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

**Teardown Methods in JUnit**

**Calculator.java**

package org.example;

public class Calculator {

public int add(int a, int b) {

return a + b;

}

public int divide(int a, int b) {

if (b == 0) throw new ArithmeticException("Cannot divide by zero");

return a / b;

}

}

**CalculatorTest.java**

package org.example;

import org.junit.After;

import org.junit.Before;

import org.junit.Test;

import static org.junit.Assert.\*;

public class CalculatorTest {

private Calculator calc;

@Before

public void setUp() {

// Setup: runs before each test

calc = new Calculator();

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

}

@After

public void tearDown() {

// Teardown: runs after each test

calc = null;

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

}

@Test

public void testAddition() {

// Arrange

int a = 2;

int b = 3;

// Act

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

// Assert

assertEquals(5, result);

}

@Test

public void testDivision() {

// Arrange

int a = 10;

int b = 2;

// Act

int result = calc.divide(a, b);

// Assert

assertEquals(5, result);

}

@Test(expected = ArithmeticException.class)

public void testDivisionByZero() {

// Act (no need for Arrange in this case)

calc.divide(10, 0);

// Assert handled by 'expected' parameter

}

}

**Pom.xml**

<?xml version="1.0" encoding="UTF-8"?>

<project xmlns="http://maven.apache.org/POM/4.0.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">

<modelVersion>4.0.0</modelVersion>

<groupId>org.example</groupId>

<artifactId>Junitt</artifactId>

<version>1.0-SNAPSHOT</version>

<properties>

<maven.compiler.source>24</maven.compiler.source>

<maven.compiler.target>24</maven.compiler.target>

<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>

</properties>

<dependencies>

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

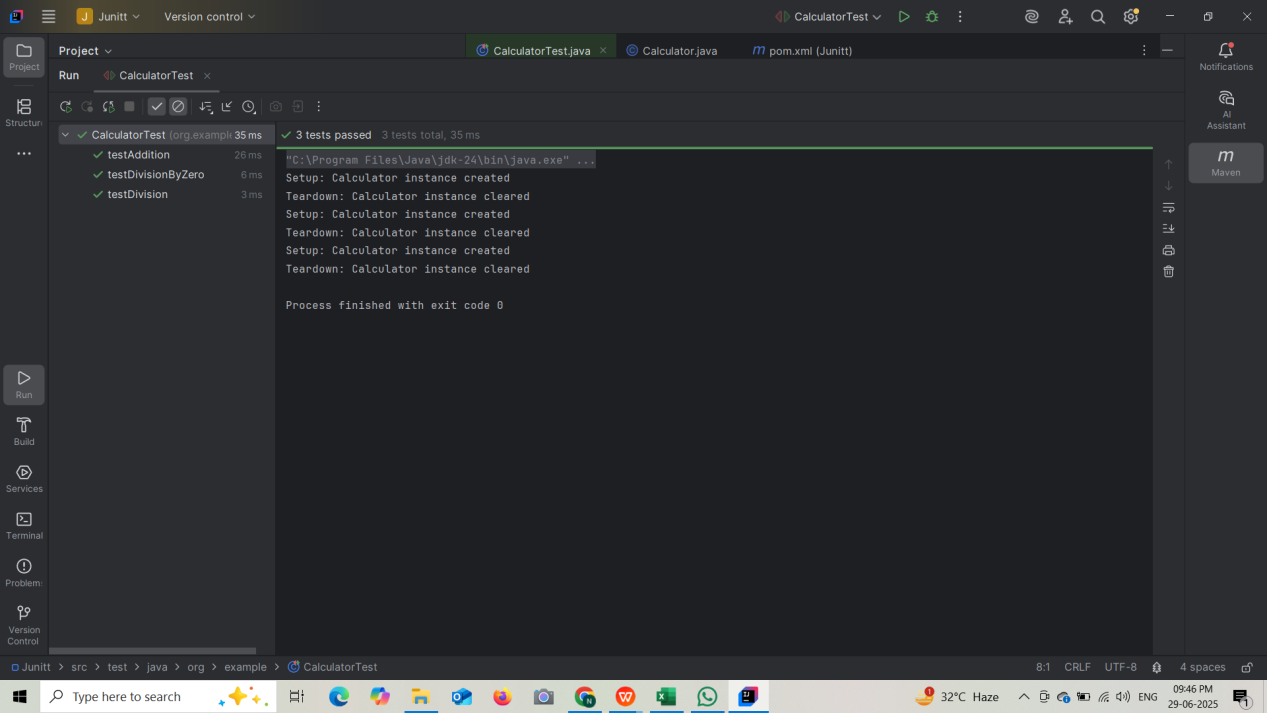
<scope>test</scope>

</dependency>

</dependencies>

</project>

**OUTPUT:**

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