

Smarandache-Wellin Numbers and Primes

A **Smarandache-Wellin Number**, $SWN(n)$, in a given base b , is a number resulted from the concatenation of first consecutive prime numbers.

For example, in base 10:

$SW(n) = 23571113171923\dots p_n$, where p_n is the n^{th} prime.

A **Smarandache-Wellin Prime**, $SWP(n)$, in a given base b , is a Smarandache-Wellin Number which is prime.

For example, in base 10, we have as SWP: 2, 23, 2357.

Another SWP is a 355-digit number
2357111317192329313741434753...677683691701709719

Question 1: How many SWP are? What is the largest SWP known?

Question 2 (F. Smarandache): How many primes, in a given base b , are composed of digits which are primes, but not necessarily consecutive primes?

For example: in base 10, we have $197 = \text{prime}$ and it is formed by the concatenation of primes 19 and 7.

While $809 = \text{prime}$, but its digits are not all primes (8 or 80 are not prime).

References:

R. Crandall and C. Pomerance, Prime [Numbers](#): A Computational Perspective, Springer, NY, 2001: 72

H. Ibstedt, A Few [Smarandache Sequences](#), [Smarandache Notions Journal](#), Vol. 8, No. 1-2-3, 1997: 170 - 183