

$$\boxed{\text{CSE} - 313} \rightarrow \boxed{71 - 126}$$

$$\text{Ch} - 3$$

The mean, median, Mode and other dispersion

- Mean
- Arithmetic mean 3.13, 3.12
- The weighted arithmetic mean

Do yourself: 3.15

- Grouped Data → 3.20, 3.21, 3.22

www.sslwireless.com

Notes

measures of dispersion
~~0-8~~  
~~8-16~~

Q. Why is weighted mean important

Dispersion: The degree to which numerical data tend to spread about an average value is called the dispersion or variation of the data.

Measures of variation:

- i) Range
- ii) ~~Average~~<sup>Mean</sup> deviation
- iii) Quartile deviation / Inter Quartile R
- iv) Standard deviation

For unit free comparison:

- i) Coefficient of Range
- ii) " " Mean dev
- iii) " " Quartile "
- iv) " " Standard "

Notes

Range: difference between the highest & lowest value.

5, 20, 1, 50, 100

$$L = 100 - 1 = 99$$

Average deviation: From book

...tion 1

Notes

$$s = \sqrt{\frac{\sum f_i (x_i - \bar{x})^2}{\sum f_i}}$$

	$f_i$	$x_i$
0-5	5	2.5
5-10	1	7.5
10-15	3	..
15-20	2	..
20-25	4	..

### Quantile deviation

Ungrouped data:

After sorting:

5, 10, 15, 17, 18, 19, 20, 21, 25, 28

$$Q_1 = \frac{n+1}{4} \text{th term}$$

$$= \frac{10+1}{4} \text{th term}$$

$$= 2.75 \text{th term}$$

$$= 2\text{nd term} + 0.75 \times (3\text{rd} - 2\text{nd})$$

$$= 10 + 0.75 \times (15 - 10)$$

$$= 13.75$$

Notes

$$Q_3 = \frac{3(n+1)}{4} \text{th term} \\ = 8.25 \text{th term}$$

$$Q.D = \text{Semi-Inter Quartile Range} \\ = \frac{Q_3 - Q_1}{2}$$

Coefficient of Q.D :

$$= \frac{Q_3 - Q_1}{Q_3 + Q_1} \times 100$$

<u>Grouped:</u>	<u>f</u>	<u>cf</u>
0-10	10	10
10-20	20	30
20-30	30	60
30-40	50	110
40-50	40	150
50-60	30	180

1st Quartile:  $\frac{180}{4} = 45$

Notes

$$\frac{3N}{4}$$

$$\frac{N}{4}$$

$$\frac{N}{2}$$

$$Q_1 = L + \frac{\frac{N}{4} - P_{pcf}}{f} \times W$$

=

$$Q_2 = L + \frac{\frac{N}{2} - P_{pcf}}{f} \times W$$

$$Q_3 = \dots + \frac{\frac{3N}{4} - P_{pcf}}{f} \times W$$

pcf  $\rightarrow$  preceding cumulative freq.

Random variables: A random variable is a variable that is subject to randomness, which means it can take on different values.

D.R.V: that represents numbers found by counting.

Ex: No. of marbles in a jar, number of heads tossing two coins.

CRV: When we have to use intervals for our random variable or all value in an interval are possible, we call a continuous RV. CRV are random variables that are found for from measuring 0-40% 5/20% - < 40% 20/40% to < 60% 30 etc