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Question: Will the mean or median increase if the last number in the data set increased?

Data	Data in Ascending Order	Data with Increased Last Number
55	32	32
32	33	33
55	37	37
40	40	40
44	41	41
33	44	44
100	55	55
41	55	55
63	63	63
37	100	~~100~~ 200

Figure 1 Data Set

Claim: When finding the mean, you must add up all numbers and divide by the total number of data. To find the mean the data does not have to be put in order. When finding the median, you must first put the numbers in order from least to greatest or in ascending order.

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Data:

Data	Data in Ascending Order with Increasing Last Number
32	32
33	33
37	37
40	40
41	41
44	44
55	55
55	55
63	63
100	~~100~~ 200
======	========
500	600

Figure 2 Data Set with Increasing the Last Number

ADD: 32+33+37+40+41+44+55+55+63+100 = 500

Mean (with regular data) = 500 / 10 = 50

ADD: 32+33+ 37+40+41+44+55+55+63+~~100~~ 200= 600

Mean (with increased last number) 600 / 10 = 60

Median (with regular data) = 41 + 44 = 85, 85 / 2 = 42.5

Median (with increased last number) = 41 + 44 = 85, 85 / 2 = 42.5

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Commentary: As you can see the mean does change if the data increases on the last number; however, the median stays the same.

To calculate the mean, add up all the number and divide by the total number of data. This will give you average of all the data. Add 32 plus 33 plus 37 plus 40 plus 41 plus 44 plus 55 plus 55 plus 63 plus 100 equals 500. Next, divide by total number of data which is 10 (500/10). This equals 50 mean. Then we changed the last value from 100 to 200 so we could evaluate how this might increase or decrease or no change on the mean. Add 32 plus 33 plus 37 plus 40 plus 41 plus 44 plus 55 plus 55 plus 63 plus 200 equals 600. Next, divide by total number of data which is 10 (600/10). This equals 60 mean. Wow, what a difference. This increase the mean by 10!

ADD: 32+33+37+40+41+44+55+55+63+100 = 500

Mean (with regular data) = 500 / 10 = 50

ADD: 32+33+ 37+40+41+44+55+55+63+~~100~~ 200= 600

Mean (with increased last number) 600 / 10 = 60

Wow, the mean increased by 10. That is a huge increase!

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To calculate median, put the data in ascending order, (32,33,37,40,41,44,55,55,63,100) that is, least to greatest. Then find the middle number(s) (41 and 44). If there are two middle numbers, add them together and divide by 2. If there were three numbers then divide by 3, etc. In this case there were only two middle numbers.

ADD 41 + 44 = 85,

DIVIDE 85/ 2 = 42.5.

If the last number of the data increased to 200 (32,33,37,40,41,44,55,55,63,200)this does NOT affect the median, because we only used the two middle numbers and the last has NO effect on the middle numbers.

Data with increased last number to 200

ADD 41 + 44 = 85,

DIVIDE 85/ 2 = 42.5.

As you can see, there is no change in the median!

I proved that the mean will increase if the last number increases and the median stays the same.