

Report Machine Learning, Homework 6

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The report describes the results obtained during the development of Homework 6. The main goal of the assignment has been to evaluate the capabilities and functionalities of Bayesian Networks.

1 Assignment 1

Firstly has been drawn, as we can see in Figure 1, the Bayesian network of Assignment 1.

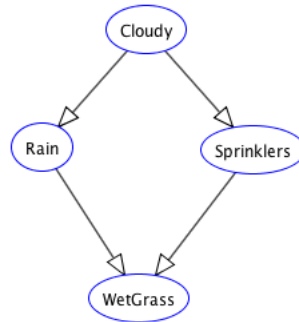


Figure 1

The joint probability function for this graph is the follow:

$$P(c, r, s, wg) = P(c) P(r|c) P(s|c) P(wg|r, s)$$

Finally, Figure 2 shows the probability that Rain=True and Sprinklers=True when WetGrass=True and Cloudy=False

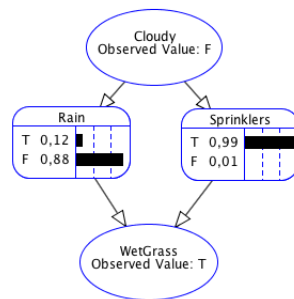


Figure 2

2 Assignment 2

Firstly has been drawn, as we can see in Figure 3, the Bayesian network of Assignment 2.

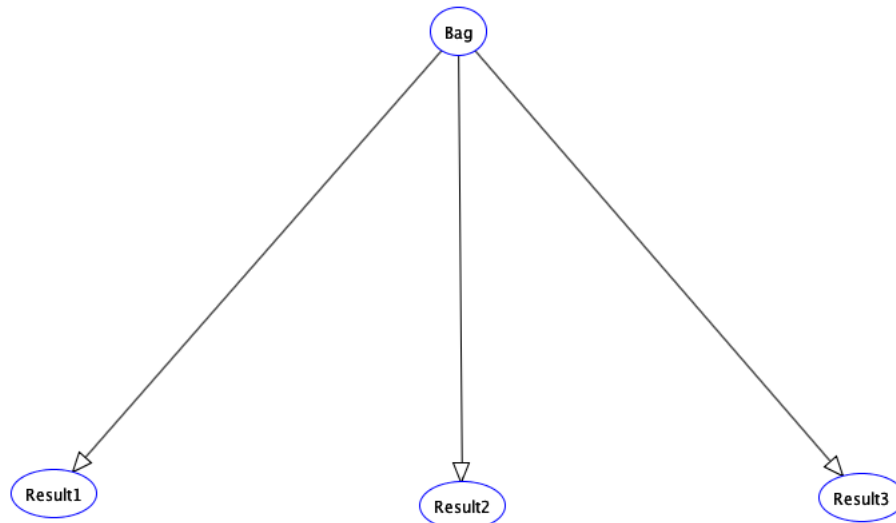


Figure 3

Then has been calculated which coin was most likely to have been drawn from the bag if the observed flips come out heads twice and tails once.

Figure 4 shows the result.

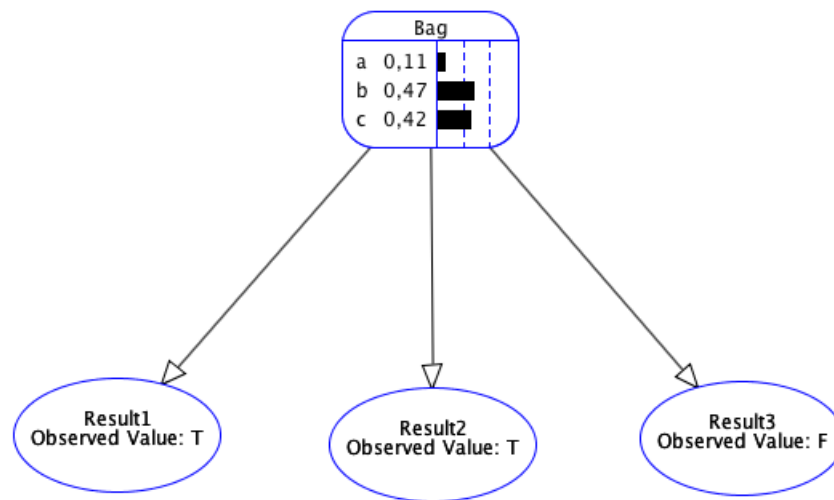


Figure 4

3 Assignment 3

Firstly has been loaded the sample problem Fire Alarm Belief Network and has been written the joint probability for this one as follow:

$$P(t, f, a, s, l, r) = P(t) P(f) P(s|f) P(a|t, f) P(l|a) P(r|l)$$

Finally, as requested, has been changed the network by adding a node representing the probability that someone will call their mother if the alarm goes off like in Figure 5.

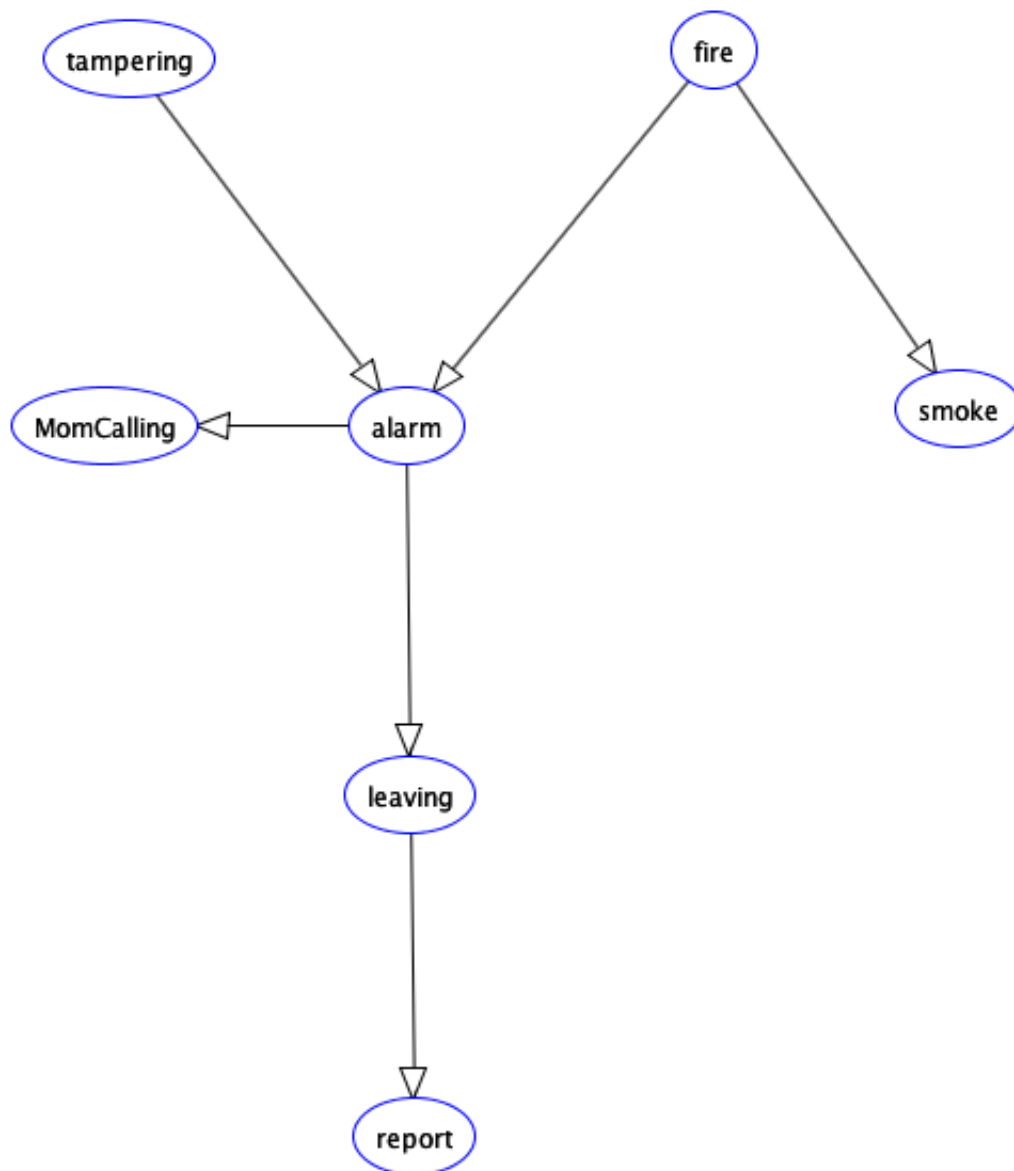


Figure 5