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Carl Pomerance*, Mathematics Department, HB 6188, Hanover, NH 03755. *Some statistical problems concerning the arithmetic functions σ and φ .* Preliminary report.

Let σ be the sum-of-divisors function and let φ be Euler's function. Some famously hard problems: Are there infinitely many solutions to $n \mid \sigma(n)$ or any odd solutions $n > 1$? Are there any composite solutions to $\varphi(n) \mid n - 1$? Short of solving these and similar problems, one can perhaps move to more tractable ground by framing them statistically; that is, as counting problems. For example, how many composite solutions to $\varphi(n) \mid n - 1$ are there in $[1, x]$ as x grows? A small upper bound for such a count can then be regarded as progress towards the possibility that there are no solutions. In this talk I will discuss recent developments with problems of this type representing joint work in several papers with A. Anavi, F. Luca, P. Pollack, and E. Treviño. (Received September 05, 2012)