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Mechanizing Logic II: Automated Map Logic Method for Relational Arguments on Paper and by Computer

JANET RYBAK and JOHN RYBAK*

This article is a continuation of our [12] and [13]. The methods of [12] enable us to mechanize arguments with premises containing complex terms such as 'All (X or Y) are (Z and non-W)'. Then [13] goes on to provide a basis for mechanizing relational arguments.

To the methods of [12] we add two new ideas:

(1) A rule for handling relational propositions we call Relational Conversion (RC). Here we state the rule in generalized form, and show how it works.
(2) A proposition-sorting routine, based on the moves used in our formal solutions, called "*streaming*" which allocates variables to Karnaugh maps.

Relational Conversion [10] Although Relational Conversion seems to be customarily used to describe an interchange of singular terms, we have employed it to cover also general terms. This process is not quite the same as change of quantifier order in predicate calculus.

The rule RC yields equivalent but formally different relational propositions for propositions having a relational term as predicate. (If only the subject is relational, a separate RC rule could be added, but it is ultimately simpler to use ex-

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