



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



Bookmarks

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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

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

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Bookmark

Exercise: Indicator variables

(2/2 points)

Let A and B be two events (subsets of the same sample space Ω), with nonempty intersection. Let I_A and I_B be the associated indicator random variables.

For each of the two cases below, select one statement that is true.

a) $I_A + I_B$:

is not the indicator random variable of any event ▼

**Answer:** is not the indicator random variable of any eventb) $I_A \cdot I_B$:is the indicator variable of the event $A \cap B$ ▼**Answer:** is the indicator variable of the event $A \cap B$

Answer:

a) If the outcome of the experiment lies in the intersection of the events A and B , then $I_A + I_B$ takes the value of 2. But indicator random variables can take only the values 0 or 1. Therefore, $I_A + I_B$ is not an indicator random variable.

b) Note that $I_A \cdot I_B$ can take only the values 0 or 1. It is equal to 1 if and only if $I_A = 1$ (i.e., event A occurs) and $I_B = 1$ (i.e., event B occurs). Thus, $I_A \cdot I_B$ takes the value of 1 if and only if both A and B occur, and so it is the indicator random variable of the event $A \cap B$.

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

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