FogBUGZ

- [http://www.fogcreek.com/FogBUGZ/](http://www.fogcreek.com/FogBUGZ/)
- “At any given time, every case is assigned to one person who must resolve it or forward it to someone else.
- Cases can be prioritized, documented, sorted, discussed, edited, assigned, estimated, searched, and tracked.”

FogBUGZ - Example Case

- “A tester finds a bug, enters it, and assigns it to the development manager.
- The development manager assigns it to the programmer who is responsible for that area of the code.
- The programmer fixes it, and assigns it back to the tester to check that it’s really fixed.
- The tester confirms that it’s fixed and closes the bug.”

FogBUGZ - Demonstration

- [http://trial.fogbugz.com/](http://trial.fogbugz.com/)

Debugging

- The tester needs to document actions that trigger bugs very clearly; otherwise you will need to interview the bug reporter in order to understand the problem, which takes time.
- You need to test a multitude of cases, even those that seem unlikely – if it is possible, then someone will probably find it (better you than a customer).
- Traces can be written to a file.
- Explain the code to someone else.
- Assume that your code is broken before blaming the system.
Unit Testing

- JUnit
  - Regression Testing
    - [http://www.junit.org](http://www.junit.org)
- Artima SuiteRunner
  - Conformance Testing
- Jakarta Cactus (Servlets)
  - Extends JUnit and uses Ant

Catalyst Web Tools

- EPost – online discussion board
- QuickPoll – one question survey
- WebQ – full survey
  - [http://catalyst.washington.edu/home.html](http://catalyst.washington.edu/home.html)

UW Mailman

- E-mail Lists

Scripting and Code Generators

- Scripting can be used to quickly implement tasks that could take much longer using a conventional language.
- Examples: Perl, awk, sed, Python, Tcl
- Shell Scripts (bash, csh, etc.)
- Code Generators
  - Good for making tables.
  - Good for reducing work.
  - Bad if not understood.

Plain Text

- Easier to read and interpret when the original software application is lost.
- Easier to manipulate and test.
- Large (but can be compressed)
- Modifiable with languages like Perl

Editors

- Configurable
  - Custom looks, all keyboard interface
- Extensible
  - Works with all languages
- Programmable
  - Modifiable through programming
  - Emacs, VI, Eclipse, JEdit, etc?
- Do we believe this?
Code Metrics

- JavaNCSS
- JDepend
  - [http://www.clarkware.com/software/JDepend.html](http://www.clarkware.com/software/JDepend.html)

JavaNCSS Metrics

- Non Commenting Source Statements (NCSS).
- Cyclomatic Complexity Number (McCabe metric).
- Packages, classes, functions and inner classes are counted.
- Number of formal Javadoc comments per class and method.

JDepend Metrics

- CC - Concrete Class Count
- AC - Abstract Class (and Interface) Count
- Ca - Afferent Couplings (Ca)
- Ce - Efferent Couplings (Ce)
- A - Abstractness (0-1)
- I - Instability (0-1)
- D - Distance from the Main Sequence (0-1)
- V - Volatility (0-1)
- Cyclic - If the package contains a dependency cycle

Project Comments

- You may be using an emulator, but don’t make absurd design decisions unless you can justify them.
- We expect you to use some kind of bug tracking.
- We expect you to use CVS or something similar.
- Why? Well, don’t you want to learn these tools in this class? 😊 Don’t wait for your job.