CSE-221 Section-1: Quiz

Time: 30 minutes

Marks : 30

Attempt all the questions.

1. What is the difference between Dynamic Programming and divide-and-conquer approach? Write down a pseudo-code for determining nth Fibonacci in Top-down and bottom-up dynamic programming approach.

2. Find out the LCS (longest common subsequence) for the following two DNA strings. You need to compute the solutions in 2D matrix and show the path of tracing that longest common sequence(s).

X=”ACGGTA”

Y=”ACTGGT”

Analyze the time and space complexity of computing the LCS. Mention both time and space complexity for the above example in terms of length of two input strings X and Y.

3. Assume you have a set of coins, S={c1,c2,c3}. You need to compute the amount M such that the total number of coins will be minimum. Write down the recurrence formula for computing the optimal solution of it using DP approach.

Consider c1 = 1, c2=3, c3= 5 and M = 12.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 0 | 1 | 2 | 1 | 2 | 1 | 2 |  |  |  |  |  |  |
| 0 | 1 | 1 | 1 | 3 | 5 | 3 |  |  |  |  |  |  |

Answer the following questions.

1. Compute the minimum number of coins?
2. Find out the optimal set(s) of coins.