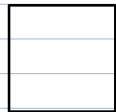


HW #6 - due 11/13 / Sun midnight

[LCS] → 1. <BDCABA>
 opt sub property
 ↑
 bottom-up



Question 1.

we want to find a longest common sequence from these two. by using a table

How to use table?

Ex of solving a problem by structural property.

ex) 1) <BDCABA> = x

= BD, DC, CA, AB, BA, BDC, DCA, CAB, ABA, ... } $2^6 = 64$

2) <ABCBDA> = y

= AB, BC, CB, BD, DA, AB, ABC, BCB, ... } $2^6 = 64$

x = <BDCABA>

y = <ABCBDA>

(j) \ (i)	x →	B	D	C	A	B	A
Y ↓		0	0	0	0	0	0
A	0	0	0	1	1	1	1
B	0	1	1	1	1	2	2
C	0	1	1	2	2	2	2
B	0	1	1	2	2	3	3
D	0	1	2	2	2	3	3
A	0	1	2	2	3	3	4
B	0	1	2	2	3	4	4

start lines are zero from the diagonal, $(1,1)$ to (i,j) if the two letters are the same then start with one and add the diagonal value $(i-1, j-1)$

After fill the table, if the arrow goes diagonally upwards write down the Alphabet

B D A B

B C B A

this is one of the longest common subsequence that is only

$$\text{if } (x[i] == y[j]), \text{ then } L[i][j] = 1 + L[i-1][j-1]$$

$$L[i][j] = \max(L[i][j-1], L[i-1][j])$$

Questions

0/1 knapsack problem solve by Dynamic programming by using a table.
 n, v, w

max 40 lb

		\$	lb
6	item 1	60	10
5	item 2	100	20
4	item 3	120	30
			60

DP

\$/lb criteria 만 사용해서 item 1, 2 만 선택하여 item 3 을 사용하지 못한다. (GA X) 어떻게 table 을 사용해야 할 수 있을 까?

			0	10	20	30	40	
\$	lb	0	0	0	0	0	0	no item
60	10	1	0	60	60	60	60	
100	20	2	0	60	100	160	160	
120	30	3	0	60	100	120	180	

0/1 knapsack problem

maximum weight = 8

$n = 4$

price $\in \{1, 2, 5, 6\}$

weight $\in \{2, 3, 4, 5\}$

			0	1	2	3	4	5	6	7	8
P	w	0	0	0	0	0	0	0	0	0	0
1	2	1	0	0	1	1	1	1	1	1	1
2	3	2	0	0	1	2	2	3	3	3	3
5	4	3	0	0	1	2	5	5	6	7	7
6	5	4	0	0	1	2	5	6	6	7	8

$$V[i, w] = \max \{ V[i-1, w], V[i-1, w - w_i] + p_i \}$$

$$V[4, 1] = \max \{ V[3, 1], V[3, 1-5] + 6 \}$$

