

Unit 06: Correlation and Regression

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1. Unit 06: Correlation and Regression

4. Chapter: Unit 06: Correlation and Regression

1. Unit 06: Correlation and Regression Questions

4.1.1. A correlation coefficient between two variables (x and y) equal to ...

Author: David Bourgeois

A correlation coefficient between two variables (x and y) equal to 0.99 best describes the relationship between the two variables in which of the following ways?

Please choose only one answer:

- x causes y.
- y causes x.
- x and y are strongly correlated.
- x and y are weakly correlated.

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Question: [A correlation coefficient between two David Bourgeois @The Saylor](#)

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4.1.2. A correlation coefficient equal to 1 best describes the relationshi...

Author: David Bourgeois

A correlation coefficient equal to 1 best describes the relationship between two variables (x and y) in which of the following ways?

Please choose only one answer:

- The value of the correlation coefficient means that when x increases, y tends to increase, and when x decreases, y tends to decrease.
- The value of the correlation coefficient means that when x increases, y tends to decrease, and when x decreases, y tends to increase.
- The value of the correlation coefficient means that when x increases, y tends to decrease by exactly the same amount.
- The value of the correlation coefficient means that when x increases, y tends to increase by exactly the same amount.

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4.1.3. A linear regression with hours spent exercising per week as the ind...

Author: David Bourgeois

A linear regression with hours spent exercising per week as the independent variable and body fat percentage as the dependent variable results in an estimated regression line, $\hat{Y}_i = 45 - 3X_i$. Assume that the predicted body fat percentage for a person that exercises for 10 hours is $\hat{Y}_i = 15$, yet the actual value of the dependent variable in the sample for the person who exercises 10 hours equals 18.5. The difference is best described as which of the following?

Please choose only one answer:

- The slope of the regression line
- The effect of the independent variable on the dependent variable
- The effect of the dependent variable on the independent variable
- The residual

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Question: [A linear regression with hours spent David Bourgeois @The Saylor](#)

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4.1.4. A linear regression with hours spent exercising per week as the ind...

Author: David Bourgeois

A linear regression with hours spent exercising per week as the independent variable and body fat percentage as the dependent variable results in an estimated regression line $\hat{Y}_i = 45 - 3X_i$. The estimated value -3 is best interpreted as which of the following?

Please choose only one answer:

- The predicted level of the body fat percentage for the number of exercise hours equal to 3
- The predicted level of the dependent variable for the number of exercise hours equal to 42
- The amount that body fat percentage will decline for every 1 hour increase in exercise
- The amount that body fat percentage will increase for every 1 hour increase in exercise

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Question: [A linear regression with hours spent David Bourgeois @The Saylor](#)

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4.1.5. A positive correlation coefficient best describes the relationship ...

Author: David Bourgeois

A positive correlation coefficient best describes the relationship between two variables (x and y) in which of the following ways?

Please choose only one answer:

- A positive value of the correlation coefficient means that when x increases, y tends to increase, and when x decreases, y tends to decrease.
- A positive value of the correlation coefficient means that when x increases, y tends to decrease, and when x decreases, y tends to increase.
- A positive value of the correlation coefficient means that when x increases, y tends diminish.
- A positive value of the correlation coefficient means that when x increases, y tends be unaffected.

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4.1.6. Assume you are interested in using linear regression to test the ef...

Author: David Bourgeois

Assume you are interested in using linear regression to test the effect of the number of hours studied for a college statistics exam on the exam score. From a sample of 150 business statistics students, you obtain the following information: the number of hours the student studied for the exam (HOURS) and their eventual score on the exam out of 100 (SCORE). Which of the following best describes the dependent and independent variables in this scenario?

Please choose only one answer:

- HOURS is the dependent variable, and SCORE is the independent variable.
- HOURS is the independent variable, and SCORE is the dependent variable.
- HOURS and SCORE are both independent variables.
- Neither HOURS nor SCORE are independent variables.

Check the answer of this question online at QuizOver.com:

Question: [Assume you are interested in using linear David Bourgeois @The Business](#)

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4.1.7. Assume you are interested in using linear regression to test the ef...

Author: David Bourgeois

Assume you are interested in using linear regression to test the effect of the number of lattes a person drinks in a week on his or her weight. From a survey of 1,200 people, you obtain the following information: the number of lattes a person drinks in a work week from Monday to Friday (LATTE) and his or her weight at the time of the survey (LBS). Which of the following best describes the dependent and independent variables in this scenario?

Please choose only one answer:

- LBS is the dependent variable, and LATTE is the independent variable.
- LATTE is the dependent variable, and LBS is the independent variable.
- LATTE and LBS are both independent variables.
- Neither LATTE nor LBS are independent variables.

Check the answer of this question online at QuizOver.com:

Question: [Assume you are interested in using linear David Bourgeois @The Business](#)

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4.1.8. Assume you measure the average number of hours studied for an exam ...

Author: David Bourgeois

Assume you measure the average number of hours studied for an exam from a sample of 150 business statistics students. The mean number of hours studied equals 15, and the standard deviation for the sample is 4 hours. You notice one student in the sample studied 27 hours. That student best represents which of the following in the sample?

Please choose only one answer:

- An outlier
- A unit of observation
- The independent variable
- The dependent variable

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4.1.9. Complete the following sentence. The coefficient of determination b...

Author: David Bourgeois

Complete the following sentence. The coefficient of determination between the dependent variable, TEST SCORE, and the independent variable, HOURS SPENT STUDYING, equals 0.43. This means that:

Please choose only one answer:

- variation in the variable, HOURS SPENT STUDYING, explains 43% of the variation in the variable, TEST SCORE.
- variation in the variable, TEST SCORE, explains 43% of the variation in the variable, HOURS SPENT STUDYING.
- The correlation between HOURS SPENT STUDYING and TEST SCORE equals 0.43.
- The correlation between HOURS SPENT STUDYING and TEST SCORE equals 0.57.

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4.1.10. Consider the estimated regression line, $\hat{Y}_i = 5.43 + 3.4X_i$...

Author: David Bourgeois

Consider the estimated regression line, $\hat{Y}_i = 5.43 + 3.4X_i$. The estimated value 5.43 is best interpreted as which of the following?

Please choose only one answer:

- The predicted level of the dependent variable for values of the independent variable equal to 0
- The predicted level of the independent variable for values of the dependent variable equal to 0
- The unit increase of the dependent variable when the independent variable increases by one unit
- The unit increase of the independent variable when the dependent variable increases by one unit

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4.1.11. Consider the estimated regression line, $\hat{Y}_i = 5.43 + 3.4X_i$...

Author: David Bourgeois

Consider the estimated regression line, $\hat{Y}_i = 5.43 + 3.4X_i$. The estimated value 3.4 is best interpreted as which of the following?

Please choose only one answer:

- The predicted level of the dependent variable for values of the independent variable equal to 3.4
- The predicted level of the dependent variable for values of the independent variable equal to 8.83
- The unit increase of the dependent variable when the independent variable increases by one unit
- The unit increase of the independent variable when the dependent variable increases by one unit

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4.1.12. If the correlation coefficient between x and y equals 0.50, then th...

Author: David Bourgeois

If the correlation coefficient between x and y equals 0.50, then the coefficient of determination must equal which of the following?

Please choose only one answer:

- -0.50
- +0.50
- 0.25
- 0.70

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

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4.1.13. The figure below shows a plot of the residuals from a linear regres...

Author: David Bourgeois

The figure below shows a plot of the residuals from a linear regression.

Notice the two residuals marked A and B.

Which of the following below best describes what these residuals reveal about the fitted regression line?

Please choose only one answer:

- Residuals A and B represent positive outliers in the sample, which results in the slope being over-estimated (it is larger than the true relationship between x and y).
- Residuals A and B represent negative outliers in the sample, which results in the slope being under-estimated (it is smaller than the true relationship between x and y).
- Residuals A and B represent outliers in the sample, which results in the line of best fit.
- Residuals A and B represent observations in the sample, which results in the line of best fit.

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4.1.14. The figure below shows a plot of the residuals from a linear regres...

Author: David Bourgeois

The figure below shows a plot of the residuals from a linear regression.

Notice the residual marked A.

Which of the following best describes what this residual reveals about the fitted regression line?

Please choose only one answer:

- Residual A represents a negative outlier in the sample, which results in the slope being over-estimated (it is larger than the true relationship between x and y).
- Residual A represents a negative outlier in the sample, which results in the slope being under-estimated (it is smaller than the true relationship between x and y).
- Residual A represents an outlier in the sample, which results in the line of best fit.
- Residual A represents an observation in the sample, which results in the line of best fit.

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4.1.15. The method of least squares used to estimate a regression line is b...

Author: David Bourgeois

The method of least squares used to estimate a regression line is best described by which of the following?

Please choose only one answer:

- Solve for the minimum possible sum of the squared errors (SSE) from a sample of data scattered around a straight line.
- Solve for the maximum possible sum of the squared errors (SSE) from a sample of data scattered around a straight line.
- Solve for the minimum possible residuals from a sample of data scattered around a straight line.
- Solve for the minimum possible correlation coefficient from a sample of data scattered around a straight line.

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4.1.16. The slope b can be written as $b = r \left(\frac{s_y}{s_x} \right)$

Author: David Bourgeois

The slope b can be written as $b = r \left(\frac{s_y}{s_x} \right)$, where r is the correlation coefficient between x and y , and s_y and s_x are the standard deviations of y and x , respectively. Which of the following statements best describes the slope of a linear regression line?

Please choose only one answer:

- The slope reveals how a change in x affects a change in y , given the variation of sample data on x and y .
- The slope reveals how a change in y affects a change in x , given the variation of sample data on x and y .
- The slope reveals the strength of association between x and y .
- The slope reveals the strength of association between a change in x and a change in y .

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4.1.17. The sum of the squared errors is calculated by which of the followi...

Author: David Bourgeois

The sum of the squared errors is calculated by which of the following methods?

Please choose only one answer:

- Measure the vertical distance between the actual value of y in a sample and the estimated value of y from the fitted regression line, and then add the squared distances for each observation in the sample.
- Measure the vertical distance between the actual value of y in a sample and the estimated value of y from the fitted regression line, and then add the distances for each observation in the sample.
- Measure the vertical distance between the actual value of y in a sample and the estimated value of y from the fitted regression line, and then multiply each term by the correlation coefficient between x and y .
- Measure the vertical distance between the actual value of y in a sample and the estimated value of y from the fitted regression line.

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4.1.18. The table below shows three observations from data on the number of...

Author: David Bourgeois

The table below shows three observations from data on the number of traffic tickets in a semester for a sample of students from colleges across the United States and the number of rainy days over the same period. Based on linear regression with TICKETS as the dependent variable, which of the following reveals the sum of the squares of the Error (SSE)?

Please choose only one answer:

- SSE = 11
- SSE = 5
- SSE = 6
- SSE = -5

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4.1.19. The table below shows three observations from data on the number of...

Author: David Bourgeois

The table below shows three observations from data on the number of cups of coffee consumed per day for a sample of MBA students from colleges across the United States and their GPAs. Based on linear regression with CUPS OF COFFEE as the dependent variable, which option below reveals the sum of the squares of the error (SSE)?

Please choose only one answer:

- SSE = 0.50
- SSE = 0.25
- SSE = 1.0
- SSE = 7.5

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Question: [The table below shows three observations David Bourgeois Saylor Business](#)

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4.1.20. Which of the following best describes the difference between the co...

Author: David Bourgeois

Which of the following best describes the difference between the coefficient of determination and the correlation coefficient?

Please choose only one answer:

- The coefficient of determination reveals to what extent a change in x causes a change in y, while the correlation coefficient shows how a change in y causes a change in x.
- The coefficient of determination reveals to what extent a change in x causes a change in y, while the correlation coefficient shows strength of association between x and y.
- The coefficient of determination reveals the extent a change in y that can be explained by a change in x by using the regression line, whereas the correlation coefficient shows strength of association between x and y.
- The coefficient of determination reveals the extent a change in x that can be explained by a change in y by using the regression line, whereas the correlation coefficient shows strength of association between x and y.

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4.1.21. Which of the statements about the line of best fit is true?

Author: David Bourgeois

Which of the statements about the line of best fit is true?

Please choose only one answer:

- The best fit line always passes through the point $\left(\bar{x}, \bar{y} \right)$.
- The best fit line always passes through the point where both x and y are at their minimum in the sample.
- The best fit line always passes through the point (s_x, s_y) , the standard deviations for x and y, respectively.
- The best fit line always passes through the largest outlier in the sample.

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4.1.22. You are interested in using linear regression to test whether drink...

Author: David Bourgeois

You are interested in using linear regression to test whether drinking a protein shake improves weightlifting performance. From a sample of 200 college students, you estimate a linear regression with WEIGHTLIFT as the dependent variable and PROTEIN as the independent variable and find the slope of the line of best fit equals zero. Choose the best interpretation of this evidence:

Please choose only one answer:

- Drinking protein shakes has no measurable effect on weightlifting performance.
- Drinking protein shakes has no measurable effect on weightlifting performance, and that proves protein shakes are not beneficial to weightlifting performance.
- Drinking protein shakes has a positive measurable effect on weightlifting performance.
- Drinking protein shakes has a positive measurable effect on weightlifting performance, and that proves that protein shakes are beneficial to weightlifting performance.

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4.1.23. You are interested in using linear regression to test whether the n...

Author: David Bourgeois

You are interested in using linear regression to test whether the number of minutes spent under a sunlamp help improve symptoms of Seasonal Affective Disorder (SAD). From a sample of 100 residents of the Seattle, Washington area, you estimate linear regression model with SAD as the dependent variable (based on a rating system where the rating increases as mood improves) and SUNLAMP as the independent variable. You estimate the slope to equal 1.5. Choose the best interpretation of this evidence.

Please choose only one answer:

- For every minute spent under the sun lamp, the SAD rating increases by 1.5 units.
- For every minute spent under the sun lamp, the SAD rating decreases by 1.5 units.
- For every minute spent under the sun lamp, the SAD rating does not change.
- For every 1.5 unit increase in the SAD rating, the number of minutes spent under the sunlamp increase by 1.5 minutes.

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4.1.24. A positive outlier in a sample of data will tend to have what effec...

Author: David Bourgeois

A positive outlier in a sample of data will tend to have what effect on the estimated regression line?

Please choose only one answer:

- A positive outlier will make the estimated line the best fit.
- A positive outlier will tend to over-estimate the relationship between x and y.
- A positive outlier will tend to lead to a value for the slope close to zero.
- A positive outlier will tend to lead to a negative value for the slope.

Check the answer of this question online at QuizOver.com:

Question: [A positive outlier in a sample of data David Bourgeois @The Saylor](#)

Flashcards:

<http://www.quizover.com/flashcards/a-positive-outlier-in-a-sample-of-data-david-bourgeois-the-saylor?pdf=3044>

Interactive Question:

<http://www.quizover.com/question/a-positive-outlier-in-a-sample-of-data-david-bourgeois-the-saylor?pdf=3044>

4.1.25. Assume you are interested in using linear regression to test whethe...

Author: David Bourgeois

Assume you are interested in using linear regression to test whether a person smokes or not has an effect on his or her income level. From a sample of 200 working persons, you obtain the following information: whether a person in the sample is a smoker or not (SMOKER) and their personal income in the current year (CURRENT INCOME). Which of the following best describes the dependent and independent variables in this scenario?

Please choose only one answer:

- SMOKER is the dependent variable, and CURRENT INCOME is the independent variable.
- SMOKER is the independent variable, and CURRENT INCOME is the dependent variable.
- SMOKER and CURRENT INCOME are both independent variables.
- Neither SMOKER nor CURRENT INCOME are independent variables.

Check the answer of this question online at QuizOver.com:

Question: [Assume you are interested in using linear David Bourgeois @The Business](#)

Flashcards:

<http://www.quizover.com/flashcards/assume-you-are-interested-in-using-linear-david-bourgeois-the--8040476?pdf=3044>

Interactive Question:

<http://www.quizover.com/question/assume-you-are-interested-in-using-linear-david-bourgeois-the--8040476?pdf=3044>

4.1.26. If the coefficient of determination between x and y equals 0.40, th...

Author: David Bourgeois

If the coefficient of determination between x and y equals 0.40, then the correlation coefficient must equal which of the following?

Please choose only one answer:

- $r = 0.16$
- $r = 0.63$
- $r = 0.40$
- $r = 0.80$

Check the answer of this question online at QuizOver.com:

Question: [If the coefficient of determination between David Bourgeois Saylor](#)

Flashcards:

<http://www.quizover.com/flashcards/if-the-coefficient-of-determination-between-david-bourgeois-saylor?pdf=3044>

Interactive Question:

<http://www.quizover.com/question/if-the-coefficient-of-determination-between-david-bourgeois-saylor?pdf=3044>