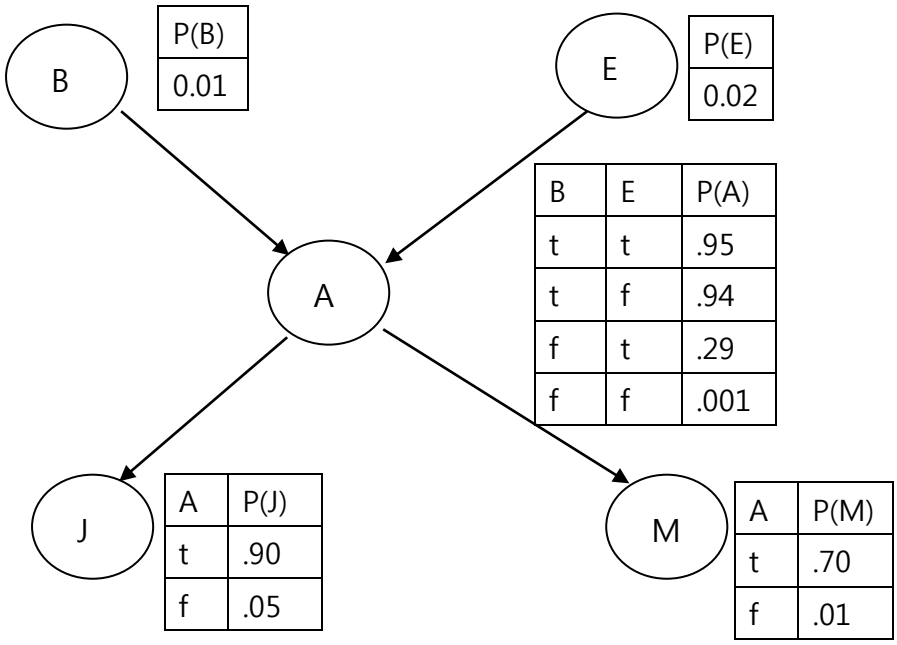
Artificial Intelligence, 2019 Fall, Final Exam, Professor: Minkoo Kim

1. In the following Bayesian Network, B, E, A, J, and M denote binary probability variables which denote 'Burglary', 'Earthquake', 'Alarm', 'John's Call', and 'Mary's Call', respectively, and b, e, a, j, and m represent the events which actually happen (i.e. true events), respectively. Calculate the following probabilities: 1) P(a|b) (10 Points);
2) P(a) (10 Points).



2. Explain SVM(Support Vector Machine) with the two key ideas. (10 Points) and explain k-NN (Nearest Neighbor) with pros (advantages) and cons (disadvantages) (10 Points).

3. Describe MLP(Multi Layered Perceptron) with backpropagation algorithm as much as in detail (20 Points)

4. Let the table with the following training data set D be given. Develop a decision tree for D by calculating the Information Gain = G(D, x_i). (20 Points)

Num.	x_1	x_2	Class
1	6	1	0
2	7	3	0
3	8	2	0
4	9	0	0
5	8	3	0
6	8	6	1
7	9	2	1
8	9	5	1

5. Describe CNN (Convolutional Neural Network) respectively in terms of network structure, key ideas, learning algorithm and application areas. (20 Points)