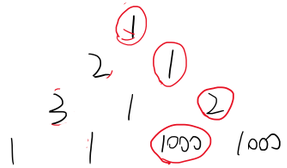
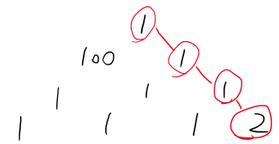
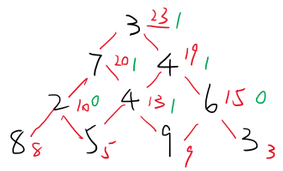
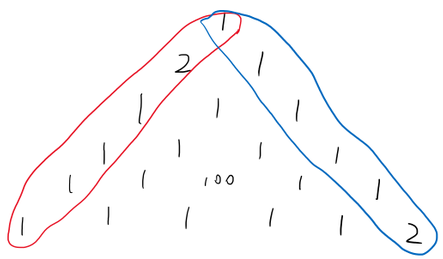




Lecture notes, Sept 29th, 2020



policy
left = 0
right = 1



tree [1, 1] = 3
tree [2, 1] = 7 [2, 2] = 4
[3, 1] = 2 [· · ·] · · · · ·
tree [i, j] => i: level of the tree
j: index of element from left

res [: , :] n rows
res [n, i] = tree [n, i]
starting from j. for i: (n-1) -> 1

go down,
what's the max ...?

for j: 1 -> i

$$res[i,j] = tree[i,j] + \max\{res[i,j+1],\ res[i+1,j]\}$$

end

end

Math ?

$$V(n,i) = f(n,i)$$

$$V(i,j) = f(i,j) + \max\{V(i+1,j),\ V(i+1,j+1)\}$$

Value function

$$P(i,j) = \text{argmax}\{V(i+1,j),\ V(i+1,j+1)\} = \begin{cases} j & \text{if } V(i+1,j) > V(i+1,j+1) \\ j+1 & \text{otherwise} \end{cases}$$

Policy function

(i, j) => states

s = (i, j)

$$V(s) = \max_{s'}\{f(s) + V(s')\}$$

where $s' \in \{(i+1, j),\ (i+1, j+1)\}$ in this example

$$P(s) = \text{argmax}_{s'}\{f(s) + V(s')\}$$