Introduction to Probability

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References:
- Dimitri P. Bertsekas and John N. Tsitsiklis, *Introduction to Probability*
- Slides are credited from Prof. Berlin Chen, NTNU.

Probability

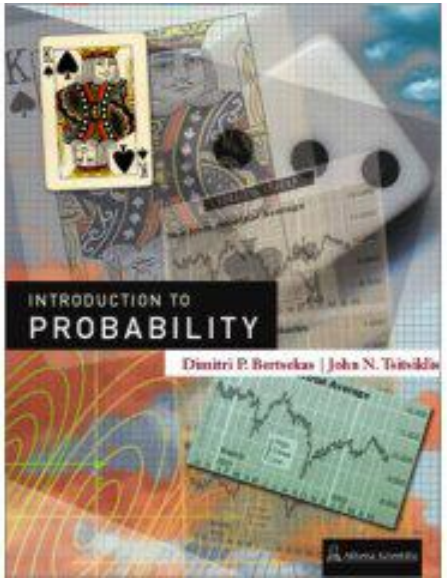
- Probability and its relatives (Possible, Probable, Likely) were read in many contexts
- Probability was developed to describe phenomena that cannot be predicted with certainty
  - Frequency of occurrences
  - Subjective beliefs
- Everyone accepts that the probability (of a certain thing to happen) is a number between 0 and 1 (?)

Main Objectives

- Develop the art of describing uncertainty in terms of probabilistic models
  - Fundamentals of probability theory: discrete/continuous random variables, multiple random variables, limit theorems, etc.
    - Definitions, axioms, and inferences following the axioms
  - Further topics: transforms, a more advanced view of conditioning, sums of random variables, etc.
- Learn the skills of probabilistic reasoning
  - E.g. the use of Bayesian statistics (Bayes' rule)

Textbook

- D. P. Bertsekas, J. N. Tsitsiklis, "*Introduction to Probability*," Athena Scientific, 2nd Ed.

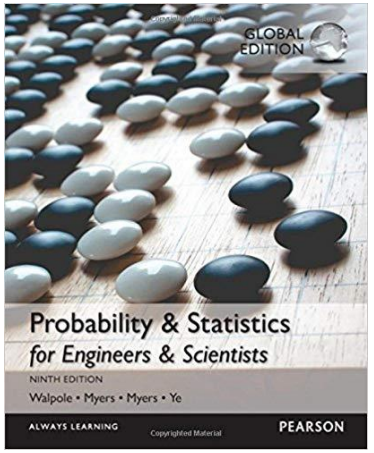


- Website
  - http://www.athenasc.com/probbook.html

- Supplement problems of textbook
  - Theoretic problems (marked by *)
  - Problems in the text (various levels of difficulty)
  - Supplementary problems (at the book's website)

Reference Books

- Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers and Keying Ye, "*Probability and Statistics for Engineers and Scientists,*" 9th Edition*, Person, 2016*



Tentative Topic List

1. Course Overview & Introduction
2. Sample Space and Probability
3. Discrete Random Variables
4. Continuous Random Variables
5. Further Topics on Random Variables and Expectations
6. Limit Theorems

Grading (Tentatively!)

- Midterm and Final: 55%
- Quizzes (≥ 5 times) and Homework:35%
- Attendance/Other: 10%

- Teaching Assistant: 黃鈺茗 (D0629080@o365.fcu.edu.tw)
- Available time/place: 週四(Thr.) 16:00-18:00