

Heuristic Method for Bayesian Network

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For the implementation of the third algorithm of the assignment, I answered the queries using variable elimination in the same way as the second algorithm, the difference between the two being the order of elimination of the variables that was being used.

One of the heuristic methods to use in this scenario, and the one I used is called “min-neighbors” or “min-neighbor”, it’s an algorithm which minimizes the number of neighbours for each variable.

After organizing and reordering the variables by the number of neighbours each variable has (in ascending order), the number of additions and multiplications that occur during the computation should be smaller since there are less join operations to make.

Furthermore, it’s important to clarify that this algorithm is a “greedy algorithm” which means that it follows the problem-solving heuristic of making the locally optimal choice at each stage. A greedy strategy does not usually produce an optimal solution, but nonetheless, a greedy heuristic may yield locally optimal solutions that approximate a globally optimal solution in a reasonable amount of time.

Sources used for extra help for the heuristic method:

- https://www.cs.tau.ac.il/~haimk/pgm-seminar/part_2_barak.pdf