In-Section Exercises - Week 3

CS50 — Fall 2012

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1. According to the Collatz Conjecture, given any natural number (nonzero, positive integer) if you follow the below procedure you will eventually arrive back at the number 1:

   - If the input number is even, divide by 2.
   - If the input number is odd, multiply by 3 and add 1.

   With a partner, write a function `collatz()` that takes as its parameter an integer, and **recursively** calculates the number of steps taken for the input integer to get back to 1. You may not assume that the input is necessarily a natural number.

2. Write a function `alphabet()` that **recursively** prints the alphabet after "counting backwards" from an original input letter, which is the only parameter it accepts. You may assume that the input character is a capital letter in the range [A-Z]. Leverage your knowledge of the stack and, as an extra challenge, see if you can complete this task in five lines of code or less.