

# Effective bases of finite closure systems

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A closure system is a unifying concept for many areas of mathematics and computer science. It can be defined by a set of implications (a basis), and in such form it appears as a Horn formula in logic programming, a dependency in relational data bases, or a Horn Boolean function and a directed hypergraph in discrete optimization. Closure systems can also be presented in the terms of finite lattices, and the tools of economic description of a finite lattice have long existed in lattice theory. We give an overview of recent joint work with J.B.Nation in finding effective bases of closure systems inspired by the knowledge of the structure of their closure lattices. We establish general facts connecting existing parameters of optimality of the bases, as well as new classes of closure systems with the tractable optimum bases.

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