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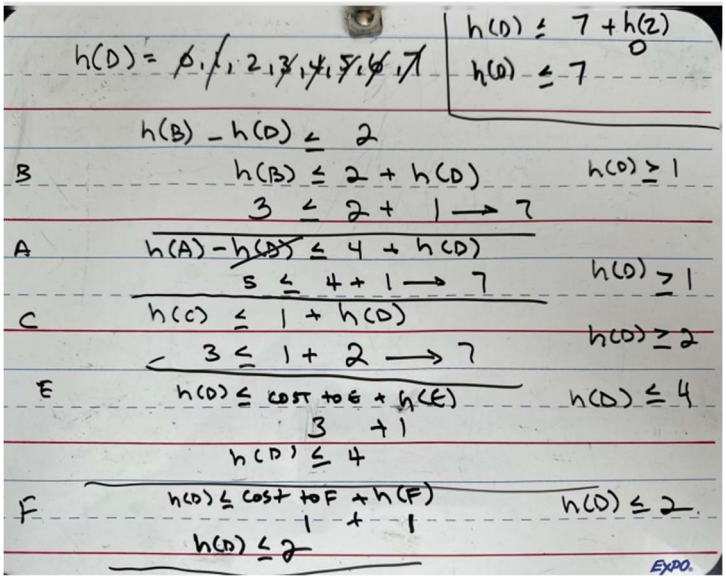
CS 411 – Artificial Intelligence

1. A – B – C – D – E – F – Z
2. Heuristics
    a. h(D) can have any heuristic value of 0-7 and still satisfy admissibility. The true cost from D to Z is 7, based on the Search Cost graph. Knowing this g(Z) = 7, so any h(D) value that satisfies 0 <= h(n) <= g(n) would be any number from 0 – 7.
    b. h(D) can only have a value of 2 and satisfy consistency.



3.

Cryptarithmetic Consider the following cryptarithmetic problem:

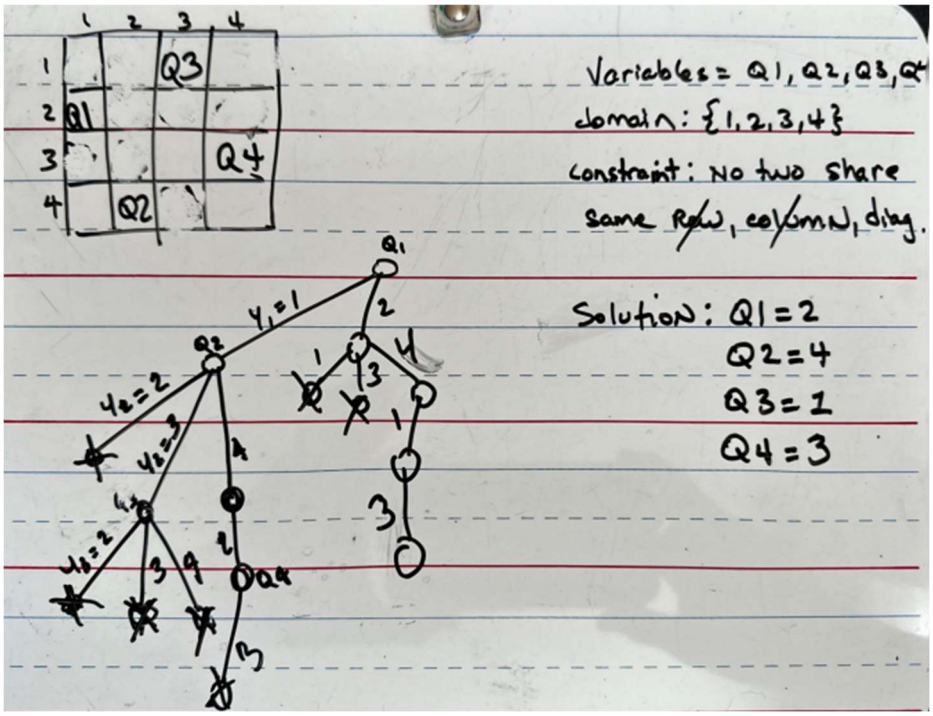
$$\begin{array}{cccc} & \mathrm{O} & \mathrm{N} & \mathrm{E} \\ + & \mathrm{O} & \mathrm{N} & \mathrm{E} \\ \hline & \mathrm{T} & \mathrm{W} & \mathrm{O} \end{array}$$

Variables: the letters

Values: letters can be assigned values {0,1,2,….,9}

Constraints: leading digit aren’t zero, all letters have different values, addition works as expected

4.)



Constraints are that queens can not be horizontal, vertical or diagonal from each other. Further constraint from question 4, has Qi locked into column i, and can only move within the domain of {1, 2, 3, 4}. With that, we only have to make sure that the queens are not diagonal from each other. Tree structure shows Q1 starting at y = 1 and traversing the tree, when diagonal condition isn't met, we backtrack and expand states. Eventually, we come to the goal state when all queens are on the board and constraints are satisfied.