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

What is the AAA Pattern?

It’s a way to structure tests clearly:

Arrange – Set up objects and data needed for the test.

Act – Call the method you’re testing.

Assert – Check that the result is what you expected.

**The Class Under Test**

// Calculator.java

package com.example;

public class Calculator {

public int add(int a, int b) {

return a + b;

}

public int subtract(int a, int b) {

return a - b;

}

}

**The Test Class (with AAA, Setup, and Teardown)**

// CalculatorTest.java

package com.example;

import org.junit.Before;

import org.junit.After;

import org.junit.Test;

import static org.junit.Assert.\*;

public class CalculatorTest {

private Calculator calculator;

@Before

public void setUp() {

// Arrange: Set up the calculator before each test

calculator = new Calculator();

System.out.println("Setup: Calculator instance created");

}

@After

public void tearDown() {

// Clean up after each test

calculator = null;

System.out.println("Teardown: Calculator instance cleared");

}

@Test

public void testAdd() {

// Arrange done in @Before

// Act

int result = calculator.add(5, 3);

// Assert

assertEquals(8, result);

}

@Test

public void testSubtract() {

// Act

int result = calculator.subtract(10, 4);

// Assert

assertEquals(6, result);

}

}

@Before setUp() runs before each test method.

@After tearDown() runs after each test method.

Each test uses AAA: Arrange (via @Before), Act, Assert.

**Output:**

