

Calculate Pearson's Coefficient Correlation from the following data:-

X	12	18	16	15	12	10	20	17
Y	6	10	9	8	9	8	12	10

Solution: Here N = 8

X	Y	$dX (\bar{X}=15)$ $X-\bar{X}$	$(dX)^2$	$dY (\bar{Y}=9)$ $Y-\bar{Y}$	$(dY)^2$	$(dX) \times (dY)$ $= dXdY$
12	6	-3	9	-3	9	9
18	10	+3	9	+1	1	3
16	9	+1	1	+0	0	0
15	8	+0	0	-1	1	0
12	9	-3	9	+0	0	0
10	8	-5	25	-1	1	5
20	12	+5	25	+3	9	15
17	10	+2	4	+1	1	2
ΣX 120	ΣY 72	$-11+11=0$	82	$-5+5=0$	22	34

$\bar{X} = \frac{\Sigma X}{N} = \frac{120}{8} = 15$ (X-series arithmetic mean)

$\bar{Y} = \frac{\Sigma Y}{N} = \frac{72}{8} = 9$ (Y series arithmetic mean)

$r = \frac{\Sigma dX \cdot dY}{\sqrt{\Sigma dX^2 \times \Sigma dY^2}} = \frac{34}{\sqrt{82 \times 22}} = \frac{34}{9.05 \times 4.69}$

$r = \frac{34}{42.14} = \boxed{+0.80}$

It is a positive correlation. The two variables X & Y are independent.