

**Draft is due May 9. The final report is due Thursday, May 16.**

**Overview:** You will be doing two hypothesis tests based on the data your group collected.

**Individual Part:** Each group member will hand write the graph of the sampling distribution for each of the hypothesis tests. In addition, each member should hand write the final conclusions and the meanings of p-value for each test in nontechnical terms. This should be stapled to the back of the group's final project.

**Format:** The report should include these headings in this order for **both** your mean data and your proportion data. It should be turned in stapled in the upper left hand corner (a folder is not required nor desired.)

### **Means comparison**

Perform a Hypothesis Test of your claim about your population means

- Include **title** of project, your name(s), Math 15, and my name (Jones).
- **Data summary** should be summary statistics copied from StatCrunch. Formatted to it is easy to read.
- Assumptions and **requirements** for a hypothesis test.
- **Write a Question** and a claim about your population means and a description of the populations you are making your claim about. This should look like a problem from 9.2. Clearly state the claim that you are testing as if you were writing a problem for the text book. Determine if there is a significant difference between the men and the women (or whatever comparable populations you chose).
- Do a **Hypothesis test** for the difference between two means.
  - 1) State the claim, null and alternate hypothesis.
  - 2) Graph and shade the critical region on a hand drawn t-distribution.
  - 3) Find the critical value. Label it on your graph.
  - 4) Use StatCrunch to find the point estimate of the difference between the samples means (independent 9.2). Copy and paste the hypothesis test output into your project. Label the test statistic and point estimate on your hand drawn graph of the t-distribution.
  - 5) Give initial conclusion.
- Discussion and **final conclusion** about population means.
  - 1) Give justification of conclusion using the P-value and meaning of p-value.
  - 2) Give the test statistic and critical value and their meanings. Explain how they justify your conclusion.
  - 3) Make a confidence interval for the difference between your population proportions. Choose your confidence level so the Critical values would be the same as those used for your hypothesis test.
  - 4) Explain how the confidence interval justifies your conclusion.

## Proportion comparison

Perform a Hypothesis Test of your claim about your population proportions

- **Title** for proportions
- **Data summary.** Include  $n_1$ ,  $n_2$ ,  $x_1$ ,  $x_2$ ,  $p_1$ -hat and  $p_2$ -hat. These calculations are done by hand.
- State the Assumptions and **Requirements** for confidence intervals and hypothesis test.
- The **Question** about your proportions looks like question in section 9.1 Determine if there is a significant difference between the population proportions.
- Perform a **Hypothesis Test** of your claim. Which Test are you using?
  - 1) State the claim, null and alternate hypothesis.
  - 2) Graph and shade the critical region on a hand drawn normal distribution.
  - 3) Find the critical value. Label it on your graph.
  - 4) Use your calculator to find the point estimate of the difference between the sample proportions and its test statistic.
  - 5) Label the Test statistic and point estimate on your graph.
  - 6) Make an initial conclusion.
- Final **Conclusion** about population proportions.
  - 1) Give p-value and meaning of p-value and how it justifies your conclusion.
  - 2) Give Test Statistic and Critical value and their meanings and explain how they lead to the final conclusion.
  - 3) Make a confidence interval for the difference between your population proportions. Choose your confidence level so the Critical values would be the same as those used for your hypothesis test.
  - 4) Explain how meaning of the confidence interval for the difference between your sample proportions justifies the conclusion to your hypothesis test.
- **Appendix** giving all of your mean and proportions data collection lists.

Grading will be based on how well you answer every part of the questions in complete sentences that demonstrate an exemplary understanding of the concepts with graphs neatly and clearly labeled.

_____ / 5	Data Collection for project. (Put your name on the hand written copy)
_____ /15	Part 1 of project
_____ /20	Part 2 of project <b>Confidence Intervals</b> , and meanings.
_____ /5	<b>Format</b> , presentation, correct spacing, and completeness apparent in project.
_____ /5	<b>Question</b> , claim, description of population correctly stated.
_____ /5	Assumptions, justifications, <b>requirements</b> for hypothesis test justified.
_____ /15	Group part of <b>hypothesis tests</b>
_____ /30	Each member submits a hand drawn <b>Graph</b> for both tests, gives <b>Meaning of p-value</b> , and writes conclusions sentences for p-value, critical value, and confidence interval.
	Understanding of inference in <b>Conclusions</b> is correct. (Assigned individually)
_____ /100	Total