Revision History			
Version	**Date**	**Auteur**	**Description**
001	05/12/16	Gregory Amirthanathan	First version Overview of Junit
002	06/12/16	Gregory Amirthanathan	Second version Installation of Junit Set up Junit Test for Java Program
003	00/00/00	Gregory Amirthanathan	Third version Organise JUnit tests in project

What is Junit?

- JUnit is a unit testing framework for Java programming language.

Features of Junit

- Junit is an open source framework, which is used for writing and running tests.
- Provides annotations to identify test methods.
- Provides assertions for testing expected results.
- Provides test runners for running tests.
- JUnit tests allow you to write codes faster, which increase quality.
- JUnit is elegantly simple. It is less complex and takes less time.
- JUnit tests can be run automatically and they check their own results and provide immediate feedback. There's no need to manually comb through a report of test results.
- JUnit tests can be organized into test suites containing test cases and even other test suites.
- JUnit shows test progress in a bar that is green if the test is running smoothly, and it turns red when a test fails.

***There must be at least two unit test cases for each requirement – one positive test and one negative test.

■ JUnit Framework can be easily integrated with either of the following –

- Eclipse
- Ant
- Maven

■ Download and Install

To download and install JUnit you currently have the following options.

Plain-old JAR

Download the following JARs put them on your test classpath:

- junit.jar
- hamcrest-core.jar

Maven

Add a dependency to `junit:junit` in `test` scope. (Note: 4.12 is the latest stable version as of the latest edit on this page.)

```
<dependency>
  <groupId>junit</groupId>
  <artifactId>junit</artifactId>
  <version>4.12</version>
  <scope>test</scope>
</dependency>
```

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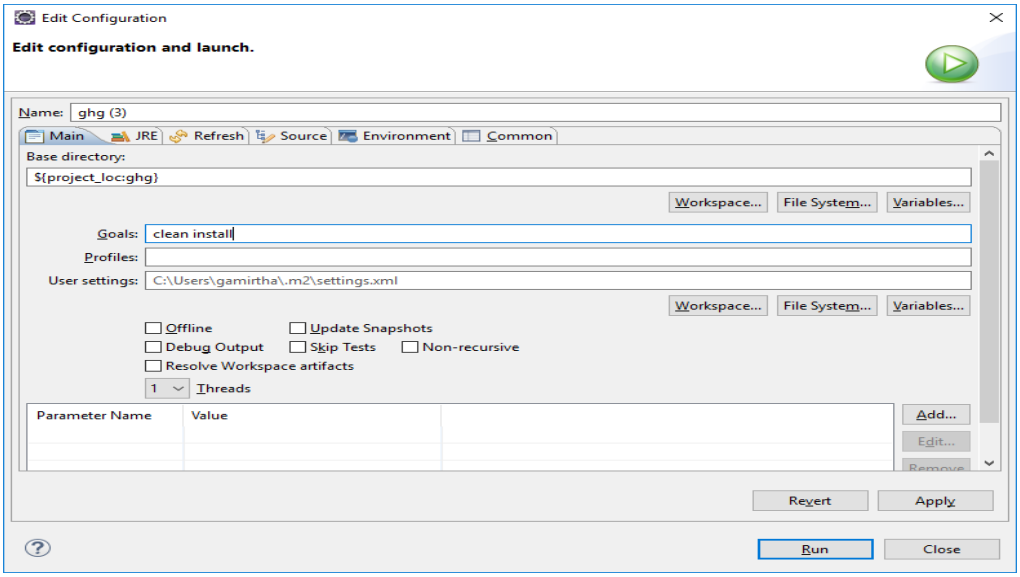
Run Maven build,



And see build status,

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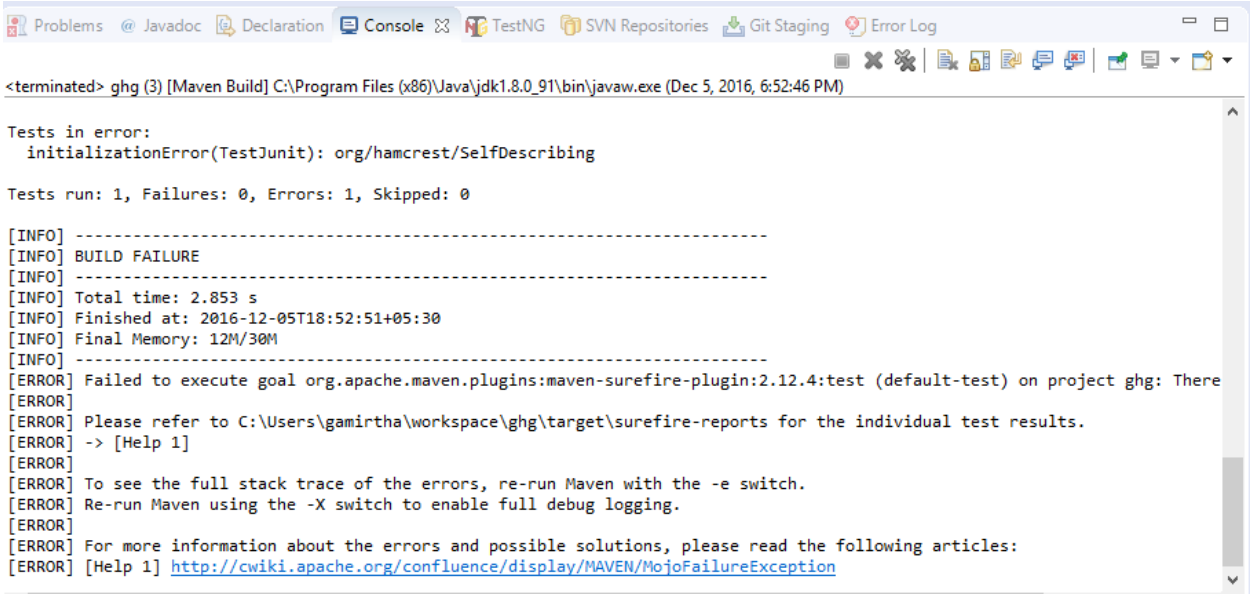

Note – Above status is failed, however adding library below helps.

■ ADD Junit Library to Eclipse

A few steps you have to follow:

1. Right click on the project.
2. Choose Build Path Then from its menu choose Add Libraries.
3. Choose JUnit then click Next.
4. Choose JUnit4 then Finish.

Set up Junit Test for Java Program

1. Create New Java Project | New package | New Class

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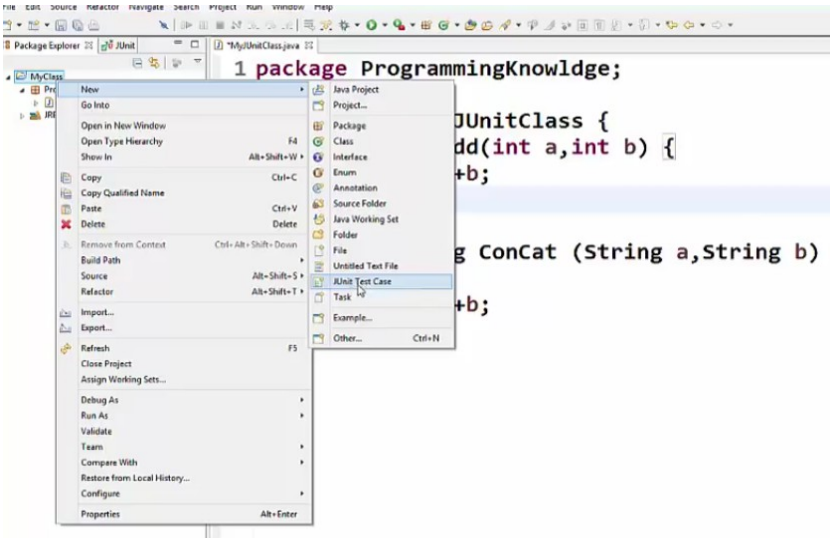
JUnit
Testing Framework

```java
package ProgrammingKnowldge;

public class MyJUnitClass {
    public int add(int a,int b) {
        return a+b;
    }

    public String ConCat (String a,String b)
    {
        return a+b;
    }
}
```

Right click on project → select 'New | Junit Test Case'



Give Name | finish | ok

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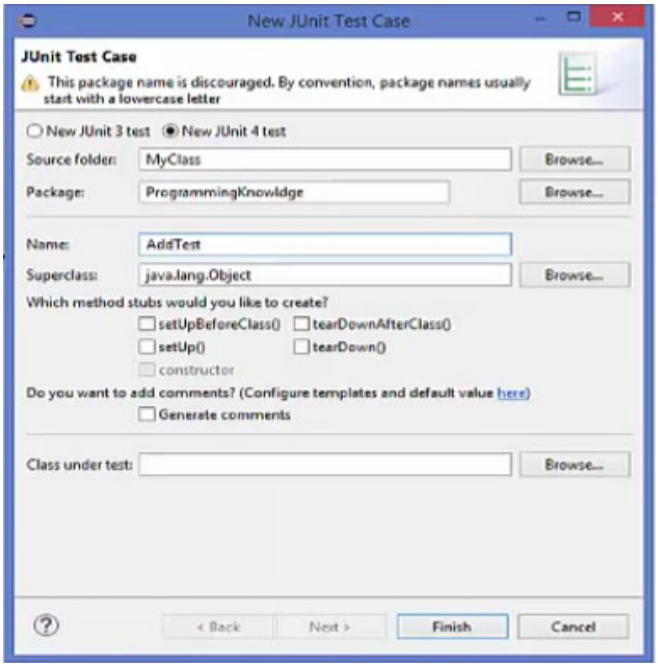

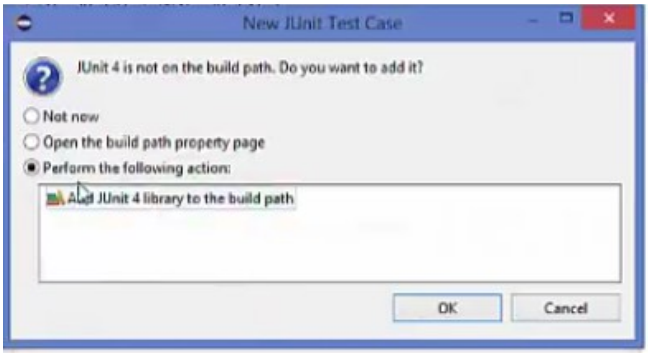

Create object of java class

Use the function to be tested

Use Assertions

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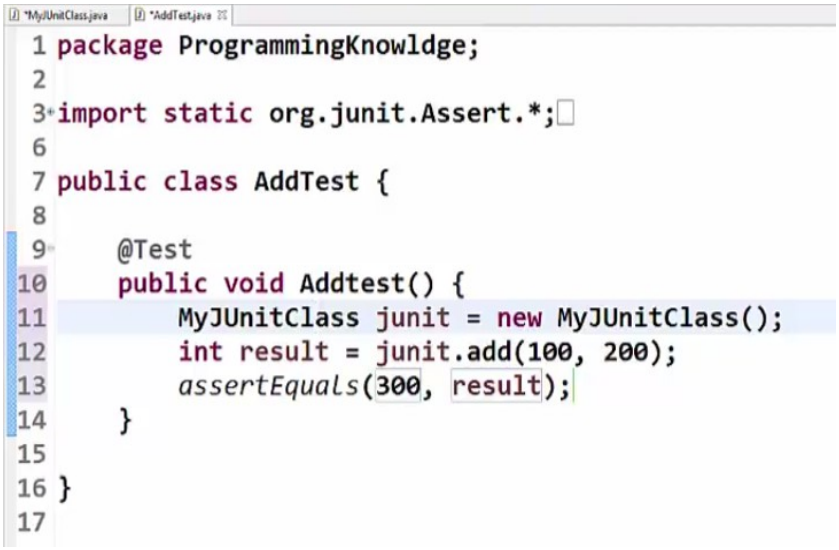
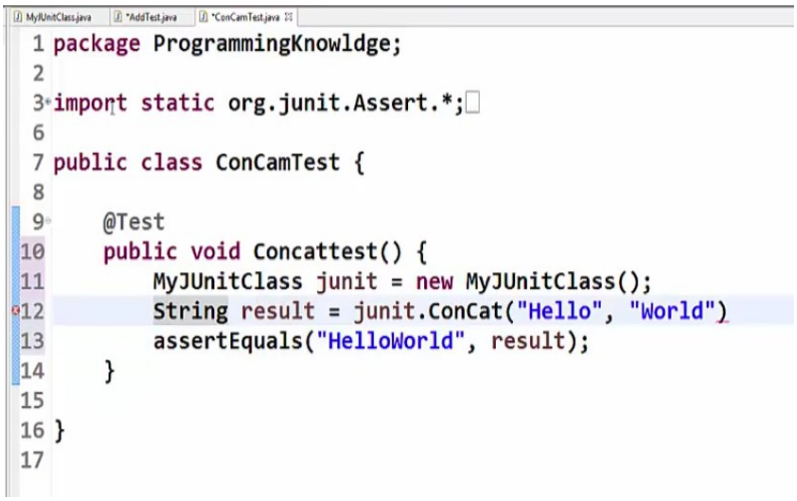


```java
package ProgrammingKnowldge;

import static org.junit.Assert.*;

public class AddTest {

    @Test
    public void Addtest() {
        MyJUnitClass junit = new MyJUnitClass();
        int result = junit.add(100, 200);
        assertEquals(300, result);
    }

}
```

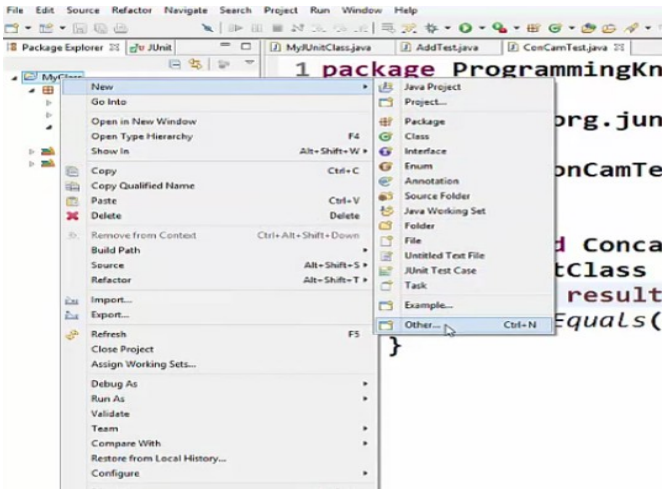
New Java Class

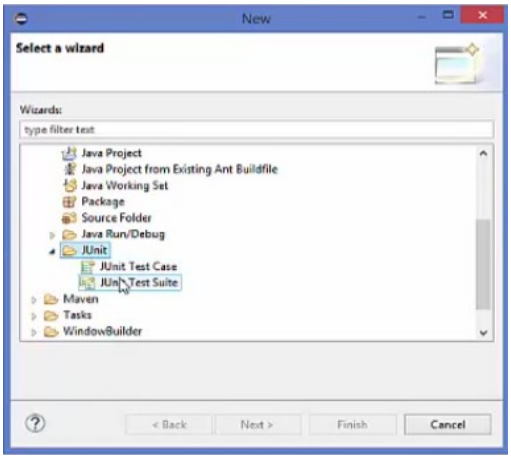


```java
package ProgrammingKnowldge;

import static org.junit.Assert.*;

public class ConCamTest {

    @Test
    public void Concattest() {
        MyJUnitClass junit = new MyJUnitClass();
        String result = junit.ConCat("Hello", "World")
        assertEquals("HelloWorld", result);
    }

}
```

Create test Suite

***There must be at least two unit test cases for each requirement – one positive test and one negative test.





Next | Add package | Add tests | finish

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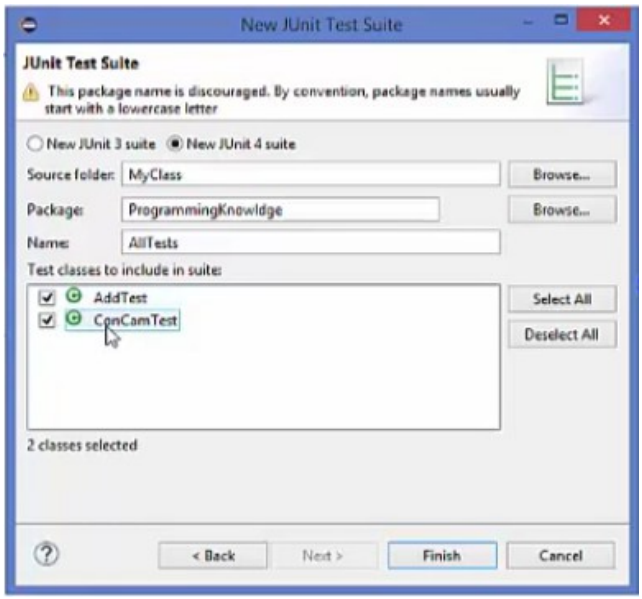


See the test suite

```
MyJUnitClass.java | AddTest.java | ConCamTest.java | AllTests.java
 1 package ProgrammingKnowldge;
 2
 3+import org.junit.runner.RunWith;
 6
 7 @RunWith(Suite.class)
 8 @SuiteClasses({ AddTest.class, ConCamTest.class })
 9 public class AllTests {
10
11 }
12
```

■ Test JUnit Setup

Create a java class file name TestJunit

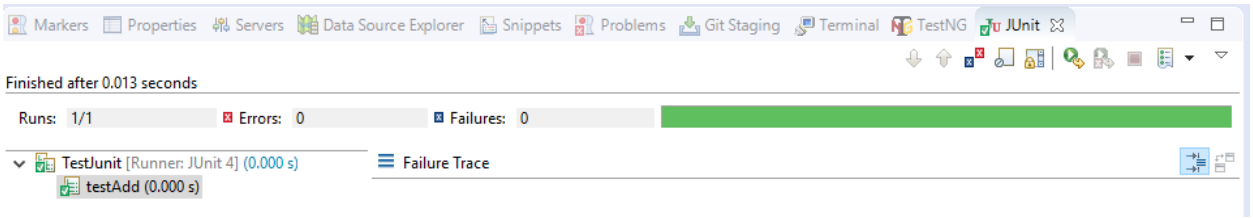
***There must be at least two unit test cases for each requirement – one positive test and one negative test.


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

public class TestJunit {
   @Test

   public void testAdd() {
      String str = "Junit is working fine";
      assertEquals("Junit is working fine",str);
   }
}
```

Execution status –



Create a java class file name 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());
   }
}
```

Execution status –

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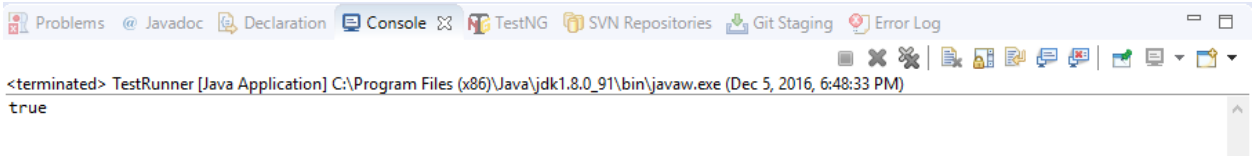

- Junit Assertions

Sr.No.	Methods & Description
1	**void assertEquals(boolean expected, boolean actual)** Checks that two primitives/objects are equal.
2	**void assertTrue(boolean expected, boolean actual)** Checks that a condition is true.
3	**void assertFalse(boolean condition)** Checks that a condition is false.
4	**void assertNotNull(Object object)** Checks that an object isn't null.
5	**void assertNull(Object object)** Checks that an object is null.
6	**void assertSame(boolean condition)** The assertSame() method tests if two object references point to the same object.
7	**void assertNotSame(boolean condition)** The assertNotSame() method tests if two object references do not point

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	to the same object.
8	**void assertArrayEquals(expectedArray, resultArray);** The assertArrayEquals() method will test whether two arrays are equal to each other.

Annotations

- The beforeClass() method executes only once.
- The afterClass() method executes only once.
- The before() method executes for each test case, but before executing the test case.
- The after() method executes for each test case, but after the execution of test case.
- In between before() and after(), each test case executes.
- @RunWith and @Suite annotations are used to run the suite tests
- A test method annotated with @Ignore will not be executed.
- The timeout parameter is used along with @Test(timeout) annotation
- The **expected** parameter is used along with @Test(expected) annotation
- Annotate test class with @RunWith(Parameterized.class).
- Create a public static method annotated with @Parameters that returns a Collection of Objects (as Array) as test data set.
- Create a public constructor that takes in what is equivalent to one "row" of test data.
- Create an instance variable for each "column" of test data.
- Create your test case(s) using the instance variables as the source of the test data.

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