

Module 1 Basic Statistics

1. Consider the following three sets of observations:

Set 1: 8,9,10,11,12

Set 2: 8,9,10,11,100

Set 3: 8,9,10,11,1000

- (a) Find the median and mean for each data set.
- (b) Find the range and variance for each data set.
- (c) What do these data sets illustrate about the resistance of the median and mean?

Solution:

(a) Set 1: Median=10; Mean= $\frac{8+9+10+11+12}{5} = 10$.

Set 2: Median=10; Mean= $\frac{8+9+10+11+100}{5} = 27.6$.

Set 3: Median=10; Mean= $\frac{8+9+10+11+1000}{5} = 207.6$.

(b) Set 1: Range= $12 - 8 = 4$; Variance= $\frac{(8-10)^2+(9-10)^2+(10-10)^2+(11-10)^2+(12-10)^2}{5-1} = 2.5$.

Set 2: Range= $100 - 8 = 92$;

Variance= $\frac{(8-27.6)^2+(9-27.6)^2+(10-27.6)^2+(11-27.6)^2+(12-27.6)^2}{5-1} = 1639.3$

Set 3: Range= $1000 - 8 = 992$;

Variance= $\frac{(8-207.6)^2+(9-207.6)^2+(10-207.6)^2+(11-207.6)^2+(12-207.6)^2}{5-1} = 196,219.3$

(c) The median is unaffected whereas the rest gets higher and higher as the data become more skewed.