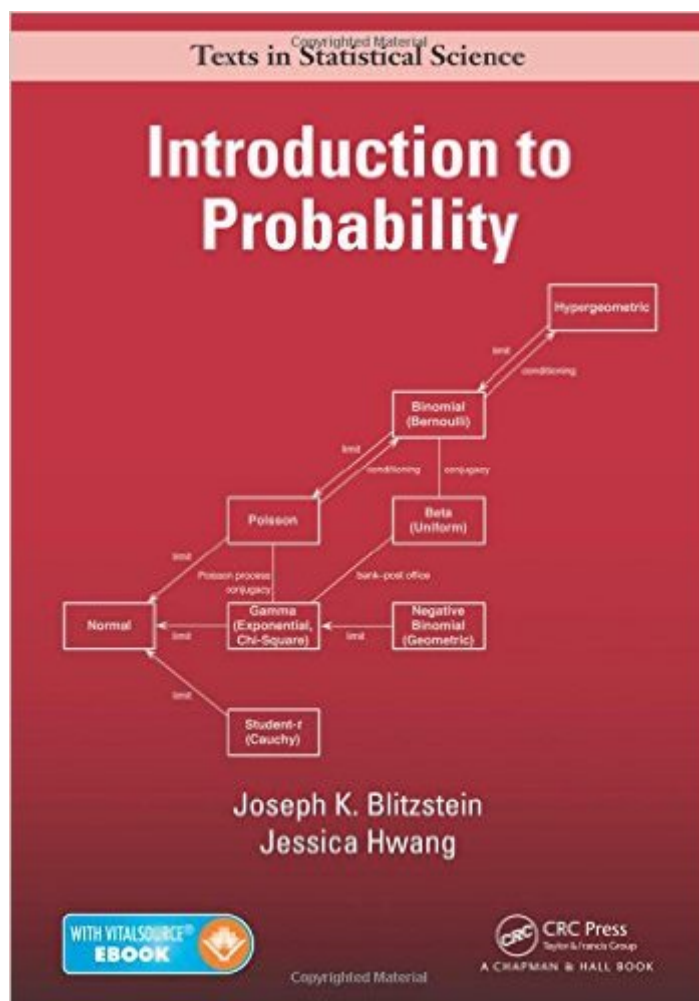# Introduction To Probability (Chapman & Hall/CRC Texts In Statistical Science)

Synopsis

Developed from celebrated Harvard statistics lectures, Introduction to Probability provides essential language and tools for understanding statistics, randomness, and uncertainty. The book explores a wide variety of applications and examples, ranging from coincidences and paradoxes to Google PageRank and Markov chain Monte Carlo (MCMC). Additional application areas explored include genetics, medicine, computer science, and information theory. The print book version includes a code that provides free access to an eBook version. The authors present the material in an accessible style and motivate concepts using real-world examples. Throughout, they use stories to uncover connections between the fundamental distributions in statistics and conditioning to reduce complicated problems to manageable pieces.The book includes many intuitive explanations, diagrams, and practice problems. Each chapter ends with a section showing how to perform relevant simulations and calculations in R, a free statistical software environment.

Book Information

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Customer Reviews

This terrific text is most likely the best introduction to probability available today. Let me justify this claim with a personal story, and one that ties in well to an example in the book.As an undergraduate, I had two quarters of probability as part of my statistics coursework. While I had a good professor, the text was terrible, and didn't motivate many important topics like conditional probability, conditional expectation, MGFs, PGFs, indicator random variables, inequalities, etc. I was able to apply the basic probability lessons I'd learned in these courses (in my job as a

bioinformatician and statistical programmer), but I didn't see the bigger picture. Reading Frederick Mosteller's story of probability generating functions in the book (p. 263) perfectly encapsulates how I felt, "... he [a professor of the mathematics department] showed me [Mosteller] a generating function. It was the most marvelous thing I had ever seen in mathematics. It used mathematics up to that time, in my heart of hearts, I had thought was something that mathematicians did just to create homework problems for innocent students in high school and college." I have many other probability books bookshelf, but all are collecting dust because they teach probability in a way that reminds me of the homework problems Mosteller speaks of.In contrast, every topic in this book is painstakingly motivated with "story proofs", real examples, historical anecdotes, and elegant mathematical connections to earlier concepts. These motivating sections not only make the material crystal clear, but also help you remember why certain theorems are important, and what the types of problems they allow you to solve (which is vital when you need to apply them for your own real world problems!).

Take this review with a (small) grain of salt: as a full disclaimer, I am currently serving as a Teaching Fellow for the course on which the text is based (Harvard's infamous Stat 110). Although Professor Blitzstein is on sabbatical this year, his pedagogical spirit and mastery permeate the course, especially through this text.There are a few "classics" in introductory probability -- namely, those of Ross and Feller, both of which are undoubtedly excellent. Yet I can claim, with no reservations, that this text by Blitzstein and Hwang can stand alongside, if not above, these classics in its style, presentation, and content. Years of notes and problems painstakingly written, edited, and compiled by Prof. Blitzstein and the Teaching Fellows for the course have resulted in a wonderful introduction to the subject that goes far above other references.First, the content. As an introduction to probability, there are a certain set of topics that must inevitably be covered: i.e. counting and combinatorics, probability and conditional probability, random variables, expectation and moments, among others. Yet the organization and pacing of the book really brings the logic of these topics into the fore. Conditional probability is introduced as a mechanism by which the student can break down more complicated events into simpler ones; random variables are "bridged" to indicator functions, which serve the dual purpose of similarly breaking down complex random variables into simpler ones, while also tying in the idea that the realization of a random variable is an event. In a similar fashion, nearly all of the topics in the book are covered with an eye to both the topic's inherent novelty and interest as well as its utility as a problem-solving strategy.Second, the presentation.

Five stars through and through. I first stumbled on Professor Blitzsteinâ ™s statistics 110 lecture series on iTunesU when I was trying to learn more about a statistical test I came across in a scientific paper. I watched lecture one out of curiosity and was hooked. This is the class I wish I took in college! Professor Blitzstein is a gifted teacher and the manner in which he lays out the foundations of probability from the absolute ground up is outstanding. All his lectures are given using nothing but a black and white chalkboard. No powerpoint, no animation: this is classroom instruction at its purest. Even just watching these videos on the computer, I felt I was right there in the lecture hall with Dr. Blitzstein thinking about the material together; interacting in a way that belies the size and scope of a MOOC.While going through the lecture series, I could not help but wish there were a textbook I could study from: something that spelled things out just a bit more; provided a few more examples; walked me through things a little bit slower. Enter Introduction to Probability. While Iâ ™m sure it could function perfectly well as a standalone text, this is truly the companion textbook to the course. It follows the same syllabus, has many of the same examples and includes all the homework and â œstrategic practiceâ • problems for which there are full solutions online (and tons more). In addition, it provides more detailed explanations and of course, being a written document, allows you to pace yourself and review past material more easily than a lecture series could. I find myself frequently flipping back and forth, even if only to review the naÃƒÂ ve and non-naÃƒÂ ve definitions of probability. I have had so much fun learning from Dr.

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