

Mean and Median – part 1

Group Members: List the names of your group mates below.

Opening Question: How long is your commute (in minutes?)

My students asked 40 people this question last semester. Below is a random sample of 9 responses.

25 10 50 20 45
35 30 45 120

Looking at these responses, what would you say is a *typical* commute time? Give a precise answer and be prepared to justify your answer to the class.

1. If raw chicken is packaged and stored properly in the refrigerator, it will take approximately three to four days to spoil (according to the internet.) To test this, I bought ten chickens from a variety of different stores & left them in the fridge to spoil. The number of days they took to spoil are listed below:

7 3 3 2 5
3 1 9 4 3

a) Fill in the missing information in the formula below to calculate the mean.

$$\text{mean} = \bar{x} = \frac{\quad + \quad +}{10} = \frac{\quad}{10} =$$

b) Fill in the missing information in the table below to order the numbers from smallest to largest. Circle the middle two numbers and use this to calculate the median.

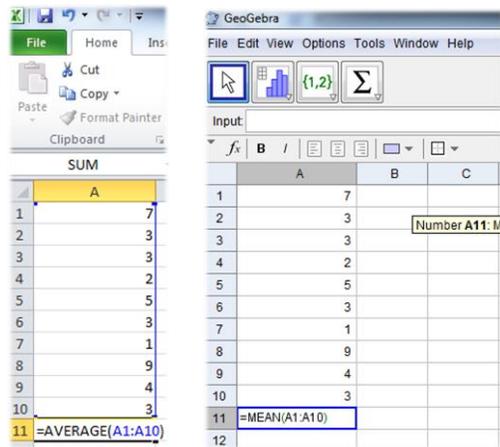
1 st = smallest	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th = largest

median =

2. You can calculate the mean and the median much faster using Excel or GeoGebra.

In Excel, you record the data from your sample in the columns of an Excel spreadsheet and then use the AVERAGE and MEDIAN commands. For example, if you put your data in cells A1 to A10, then =AVERAGE(A1:A10) would give you the mean and =MEDIAN(A1:A10) would give you the median.

The mean and median are calculated the same way in GeoGebra except you use the MEAN command for the mean rather than the AVERAGE command.



- a) Use both Excel and GeoGebra to check your answers to the previous problem.
- b) Change the number 9 in this data set to 900. Does the median change? If so, how? Does the mean change? If so, how? **Explain your answer.**

3. Let's go back to the data set from the opening question about commute times.

- a) By hand, calculate the median and mean commute time.

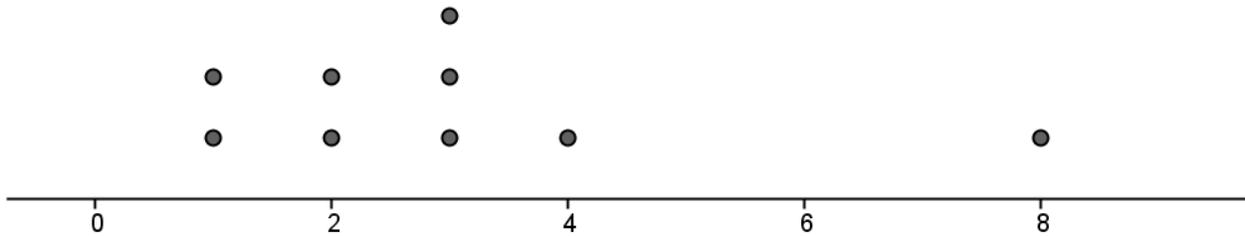
$$\text{mean} = \bar{x} =$$

$$\text{median} =$$

- b) Check your answers to the previous problem using Excel and/or GeoGebra.

- c) Based on your answers to the previous two problems, what would you say is a *typical* commute time? **Explain** how mean and median help you justify your answer.

4. In Washington DC, Moombahton artist Dave Nada's mom runs an empanada business called Empanadas de Nada. She keeps track of how many empanadas were purchased by each customer in the last hour and produces the following dotplot.



- a) Recreate this dotplot in front of you, using the plastic chips as dots.
- b) What is the mean in señora Nada's sample?
- c) What is the *fewest* number of empanadas eaten by a customer in the last hour? What is the *most* number of empanadas eaten?
- d) What was the most common number of empanadas for someone to eat?
- e) Move the plastic chip for the smallest number of empanadas to the right so that this person now eats 2 empanadas, and move the plastic chip for the largest number of empanadas to the left so that this person now eats 7 empanadas. Draw this modified dot plot below. Did these two moves change the mean? **Explain your answer.**

f) Repeat the previous step again and again, each time moving a chip from both edges of the dot plot toward the center. When does this process end?

g) How could you use this process above to calculate the mean? **Explain your answer.**

5. As a group, you're going to design posters explaining the mean and median (one poster for each statistic.) Your posters should have:

- a) A description in words of how to calculate the mean (or median): You could write it as a list of steps or describe it in a couple of sentences.
- b) An example calculation: You can make up the numbers, but you should tell me what is the real-world thing these numbers describe.
- c) A comic describing how to calculate the mean (or median.) Be creative, and don't worry if you're not an artist. Anyone can draw stick figures.
- d) A description of the use of the mean (or median): Why do we care about this thing? What does it tell us about a sample?
- e) Make your posters pretty.