Object Inheritance Without Classes (Artifact)

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Abstract

This artifact is a PLT Redex implementation of the operational semantics presented in Object Inheritance Without Classes. It defines the core syntax and runtime semantics of the Graceless language, and then extends it in multiple different ways to produce the various implementations of object inheritance, including single and multiple inheritance. The implementation makes the semantics runnable, and precisely defines some behaviour which is defined informally in the paper.

1 Scope

The artifact is designed to support a precise and runnable semantics of all of the models in the companion paper, allowing users to execute programs step-by-step to observe their behaviour. Care has been taken to allow for optional syntactic elements where the paper does not to ensure that any program that is syntactically valid for the single inheritance languages is also syntactically valid for any of the multiple inheritance languages as well. The companion paper claims that any of the foundational object inheritance models could be implemented under any of the given multiple inheritance schemes, and refers to the artifact as proof: the artifact demonstrates this fact by implementing all of them.

2 Content

The artifact package includes:

- an installation of Racket, the DrRacket editor, and PLT Redex;
- an implementation of each of the language semantics given in the paper, including the multiple inheritance combinations discussed but not explicitly defined;
- detailed instructions for using the artifact and for rebuilding it from scratch, provided as an `index.html` file.

The implementation of the semantics is provided directly in the artifact archive, but to simplify the process of running the Redex semantics we also provide an Open Virtualization Archive (OVA) appliance containing Xubuntu 16.04, with the installation and implementation already installed. The appliance can be imported into common virtualization software such as Oracle VirtualBox,

and will automatically log in to the appropriate account with the artifact's files on the desktop when started.

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). The latest version of our code is available on Github at `https://github.com/zmthy/graceless-redex`, with the exact code in this artifact tagged: `https://github.com/zmthy/graceless-redex/releases/tag/ecoop16`.

4   Tested platforms

The artifact is known to work on any platform with Racket 6.5 (April 2016), or running Oracle VirtualBox 5 (`https://www.virtualbox.org`) with at least 5 GB of free space on disk and at least 2 GB of free space in RAM.

5   License

GPL-3.0+ (`https://gnu.org/licences/gpl`)

6   MD5 sum of the artifact

7d8cefecd0152cd0fe7291df3cd709f9

7   Size of the artifact

1.7 GB