

Understanding Data

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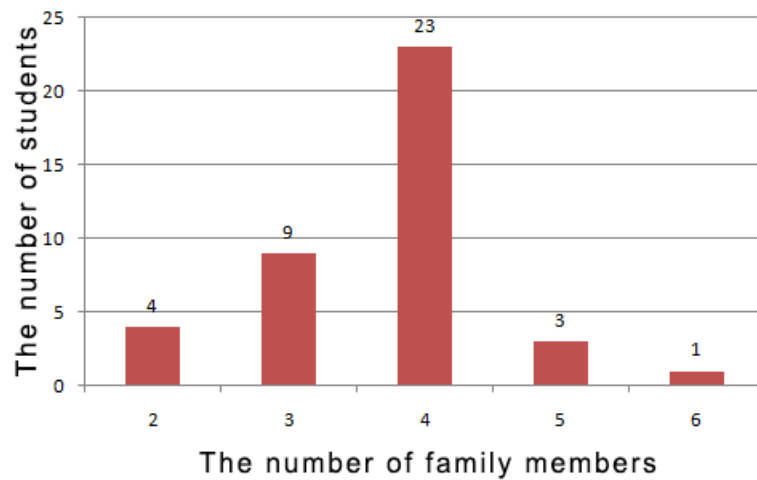
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Problem Set

What is the mean of the following three numbers: 1, 9, 14?

What is the mean of the set: {5, 8, 10, 15, 27}?

What is the mean of the set: {2, 4, 4, 6, 8, 12}?

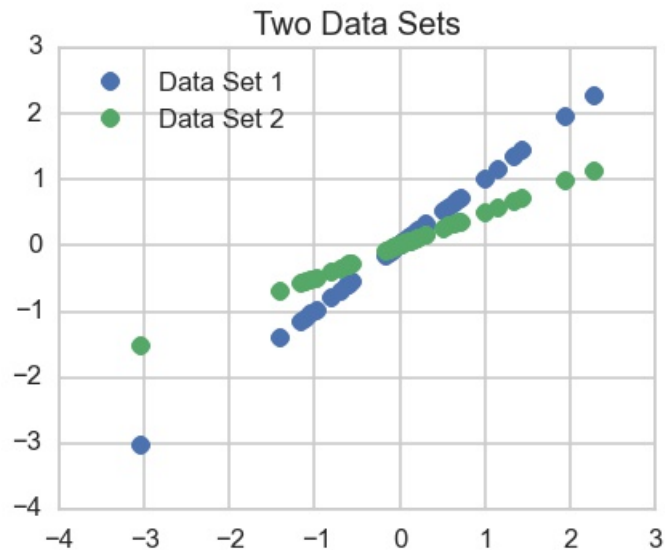


A group of students were asked how many family members they each have in their family, and the above graph is the frequency distribution from the survey. Determine the mean number of their family members.

- 3.7
- 3.8
- 4
- 8

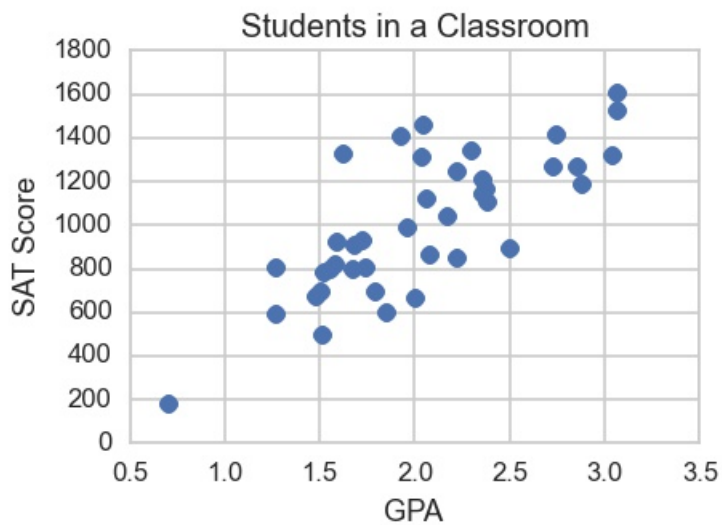
What is the maximum value that the correlation of two random variables can take on?

- -1
- 0
- 1
- 100
- it is unbounded



Consider the two data sets represented by the data in the graph. Suppose that for each set, the points lie exactly on a line. Which one has a higher correlation?

- Data Set 1
- Data Set 2
- They have the same correlation.



The scatter plot above is drawn to represent a class of 40 students. Which of the following is closest to the correlation between GPA and SAT score?

- -1.00
- -0.75
- 0.00
- 0.75
- 1.00

Johnny is measuring and weighing apples. He finds that the correlation between the width measured in inches to the weight measured in pounds is 0.2. What is the correlation between the width in centimeters and the weight in pounds?

You may find it helpful to know that there are 2.54 cm in an inch.

- 0
- $\frac{0.2}{2.54}$
- 0.2
- 0.2×2.54

You have 100 squares all of which are a different size. What is the correlation between the area and side length of these squares?

- 1
- less than 1 but greater than 0
- 0
- less than 0 but greater than -1
- -1

The probability distribution of a random variable X is $P(X = 1) = 0.1$, $P(X = 2) = 0.2$, $P(X = 3) = 0.3$, $P(X = 4) = 0.4$. The variable $Y = 9X + 14$. What is the variance of Y ?

- 83
- 81
- 79
- 85

A random variable X has $E(X) = 3$ and $V(X) = 9$. If $Y = aX + b$, $E(Y) = 6$, $V(Y) = 9$, what are $a > 0$ and b ?

- $a = 2$, $b = 5$
- $a = 1$, $b = 3$
- $a = 1$, $b = -3$
- $a = 7$, $b = -2$

If $V(X) = 4$, what is $V(2X + 7)$?

- 28
- 24
- 20
- 16

If $V(X) = 3$ and $E(X^2) = 10$, what is $(E(X))^2$?

- 13
- 11
- 9
- 7

If $V(X) = 5$, what is $V(2X + 4)$?

- 32
- 20
- 28
- 24

In Mrs. Krol's math class, there are 20 students and the class average is 91. In Mr. Tan's math class, there are 30 students and the class average is 71. What is the average score of the combined classes?

Let the median of 33 observations be 50. If each of the observations greater than the median is increased by 8, then what is the median of the new data?

- 42
- 50
- 58
- 314

How many values of x are there that would make the range of the below set equal to 50?

$$\{-3.3, 6.7, x, 29.2, 42.4\}$$

- 2
- 1
- 0
- 3

A set of three distinct positive integers has mean 4 and median 5. What is the largest number in the set?

A group of 7 girls each wrote down a number. The average of the 7 numbers is 50. The average of the numbers not written by Sally is 45. What number did Sally write?

- 50
- 60
- 80
- 70

A set of data points has a median of 45. If we multiplied all the data points by $\frac{1}{5}$, what would be the new median?

- 9
- 225
- 5
- 45

A set of data points has a mean of 10. If we multiplied all the data points by 2, what would be the new mean?

- 5
- 2
- 20
- 10

A set of data points has a median of 16. If we added 2 to all the data points, what would be the new median?

- 32
- 18
- 2
- 16

A set of data points has a range of 10. If we added 2 to all the data points, what would be the new range?

- 10
- 8
- 12
- 5

A set of data points has a range of 12. If we multiplied all the data points by 2, what would be the new range?

- 6
- 12
- 2
- 24

Suppose you have data points x_1, \dots, x_n with mean 5 and variance 2. If I first multiply them all by three and then square all the new values I get, what is the mean of the data points I end up with?

- 225
- 229
- 227
- 243

You have a data set with standard deviation 10. What is the minimum value of the standard deviation of the data set obtained by taking the absolute value of all the elements in the original data set?

- 10
- 0
- $\sqrt{10}$
- 5

A set of data points has a mean of 10 and a standard deviation of 5. If all the data points are squared, what is their new mean?

- 95
- 105
- 100
- 75
- 125

A set of an odd number of data points has median 5. If we square all the values, what is the new median?

- at least 25, but possibly more
- it must be 25
- at most 25, but possibly less

The side lengths of a set of squares have an average of 5 and variance of 4. What is their average area?

- 41
- 29
- 27
- 25

Consider the data set $X = x_1, \dots, x_n$, which has a mean of 5. What is the smallest possible mean of $|X| = |x_1|, \dots, |x_n|$?

- 5
- 0
- 3
- 2
- 2.5