



Semester : 1

Subject : Statistics for AID

Academic Year: 2023 - 2024

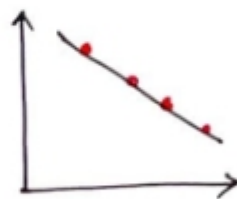
### CORRELATION COEFFICIENT:-



$$r = +1$$

$X \uparrow Y \uparrow$

(Positive Correlation)



$$r = -1$$

$X \uparrow Y \downarrow$

(Negative Correlation)

### Example:-

Find the correlation coefficient for the following:

X	1	2	3	4	5	6
Y	2	4	7	9	12	14

X	Y	XY	X <sup>2</sup>	Y <sup>2</sup>	
1	2	2	1	4	
2	4	8	4	16	
3	7	21	9	49	
4	9	36	16	81	
5	12	60	25	144	
6	14	84	36	196	
$\Sigma$	21	48	211	91	4980

$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$   
 $\Sigma X \quad \Sigma Y \quad \Sigma XY \quad \Sigma X^2 \quad \Sigma Y^2$



Semester : I

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$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{[n \sum x^2 - (\sum x)^2] [n \sum y^2 - (\sum y)^2]}}$$

$$r = \frac{6(211) - (21)(48)}{\sqrt{[6(91) - (21)^2] [6(490) - (48)^2]}}$$

$$= \frac{1266 - 1008}{\sqrt{[546 - 441] [2940 - 2304]}}$$

$$= \frac{258}{\sqrt{(105)(638)}} \quad \neq \frac{258}{\sqrt{66990}}$$

$$r = 0.998$$

Since  $r$  is positive.  $X$  and  $Y$  are positively correlated.