Stat 134: Section 2

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Problem 1

Suppose a word is picked at random from this sentence.

a. What is the distribution of the length of the word picked?

b. What is the distribution of the number of vowels in the word?

What does a probability distribution consist of? What conditions must it satisfy?

Ex 1.3.6 in Pitman's Probability

Problem 2

Events A, B, and C are defined in an outcome space. Find expressions for the following probabilities in terms of $P(A)$, $P(B)$, $P(C)$, $P(AB)$, $P(AC)$, $P(BC)$, and $P(ABC)$.

a. The probability that exactly two of A, B, C occur.

b. The probability that exactly one of these events occurs.

c. The probability that none of these events occur.

Drawing a Venn diagram might help.

In part c., use what you already know to avoid doing unnecessary work.

Ex 1.3.10 in Pitman's Probability

Problem 3

There are two urns. The first urn contains 2 black balls and 3 white balls. The second urn contains 4 black balls and 3 white balls. An urn is chosen at random, and a ball is chosen at random from that urn.

a. Draw a suitable tree diagram.

b. Assign probabilities and conditional probabilities to the branches of the tree.

c. Calculate the probability that the ball drawn is black.

Ex 1.4.5 in Pitman's Probability

Problem 4

A hat contains a number of cards, with 30% white on both sides, 50% black on one side and white on the other, and 20% black on both sides. The cards are mixed up, then a single card is drawn at random and placed on the table. If the top side is black, what is the chance that the other side is white?
Ex 1.4.8 in Pitman's Probability

Once again, drawing a diagram here might prove helpful.

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