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Design Doc:

Purpose: We are developing a program to generate graph output using gnuplot with bash, to graph 3 plots given to us figure 2, figure 3, and figure 4 from given values using different labels as well as creating our own plot using the Collatz sequence.

Pseudocode

#!/bin/bash : creating my files to execute (bash script)

Creating a for loop that will run from 2-10000 times

Placing the data points (collatz.c) into a file called num.dat

Placing all the y values in a temp doc, from num.dat

Placing all the x values in a temp doc, from i

Pasting both the temp documents for x and y into one, graph1.dat

Removing both x and y temp doc

Graph 1 (Figure 2)

Putting it into gnuplot.

Saving the graph into pdf version calling it

Setting the title to the pdf len.pdf

Set the title of the graph, Collatz Sequence Lengths

Setting x and y label. X is called n, and Y is called length.

Setting the graph's Y range 0-300

Setting the graph's Y scale 50

Setting the graph's X range 0-10000

Setting the graphs X scale 1000

Next we have to plot the graph

Graph 2 (Figure 3)

Creating a for loop that will run from 2-10000 times

Placing the data points (collatz.c) into a file called num.dat

Sorting all the values in num.dat and setting it to sort_num.dat

Takes the max in sort-num.dat and puts it in the temp doc y_val.dat

Placing all the x values in a temp doc, from i

Pasting both the temp documents for x and y into one, graph2.dat

Removing both x and y temp doc

Removing sort_num.dat temp doc

Putting it into gnuplot.

Saving the graph into pdf version calling it

Setting the title to the pdf val.pdf

Set the title of the graph, Maximum Collatz Sequence Value

Setting x and y label. X is called n, and Y is called value.

Setting the graph's Y range 0-100000

Setting the graphs Y scale 2000

Setting the graph's X range 0-10000

Setting the graphs X scale 1000

Next we have to plot the graph

Graph 3 (Figure 4)

Creating a for loop that will run from 2-10000 times

Placing the data points (collatz.c) into a file called num.dat

Takes the max in sort-num.dat and puts it in the temp doc x_val.dat

Pasting the temp documents for x into one, graph3.dat

Removing the x doc

Putting it into gnuplot.

Saving the graph into pdf version calling it

Setting the title to the pdf freq.pdf

Setting the title of the graph, Collatz Sequence Length Histogram

Setting x and y label. X is called length, and Y is called frequency.

Setting the graph's Y range 0-200

Setting the graph's X range 0-225

Next we have to plot the graph

Graph 4 (Additional Plot)

Creating a for loop that will run from 2-10000 times

Placing the data points (collatz.c) into a file called num.dat

Placing all the y values in a temp doc, from num.dat

Placing all the x values in a temp doc, from i

Pasting both the temp documents for x and y into one, graph1.dat

Removing both x and y temp doc

Putting it into gnuplot.

Saving the graph into pdf version calling it

Setting the title to the pdf len.pdf

Set the title of the graph, Collatz Length Sequence

Setting x and y label. X is called n, and Y is called length.

Setting the graph's Y range 0-100

Setting the graph's Y scale 10

Setting the graph's X range 0-1000

Setting the graph's X scale 100

Next we have to plot the graph