

**Conjecture on the primes  $S(n+1)+S(n)-1$  where  $S(n)$  is  
a term in the concatenated odd sequence**

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**Abstract.** In this paper I make the following conjecture:  
There exist an infinity of primes  $S(n+1) + S(n) - 1$ ,  
where  $S(n)$  is a term in Smarandache concatenated odd  
sequence (which is defined as the sequence obtained  
through the concatenation of the first  $n$  odd primes).

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**The concatenated odd sequence:**

(A089933 in OEIS)

: 3, 35, 357, 35711, 3571113, 357111317, 35711131719,  
3571113171923, 357111317192329, 35711131719232931,  
3571113171923293137, 357111317192329313741,  
35711131719232931374143, 3571113171923293137414347  
(...)

Note: Florentin Smarandache conjectured that there  
exist an infinity of prime terms of this sequence.  
The terms of this sequence are primes for the  
following values of  $n$ : 2, 10, 16, 34, 49, 2570 (the  
term corresponding to  $n = 2570$  is a number with 9725  
digits); there is no other prime term known though  
where checked the first about 26 thousand terms of  
this sequence.

**The primes of the form  $P = S(n+1) + S(n) - 1$ :**

:  $P_1 = 37 = S(2) + S(1) - 1 =$   
 $35 + 35 - 1;$   
:  $P_2 = 36067 = S(4) + S(3) - 1 =$   
 $35711 + 357 - 1;$   
:  $P_3 = 360682429 = S(6) + S(5) - 1 =$   
 $357111317 + 3571113 - 1;$   
:  $P_4 = 360682430364251 = S(9) + S(8) - 1 =$   
 $357111317192329 + 3571113171923 - 1;$   
:  $P_5 = 36068243036425260687883$   
 $= S(14) + S(13) - 1 = 35711131719232931374143$   
 $+ 357111317192329313741 - 1;$

: P6 = 360682430364252606878849099 = S(16) + S(15) - 1  
 = 357111317192329313741434753 +  
 3571113171923293137414347 - 1;  
 : P7 = 3606824303642526068788491011321293943  
 = S(21) + S(20) - 1 =  
 3571113171923293137414347535961677173 +  
 35711131719232931374143475359616771 - 1;  
 (...)

Note that there also exist primes of the form  $Q = S(n+1) - S(n) + 1$ ; I conjecture that there exist an infinity of such primes too:

: Q1 = 3535403 = S(4) - S(3) + 1 = 3571113 - 35711 + 1;  
 : Q2 = 35354020402040603 = S(10) - S(9) + 1 =  
 35711131719232931 - 357111317192329 + 1;  
 : Q3 = 3535402040204060207 = S(11) - S(10) + 1 =  
 3571113171923293137 - 35711131719232931 + 1;  
 (...)