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EX SAPIENTIA MODUS

THE UNIVERSITY OF NEW ENGLAND
ARMIDALE, N.S.W. 2351, Australia.

Mathematics Department,
27th August, 1976

Dr N. J. A. Sloane,
Mathematics Research Center,
Bell Telephone Laboratories, Inc.,
Murray Hill,
New Jersey, 07974
U.S.A.

Dear Dr Sloane,

I have recently enjoyed several hours browsing through your 1973 book "A Handbook of Integer Sequences". I met several old friends and found some new ones that answered some questions about monotone boolean functions that had bothered me for some time. Thank you for taking the initiative to present such a wealth of information in such a compact and convenient handbook.

I can recall only two relatively simple sequences of integers that do not appear in the book but which probably deserve a place. These arose in some as yet unpublished work I did a few years ago on asymptotic expansions of the incomplete gamma functions. I would not be surprised if they have some combinatorial significance. Some details of these sequences are attached.

I note that you planned to issue supplements from time to time. I would be grateful if you would send me any you have issued and put my name on your mailing list for future supplements.

Yours sincerely,

E. W. Bowen

(Dr) E. W. Bowen

Sent
add to list

wrote 07/25/80

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Two integer sequences not in Sloane, *A Handbook of Integer Sequences*

n	a_n	b_n
	have	A4208
1	1	1
2	3	5
3	13	37
4	71	353
5	461	4081
6	3447	55205
7	29093	854197
8	273343	14876033
9	2829325	288018721
10	31998903	6138913925
11	392743957	142882295557
12	5201061455	3606682364513
13	73943424413	98158402127761
14	1123596277863	2865624738913445
⋮	⋮	⋮

These are the numerators in the following divergent series expansions:

$$\log \sum_{n=0}^{\infty} n!x^n = \sum_{n=1}^{\infty} \frac{a_n}{n} x^n ,$$

$$\log \sum_{n=0}^{\infty} (2n-1)!!x^n = \sum_{n=1}^{\infty} \frac{b_n}{n} x^n .$$

Terms of both sequences may be calculated in succession with the aid of the recurrence relations:

$$a_n = n.n! - 1!a_{n-1} - 2!a_{n-2} - \dots - (n-1)!a_1 ,$$
$$b_n = n.(2n-1)!! - 1!!b_{n-1} - 3!!b_{n-2} - \dots - (2n-3)!!b_1 ,$$

with $a_1 = b_1 = 1$. They occur in asymptotic series expansions of the logarithms of the exponential integral and complementary error integral functions.

name: ~~An~~ An asymptotic expansion.

ref: BØ5.

E. W. Bowen,
Department of Mathematics,
University of New England,
Armidale, N.S.W. 2351
Australia.

SEP 1 4 1976

Dr. E. W. Bowen
Mathematics Department
University of New England
Armidale
NSW 2351
AUSTRALIA

Dear Dr. Bowen:

Thank you very much for your letter of 27th August. That is the kind of letter an author like to get. A copy of Supplement I is enclosed, the only one issued so far. Another is long overdue.

Thank you for suggesting those two sequences. As a matter of fact I came across the first, a_n, a year or two ago, and refer you to Comptes Rendus, Vol. 275 (1972), page 569. The other is new to me and will go into the next supplement.

It was very kind of you to write.

Yours sincerely,

MH-1216-NJAS-mv N. J. A. Sloane

Enc.
As above
APPROVAL

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