**Exercise 7: Financial Forecasting**

**Scenario:**

You are developing a financial forecasting tool that predicts future values based on past data.

**Steps:**

1. **Understand Recursive Algorithms:**
   * Explain the concept of recursion and how it can simplify certain problems.
2. **Setup:**
   * Create a method to calculate the future value using a recursive approach.
3. **Implementation:**
   * Implement a recursive algorithm to predict future values based on past growth rates.
4. **Analysis:**
   * Discuss the time complexity of your recursive algorithm.
   * Explain how to optimize the recursive solution to avoid excessive computation.

**Source code:**

**package week1.algorithmsanddatastructures;**

**public class FinancialForecasting {**

**public static void main(String[] *args*) {**

**double initialValue = 10000;**

**double growthRate = 0.08;**

**int years = 5;**

**double futureValue = Forecast.*recursiveForecast*(initialValue, growthRate, years);**

**System.out.println("Future Value (Recursive): " + futureValue);**

**}**

**}**

**class Forecast {**

**public static double recursiveForecast(double *amount*, double *rate*, int *years*) {**

**if (*years* == 0) return *amount*;**

**return *recursiveForecast*(*amount*, *rate*, *years* - 1) \* (1 + *rate*);**

**}**

**}**

Output :

