DP Questions

Question 1 :

Tribonacci Numbers

The Tribonacci series is a generalization of the Fibonacci sequence where each term is the sum of the three preceding terms.

a(n) = a(n-1) + a(n-2) + a(n-3) with a(0) = a(1) = 0, a(2) = 1.

Input : 5
Output : 0, 0, 1, 1, 2

Input : 10
Output : 0, 0, 1, 1, 2, 4, 7, 13, 24, 44

Input : 20
Output : 0, 0, 1, 1, 2, 4, 7, 13, 24, 44, 81, 149, 274, 504, 927, 1705, 3136, 5768, 10609, 19513

Question 2 :

Print all combinations of balanced parentheses

Write a function to generate all possible n pairs of balanced parentheses..

Input: n=1
Output: {}

Input : n=2
Output: {}{} {{}}

Question 3 :

Maximum profit after buying and selling stocks with transaction fees

We have an array of positive integers containing the price of stocks and transaction fee, the task is to find the maximum profit and the difference of days on which you are getting the maximum profit.

Input: arr[] = {6, 1, 7, 2, 8, 4} transactionFee = 2
Output: 8 1

Input: arr[] = {7, 1, 5, 3, 6, 4} transactionFee = 1
Output: 5 1

Question 4 :

Longest Increasing Path in Matrix

We have a matrix of N rows and M columns. From m[i][j], we can move to m[i+1][j], if m[i+1][j] > m[i][j], or can move to m[i][j+1] if m[i][j+1] > m[i][j]. The task is to print the longest path length if we start from (0, 0).

Input : N = 4, M = 4
m[][] = { { 1, 2, 3, 4 },
{ 2, 2, 3, 4 },
{ 3, 2, 3, 4 },
{ 4, 5, 6, 7 } };
Output : 7
Longest path is 1 2 3 4 5 6 7.

Input : N = 2, M =2
m[][] = { { 1, 2 },
{ 3, 4 } };
Output :3
Longest path is either 1 2 4 or 1 3 4.

Question 5 :

Number of Parenthesis Combinations

Given N number of parenthesis (pair of opening and closing parenthesis), you have to count all the valid combinations of the parenthesis.

Input : N = 4
Output : 14
//Following 14 combinations
{
((())), (()()), (())(), ((()))(), ()(()), (()())
()()(), ()(()), (())()(), ()((())),()(()()), ()(())()
()()(()), ()()()()
}

Practice on Platform

Question 6 :

House Thief (MEDIUM)

https://leetcode.com/problems/house-robber/

Question 7 :

Longest Palindromic Subsequence (MEDIUM)

https://leetcode.com/problems/longest-palindromic-subsequence/

Question 8 :

Equal Subset Sum Difference (MEDIUM)

https://leetcode.com/problems/partition-equal-subset-sum/

Question 9 :

Mountain Array(Longest Bitonic Subsequence) (HARD)

https://leetcode.com/problems/minimum-number-of-removals-to-make-mountain-array/

Question 10 :

Box Stacking (HARD)

https://leetcode.com/problems/maximum-height-by-stacking-cuboids/