Stat 134: Section 1

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WELCOME TO STAT 134! Alongside lecture, discussion sections are a key way to clarify and reinforce the course materials. We hope to make discussions an engaging and welcoming environment!

Problem 1

Suppose a word is picked at random from this sentence.

a. Find the chance that the word contains at least 2 vowels (a,e,i,o,u).

b. Find the chance that the word contains at least 4 letters and at least 2 vowels.

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

From Ex 1.1.2 and 1.3.6 in Pitman's Probability

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

Problem 2

Cards are dealt from a well-shuffled standard deck until the first heart appears.

a. What is the probability that exactly 5 deals are required?

b. What is the probability that 5 or fewer deals are required? Try to answer without using a summation term.

Ex 1.rev.8 in Pitman's Probability

Problem 3: The Birthday Problem

CLASS ACTIVITY: In your discussion section, how many students do you think have the same birthday? As time permits, your GSI will go around the room and have students say their birthdays.

Suppose you are in a classroom of n students ($n \leq 365$). In the following calculations, ignore leap days and assume that students' birthdays are independent and distributed uniformly at random across the year. Find:

How are these assumptions violated in reality? How does this affect the true probability of these events?

a. the chance that at least one other student shares *your* birthday.

b. the chance that at least two students share the same birthday.

c. (continued from part b): Using your answer from part (b), derive a useful approximation for this expression, using the approximation $\log(1 + x) \approx x$ for small x.

From Section 1.6, Example 5 (pg 62) in Pitman's Probability

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