**Week 2**

**Exercise 1: Setting Up JUnit**

**Claculator.java:**

**package** calculator;

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

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

**return** a+b;

}

}

**CalculatorTest.java:**

**package** calculator;

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

**import** org.junit.Test;

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

@Test

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

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

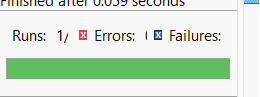
**int** result = calc.add(2, 3);

*assertEquals*(5, result);

}

}

**Output:**



**Exercise 3: Assertions in JUnit**

**AssertionsTest.java:**

package test;

import static org.junit.Assert.\*;

import org.junit.Test;

public class AssertionsTest {

@Test

public void testAssertions() {

*assertEquals*(5, 2 + 3);

*assertTrue*(5 > 3);

*assertFalse*(5 < 3);

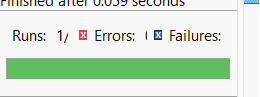
*assertNull*(null);

*assertNotNull*(new Object());

}

}

**Output:**



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

**Teardown Methods in JUnit**

**CalTest.java:**

package test;

import calculator.Calculator;

import static org.junit.Assert.\*;

import org.junit.Before;

import org.junit.After;

import org.junit.Test;

public class CalTest {

private Calculator calc;

@Before

public void setUp() {

calc = new Calculator(); // Arrange

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

}

@After

public void tearDown() {

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

}

@Test

public void testAddition() {

int result = calc.add(3, 4);

*assertEquals*(7, result);

}

@Test

public void testSubtraction() {

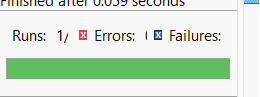
int result = calc.subtract(10, 5);

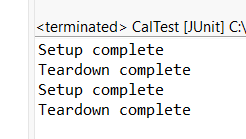
*assertEquals*(5, result);

}

}

**Output:**



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**Exercise 1: Mocking and Stubbing**

MyService.java:

package com.example;

public class MyService {

private ExternalApi api;

public MyService(ExternalApi api) {

this.api = api;

}

public String fetchData() {

return api.getData();

}

}

**MyServiceTest.java:**

package com.example;

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

import static org.mockito.Mockito.\*;

import org.junit.Test;

public class MyServiceTest {

@Test

public void testExternalApi() {

ExternalApi mockApi = *mock*(ExternalApi.class);

*when*(mockApi.getData()).thenReturn("Mock Data");

MyService service = new MyService(mockApi);

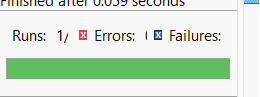
String result = service.fetchData();

*assertEquals*("Mock Data", result);

}

}

**Output:**



**Exercise 2: Verifying Interactions**

**MyServiceTest.java:**

package com.example;

import static org.junit.Assert.\*;

import static org.mockito.Mockito.\*;

import org.mockito.Mockito;

import org.junit.Test;

public class MyServiceTest {

@Test

public void testExternalApi() {

ExternalApi mockApi = *mock*(ExternalApi.class);

*when*(mockApi.getData()).thenReturn("Mock Data");

MyService service = new MyService(mockApi);

String result = service.fetchData();

*assertEquals*("Mock Data", result);

}

@Test

public void testVerifyInteraction() {

ExternalApi mockApi = Mockito.*mock*(ExternalApi.class);

MyService service = new MyService(mockApi);

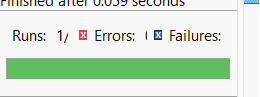
service.fetchData();

*verify*(mockApi).getData();

}

}

**Output:**



**Exercise 1: Logging Error Messages and Warning Levels**

**LoggingExample.java:**

package com.example;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

public class LoggingExample {

private static final Logger *logger* = LoggerFactory.*getLogger*(LoggingExample.class);

public static void main(String[] args) {

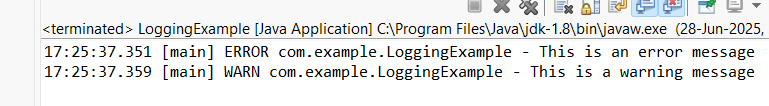
*logger*.error("This is an error message");

*logger*.warn("This is a warning message");

}

}

**Output:**

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