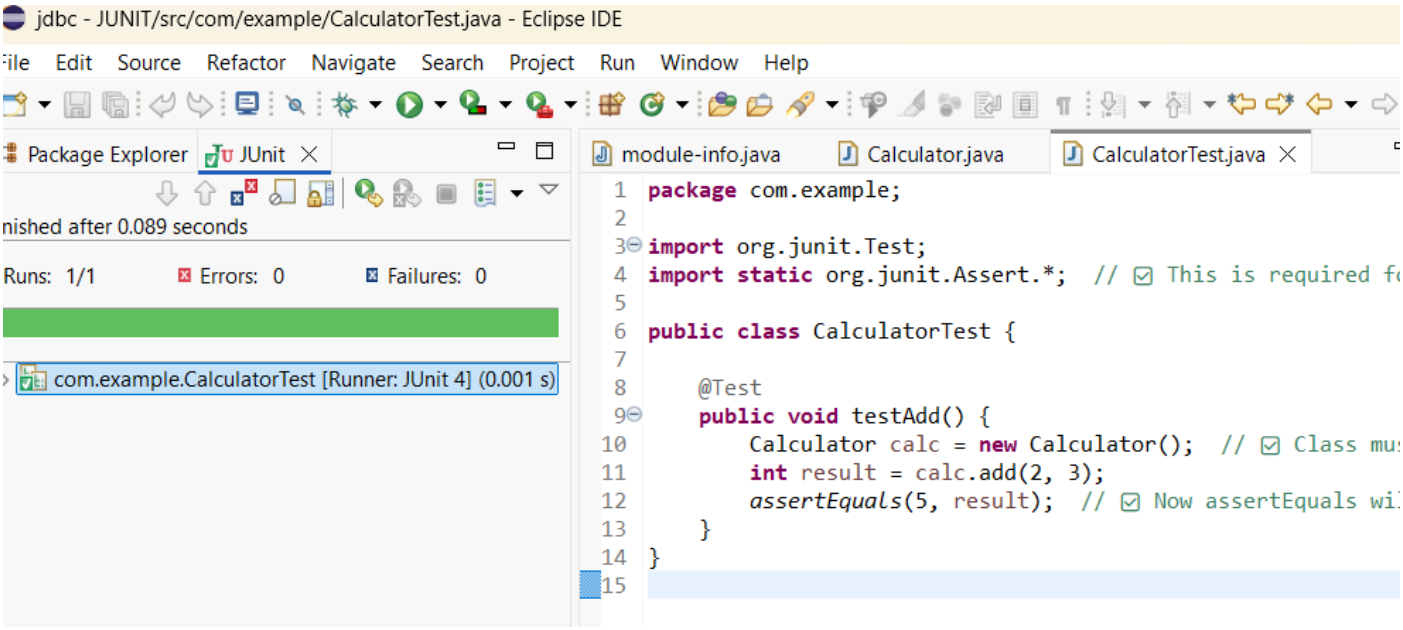
1.JUnit_Basic Testing Exercises

Exercise 1: Setting Up Junit

OUTPUT



Exercise 2: Writing Basic JUnit Tests

CODE

File name: Calculator.java

```
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) {
```

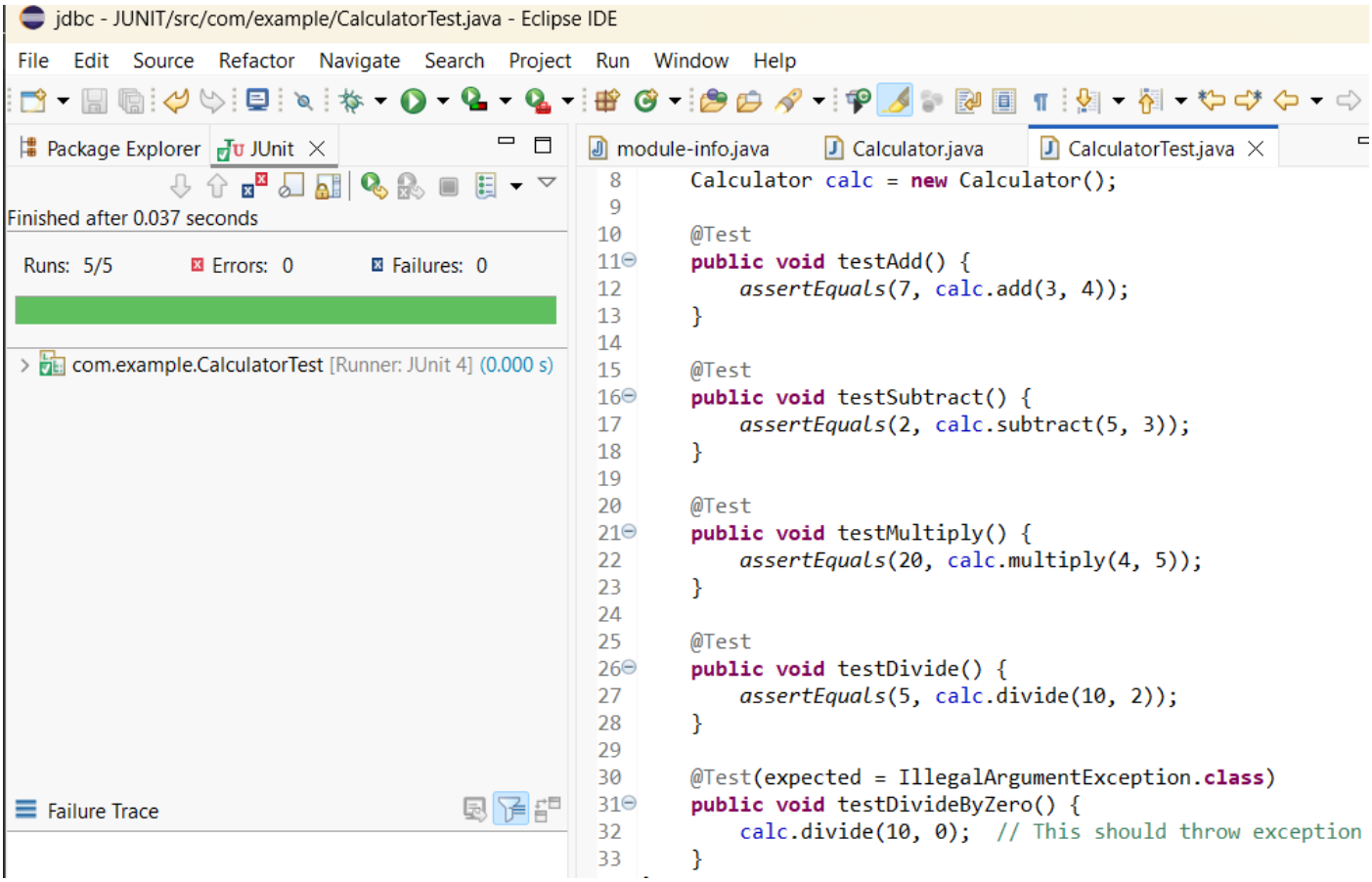
```
        if (b == 0) throw new IllegalArgumentException("Division by zero");
        return a / b;
    }
}
```

File name:CalculatorTest.java

```
package com.example;

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

public class CalculatorTest {

    Calculator calc = new Calculator();

    @Test
    public void testAdd() {
        assertEquals(7, calc.add(3, 4));
    }

    @Test
    public void testSubtract() {
        assertEquals(2, calc.subtract(5, 3));
    }

    @Test
    public void testMultiply() {
        assertEquals(20, calc.multiply(4, 5));
    }

    @Test
    public void testDivide() {
        assertEquals(5, calc.divide(10, 2));
    }
```

```
    @Test(expected = IllegalArgumentException.class)
    public void testDivideByZero() {
        calc.divide(10, 0);  // This should throw exception
    }
}
```

OUTPUT



Exercise 3: Assertions in Junit

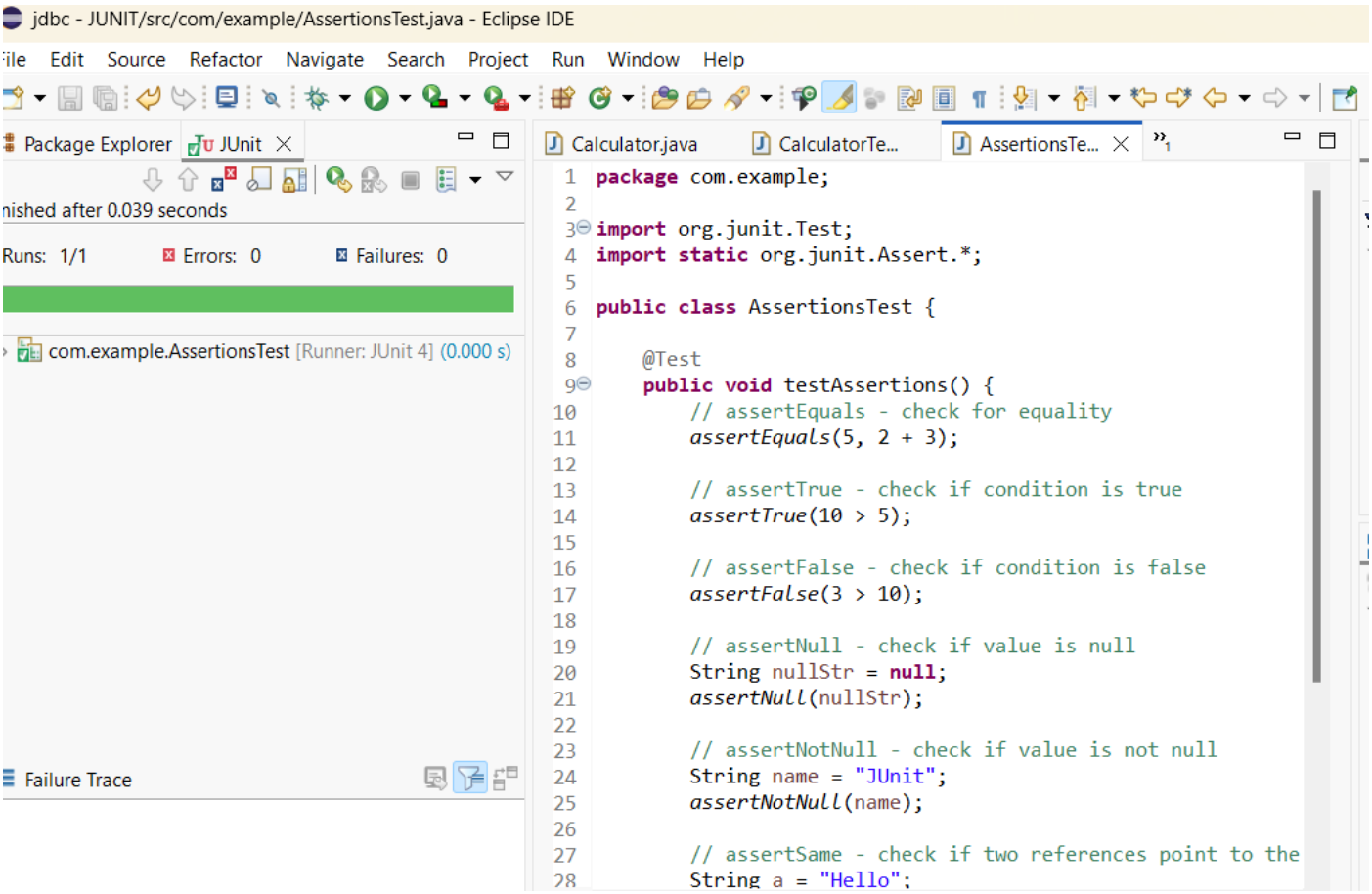
CODE

File name: AssertionsTest.java

```
package com.example;

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

public class AssertionsTest {

    @Test
    public void testAssertions() {
        // assertEquals - check for equality
```

```
        assertEquals(5, 2 + 3);

        // assertTrue - check if condition is true
        assertTrue(10 > 5);

        // assertFalse - check if condition is false
        assertFalse(3 > 10);

        // assertNull - check if value is null
        String nullStr = null;
        assertNull(nullStr);

        // assertNotNull - check if value is not null
        String name = "JUnit";
        assertNotNull(name);

        // assertSame - check if two references point to the same object
        String a = "Hello";
        String b = a;
        assertSame(a, b);

        // assertNotSame - check if two references do not point to the same object
        String x = new String("World");
        String y = new String("World");
        assertNotSame(x, y);
    }
}
```

OUTPUT



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

CODE

File name: Calculator.java

```
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;
    }
}
```

File name: CalculatorTest.java

```
package com.example;

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

public class CalculatorTest {

   private Calculator calc;

   // setup method - runs BEFORE each test
   @Before
   public void setUp() {
      System.out.println("Setting up Calculator...");
      calc = new Calculator();
   }

   // Teardown method - runs AFTER each test
   @After
   public void tearDown() {
      System.out.println("Cleaning up...");
      calc = null;  //
   }

   @Test
   public void testAddition() {
      // Act
      int result = calc.add(5, 3);

      // Assert
      assertEquals(8, result);
   }
```

```
    @Test
    public void testSubtraction() {
        int result = calc.subtract(10, 4);
        assertEquals(6, result);
    }
}
```

OUTPUT