1. Unique Paths
2. Climbing Stairs
3. Coin Change

문제1) Unique Path

Problem

A robot is located at the top-left corner of a *m* x *n* grid
(marked 'Start' in the diagram below).
The robot can only move either down or right at any point in time.
The robot is trying to reach the bottom-right corner of the grid
(marked 'Finish' in the diagram below).
How many possible unique paths are there? (7*3)

start						
						Finish

Note: *m* and *n* will be at most 100.
Example 1:
Input: m = 3, n = 2
Output: 3
Explanation: From the top-left corner, there are a total of 3 ways to reach the bottom-right corner:
1. Right -> Right -> Down
2. Right -> Down -> Right
3. Down -> Right -> Right

Unique Path

Problem

1 (0,0)	1 (0,1)	1 (0,2)
1 (1,0)	2 (1,1)	3 (1,2)

Intput : m=3 , n=2
Output : 3

1. Right -> Right -> Down
2. Right -> Down -> Right
3. Down -> Right -> Right

Intput : m=7 , n=3
Output : 28

Example

1	1	1
1	2	3
1	3	6
1	4	10

문제 2) Climbing Stairs

Problem

You are climbing a stair case. It takes n steps to reach to the top.

Each time you can either climb 1 or 2 steps. In how many distinct ways can you climb to the top?

Note: Given n will be a positive integer.

Example 1:

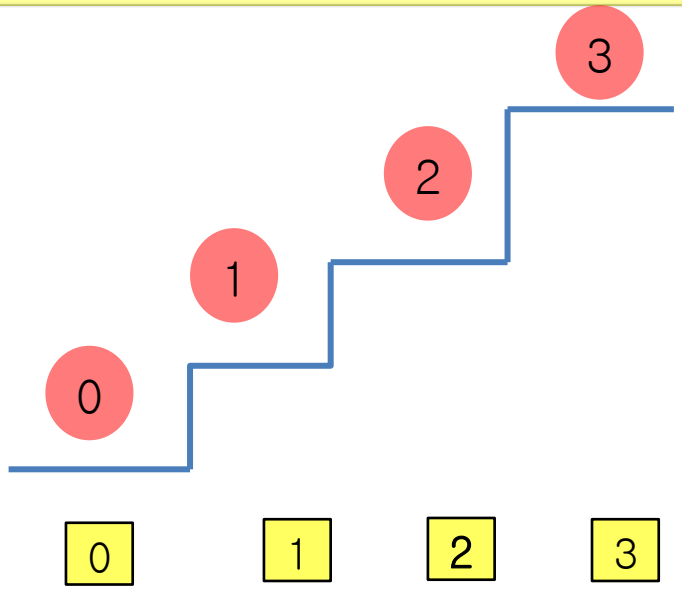
Input: 2
Output: 2
Explanation: There are two ways to climb to the top.
1. 1 step + 1 step
2. 2 steps

Climbing Stairs

Problem

Input: 3
Output: 3

1. 1 step + 1 step + 1 step
2. 1 step + 2 steps
3. 2 steps + 1 step



Solution

dp[3] = dp[2] + dp[1]

dp[i] = dp[i-1] + dp[i-2]

문제 3) Coin Change

Problem

You are given coins of different denominations and a total amount of money amount. Write a function to compute the fewest number of coins that you need to make up that amount. If that amount of money cannot be made up by any combination of the coins, return -1.

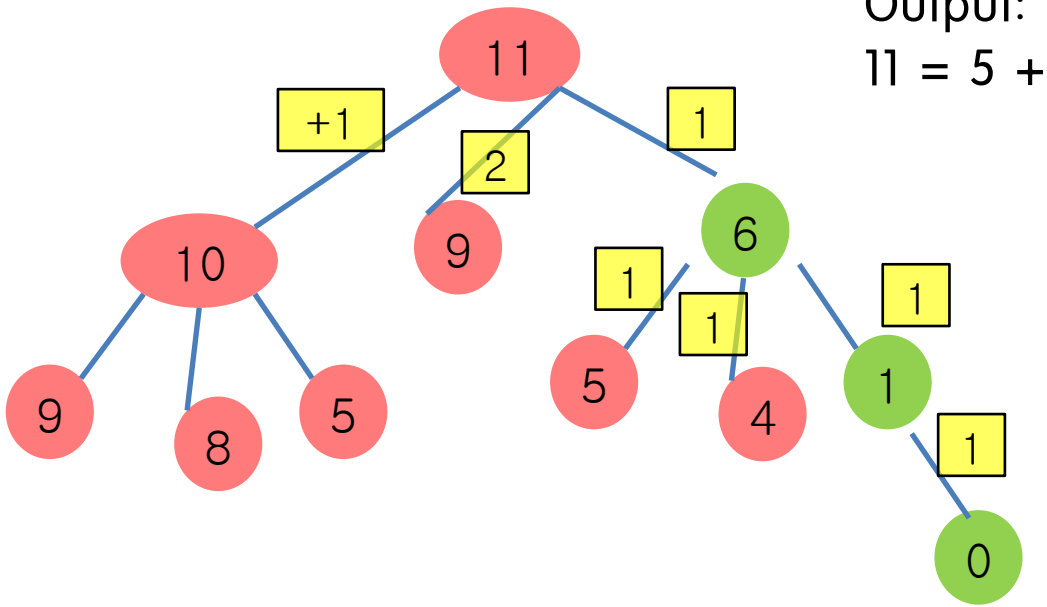
Example 1:

Input: coins = [1, 2, 5], amount = 11
Output: 3
Explanation: 11 = 5 + 5 + 1

Coin Change

Problem

Input: coins = [1, 2, 5], amount = 11
Output: 3
11 = 5 + 5 + 1



dp[0]=0 을 기준으로 +1

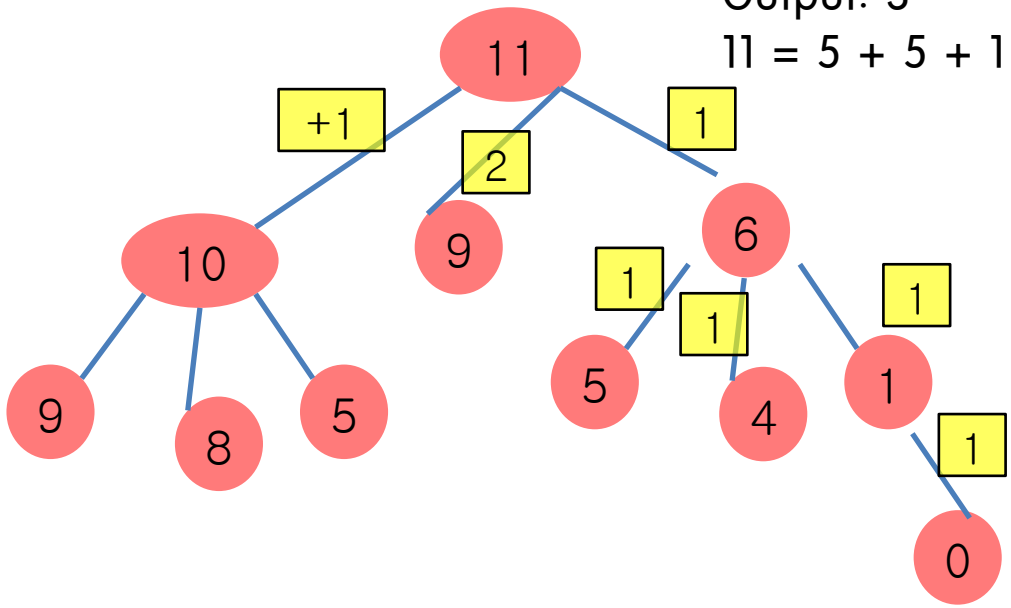
Solution

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

Coin Change

Problem

Input: coins = [1, 2, 5], amount = 11
Output: 3
11 = 5 + 5 + 1



dp[i] = Math.min(dp[i], dp[i - coins[j]] + 1);

dp[1] = Math.min(dp[1], dp[1 - coins[j]] + 1)

1-1 =dp[0] =0
1-2 (X)
1-5 (X)

dp[5] = Math.min(dp[5], dp[5 - coins[j]] + 1

5-1 =dp[4] =2
5-2=dp[3] =2
5-5=dp[0] =0

Solution

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