Rascal Tooling for Datatype Defining Rewrite Systems
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Abstract

It has been argued in [7] that using automated provers such as AProVE [4] and CSI [3] can benefit research projects on the topic of datatype defining rewrite systems (DDRSs), as the size of these DDRSs make manual completeness proofs long and error-prone. The authors of [7] note that no similar software exists for the ground-confluence property, and in [1] it is argued that such software should be developed.

The present work details an implementation of such a prover, developed in Rascal [2], which operates according to the ground-confluence proof methodology used in [1]. Alongside this prover other Rascal tools are detailed that serve practical purposes related to the use of provers. The proof methodology is first shown to be correct, and the tools are then detailed through code fragments and demonstrations of their workings. It is argued that these tools may accelerate DDRS research and help prevent errors. A demonstration of the ground-confluence prover reveals an oversight made in previous research, thus further confirming the need for such tools.