

## Statistics Part-2

### Statistics: Part-2

Q1. The mean of the data given is 39.2. what is the missing frequency?

x	36	40	35	44
f	10	13	12	-y

a. 10 b. 12 c. 14 d. 15

mean =

$$\begin{array}{r} 39.2 \times 1 \\ 35 \quad 4 \\ \hline 1960 \\ 1476 \\ \hline 1372 \end{array} \quad \begin{array}{r} 2, 3, 4, 5, 6 \\ \hline 5 \end{array}$$

$$\frac{\sum f(x)}{\sum f} = \frac{1372}{420}$$



$$39.2 = \frac{36 \times 10 + 40 \times 13 + 35 \times 12 + 44 \times y}{10 + 13 + 12 + y}$$

$$39.2 = \frac{720 + 520 + 420 + 44y}{35 + y}$$

$$39.2(35 + y) = 1660 + 44y$$

$$1372 + 39.2y = 1660 + 44y$$

$$-4.8y = -288$$

$$y = 60$$

### Statistics: Part-2

Q2. The median from the following data.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	10	15	12	15	8

a. 24.366 b. 24.266 c. 24.133 d. 24.166

$$\text{Median} = l + \frac{\left[ \frac{N}{2} - (cf) \right] \times h}{f}$$

$$20 + \frac{(30 - 25) \times 10}{12}$$

$$20 + \frac{5 \times 10}{12}$$

$$20 + 4.166 = 24.166$$

$$\frac{N}{2} = \frac{60}{2} = 30$$

$$l = 20$$

$$cf = 25$$

$$f = 12$$

$$h = 10$$

6)  $25 \times 4.166$

Class	f	cf
0-10	10	10
10-20	15	25
20-30	12	37
30-40	15	52
40-50	8	60

$N = 60$



## Statistics: Part-2

Q3. Calculate mean and median from the following data.



Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	
No. of students	5	7	15	25	20	15	8	5	$\Sigma f = 100$
$\frac{0+10}{2}$	5	15	25	35	45	55	65	75	2
$\Sigma fx$	25	105	375	875	900	825	520	375	

$\frac{790}{100} = 7.9$   
 $\frac{750}{25} = 30$   
 $\frac{4000}{100} = 40$   
 $\frac{4000}{100} = 40$

(40)

## Statistics: Part-2



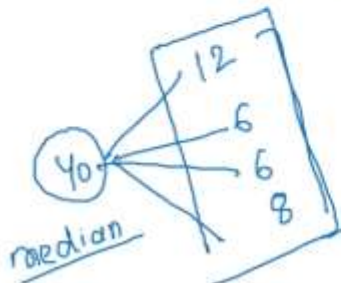
Q4. what is the mean deviation from the median for the data given below

Data: 34, 46, 28, 48 ?

1.8 2.5 3.10 4.15

median  $\Rightarrow$

28 (34, 46, 48)  $\Rightarrow$  Even: 4



$$\frac{34+46}{2} = \frac{80}{2} = 40$$

$$\text{mean: } \frac{12+6+6+8}{4} = \frac{32}{4} = 8$$

### Statistics: Part-2

Q6. What is the mean deviation of the data 8, 9, 12, 15, 16, 20, 24, 30, 32, 34?

A. 10.2 B. 8 C. 0 D. 9.6

$$\bar{x} = \text{mean} = \frac{8+9+12+15+16+20+24+30+32+34}{10} = \frac{200}{10} = 20$$

$$\bar{x} = \text{mean} = 20$$

$$20$$

$$\text{mean} = \frac{12+11+8+5+4+0+4+10+12+14}{10} = \frac{40+40}{10} = \frac{80}{10} = 8$$



### Statistics: Part-2

Q5. The mean of a set of data is 5. What will be the mean if ten is subtracted from each data?

1. -5 2. 5 3. 10 4. -15

Basic

assume 5, 5, 5, 5, 5 ✓

mean =  $\frac{5+5+5+5+5}{5}$

$\frac{5-10+5-10+5-10+5-10+5-10}{5}$

$\frac{25-50}{5} = \frac{-25}{5} = -5$

Total no = n

$5 = \frac{\text{Sum}}{n} \Rightarrow \text{Sum} = 5n$

$\frac{5n - 10 \times n}{n} = \frac{-5n}{n} = -5$





### Statistics: Part-2



Q7. With what value should the highest quantity in data 65, 52, 14, 26, 18, 35, 32, 38 be replaced so that the mean and median become equal?

- A. 51
- B. 66
- C. 64
- D. 53

Handwritten solution for Q7:

Median: 14, 18, 26, 32, 35, 38, 52, 65. The median is 32.5.

Mean:  $\frac{14 + 18 + 26 + 32 + 35 + 38 + 52 + x}{8}$

Setting Mean = Median:  $\frac{215 + x}{8} = 32.5$

Solving for x:  $215 + x = 260$ ,  $x = 45$ .

Wait, the handwritten solution shows a different calculation. Let's re-examine the data: 65, 52, 14, 26, 18, 35, 32, 38. The median is 32.5. The mean is  $\frac{14 + 18 + 26 + 32 + 35 + 38 + 52 + 65}{8} = \frac{270}{8} = 33.75$ . To make the mean equal to the median (32.5), we need to replace 65 with a value x such that  $\frac{270 - 65 + x}{8} = 32.5$ .  $\frac{205 + x}{8} = 32.5$ ,  $205 + x = 260$ ,  $x = 55$ .

However, the handwritten solution shows a different approach. It calculates the mean as  $\frac{14 + 18 + 26 + 32 + 35 + 38 + 52 + 53}{8} = \frac{215 + 53}{8} = \frac{268}{8} = 33.5$ . It then shows a long division for 268 divided by 8, which equals 33.5. It also shows a calculation for the median:  $\frac{32 + 35}{2} = 33.5$ . Therefore, the handwritten solution concludes that the value to replace 65 is 53.

### Statistics: Part-2



Q8. If mean of 29 observations is 33 and on adding one more observation in the new mean it becomes 34. what is the value of the 30<sup>th</sup> observation?

- 1. 55
- 2. 63
- 3. 68
- 4. 34

Handwritten solution for Q8:

Average:  $\frac{\text{Sum}}{\text{no}}$

For 29 observations:  $33 = \frac{\sum 29}{29}$ ,  $\sum 29 = 33 \times 29 = 957$

For 30 observations:  $34 = \frac{\sum 29 + 30^{\text{th}}}{30}$

$34 \times 30 = 33 \times 29 + 30^{\text{th}}$

$1020 = 957 + 30^{\text{th}}$

$30^{\text{th}} = 1020 - 957 = 63$

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**Statistics: Part-2**

Q9 The index numbers of five commodities are 121, 123, 125, 126, 128 and the weight assigned to these are respectively 5, 11, 10, 8, 6. Then what is the weighted average index number?

Mean

1. 123.8	x	121	123	125	126	128
2. 125.2	f	5	11	10	8	6

3. 124.6

4. 124.2

5. 124.35

weighted avg index:  
(mean)

$$\frac{\sum f \cdot x}{\sum f}$$

$$\frac{123}{1353}$$

$$\Rightarrow \frac{605 + 1353 + 1250 + 1008 + 768}{40} = \frac{4974}{40} = 124.35$$

$$5 + 11 + 10 + 8 + 6$$

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**Statistics: Part-2**

Q10. The mode of the following series is 36. find the missing frequency in it.

mean  
median

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	8	10	x	16	12	6	7

$$\text{mode} = L + \left[ \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right] \times h$$

$$\frac{36 - 30}{1} = \frac{(16 - x) \times 10}{(20 - x)}$$

$$(6) \times (20 - x) = (16 - x) \times 10$$

$$120 - 6x = 160 - 10x$$

$$160 - 120 = 10x - 6x$$

$$4x = 40$$

$$x = 10$$

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