# *PRACTICAL*

# *SPSS (PRACTICALS)*

# 

# *SUBMITTED TO*

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Q.NO#1: Ten items of a sample had the following values 63,63,66,67,68,69,70,70,71,71. Test the Hypothesis that µ=66 by apply one sample t-test?

Solution:

* First we create a variable “X” in variable view and then entered a data view in one column of the data matrix.
* In order to apply “one sample t-test” go to menu bar and click on “Analyze” and then select “Compare mean” then another menu will be appear and click on “One sample t-test”. As shown below;

|  |
| --- |
| Reports |
| Descriptive statistics |
| Tables |
| COMPARE MEAN |
| etc……… |

|  |
| --- |
| Mean |
| One sample t-test |
| etc….. |

* A dialoged box will appear now shift variable “X” to the test variable and enter “66” for test value.
* Then click on “ok”.
* The result will be appearing on “OUTPUT” window.

OUT PUT RESULT:

**T-Test**

| **One-Sample Statistics** | | | | |
| --- | --- | --- | --- | --- |
|  | N | Mean | Std. Deviation | Std. Error Mean |
| X | 10 | 67.8000 | 3.01109 | .95219 |

| **One-Sample Test** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | Test Value = 66 | | | | | |
|  | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
|  | Lower | Upper |
| X | 1.890 | 9 | .091 | 1.80000 | -.3540 | 3.9540 |

Q.NO#2: The weights of 4 persons before they stopped smoking and 5 weeks after they stopped smoking are as follow;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Persons | 1 | 2 | 3 | 4 |
| Before | 148 | 176 | 153 | 116 |
| After | 154 | 176 | 151 | 121 |

Use t-test for paired observation.

Solution:

* First enter the variable in variable view i-e

1) Before.

2) After.

* Then, go to tool bar and click on “Analyze”, select “Compare mean” then click on “Paired sample t-test.

I-e

|  |
| --- |
| Reports |
| Descriptive statistics |
| Tables |
| COMPARE MEAN |
| etc……… |

|  |
| --- |
| Mean |
| One sample t-test |
| etc….. |

* Entered the labels for the two data columns into the “Paired variable box.
* Highlight “Before” as variable I and “After” as variable II.
* Then click on “OK”.
* The result will appear.

Output result:

**T-Test**

| **Paired Samples Statistics** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  |  | Mean | N | Std. Deviation | Std. Error Mean |
| Pair 1 | Before | 1.4825E2 | 4 | 24.71673 | 12.35836 |
| After | 1.5050E2 | 4 | 22.60531 | 11.30265 |
|  |  |  |  |  |  |

| **Paired Samples Test** | | | |
| --- | --- | --- | --- |
|  |  |  | Pair 1 |
|  |  |  | before - after |
| Paired Differences | Mean | | -2.25000 |
| Std. Deviation | | 3.86221 |
| Std. Error Mean | | 1.93111 |
| 95% Confidence Interval of the Difference | Lower | -8.39564 |
| Upper | 3.89564 |
| T | | | -1.165 |
| Df | | | 3 |
| Sig. (2-tailed) | | | .328 |

Q.NO#3: Out of 20 children, 10 selected random were given a ration of orange juice each day and the other 10, a ration of milk. Their gains in weights after a certain period were found to be as follow;

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Group1 | 2.6 | 1.5 | 4 | 1 | 3.5 | 3.4 | 2.5 | 3 | 4 | 3.5 |
| Group2 | 3.5 | 2.5 | 1.5 | 2.5 | 3 | 2 | 3 | 2 | 1.5 | 2.5 |

Use independent sample t-test?

Solution:

* Enter data and samples in variable view.
* Enter the group data and samples No: in data view.
* Click on analyze in menu bar select compare mean from drop down menu.
* Then select independent-samples t-test.
* Shift data into test variables.
* Shift samples in grouping variables then click on define group option and define group option and declare group 1 and group 2.
* Click on continue.
* Click options and enter confidence interval 95% and click “OK”.
* The result will appear.

Output result:

**T-Test**

| **Group Statistics** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | group2 | N | Mean | Std. Deviation | Std. Error Mean |
| group1 | 1 | 10 | 2.900 | 1.0121 | .3201 |
| 2 | 10 | 2.400 | .6583 | .2082 |

| **Independent Samples Test** | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|  |  | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
|  |  | Lower | Upper |
| group1 | Equal variances assumed | 1.757E0 | .202 | 1.310E0 | 18 | .207 | .5000 | .3818 |  | 1.3022E0 |
| Equal variances not assumed |  |  | 1.310E0 | 1.546E1 | .209 | .5000 | .3818 | -.3117 | 1.3117E0 |

Q.NO#4: **Test for normality and homogeneity of variances**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Salesman | A | 152 | 175 | 160 |
| B | 175 | 171 | 130 |
| C | 180 | 203 | 124 |

**Also apply one way ANOVA to for the significance between salesmen at 5% level of significance.**

*Solution*:

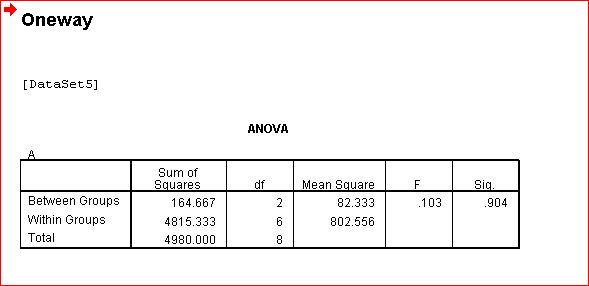
* Enter the data and samples in variable view.
* Enter the data and samples no: in data view.
* Go to tool bar Click on “Analyze” and select “Compare mean”.
* Then select one way ANOVA.
* I-e

|  |
| --- |
| Reports |
| Descriptive statistics |
| Tables |
| COMPARE MEAN |
| etc……… |

|  |
| --- |
| Mean |
| One sample t-test |
| One way ANOVA |

* Shift data in dependent list shift samples in factor.
* Click “OK”.
* The result appeared.

Output result:



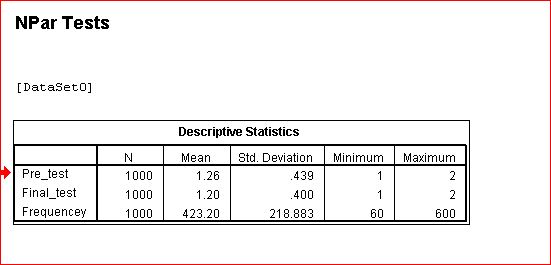
Q.NO**#**5: The following table shows the numbers of recruits taking preliminary test and final test in car driving. Use Chi-square test to discuss whether there is any association between the results preliminary and those of the final test.

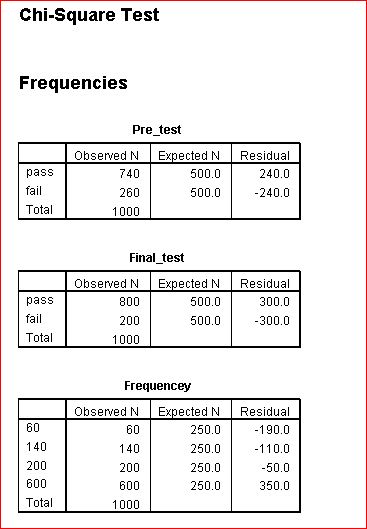
|  |  |  |  |
| --- | --- | --- | --- |
| Categories | | Preliminary | |
|  | | Pass | Fail |
| Final | Pass | 600 | 140 |
| Fail | 200 | 60 |

*Solution:*

* Enter three variables (i.e. classes, row and column) in Variable View.
* Enter the data in data view.
* Click data in menu bar then select weight cases.
* Select option weight cases by and shift the data in frequency variable.
* Click on ok.
* Now click on analyze in menu bar.
* Click on descriptive statistics then selects crosstabs.
* Now click on statistics and select chi square statistics then click on continues.
* The result will appear.

OUTPUT RESULT:





Q.NO#6: Find correlation coefficient from the following data.

Heights (X):60,60,60,,62,62,62,62,64,64,70,70,70.

Weights(Y):110,135,120,120,140,130,135,150,145,170,185,160.

Solution:

* First create variable “Y” and “X” in variable view.
* Then entered the data in “Y” and “X” column in data view.
* Go to tool bar and click on “Analyze” than go to “Correlate”.
* Click on “Bivariate”.
* Shift “Y” and “X” in variable box.
* Click on “OK”.
* The result appeared.

OUTPUT RESULT:

| **Correlations** | | | |
| --- | --- | --- | --- |
|  |  | X | y |
| x | Pearson Correlation | 1 | -.159 |
| Sig. (2-tailed) |  | .708 |
| N | 8 | 8 |
| y | Pearson Correlation | -.159 | 1 |
| Sig. (2-tailed) | .708 |  |
| N | 8 | 8 |

Q.NO#7: Given the data

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 0.3 | 0.6 | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 | 2.4 |
| Y | 10 | 15 | 30 | 35 | 25 | 30 | 50 | 45 |

Test linearity of Regression?

Solution:

* Enter the variables x and y in variable view.
* Enter the values of x and y in data view.
* Click on “Analyze” in tool bar and select the Regression then click on Linear Regression.
* Shift “Y” in dependent box and “X” independent box.
* Go to “statistics” and select confidence interval and then click on continue.
* Then click “OK”.
* The result will appear.

OUTPUT RESULT:

**Regression**

[DataSet1]

| **Variables Entered/Removedb** | | | |
| --- | --- | --- | --- |
| Model | Variables Entered | Variables Removed | Method |
| 1 | xa | . | Enter |
| a. All requested variables entered. | | |  |
| b. Dependent Variable: y | | |  |

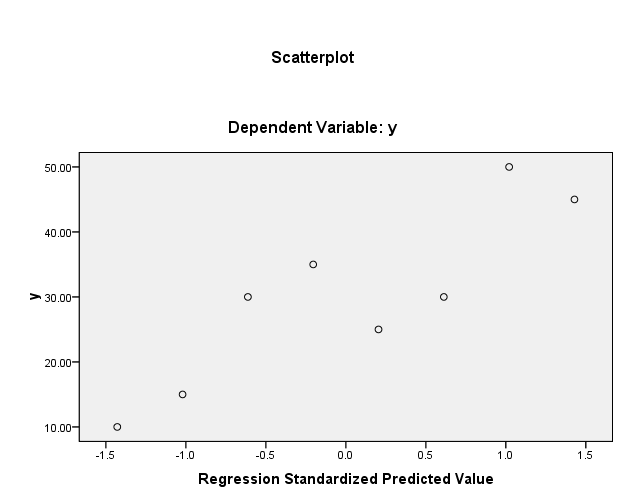
| **Model Summaryb** | | | | |
| --- | --- | --- | --- | --- |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .877a | .770 | .731 | 7.06405 |
| a. Predictors: (Constant), x | | | |  |
| b. Dependent Variable: y | | |  |  |

| **ANOVAb** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 1000.595 | 1 | 1000.595 | 20.052 | .004a |
| Residual | 299.405 | 6 | 49.901 |  |  |
| Total | 1300.000 | 7 |  |  |  |
| a. Predictors: (Constant), x | | |  |  |  |  |
| b. Dependent Variable: y | | |  |  |  |  |

| **Coefficientsa** | | | |
| --- | --- | --- | --- |
| Model | | 95% Confidence Interval for B | |
| Lower Bound | Upper Bound |
| 1 | (Constant) | -5.433 | 21.504 |
| X | 7.379 | 25.160 |
| a. Dependent Variable: y | | |  |

| **Residuals Statisticsa** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | 12.9167 | 47.0833 | 30.0000 | 11.95584 | 8 |
| Residual | -7.44048 | 7.79762 | .00000 | 6.54004 | 8 |
| Std. Predicted Value | -1.429 | 1.429 | .000 | 1.000 | 8 |
| Std. Residual | -1.053 | 1.104 | .000 | .926 | 8 |
| a. Dependent Variable: y | |  |  |  |  |

**Charts**



Q.NO#8: Two varieties of tomato were experimented with concerning their fruit-producing abilities, the following data were obtained.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variety A | 27 | 39 | 30 | 22 | 32 | 24 | 25 | 29 |
| Variety B | 32 | 24 | 32 | 33 | 36 | 35 | 30 | 25 |

Apply the sign test?

Solution:

* First create variable in variable view i-e

1. Variety A.
2. Variety B.

* Entered the data of “variety A” and “variety B” in data view.
* Go to “Analyze” in tool bar than select “Non-Parametric tests”.
* Then click on “Two Related sample test”.
* Now shift the “variety A” to variable 1, and “variety B” to variable 2 in pair test menu.
* Then select “sing test”.
* Click on “OK”.
* The result appears.

Output result:

**NPar Tests**

**Sign Test**

| **Frequencies** | | |
| --- | --- | --- |
|  |  | N |
| VAR00002 - VAR00001 | Negative Differencesa | 2 |
| Positive Differencesb | 6 |
| Tiesc | 0 |
| Total | 8 |
| a. VAR00002 < VAR00001 | |  |
| b. VAR00002 > VAR00001 | |  |
| c. VAR00002 = VAR00001 | |  |

| **Test Statisticsb** | |
| --- | --- |
|  | VAR00002 - VAR00001 |
| Exact Sig. (2-tailed) | .289a |
| a. Binomial distribution used. | |
| b. Sign Test |  |

Q.NO#9: Perform the median test the following data are given;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sample I | 22 | 44 | 66 | 77 | 99 |
| Sample II | 33 | 55 | 77 | 88 | 11 |

Solution:

* Create samples and sample no: in variable view..
* Entered the “samples” in first column of data and then enter “sample no” in second column in data view.
* Go to “Analyze” in tool bar than select “Non-Parametric tests”.
* Then click on “K-independent sample test”.
* Now shift the “samples” to test variable list, and

“Sample no” to “Group variable” and define Rang.

* Then select “Median test”.
* Click on “OK”.
* The result appears.

OUTPUT RESULT:

**NPar Tests**

**Median Test**

| **Frequencies** | | | |
| --- | --- | --- | --- |
|  |  | Number | |
|  |  | 1 | 2 |
| Samples | > Median | 3 | 2 |
| <= Median | 2 | 3 |

| **Test Statisticsa** | |
| --- | --- |
|  | samples |
| N | 10 |
| Median | 60.5000 |
| Exact Sig. | 1.000 |
| a. Grouping Variable: Number | |

Q.NO#10: Each day a sample of 10 production items was taken and the mean weight computed .following are the first 10 daily mean;

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 13 | 12.8 | 12.9 | 13 | 13.1 | 12.9 | 12.6 | 12.6 | 12.7 | 12.9 |

Apply Run- test.

Solution:

* First create variable in variable view.
* Entered the data in data view.
* Go to “Analyze” in tool bar than select “Non-Parametric tests”.
* Then click on “Run-test”.
* Now shift the “X” to test variable list .
* Then select “median”.
* Click on “OK”.
* The result appears.

OUTPUT RESULT:

| **Runs Test** | |
| --- | --- |
|  | X |
| Test Valuea | 12.9 |
| Cases < Test Value | 4 |
| Cases >= Test Value | 5 |
| Total Cases | 9 |
| Number of Runs | 4 |
| Z | -.683 |
| Asymp. Sig. (2-tailed) | .495 |
| a. Median |  |

Q.NO#11: Apply Mann-Whitney U-test for the following data:

Variety A:3.03,3.10,2.35,3.86,3.91,1.72,2.65,2.30,2.70,3.60

Variety B:2.28,3.68,2.17,3.56,3.73,1.85,1.48,1.86,2.76,2.68

*Solution:*

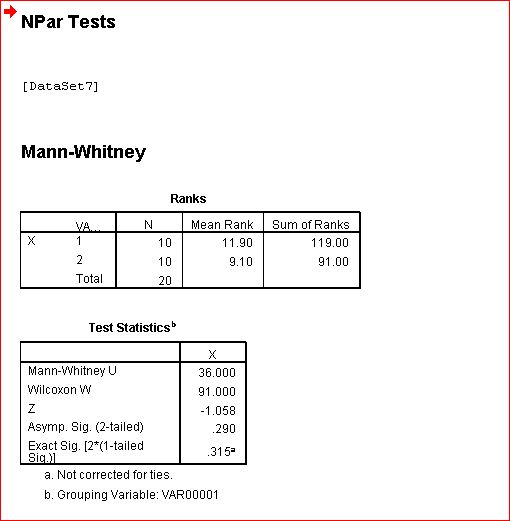
* Create samples and sample no: in variable view..
* Entered the “samples” in first column of data and then enter “sample no” in second column in data view.
* Go to “Analyze” in tool bar than select “Non-Parametric tests”.
* Then click on “two-independent sample test”.
* Now shift the “samples” to test variable list, and

“Sample no” to “Group variable” and define group.

* Then select “Mann-Whitney test”.
* Click on “OK”.
* The result appears.

OUTPUT RESULT:

**Mann-Whitney test**

****

Q.NO#12:the following data show the kidney weight in grams;

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 38 | 49 | 45 | 29 | 31 | 35 |  |  |  |
| Y | 31 | 42 | 22 | 26 | 43 | 37 | 25 | 30 | 47 |

Apply Kolmogorov-Smirnov test.

Solution:

* Create samples and sample no: in variable view..
* Entered the “X and Y” in first column of data and then enter “sample no” in second column in data view.
* Go to “Analyze” in tool bar than select “Non-Parametric tests”.
* Then click on “two-independent sample test”.
* Now shift the “samples” to test variable list, and

“Sample no” to “Group variable” and define group.

* Then select “Kolmogorov-Smirnov”.
* Click on “OK”.
* The result appears.

OUTPUT RESULT:

**Two-Sample Kolmogorov-Smirnov Test**

| **Frequencies** | | |
| --- | --- | --- |
|  | Y | N |
| X | 1 | 6 |
| 2 | 9 |
| Total | 15 |

| **Test Statisticsa** | | |
| --- | --- | --- |
|  |  | X |
| Most Extreme Differences | Absolute | .333 |
| Positive | .333 |
| Negative | .000 |
| Kolmogorov-Smirnov Z | | .632 |
| Asymp. Sig. (2-tailed) | | .819 |
| a. Grouping Variable: Y | |  |