



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 overview

Lec. 2:
Conditioning and Bayes' rule
Exercises 2 due Feb 17, 2016 at 23:59 UT

Lec. 3:
Independence
Exercises 3 due Feb 17, 2016 at 23:59 UT

Solved problems

Problem Set 2
Problem Set 2 due Feb 17, 2016 at 23:59 UT

Unit 2: Conditioning and independence > Lec. 3: Independence > Lec 3 Independence vertical2

Bookmark

EXERCISE: INDEPENDENCE OF TWO EVENTS - III (2/2 points)

When is an event A independent of itself?

Choose one of the following possible answers:



Always

If and only if $\mathbf{P}(A) = 0$ If and only if $\mathbf{P}(A) = 1$ If and only if $\mathbf{P}(A)$ is either 0 or 1

Answer:

Using the definition, A is independent of itself if and only if

$$\mathbf{P}(A \cap A) = \mathbf{P}(A) \cdot \mathbf{P}(A).$$

Since $A \cap A = A$, we have $\mathbf{P}(A \cap A) = \mathbf{P}(A)$ and we obtain the equivalent condition

$$\mathbf{P}(A) = \mathbf{P}(A) \cdot \mathbf{P}(A),$$

or

$$\mathbf{P}(A) \cdot (1 - \mathbf{P}(A)) = 0,$$

and this happens if and only if $\mathbf{P}(A)$ is either 0 or 1.

You have used 1 of 2 submissions

© 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.

