Statistics.

Statistics is basically the science of collecting ,analyzing and interpreting data.

Statistics can be classified to two main categories :

Descriptive	Inferential
Organizing and summarizing data Using numbers & graphs .	Using sample data to make an inference or draw a conclusion of the population .
Data summary: Bar graphs , histograms ,pie chart , etc.	Uses probability to determine how confident we can be that the
Measures of central tendency: Mean , median & mode .	Conclusions we make are correct.
Measures of variability : Range , variance & standard deviation .	_____

Mean : " average "	Sum of the Given Data/Total number of Data
Median :	is the middle number in a set of *data.* If there is an even number of items of data, there will be two numbers in the middle. The median is the number that is half way between these two numbers.
Mode :	the number, or item, which occurs most often in a set of *data*
Renge :	The largest number – the smallest number .

Variance : is a measure of a spread of the data .

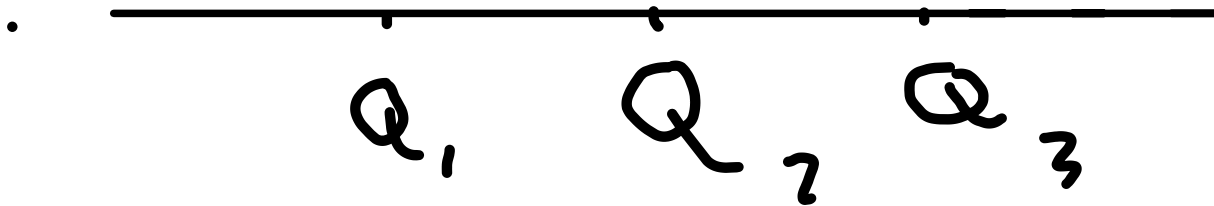The variance tell us how far the data is spread from the mean.

Variance Formula : $s\,2 = \sum (x - \bar{x})\,2\,/\,n - 1$

Where ($\bar{x}$) is the mean .

standard deviation : SD = root($\sum (x - \bar{x})^2 / n - 1$).

Interquartile range and any potential outliers:

Q1 is the median of the lower half of the data

Q2 is the median of the all data

Q3 is the median of the upper half of the data

The interquartile range represents the meddle 50% of the data .

Or IQR is the difference between the third quartile (Q3) and the first quartile (Q1).

IQR = Q3 – Q1 .

Outliers = [Q1 – 1.5*IQR , Q3 + 1.5IQR]

if we have a set of numbers and any number of them doesn't exist in outlier range

so that number is considered to be an outlier number

Ex : 11 , 31 ,21 , 19 , 8 , 54 , 35 , 26 , 23 , 13 , 29 , 17 .

Mean = (11+31+21+19+8+54+35+26+23+13+29+17)/12 = 22.25.

Median : 1- rearrange : 8,11,13,17,19,21,23,26,29,31,35,54

　　　 2- median = (21+23)/2 = 22.

Mode = no mode .

Range = 54 – 8 = 46 .

Variance = [(11-22.25)^2 + (11-22.25)^2 +(13-22.25)^2 +(17-22.25)^2+(19-22.25)^2+

(21-22.25)^2 + (23-22.25)^2 +(26-22.25)^2 + (29-22.25)^2 +(31-22.25)^2 +(35-22.25)^2+

(54-22.25)^2]/11 = 150.31.

standard deviation = (variance)^0.5 = 12.26.

Q1 = (17+13)/2 = 15 , Q2 = (21+23)/2 = 22 , Q3 = (29+31)/2 =30

IQR = Q3-Q1 = 15

Outliers = [Q1 – 1.5*IQR , Q3 + 1.5IQR] = [-7.5,52.5]