

CSCD84: Artificial Intelligence:
Problem Set 4: Bayesian Networks
Due: 11:59 PM, Sunday March 24

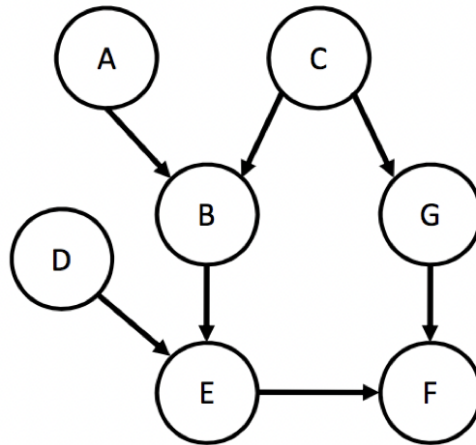
Submission Instruction

This problem set will be auto graded and the submission platform for this quiz is implemented on Quercus. Please submit your answer to Quiz PS4 available on the course page.

Question 1

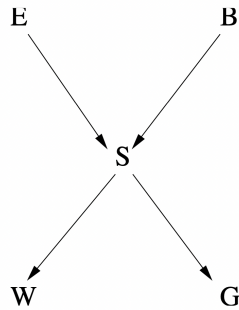
Given the Bayesian Network below, determine if:

- (a) A is independent of C given F.
- (b) G is independent of D given E.
- (c) C is independent of D.



Question 2

Consider the following Bayesian Network:



$$P(E, S, B, W, G) = P(E)P(B)P(S|E, B)P(W|S)P(G|S)$$

where the marginal probabilities are given as:

P(E)	e	-e
	1/10	9/10

P(B)	b	-b
	1/10	9/10

P(S E,B)	s	-s
e ∧ b	9/10	1/10
e ∧ -b	2/10	8/10
-e ∧ b	8/10	2/10
-e ∧ -b	0	1

P(W S)	w	-w
s	8/10	2/10
-s	2/10	8/10

P(G S)	g	-g
s	1/2	1/2
-s	0	1

Find $P(G|W)$. (i.e., the four probability values $P(g|w)$, $P(-g|w)$, $P(g|-w)$, and $P(-g|-w)$). Give your answer to 2 decimal places. We set the error margin on Quercus to 0.01. For example, if the answer is 2.12, the quiz accepts any response between 2.11 and 2.13 (inclusively).