

Algorithms_Data Structures:

Exercise 7: financial Forecasting

```
import java.util.Scanner;
```

```
public class FinancialForecast {

    public static double calculateFutureValue(double V0, double r, int n) {

        if (n == 0) {

            return V0;

        }

        return calculateFutureValue(V0, r, n - 1) * (1 + r);

    }

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.println("=====");

        System.out.println("    Recursive Financial Forecast Tool    ");

        System.out.println("=====");

        System.out.print("Enter initial investment amount (V0): ");

        double initialInvestment = scanner.nextDouble();

        System.out.print("Enter annual growth rate (in %): ");

        double growthRatePercent = scanner.nextDouble();

        double growthRate = growthRatePercent / 100.0;

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

        int years = scanner.nextInt();

        double futureValue = calculateFutureValue(initialInvestment, growthRate, years);

        System.out.println("\n===== Forecast Summary =====");

        System.out.printf("Initial Investment: $%.2f%n", initialInvestment);

    }

}
```

```

        System.out.printf("Growth Rate:    %.2f%%\n", growthRatePercent);

        System.out.printf("Number of Years:  %d\n", years);

        System.out.println("-----");

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

        System.out.println("=====");

        scanner.close();
    }
}

```

Output:

The screenshot shows an IDE window titled 'FinancialForecast.j...' with a toolbar at the top containing buttons for Run, Debug, Stop, Share, Saved, Beautify, and a download icon. The code editor displays the following Java code:

```

1 import java.util.Scanner;
2
3 public class FinancialForecast {
4
5
6     public static double calculateFutureValue(double V0, double r, int n) {
7         if (n == 0) {
8             return V0;
9         }
10        return calculateFutureValue(V0, r, n - 1) * (1 + r);
11    }
12
13
14    public static void main(String[] args) {
15        Scanner scanner = new Scanner(System.in);
16
17
18        System.out.println("=====");
19        System.out.println("        Recursive Financial Forecast Tool        ");
20        System.out.println("=====");

```

Below the code editor, the output window shows the program's execution. It prompts the user for input and displays the forecast summary:

```

=====
Recursive Financial Forecast Tool
=====
Enter initial investment amount (V0): 1500
Enter annual growth rate (in %): 6
Enter number of years (n): 4

===== Forecast Summary =====
Initial Investment: $1500.00
Growth Rate:      6.00%
Number of Years:   4
-----
Future Value:      $1893.72
=====

```