Report Bayes Network Lab

During our various attempts to solve the lab, we found that although we had the intuition for solving Bayes Networks, we weren't able to translate our knowledge into code, it is rather difficult to come up with a solution to a problem in which we consider that some human intelligence and processing is needed to fully deliver. It is even more difficult when you can't picture a way to solve the problem at hand. This is exactly what happened, we encountered quite a tricky problem that we were not able to abstract into code.

As we know the Enumeration algorithm is not the fastest nor the most optimized one to work with Bayes Networks, we searched for some like the Querying best parents, and we even found that A* (A star) can also be implemented with this type of exercises. Hugin tool implements the PC algorithm and the extended version of it NPC that allows it to be faster than the Enumeration algorithm.

Hugin tool was a great way to represent what we attempted to do in a visual manner, the way the queries are represented are by selecting nodes from a list and double clicking the evidences we wanted to provide in order to get the results, we assume that Hugin employs a different algorithm because their results are displayed in a very fast way.

For real life applications, Hugin Tool would be a better choice, even if our code had worked, because the enumeration algorithm that we had to implement is very slow, $O(n^2)$ kind of slow, so with big networks the algorithm would take a lot of time to calculate the probability of certain nodes.