Combinatorics Seminar

Two problems in asymptotic combinatorics

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Abstract: I will divide the talk between two topics. The first is Stirling numbers of the second kind, $S(n,k)$. For each n the maximum $S(n,k)$ is achieved either at a unique $k = K_n$, or is achieved twice consecutively at $k = K_n, K_n + 1$. Call those n of the second kind *exceptional*. Is $n = 2$ the only exceptional integer? The second topic is $m \times n$ nonnegative integer matrices all of whose rows sum to s and all of whose columns sum to t, $ms = nt$. We have an asymptotic formula for the number of these matrices, valid for various ranges of $(m, s; n, t)$. Although obtained by a lengthy calculation, the final formula is succinct and has an interesting probabilistic interpretation. The work presented here is collaborative with Carl Pomerance and Brendan McKay, respectively.

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