# Three sequences of primes obtained using the digital root and the digital sum of a prime

Marius Coman
email: mariuscoman13@gmail.com

**Abstract.** In this paper I make the following three conjectures: (I) The set of the primes which are obtained concatenating to the left a prime with its digital sum is infinite; (II) The set of the primes which are obtained concatenating to the left a prime with its digital root is infinite; (III) The set of the primes which are equal to the sum of a prime p with the number obtained concatenating to the left p with its digital sum and the number obtained concatenating to the left p with its digital root is infinite.

**Conjecture I:**

The set of the primes which are obtained concatenating to the left a prime with its digital sum is infinite.

The sequence of these primes:
: 211 (11 concatenated to the left with s(11) = 2);
: 1019 (19 concatenated to the left with s(19) = 10);
: 523 (23 concatenated to the left with s(23) = 5);
: 1129 (29 concatenated to the left with s(29) = 11);
: 431 (31 concatenated to the left with s(31) = 4);
: 541 (41 concatenated to the left with s(41) = 5);
: 743 (43 concatenated to the left with s(43) = 7);
: 853 (53 concatenated to the left with s(53) = 8);
: 1459 (59 concatenated to the left with s(59) = 14);
: 761 (61 concatenated to the left with s(61) = 7);
: 1367 (67 concatenated to the left with s(67) = 13);
: 1789 (89 concatenated to the left with s(89) = 17);
: 1697 (97 concatenated to the left with s(97) = 16);
: 5113 (113 concatenated to the left with s(113) = 5);
: 14149 (149 concatenated to the left with s(149) = 14);
: 7151 (151 concatenated to the left with s(151) = 7);
: 10163 (163 concatenated to the left with s(163) = 10);
(...)

**Conjecture II:**

The set of the primes which are obtained concatenating to the left a prime with its digital root is infinite.

The sequence of these primes:

```
:    211   (11 concatenated to the left with r(11) = 2);
:    523   (23 concatenated to the left with r(23) = 5);
:    229   (29 concatenated to the left with r(29) = 2);
:    431   (31 concatenated to the left with r(31) = 4);
:    137   (37 concatenated to the left with r(37) = 1);
:    541   (41 concatenated to the left with r(41) = 5);
:    743   (43 concatenated to the left with r(43) = 7);
:    853   (53 concatenated to the left with r(53) = 8);
:    761   (61 concatenated to the left with r(61) = 7);
:    467   (67 concatenated to the left with r(67) = 4);
:    173   (73 concatenated to the left with r(73) = 1);
:    283   (83 concatenated to the left with r(83) = 2);
:    797   (97 concatenated to the left with r(97) = 7);
:    1109  (109 concatenated to the left with r(109) = 1);
:    5113  (113 concatenated to the left with r(113) = 5);
:    2137  (137 concatenated to the left with r(137) = 2);
:    4139  (139 concatenated to the left with r(139) = 4);
:    7151  (151 concatenated to the left with r(151) = 7);
:    4157  (157 concatenated to the left with r(157) = 4);
:    1163  (163 concatenated to the left with r(163) = 1);
     (...)
```

**Conjecture III:**

The set of the primes which are equal to the sum of a prime p with the number obtained concatenating to the left p with its digital sum and the number obtained concatenating to the left p with its digital root is infinite.

The sequence of these primes:

```
:    433   (= 11 + 211 + 211);
:    839   (= 13 + 413 + 413);
:    1069  (= 23 + 523 + 523);
:    1123  (= 41 + 541 + 541);
:    1759  (= 53 + 853 + 853);
:    1583  (= 61 + 761 + 761);
:    1901  (= 67 + 1367 + 467);
:    1319  (= 73 + 1073 + 173);
:    1549  (= 83 + 1183 + 283);
:    2767  (= 89 + 1789 + 889);
:    2591  (= 97 + 1697 + 797);
:    17417 (= 139 + 13139 + 4139);
:    19447 (= 149 + 14149 + 5149);
:    17471 (= 157 + 13157 + 4157);
:    11489 (= 163 + 10163 + 1163);
     (...)
```