Structured CPDs

测验, 4 个问题

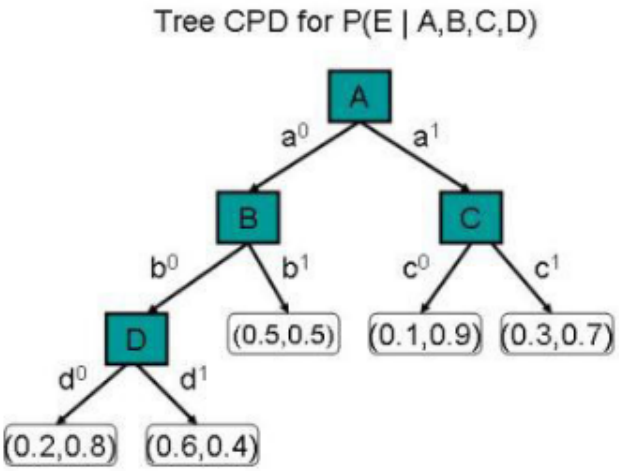
✔ 恭喜！您通过了！

下一项

✔ 1 / 1
分数

1.

Causal Influence. Consider the CPD below. What is the probability that $E = e_1$ in the following graph, given an observation $A = a_0, B = b_0, C = c_1, D = d_1$? Note that for the pairs of probabilities that make up the leaves, the probability on the left is the probability of e_0, and the probability on the right is the probability of e_1.



0.4

正确回答

This is the probability that is reached when following the tree down the appropriate branches.

✔ 1 / 1
分数

2.

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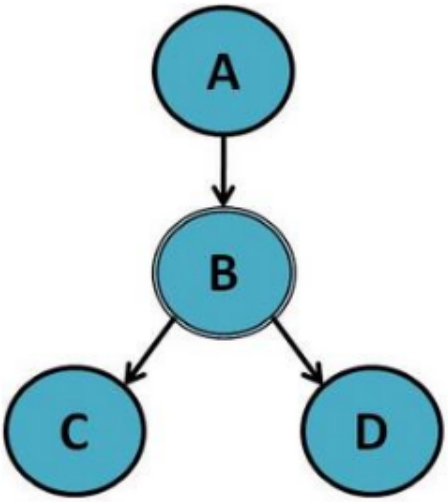
Independencies with Deterministic Functions. In the following Bayesian network, the node B is a deterministic function of its parent A. Which of the following is an independence statement that holds in the network? You may select 1 or more options.



- [ ] $(A \perp D \mid C)$

未选择的是正确的

- [ ] $(C \perp D \mid B)$

正确
Since B is given and is the only parent of C and of D, C and D are independent.

- [ ] $(C \perp D \mid A)$

正确
Since B is a deterministic function of A, observing A implies that B is also observed, which d-separates C and D. Therefore, $(C \perp D \mid A)$.

- [ ] $(A \perp D \mid B)$

正确
Given B, there is no active trail between A and D therefore, they are conditionally independent.

1 / 1
分数

3.

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Independencies in Bayesian Networks. For the network in the previous question, let B no longer be a deterministic function of its parent A. Which of the following is an independence statement that holds in the modified Bayesian network? You may select 1 or more options.

- [x] $(A \perp D \mid B)$

正确

The only active trail from A to D passes through B, and there are no V-structures between A and D, so observing B makes A and D independent.

- [x] $(C \perp D \mid A)$

未选择的是正确的

- [x] $(B \perp D \mid C)$

未选择的是正确的

- [x] $(A \perp D \mid C)$

未选择的是正确的

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1 / 1
分数

4.

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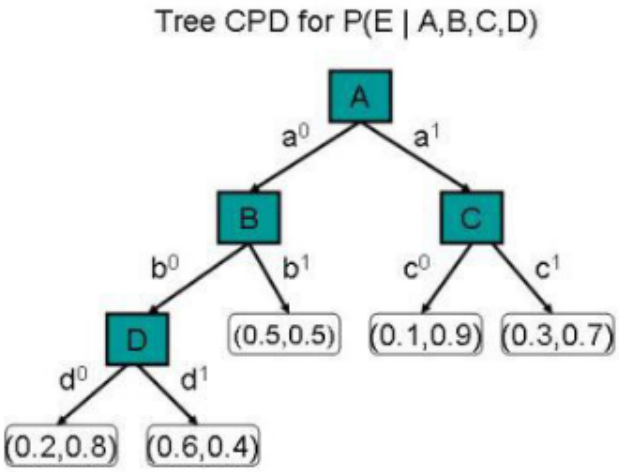
Context-Specific Independencies in Bayesian Networks. Which of the following are context-specific independences that **do** exist in the tree CPD below? (Note: Only consider independencies in this CPD, ignoring other possible paths in the network that are not shown here. You may select 1 or more options.)



- [ ] $(E \perp_c C \mid b^0, d^0)$

未选择的是正确的

- [ ] $(E \perp_c D \mid a^0)$

未选择的是正确的

- [ ] $(E \perp_c D \mid b^1)$

正确
A variable X is independent of E given conditioning assignments $\bar{z}$ if all paths consistent with $\bar{z}$ traversed in the tree CPD reach a leaf without querying X. This is true for this option.

- [ ] $(E \perp_c D, B \mid a^1)$

正确
A variable X is independent of E given conditioning assignments $\bar{z}$ if all paths consistent with $\bar{z}$ traversed in the tree CPD reach a leaf without querying X. This is true for this option.

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