Sprague, Alan P.; Brossette, Stephen E.
Medical surveillance, frequent sets, and closure operations. (English) Zbl 1047.68591 J. Comb. Optim. 5, No. 1, 81-94 (2001).

Summary: Surveillance of hospital-acquired infections, especially those caused by antibiotic resistant bacteria, is an important component of hospital infection control. A computer program for this purpose experienced a combinatorial computational explosion in time and space when processing data describing certain multi-drug resistant organisms. The blowup occurred while the program was generating frequent sets, a common phase in data mining algorithms. We present a modified algorithm for composing frequent sets that more efficiently handles the computational burden. The algorithm’s proof of correctness involves the concepts of closure, independent sets, and circuits in a space more general than a matroid. Of central concern in the theory are inferences about a closure operation that can be obtained from limited information about the circuits.

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