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

```java
package com.example;

import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import static org.junit.jupiter.api.Assertions.*;

public class CalculatorTest {

    private Calculator calculator;


    @BeforeEach
    public void setUp() {

        calculator = new Calculator();
    }


    @Test
    public void testAdd() {

        int result = calculator.add(10, 5);

        assertEquals(15, result);
    }
    @Test
    public void testSubtract() {
        int result = calculator.subtract(10, 5);
        assertEquals(5, result);
    }

    @Test
    public void testMultiply() {
        int result = calculator.multiply(4, 2);
        assertEquals(8, result);
    }

    @Test
    public void testDivide() {
        int result = calculator.divide(20, 5);
        assertEquals(4, result);
    }

    @Test
    public void testDivideByZero() {
        Exception exception = assertThrows(IllegalArgumentException.class, () -> {
            calculator.divide(10, 0);
        });
        assertEquals("Cannot divide by zero", exception.getMessage());
    }
}

package com.example;
```

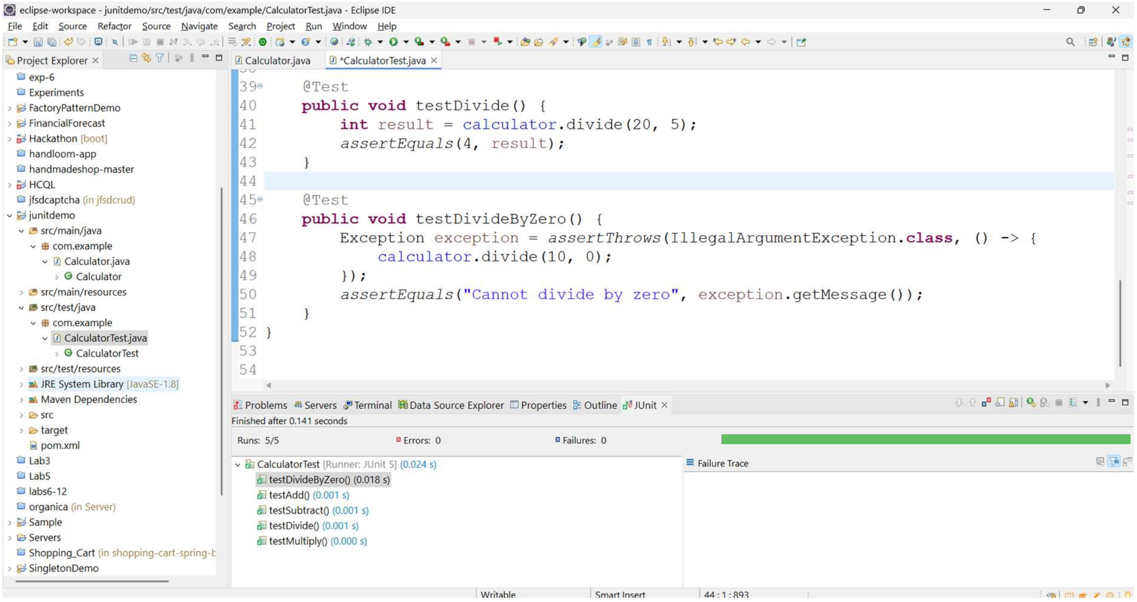
```
public class Calculator {
    public int add(int a, int b) {
        return a + b;
    }

    public int subtract(int a, int b) {
        return a - b;
    }

    public int multiply(int a, int b) {
        return a * b;
    }

    public int divide(int a, int b) {
        if (b == 0) throw new IllegalArgumentException("Cannot divide by zero");
        return a / b;
    }
}
```

OUTPUT:



```java
    @Test
    public void testDivide() {
        int result = calculator.divide(20, 5);
        assertEquals(4, result);
    }

    @Test
    public void testDivideByZero() {
        Exception exception = assertThrows(IllegalArgumentException.class, () -> {
            calculator.divide(10, 0);
        });
        assertEquals("Cannot divide by zero", exception.getMessage());
    }
}
```

```
Finished after 0.141 seconds
Runs:  5/5          Errors:  0          Failures:  0

CalculatorTest [Runner: JUnit 5] (0.024 s)
    testDivideByZero() (0.018 s)
    testAdd() (0.001 s)
    testSubtract() (0.001 s)
    testDivide() (0.001 s)
    testMultiply() (0.000 s)
```