

ECO 2200 Quiz 5

The data in the table is the number of absences for 7 students and their corresponding grade.

Number of Absences	Grade
1	4
1	3.7
2	3.5
2	2.7
3	2.4
3	1.7
7	1.7

The regression model is assumed to be

$$y = \beta_0 + \beta_1 x + \varepsilon$$

and is estimated to be

$$\hat{y} = b_0 + b_1 x.$$

The regression output is given by

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.787899112					
R Square	0.620785011					
Adjusted R Square	0.544942013					
Standard Error	0.635715999					
Observations	7					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	3.307897271	3.307897271	8.185132816	0.03536641	
Residual	5	2.020674157	0.404134831			
Total	6	5.328571429				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	3.793258427	0.418117652	9.072227419	0.000272144	2.718452786	4.868064068
Absences (x)	-0.360674157	0.126067215	-2.860967112	0.03536641	-0.684740251	-0.036608063

1. What is the value of b_0 ? What is the value of b_1 ?



↓ ↘

3.793 - 0.361

2. What is the value of the sum of squared errors (SSE)? 2.021

3. What is value of the mean squared error (MSE) or the estimated variance of errors, s_e^2 ? 0.404

4. What is the value of the estimated standard deviation (i.e., the standard error) of the slope, s_{b_1} ? 0.126

5. What is the 95% confidence interval for the slope? $[-0.685, -0.037]$

6. If $H_0: \beta_1 = 0$ and $H_a: \beta_1 \neq 0$, can we reject H_0 at $\alpha=0.05$? *Reject.*

7. What is the predicted grade for two absences?

$$\hat{y} = b_0 + (b_1 \times 2) = 3.793 - (0.361 \times 2)$$

8. What proportion of the variation in grades is explained by absences?

0.621