

**On terms of consecutive numbers sequence concatenated both to the left and to the right with same prime**

**Abstract.** In this paper I make the following conjecture: For any term  $S(n)$  of the *Smarandache consecutive numbers sequence* (1, 12, 123, 1234, 12345, 123456, 1234567...) there exist an infinity of primes  $p$  such that the number  $q$  obtained concatenating  $S(n)$  both to the left and to the right with  $p$  is prime.

**Conjecture:**

For any term  $S(n)$  of the Smarandache consecutive numbers sequence (1, 12, 123, 1234, 12345, 123456, 1234567...) there exist an infinity of primes  $p$  such that the number  $q$  obtained concatenating  $S(n)$  both to the left and to the right with  $p$  is prime.

**The sequence of primes  $q$  for  $S(n) = 1$ :**

: 313, 17117, 29129, 41141, 47147, 59159, 71171,  
89189, 1131113, 1311131, 1371137, 2391239, 2631263,  
3591359, 3891389, 4431443, 4611461, 4671467, 5091509  
(...)

**The sequence of primes  $q$  for  $S(n) = 12$ :**

: 7127, 111211, 131213, 231223, 371237, 411241,  
531253, 591259, 10112101, 17912179, 22912229,  
24112241, 29312293, 30712307, 31112311, 4191249,  
47912479 (...)

**The sequence of primes  $q$  for  $S(n) = 123$ :**

: 71237, 3112331, 5312353, 6112361, 6712367, 8912389,  
9712397, 103123103, 131123131, 151123151, 167123167,  
173123173, 193123193, 211123211, 227123227,  
241123241, 251123251, 271123271, 307123307,  
311123311, 313123313, 379123379, 389123389,  
421123421, 449123449 (...)

**The sequence of primes  $q$  for  $S(n) = 1234$ :**

: 312343, 71123471, 1491234149, 2271234227,  
2511234251, 3531234353 (...)

**The sequence of primes  $q$  for  $S(n) = 12345$ :**

: 111234511, 311234531, 371234537, 531234553,  
711234571, 11312345113, 13112345131, 15112345151,  
15712345157, 17912345179, 19312345193, 24112345241,  
31112345311, 34712345347, 35312345353, 38912345389,  
40112345401, 44312345443, 44912345449, 47912345479,  
49912345499 (...)

**The sequence of primes  $q$  for  $S(n) = 123456$ :**

: 71234567, 1912345619, 311234563, 4712345647,  
7312345673, 127123456127, 131123456131,  
157123456157, 167123456167, 179123456179,  
181123456181, 193123456193, 227123456227,  
229123456229, 233123456233, 281123456281,  
313123456313, 317123456317, 353123456353,  
359123456359, 409123456409, 421123456421,  
443123456443, 449123456449, 487123456487 (...)

**The sequence of primes  $q$  for  $S(n) = 1234567$ :**

: 71123456771, 1311234567131, 1371234567137,  
1491234567149, 2571234567257 (...)

**The sequence of primes  $q$  for  $S(n) = 12345678$ :**

: 611234567861, 831234567883, 10712345678107,  
18112345678181, 21112345678211, 29312345678293,  
34712345678347, 35912345678359, 37912345678379,  
38912345678389, 40912345678409, 45712345678457,  
49112345678491, 49912345678499 (...)

**The sequence of primes  $q$  for  $S(n) = 123456789$ :**

: 1712345678917, 6712345678967, 227123456789227,  
281123456789281, 353123456789353, 409123456789409  
(...)

**Note:** the numbers from sequences above covers all possibilities up to  $S(n) = 123456789$  and  $p \leq 509$ .

**The least prime  $q$  for  $S(n) = 12345678910$ :**

: 831234567891083, for  $p = 83$ .

**The least prime  $q$  for  $S(n) = 123456789101112131415161718$ :**

: 71234567891011121314151617187, for  $p = 7$ .