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**Exercise 1: Setting Up JUnit Scenario:**

You need to set up JUnit in your Java project to start writing unit tests.  
**code:**

Pom.xml:

<dependencies>

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

<scope>test</scope>

</dependency>

</dependencies>

**Calculator.java:**

public class Calculator {

public int add(int a,int b) {

return a+b;

}

public int multiply(int a,int b) {

return a\*b;

}

}

**CalculatorTest.java:**

import static org.junit.Assert.\*;

import org.junit.Test;

public class CalculatorTest {

@Test

public void testAdd() {

Calculator calc = new Calculator();

assertEquals(5, calc.add(2, 3));

}

@Test

public void testMultiply() {

Calculator calc = new Calculator();

assertEquals(6, calc.multiply(2, 3));

}

}

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**Exercise 3: Assertions in JUnit Scenario:**

You need to use different assertions in JUnit to validate your test results.

**AssertionTest.java:**

public class AssertionsTest {

@Test public void testAssertions() {

// Assert equals

assertEquals(5, 2 + 3);

// Assert true

assertTrue(5 > 3);

// Assert false

assertFalse(5 < 3);

// Assert null

assertNull(null);

// Assert not null

assertNotNull(new Object());

}

}

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

Scenario: You need to organize your tests using the Arrange-Act-Assert (AAA) pattern and use setup and teardown methods.

Steps:

1. Write tests using the AAA pattern.

2. Use @Before and @After annotations for setup and teardown methods.

**CalculatorTest.java:**  
  
import static org.junit.Assert.\*;

import org.junit.Before;

import org.junit.After;

import org.junit.Test;

public class CalculatorTest {

private Calculator calculator;

@Before

public void setUp() {

calculator = new Calculator();

System.*out*.println("Setting up Calculator object...");

}

@After

public void tearDown() {

calculator = null;

System.*out*.println("Tearing down Calculator object...");

}

@Test

public void testAddition() {

// Arrange

int a = 2;

int b = 3;

// Act

int result = calculator.add(a, b);

// Assert

*assertEquals*(5, result);

}

@Test

public void testMultiplication() {

// Arrange

int a = 4;

int b = 5;

// Act

int result = calculator.multiply(a, b);

// Assert

*assertEquals*(20, result);

}

}

Output:

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