

Name: _____

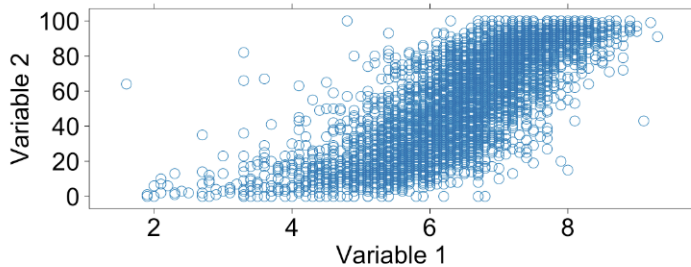
Date: _____

LAB 4D: Interpreting Correlations Response Sheet

Directions: Record your responses to the lab questions in the spaces provided.

Some background...

Correlation coefficients



(1) Are these variables linearly related? Why or why not?

Correlation review I

(2) Does this plot have a positive or negative correlation?

Correlation review II

(3) What do you guess the correlation coefficient will be for these two variables?

The movie data

(4) Write and run code loading the movie data using the data command.

Calculating Correlation Coefficients!

(5) Write and run code calculating the correlation coefficient for these variables using the `cor()` function. The inputs to the functions work just like the inputs of the `xyp1ot` function.

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Now answer the following

- (6) What was the value of the correlation coefficient you calculated?
- (7) How does this actual value compare with the one you estimated previously?
- (8) Does this indicate a strong, weak, or moderate association? Why?
- (9) How would the scatterplot need to change in order for the correlation to be stronger?
- (10) How would it need to change in order for the correlation to be weaker?

Correlation and Predictions

- (11) Find the two variables that look to have the strongest correlation with `critics_rating`.
- (12) Compute the correlation coefficients for `critics_rating` and each of the two variables.
- (13) Use the correlation coefficient to determine which variable has a stronger linear relationship with `critics_rating`.

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(14) Write and run code fitting two `lm()` models to predict `critics_rating` with each variable and compute the MSE for each.

- (15) Use the MSE to determine which variable is a better predictor of `critics_rating`.

(16) How are the correlation coefficient and the MSE related?

On your own

(17) Select two different numerical variables from the movie data. Plot the variables using the `xypplot()` function.

- (18) Would calculating a correlation coefficient for the two variables be appropriate? Justify your answer.
- (19) Predict what value you think the correlation coefficient will be. Compare this value to the actual value. Finally, interpret what the actual correlation coefficient means.

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(20) Work with your classmates to determine which two variables have the strongest correlation coefficient. Write them down.

– (21) Why do you think these variables are so strongly related?

– (22) Is using the correlation coefficient to describe the relationship appropriate and why/why not?