Stat 4155/5155 Homework One

Please include your names as part of the file name

Part A

The references to SMOG are to the textbook; e.g. SMOG 4.5 refers to Exercise 4.5 in Chapter Four.

1. SMOG 4.5 (a, c, e)

2. SMOG 4.9

3. SMOG 4.14 What we refer to in the text as a "bound on the error" is 2xSE (i.e. the margin of error from an approximate 95% confidence interval.

4. SMOG 4.15

5. SMOG 4.20

6. SMOG 4.21

7. Read SMOG 2.2 (Technical Terms). Describe for me one point therein that is not clear to you. If you have more than one, tell me about the most vexing.

Part B

Your goal: to estimate the average size of high schools in the (artificial) population of high school sizes[1] represented in the Excel file **high school size**. In this exercise you will play the role of sampler/scientist *and* god/goddess. A rare opportunity!

(1) Determine the required sample size to achieve a 95% confidence interval that has a margin of error no larger than 15% of the mean. Use as your initial estimates for the mean 250; for the SD 150. There are 1005 students in the population.
(2) Draw a random sample from the population (it is in column 1 of the worksheet).
(3) Create a 95% C.I. using the fpc, and ignoring the fpc. Which do you recommend? Why?
(4) Did you achieve your targeted margin of error with your actual data?
(5) Given your chosen precision target (a relative margin of error of 15%), would a 90% C.I. have required a larger or smaller sample size? Explain.
(6) Given a 95% confidence level, would a targeted relative margin of error of 5% have required a larger or smaller sample size? Explain.

[1] These are actual high school sizes reported for undergraduates at U.W who went to high school in Wyoming. As such they really are a sample, which you are using for my nefarious purposes as an actual population of values.