Introduction to branching processes

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We intend to present a brief introduction to the branching processes as they occur in modelling the population dynamics. We give a quick development of the so called semigroup approach, with transparent proofs and without requiring special preliminary knowledge on stochastic analysis and branching processes.

The following issues will be attained: The classical Galton-Watson process (abbreviated G-W process); Basic properties and examples, the G-W process as a Markov chain taking values in the positive integers, the extinction probability; The time continuous G-W process on N; Branching processes on N; Continuous-state branching processes (abbreviated CB-processes) on the positive half line, characterization by means of the branching kernels, examples; Branching processes with spatial motion; The associated nonlinear evolution equation; The induced total mass process as a time continuous G-W process or a CB-process.

References
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