A MAN A PLAN A CANAL PANAMA

A~~B~~C~~E~~DC~~B~~A~~G~~

ACDCA

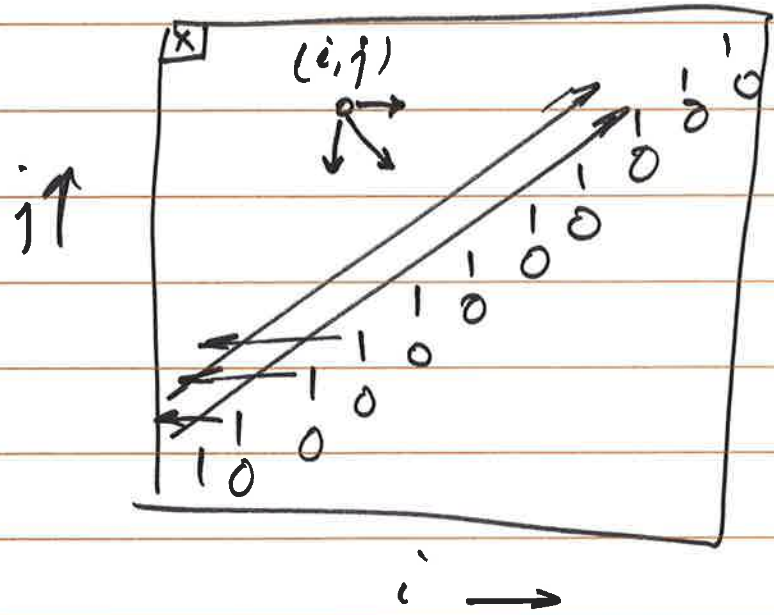
ACECA

$S_i \ldots S_j$

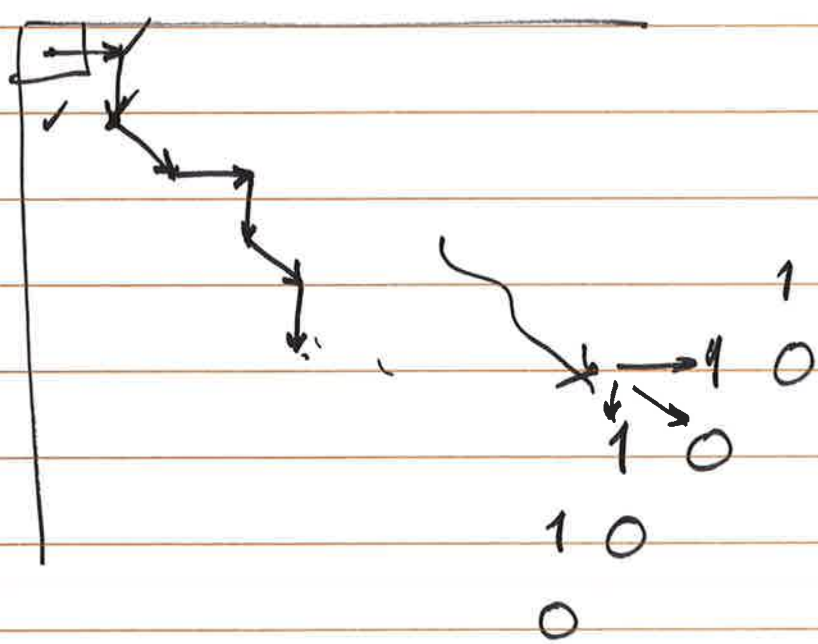
$OPT(i,j)$ = length of the longest palindrome embedded in $S_i \ldots S_j$

$$OPT(i,j) = \begin{cases} \text{if } S_i = S_j, & OPT(i+1, j-1) + 2 \\ \text{otherwise}, & \max(OPT(i, j-1), OPT(i+1, j)) \end{cases}$$

1



takes $O(n^2)$



reuse our seq. alignment sol.:

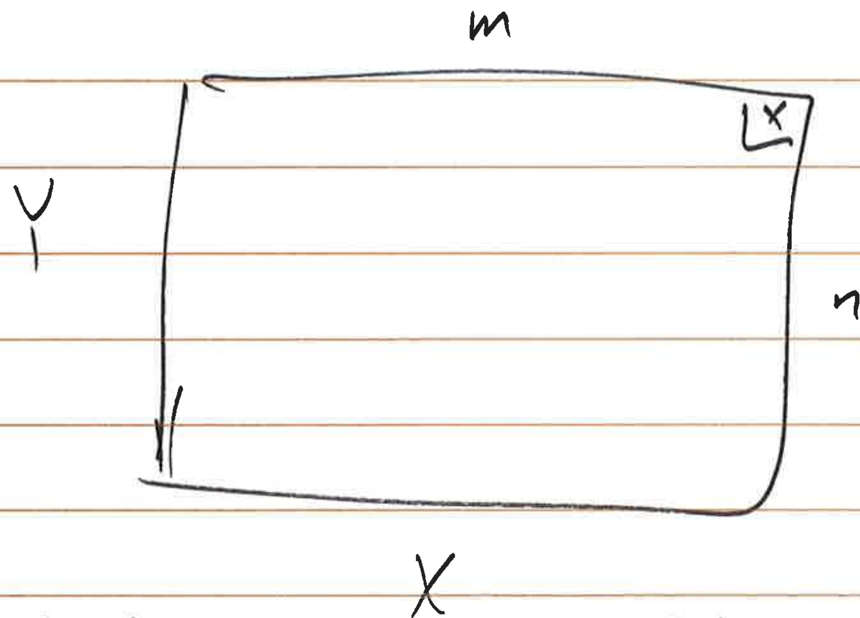
we take S and $\hat{S}$ (reverse of S) and feed it to the seq. alignment solver. This takes $O(n^2)$

δ - gap penalty

α_{pq} - mismatch cost between p & q

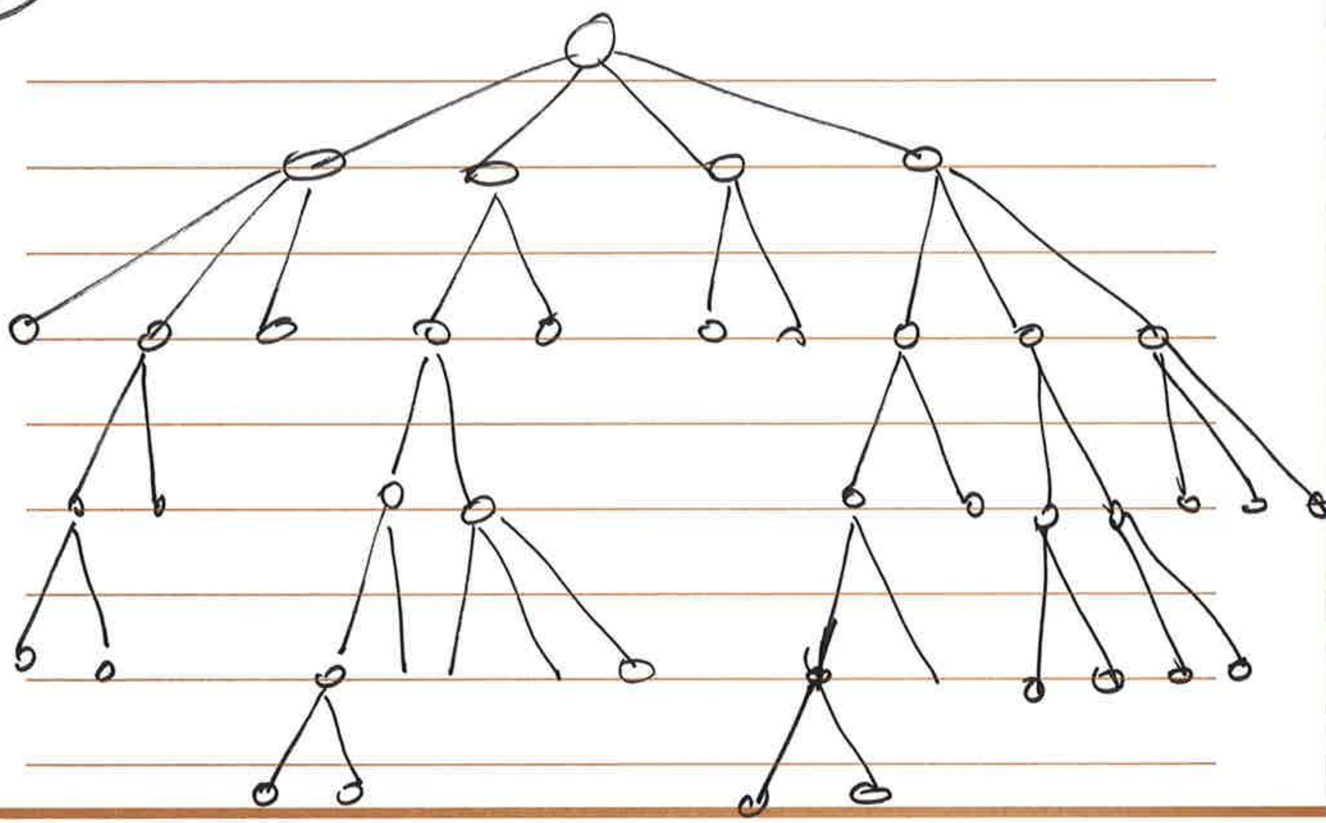
$\delta = 1$

	A	B	C	D	E	...
A	0		α	∞	∞	
B		0		$\vdots$	$\vdots$	
C			0	$\vdots$		
D				0		
E					0	
$\vdots$						



Standard seq. alignment solution fills out the whole $n \times n$ array.
The special sol. presented above only fills out half of the array (upper triangle)

②



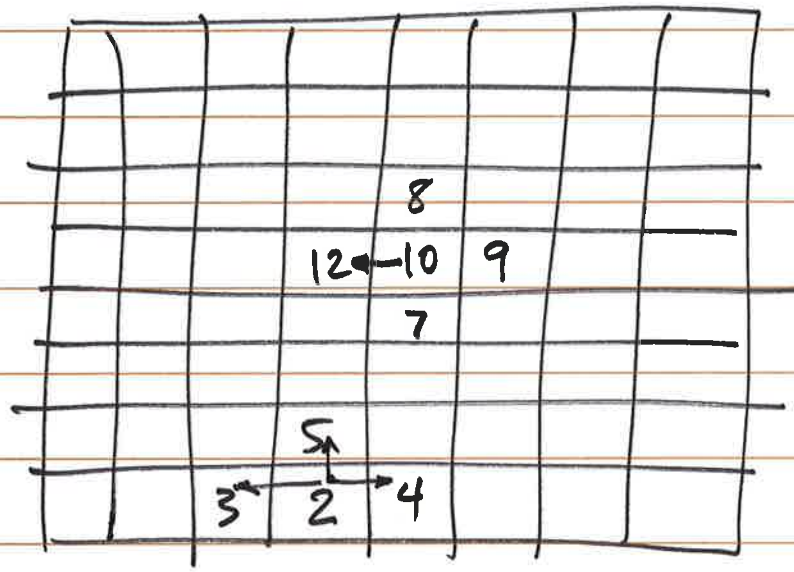
emp i has fun factor N_i
which emp's to invite to Maximize the
party fun factor?
subject to the constraint: if emp i is
invited, i's boss cannot be invited.

OPT(r) = Max. fun factor for subtree rooted at $\underline{r}$.

$$OPT(r) = Max\left(V_r + \sum_g OPT(g),\ \sum_c OPT(c)\right)$$

takes $O(n)$

③ downhill ski prob. from lecture.



OPT(i,j) = length of ~~longest~~ run starting at (i,j)

OPT(i,j) = 0 if (i,j) is a local Min.

Sorting ~~pot~~ points by el. takes $O(n^2 \lg n)$

OPT(i,j) = Max(OPT(i',j') + 1 : (i',j') is a neighbor of (i,j) and is lower than (i,j))

DAG representing the grid will have n^2 nodes & ~~e~~ at most $4n^2$ edges.

~~top. logical~~ top. ordering will take $O(n^2)$