
Accuracy of Mathematical Functions in Julia

Mantas Mikaitis*¹

¹University of Leeds – United Kingdom

Abstract

We present methodology and a software tool that is suited for exhaustive and non-exhaustive testing of mathematical functions of Julia in various floating-point formats. The software tool is useful to the users of Julia, to understand the level of accuracy of the mathematical functions and possible effects of errors on their numerical applications when using mathematical functions approximated to various levels. It is also useful to the developers and maintainers of the functions in Julia Base to test the modifications to existing functions and test the accuracy of new functions. The software (a test bench) is designed to be easy to set up to run accuracy tests automatically for regression testing. Our focus is to provide software that is user friendly and avoids the need for specialized knowledge of floating-point arithmetic or the workings of mathematical functions.

*Speaker