Lab 03: Using JUnit for Unit Testing

(Ref: https://courses.cs.washington.edu/courses/cse143/11wi/eclipse-tutorial/junit.shtml)

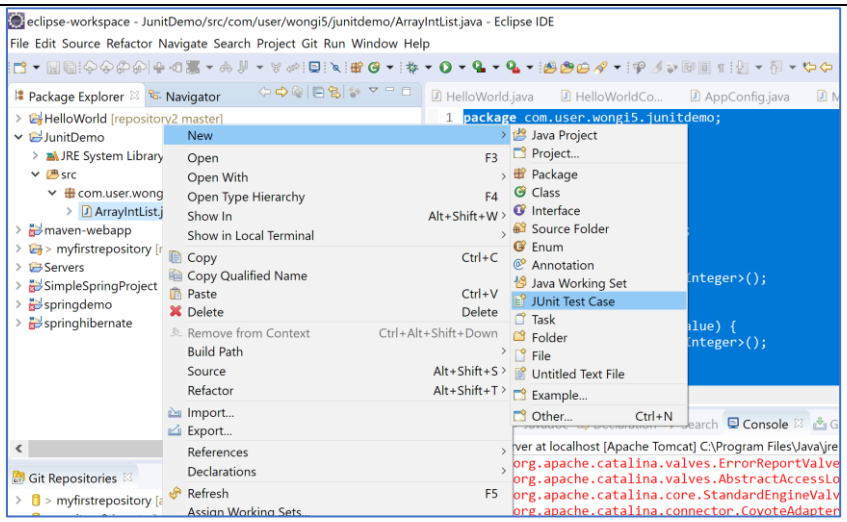
Step 1: Creating a Java class for testing

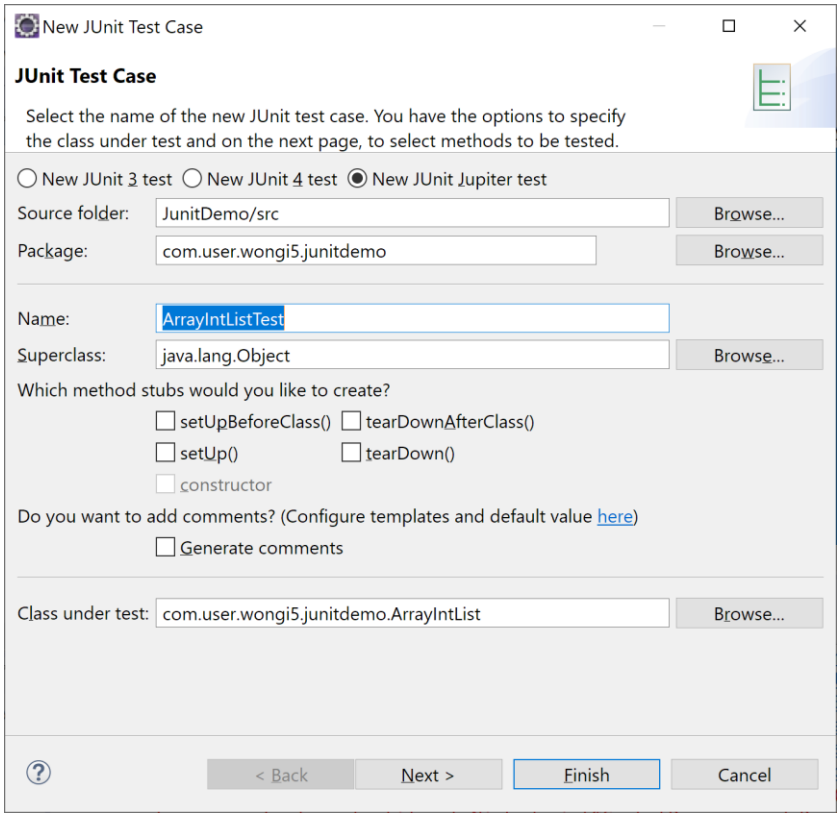
Create a Java Project and add a class called ArrayIntList.java as shown

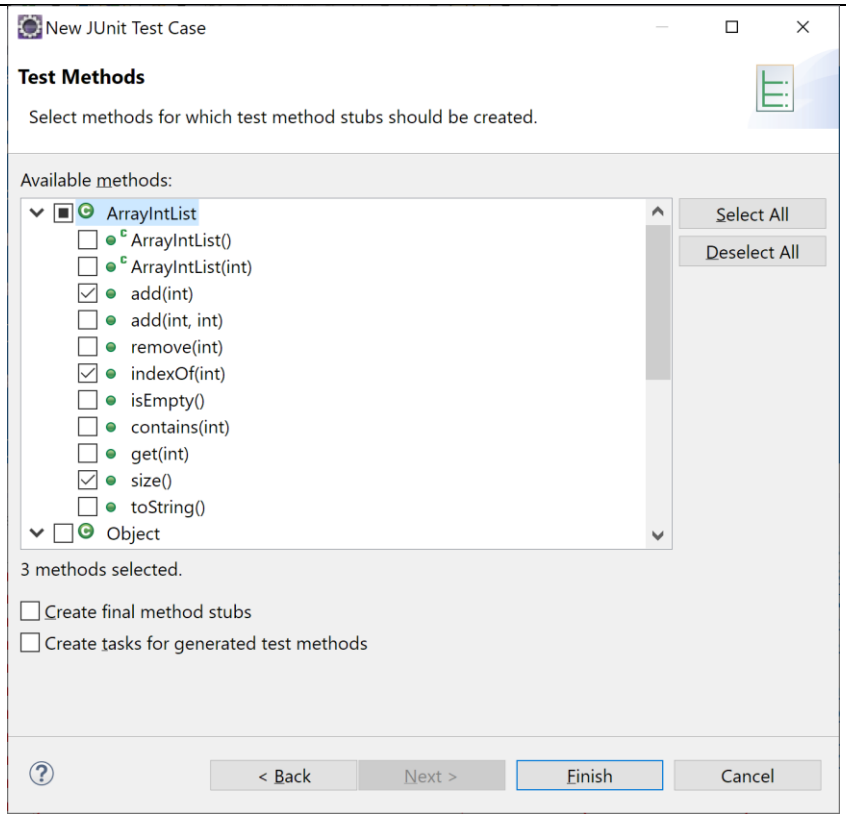
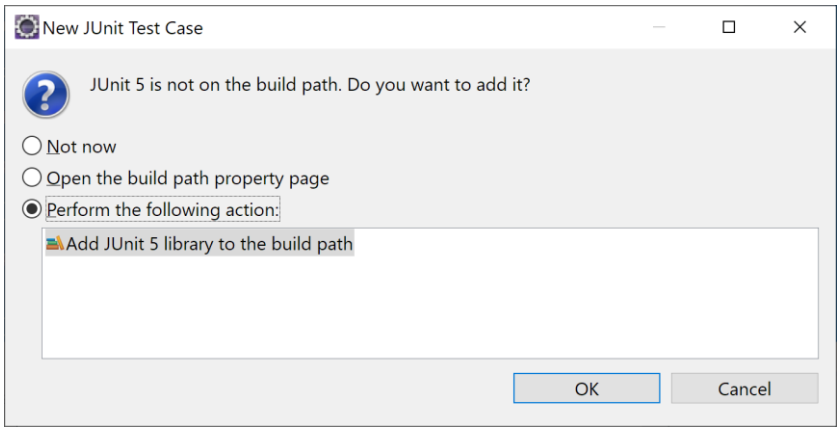
```
package com.user.wongi5.junitdemo;

import java.util.ArrayList;
import java.util.List;

public class ArrayIntList {

	List<Integer> list = null;

	public ArrayIntList() {
		list = new ArrayList<Integer>();
	}
	public ArrayIntList(int value) {
		list = new ArrayList<Integer>();
		list.add(value);
	}
	public void add(int value) {
		list.add(value);
	}
	public void add(int pos, int value) {
		list.add(pos, value);
	}
	public void remove(int pos) {
		list.remove(pos);
	}
	public int indexOf(int value) {
		return list.indexOf(value);
	}
	public boolean isEmpty() {
		return list.isEmpty();
	}
	public boolean contains(int value) {
		return list.contains(value);
	}
	public int get(int pos) {
		return list.get(pos);
	}
	public int size() {
		return list.size();
	}
	public String toString() {
		return list.toString();
	}
}
```

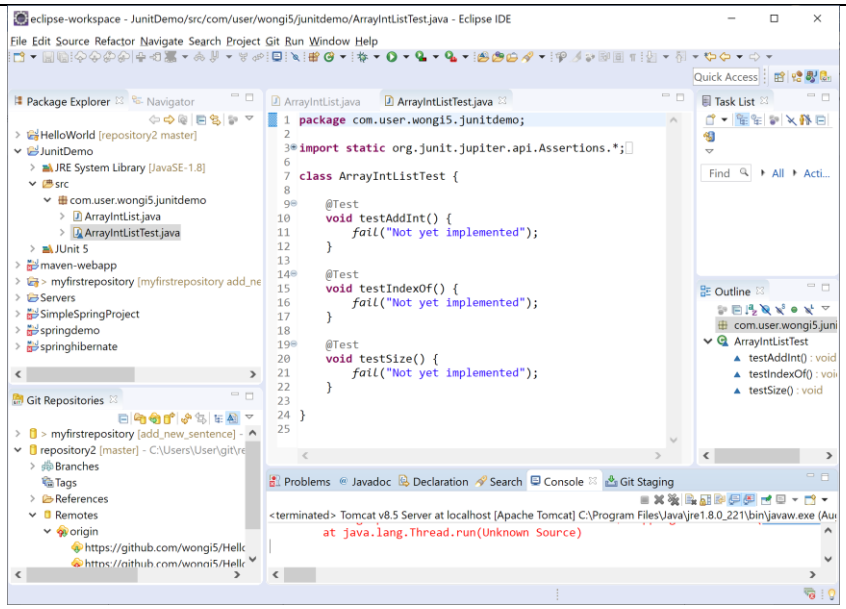
Step 2: Creating Junit test cases

Right-click ArrayIntList.java and choose New → JUnit Test Case → Next





Choose the methods to be tested: add(int), indexOf(int), size(), then click Finish	
Click OK in the following dialog	

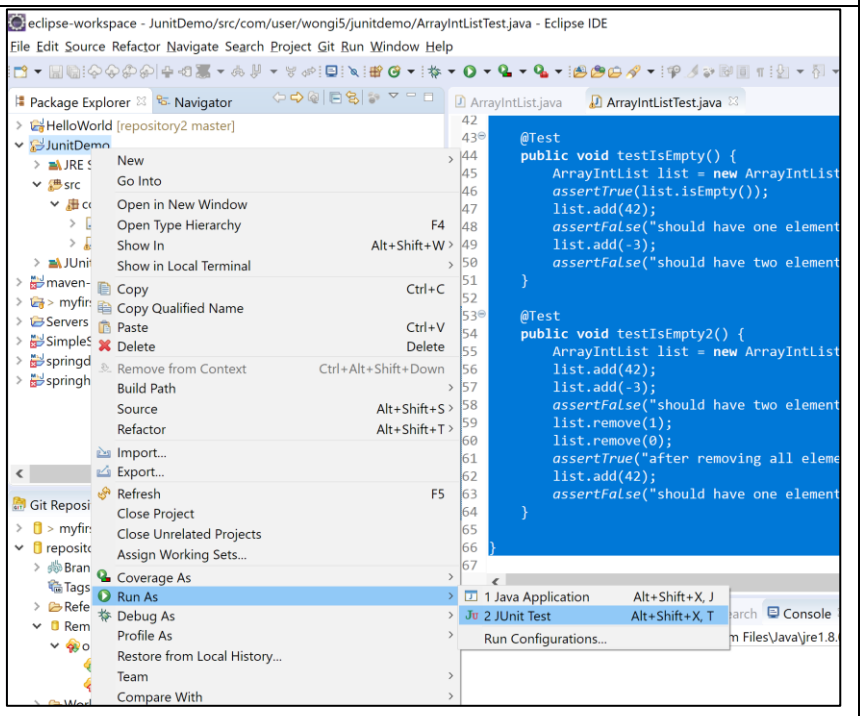
Delete the generated test methods and change the codes as shown	

```
package com.user.wongi5.junitdemo;

import static org.junit.Assert.assertEquals;
import static org.junit.Assert.assertFalse;
import static org.junit.Assert.assertTrue;
import static org.junit.jupiter.api.Assertions.*;

import org.junit.jupiter.api.Test;

class ArrayIntListTest {

	@Test
	public void testAddAndGet() {
		ArrayIntList list = new ArrayIntList();
		list.add(42);
		list.add(-3);
		list.add(17);
		list.add(99);
		assertEquals(42, list.get(0));
		assertEquals(-3, list.get(1));
		assertEquals(17, list.get(2));
		assertEquals(99, list.get(3));

		assertEquals("second attempt", 42,
list.get(0)); // make sure I can get them a second
time
		assertEquals("second attempt", 99,
list.get(3));
	}

	@Test
	public void testSize() {
		ArrayIntList list = new ArrayIntList();
		assertEquals(0, list.size());
		list.add(42);
		assertEquals(1, list.size());
		list.add(-3);
		assertEquals(2, list.size());
		list.add(17);
		assertEquals(3, list.size());
		list.add(99);
		assertEquals(4, list.size());
		assertEquals("second attempt", 4,
list.size()); // make sure I can get it a second time
	}

	@Test
	public void testIsEmpty() {
		ArrayIntList list = new ArrayIntList();
		assertTrue(list.isEmpty());
		list.add(42);
		assertFalse("should have one element",
list.isEmpty());
		list.add(-3);
		assertFalse("should have two elements",
list.isEmpty());
	}
```

```
        @Test
        public void testIsEmpty2() {
                ArrayIntList list = new ArrayIntList();
                list.add(42);
                list.add(-3);
                assertFalse("should have two elements",
list.isEmpty());
                list.remove(1);
                list.remove(0);
                assertTrue("after removing all
elements", list.isEmpty());
                list.add(42);
                assertFalse("should have one element",
list.isEmpty());
        }

}
```

Step 3: Run the test

Right-click the project, choose Run As → JUnit Test



It shows that all test cases pass Try to introduce one or two errors in ArrayIntList and test again