Opening Discussion

- Questions about the course?
- Who added?!?
- Student presentations
Software Lifecycle

- Requirements/Analysis
- Design
- Implementation
- Testing
- Deployment
- Maintenance
Agile Programming

- Approaches to software that are well removed from the waterfall.
- Different steps happen continuously, all the time.
- Lots of different agile approaches.
- XP was the big one that made it popular.
We are uncovering better ways of developing software by doing it and helping others do it.

Through this work we have come to value:

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

That is, while there is value in the items on the right, we value the items on the left more.
- Pair programming
  - Collective code ownership
  - Uniform coding standards
- Automated testing
- Small releases
- Continuous integration
- Stories
- Incremental development
Reliability

- Maintain a certain level of performance for specific conditions.
- Things that help:
  - Programming languages developments
  - Code reviews
  - Testing
Testing

- Executing software to find failures.
- A defect is the algorithmic cause of failure.
Failure

- A situation in which the behavior of the executing software is different from expectation.
A test case some input values and expected output values for a unit.

A test suite is a collection of test cases.

You can test manually or using an automatic tool.

Automatic tools support regression testing.

Test code should be simple so that it is unlikely to have bugs.
JUnit

- Testing framework for Java.
  - Works for Scala too.
- Makes it easy to label methods as tests.
- Put in various asserts to check that outputs match expectations.
Maintainability

- The capability of the software product to be modified.
  - Analyzability
    - Capability to be diagnosed for deficiencies or failures, or identify parts of modification.
  - Changability
    - Capability to enable specific modifications.
  - Stability
    - Ability to avoid effects from modification.
  - Testability
    - Capability to be tested.
Flexibility

- Capability to add or enhance functionality by adding units, not modifying existing units.
Closing Comments

- ACM meeting across the hall at 4:00.