

## Observations on Poulet numbers having only odd digits based on their reversals

Marius Coman  
email: mariuscoman13@gmail.com

**Abstract.** The set of Poulet numbers having only odd digits is: 1333333, 1993537, 3911197, 5351537, 5977153, 7759937, 11777599... (22 from the first 7196 Poulet numbers belong to this set). Question: is this sequence infinite? Observations: the numbers  $n \cdot P + R(P) - n$  respectively  $P + n \cdot R(P) - n$ , where  $R(P)$  is the reversal of  $P$  and  $n$  positive integer, are often primes. Examples: for  $P = 1333333$ , the number  $1333333 + 3333331 - 1 = 4666663$ , prime; also  $3 \cdot 1333333 + 3333331 - 3 = 7333327$ , prime; also  $5 \cdot 1333333 + 3333331 - 5 = 9999991$ , prime. For the same  $P$ , the number  $1333333 + 2 \cdot 3333331 - 2 = 7999993$ , prime; also the number  $1333333 + 4 \cdot 3333331 - 4 = 14666653$ , prime.

**The first twenty-two Poulet numbers having only odd digits**  
(complete set up to the 7196-th Poulet number):

1333333, 1993537, 3911197, 5351537, 5977153, 7759937, 11777599,  
15139199, 17777191, 33193117, 53711113, 59913157, 59955331,  
79539197, 79739713, 151533377, 177951973, 191191933, 971515777,  
977755351, 1191153937, 1791157537.

**Question:** is this sequence infinite?

### Observation:

The numbers  $n \cdot P + R(P) - n$ , where  $R(P)$  is the reversal of  $P$ ,  $P$  is Poulet number having only odd digits and  $n$  positive integer, are often primes.

Primes for  $n$  smaller than or equal to 5 are obtained for 7 from the first 22 such numbers  $P$ :

:  $1 \cdot 1333333 + 3333331 - 1 = 4666663$ , prime, also  
:  $3 \cdot 1333333 + 3333331 - 3 = 7333327$ , prime, also  
:  $5 \cdot 1333333 + 3333331 - 5 = 9999991$ , prime;  
  
:  $2 \cdot 5351537 + 7351535 - 2 = 18054607$ , prime;  
  
:  $3 \cdot 5977153 + 3517795 - 3 = 21449251$ , prime, also  
:  $4 \cdot 5977153 + 3517795 - 4 = 27426403$ , prime;  
  
:  $5 \cdot 11777599 + 99577711 - 5 = 158465701$ , prime;

:  $4 \cdot 17777191 + 19177771 - 4 = 158465701$ , prime, also  
 :  $5 \cdot 17777191 + 19177771 - 5 = 108063721$ , prime;  
  
 :  $5 \cdot 191191933 + 339191191 - 5 = 1295150851$ , prime;  
  
 :  $1 \cdot 977755351 + 153557779 - 1 = 1131313129$ , prime.

**Observation:**

The numbers  $P + n \cdot R(P) - n$ , where  $R(P)$  is the reversal of  $P$ ,  $P$  is Poulet number having only odd digits and  $n$  positive integer, are often primes.

Primes for  $n$  smaller than or equal to 5 are obtained for 11 from the first 22 such numbers  $P$ :

:  $1333333 + 1 \cdot 3333331 - 1 = 4666663$ , prime,  
 :  $1333333 + 2 \cdot 3333331 - 2 = 7999993$ , prime, also  
 :  $1333333 + 4 \cdot 3333331 - 4 = 14666653$ , prime;  
  
 :  $3911197 + 5 \cdot 7911193 - 5 = 43467157$ , prime;  
  
 :  $11777599 + 5 \cdot 99577711 - 5 = 509666149$ , prime;  
  
 :  $17777191 + 5 \cdot 19177771 - 5 = 113666041$ , prime;  
  
 :  $53711113 + 5 \cdot 31111735 - 5 = 209269783$ , prime;  
  
 :  $79739713 + 3 \cdot 31793797 - 3 = 175121101$ , prime, also  
 :  $79739713 + 5 \cdot 31793797 - 5 = 238708693$ , prime;  
  
 :  $151533377 + 5 \cdot 773335151 - 5 = 4018209127$ , prime;  
  
 :  $177951973 + 2 \cdot 379159771 - 2 = 936271513$ , prime, also  
 :  $177951973 + 5 \cdot 379159771 - 5 = 2073750823$ , prime;  
  
 :  $191191933 + 2 \cdot 339191191 - 2 = 869574313$ , prime;  
  
 :  $971515777 + 3 \cdot 777515179 - 3 = 3304061311$ , prime, also  
 :  $971515777 + 4 \cdot 777515179 - 4 = 4081576489$ , prime;  
  
 :  $977755351 + 1 \cdot 153557779 - 1 = 1131313129$ , prime.