

## Maxima of the cells of an equiprobable multinomial

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### Abstract

Consider a sequence of multinomial random vectors with increasing number of equiprobable cells. We show that if the number of trials increases fast enough, the sequence of maxima of the cells after a suitable centering and scaling converges to the Gumbel distribution. While results are available for maxima of triangular arrays of independent random variables with certain types of distribution, such results in a dependent setup is new. We also prove that the maxima of a triangular sequence of appropriate Binomial random variables have the same limit distribution. An auxiliary large deviation result for multinomial distribution with increasing number of equiprobable cells may also be of independent interest.

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