**Data Structures and Algorithms – Exercise 7**

**Financial Forecasting**

Iteration or Recursion is a programming technique by which a piece of code is executed repeatedly with the help of loops (for example, for or while) until some condition is met.  
It is an inexpensive way of handling duplicate computations without employing additional memory in the form of function call stacks (such as recursion).  
  
Iteration is particularly helpful in performance-critical code in which memory usage must be minimized and execution speed must be maximized.

**Main.java**

import java.util.\*;

public class Main {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("\nWelcome to Financial Forecasting.\n");

System.out.print("Enter the Principal Amount: ");

int principalAmount = sc.nextInt();

System.out.print("Enter the Growth Rate (in %): ");

double growthRate = sc.nextDouble();

growthRate = growthRate / 100;

System.out.print("Enter the Time Duration (in Years): ");

int time = sc.nextInt();

System.out.printf("\nThe Future Predicted Value is: %.3f\n", findFutureValue(principalAmount, growthRate, time));

sc.close();

}

// Iterative method to calculate future value

static double findFutureValue(int principalAmount, double growthRate, int time) {

double futureValue = principalAmount;

for (int i = 1; i <= time; i++) {

futureValue \*= (1 + growthRate);

}

return futureValue;

}

}

**Output**

**A screen shot of a computer

AI-generated content may be incorrect.**

**Time Complexity – O (t) where, t is time**

The **iterative method** is more **efficient** and **robust** for long-term forecasting, especially when time becomes large. While recursion offers elegance, iteration is preferred in financial applications where performance and memory usage are critical.