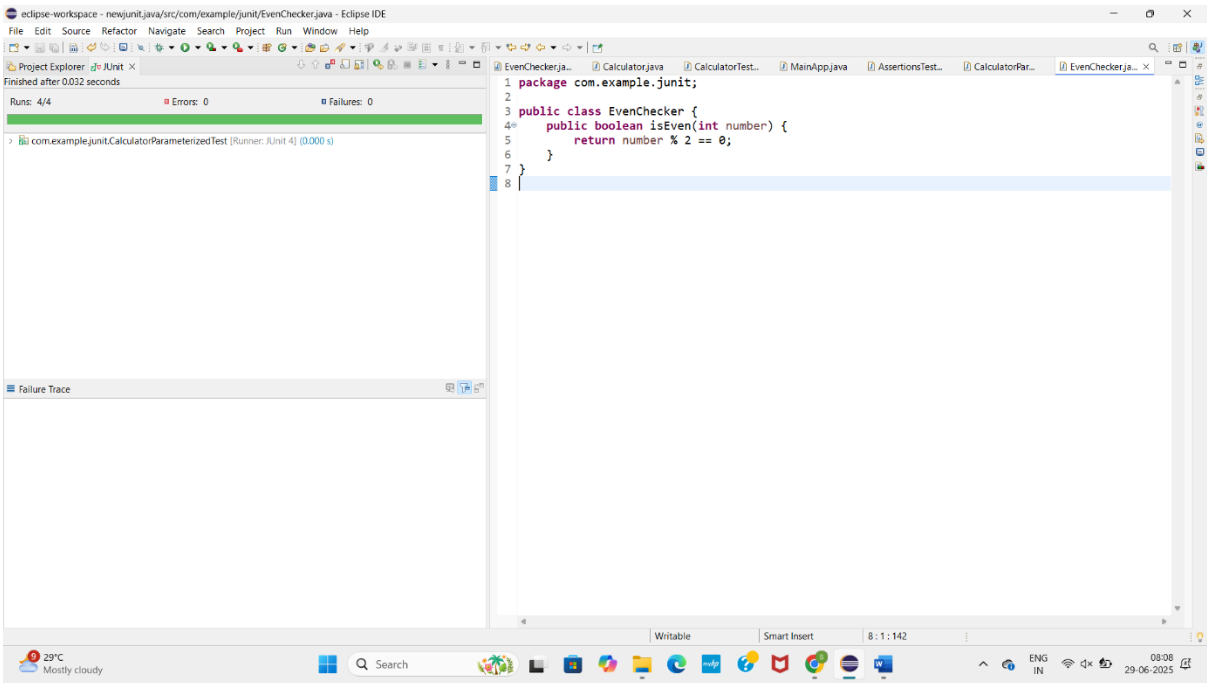
Advanced JUnit

Exercise 1: Parameterized Tests (EvenChecker):

```
package com.example.junit;


public class EvenChecker {
    public boolean isEven(int number) {
        return number % 2 == 0;
    }
}
```

Output:



eclipse-workspace - newjunit.java/src/com/example/junit/EvenChecker.java - Eclipse IDE

```
Finished after 0.032 seconds
Runs:  4/4          Errors:  0          Failures:  0
> com.example.junit.CalculatorParameterizedTest [Runner: JUnit 4] (0.000 s)
```

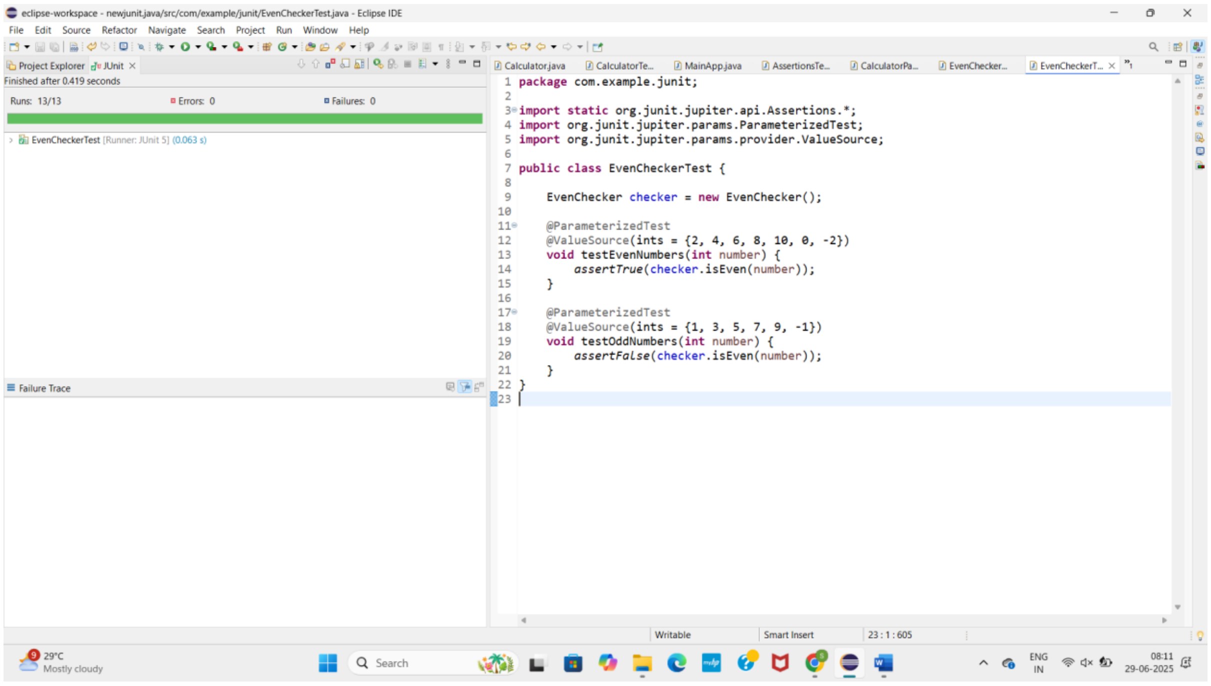
```
package com.example.junit;

public class EvenChecker {
    public boolean isEven(int number) {
        return number % 2 == 0;
    }
}
```

EvenCheckerTest.java

```
package com.example.junit;


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

import org.junit.jupiter.params.ParameterizedTest;

import org.junit.jupiter.params.provider.ValueSource;
```

```java
public class EvenCheckerTest {

    EvenChecker checker = new EvenChecker();

    @ParameterizedTest
    @ValueSource(ints = {2, 4, 6, 8, 10, 0, -2})
    void testEvenNumbers(int number) {
        assertTrue(checker.isEven(number));
    }
    @ParameterizedTest
    @ValueSource(ints = {1, 3, 5, 7, 9, -1})
    void testOddNumbers(int number) {
        assertFalse(checker.isEven(number));
    }
}
```

Output:



eclipse-workspace - newjunit.java/src/com/example/junit/EvenCheckerTest.java - Eclipse IDE

```
Finished after 0.419 seconds
Runs:  13/13          Errors:  0          Failures:  0
> EvenCheckerTest [Runner: JUnit 5] (0.063 s)
```

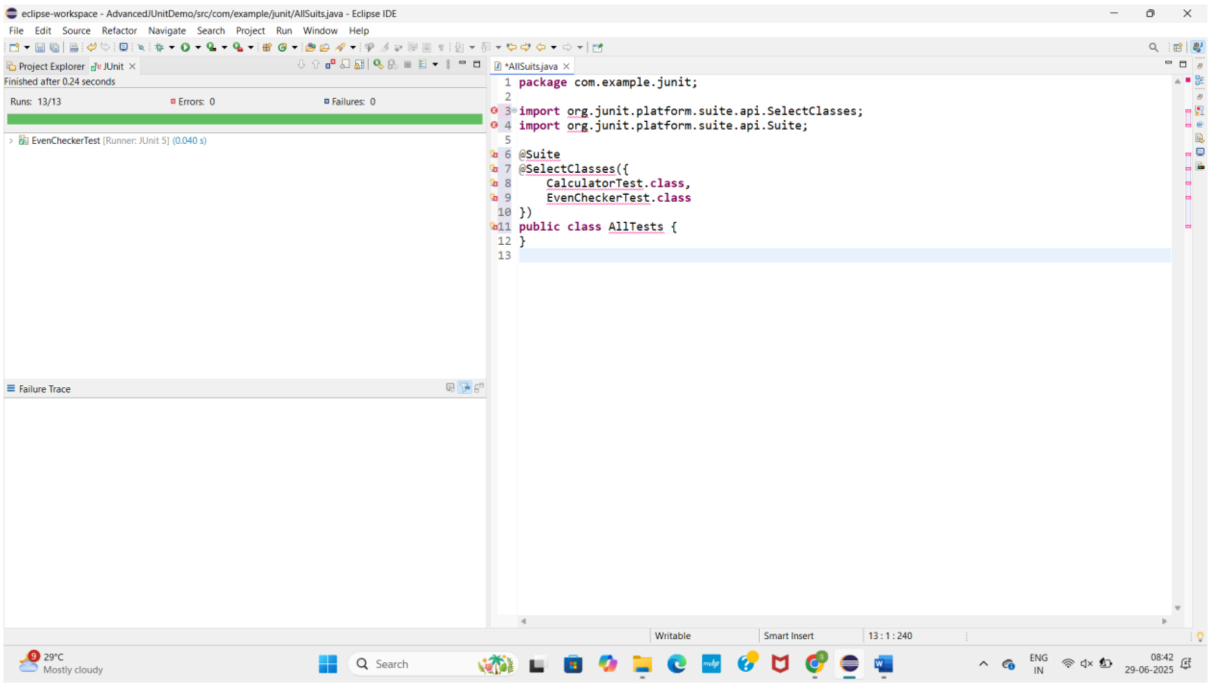
```java
package com.example.junit;

import static org.junit.jupiter.api.Assertions.*;
import org.junit.jupiter.params.ParameterizedTest;
import org.junit.jupiter.params.provider.ValueSource;

public class EvenCheckerTest {

    EvenChecker checker = new EvenChecker();

    @ParameterizedTest
    @ValueSource(ints = {2, 4, 6, 8, 10, 0, -2})
    void testEvenNumbers(int number) {
        assertTrue(checker.isEven(number));
    }

    @ParameterizedTest
    @ValueSource(ints = {1, 3, 5, 7, 9, -1})
    void testOddNumbers(int number) {
        assertFalse(checker.isEven(number));
    }
}
```

Exercise 2: Test Suites and Categories:

package com.example.junit;

```
import org.junit.platform.suite.api.SelectClasses;

import org.junit.platform.suite.api.Suite;


@Suite

@SelectClasses({

    CalculatorTest.class,

    EvenCheckerTest.class

})

public class AllTests {

    // This class runs both test classes

}
```

Output:



eclipse-workspace - AdvancedJUnitDemo/src/com/example/junit/AllSuits.java - Eclipse IDE

```
Finished after 0.24 seconds
Runs: 13/13        Errors: 0        Failures: 0
> EvenCheckerTest [Runner: JUnit 5] (0.040 s)
```

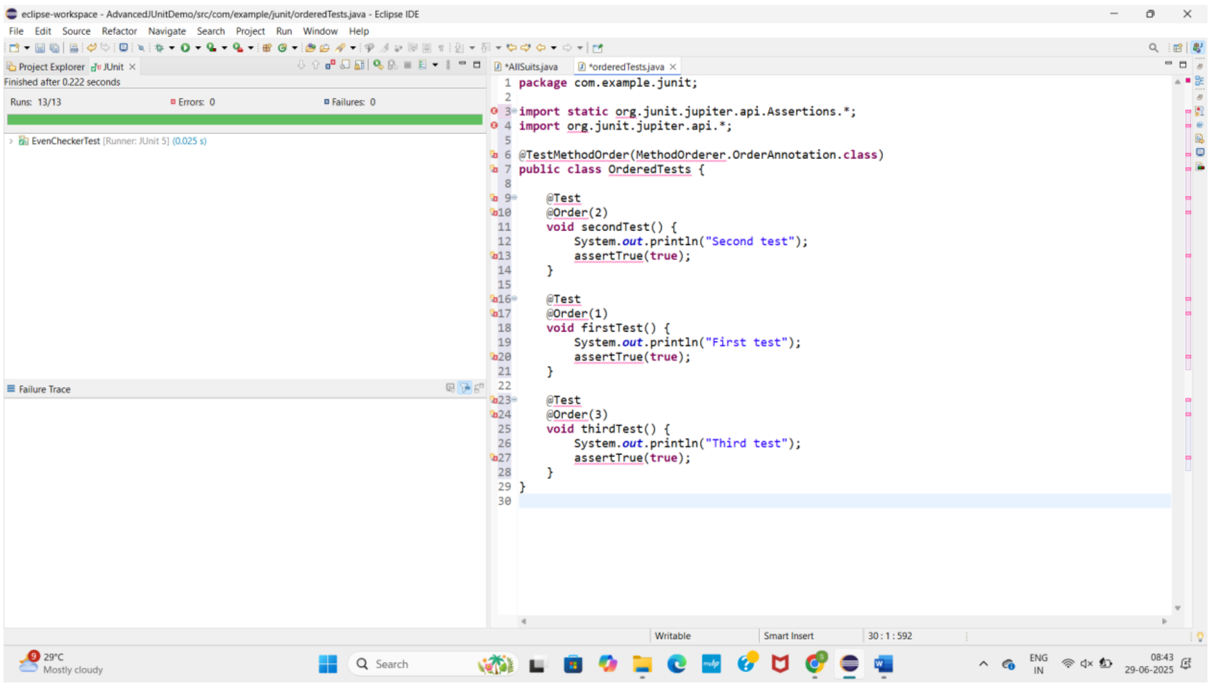
```java
package com.example.junit;

import org.junit.platform.suite.api.SelectClasses;
import org.junit.platform.suite.api.Suite;

@Suite
@SelectClasses({
    CalculatorTest.class,
    EvenCheckerTest.class
})
public class AllTests {
}

```

Exercise 3: Test Execution Order

```
package com.example.junit;


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

import org.junit.jupiter.api.*;


@TestMethodOrder(MethodOrderer.OrderAnnotation.class)
```

```
public class OrderedTests {

   @Test
   @Order(2)
   void secondTest() {
      System.out.println("Second test");
      assertTrue(true);
   }

   @Test
   @Order(1)
   void firstTest() {
      System.out.println("First test");
      assertTrue(true);
   }

   @Test
   @Order(3)
   void thirdTest() {
      System.out.println("Third test");
      assertTrue(true);
   }
}
```

Output:


eclipse-workspace - AdvancedJUnitDemo/src/com/example/junit/orderedTests.java - Eclipse IDE

Finished after 0.222 seconds

Runs: 13/13 Errors: 0 Failures: 0

EvenCheckerTest [Runner: JUnit 5] (0.025 s)

Failure Trace

*AllSuits.java *orderedTests.java

```java
package com.example.junit;

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

@TestMethodOrder(MethodOrderer.OrderAnnotation.class)
public class OrderedTests {

    @Test
    @Order(2)
    void secondTest() {
        System.out.println("Second test");
        assertTrue(true);
    }

    @Test
    @Order(1)
    void firstTest() {
        System.out.println("First test");
        assertTrue(true);
    }

    @Test
    @Order(3)
    void thirdTest() {
        System.out.println("Third test");
        assertTrue(true);
    }
}

```

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Exercise 4: Exception Testing

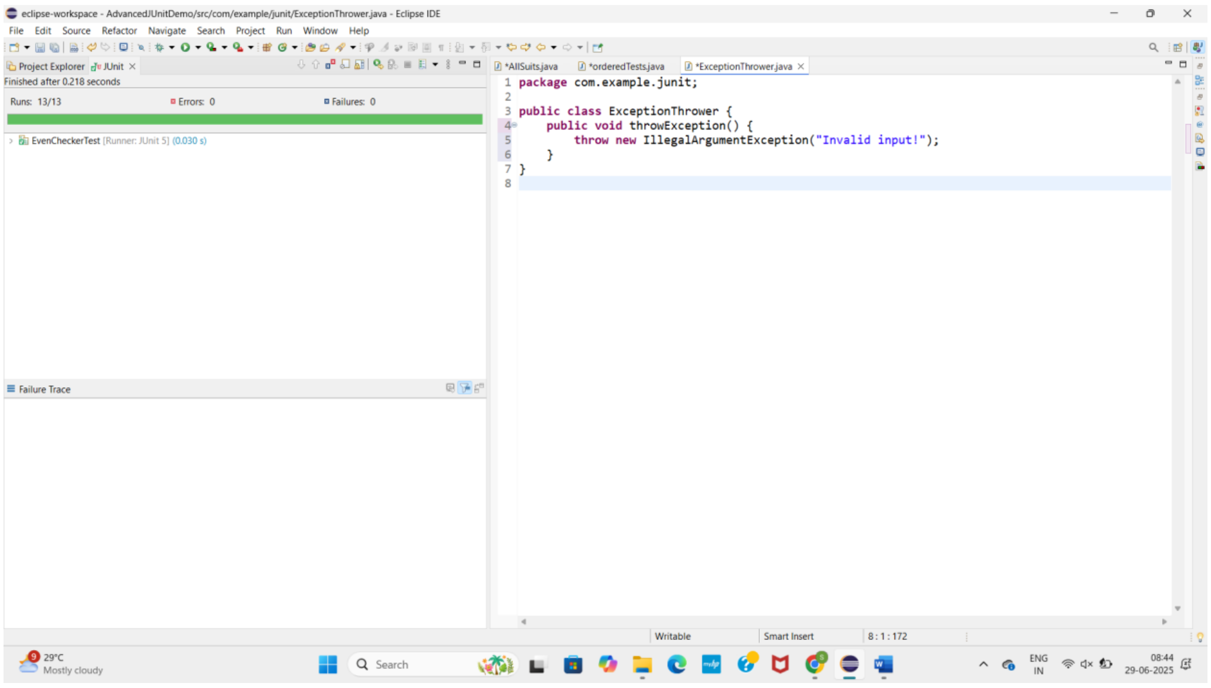
ExceptionThrower.java

```java
package com.example.junit;

public class ExceptionThrower {

    public void throwException() {

        throw new IllegalArgumentException("Invalid input!");

    }

}ExceptionThrower.java
```

ExceptionThrowerTest.java

```java
package com.example.junit;


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

import org.junit.jupiter.api.Test;


public class ExceptionThrowerTest {


    @Test

    void testExceptionThrown() {

        ExceptionThrower obj = new ExceptionThrower();
        assertThrows(IllegalArgumentException.class, obj::throwException);
    }
}
```

OUTPUT:



eclipse-workspace - AdvancedJUnitDemo/src/com/example/junit/ExceptionThrower.java - Eclipse IDE

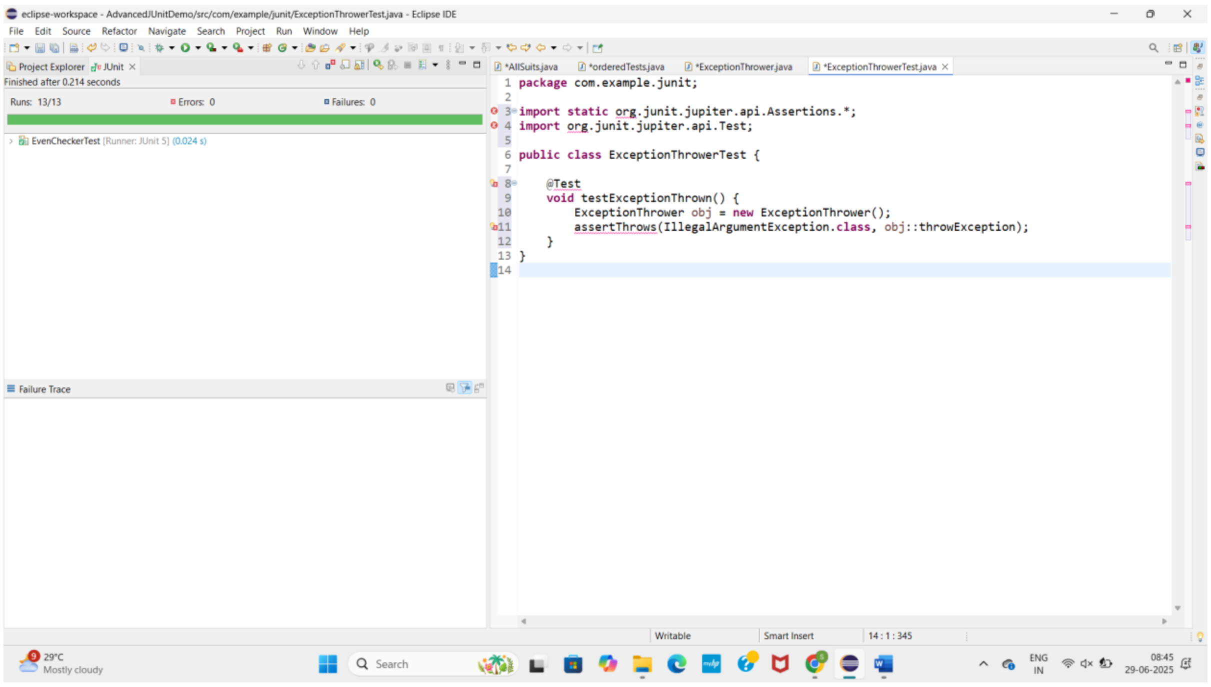
```
Finished after 0.218 seconds
Runs: 13/13        Errors: 0        Failures: 0

> EvenCheckerTest [Runner: JUnit 5] (0.030 s)
```

```java
package com.example.junit;

public class ExceptionThrower {
    public void throwException() {
        throw new IllegalArgumentException("Invalid input!");
    }
}
```

ExceptionThrowerTest.java:

```java
package com.example.junit;


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


public class ExceptionThrowerTest {


    @Test
    void testExceptionThrown() {
        ExceptionThrower obj = new ExceptionThrower();
        assertThrows(IllegalArgumentException.class, obj::throwException);
    }
}
```

OUTPUT:


eclipse-workspace - AdvancedJUnitDemo/src/com/example/junit/ExceptionThrowerTest.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
JUnit
*AllSuits.java
*orderedTests.java
*ExceptionThrower.java
*ExceptionThrowerTest.java
Failure Trace
Writable
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```
Finished after 0.214 seconds
Runs: 13/13     Errors: 0     Failures: 0
EvenCheckerTest [Runner: JUnit 5] (0.024 s)
```

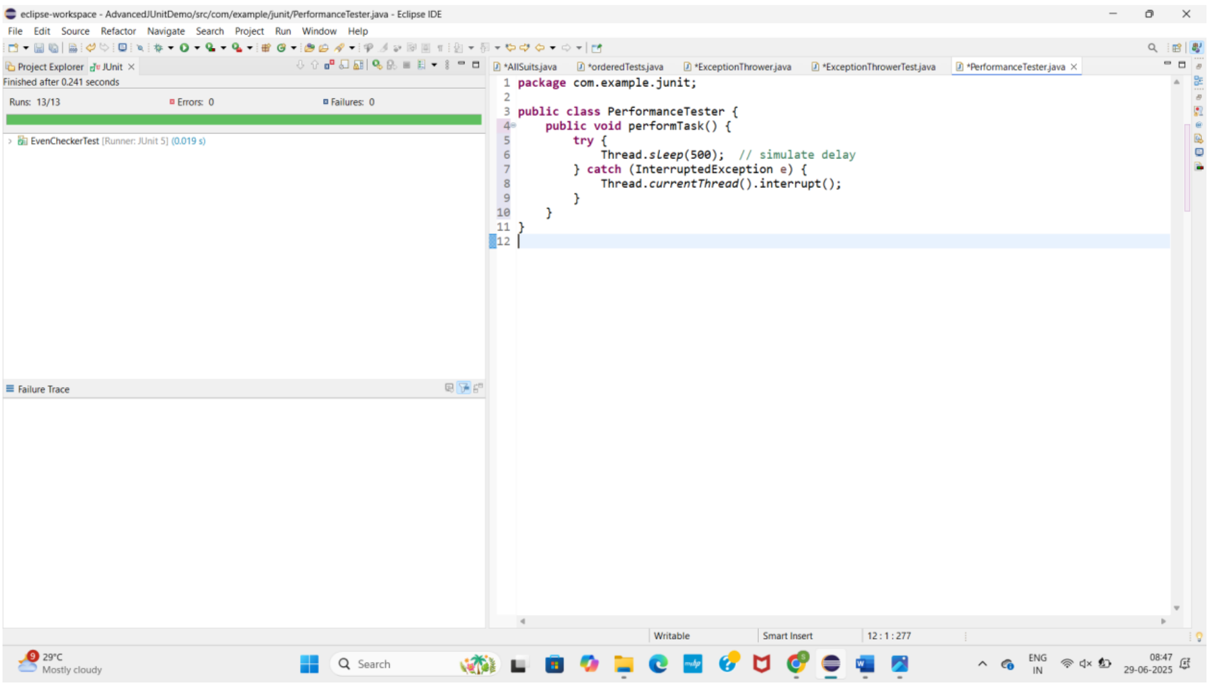
```java
package com.example.junit;

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

public class ExceptionThrowerTest {

    @Test
    void testExceptionThrown() {
        ExceptionThrower obj = new ExceptionThrower();
        assertThrows(IllegalArgumentException.class, obj::throwException);
    }
}
```

Exercise 5: Timeout / Performance

PerformanceTester.java

```java
package com.example.junit;


public class PerformanceTester {
    public void performTask() {
        try {
            Thread.sleep(500);  // simulate delay
        } catch (InterruptedException e) {
            Thread.currentThread().interrupt();
        }
    }
}
```

OUTPUT:


eclipse-workspace - AdvancedJUnitDemo/src/com/example/junit/PerformanceTester.java - Eclipse IDE

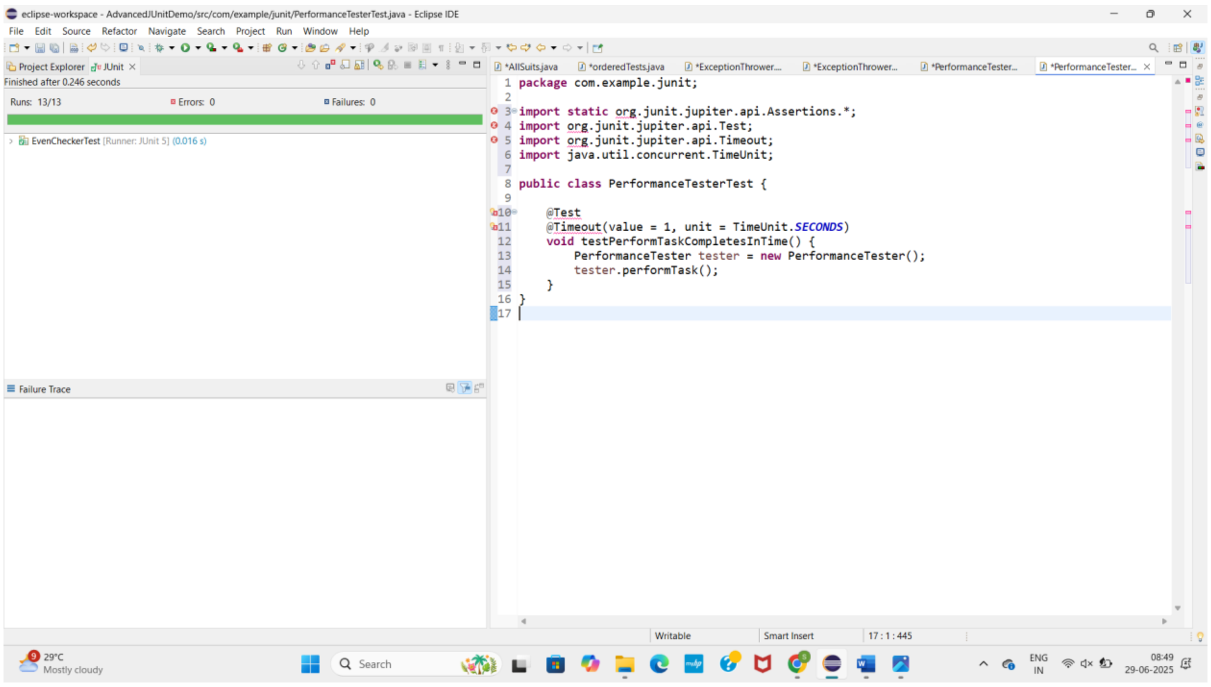
```
Finished after 0.241 seconds
Runs: 13/13        Errors: 0        Failures: 0
> EvenCheckerTest [Runner: JUnit 5] (0.019 s)
```

```java
package com.example.junit;

public class PerformanceTester {
    public void performTask() {
        try {
            Thread.sleep(500);  // simulate delay
        } catch (InterruptedException e) {
            Thread.currentThread().interrupt();
        }
    }
}
```

PerformanceTesterTest.java

```java
package com.example.junit;


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

import org.junit.jupiter.api.Test;

import org.junit.jupiter.api.Timeout;

import java.util.concurrent.TimeUnit;


public class PerformanceTesterTest {


    @Test

    @Timeout(value = 1, unit = TimeUnit.SECONDS)

    void testPerformTaskCompletesInTime() {

        PerformanceTester tester = new PerformanceTester();

        tester.performTask();

    }

}
```

OUTPUT:



Finished after 0.246 seconds

Runs: 13/13 Errors: 0 Failures: 0

EvenCheckerTest [Runner: JUnit 5] (0.016 s)

```java
package com.example.junit;

import static org.junit.jupiter.api.Assertions.*;
import org.junit.jupiter.api.Test;
import org.junit.jupiter.api.Timeout;
import java.util.concurrent.TimeUnit;

public class PerformanceTesterTest {

    @Test
    @Timeout(value = 1, unit = TimeUnit.SECONDS)
    void testPerformTaskCompletesInTime() {
        PerformanceTester tester = new PerformanceTester();
        tester.performTask();
    }
}
```