CS1571
Fall 2019
11/11 In-Class Worksheet

Name: Simran Gidwani
Where were you sitting in class today: Back Left

A. Pre-Reflection

On a scale of 1-5, with 5 being most confident, how well do you think you could execute these learning objectives:

- 18.3 Identify independence relationships within a Bayes Net ___
- 18.5 Explain the complexity of inference by enumeration using Bayes Nets ___
- 19.1 Describe optimizations to inference using Bayes Nets ___
- 19.2 Define expected value ___
- 19.3 Explain how decisions are made using expected value ___

B. Bayes Nets

1. Using a Bayes Net, how many products do you have to compute to get the probability that P(J=T).

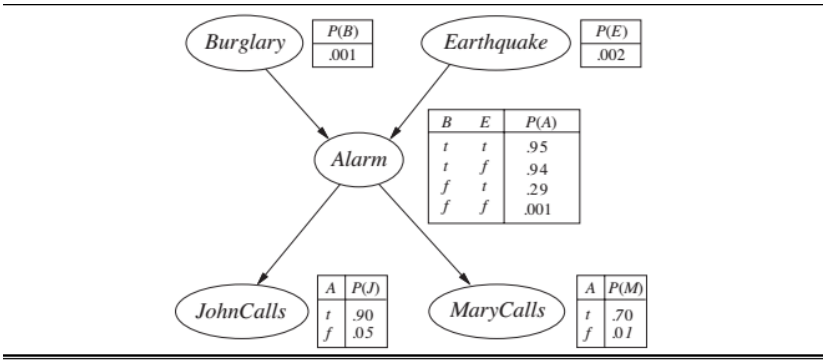


Figure 14.2 A typical Bayesian network, showing both the topology and the conditional probability tables (CPTs). In the CPTs, the letters B, E, A, J, and M stand for *Burglary*, *Earthquake*, *Alarm*, *JohnCalls*, and *MaryCalls*, respectively.

$$P(J=T) = \sum_{\{b\}} \sum_{\{e\}} \sum_{\{a\}} \sum_{\{m\}} P(B = b, E = e, A = a, J = T, M = m)$$

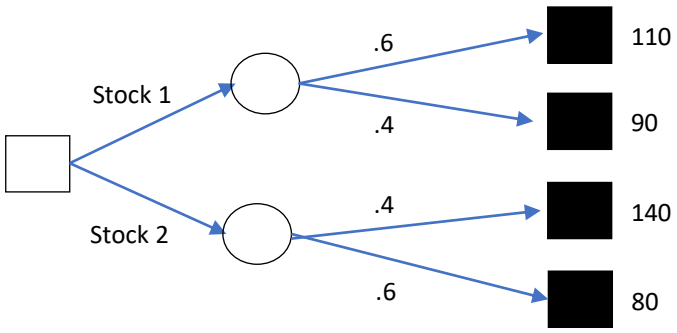
P(J+T|A) *P(M|A) * P(A| B, E) * P(B) * P(E)

4 values and then each of the 4 variables can either be true or false, summing across all

4* 2^4 = 64

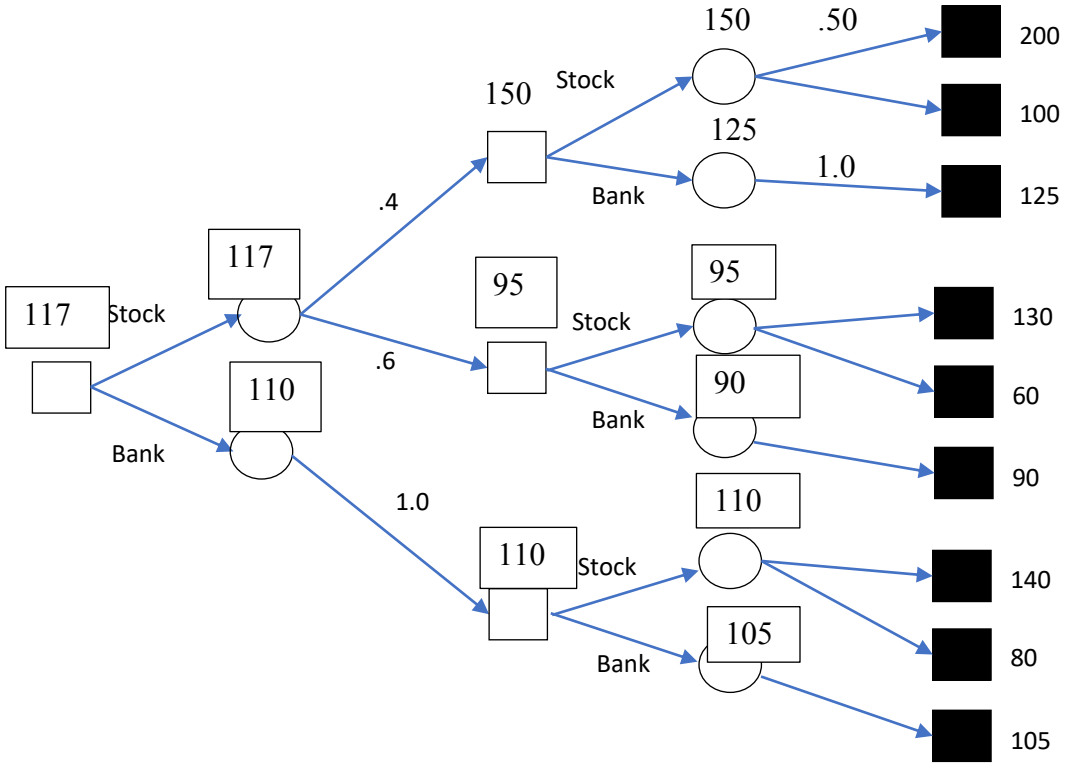
C. Expected Value

2. Using expected value, compute the rational decision to make in this situation.



.6 * 110 + .4 * 90 =102
.4 * 140 + .6 * 80 =104

3. Using Expectimax, compute the rational decision to make in this situatino.



D. Post Reflection

On a scale of 1-5, with 5 being most confident, how well do you think you could execute these learning objectives:

- 18.3 Identify independence relationships within a Bayes Net ___
- 18.5 Explain the complexity of inference by enumeration using Bayes Nets ___
- 19.1 Describe optimizations to inference using Bayes Nets ___
- 19.2 Define expected value ___
- 19.3 Explain how decisions are made using expected value ___