Basic Definitions

测验, 4 个问题

✔ 恭喜! 您通过了!

下一项



1 / 1 分数

1

Factor product.

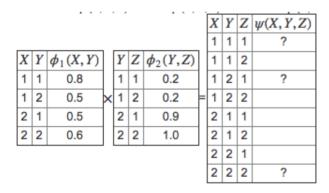
Let X, Y and Z be binary variables.

If $\phi_1(X,Y)$ and $\phi_2(Y,Z)$ are the factors shown below, compute the selected entries (marked by a '?') in the factor $\psi(X,Y,Z)=\phi_1(X,Y)\cdot\phi_2(Y,Z)$, giving your answer according to the ordering of assignments to variables as shown below.

Separate each of the 3 entries of the factor with spaces, e.g., an answer of

0.1 0.2 0.3

means that $\psi(1,1,1)=0.1$, $\psi(1,2,1)=0.2$, and $\psi(2,2,2)=0.3$. Give your answers as exact decimals without any trailing zeroes.



0.16 0.45 0.6

正确回答



Factor reduction.

Let X, Z be binary variables, and let Y be a variable that takes on values 1, 2, or 3.

Now say we observe Y=1. If $\phi(X,Y,Z)$ is the factor shown below, compute the missing entries of the reduced factor $\psi(X,Z)$ given that Y=1, giving your answer according to the ordering of assignments to variables as shown below.

As before, separate the 4 entries of the factor by spaces.

X	Y	Z	$\phi(X,Y,Z)$			
1	1	1	14			
1	1	2	60			
1	2	1	40			
1	2	2	27	X	Z	$\psi(X,Z)$
1	3	1	42	1	1	?
1	3	2	85	1	2	?
2	1	1	4	2	1	?
2	1	2	59	2	2	?
2	2	1	54			
2	2	2	3			
2	3	1	96			
2	3	2	30			

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正确回答



1 / 1

分数

3

Properties of independent variables.

Assume that A and B are independent random variables. Which of the following options are always true? You may select 1 or more options.

$$P(B|A) = P(B)$$

正确

In intuitive terms, this means that the value of B is not dependent on the value of A. We can derive this from $P(A,B)=P(A)\times P(B)$ as follows:

$$P(A, B) = P(A) \times P(B)$$

= $P(B|A) \times P(A)$

(by definition of independence) (by chain rule of probabilities)

测验, 4 个问题

therefore

$$P(B|A) = P(B).$$

正确

This is the standard definition of independence.

未选择的是正确的

未选择的是正确的



1/1 分数

4

Factor marginalization.

Let X, Z be binary variables, and let Y be a variable that takes on values 1, 2, or 3.

If $\phi(X,Y,Z)$ is the factor shown below, compute the entries of the factor

$$\psi(Y,Z) = \sum_{X} \phi(X,Y,Z)$$
,

giving your answer according to the ordering of assignments to variables as shown below.

Separate the 4 entries of the factor with spaces, and do not add any extra trailing or leading zeroes or decimal points.

Basi	X Ç	P		φ(X,Y,Z) finglior	ıs		
测验, 4	1	可是	2	95			
	1	2	1	65	Y	Z	$\psi(Y,Z)$
	1	2	2	63	1	1	?
	1	3	1	57	1	2	?
	1	3	2	5	2	1	?
	2	1	1	40	2	2	?
	2	1	2	40	3	1	
	2	2	1	14	3	2	
	2	2	2	78			
	2	3	1	16			
	2	3	2	89			

108 135 79 141

正确回答

5 Q P