# Dynamic Programming

## Intro Question

1. Calculate the 40th number of the Fibonacci sequence.
2. Count the number of different ways to move through a 6\*9 grid.
3. Given a set of coins, how can we make 27 cents in the least number of coins?
4. Given a set of substrings, what are the possible ways to construct the string ‘potentpot’?

## Rubric

1. Part 1: Memorization
2. Part 2: Tabulation

## Solve a Fibonacci problem

### Some basic

1. Write a function ‘fib(n)’ that takes in a number as an argument. The function should return the n-th number of the Fibonacci sequence.
2. The 1st and 2nd number of the sequence is 1. To generate the next number of the sequence, we sum the previous two.
3. Ex. 1,1,2,3, 4,……

### How is Fibonacci number generated

Shape, arrow

Description automatically generated

In the graph, the seventh number comes from the sixth and the fifth.

### Why the classic Fibonacci recursion has the time complexity of 2^n