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Elimination Schemes and Lattices

Perfect (vertex) elimination schemes are part of characterizations for several graph classes, including chordal and cop-win. Partial elimination schemes reduce a graph to an important subgraph, such as k -cores or robber-win graphs. We are interested in those partial elimination schemes, in which once a vertex is ready to be eliminated, it remains in that state regardless of which other vertices are eliminated. We show that in such a scheme, the sets of subsets of eliminated vertices (when ordered by inclusion) form an upper-locally distributive lattice. We show that process of cleaning graphs and also the cop-win orderings having this property (unless they contain a specific induced subgraph) lead to upper-locally distributive lattices.

*Joint work with R.J. Nowakowski and P. Pralat