Generating All Odd Primitive Abundant Numbers with $d$ Prime Divisors.

For an integer $n$, if the sum of the proper divisors of $n$ equals or exceeds $n$, then we say that $n$ is an abundant number. An abundant number is said to be primitive if none of its proper divisors are abundant. An abundant number must have at least one primitive abundant divisor. In 1913, Dickson proved that for an arbitrary positive integer $d$ there exists only finitely many odd primitive abundant numbers having exactly $d$ distinct prime divisors. In 2017, all odd primitive abundant numbers with up to 5 distinct prime divisors have been found by Dičiūnas. In this paper, we describe a fast algorithm that finds all odd primitive abundant numbers with $d$ distinct prime divisors. We use this algorithm to find all odd primitive abundant numbers with 6 distinct prime divisors. An abundant number $n$ is said to be weird if no subset of the proper divisors of $n$ sums to $n$. We use our algorithm to show that an odd weird number must have at least 6 prime divisors. (Received August 06, 2018)