

Answer on Question #57134 – Math – Statistics and Probability

Provided below is a partial computer output based on a sample of 12 observations relating the number of personal computers sold by a computer shop per month (Y), unit price (X1 in \$1,000) and the number of advertising spots (X2) they used on a local television station.

ANOVA Table

	DF	SS	MS	F	Significance F
Regression	2	655.955			
Error	9	182.96			
Total		838.917			

At $\alpha = 0.05$ level of significance, what is the F value?

At $\alpha = 0.05$ level of significance, what is critical F?

At $\alpha = 0.05$ level of significance, is the regression model significant?

What is the multiple coefficient of determination?

What is the adjusted multiple coefficient of determination?

Solution

At $\alpha = 0.05$ level of significance, the F value is

$$F = \frac{MS_{regr}}{MS_{err}} = \frac{\frac{655.955}{2}}{\frac{182.96}{9}} = 16.134$$

At $\alpha = 0.05$ level of significance, critical F is

$$F_{cr} = F(2; 9; 0.05) = 4.256$$

At $\alpha = 0.05$ level of significance, the regression model is significant,

because $F > F_{crit}$.

The multiple coefficient of determination is

$$R^2 = 1 - \frac{SS_{err}}{SS_{total}} = 1 - \frac{182.96}{838.917} = 0.7819$$

The adjusted multiple coefficient of determination is

$$R_{adj}^2 = 1 - \frac{MS_{err}}{MS_{total}} = 1 - \frac{\frac{182.96}{9}}{\frac{838.917}{11}} = 0.7334$$