Calculate Standard Deviation and Standard Error

Canvas will give you 4 observations to enter into the spreadsheet (below): the four X_i values. Use them to calculate the mean, the standard deviation, and the standard error by filling in the shaded boxes — just as you did for the exam review. (8 points)

i	X_i	Mean $\overline{X}$	Deviation from mean	Deviation squared
1				
2				
3				
4				
Sum = Σ X_i			sum of squares		SS
n	4		variance		SS / (n − 1)
Sample mean $\overline{X}$ ① (X bar)			sd = standard deviation		sd = $\sqrt{\text{variance}}$
			se = standard error ②		se = sd / $\sqrt{n}$

Calculate Confidence Intervals

As you can see, the spreadsheet ends up calculating ① the <u>mean</u> and ② the <u>standard error</u>. On the worksheet on the next page, use those two numbers to calculate the 95% confidence interval (CI). Then graph the mean and the 95% CI on the number line below.

To receive credit for an answer here, it must be supported by work you show on page 2.

95% Confidence Interval: (2 points)

$$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15$$
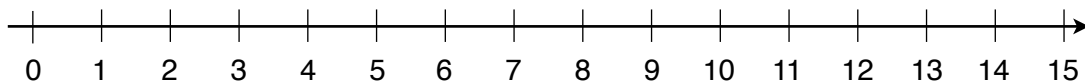
For the mean, make a solid dot. For the confidence interval, draw a heavy line with a hash mark at each end. Here is how that looks for a mean of 10, and a CI of 8.5 to 11.5:

$$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15$$

Worksheet for Confidence Intervals

Use this worksheet to calculate the 95% confidence interval around the mean.

- You must submit this page (page 2, along with page 1), because it shows your work.
- You must show your work to get credit.
- However, I will NOT look at this page to do the actual grading.
- I will grade based on what you write on page 1. However...
- I will deduct points if you do not show your work on this page that supports your answers on page 1.

Start by entering (into the first two shaded boxes) the mean and the standard error that you calculated in the top half of page 1. Then do the math, and write the answers in the next three shaded boxes. Go back to page 1 and graph your answers using the number line there.

$\overline{X}$	①	mean
se	②	standard error
multiply se by 1.96		$1.96 \times \text{se}$
Upper 95% CI		$\overline{X} + (1.96 \times \text{se})$
Lower 95% CI		$\overline{X} - (1.96 \times \text{se})$

Above, feel free to use 2.00 instead of 1.96.

Here are some intervals you can use for PRACTICE. Only the ones on page 1 count for your grade, however.