**Practical No.:13**

**STATEMENT:**

TEN PROGRAMMERS IN A PRESENTATION ARE RANKED BY THREE EXPERTS IN THE FOLLOWING ORDER.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Programmers | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Rank by expert I | 1 | 6 | 5 | 10 | 3 | 2 | 4 | 9 | 7 | 8 |
| Rank by expert II | 3 | 5 | 8 | 4 | 7 | 10 | 2 | 1 | 6 | 9 |
| Rank by expert III | 6 | 4 | 9 | 8 | 1 | 2 | 3 | 10 | 5 | 7 |

USE THE METHOD OF RANK CORRELATION TO FIND WHICH PAIR OF EXPERT HAVE NEAREST APPROACH OF RANKING.

**WORKING EXPRESSIONS:**

1. **Spearman rank correlation coefficient:**

The degree of relationship between two attributes is known as the rank correlation coefficient and which is also known as Spearman rank correlation coefficient. It is used to find the correlation coefficient between the qualitative variables such as beauty, knowledge, intelligence, honesty etc which cannot be measured quantitatively directly.

When the ranks are given then we can calculate (R) by given formula:

R = where, ∑d=0, d = R1-R2  or R2-R1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Programmers** | **(R1)** | **(R2)** | **(R3)** | **d12**  **(R1-R2)** | **d122** | **d13**  **(R1-R3)** | **d132** | **d23**  **(R2-R3)** | **d232** |
| 1 | 1 | 3 | 6 | -2 | 4 | -5 | 25 | -3 | 9 |
| 2 | 6 | 5 | 4 | 1 | 1 | 2 | 4 | 1 | 1 |
| 3 | 5 | 8 | 9 | -3 | 9 | -4 | 16 | -1 | 1 |
| 4 | 10 | 4 | 8 | 6 | 36 | 2 | 4 | -4 | 16 |
| 5 | 3 | 7 | 1 | -4 | 16 | 2 | 4 | 6 | 36 |
| 6 | 2 | 10 | 2 | -8 | 64 | 0 | 0 | 8 | 64 |
| 7 | 4 | 2 | 3 | 2 | 4 | 1 | 1 | -1 | 1 |
| 8 | 9 | 1 | 10 | 8 | 64 | -1 | 1 | -9 | 81 |
| 9 | 7 | 6 | 5 | 1 | 1 | 2 | 4 | 1 | 1 |
| 10 | 8 | 9 | 7 | -1 | 1 | 1 | 1 | 2 | 4 |
|  |  |  |  | 0 | ∑d122 = 200 | 0 | ∑d132 = 60 | 0 | ∑ d232 = 214 |

**CALCULATIONS:**

Now, Spearman’s Rank correlation coefficient between expert I and expert II

R (I, II)  = =  = -0.212

Again,

Spearman’s Rank Correlation coefficient between expert I and expert III

R (I, III) = = = 0.636

Similarly, Spearman’s Rank correlation coefficient between expert II and expert III

R (*I*I, III) = = = -0.296

Here, R (I, III) = 0.636 is positive correlation, hence expert I and III have common approach of ranking.

**RESULT:**

From using Spearman’s Rank Correlation coefficient, we have the following observations such as spearman’s rank correlation coefficient between expert I and expert II = -0.212 , spearman’s rank correlation coefficient between expert I and expert III = 0.636 and spearman’s rank correlation coefficient between expert II and expert III = -0.296. And finally the positive correlation is between expert I and III and have common approach of ranking.

**CONCLUSION:**

Hence, we can use the spearman’s correlation to find the common approach of ranking as shown above in the observations.