Statistics

frequency - how many times event occured

class interval - clubbing data

Mid Point - $\frac{UL + LL}{2}$ upper limit - Lower limit

Range - UL - LL

Mean = $\bar{x}$ = average of all observations

$$= \frac{\text{Sum of all observations}}{\text{Total No. of observations}}$$

$$= \frac{\Sigma fx}{\Sigma f}$$

1) Mark obtained by 40 students of class XI are given find mean marks

Class	Mid $\frac{(UL+LL)}{2}$	f_i	x_i	$f_i x_i$
55	10			
60	30			
65	50			
95	70			
45	90			

Assumed Mean

find Mean, assume value to be mean

Subtract Mean value from x_i

		d_i	$f_i d_i$	$\bar{x} = a + \frac{\Sigma f_i d_i}{\Sigma f_i}$
55	10	10 - 50 = -40	2200	
60	30	30 - 50 = -20	1600	50 + (-7.5)
65	50	50 - 50 = 0	0	
95	70	70 - 50 = 20	1900	
45	90	90 - 50 = 40	1000	-900

Mean value gets affected by addition, subtraction, division

4) The mean of 17 terms is 25. what is new

If 5 is subtracted $25-5=20$

5 is added $25+5=30$

5 is multiplied $25\times5=125$

5 is divided $25/5=5$

Variance

how data points differ from mean always five σ^2

$$\sigma^2 = \frac{\Sigma |x-\bar{x}|}{n}$$

x - Data

$\bar{x}$ - mean

eg.) 2, 5, 8, 9

$$\bar{x} = \frac{2+5+8+9}{4} = 6$$

$x-\bar{x}$	$\lvert x-\bar{x}\rvert^2$
$2-6 = -4$	16
-1	1
$+2$	4
$+3$	9
	30

$\frac{30}{4} = 7.5$

$\sqrt{7.5} = 2$

Standard deviation

σ always positive

Square root of variance

Co-efficient of variance = $\frac{SD}{Mean} \times 100$

Answer in %.

$\frac{\sigma}{\bar{x}} \times 100$

Mode - Data that is repeated maximum number of times

No. of goals	0	1	2	3
match	1	1	3	

2 is the mode

No. of volunteers	5-7	7-9	9-11
No. of groups	5	7	3
	f_0	f_1	f_2

modal class

lower limit 7

range = 7 - 9 = 2

$$\text{Mode} = L + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times 2$$

Median

Middle most value (ascending order)

value of $\frac{n+1}{2}^{th}$ term

It gives the position of that

for even

average of observations at $\frac{n}{2}$ & $\frac{n+1}{2}$ Position

155, 160, 145, 149, 150, 147

145, 147, 149, 150, 155, 160

↳ find those avg

$\frac{6}{2} = 3$ $\frac{6}{2}+1 = 4$ — $\frac{149+150}{2} = 149.5$ median

cumulative frequency = 1 adding

2 so on

3

6

If class interval

$l + \left[\frac{\frac{n}{2} - Cf}{f}\right] \times h$

R/P btw mean, mode & median

Mode = 3 * Media - 2 * mean