Binding-Time Analysis for Relational Programs

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Abstract—Programs in relational programming are mathematical relations. Such relations can be run in different directions: by providing some arguments of a program, one can compute the values of the others. The execution of a program in the given direction is not always efficient. One way to improve the performance of a relational program is to convert it into a functional program. To create a function by a relation, it is necessary to determine the order in which names within the input program are bound with respect to the given direction. Binding-time analysis is used to solve this problem in the area of program specialization, but it has not been created for relational programming before. In this paper we propose a binding-time analysis algorithm for the relational programming language miniKanren.

Index Terms—Relational programming, binding-time analysis, static analysis