2. Common Stochastic Processes

Common Stochastic Processes

A list of some special stochastic processes and their properties

The Bernoulli process

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

1. $X_1, X_2, ...$ 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 $T = \{1, 2, 3, ...\}$

The Binomial process

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

$$S = \left\{ \begin{array}{cc} 0, & n = 0 \\ X_1 + X_2 + ... & n = 1, 2, ... \end{array} \right.$$