**Algorithms and Data Structures**

**Exercise 7: Financial Forecasting**

**SOLUTION**

**package** com.fse.finance;

public class Finance {

    // Recursive method

    public static double futureValueRecursive(double principal, double rate, int years) {

        if (years == 0) {

            return principal;

        }

        return futureValueRecursive(principal, rate, years - 1) \* (1 + rate);

    }

    // Iterative method

    public static double futureValueIterative(double principal, double rate, int years) {

        double result = principal;

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

            result \*= (1 + rate);

        }

        return result;

    }

    public static void main(String[] args) {

        double principal = 10000.0;  // ₹10,000 initial investment

        double rate = 0.10;          // 10% annual growth

        int years = 5;

        double recursiveResult = futureValueRecursive(principal, rate, years);

        double iterativeResult = futureValueIterative(principal, rate, years);

        System.out.println("Principal = ₹" + principal);

        System.out.println("Rate = 10% per year");

        System.out.println("Years = " + years);

        System.out.printf("Recursive Result: ₹%.2f\n", recursiveResult);

        System.out.printf("Iterative Result: ₹%.2f\n", iterativeResult);

    }

}

**OUTPUT**

