**Exercise 7: Financial Forecasting**

public class Main {

    public static void main(String[] args) {

        double initialValue = 10000;

        double growthRate = 0.10;

        int years = 5;

        double futureValue = forecastRecursive(initialValue, growthRate, years);

        System.out.printf("Forecasted Value after %d years: ₹%.2f%n", years, futureValue);

        double[] memo = new double[years + 1];

        double optimizedValue = forecastRecursiveMemo(initialValue, growthRate, years, memo);

        System.out.printf("Optimized Forecasted Value after %d years: ₹%.2f%n", years, optimizedValue);

    }

    public static double forecastRecursive(double value, double rate, int years) {

        if (years == 0) return value;

        return forecastRecursive(value, rate, years - 1) \* (1 + rate);

    }

    public static double forecastRecursiveMemo(double value, double rate, int years, double[] memo) {

        if (years == 0) return value;

        if (memo[years] != 0) return memo[years];

        memo[years] = forecastRecursiveMemo(value, rate, years - 1, memo) \* (1 + rate);

        return memo[years];

    }

}

Output:

