

Q Calculating Karl Pearson's Coefficient
Correlation by Actual Value / Actual data
 { Third Method }

$$r = \frac{N \cdot \sum XY - \sum X \cdot \sum Y}{\sqrt{N \cdot \sum X^2 - (\sum X)^2} \cdot \sqrt{N \cdot \sum Y^2 - (\sum Y)^2}}$$

X	X ²	Y	Y ²	XY
1	1	2	4	2
2	4	3	9	6
3	9	5	25	15
4	16	8	64	32
5	25	7	49	35
$\sum X = 15$	$\sum X^2 = 55$	$\sum Y = 25$	$\sum Y^2 = 151$	$\sum XY = 90$

$$N = 5$$

Step 1: Obtain the values $\sum X$ and $\sum Y$.

Step 2: Calculate X^2 and Y^2 to Obtain $\sum X^2$ and $\sum Y^2$.

Step 3: Calculate the product of X and Y to obtain $\sum XY$.

Step 4: Put all values in the formula

$$r = \frac{5 \times 90 - 15 \times 25}{\sqrt{5 \times 55 - (15)^2} \cdot \sqrt{5 \times 151 - (25)^2}}$$

$$= \frac{450 - \cancel{1125} 375}{7.07 \times 11.40} = \frac{75}{80.598} = 0.931$$

$$r = 0.931$$

Positive High Correlation
between X and Y.