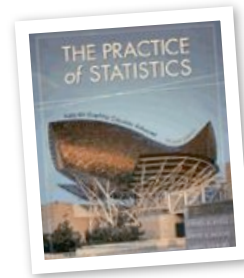


# AP STATISTICS CHAPTER 10: INTRODUCTION TO INFERENCE



"A STATISTICAL ANALYSIS, PROPERLY CONDUCTED, IS A DELICATE DISSECTION OF UNCERTAINTIES, A SURGERY OF SUPPOSITIONS."

~M.J. MORONEY

Tentative Lesson Guide					
Date	Stats	Lesson	Assignment	Done	
Mon	1/29	10.1	Estimating with Confidence	Rd 535-541 <b>Do 1-4</b>	
Tues	1/30	10.1	Confidence Intervals	Rd 543-554 <b>Do 8-10, 20-21, 24-25</b>	
Wed	1/31	10.2	Tests of Significance	Rd 559-566 <b>Do 27-32</b>	
Thu	2/1	10.2	Hypotheses - Procedure	Rd 567-581 <b>Do 38-40,46-48</b>	
Fri	2/2	10.3	Using Significance Tests	<b>Practice Sheet</b>	
Mon	2/5	<b>Quiz</b>	<b>Quiz 10.1-10.2</b>	Rd 586-592 <b>Do 57-61</b>	
Tues	2/6	10.4	Inference as a Decision	Rd 593-598 <b>Do 66-68</b>	
Wed	2/7	10.4	Type I, II Errors - Power	Rd 599-602 <b>Do 71-72</b>	
Thu	2/8	<b>Rev</b>	<b>Review Chapter 10</b>	Rd 606-608 <b>Review Sheet</b>	
Fri	2/9	<b>Ex</b>	<b>Exam Chapter 10</b>	<b>Online Quiz 10 Due</b>	

### 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](mailto:jmmolesky@isd194.k12.mn.us)

## Chapter 10 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.

### Estimating with Confidence

- C% confidence Interval for a Parameter: An interval computed from sample data by a method that has probability C% of producing an interval containing the true value of the parameter.
- A confidence interval for an unknown population mean  $\mu$ , calculated from a sample of size  $n$  with mean  $\bar{x}$ , has the form  $\bar{x} \pm z^* \left( \frac{\sigma}{\sqrt{n}} \right)$  where  $z^*$  is obtained from the normal distribution table and ' $\sigma$ ' is the standard deviation of the population.
- The margin of error formula has the form  $z^* \left( \frac{\sigma}{\sqrt{n}} \right)$ . The margin of error actually determines the length of the confidence interval.
- Determine a sample size necessary for a given margin of error.

### Tests of Significance

- The reasoning of a test of significance is as follows: Suppose a null hypothesis is true. If we were to repeat our sampling numerous times, what would the chances be that we would observe a sample value as extreme as the one that was observed?
  - (1) A null hypothesis is basically a hypothesis of no change. Basically, if one does not reject a null hypothesis, then the test results are not statistically significant.
  - (2) Failing to reject a null hypothesis at a low level of significance is not strong evidence that it is true. It simply means that it is not unreasonable to assume that the hypothesis is true.
  - (3) Rejecting a null hypothesis is equivalent to saying that test statistic is statistically significant.
  - (4) The null and alternate hypotheses are both stated in terms of population parameters, not sample statistics. You are attempting to use sample statistics to come to reasonable conclusions about population parameters.

(5) A P-value is the probability that one would obtain a statistic as "extreme" as that which was calculated from the sample.

(6) The level of significance for a test is usually set beforehand. If a P-value is smaller than the level of significance, then the test statistic is statistically significant.

(7) A statistical test could be 2-tail or 1-tail. Which one is used depends on the purpose and nature of the test. If both positive and negative deviations from a parameter are important, then one should use a 2-tail test. If only positive (or negative) deviations are important, then one should use a 1-tail test.

### Inference as a Decision

- Real-life situations frequently involve Type I and Type II errors. Consider the legal world and a null hypothesis "This accused man is innocent." A Type I error would be determining the man is guilty when he is innocent..A Type II error would involve declaring the man innocent when he is guilty. In real world situations, one must often decide which error type is more important to minimize.

Things to remember:

- (1) A Type I error can only occur when a null hypothesis is true.
- (2) A Type II error can only occur when a null hypothesis is false.
- (3) The Power of a test is  $1 - \text{probability (Type II error)}$ . This is the probability that you correctly reject a false null hypothesis.

