**Financial Forecasting**

**FinancialForecast.java**

public class FinancialForecast {

// Recursive function to compute future value

public static double predictFutureValue(double initialAmount, double growthRate, int years) {

if (years == 0) {

return initialAmount;

}

return predictFutureValue(initialAmount, growthRate, years - 1) \* (1 + growthRate);

}

// Optimized version using memoization

public static double predictFutureValueMemo(double initialAmount, double growthRate, int years, Double[] memo) {

if (years == 0) {

return initialAmount;

}

if (memo[years] != null) {

return memo[years];

}

memo[years] = predictFutureValueMemo(initialAmount, growthRate, years - 1, memo) \* (1 + growthRate);

return memo[years];

}

public static void main(String[] args) {

double initialAmount = 10000; // ₹10,000

double growthRate = 0.08; // 8% annual growth

int years = 5;

// Basic recursive prediction

double future = predictFutureValue(initialAmount, growthRate, years);

System.out.println("Future Value (Recursive): ₹" + future);

// Optimized with memoization

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

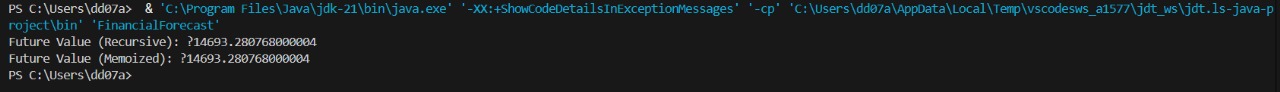
double futureMemo = predictFutureValueMemo(initialAmount, growthRate, years, memo);

System.out.println("Future Value (Memoized): ₹" + futureMemo);

}

}

**Output:**

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