# CE0825a: Object Oriented Programming II
# 10: Project, Testing, Randomness

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Abertay University

Monday, 14th March 2016

# Coursework Project

**Submission Deadline** End of Monday 18th April (week 13)

**Submission Format** **Two** files in Blackboard

- Standalone runnable JAR file containing binary and source
- Project report (Word or PDF)

**Demonstration** Week 13 timeslot, chosen during week 12 lab session

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**JAR file** Hopefully you know what that is now!

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**Unit Test** Test of a single component

**Integration Test** Test of interaction between components

**Performance Test** Still responds OK under load?

**Regression Test** Check old bugs stay dead

**Test Coverage** How much of the total code gets tested

**Continuous Integration** Constant automated build & test

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- From the start (Test Driven Development)
- Legacy code: add to most problematic parts first
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- Plain old "import" makes a class available by short name
  - `new java.io.File();`
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# Annotations

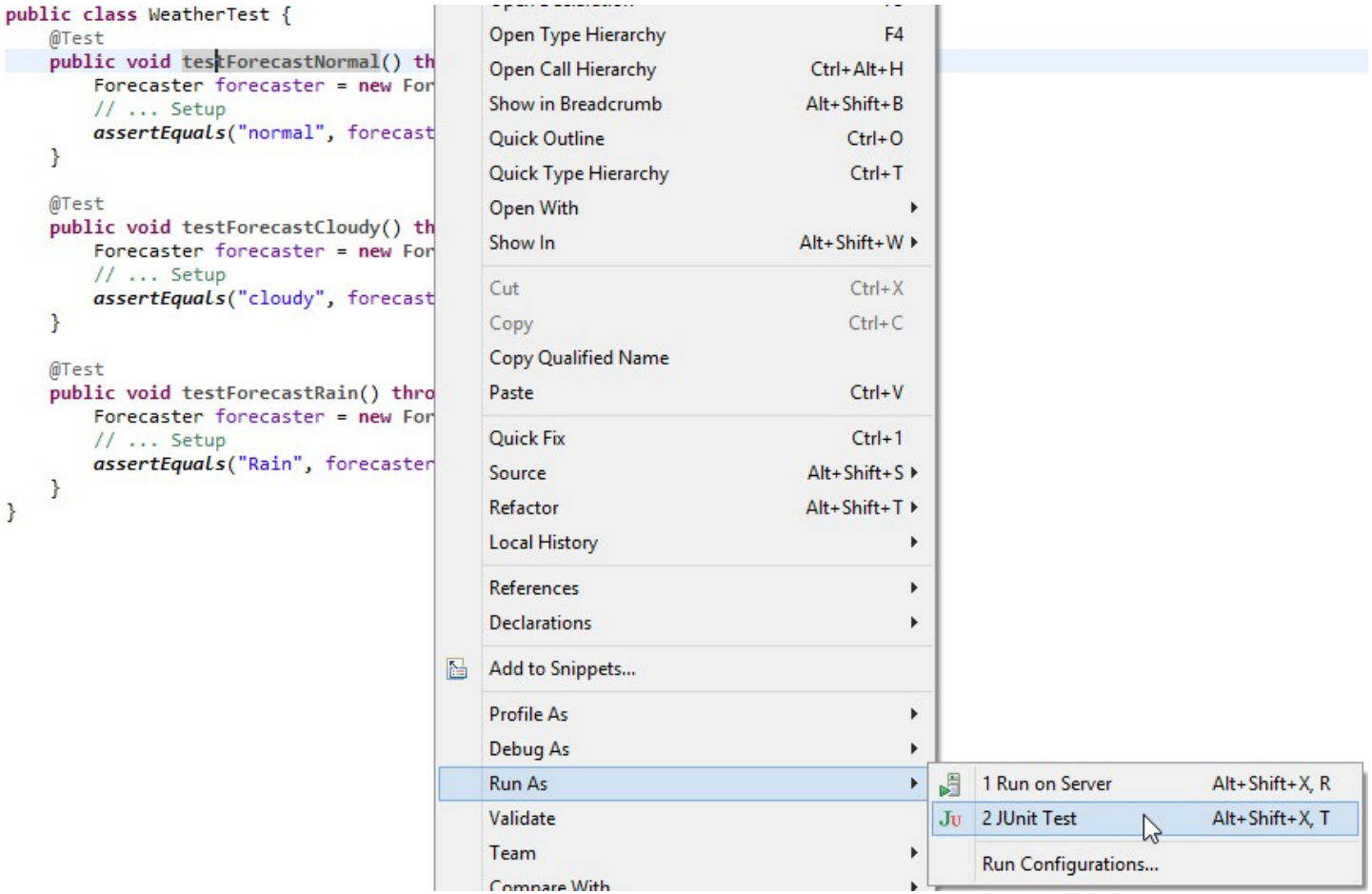
Annotations: little notes for various purposes, all starting with an @ symbol. For example, `@Deprecated` marks a function which shouldn't be used any more: each tiem you compile code that uses it, the compiler will warn you about that. Also used in JUnit, with @Test, which we're about to meet . . .

# JUnit Introduction

JUnit: Testing framework

```
import static org.junit.Assert.assertEquals;
import org.junit.Test;
public class MyTests {
  @Test
  public void fooMustBeZero() {
    MyClass tester = new MyClass();
    assertEquals("foo returns 0", 0,
        tester.foo());
  }
}
```

# Running Individual JUnit Tests



# JUnit View in Eclipse

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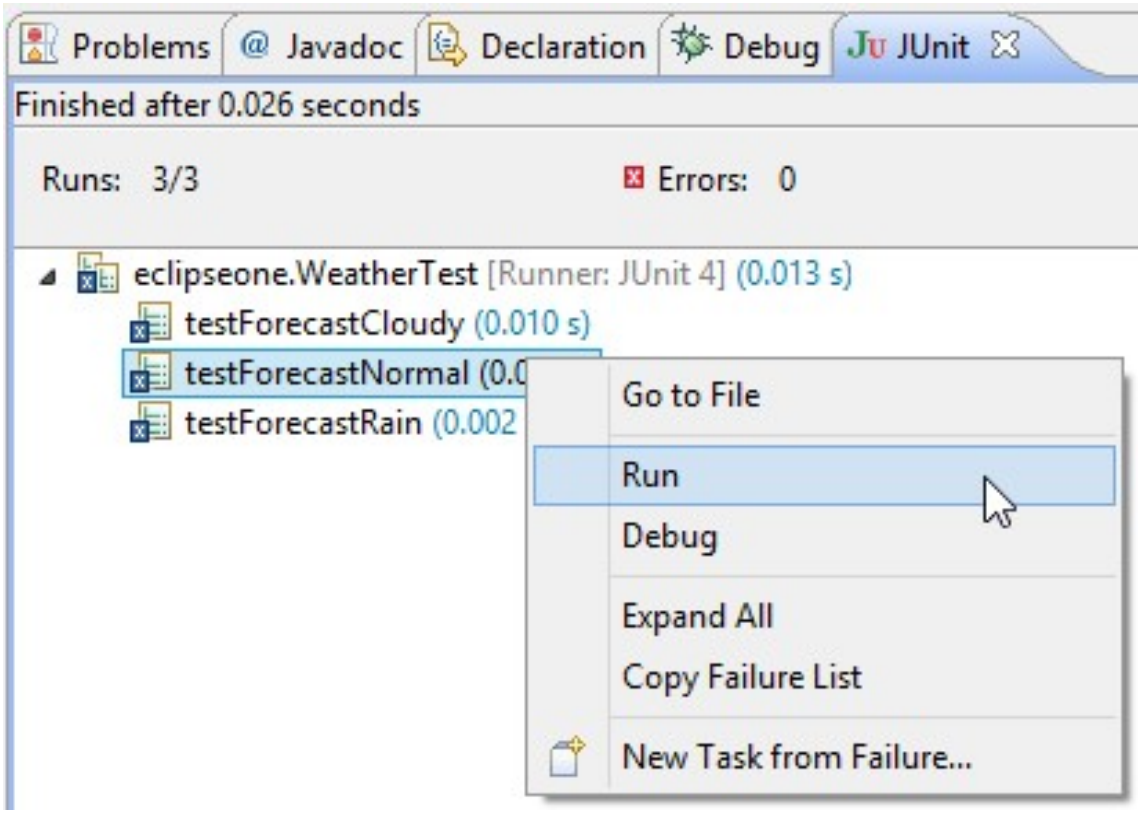
# Running Tests From JUnit View



# Randomness & SecureRandom

- Random numbers are surprisingly important for games, encryption and other things. Unfortunately, also surprisingly difficult for computers!
- One of the 'Snowden revelations' was that the NSA had put a back door in one of the new standard RNGs. (Then, that another government had copied it into the US government's own firewalls. . . )
- `SecureRandom` is intended to be a cryptographically strong random number generator.

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import java.security.SecureRandom;
SecureRandom sr=new SecureRandom();
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