Inference Study Guide [Still Under Construction]

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1 The book and the test

Our textbook, De Veaux, has a fantastic presentation of the theory and concepts behind inference. Many of this theory and concepts are important for applying inference to problems. However, I have found over the past couple of semesters that I have used the book, that students don't always master the concepts and theory, and many of them, at the same time, do not learn to apply the methods to problems.

We will continue to go through the book as far as we can—and do the MyStatLab homework—but my intention is to provide problems ahead of time that you will need to solve to do well on the final exam. To this extent, I have posted the midterm I used for the last semester. This is a study guide for learning to master those problems.

2 Lists of Concepts

The "stats" on the menu in StatCrunch allow you to perform inference in two different ways:

1. Confidence intervals.

2. Hypothesis tests.

There are 5 general types of "stats" (what StatCrunch labels the menus) that we will cover (the top two submenus)

1. One-sample proportion stats.

2. One-sample t-stats.

3. Two-sample proportion stats.

4. Two-sample t-stats.

5. Paired t-stats.

For confidence interval, you need to know:

1. Confidence level.

2. Point estimate.

3. Standard error.

4. Critical value of test statistic.

5. Margin of error.

For hypothesis testing, you need to know:

1. P-value.

2. Test statistic.

3. Critical value of test statistic.

4. Level of significance of test.

5. One-sided alternative test.

6. Two-sided alternative test.

7. Type I error.

8. Type II error.

9. Power of test.

The types of problems you will encounter on the exam include:

1. Given a scenario, choose the type of "stat" that you will need to employ from the StatCrunch menu.

2. Given a problem, check the conditions for the type of "stat" you need to use.

3. Given a problem, plug the numbers into StatCrunch.

4. Interpret the given output of StatCrunch for an inference problem.

5. Do all the steps above in one problem.

6. Solve problems that involve just concepts and theory in addition to the problems above that may also require knowing concepts and theory.