CSC384 S19 A4 Module 3 (Version B)

Total points 20/20

This module is worth 20 points. Your last submission will be used for the final score. You may attempt this module 5 times without penalty. After 5 attempts, each additional attempt will result in a penalty of 5% (e.g., On your 7th attempt, you obtain a score of 18 points. Then, your final score for this module will be 18 - (2*1) = 16 points.)

If you encounter any problems with the assignment, please email zheweisun@cs.toronto.edu with [CSC384 A4] in the subject. Be sure to include the module number and version.

Section score 0/0

Student ID *

1003812813

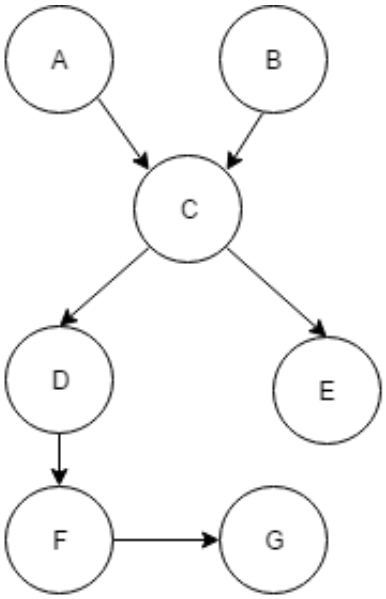
Name *

Mingdi Xie

M3P1 – D-Separation

Answer the following True/False questions based on the following graph:

Section score 4/4



A and B are independent, given no evidence. 1/1

- (●) True
- ( ) False

A and B are conditionally independent, given C. 1/1

- ( ) True
- (●) False

D and E are conditionally independent, given C. 1/1

- [x] True
- [ ] False

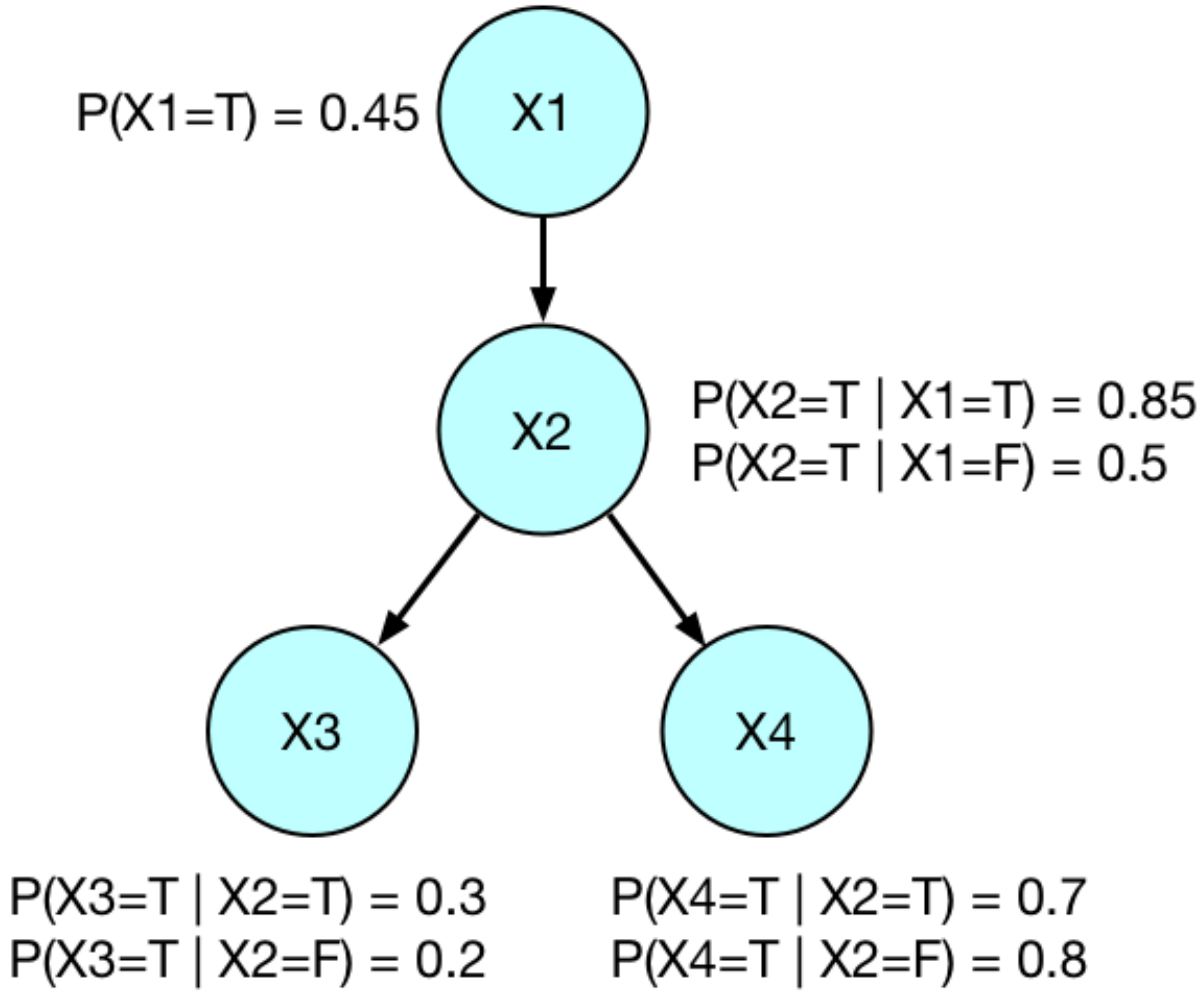
D and E are conditionally independent, given A and B. 1/1

- [ ] True
- [x] False

M3P2 – Variable Elimination I

Answer the questions based on the following Bayes net:

Section score 6/6



Select all that are true: 2/2

- [x] Pr(X2 = T | X3 = F) = Pr(X2 = T, X3 = F) / Pr(X3 = F)
- [x] Pr(X2 = T | X3 = F) = Pr(X2 = T, X3 = F) / [Pr(X2 = T, X3 = F) + Pr(X2 = F, X3 = F)]
- [ ] Pr(X2 = T | X3 = F) = Pr(X2 = T, X3 = F) / [Pr(X2 = T, X3 = T) + Pr(X2 = T, X3 = F)]
- [ ] Pr(X2 = T | X3 = F) = Pr(X2 = T, X3 = F) / Pr(X2 = T)

Calculate the following: 1/1

$$\sum_{X4} P(X4|X3 = T)$$

1.000

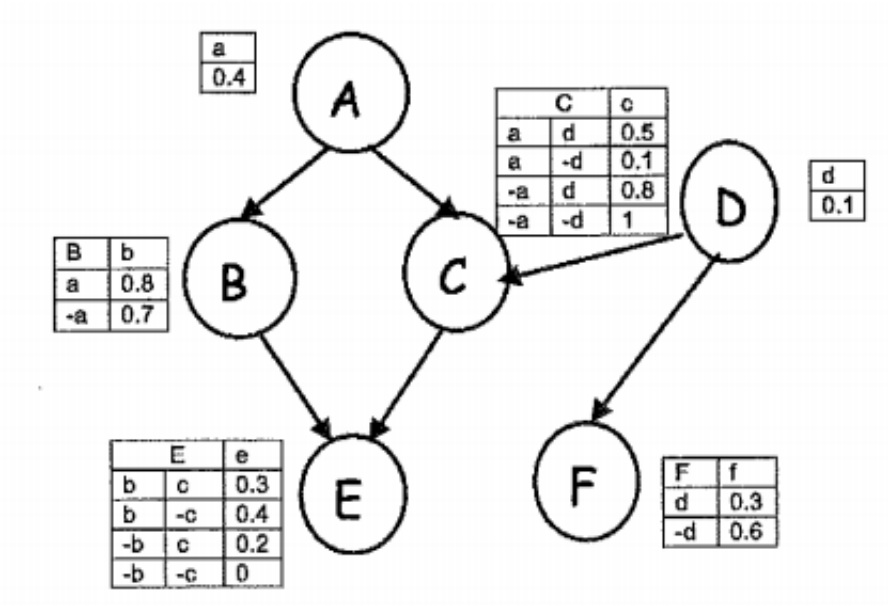
Solve P(X2 = T | X3 = F). 3/3

*Hint: Using variable elimination with elimination ordering X4, X1, X2, X3 will greatly simplify your calculations! The two previous questions should also guide your calculations. Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.627

M3P3 – Variable Elimination II

Section score 10/10



Given the table of probabilities pictured, what is P(C = -c | D = -d)? 5/5

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.360

Given the table of probabilities pictured, what is P(E=e|A=a,D=d)? 5/5

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.300