Rank Correlation:

In some problems, we cannot deal with quantitative data, but we have to deal with qualitative & assessment.

In this cases, we have to find the rank correlation according as the arrangement of the individuals.

The formula for rank rank correlation co-efficient is,

$$r = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \quad , \text{ where } d_i = x_i - y_i$$

Example: The marks secured by recruits in the selection of test (X) and in the proficiency test (Y) are given below:

Serial no. :	1	2	3	4	5	6	7	8	9
X :	10	15	12	17	13	16	24	14	22
Y :	30	42	45	46	33	34	40	35	39

Calculate the rank correlation co-efficient

Solⁿ For the given marks, the number with the largest size is ranked 1, next is ranked 2 and so on ie we rank in decending order.

X	10	15	12	17	13	16	24	14	22	Total
Y	30	42	45	46	33	34	40	35	39	
Ranks in X (x)	9	5	8	3	7	4	1	6	2	
Ranks in Y (y)	9	3	2	1	8	7	4	6	5	
$d_i = x_i - y_i$	0	2	6	2	-1	-3	-3	0	-3	0
d_i^2	0	4	36	4	1	9	9	0	9	72

$$\therefore \quad \sum d_i^2 = 72, \quad \text{here } n = 9$$

$\therefore$ rank correlation coefficient,

$$r = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

$$= 1 - \frac{6 \times 72}{9 \times 80} = 1 - \cdot 6 = 0 \cdot 4$$