



GS04: Tools and Environments

Lab Session 2: Manipulating Java ASTs using Eclipse JDT

The aim of this lab session is to explore how abstract syntax trees are used in modern interactive development environments and to apply the principles we have discussed about abstract syntax trees in practice using the Eclipse platform.

To gain experience with the Eclipse API contained in JDT for manipulating Java ASTs we will write an Eclipse plug-in that calculates the following metrics:

- Number of classes in the package
- Average number of methods per class
- Average number of fields per class
- Average ratio of private and public methods per class
- Maximum depth of the inheritance tree.

Getting started

Download the Eclipse plug-in source for a very rudimentary metrics plug-in from the course web page at <http://www.cs.ucl.ac.uk/staff/w.emmerich/lectures/GS04-0708>. Use this source to create a new Eclipse plug-in project. The plug-in as you have downloaded it already calculates the number of classes in a package. You now need to extend it to calculate the remaining five metrics.

Creating the User Interface

Create new menu entries in the “Metrics” Menu. You can do this by extending the plugin.xml file that describes the plugin. Create new a new command handler class for each of your new commands. Test your user interface before you move on to the next task.

Extending the Metrics Engine

Now consider the API in package `eclipse.org.jdt.core` that you can use for accessing ASTs. It's Java API documentation is available from <http://help.eclipse.org/help33/index.jsp?topic=/org.eclipse.jdt.doc.isv>

Now extend the class `MetricsCalculator` to create the remaining metrics. Write one method per metric required above. Then call the metrics calculations from your command handlers.

Testing

For this lab session, we will need a number of abstract syntax trees as test data. To obtain them, create an Eclipse project called `gz04CW` using the test data that is available on the course web page at <http://www.cs.ucl.ac.uk/staff/w.emmerich/lectures/GS04-0708>