1050-11-34 **Florian Luca*** (`fluca@matmor.unam.mx`), Mathematical Institute, UNAM, 58089 Morelia, Michoacan, Mexico. *Variants of a problem of Erdos and Romanov.* Preliminary report.

Romanov proved that there is a positive proportion of odd positive integers of the form $2^n + p$ for some positive integer n and prime p. Erdős proved that the odd integers not representable in this way also account for a positive proportion of all the integers. Note that if m is a positive integer of the latter kind, then $m-1$ is even and not representable under the form $2^n + (p-1) = 2^n + \phi(p)$ for any positive integer n and prime p, where ϕ is the Euler function. Similarly, $m+1$ is even and not representable under the form $2^n + (p+1) = 2^n + \sigma(p)$ for any positive integer n and prime p, where σ is the sum of divisors function. It makes sense to ask if we can remove the assumption that p is prime in the above statements and prove that there are infinitely many positive integers not of the form $2^n + \phi(m)$, or not of the form $2^n + \sigma(m)$ for any positive integers n and m, respectively. In my talk, I will prove that the answer to the above questions is yes. In fact, each of the above two sets of positive integers has a positive lower density. We shall also discuss some related problems and pose some open questions.

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