

LCS Algorithm

$LCS[x, y]$
 $\downarrow \quad \downarrow$
 $n \quad m$

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

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

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

else

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

return L

ex

$i=0$
 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