Limit Theorems for Sums of Independent Indicators, with Application to Karlin's Occupancy Scheme

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Let $X(t)$ be an infinite sum of independent indicators parameterized by t. As a warm-up, I shall present a central limit theorem and a result on the convergence of exponential moments of $X(t)$ as $t \to \infty$. Our main result is a law of the iterated logarithm (LIL) for $X(t)$. I shall explain that if the expectation b and the variance a of the sum are comparable, then the normalization in the LIL includes the iterated logarithm of a. If the expectation grows faster than the variance, while the ratio $\log a / \log b$ remains bounded, then the normalization in the LIL includes the single logarithm of a. Finally, I shall discuss an application of the LIL to the number of occupied boxes and related quantities in Karlin's occupancy scheme.

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