chapter 05

5.1 Introduction

5.2 The Exponential Distribution

Definition

5.2.1. Definition

Definition

5.2.2 Properties of the Exponential Distribution

Only exponential distribution is “memoryless"

Properties of the Exponential Distribution

5.2.3. Further Properties of the Exponential Distribution

Further Properties of the Exponential Distribution

5.3 The Poisson Process

5.3.1. Counting Processes

definition

Properties of the Counting Process

5.3.2. Definition of the Poisson Process

Definition 5.1

o(h)

Definition 5.2

Definition 5.3

Alternative definition of Poisson process

Proof of Theorem 5.1

5.3.3. Interarrival and Waiting Time Distributions

definition

Proposition 5.1

Remark

The Waiting time until the nth event

Derivation of Equation (5.13)

5.3.4. Further Properties of Poisson Processes

Proposition 5.2

Proof

5.3.5. Conditional Distribution of the Arrival Times

definition

Order statistics

Theorem 5.2

Proof

Sampling a Poisson Process

Remark

Application of Theorem 5.2 (Sampling a Poisson Process)

Proposition 5.3

Proof of Proposition 5.3

5.4 Generalizations of the Poisson Process

Nonhomogeneous Poisson Process

5.4.1 Nonhomogeneous Poisson Process

Definition 5.4

Time sampling of ordinary Poisson process

Proposition 5.4

5.4.2. Compound Poisson Process

Examples of Compound Poisson Processes

5.4.3 Conditional or Mixed Poisson Processes

The mean and variance of a conditional Possion

process

definition

Computing P{N(t) > n}