.000 s)
- [3] 4,1750.00,TRUE,FALSE,251,0.0825,0.100,1704.938,TRUE,10-13-16-19-20-23,- (testfor2) (0.000 s)
- [4] 5,1750.01,TRUE,FALSE,251,0.0825,0.125,1657.588,TRUE,10-13-16-19-22-25,- (testfor2) (0.000 s)
- [5] 6,0.00,TRUE,FALSE,251,0.0825,0.000,0.000,TRUE,-,- (testfor2) (0.000 s)
- [6] 7,10000.00,TRUE,FALSE,251,0.0825,0.125,9471.875,TRUE,-,- (testfor2) (0.000 s)
- [7] 8,250.00,TRUE,FALSE,251,0.0825,0.050,257.094,TRUE,-,- (testfor2) (0.000 s)
- [8] 9,750.01,TRUE,FALSE,251,0.0825,0.075,750.994,TRUE,-,- (testfor2) (0.000 s)
- [9] 10,1200.00,TRUE,FALSE,251,0.0825,0.100,1169.100,TRUE,-,- (testfor2) (0.000 s)
- [10] 11,249.99,TRUE,FALSE,0,0.0825,0.000,270.614,TRUE,-,- (testfor2) (0.000 s)
- [11] 12,249.99,TRUE,FALSE,999,0.0825,0.000,270.614,TRUE,-,- (testfor2) (0.000 s)
- [12] 13,2500.01,TRUE,FALSE,251,0.0825,0.125,2367.978,TRUE,-,FFFT (testfor2) (0.001 s)
- [13] 14,2500.00,TRUE,FALSE,251,0.0825,0.125,2367.969,TRUE,-,FFFT (testfor2) (0.000 s)
- [14] 15,2500.01,TRUE,FALSE,250,0.0825,0.125,2367.978,TRUE,-,FFFT (testfor2) (0.000 s)
- [15] 16,2500.01,TRUE,FALSE,250,0.0825,0.125,2367.978,TRUE,-,TFFT (testfor2) (0.000 s)
- [16] 17,2500.00,TRUE,FALSE,251,0.0825,0.125,2367.969,TRUE,-,FTFT (testfor2) (0.000 s)
- [17] 18,2500.01,TRUE,FALSE,250,0.0825,0.125,2367.978,TRUE,-,FTFT (testfor2) (0.000 s)

```

1 package Homework5;
2
3 public class Problem2Class {
4
5     private boolean memberBonus;
6     private double total;
7
8     public void determineMemberBonus (double cart, boolean firstTimeBuyer, boolean goldStatus, int bonusPoints, double taxRate) {
9         double discount;
10         if (cart < 250.00)
11             discount = 0.000;
12         else
13             if (cart <= 750.00)
14                 discount = 0.050;
15             else
16                 if (cart <= 1200.00)
17                     discount = 0.075;
18                 else
19                     if (cart <= 1750.00)
20                         discount = 0.100;
21                     else
22                         discount = 0.125;
23         total = (1+taxRate)*cart*(1.0-discount);
24
25         memberBonus = firstTimeBuyer || goldStatus || (cart > 2500.00 && bonusPoints > 250);
26
27         public double getTotal() {
28             return total;
29         }
30         public void setTotal(double total) {
31             this.total = total;
32         }
33         public boolean isMemberBonus() {
34             return memberBonus;
35         }
36         public void setMemberBonus(boolean memberBonus) {
37             this.memberBonus = memberBonus;
38         }
39     }

```

Problems    Javadoc    Declaration    Console    PIT Mutations    PIT Summary    Coverage

Problem2ClassTest (2) (06-May-2020 10:16:24 pm)

| Element   | Coverage | Covered Instru... | Missed Instruct... | Total Instructio... |
|-----------|----------|-------------------|--------------------|---------------------|
| Homework5 | 14.9 %   | 98                | 560                | 658                 |

## PIT SUMMARY:

### Problem2Class.java

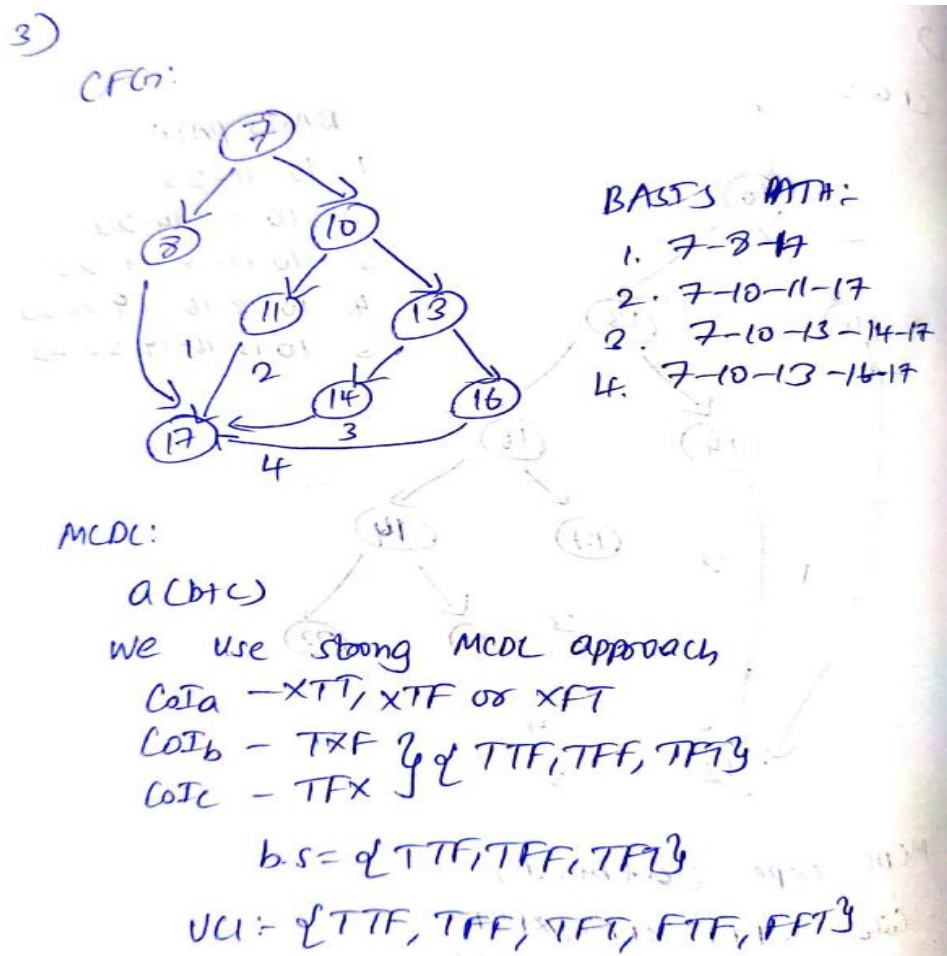
```

1 package Homework5;
2
3 public class Problem2Class {
4
5     private boolean memberBonus;
6     private double total;
7
8     public void determineMemberBonus (double cart, boolean firstTimeBuyer, boolean goldStatus, int bonusPoints, double taxRate) {
9         double discount;
10        if (cart < 250.00)
11            discount = 0.00;
12        else
13            if (cart <= 750.00)
14                discount = 0.050;
15            else
16                if (cart < 1_200.00)
17                    discount = 0.075;
18                else
19                    if (cart <= 1_750.00)
20                        discount = 0.100;
21                    else
22                        discount = 0.125;
23        total = (1+taxRate)*cart*(1.0-discount);
24
25        memberBonus = firstTimeBuyer || goldStatus || (cart > 2_500.00 && bonusPoints > 250);
26    }
27    public double getTotal() {
28        return total;
29    }
30 }

```

## PROBLEM 3:

### BASIS PATH AND CFG:



## TEST CASE TABLE:

|    | A                | B      | C               | D              | E              | F               | G        | H             | I           |
|----|------------------|--------|-----------------|----------------|----------------|-----------------|----------|---------------|-------------|
| 1  | Test Case Number | Input  |                 |                |                | Expected Output |          |               |             |
| 2  |                  | Total  | Existing Member | Valid Discount | Valid Discount | Discounts       | Return   | Basis Path    | MCDC        |
| 3  | 1                | 500    | TRUE            | TRUE           | FALSE          | 0.075           | 500.66   | 7-8-17        | stmt17 TTF  |
| 4  | 2                | 375.01 | TRUE            | TRUE           | FALSE          | 0.05            | 385.65   | 7-10-11-17    |             |
| 5  | 3                | 250    | TRUE            | TRUE           | FALSE          | 0.025           | 263.86   | 7-10-13-14-17 |             |
| 6  | 4                | 249.99 | TRUE            | TRUE           | FALSE          | 0.0125          | 267.23   | 7-10-13-16-17 |             |
| 7  | 5                | 0      | TRUE            | TRUE           | FALSE          | 0.0125          | 0        | Missing Ev    |             |
| 8  | 6                | 10000  | TRUE            | TRUE           | FALSE          | 0.075           | 10013.13 | Missing Ev    |             |
| 9  | 7                | 375    | TRUE            | TRUE           | FALSE          | 0.025           | 395.79   | Missing Bv    |             |
| 10 | 8                | 499.99 | TRUE            | TRUE           | FALSE          | 0.05            | 514.18   | Missing Bv    |             |
| 11 | 9                | 500    | FALSE           | TRUE           | FALSE          | 0.075           | 500.66   |               | stmt 17 TTF |
| 12 | 10               | 500    | TRUE            | FALSE          | FALSE          | 0.075           | 500.66   |               | stmt 17 TTF |
| 13 | 11               | 500    | TRUE            | FALSE          | TRUE           | 0.075           | 500.66   |               | stmt 17 TTF |
| 14 | 12               | 500    | FALSE           | TRUE           | TRUE           | 0.075           | 500.66   |               | stmt 17 TTF |

## JUNIT,JACOBO COVERAGE:

eclipse-workspace - Homework5/src/Homework5/Problem3Class.java - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer JUnit

Finished after 0.053 seconds

Runs: 12/12 Errors: 0 Failures: 0

Homework5.Problem3ClassTest [Runner: JUnit 4] (0.001 s)

- testfor3 (0.001 s)
  - [0] 1,500,TRUE,TRUE,FALSE,0.075,500.66,7-8-17,TTF (testfor3) (0.000 s)
  - [1] 2,375.01,TRUE,TRUE,FALSE,0.05,385.65,7-10-11-17,TTF (testfor3) (0.000 s)
  - [2] 3,250,TRUE,TRUE,FALSE,0.025,263.86,7-10-13-14-17,TTF (testfor3) (0.000 s)
  - [3] 4,249.99,TRUE,TRUE,FALSE,0.0125,267.23,7-10-13-16-17,TTF (testfor3) (0.000 s)
  - [4] 5,0,TRUE,TRUE,FALSE,0.0125,0.00,-,TTF (testfor3) (0.001 s)
  - [5] 6,10000,TRUE,TRUE,FALSE,0.075,10013.13,-,TTF (testfor3) (0.000 s)
  - [6] 7,375,TRUE,TRUE,FALSE,0.025,395.79,-,TTF (testfor3) (0.000 s)
  - [7] 8,499.99,TRUE,TRUE,FALSE,0.05,514.18,-,TTF (testfor3) (0.000 s)
  - [8] 9,500,TRUE,FALSE,FALSE,0.075,541.25,-,TTF (testfor3) (0.000 s)
  - [9] 10,500,TRUE,FALSE,TRUE,0.075,500.66,-,TTF (testfor3) (0.000 s)
  - [10] 11,500,FALSE,TRUE,FALSE,0.075,541.25,-,FTF (testfor3) (0.000 s)
  - [11] 12,500,FALSE,FALSE,TRUE,0.075,541.25,-,FFT (testfor3) (0.000 s)

```

1 package Homework5;
2
3 public class Problem3Class {
4
5     public double calcTotal (double total, boolean existingMember, boolean validDiscount, boolean validCoupon) {
6         double discount;
7         if (total >= 500.00)
8             discount = 0.0750;
9         else
10            if (total > 375.00)
11                discount = 0.050;
12            else
13                if (total >= 250.00)
14                    discount = 0.0250;
15                else
16                    discount = 0.0125;
17        return (existingMember && (validDiscount || validCoupon)) ? (total * (1-discount) * 1.0825):total * 1.0825 ;
18    }
19 }
  
```

Problems Javadoc Declaration Console PIT Mutations PIT Summary Coverage

Problem3ClassTest (1) (06-May-2020 10:17:27 pm)

| Element   | Coverage | Covered Instru... | Missed Instructio... | Total Instructio... |
|-----------|----------|-------------------|----------------------|---------------------|
| Homework5 | 9.7 %    | 64                | 594                  | 658                 |

## PIT SUMMARY:

Problems @ Javadoc Declaration Console PIT Mutations PIT Summary Coverage

### Problem3Class.java

```

1 package Homework5;
2
3 public class Problem3Class {
4
5     public double calcTotal (double total, boolean existingMember, boolean validDiscount, boolean validCoupon) {
6         double discount;
7         if (total >= 500.00)
8             discount = 0.0750;
9         else
10            if (total > 375.00)
11                discount = 0.050;
12            else
13                if (total >= 250.00)
14                    discount = 0.0250;
15                else
16                    discount = 0.0125;
17            return (existingMember && (validDiscount || validCoupon)) ? (total * (1-discount) * 1.0825):total * 1.0825 ;
18        }
19    }

```

## PROBLEM 4:

### TEST CASE TABLE:

|    | A         | B       | C      | D     | E     | F     | G     | H                  | I     | J    |
|----|-----------|---------|--------|-------|-------|-------|-------|--------------------|-------|------|
| 1  | Test Case | Current | Inputs |       |       |       |       | Exp Outputs        |       | Next |
| 2  | Number    | State   | C      | H     | N     | S     | X     | D                  | G     |      |
| 3  | 1         | Start   | false  | false | false | false | false | Welcome            | false | S0   |
| 4  | 2         | S0      | TRUE   | false | false | false | false | Welcome            | false | S0   |
| 5  | 3         | S0      | false  | TRUE  | false | false | false | Welcome            | false | S0   |
| 6  | 4         | S0      | false  | false | TRUE  | false | false | Welcome            | false | S0   |
| 7  | 5         | S0      | false  | false | false | TRUE  | false | Ready              | false | S1   |
| 8  | 6         | S0      | false  | false | false | false | TRUE  | Welcome            | false | S0   |
| 9  | 7         | S1      | TRUE   | false | false | false | false | Ready              | false | S1   |
| 10 | 8         | S1      | false  | TRUE  | false | false | false | Ready              | false | S1   |
| 11 | 9         | S1      | false  | false | TRUE  | false | false | Dispensing         | false | S2   |
| 12 | 10        | S1      | false  | false | false | TRUE  | false | Ready              | false | S1   |
| 13 | 11        | S1      | false  | false | false | false | TRUE  | Ready              | false | S1   |
| 14 | 12        | S2      | TRUE   | false | TRUE  | false | false | Dispensing         | false | S2   |
| 15 | 13        | S2      | false  | TRUE  | TRUE  | false | false | Dispensing         | TRUE  | S2   |
| 16 | 14        | S2      | false  | false | TRUE  | TRUE  | false | Dispensing         | FALSE | S2   |
| 17 | 15        | S2      | false  | false | TRUE  | FALSE | false | Dispensing         | FALSE | S2   |
| 18 | 16        | S2      | false  | false | FALSE | false | false | Ready              | FALSE | S1   |
| 19 | 17        | S2      | false  | false | TRUE  | FALSE | TRUE  | Please Pay Cashier | false | S3   |
| 20 | 18        | S3      | TRUE   | false | false | false | false | Welcome            | false | S0   |
| 21 | 19        | S3      | false  | TRUE  | false | false | false | Please Pay Cashier | false | S3   |
| 22 | 20        | S3      | false  | false | TRUE  | false | false | Please Pay Cashier | false | S3   |
| 23 | 21        | S3      | false  | false | false | TRUE  | false | Please Pay Cashier | false | S3   |
| 24 | 22        | S3      | false  | false | false | false | TRUE  | Please Pay Cashier | false | S3   |

## JUNIT,JACOCO COVERAGE:

Package ExplorerJUnit

Finished after 0.087 seconds

Runs: 22/22Errors: 0Failures: 0

▼ Homework5.Problem4ClassTest [Runner: JUnit 4] (0.001 s)

testDetermine (0.001 s)

[0] 1.Start,false,false,false,false,Welcome,false,S0 (testDetermine) (0.000 s)

[1] 2.S0,TRUE,false,false,false,false,Welcome,false,S0 (testDetermine) (0.000 s)

[2] 3.S0,false,TRUE,false,false,false,Welcome,false,S0 (testDetermine) (0.000 s)

[3] 4.S0,false,false,TRUE,false,false,Welcome,false,S0 (testDetermine) (0.000 s)

[4] 5.S0,false,false,TRUE,false,Ready,false,S1 (testDetermine) (0.000 s)

[5] 6.S0,false,false,false,false,TRUE,Welcome,false,S0 (testDetermine) (0.000 s)

[6] 7.S1,TRUE,false,false,false,Ready,false,S1 (testDetermine) (0.000 s)

[7] 8.S1,false,TRUE,false,false,Dispensing,false,S2 (testDetermine) (0.000 s)

[8] 9.S1,false,false,TRUE,false,false,Dispensing,false,S2 (testDetermine) (0.000 s)

[9] 10.S1,false,false,false,TRUE,Ready,false,S1 (testDetermine) (0.000 s)

[10] 11.S1,false,false,false,TRUE,Ready,false,S1 (testDetermine) (0.000 s)

[11] 12.S2,TRUE,false,TRUE,false,false,Dispensing,false,S2 (testDetermine) (0.000 s)

[12] 13.S2,false,TRUE,TRUE,false,false,Dispensing,TRUE,S2 (testDetermine) (0.000 s)

[13] 14.S2,false,false,TRUE,TRUE,false,Dispensing,FALSE,S2 (testDetermine) (0.000 s)

[14] 15.S2,false,false,TRUE,FALSE,false,Dispensing,FALSE,S2 (testDetermine) (0.000 s)

[15] 16.S2,false,false,FALSE,false,false,Ready,FALSE,S1 (testDetermine) (0.000 s)

[16] 17.S2,false,false,TRUE,FALSE,TRUE,Please Pay Cashier,false,S3 (testDetermine) (0.000 s)

[17] 18.S3,TRUE,false,false,false,false,Welcome,false,S0 (testDetermine) (0.000 s)

[18] 19.S3,false,TRUE,false,false,false,Please Pay Cashier,false,S3 (testDetermine) (0.000 s)

[19] 20.S3,false,false,TRUE,false,false,Please Pay Cashier,false,S3 (testDetermine) (0.000 s)

[20] 21.S3,false,false,false,TRUE,false,Please Pay Cashier,false,S3 (testDetermine) (0.000 s)

[21] 22.S3,false,false,false,false,TRUE,Please Pay Cashier,false,S3 (testDetermine) (0.001 s)

Failure Trace

Problem4Class.java

```
1 package Homework5;
2
3 public class Problem4Class {
4
5     public enum state {Start,S0,S1,S2,S3};
6
7     private state nextState;
8     private String s;
9     private boolean g;
10
11     public void gasPump(state currentState, boolean C, boolean H, boolean W, boolean S, boolean X) {
12         switch (currentState) {
13             case Start: {setS("welcome");if(false;nextState=state.S0;break;}
14             case S0: {if (C) {setS("Ready");if(false;nextState=state.S1;}
15                     } else {setS("welcome");if(false;nextState=state.S0;}
16                     }
17             case S1: {if (H) {setS("Dispensing");if(false;nextState=state.S2;}
18                     } else {setS("Ready");if(false;nextState=state.S1;}
19                     }
20             case S2: {if (!H) {setS("Ready");if(false;nextState=state.S1;}
21                     } else {if (H) {setS("Dispensing");if(true;nextState=state.S2;}
22                             } else {if (X) {setS("Please Pay Cashier");if(false;nextState=state.S3;}
23                             } else {setS("Dispensing");if(false;nextState=state.S2;}
24                             }
25             case S3: {if (C) {setS("welcome");if(false;nextState=state.S0;}
26                     } else {setS("Please Pay Cashier");if(false;nextState=state.S3;}
27                     }
28             break;
29         }
30     }
31
32     public String getD() {
33         return s;
34     }
35
36     public void setD(String d) {
37         s = d;
38     }
39
40     public boolean isG() {
41         return g;
42     }
43
44     public void setG(boolean g) {
45         g = g;
46     }
47
48     public state getNextState() {
49         return nextState;
50     }
51
52     public void setNextState(state nextState) {
53         this.nextState = nextState;
54     }
55 }
```

ProblemsJavadocDeclarationConsolePIT MutationsPIT SummaryCoverage

Problem4ClassTest (1) (06-May-2020 10:17:53 pm)

| Element     | Coverage | Covered Instru... | Missed Instruct... | Total Instructio... |
|-------------|----------|-------------------|--------------------|---------------------|
| ▼ Homework5 | 20.0 %   | 262               | 206                | 468                 |



## PIT SUMMARY:

Problems @ Javadoc Declaration Console PIT Mutations PIT Summary Coverage

### Problem4Class.java

```
1 package Homework5;
2
3 public class Problem4Class {
4
5     public enum state {Start,S0,S1,S2,S3};
6
7     private state nextState;
8     private String D;
9     private boolean G;
10
11     public void gasPump(state currentState, boolean C, boolean H, boolean N, boolean S, boolean X) {
12         switch (currentState) {
13             case Start: {setD("Welcome");G=false;nextState=state.S0;break;}
14             case S0: {if (S)
15                     {setD("Ready");G=false;nextState=state.S1;}
16                     else
17                     {setD("Welcome");G=false;nextState=state.S0;}
18                 }
19             break;
20             case S1: {if (N)
21                     {setD("Dispensing");G=false;nextState=state.S2;}
22                     else
23                     {setD("Ready");G=false;nextState=state.S1;}
24                 break;}
25             case S2: {if (N)
26                     {setD("Ready");G=false;nextState=state.S1;}
27                     else
28                     if (H)
29                     {setD("Dispensing");G=true;nextState=state.S2;}
30                     else
31                     if (X)
32                     {setD("Please Pay Cashier");G=false;nextState=state.S3;}
33                     else
34                     {setD("Dispensing");G=false;nextState=state.S2;}
35                 }
36             break;
37             case S3: {if (C)
38                     {setD("Welcome");G=false;nextState=state.S0;}
39                     else
40                     {setD("Please Pay Cashier");G=false;nextState=state.S3;}
41                 }
42             break;
43         }
44     }
45     public String getD() {
46         return D;
47     }
48     public void setD(String d) {
49         D = d;
50     }
51
52     public boolean isG() {
53         return G;
54     }
55
56     public void setG(boolean g) {
57         G = g;
58     }
59
60     public state getNextState() {
61         return nextState;
62     }
63
64     public void setNextState(state nextState) {
65         this.nextState = nextState;
66     }
67 }
```



## PROBLEM 5:

### TEST CASE TABLE:

|    | A                | B      | C               | D              | E              | F               | G        | H             | I           |
|----|------------------|--------|-----------------|----------------|----------------|-----------------|----------|---------------|-------------|
| 1  | Test Case Number | Input  |                 |                |                | Expected Output |          |               |             |
| 2  |                  | Total  | Existing Member | Valid Discount | Valid Discount | Discounts       | Return   | Basis Path    | MCDC        |
| 3  | 1                | 500    | TRUE            | TRUE           | FALSE          | 0.075           | 500.66   | 7-8-17        | stmt17 TTF  |
| 4  | 2                | 375.01 | TRUE            | TRUE           | FALSE          | 0.05            | 385.65   | 7-10-11-17    |             |
| 5  | 3                | 250    | TRUE            | TRUE           | FALSE          | 0.025           | 263.86   | 7-10-13-14-17 |             |
| 6  | 4                | 249.99 | TRUE            | TRUE           | FALSE          | 0.0125          | 267.23   | 7-10-13-16-17 |             |
| 7  | 5                | 0      | TRUE            | TRUE           | FALSE          | 0.0125          | 0        | Missing Ev    |             |
| 8  | 6                | 10000  | TRUE            | TRUE           | FALSE          | 0.075           | 10013.13 | Missing Ev    |             |
| 9  | 7                | 375    | TRUE            | TRUE           | FALSE          | 0.025           | 395.79   | Missing Bv    |             |
| 10 | 8                | 499.99 | TRUE            | TRUE           | FALSE          | 0.05            | 514.18   | Missing Bv    |             |
| 11 | 9                | 500    | FALSE           | TRUE           | FALSE          | 0.075           | 500.66   |               | stmt 17 TTF |
| 12 | 10               | 500    | TRUE            | FALSE          | FALSE          | 0.075           | 500.66   |               | stmt 17 TFF |
| 13 | 11               | 500    | TRUE            | FALSE          | TRUE           | 0.075           | 500.66   |               | stmt 17 TTF |
| 14 | 12               | 500    | FALSE           | TRUE           | TRUE           | 0.075           | 500.66   |               | stmt 17 FTF |

### JUNIT,JACOCO COVERAGE:

Package Explorer
JUnit
Runs: 12/12
Errors: 0
Failures: 0
Finished after 0.098 seconds

Homework5.Problem5ClassTest [Runner: JUnit 4] (0.014 s)

- testfor3 (0.014 s)
  - [0] 1,500,TRUE,TRUE,FALSE,0.075,500.66,7-8-17,TTF (testfor3) (0.000 s)
  - [1] 2,375.01,TRUE,TRUE,FALSE,0.05,385.65,7-10-11-17,TTF (testfor3) (0.000 s)
  - [2] 3,250,TRUE,TRUE,FALSE,0.025,263.86,7-10-13-14-17,TTF (testfor3) (0.000 s)
  - [3] 4,249.99,TRUE,TRUE,FALSE,0.0125,267.23,7-10-13-16-17,TTF (testfor3) (0.000 s)
  - [4] 5,0,TRUE,TRUE,FALSE,0.0125,0.00,-,TTF (testfor3) (0.000 s)
  - [5] 6,10000,TRUE,TRUE,FALSE,0.075,10013.13,-,TTF (testfor3) (0.000 s)
  - [6] 7,375,TRUE,TRUE,FALSE,0.025,395.79,-,TTF (testfor3) (0.000 s)
  - [7] 8,499.99,TRUE,TRUE,FALSE,0.05,514.18,-,TTF (testfor3) (0.001 s)
  - [8] 9,500,TRUE,TRUE,FALSE,0.075,541.25,-,TTF (testfor3) (0.003 s)
  - [9] 10,500,TRUE,TRUE,FALSE,0.075,500.66,-,TTF (testfor3) (0.005 s)
  - [10] 11,500,TRUE,TRUE,FALSE,0.075,541.25,-,FTF (testfor3) (0.004 s)
  - [11] 12,500,TRUE,TRUE,FALSE,0.075,541.25,-,FTF (testfor3) (0.001 s)

Problem3Class.java
Problem5Class.java
Problem5ClassTest.java

```

1 package Homework5;
2
3 public class Problem5Class {
4
5     public double calcTotal (Problem5ServerData totalVal, boolean existingMember, boolean validDiscount, boolean validCoupon) {
6         double total=totalVal.getTotal();discount;
7         if (total >= 500.00)
8             discount = 0.0750;
9         else
10             if (total > 375.00)
11                 discount = 0.050;
12             else
13                 if (total >= 250.00)
14                     discount = 0.0250;
15                 else
16                     discount = 0.0125;
17         return (existingMember && (validDiscount || validCoupon)) ? (total * (1-discount) * 1.0825):total * 1.0825 ;
18     }
19 }

```

Problems
Javadoc
Declaration
Console
PIT Mutations
PIT Summary
Coverage

Problem5ClassTest (1) (06-May-2020 10:13:08 pm)

| Element     | Coverage | Covered Instru... | Missed Instruct... | Total Instructio... |
|-------------|----------|-------------------|--------------------|---------------------|
| > Homework5 | 13.7 %   | 90                | 568                | 658                 |

## PIT SUMMARY:

Problems Javadoc Declaration Console PIT Mutations **PIT Summary** Coverage

### Problem5Class.java

```
1 package Homework5;
2
3 public class Problem5Class {
4
5     public double calcTotal (Problem5ServerData totalVal, boolean existingMember, boolean validDiscount, boolean validCoupon) {
6         double total=totalVal.getTotal();discount;
7         if (total >= 500.00)
8             discount = 0.0750;
9
10        else
11            if (total > 375.00)
12                discount = 0.050;
13            else
14                if (total >= 250.00)
15                    discount = 0.0250;
16                else
17                    discount = 0.0125;
18        return (existingMember && (validDiscount || validCoupon)) ? (total * (1-discount) * 1.0825):total * 1.0825 ;
19    }
20 }
```

//Preferences for PIT all set to green is shown below:

The screenshot shows the Eclipse IDE interface. The main editor displays the `Problem5Class.java` file. The **PIT Summary** tab is active, showing a table of PIT results. The table has columns for Element, Coverage, Covered Instru..., Missed Instru..., and Total Instru... The first row shows a coverage of 100.0%.

The **Preferences** dialog box is open, showing the **Mutators** section. The **All Mutators** option is selected, and the **Apply and Close** button is highlighted.

| Element                                         | Coverage | Covered Instru... | Missed Instru... | Total Instru... |
|-------------------------------------------------|----------|-------------------|------------------|-----------------|
| Problem5ClassTest (1) (06-May-2020 10:56:36 pm) | 100.0%   | 367               | 0                | 367             |