

## PROBLEM #1

$$3.61 \pm 2.03(1.81/\sqrt{36})$$

$$3.61 \pm 2.03(1.81/36)$$

$$3.61 \pm (2.03 * 0.30)$$

$$3.61 \pm 0.061$$

$$[3.00, 4.21]$$

## Problem #2

Consider the following scenario:

You are tasked with examining whether the first-year GPA of in-state students differs from the first-year GPA of out-state students. You have access to confidence intervals of the difference between the average in-state first-year GPA and the average out-state first-year GPA.

If the confidence interval was  $(-0.18, 0.31)$ , would you state that the differences between these groups are statistically significant?

- This is not significant because one number is positive and the other number is positive. If it was statistically significant, both numbers would be on the same side of zero as a measure of sample mean.

If the confidence interval was  $(0.15, 0.42)$ , would you state that the differences between these groups are statistically significant?

- Yes, these groups are statistically significant because the sample mean can easily fall between the .15-.42 range in different for GPA between instate and out of state students.

If the confidence interval was  $(-0.39, -0.06)$ , would you state that the differences between these groups are statistically significant?

- Yes, these groups are statistically significant because the sample mean can easily fall between the -.39 and -.06 range in different GPA between in state and out of state students.

If the confidence interval was  $(-0.22, 0.14)$ , would you state that the differences between these groups are statistically significant?

- This is not significant because one number is positive and the other number is positive. If it was statistically significant, both numbers would be on the same side of zero as a measure of sample mean.

### Problem #3

Average GPA for male students: 2.99; Average GPA for female students 3.02; Sample size: 22,234 male students and 24,153 female students; t-statistic: 3.32; p-value 0.001.

Since the p-value is less than .05, one can conclude that the null hypothesis is false and that the GPA difference between male students and female students is statistically significant and that they will have different gpas.

Average GPA for male students: 2.94; Average GPA for female students 3.07; Sample size: 133 male students and 151 female students; t-statistic: 1.81; p-value 0.08.

Since the p-value is not less than .05, the null hypothesis cannot be rejected.

### Problem #4

To me, it would suggest that smaller sample sizes of students is throwing off the statistical significant of the institution in comparison to other institutions with larger sample sizes.