

Date: 04/08/2022
Lab Session No.: 04

Task 4: Parameterized testing using JUnit

Aim: To perform parameterized testing for Triangle using JUnit.

Procedure:**Steps:**

1. Creating Java project.

- Click on File and select New project
- Enter project name as com.Junit.triangle
- Click on Next and then on Finish

2. Creating java Test Project

- Right click on com.Junit.triangle
- Click on properties and select tab java build path
- Click on source and click on Create New Folder.
- Give the folder name as test and click on next.
- Click on Finish and then on OK

3. Creating java class

- Right click on com.Junit.triangle and click on New .
- Click on class and give the class name as Triangle
- Click on Finish
- Type the following code

```
package com.Junit.triangle;

public class Traingle {
    public int shape(int a,int b,int c) {
        if(a>=b+c || b>=a+c || c>=a+b) {
            return 0;
        }
        else if(a==b && b==c) {
            return 1;
        }
        else if((a==b && b!=c) || (b==c && c!=a) || (c==a && c!=b)) {
            return 2;
        }
        else {
            return 3;
        }
    }
}

// 0-Not a Traingle
```

```
// 1-Equilateral Traingle
// 2-Isosceles Traingle
// 3-Scalene Traingle
```

4. Create java test class

- Right click on com.Junit.traingle and click on new
- Click on Junit test case.
- Change the name of folder src to Test in source folder tab.
- Click on browse and select Triangle class and click on Next.
- Click on Finish and then on OK.
- Add the following code

```
package com.Junit.traingle;
import static org.junit.Assert.*;
import org.junit.Test;
import java.util.Arrays;
import java.util.Collection;
import org.junit.runner.RunWith;
import org.junit.runners.Parameterized;
import org.junit.runners.Parameterized.Parameters;
@RunWith(Parameterized.class)
public class Traingle_test {
    int a;
    int b;
    int c;
    int res;
    public Traingle_test(int a,int b,int c,int res) {
        this.a=a;
        this.b=b;
        this.c=c;
        this.res=res;
    }
    @Parameters
    public static Collection<Integer[]> sides_checked(){
        return Arrays.asList(new Integer[][]{{3,4,5,2},{3,3,3,1}});
    }
    @Test
    public void test() {
        Traingle ct=new Traingle();
        System.out.println("Triangle with sides :"+a+", "+b+" and "+c);
        assertEquals(res,ct.shape(a, b, c));
    }
}
```

Output:

Pass Case for Triangle:

The screenshot shows the Eclipse IDE with the following details:

- Package Explorer:** Shows the project structure with 'JUnit' selected.
- JUnit Run Progress:** 'Finished after 0.016 seconds', 'Runs: 5/5', 'Errors: 0', 'Failures: 0'.
- JUnit Test Results:** 'com.vogella.junit.triangle.test [Runner: JUnit 4] (0.000 s)'.
- Source Editor:** Displays the 'Triangle.java' file with the following code:


```
1 package com.vogella.junit.triangle;
2 import static org.junit.Assert.*;
3 import java.util.Arrays;
4 import java.util.Collection;
5 import org.junit.Test;
6 import org.junit.runner.RunWith;
7 import org.junit.runners.Parameterized;
8 import org.junit.runners.Parameterized.Parameters;
9 @RunWith(Parameterized.class)
10 public class test {
11     private int expected;
12     private int first;
13     private int second;
14     private int third;
15     public test(int firstNumber, int secondNumber, int thirdNumber, int expectedResult) {
16         this.expected = expectedResult;
17         this.first = firstNumber;
18         this.second = secondNumber;
19         this.third = thirdNumber;
20     }
21     @Parameters
22     public static Collection<Integer[]> addedNumbers() {
23         return Arrays.asList(new Integer[][]{{4,4,4,1},{2,2,2,1},{7,2,6,3},{1,1,2,2},{7,8,1,3}});
24     }
25     @Test
26     public void test() {
27         Triangle s = new Triangle();
28         System.out.println("Prime check with parameter : "+first);
29         assertEquals(s.fun(first,second,third),expected);
30     }
31 }
```
- Console:** Shows the output of the test run:


```
<terminated> test [JUnit] C:\Program Files\Java\jdk1.8.0_05\bin\javaw.exe (04-Aug-2022 3:23:59 pm)
Prime check with parameter : 4
Prime check with parameter : 2
Prime check with parameter : 7
Prime check with parameter : 1
Prime check with parameter : 7
```

Fail Case for Triangle

The screenshot shows the Eclipse IDE with the following details:

- Package Explorer:** Shows the project structure with 'JUnit' selected.
- JUnit Run Progress:** 'Finished after 0.01 seconds', 'Runs: 1/1', 'Errors: 1', 'Failures: 0'.
- JUnit Test Results:** 'com.vogella.junit.triangle.test [Runner: JUnit 4] (0.000 s)' with an 'initializationError (0.000 s)'.
- Source Editor:** Displays the 'Triangle.java' file with the following code:


```
1 package com.vogella.junit.triangle;
2 import static org.junit.Assert.*;
3 import java.util.Arrays;
4 import java.util.Collection;
5 import org.junit.Test;
6 import org.junit.runner.RunWith;
7 import org.junit.runners.Parameterized;
8 import org.junit.runners.Parameterized.Parameters;
9 @RunWith(Parameterized.class)
10 public class test {
11     private int expected;
12     private int first;
13     private int second;
14     private int third;
15     public test(int firstNumber, int secondNumber, int thirdNumber, int expectedResult) {
16         this.expected = expectedResult;
17         this.first = firstNumber;
18         this.second = secondNumber;
19         this.third = thirdNumber;
20     }
21     @Parameters
22     public static Collection<Integer[]> addedNumbers() {
23         return Arrays.asList(new Integer[][]{{4,4,4,1},{2,2,2,1},{7,2,6,3},{1,1,2,2},{7,8,1,3}});
24     }
25     @Test
26     public void test() {
27         Triangle s = new Triangle();
28         System.out.println("Prime check with parameter : "+first);
29         assertEquals(s.fun(first,second,third),expected);
30     }
31 }
```
- Failure Trace:** Shows the error:


```
java.lang.Error: Unresolved compilation problem:
Syntax error on token ",," delete this token

at com.vogella.junit.triangle.test.addedNumbers(test.java:25)
at java.lang.reflect.Constructor.newInstance(Constructor.java:408)
```
- Console:** Shows the output of the test run:


```
<terminated> test [JUnit] C:\Program Files\Java\jdk1.8.0_05\bin\javaw.exe (04-Aug-2022 3:27:08 pm)
```

Result: Performing parameterized testing using JUnit has been done successfully.

Evaluator's Observation

Marks Secured:_____out of _____

Full Name of the Evaluator:

Student's Signature

Signature of the Evaluator:

Date of Evaluation: