Software Component Technology Group

Semester Project

Testing Tool for Compilers

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Introduction: At the moment the test cases for the Universe type system are integrated into MultiJava and JML. As we build other tools that use the Universe type system, most notably ESC/Java2, we need a test harness that ensures compatibility between the different tools. Currently, the testing is done with Make files, JUnit classes, and shell scripts, all of which have grown over time and became hard to manage.

Goal of this semester project is the development of a separate test management program that improves the test process by supporting multiple compilers (e.g. MultiJava, JML, ESC/Java2, . . .) and by providing a mechanism to subdivide the test cases (e.g. into the JML language levels).
The tool should support different kinds of test cases:

- compiler behavior: compile a test file and compare the generated error messages with the expected output for this compiler

- bytecode behavior: compile a test file and compare the output of the executed program with the expected output

Several ways to execute the tests should be possible:

- all test cases that corresponds to a compiler (including a version constraint)

- all test cases of a test (sub-)category (types, runtime, classfiles, . . .)

- all tests listed in a configuration file

A console program will be used to execute the tests. A GUI will be used to manage the tests and will support the creation of new test cases. The tool should be easily extendible to work with other compilers, different categories, and different kinds of test cases.

The main parts of this project are:

1. specification of the requirements together with the supervisors

2. design and implementation of the testing framework

3. design and implementation of the console tool

4. design and implementation of the GUI as an Eclipse plug-in

5. migration of all current Universe test cases to the new application

6. a report that describes the usage and architecture of the tool

The program will be used for black-box testing of the behavior that should be similar for different compilers and not for unit tests that are only valid for one compiler.