**Exercise 7: Financial Forecasting**

**Scenario:**

**You are developing a financial forecasting tool that predicts future values based on past data.**

**Steps:**

1. **Understand Recursive Algorithms:**
   * **Explain the concept of recursion and how it can simplify certain problems.**

Recursion is a process in which a function calls itself directly or indirectly to solve a problem. The problem is broken down into smaller sub-problems of the same type.

Base Case: The condition under which the recursion terminates. Without a base case, a recursive function would call itself indefinitely, leading to a stack overflow.

Recursive Case: The part of the function where the recursion occurs, breaking the problem into smaller sub-problems and calling the function itself.

1. **Setup:**
   * **Create a method to calculate the future value using a recursive approach.**
2. **Implementation:**
   * **Implement a recursive algorithm to predict future values based on past growth rates.**
3. **Analysis:**
   * **Discuss the time complexity of your recursive algorithm.**

Time complexity is O(n) where n is the number of time periods for which the function makes the recursive call.

* + **Explain how to optimize the recursive solution to avoid excessive computation.**

To avoid excessive computation, the result of the previous function calls can be stored and can be reused when needed.