question 2 views

Daily Challenge 25.2

~~**(Due Sunday 3/24 at 12:00 noon Eastern)**~~
(Due Monday 3/25 at 12:00 noon Eastern)

Do problem 6 on the 6.041 problem set here (the one about the defective coin minting machine).

Hint 1: In part (a), since the probability of getting heads is a random variable $f_P(p)$, you will need to integrate over all possible values of p in order to find the overall probability that the first flip gives heads. Said differently, you are finding the expectation value $E[p]$ for the probability of getting a heads, using the fact that the probability of heads is itself a random variable with PDF $f_P(p)$.

Hint 2: In part (b), you will need to use the version of Bayes' rule for a continuous variable conditioned on a discrete outcome, namely

$$f_{P|A}(p \mid A) = \frac{\mathbb{P}(A \mid P = p) f_P(p)}{\mathbb{P}(A)}.$$

Hint 3: In part (c), again integrate over possible p's, but now using the conditional PDF you found in part (b). Said differently, now you're computing $E[p]$ given your updated PDF from seeing one heads.

Refer to the solutions here if you get stuck, but be sure to fill in the steps they skip in the integrals ("after some calculation..."). Both integrals require integration by parts.

daily_challenge

Updated 21 days ago by Christian Ferko

the students' answer, *where students collectively construct a single answer*

We're just green bois doin' what green bois do

~ An instructor (Christian Ferko) endorsed this answer ~

Updated 19 days ago by Logan Pachulski

the instructors' answer, *where instructors collectively construct a single answer*

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