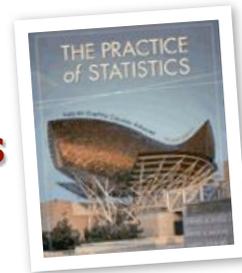


AP STATISTICS CHAPTER 6: PROBABILITY: THE STUDY OF RANDOMNESS

"THE MOST IMPORTANT QUESTIONS OF LIFE ARE, FOR THE MOST PART,
REALLY QUESTIONS OF PROBABILITY" ~LAPLACE



Tentative Lesson Guide					
Date	Stats	Lesson	Assignment	Done	
Mon	11/27	6.1	Flipping Coins...Randomness	Rd 330-340 Do 11-15, 17-18	
Tues	11/28	6.2	Probability Rules	Rd 342-354 Do 19-23, 26-29, 31	
Wed	11/29	6.3	General Probability Rules	Rd 359-369 Do- 53 46	
Thu	11/30	6.3	Conditional Probabilities	Rd 366-369 Do 54-61	
Fri	12/1	Quiz	Quiz - Probability		
Mon	12/4	6.3	Bayes' Rule - Practice	Rd 371-376 Do 62-65	
Tues	12/5	Rev	Review	Rd 383-383 Do 66-71, 73-74	
Wed	12/6	2 Hour Late Start - Opportunities Day			
Thurs	12/7	Rev	Review	Do 78-87	
Fri	12/8	Exam	Exam Chapter 6	Online Quiz Due	

Note:

The purpose of this guide is to help you organize your studies for this chapter. The schedule and assignments may change slightly.

Keep your homework organized and refer to this when you turn in your assignments at the end of the chapter.



Class Website:

Be sure to log on to the class website for notes, worksheets, links to our text companion site, etc.

<http://web.mac.com/statsmonkey>

Don't forget to take your online quiz!. Be sure to enter my email address correctly!

<http://bcs.whfreeman.com/yates2e>

My email address is:

jmmolesky@isd194.k12.mn.us

Chapter 6 Objectives and Skills:

These are the expectations for this chapter. You should be able to answer these questions and perform these tasks accurately and thoroughly. Although this is not an exhaustive review sheet, it gives a good idea of the "big picture" skills that you should have after completing this chapter. The more thoroughly and accurately you can complete these tasks, the better your preparation.

The Idea of Probability

Random phenomenon...individual outcomes are uncertain, but there is a regular distribution of outcomes in a large number of repetitions.

Probability...proportion of times an event occurs in many repeated events of a random phenomenon. Probability can also be thought of as long-term relative frequency.

Independent events (trials)...outcome of an event (trial) does not influence the outcome of any other event (trial).

Probability Models

- Sample space: The set of all possible outcomes of a random phenomenon
- Event: any outcome or a set of outcomes of a random phenomenon
- Probability model: a mathematical description of a random phenomenon consisting of two parts: a sample space "S" and a way of assigning probabilities to particular events.
- It is very important to find all possible outcomes in a sample space. To do this, you may want to use a tree diagram or the multiplication counting principle.
- If A is an event, then $0 \leq P(A) \leq 1$
- Complement rule: $P(\text{not } A) = 1 - P(A)$.
- Two events are disjoint, or mutually exclusive, if they have no outcomes in common. If A and B are disjoint, then $P(A \text{ or } B) = P(A) + P(B)$.
- Two events are independent if knowing that one occurs does not change the probability of the other. If events A and B are independent, then $P(A \text{ and } B) = P(A)P(B)$.



General Probability Rules

- There are basic laws that govern uses of probability. An understanding of these laws is important for those who wish to utilize statistics in practical and meaningful ways.
 - For any two events A and B,
 - $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$.
 - If A and B are disjoint, then $P(A \text{ and } B) = 0$.
 - $\text{Prob}(B|A) = P(A \text{ and } B)/P(A)$.
- The probability formulas are useful, but often times they are not needed if sample spaces are small and one uses common sense.
- In many problems, a tree diagram may help organize information and make calculating probabilities somewhat easier. One type of problem in which tree diagrams are especially useful is that of the "converse problem" as studied by Thomas Bayes. His findings, known as Bayes' Rule or Bayes' Theorem, allow us to solve problems such as "Given somebody tests positive for a disease, what is the probability they actually have that disease?"
- Bayes' Rule**

$$P(A|B) = \frac{P(A)P(B|A)}{P(A)P(B|A) + P(A')P(B|A')}$$

Rather than memorizing the formula, I'd suggest using a tree diagram and a little common sense...but that's just me.

