# Multi-Threaded Collatz Stopping Time Generator

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### Background

This purpose of this experiment is to explore the use of threads in a computational setting.1 To do so, we will be computing Collatz sequences in a multi-threaded environment. The Collatz conjecture defines a mathematical sequence such that for any positive integer *n*, the sequence will always reach 1.2 The sequence uses the following formula for determining the next term:1

The conjecture is defined as such:

if *n* is even, then divide by 2 to get the next term f(*n*)

if n is odd, then multiple n by 3 and add 1 to get the next term f(*n*)

Stopping time is defined as the number of iterations i that must occur for the sequence to reach 1:

If the output of the function f(*n*) is equal to *n* on the first iteration, then the *n* must be 1

If i > 0, then the smallest i for which ai = 1, is the stopping time

### Experiment

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### Results

### Discussion

### Conclusions