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CS1567 Introduction to Machine Learning
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Problem Assignment 8

Problem 1:

a) The computational cost involves 15 additions and 64 products for the blind. Because we have a total of 6 nodes but need to of them giving us 4.

b) If instead we interleave the sums and products we can bring the additions down to 9, and the products all the way down to 16. This is much less computationally intensive.

Problem 2:

a) (all given that the patient has Pneumonia)
ML estimate for fever is: T:0.900000, F:0.100000
ML estimate for paleness is: T:0.700000, F:0.300000
ML estimate for cough is: T:0.900000, F:0.100000
ML estimate for highwbcount is: T:0.800000, F:0.200000
(all given that the patient does not have pneumonia
ML estimate for fever is: T:0.600000, F:0.400000
ML estimate for paleness is: T:0.500000, F:0.500000
ML estimate for cough is: T:0.100000, F:0.900000
ML estimate for highwbcount is: T:0.500000, F:0.500000

b) Given that the patient has a fever and a cough, but is not pale and does not have high wbcount the probability that they have pneumonia is 0.015283

c) Given that the patient has a fever and a cough but we do not know if they are pale or what their wbcount is is: 0.018621

d) N/A