Dynamic Programming Workshop

Please ask our helpful programming team if you are confused or stuck! We are happy to help :)

1) **Maximum Grid Path**

   Given an n x n grid filled with integers, find a path from top left to bottom right, which maximises the sum of all numbers along its path.

   Note: You can only move either down or right at any point in time.

   Similar question: https://leetcode.com/problems/minimum-path-sum/

2) **Subset Sum** You are given an array of N items, with given weights. Determine if it's possible to select a subset of these items with a total weight of W

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

3) **0/1 Knapsack** You are given an array of N items, with given weights and values. Select a subset of items with the maximum possible value, given the total weight of the items is at most W

   hint: Try using the same approach as Subset Sum, but track "max value" instead of "possible to reach"

   Link: https://www.hackerrank.com/contests/srin-aadc03/challenges/classic-01-knapsack/problem

4) **Ones and Zeroes**

   You are given a set of binary strings, and 2 integers m and n. What is the biggest subset you can pick so that there are at most m zeroes and n ones.

   For example, the set is $\{10, 0001, 111001, 1, 0\}$, and $m = 5$ and $n = 3$. The answer is 4, with the maximum subset being $\{10, 0001, 1, 0\}$.

   Link: https://leetcode.com/problems/ones-and-zeroes/