

Explanation

1. How much more research expenditure is needed for the university to have an additional predicted startup, with everything else being the same?

Answer:

The coefficient for Research is 0.008674.

This means that for each unit increase in Research expenditure, the number of startups is expected to increase by 0.008674 units, holding all other variables constant.

Therefore, to have an additional predicted startup:

Additional research expenditure needed = $1 / 0.008674 \approx 115.27$ units.

2. What is the standard error of the estimate?

Answer:

The standard error of the estimate is provided in the output:

Residual standard error: 3.137.

3. Find and interpret the coefficient of determination.

Answer:

The coefficient of determination, R^2 , is provided in the output:

Multiple R-squared: 0.7168.

Interpretation: Approximately 71.68% of the variability in the number of startups can be explained by the linear relationship with the predictor variables (Research, Patents, and Duration).

4. At the 5% significant level, determine if all predictor variables individually significant in Startups (outcome).

Answer:

The significance of predictor variables can be assessed using the p-values in the coefficients table:

For Research: p-value < 0.001 (significant).

For Patents: p-value = 0.0104 (significant).

For Duration: p-value = 0.4115 (not significant).

Conclusion: Research expenditure and the number of patents issued are individually significant predictors of startups at the 5% significance level, while the age of the technology transfer office (Duration) is not significant.

5. Explore the data to determine if the assumptions are violated.

Answer:

Assumptions such as linearity, independence, homoscedasticity, and normality of residuals should be assessed using diagnostic plots and statistical tests.