Weekly Homework 8

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CS 1675: Intro to Machine Learning

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Problem 1. Bayesian belief networks

(a) The computational cost of the blind solution is 15 additions and 80 products.
(b) Interleaving the sums and the products brings the number of needed additions to 9 and products down to 36.

Problem 2. Pneumonia diagnosis
(a) Given that the patient has pneumonia, the ML estimates are:
Fever: T = .90, F = .10
Paleness: T = .70, F = .30
Cough: T = .90, F = .10
High WB Count: T = .80, F = .20

Given that the patient doesn't have pneumonia, the ML estimates are:
Fever: T = .60, F = .40
Paleness: T = .50, F = .50
Cough: T = .10, F = .90
High WB Count: T = .50, F =.50

(b) The probability that the patient had pneumonia given that the patient has a fever and a cough, but is not pale and does not have a high WBcount is 0.015283.

(c) The probability that the patient had pneumonia given that the patient has a cough and fever but the paleness and WBCount are unknown is 0.018621.

(d) See code.