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A family of bivariate distributions generated by the bivariate Bernoulli distribution. (English)

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J. Am. Stat. Assoc. 80, 332-338 (1985).

If X_1, X_2, \dots is a sequence of independent Bernoulli random variables, the number of successes in the first n trials has a binomial distribution and the number of failures before the r th success has a negative binomial distribution. From both the binomial and the negative binomial distributions, the Poisson distribution is obtainable as a limit. Moreover, gamma distributions (integer shape parameters) are limits of negative binomial distributions, and the normal distribution is a limit of negative binomial Poisson, and gamma distributions. These basic facts from elementary probability have natural extensions to two dimensions because there is a unique natural bivariate Bernoulli distribution. In this article, such extensions yielding a family of bivariate distributions are obtained and studied.

MSC:

60E99 Distribution theory

60F05 Central limit and other weak theorems

Cited in **42** Documents

Keywords:

bivariate hypergeometric distribution; bivariate exponential distribution; binomial distribution; negative binomial distribution; gamma distributions

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