Saturday, 6 November 2021 3:18 PM

Q. Longest Common Subsequence

Q. Given two strings t1 & t2, return the length of thier longest common subsequence.

Eg: t1 = abcde
t2 = ace

ans → 3

Eg: t1 = abc
t2 = def

ans → 0

s(abc) = - - -
- - c
- b -
a - -
a b -
a - c
⋮

s(bc) = - -
- c
b -

bc: _, c, b, bc, _, ac, ab, abc, a

s(abc) = _ s(bc)
a s(bc)

lcs (s1, s2) = l (c1 r1, c2 r2)

s(r1) x _ s(r2)
s(r1) x c2 s(r2)
c1 s(r1) x _ s(r2)
c1 s(r1) x c2 s(r2)

lcs(s1, s2) =
1 + l(r1, r2)   c1 = c2
max(l(r1, s2), l(s1, r2))   c1 ≠ c2

	a	b	c	d	_
a	3	2	1	1	0
e	2	2	1	1	0
b	2	2	1	1	0
d	1	1	1	1	0
_	0	0	0	0	0

(bd, d) (bd, cd) (d, cd)

(d, d)

(d, cd)

_, cd (d, d) _, cd (d, d)

Q. Target sum subset

You are given n numbers and a target value.

Print true / false, if there is a subset of elements add up to target

Eg: 4 2 7 1 3   target = 10

ans → true

7 + 3

Eg: {3, 34, 4, 12, 5, 2}   target = 9

ans → true

{4, 5}
{3, 4, 2}

	0	1	2	3	4	5	6	7	8	9	10
x 0	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
4 1	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
2 2	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗
7 3	✓	✗	✓	✗	✓	✗	✓	✓	✗	✓	✗
1 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

(4, 2)   [4, 2] → [4], [2], [4, 2]

[4] → [8] ✗, [4]

[2] → ✗   6   2

4, 9

Q. 0 1 Knapsack

Value 15 14 10 45 30
weight 2 5 1 3 4

W = 7.

	0	1	2	3	4	5	6	7
x	0	0	0	0	0	0	0	0
2 - 15	0	0	15	15	15	15	15	15
5 - 14	0	0	15	15	15	15	15	29
1 - 10	0	10	15	25	25	25	25	29
3 - 45	0	10	15	45	55	60	70	70
4 - 30	0	10	15	45	55	60	70	75