

Geometric growth for stochastic difference equations with application to branching populations

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We investigate the asymptotic behaviour of discrete-time processes that satisfy a stochastic difference equation. We provide conditions to guarantee geometric growth on the whole set where these processes go to infinity. The class of processes considered includes homogeneous Markov chains. The results are of interest in population dynamics. In this work they are applied to two branching populations.

Keywords: branching processes; discrete-time processes; homogeneous Markov chains; stochastic difference equations