**Practical No: 06**

**OBJECT:** Test the hypothesis of no difference between the ages of male and female employees of a certain company, using the Mann-Whitney U test for the sample data below. Use **** = 5%

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Male | 35 | 43 | 26 | 44 | 40 | 42 | 33 | 38 | 25 | 26 |
| Female | 30 | 41 | 34 | 41 | 36 | 32 | 25 | 47 | 28 | 24 |

**WORKING EXPRESSION:**

Mann Whitney U- test is the most powerful non-parametric test. It is used to test whether the two independent random samples drawn from population with unknown medians are same or not. This is a nonparametric alternative to the t-test, and it is a very popular test amongst the rank sum test for two independent random samples. There are two cases in Mann Whitney U-Test

Case I: Small sample size (

Case II: Large sample size (

**Test Statistic: Under Ho**

* **= +**
* **= +**
* **Minimum of {}**

Where,

number of observations in the first sample

number of observations in the second sample

= sum of ranks of first sample

= sum of ranks of second sample

**Hypothesis Setting:**

Null hypothesis (Hₒ): There is no difference between the ages of male and female employees of a certain IT group.

Alternative hypothesis (H₁): There is difference between the ages of male and female employees of a certain IT group.

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

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Name: Aakash Shrestha

Roll No.: 02

Subject: Statistics

Date: 2080/04/14

Faculty: BSc. CSIT 3rd Semester

**OUTPUT:**

\*Nonparametric Tests: Independent Samples.

NPTESTS

/INDEPENDENT TEST (Age) GROUP (Gender) MANN\_WHITNEY

/MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE

/CRITERIA ALPHA=0.05 CILEVEL=95.

**Nonparametric Test**



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Mann-Whitney Test**  **Ranks** | | | | |
|  | Male and Female | N | Mean Rank | Sum of Ranks |
| Age | Male | 10 | 11.25 | 112.50 |
| Female | 10 | 9.75 | 97.50 |
| Total | 20 |  |  |

****

**RESULTS:**

From the above test we obtained the p-value = 0.579.

**Decision**:

Since, p-value = 0.579 > α = 0.05. So, we accept Ho.

**CONCLUSION:**

We have calculated Mann Whitney U test. Also, we can see that total number of observations are 20 and man Whitney U is given 42.5. In the non-parametric hypothesis test, we obtained the p-value is 0.579. At last, we can conclude that there is no difference between the ages of male and female employees of a certain IT company.