Karthika Vijay - 6377005

JUnit Testing Exercises

Exercise 1: Setting Up JUnit

Scenario:

You need to set up JUnit in your Java project to start writing unit tests.

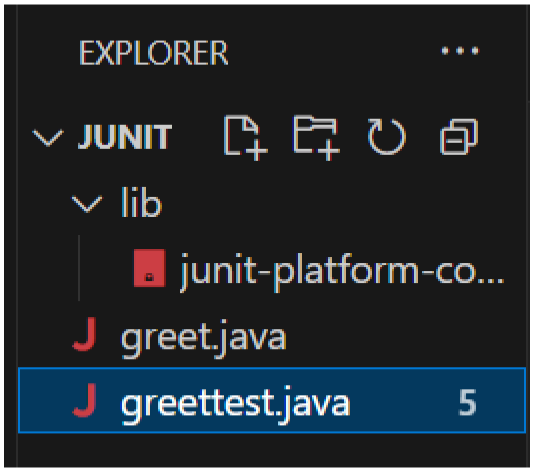
Steps:

1. Create a new Java project in your IDE (e.g., IntelliJ IDEA, Eclipse).

2. Add JUnit dependency to your project. If you are using Maven, add the following to your pom.xml:

```
<dependency>
   <groupId>junit</groupId>
   <artifactId>junit</artifactId>
   <version>4.13.2</version>
   <scope>test</scope>
</dependency>
```

3. Create a new test class in your project.



Exercise 2: Writing Basic JUnit Tests

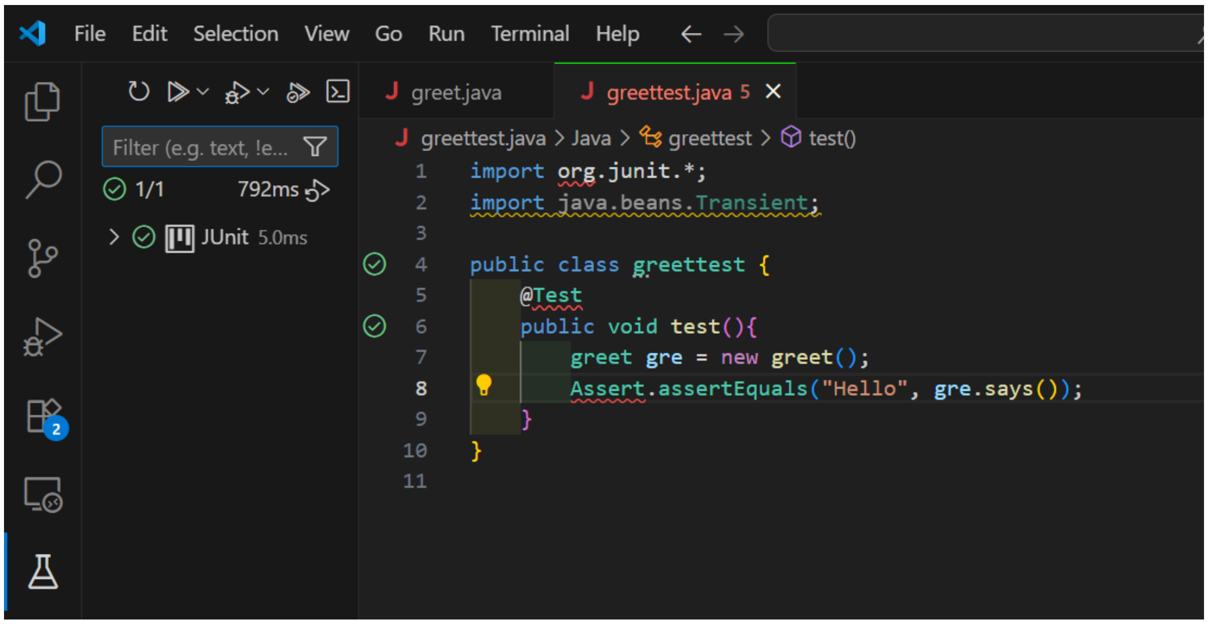
Scenario:

You need to write basic JUnit tests for a simple Java class.

Steps:

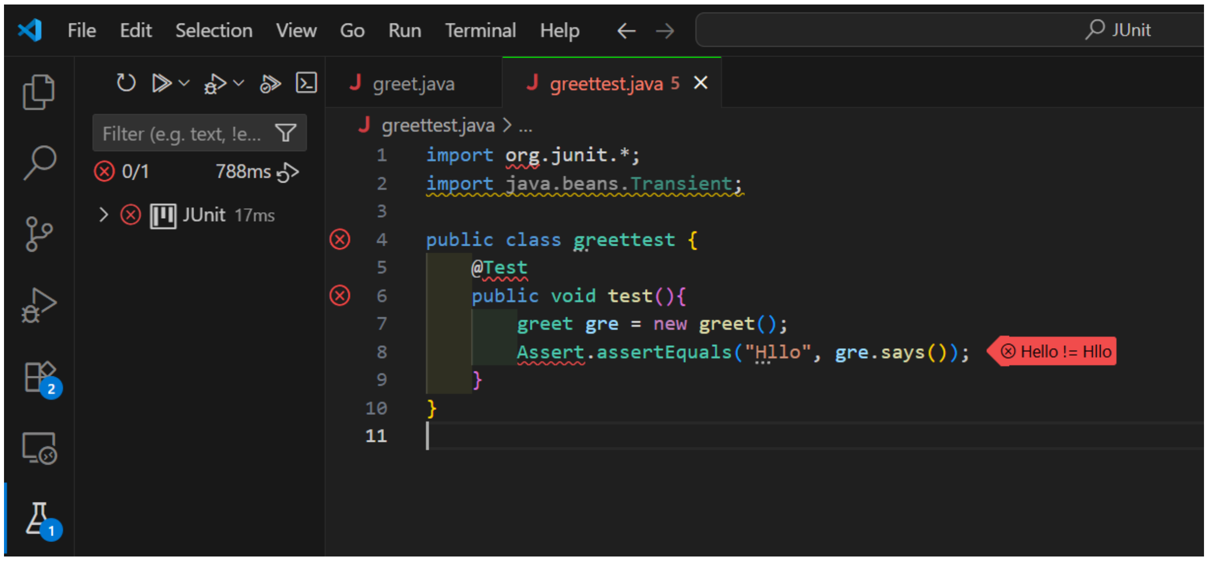
1. Create a new Java class with some methods to test.

2. Write JUnit tests for these methods.


File Edit Selection View Go Run Terminal Help
greet.java
greettest.java 5
Filter (e.g. text, !e...
1/1 792ms
JUnit 5.0ms
greettest.java > Java > greettest > test()

```java
import org.junit.*;
import java.beans.Transient;

public class greettest {
    @Test
    public void test(){
        greet gre = new greet();
        Assert.assertEquals("Hello", gre.says());
    }
}
```



```java
import org.junit.*;
import java.beans.Transient;

public class greettest {
    @Test
    public void test(){
        greet gre = new greet();
        Assert.assertEquals("Hllo", gre.says());  Hello != Hllo
    }
}
```

Exercise 3: Assertions in JUnit

Scenario:

You need to use different assertions in JUnit to validate your test results.

Steps:

1. Write tests using various JUnit assertions.

Solution Code:

```
public class AssertionsTest {
    @Test
    public void testAssertions() {
        // Assert equals
        assertEquals(5, 2 + 3);

        // Assert true
        assertTrue(5 > 3);

        // Assert false
        assertFalse(5 < 3);

        // Assert null
        assertNull(null);

        // Assert not null
        assertNotNull(new Object());
    }
}
```

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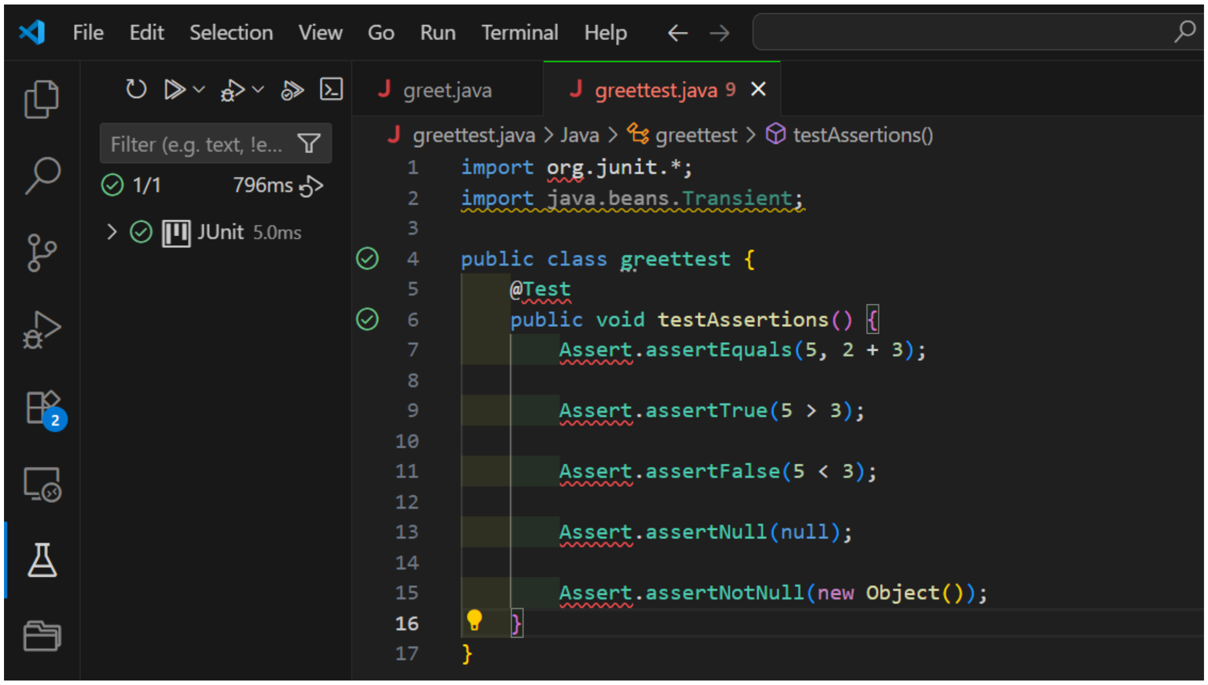
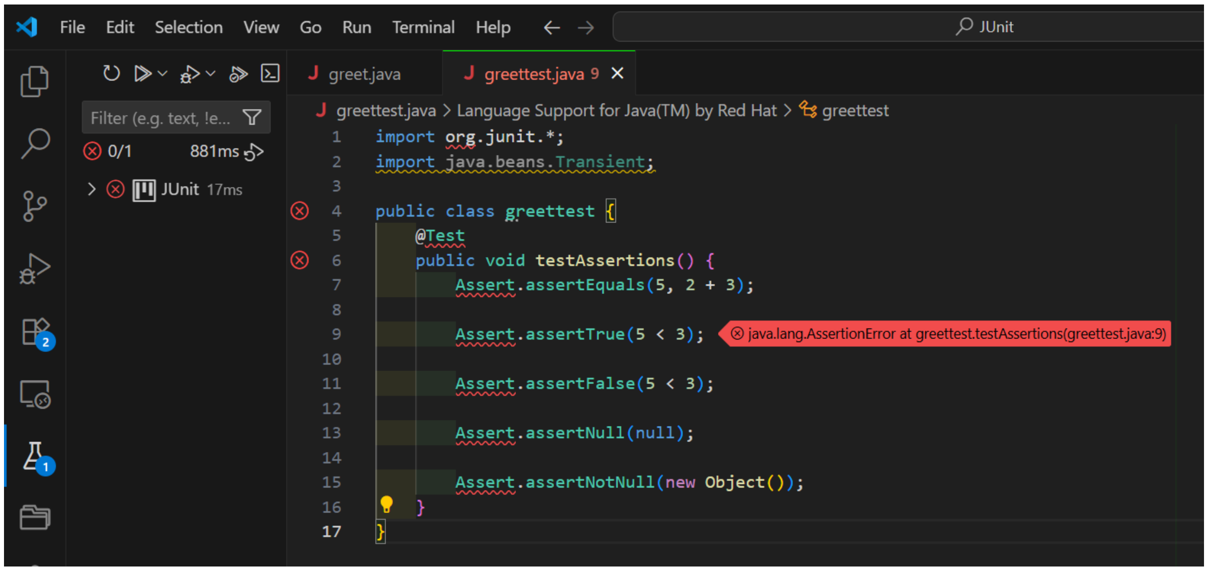


```
import org.junit.*;
import java.beans.Transient;

public class greettest {
    @Test
    public void testAssertions() {
        Assert.assertEquals(5, 2 + 3);

        Assert.assertTrue(5 > 3);

        Assert.assertFalse(5 < 3);

        Assert.assertNull(null);

        Assert.assertNotNull(new Object());
    }
}
```

File Edit Selection View Go Run Terminal Help
greet.java
greettest.java 9
greettest.java > Java > greettest > testAssertions()
1/1 796ms
JUnit 5.0ms



```
import org.junit.*;
import java.beans.Transient;

public class greettest {
    @Test
    public void testAssertions() {
        Assert.assertEquals(5, 2 + 3);

        Assert.assertTrue(5 < 3);   ⊗ java.lang.AssertionError at greettest.testAssertions(greettest.java:9)

        Assert.assertFalse(5 < 3);

        Assert.assertNull(null);

        Assert.assertNotNull(new Object());
    }
}
```

File Edit Selection View Go Run Terminal Help
JUnit
greet.java
greettest.java 9
greettest.java > Language Support for Java(TM) by Red Hat > greettest
0/1 881ms
JUnit 17ms

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

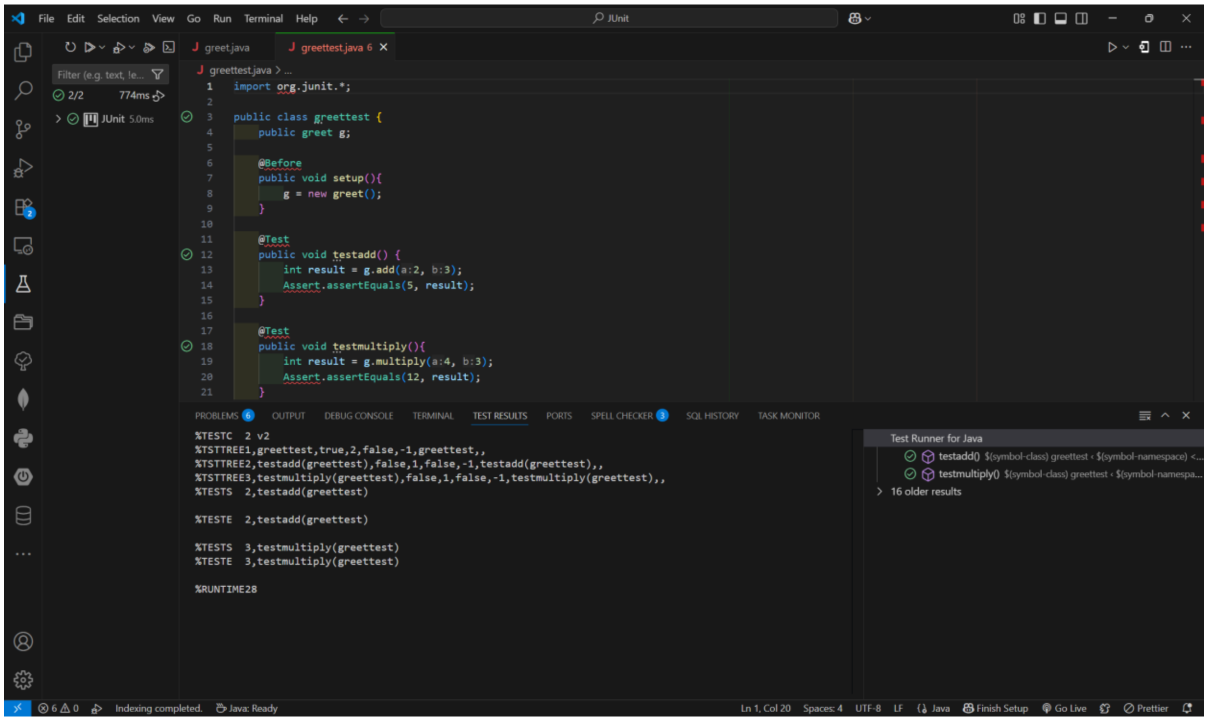
Scenario:

You need to organize your tests using the Arrange-Act-Assert (AAA) pattern and use setup and teardown methods.

Steps:

1. Write tests using the AAA pattern.

2. Use @Before and @After annotations for setup and teardown methods.



```java
import org.junit.*;

public class greettest {
    public greet g;

    @Before
    public void setup(){
        g = new greet();
    }

    @Test
    public void testadd() {
        int result = g.add(a:2, b:3);
        Assert.assertEquals(5, result);
    }

    @Test
    public void testmultiply(){
        int result = g.multiply(a:4, b:3);
        Assert.assertEquals(12, result);
    }
```

```
%TESTC  2 v2
%TSTTREE1,greettest,true,2,false,-1,greettest,,
%TSTTREE2,testadd(greettest),false,1,false,-1,testadd(greettest),,
%TSTTREE3,testmultiply(greettest),false,1,false,-1,testmultiply(greettest),,
%TESTS  2,testadd(greettest)

%TESTE  2,testadd(greettest)

%TESTS  3,testmultiply(greettest)
%TESTE  3,testmultiply(greettest)

%RUNTIME28
```

```
Test Runner for Java
  testadd() $(symbol-class) greettest ‹ $(symbol-namespace) <...
  testmultiply() $(symbol-class) greettest ‹ $(symbol-namespa...
> 16 older results
```

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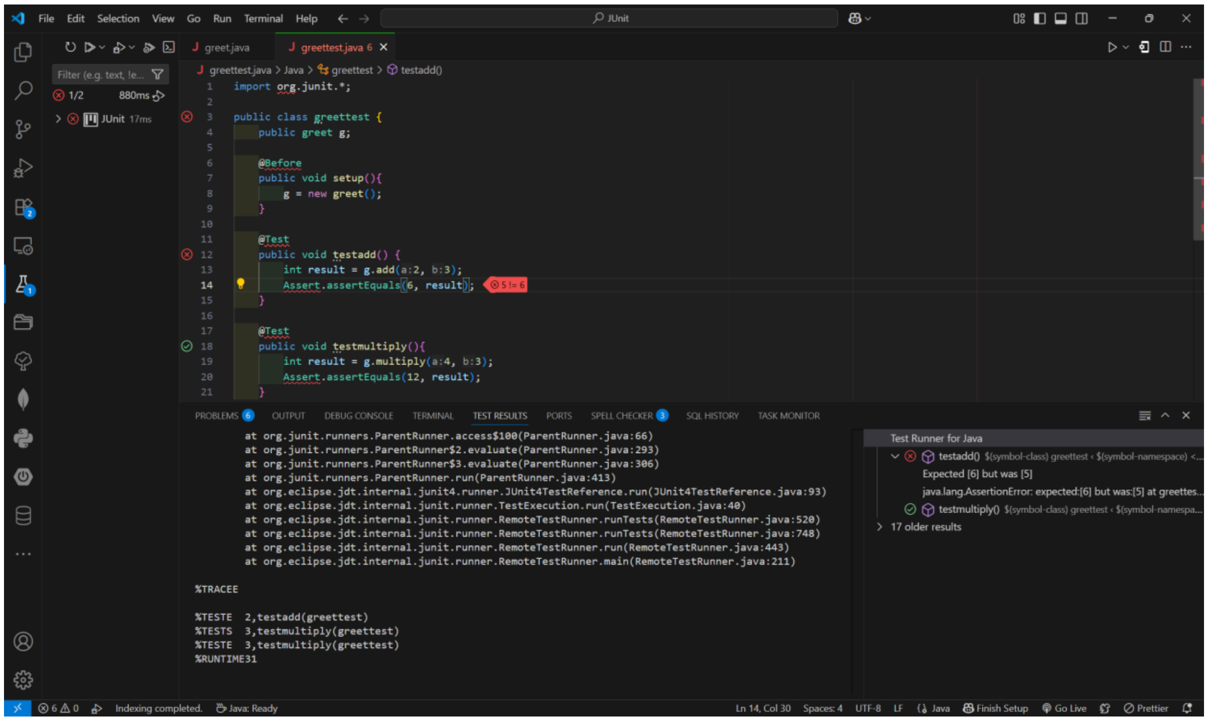
File Edit Selection View Go Run Terminal Help
JUnit
greet.java
greettest.java 6
greettest.java > Java > greettest > testadd()
1/2 880ms
JUnit 17ms
PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL TEST RESULTS PORTS SPELL CHECKER 3 SQL HISTORY TASK MONITOR
Indexing completed. Java: Ready
Ln 14, Col 30 Spaces: 4 UTF-8 LF Java Finish Setup Go Live Prettier

```java
import org.junit.*;

public class greettest {
    public greet g;

    @Before
    public void setup(){
        g = new greet();
    }

    @Test
    public void testadd() {
        int result = g.add(a:2, b:3);
        Assert.assertEquals(6, result);   ⊗ 5 != 6
    }

    @Test
    public void testmultiply(){
        int result = g.multiply(a:4, b:3);
        Assert.assertEquals(12, result);
    }
```

```
        at org.junit.runners.ParentRunner.access$100(ParentRunner.java:66)
        at org.junit.runners.ParentRunner$2.evaluate(ParentRunner.java:293)
        at org.junit.runners.ParentRunner$3.evaluate(ParentRunner.java:306)
        at org.junit.runners.ParentRunner.run(ParentRunner.java:413)
        at org.eclipse.jdt.internal.junit4.runner.JUnit4TestReference.run(JUnit4TestReference.java:93)
        at org.eclipse.jdt.internal.junit.runner.TestExecution.run(TestExecution.java:40)
        at org.eclipse.jdt.internal.junit.runner.RemoteTestRunner.runTests(RemoteTestRunner.java:520)
        at org.eclipse.jdt.internal.junit.runner.RemoteTestRunner.runTests(RemoteTestRunner.java:748)
        at org.eclipse.jdt.internal.junit.runner.RemoteTestRunner.run(RemoteTestRunner.java:443)
        at org.eclipse.jdt.internal.junit.runner.RemoteTestRunner.main(RemoteTestRunner.java:211)

%TRACEE

%TESTE  2,testadd(greettest)
%TESTS  3,testmultiply(greettest)
%TESTE  3,testmultiply(greettest)
%RUNTIME31
```

```
Test Runner for Java
  ⊗ testadd() $(symbol-class) greettest ‹ $(symbol-namespace) <...
      Expected [6] but was [5]
      java.lang.AssertionError: expected:[6] but was:[5] at greettes...
  ✓ testmultiply() $(symbol-class) greettest ‹ $(symbol-namespa...
> 17 older results
```