Experiment No : 12

Experiment Name : Test the hypothesis that the median systolic blood pressure of healthy subjects (status-0) and subject with hypertension (status-1) are equal have $d_0 = 0$. The dataset contains $n_1 = 25$ subjects with status-0 and $n_2 = 30$ with status-1.

status-0 : (120, 115, 94, 118, 111, 102, 102, 131, 104, 107, 115, 139, 115, 113, 114, 105, 115, 134, 109, 109, 93, 118, 109, 106, 125)

status-1 : (150, 142, 119, 127, 141, 149, 144, 142, 149, 161, 143, 140, 148, 149, 141, 146, 159, 152, 135, 134, 161, 130, 125, 141, 148, 153, 145, 137, 147, 169)

Is there any difference in the median between status=0 and status-1?

Objectives:

1. To calculate the difference in the median between status-0 and status-1.
2. To calculate p-value.
3. To comment on the data.

Procedure:

step-1: Select the null hypothesis and alternate hypothesis. The null hypothesis state that there is no difference in the median between status-0 and status-1. The alternate hypothesis state that there is difference in the median between status-0 and status-1.

$H0: md1 = md2$

$H1: md1 \neq md2$

step-2: Select the level of significance. The selected level of significance is 0.05.

step-3: Select the test statistics. There are two valued non parametric so the test statistics is wilcoxon rank sum test.

Step-4: Formulate the decision rule. If P value is greater than alpha then the null hypothesis is accepted otherwise null hypothesis is rejected.

R-Source Code:

```
X1<-c(120, 115, 94, 118, 111, 102, 102, 131, 104, 107,
115, 139, 115, 114, 113, 105, 115, 134, 109, 109, 93,
118, 109, 106, 125)
X2<-c(150, 142, 119, 127, 141, 149, 144, 142, 149, 161,
143, 140, 148, 149, 141, 146, 159, 152, 135, 134, 161, 130,
125, 141, 148, 153, 145, 137, 147, 169)
```

```
wilcox.test(x1, x2, exact = FALSE,
correct = TRUE, alternative = "two.sided")
```

Input and output:

W = 18.

p-value = 1.649×10^{-9}

Comment: From the R code we can see that, p-value is less than alpha. p-value < alpha, so the null hypothesis is rejected. We can say that, There is difference in the median between status-0 and status-1.