

1. Many doctors tell us not to encourage babies to become too fat. Medical research indicates that there is a positive correlation between the weight (x) of a one-year-old baby and the weight (y) of that baby as a mature adult (30 years old). A random sample of medical files produced the following information for 14 females:

x (lb.)	21	25	23	24	20	15	25	21	17	24	26	22	18	19
y (lb.)	125	125	120	125	130	120	145	130	130	130	130	140	110	115

- Draw a scatter diagram of this data.
 - What is the correlation coefficient for this data? Is there a strong, weak, or moderate correlation between the weight of a one-year-old baby and the weight of that baby as a mature adult?
 - What is the prediction equation for this example?
 - Predict the weight of a one-year-old 20 lb. baby at age 30.
2. A teacher assumes that there is a correlation between a student's test scores on a standardized Achievement Test in math and that student's grade point average (GPA) for the year. After final grades have been submitted, she collects the data shown in this table to study her hypothesis that there is a strong correlation between these two variables.

Test Score	98	90	85	71	95	68	72	75	79	86	77	91	96	94	88	59
Final Average	3.6	2.9	2.4	2.5	3.2	2.0	2.3	2.5	2.5	3.1	2.2	3.2	3.6	2.9	3.1	1.6

- Draw a scatter diagram of this data.
- What is the correlation coefficient for this data set? Is there a strong, moderate or weak correlation between test scores and GPA?
- What is the prediction equation for the GPA of a student based on his or her score on the Achievement Test?

Based on this data, predict the GPA of a student who makes a test score of 89 on the Achievement Test.

Short Answer Questions

1. Would the correlation between these variables be positive or negative? Why?
 - a. the age of a second-hand car and its market value
 - b. weight of a car and miles per gallon
 - c. a child's age and his height
 - d. the number of policemen patrolling the park at night and the number of muggings
2. Draw a scatter diagram and compute the correlation coefficient for the following set of data.

x	y
1	6
2	7
3	5
5	5
4	6
6	1
7	2

Correlation Coefficient = _____

Strong, Moderate or Weak Correlation?

3. Suppose women always married men who were exactly five percent taller. What would the correlation between their heights be?
4. A regression equation for predicting weight in pounds (y) from height in inches (x) is
$$y = 4x - 130$$
 - a. Predict the weight of a person who is 65 inches tall.
 - b. The standard error of a prediction allows you to create a range of values above and below the predicted value that likely contains the true answer. If the standard error of the prediction for this problem is 8.5 lb., give a range of values that would likely contain the weight of a person 68 inches tall.

Gather data from your classmates that compares their shoe sizes and their heights in inches. Gather separate data for males and females. What is the correlation coefficient? Write a regression equation using your data. Can you predict a person's shoe size from his or her height with reliability?