

SD2 - Worksheet 3 - 8%



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Faculty:	Computing Science					
Course:	BSCH/BSCO/EXCH			Stage/year:	2	
Subject:	Software Development 2					
Study Mode:	Full time	<input checked="" type="checkbox"/>		Part-time	<input type="checkbox"/>	
Lecturer Name:	Gemma Deery					
Assignment Title:	Worksheet 3					
Date due:						
Date submitted:						
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Repo Link: https://github.com/SylerEdd/WorksheetThree_3112121

Enkhbaatar Idersaikhan - 3112121

Tasks: 1

```
*Shape.java X
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 public abstract class Shape {
5
6     private String name;
7
8     public Shape(String name) {
9         this.name = name;
10    }
11
12    public String getName() {
13        return name;
14    }
15
16    public void setName(String name) {
17        this.name = name;
18    }
19
20    public abstract double area();
21    public abstract double perimeter();
22
23    @Override
24    public String toString() {
25        String string = "Shape: " + name;
26        return string;
27    }
28 }
```

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```
Shape.java  Circle.java  Rhombus.java  RightAngledTriangle.java
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 public class Circle extends Shape {
5
6     private double radius;
7
8     public Circle(String name, double radius) {
9         super(name);
10        this.radius = radius;
11    }
12
13    public double getRadius() {
14        return radius;
15    }
16
17    public void setRadius(double radius) {
18        this.radius = radius;
19    }
20
21    @Override
22    public double area() {
23        // TODO Auto-generated method stub
24        return 0;
25    }
26
27    @Override
28    public double perimeter() {
29        // TODO Auto-generated method stub
30        return 0;
31    }
32
33    public String toString() {
34        return super.toString()+" Radius: "+ radius;
35    }
36 }
37
```

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```
Shape.java  Circle.java  *Rhombus.java  RightAngledTriangle.java
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 public class Rhombus extends Shape{
5
6     private double diagonalp;
7     private double diagonalq;
8     private double side;
9
10    public Rhombus(String name, double diagonalp, double diagonalq, double side) {
11        super(name);
12        this.diagonalp = diagonalp;
13        this.diagonalq = diagonalq;
14        this.side = side;
15    }
16
17    public double getDiagonalp() {
18        return diagonalp;
19    }
20
21    public double getDiagonalq() {
22        return diagonalq;
23    }
24
25    public double side() {
26        return side;
27    }
28
29    @Override
30    public double area() {
31        // TODO Auto-generated method stub
32        return 0;
33    }
34
35    @Override
36    public double perimeter() {
37        // TODO Auto-generated method stub
38        return 0;
39    }
40
41    @Override
42    public String toString() {
43        return super.toString()+" , Diagonal: "+ diagonalp+ " , Diagonal2: " + diagonalq+ " , Side:" + side;
44    }
45
46 }
```

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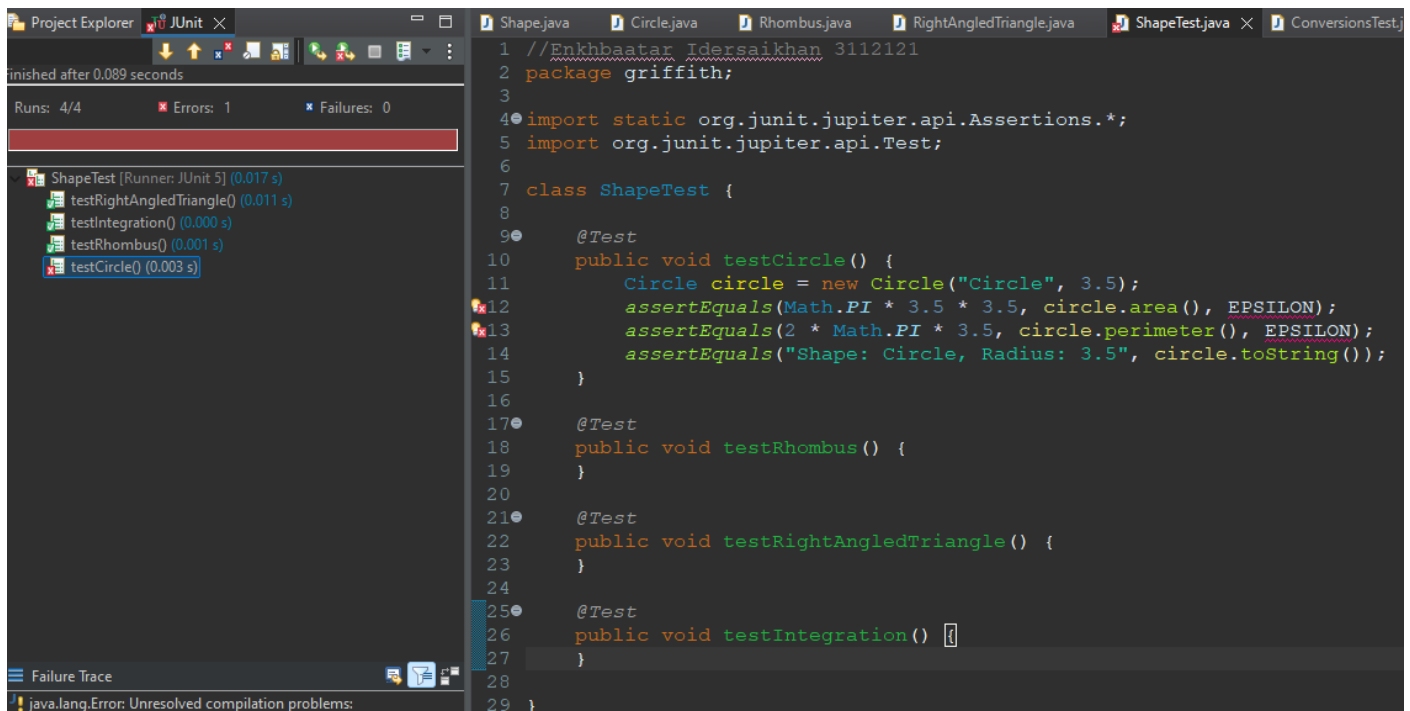
```
Shape.java  Circle.java  *Rhombus.java  *RightAngledTriangle.java X
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 public class RightAngledTriangle extends Shape{
5     private double base;
6     private double height;
7     private double hypotenuse;
8
9     public RightAngledTriangle(String name, double base, double height, double hypotenuse) {
10         super(name);
11         this.base = base;
12         this.height = height;
13         this.hypotenuse = hypotenuse;
14     }
15
16     public double getBase() {
17         return base;
18     }
19
20     public double getHeight() {
21         return height;
22     }
23
24     public double getHypotenuse() {
25         return hypotenuse;
26     }
27
28     @Override
29     public double area() {
30         // TODO Auto-generated method stub
31         return 0;
32     }
33
34     @Override
35     public double perimeter() {
36         // TODO Auto-generated method stub
37         return 0;
38     }
39
40     @Override
41     public String toString() {
42         return super.toString() + ", Base: " + base + ", Height: " + height + ", Hypotenuse:" + hypotenuse;
43     }
44 }
```

ShapeTest

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```
Shape.java Circle.java Rhombus.java RightAngledTriangle.java ShapeTest.java X
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 import static org.junit.jupiter.api.Assertions.*;
5 import org.junit.jupiter.api.Test;
6
7 class ShapeTest {
8
9     @Test
10    public void testCircle() {
11    }
12
13    @Test
14    public void testRhombus() {
15    }
16
17    @Test
18    public void testRightAngledTriangle() {
19    }
20
21    @Test
22    public void testIntegration() {
23    }
24
25 }
26
```

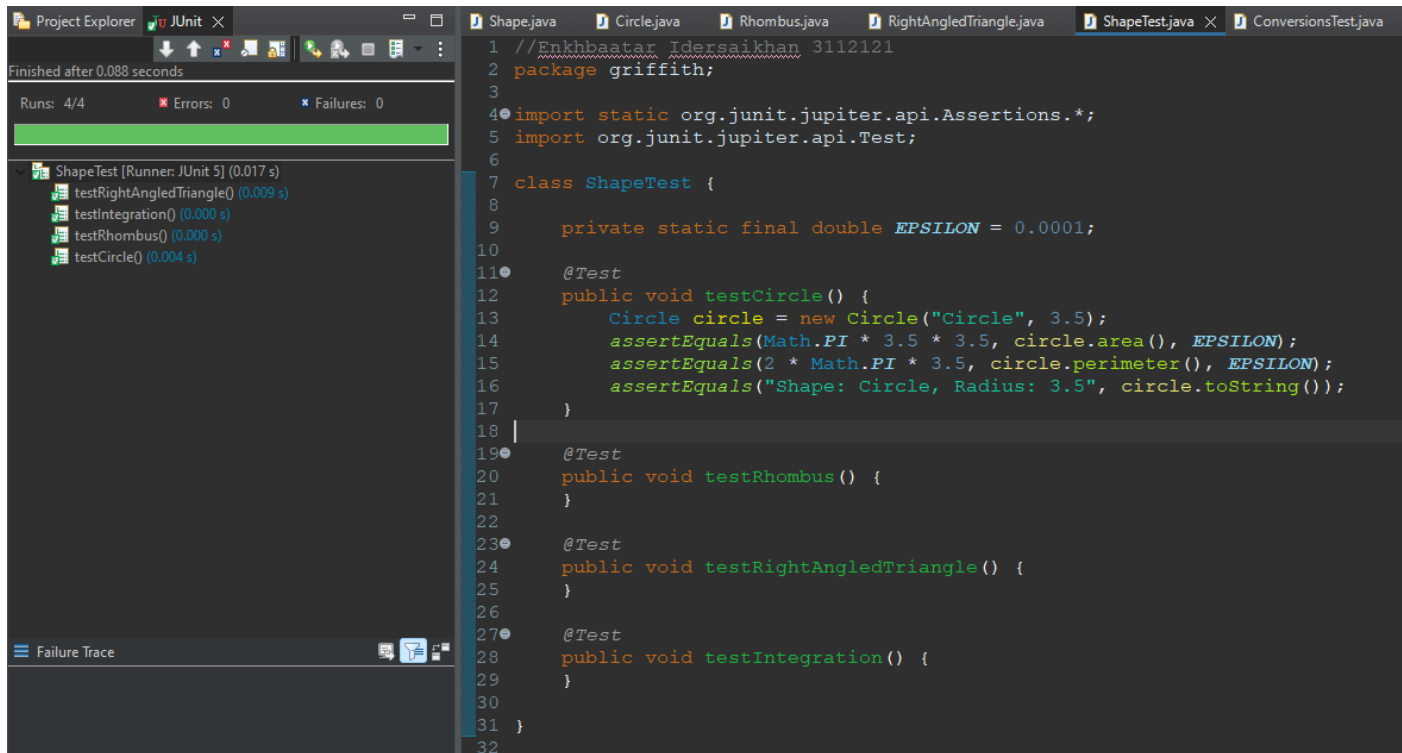
Failing test – testCircle



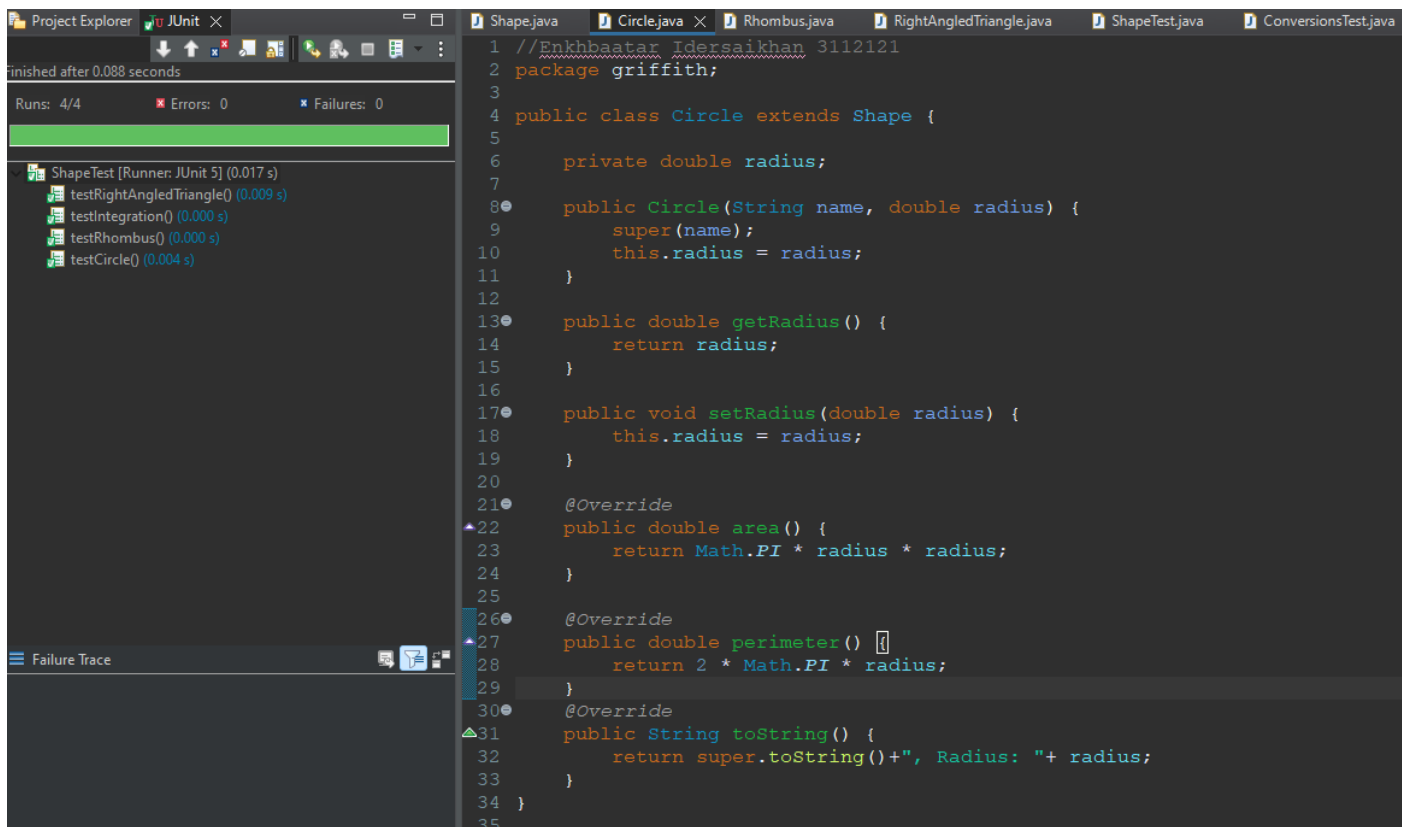
```
Project Explorer JUnit X
finished after 0.089 seconds
Runs: 4/4 Errors: 1 Failures: 0
ShapeTest [Runner: JUnit 5] (0.017 s)
  testRightAngledTriangle() (0.011 s)
  testIntegration() (0.000 s)
  testRhombus() (0.001 s)
  testCircle() (0.003 s)
Failure Trace
java.lang.Error: Unresolved compilation problems:
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 import static org.junit.jupiter.api.Assertions.*;
5 import org.junit.jupiter.api.Test;
6
7 class ShapeTest {
8
9     @Test
10    public void testCircle() {
11        Circle circle = new Circle("Circle", 3.5);
12        assertEquals(Math.PI * 3.5 * 3.5, circle.area(), EPSILON);
13        assertEquals(2 * Math.PI * 3.5, circle.perimeter(), EPSILON);
14        assertEquals("Shape: Circle, Radius: 3.5", circle.toString());
15    }
16
17    @Test
18    public void testRhombus() {
19    }
20
21    @Test
22    public void testRightAngledTriangle() {
23    }
24
25    @Test
26    public void testIntegration() {
27    }
28
29 }
```

Passed test of testCircle

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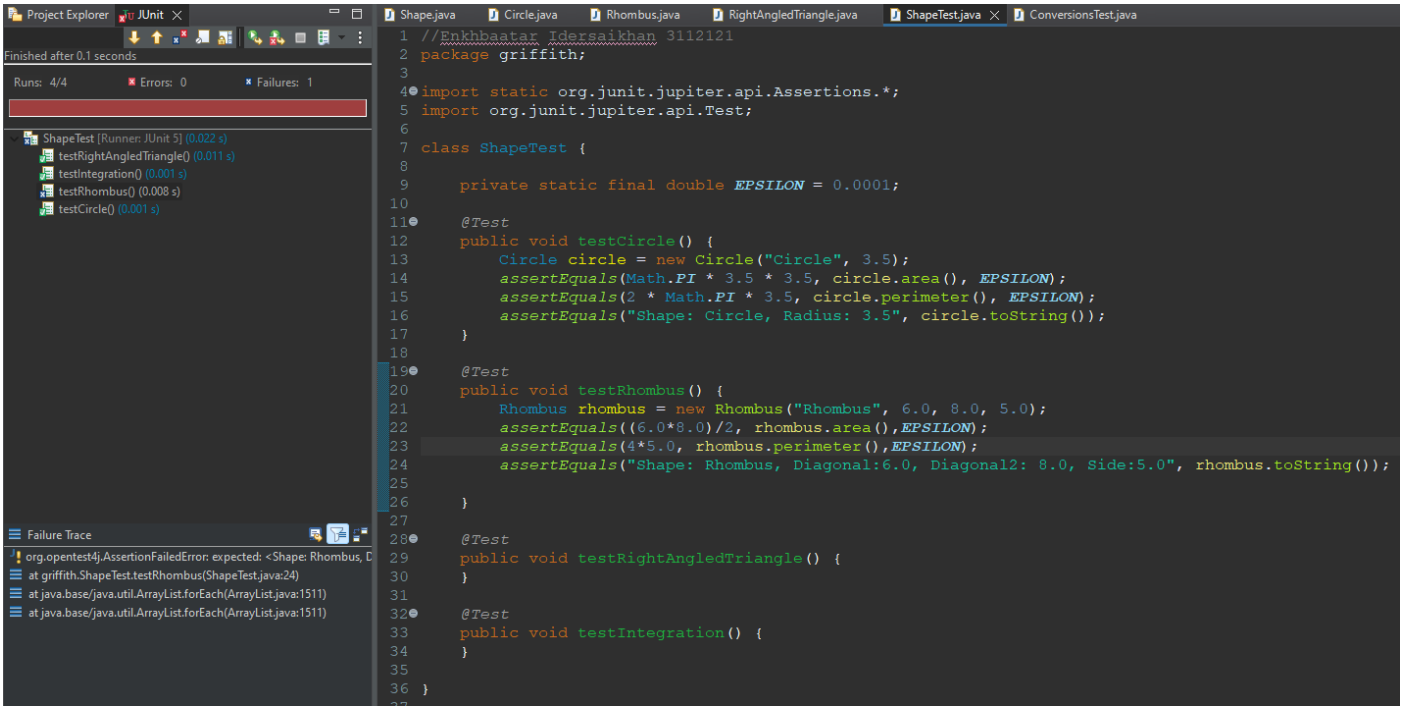


Implemented circle

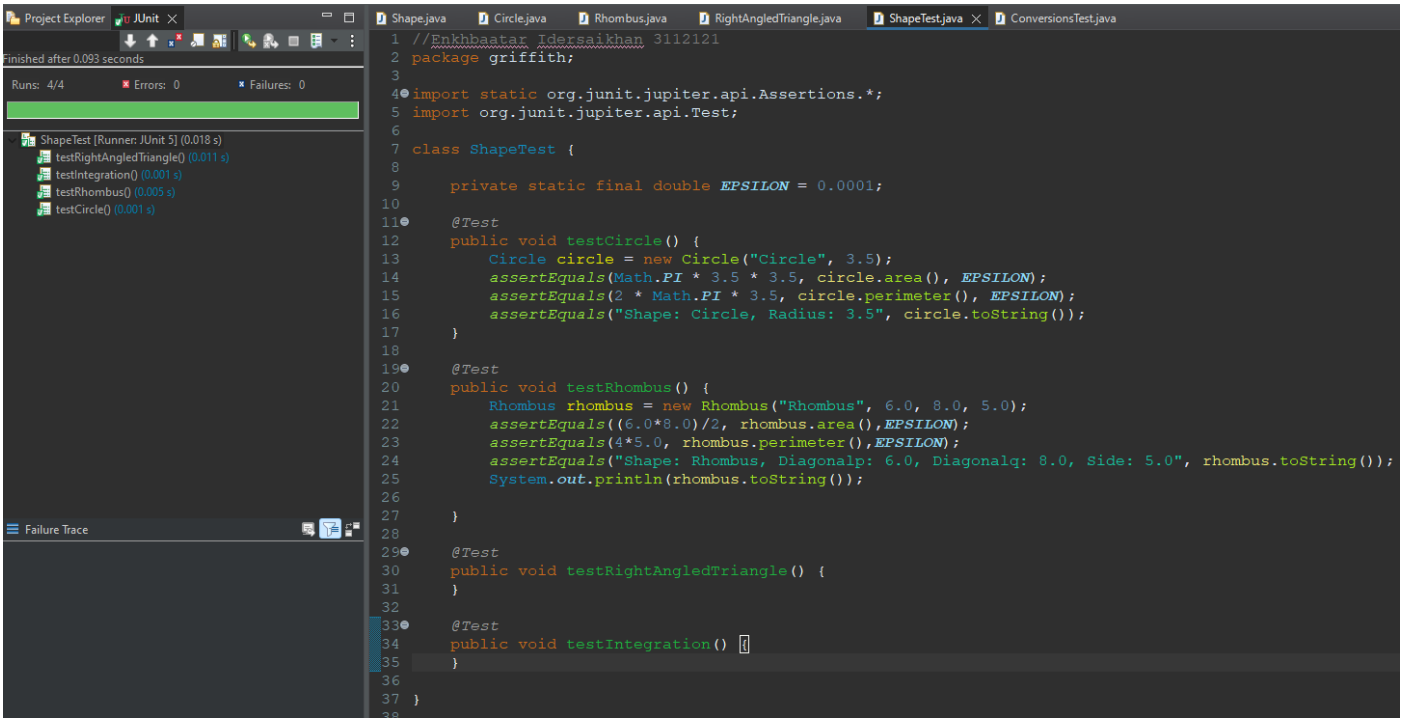


testRhombus failed

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Passed test rhombus



Implemented rhombus.java

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```
Shape.java  Circle.java  Rhombus.java  RightAngledTriangle.java  ShapeTest.java  ConversionsTest.java
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 public class Rhombus extends Shape{
5
6     private double diagonalp;
7     private double diagonalq;
8     private double side;
9
10    public Rhombus(String name, double diagonalp, double diagonalq, double side) {
11        super(name);
12        this.diagonalp = diagonalp;
13        this.diagonalq = diagonalq;
14        this.side = side;
15    }
16
17    public double getDiagonalp() {
18        return diagonalp;
19    }
20
21    public double getDiagonalq() {
22        return diagonalq;
23    }
24
25    public double getSide() {
26        return side;
27    }
28
29    @Override
30    public double area() {
31        return (diagonalp*diagonalq) /2;
32    }
33
34    @Override
35    public double perimeter() {
36        return 4*side;
37    }
38
39    @Override
40    public String toString() {
41        return "Shape: "+getName()+" , Diagonalp: " + diagonalp+ " , Diagonalq: " + diagonalq+ " , Side: " + side;
42    }
43
44 }
45
```

Failing test of testRightAngledTriangle

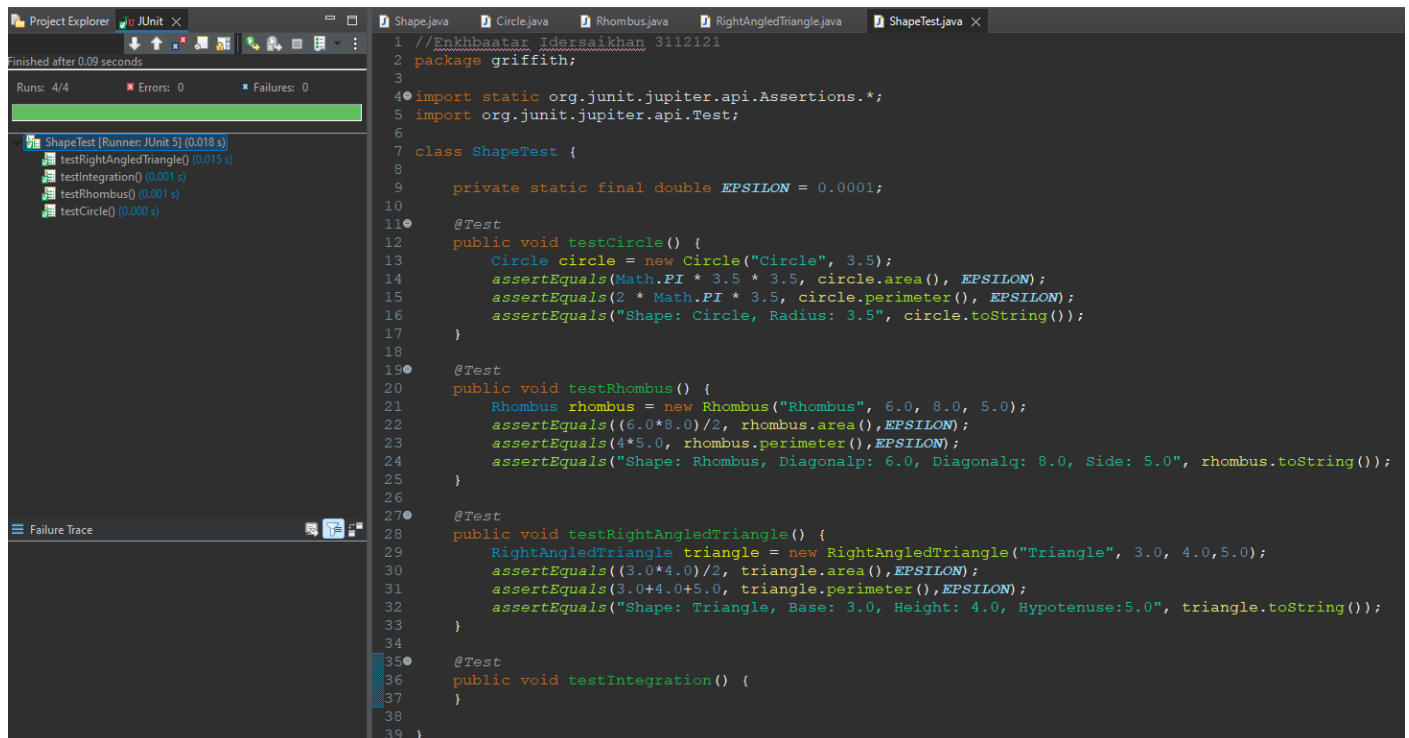
```
Project Explorer  JUnit  X
Runs: 4/4  Errors: 0  Failures: 1
ShapeTest [Runner: JUnit 5] (0.022 s)
  testRightAngledTriangle() (0.018 s)
  testIntegration() (0.001 s)
  testRhombus() (0.001 s)
  testCircle() (0.002 s)

Failure Trace
org.opentest4j.AssertionFailedError: expected: <6.0> but was: <0.0>
    at griffith.ShapeTest.testRightAngledTriangle(ShapeTest.java:32)
    at java.base/java.util.ArrayList.forEach(ArrayList.java:1511)
    at java.base/java.util.ArrayList.forEach(ArrayList.java:1511)

Shape.java  Circle.java  Rhombus.java  RightAngledTriangle.java  ShapeTest.java  X
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 import static org.junit.jupiter.api.Assertions.*;
5 import org.junit.jupiter.api.Test;
6
7 class ShapeTest {
8
9     private static final double EPSILON = 0.0001;
10
11    @Test
12    public void testCircle() {
13        Circle circle = new Circle("Circle", 3.5);
14        assertEquals(Math.PI * 3.5 * 3.5, circle.area(), EPSILON);
15        assertEquals(2 * Math.PI * 3.5, circle.perimeter(), EPSILON);
16        assertEquals("Shape: Circle, Radius: 3.5", circle.toString());
17    }
18
19    @Test
20    public void testRhombus() {
21        Rhombus rhombus = new Rhombus("Rhombus", 6.0, 8.0, 5.0);
22        assertEquals((6.0*8.0)/2, rhombus.area(), EPSILON);
23        assertEquals(4*5.0, rhombus.perimeter(), EPSILON);
24        assertEquals("Shape: Rhombus, Diagonalp: 6.0, Diagonalq: 8.0, Side: 5.0", rhombus.toString());
25    }
26
27    @Test
28    public void testRightAngledTriangle() {
29        RightAngledTriangle triangle = new RightAngledTriangle("RightAngledTriangle", 3.0, 4.0, 5.0);
30        assertEquals((3.0*4.0)/2, triangle.area(), EPSILON);
31        assertEquals(3.0+4.0+5.0, triangle.perimeter(), EPSILON);
32        assertEquals("Shape: Triangle, Base: 3.0, Height: 4.0, Hypotenuse: 5.0", triangle.toString());
33    }
34
35    @Test
36    public void testIntegration() {
37    }
38
39 }
40
```

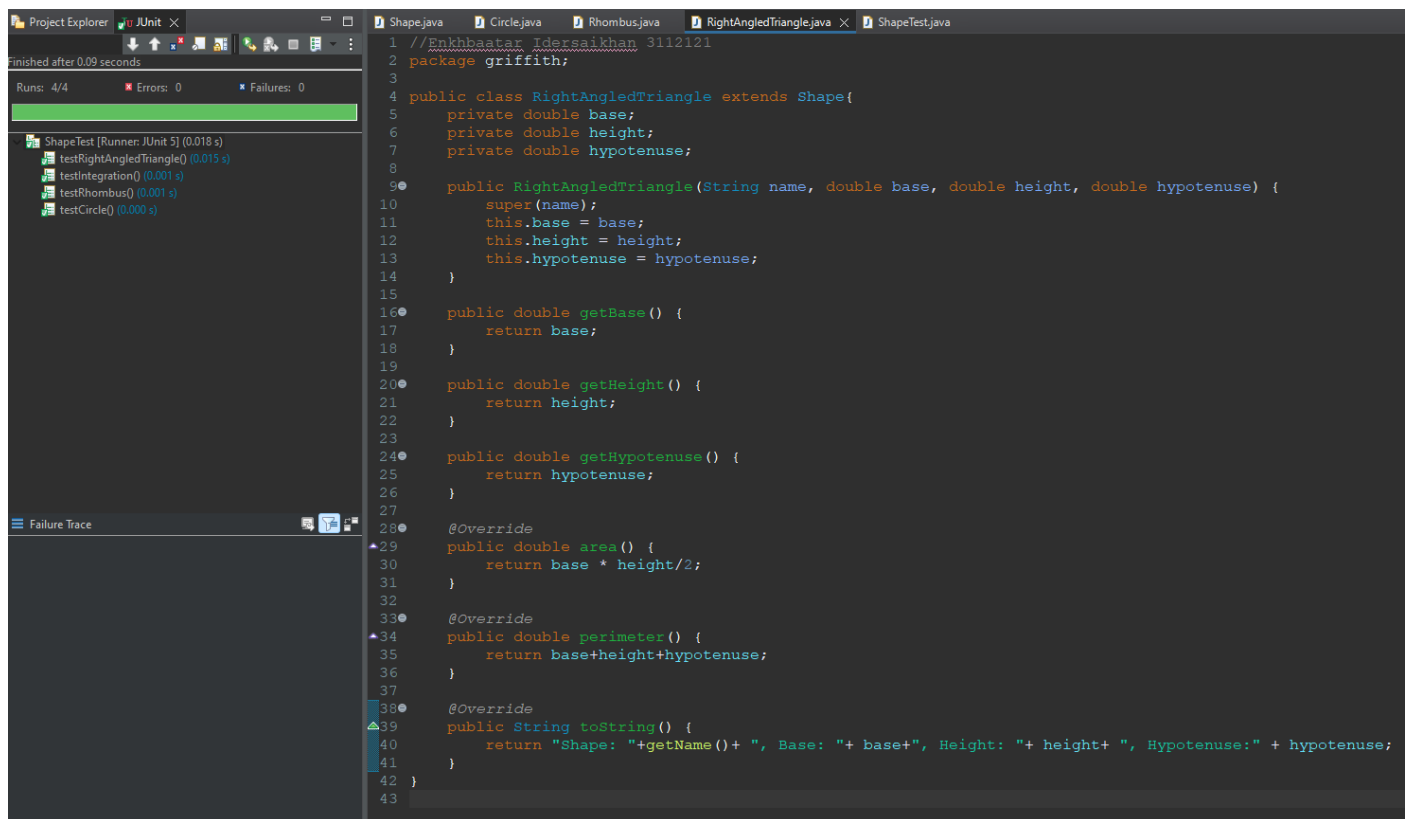
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Passed test of testRightAngledTriangle



```
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 import static org.junit.jupiter.api.Assertions.*;
5 import org.junit.jupiter.api.Test;
6
7 class ShapeTest {
8
9     private static final double EPSILON = 0.0001;
10
11     @Test
12     public void testCircle() {
13         Circle circle = new Circle("Circle", 3.5);
14         assertEquals(Math.PI * 3.5 * 3.5, circle.area(), EPSILON);
15         assertEquals(2 * Math.PI * 3.5, circle.perimeter(), EPSILON);
16         assertEquals("Shape: Circle, Radius: 3.5", circle.toString());
17     }
18
19     @Test
20     public void testRhombus() {
21         Rhombus rhombus = new Rhombus("Rhombus", 6.0, 8.0, 5.0);
22         assertEquals((6.0*8.0)/2, rhombus.area(), EPSILON);
23         assertEquals(4*5.0, rhombus.perimeter(), EPSILON);
24         assertEquals("Shape: Rhombus, Diagonalp: 6.0, Diagonalq: 8.0, Side: 5.0", rhombus.toString());
25     }
26
27     @Test
28     public void testRightAngledTriangle() {
29         RightAngledTriangle triangle = new RightAngledTriangle("Triangle", 3.0, 4.0, 5.0);
30         assertEquals((3.0*4.0)/2, triangle.area(), EPSILON);
31         assertEquals(3.0+4.0+5.0, triangle.perimeter(), EPSILON);
32         assertEquals("Shape: Triangle, Base: 3.0, Height: 4.0, Hypotenuse:5.0", triangle.toString());
33     }
34
35     @Test
36     public void testIntegration() {
37     }
38
39 }
```

Implemented RightAngledTriangle.java



```
1 //Enkhbaatar Idersaikhan 3112121
2 package griffith;
3
4 public class RightAngledTriangle extends Shape{
5     private double base;
6     private double height;
7     private double hypotenuse;
8
9     public RightAngledTriangle(String name, double base, double height, double hypotenuse) {
10         super(name);
11         this.base = base;
12         this.height = height;
13         this.hypotenuse = hypotenuse;
14     }
15
16     public double getBase() {
17         return base;
18     }
19
20     public double getHeight() {
21         return height;
22     }
23
24     public double getHypotenuse() {
25         return hypotenuse;
26     }
27
28     @Override
29     public double area() {
30         return base * height/2;
31     }
32
33     @Override
34     public double perimeter() {
35         return base+height+hypotenuse;
36     }
37
38     @Override
39     public String toString() {
40         return "Shape: "+getName()+ ", Base: "+ base+", Height: "+ height+ ", Hypotenuse:" + hypotenuse;
41     }
42 }
43
```

testIntegration passed

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