

Homework 5

1. We will use a couple of the applets posted on the course webpage, as demonstrated in class.
 - (a) For the Stats Portal Confidence Intervals applet, select 90% for the confidence level and press Sample 25. How many of your intervals are “Hits”? How many hits did you expect? The default sample size for this experiment was $n = 20$. Should changing the sample size have an effect on the expected number of hits? Explain.
 - (b) For the Rossman Chance applet, Simulating Confidence Intervals for Population Parameter, select Means under Method and enter 100 in Intervals. How many of your intervals do not contain the population mean $\mu = 0.5$? How many did you expect not to contain the population mean? Does your histogram of sample means appear approximately normal? *Graduate students only:* Based on the population standard deviation of $\sigma = 10$, what should $\sigma_{\bar{X}}$ be? Are results for the histogram of sample means consistent with this value? Change n to 25, re-run the simulation and comment.
2. 7.14, though use $\alpha = 0.01$ rather than $\alpha = 0.02$ for parts (c) and (d).
3. Answer the following questions using the example in 7.43.
 - (a) Compute the mean and standard deviation for this example (you can compare your answers to the computer print-out provided).
 - (b) Construct a normal quantile plot using the statistical package of your choice. Are the data approximately normally distributed?
 - (c) Construct a 99% confidence interval for the mean daily minutes of daylight in Sharon, PA. Interpret the interval.
4. 7.55, with $\alpha = 0.05$ replaced by $\alpha = 0.02$.
5. 7.61
6. 7.80, but for part (a), assume p is near 0.25, rather than p is near 0.3.
7. 7.111
8. Answer the following question using the example in 9.19.
 - (a) Compute s_1 and s_2 for the two samples of students.
 - (b) Construct and interpret a 90% confidence interval for the ratio of population standard deviations.