An important application of regression analysis in accounting is in the estimation of cost. By collecting data on volume and cost and using the least squares method to develop an estimated regression equation relating volume and cost, an accountant can estimate the cost associated with a particular manufacturing volume. Sample data on production volumes and total cost data for a manufacturing operation was gathered and the following analysis results were obtained.



8000

6000

4000

2000

0

0

200

400

600

800

**Production Volume (Units)**

*SS*

5415000.00

*MS*

*F*

*Significance F*

0.0006

5648333.33

*Standard Error t Stat P-value*

464.16 2.686 0.055

*Lower 95%*

-42.05

*Upper 95% Lower 99.0% Upper 99.0%*

2535.38

-890.37

3383.70

0.79

9.635 0.001

5.41

9.79

3.97

11.23

**Total Cost ($)**

|  |  |
| --- | --- |
| SUMMARY OUTPUT  *Regression St*  Multiple R R Square | *atistics*  0.9791  0.9587 |
| Adjusted R Square | 0.9484 |
| Standard Error Observations  ANOVA  Regression Residual Total  Intercept Production Volume (units) | 241.5229  6  *df*  *Coefficients*  1246.67  7.60 |

* 1. Complete the above ANOVA table.
  2. Based on the scatter diagram developed, do you expect a relationship between Total Cost and Production Volume? Indicate the expected type of relationship if any.
  3. What is the sample size?
  4. Write down what the estimated regression equation is that relates Total Cost with Production Volume.
  5. State the Null and Alternate Hypotheses used to test statistical significance of regression between Total Cost and Production Volume
  6. Read and state what the p-value is from the report. Test the significance of the regression at a .01 level using p-value approach. What is the test decision?
  7. Determine Critical-value for the test. Test the significance of the regression at a .01 level using Critical-value approach. What is the test decision?
  8. Write down the 99% confidence interval on the “Slope Coefficient” based on the report. Based on the CI would you Reject or Not Reject the Null Hypothesis? Why or Why not?
  9. What conclusion you arrive at based on the Hypothesis tests with respect to the relationship between Total Cost and Production Volume?
  10. State why the estimated regression equation is “good” or “no good.”
  11. What is the value of sample correlation coefficient?
  12. Why is R Square value equal to 95.87%?
  13. Interpret what the value of slope coefficient = 7.6 means.