



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. 5: Probability mass functions and expectations

Exercises 5 due Mar 02, 2016 at 23:59 UTC

Lec. 6: Variance; Conditioning on an event; Multiple r.v.'s

Exercises 6 due Mar 02, 2016 at 23:59 UTC

Lec. 7: Conditioning on a random variable; Independence of r.v.'s

Unit 4: Discrete random variables > Lec. 6: Variance; Conditioning on an event; Multiple r.v.'s > Lec 6 Variance Conditioning on an event Multiple r v s vertical5



Bookmark

Exercise: Memorylessness of the geometric

(2/2 points)

Let X be a geometric random variable, and assume that $\text{var}(X) = 5$.a) What is the conditional variance $\text{var}(X - 4 \mid X > 4)$? $\text{var}(X - 4 \mid X > 4) =$ ✓ Answer: 5b) What is the conditional variance $\text{var}(X - 8 \mid X > 4)$? $\text{var}(X - 8 \mid X > 4) =$ ✓ Answer: 5

Answer:

a) The conditional distribution of $X - 4$ given $X > 4$ is the same geometric PMF that describes the distribution of X . Hence $\text{var}(X - 4 \mid X > 4) = \text{var}(X) = 5$.

b) In the conditional model (i.e., given that $X > 4$), the random variables $X - 4$ and $X - 8$ differ by a constant. Hence they have the same variance and the answer is again 5.

You have used 1 of 2 submissions

Exercises 7 due Mar
02, 2016 at 23:59 UTC

Solved problems

**Additional
theoretical
material**

Problem Set 4

Problem Set 4 due Mar
02, 2016 at 23:59 UTC

Unit summary

- ▶ Unit 5:
Continuous
random
variables

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