Project 2

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The Experiment

In this experiment, we tested how increasing thread counts in a program influenced the time it took to compute Collatz Sequence stopping times concurrently. We computed the stopping times of values 0-10000000, with thread counts of 1-8. The data was collected from running the code on a laptop with 16 Gb RAM, and an AMD Ryzen 5 5500U, which was 6 cores and 12 threads, and an 8 MB L3 chache.

Results

The following is a histogram of the stopping times of the collatz sequences of values 0-10000000. For each sequence, a stopping time was calculated, and the graph reflects how many of each stopping time was found in the range of N values specified.

The following line chart shows the computation time for each number of threads, for both locking and nonlocking threads.

Based on the data we got, there isn’t a large difference between the computation times when locking versus when not locking. The locking threads, however, ensure data integrity, so the fact that the computation times are not dissimilar is good news, since that means we can feel free to lock the data when using multiple threads without worrying about slowing the program down.

Additionally, based on the data we received, increasing numbers of threads increased computation time.