Worksheet 8 - the median

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Your Name: _____

Names of people you worked with: _____

- Introduce yourself. What are you most looking forward to during the spring semester?
- Name one thing you learned in the class that you are looking forward to using in the future.

Task: Today we are going to calculate the mean and the median. I'll give you a series of numbers. As I read the numbers, I want you to work at calculating both the mean and the median.

Reflection: which is easier for you to calculate, the mean or the median? which is easier for the computer to calculate? Explain.

Solution:

1. If you sort the numbers and then find the (average of the) middle numbers, the task will take $O(nlog(n))$ time. That is, a dataset with 1000 records will be $(1000 \cdot log(1000))/(100 \cdot log(100)) = 10 \cdot log(900)$ times slower than a data set with 100 records. There are some caveats: (1) some sorting algorithms are faster, and (2) you don't need to sort every number to get the median. But generally, sorting is a slow operation!
2. Averaging is just summing, and happens in linear time, $O(n)$. That means that a dataset with 1000 records will be $1000/100 = 10$ times slower than a dataset with 100 records.

Generally, for a computer, it is easier to calculate a mean than a median, because of the need to sort.