Students have either already taken or started taking this quiz, so be careful about editing it. If you change any quiz questions in a significant way, you may want to consider regrading students who took the old version of the quiz.

Points 5 Published

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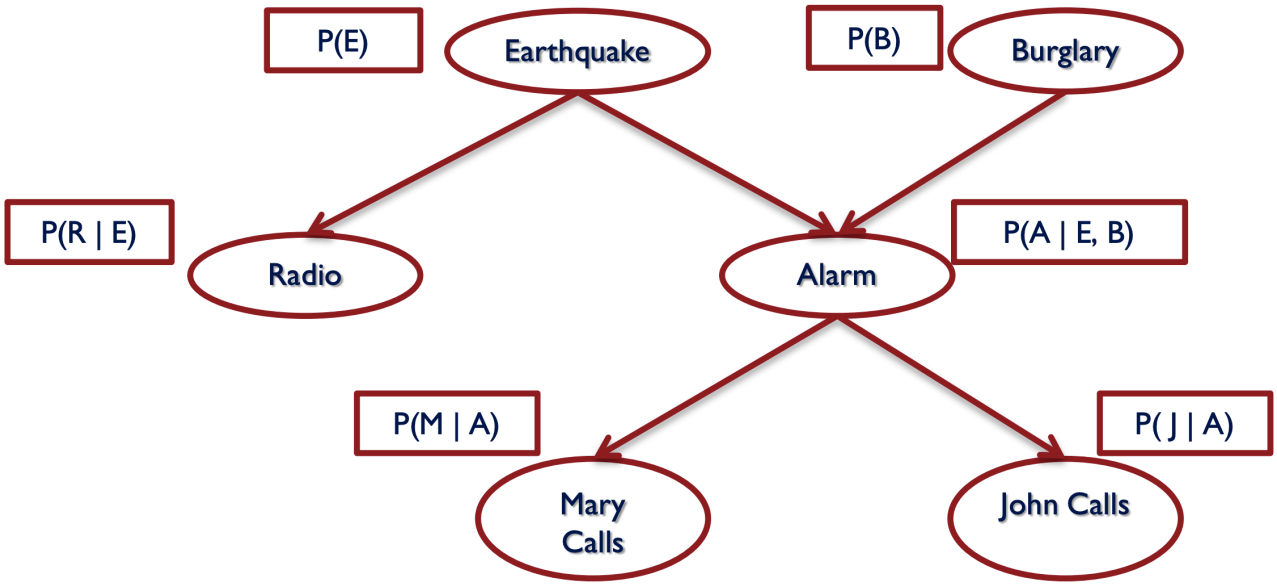
Question 1 pts

What statement(s) are true about the expectation-maximization (EM) algorithm?

- It requires some assumption about the underlying probability distribution.
- Comparing to a gradient descent algorithm that optimizes the same objective function as EM, EM may only find a local optima whereas the gradient descent will always find the global optima.
- The EM algorithm maximizes a lower bound of the marginal likelihood $P(D;\ \theta)$
- The algorithm assumes some that some of the data generated by the probability distribution is not observed.

Question 1 pts



Consider the example shown in the figure above. What's P(R, A)?

- [ ] $P(E) * P(R|E) * P(A|E,B) * P(B)$
- [ ] $P(E)^2 * P(R|E) * P(A|E,B) * P(B)$
- [ ] $P(R|E) * P(A|E,B)$
- [ ] $P(R) * P(A)$

Question 1 pts

Which statement(s) are true about the K-means algorithm?

- [ ] It is a clustering algorithm.
- [ ] It is an EM algorithm.
- [ ] It assumes the data is from a mixture of Gaussian distributions.
- [ ] It is a soft EM algorithm, where all possible hidden attributes are considered in the E step.

Question 1 pts

You are presented with a dataset that has hidden/missing variables that influences your data. You are asked to use Expectation Maximization algorithm to best capture the data.

How would you define the E and M in Expectation Maximization?

ıswer

- Estimate the Missing/Latent Variables in the Dataset, Maximize the likelihood over the parameters in the model
- Estimate the number of Missing/Latent Variables in the Dataset, Maximize the likelihood over the parameters in the model
- Estimate likelihood over the parameters in the model, Maximize the number of Missing/Latent Variables in the Dataset
- Estimate the likelihood over the parameters in the model, Maximize the number of parameters in the model

Question 1 pts

Imagine you have a party on Sunday and an exam on Monday. Too much food on Sunday could lead to lack of concentration on Monday. Consequence of reduced concentration could be stress with your roommate as you forgot to clear the room after dinner!

We can form the following graph from this:

where Z=Too much food on Sunday, Y= Reduced Concentration on Monday, X=Stress with your roommate.

Using the Bayesian Network Concepts chose the correct options:

ıswer

- [ ] P(X|Y,Z) = P(X|Y)

ıswer

- [ ] P(Z|X,Y) = P(Z|Y)

- [ ] Z is independent of X
- [ ] Z is independent of Y given X
- [ ] X is independent of Z given Y

ıswer

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