Bayesian Networks and Causal Inference
Lecture Notes Problem Answers
Chapter 2

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September 15, 2023

Problem 2.1

1.

$$\begin{aligned} P(A=0) &= \sum_b P(A=0,b) \\ &= P(A=0,B=0) + P(A=0,B=1) \\ &= 0.3 + 0.4 \\ &= 0.7 \end{aligned}$$

$$\begin{aligned} P(B=0) &= \sum_a P(a,B=0) \\ &= P(A=0,B=0) + P(A=1,B=0) \\ &= 0.3 + 0.2 \\ &= 0.5 \end{aligned}$$

2.

$$\begin{aligned} P(A=0|B=0) &= \frac{P(B=0|A=0)P(A=0)}{P(B=0)} \\ &= \frac{P(B=0,A=0)}{P(A=0)} \\ &= \frac{0.3}{0.7} \\ &\approx 0.429 \end{aligned}$$

3.

$$P(a|B=0)$$

4.

$$P(B=0|A=0)$$