

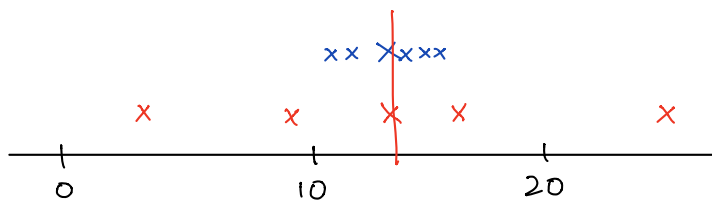
# Dispersion

mean: 16  
Median: 16

14      14      14      14                      18      18      18      18

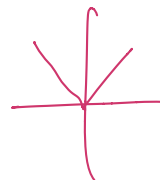
Mean: 16  
Median: 16

16      16      16      16                      16      16      16      16

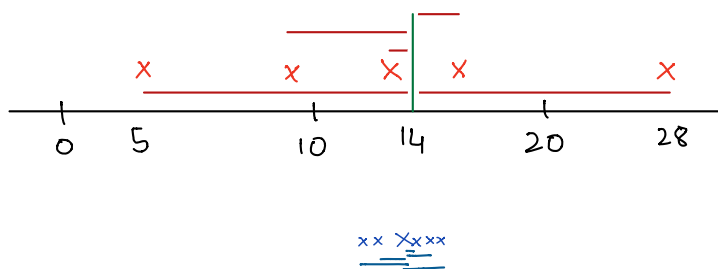


"Dispersion"

"Average distance of values from mean"  
    ↓  
    squared



$$\bar{X} = \left( \sum_i^N x_i \right) / N$$



$$(x_i - \bar{x})^2$$

$$28 - 14 = 14^2$$

$$5 - 14 = -9$$



$$\sigma^2 = \frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N}$$

"variance"

Problem: Original data units : m  
variance units : m<sup>2</sup>

Solution : Square root !

$$\sigma = \sqrt{\sigma^2}$$

Standard Deviation:

"Square root of  
average square distances of values from the mean"

"How far away are values from the mean..."

How large is SD?

Is 10.7 large?

How about 1094?

- Depends on the mean ...

$$\rightarrow \frac{10.7}{100} \times 100 = 10.7$$

$$\rightarrow \frac{1094}{100,000} \times 100 = 1.09$$

Coefficient of variation :  $\frac{\sigma}{\bar{x}} * 100$

" Relative measure of deviation."