



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
- ▶ Exam 1
- ▶ Unit 5: Continuous random variables
- ▶ Unit 6: Further topics on random variables
- ▶ Unit 7: Bayesian inference

Unit 9: Bernoulli and Poisson processes > Problem Set 9 > Problem 7 Vertical: Sampling families



Bookmark

Problem 7: Sampling families

(3/3 points)

We are given the following statistics about the number of children in the families of a small village.

There are 100 families: 10 families have no children, 40 families have 1 child each, 30 families have 2 children each, 10 families have 3 each, and 10 families have 4 each.

1. If you pick a family at random (each family in the village being equally likely to be picked), what is the expected number of children in that family?



2. If you pick a child at random (each child in the village being equally likely to be picked), what is the expected number of children in that child's family (including the picked child)?



3. Generalize your approach from part 2: Suppose that a fraction p_k of the families have k children each. Let K be the number of children in a randomly selected family, and let $a = \mathbf{E}[K]$ and $b = \mathbf{E}[K^2]$. Let W be the number of children in a randomly chosen child's family. Express $\mathbf{E}[W]$ in terms of a and b using standard notation .




$\mathbf{E}[W] =$

You have used 1 of 2 submissions


- ▶ Exam 2
- ▶ Unit 8: Limit theorems and classical statistics
- ▼ Unit 9: Bernoulli and Poisson processes

Unit overview


Lec. 21: The Bernoulli process

Exercises 21 due May 11, 2016 at 23:59 UTC 

Lec. 22: The Poisson process

Exercises 22 due May 11, 2016 at 23:59 UTC 


Lec. 23: More on the Poisson process

Exercises 23 due May 11, 2016 at 23:59 UTC 

Solved problems

Additional theoretical material

Problem Set 9

Problem Set 9 due May 11, 2016 at 23:59 UTC 

Unit summary

DISCUSSION

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