

Calculate the coefficient of rank correlation from the following data:-

X	R ₁	y	R ₂	d	d ²
4	4	9	2	1	1
7	2	12	3	1	1
10	1	3	5	-4	16
2	5	6	4	1	1
5	3	11	2	1	1
				0	20

$$R = 1 - \frac{6 \sum d^2}{N(N^2 - 1)}$$

$$= 1 - \frac{6 \times 20}{5(25 - 1)}$$

$$= 1 - \frac{120}{120}$$

$$= 1 - 1 = 0$$

Calculate the coefficient of rank correlation from the following data:-

X	R ₁	y	R ₂	d	d ²
87	1	23	5	-4	16
22	5	63	1	4	16
37	4	52	2	2	4
75	2	46	4	-2	4
32	3	48	3	0	0
					40

$$R = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} = 1 - \frac{6 \times 40}{5(25 - 1)} = 1 - \frac{240}{120} = 1 - 2 = -1$$

$$R = -1$$

(1) When ranks are given $\rightarrow$ When ranks are given the corr coefficient directly determine by the following steps.

(i) $\rightarrow$ Represent the rank of First variable by r_1 and Second variable by r_2 .

(ii) $\rightarrow$ Take the differences of two ranks i.e., $(r_1 - r_2)$ and take square of this diff d .

(iii) Calculate the sq. of these diff and total them to get $\sum d^2$.

(iv) Apply the formula:

$$r = 1 - \frac{\sum d^2}{N(N^2 - 1)}$$

N $\rightarrow$ In a dance competition two judges ranks seven contestant contestant are follows:

Judge 1	1	3	4	2	7	5	6
Judge 2	6	5	7	8	4	3	1

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Page 13 of 15

R_1	R_2	$d = (R_1 - R_2)$	d^2
1	6	-5	25
3	5	-2	4
4	7	-3	9
2	8	-6	36
7	4	3	9
5	3	2	4
6	1	5	25
			76

$$r = 1 - \frac{\sum d^2}{N(N^2 - 1)}$$

$$= 1 - \frac{76}{7 \times 48}$$

$$= 1 - \frac{45.6}{336}$$

$$= 1 - 0.35 = 0.65$$