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Autore	Stapleton James H. <1931->
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Nota di contenuto	Models for Probability and Statistical Inference; Contents; Preface; 1. Discrete Probability Models; 1.1. Introduction; 1.2. Sample Spaces, Events, and Probability Measures; 1.3. Conditional Probability and Independence; 1.4. Random Variables; 1.5. Expectation; 1.6. The Variance; 1.7. Covariance and Correlation; 2. Special Discrete Distributions; 2.1. Introduction; 2.2. The Binomial Distribution; 2.3. The Hypergeometric Distribution; 2.4. The Geometric and Negative Binomial Distributions; 2.5. The Poisson Distribution; 3. Continuous Random Variables; 3.1. Introduction 3.2. Continuous Random Variables 3.3. Expected Values and Variances for Continuous Random Variables; 3.4. Transformations of Random Variables; 3.5. Joint Densities; 3.6. Distributions of Functions of Continuous Random Variables; 4. Special Continuous Distributions; 4.1. Introduction; 4.2. The Normal Distribution; 4.3. The Gamma Distribution; 5. Conditional Distributions; 5.1. Introduction; 5.2. Conditional Expectations for Discrete Random Variables; 5.3. Conditional Densities and Expectations for Continuous Random Variables; 6. Moment Generating Functions and Limit Theory; 6.1.

## Introduction

6.2. Moment Generating Functions 6.3. Convergence in Probability and in Distribution and the Weak Law of Large Numbers; 6.4. The Central Limit Theorem; 7. Estimation; 7.1. Introduction; 7.2. Point Estimation; 7.3. The Method of Moments; 7.4. Maximum Likelihood; 7.5. Consistency; 7.6. The  $\delta$ -Method; 7.7. Confidence Intervals; 7.8. Fisher Information, Cramer-Rao Bound and Asymptotic Normality of MLEs; 7.9. Sufficiency; 8. Testing of Hypotheses; 8.1. Introduction; 8.2. The Neyman-Pearson Lemma; 8.3. The Likelihood Ratio Test; 8.4. The p-Value and the Relationship between Tests of Hypotheses and Confidence Intervals; 9. The Multivariate Normal, Chi-Square, t, and F Distributions; 9.1. Introduction; 9.2. The Multivariate Normal Distribution; 9.3. The Central and Noncentral Chi-Square Distributions; 9.4. Student's t-Distribution; 9.5. The F-Distribution; 10. Nonparametric Statistics; 10.1. Introduction; 10.2. The Wilcoxon Test and Estimator; 10.3. One-Sample Methods; 10.4. The Kolmogorov-Smirnov Tests; 11. Linear Statistical Models; 11.1. Introduction; 11.2. The Principle of Least Squares; 11.3. Linear Models; 11.4. F-Tests for  $H_0: \mu = (1)\mu_1 + \dots + (k)\mu_k$  vs  $\mu \neq (1)\mu_1 + \dots + (k)\mu_k$ , a Subspace of  $V$ ; 11.5. Two-Way Analysis of Variance; 12. Frequency Data; 12.1. Introduction; 12.2. Confidence Intervals on Binomial and Poisson Parameters; 12.3. Logistic Regression; 12.4. Two-Way Frequency Tables; 12.5. Chi-Square Goodness-of-Fit Tests; 13. Miscellaneous Topics; 13.1. Introduction; 13.2. Survival Analysis; 13.3. Bootstrapping; 13.4. Bayesian Statistics; 13.5. Sampling; References; Appendix; Answers to Selected Problems; Index

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### Sommario/riassunto

This concise, yet thorough, book is enhanced with simulations and graphs to build the intuition of readers. Models for Probability and Statistical Inference was written over a five-year period and serves as a comprehensive treatment of the fundamentals of probability and statistical inference. With detailed theoretical coverage found throughout the book, readers acquire the fundamentals needed to advance to more specialized topics, such as sampling, linear models, design of experiments, statistical computing, survival analysis, and bootstrapping. Ideal as a textbook for a two-semester course.

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