

Cinquante signes

A proportion (odd digits vs all digits)



mai 14, 2020



Obviously (and unfortunately) no one has been interested in this two week-old message on [SeqFan](#):

> Hello SeqFans, [posted from Brussels, Belgium, May 6th at 17:08]

We want $a(n)/a(n+1)$ to represent a proportion where:

--> $a(n)$ is the number of odd digits used in the seq up to $a(n)$ -- $a(n)$ included;

--> $a(n+1)$ is the total number of digits used so far.

$S = 1, 2, 3, 5, 8, 12, 19, 31, 49, 61, 72, 83, 94, 105, 116, 132, 200, \dots$

I think that this is true for the first 7 proportions here, but I am 100% sure that from $a(7)$ on this is lexico-wrong (perhaps even earlier :-)

Let's see:

$1/2$ means that there is 1 odd digit in the first 2 digits of S

[true: they are respectively (1) and (1,2)]

$2/3$ means that there are 2 odd digits in the first 3 digits of S

[true: they are respectively (1,3) and (1,2,3)]

$3/5$ means that there are 3 odd digits in the first 5 digits of S

[true: they are respectively (1,3,5) and (1,2,3,5,8)]

$5/8$ means that there are 5 odd digits in the first 8 digits of S

[true: they are respectively (1,3,5,1,1) and (1,2,3,5,8,1,2,1)]

$8/12$ means that there are 8 odd digits in the first 12 digits of S

[true: they are respectively (1,3,5,1,1,9,3,1) and (1,2,3,5,8,1,2,1,9,3,1,4)]

$12/19$ means that there are 8 odd digits in the first 12 digits of S

[true: they are respectively (1,3,5,1,1,9,3,1,9,1,7,3) and (1,2,3,5,8,1,2,1,9,3,1,4,9,6,1,7,2,8,3)]

$19/31$ means that there are 19 odd digits in the first 31 digits of S

[true: they are respectively (1,3,5,1,1,9,3,1,9,1,7,3,9,1,5,1,1,1,3) and (1,2,3,5,8,1,2,1,9,3,1,4,9,6,1,7,2,8,3,9,4,1,0,5,1,1,6,1,3,2,2)]

etc.

Could someone compute S, if this is of interest?

14 May 2020 update

I think the hereunder new S beats the example above:

$S_n = 1, 2, 3, 5, 8, 11, 21, 31, 41, 51, 62, 80, 201, 311, 331, 351, 371, 391, 511, 531, 551, 571, 590, 711, 731, 751, 761, 771, 781, 791, 801, 812, 822, 832, 842, 852, 862, 872, 882, 892, 902, 912,$

922, 932, 942, 952, 962, 972, 982, 992, 1002, ...

Let's see now:

$1/2$ means that there is 1 odd digit in the first 2 digits of S

[true: they are respectively (1) and (1,2)]

$2/3$ means that there are 2 odd digits in the first 3 digits of S

[true: they are respectively (1,3) and (1,2,3)]

$3/5$ means that there are 3 odd digits in the first 5 digits of S

[true: they are respectively (1,3,5) and (1,2,3,5,8)]

$5/8$ means that there are 5 odd digits in the first 8 digits of S

[true: they are respectively (1,3,5,1,1) and (1,2,3,5,8,1,2,1)]

$8/11$ means that there are 8 odd digits in the first 11 digits of S

[true: they are respectively (1,3,5,1,1,1,3,1) and (1,2,3,5,8,1,1,2,1,3,1)]

$11/21$ means that there are 11 odd digits in the first 21 digits of S

[true: they are respectively (1,3,5,1,1,1,3,1,1,5,1)

and (1,2,3,5,8,1,1,2,1,3,1,4,1,5,1,6,2,8,0,2,0)]

$21/31$ means that there are 21 odd digits in the first 31 digits of S

[true: they are respectively (1,3,5,1,1,1,3,1,1,5,1,1,3,1,1,3,3,1,3,5,1)

and (1,2,3,5,8,1,1,2,1,3,1,4,1,5,1,6,2,8,0,2,0,1,3,1,1,3,3,1,3,5,1)]

$31/41$ means that there are 31 odd digits in the first 41 digits of S

[true: they are respectively

(1,3,5,1,1,1,3,1,1,5,1,1,3,1,1,3,3,1,3,5,1,3,7,1,3,9,1,5,1,1,5) and (1,2,3,5,8,1,1,2,1,3,1,4,1,5,1,6,2,8,0,2,0,1,3,1,1,3,3,1,3,5,1)]; etc.



MFH 18 mai 2020 à 15:39

I agree up to 201 but then my program suggests 331, 511, 711, ...(jumps of 200)..., 2111, 3111, 4111, 5111, 6111, 7200 ...(some fancy values)... 20000,

26000, 40000, 60000, 80000, 200000, 400000, 600000, 800000... I think 311 can't be right because one has $a(n+1) \geq 2a(n) - a(n-1)$ (we had exactly $a(n-1)$ odd digits among the first $a(n)$ digits, and now we need $a(n)$ odd digits among the $a(n+1)$ first digits, so we have to add at least $a(n) - a(n-1)$ more odd digits *after* the $a(n)$ -th digit). This gives here $a(14) \geq 2 \cdot 201 - 80 = 322$.

RÉPONDRE

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A square for three (chess)

juin 22, 2024



(English translation after the French text) Voici cinq problèmes d'échecs disjoints : a) combien faut-il de coups au minimum pour que trois pions soient capturés sur la même case ? b) trois tours c) trois c ...

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Le tripalin se présente

avril 11, 2024



Un tripalin est constitué de trois images. Chaque image illustre un substantif. Accolés, ces trois substantifs forment une chaîne palindromique. Laquelle nous vous invitons à trouver. Exer ...

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Some strings au cinéma Galeries

juillet 19, 2024

Lettre ouverte au cinéma Galeries Bonsoir à tous, Je viens de voir pour la seconde fois chez vous le beau film de Léos Carax (la première fois c'était le 26 juin en présence du réalisateur, au BRIFF). Apparus à l'écran aujourd'hui, avant la projection propre ...

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