THE MAHONIAN PROBABILITY DISTRIBUTION ON WORDS IS ASYMPTOTICALLY NORMAL

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Abstract. This paper consists of two indpendent, but related parts. In the first part we show how how to use symbolic computation to derive explicit expressions for the first few moments of the number of implicants that a random Boolean function has, or equivalently the number of fixed-dimensional subcubes contained in a random subset of the n-deimensional cube. These explicit expressions suggest, but do not prove, that these random variables are always asymptotically normal.

The second part is a full, human-generated proof, of this asymptotic normality.

1. Introduction

2. Explicit Expressions for Moments of the Number of Low-Dimensional Subcubes in a Random Subest of the n-dimensional cube

COMING UP

3. Asymptotic Normality

References

[1] W. Feller, *An Introduction to Probability Theory and Its Application*, volume I, third edition, Wiley, New York, 1968.

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Accompanied by Maple package MahonianStat available from
`http://www.math.rutgers.edu/~zeilberg/mamarim/mamarimhtml/mahon.html`.
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