**Exercise 7: Financial Forecasting**

1. **Understanding Recursive Algorithms:**

**Q) Explain the concept of recursion and how it can simplify certain problems.**

**Ans)** Recursion is a technique where a function calls itself to help solve a problem. Recursive algorithms are particularly useful for problems that have a recursive structure, as they can break down the problem into smaller subproblems of the same type.

Generally, a recursive function consists of two parts:

**Base Case**: The condition under which the recursion stops.

**Recursive Case**: The part where the function calls itself.

1. **Analysis:**

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

**Ans)** The time complexity of this recursive algorithm is O(n), where ‘n’ is the number of years. This is because the function calls itself once for each year.

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

**Ans)** To avoid excessive computation and potential stack overflow for large inputs, you can use memoization or convert the problem into an iterative approach.

**Memorization**: This involves storing the results of expensive function calls and reusing them when the same inputs occur again.

**Iterative Approach**: This solves the problem without recursion, using a loop instead.