WEEK\_1\_ALGORITHMS\_DATA\_STRUCTURES

Exercise 7: **Financial Forecasting**

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

Recursion is a method of solving problems where a function calls itself as a subroutine. This allows the function to be repeated several times as it breaks down the problem into smaller, more manageable parts. This simplifies a tough problem thus breaking it into chunks. So, we write the logic to solve only a small part of that chunk and recursion does the rest. That is why it can be used to simplify certain complex problems.

1. Discuss the time complexity of your recursive algorithm.

The recursive method will be called n times, where n is the number of periods. Each call involves operations of linear time complexity. Thus, the time complexity would be O(n).

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

In order to optimize recursive solutions we generally use a technique called memorization. It avoids excessive computation by saving the results of expensive operations and reusing their values in the next iteration. Thus the expensive compute doesn’t need to be recomputed again. That is how recursive solutions can be optimized to avoid excessive computation.