**FINANCIAL FORECASTING**

**Concept of Recursion**

* **Recursion**: A technique where a function calls itself to solve a smaller instance of the same problem. It's used to break down complex problems into simpler subproblems.
* **Base Case**: The condition under which the recursion stops. This prevents infinite recursion and stack overflow errors.
* **Recursive Case**: The part of the function where it calls itself to solve the smaller subproblems.

Recursion can simplify certain problems like factorial computation, Fibonacci sequence, and tree traversals by providing a clear and concise solution.

**Step 2: Setup**

**Create a Method to Calculate Future Value Using Recursion**

Assume we have a list of past growth rates and want to predict the future value based on these rates.

**Time Complexity**

* **Time Complexity**: O(n), where n is the number of years. Each year involves a single computation and a recursive call, leading to linear time complexity.
* **Space Complexity**: O(n) due to the recursive call stack. Each recursive call adds a new frame to the call stack.

**Optimization: Memoization**

To avoid excessive computation and reduce redundant calculations, we can use memoization. This technique stores the results of expensive function calls and reuses them when the same inputs occur again.