

Program Overview

The FibonacciSeq program generates a CSV file containing execution times for recursive and iterative implementations of the Fibonacci sequence. The program calculates the Fibonacci sequence for a range of input values, from 0 to 20, and writes the execution times to a CSV file. The CSV file can be used to create a graph of the execution times over the input range.

Program Functions

`fibonacciRecursive(int n)`

This method takes an integer `n` as input and returns the `n`th number in the Fibonacci sequence, calculated using a recursive algorithm.

`fibonacciIterative(int n)`

This method takes an integer `n` as input and returns the `n`th number in the Fibonacci sequence, calculated using an iterative algorithm.

`main(String[] args)`

This is the main method of the program, responsible for executing the program logic. The method calculates the Fibonacci sequence for a range of input values, from 0 to 50, and writes the execution times to a CSV file. The CSV file contains three columns: the input value, the execution time of the recursive implementation, and the execution time of the iterative implementation.

Program Dependencies

The FibonacciCSV program does not depend on any external libraries or APIs. The program is implemented using only standard Java libraries and features.

How to Use the Program

To use the FibonacciSeq program, simply compile the source code and run the resulting executable JAR file. The program will automatically generate a CSV file named "fibonacci.csv" in the current directory, containing execution times for the recursive and iterative implementations of the Fibonacci sequence.

To visualize the execution times, open the "fibonacci.csv" file in a spreadsheet program like Excel or Google Sheets, and create a line graph with the input values on the x-axis and the execution times on the y-axis. This will show the execution time of both the recursive and iterative implementations of the Fibonacci sequence over the input range.

To create a graph from the data in the "fibonacci.csv" file generated by the program, you can use a spreadsheet program like Microsoft Excel or Google Sheets. Here are the steps to create a graph:

1. Open the "fibonacci.csv" file in a spreadsheet program.
2. Select the entire range of data, including the column headers.
3. Click on the "Insert" tab in the menu bar.
4. Choose the type of graph you want to create, such as a line graph or scatter plot. This will insert the graph into the spreadsheet.
5. Format the graph as desired, adding titles, labels, and other features as needed.
6. Save the spreadsheet with the graph included.

Here's an example of how you could create a line graph in Excel:

1. Open the "fibonacci.csv" file in Excel.
2. Select the entire range of data, including the column headers.
3. Click on the "Insert" tab in the menu bar.
4. Click on the "Line" button in the "Charts" section.
5. Choose the first option, which is a simple line graph with markers.
6. The graph will be inserted into the spreadsheet. You can now format it as desired, adding titles, labels, and other features.
7. Save the spreadsheet with the graph included.