Software Component Technology Group

Semester Project

Extending supported language subset of Jive

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Introduction The Software Component Technology Group at ETH works in cooperation with the Softwaretechnik Group at TU Kaiserslautern on Jive, the Java Interactive Verification Environment. As its name suggests, Jive is a tool which enables users to interactively prove properties of annotated programs. To be more exact, Jive expects as input Diet Java Card (DJC) programs together with Java Modeling Language (JML) specifications and provides the user with a GUI to browse and verify the generated proof obligations separately.
One of JML's goals is to be a useful specification language for a variety of different tools. But as the tools can't be expected to support every feature, the research groups working on JML defined a hierarchy of several language levels. The level 0 features should be supported by all JML tools and constitute the heart of JML. Jive already supports most of JML level 0, but for full support it still needs to be extended.
The goal of this project is to extend DJC with **assume** and **assert** statements (JML level 0 features) and also with non-default **constructors**, another important feature that is not yet supported in Jive. The extensions should take effect through the whole system of Jive, that is, from parsing to automated program proving.

The tasks of this semester project are:

1. define Hoare-rules for **constructors** according to Java's semantics and for **assume** and **assert** statements.

2. extend the internal representation of DJC with the above constructs in Jive.

3. implement the defined Hoare-rules and adapt the corresponding tactics in Jive.

4. document and test all the newly implemented code.

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