

# Central tendency

Are averages =  $\bar{A}$

Mode Easy to find

Median Easy to find

Mean Useful in stats

Disadv  
 May be none  
 (not useful in other  
 stats)  
 Not useful

Outlier

Mode = most often

Median = middle in order of size

$$\text{Mean} = \frac{\text{Sum of observations}}{\text{total number of observations}} = \frac{\sum x}{n}$$

$n$  = number of observation.

Outlier = result either way larger or way smaller than rest.

Find averages of

(i) 1, 3, 1, 5, 90

Mode = 1

Median 1, 1, 3, 5, 90 Ans 3

$$\text{Mean} = \frac{1 + 1 + 3 + 5 + 90}{5} = 20$$

$\bar{x}$  = mean of sample  
 $\mu$  = mean of population.

(iii)

5, 3, 1, 4, 9, 6

Mode = none

Median 1, 3, 4 || 5, 6, 9 Ans 4.5

Median of  $n$  is  $\frac{n+1}{2}$

$$\text{Mean} = \frac{5+3+1+4+9+6}{6} = 4.6$$

Spread of data

Range = [low, high] = high - low

Interquartile =  $\frac{3}{4} - \frac{1}{4}$   
3<sup>rd</sup> quartile - 1<sup>st</sup> quartile

Standard deviation  $\sigma$

This is the average distance from the mean.

Find central tendencies and

spread of 3, 1, 4, 7, 1, 5, 10

Mode = 1

Median = 1, ①, 3, 4, 5, ⑦, 10

$$\text{Mean} = \bar{x} = \frac{3+1+4+7+1+5+10}{7} = \frac{31}{7}$$

$$\text{Range} = 10 - 1 = 9$$

$$\text{Interquartile} = \frac{n+1}{4} = \frac{7+1}{4} = 2^{\text{nd}} = 7 - 1 = 6$$

(ii) 3, 1, -5, -6, 4, 9.

$$\text{Mode} = \text{none}$$

$$\begin{array}{l} \text{Median} \quad -6, -5, 1, 3, 4, 9 \\ 6+1 = \frac{7}{2} = 3.5 \quad \text{Ans } 2. \end{array}$$

$$\text{Mean} = \frac{-6-5+1+3+4+9}{6} = 1$$

$$\text{Range} = 9 - (-6) = 15$$

$$\text{Interquartil} \quad 6+1 = \frac{7}{2} = 3\frac{1}{2}$$

$$\begin{array}{l} -6, -5, 1, 3, 4, 9 \\ \text{Lower} \quad -5.5 \end{array}$$

$$\text{Upper} \quad 6.5 \quad \text{Ans } 6.5 + 5.5 = 12$$

$$\sigma = 5.196 = 5.2$$

2	0	1	2	3
f	5	1	4	7

$$\text{Mode} = 3$$

$$\text{Median} \quad 17+1 = \frac{18}{2} = 9^{\text{th}} \quad \text{Ans } 2.$$

$$\text{Mean} = 1.76 = 1.8$$

$$\text{Range} = 3 - 0 = 3$$

$$\begin{array}{l} \text{Inter} \quad 17+1 = \frac{18}{4} = 4.5 \\ \quad \quad \quad 3-0 = 3 \end{array}$$

$$\sigma = 1.26 = 1.3$$

Top = Data = variable = observation
Bottom: Freq. = how often

Goals for Dundalk F.C.

0, 1, 2, 0, 3, 0

1, 3, 0, 1, 2, 1

0, 0, 1, 3, 2, 0

0, 0, 1, 1, 1, 2. (Raw data)

Form a tally.

Show on Frequency table.

Averages and spread.

0, 1, 2, 0, 3, 0

1, 3, 0, 1, 2, 1

0, 0, 1, 3, 2, 0

0, 0, 1, 1, 1, 2.

0                      1                      2                      3  
~~||||~~                      ~~||||~~                      ||||                      |||  
 |||                      |||

Goals	0	1	2	3
Count	9	8	4	3

Mode = 0

Median = 1

Mean = 1.04

Range = 3

Inter = 2

$\sigma = 1.02$ .

Age	0-2	2-4	4-6	6-8
People	3	8	5	2

(i) Modal

(ii) Median interval

(iii) Mean

(iv)  $\sigma$ .

(i) Modal = 2-4

(ii)  $3 + 8 + 5 + 2 = 18 + 1 = \frac{19}{2} = 9^{\text{th}} / 10^{\text{th}} = 2-4$

(iii)  $3.\overset{\cdot}{6} = 3.7$

(iv)  $\sigma = 1.76 \Rightarrow \sigma = 1.8$