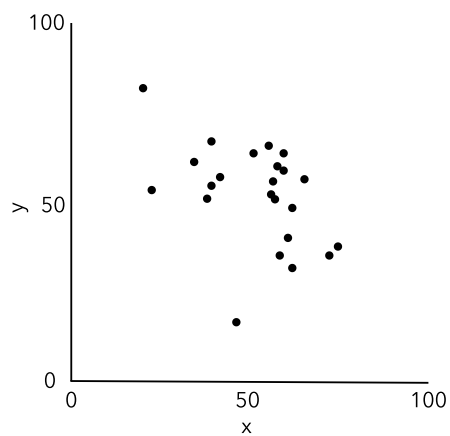
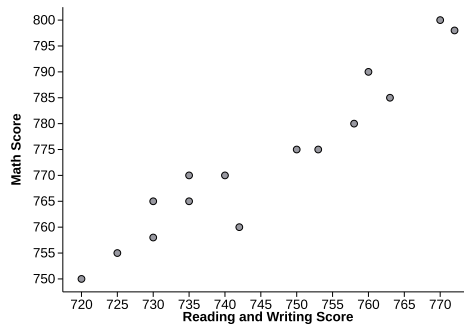


- For the relationship shown in the scatterplot, which value is the correlation closest to?

−1, −0.5, 0, 0.5, 1



2. An admissions officer at Columbia University believes that the math SAT score for incoming students can be predicted using their reading and writing SAT score. The scatterplot shows the reading and writing scores and math SAT scores of 15 incoming students at Columbia University.



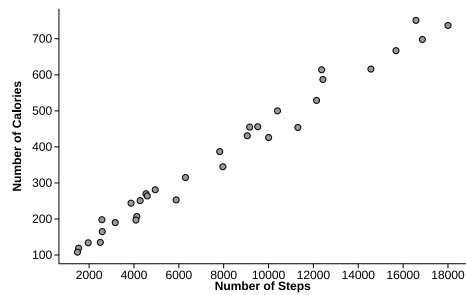
- Which variable is the explanatory variable? Which is the response variable?
- The correlation is 0.956. Interpret this value.
- Does the strong correlation mean that a change in the explanatory variable causes a change in the response variable? Explain.

3. A random sample of 15 high school students generated from Census at School includes the following data.

Foot length (cm)	23	27	25	30.5	22	25	24	23	24	23	26	28	24	28	22
Arm span (cm)	158.5	168	168	186	156	162	174	157.5	163	165	177	178	152	166	170

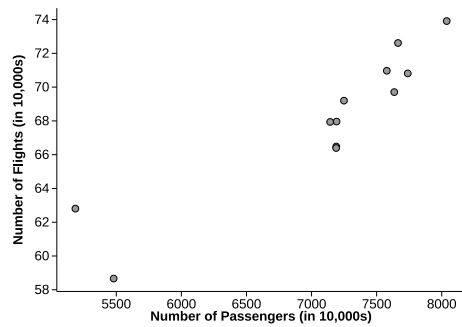
- Using technology, calculate the correlation of the relationship when foot length is the explanatory variable.
- Interpret the correlation r .
- Calculate the correlation again, this time using arm span as the explanatory variable.
- Explain the impact switching the explanatory and response variables had on the correlation. Will this always be true?

4. A fitness tracker records the number of steps the user takes each day and the number of calories burned during exercise each day for the same user over a period of 30 days. The results are shown in the scatterplot.



- a. The user wishes to convert the number of steps taken each day to a distance. They determine that their average step is 2.2 feet long. The lowest number of steps recorded is 1,480 steps. What would this value be as a distance in feet?
- b. Will changing the explanatory variable from number of steps to distance in feet change the correlation r ? Explain.
- c. Will changing the explanatory variable from number of steps to distance in feet change the units of the correlation? Explain.

5. The scatterplot shows the total number of flight passengers (in 10,000s) and the total number of flights (in 10,000s) each month in a recent year for all U.S. commercial airlines. The correlation of the relationship is $r = 0.914$.



- a. Describe the relationship in context.
- b. Give an example of an additional ordered pair that would strengthen the correlation. Explain.
6. To introduce scatterplots to her AP Statistics class, Mrs. Berg showed pictures of 12 celebrities and asked her students to guess each celebrity's height in inches. The class then paired their guesses with the actual heights and created scatterplots. Lucy, a student in Mrs. Berg's AP Statistics class calculated a correlation of 0.939. Which of the following is the most appropriate conclusion?
- A) There is a strong, positive, linear relationship between guessed heights and actual heights.
- B) The typical deviation between observed and predicted guessed heights is 0.881.
- C) For each one-inch increase in guessed height, there is an increase of 0.881 inch in actual height.
- D) Because of the strong correlation, the guessed heights cause the change in actual heights.

7. According to a local water treatment company, U.S. adults typically use 2.5 gallons of water per minute while in the shower. However, this value may vary according to each home's plumbing and water pressure. To reduce water consumption, researchers at the water treatment company asked a sample of volunteers to record the amount of time they spent taking one shower and then calculate how many gallons of water was used.

The amount of time spent in the shower and the number of gallons of water used

- A) will have a correlation of 0.
- B) will have a negative correlation.
- C) will have a positive correlation that is less than 1.
- D) will have a correlation of 1.