Dependent Types for Class-based Mutable Objects (Artifact)

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Abstract

This artifact is based on DOL, a Dependent Object-oriented Language featuring dependent types, mutable objects and class-based inheritance with subtyping. The typechecker written in Xtend, a flexible and expressive dialect of Java, is a direct implementation of the algorithmic type system described in the companion paper. It uses a direct interface to Z3 theorem prover via its API for Java. The artifact ships with an IDE developed as an Eclipse plugin based on the Xtext framework.

1 Scope

To attest the relevance of the formal language given in the companion paper, we provide a fully functional prototype where the examples in the paper as well as other programs can be typechecked, compiled and run. The artifact ships with an IDE developed as an Eclipse plugin based on the Xtext framework. The IDE support includes: a code editor assistant for DOL programs, on-the-fly error checking, and target code generation in the form of Java classes. Note that the prototype lacks some useful features. For example, DOL does not come with strings, and some constructs, such as the `while` loop, are available, but have limited usefulness. For an online web interface running on the command line with no installation required, see `http://rss.di.fc.ul.pt/tools/dol/`.

2 Content

The artifact package includes:
- `dol.ova`: the virtual machine image that has `Ubuntu 15.10 Wily` as guest operating system with all the software required to run DOL already installed.
- `ArtifactOverView.pdf`: a description of how to run the virtual machine image, the Eclipse IDE, and the examples.
- `ThirdPartySoftware.txt`: a description of third-party software included in the DOL bundle.

3   Getting the artifact

The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the Dagstuhl Research Online Publication Server (DROPS). In addition, the artifact is also available at: `http://download.rss.di.fc.ul.pt/dol/dol-v001-artifact.zip`.

4   Tested platforms

The artifact is known to work on macOS High Sierra and Windows 10 with at least 8 GB of free RAM. It should work on any system with the specified RAM, capable of running Oracle VirtualBox 5.2.8.

5   License

The artifact is available under license EPL-1.0 (`https://www.eclipse.org/legal/epl-v10.html`).

6   MD5 sum of the artifact

d297a4689340e5f6ebac3b9776232b0c

7   Size of the artifact

3 GB