**JUnit Testing Exercises (Hands\_On)**

**Exercise 1: Setting Up JUnit**

**Calculator.java**

public class Calculator {

public int add(int a, int b) {

return a + b;

}

}

**Pom.xml**

<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>Junitex</groupId>

<artifactId>Junitex</artifactId>

<version>0.0.1-SNAPSHOT</version>

<build>

<sourceDirectory>src</sourceDirectory>

<plugins>

<plugin>

<artifactId>maven-compiler-plugin</artifactId>

<version>3.8.1</version>

<configuration>

<release>22</release>

</configuration>

</plugin>

</plugins>

</build>

<dependencies>

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

<scope>test</scope>

</dependency>

</dependencies>

</project>

**CalculatorTest.java**

**package** com.example.junit;

**import** **static** org.junit.Assert.\*;

**import** org.junit.Test;

**public** **class** CalculatorTest {

@Test

**public** **void** testAdd() {

Calculator calc = **new** Calculator();

**int** result = calc.add(2, 3);

*assertEquals*(5, result);

}

}

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

**Exercise 3: Assertions in JUnit**

**CalulatorTest.java**

**package** com.example.junit;

**import** **static** org.junit.Assert.\*;

**import** org.junit.Test;

**public** **class** CalculatorTest {

@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());

}

}

OUTPUT:

**A screenshot of a computer error

AI-generated content may be incorrect.**

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

**Teardown Methods in Junit**

**Calculator.java:**

**package** com.example.junit;

**public** **class** Calculator {

**public** **int** add(**int** a, **int** b) {

**return** a + b;

}

**public** **int** subtract(**int** a, **int** b) {

**return** a - b;

}

}

**CalculatorTest.java:**

package com.example.junit;

import static org.junit.Assert.\*;

import org.junit.Before;

import org.junit.After;

import org.junit.Test;

public class CalculatorTest {

private Calculator calculator;

// Setup method – runs before each test

@Before

public void setUp() {

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

calculator = new Calculator();

}

// Teardown method – runs after each test

@After

public void tearDown() {

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

calculator = null;

}

// Test using AAA pattern

@Test

public void testAdd() {

// Arrange

int a = 5;

int b = 3;

// Act

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

// Assert

*assertEquals*(8, result);

}

@Test

public void testSubtract() {

// Arrange

int a = 10;

int b = 4;

// Act

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

// Assert

*assertEquals*(6, result);

}

}

**OUTPUT:**

**A screenshot of a computer

AI-generated content may be incorrect.**