Linear regression calculates an equation that minimizes the distance between the fitted line and all of the data points. Technically, ordinary least squares (OLS) regression minimizes the sum of the squared residuals.

In general, a model fits the data well if the differences between the observed values and the model's predicted values are small and unbiased.

By using ANOVA test one can verify the predictive power of the model. The failor to reject hypothesis that B1=0 implies that there is no linear relationship between x and y.

R-squared is the percentage of the response variable variation that is explained by a linear model.

0% indicates that the model explains none of the variability of the response data around its mean.

100% indicates that the model explains all the variability of the response data around its mean

When several variables are used Adj R-squared might be a better measure of the goodness of fit. It will only increase if the added variable contributes to explanation of variation of the response variable.

R-squared should be combined with residual analysis. High R-squared value does not necessarily mean that model fits well the data. The residuals should be random, and not showing any pattern. If one can spot a pattern then even is R-squared is high the model is a bad fit