COMP47480 Artefact for Practical 3

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```
☐ Package Explorer ☐ JUnit 🏻

    ▼ TestTriangle.java 
    □

                                         1 package Part1;
 3⊖ import static org.junit.Assert.assertFalse;
                                            import static org.junit.Assert.assertTrue;
Finished after 0.099 seconds
                                            import static org.junit.jupiter.api.Assertions.*;
 Runs: 1/1 Errors: 1 Failures: 0
                                            import org.junit.jupiter.api.Test;
                                         9
                                            public class TestTriangle {

▼ TestTriangle [Runner: JUnit 5] (0.001 s)

                                        10
     testTypeOfShouldReturnEquilateralTri
                                        110
                                                public void testTypeOfShouldReturnEquilateralTriangle() {
                                        12
                                       13
                                                    Triangle triangle = new Triangle(5,5,5);
                                       14
                                                    assertEquals(Triangle.Type.Equilateral, triangle.typeOf());
                                        15
                                        16
                                        17 }
                                        18
```

Figure 1: (Failing) Test for equilateral triangle

```
Package Explorer Ju Junit 🖂
                                                         J TestTriangle.java
                                        1
                                           package Part1;
    3
                                           public class Triangle {
                                        4
Finished after 0.097 seconds
                                        50
                                               public static enum Type {
 Runs: 1/1 ■ Errors: 0 ■ Failures: 0
                                        6
                                                   Equilateral
                                        7
                                        8
                                        90
                                               public Triangle(int i, int j, int k) {
> TestTriangle [Runner: JUnit 5] (0.000 s)
                                                   // TODO Auto-generated constructor stub
                                      10
                                       11
                                       12
                                       130
                                               public Type typeOf() {
                                      14
                                                   // TODO Auto-generated method stub
                                       15
                                                   return Type. Equilateral;
                                       16
                                               }
                                       17
                                       18
                                           }
                                       19
```

Figure 2: (Passing) Test by adding the production code for equilateral triangle

```
Package Explorer 🗗 JUnit 🖾 📅 🗖

    ∏ TestTriangle.java 
    ☐ Triangle.java

 1
                                               package Part1;
                                          3⊕ import static org.junit.Assert.assertFalse;
                                          4 import static org.junit.Assert.assertTrue;
5 import static org.junit.jupiter.api.Assertions.*;
Finished after 0.114 seconds
 Runs: 2/2 ☐ Errors: 0 ☐ Failures: 1
                                                import org.junit.jupiter.api.Test;
                                               public class TestTriangle {
                                             9

▼ TestTriangle [Runner: JUnit 5] (0.002 s)

                                           10
      testTypeOfShouldReturnIsocelesTrian
                                            110
                                                    @Test
      testTypeOfShouldReturnEquilateralTi
                                                    public void testTypeOfShouldReturnEquilateralTriangle() {
                                                        Triangle triangle = new Triangle(5,5,5);

assertEquals(Triangle.Type.Equilateral, triangle.typeOf());
                                            13
                                            14
                                            15
                                            16
                                            179
                                            18
                                                    public void testTypeOfShouldReturnIsocelesTriangle() {
                                                         Triangle triangle = new Triangle(6,6,8);
                                            19
                                                         assertEquals(Triangle.Type.Isoceles, triangle.typeOf());
                                            20
                                            21
                                            22
                                            23
```

Figure 3: (Failing) Test for isoceles triangle

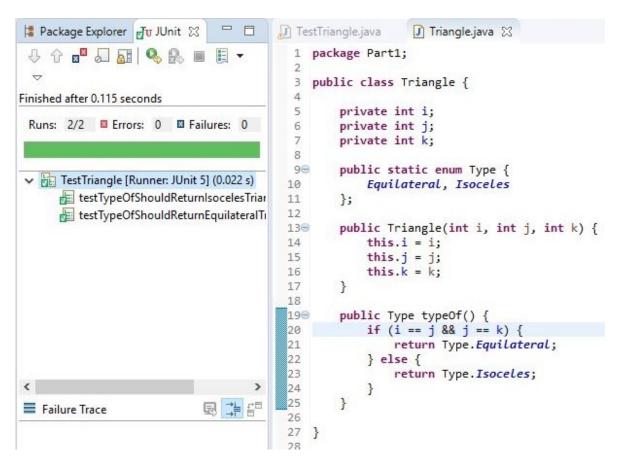


Figure 4: (Passing) Test by adding the production code for isoceles triangle

```
Package Explorer Tu JUnit 🖾 🗀 🗖
                                     🕡 TestTriangle.java 💢 🚺 Triangle.java
                                           package Part1;
 1
                                      3@ import static org.junit.Assert.assertFalse;
                                           import static org.junit.Assert.assertTrue;
Finished after 0.141 seconds
                                           import static org.junit.jupiter.api.Assertions.*;
 Runs: 3/3 ■ Errors: 0 ■ Failures: 1
                                            import org.junit.jupiter.api.Test;
                                         9
                                           public class TestTriangle {

▼ TestTriangle [Runner: JUnit 5] (0.002 s)

                                        10
      testTypeOfShouldReturnIsocelesTriar
                                        110
                                                public void testTypeOfShouldReturnEquilateralTriangle() {
      testTypeOfShouldReturnEquilateralTi
                                        12
                                                    Triangle triangle = new Triangle(5, 5, 5);
                                        13
     testTypeOfShouldReturnScaleneTriar
                                                    assertEquals(Triangle.Type.Equilateral, triangle.typeOf());
                                        14
                                        15
                                        16
                                        179
                                                public void testTypeOfShouldReturnIsocelesTriangle() {
                                        18
                                        19
                                                    Triangle triangle = new Triangle(6, 6, 8);
                                        20
                                                    assertEquals(Triangle.Type.Isoceles, triangle.typeOf());
                                        21
                                        22
                                               @Test
                                        230
                                        24
                                                public void testTypeOfShouldReturnScaleneTriangle() {
                                        25
                                                    Triangle triangle = new Triangle(6, 7, 8);
                           量 計 音
Failure Trace
                                        26
                                                    assertEquals(Triangle.Type.Scalene, triangle.typeOf());
org.opentest4j.AssertionFailedError: expe ^
                                        27
at Part1.TestTriangle.testTypeOfShouldRi
                                        28
                                        29 }
= at iava util stream ForFachOns (ForFach)
```

Figure 5: (Failing) Test for scalene triangle

```
TestTriangle.java
                                       1 package Part1;
    3
                                          public class Triangle {
                                       4
Finished after 0.099 seconds
                                       5
                                              private int i;
 Runs: 3/3 Errors: 0 E Failures: 0
                                              private int j;
                                       7
                                              private int k;
                                       8
                                       99
                                              public static enum Type {
TestTriangle [Runner: JUnit 5] (0.016 s)
                                       10
                                                  Equilateral, Isoceles, Scalene
     testTypeOfShouldReturnIsocelesTriar
                                       11
                                              };
                                       12
     testTypeOfShouldReturnEquilateralTi
                                              public Triangle(int i, int j, int k) {
                                       130
     testTypeOfShouldReturnScaleneTriar
                                       14
                                                  this.i = i;
                                       15
                                                  this.j = j;
                                       16
                                                  this.k = k;
                                       17
                                       18
                                       19⊕
                                              public Type typeOf() {
                                                  if (i == j \&\& j == k) {
                                       20
                                       21
                                                      return Type. Equilateral;
                                                  } else if (i == j || j == k || k == i) {
                                       22
                                       23
                                                      return Type. Isoceles;
                                                    else {
                                       25
                                                      return Type. Scalene;
Failure Trace
                                      27
                                              }
                                      28
                                      29
                                          }
```

Figure 6: (Passing) Test by adding the production code for scalene triangle

```
Package Explorer Tu JUnit 🖾 📅 🗖

    ∏ TestTriangle.java 
    ☐ Triangle.java

                                              package Part1;
 😘 30 import static org.junit.Assert.assertFalse;
Finished after 0.167 seconds
                                              import static org.junit.Assert.assertTrue;
                                              import static org.junit.jupiter.api.Assertions.*;
 Runs: 4/4 Errors: 0 Failures: 1
                                              import org.junit.jupiter.api.Test;
                                           9
                                              public class TestTriangle {
✓ TestTriangle [Runner: JUnit 5] (0.045 s)
      testTypeOfShouldReturnIsocelesTriar
                                           11⊖
                                                   public void testTypeOfShouldReturnEquilateralTriangle() {
      testTypeOfShouldReturnEquilateralTi
                                                       Triangle triangle = new Triangle(5, 5, 5);
                                           13
      testTypeOfShouldReturnScaleneTriar
                                                       assertEquals(Triangle.Type.Equilateral, triangle.typeOf());
                                           14
      testTypeOfShouldReturnInvalidTrian
                                                   }
                                           16
                                           179
                                           18
                                                   public void testTypeOfShouldReturnIsocelesTriangle() {
                                           19
                                                       Triangle triangle = new Triangle(6, 6, 8);
                                           20
                                                       assertEquals(Triangle.Type.Isoceles, triangle.typeOf());
                                           21
                                           22
                                           23⊜
                                                   @Test
                                                   public void testTypeOfShouldReturnScaleneTriangle() {
                                           25
                                                       Triangle triangle = new Triangle(6, 7, 8);
                             量 詳 音
Failure Trace
                                           26
                                                       assertEquals(Triangle.Type.Scalene, triangle.typeOf());
org.opentest4j.AssertionFailedError: expe
                                           27
 at Part1.TestTriangle.testTypeOfShouldRi
                                           28
                                           29⊜
at java.util.stream.ForEachOps$ForEach(
                                           30
                                                   public void testTypeOfShouldReturnInvalidTriangle() {
at java.util.stream.ReferencePipeline$2$1
                                                       Triangle triangle = new Triangle(6, 7, 14);
assertEquals(Triangle.Type.Invalid, triangle.typeOf());
                                           31
at java.util.lterator.forEachRemaining(Ur
                                           32
                                           33
at java.util.Spliterators$IteratorSpliterator
                                           34
at java.util.stream.AbstractPipeline.copy
                                          35
```

Figure 7: (Failing) Test for invalid triangle

```
🖺 Package Explorer 🗗 JUnit 🖂
                                         TestTriangle.java
                                                               ☑ Triangle.java ⋈
 package Part1;
                                            3
                                               public class Triangle {
                                            4
Finished after 0.128 seconds
                                            5
                                                   private int i;
 Runs: 4/4 Errors: 0 Erailures: 0
                                            6
                                                   private int j;
                                            7
                                                   private int k;
                                            8
                                            99
                                                   public static enum Type {
> TestTriangle [Runner: JUnit 5] (0.027 s)
                                           10
                                                       Equilateral, Isoceles, Scalene, Invalid
                                           11
                                           12
                                          130
                                                   public Triangle(int i, int j, int k) {
                                          14
                                                       this.i = i;
                                                       this.j = j;
                                          15
                                          16
                                                       this.k = k;
                                          17
                                          18
                                                   public Type typeOf() {
   if (i + j > k && j + k > i && k + i > j) {
      if (i == j && j == k) {
                                          19⊖
                                          20
                                          21
                                          22
                                                                return Type. Equilateral;
                                                            } else if (i == j || j == k || k == i) {
                                          24
                                                                return Type. Isoceles;
                                          25
                                                            } else {
Failure Trace
                                           26
                                                                return Type. Scalene;
                                          28
                                                       } else {
                                          29
                                                            return Type. Invalid;
                                          30
                                          31
                                                   }
                                          32
                                          33 }
```

Figure 8: (Passing) Test by adding the production code for invalid triangle

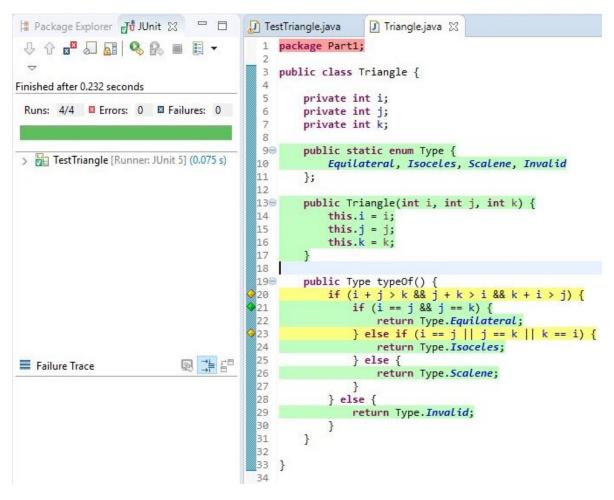


Figure 9: Code coverage: One can see now few branches were not tested

```
Package Exp... Ju JUnit 🖾 🗀 🗇
                                    🔃 TestTriangle.java 🛭 🗓 Triangle.java
                                         package Part1;
 😘 3@ import static org.junit.Assert.assertFalse; 🛚
 Q Q = E -
                                         public class TestTriangle {
                                      9
                                     10
Finished after 0.106 seconds
                                     110
                                             @Test
 Runs: 1/1 

Errors: 0 

Failures: 0
                                     12
                                             public void testTypeOfShouldReturnEquilateralTriangle() {
                                                 Triangle triangle = new Triangle(5, 5, 5);
                                     13
                                                 assertEquals(Triangle.Type.Equilateral, triangle.typeOf());
                                     14
                                     15
> TestTriangle [Runner: JUnit 5] (0.020 s
                                     16
                                     170
                                             public void testTypeOfShouldReturnIsocelesTriangle1() {
                                     18
                                                 Triangle triangle = new Triangle(6, 6, 8);
                                     19
                                     20
                                                 assertEquals(Triangle.Type.Isoceles, triangle.typeOf());
                                     21
                                     22
                                     23@
                                             @Test
                                     24
                                             public void testTypeOfShouldReturnIsocelesTriangle2() {
                                     25
                                                 Triangle triangle = new Triangle(6, 7, 7);
                                     26
                                                 assertEquals(Triangle.Type.Isoceles, triangle.typeOf());
                                     27
                                     28
                                     29⊕
                                     30
                                             public void testTypeOfShouldReturnIsocelesTriangle3() {
                                                 Triangle triangle = new Triangle(8, 6, 8);
                                     31
                                     32
                                                 assertEquals(Triangle.Type.Isoceles, triangle.typeOf());
                                     33
                                     34
                                     35⊕
                                             @Test
                                     36
                                             public void testTypeOfShouldReturnScaleneTriangle() {
                                     37
                                                 Triangle triangle = new Triangle(6, 7, 8);
                                                 assertEquals(Triangle.Type.Scalene, triangle.typeOf());
                                     38
Failure Trace
                         國準留
                                     39
                                     40
                                     410
                                             public void testTypeOfShouldReturnInvalidTriangle1() {
                                     42
                                                 Triangle triangle = new Triangle(6, 7, 14);
                                     43
                                     44
                                                 assertEquals(Triangle.Type.Invalid, triangle.typeOf());
                                     45
                                     46
                                     479
                                             @Test
                                             public void testTypeOfShouldReturnInvalidTriangle2() {
                                     48
                                     49
                                                 Triangle triangle = new Triangle(6, 14, 4);
                                     50
                                                 assertEquals(Triangle.Type.Invalid, triangle.typeOf());
                                     51
                                             }
                                     52
                                     530
                                             public void testTypeOfShouldReturnInvalidTriangle3() {
                                     55
                                                 Triangle triangle = new Triangle(15, 7, 4);
                                     56
                                                 assertEquals(Triangle.Type.Invalid, triangle.typeOf());
                                     58
                                     59 }
```

Figure 10: Added code to test the other branches of the production code mainly for isoceles and invalid triangle

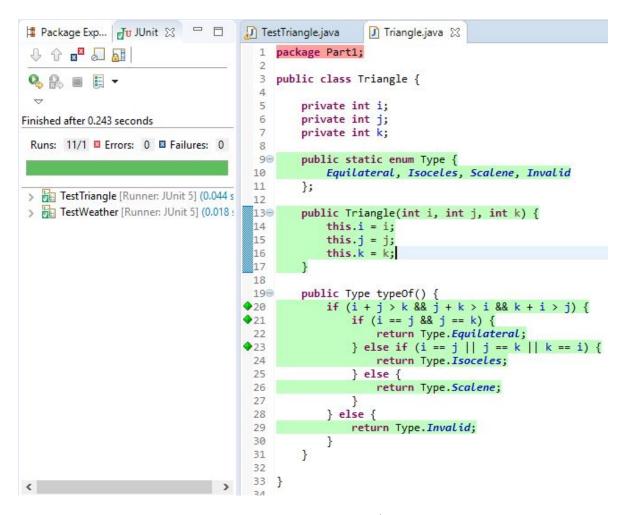


Figure 11: Test show full coverage after the adding the test. *Red colour is because of package issue in the environment