Tools

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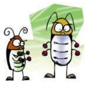
Tools

- CVS
- FogBUGZ (Bug Tracking)
- Unit Testing (JUnit, Jakarta Cactus)
- Catalyst Web Tools (BB and Surveys)
- Mailman (E-mail Lists)
- Ant (Build File Languages)
- Scripting Languages
- Shells
- Editors
- Code Metrics

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**."

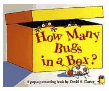
FogBUGZ – Example Case

- "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/

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
- Artima SuiteRunner
  - Conformance Testing
  - http://www.artima.com/suiterunner/tutorial.html
- Jakarta Cactus (Servlets)
  - Extends JUnit and uses Ant
  - http://jakarta.apache.org/cactus/

Catalyst Web Tools

- EPost – online discussion board
- QuickPoll – one question survey
- WebQ – full survey

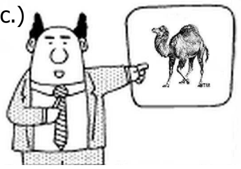
- http://catalyst.washington.edu/home.html

UW Mailman

- E-mail Lists
- http://www.washington.edu/computing/mailman/

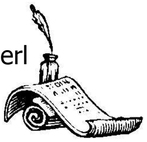
Scripting and Code Generators

- 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.

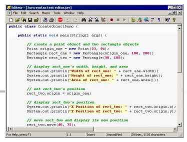


Plain Text

- 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

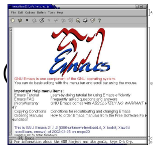


Editors


Editeur - [Java syntax text editor.jav]
File Edit Search Macro Tools Window Help
For Help, press F1
1:1
Insert
Unmodified
28 lines, 1103 characters

```
public class CreateObjectDemo {

    public static void main(String[] args) {

        // create a point object and two rectangle objects
        Point origin_one = new Point(23, 94);
        Rectangle rect_one = new Rectangle(origin_one, 100, 200);
        Rectangle rect_two = new Rectangle(50, 100);

        // display rect_one's width, height, and area
        System.out.println("Width of rect_one: " + rect_one.width);
        System.out.println("Height of rect_one: " + rect_one.height);
        System.out.println("Area of rect_one: " + rect_one.area());

        // set rect_two's position
        rect_two.origin = origin_one;

        // display rect_two's position
        System.out.println("X Position of rect_two: " + rect_two.origin.x);
        System.out.println("Y Position of rect_two: " + rect_two.origin.y);

        // move rect_two and display its new position
        rect_two.move(40, 72);
```

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


emacs@zus110.sfc.keio.ac.jp
File Edit Options Buffers Tools Help
Emacs
A
B
C
D

GNU Emacs is one component of the GNU operating system.
You can do basic editing with the menu bar and scroll bar using the mouse.

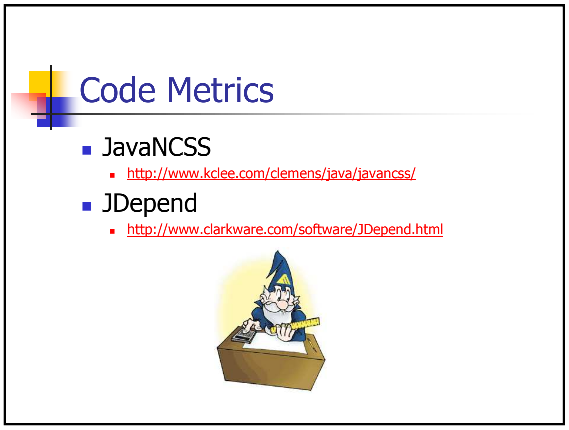
Important Help menu items:

Emacs Tutorial	Learn-by-doing tutorial for using Emacs efficiently
Emacs FAQ	Frequently asked questions and answers
(Non)Warranty	GNU Emacs comes with ABSOLUTELY NO WARRANTY
Copying Conditions	Conditions for redistributing and changing Emacs
Ordering Manuals	How to order Emacs manuals from the Free Software Foundation

This is GNU Emacs 21.1.2 (i386-unknown-freebsd4.5, X toolkit, Xaw3d scroll bars, emcws) of 2002-03-25 on mcpc20
Copyright (C) 2001 Free Software Foundation, Inc.

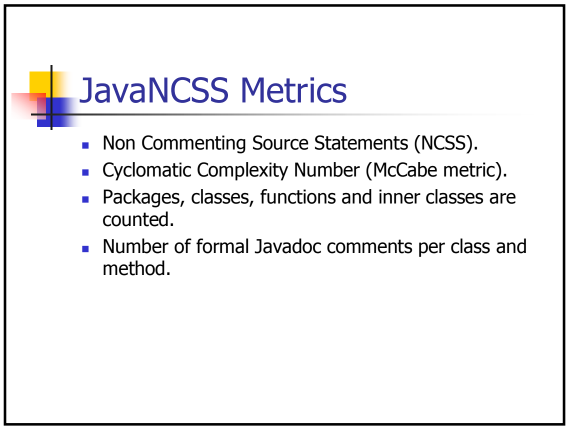
GNU Emacs

For information about the GNU Project and its goals, type C-h C-p.



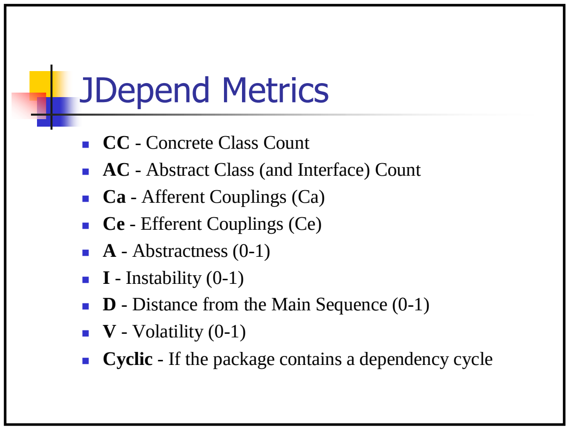
Code Metrics

- JavaNCSS
  - http://www.kclee.com/clemens/java/javancss/
- JDepend
  - http://www.clarkware.com/software/JDepend.html



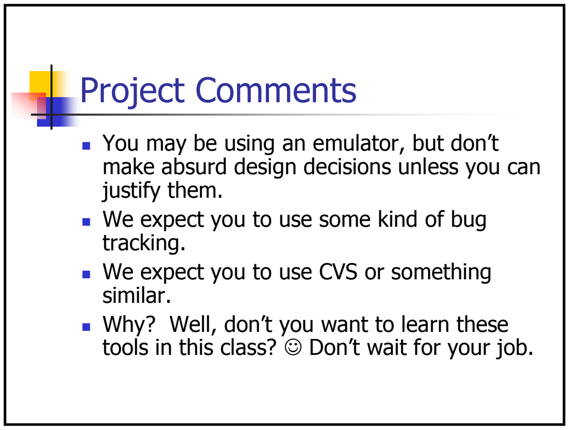
JavaNCSS Metrics

- 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.