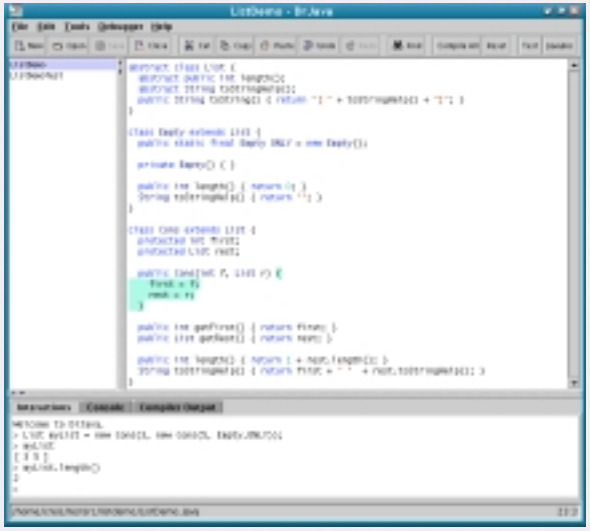
DrJava Development

Charles Reis
CSE 403 Guest Lecture

DrJava



Pedagogic Java IDE

Simple, Interactive

Used at dozens of schools around the world

Freely Available

Development Overview

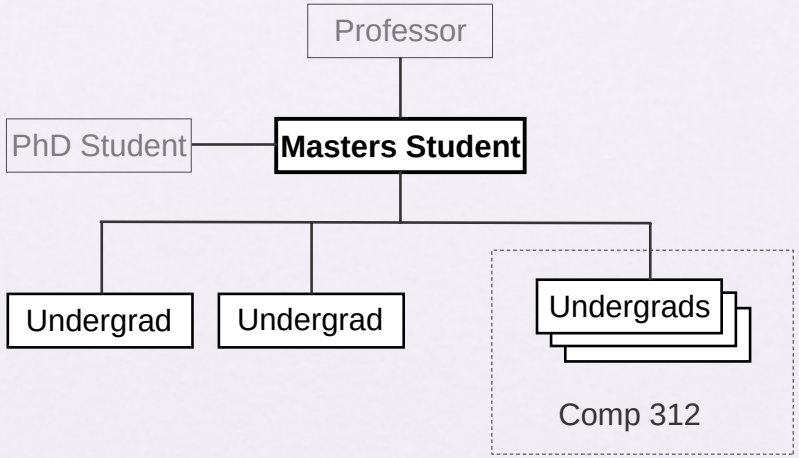
Written by students at Rice University

Graduate, Undergraduate

High rate of turnover

Open Source
Extreme Programming

Development Team



On the Inside

Java with generics (`List<String>`)
~400 classes, 50,000 lines of code
Complex (*unit tests are critical!*)
Two JVMs, plus multithreaded GUI
RMI, JDI, Custom Classloaders
Backward compatibility

Benefits of Open Source

Freely available
Tool and Management Support
Incorporate existing code
Educational value
Word of mouth, Credibility?

Tools and Management

Sourceforge.net
Free hosting for 80,000 projects
Professional management tools
Track features, bugs, tasks, support

Ant, JUnit, CVS

Use Existing Code

Dynamic Java
Java source code interpreter
Critical to DrJava's quick maturity

JUnit Integration

Educational Value

Source code available for students, tinkerers
Credible use of undergrads in Comp 312
Building block for research tools (DrScala)

Complications

Choice of License is tricky
GPL: true "free software"
All incorporated/derivative works GPL'd
BSD: more flexible, fewer guarantees
Allows us to use JUnit

Extreme Programming

Simple practices that work well together
Pair Programming
Unit Testing
Continuous Refactoring
Incremental Development
On-site Customer

Typical Activity

Prioritize bug reports
Write test to exhibit bug
Pair program to fix bug
"Commit" (update, compile, test, commit)
Release

Releases

Theory: repository can always be released
Practice: not exactly...

Development releases (weekly/monthly)
Stable releases (a few each year)

Life Cycle

Peak development in spring and summer (Comp 312, summer interns)
3-4 large features, many small fixes
Masters Theses
Maintenance in "off-season"

Lessons Learned

Unit tests are essential to stability
Work incrementally
XP is effective for high turnover
Much to be gained from open source, even without many external developers

Difficulties

Hard to test (and design) GUIs
Hard to enforce good test coverage
Concurrency can be a mess
Java isn't *really* platform independent...
Tough to keep documentation up to date
Maintenance/support is a full time job

Closing Thoughts

Immensely satisfying to work on a widely used product

Open source is a great fit for academia (perhaps elsewhere as well)

XP can work very well for small teams

More Info

http://drjava.org

creis@cs.washington.edu