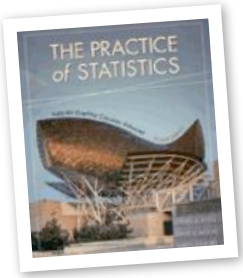
AP Statistics Chapter 7: Random Variables



"It seems that to make a correct conjecture about any event whatever, it is necessary to calculate exactly the number of possible cases and then to determine how much more likely it is that one case will occur than another." ~JAKOB BERNOULLI

Tentative Lesson Guide					
Date		**Stats**	**Lesson**	**Assignment**	**Done**
Mon	12/11	7.1	Discrete RandomVariables	Rd 391-395 Do **1-5**	
Tues	12/12	7.1	Continuous RandomVariables	Rd 397-403 Do **6-12, 14-16**	
Wed	12/13	7.2	Mean/Variance of R.V.	Rd 407-411 Do **22-26, 29**	
Thu	12/14	7.2	Rules for Mean/Variance	Rd 418-423 Do **34-39, 41**	
Fri	12/15	7.2	Combining Random Variables	Rd 424-427 Do **42-46, 49-50**	
Mon	12/18	Rev	Review	Practice Problems	
Tues	12/19	Rev	Review	Practice Problems	
Wed	12/20	**Exam**	**Exam Chapter 7**	**Online Quiz Due**	
Thurs	12/21		***Casino Lab***		
Fri	12/22		***Casino Lab***		
		Have a Great Happy Festive Winter Season Break!			

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 7 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.

Random Variables

- A Random Variable is a variable whose outcome is a numerical value of a random phenomenon.
- When describing a random variable "X", be sure to note the probability distribution, showing the values X takes on and their respective probabilities.

Discrete and Continuous Random Variables

- A "discrete" random variable has a countable number of possible values.
- We can display the probability distribution of a discrete random variable using a probability histogram. The height of each bar represents the probability of the outcome.
- A "continuous" random variable takes on all possible values in an interval of numbers.
- We can display the probability distribution of a continuous random variable with a density curve.
- All continuous probability distributions assign a probability of zero to each individual outcome. Probabilities are defined over ranges of values.

Means and Variances

- The mean, or "expected value" of a random variable is the average value we would expect to see in a long run of repeated observations.
- For a discrete RV, $E(X) = \mu_X = \sum x_i p_i$
- The variance of a random variable is a measure of the amount of variability we would expect to see in a long run of repeated observations.
- For a discrete RV,

$$Var(X) = \sigma_X^2 = \sum (x_i - \mu_X)^2 p_i$$

Rules for Means and Variances

- We often work with combinations or linear transformations of Random Variables. We can calculate the means and variances of these new random variables using the following formulas:

$$\mu_{a+bX} = a + b\mu_X$$

$$\sigma^2_{a+bX} = b^2\sigma^2_X$$

$$\mu_{X\pm Y} = \mu_X \pm \mu_Y$$

$$\sigma^2_{X\pm Y} = \sigma^2_X + \sigma^2_Y$$