

Instruction: Complete each of the steps below using Minitab. You can find the data in the file **143data4.xlsx**. This is the same data from Lab #1. You will need to copy and paste the data into Minitab. Complete the tasks below. Copy and paste any output (graphs, tables, summary statistics, etc.) to a Word document where you should include the requested analysis next to each item. Save the Minitab work as a project. Submit the Word document and the Minitab file to Blackboard.

1. The data on paternal smoking lists birth weights in grams of children of fathers who smoke and those who don't. Calculate the mean and standard deviation of both sets of data separately (one mean and standard deviation for smoke, and one set for non-smoke). Graph each set separately in a histogram with distribution curve. Visually assess whether the data appears to be approximately normal. (You may want to also consider a normal probability plot to assess this.) Calculate a confidence interval for the difference of means. Interpret the results.

2. Using the Poverty data (given as percentages), calculate the mean and standard deviation of the data (not the years). Create a line graph. Inspect the graph to see if the data appears random or has a general trend (plot poverty on the vertical axis and year on the horizontal axis). Analyze whether the poverty data is normally distributed (histogram, normal probability plot or other graph). According to the US Census Bureau (<https://www.census.gov/library/publications/2019/demo/p60-266.html>), the poverty rate in 2018 was 11.8 percent. Construct a confidence interval (for means) on the poverty data in the spreadsheet and compare the result to the 2018 number. Is the most recent information a significant departure from poverty rates over the last (roughly) sixty years?

3. Using the data on coupons and purchases, separate the data into one group that received coupons and one group that did not. Construct a pie chart for each group (coupon or no coupon) for the percent of those that made a purchase. Find a confidence interval for the difference of proportions to determine if purchasing rate was influenced by receiving a coupon.

4. For each of the scenarios below, determine the sample size needed to calculate a confidence interval with the given margin of error.
 - a. An initial small sample determines that the standard deviation is about 5.7. What sample size is needed to construct a 95% confidence interval to obtain a margin of error of 1 or smaller?

 - b. An initial small sample determines that the proportion of people who support a given candidate is about 27%. How large a sample is needed to obtain a 99% confidence interval with a margin of error of 2%?