

# Research of logical calculi for data mining

Each database is a formally described data structure. We refer to a fact that particular relations and fields have their own names. Results of methods of data mining are assertions that concern these names. Thus these assertions are formal expressions concerning formal data structures.

Mathematical logic studies formal languages and formal data structures as their models. It is defined what it means that a sentence of formal language is true/false in the model. There are lot of interesting results concerning deduction rules, universally valid formulas, decidability, etc.

The goal of this research is to study logical properties of patterns the LISp-Miner system mines for. We use observational calculi defined by P. Hájek and P. Havránek in [Ha 78] and results achieved in [Ha 78], [Ra 86], see also [Ra 97].

We investigate namely logical calculi of association rules. Several classes of association rules are defined and studied. There are both theoretically interesting and practically results concerning deduction rules and further features of association rules related to the defined classes.

Current research concerns further logical properties of association rules and patterns mined by the analytical procedures of the LISp-Miner system. Some problems related to logical calculi for multi-relational data mining are also studied, see [Ra 86] and e.g. [Ra 02B].