

Testing

- λ **Unit testing**
 - Testing at the method level
 - *Every* method tested for correctness
 - In theory all methods tested
 - In practice ignore getters and setters
 - One part of *regression* testing
- λ **Role of Unit Testing in Extreme Programming (XP)**
 - Write the tests before writing code
 - Makes refactoring trivial when done well (why?)

Unit Testing with JUnit

- λ www.junit.org
 - Built into Eclipse with basic install
 - Related xunit packages for other languages
 - Cppunit and others
 - Developed by Kent Beck and Erich Gamma
- λ **Automate unit testing**
 - Setup and teardown methods
 - Testing class methods to “go green”
 - Also meta tools to help write tests (see web)

Black box and White box testing: QA

- λ **Higher level than unit testing**
- λ **Augment Unit Testing, can be both at class level, module level, ...**
- λ **For black box testing**
 - Based on specifications and requirements, not on knowledge of implementation
- λ **For white box testing**
 - Knowledge of code and logic, can test code coverage: all paths, all code, ...

More Testing

- λ **Integration testing**
 - When modules are combined, test integration
 - More system level than unit level
- λ **Performance testing**
 - Synthetic and real workloads
- λ **Load/Stress tests**
 - Average and high loads, stress system
- λ **Regression testing in general**
 - Tests re-run after changes (see jUnit)