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Prot. n.

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Dear Prof. Sloane

I will be very glad to receive a copy of your paper "Spherical codes, quantizing and numerical integration", you will present at the next "Conference on the Applications of Discrete Mathematics".

I take this opportunity for let you communicate here below (I hope you don't know it) an integer sequence connected with a classical unsolved problem, that I didn't find in your book "A handbook of integer sequences".

Let us consider both the sequence  $S_1$  of natural integers

$$S_1 : 1, 2, 3, \dots, n, \dots$$

and the sequence  $f(S_1)$  obtained by transforming it with the function  $f$  defined as follows

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

Let  $f^{(n)}(n)$  denote the  $n$ -th iterate of the function  $f$ . It is a longstanding conjecture that the sequence  $f^{(\infty)}(S_1)$  is composed of only the numbers 1, 2 and 4.

The sequence  $f^{(\infty)}(S_1)$  cycles with period 3 under the action of function  $f$ , the first elements of the sequence which begins with 1 are:

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1, 2, 2, 4, 4, 4, 2, 1, 2, 1, 4, 1, 1, 4, 4, 2, 1, 4, 4, 2, ...

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Thanking you very much for the <sup>kind</sup> attention you reserved me and hoping to hear from you again, I remain

Sincerely yours



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