**CTS DIGITAL NURTURE - 4.0 JAVA FSE**

**WEEK 2 -TDD using JUnit5 and Mockito**

**1. JUnit\_Basic Testing Exercises**

MANDATORY HANDS-ON 1:

QUESTION:

**Exercise 1: Setting Up JUnit**

**Scenario: You need to set up JUnit in your Java project to start writing unit tests. Steps: 1. Create a new Java project in your IDE (e.g., IntelliJ IDEA, Eclipse). 2. Add JUnit dependency to your project. If you are using Maven, add the following to your pom.xml: junit junit 4.13.2 test 3. Create a new test class in your project.**

PROGRAM:

**Calculator.java**

package com.example.junitdemo;

public class Calculator {

public int add(int a, int b) {

return a + b;

}

}

**CalculatorTest.java**

package com.example.junitdemo;

import static org.junit.Assert.\*;

import org.junit.Test;

public class CalculatorTest {

*@Test*

public void testAdd() {

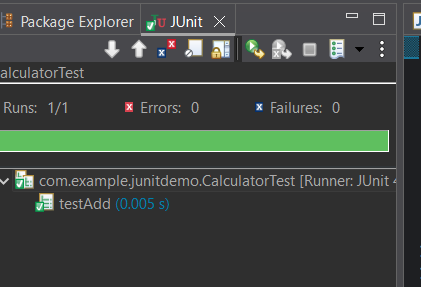
Calculator calc = new Calculator();

*assertEquals*(8, calc.add(5, 3));

}

}

OUTPUT:



**Exercise 3: Assertions in Junit**

**Scenario: You need to use different assertions in JUnit to validate your test results. Steps: 1. Write tests using various JUnit assertions**

PROGRAM:

package com.example.junitdemo;

import org.junit.Test;

import static org.junit.Assert.\*;

public class AssertionTest {

*@Test*

public void testAssertions() {

*assertEquals*(5, 2 + 3);

*assertTrue*(5 > 3);

*assertFalse*(5 < 3);

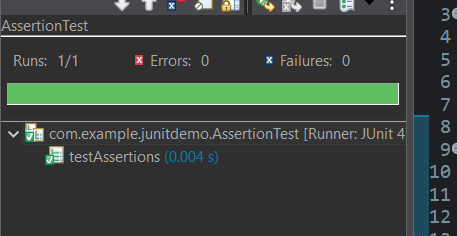
*assertNull*(null);

*assertNotNull*(new Object());

}

}

OUTPUT:



**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.**

PROGRAM:

**Calculator1.java**

package com.example.junitdemo;

public class Calculator1 {

public int add(int a, int b) {

return a + b;

}

public int subtract(int a, int b) {

return a - b;

}

}

**Calculator1Test.java**

package com.example.junitdemo;

import org.junit.After;

import org.junit.Before;

import org.junit.Test;

import static org.junit.Assert.\*;

public class Calculator1Test {

private Calculator1 calculator;

*@Before*

public void setUp() {

calculator = new Calculator1();

System.*out*.println("Setup complete.");

}

*@After*

public void tearDown() {

calculator = null;

System.*out*.println("Teardown complete.");

}

*@Test*

public void testAddition() {

// Arrange

int a = 10;

int b = 5;

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

*assertEquals*(15, result);

}

*@Test*

public void testSubtraction() {

int a = 10;

int b = 5;

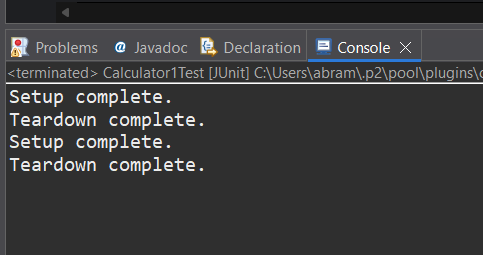
int result = calculator.subtract(a, b);

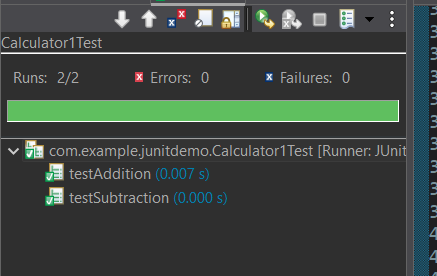
*assertEquals*(5, result);

}

}

OUTPUT:



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