Collatz Function:

$$c(n) = \begin{cases} 3n+1 & \text{if } n \text{ is odd} \\ \frac{n}{2} & \text{if } n \text{ is even} \end{cases}$$

Iterate $c(n)$ for various starting values n.
What patterns emerge?

$n=5$:

$c(5) = 3(5)+1 = 16$

$c(16) = \frac{16}{2} = 8$

$c(8) = 4$

$c(4) = 2$

$c(2) = 1$

$c(1) = 3(1)+1 = 4$

cycle: 4, 2, 1, 4, 2, 1, ...

Collatz Conjecture: Starting with any positive integer n, the sequence of Collatz iterates eventually reaches 1.

This has been computationally verified up to about 10^{20}.