Assignment 1: Collatz's Formula

Aniket Pratap

Jan 2022

The main purpose of this assignment is to form a bash script using the collatz.c program in order to make graphs regarding the length of the list of numbers, maximum value, and a histogram regarding the length. The first graph, length scatter plot can be done using a for loop. The for loop would read each character and when it reaches a "/n" the length counter increments by one. This works because "/n" is considered a character. The loop continues until it reaches the EOF. This technique can be done by using piping and the wc -l flag to coutn the lines for us. And in order to obtain x-coordinates to make the data graphable, echo " " can be used to iterate through the loop, getting an x-coordinate, and adding a space after os that gnuplot can read the dat. The max value is scatter plot simply takes the randomized list of numbers and sorts them in a reverse order so that the max number is first. One can then take the first line and plot it on a scatter plot. Luckily, there were a couple commands that did just that. by using the same echo command, I created a space to distinguish the data and used the sort function along with tail in order to get the maximum length in a list. The final length histogram should involve the code for the scatter plot histogram. Everytime the length of the number list is calculated, the program finds that number on the X-axis and adds one at that value. This would have to be done outside the loop otherwise the uniq -c command would only work for each loop.