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ENUMERATIVE COMBINATORICS FOR THE LUCE MODEL FOR RANDOM PERMUTATIONS

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A host of non-uniform distributions on combinatorial objects has recently been the focus of study, Mallows model and the Ewens sampling formula for random permutations are examples. In this talk, I report joint work with Sourav Chatterjee and Gene Kim on the Luce model. Here, each of the symbols $1, 2, \dots, n$ has a weight, $w(i)$ for i say. The weights are 'put in an urn' and sampled WITHOUT replacement, each time sampling i with probability proportional to its weight among the remaining objects. This gives a family of measures on S_n . These measures are widely used in applications (in psychology, taste testing experiments, to settle poker tournaments, and assess chances in horse racing). Think of $w(i) = 1/i$ for a widely applicable special case. One may ask 'the usual questions: what is the distribution of the number of fixed points, number of cycles, length of longest cycle, and so on. Many of these problems are open and even simple questions seem challenging—what is the distribution of the last symbol sampled? I will explain the motivation(s) and report recent progress.