IaTestGen

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Abstract

We present IaTestGen a unit test generator written in Java for implementations of the upcoming IEEE P1788 interval arithmetic standard.

In order to generate tests for various backends IaTestGen defines a DSL that can be used to specify testcases and will support all operations defined in the P1788 draft standard. Therefore it is possible to provide one test suite for all implementations with well selected cases by providing their own backend.

Also a general exhaustive testsuite will help implementors by providing regression-tests and therefore enabling the early detection of problems.

Although tests can't replace a rigorous verification they can help in the process of evaluating implementations.

We're currently developing a reference implementation for the IEEE P1788 draft standard in C++ and will provide a backend that generates Boost Unit Tests for our implementation.

The domain specific language supports different data types and formats to express numbers and can describe function calls with parameters and return values that are then used by the backend to generate the concrete test cases.

A parser generator is used to define the DSL hence it is easy to add new operations.

References:

[1] IEEE Interval Standard Working Group - P1788,
`http://grouper.ieee.org/groups/1788/`