General Idea

Create a shell script that will create 4 plots of a provided C program that has the Collatz sequence. The plots should show the Collatz Sequence Lengths, Maximum Collatz Sequence Value, Collatz Sequence Length Histogram, and Byte Count of Each Value in Collatz Sequence.

Pseudocode

Create a script that will output 4 plots to 4 different pdfs. One to each pdf.

For plot 1:
Rebuild the clean and collatz executable.
Create a for-loop that iterates a variable between the range of 2 - 10,000. In this loop, the collatz file will execute using the deterministic starting point of the variable of your choice.
    Count the number of lines in output from collatz.c.
    Append to the data.
Set the output of the script to output the plot to a pdf.
Set title as "Collatz Sequence Lengths".
Set the x label as "n".
Set the y label as "length".
Set zero axis.
Plot using point type and point size of 0.1.
End of gnuplot.

For plot 2:
Rebuild the clean and collatz executable.
Create a for-loop that iterates a variable between the range of 2 - 10,000. In this loop, the collatz file will execute using the deterministic starting point of the variable of your choice.
    Sort the values from the outputs from collatz.c.
    Output the numbers in reverse order.
    Append to the data.
Set the output of the script to output the plot to a second pdf.
Set title as "Maximum Collatz Sequence Value".
Set the x label as "n".
Set the y label as "value"
Set zero axis.
Set yrange to end at 100,000.
Set xrange to end at 10,000.
Plot using point type and point size of 0.1.
End of gnuplot.

For plot 3:
Rebuild the clean and collatz executable.
Create a for-loop that iterates a variable between the range of 2 - 10,000. In this loop, the collatz file will execute using the deterministic starting point of the variable of your choice.
    Find the amount of lines in the collatz file.

Sort the values from the outputs from collatz.c.
Find the amount of unique values.
Put the second column of values into one file and the first column of values in another.
Set the output of the script to output the plot to a third pdf.
Set the title to "Collatz Sequence Length Histogram".
Set the x label as "length".
Set the y label as "frequency".
Set the zero axis.
Set the y range to end at 200.
Set the x range from 0 to 225.
Set x tics to be 25.
Make sure to plot this graph as a histogram.
Graph using the second column of values as the x coordinates, and the first column of values as the y coordinates.
End of gnuplot.

For plot 4:
Rebuild the clean and collatz executable.
Create a for-loop that iterates a variable between the range of 2 - 10,000. In this loop, the collatz file will execute using the deterministic starting point of the variable of your choice.
    Count the number of byte counts in each output from collatz.c.
    Append to the data.
Set the output of the script to output the plot to a fourth pdf.
Set title as "Byte Count of Each Value in Collatz Sequence".
Set the x label as "value".
Set the y label as "byte count".
Set the x range to end at 10,000.
Set zero axis.
Plot using point type and point size of 0.1.
End of gnuplot.