Markov Networks

✔ **4/4** 得分（100%）

测验通过！

返回第 3 周课程

✔ 1 / 1 分

1.

Factor Scope. Let $\phi(c, e)$ be a factor in a graphical model, where c is a value of C and e is a value of E. What is the scope of ϕ?

◉ {C, E}
▲

正确回答
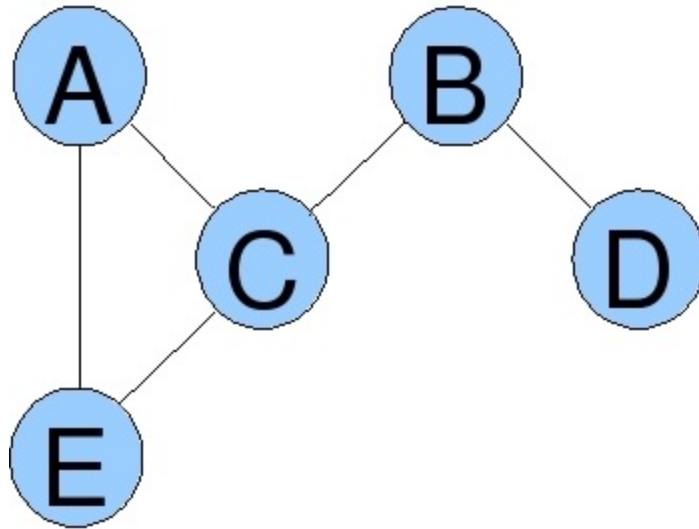
◯ {A, C, E}

◯ {A, B, C, E}

◯ {C}

✔ 1 / 1 分

2.

Independence in Markov Networks. Consider this graphical model from week 1's quizzes. This time, all of the edges are undirected (see modified graph below). Which pairs of variables are independent in this network? You may select 1 or more options.

☑ No pair of variables are dependent on each other.

正确回答
No pairs of variables are independent in a fully connected Markov network.

☐ A, D

正确回答
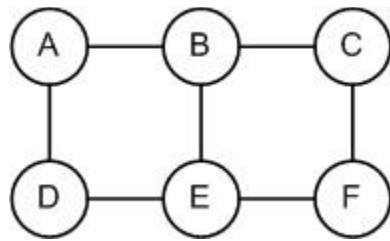There is a path from A to D that goes through B and C.

☐ B, E

正确回答
There is a path connecting B and E that goes through C.

✔ 1 / 1 分

3.

Factorization. Which of the following is a valid Gibbs distribution over this graph?

○ $\phi(A, B, C, D, E, F)$

○ There is no Gibbs distribution for this Markov network

○ $\phi(A, B, D) \times \phi(C, E, F)$

● $\dfrac{\phi(A) \times \phi(B) \times \phi(C) \times \phi(D) \times \phi(E) \times \phi(F)}{Z}$, where Z is the partition function

正确回答

A Gibbs distribution is a factor product divided by the partition function, and this expression complies with this definition.

✔ 1 / 1 分

4.

Factors in Markov Network. Let $\pi_1[A, B]$, $\pi_2[B, C]$, and $\pi_3[A, C]$ be all of the factors in a particular undirected graphical model. Then what is $\sum_{A,B,C} \pi_1[A, B] \times \pi_2[B, C] \times \pi_3[A, C]$? More than one answer could be correct.

☑ Always less than or equal to $\pi_1[a, b] \times \pi_2[b, c] \times \pi_3[a, c]$, where a is a value of A , b is a value of B , and c is a value of C .

正确回答

This is the sum over the factor products for all possible
values of the variables in the factors, so it is at least
the factor product for only one combination of values.

☑ Always greater than or equal to 0

正确回答
The factors can be any positive function.

☑ Always equal to the partition function, Z

正确回答
This is the forumla for Z , the partition function.

☐ Always equal to 1

正确回答
There is no restriction that this sum over possible
factor products be 1 (it is not normalized).

☑ Always greater than or equal to
$\pi_1[a, b] \times \pi_2[b, c] \times \pi_3[a, c]$, where a is a value of
A , b is a value of B , and c is a value of C

正确回答
This is the sum over the factor products for all possible
values of the variables in the factors, so it is greater
than or equal to the factor product for only one
combination of values.

☐ Always greater than or equal to 1

正确回答
There is no restriction that this sum over possible
factor products be greater than 1.