

LCS Algorithm

$LCS[x, y]$

\downarrow
 n
 \downarrow
 m

Running Times → Brute force: $2^n \times m$
Dynamic programming: $O(nm)$

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for i=1 to n-1, do;
    L[i, -1] = 0
for j=0 to m-1, do
    L[-1, j] = 0
for i=0 to n-1, do
    for j=0 to m-1, do
        if  $x_i = y_j$ , then

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$$L[i, j] = L[i-1, j-1] + 1$$

else

$$L[i, j] = \max\{L[i-1, j], L[i, j-1]\}$$

return L

i=0

ex:

A B C D D F 2
j=0
C E D D G 2 F

F(5, 6)

4, 5

F(6, 5)

5, 4
+1

L	-1	0	1	2	3	4	5	6
-1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	1	1	1	1	1	1	1
3	0	1	2	2	2	2	2	2
4	0	1	2	3	3	3	3	3
5	0	1	2	3	3	3	3	4
6	0	1	2	3	3	3	4	4