

Test-First Development: Java, JUnit and Eclipse

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Test First?

- *Developers traditionally wrote tests after the code*
- *An afterthought*
- *“If there’s time” (there never is!)*
- *Test-first development inverts this...*

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Test First!

- *Writing a set of tests clarifies exactly what the module to be tested is supposed to do*
- *“If you don’t have a test, you don’t know when the module is correct!”*
- *So: First write and run the test case (it will fail), then write the module, revise it until the test passes*

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JUnit

- *JUnit is the standard test framework for Java*
- *Part of “Xunit” family (cppunit, etc.)*
- *Extensible: add-ons for J2EE work, etc.*
- *Home page: <http://www.junit.org/>*

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JUnit Basics

- *A JUnit test class extends TestCase*

```
public class TestABC extends TestCase
```

- *Test methods:*

```
public void testXXX() throws Exception {  
    result = // do the test  
    assertEquals("foo", expect, result);  
}
```

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JUnit Assert Methods

- *assertEquals, with or without message, all expected polymorphic forms (primitives, String, Object)*
- *Special type-specific assertTrue/assertFalse, assertNull/assertNotNull, etc.*

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Other JUnit Methods

- *setUp() - run before each test*
- *tearDown() - run after each test*

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Running JUnit Test

- *Text Runner*
- *GUI Runners (AWT-only and Swing)*
- *IDE integration*

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JUnit and Eclipse

- *Eclipse offers:*
 - *test case development wizard*
 - *e.g. class to test, methods to test...*
 - *test runner*
 - *etc.*

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Create Test and Code

- *Create new “target” class with no methods.*
- *As you write the tests, use Eclipse Quick-Fix to create the methods being tested in the new class!*
 - *Ensures agreement of argument types*
 - *may need to refine types in target*
 - *Object --> some subclass)*

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- *These are all stub methods*
 - *Then you write code and re-run tests*
 - *until they all pass!*

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JUnit Test Suite

- *Usually need to test more than one class(!)*
- *JUnit test suite runs a number of test cases*

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Eclipse and Test Suite

- *Eclipse “JUnit Test Suite” wizard will create and maintain a test suite file*
 - *Default Suite class is AllTests*
 - *re-run wizard when you create new tests*