

## *Stat 134: Section 5*

*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 second 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*