Object

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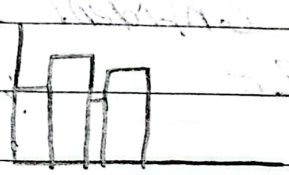
difference between statistics (Descriptive and Inferential)

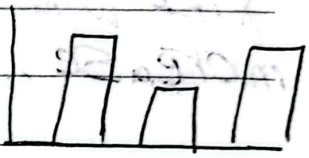
These are two types of statistics

statistics → science of collecting and analyzing Data

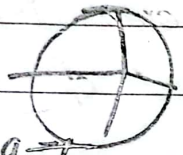
discriptive statistics → الاحصاء الوصفي

- organising and summarizing Data with bar graph and histogram

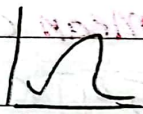




and pi charts



- using to discripe the shape of the graph

* Symmetric (normal distribution) 
* Skewed Right and left

depends on what is greater than median or average → $\bar{X}$ → $\tilde{m}$

- and using number to discripe Data by measures of Tendency :- mean (median (mode → most occurance

Sample — population — the middle of Data

- measure of Variability → Range (variance (standard deviation

Object بناءًا على الشيء والاحصائيات   \ \ Date

Inferential statistics → الاحصاء الاستنتاجية
using sample Data to Represent population
and using probability to Represent Data
100 ← 100,000   Confidence interval and
20% of blue car   margin error
and 2% error
that represent population size

* if I want to increase confident → you should increase sample size

Sample → (1000) ⟹ 21%   mergin error is 1% instead of 2%

mean , median , mode , Range

12, 7, 4, 4, 5, 11, 9, 7

mean = average = $\frac{\text{Sum}}{n}$ = $\frac{65}{7}$ = 9.2

~~5~~, ~~7~~, ~~7~~, 9, ~~11~~, ~~12~~, ~~4~~

median = 9   Mode = ~~5~~ 7
highest occurance

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Range = highest - lowest

14 - 5 = 9

Variance → spread of Data (some Data close to the mean

$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{n-1}$$

6, 9, 14, 10, 5, 8, 11

$\bar{x} = 9$

$s^2 = 9.3$

Standard deviation 82, 93, 98, 89, 88

$$\bar{x} = \frac{450}{5} = 90$$

$$s = \sqrt{\frac{\Sigma(x - \bar{x})^2}{n-1}} = \sqrt{\frac{142}{4}} = 5.96$$

population of standard deviation

-population mean is μ

$$\sigma = \sqrt{\frac{\Sigma(x_i - \mu)^2}{N}}$$

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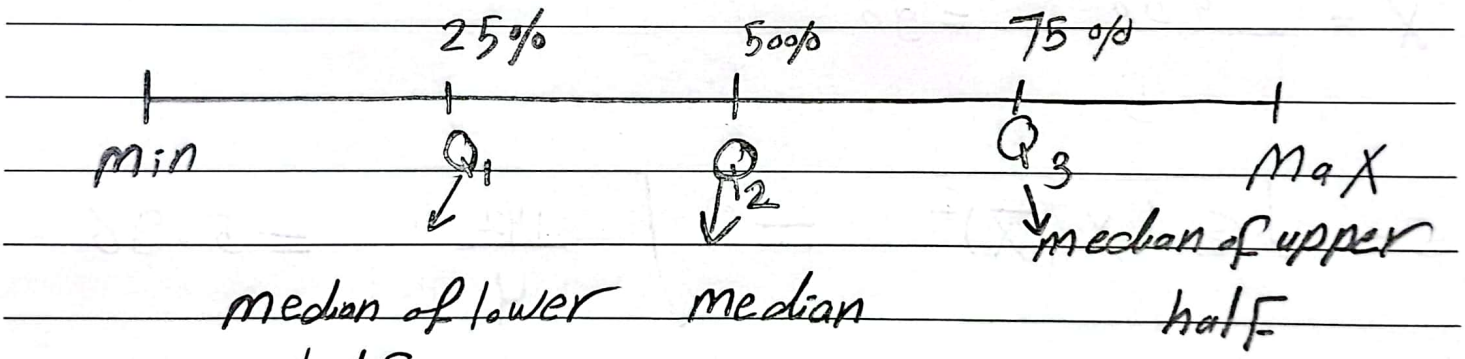
Sample

$$s = \sqrt{\frac{\Sigma(x_i - \bar{x})}{n-1}}$$

Standard deviation → how far of numbers related To each other

*the more spread the greater of sd

Interquartile Range (any outliers



IQR

$$IQR = Q_3 - Q_1$$

outliers → values that very very high or very very low
it must be in this range

$$= [Q_1 - 1.5IQR, Q_3 + 1.5IQR]$$

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5, 8, 15, 26, 6, 18, 8, 12, 6, 14, 11

3, 5, 6, 8, 10, 11, 12, 15, 18, 26

$Q_1 = 6$

median $= Q_2 = 11$

Q_2

50%

$Q_3 = 15$

$IQR = Q_3 - Q_1 = 15 - 6 = 9$

26 → is ~~outliers~~ is not outliers because it is in this range

$[Q_1 - 1.5\,IQR,\ Q_3 + 1.5\,IQR] = [-7.5,\ 28.5]$