THE DISTRIBUTIONS OF THE ENTRIES OF A YOUNG TABLEAU

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Abstract

Let T be a standard Young tableau of shape $\lambda \vdash k$. We show the probability that a Young tableau of n cells contains T as a subtableau is, in the limit $n \to \infty$, equal to $f^\lambda/k!$, where f^λ is the number of all tableaux of shape λ. In other words, the probability that a large tableau contains T is equal to the number of tableaux whose shape is that of T, divided by $k!$. We give several applications, to the probabilities that a set of prescribed entries will appear in a set of prescribed cells of a tableau, and to the probabilities that subtableaux of given shapes will occur. Our argument rests on a notion of quasirandomness of families of permutations, and we give sufficient conditions for this to hold. This is joint work of Brendan McKay, Jennifer Morse and myself.

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