

CSC384 S19 A4 Module 3 (Version A)

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 $18 - (2 \times 1) = 16$ 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 *

1003988982

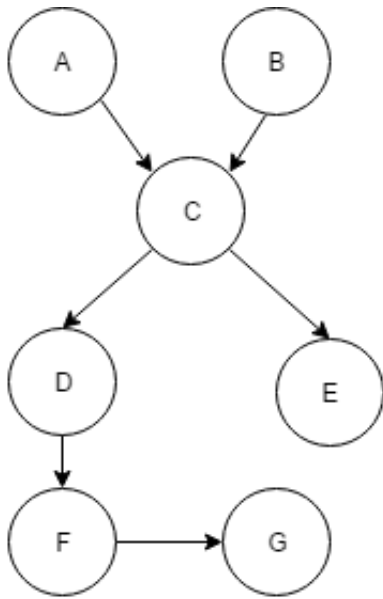
Name *

Junming Zhang

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

☒ True

☐ False

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

1/1

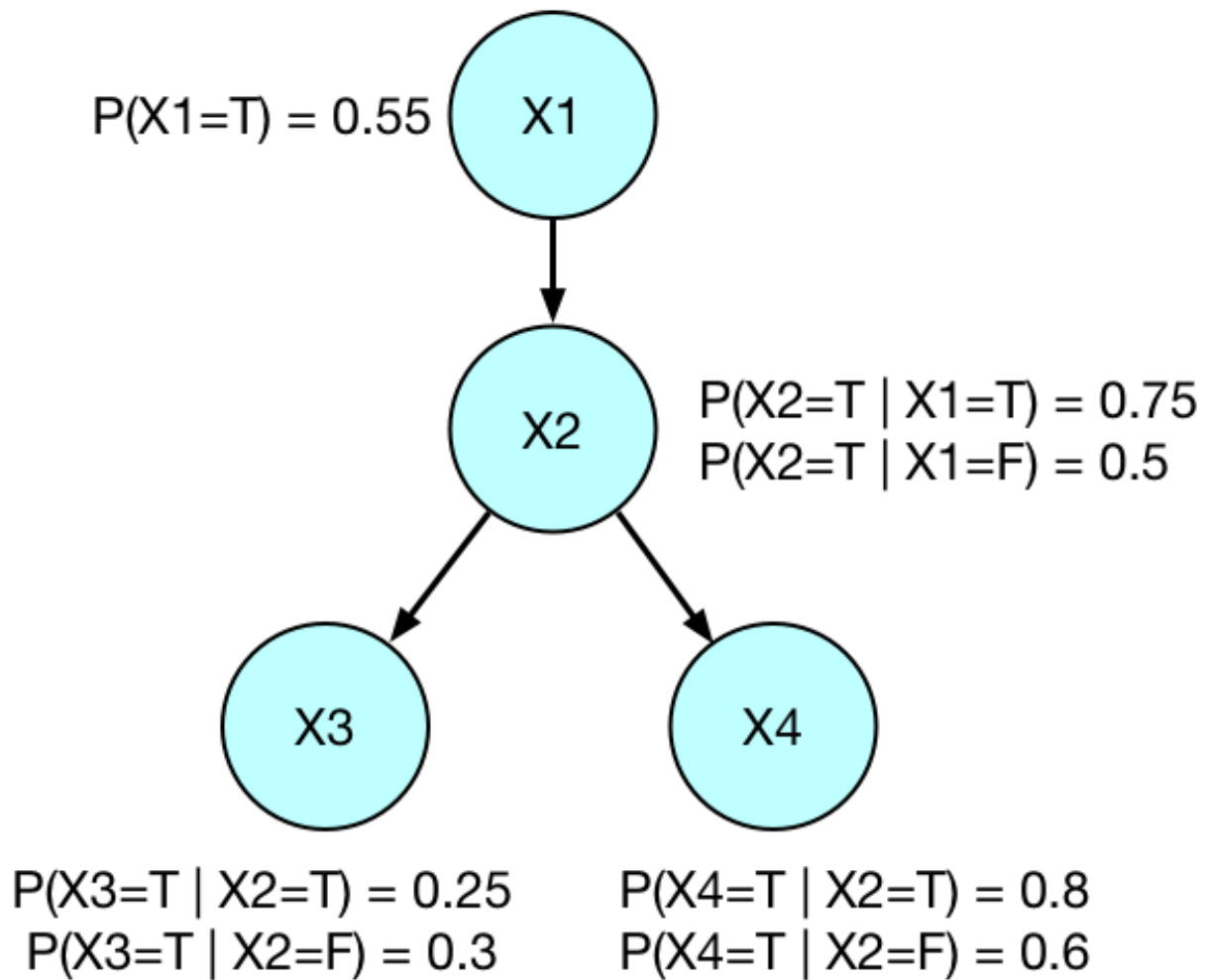
☐ True

☒ 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

- ☒ $\Pr(X2 = T \mid X3 = F) = \Pr(X2 = T, X3 = F) / \Pr(X3 = F)$
- ☒ $\Pr(X2 = T \mid X3 = F) = \Pr(X2 = T, X3 = F) / [\Pr(X2 = T, X3 = F) + \Pr(X2 = F, X3 = F)]$
- ☐ $\Pr(X2 = T \mid X3 = F) = \Pr(X2 = T, X3 = F) / [\Pr(X2 = T, X3 = T) + \Pr(X2 = T, X3 = F)]$
- ☐ $\Pr(X2 = T \mid X3 = F) = \Pr(X2 = T, X3 = F) / \Pr(X2 = T)$

Calculate the following:

1/1

$$\sum_{X4} P(X4|X2 = F)$$

1.000

Solve $P(X2 = T | X3 = F)$.

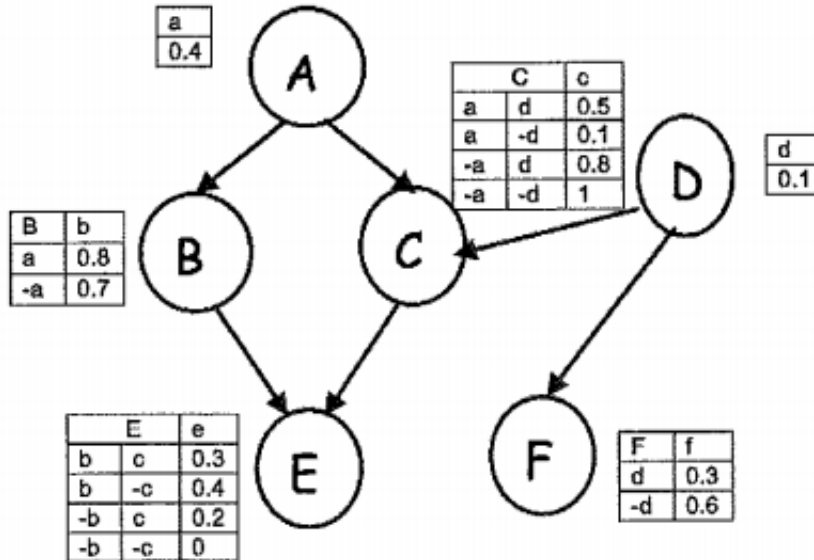
3/3

*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).

0.653

M3P3 – Variable Elimination II

Section score 10/10



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

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

0.680

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

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

0.300

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