

2. Common Stochastic Processes

Common Stochastic Processes

A list of some special stochastic processes and their properties

The Bernoulli process

The stochastic process $\{X_n : n = 1, 2, \dots\}$ is called a **Bernoulli process** with success probability p if,

1. X_1, X_2, \dots are independent
2. $P(X_n = 1) = p, P(X_n = 0) = 1 - p = q$. for all n

The Bernoulli process $\{X(n)\}$ has state space $S = \{0, 1\}$ and index set $T = \{1, 2, 3, \dots\}$

The Binomial process

Let $\{X_n : n = 1, 2, \dots\}$ be a Bernoulli process with success probability p and let

$$S = \begin{cases} 0, & n = 0 \\ b & k \end{cases}$$