

Stat 134: Section 6

Adam Lucas

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Conceptual Review

- a. For random variables X, Y , what does $X = Y$ mean? How is this different from saying that X and Y have the same distribution?
- b. Let X follow the Hypergeometric (N, G, n) distribution. What does X represent? What are the possible values of X ?
- c. In a standard deck, how many different ways are there to get two pairs in 4 cards?

Problem 1

A lot of 50 items (10 bad) is inspected by the following two stage plan: (i) A first sample of 5 items is drawn. If all are good the lot is passed; if two or more are bad the lot is rejected. (ii) If the sample contains exactly one bad item, a second sample of 10 more items is drawn from the remaining 45; the lot is rejected if two or more are bad. Otherwise the lot is accepted.

- a. What is the probability the sample is drawn and contains more than one bad item?
- b. Find the chance the lot is accepted.

Ex 2.5.9 in Pitman's Probability

Problem 2

Eight cards are drawn from a well-shuffled deck of 52 cards. What is the probability the 8 cards contain:

- a. two sets of four of a kind (e.g., 4 jacks and 4 kings);
- b. exactly 1 set of four of a kind.

Adapted from 2.rev.16 in Pitman's Probability

Problem 3

A fair coin is tossed 3 times. Let X be the number of heads in the first two tosses, and Y be the number of heads in the last two tosses.

- a. Make a table showing the joint distribution of X and Y .
- b. Are X and Y independent?
- c. Find the distribution of $Z = \max\{X, Y\}$.

from Ex 3.1.6 in Pitman's Probability