Homework 4

Instructions

1. Download the printable version of this assignment here. Print it out and record your answers directly in the space provided.
2. Write your **name** and **student number** on the top of the assignment.
3. For problems requiring additional written work, use the allotted work space and/or margins of the page.
4. Once you're done with a problem, reflect on how you well-equipped you felt answering that particular problem using the confidence level assessment.

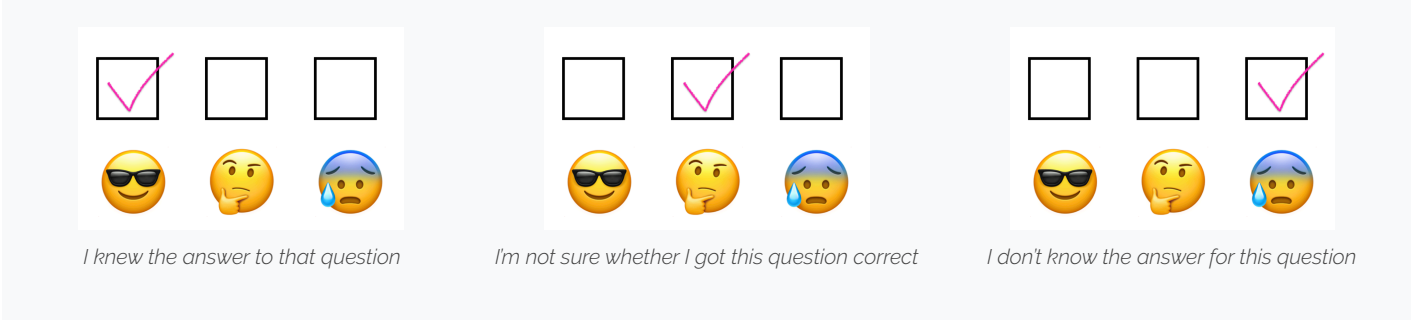


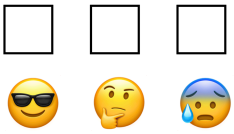
Figure 1: Confidence Level Assessment

5. Turn in your assignment in class on the due date.

Questions

Question 1

A recent magazine article claimed that "our survey results using a random sample indicate that, on average, American adults watch between 75 and 77 minutes of television per day."



a. What is the population of interest in this example?

---

b. Based on the reported confidence interval, what is the average amount of time spent watching TV for the sample?

---

c. What is the margin of error?

---

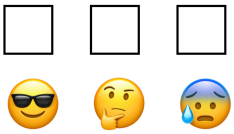
d. What other information is needed to assess the quality of the inference made in this statement?

---

e. Name at least two factors that might help to explain the high precision (i.e., small margin of error) for the confidence interval.

Question 2

A social researcher is interested in estimating the number of friends that college students typically made during their first year of school. Questioning a random sample of 50 students at the end of their freshman year, he finds a mean of 3 friends. Assume that the sample comes from a population with a standard deviation of 1.0.



a. Calculate the standard error.

---

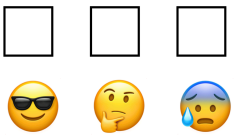
b. Construct a 95% confidence interval to estimate the mean number of friends made by the population of students during their first year on campus.

---

c. Provide an interpretation of the confidence interval.

Question 3

A school principal is interested in assessing the performance of her students on the Totally Oppressive Standardized test (TOST). She selects a simple random sample of 16 of her students and finds the following set of scores:



6	5	6	12	5	10	11	13
12	10	9	20	23	20	28	18

Assume that the sample is drawn from a population with a standard deviation $\sigma = 7.20$.

a. What is the average score for the sample of students?

---

b. Calculate the standard error.

---

c. Find and interpret the 95% confidence interval for the mean.

---

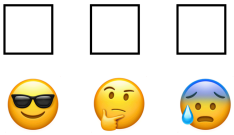
d. Find and interpret the 99% confidence interval for the mean.

---

e. Why is the margin of error smaller for the 95% confidence interval in question c than for the 99% confidence interval in question d?

Question 4

A mayor of a big city finds that 212 of 400 randomly selected city residents believe that that believes that the city should spend more money on road maintenance. Use this information for a large-sample inference of the proportion of all city residents who believe that the city should be spending more.



a. What percentage of the sample members believe the city should be spending more?

_____

b. Calculate the standard error of the proportion.

_____

c. Find and interpret the 95% confidence interval for the population proportion.

_____

d. Based on your findings, is it safe to say that a majority of the city's population wants more spent on roads? Explain your answer.