

Re: factorial sequence proposal

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- *From:* "wugi" <brol@xxxxxxxxxxx>
 - *Date:* Mon, 12 May 2008 11:00:03 +0200
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"I.N. Galidakis" :

wugi wrote:

The basic idea is, implementing factorials of factorials, or "powered" factorials.

So I came to use the notation $!$, $!!$, $!!!$, $!^k$, although I found out that $!!$ is being used for less exciting (in my view) definitions.

A sequence needs a starting number, or seed n : hence,

Seq = Seq(n), with terms $a(k)=\text{Seq}(n,k)$ as follows:

$$a(0) = n$$

$$a(1) = n!$$

$$a(2) = a(1)! = (n!)! == n!!$$

.....

$$a(k) = a(k-1)! = n(!\dots!) == n(!^k)$$

The idea is not really new. People have worked with iterated factorials before.

For example:

<http://ioannis.virtualcomposer2000.com/math/hfseries.html>

There is a reference given to me by Dave L. Renfro in AMM Problems (which

I

can't find right now) which gives bounds for it. Using your notation (and

if

memory serves right):

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$$n^{^k} < n^{(!^k)} < n^{^(k+1)},$$

where $^{^}$ is the tetration operator. Perhaps that's why your sequence didn't make it to OEIS.

Thank you.

But didn't OEIS aspire comprehensiveness? So if one signals not having found such or so a series in their site, one likes at least to be pointed to it, or any other reply. The application procedure also does (apparently) only take specific number examples; parametered formulas seem out of question, ruling out god knows how many cases.

A by-observation for the series above:

2 is apparently a unit seed (besides 1), as we get

$$2=2!=2!!=2!!!=....$$

guido

<http://home.scarlet.be/~pin12499>

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