

**A recreative conjecture on primes obtained inserting  $n$  with digit sum 12 after the first digit of a prime**

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**Abstract.** In this paper I conjecture that for any prime  $p$ ,  $p \geq 5$ , there exist a prime  $q$  obtained inserting a number  $n$  with the sum of digits equal to 12 after the first digit of  $p$ .

**Conjecture:**

For any prime  $p$ ,  $p \geq 5$ , there exist a prime  $q$  obtained inserting a number  $n$  with the sum of digits equal to 12 after the first digit of  $p$ .

**The sequence of the least primes  $q$  obtained for  $p$  primes,  $p \geq 5$ :**

: 557, 397, 1481, 1483, 1487, 1399, 2393, 2399, 3391, 3847, 4391, 4483, 4397, 5393, 5399, 6481, 6397, 7481, 7393, 7489, 8573, 8669, 9397, 13901, 13903, 13907, 17509, 13913, 14827, 13931, 113837, 15739, 15749, 14851, 16657, 13963, 13967, 15773, 14879, 17581, 14891, 16693, 13997, 13999, 23911, 212923, 26627, 23929, 25733, 27539, 24841, 24851 (...)

The corresponding  $[p, n]$  for the fifty terms above:

[5, 57], [7, 39], [11, 48], [13, 48], [17, 48], [19, 39], [23, 39], [29, 39], [31, 39], [37, 84], [41, 39], [43, 48], [47, 39], [53, 39], [59, 39], [61, 48], [67, 39], [71, 48], [73, 39], [79, 48], [83, 57], [89, 66], [97, 39], [101, 39], [103, 39], [107, 39], [109, 75], [113, 39], [127, 48], [131, 39], [137, 138], [139, 57], [149, 57], [151, 48], [157, 66], [163, 39], [167, 39], [173, 57], [179, 48], [181, 75], [191, 48], [193, 66], [197, 39], [199, 39], [211, 39], [223, 129], [227, 66], [229, 39], [233, 57], [239, 75], [241, 48], [251, 48].

Note that for 40 from the 50 terms above  $n$  is 39, 48 or 57! For 4 terms  $n$  is 66, for 3 terms  $n$  is 75, for one term  $n$  is 84, for one term  $n$  is 129 and for one term  $n$  is 138.

**The least primes q obtained for ten consecutive primes with 10 digits:**

: 96174894931, 961748941927, 961748951291, 96174896939,  
96174898847, 96174899933, 96174902573, 96174903577,  
961749041473, 96174906937.

The corresponding [p, n] for the ten terms above:

[961748941, 93], [961748947, 192], [961748951, 129],  
[961748969, 93], [961748987, 84], [961748993, 93],  
[961749023, 57], [961749037, 57], [961749043, 147],  
[961749067, 93].

Note that for 4 from the 10 terms above n is 93! And n is not greater than 192 (which is just the 15th highest number having the digit sum 12) for any term!

**The least primes q obtained for five random primes with 30 digits** (actually not randomly chosen by me but presented as "random 30 digit primes" on "Prime Pages" site):

: 671998030559713968361666935761659,  
282174488599599500573849980904179,  
521419622856657689423872613771291,  
362736035870515331128527330651479,  
11575698666830365789896246795577.

The corresponding [p, n] for the ten terms above:

[671998030559713968361666935769, 165],  
[282174488599599500573849980909, 417],  
[521419622856657689423872613771, 129],  
[362736035870515331128527330659, 147],  
[115756986668303657898962467957, 57].

Note that n is not greater than 417 (which is just the 36th highest number having the digit sum 12) for any term!