**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.

**Solution-**

Recursion-

It is a programming technique where the function calls itself to solve a smaller instance of the problem.

Base case – condition under which the recursion ends.

Recursive case – function calls itself with smaller or simpler inputs.

**Formula for finding the future value –**

**FV(n)=P\*(1+r)n**

**Code –**

package week\_1\_datastructures\_algorithms.exercise\_7\_financialforcast;

import java.util.\*;

public class financial{

    public static double futurevalue(double principal,double rate,int year){

        if(year==0){

            return principal;

        }

        return futurevalue(principal,rate,year-1)\*(1+rate);

    }

    public static void main(String[] args) {

        Scanner sc=new Scanner(System.in);

        double principal=sc.nextDouble();

        double rate=sc.nextDouble();

        int year=sc.nextInt();

        double result=futurevalue(principal,rate,year);

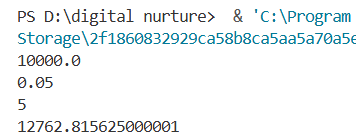
        System.out.println(result);

        sc.close();

    }

}

Output –



**Time complexity -**

The time complexity is O(n)