Models of population evolution
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Summary. We shall study three classes of stochastic processes that can be interpreted as theoretical models for the random evolution of populations
– the birth-and-death Markov chains, in the case of finite and infinite countable state space
– the Galton-Watson process, which was first considered by Galton and Watson while seeking a quantitative explanation for the phenomenon of the disappearance of family name, even in a growing population
– the so-called “Branching Markov chains”, which combine Markov chains and Galton-Watson process.

We will first study basic properties of Markov chains (definition, classification of states, irreducibility classes, spectral radius and the properties of recurrence/transience ...)

We will also try to develop further simulations with computers for these models in order to show explicitly their evolution with time.

References.
WOESS WOLFGANG Denumerable Markov Chains, EMS Textbooks in Mathematics 2009.

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