Week 3 Friday

Ice cream left in a carton

Make sure you know your neighbors' names. Then discuss:

Ice cream cartons contain about 50 ounces of ice cream with a variance of 1. Your ice cream scoop scoops out about 2 ounces of ice cream with a variance of 0.25. You buy a new carton of ice cream and then you scoop out two scoops.

(a) What is the expected amount of ice cream left in the carton?

(b) What is the variance of the amount of ice cream left in the carton?

(c) What assumptions, if any, did you have to make in order to answer the previous questions?

Review on Monday

- ▶ Mention specific problems you're struggling with on Zulip under the existing topic "Midterm review"
- ▶ Bring questions with you to class (?)

Bernoulli, Geometric, Poisson

1. You are a statistician studying blood types in San Diego. Which of the following situations might you model using a Bernoulli random variable?

(A) You select a random American and check to see whether or not their blood type is O-.

(B) You repeatedly select random Americans until you find someone whose blood type is O-.

(C) You select 100 random Americans and count how many of them have blood of type O-.

(D) None of the above OR more than one of the above.

2. A toaster factory estimates that 5% of the toasters they manufacture are defective. What is the probability that, if you start examining toasters at random, the first defect you find is the third toaster you examine?

Would finding a defect on the third toaster you examine be "unusually early" to find a defect?

3. You are a statistician at a small blood donation clinic in San Diego. Which of the following situations might you model using a Poisson random variable?

(A) The proportion of O- blood type donations you receive per day.

(B) The amount of time that elapses between two consecutive O- blood type donations.

(C) The number of O- blood type donations you receive per day.

(D) None of the above OR more than one of the above.

4. A car dealership sells an average of 5 cars in a day. What is the probability that the dealer only sells 3 cars tomorrow?

Would selling 3 cars be an "unusually low" number of cars to sell in a day?

5. Tametomo is an archer who has a 75% chance of hitting a bull's eye from a distance of 300 m. What is the expected number of times he has to shoot in order to hit a bull's eye from 300 m?