JUnit Tutorial

Kuan-Ting Lai
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JUnit – Automatic Testing

- Unit-testing framework
- "test a little, code a little, test a little, code a little.”
- Annotations to identify test methods
- Assertions to test results
- Test runners to run tests
- Run automatically

What is Unit Test Case?

- Part of code that ensures other part of code work as expected
- Define input and expected output
- At least two unit tests – one positive and one negative tests

Environment Setup

- Download JUnit archive
  - Download the latest JUnit jar file from http://www.junit.org
  - We are using https://github.com/downloads/junit-team/junit/junit-4.10.jar in this tutorial

- (Optional) Set JUnit environment
  - **Windows**: Set the environment variable JUNIT_HOME to C:\JUNIT
  - **Linux**: export JUNIT_HOME = /usr/local/JUNIT

- (Optional) Set CLASSPATH Variable
  - **Windows:** Set the environment variable CLASSPATH to %CLASSPATH%;%JUNIT_HOME%\junit4.12.jar;.;

Running with Jar

- **Windows**: java -cp ".;.\junit-4.10.jar" YourClass

- **Linux**: java -cp ".:./junit-4.10.jar" YourClass

Junit Test Framework

- Fixtures
  - setup() – runs before every test
  - tearDown() – runs after every test
- Test Suites
  - @RunWith
  - @Suite
- Test Runners
  - Run test cases
- Junit Classes
  - Assert
  - TestCase
  - TestResult

Create a Class to be Tested

```
/* * This class prints the given message on console. */
public class MessageUtil {
	private String message;

	//Constructor //@param message to be printed
	public MessageUtil(String message){
		this.message = message;
	}

	// prints the message
	public String printMessage() {
		System.out.println(message);
		return message;
	}
}
```

Create Unit Tests (TestJunit.java)

```
import org.junit.Test;
import static org.junit.Assert.assertEquals;

public class TestJunit {

	String message = "Hello World";
	MessageUtil messageUtil = new MessageUtil(message);

	@Test
	public void testPrintMessage() {
		assertEquals(message, messageUtil.printMessage());
	}
}
```

Create Test Runner Class (TestRunner.java)

```
import org.junit.runner.JUnitCore;
import org.junit.runner.Result;
import org.junit.runner.notification.Failure;

public class TestRunner {

	public static void main(String[] args) {
		Result result = JUnitCore.runClasses(TestJunit.class);

		for (Failure failure : result.getFailures()) {
			System.out.println(failure.toString());
		}

		System.out.println(result.wasSuccessful());
	}
}
```

Compile & Run JUnit

- javac -cp ".;.\junit-4.10.jar" MessageUtil.java TestJunit.java TestRunner.java

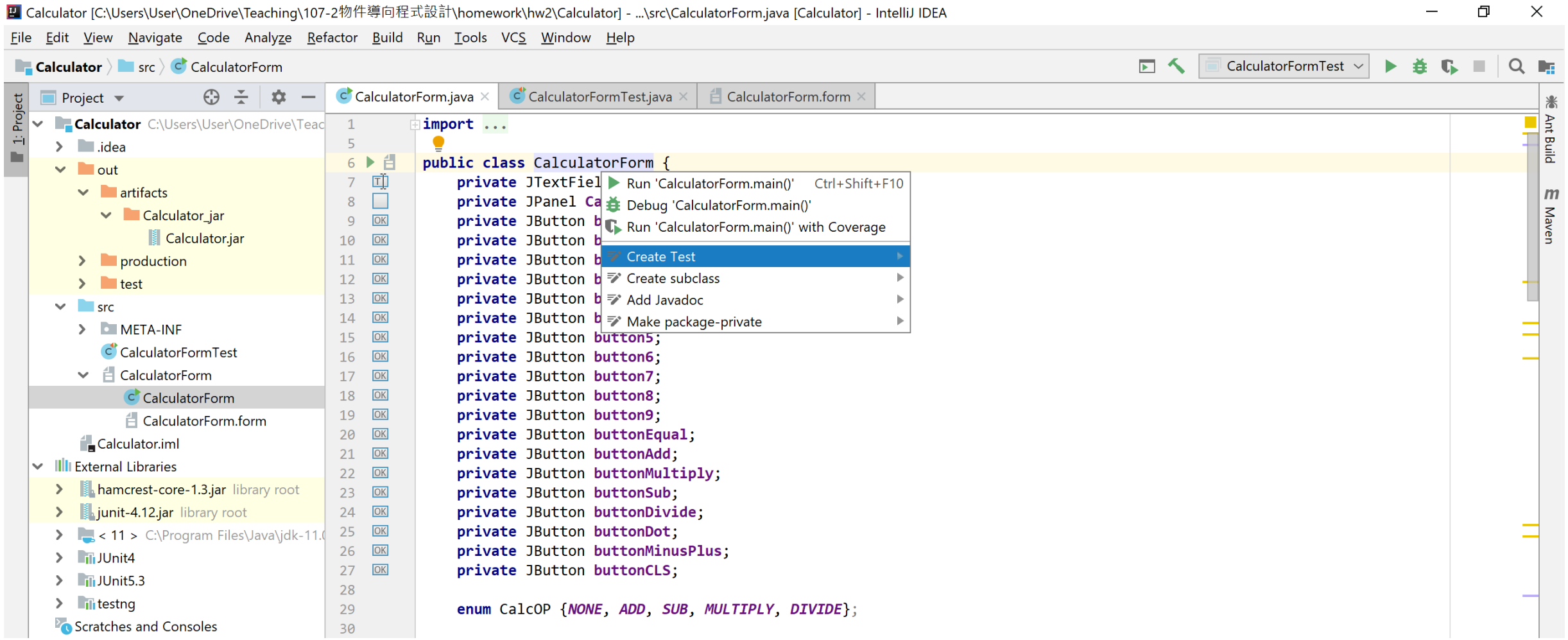
- java -cp ".;.\junit-4.10.jar" TestRunner

Annotations

- @Test
- @Before
- @After
- @BeforeClass
- @AfterClass
- @Ignore

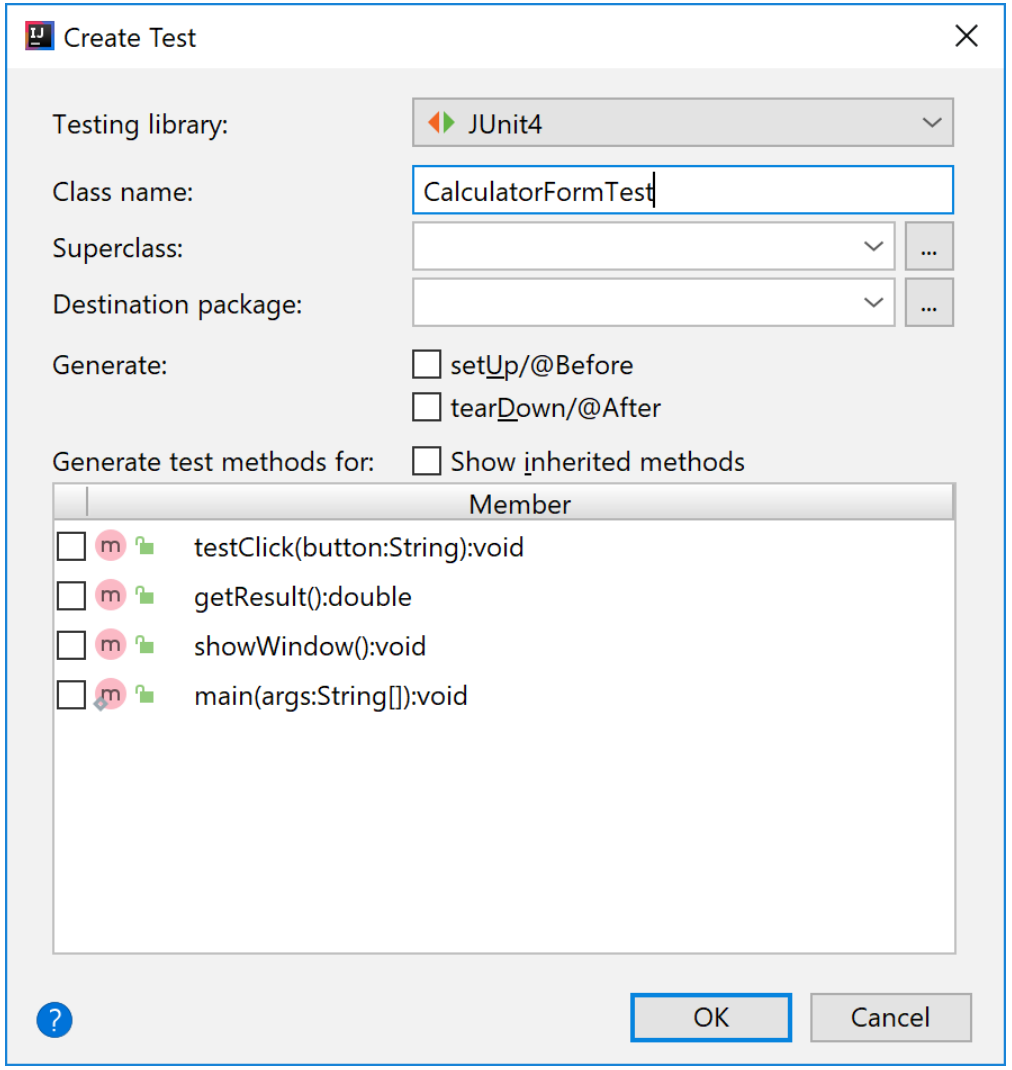
Create Unit Testing using IntelliJ

Select Your Class and Press “Alt + Enter”

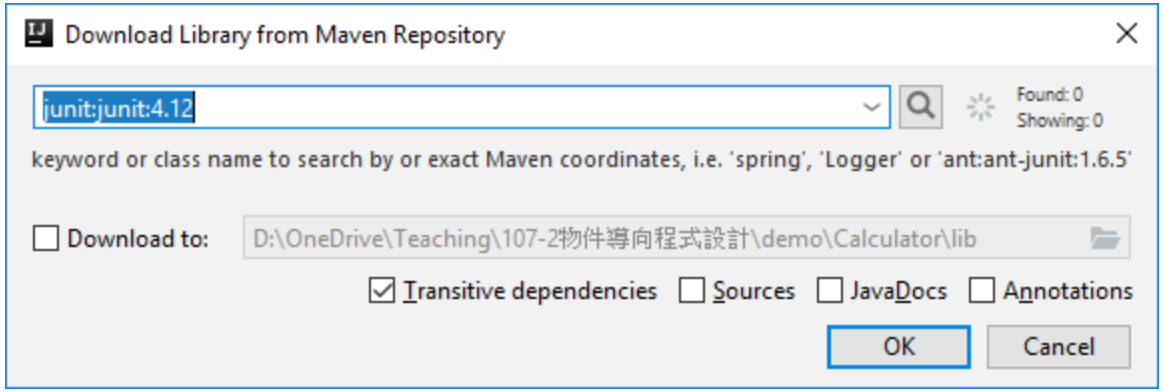


Select Your Test Framework

- We use JUnit4 here.



Auto Download Library



Using Junit Test & Runner

Junit Test Unit

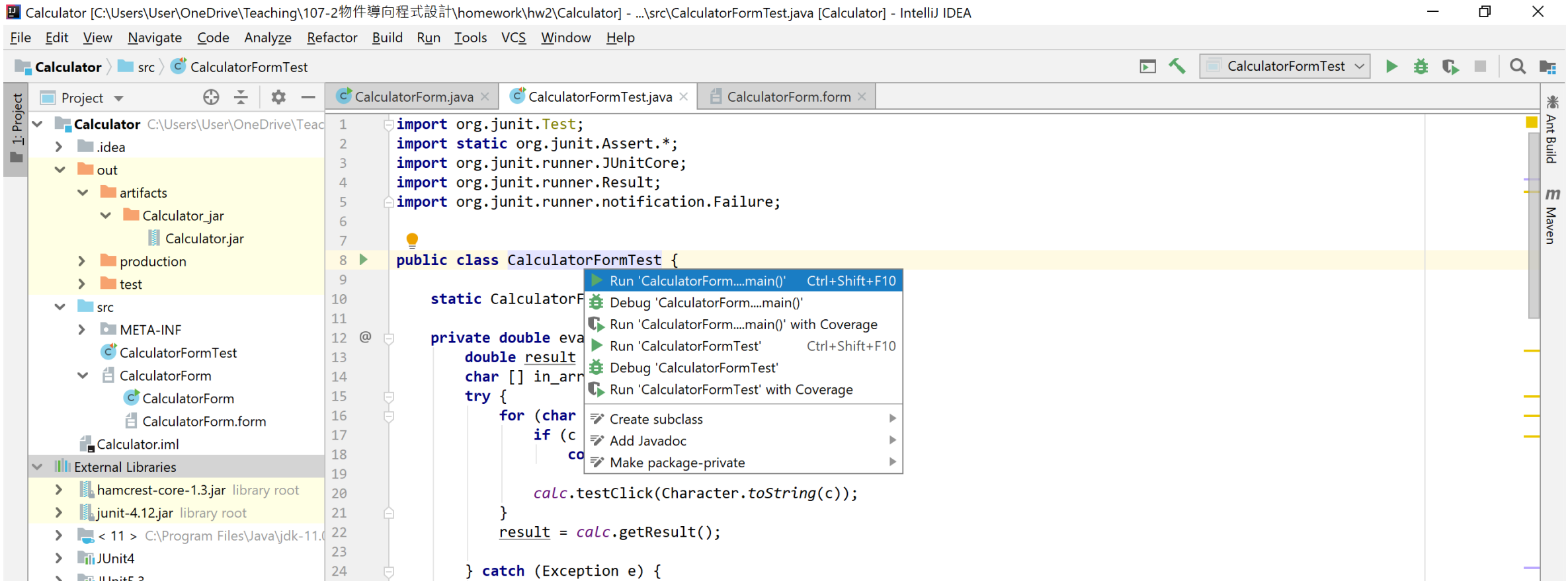
Junit Runner

```
import org.junit.Test;
import static org.junit.Assert.*;
import org.junit.runner.JUnitCore;
import org.junit.runner.Result;
import org.junit.runner.notification.Failure;

public class CalculatorFormTest {
    static CalculatorForm calc = new CalculatorForm();
    @ Test
    public void testAddSub() {
        try {
            calc.testClick("CLEAR");
            calc.testClick(“1"); calc.testClick(“+");
            calc.testClick(“2"); calc.testClick(“=");
        }
        catch (Exception e) {
            System.out.println(e.getMessage());
        }
        double result = calc.getResult();
        assertEquals(3, result, 0);
    }
    public static void main(String[] args) {
        calc.showWindow();
        Result result = JUnitCore.runClasses(CalculatorFormTest.class);
        for (Failure failure : result.getFailures()) {
             System.out.println(failure.toString());
        }
        System.out.println(result.wasSuccessful());
    }
}
```

Run Your Test

- Press “Alt + Enter” on your test class



Reference

- https://junit.org/junit5/docs/current/user-guide/
- https://www.tutorialspoint.com/junit/