Data 88S

Jan 31, 2024

1. Chapter 2 Ex. 4

4. A class has eight sections, five of which are in the morning and three in the afternoon. The instructor picks two sections at random without replacement.

Say whether each of the following statements is true or false, and justify your answer.

a) The chance that the first section picked by the instructor is in the morning is $5/8$.

b) The chance that the second section picked by the instructor is in the morning is $5/8$.

c) The chance that both sections picked by the instructor are in the morning is $(5/8)(5/8)$.

2. Chapter 2 Ex. 11

11. Daniel Kahneman and the late Amos Tversky looked deeply into people's biases and perceptions of risk. Kahneman's book Thinking Fast and Slow became a New York Times bestseller – read it! In it Kahneman describes a study with Tversky in which they asked people the following question.

"A cab was involved in a hit and run accident at night. Two cab companies, the Green and the Blue, operate in the city. You are given the following data:

- 85% of the cabs in the city are Green and 15% are Blue.
- A witness identified the cab as Blue. The court tested the reliability of the witness under the same circumstances that existed on the night of the accident and concluded that the witness correctly identified each one of the two colors 80% of the time and failed 20% of the time.

What is the probability that the cab involved in the accident was Blue rather than Green?"

The most common answer was 80%. What is your answer?

3. Chapter 2 Ex. 6
Chapter 2, Exercise 6

6. There are three boxes, each of which contains two coins. One box has two gold coins, one has two silver coins, and one has a gold coin and a silver coin. A box is picked at random and then a coin is picked at random from the box. Given that the coin is gold, what is the chance that the other coin in the box is silver?

4. Selena is heating up 3 containers of soup in the microwave. For each container of soup, there is a 15% chance that the soup leaks out. Given no other assumptions, either provide the exact probability, or provide the best upper and lower bounds on the chance that none of the soup containers leak out. Hint: it may be helpful to think about the complement of this event in the diagrams that you draw