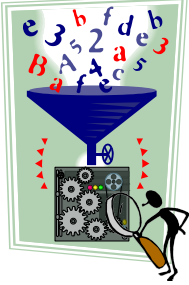


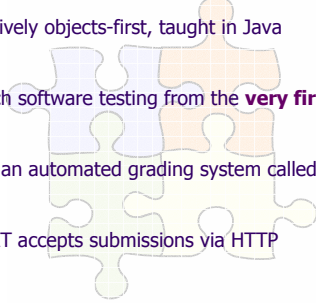
Experiences Using BlueJ's Submitter with an Automated Grader



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We use BlueJ in our CS1 course


- Aggressively objects-first, taught in Java
- We teach software testing from the **very first lab** as well
- We use an automated grading system called **Web-CAT**
- Web-CAT accepts submissions via HTTP



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Web-CAT is a flexible, customizable grading system that supports test-based assignments

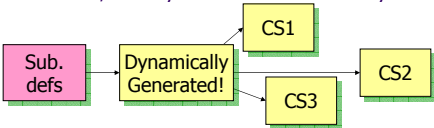
- We require students to **write tests for everything**
- Our grading system runs student tests on their code, and
- Performs **static analysis** (checkstyle, PMD)
- Tracks **code coverage** (Clover)
- Supports **"by hand"** feedback too
- Provides feedback in one, **integrated HTML report**



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Our strategy for managing submission definitions has evolved over time

- Submission.defs format allows BlueJ to include definitions from a **URL**, so they can be loaded from anywhere



```

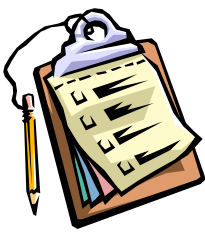
graph LR
    A[Sub. defs] --> B[Dynamically Generated!]
    B --> C[CS1]
    B --> D[CS2]
    B --> E[CS3]
  
```

- First, we used a single web-hosted definitions file
- Then we let each instructor write their own, and used a top-level file to include them all together
- Then we modified Web-CAT to dynamically generate submission.defs for the assignments it knows about

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Student behavior has led us to use other extensions

- Requiring students to write their own tests definitely **improves code quality**
- Using **PMD and Checkstyle** as part of automated assessment is very useful, but ...
- They also help **spot common errors**, but ...
- Students **don't submit** when they know their code isn't working, so ...
- We've configured the Checkstyle extension for use in our course (and are working on PMD)




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The BlueJ submitter extension inspired us to write one for Eclipse

- Submission targets are defined in an **XML file** that can be located anywhere
- Transmission over a **variety of protocols** (http, https, ftp, mailto) with fully customizable parameters
- Built in **extension points** for new packagers and protocols
- Modularized submission engine with fully replaceable GUI

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Visit our SourceForge project!

- <http://web-cat.sourceforge.net/>
- Still a bit green, but some of our plug-ins are already available (as is the first alpha release of Web-CAT)
- Install from our own Eclipse feature site
- <http://web-cat.cs.vt.edu/eclipse/> 
- We also have a full-blown pre-packaged BlueJ distribution, as well as one for Eclipse with all our Java/C++ support and custom workspace settings, too