Week 1 Practice Quiz

Practice Quiz, 4 questions

✖ **Try again once you are ready.**

Required to pass: 80% or higher

You can retake this as many times as you'd like.

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Retake

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0/1 points

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1.

A statistics instructor wants to use the number of hours studied to predict exam scores in her class. She wants to use a linear regression model. Data from previous years shows that the correlation between these two variables is 0.76. Which of the following is the **best** response for whether or not the instructor should use linear regression to predict exam scores for a student who studied 10 hours for the final?

- Yes, because linear regression is the statistical method used to make predictions when you have bivariate quantitative data.
- Linear regression could be appropriate if the scatterplot shows a clear linear relationship.
- Yes, there is a high correlation, so it is appropriate to use linear regression.

This should not be selected

This question refers to the following learning objective(s):
When describing the association between two numerical variables, evaluate

- direction: positive (x ↑, y ↑), negative (x ↓, y ↑)
- form: linear or not
- strength: determined by the scatter around the underlying relationship

The data should be displayed graphically (in a scatterplot) to ensure there appears to be a linear relationship; it is certainly possible for data with the same correlation coefficient of 0.76 to **not** have a linear relationship therefore we can't rely on the high-ish correlation coefficient to ensure a linear relationship between the variables.

- No, because there is no way to prove that more hours of study causes higher exam scores.

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1 / 1 points

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2.

Which of the following is **false**?

- The magnitude of the correlation coefficient measures the strength of the linear association between two numerical variables.
- Two numerical variables with a correlation of 0.01 have very weak linear association.
- If the correlation coefficient is 1, then the slope must be 1 as well.

Correct

This question refers to the following learning objective(s):
Note that correlation coefficient (R, also called Pearson's R) has the following properties:

- the magnitude (absolute value) of the correlation coefficient measures the strength of the linear association between two numerical variables
- the sign of the correlation coefficient indicates the direction of association
- the correlation coefficient is always between -1 and 1, -1 indicating perfect negative linear association, +1 indicating perfect positive linear association, and 0 indicating no linear relationship
- the correlation coefficient is unitless
- since the correlation coefficient is unitless, it is not affected by changes in the center or scale of either variable (such as unit conversions)
- the correlation of X with Y is the same as of Y with X
- the correlation coefficient is sensitive to outliers

The slope does not necessarily have to be 1. Imagine a dependent variable which increases by precisely 2 units for every 1 unit increase in the explanatory variable. These variables have correlation coefficient R = 1 yet the slope of the regression line would be 2.

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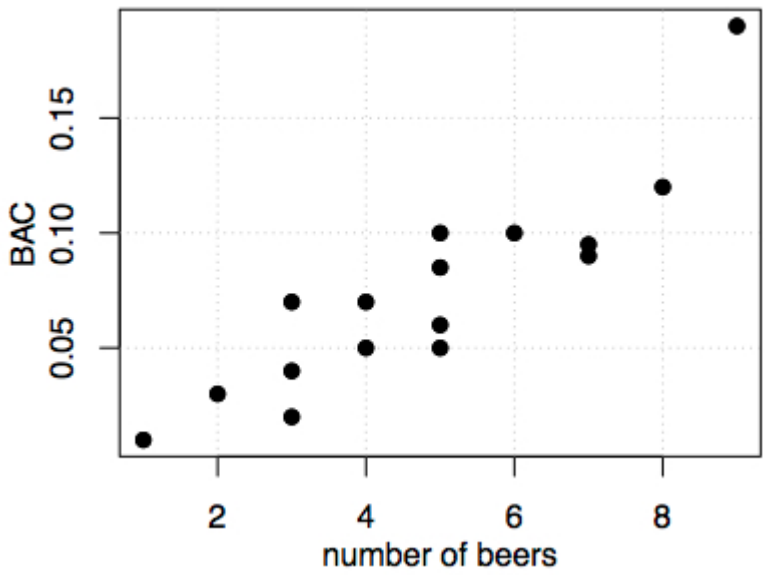
3.

Sixteen student volunteers at Ohio State University drank a randomly assigned number of beers. Thirty minutes later, a police officer measured their blood alcohol content (BAC) in grams of alcohol per deciliter of blood. The scatterplot displays the relationship between BAC and number of beers consumed. If the student who drank the highest number of beers (9 beers) actually had a BAC of 0.15 grams/deciliter, how would the strength of the association change?



- Increase

Correct

This question refers to the following learning objective(s):
When describing the association between two numerical variables, evaluate

- direction: positive ($$x$$ ↑, $$y$$ ↑), negative ($$x$$ ↓, $$y$$ ↑)
- form: linear or not
- strength: determined by the scatter around the underlying relationship

If the data point all the way on the right were moved

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4.

The R^2 for the linear regression of two variables x and y is 0.60. The variables are negatively associated. Which of the following is the correct correlation coefficient? Choose the **closest** answer.

- 0.40
- -0.77

Correct

This question refers to the following learning objective(s): Define R2 as the percentage of the variability in the response variable explained by the the explanatory variable.

- For a good model, we would like this number to be as close to 100% as possible.
- This value is calculated as the square of the correlation coefficient.

$\sqrt{0.60} \approx 0.77$, but the correlation coefficient is negative since the variables are negatively associated.

- 0.77
- 0.36
- -0.36