JUnit_Basic Testing

Exercise 1: Getting Started with JUnit

Goal: Set up a JUnit test class and write basic test methods.

1. Calculator.java — Class to be tested:

```java
public class Calculator {
 public int add(int a, int b) {
 return a + b;
 }
 public int subtract(int a, int b) {
 return a - b;
 }
}
```

2. CalculatorTest.java — JUnit Test:

```java
import org.junit.Test;
 import static org.junit.Assert.*;

public class CalculatorTest {

@Test
public void testAdd() {
    Calculator calc = new Calculator();
    assertEquals(5, calc.add(2, 3));
}

@Test
public void testSubtract() {
    Calculator calc = new Calculator();
```

```java
        assertEquals(4, calc.subtract(7, 3));
    }

}
```

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Exercise 3: Assertions in JUnit

Goal: Practice using different JUnit assertions like assertEquals, assertTrue, etc.

1. AssertionsTest.java:

```java
import org.junit.Test;
 import static org.junit.Assert.*;

public class AssertionsTest {

@Test
public void testAssertions() {
   // assertEquals
   assertEquals("Sum check", 10, 5 + 5);

   // assertTrue
   assertTrue("Should be true", 8 > 3);

   // assertFalse
   assertFalse("Should be false", 2 > 10);

   // assertNull
   String str = null;
   assertNull(str);

   // assertNotNull
   String text = "JUnit";
```

```
    assertNotNull(text);
}
```

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Exercise 4: Using the AAA Pattern (Arrange-Act-Assert), @Before and @After

Goal: Use structured test pattern with setup and teardown methods.

1. Service.java — Class with logic:

```
public class Service {
 public String greet(String name) {
 return "Hello, " + name;
 }
}
```

2. ServiceTest.java — JUnit Test with @Before and @After:

```
import org.junit.Before;
 import org.junit.After;
 import org.junit.Test;
 import static org.junit.Assert.*;

public class ServiceTest {

private Service service;

@Before
public void setUp() {
    service = new Service();
    System.out.println("Before each test");
```

```java
    }

    @After
    public void tearDown() {
        service = null;
        System.out.println("After each test");
    }

    @Test
    public void testGreet() {
        // Arrange
        String name = "Alice";

        // Act
        String result = service.greet(name);

        // Assert
        assertEquals("Hello, Alice", result);
    }
```