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Mining Negative and Positive Exceptions

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Multidimensional association rules represent an important type of knowledge that can be mined from large relational databases or data warehouses. These rules describe combinations of attribute values that often occur together in a database and can reveal hidden and useful patterns.

The main contribution of this work is to propose an approach to mine negative and positive exceptions from multidimensional databases. The goal of this approach is to find association rules that become weaker (negative exceptions) or stronger (positive exceptions) in some subsets of the database, which satisfy specific conditions over selected attributes. The candidates for exceptions are generated combining previously discovered multidimensional association rules with a set of significant attributes specified by the user. An exception is mined only when the actual support value of the candidate is much different from its expected support value. A method to estimate this expectation is proposed, as well as interest measures to evaluate the exceptions. An algorithm to mine such exceptions and experimental results are also presented.