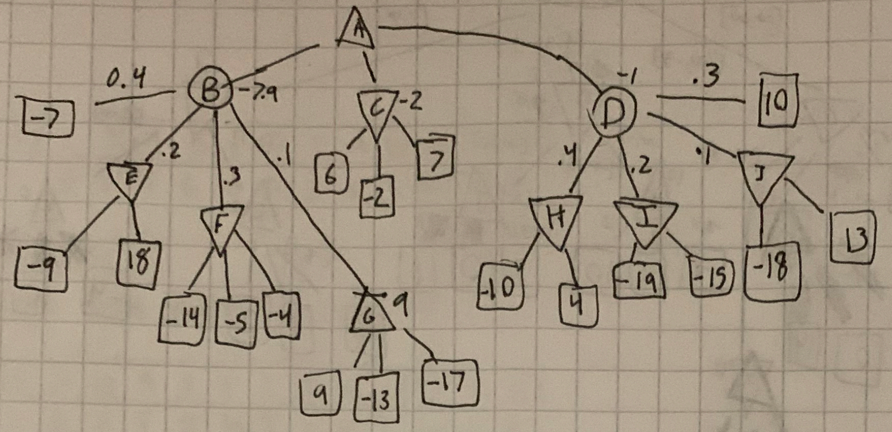
Sam Hopkins
CS 420

1.



a) A = -1

B = .4·-7 + .2·-9 + .3·-14 + .1×9 = -7.9

C = -2

D = .4·-10 + .2·-19 + .1·-18 + .3·10 = -6.6

E = -9

F = -14

G = 9

H = -10

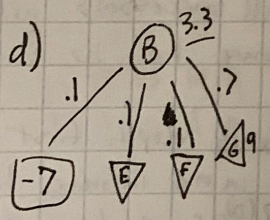
I = -19

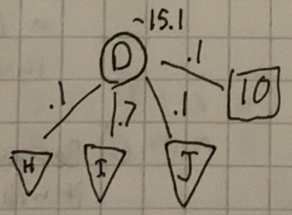
J = -18

b) To follow node C, the middle most node

c) Following D could lead to a node of value 10(D), which is best case

d)





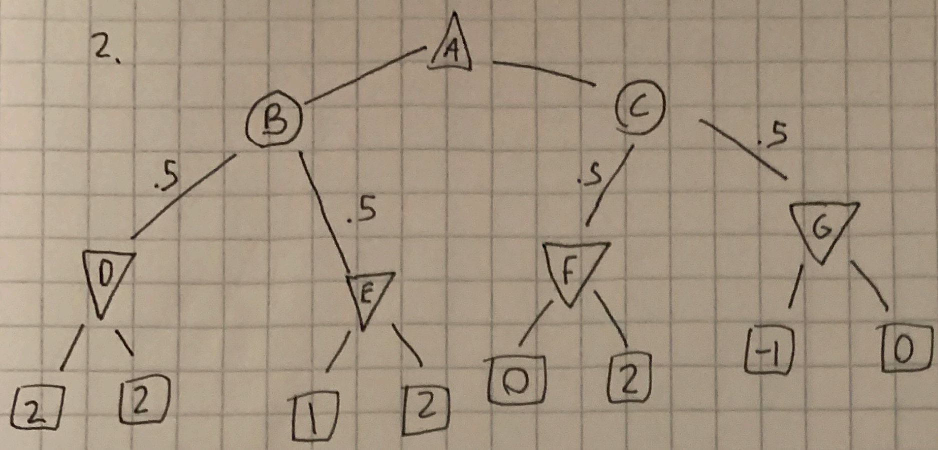
This would make the decision go to the B node

e) You only need to change one node, one of the nodes under G to a large number like 100 and B will be positive, making it the best path for MAX at the root

Hopkins

Cs 470

2.



a) A = 1.5

B = $.5\cdot2 + 1\cdot.5 = \underline{1.5}$

C = $.5\cdot0 + .5\cdot-1 = -0.5$

D = 2

E = 1

F = 0

G = -1

b) B

c) Yes, because the values under G (N, O) could both be big numbers and lead to G being a large value that would alter the value of C in the end.

D) No, because the last node O doesn't matter as the min gives the range of G with node N would be [∞, -1], while the current range for A after the first 6 nodes is [1.5, ∞], so we would prune and not need to evaluate the 8th node with F = 0, C = $.5\cdot0 + .5\cdot G$. G could only be ≤ -1, which evaluates to less than 1.5, the current max.

e) i) Value range for B = $.5\times2 + .5\times E$ and E is between -2, 2, so the range is $[\underbrace{.5\times2}_{1} + \underbrace{.5\times-2}_{-1}, \underbrace{.5\times2}_{1} + \underbrace{.5\times2}_{1}] \approx \underline{[0, 2]}$

ii) M, because the range [A] is currently [1.5, ∞], and with L = 0, F could only be [-2, 0] which would mean max for C = [-2, 1] which is not in the current range.

G, N, O - see above explaination, the range of values are below the current range