



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



Bookmarks

- ▶ Unit 0: Overview
- ▶ Entrance Survey
- ▼ Unit 1:
Probability
models and
axioms

Lec. 1: Probability models and axioms

Exercises 1 due Feb 10, 2016 at 23:59 UTC

Mathematical background: Sets; sequences, limits, and series; (un)countable sets.

Solved problems**Problem Set 1**

Problem Set 1 due Feb 10, 2016 at 23:59 UTC

Unit 1: Probability models and axioms > Lec. 1: Probability models and axioms > Lec 1 Probability models and axioms vertical7



Bookmark

EXERCISE: USING COUNTABLE ADDITIVITY (1/1 point)

Let the sample space be the set of positive integers and suppose that $\mathbf{P}(n) = 1/2^n$ for $n = 1, 2, \dots$. Find the probability of the set $\{3, 6, 9, \dots\}$, that is, of the set of positive integers that are multiples of 3.

1/7



Answer: 0.14286

Answer:

Using countable additivity, and with $\alpha = 2^{-3} = 1/8$, the desired probability is

$$\frac{1}{2^3} + \frac{1}{2^6} + \frac{1}{2^9} + \dots = \alpha + \alpha^2 + \alpha^3 + \dots = \frac{\alpha}{1 - \alpha} = \frac{1/8}{1 - (1/8)} = \frac{1}{7}.$$

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.

POWERED BY
OPENedX

