

Abstract: A Unified Attribute Reduction Method of Concept Lattices with Rough Set Theory

Xia Wang

School of Mathematics, Physics and Information Science

Zhejiang Ocean University

Zhoushan, Zhejiang, 316000, P. R. China

bblylm@126.com

Abstract

This paper mainly proposes a new approach to attribute reduction in concept lattices which has the same expression of attribute reduction in rough set theory. Using congruence relations and dependence space of concept lattices, the partial order relation on concept lattices is first transformed into the partial order relation on the congruence relations of the corresponding concept lattices. Then an approach to attribute reduction in a formal context based on congruence relations is developed. This approach can keep not only all extents of formal concepts and their original hierarchy in the concept lattice, but also the congruence partition of the object set of the formal context. Therefore, the expression, even the essence of attribute reduction in concept lattices and rough set theory are very much the same. Finally, discernibility matrices of a formal context are defined to calculate all attribute reducts.

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