**MODULE-2**

**DATA STRUCTURE AND ALGORITHM**

SUPERSET ID:6407550

**EXERCISE:7 - Financial Forecasting**

**Forecast.java**

package financial;

public class Forecast {

public static double calculateFutureValue(double presentValue, double rate, int years) {

if (years == 0) return presentValue;

return calculateFutureValue(presentValue \* (1 + rate), rate, years - 1);

}

public static double calculateFutureValueMemo(double presentValue, double rate, int years, double[] memo) {

if (years == 0) return presentValue;

if (memo[years] != 0.0) return memo[years];

memo[years] = calculateFutureValueMemo(presentValue, rate, years - 1, memo) \* (1 + rate);

return memo[years];

}

}

**Main1.java**

package financial;

import java.util.Scanner;

public class Main1 {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter present value: ");

double presentValue = sc.nextDouble();

System.out.print("Enter annual growth rate (e.g., 0.05 for 5%): ");

double rate = sc.nextDouble();

System.out.print("Enter number of years: ");

int years = sc.nextInt();

double future = Forecast.calculateFutureValue(presentValue, rate, years);

System.out.printf("\nRecursive Future Value: %.2f\n", future);

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

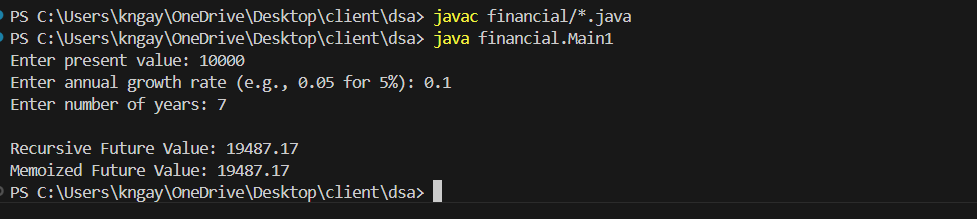
double futureMemo = Forecast.calculateFutureValueMemo(presentValue, rate, years, memo);

System.out.printf("Memoized Future Value: %.2f\n", futureMemo);

}

}

**OUTPUT:**

****