1. **Calculator.java (Main Logic for Testing)**

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) {

if (b == 0) throw new ArithmeticException("Division by zero not allowed");

return a / b;

}

}

1. **CalculatorTest.java (Basic JUnit Tests)**

import org.junit.Test;

import static org.junit.Assert.\*;

public class CalculatorTest {

Calculator calc = new Calculator();

@Test

public void testAdd() {

assertEquals(10, calc.add(7, 3));

}

@Test

public void testSubtract() {

assertEquals(4, calc.subtract(10, 6));

}

@Test

public void testMultiply() {

assertEquals(15, calc.multiply(3, 5));

}

@Test

public void testDivide() {

assertEquals(5, calc.divide(10, 2));

}

@Test(expected = ArithmeticException.class)

public void testDivideByZero() {

calc.divide(5, 0);

}

}

1. **AssertionsTest.java (Demonstrating JUnit 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());

}

}

1. **CalculatorTestWithSetup.java (AAA Pattern + Setup/Teardown)**

import org.junit.\*;

import static org.junit.Assert.\*;

public class CalculatorTestWithSetup {

private Calculator calc;

@Before

public void setUp() {

calc = new Calculator();

System.out.println("Before each test");

}

@After

public void tearDown() {

calc = null;

System.out.println("After each test");

}

@Test

public void testAdd() {

int result = calc.add(1, 2);

assertEquals(3, result);

}

@Test

public void testSubtract() {

int result = calc.subtract(5, 2);

assertEquals(3, result);

}

}

**Output**:

