ANNOUNCEMENTS:

- You may pick up homework and exams in office hours, or at the final exam.

- Don't forget to bring a calculator and #2 pencil to the final exam. You may have 4 pages of notes, both sides, typed or hand-written.

- Office hours Today: 1-3 (Kramer), Mon, 10 – noon (Utts)

- Final grades will be posted 24 hours before they are sent to the Registrar. After they are sent to the Registrar it is almost impossible to change them, so if you are missing any grades or see an obvious error in your grades, you must let me know *before* I send them to the Registrar. I will send an email when they are posted, so make sure you check your UCI email! If you see an errors or missing grades now, let me know asap.

- In response to my request to answer questions related to what we covered but not explained already, someone asked if I could explain what is meant by "error bars." Four of the next 5 slides on error bars cannot be posted on website because of copyright held by others but will be sent by email to anyone who requests them.

ERROR BARS

They are used in a variety of ways, so a picture needs to tell you which way they are being used. Here are some common uses:

- One standard deviation above and below the mean (sometimes above only, not below)
- Two standard deviations above and below the mean, capturing about 95% of *all* population values
- Two standard errors above and below the mean, representing a 95% confidence interval

STATISTICS 8 – REVIEW FOR FINAL EXAM (MATERIAL AFTER MIDTERM 2)

Know how to find, construct or calculate (example, page number(s) of example):

1. Describe a sampling distribution for one sample mean. (9.12, 360)
2. Describe a sampling distribution for the sample mean of paired differences (9.13, 364)
3. Describe a sampling distribution for the difference in two sample means (9.14, 367-368)

For 1 to 3, see the summary table on pages 382-383 (at the end of Chapter 9)

4. Calculate a standardized statistic for a given value of a sample mean or mean difference (9.16, 371-372)
5. Find a confidence interval for a population mean (11.6, 455-456)
6. Find a confidence interval for a population mean of differences for paired data (11.9, 463-464)
7. Find a confidence interval for difference in two population means, independent samples (11.12, 471-472)
   Note: In this situation you would be provided with either the standard error or computer output.

For 5 to 7, see the summary table on page 483 (at the end of Chapter 11)

8. Carry out a hypothesis test for one population proportion (12.13, 520-521)
9. Carry out a hypothesis test for one population mean (13.1, 553 and 556-557)
10. Carry out a hypothesis test for a population mean of differences for paired data (13.2, 562-564)

For 8 to 10, see the summary table on pages 586-587 (at the end of Chapter 13)

11. Carry out a chi-square goodness-of-fit test (15.13, 654-655)
12. Given an ANOVA table, specify and test hypotheses (16.9, 683)
13. Given part of an ANOVA table, fill in the rest (exercise 16.17, p. 697, see homework solution)

Know how to identify:

1. Which of the 5 parameters is relevant in a given situation.
2. Whether it is more appropriate to use paired data or independent samples in a given situation.
3. Whether it is more appropriate to use a confidence interval, hypothesis test, or both in a given situation.
4. The null and alternative hypotheses in a given situation, including whether to use one or two-sided H_a
5. What constitutes a type 1 error and type 2 error in a given situation, the consequences of each, and which is more serious in that situation.
6. When to use a chi-square goodness-of-fit test and when to use an ANOVA F-test.

Understand:

1. What a sampling distribution is.
2. The purpose of statistical inference, including the relationship between a parameter and statistic; a population and a sample, and when statistical inference is not needed
3. Why and when a t-distribution is used in place of a z-distribution
4. How to interpret a confidence interval for a mean (and possible misinterpretation – see page 457)
5. The logic of hypothesis testing (page 499)
6. How to interpret a p-value
7. How to use a p-value to make a conclusion
8. The possible conclusions that can be made for a hypothesis test, and why (i.e. why we don't *accept* H_0)
9. How a type 1 error or type 2 error is made and when each one could be made
10. The concept of the power of a test
11. The relationship between sample size, p-value, power and the outcome of a hypothesis test
12. Statistical significance versus practical importance
13. The relationship between confidence intervals and hypothesis tests
14. The problem of multiple testing
15. When results can be extended to a population
16. When a cause-effect conclusion can be made
17. Non-statistical factors that contribute to assessing cause and effect
18. The many ways statistics is used in life.