Dynamic programming

The core idea of Dynamic Programming is to avoid repeated work by remembering partial results and this concept finds it application in a lot of real life situations.

In programming, Dynamic Programming is a powerful technique that allows one to solve different types of problems in time O(n2) or O(n3) for which a naive approach would take exponential time.

**Dynamic Programming and Recursion:**

Dynamic programming is basically, **recursion plus using common sense**. What it means is that recursion allows you to express the value of a function in terms of other values of that function. Where the common sense tells you that if you implement your function in a way that the recursive calls are done in advance, and stored for easy access, it will make your program faster. This is what we call Memoization - it is memorizing the results of some specific states, which can then be later accessed to solve other sub-problems.

**The intuition behind dynamic programming is that we trade space for time**, i.e. to say that instead of calculating all the states taking a lot of time but no space, we take up space to store the results of all the sub-problems to save time later.