Q2.12 entries in a painting competition were ranked by two judges , Judge I : 5, 2, 3, 4, 1, 6, 8, 7, 10, 9, 12, 11 and by Judge II: 4, 5, 2, 1, 6, 7, 10, 9, 11, 12, 3, 8 . Calculate Spearman's rank correlation coefficient.

Answer:

Solution:

x	y	Rx	Ry	$d = Rx - Ry$	d^2
5	4	8	9	-1	1
2	5	11	8	3	9
3	2	10	11	-1	1
4	1	9	12	-3	9
1	6	12	7	5	25
6	7	7	6	1	1
8	10	5	3	2	4
7	9	6	4	2	4
10	11	3	2	1	1
9	12	4	1	3	9
12	3	1	10	-9	81
11	8	2	5	-3	9
---	---	---	---	---	---
--	--	--	--	--	154

$$r = 1 - \frac{6 \cdot \sum d^2}{n\left(n^2 - 1\right)}$$

$$= 1 - \frac{6 \cdot 154}{12 \cdot \left(12^2 - 1\right)}$$

$$= 1 - \frac{6 \cdot 154}{12 \cdot (144 - 1)}$$