

STA 215 Test 3 Review

Correlation, Linear Regression, Independent Samples t-Test, Independent Samples CI

1. Know and explain the following terms and be able to give examples of each

- Population Parameter
- Sample Statistic
- Point Estimate
- Margin of Error
- Confidence Interval
- Hypothesis Test
- Independent Sample versus Dependent Sample
- Correlation Coefficient
- Interpolation
- Extrapolation
- Response Variable (Dependent Variable)
- Explanatory Variable (Independent Variable)

2. Use the following paired data to:

X:	3	4	6	10
Y:	7	6	5	9

- Construct a Scatter Plot and determine the shape and direction of the pattern
- Calculate and interpret the correlation coefficient using your calculator
- Calculate the slope and y-intercept and be able to interpret the slope
- Calculate the linear regression equation and explain if it is a good model for the data
- Use the linear regression equation to estimate $x = 5$ and explain if this is interpolation or extrapolation and if it is a good estimate.
- Use the linear regression equation to estimate $x = 25$ and explain if this is interpolation or extrapolation and if this is a good estimate.

3. Hypothesis Testing

- Know the 5-step hypothesis testing procedure
- Know the assumptions for each of the independent sample t-test (un-pooled)
- Write the Null Hypothesis and Alternative Hypothesis for a given scenario
- Calculate the test statistic and p-value
- State and apply the decision rule
- Write a conclusion for a hypothesis test given a scenario

4. Use the data below to complete a hypothesis test at the $\alpha=0.10$ level of significance to determine if the two population means are different on average. Construct a 90% confidence interval to estimate the difference in the two population means. If the two population means are different use the confidence interval to determine if μ_1 is larger than μ_2 or μ_1 is smaller than μ_2 on average.

Sample 1	Sample 2	Hypothesis
$n_1 = 16$	$n_2 = 14$	$H_0: \mu_1 = \mu_2$
$\bar{x}_1 = 22$	$\bar{x}_2 = 25$	$H_A: \mu_1 \neq \mu_2$
$s_1 = 3.5$	$s_2 = 5.2$	

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5. Do stocks on the NYSE perform better than stocks on the NASDAQ on average. Show all 5 steps of the hypothesis testing procedure at the $\alpha=0.05$ level of significance and the sample data below to evaluate the given hypothesis.

NYSE	NASDAQ	Hypothesis
17.16	15.80	$H_0: \mu_1 \leq \mu_2$
17.08	16.28	
15.51	16.21	$H_A: \mu_1 > \mu_2$
8.43	17.97	
25.15	7.77	