

A.P. Statistics
Assignment 7.1

Remember to show your thinking through your work.

1. What proportion of all Americans believe the president is doing a good job? In a recent poll (conducted February 9-12, 2006) found that 39% of 1000 randomly selected Americans approved of the way George W. Bush is handling his job as president.

a. Does this mean that only 39% of all Americans approve of the way George W. Bush is handling his job as president?

b. For a sample proportion, as long as the population is greater than ten times the sample size, we can approximate the standard deviation to be $\sqrt{\frac{p(1-p)}{n}}$.
What is the standard deviation for this sample?

c. What is the critical value for a 90% confidence interval?

d. What is the critical value for a 95% confidence interval?

e. What is the 90% confidence interval? Be sure to include the formula with your numbers plugged in. Use the model: $p \pm z^* \sqrt{\frac{p(1-p)}{n}}$

f. What is the 95% confidence interval?

2. What is the mean number of hours that high school students spend on homework per week? It is known that the standard deviation of the population is 2.2 hours. In a

random sample of 40 students, it is found that they average 13 hours per week on homework.

- a. What is the standard deviation for this sample?

- b. What is the critical value for a 90% confidence interval?

- c. What is the critical value for a 95% confidence interval?

- d. What is the 90% confidence interval? Be sure to include the formula with your numbers plugged in. Use the model: $\bar{x} \pm z * \frac{\sigma}{\sqrt{n}}$

- e. What is the 95% confidence interval?

3. The Acculturation Rating Scale for Mexican Americans (ARSMA) is a psychological test developed to measure the degree of Mexican/Spanish versus Anglo/English acculturation of Mexican Americans. The distribution of ARSMA scores in a population used to develop the test was approximately normal, with mean 3.0 and standard deviation 0.8. A further study gave ARSMA to 50 first-generation Mexican Americans. The mean of their scores is $\bar{x} = 2.36$. If the standard deviation for the first-generation population is also 0.8, give a 95% confidence interval for the mean ARSMA score for first-generation Mexican Americans.

4. A newspaper headline describing a poll of registered voters taken two weeks before a recent election read "Ringel leads with 52%." The accompanying article describing the poll stated that the margin of error was 2% with 95% confidence.

- a. Explain in plain language to someone who knows no statistics what "95% confidence" means.

- b. The poll shows Ringel leading. But the newspaper article said that the election was too close to call. Explain why.

5. A student reads that a 95% confidence interval for the mean SAT math score of California high school seniors is 452 to 470. Asked to explain the meaning of this interval, the student says, "95% of California high school seniors have SAT math scores between 452 and 470." Is the student right? Justify your answer.

6. You measure the weights of 24 male runners. You do not actually choose an SRS, but you are willing to assume that these runners are a random sample from the population of male runners in your town or city. Here are their weights in kilograms:

67.8	61.9	63.0	53.1	62.3	59.7	55.4	58.9
60.9	69.2	63.7	68.3	64.7	65.6	56.0	57.8
66.0	62.9	53.6	65.0	55.8	60.4	69.3	61.7

- a. Suppose that the standard deviation of the population is known to be $\sigma = 4.5$ kg. What is σ_x , the standard deviation of x ?

- b. Give a 95% confidence interval for the mean of the population from which the sample is drawn.

- c. Are you quite sure that the average weight of the population of runners is less than 65 kg?