**Exercise 1: Setting Up JUnit**

**pom.xml:**

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

<scope>test</scope>

</dependency>

Create a basic test class:

import org.junit.Test;

import static org.junit.Assert.\*;

public class HelloTest {

@Test

public void testHello() {

assertEquals("Hello", "Hello");

}

}

**Exercise 2: Writing Basic JUnit Tests**

**Example Java Class to Test:**

public class Calculator {

public int add(int a, int b) { return a + b; }

public int subtract(int a, int b) { return a - b; }

public int multiply(int a, int b) { return a \* b; }

public int divide(int a, int b) { return a / b; } // Note: No zero check for now

}

**JUnit Test Class:**

import org.junit.Test;

import static org.junit.Assert.\*;

public class CalculatorTest {

Calculator calc = new Calculator();

@Test

public void testAdd() {

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

}

@Test

public void testSubtract() {

assertEquals(1, calc.subtract(4, 3));

@Test

public void testMultiply() {

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

}

@Test

public void testDivide() {

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

}

}

**Exercise 3: Assertions in JUnit**

**Sample Test Using All Assertions:**

import org.junit.Test;

import static org.junit.Assert.\*;

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());

}

}

**Exercise 4: AAA Pattern + Setup and Teardown**

**Test Class Using @Before and @After:**

import org.junit.Before;

import org.junit.After;

import org.junit.Test;

import static org.junit.Assert.\*;

public class AaaPatternTest {

private Calculator calc;

@Before

public void setUp() {

// Arrange: Run before each test

calc = new Calculator();

System.out.println("Setting up...");

}

@After

public void tearDown() {

// Cleanup: Run after each test

System.out.println("Tearing down...");

@Test

public void testAddition() {

// Act

int result = calc.add(4, 6);

// Assert

assertEquals(10, result);

}

@Test

public void testSubtraction() {

int result = calc.subtract(10, 5);

assertEquals(5, result);

}

}