Stat 134: Section 3

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Problem 1

Suppose 5 dice are rolled. Assume they are fair and the rolls are independent. Calculate the probability of the following events:

Don't forget to take into account the counting factors!

a. exactly two sixes;

b. at least two sixes;

c. at most two sixes;

d. exactly three dice show 4 or greater;

e. at least 3 dice show 4 or greater.

Ex 2.1.3 in Pitman's Probability

Problem 2

Given that there were 12 heads in 20 independent coin tosses, calculate the chance that

a. the chance that the first toss landed heads;

Try to do this problem with as little tedious work as possible.

b. the chance that the first two tosses landed heads;

c. the chance that at least two of the first five tosses landed heads.

Ex 2.1.5 in Pitman's Probability

Problem 3

The chance of winning a bet on oo at roulette is $1/38 = 0.026315$. In 325 bets on oo at roulette, the chance of six wins is 0.104840. Use this fact, and consideration of odds ratio, to answer the following questions without long calculations.

a. What is the most likely number of wins in 325 bets on oo, and what is its probability?

b. Find the chance of ten wins in 325 bets on oo.

c. Find the chance of ten wins in 326 bets on oo.

Ex 2.1.9 in Pitman's Probability

Problem 4

Suppose a fair coin is tossed n times. Find simple formulae in terms of n and k for

a. $P(k-1 \text{ heads} \mid k-1 \text{ or } k \text{ heads})$

b. $P(k \text{ heads} \mid k-1 \text{ or } k \text{ heads})$

Ex 2.1.10. in Pitman's Probability

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