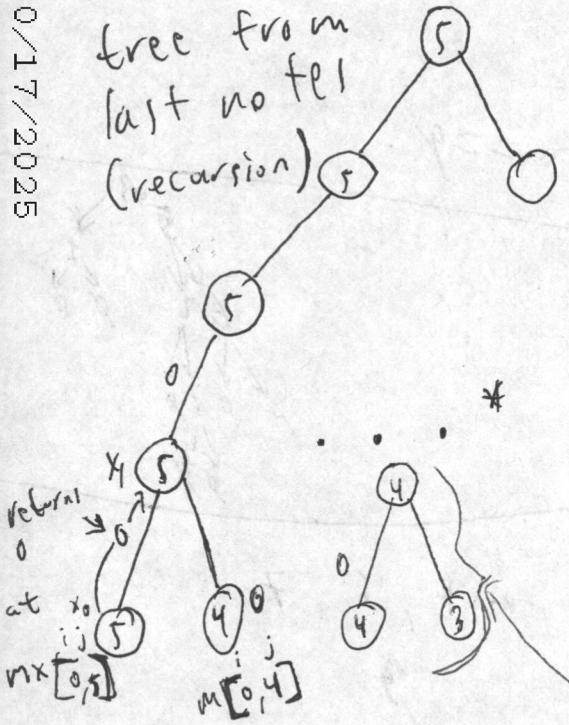
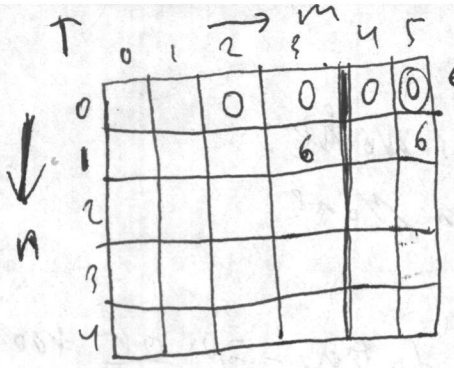
10/17/2025

Memoization

* refer to the tree from last no tel (recursion)





- initially all cells in mx have '-1'

at the bottom most side of the tree, when the bag still has space '5' and returns '0'.

where the 0 in mx [0,5] is x_0

at mx[i,j] the profit returns not 0 but 6

* we check the mx to see if a call was made before we make a call. Example: the first time we actually stop a call here is at , and that is because we have in the mx [0,4] = 0, so given that this is the case, we don't make this call.

New Alg with moization

```
int knap(int n, int m){
    if (n==0 || m==0){
        mx[n][m] = 0;
        return 0;
    }
    if (mx[n][m] != -1)
        return mx[n][m]
    else{
        if (w[n] <= m){
            int no = knap(n-1, m);
            int yes = knap(n-1, m-w[n]) + p[n]
            mx[n][m] = no > yes ? no : yes;
        }
        T[n][m] = knap(n-1, m);
```