**DYNAMIC PROGRAMMING!**

**What is Dynamic Programming (DP)?**

**Dynamic Programming (DP)** is a method used in mathematics and computer science to solve complex problems by breaking them down into simpler subproblems. By solving each subproblem *only once* and *storing the results*, it avoids redundant computations, leading to more efficient solutions for a wide range of problems.

**How Does Dynamic Programming (DP) Work?**

* **Identify Subproblems:** Divide the main problem into smaller, independent subproblems.
* **Store Solutions:***Solve each subproblem* and *store the solution in a table or array.*
* **Build Up Solutions:** Use the *stored solutions to build up the solution* to the main problem.
* **Avoid Redundancy:** By storing solutions, DP ensures that each subproblem is solved only once, reducing computation time.

**When to Use Dynamic Programming (DP)?**

Dynamic programming is an *optimization technique* used when solving problems that consists of the following characteristics: