Understand Recursive Algorithms:

1.Explain the concept of recursion and how it can simplify certain problems.

Recursion is an approach in which a function invokes itself over and over again until it reaches a base case. It makes problems easier by dividing them into smaller subproblems that can be solved easily. In forecasting finance, rather than employing complicated loops, recursion can express the compounding growth year after year in a more inherent and understandable form.

Analysis:

1.Discuss the time complexity of your recursive algorithm.

Time Complexity: O(n)
Each recursive call takes one year, and there are n years, so the function calls n times.

Space Complexity: O(n)
Each call resides in the call stack until the base case is reached, so the space consumption also increases linearly with n.

2.Explain how to optimize the recursive solution to avoid excessive computation.

Replace the recursion with an iterative solution, which lowers space complexity to O(1) and prevents call stack overflow.