Quiz 5 - Uncertainty

Started: Dec 5 at 9:53pm

Quiz Instructions

Question 1	1 pts

Which one defines the inclusion-exclusion principle?

- ○ $P(A \vee B) = P(A) + P(B)$
- ◉ $P(A \vee B) = P(A) + P(B) - P(A \wedge B)$
- ○ $P(A \wedge B) = P(A) + P(B) - P(A \vee B)$
- ○ $P(A \vee B) = P(A) + P(B) + P(A \wedge B)$

Question 2	1 pts

What is the relationship between A and B when the following is true:
$P(A, B) = P(A) \times P(B)$?

- ◉ A and B are marginally independent
- ○ A and B are dependent
- ○ A and B have equal probabilities
- ○ A and B are conditionally independent

Question 3	1 pts

Consider A, B as Boolean variables and $P(A) = 0.5$, $P(B|A) = 0.1$. What is $P(A, B)$?

- ○ 0.1
- ○ 0.6
- ○ 0.5
- ● 0.05

Question 4   1 pts

$P(\neg A|B) = 0.4$, $P(B) = 0.3$, $P(B|A) = 0.8$, $P(B|C) = 0.2$, $P(C) = 0.1$. B is conditionally independent with A given C. What is $P(B|A, C)$?
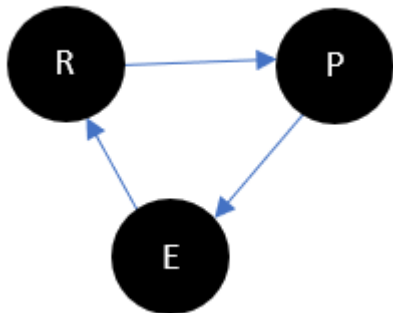
- ● 0.2
- ○ 0.3
- ○ 0.8
- ○ 0.1

Question 5   1 pts

$P(A) = 0.1$, $P(B) = 0.31$, $P(A|B) = 0.1$. What is $P(B|A)$?

- ● 0.31
- ○ 0.031
- ○ 0.1
- ○ 0.01

Question 6

1 pts

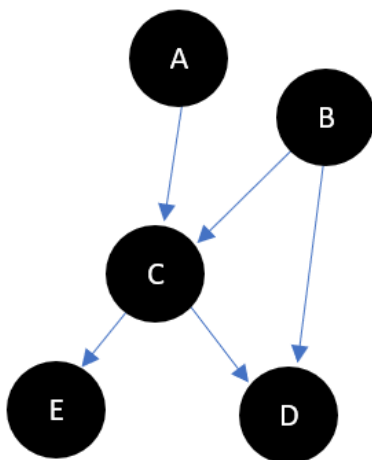R: Rain, P: Pond, E: Evaporation. Is this a Bayes Network?

○ Yes

● No

Question 7

1 pts

Consider the following Bayes Network for the next following questions. For this one, what is the relationships between A and B?
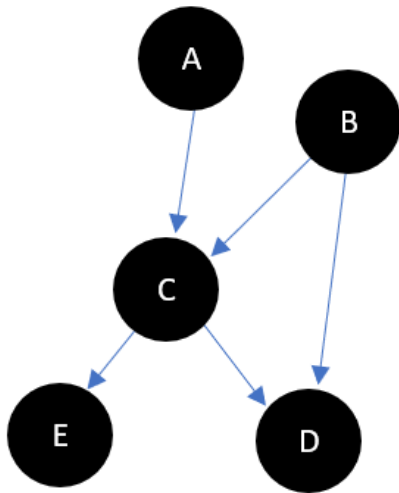

○ They are conditionally independent given D

○ They are dependent

○ They are conditionally independent given C

◉ They are marginally independent
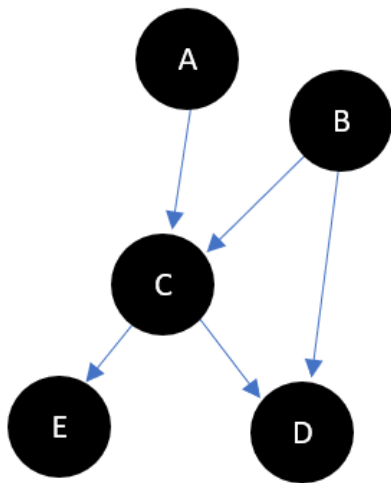
Question 8   1 pts

E is conditionally independent with B given C.

◉ True

○ False
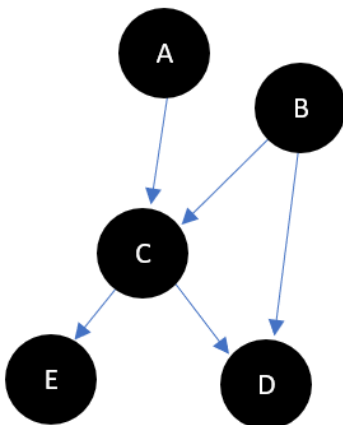
Question 9   1 pts

What is the relationship between A and B given C?

○ They are conditionally independent

○ They are marginally independent

● They are dependent

Question 10

1 pts

What would be a shortened way of calculating the joint probability $P(A, B, C, D, E)$ using this Bayesian network?

○ $P(A)P(B)P(C|D, E)P(E|A, B)P(D|E, A)$

○ $P(A)P(B|A)P(C|A,B)P(D|A,B,C)P(E|A,B,C,D)$
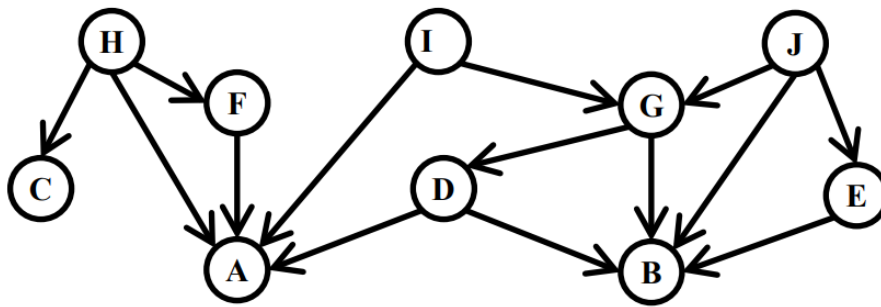
○ $P(A)P(B)P(C|A)P(D|C)P(E|C)$

◉ $P(A)P(B)P(C|A,B)P(D|B,C)P(E|C)$

Question 11   1 pts

For the given Bayesian network, the correct conditional probability will be?

○ P(A | D,F,H,I) P(B | D, E,G, J) P(C | H) P(D | G) P(E| J) P(F | H) P(G | I, J) P(H|F) P(I) P(J)

○ P(A | D,F,H,I) P(B | D, E,G, J) P(C | H) P(D | G) P(E| J) P(F) P(G | I, J) P(H) P(I) P(J)

○ None apply

◉ P(A | D,F,H,I) P(B | D, E,G, J) P(C | H) P(D | G) P(E| J) P(F | H) P(G | I, J) P(H) P(I) P(J)