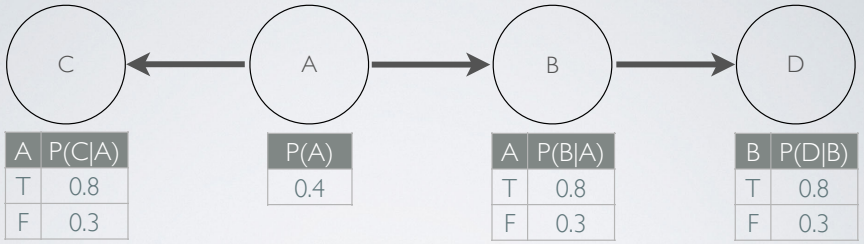
EXAMPLE INFERENCE COMPUTATIONS

CSE 511A: Introduction to Artificial Intelligence

EXAMPLE INFERENCES



A	P(C|A)
T	0.8
F	0.3

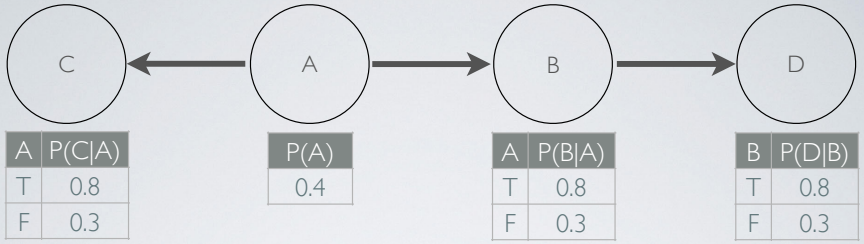
P(A)
0.4

A	P(B|A)
T	0.8
F	0.3

B	P(D|B)
T	0.8
F	0.3

- P(B|A) =
- P(B|¬A) =

P(¬B|A) =
P(¬B|¬A) =



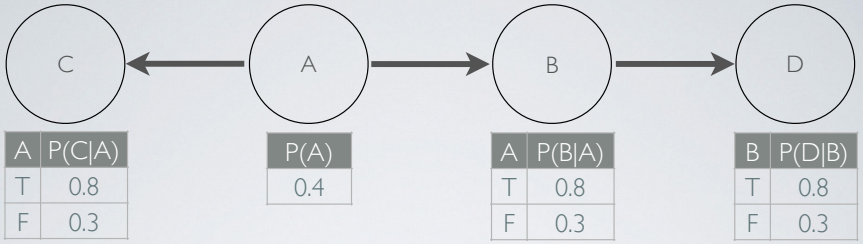
A	P(C|A)
T	0.8
F	0.3

P(A)
0.4

A	P(B|A)
T	0.8
F	0.3

B	P(D|B)
T	0.8
F	0.3

- P(C) =



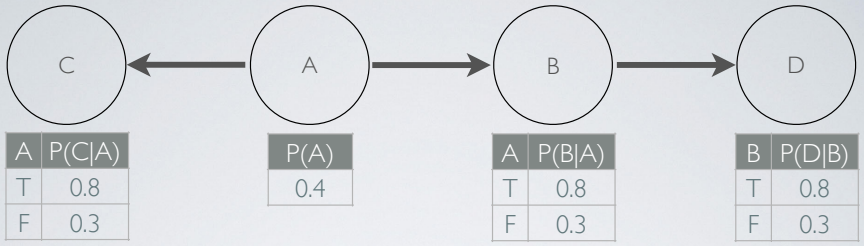
A	P(C|A)
T	0.8
F	0.3

P(A)
0.4

A	P(B|A)
T	0.8
F	0.3

B	P(D|B)
T	0.8
F	0.3

- P(A|C) =



A	P(C|A)
T	0.8
F	0.3

P(A)
0.4

A	P(B|A)
T	0.8
F	0.3

B	P(D|B)
T	0.8
F	0.3

- P(A,B,C) =

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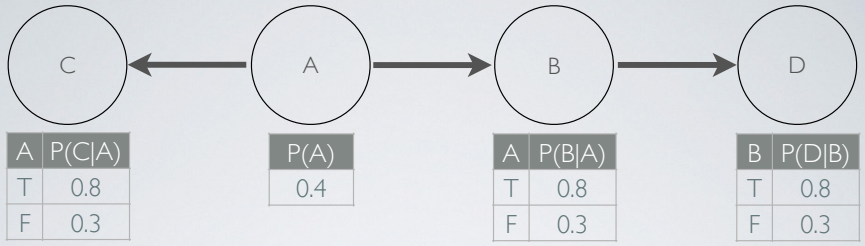

A	P(C|A)
T	0.8
F	0.3

P(A)
0.4

A	P(B|A)
T	0.8
F	0.3

B	P(D|B)
T	0.8
F	0.3

- P(B,C) =

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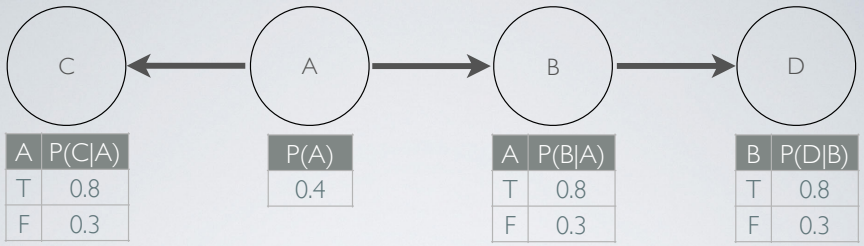

A	P(C|A)
T	0.8
F	0.3

P(A)
0.4

A	P(B|A)
T	0.8
F	0.3

B	P(D|B)
T	0.8
F	0.3

- P(D|A) =

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EXAMPLE INFERENCES

- P(B|A) = 0.8
- P(¬B|A) = 1-P(B|A) = 1-0.8 = 0.2
- P(B|¬A) = 0.3
- P(¬B|¬A) = 1-P(B|¬A) = 1-0.3 = 0.7
- P(C) = P(C|A)P(A) + P(C|¬A)P(¬A) = 0.8*0.4 + 0.3*0.6 = 0.5
- P(A|C) = P(C|A)P(A)/P(C) = 0.8*0.4 / 0.5 = 0.64
- P(A,B,C) = P(C|A)P(B|A)P(A) = 0.8*0.8*0.4 = 0.256
- P(B,C) = P(A,B,C) + P(¬A,B,C)
  = 0.256 + P(C|¬A)P(B|¬A)P(¬A)
  = 0.256 + 0.3*0.3*0.6 = 0.31
- P(D|A) = P(A,D) / P(A) = [P(A,B,D) + P(A,¬B,D)] / P(A)
  = [P(D|B)P(B|A)P(A) + P(D|¬B)P(¬B|A)P(A)] / P(A)
  = P(D|B)P(B|A)+ P(D|¬B)P(¬B|A)
  = 0.8*0.8 + 0.3*(1-0.8) = 0.7

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