Homework 5.

Consider the following sequence defined completely by the first element S_1[¶]:

$$S_{n+1} = \begin{cases} S_n/2 & \text{if } S_n \text{ is even} \\ 3S_n + 1 & \text{if } S_n \text{ is odd} \end{cases} \tag{15}$$

A still[‖] open question in mathematics is whether all such sequences always arrive at 1 for large enough n (the alternatives being that some sequences may rise indefinitely, or that there may be a closed orbit that does not include 1). Compute the number of iterations it takes to arrive at 1 given a starting value s using a while loop. Since we do not know how long it will take to arrive at 1 (though you can assume that it will happen eventually) we might want to construct this sequence using a while-loop. What starting number smaller than 10,000 has the longest trajectory? What's the largest number on that trajectory?

[¶]This is the subject of the Collatz Conjecture
[‖]Despite a recent "near" solution.

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