

Chapter 8: Linear Regression

Key Vocabulary: Define each...

parameter

slope

linear model

\hat{y}

predicted value

regression line

residual

R^2

line of best fit

coefficient of determination

Guided Reading Questions:

1. Explain the quote (by George Box, a famous statistician), "All models are wrong, but some are useful."
2. What are the *parameters* of the Normal model?
3. Describe the difference in notation between y and \hat{y} .
4. What is a *residual* and how is it calculated?
5. What does a negative *residual* indicate? A positive *residual*? A *residual* of zero?

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6. How many *residuals* does a set of data have?

7. What is meant by a *line of best fit*?

8. The *line of best fit* always passes through which point?

9. The R^2 value shows how much of the *variation* in the response variable can be accounted for by the linear regression model. If $R^2 = 0.95$, what can be concluded about the relationship between x and y ?

____ % of the variability in ____ is accounted for by the linear relationship with ____.

10. What conditions are necessary before using a *linear model* for a set of data?

11. Explain how to construct a *residual plot*.

12. If a least-squares regression line fits the data well, what characteristics should the residual plot exhibit? Sketch a well-labeled example.

Calculator Skills: *LinReg ($a + bx$) & *RESID