

Extra Credit #2

Due: Thursday, February 8, 2018 at 11:59 p.m.

Points: 30

Please turn in your answers for the homework assignment on Canvas under Extra Credit #1 there.

1. (30 points) Define the function:

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

The *Collatz conjecture* says that, if you iterate this sequence for any initial value of n , then eventually the sequence will reach the number 1.

For a given number n , let k be the *least* number of iterations needed to reach the number 1 (excluding the initial value). Then k is called the *total stopping time* of n .

For example, if $n = 29$, then the sequence is:

```
29 88 44 22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1
```

and so the total stopping time of 29 is 18.

Write a program that takes as input a positive integer and prints both the sequence and the total stopping time for that integer. The output should look like:

```
29 88 44 22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1
The total stopping time for 29 is 18
```