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CSE13S Winter 2022

Bash Design Document

Description:

Use UNIX to create a bash script that runs collatz.c to produce different graphs like length of sequences, maximum number of each sequence, and histogram frequency of lengths.

FIles:

1. plot.sh:

   Bash file that will have been done by myself

2. collatz.c:

   Provided file of the collatz sequence done in C. Nothing has to be done to this file

3. Makefile:

   A file that acts as shortcuts to be used in shell. Already provided.

4. README.md:

   Tells you what kind of arguments the .sh files accept and why the Makefile was how it is.

5. DESIGN.pdf:

   A blueprint on how to recreate the plot.sh given the proper resources.

6. WRITEUP.pdf:

   Plots produced from the .sh and the UNIX commands that were used for each one with an explanation.

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Pseudocode:

Clean workspace with Makefile and compile collatz

Create files to hold data outside of for loop

For loop starting from 2 … 10,000

    Run collatz and collect data

    Sort the data to get maximum number

    Count number of lines in collected data

    Move data to files outside of for loop

    Clear used files to be reused next loop

Sort number of lines data and count repeat occurrences *after* sorting

Plugin files into Gnuplot using example from resources git

    Edit ranges to match example plots shown in asgn1.pdf

Delete files used after creating respective Gnuplots

Clean workspace

Pseudocode description:

We don't want to run into any errors of files already existing that we are trying to create so we clean our workspace and make collatz. Then we're gonna use a for loop that will run collatz every time with a new number starting from 2 - 10,000 collecting data and moving it around every loop. At the end of the loop clear any files used to not run into problems. Do any sorting or manipulation of data to be presented to Gnuplot. Then plugin files into Gnuplot the same way that was shown in the example plot.sh from resources while making any fine-tuning to match the graphs as best as possible. After all .pdf have been created remove all files created in shell script as they aren't needed.