**Exercise 7: Financial Forecasting**

**Steps:**

**1.Understand Recursive Algorithms:**

**What is Recursion?**

Recursion is a technique where a method **calls itself** to solve smaller instances of the same problem.

**Why Use Recursion?**

* Recursion can **simplify complex repetitive problems**, such as tree traversal, factorial, or computing compounded growth.
* It is especially useful when each step of the problem depends on the result of the previous step — like financial forecasting.

**2.Analysis:**

**Discuss the time complexity of your recursive algorithm.**

**Time Complexity of the Recursive Algorithm:**

**Time Complexity: O(n)** for recursive approach (futureValue())  
**Time Complexity**: O(log n) for optimized recursive approach **beacuse** It uses **divide and conquer**, halving the problem in each step. (futureValueFastOptim())

**How to optimize the recursive solution to avoid excessive computation.**

**Use Memoization or Dynamic Programming**  
Store results of previous calculations so you don’t repeat the same work again. This saves time and makes the program run faster.