ADD TO LIST OF SHARP-P COMPLETE PROBLEMS

1. EXT is the problem of, given a partially ordered set (via the elements and the relations) determine if there is an extension of it (s consistent way to order some pair that is not ordered). This problem is easily in P since a partial order is in EXT iff it does not compare every pair. But what about the problem of *counting* the number of extensions. Brightwell & Winkler [1] showed that this problem is #P-complete.

2. Recall that 3COL is the problem of, given a graph $\mathsf{G}$, determine if it is 3-colorable. Creignou & Hermann [3] have shown that #3COL is #P-complete.

3. Creignou & Hermann [2] proved a dichotomy theorem about which classes of formulas $\mathsf{F}$ are such that #FSAT is in P and which are #P-complete. Every case is covered. Their results are in the same spirit as Schaefer's dicotomy theorem [4].

# References


[1] G. Brightwell and P. Winkler. Counting linear extensions. *Order*, 8:225–242, 1991.
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[2] N. Creignou and M. Hermann. Complexity of generalized satisfiability counting problems. *Information and Computation*, 125(1):1–12, 1996.

[3] N. Creignou and M. Hermann. On #p-completeness of some counting problems, 1999.
`https://www.cs.umd.edu/~gasarch/BLOGPAPERS/3colsharpp.pdf`.

[4] T. Schaefer. The complexity of satisfiability problems. In *Proceedings of 10th ACM Symposium on Theory of Computing (STOC)*, 1978.