

Week 5 post

a) State the independent and dependent variables.

IV: annual dividend

DV: stock selling price

b) What are the regression coefficients for the independent variable and the constant from the table?

b0: 25.25981549

b1: 2.520647151

c. Interpret the regression coefficients.

b0: Represents the stock selling price when annual dividend is equal to zero. When annual dividend is \$0, stock selling price is \$25.26.

b1: Represents the change in stock selling price that results from a one-unit (\$) change in annual dividend. Stock selling price increases \$2.52 with every \$1 increase in annual dividend.

d. Write the regression equation using the regression coefficient and constant.

$$y = b_0 + b_1x$$

$$y = 25.26 + 2.53x$$

You think stock prices will rise or fall based on the annual dividend the company distributes. You run a regression analysis using Data Analysis to answer the following question: Is stock selling price a function of annual dividend?

Using the Regression output table given, answer the questions below.

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.810693784					
R Square	0.657224412					
Adjusted R Square	0.644982426					
Standard Error	9.029129098					
Observations	30					
ANOVA						
		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	4376.768313	4376.768313	53.6861	5.60401E-08	

Residual	28	2282.704823	81.52517226			
Total	29	6659.473137				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	25.25981549	4.133768281	6.110602669	1.36E-06	16.79217502	33.72745596
Dividend	2.520647151	0.344017979	7.327079711	5.6E-08	1.815958267	3.225336035

Week 5 post

1. You want to answer the question: Is there a difference in the average number of patients being seen in Clinic Alpha versus Clinic Bravo?

a) What is the most appropriate test? State your rationale.

A two-tailed T-test for independent samples is most appropriate in evaluating the difference in the average number of patients being seen by two separate clinics, Clinic Alpha and Clinic Bravo. This T-test is a hypothesis testing tool utilized to determine whether there is a significant difference in the means of two groups "which may be related in certain features," providing insight into whether the null hypothesis may or may not be rejected (Kenton, 2020). In this scenario, it is assumed that the subjects are unrelated and independently selected from their populations. Additionally, the assumption is made that the populations have a normal distribution or nearly equal variance (Boslaugh, 2013, p.160-161).

References:

Boslaugh, S. (2013). *Statistics in a nutshell* (2nd ed.). Sebastopol, CA: O'Reilly Media.

Kenton, W. (2020, March 22). *Tools for fundamental analysis: T-test*. Retrieved from <https://www.investopedia.com/terms/t/t-test.asp>

b) State your null and alternative hypothesis in words and symbols for the test you chose as the answer in part a.

Symbols

H₀: $\mu_1 - \mu_2 = 0$ or $\mu_1 = \mu_2$ or $\mu\bar{x}_1 - \mu\bar{x}_2 = 0$ or $\mu\bar{x}_1 - \bar{x}_2 = 0$

H_a: $\mu_1 - \mu_2 \neq 0$ or $\mu_1 \neq \mu_2$ or $\mu\bar{x}_1 - \mu\bar{x}_2 \neq 0$ or $\mu\bar{x}_1 - \bar{x}_2 \neq 0$

Words

H₀: The mean number of patients being seen by each clinic, Clinic Alpha and Clinic Bravo, is equal.

H_a: The mean number of patients being seen by each clinic, Clinic Alpha and Clinic Bravo, is not equal.

c) You set your level of significance at $\alpha = 0.05$ and determine your test critical value = 2.045. What is your decision rule? (State when would you reject the null hypothesis and when you would fail to reject the null hypothesis.)

If $t < -t_{\alpha/2}$ or $t > t_{\alpha/2}$ then reject the null hypothesis

If $p < \alpha$, reject the null hypothesis

$t_{\alpha/2} = 2.045$ $\alpha = 0.05$

- If $t < -2.045$ or $t > 2.045$, then reject the null hypothesis
- If $p < 0.05$, then reject the null hypothesis
- If $t > -2.045$ or $t < 2.045$, then fail to reject the null hypothesis
- If $p > 0.05$, then fail to reject the null hypothesis

Teach Response: Excellent Answer. You stated the rejection rules perfectly:

If $t < -t_{\alpha}$ or $t > t_{\alpha}$ then reject the null hypothesis

If $p < \alpha$, reject the null hypothesis

$t_{\alpha} = 2.045$ $\alpha = 0.05$

- If $t < -2.045$ or $t > 2.045$, then reject the null hypothesis
- If $p < 0.05$, then reject the null hypothesis

Week 5 Post

2. You want to answer the question:

Does marijuana smoking affect the appetite of cancer patients? You divide the participants up into three smoking groups (never, less than 4 times per month, 4 or more times per month) and then gather information on the number of calories consumed in a week. Each group has 20 people.

a) What is the most appropriate test? State your rationale.

ANOVA analysis is appropriate here since we have 3 means to be compared.

b) State your null and alternative hypothesis in words and symbols for the test you chose as the answer in part a.

Symbols **$H_0: \mu_1 = \mu_2 = \mu_3$**

H_a : At least one population mean is not equal to another population mean

Words **H_0 : The average calorie consumption is the same in every marijuana smoking groups**

H_a : At least one average calorie consumption is different from another marijuana group

c) You set your level of significance at $\alpha = 0.05$ and determine your test critical value = 3.49. What is your decision rule? (State when would you reject the null hypothesis and when you would fail to reject the null hypothesis.)

If the sample f -statistic is greater than 3.49, we reject the null hypothesis.

Rejection region: $f > 3.49$

Excellent! So you run the ANOVA analysis and you get $F = 4.11$. What do you do now?

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You think stock prices will rise or fall based on the annual dividend the company distributes. You run a regression analysis using Data Analysis to answer the following question: Is stock selling price a function of annual dividend?

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a) State the independent and dependent variables.

IV: Annual Dividend company distributes

DV: Stock Prices

b. Is the overall model statistically significant? State how you made your decision based on the regression output.

It is statistically significant based on the F-test since $p < .05$. You can find the p-value by looking at the "Significance F" of 5.60401E-08. This value is less than .05.

c. Interpret the coefficient of determination from the table.

The variation in annual dividend the company distributes (IV) accounts for 65.7% of the variation in stock prices (DV), which was statistically significant according to the F-test.

The final exam will be available at 8 am today, Oct 5. To help you prepare, the answer key for Assignment #2 has been posted in Week 8 Course Content. Please review your answers to understand what you did correctly and incorrectly. I will not be getting your assignments returned prior to you taking the exam. This will be very similar to your Midterm, and I encourage you to review Assignment 1, Assignment 2 and Discussion Week 5 posts, as well as your slides and Panopto videos, focusing on Week 3-Week 7.

This exam consists of 28 questions worth 200 points. There are also 2 extra credit questions that are worth 5 points each (total possible 10 points). The extra credit does not automatically get calculated when you complete the exam, and it will be an adjustment at a later date.

This is a timed, 2 hour exam, so please set aside enough uninterrupted time. Once you start the exam, you must finish in one sitting. The exam must be complete NLT 12 pm, noon, 11 Oct.