Teaching Programming with DrJava

Ideal for Teaching Beginners...

Problem: Complex Development Environments

- Confusing interfaces, often huge and buggy
- Code generation: ineffective for teaching students

Solution: Simplicity & Interaction

- DrJava: simple to use, stable, and small
- Powerful, intuitive features
- Users interact with the code



Interactions Pane:

- Evaluate expressions and statements on the fly
- Create objects, call methods
- Test program behavior
- Experiment with new classes and libraries

- **Integrated Compiler:**
- Highlights lines with compile errors
- Supports compiling with generics (GJ or JSR-14)

Support for Unit Testing (JUnit)

- Run a set of tests with the Test button
- Highlights tests that fail
- Encourages students to write tests
- **Useful for grading** projects



Integrated Debugger

- Complements the **Interactions Pane**
- Tracks down bugs
- Useful for even advanced programmers
- Set Breakpoints
- Step through code
- Watch values

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Future Plans:

- Language Levels: simple subsets of Java
- View Classes as UML Diagrams

Problem:

Students are not prepared for Production Programming

- Assignments are written and forgotten
- No real customers to support
- No project maintenance

Solution:

Extend DrJava as Course Project

- Students add features to DrJava in Software Engineering course
- Experienced TAs transfer knowledge, manage projects

Open Source

SourceForge:



- Professional Management Tools
- Free Project Hosting

Leverage Existing Work:

- **Build Scripting Tool** • Ant:
- JUnit: **Unit Test Framework**
- DynamicJava: Java Interpreter

Extreme Programming

Fully Unit Tested

- Tests are a safeguard



35% **Test Code**

Required Pair Programming

- Better design, fewer bugs
- Knowledge transfer among students
- Sustainable: Students can become project managers as TAs
- Schedule class time for pairing

DrJava is available at http://drjava.org

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 Students get feedback as course progresses

Students get experience with a production environment!