



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



Bookmarks

- ▶ Unit 0: Overview
- ▶ Entrance Survey
- ▶ Unit 1: Probability models and axioms
- ▶ Unit 2: Conditioning and independence
- ▶ Unit 3: Counting
- ▼ Unit 4: Discrete random variables

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 vertical2



Bookmark

Exercise: Variance of the uniform

(2/2 points)

Suppose that the random variable X takes values in the set $\{0, 2, 4, 6, \dots, 2n\}$ (the even integers between 0 and $2n$, inclusive), with each value having the same probability. What is the variance of X ? *Hint:* Consider the random variable $Y = X/2$ and recall that the variance of a uniform random variable on the set $\{0, 1, \dots, n\}$ is equal to $n(n+2)/12$.

Express your answer in terms of n using standard notation. Remember to write '*' for all multiplications and to include parentheses where necessary.

var(X) =

n*(n+2)/3



Answer: n*(n+2)/3

Answer:

Following the hint, let $Y = X/2$. The random variable Y takes values in the set $\{0, 1, 2, \dots, n\}$, each value having the same probability. Therefore, Y is uniform and has a variance of $n(n+2)/12$. Since $X = 2Y$,

$$\text{var}(X) = \text{var}(2Y) = 4 \cdot \text{var}(Y) = \frac{4}{12}n(n+2).$$

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

© All Rights Reserved



© edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.

POWERED BY
OPENedX

