

Name: _____ Lecture time (10, 11 or 12): _____

Lab Problems 5-8

Statistics 0200 Dr. Nancy Pfenning

5. The proportion of college students who smoke is reported to be 0.20. Is the proportion significantly lower for students at this university?
- (a) What variable or variables are involved? For each variable, tell whether it is quantitative or categorical.
 - (b) **Before you even look at the data**, give a rough guess for the population proportion of students who smoke _____. Then formulate null and alternative hypotheses to test if the population proportion is necessarily less than 0.20. H_0 : _____ H_a : _____
Do you suspect that there will be enough evidence to reject H_0 ? _____
 - (c) Use **MINITAB Basics Example S** to find the 95% confidence interval for unknown population proportion. _____
Test your hypotheses, making sure to opt for the correct alternative: Report the P -value _____, and whether or not you reject the null hypothesis. _____
 - (d) **State your results**: since you did or did not reject H_0 , what do you conclude about the unknown population proportion? Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your suspicions in (b).
6. Writing SAT scores are assumed to have standard deviation 100. Is the mean Writing SAT score of all Stat students 610? (610 is presumably the mean score of all Pitt students.)
- (a) What variable or variables are involved? For each variable, tell whether it is quantitative or categorical.
 - (b) Before you even look at the data, formulate null and alternative hypotheses about the population mean μ . H_0 : _____ H_a : _____
Do you suspect that there will be enough evidence to reject H_0 ? _____
 - (c) Use **MINITAB Basics Example N** to carry out a z test, specifying σ and making sure to opt for the correct alternative ($<$, \neq , or $>$); include a display of the data. What is the p -value? _____
Do you reject H_0 ? _____

Give a 95% confidence interval for μ : _____

Note: this was automatically provided if your alternative was \neq ; otherwise, repeat the procedure, this time opting for a two-sided alternative.

- (d) **State your results:** since you did or did not reject H_0 , what do you conclude about the unknown population mean? Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your suspicions in (b).

7. Adults in the U.S. average 7 hours of sleep a night. Is this also the mean for the population of Stat students?
- What variable or variables are involved? For each variable, tell whether it is quantitative or categorical.
 - Before you even look at the data**, formulate null and alternative hypotheses about the population mean μ . H_0 : _____ H_a : _____
Do you suspect that there will be enough evidence to reject H_0 ? _____
 - Note: When σ is unknown, you should carry out a test of your hypotheses using a t procedure, not z. Use **MINITAB** to carry out the one-sample t procedure, making sure to opt for the correct alternative ($<$, \neq , or $>$); include a display of the data. What is the p-value? _____ Do you reject H_0 ? _____
Give a 95% confidence interval for μ : _____ [Note: this was automatically provided if your alternative was \neq ; otherwise, repeat the t procedure, this time opting for a two-sided alternative.]
 - State your results**: since you did or did not reject H_0 , what do you conclude about the unknown population mean? Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your suspicions in (b).
8. Overall, is there a positive mean difference between the ages of students' fathers and mothers? (I suspect the fathers to be older.)
- What variable or variables are involved? For each variable, tell whether it is quantitative or categorical.
 - Before you even look at the data**, formulate null and alternative hypotheses about the population mean difference μ_d .
 H_0 : _____
 H_a : _____
Do you suspect that there will be enough evidence to reject H_0 ? _____
 - Use **MINITAB Basics Example O** to carry out a paired-sample t procedure, making sure to opt for the correct alternative ($<$, \neq , or $>$); include a display of the data. What is the p-value? _____
Do you reject H_0 ? _____
 - State your results**: since you did or did not reject H_0 , what do you conclude about the unknown population mean difference? Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your suspicions in (b).