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CSE 5321 Homework 5
Spring 2019

1)

Finished after 0.069 seconds

Runs: 11/11 Errors: 0 Failures: 0

Homework5.Problem1TestFileParam [Runner: JUnit 4] (0.000 s)

test (0.000 s)

[0] 1,TRUE,50.00,4,TRUE,54.13,11-12-27 and mcdc statement 26 FFF (0.000 s)

[1] 2,TRUE,100.00,4,TRUE,102.84,11-14-15-27 and mcdc statement 26 FTF (0.000 s)

[2] 3,TRUE,250.00,4,TRUE,243.56,11-14-17-18-27 (test) (0.000 s)

[3] 4,TRUE,500.00,4,TRUE,460.06,11-14-17-20-21-27 (test) (0.000 s)

[4] 5,TRUE,500.01,4,TRUE,433.01,11-14-17-20-23-27 (test) (0.000 s)

[5] 6,TRUE,50.00,0,TRUE,0.00,mcdc statement 26 TFF and extreme range (test) (0.000 s)

[6] 7,TRUE,50.00,5,TRUE,54.13,mcdc statement 26 FFT (test) (0.000 s)

[7] 8,TRUE,5000.00,1000,TRUE,4330.00,extreme range (test) (0.000 s)

[8] 9,TRUE,50.01,4,TRUE,51.43,bv (test) (0.000 s)

[9] 10,TRUE,100.01,4,TRUE,97.43,bv (test) (0.000 s)

[10] 11,TRUE,250.01,4,TRUE,230.04,bv (test) (0.000 s)

Package Explorer

helloworld

src

Code

Homework4

Problem1Class.java

Problem1TestFileParam.java

Problem1TestFileParam.java

```

1 package Homework5;
2 import static junitparams.JUnit4ParamsRunner;
3
4 public class Problem1TestFileParam {
5
6     private Problem1Class probl;
7
8     @SuppressWarnings("unused")
9     private static final Object[] params = {
10         // ...
11     };
12
13     @Before
14     public void setUp() {
15         probl = new Problem1Class();
16     }
17
18     @Test
19     @FileParameters("src/Homework5/Params.txt")
20     public void test(int testcaseNumber, boolean specialOrderStatus,
21                     double deepDish, double ordAmount, int numPizzas,
22                     double total, double discount, boolean isSpecialOrderStatus) {
23
24         probl.setTotal(0);
25         probl.setSpecialOrderStatus(specialOrderStatus);
26         probl.specialOrder(deepDish, ordAmount, numPizzas);
27         assertEquals("total", total, probl.getTotal());
28         assertEquals("discount", discount, probl.getDiscount());
29         assertEquals("isSpecialOrderStatus", isSpecialOrderStatus, probl.isSpecialOrderStatus());
30     }
31 }

```

Problem1Class.java

```

1 private boolean specialOrderStatus;
2
3 public void specialOrder (boolean deepDish, double ordAmount, int numPizzas) {
4
5     double discount;
6     if (ordAmount <= 50.00)
7         discount = 0.00;
8     else if (ordAmount <= 100.00)
9         discount = 0.05;
10    else if (ordAmount <= 250.00)
11        discount = 0.10;
12    else if (ordAmount <= 500.0)
13        discount = 0.15;
14    else
15        discount = 0.20;
16
17    total = ordAmount*(1-discount)*1.0825;
18
19    specialOrderStatus = (deepDish) || (ordAmount > 50.0) || (numPizzas > 4);
20 }
21
22 public double getTotal() {
23     return total;
24 }
25
26 public void setTotal(double total) {
27     this.total = total;
28 }
29
30 public boolean isSpecialOrderStatus() {
31     return specialOrderStatus;
32 }
33
34 public void setSpecialOrderStatus(boolean specialOrderStatus) {
35     this.specialOrderStatus = specialOrderStatus;
36 }

```

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2:57 AM 5/2/2019

Test Case Number	Inputs			Exp Out		Comments			
	deepDish	ordAmount	numPizzas	specialOrderStatus	total				
1	TRUE	\$50.00	4	FALSE	\$54.13	11-12-27 and mcdc statement 26 FFF			
2	TRUE	\$100.00	4	TRUE	\$102.84	11-14-15-27 and mcdc statement 26 FTF			
3	TRUE	\$250.00	4	TRUE	\$243.56	11-14-17-18-27			
4	TRUE	\$500.00	4	TRUE	\$460.06	11-14-17-20-21-27			
5	TRUE	\$500.01	4	TRUE	\$433.01	11-14-17-20-23-27			
6	FALSE	\$0.00	0	TRUE	\$0.00	mcdc statement 26 TFF and extreme range			
7	TRUE	\$50.00	5	TRUE	\$54.13	mcdc statement 26 FFT			
8	TRUE	\$5,000.00	1,000	TRUE	\$4,330.00	extreme range			
9	TRUE	\$50.01	4	TRUE	\$51.43	bv			
10	TRUE	\$100.01	4	TRUE	\$97.43	bv			
11	TRUE	\$250.01	4	TRUE	\$230.04	bv			

2) provided test cases (JaCoCo is all green because it covers decision and conditional coverage, but PIT won't be all green unless it gets in addition boundary value (BV) coverage:

PIT Summary

5 public double calcTotal (double total, boolean
6
7 23 return ((existingMember || validDiscou
8
9 }

Mutations

1. changed conditional boundary → SURVIVED
2. changed conditional boundary → KILLED
3. Substituted 650 with 651 → SURVIVED
4. Substituted 2000.0 with 1.0 → KILLED
5. Substituted 0.85 with 1.0 → KILLED
6. Substituted 1.0825 with 1.0 → KILLED
7. Substituted 1.0825 with 1.0 → KILLED
8. Replaced double multiplication with division → KILL
9. Replaced double multiplication with division → KILL
10. Replaced double multiplication with division → KILL
11. negated conditional → KILLED
12. negated conditional → KILLED
13. negated conditional → KILLED
14. negated conditional → KILLED
15. removed conditional - replaced equality check with
16. removed conditional - replaced equality check with
17. removed conditional - replaced equality check with
18. removed conditional - replaced equality check with
19. removed conditional - replaced comparison check wit
20. removed conditional - replaced comparison check wit
21. removed conditional - replaced comparison check wit
22. removed conditional - replaced comparison check wit
23. replaced return of double value with -(x + 1) for

2) My test cases:

PIT Summary

7 23 return ((existingMember || validDiscou
8
9 }

Mutations

1. changed conditional boundary → KILLED
2. changed conditional boundary → KILLED
3. Substituted 650 with 651 → KILLED
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5. Substituted 0.85 with 1.0 → KILLED
6. Substituted 1.0825 with 1.0 → KILLED
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9. Replaced double multiplication with division → KILL
10. Replaced double multiplication with division → KILL
11. negated conditional → KILLED
12. negated conditional → KILLED
13. negated conditional → KILLED
14. negated conditional → KILLED
15. removed conditional - replaced equality check with
16. removed conditional - replaced equality check with
17. removed conditional - replaced equality check with
18. removed conditional - replaced equality check with
19. removed conditional - replaced comparison check wd
20. removed conditional - replaced comparison check wd
21. removed conditional - replaced comparison check wd
22. removed conditional - replaced comparison check wd
23. replaced return of double value with -(x + 1) for

Active mutators

Test Case Number	Inputs				Exp Out	
	existingMember	validDiscount	memberPoints	total	expTotal	Comments
1	TRUE	FALSE	650	\$2,000.00	\$1,840.25	MCDC TFFT
2	FALSE	FALSE	650	\$2,000.00	\$2,165.00	MCDC FFFT
3	FALSE	TRUE	650	\$2,000.00	\$1,840.25	MCDC FTTT
4	FALSE	TRUE	649	\$2,000.00	\$2,165.00	MCDC FTFT
5	FALSE	TRUE	650	\$1,999.99	\$2,164.99	MCDC FTTF
6	TRUE	TRUE	0	\$2,000.00	\$1,840.25	extreme range
7	TRUE	TRUE	1,000	\$2,000.00	\$1,840.25	extreme range
8	TRUE	TRUE	650	\$0.00	\$0.00	extreme range
9	TRUE	TRUE	650	\$5,000.00	\$4,600.63	extreme range

3)

Finished after 0.05 seconds

Runs: 6/6 Errors: 0 Failures: 0

Homework5.Problem3TestFileParam (Runner: JUnit 4) (0.005 s)

- test (0.005 s)
 - [0] 1,1,3,25,401,mcdd statement 8 FTT (test) (0.000 s)
 - [1] 1,1,3,1,391,mcdd statement 8 FTF (test) (0.000 s)
 - [2] 3,1,3,15,401,mcdd statement 8 TTF (test) (0.001 s)
 - [3] 4,1,3,10,391,mcdd statement 8 TFF (test) (0.001 s)
 - [4] 5,1,1,100000,1,extreme range (test) (0.002 s)
 - [5] 6,180,10,1,2000,extreme range (test) (0.001 s)

Package Explorer: Console Coverage

helloworld

- Name
 - src
 - Code
 - Homework4
 - Homework5
 - Problem1Class.java

omework5.Problem1TestFileParam.java - Name/src

```

1 package Homework5;
2
3 import static junitparams.JUnit4Params.*;
4 import static org.junit.Assert.*;
5
6 import junitparams.FileParameters;
7 import junitparams.JUnit4ParamsRunner;
8 import junitparams.Parameters;
9 import org.junit.Before;
10 import org.junit.Test;
11 import org.junit.runner.RunWith;
12
13 @RunWith(JUnit4ParamsRunner.class)
14 public class Problem3TestFileParam
15 {
16     private Problem3Class prob3;
17
18     @SuppressWarnings("unused")
19     private static final Object[] parameters = {
20         // ...
21     };
22
23     @Before
24     public void setUp () {
25         prob3 = new Problem3Class();
26     }
27
28     @Test
29     @FileParameters("src/Homework5/
30     public void test(int testcaseNum
31         int boxNumInShip_res, S
32
33     prob3.calcPrevBoxNumber(box
34     assertEquals(boxNumInShip_r
35     }
36 }
  
```

```

1 package Homework5;
2
3 public class Problem3Class {
4
5     public int calcPrevBoxNumber (int boxInCarNum, int rrCarNum, int shipmentNum) {
6         int BoxesperRRCar[] = {190, 200, 210, 215, 190, 200, 215, 210, 190};
7         int boxSum=0;
8         if (((shipmentNum % 5 == 0) && (shipmentNum % 10 != 0)) || (shipmentNum % 25 == 0))
9         {
10             BoxesperRRCar[1] = 210;
11             BoxesperRRCar[2] = 200;
12         }
13
14         for (int i=0;i<rrCarNum-1;i++)
15             boxSum+=BoxesperRRCar[i];
16         return boxSum+boxInCarNum;
17     }
18 }
  
```

Test Case Number	Inputs			Output		Comments	schedule
	Box in car	Car number	Shipment number	Box Number in Shipment			
1	1	3	25	401	mcdd statement 8 FTT		2
2	1	3	1	391	mcdd statement 8 FTF		1
3	1	3	15	401	mcdd statement 8 TTF		2
4	1	3	10	391	mcdd statement 8 TFF		1
5	1	1	100,000	1	extreme range		2
6	180	10	1	2,000	extreme range		1

4) 3 of 9 tests failed. Same test table as #2.

Workspace
Finished after 0.136 seconds
Runs: 9/9 Errors: 0 Failures: 3

Homework5.Problem4TestFileParam [Runner: JUnit 4] (0.09s)
test (0.095 s)
[0] 1, TRUE, FALSE, 650, 2000.00, 1840.25, MCDC TFFT (t
[1] 2, FALSE, FALSE, 650, 2000.00, 2165.00, MCDC FFFT (t
[2] 3, FALSE, TRUE, 650, 2000.00, 1840.25, MCDC FTFT (t
[3] 4, FALSE, TRUE, 649, 2000.00, 2165.00, MCDC FTFT (te
[4] 5, FALSE, TRUE, 650, 1999.99, 2164.99, MCDC FTTF (te
[5] 6, TRUE, TRUE, 0, 2000.00, 1840.25, extreme range (tes
[6] 7, TRUE, TRUE, 1000, 2000.00, 1840.25, extreme range (tes
[7] 8, TRUE, TRUE, 650, 0.00, 0.00, extreme range (test) (0.
[8] 9, TRUE, TRUE, 650, 5000.00, 4600.63, extreme range (t

Failure Trace

```

1 package Homework5;
2
3 public class Problem4Class {
4
5     public double calcTotal (double total, boolean
6
7     return ((existingMember || validDiscount
8
9 }

```

```

1 package Homework5;
2
3 public interface Problem4ServerData {
4
5     public int getMemberPoints();
6 }

```

```

1 package Homework5;
2 import static junitparams.JUnit4Params
3
4 @RunWith (JUnitParamsRunner.class)
5 public class Problem4TestFileParam {
6
7     Problem4ServerData mockobj; //decla
8     private Problem4Class prob4;
9
10    @SuppressWarnings ("unused")
11    private static final Object[] prob
12
13    return $ {
14
15    };
16
17    @Before
18    public void setUp () {
19        prob4 = new Problem4Class();
20        mockobj = EasyMock.strictMock (P
21    }
22
23    @Test
24    @FileParameters ("src/Homework5/Pr
25    public void test (int testCaseNumbe
26        double expTotal_res, Strin
27
28    EasyMock.expect (mockobj.getMem
29    EasyMock.replay (mockobj);
30    prob4.calcTotal (total, existin
31    assertEquals (expTotal_res, prob
32
33 }

```

Console Coverage
<terminated> Problem4TestFileParam (1) [JUnit] C:\Program Files (x86)\Java\jre1.8.0_211\bin\javaw.exe (May 2, 2019, 6:55:39 AM)

Test Case	Inputs				Exp Out	Comments
Number	existingMember	validDiscount	memberPoints	total	expTotal	
1	TRUE	FALSE	650	\$2,000.00	\$1,840.25	MCDC TFFT
2	FALSE	FALSE	650	\$2,000.00	\$2,165.00	MCDC FFFT
3	FALSE	TRUE	650	\$2,000.00	\$1,840.25	MCDC FTFT
4	FALSE	TRUE	649	\$2,000.00	\$2,165.00	MCDC FTFT
5	FALSE	TRUE	650	\$1,999.99	\$2,164.99	MCDC FTTF
6	TRUE	TRUE	0	\$2,000.00	\$1,840.25	extreme range
7	TRUE	TRUE	1,000	\$2,000.00	\$1,840.25	extreme range
8	TRUE	TRUE	650	\$0.00	\$0.00	extreme range
9	TRUE	TRUE	650	\$5,000.00	\$4,600.63	extreme range