

Primes obtained deconcatenating with a group of k digits of 0 the factorial numbers then adding or subtracting 1

Abstract. In this paper I state the following two conjectures: (I) For any k non-null positive integer there exist a sequence having an infinity of prime terms obtained deconcatenating to the right with a group with k digits of 0 the factorial numbers and adding 1 to the resulted number; (II) for any k non-null positive integer there exist a sequence having an infinity of prime terms obtained deconcatenating to the right with a group with k digits of 0 the factorial numbers and subtracting 1 from the resulted number. It is worth noting the pair of twin primes having 49 digits each obtained for $k = 9$:
(5502622159812088949850305428800254892961651752959,
5502622159812088949850305428800254892961651752961).

The sequence of factorial numbers $n! = 1*2*3*...*n$
(A000142 in OEIS):

: 1, 1, 2, 6, 24, 120, 720, 5040, 40320, 362880,
3628800, 39916800, 479001600, 6227020800,
87178291200, 1307674368000, 20922789888000,
355687428096000, 6402373705728000,
121645100408832000, 2432902008176640000,
51090942171709440000, 1124000727777607680000 (...)

Conjecture I:

For any k non-null positive integer there exist a sequence having an infinity of prime terms p obtained deconcatenating to the right with a group with k digits of 0 the factorial numbers and adding 1 to the resulted number.

The sequence of primes p for $k = 1$:

: 13, 73, 3991681, 2585201673888497664001,
40329146112660563558400001,
1376375309122634504631597958158090240000001 (...)

The sequence of primes p for $k = 2$:

: 62270207, 871782911, 24329020081766401 (...)

The least prime p for the following values of k:

: 1307674369, for $k = 3$;

: 243290200817663, for k = 4;
 : 2652528598121910586363084801, for k = 5;
 : 37199332678990121746799944815083521, for k = 7;
 : 8159152832478977343456112695961158942721, for k = 8;
 : 5502622159812088949850305428800254892961651752961,
 for k = 9.

Conjecture II:

For any k non-null positive integer there exist a sequence having an infinity of prime terms p obtained deconcatenating to the right with a group with k digits of 0 the factorial numbers and subtracting 1 from the resulted number.

The sequence of primes p for k = 1:

: 11, 71, 503, 622702079, 35568742809599,
 3048883446117136050150399999 (...)

The sequence of primes p for k = 2:

: 871782913, 3556874280959, 64023737057279,
 510909421717094399,
 86833176188118864955181944012799999 (...)

The least prime p for the following values of k:

: 121645100408831, for k = 3;
 : 243290200817663, for k = 4;
 : 4032914611266056355841, for k = 5;
 : 304888344611713860501503, for k = 6;
 : 52302261746660111176000722410007429119, for k = 7;
 : 137637530912263450463159795815809023, for k = 8.
 : 5502622159812088949850305428800254892961651752959,
 for k = 9.

Observation:

It is worth noting the pair of twin primes having 49 digits each obtained for k = 9:
 (5502622159812088949850305428800254892961651752959,
 5502622159812088949850305428800254892961651752961).