Basic Mathematics_22103_CO5_UO5.1

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MSBTE LEAD: Learning at your Doorstep

Statistics

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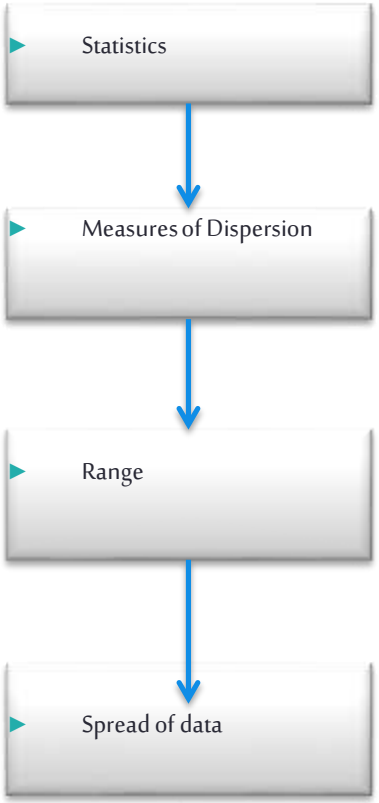
Introduction

- Statistics is a science of collection, presentation, analysis and interpretation of numerical data.
- Statistics has a wide range of applications in the modern age of technology.
- Statistical information enables organizations to frame policies and guidelines to improve the overall working of the system.
- Statistics also helps in understanding various economic problems.
- In industries, statistics helps in the field of Quality Control and also provides information in making critical decisions .

Concept Map



Range

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Learning Objective/ Key learning

- Obtain the range and coefficient of range of the given grouped and ungrouped data.

Content:

1. Range and coefficient of range for raw data
2. Range and coefficient of range for ungrouped data
3. Range and coefficient of range for grouped data

Key takeaways

Range and Coefficient of Range

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Range

For Raw data: -

Range = Largest value – Smallest value

= L – S

Coefficient of Range $= \frac{L-S}{L+S}$

Example:

Find the Range and coefficient of Range for the following data:

21, 25, 30, 35, 32, 27

Solution: Range $= L - S$

$= 35 - 21$

$= 14$

Coefficient of Range $= \frac{L-S}{L+S}$

$= \frac{35-21}{35+21}$

$= \frac{14}{56}$

$= \frac{1}{4}$ OR 0.25

Range

For Ungrouped data: -

Range = Largest value of x_i – Smallest value of x_i

= L – S

Coefficient of Range = $\frac{L-S}{L+S}$

Example:

Find the range and coefficient of range for the following:

x_i	30	40	50	60	70
f_i	15	20	17	22	18

Solution: Range = $L-S$

$= 70-30$

$= 40$

Coefficient of Range $= \frac{L-S}{L+S}$

$= \frac{70-30}{70+30}$

$= \frac{40}{100} = 0.4$

Range

For Grouped data: -

Range = Upper class boundary of last class – Lower class boundary of first class

= U – L

Coefficient of Range = $\frac{U-L}{U+L}$

Example:

Find the range and coefficient of range of the following:

Marks	21-25	26-30	31-35	36-40	41-45
No. of students	4	16	38	12	10

Range = U – L

=45.5-20.5

=25

Coefficient of range = $\frac{U-L}{U+L}$

= $\frac{45.5-20.5}{45.5+20.5}$

=0.379

Application of Concept

Range is the easy measure to calculate how spread out the data set is.

Quiz:

Q1. Find the range of the following data:

2, 3, 1, 6, 10, 17, 20, 24, 31

a) 30 b) 32 c) 29 d) 7

Q 2.Find the range of the following:

x_i	10	20	30	40	50
f_i	7	5	3	2	1

a) 60 b) 40 c) 30 d) 42

Ans: 1) a 2) b