Financial Forecasting – Java

Exercise Title: Financial Forecasting using Recursion
Module: Algorithms_Data_Structure
Track: DN 4.0 DotNet FSE Deep Skilling Program

Objective

To develop a financial forecasting tool that recursively predicts future values based on past data, and optimize the algorithm using memorization to avoid redundant computations and improve performance.

Concepts Applied

Object-Oriented Programming (OOP)
Recursive Algorithms
Memoization (Dynamic Programming)
Time and Space Complexity
Clean Coding Principles

Problem Summary

Create a forecasting utility where:
A recursive method calculates the future value from an initial amount, a fixed growth rate, and a number of years.
An optimized version uses memorization to store intermediate results and reduce computation time.
Demonstrates recursive thinking and efficient use of memory and logic, much like the Singleton pattern prevents redundancy.

Deliverables

- A FinancialForecasting class implementing:
  -forecastRecursive(...) for basic recursion
  -forecastMemo(...) for optimized recursion with memorization
- A main method to test both versions and print results
- A week-wise folder containing the complete solution

Tools & Technologies

Java
IDE (IntelliJ, Eclipse, or VS Code)

Evaluation Criteria

Accurate implementation of recursive and memorized algorithms
Clear structure and proper naming conventions
Time and space complexity considerations addressed
Proper folder structure and documentation
Code tested and verified
Solution committed to GitHub as per instructions

Self-Evaluation Checklist

✔ Recursive algorithm implemented to calculate future value
✔ Memoization used to improve efficiency
✔ Folder structure organized under the correct week
✔ Code compiled and tested successfully.