1] You discover a treasure containing n pieces of jewel stones. You have a sack to collect them but it can hold only contents upto weight capacity.

You are given the weight and value of each of the stones - weighti and valuei.

Find the maximum value of stones that you can carry in the sack.

Example
stones(weight, value): [(1, 3), (2, 4), (3, 5), (4, 7)]
capacity: 5
Max value: 10
Explanation: Choose stones at index 0 and 3.

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2] Given a set A composed of non-negative integers, find if it has a subset with sum equal to a given target.

Example
A: [3, 0, 4, 9, 5]
target: 17
Result: True
Explanation: The subset [3, 9, 5] has a sum of 17

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3]You are given a rod of length n, and an array prices of size n which contains the prices of rods of lengths 1 to n. Find the maximum amount you can make if you cut up the rod optimally.

Example
n: 8
A: [1, 3, 4, 5, 7, 9, 10, 11]
Result: 12
Explanation: Rods of length 2 and 6 cost: 3 + 9

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4]You are given coins of different denominations, represented by an array - coins of size n. You are also given a value - target. Find the different number of combinations that make up the amount target. Assume that you have infinite number of each kind of coin.

Example
coins: [5, 2, 4]
target: 13
Result: 3
Explanation: The three ways are-
2, 2, 2, 2, 5
2, 2, 4, 5
4, 4, 5

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5] A message containing letters from 'A' to 'Z' is being encoded into numbers using the following encoding:

'A' -> 1
'B' -> 2
.
.
.
'Y' -> 25
'Z' -> 26
Given an encoded string, find the number of ways it can be decoded.

Examples
decoded: 123
encoded: ["ABC", "LC", "AW"]
answer: 3
decoded: 36
encoded: ["CF"]
answer: 1
decoded: 106

encoded: ["JF"]
answer: 1

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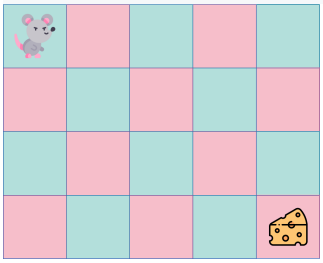
6]A rat is located at the top-left cell of a m*n matrix. The rat wants to get to the cheese which is at the bottom-right cell of the matrix.

The rat can move only in one of the two directions - down and right. How many unique paths can the rat take to reach the destination?



Examples

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m:3, n:2
paths: 3

Explanation:
[[Down, Down, Right], [Down, Right, Down], [Right, Down, Down]]
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