Bayes Networks Winter 2019/2020
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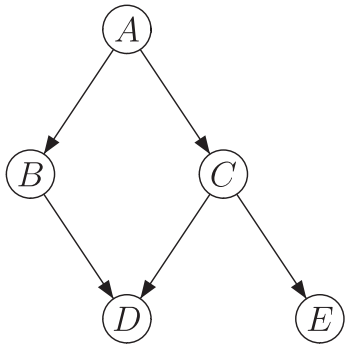
Exercise Sheet 8

Exercise 25 Clique Tree Propagation I

Recall the example network from the lecture:



$$P(e_1 \mid c_1) = 0.8 \qquad P(e_1 \mid c_2) = 0.6$$
$$P(d_1 \mid b_1, c_1) = 0.8 \qquad P(d_1 \mid b_1, c_2) = 0.8$$
$$P(d_1 \mid b_2, c_1) = 0.8 \qquad P(d_1 \mid b_2, c_2) = 0.05$$
$$P(b_1 \mid a_1) = 0.8 \qquad P(b_1 \mid a_2) = 0.2$$
$$P(c_1 \mid a_1) = 0.2 \qquad P(c_1 \mid a_2) = 0.05$$
$$P(a_1) = 0.2$$

Determine the a-priori distribution for all five variables!

You may use the HUGIN tool to check your calculations, before using them to address the next assignment.

Exercise 26 Clique Tree Propagation II

It becomes evident that the patient has severe headache ($E = e_1$). Propagate this evidence across the network with the clique tree propagation algorithm presented in the lecture, i.e., compute all five a-posteriori distributions!

Exercise 27 Clique Tree Propagation III

In addition to b), we now learn that the patient has no increased serum calcium ($B = b_2$). Again, propagate this additional evidence!