Testing

- **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

- **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

- 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

- 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

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

More Testing

- **Integration testing**
  - When modules are combined, test integration
  - More system level than unit level

- **Performance testing**
  - Synthetic and real workloads
- **Load/Stress tests**
  - Average and high loads, stress system
- **Regression testing in general**
  - Tests re-run after changes (see jUnit)