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Theory and Applications

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To our families

Preface

This monograph is devoted to theoretical and experimental study of partial reducts and partial decision rules on the basis of the study of partial covers. The use of partial (approximate) reducts and decision rules instead of exact ones allows us to obtain more compact description of knowledge contained in decision tables, and to design more precise classifiers.

We consider algorithms for construction of partial reducts and partial decision rules, bounds on minimal complexity of partial reducts and decision rules, and algorithms for construction of the set of all partial reducts and the set of all irreducible partial decision rules. We discuss results of numerous experiments with randomly generated and real-life decision tables. These results show that partial reducts and decision rules can be used in data mining and knowledge discovery both for knowledge representation and for prediction.

The results obtained in the monograph can be useful for researchers in such areas as machine learning, data mining and knowledge discovery, especially for those who are working in rough set theory, test theory and LAD (Logical Analysis of Data).

The monograph can be used under the creation of courses for graduate students and for Ph.D. studies.

An essential part of software used in experiments will be accessible soon in RSES – Rough Set Exploration System (Institute of Mathematics, Warsaw University, head of project – Professor Andrzej Skowron).

We are greatly indebted to Professor Andrzej Skowron for stimulated discussions and various support of our work. We are grateful to Professor Janusz Kacprzyk for helpful suggestions.

Sosnowiec, Poland
April 2008

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Beata Zielosko

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