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Name: Lavesh R. Jain, Class: TE-IT, Roll No: A-38

ID: TU4F1920033, Subject: ADSA

Exam: IAT-2

Laveshjain

Q2.]

B.] Knapsack capacity W = 10.

Item	Weight	Value (Profit)
1	3	12
2	4	40
3	5	25
4	7	42

	0	1	2	3	4	5	6	7	8	9	10
	0	0	0	0	0	0	0	0	0	0	0
Item 1	0	0	0	12	12	12	12	12	12	12	12
Item 2	0	0	0	12	40	40	40	52	52	52	52
Item 3	0	0	0	12	40	40	40	52	52	65	65
Item 4	0	0	0	12	40	40	40	52	52	65	65

→ Maximum resultant profit = 65,
which is from Item 2 and Item 3 (40 + 25 = 65)

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Q3.] B.] The longest common subsequence problem is the problem of finding the longest subsequence common to all sequences in a set of sequences, provided that the elements of the subsequence are not required to occupy consecutive positions within the original sequences.

For example:

There are two strings. say, S1 and S2 such that

S1 = {B, C, D, A, A, C, D}.

S2 = {A, C, D, B, A, C}.

The, common subsequences are

{B, C}, {C, D, A, C}, {D, A, C}, {A, A, C}, {A, C}, {C, D}

Among these subsequences, {C, D, A, C} is the longest common subsequence.

To find LCS for the following strings

String 1 = "abcdhe"

String 2 = "aedfhr", we use dynamic programming / approach.

		a	b	c	d	h	e
	0	0	0	0	0	0	0
a	0	1	1	1	1	1	1
e	0	1	1	1	1	1	2
d	0	1	1	1	2	2	2
f	0	1	1	1	2	2	2
h	0	1	1	1	2	3	3
r	0	1	1	1	2	3	3

So now if we backtrace and check we get the

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longest common subsequence as

h (from 3)
d (from 2)
a (from 1)

So the longest common subsequence is adh and its length is 3.

Sundaram
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