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File: plot.sh

Assignment 1 Pseudocode

Final Design.

Start code
Indicate plot.sh should be executable.

Build the collatz.c executable file.

For each number ‘n’ from 2 through 10000 run collatz.c with the argument being ‘n’:

Append the sequences to a file (file 1).

#To graph the sequence lengths
While having a variable to keep track of this, count the length of sequence (or number of lines in file) and subtract 1, since the starting number does not count.

Make a variable (collatz sequence plotting data) that will be used to plot the data, including iterator and count of length of sequence.

Output the values of that variable into another file (file 2).

#To graph the max number from a sequence.
Sort the sequence file (file 1) from greatest to least.
While using a variable to keep track, read the top most line of the sorted file (file 1).
Make a variable that is used to plot max number of a sequence; this will include the iterator and the variable used to read the top most of the sorted collatz file.
Direct the values of that variable to a second .dat file.

#To graph the frequency
Direct the value of the sequence length count to another file (file 3).

End loop.

Sort the sequence length (file 3) and output the result of the sort into the same file

Get the frequency of each number in the sequence length file (file 3).

Vincent Siu
10/2/22
File: plot.sh

#Start Code to plot the house; the graph will be 500 by 500.
#Draw the left roof of the house
#Starting coordinates (0,150)
For each number from 0 through 250:
    Have a variable keep track of the iterator
    Have a variable keep track of the y coordinate, which will be iterator + 150
    Set a string variable for plotting data and concatenate the iterator and the yCoordinate in it.
    Direct the variables of the plotting data to a house .dat file.
    End loop

#Draw the right roof of the house
Set the y coordinate equal to 300
For each number from 150 to 300:
    Set a variable equal to the iterator.
    Subtract y coordinate by 1
    Make a variable for plotting data and concatenate the iterator and the y coordinate
    Direct the variables of the plotting data to the house .dat file.
    End loop

#Draw the side walls of the house and the left of the chimney
For each number from 0..215:
    Set the coordinate variable equal to 20.
    Concatenate the iterator to the coordinate variable.
    Direct the value of the coordinate variable to the house .dat file

    If the iterator is smaller than or equal to 170:
        Set the coordinate variable equal to 280.
        Concatenate the iterator to the coordinate variable.
        Direct the value of the coordinate variable to the house .dat file
End loop

#draw the top of the chimney, horizontal outline of the window, and top outline of the door.
For each number in 20…45
    If the iterator is smaller than or equal to 40:
        Set a variable equal to the iterator.
        Concatenate the number 215 to the coordinate variable.
        Direct the variables of the plotting data to the house .dat file.

Vincent Siu
10/2/22
File: plot.sh

Set a variable equal to the iterator and add 160 to the iterator.
Make a variable for plotting data and concatenate the iterator and the y coordinate
Concatenate the number 125 to the coordinate variable.
Direct the variables of the plotting data to the house .dat file.

Set a variable equal to the iterator and add 160 to the iterator.
Make a variable for plotting data and concatenate the iterator and the y coordinate
Concatenate the number 95 to the coordinate variable.
Direct the variables of the plotting data to the house .dat file.

Set a variable equal to the iterator and add 160 to the iterator.
Make a variable for plotting data and concatenate the iterator and the y coordinate
Concatenate the number 65 to the coordinate variable.
Direct the variables of the plotting data to the house .dat file.
End of if loop.

Set a variable equal to the iterator and add 130 to the iterator
Concatenate 125 to that variable
Direct the values of that variable to the house .dat file.
End loop

#Draw the right part of the chimney
For each number from 190 to 215…
Set coordinates variable equal to 40
Concatenate the iterator to coordinates variable
Direct the value of variable to the house .dat file
End loop

#Draw the sides of the door
For each number in 0-125
Set coordinates variable equal to 50
Concatenate the iterator to the the coordinates variable
Direct the value of the coordinates variable to the house .dat file

Set coordinates variable to 75
Concatenate the iterator to the the coordinates variable
Direct the value of the coordinates variable to the house .dat file

End loop

Vincent Siu
10/2/22
File: plot.sh

Draw the vertical outlines of the window
For each number from 65-125
    Set coordinates variable equal to 180
    Concatenate the iterator to the the coordinates variable
    Direct the value of the coordinates variable to the house .dat file

    Set coordinates variable to 200
    Concatenate the iterator to the the coordinates variable
    Direct the value of the coordinates variable to the house .dat file
    End Loop

#draw the door knob
Set coordinates variable equal to 65
Concatenate 65 to that coordinates variable
Direct the varlie of the coordinates variable to the house .dat file.

Start gnuplot code
    #graph the sequence lengths
    Set the output file type to pdf.
    Set name of the pdf file.
    Set the title of the graph.
    Set name of the horizontal label.
    Set name of the vertical label.
    Set the horizontal range from 0 - 100000.
    Set the vertical range from 0 - 300.
    Set zero axis
    Plot collatz sequence plotting data using dot plots.

    #graph the max values of a collatz sequence
    Set the horizontal range from 0 - 10000.
    Set the vertical range from 0 - 100000.
    Set the title of the graph.
    Set name of the horizontal label.
    Set the name of the vertical label.
    Set the zero axis.
    Plot the max numbers of collatz sequences using dot plots.

    #graph the histogram of sequence length frequencies.
    Set the style of plot to histogram stacked by columns
    Set the horizontal range from 0 - 225.
    Set the vertical range from 0-200.
    Set the name of the horizontal axis
    Set the name of the vertical axis.

Vincent Siu
10/2/22
File: plot.sh

Plot the sequence length frequencies with axis inverted with boxes.
#note: axis are inverted because when the uniq command was used for the sequence counts, the number of occurrences are prefixed, while they should be the vertical axis.

#Draw the house
Set the horizontal axis from 0 - 500
Set the vertical axis from 0 - 500
Set the title of the graph
Plot the house with dots.

END the gnuplot code.

Vincent Siu
10/2/22
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