Answer on Question #74283 - Economics / Microeconomics

Question: Koonj manufacturing has collected the following data on quantity sold and price

Period 1 2 3 4 5 6 7 8 9 10

Quantity 2800 3300 2400 3300 3600 2600 2000 3000 3800 3200

Price 100 80 140 60 80 140 180 80 60 100

(a) Use the least squares regression technique to estimate the linear relationship between quantity

and price.

Answer:

Under the least squares regression, a scatter diagram is constructed to estimate the relationship

between price and quantity sold. A scatter diagram for the given data on quantity sold and price

is showing below:
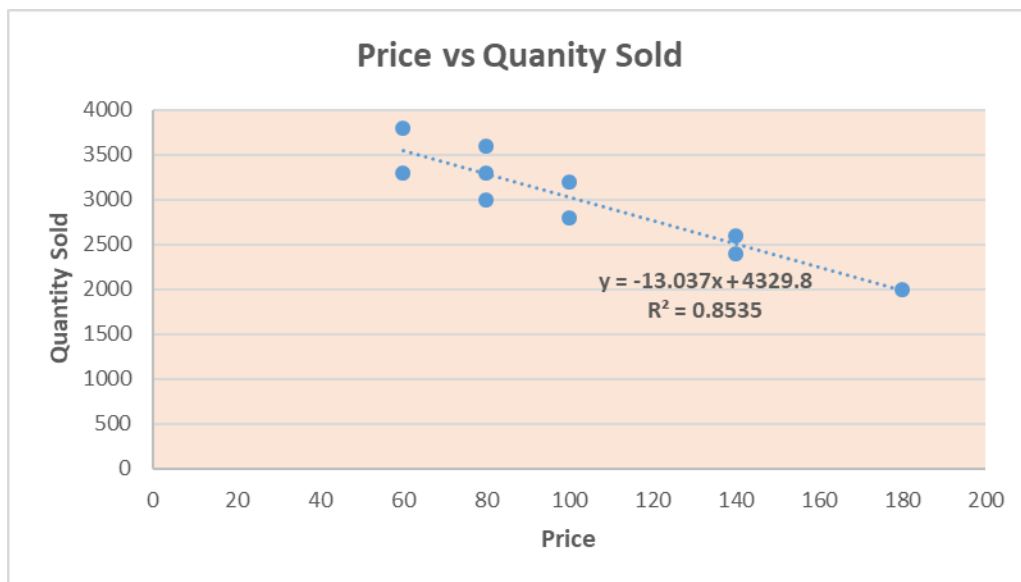
The above scatter diagram shows a negative correlation between quantity and price. It is because

the direction of best line fit is downside from left to right. The equation for least squares

regression is:

y = -13.037x + 4329.8

Where,

a (intercept) = 4329.8

b (slope coefficient) = -13.037

(b) Evaluate the strength of the relationship between quantity and price by computing the t-statistics and R^2

Answer:

Regression analysis is performed on data of quantity sold and price by using Excel. The regression output is presenting below:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.9239
R Square	0.8535
Adjusted R Square	0.8352
Standard Error	225.6159985
Observations	10

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2372779.37	2372779.37	46.61	0.00
Residual	8	407220.63	50902.58		
Total	9	2780000			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	4329.80	207.43	20.87	0.00	3851.47	4808.13
Quantity Sold	-13.04	1.91	-6.83	0.00	-17.44	-8.63

As per the above output, the value of t-statistics is -6.83, which is negative. It is also identified that the value of R^2 is 0.8535, which is close to zero.

Based on this result, it can be determined that there is a negative, but strong relationship between quantity and price.