SD2 - Worksheet 3 - 8%

GRIFFITH COLLEGE DUBLIN

Student name:	**Enkhbaatar Idersaikhan**					
Student number:	**3112121**					
Faculty:	**Computing Science**					
Course:	**BSCH/BSCO/EXCH**			**Stage/year:**	**2**	
Subject:	**Software Development 2**					
Study Mode:	Full time	☑		Part-time		
Lecturer Name:	**Gemma Deery**					
Assignment Title:	**Worksheet 3**					
Date due:						
Date submitted:						

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I hereby certify that this assignment is my own work, based on my personal study and/or research, and that I have acknowledged all material and sources used in its preparation. I also certify that the assignment has not previously been submitted for assessment and that I have not copied in part or whole or otherwise plagiarised the work of anyone else, including other students.

Signed: _____ **Date:** _____

Please note: **Students** MUST **retain a hard / soft copy of** ALL assignments as well as a receipt issued and signed by a member of Faculty as proof of submission.

Repo Link: https://github.com/SylerEdd/WorksheetThree_3112121

Tasks: 1

*Shape.java

```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

public abstract class Shape {

    private String name;

    public Shape(String name) {
        this.name = name;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public abstract double area();
    public abstract double perimeter();

    @Override
    public String toString() {
        String string = "Shape: " + name;
        return string;
    }
}
```

Shape.java | Circle.java | Rhombus.java | RightAngledTriangle.java

```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

public class Circle extends Shape {

    private double radius;

    public Circle(String name, double radius) {
        super(name);
        this.radius = radius;
    }

    public double getRadius() {
        return radius;
    }

    public void setRadius(double radius) {
        this.radius = radius;
    }

    @Override
    public double area() {
        // TODO Auto-generated method stub
        return 0;
    }

    @Override
    public double perimeter() {
        // TODO Auto-generated method stub
        return 0;
    }

    public String toString() {
        return super.toString()+", Radius: "+ radius;
    }
}
```

Shape.java | Circle.java | *Rhombus.java | RightAngledTriangle.java

```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

public class Rhombus extends Shape{

    private double diagonalp;
    private double diagonalq;
    private double side;

    public Rhombus(String name, double diagonalp, double diagonalq, double side) {
        super(name);
        this.diagonalp = diagonalp;
        this.diagonalq = diagonalq;
        this.side = side;
    }

    public double getDiagonalp() {
        return diagonalp;
    }

    public double getDiagonalq() {
        return diagonalq;
    }

    public double side() {
        return side;
    }

    @Override
    public double area() {
        // TODO Auto-generated method stub
        return 0;
    }

    @Override
    public double perimeter() {
        // TODO Auto-generated method stub
        return 0;
    }

    @Override
    public String toString() {
        return super.toString()+", Diagonal: "+ diagonalp+ ", Diagonal2: " + diagonalq+ ", Side:" + side;
    }

}
```

Shape.java | Circle.java | *Rhombus.java | *RightAngledTriangle.java

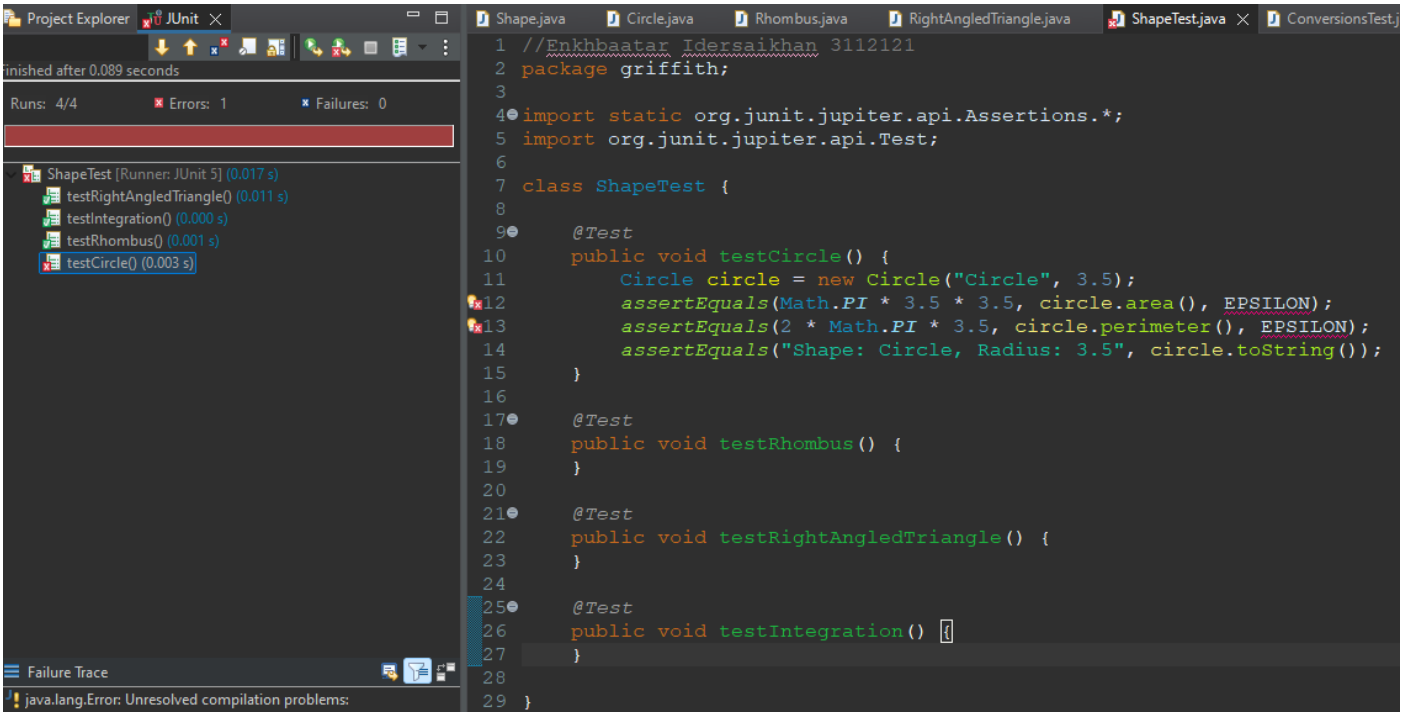
```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

public class RightAngledTriangle extends Shape{
    private double base;
    private double height;
    private double hypotenuse;

    public RightAngledTriangle(String name, double base, double height, double hypotenuse) {
        super(name);
        this.base = base;
        this.height = height;
        this.hypotenuse = hypotenuse;
    }

    public double getBase() {
        return base;
    }

    public double getHeight() {
        return height;
    }

    public double getHypotenuse() {
        return hypotenuse;
    }

    @Override
    public double area() {
        // TODO Auto-generated method stub
        return 0;
    }

    @Override
    public double perimeter() {
        // TODO Auto-generated method stub
        return 0;
    }

    @Override
    public String toString() {
        return super.toString()+ ", Base: "+ base+", Height: "+ height+ ", Hypotenuse:" + hypotenuse;
    }
}
```

ShapeTest

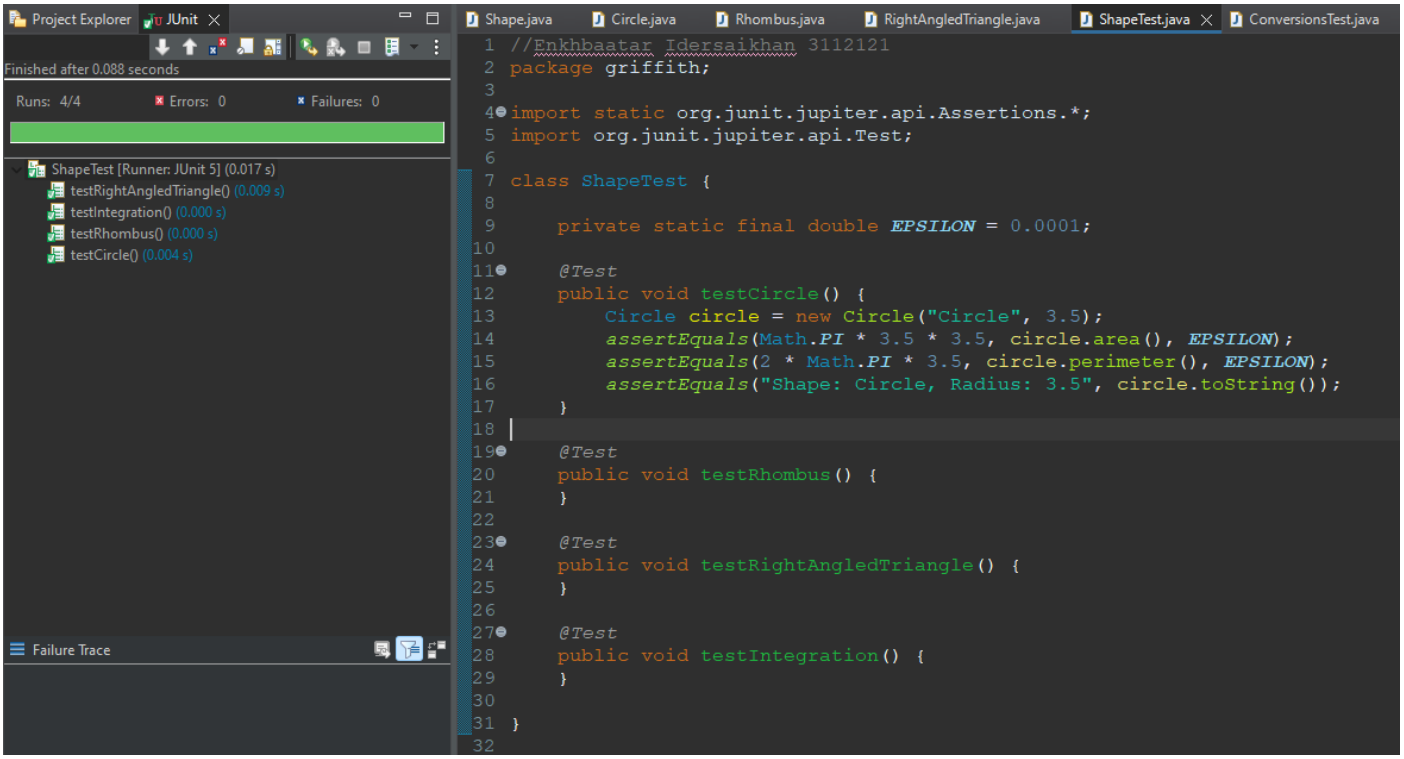
Shape.java | Circle.java | Rhombus.java | RightAngledTriangle.java | ShapeTest.java

```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

import static org.junit.jupiter.api.Assertions.*;
import org.junit.jupiter.api.Test;

class ShapeTest {

    @Test
    public void testCircle() {
    }

    @Test
    public void testRhombus() {
    }

    @Test
    public void testRightAngledTriangle() {
    }

    @Test
    public void testIntegration() {
    }

}
```

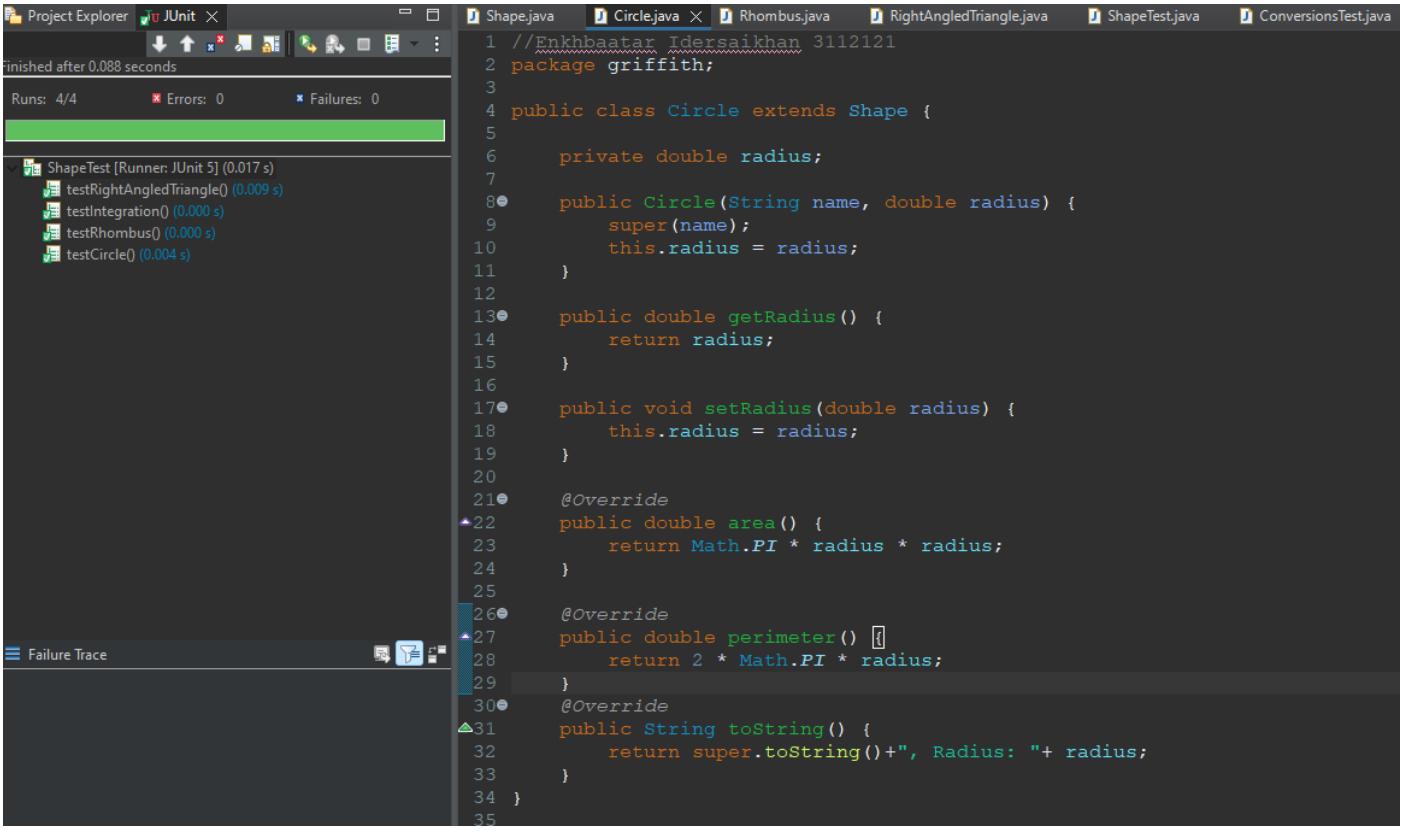
Failing test – testCircle



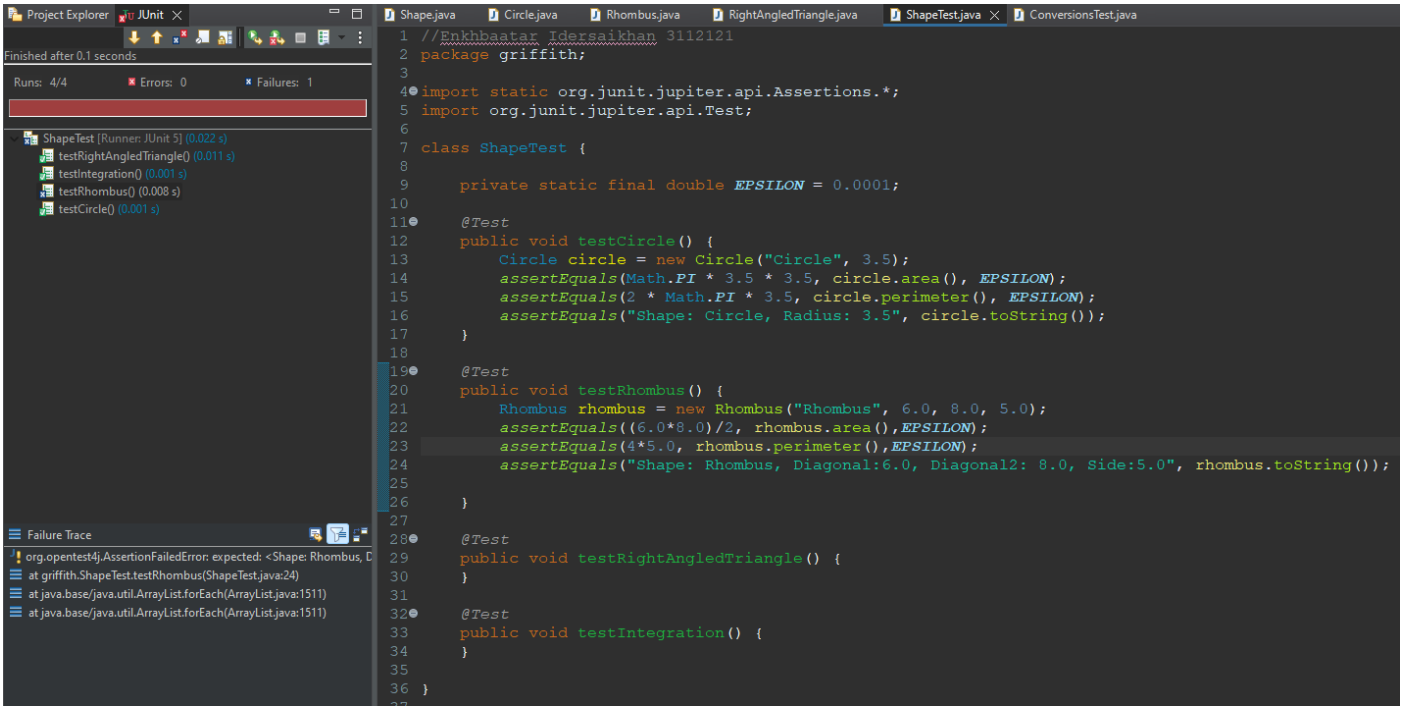
Passed test of testCircle



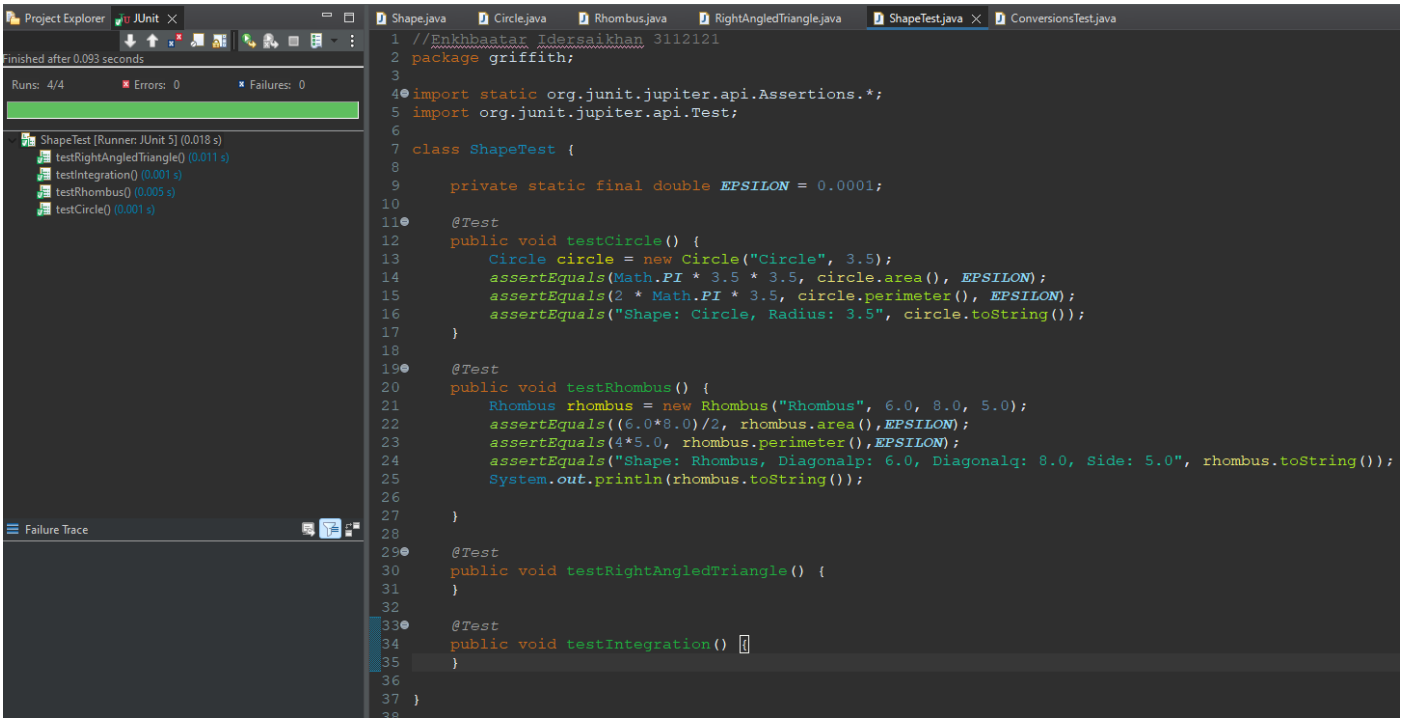
Implemented circle



testRhombus failed



Passed test rhombus



Implemented rhombus.java

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Shape.java | Circle.java | Rhombus.java | RightAngledTriangle.java | ShapeTest.java | ConversionsTest.java

```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

public class Rhombus extends Shape{

    private double diagonalp;
    private double diagonalq;
    private double side;

    public Rhombus(String name, double diagonalp, double diagonalq, double side) {
        super(name);
        this.diagonalp = diagonalp;
        this.diagonalq = diagonalq;
        this.side = side;
    }

    public double getDiagonalp() {
        return diagonalp;
    }

    public double getDiagonalq() {
        return diagonalq;
    }

    public double getSide() {
        return side;
    }

    @Override
    public double area() {
        return (diagonalp*diagonalq) /2;
    }

    @Override
    public double perimeter() {
        return 4*side;
    }

    @Override
    public String toString() {
        return "Shape: "+getName()+", Diagonalp: "+ diagonalp+ ", Diagonalq: " + diagonalq+ ", Side: " + side;
    }

}
```

Failing test of testRightAngledTriangle

Project Explorer | JUnit

nished after 0.092 seconds

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)

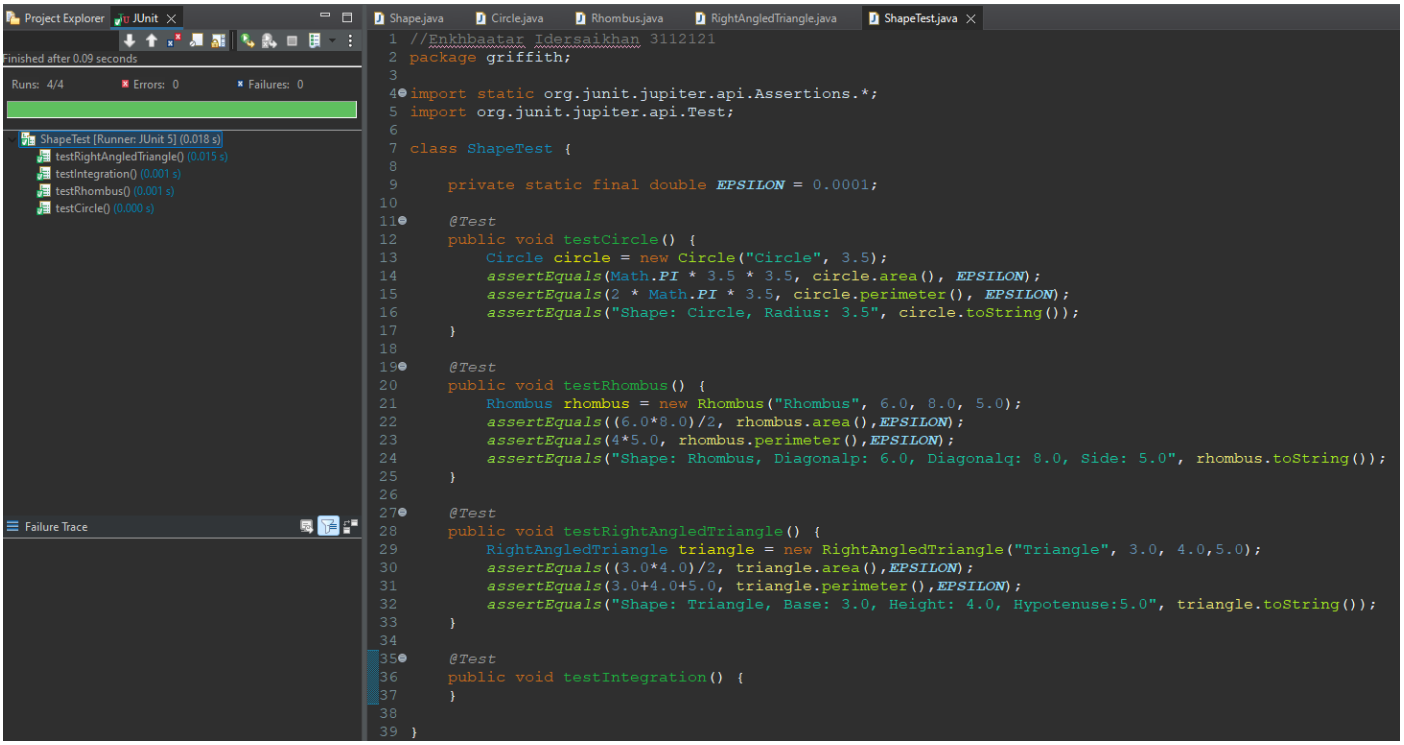
Failure Trace

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)

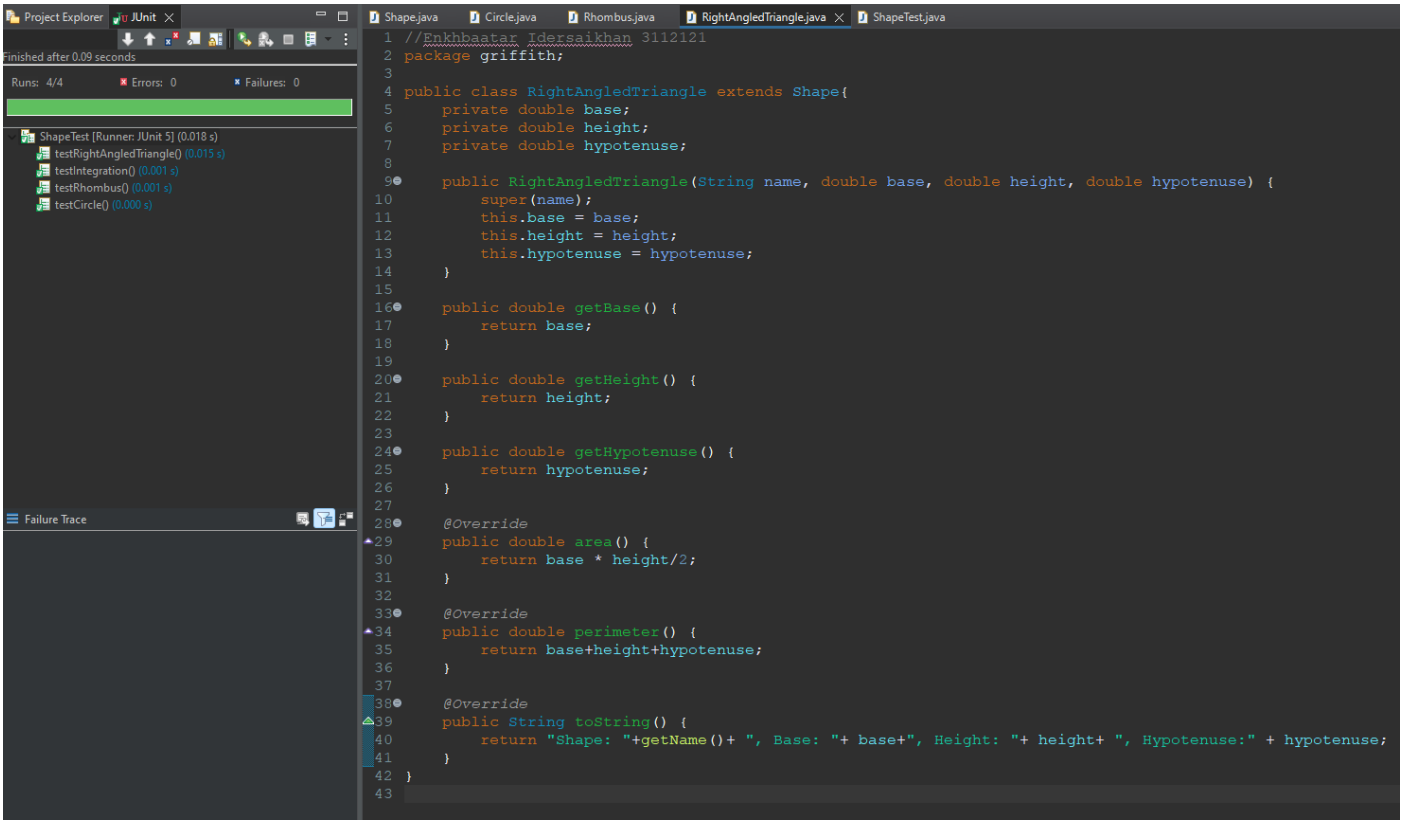
Shape.java | Circle.java | Rhombus.java | RightAngledTriangle.java | ShapeTest.java

```java
//Enkhbaatar Idersaikhan 3112121
package griffith;

import static org.junit.jupiter.api.Assertions.*;
import org.junit.jupiter.api.Test;

class ShapeTest {

    private static final double EPSILON = 0.0001;

    @Test
    public void testCircle() {
        Circle circle = new Circle("Circle", 3.5);
        assertEquals(Math.PI * 3.5 * 3.5, circle.area(), EPSILON);
        assertEquals(2 * Math.PI * 3.5, circle.perimeter(), EPSILON);
        assertEquals("Shape: Circle, Radius: 3.5", circle.toString());
    }

    @Test
    public void testRhombus() {
        Rhombus rhombus = new Rhombus("Rhombus", 6.0, 8.0, 5.0);
        assertEquals((6.0*8.0)/2, rhombus.area(),EPSILON);
        assertEquals(4*5.0, rhombus.perimeter(),EPSILON);
        assertEquals("Shape: Rhombus, Diagonalp: 6.0, Diagonalq: 8.0, Side: 5.0", rhombus.toString());
    }

    @Test
    public void testRightAngledTriangle() {
        RightAngledTriangle triangle = new RightAngledTriangle("RightAngledTriangle", 3.0, 4.0,5.0);
        assertEquals((3.0*4.0)/2, triangle.area(),EPSILON);
        assertEquals(3.0+4.0+5.0, triangle.perimeter(),EPSILON);
        assertEquals("Shape: Triangle, Base: 3.0, Height: 4.0, Hypotenuse:5.0", triangle.toString());
    }

    @Test
    public void testIntegration() {
    }

}
```

Passed test of testRightAngledTriangle



Implemented RightAngledTriangle.java



testIntegration passed

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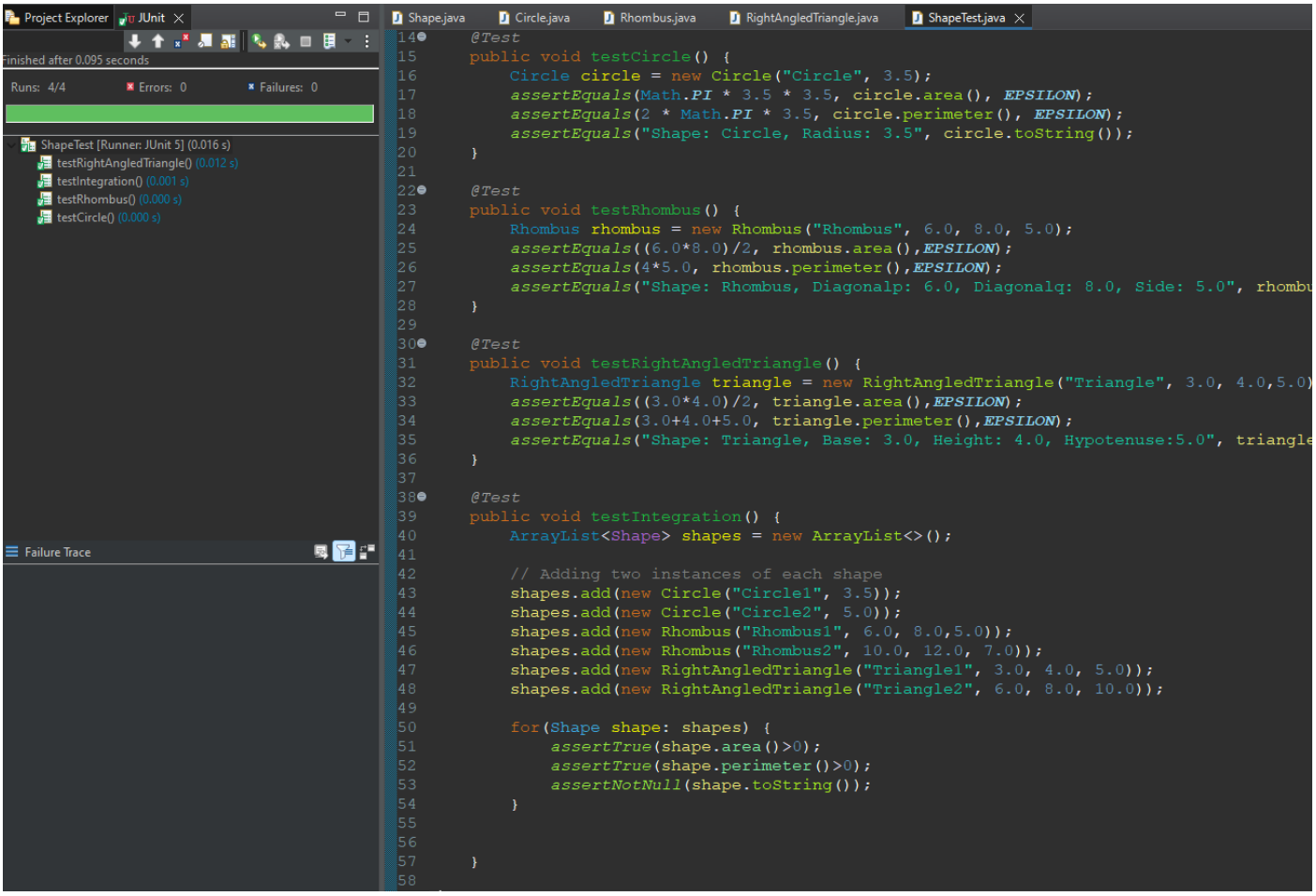

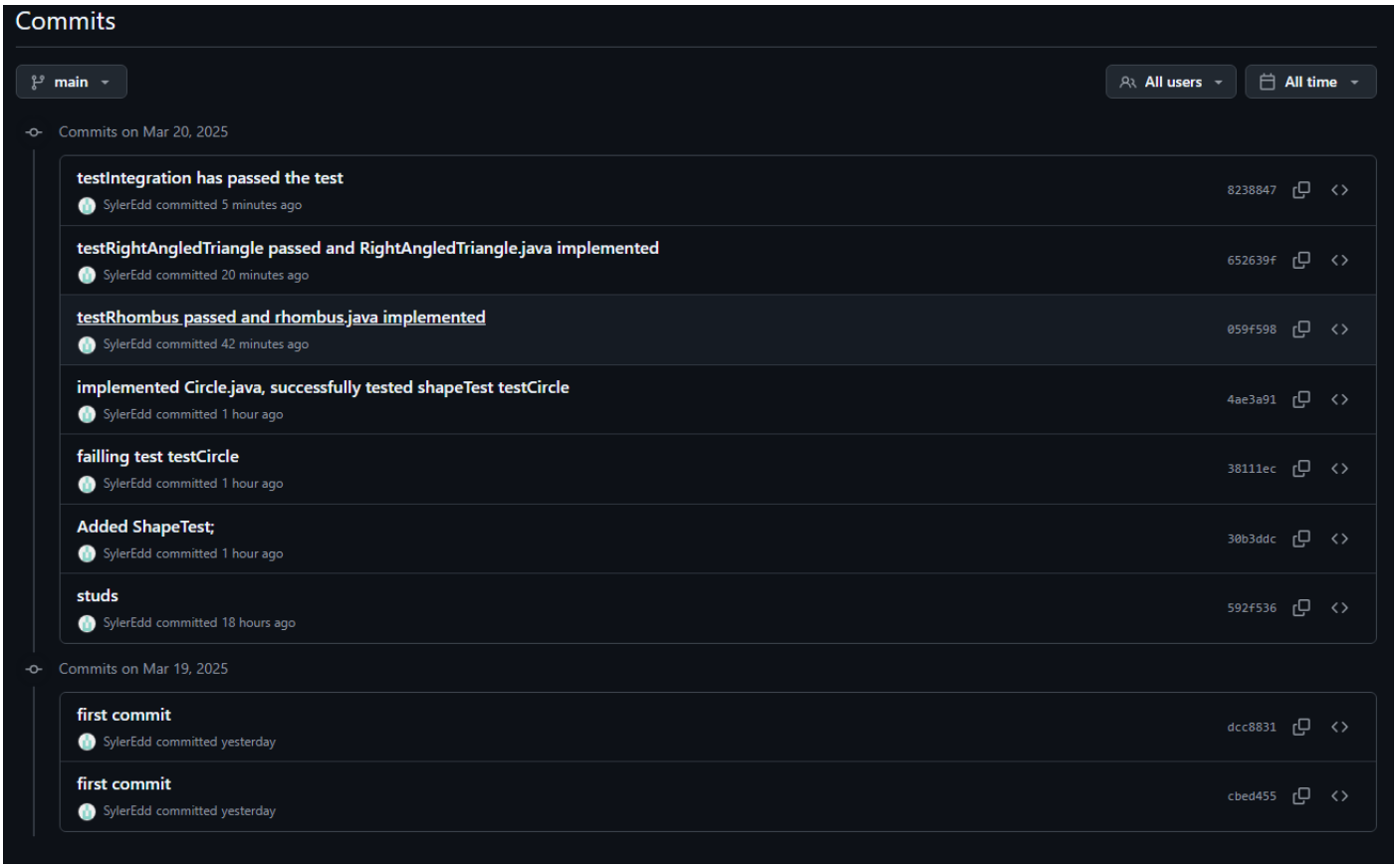

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