Exam 3: April 28.

#### Longest Common Subsequence.

Input: Two Seprens X, Y

 $\times : \langle \chi_1, \chi_2, \ldots, \chi_m \rangle$ 

Y: <Y,, y2, ..., yn>

Objective: To find LCS(X,Y).

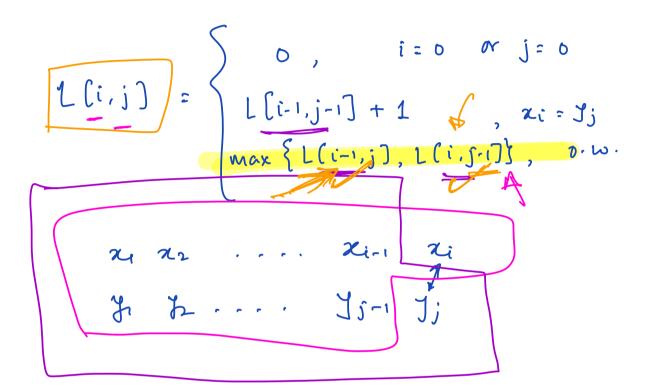
X: AAATACTAGATCC
Y: TTATCTCGCAATA

### Subproblems &

[[i,j]: length of the longest common Subsequence of X[1...i] and Y[1...j].

# Our solution: L [m,n]

## Recurrence: &



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0 (mn).

LLCS 
$$(x, Y)$$

for  $i \in 0$  to  $m do$ 
 $L[i,0] \in 0$ 
 $f_{m} j \in 1$  to  $n do$ 
 $L[0,j] \in 0$ 
 $f_{m} i \in 1$  to  $m do$ 
 $f_{m} j \in 1$  to  $m do$ 

# return L (m,n)

LCS(L, X, Y)

$$S \leftarrow \{ j \}$$
 $i \leftarrow m$ ,  $j \leftarrow n$ 

while  $i > 0$  and  $j > 0$  do

 $i \leftarrow i = y_j$  then

add  $\pi i$  at the beginning  $\{ S \in i \in i-1, j-1 \}$ 

else if  $L[i,j] > L[i-1,j]$  then

 $j \leftarrow j-1$ 

else

 $i \leftarrow i-1$ 

return S

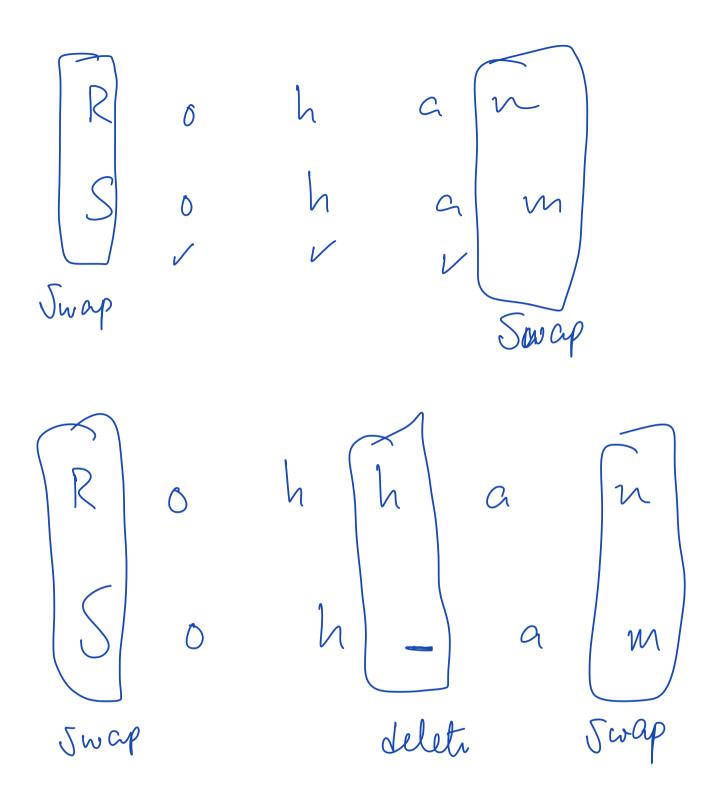
#### Edit Distance

Input: Two Strips X [1..m] 4 7= [1..n]

Objective: To find the edit distance of X&Y, i.e., # Insuts, # Ideletis & # swaps to Convert Stry X mb Stry Y.

Rohan

Soham



## Subpodelens

E[i,j]: edit distanu Q X[I..i] & Y[I..j].

Om 80h : E[m,n]

Remorane: