A unifying probabilistic interpretation of Benford’s Law (joint work with Elise Janvresse (Rouen))

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Abstract:

We propose a probabilistic interpretation of Benford’s law, which predicts the probability distribution of all digits in everyday-life numbers. Heuristically, our point of view consists in considering an everyday-life number as a continuous random variable taking value in an interval $[0, A]$, whose maximum $A$ is itself an everyday-life number. This approach can be linked to the characterization of Benford’s law by scale-invariance, as well as to the convergence of a product of independent random variables to Benford’s law. It also allows to generalize Flehinger’s result about the convergence of iterations of Cesaro-averages to Benford’s law.