Week 7 Quiz

CASA0006

Q1. What is the objective of linear regression?

a. To minimize the sum of absolute deviations between the predicted values and the actual values of the dependent variable.

b. To maximize the correlation coefficient between the dependent variable and the independent variable.

c. To minimize the sum of squared deviations between the predicted values and the actual values of the dependent variable.

d. To maximize the adjusted R-squared of the model.

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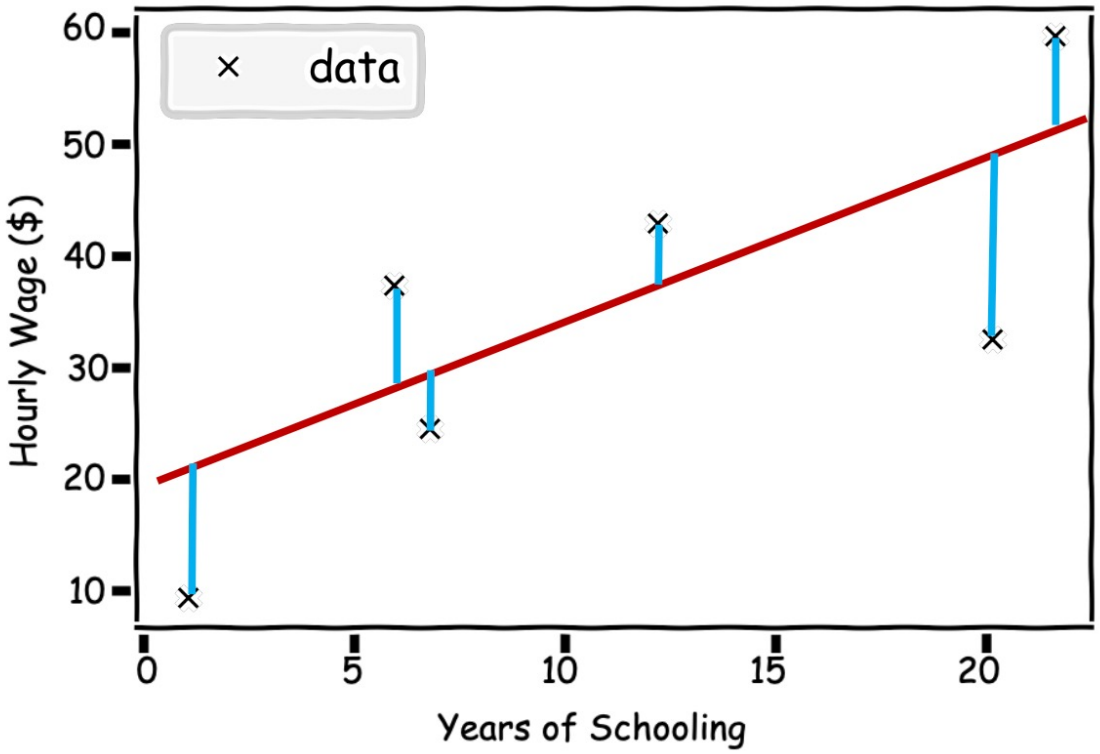

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Find the line of best fit

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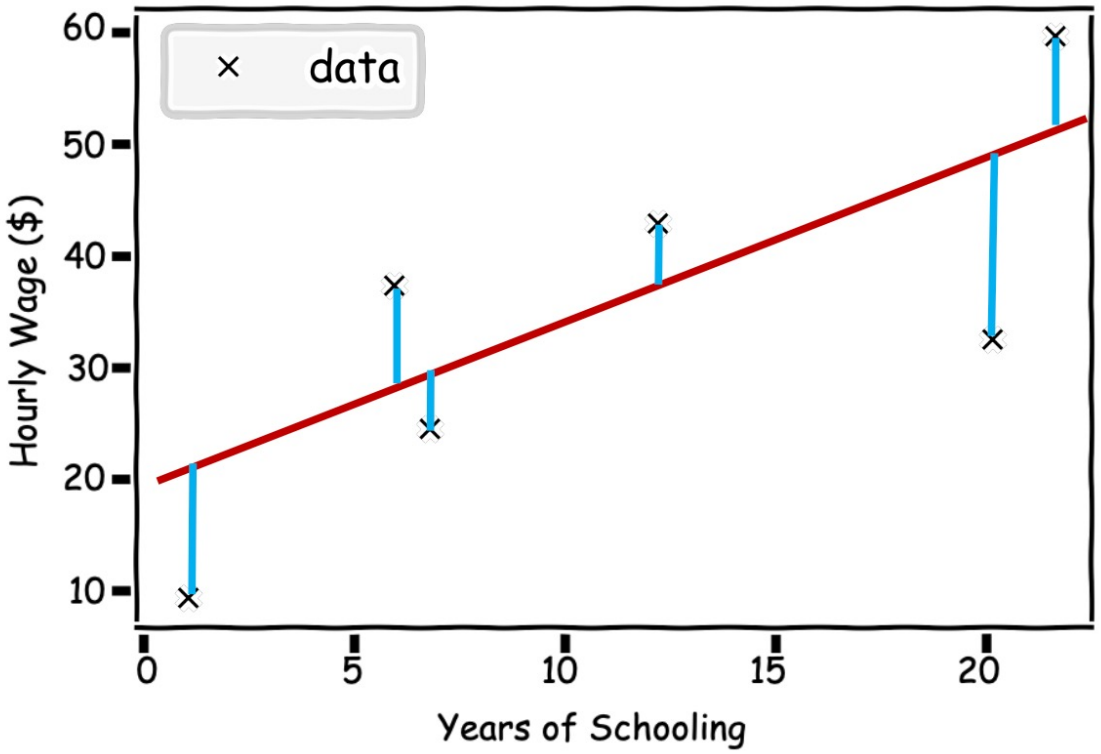

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Q2. Which of the following is the assumption of linear regression?

a. The variance of the residuals is constant across all values of the independent variable.

b. The relationship between the dependent variable and independent variable is nonlinear.

c. The independent variables are highly correlated with each other.

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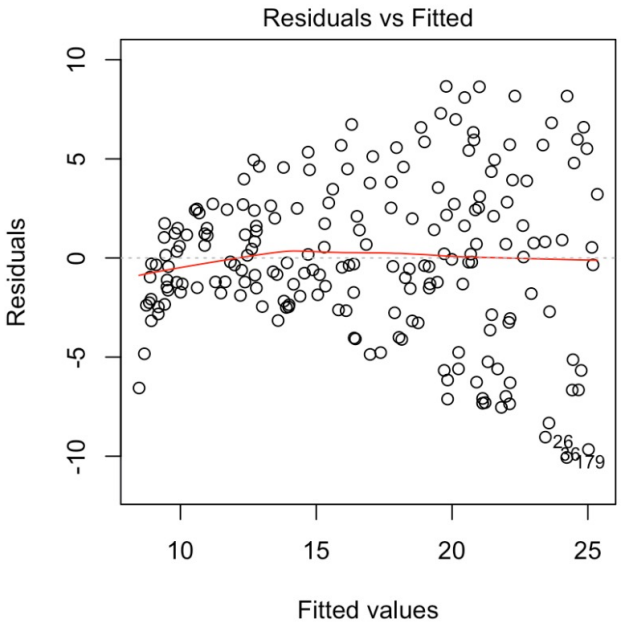
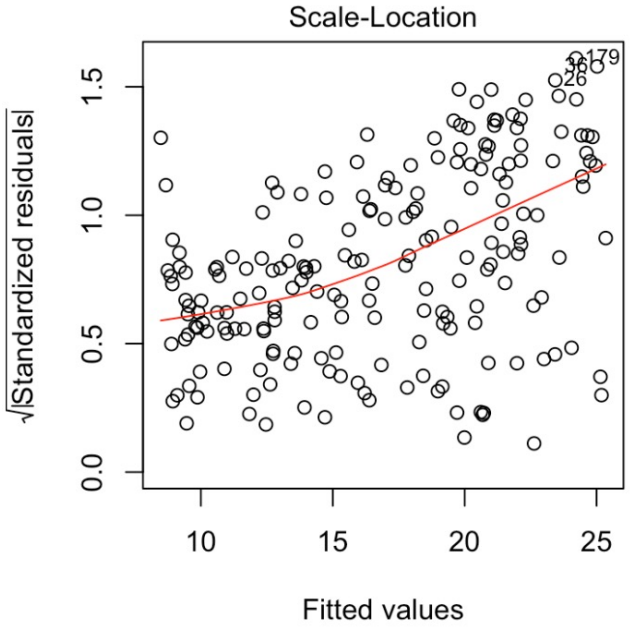
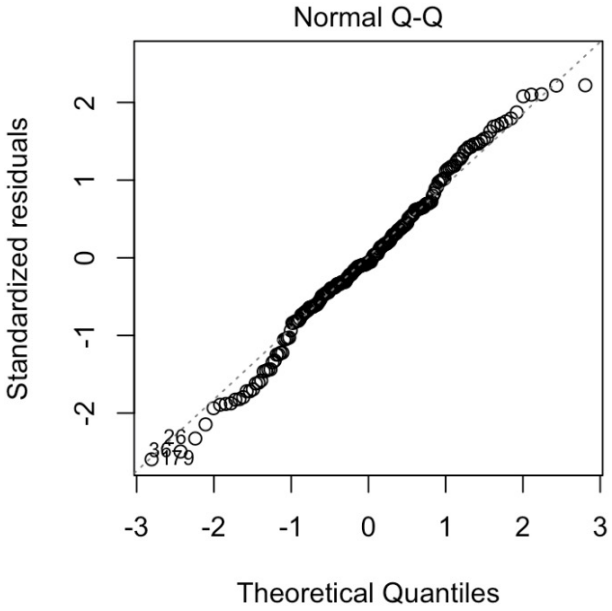


Homogeneity of variance



Normality of residuals



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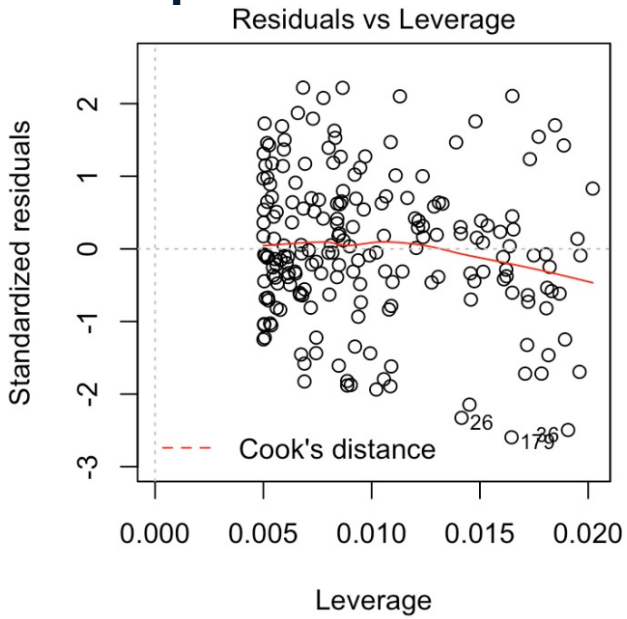

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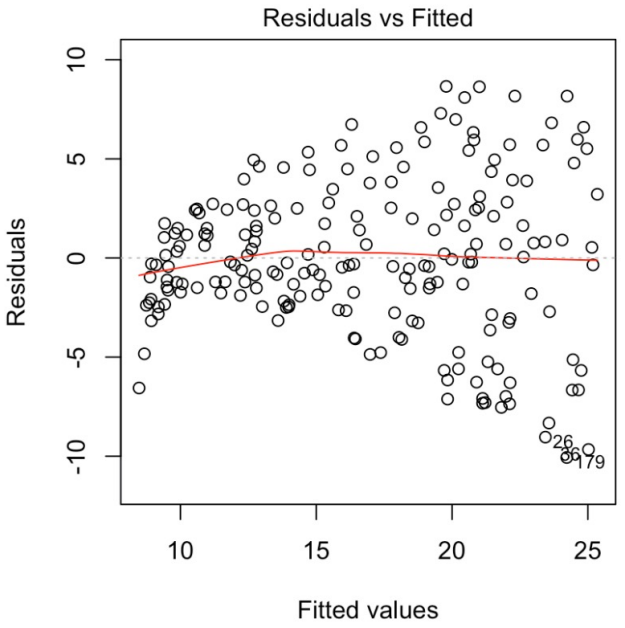

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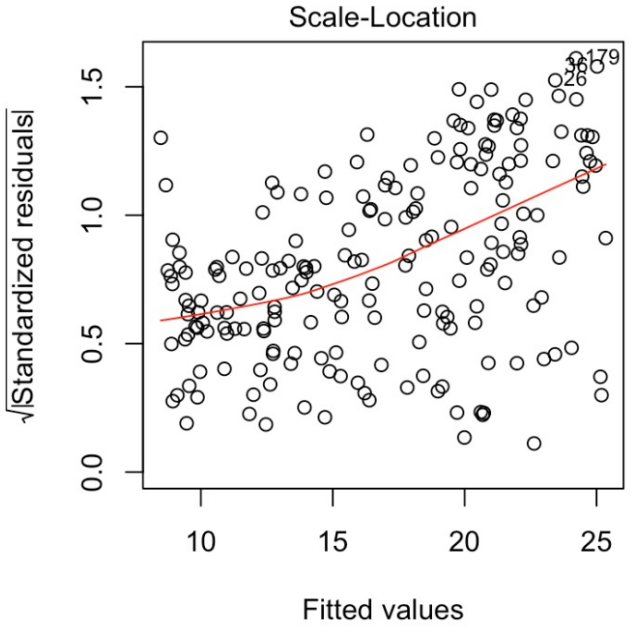

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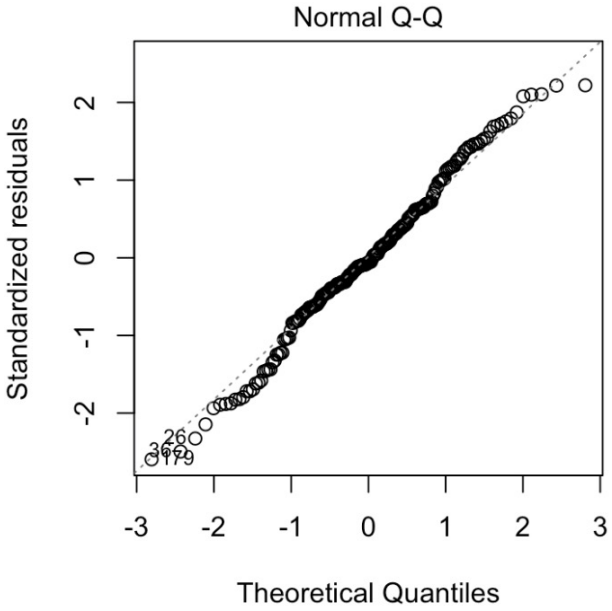

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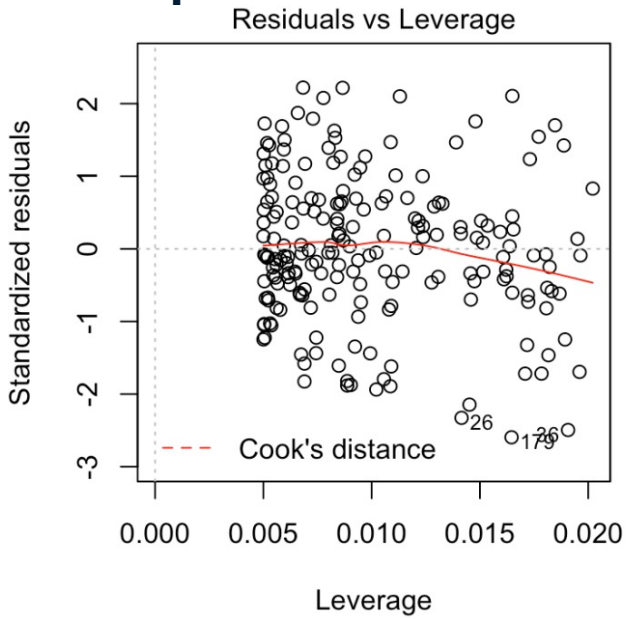

Q3. What does the coefficient of determination (R-squared) measure in linear regression?

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c. The proportion of the variation in the dependent variable that is explained by the independent variable

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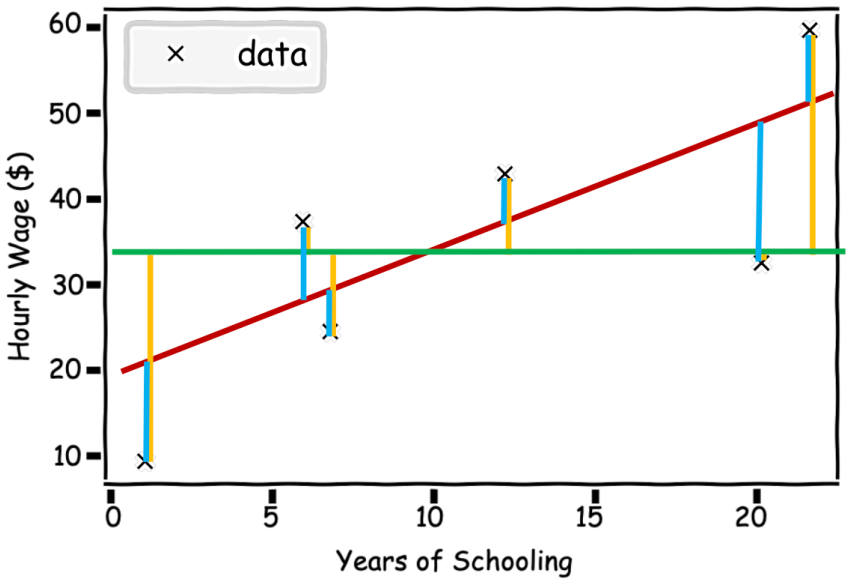

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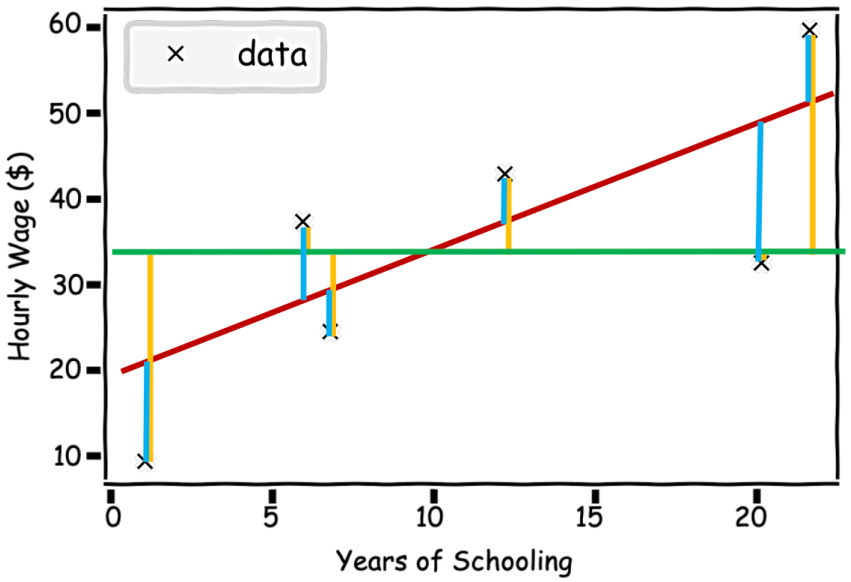

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a. To test the hypothesis that the residuals are normally distributed

b. To test the null hypothesis that the coefficient is equal to zero

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Null hypothesis (H0):
the coefficients are equal to zero
(i.e., no relationship between x and y)

Alternative Hypothesis (Ha):
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The p-value, or probability value, is a measure used in statistical hypothesis testing to determine the significance of the results of a hypothesis test.

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For a given beta coefficient (b), the t-statistic is computed as

$$t = (b - 0)/SE(b)$$

where SE(b) is the standard error of the coefficient b.

The t-statistic measures the number of standard deviations that b is away from 0.

A low P-value (< 0.05) means that the coefficient is likely not to equal zero and we reject H0

A high P-value (> 0.05) means that we cannot conclude that the x variable affects the y variable, so we fail to reject H0

Q5. How can we check for homoscedasticity?

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b. By plotting the predicted values against the actual values of the dependent variable

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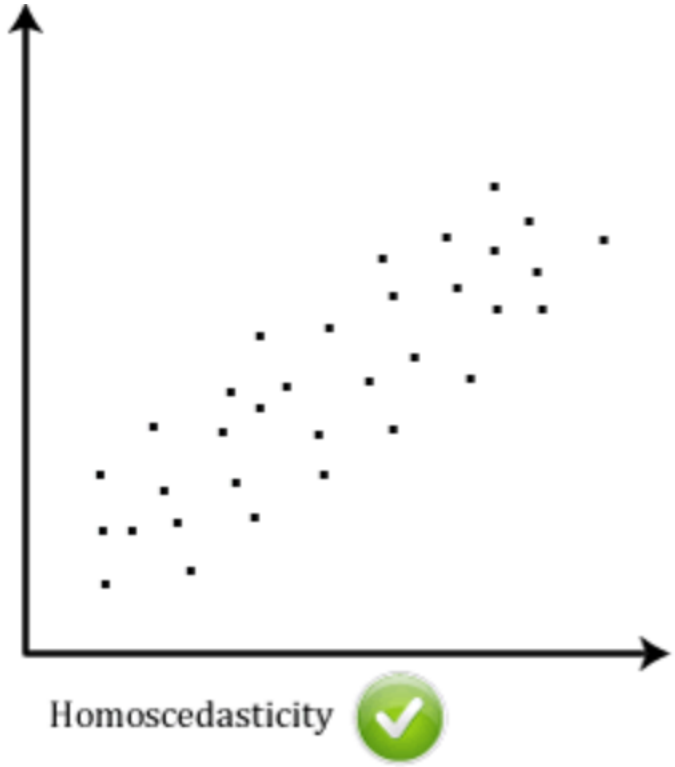

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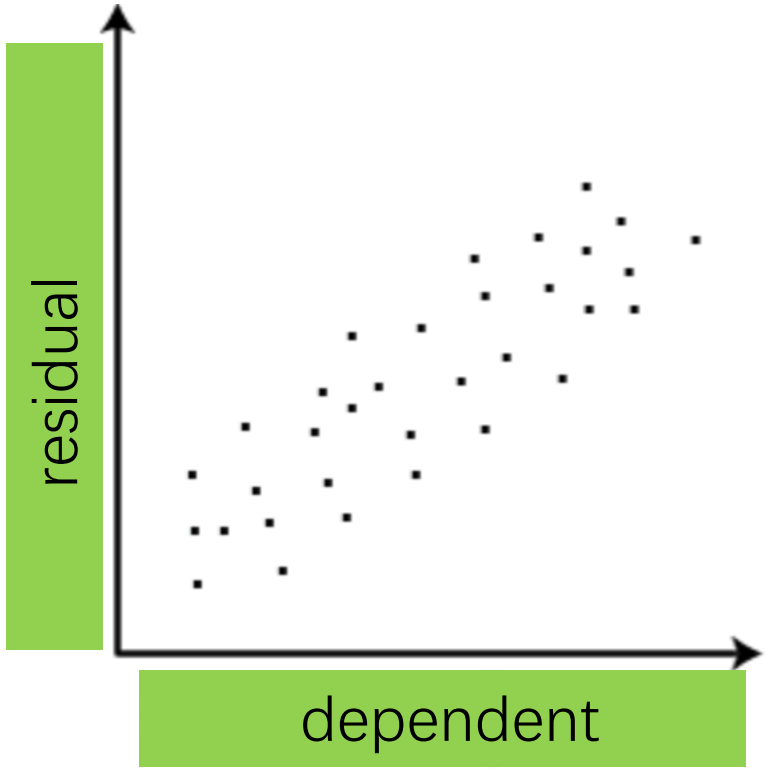

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