1. Exercise 1: Setting Up Junit

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

<scope>test</scope>

</dependency>

import org.junit.Test;

import static org.junit.Assert.assertEquals;

public class SampleTest {

@Test

public void testAddition() {

assertEquals(4, 2 + 2);

}

}

Output:

Tests run: 1, Failures: 0

1. Exercise 3: Assertions in Junit

import org.junit.Test;

import static org.junit.Assert.\*;

public class AssertionsTest {

@Test

public void testAssertions() {

assertEquals(5, 2 + 3);

assertTrue(5 > 3);

assertFalse(5 < 3);

assertNull(null);

assertNotNull(new Object());

}}

Output:

Tests run: 1, Failures: 0

1. Exercise 4: AAA Pattern and Setup/Teardown

import org.junit.Before;

import org.junit.After;

import org.junit.Test;

import static org.junit.Assert.assertEquals;

public class AAATest {

private int value;

@Before

public void setUp() {

value = 5;

}

@After

public void tearDown() {

value = 0;

}

@Test

public void testValueIncrement() {

value += 3;

assertEquals(8, value);

}

}

Output:

Tests run: 1, Failures: 0

1. Exercise 1 (Mockito): Mocking and Stubbing

import static org.mockito.Mockito.\*;

import org.junit.jupiter.api.Test;

import org.mockito.Mockito;

public class MyServiceTest {

@Test

public void testExternalApi() {

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

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

MyService service = new MyService(mockApi);

String result = service.fetchData();

assertEquals("Mock Data", result);

}

}

Output:

Tests run: 1, Failures: 0

1. **Exercise 2: Verifying Interactions**

import static org.mockito.Mockito.\*;

import org.junit.jupiter.api.Test;

import org.mockito.Mockito;

public class MyServiceTest {

@Test

public void testVerifyInteraction() {

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

MyService service = new MyService(mockApi);

service.fetchData();

verify(mockApi).getData();

}

}

Output:

Tests run: 1, Failures: 0

1. Exercise 1: Logging Error Messages and Warning Levels

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:

ERROR LoggingExample - This is an error message

WARN LoggingExample - This is a warning message