

Manual for SOA Exam MLC.

Chapter 10. Markov chains.

Section 10.1. Stochastic processes.

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If T is an interval, $\{X(t) : t \in T\}$ is called a **continuous-time process**. Usually, $T = [0, \infty)$.

Let \mathbb{R}^T be the collection of functions from T into \mathbb{R} . A stochastic process $\{X(t) : t \in T\}$ defines a function from Ω into \mathbb{R}^T as follows $\omega \in \Omega \mapsto X(\cdot)(\omega) \in \mathbb{R}^T$. A stochastic process associates a function to each outcome ω . In some sense a stochastic process is a **random function**. The distribution of a stochastic process $\{X(t) : t \in T\}$ is the probability measure

$$\mathbb{P}\{\{X(t) : t \in T\} \in A\}, A \subset \mathbb{R}^T.$$