
Zbl 419.10040
Erdős, Paul; Sárközy, András
On the prime factors of $\binom{n}{k}$ and of consecutive integers. (In English)
Util. Math. 16, 197-215 (1979). [0315-3681]

Let m_k denote the smallest integer m such that $\binom{m}{k}$ has more than k distinct prime factors. It was shown by *P.Erdős, H.Gupta* and *S.P.Khare* [Utilitas Math. 10, 51-60 (1976; Zbl 339.10006)] that $m_k > Ck^2 \log k$. Using deep results on the distribution of primes the present authors show that $\log k$ can replaced by

$$(\log k)^{4/3}(\log\log k)^{-4/3}(\log\log\log k)^{-1/3}.$$

Also let n_k denote the smallest integer n such that the numbers $n+1, \dots, n+k$ all have a prime factor exceeding k. It is shown by elementary means that, for sufficiently large k, $n_k > \frac{1}{16}k^{5/2}$. This bounded is probably nowhere near the best possible.

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Classification:
11N05 Distribution of primes
11A41 Elemementary prime number theory
05A10 Combinatorial functions

Keywords:
binomial coefficient; consecutive integers; distinct prime factors