

The number of matrices and a random matrix with prescribed row and column sums and 0-1 entries

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Abstract

We consider the set of all 0-1 matrices with prescribed row and column sums. If the set is non-empty, we consider it as a finite probability space endowed with the uniform measure. I plan to review recent asymptotic formulas for cardinality of the set and the structure of a random matrix from the set. It turns out that a random matrix is likely to be very close to a particular matrix with the entries between 0 and 1 that maximizes the sum of entropies of the entries among all matrices with prescribed row and column sums. Similar results are obtained for 0-1 matrices with prescribed row and column sums and assigned 0's in some positions.