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FACULTY OF ENGINEERING & TECHNOLOGY

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LECTURE- 22

BSc (AG)
2nd Year , IIIrd Sem.
Statistical Methods
AES-213

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Outline of lecture

- Correlation
- Numerical Question based on Karl Pearson's coefficient of correlation
- Scatter Diagram
- Suggested Readings & References

Numerical Problem

Find the coefficient of correlation b/w price "x" and supply "y" is :

x	5	3	8	7	3	4	8	2
y	5	2	6	4	5	2	5	3

$$r = \frac{\Sigma (x-\bar{x})(y-\bar{y})}{\sqrt{\Sigma (x-\bar{x})^2 \cdot \Sigma (y-\bar{y})^2}} \quad \text{---- (1)}$$

x	y	$x-\bar{x}$	$(x-\bar{x})^2$	$(y-\bar{y})$	$(y-\bar{y})^2$	$(x-\bar{x})(y-\bar{y})$
5	5	0	0	1	1	0
3	2	-2	4	-2	4	4
8	6	3	9	2	4	6
7	4	2	4	0	0	0
3	5	-2	4	1	1	-2
4	2	-1	1	-2	4	2
8	5	3	9	1	1	3
2	3	-3	9	-1	1	3
		0	40	0	16	16

$$\bar{x} = \frac{5+3+8+7+3+4+8+2}{8} = \frac{40}{8} = 5$$

$$\bar{y} = \frac{5+2+6+4+5+2+5+3}{8} = \frac{32}{8} = 4$$

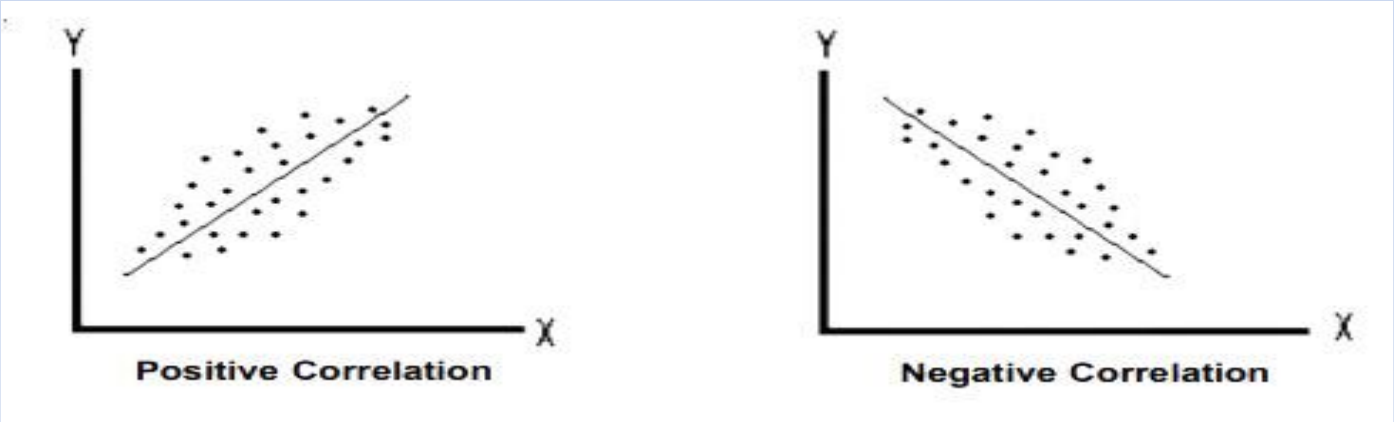
Put value in (1)

$$r = \frac{16}{\sqrt{40 \times 16}} = \frac{16}{\sqrt{640}} = \frac{16}{25.29}$$

$r = 0.63$ Ans.

Scatter Diagram

A scatter diagram or a dot chart enables us to find the nature of the relationship between the variables. If the plotted points are scattered a lot, then the relationship between the two variables is lesser. Scatter plots present data on the *x*- and *y*-axes and are used to investigate an association between two variables. A point represents each individual or object, and an association between two variables can be studied by analyzing patterns across multiple points. A regression line is added to a graph to determine whether the association between two variables can be explained or not.



Suggested Readings & References

1) Statistical Methods: P.N. Arora, Sumeet Arora & S. Arora; S. Chand & Company Ltd.

2) Fundamental of Mathematical Statistics: S.C. Gupta & V. Kapoor; Sultan Chand & Sons.

3) Statistics: M.R. Spiegel; Schaum's Outline Series, Mc-Graw Hill Publication.

4) Advanced Engineering Mathematics: Erwin Kreyszig; John Wiley & Sons Inc.

5) Elements of Statistics: J.P. Chauhan & S. Kumar; Krishna Publication.

* THANK YOU *