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Python for Probability, Statistics, and Machine Learning

- Features fully updated explanation on how to simulate, conceptualize, and visualize random statistical processes and apply machine learning methods
- New edition features Python version 3.7 and connects to key open-source Python communities and corresponding modules focused on the latest developments in this area
- Outlines probability, statistics, and machine learning concepts using an intuitive visual approach, backed up with corresponding visualization codes

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This book, fully updated for Python version 3.6+, covers the key ideas that link probability, statistics, and machine learning illustrated using Python modules in these areas. All the figures and numerical results are reproducible using the Python codes provided. The author develops key intuitions in machine learning by working meaningful examples using multiple analytical methods and Python codes, thereby connecting theoretical concepts to concrete implementations. Detailed proofs for certain important results are also provided. Modern Python modules like Pandas, SymPy, Scikit-learn, Tensorflow, and Keras are applied to simulate and visualize important machine learning concepts like the bias/variance trade-off, cross-validation, and regularization. Many abstract mathematical ideas, such as convergence in probability theory, are developed and illustrated with numerical examples. This updated edition now includes the Fisher Exact Test and the Mann-Whitney-Wilcoxon Test. A new section on survival analysis has been included as well as substantial development of Generalized Linear Models. The new deep learning section for image processing includes an in-depth discussion of gradient descent methods that underpin all deep learning algorithms.

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