

Class activity EE325

Two variable regression: interval estimation and hypothesis testing

1. State with reason whether the following statements are true, false, or uncertain. Be precise
 - a) The t test of significance discussed requires that the sampling distributions of estimators $\hat{\beta}_1$ and $\hat{\beta}_2$ follow the normal distribution.
 - b) Even though the disturbance term in the CLRM is not normally distributed, the OLS estimators are still unbiased.
 - c) In a regression model that contains the intercept, the sum of the residual is always zero.
 - d) The higher the value of σ^2 , the larger is the variance of $\hat{\beta}_2$
 - e) In the two-variable PRF, if the slope coefficient β_2 is zero, the intercept β_1 is estimated by the sample mean $\bar{Y}$.
2. The demand for cell phones regression. Letting Y = number of cell phone subscribers and X = purchasing-power-adjusted per capita income. The regression table is provided on Table 2.1.
 - a) Is the estimated intercept coefficient significant at the 5% level of significance? What is the null hypothesis you are testing?
 - b) Is the estimated slope coefficient significant at the 5% level of significance? What is the null hypothesis you are testing?
 - c) Perform analysis of variance for hypothesis testing.
 - d) Established a 99% confidence for the true slope coefficient. Interpret the meaning.

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.77612129					
R Square	0.602364256					
Adjusted R Square	0.589938139					
Standard Error	7189.047602					
Observations	34					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	2505338855	2505338855	48.47566274	6.91402E-08	
Residual	32	1653836974	51682405.42			
Total	33	4159175829				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	2363.538375	2292.466629	1.031002303	0.310269618	-2306.06334	7033.14009
Cellphone	271.4401548	38.98631762	6.962446606	6.91402E-08	192.0276245	350.8526851