



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



Bookmarks



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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

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Solved problems

Additional theoretical material

Problem Set 4

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

Unit summary

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 vertical6

Exercise: Joint PMF calculation

(2/2 points)

The random variable V takes values in the set $\{0, 1\}$ and the random variable W takes values in the set $\{0, 1, 2\}$. Their joint PMF is of the form

$$p_{V,W}(v, w) = c \cdot (v + w),$$

where c is some constant, for v and w in their respective ranges, and is zero everywhere else.

a) Find the value of c .

$c =$

✓ Answer: 0.11111

b) Find $p_V(1)$.

$p_V(1) =$

✓ Answer: 0.66667

Answer:

a) The sum of the entries of the PMF is $c \cdot (0 + 0) + c \cdot (0 + 1) + c \cdot (0 + 2) + c \cdot (1 + 0) + \dots = 9c$. Since this sum must be equal to 1, we have $c = 1/9$.

b)

$$p_V(1) = \sum_{w=0}^2 p_{V,W}(1, w) = p_{V,W}(1, 0) + p_{V,W}(1, 1) + p_{V,W}(1, 2) = \frac{1}{9}(1 + 2 + 3) = \frac{2}{3}$$

You have used 1 of 2 submissions

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