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BINOMIAL ARMA COUNT SERIES FROM RENEWAL PROCESSES

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Abstract

This paper describes a new method for generating stationary integer-valued time series from renewal processes. We prove that if the lifetime distribution of renewal processes is nonlattice and the probability generating function is rational, then the generated time series satisfy causal and invertible ARMA type stochastic difference equations. The result provides an easy method for generating integer-valued time series with ARMA type autocovariance functions. Examples of generating binomial ARMA$(p, p-1)$ series from lifetime distributions with constant hazard rates after lag p are given as an illustration.

Keywords: integer-valued time series, stochastic difference equations, autoregressive moving average, renewal process, lifetime distribution, probability generating function, palindromic polynomial, constant hazard rate.

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