Statistics Part -1

Statistics

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This Video Completely covers the problems on"Statistics" which is more than sufficient for all kind of placement Exams eg: TCS/WIPRO/AMCAT/ELITMUS/CoCubes and all other placement Exams.

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Statistics

Mean: The "average" number; found by adding all data points and dividing by the number of data points.

Example: The mean of 2, 3, and 4 is (2+3+4)/3 = 9/3 = 3

Median: The middle number; found by ordering all data points and picking out the one in the middle (or if there are two middle numbers, taking the mean of those two numbers).

Note : Arrange all numbers in ascending order.

Example: The median of 2, 3, and 5 is 3

The median of 2,3,5,6 is (2+3)/2= 4

Mode: The most frequent number—that is, the number that occurs the highest number of times.

Example: The mode of {4, 2, 3, 2, 4, 3, 2, 2, }, 2 is occurred more number of times.

Statistics

- ✓ The Standard Deviation is a measure of how spread out numbers are. Its symbol is **σ.**
- ✓ Standard deviation(σ)= [coefficient of variation * mean] / 100
- ✓ Mode= 3 Median – 2Mean

Variance

The variance (σ^2) is a measure of how far each value in the data set is from the mean. Here is how it is defined:

- ❖ Subtract the mean from each value in the data. This gives you a measure of the distance of each value from the mean.
- ❖ Square each of these distances (so that they are all positive values), and add all of the squares together.
- ❖ Divide the sum of the squares by the number of values in the data set.

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

$\bar{x}$: mean
n: number of terms

[population variance]

Statistics

Q1.The score of 7 students are : 4,6,3,1,4,2,8

The mean score is

A. 4.0 B.4.5 C.5.0 D.5.5

4, 6, 3, 1, 4, 2, 8

$$\text{Mean/Average} = \frac{4+6+3+1+4+2+8}{7}$$

$$\Rightarrow \frac{28}{7} = 4$$

Statistics

Q2. x, x+3, x+5, x+8, x+9 the mean of observation is 9. what will be the mean of the last three observation?

A. 32/3 B.31/3 C.35/3 D.34/3

$x, x+3, x+5, x+8, x+9$, Mean = 9

$$9 = \text{Mean} = \frac{\text{Sum}}{\text{NO}} = \frac{x+x+3+x+5+x+8+x+9}{5}$$

$x+5, x+8, x+9$

$$\text{Mean} = \frac{x+5+x+8+x+9}{3}$$

$$9 \times 5 = 5x + 25$$

$$45 - 25 = 5x$$

$$20 = 5x$$

$$x = 4$$

$$= \frac{12+22}{3}$$

$$= \frac{34}{3}$$

Statistics

Q3.The score of 7 students are : 4,6,3,1,4,2,8

The median score is

A. 3.5 B.4 C.4.5 D.5

4, 6, 3, 1, 4, 2, 8 ← (7)

Ascending order

1, 2, 3, 4, 4, 6, 8

median = 4

Number of numbers = odd

No of Numbers = Even

Q. 4, 6, 3, 1, 4, 2, 8, 5 (Median)

1, 2, 3, 4, 4, 5, 6, 8

$$\frac{4+4}{2} = \frac{8}{2} = 4$$

Statistics

Q4. find the median of 255,253, 256, 259, 261, 269 and 231.

A. 255 B. 256 C. 259 D. 261

Ascending order = 231, 253, 255, 256, 259, 261, 269

No. of Numbers = 7 (odd)

Median = 256

Statistics

Q5. The score of 7 students are : 4,6,3,1,4,2,8

The mode(modal) score is

A. 1 B. 3 C. 4 D. 6 E. 8

4, 6, 3, 1, 4, 2, 8

4 → 2 times

Statistics

Q6. The number of rupees notes of different denomination are

Denomination 20 5 10

Number of Rupees 150 200 80

Find mode of above data

A. 10 B. 80 C. 200 D. 5 E. 8

rupees 20rs → 150
5rs → 200
10rs → 80

5rs → 200 times

Statistics

Q7. What is the difference between the mean and median of Set

S = {2, 4, 6, 7, 7, 13, 18, 92} ?

A. 10.125 B. 11.125 C. 11.625 D. 14

S = { 2, 4, 6, 7, 7, 13, 18, 92 }

Median = $\frac{7+7}{2}$ = $\frac{14}{2}$ = 7

Mean = $\frac{2+4+6+7+7+13+18+92}{8}$

= $\frac{110+20+19}{8}$

M = 18.625

$\frac{149}{8}$ = 18.625

8) 149 (18.625
8
69
64
50
48
20

Mean − Median

18.625 − 7

= 11.625

Statistics

Q8. Evaluate the following for given set of numbers:

Set= {5, 6, 2, 3, 3, 3, 4, 4, 4, 4, 5, 7, 2}

[3 * mean + 2 * mode – 6 * median]

A. 5 B.4 C.-4 D.2 E.8

$= 3 \times 4 + 2 \times 4 - 6 \times 4$

$= 12 + 8 - 24$

$20 - 24 = -4$

Set = { 5, 6, 2, 3, 3, 3, 4, 4, 4, 4, 5, 7, 2 }

$\text{Mean} = \frac{5+6+2+3+3+3+4+4+4+4+5+7+2}{13} = \frac{52}{13} = 4$

Mode = 4

Median = 4

{ 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 6, 7 } ⇒ 13

No. of Numbers are odd.

Statistics

Q9. The score of 7 students are : 4,6,3,1,4,2,8

The variance of the score is

A. 32.15 B.5.67 C.4.85 D. 2.38

4, 6, 3, 1, 4, 2, 8

$|x - \bar{x}|^2$

$\text{Variance}(\sigma^2) = \left[\frac{\Sigma |x - \bar{x}|^2}{N}\right]$ $\bar{x}$: mean = 4

$\frac{(0)^2 + (2)^2 + (1)^2 + (3)^2 + (0)^2 + (2)^2 + (4)^2}{7}$ $= \frac{4+6+3+1+4+2+8}{7}$

$= \frac{4 + (1+9) + (4+16)}{7} = \frac{34}{7} = 4.85$ $= \frac{28}{7} = 4$

7) 34 (4.85
28
60
56
40

Statistics

Q10. The score of 7 students are : 4,6,3,1,4,2,8

The standard deviation of the score is

A. 2.20 B.5.67 C.5.29 D. 2.38

4, 6, 3, 1, 4, 2, 8 ✓

$\sigma^2 = 4.85$

$\sqrt{\sigma^2} = \sqrt{4.85}$

$= 2.20$

*** Standard deviation(σ) = $\sqrt{\text{Variance}}$

$(22)^2 = 484$ ✓

$(2.2)^2 = 4.84$

Table (1-20)
square (1-35)
cube (1-15)

Statistics

Q11. If the difference between the mode and median is 2, then the difference between the median and mean is:

A. 2 B.4 C.3 D. 1

median = x

mode − x = 2

mode = x + 2

mean = median − 1

median − mean = 1

mode − median = 2

median − mean = ?

mode = 3 median − 2 mean

x + 2 = 3 × x − 2 mean

x + 2 = 3x − 2 mean

2 mean = 3x − x − 2

2 mean = 2x − 2

mean = x − 1

Statistics

Q12. Four number when arranged in ascending order are w,x,y and z. The average of the smallest three number is 18, while the average of the largest three number was 22. what is the range of the data.

A.10 B.12 C.13 D. 11

Solution:

range = |max − Min| (12)

y, x & w

Avg = Sum / No

18 = (x + y + w) / 3

x + y + w = 54 (i)

Avg = Sum / No

x + y + z = 22 × 3

x + y + z = 66 (2)

w, x, y, z

z > y > x > w

x + y + z = 66

x + y + w = 54

z − w = 12

Statistics

Q13. The mean of distribution is 24 and the standard deviation is 6. what is the value of variance factor.

A. 50% B.25% C.100% D. 75%

Solution:

mean = 24

σ = 6

Sd = coeff of variance × mean / 100

6 = var x × 24 / 100

x = 25

Statistics

Q14. In a cricket match, the score of the players are considered such that coefficient of variation of scores is 16 and mean is 25 then the variance is:

A. 8 B.12 C.4 D. 16

Solution:

$$S.d(\sigma) = \frac{\text{coeff of variation} \times \text{mean}}{100}$$

$$\sigma = \frac{16 \times 25}{100} = 4$$

$\sigma = 4$

Variance $= \sigma^2$

$= (4)^2$

$= 16$