Exercise 4: Arrange-Act-Assert (AAA) Pattern, Test Fixtures, Setup and Teardown Methods in JUnit

Area Class:

**public** **class** Shapes {

**public** **double** areaOfCircle(**double** radius) {

**return** 3.14 \* radius \* radius;

}

**public** **double** areaOfRectangle(**double** length, **double** width) {

**return** length \* width;

}

}

Test Class:

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

**import** org.junit.jupiter.api.\*;

**class** TestArea {

**private** Shapes shapes; // Test Fixture

@BeforeAll

**void** setUp() {

// Arrange: Initialize shared test object before each test

shapes = **new** Shapes();

}

@Test

**void** testAreaOfCircle() {

// Arrange

**double** radius = 3;

// Act

**double** result = shapes.areaOfCircle(radius);

// Assert

*assertEquals*(Math.***PI*** \* 9, result, 0.001, "Area of circle calculation failed");

}

@Test

**void** testAreaOfRectangle() {

// Arrange

**double** length = 4;

**double** width = 5;

// Act

**double** result = shapes.areaOfRectangle(length, width);

// Assert

*assertEquals*(20.0, result, 0.001, "Area of rectangle calculation failed");

}

@AfterAll

**void** tearDown() {

// Clean up resources after each test if needed

shapes = **null**;

}

}

Output:

