

## 1143 Longest Common Subsequence

text 1 = "abcde"

text 2 = "ace"

$x_0 \rightarrow$  string starting  
at 0  
i.e.  $x_0, x_1, \dots, x_n$

CASE 1

1<sup>st</sup> char of text 1 and text 2 match

$$\therefore \text{LCS}(x_0, y_0) = 1 + \text{LCS}(x_1, y_1)$$

CASE 2

1<sup>st</sup> char of text 1 and text 2 don't match

text 1 = "abcde"

text 2 = "bc"

text 1 = a**bcde**

text 2 = **bc**

text 1 = **abcde**

text 2 = **bc**

$$\text{LCS}(x_0, y_0) = \max \left( \begin{array}{l} \text{LCS}(x_1, y_0) \\ \text{LCS}(x_0, y_1) \end{array} \right)$$

	a	c	e	
a				0
b				0
c			<div> <div>point 1</div> <div>*</div> <div>→</div> <div>↓</div> </div>	0
d				0
e			<div> <div>* point 2</div> <div>↘</div> </div>	0
	0	0	0	0

\* point 1

test 1 = cde

test 2 = e

val at point 1

CASE 2

MAX ( ↓ → )

\* point 2

CASE 1

1 + ( ↘ ) = 1 + 0 = 1

memo = [ ] [ ]

for i = n to -1 dec -1

for j = m to -1 dec -1

if tent1[i] = tent2[j] :

memo[i][j] = 1 + memo[i+1][j+1]

else

memo[i][j] = max  $\left[ \begin{array}{l} \text{memo}[i+1][j], \\ \text{memo}[i][j+1] \end{array} \right]$