Nonparametric Test : Two independent samples

Project 3.4 (a): Mann - Whiteny U Test

a. small sample

Test the hypothesis of no difference between the ages of male and female employees of a certain companey, using the Mann- Whiteny U test for the samples data below. Use $\alpha = 0.01$

male 35 43 26 44 40 42 33 38 25 26

Female : 30 41 34 31 36 32 25 47 28 24

solution :

1. Start the SPSS program. In the Data Editor window, type in the data.
2. Select Analyze ➡ Nonparametric tests ➡ Legacy Dialogs ➡ 2 independent sample.
3. defined groups {Gender (1, 2)} Click Ok.

Project 3.4 (b): Mann - Whiteny U Test

b. Large sample

The following are the scores which random samples of students from 2 minority groups obtained on a current event test:

Groups I	73	82	39	68	91	75	89	67	50	86	57	65
Groups II	51	42	36	53	88	59	49	66	25	64	18	76

Use Mann - Whiteny U test at the 0.05 level of sig. to test whether or not students from the two minority groups can be expected to score equally well on the test.

solution :

1. Start the SPSS program. In the Data Editor window, type in the data.
2. Select Analyze ➡ Nonparametric tests ➡ Legacy Dialogs ➡2 independent sample.
3. defined groups {Gender (1, 2)} Click Ok.

Project 3.5 (a): Median Test

a. Small Samples size

Data below shows one week growth (in cm) of maize plant from two different localities (sample I and sample II)

sample I	10	11	8	8	14		
sample II	9	12	13	9	15	9	17

Test whether the two samples have come from the same population with respect to their medians. Use median test at 0.05 level of sig. .

Project 3.5 (b): Median Test

a. Large Samples size

An IQ test was given to a randomly selected 15 male and 20 female students of a university. Their scores were recorded as follows;

male : 56 66 62 81 75 73 83 68 48 70 60 77 86 44 72

female: 63 77 65 71 74 60 76 61 67 72 64 65 55 89 45 53 68 73 50

Use median test to determine whether IQ of male and female students is same in the university.

Given Md = 68

solution :

1. Start the SPSS program. In the Data Editor window, type in the data.(in scores and Gender)

2. Select Analyze ➡ Nonparametric tests ➡ Legacy Dialogs ➡ k- independent sample.

3. defined groups {Gender (1, 2)} Click Ok.

Project 3.6 : Wilcoxon Matched Pair Signed rank test

small sample (n < 25)

Use Wilcoxon matched pair signed rank test to determine the equality of effectiveness of two types of drugs in suppressing pain from following data.

patient No.	Drug A	Drug B	Patient No.	Drug A	5.8Drug B
1	6.5	3.5	11	5.4	5.5
2	3.7	3.7	12	4	44.1
3	3.9	4.7	13	5.7	4.1
4	6.7	5.0	14	3.9	4.2
5	6.2	5.6	15	3.6	3.7
6	6.7	4.3	16	4.9	4.1
7	6.1	5.4	17	3.9	5.4
8	4.3	5.8	18	5.8	3.7
9	5.5	4.3	19	4.9	4.1
10	6.8	4.3	20	3.9	4.1

solution :

1. Start the SPSS program. In the Data Editor window, type in the data.(in Patients no. , Drug A and Drug B)

2. Select Analyze ➡ Nonparametric tests ➡ Legacy Dialogs ➡ 2 Related sample.

3. click options selecte Drug A and Drug B (in test pair variuable 1 - drug A and variable 2 - drug B)

4. Test type Wilcoxon and Click OK.

Project 3.7 : Friedman F test

A survey was conducted in four hospitals in a particular city to obtain the number of babies born over a 12 months' period. This time period was divided into four seasons to test the hypothesis that the birth rate is constant over all the four seasons. The results of the survey were as follows:

Hospital	No Of Births			
	Winter	Spring	Summer	Fall
A	92	72	94	77
B	15	16	10	17
C	58	71	51	62
D	19	26	20	18

Analyze the data using Friedman two ANOVA test.

Solution:

1. Start the SPSS program. In the Data Editor window, type in the data.(Hospital, ... and values {1, A.....} in hospital)

2. Select Analyze ➞ Nonparametric tests ➞ Legacy Dialogs ➞K Related sample.

3. Click test variable and select test type.

4. Test type Friedman and Click OK.

Project 4.1: Simple Regression

Enter the following values in SPSS and find the regression equation of y on x:

X	1	2	3	4	5	6	7
Y	6	7	5	4	3	1	2

Solution :

1. Enter values of the variables X and Y.
2. Select Analyze ➡ Regression ➡ Linear.
3. Move X into Independent(s) and Y into Depends(s). Then, Click Ok.

Regression line is Y = 7.714 - 0.929X

Project 4.2: Simple Correlation

Enter the following values in SPSS and find the correlation between X and Y :

X	1	2	3	4	5	6	7
Y	6	7	5	4	3	1	2

Solution:

1. Enter the values of the variables X and Y.
2. Select Analyze ➡ Correlate ➡ Bivariate.
3. Move X and Y into Variable(s). Select (Pearson, Kendall's tau-b, Spearman). Then, Click Ok.