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| Nota di contenuto | Cover; Preface to the second edition; Contents; Part A Basic Probability; 1 Events and probabilities; 1.1 Experiments with chance; 1.2 Outcomes and events; 1.3 Probabilities; 1.4 Probability spaces; 1.5 Discrete |

sample spaces; 1.6 Conditional probabilities; 1.7 Independent events; 1.8 The partition theorem; 1.9 Probability measures are continuous; 1.10 Worked problems; 1.11 Problems; 2 Discrete random variables; 2.1 Probability mass functions; 2.2 Examples; 2.3 Functions of discrete random variables; 2.4 Expectation; 2.5 Conditional expectation and the partition theorem; 2.6 Problems

3 Multivariate discrete distributions and independence 3.1 Bivariate discrete distributions; 3.2 Expectation in the multivariate case; 3.3 Independence of discrete random variables; 3.4 Sums of random variables; 3.5 Indicator functions; 3.6 Problems; 4 Probability generating functions; 4.1 Generating functions; 4.2 Integer-valued random variables; 4.3 Moments; 4.4 Sums of independent random variables; 4.5 Problems; 5 Distribution functions and density functions; 5.1 Distribution functions; 5.2 Examples of distribution functions; 5.3 Continuous random variables

5.4 Some common density functions 5.5 Functions of random variables; 5.6 Expectations of continuous random variables; 5.7 Geometrical probability; 5.8 Problems; Part B Further Probability; 6 Multivariate distributions and independence; 6.1 Random vectors and independence; 6.2 Joint density functions; 6.3 Marginal density functions and independence; 6.4 Sums of continuous random variables; 6.5 Changes of variables; 6.6 Conditional density functions; 6.7 Expectations of continuous random variables; 6.8 Bivariate normal distribution; 6.9 Problems; 7 Moments, and moment generating functions

7.1 A general note 7.2 Moments; 7.3 Variance and covariance; 7.4 Moment generating functions; 7.5 Two inequalities; 7.6 Characteristic functions; 7.7 Problems; 8 The main limit theorems; 8.1 The law of averages; 8.2 Chebyshev's inequality and the weak law; 8.3 The central limit theorem; 8.4 Large deviations and Cram er's theorem; 8.5 Convergence in distribution, and characteristic functions; 8.6 Problems; Part C Random Processes; 9 Branching processes; 9.1 Random processes; 9.2 A model for population growth; 9.3 The generating-function method; 9.4 An example; 9.5 The probability of extinction 9.6 Problems 10 Random walks; 10.1 One-dimensional random walks; 10.2 Transition probabilities; 10.3 Recurrence and transience of random walks; 10.4 The Gambler's Ruin Problem; 10.5 Problems; 11 Random processes in continuous time; 11.1 Life at a telephone switchboard; 11.2 Poisson processes; 11.3 Inter-arrival times and the exponential distribution; 11.4 Population growth, and the simple birth process; 11.5 Birth and death processes; 11.6 A simple queueing model; 11.7 Problems; 12 Markov chains; 12.1 The Markov property; 12.2 Transition probabilities; 12.3 Class structure 12.4 Recurrence and transience

Sommario/riassunto

Probability is an area of mathematics of tremendous contemporary importance across all aspects of human endeavour. This book is a compact account of the basic features of probability and random processes at the level of first and second year mathematics undergraduates and Masters' students in cognate fields. It is suitable for a first course in probability, plus a follow-up course in random processes including Markov chains. A special feature is the authors' attention to rigorous mathematics: not everything is rigorous, but the need for rigour is explained at difficult junctures. The text is
