**Practical No: 07**

**OBJECT:** Following are the scores obtained by trainees in 3 different categories. Test whether 3 categories have performed equally. Use Kruskal Wallis H test at 5% level of significance.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Categories |  |  |  |  | Scores | |  |  |  |  |
| A | 68 | 65 | 92 | 82 | 62 | 64 | 68 | 92 | 86 | 64 |
| B | 93 | 86 | 73 | 87 | 76 | 85 | 67 | 79 | 75 | 75 |
| C | 95 | 72 | 85 | 70 | 80 | 80 | 78 | 85 | 72 | 90 |

**WORKING EXPRESSION:**

Kruskal-Wallis H test popularly known as one-way ANOVA by rank is one of the most powerful non-parametric tests. The testing mechanism is analogous to the F-test of CRD (completely randomized design). This test, to some extent may be considered as an extension of median test and is recommended for comparing the several (k>2) independent populations.

**Test statistic:** Under Ho

**)**

Where, are the number in each of **k** samples,

and are the ranks of each sample. The sampling distribution of **H** is a chi-square distribution with **k-1** degree of freedom, provided that are all at least **5.**

Where, A.F is adjustment Factor, and it is calculated as follows:

Where, is the number of ties corresponding to each observation.

**Hypothesis Setting:**

Null hypothesis (Hₒ): There is no significance difference between scores obtained by trainees in 3 different categories.

Alternative hypothesis (H₁): There is significance difference between scores obtained by trainees in 3 different categories.

**Level of significance (α)** = 5% =0.05

Practical No: 07

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**OUTPUT:**

\*Nonparametric Tests: Independent Samples.

NPTESTS

/INDEPENDENT TEST (Scores) GROUP (Categories) KRUSKAL\_WALLIS(COMPARE=PAIRWISE)

/MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE

/CRITERIA ALPHA=0.05 CILEVEL=95.

**Nonparametric Tests**



**Kruskal-Wallis Test**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ranks** | | | |
|  | A ,B ,C | N | Mean Rank |
| Scores | A | 10 | 12.05 |
| B | 10 | 16.95 |
| C | 10 | 17.50 |
| Total | 30 |  |



**RESULTS:**

From the above test we obtained the p-value = 0.312.

**Decision**:

Since, p-value = 0.312 > α = 0.05. So, we accept Ho.

**CONCLUSION:**

We have calculated the Kruskal Wallis Test. Also, we can see that the total number of observations are 30. There are three categories A, B, C with different scores. In the non-parametric hypothesis test summary, we can see that the p-value is 0.312. The distribution of score is the same across categories of A, B, C. At last, we conclude that the null hypothesis is accepted.