

On Tuesday, February 23rd at 6:00AM EST, UTC-5, we will be conducting a brief database maintenance. The event should last about 5 minutes.



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

Unit 4: Discrete random variables > Problem Set 4 > Problem 3 Vertical: PMF, expectation, and variance



Bookmark

Problem 3: PMF, expectation, and variance

(6/6 points)

The random variables X and Y have the joint PMF

$$p_{X,Y}(x,y) = \begin{cases} c \cdot (x+y)^2, & \text{if } x \in \{1, 2, 4\} \text{ and } y \in \{1, 3\}, \\ 0, & \text{otherwise.} \end{cases}$$

All answers in this problem should be numerical.

1. Find the value of the constant c .

$c =$

1/128



2. Find $\mathbf{P}(Y < X)$.

$\mathbf{P}(Y < X) =$

83/128



3. Find $\mathbf{P}(Y = X)$.

$\mathbf{P}(Y = X) =$

1/32



4. Find the following probabilities.

$\mathbf{P}(X = 1) =$

5/32



$\mathbf{P}(X = 2) =$

17/64



$\mathbf{P}(X = 3) =$

0



$\mathbf{P}(X = 4) =$

37/64



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

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

5. Find the expectations $\mathbf{E}[X]$ and $\mathbf{E}[XY]$.

$$\mathbf{E}[X] =$$



$$\mathbf{E}[XY] =$$



6. Find the variance of X .

$$\text{var}(X) =$$



You have used 1 of 4 submissions

DISCUSSION

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