

CSE 312 Section 4

Random Variables and Expectation

Administrivia



Announcements & Reminders

- HW2
 - Grades released on gradescope – check your submission to read comments
 - Regrade requests open ~24 hours after grades are released and close after a week
- HW3
 - Written and Coding due yesterday, Wednesday 7/16 @ 11:59pm
 - Late deadline Friday 7/18 @ 11:59pm
- Quiz 3 Tomorrow!
- Midterm next week (Wednesday 7/23), information on website
- No Homework this week!

Review & Questions



Any lingering questions from this last week?

Each week in section, we'll be reviewing the main concepts from this week and putting them into action by going through some practice problems together. But before we get into that review, we'll try to start off each section with some time for you to ask questions. Was anything particularly confusing this week? Is there anything we can clarify before we dive into the review? This is your chance to clear things up!

Kahoot for content review!

see task 1 from section handout

Problem 1 – Content Review



Problem 2 – Identify that Range!



2 – Identify that Range!

Identify the support/range Ω_X of the random variable X , if X is...

- b) The number of lottery tickets I buy until I win it.
- c) The number of heads in n flips of a coin with $0 < \mathbb{P}(\text{head}) < 1$.
- d) The number of heads in n flips of a coin with $\mathbb{P}(\text{head}) = 1$.

Work on this problem with the people around you, and then we'll go over it together!

Problem 5 – Hungry Washing Machine



5 – Hungry Washing Machine

You have 10 pairs of socks (so 20 socks in total), with each pair being a different color. You put them in the washing machine, but the washing machine eats 4 of the socks chosen at random. Every subset of 4 socks is equally probable to be the subset that gets eaten. Let X be the number of complete pairs of socks that you have left.

- a) What is the range of X , Ω_X (the set of possible values it can take on)? What is the probability mass function of X ?
- b) Find $\mathbb{E}[X]$ from the definition of expectation.
- c) Find $\mathbb{E}[X]$ using LOE.

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Midterm Review!



Problem 4 – Kit Kats Again



4 – Kit Kats Again

We have N candies in the jar.

We have K kit kats in the jar.

We are drawing without replacement until we have k kit kats.

$$k \leq K \leq N$$

Let X be the number of draws until the k th kit kat (this includes the k th kit kat).

What is Ω_X , the range of X ?

What is $p_X(n) = \mathbb{P}(X = n)$?

Work on finding the range of X with the people around you!

Problem 7 – Frogger



7 – Frogger

A frog starts on a 1-dimensional number line at 0. At each second, independently, the frog takes a unit step right with probability p_1 , to the left with probability p_2 , and doesn't move with probability p_3 , where $p_1 + p_2 + p_3 = 1$. After 2 seconds, let X be the location of the frog.

- a) Find $p_X(k)$, the probability mass function for X .
- b) Compute $\mathbb{E}[X]$ from the definition.

Work on this problem with the people around you, and then we'll go over it together!

That's All, Folks!

Thanks for coming to section this week!
Any questions?