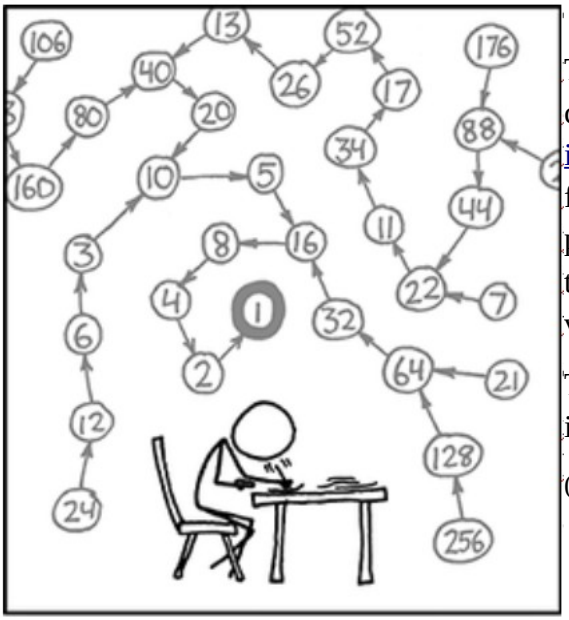
DNL 1ère – COLLATZ CONJECTURE or SYRACUSE SEQUENCE



The **Collatz conjecture** is a conjecture in mathematics that concerns a sequence defined as follows: start with any positive integer *n*. Then each term is obtained from the previous term as follows: if the previous term is even, the next term is one half the previous term. If the previous term is odd, the next term is 3 times the previous term plus 1. The conjecture is that no matter what value of *n*, the sequence will always reach 1.

The conjecture is named after Lothar Collatz, who introduced the idea in 1937, two years after receiving his doctorate.

(From Wikipedia)

1. What is the highest number reached in the sequence with 7 as starting number?
2. What is the starting number less than 10 which has the longest total stopping time?
3. Would you have enough courage to find the total stopping time of 19?
4. How to code this algorithm in your calculator in order to get the total stopping time of any number as entry?
5. Optional: what completes the following pattern?
   a) O T T F F S S E…
   b) 1, 8, 27, 64, 125,…
   c) 1, 11, 21, 1211, 111221,…
   d) 1, 1, 2, 3, 5, 8, 13,...

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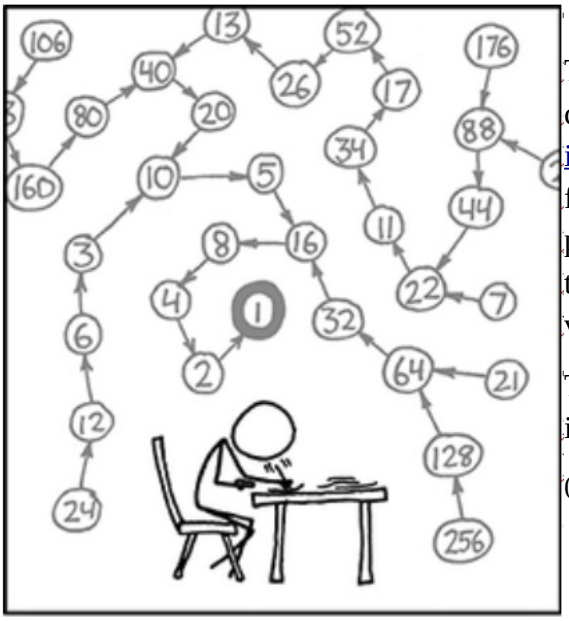

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