ON DISTRIBUTION OF PRIME NUMBERS.

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Abstract. An interesting detail in the distribution of prime numbers. .

1. Details

Consider a set of first n prime numbers:

$$p_1 = 1, p_2 = 3, p_3 = 5, ... \tag{1}$$

including 1 and excluding 2. A total number of sums $p_i + p_j, 1 \leq i, j \leq n$ from the set (1) is

$$E_n = C(n,2) + n = \frac{n!}{2!(n-2)!} + n = \frac{n(n+1)}{2} \tag{2}$$

Not all values of sums $p_i + p_j, 1 \leq i, j \leq n$ are different. Let define the number of different sums $p_i + p_j, 1 \leq i, j \leq n$ be D_n, which is such as

$$D_n \leq E_n \tag{3}$$

In a following table we provide first values of discussed parameters. In the first column is a number n, second column contain D_n,third column is a value of p_n.

n	D_n	p_n
1	1	1
2	3	3
3	5	5
4	7	7
5	10	11
6	13	13
7	16	17
8	19	19

If to calculate D_n for bigger n by simple algorithm final result id presented at Fig.1 On horizontal axis is index n of prime number $p_n, 1 \leq n \leq 128$.The vertical axis are values of primes. Reddots are primes from 1 to 128, green dots are D_n. Blue dots are $\pi(n) = \frac{n}{\ln n}$ - standard asymptotic distribution of primes.
Looking at Fig.1 one can formulate a statement that **any prime number p_n is approximately equal to the number of different sums $p_i + p_j, 1 \leq i, j < n$ from the set in Eq.1**

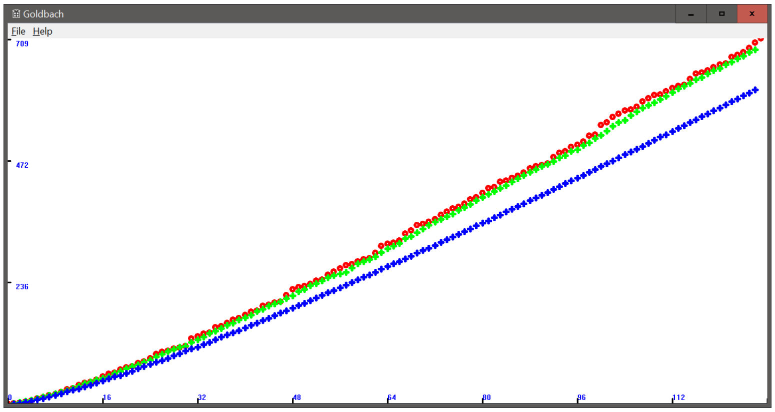

FIGURE 1. Fig,1 Dependence of P_n, D_n from n. Reddots are primes from 1 to 128, green dots are D_n. Blue dots are $\pi(n) = \frac{n}{\ln n}$ - standard asymptotic distribution of primes.