Danny Tan

AI Fall 2018

HW # 3

Problem 1:

A.

[A,E] Error = 0 + 6 = 6

Neighbors:

[A,B,E] Error = 3 + 0 = 3

[A,C,E] Error = 2 + 0 =2

[A,D,E] Error = 2 + 0 =2

[A] Error 0 + 10 = 10 [E] Error 0 + 4 = 16

[A,B] = 4 [A,C] = 4

[A,D]= 5 [E,B] =8 [E,C] = 9 [E, D] = 10

The best neighbor will be [A,C,E] and [A,D,E] each give an error of 2.

On the next iteration, the best neighbor for [B,C,E] which give a error of 1 because the algorithm will choose [A,C,E] first.

B.

The size of the state space is all of the subset. N choose 0 + N choose 1 + N choose 2 + … + N choose N which equals to 2^N.

S = the set of number that is already used

Deletion is S

Addition is N -S

Replacement is S* (N-S)

When you sum everything it will be, N+ NS –S ^2. To find the maximum we can set the derivative to 0. -2S + N = 0. So we get S = 0.5N

So the equation is N + 0.5* N^2 - 0.25* N ^2 = 0.25 * N^2 + N.

But we have to account for the odd case, in this case it will be 0.25*N^2 + N – 0.25. And the even case is 0.25*N^2 + N

Problem 2:

The roots that are pruned are 6, 2, 20, and 7. The best move for max is 8.