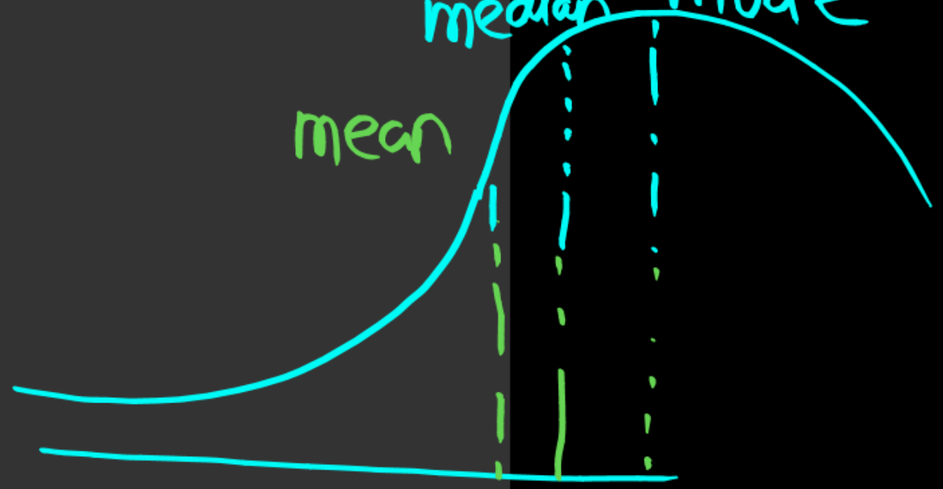
Mode- most commom no. of data
(Most frequently occurring value in the list )

$\Rightarrow$ Mode = 3.median-2.mean

$$\text{mode} - \text{median} = 2(\text{median} - \text{mean})$$

$$\frac{\text{mode-median}}{\text{median-mean}} = 2$$

negatively Skewed frequency distribution




Which relation can be true between Mode, Median and Arithmetic Mean ?

मोड, माध्यिका और अंकगणितीय माध्य के बीच कौन सा संबंध सही हो सकता है?

(SSC 10 + 2)

(a) Mean > Median > Mode

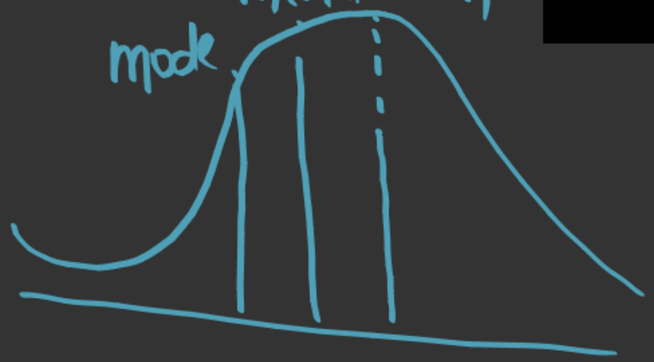
(b) Mean > Mode > Median

(c) Mean < Mode < Median

(d) Mode < Mean < Median

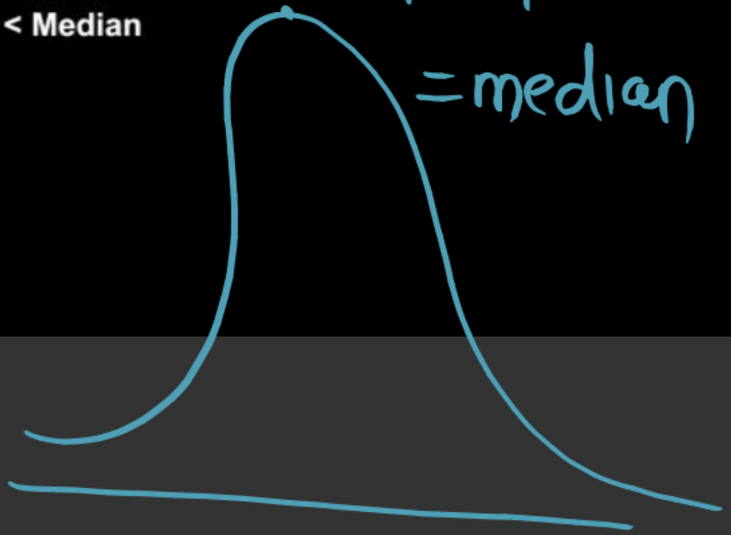
mean < median < mode

positively Skewed frequency distribution




mean > median > mode

mean = mode = median



# Mode- most commom no. of data (Most frequently occurring value in the list )

## Mode = 3.median-2.mean

## Mode for grouped data –

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

जिसकी frequency max है।

modal

$f_1$- frequency of class preceding of the median class

$f_2$- frequency of class succeeding of the median class

$f_m$- frequency of the modal

modal

L- lower limit of the mode class

h- size of class interval

there is a 15 Students in the clay. and weight are

| 39 | 40 | 45 | 50 | 51 | 52 | 53 | 60 |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 5 | 2 | 1 | 1 |

Find mode → 51 = mode

51
52
53
51
51
40
39
51
45
45
50
60

61
52

Find mode — $40 < \text{mode} < 50$

| Score | no. of Students |
|---|---|
| 20-30 | 4 |
| 30-40 | 28 $= f_1$ |
| 40-50 | 42 = modal class $= f_m$ |
| 50-60 | 20 $= f_2$ |
| 60-70 | 6 |

$L = 40$

$h = 10$

$$\text{mode} = 40 + 10\left(\frac{14}{84-48}\right)$$

$$= 40 + \frac{140}{36}^{35}_{9}$$

$$= 43.9$$

Find the mode for the given distribution (rounded off to two decimal places).

दिए गए बंटन का बहुलक ज्ञात कीजिए (दो दशमलव स्थान तक पूर्णांकित)।

| Class Interval | 5–10 | 10–15 | 15–20 | 20–25 | 25–30 | 30–35 |
|---|---|---|---|---|---|---|
| Frequency | 8 | 7 | 6 | 9 | 11 | 10 |

(a) 40.25
(b) 28.33
(c) 30.33
(d) 35.25

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$l \quad h = 5$

$f_1 \quad f_m \quad f_2$

$25 - 30$

$$\text{mode} = 25 + 5\left(\frac{2}{3}\right)$$

$$= 25 + 3.33 = 28.33$$

Range = largest observation - smallest observation.

Range - difference b/w largest and smallest no. in data.

frequency - 1, 0, 2, 3, 8, 3, 4, 5

3 - 2 = 1 frequency

mean deviation.

(about the mean $(\bar{x}) = \frac{|x_i - \bar{x}|}{n}$

$\bar{x}$: mean

mean deviation (about the median $(m) = \frac{|x_i - m|}{n}$

m: media

mean deviation for discrete frequency distribution-

data- $x_1, x_2, x_3 \cdots x_n$ observation occuring with frequency $f_1, f_2, f_3 \cdots f_n$

$$M.D(\bar{x}) = \frac{f_i |x_i - \bar{x}|}{\Sigma f_i = N}$$

$$MD(M) = \frac{f_i |x_i - M|}{\Sigma f_i = N}$$

Find the mean deviation about the mean -

| Size($x$) | 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 |
|---|---|---|---|---|---|---|---|---|
| Frequency($f$) | 3 | 3 | 4 | 14 | 7 | 4 | 3 | 4 |

$\bar{x}$ = mean = $\dfrac{1\cdot3+3\cdot3+5\cdot4+7\cdot14+9\cdot7+11\cdot4+13\cdot3+15\cdot4}{3+3+4+14+7+4+3+4} = \dfrac{336}{42}$

avg

$= 8$

$MD(\bar{x}) = \dfrac{\sum f_i|x_i-\bar{x}|}{\sum f_i} = \dfrac{3(7)+3(5)+4(3)+14(1)+7(1)+4(3)+3(5)+4(7)}{42}$

$f_1+f_2+\dots$

$= \dfrac{124}{42} = 2.95$

Variance → $x_1, x_2, x_3 \ldots x_n$ are n observations.

$\bar{x}$ - mean $= \dfrac{x_1 + x_2 \ldots x_n}{n}$

$\sigma$ = Standard deviation
मानक विचलन

$\sigma^2 = \dfrac{1}{n}(x_i - \bar{x})^2$ = variance

mean

$\sigma = \sqrt{\text{variance}}$

Standard deviation for discreate frequency —

$$\sigma = \sqrt{\frac{1}{N} f_i (x - \bar{x})^2}$$

Coefficient of variation = $\frac{\text{Standard deviation}}{\text{mean}} \times 100$

Find the variance and Standard deviation -

57, 64, 43, 67, 49, 59, 44, 47, 61, 59

$$\text{mean} = \frac{57+64+43+67+49+59+44+47+61+59}{10}$$

$$= \frac{550}{10} = 55$$

$$\text{variance} = \sigma^2 = \frac{1}{10}\left(4^2+9^2+12^2+12^2+6^2+4^2+11^2+8^2+6^2+4^2\right)$$

$$= \frac{662}{10} = 66.2$$

$\sigma$ = Standard deviation

$$= \sqrt{\text{variance}} = \sqrt{66.2} = 8.2$$

Calculate variance

| | mean | Class interval | frequency |
|---|---|---|---|
| $x_1$ | 6 | 4-8 | 3 |
| $x_2$ | 10 | 8-12 | 6 |
| $x_3$ | 14 | 12-16 | 4 |
| $x_4$ | 18 | 16-20 | 7 |

$$\bar{x} = \frac{3\cdot 6 + 6\cdot 10 + 4\cdot 14 + 7\cdot 18}{3+6+4+7}$$

$$= 13$$

$$\sigma^2 = \frac{1}{20}\left(3\cdot(7)^2 + 6(3)^2 + 4(1)^2 + 7\cdot 5^2\right)$$

$$= \frac{1}{20}\left(147 + 54 + 4 + 175\right)$$

$$= \frac{380}{20} = 19$$

$\bar{x}$ = mean = $\frac{5+3+4+7}{4}$

$= \frac{19}{4}$

Find the standard deviation of the following data (rounded off to two decimal places).

निम्नलिखित आंकड़ों का मानक विचलन ज्ञात कीजिए (दो दशमलव स्थान तक पूर्णांकित)।

5, 3, 4, 7 = $x_1, x_2, x_3, x_4$

(a) 1.48 (b) 4.12 (c) 2.45 (d) 3.21

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

$\sigma^2 = \frac{140}{64} = \frac{1}{4}\left(\frac{1}{16} + \frac{49}{16} + \frac{9}{16} + \frac{81}{16}\right)$

$\sigma$ = Standard deviation = $\frac{\sqrt{140}}{8} = \frac{11.8}{8} = 1$