

Exercise 4: Arrange-Act-Assert (AAA) Pattern, Test Fixtures, Setup and Teardown Methods in Junit:

##Calculator.java

```
package org.apache.maven.archetypes.maven_archetype_quickstart;
```

```
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 org.apache.maven.archetypes.maven_archetype_quickstart;
```

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

```
public class CalculatorTest {  
  
    private Calculator calculator;
```

@Before

```
public void setUp() {  
    calculator = new Calculator();  
    System.out.println("Setup: Calculator instance created");  
}
```

@After

```
public void tearDown() {  
    calculator = null;  
    System.out.println("Teardown: Calculator instance destroyed");  
}
```

@Test

```
public void testAddition() {  
    // Arrange  
    int a = 5;  
    int b = 3;  
  
    // Act  
    int result = calculator.add(a, b);  
  
    // Assert  
    assertEquals(8, result);  
}
```

@Test

```
public void testSubtraction() {  
    // Arrange  
    int a = 10;
```

```

    int b = 4;

    // Act

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

    // Assert

    assertEquals(6, result);

}

}

```

Output:

```

<terminated> maven-archetype-quickstart (1) [Maven build] C:\Users\Winesh Keady\p2\pool\plugins\org.eclipse.justi.openjak.notspot.jre.tuii.wins2.x86_04_23.0.2.v20231111-0004\jre\bin\javaw.exe (29 Jun
[INFO] -----
[INFO] T E S T S
[INFO] -----
[INFO] Running org.apache.maven.archetypes.maven_archetype_quickstart.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.183 s -- in org.apache.maven.archetypes.maven_archetype_quickstart.AppTest
[INFO] Running org.apache.maven.archetypes.maven_archetype_quickstart.AssertionsTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.002 s -- in org.apache.maven.archetypes.maven_archetype_quickstart.AssertionsTest
[INFO] Running org.apache.maven.archetypes.maven_archetype_quickstart.CalculatorTest
Setup: Calculator instance created
Teardown: Calculator instance destroyed
Setup: Calculator instance created
Teardown: Calculator instance destroyed
[INFO] Tests run: 2, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.015 s -- in org.apache.maven.archetypes.maven_archetype_quickstart.CalculatorTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 4.569 s
[INFO] Finished at: 2025-06-29T12:12:07+05:30
[INFO] -----

```