An elementary approach to the asymptotic normality of the Stirling numbers

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Abstract

In this study, we mention an elementary approach to display the asymptotic normality of the form of the inclusion-exclusion. One of the most representative cases is the Stirling numbers of the second kind, which is used in numerous fields such as the combination, probability, and even statistics connecting with the left-truncated generalized Poisson distribution. It has many great properties so that it was carefully studied with various technical approaches to the estimates of the value, the estimate of the summation, i.e. Bell number, and the asymptotic behavior of the local limit theorem, etc. The interesting thing is that the elementary approach we mention is enough to cover all of the above results. We thus apply this approach to other general forms of the inclusion-exclusion.

Keyword: Stirling numbers of the second kind, asymptotic estimate, Bell number, local limit theorem, inclusion-exclusion