



MITx: 6.041x Introduction to Probability - The Science of Uncertainty



Bookmarks

- ▶ Unit 0: Overview
- ▶ Entrance Survey
- ▶ Unit 1: Probability models and axioms
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Unit overview

Lec. 8: Probability density functions

Exercises 8 due Mar 16, 2016 at 23:59 UTC

Lec. 9: Conditioning on an event; Multiple r.v.'s

Exercises 9 due Mar 16, 2016 at 23:59 UTC

Unit 5: Continuous random variables > Lec. 9: Conditioning on an event; Multiple r.v.'s > Lec 9 Conditioning on an event Multiple r v s vertical5



Bookmark

Exercise: From joint PDFs to probabilities

(8/8 points)

a) The probability of the event that $0 \leq Y \leq X \leq 1$ is of the form

$$\int_a^b \left(\int_c^d f_{X,Y}(x, y) dx \right) dy.$$

Find the values of a, b, c, d . Each one of your answers should be one of the following: $0, x, y$, or 1 .

- $a =$ ✓ Answer: 0
- $b =$ ✓ Answer: 1
- $c =$ ✓ Answer: y
- $d =$ ✓ Answer: 1

b) The probability of the event that $0 \leq Y \leq X \leq 1$ is also of the form

$$\int_a^b \left(\int_c^d f_{X,Y}(x, y) dy \right) dx.$$

Note the different order of integration as compared to part (a).

Find the values of a, b, c, d . Each one of your answers should be one of the following: $0, x, y$, or 1 .

- $a =$ ✓ Answer: 0
- $b =$ ✓ Answer: 1
- $c =$ ✓ Answer: 0
- $d =$ ✓ Answer: x

Answer:

a) For any given $y \in [0, 1]$, x ranges from y to 1 , yielding

$$\int_0^1 \int_y^1 f_{X,Y}(x, y) dx dy.$$

Lec. 10:
Conditioning on a
random variable;
Independence;
Bayes' rule

Exercises 10 due Mar
 16, 2016 at 23:59 UTC

Standard normal
table

Solved problems

Problem Set 5

Problem Set 5 due Mar
 16, 2016 at 23:59 UTC

Unit summary

b) For any given $x \in [0, 1]$, y ranges from 0 to x , yielding

$$\int_0^1 \int_0^x f_{X,Y}(x, y) dy dx.$$

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