

Statistical Analysis By Using SPSS

Prepared by Dr. Alfaisal Hasan

Lecture SPSS



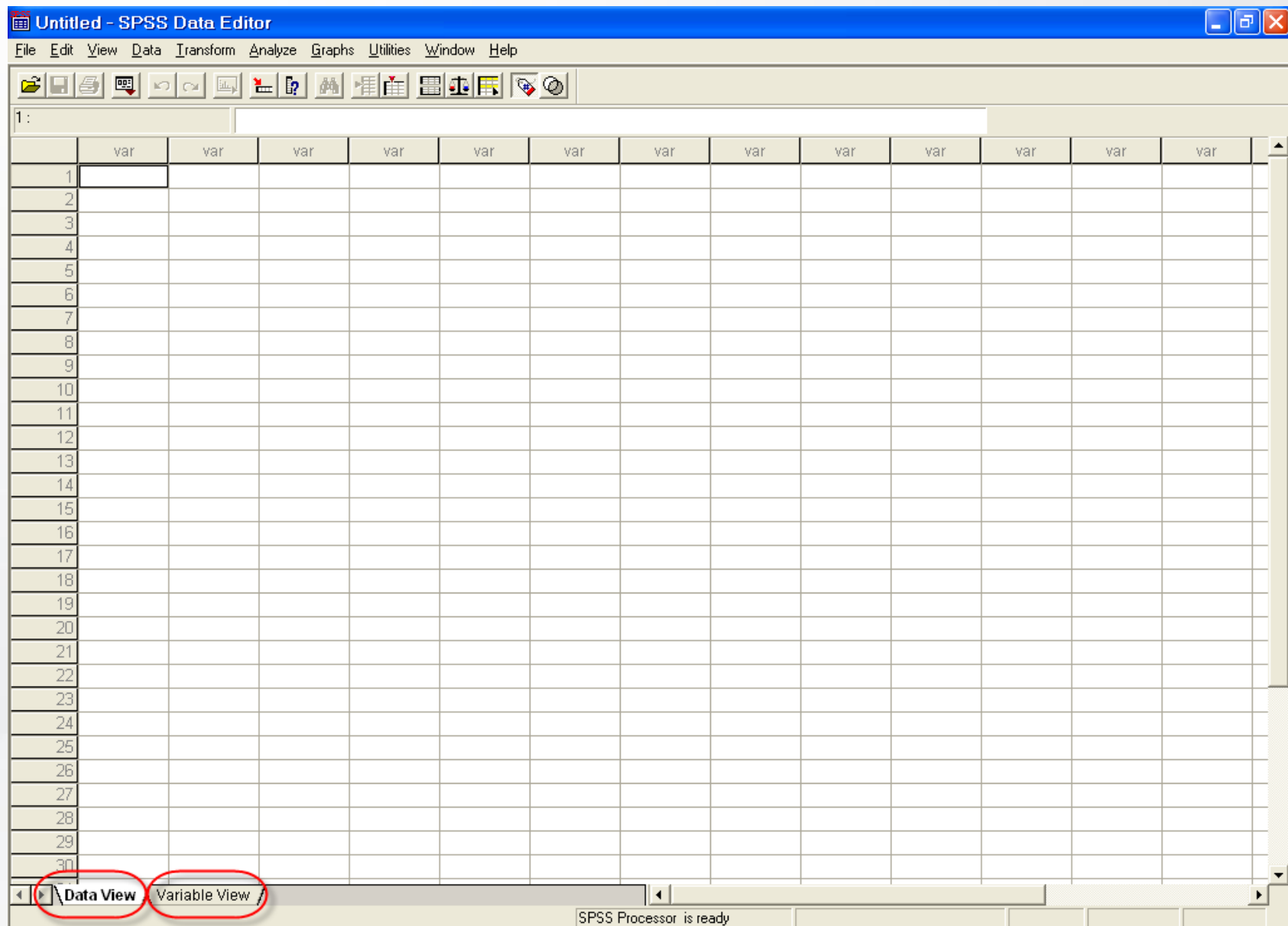
The background features a series of vertical panels with rounded ends. The first panel shows hands typing on a laptop. The second panel has a graduation cap icon. The third panel has a play button icon. The fourth panel has a target icon. The fifth panel has an open book icon. The sixth panel has a magnifying glass icon. The seventh panel has a bar chart icon. The eighth panel has a group of people icon. The background is a mix of dark blue and light blue colors.

Statistical Analysis By Using SPSS

Lecture SPSS

Prepared by
Dr. Alfaisal Hasan

**Introduction to the statistical analysis program
SPSS
Statistical Package for the Social Sciences**





File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help											
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1											
2											
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37											
38											
39											
Data View Variable View											

Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
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SPSS

Untitled - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Window Help

Icons: File operations, Data manipulation, Analysis, and Visualization tools.

	Name	Type	Width	Decimals	Label
1					
2					
3					
4					
5					
6					
7					

كتابة اسم المتغير:

1. يجب أن يبدأ بحرف أما البقية فمتاحة.

2. لا ينتهي بنقطة أو شرطة سفلية.

3. لا يتجاوز 8 خانات.

4. لا يحتوي على فراغات أو رموز مثل * أو " أو !.

5. لا يتكرر الاسم.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1										
2										
3										
4										
5										
6										
7										
8										

Value Labels

Value Labels

Value: 1

Value Label:

Add

Change

Remove

1.00 = "غير واثق بقوة"

2.00 = "غير موافق"

3.00 = "محايد"

4.00 = "موافق"

5.00 = "موافق بقوة"

OK

Cancel

Help

عدد خانات المتغير

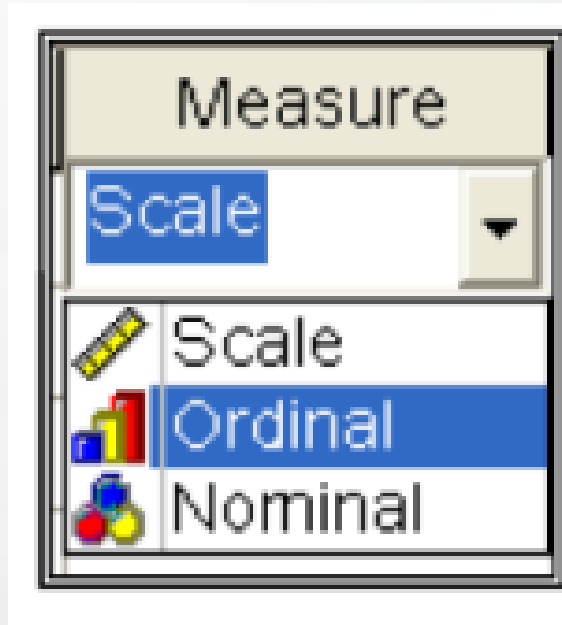
الوصف
والتمييز

القيم
فقودة
عرض العمود

المقياس:
متدرج
ترتيبي
اسمي

التنسيق

أنواع المتغيرات في القياس



Lekard scale

Strongly Disagree	1
Disagree	2
Not Sure	3
Agree	4
Strongly Agree	5

Classification of Mean in the analysis of the questionnaire

Strength	From	To less than
Very Weak	1.0	1.8
Weak	1.8	2.6
Intermediate	2.6	3.4
Strong	3.4	4.2
Very Strong	4.2	5.0

Notes that $4/5 = 0.8$

Steps for calculating measure of central Tendency and measures of dispersion using SPSS

Mode

Median

Mean

Standard Deviation

Range

Ex: In the following data, it is required to
calculate the mean, median, and mode:

30 – 25 – 42 – 34 – 36 – 22 – 33 – 52 – 41 – 23 – 54 –
44

IBM SPSS Statistics Data Editor window titled *Untitled1 [DataSet0]. The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with icons for file operations, data manipulation, and analysis.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Grades	Numeric	8	0		None	None	8	Right	Scale	Input
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											

The bottom of the window shows the 'Data View' and 'Variable View' tabs, with 'Variable View' currently selected. A status bar at the bottom indicates 'IBM SPSS Statistics Processor is ready'. The Windows taskbar at the very bottom shows the search bar, taskbar icons, and system clock (2:15 AM, 12/19/2018).

IBM SPSS Statistics Data Editor window titled *Untitled1 [DataSet0]. The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with icons for file operations, data manipulation, and analysis.

The main data grid shows a single variable named 'Grades' with 23 rows of data. The values for 'Grades' are: 30, 25, 42, 34, 36, 22, 33, and then 15 empty rows. The status bar at the bottom indicates 'Visible: 1 of 1 Variables' and 'Data View' is selected.

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	30																
2	25																
3	42																
4	34																
5	36																
6	22																
7	33																
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

IBM SPSS Statistics Processor is ready

Windows taskbar shows the time as 2:17 AM on 12/19/2018.

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze			
     			
8 : Grades			
	Grades	var	
1	30		
2	25		
3	42		
4	34		
5	36		
6	22		
7	33		
8			
9			
10			

IBM SPSS Statistics Data Editor window showing a dataset named "Untitled1 [DataSet0]". The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with various icons for file operations, data manipulation, and analysis.

The main data grid displays 23 rows and 17 columns. The first column is labeled "12 : Grades" and the second column is labeled "44". The data values are as follows:

12 : Grades	44	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	30																
2	25																
3	42																
4	34																
5	36																
6	22																
7	33																
8	52																
9	41																
10	23																
11	54																
12	44																
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

The bottom status bar indicates "IBM SPSS Statistics Processor is ready". The Windows taskbar at the bottom shows the time as 2:17 AM on 12/19/2018.

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze

12 : Grades 44

	Grades	var
1	30	
2	25	
3	42	
4	34	
5	36	
6	22	
7	33	
8	52	
9	41	
10	23	
11	54	
12	44	
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		

Data View Variable View

Type here to search

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

12 : Grades 44

	Grades	var
1	30	
2	25	
3	42	
4	34	
5	36	
6	22	
7	33	
8	52	
9	41	
10	23	
11	54	
12	44	
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

Visible: 1 of 1 Variables

Data View Variable View

Analyze IBM SPSS Statistics Processor is ready

Type here to search

2:17 AM 12/19/2018

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
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Correlate
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Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

Frequencies...
Descriptives...
Explore...
Crosstabs...
Ratio...
P-P Plots...
Q-Q Plots...

12: Grades 44

	Grades	var
1	30	
2	25	
3	42	
4	34	
5	36	
6	22	
7	33	
8	52	
9	41	
10	23	
11	54	
12	44	
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		

Visible: 1 of 1 Variables

Data View Variable View

Descriptive Statistics

IBM SPSS Statistics Processor is ready

Type here to search

2:18 AM 12/19/2018

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

12 : Grades 44

	Grades	var
1	30	
2	25	
3	42	
4	34	
5	36	
6	22	
7	33	
8	52	
9	41	
10	23	
11	54	
12	44	
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		

Visible: 1 of 1 Variables

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

Frequencies...
Descriptives...
Explore...
Crosstabs...
Ratio...
P-P Plots...
Q-Q Plots...

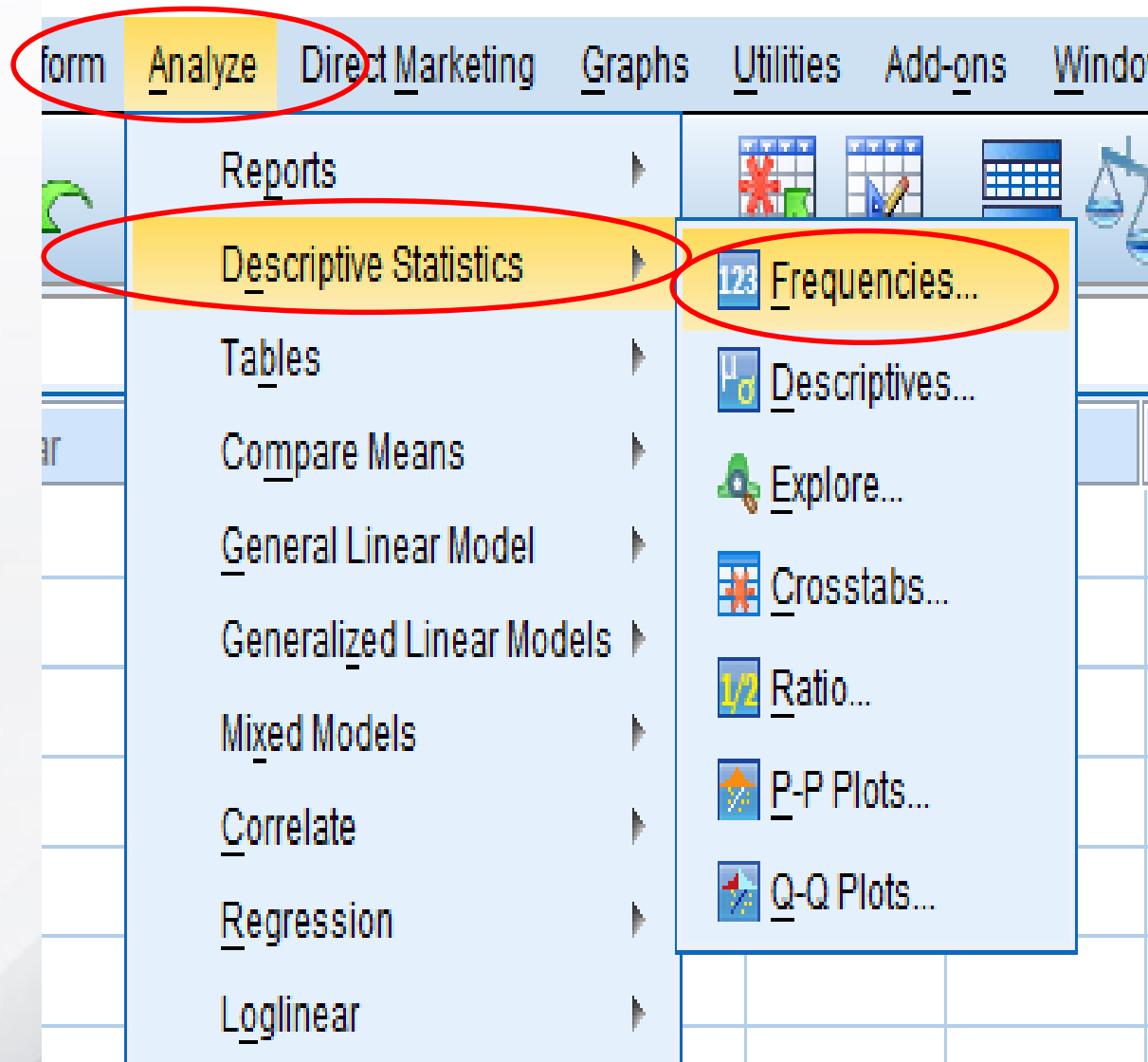
Data View Variable View

Frequencies... IBM SPSS Statistics Processor is ready

Type here to search

2:18 AM 12/19/2018

Statistics Data Editor



*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

12 : Grades 44 Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	30																
2	25																
3	42																
4	34																
5	36																
6	22																
7	33																
8	52																
9	41																
10	23																
11	54																
12	44																
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

1

12 : Grades 44

Grades

Variable(s):

Grades

Statistics... Charts... Format... Bootstrap...

☒ Display frequency tables

OK Paste Reset Cancel Help

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Type here to search

2:18 AM 12/19/2018

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	30															
2	25															
3	42															
4	34															
5	36															
6	22															
7	33															
8	52															
9	41															
10	23															
11	54															
12	44															
13																
14																
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16																
17																
18																
19																
20																
21																
22																
23																

12: Grades 44

Grades

Variable(s):

Grades

Display frequency tables

OK Paste Reset Cancel Help

Statistics... Charts... Format... Bootstrap...

IBM SPSS Statistics Processor is ready

Type here to search

2:18 AM 12/19/2018

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 17 columns. The first column is labeled 'Grades' and contains values ranging from 22 to 54. The second column is labeled '44' and contains the value 44. The 'Frequencies' dialog box is open, showing the 'Grades' variable selected in the 'Variable(s):' list. The 'Statistics...' button is highlighted with a red circle. The 'Display frequency tables' checkbox is checked. The 'Data View' tab is active.

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	30																
2	25																
3	42																
4	34																
5	36																
6	22																
7	33																
8	52																
9	41																
10	23																
11	54																
12	44																
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

SPSS Statistics Data Editor window showing a dataset named "Untitled1 [DataSet0]". The dataset has 23 rows and 17 columns. The first column is labeled "Grades" and contains values ranging from 22 to 54. The second column is labeled "var" and contains values ranging from 23 to 54. The third column is labeled "var" and contains values ranging from 23 to 54. The fourth column is labeled "var" and contains values ranging from 23 to 54. The fifth column is labeled "var" and contains values ranging from 23 to 54. The sixth column is labeled "var" and contains values ranging from 23 to 54. The seventh column is labeled "var" and contains values ranging from 23 to 54. The eighth column is labeled "var" and contains values ranging from 23 to 54. The ninth column is labeled "var" and contains values ranging from 23 to 54. The tenth column is labeled "var" and contains values ranging from 23 to 54. The eleventh column is labeled "var" and contains values ranging from 23 to 54. The twelfth column is labeled "var" and contains values ranging from 23 to 54. The thirteenth column is labeled "var" and contains values ranging from 23 to 54. The fourteenth column is labeled "var" and contains values ranging from 23 to 54. The fifteenth column is labeled "var" and contains values ranging from 23 to 54. The sixteenth column is labeled "var" and contains values ranging from 23 to 54. The seventeenth column is labeled "var" and contains values ranging from 23 to 54.

The "Frequencies: Statistics" dialog box is open, showing the following options:

- Percentile Values:
 - ☐ Quartiles
 - ☐ Cut points for: 10 equal groups
 - ☐ Percentile(s):
 - Buttons: Add, Change, Remove
- Central Tendency:
 - ☐ Mean
 - ☐ Median
 - ☐ Mode
 - ☐ Sum
- Dispersion:
 - ☐ Std. deviation
 - ☐ Minimum
 - ☐ Variance
 - ☐ Maximum
 - ☐ Range
 - ☐ S.E. mean
- Distribution:
 - ☐ Skewness
 - ☐ Kurtosis
- ☐ Values are group midpoints

Buttons: Continue, Cancel, Help

Windows taskbar shows the time as 2:19 AM on 12/19/2018. The system tray includes icons for network, volume, and power.

IBM SPSS Statistics Data Editor window showing a dataset named "Grades" with 23 rows and 17 columns. The "Grades" column contains values ranging from 30 to 54. A dialog box titled "Frequencies: Statistics" is open, displaying options for Percentile Values, Central Tendency, Dispersion, and Distribution. The "Central Tendency" section is circled in red, showing checked boxes for Mean, Median, and Mode. The "Continue" button is also circled in red.

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

12: Grades 44 Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	30															
2	25															
3	42															
4	34															
5	36															
6	22															
7	33															
8	52															
9	41															
10	23															
11	54															
12	44															
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19																
20																
21																
22																
23																

Frequencies: Statistics

Percentile Values

- ☐ Quartiles
- ☐ Cut points for: 10 equal groups
- ☐ Percentile(s):
- Add
- Change
- Remove

Central Tendency

- ☒ Mean
- ☒ Median
- ☒ Mode
- ☐ Sum

Values are group midpoints

Dispersion

- ☐ Std. deviation
- ☐ Minimum
- ☐ Variance
- ☐ Maximum
- ☐ Range
- ☐ S.E. mean

Distribution

- ☐ Skewness
- ☐ Kurtosis

Continue Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Type here to search

2:19 AM 12/19/2018

IBM SPSS Statistics Data Editor window showing a dataset with 12 rows and 17 columns. The first column is labeled 'Grades' and contains values ranging from 30 to 44. The second column is labeled 'var' and contains values ranging from 30 to 44. The third column is labeled 'var' and contains values ranging from 30 to 44. The fourth column is labeled 'var' and contains values ranging from 30 to 44. The fifth column is labeled 'var' and contains values ranging from 30 to 44. The sixth column is labeled 'var' and contains values ranging from 30 to 44. The seventh column is labeled 'var' and contains values ranging from 30 to 44. The eighth column is labeled 'var' and contains values ranging from 30 to 44. The ninth column is labeled 'var' and contains values ranging from 30 to 44. The tenth column is labeled 'var' and contains values ranging from 30 to 44. The eleventh column is labeled 'var' and contains values ranging from 30 to 44. The twelfth column is labeled 'var' and contains values ranging from 30 to 44. The thirteenth column is labeled 'var' and contains values ranging from 30 to 44. The fourteenth column is labeled 'var' and contains values ranging from 30 to 44. The fifteenth column is labeled 'var' and contains values ranging from 30 to 44. The sixteenth column is labeled 'var' and contains values ranging from 30 to 44. The seventeenth column is labeled 'var' and contains values ranging from 30 to 44.

The 'Frequencies' dialog box is open, showing the 'Grades' variable selected in the 'Variable(s):' list. The 'Display frequency tables' checkbox is checked. The 'OK' button is highlighted with a red circle.

IBM SPSS Statistics Processor is ready

Go to Settings to activate Windows.

Windows taskbar: Type here to search, 2:19 AM, 12/19/2018

IBM SPSS Statistics Viewer window showing the Output pane and the Frequencies table.

Output

- Log
- Frequencies
 - Title
 - Notes
 - Active Dataset
 - Statistics
 - Grades

Frequencies

[DataSet0]

Statistics

Grades

N	Valid	Missing
Mean	36.33	
Median	35.00	
Mode	22 ^a	

a. Multiple modes exist. The smallest value is shown

Grades

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 22	1	8.3	8.3	8.3
23	1	8.3	8.3	16.7
25	1	8.3	8.3	25.0
30	1	8.3	8.3	33.3
33	1	8.3	8.3	41.7
34	1	8.3	8.3	50.0
36	1	8.3	8.3	58.3
41	1	8.3	8.3	66.7
42	1	8.3	8.3	75.0
44	1	8.3	8.3	83.3
52	1	8.3	8.3	91.7

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Windows taskbar: Type here to search, 2:20 AM, 12/19/2018

PSS Statistics Viewer

nsform Insert Format Analyze Direc



→ **Frequencies**

[DataSet0]

Statistics

Grades

N	Valid	12
	Missing	0
Mean		36.33
Median		35.00
Mode		22 ^a

a. Multiple modes
exist. The smallest
value is shown

Correlation

Person correlation coefficients
Spearman correlation coefficients

For the following data, approximate your calculation for 2 decimal places.



x	1	2	3	4	5	6
y	12	16	18	20	18	22



Find the **Person and Spearman Correlation Coefficient** and discuss your results.

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6 : Y 22.00

	X	Y
1	1.00	12.0
2	2.00	16.0
3	3.00	18.0
4	4.00	20.0
5	5.00	18.0
6	6.00	22.0
7		
8		
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19		
20		
21		
22		
23		

Visible: 2 of 2 Variables

var var var var var var var var var var var var

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

Bivariate...
Partial...
Distances...

Data View Variable View

Bivariate... IBM SPSS Statistics Processor is ready

Go to Settings to activate Windows.

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first two columns are labeled 'X' and 'Y'. The data values for 'X' range from 1.00 to 6.00, and for 'Y' from 12.00 to 22.00. A 'Bivariate Correlations' dialog box is open, showing 'X' and 'Y' selected as variables. The dialog includes options for correlation coefficients (Pearson, Kendall's tau-b, Spearman), test of significance (Two-tailed, One-tailed), and a checkbox for 'Flag significant correlations'. The 'Data View' tab is active at the bottom.

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6: Y 22.00 Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00															
2	2.00	16.00															
3	3.00	18.00															
4	4.00	20.00															
5	5.00	18.00															
6	6.00	22.00															
7																	
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16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

Bivariate Correlations

Variables:

X
Y

Options...
Bootstrap...

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☐ Spearman

Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00														
2	2.00	16.00														
3	3.00	18.00														
4	4.00	20.00														
5	5.00	18.00														
6	6.00	22.00														
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18																
19																
20																
21																
22																
23																

Bivariate Correlations

Variables:

- X
- Y

Options... Bootstrap...

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☐ Spearman

Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00															
2	2.00	16.00															
3	3.00	18.00															
4	4.00	20.00															
5	5.00	18.00															
6	6.00	22.00															
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
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21																	
22																	
23																	

Bivariate Correlations

Variables: X Y

Options... Bootstrap...

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☒ Spearman

Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Output3 [Document3] - IBM SPSS Statistics Viewer

FileEditViewDataTransformInsertFormatAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp

Output

Log

Correlations

Title

Notes

Active Dataset

Correlations

CORRELATIONS

/VARIABLES=X Y

/PRINT=TWOTAIL NOSIG

/MISSING=PAIRWISE.

→ Correlations

[DataSet0]

Correlations

		X	Y
X	Pearson Correlation	1	.900*
	Sig. (2-tailed)		.015
	N	6	6
Y	Pearson Correlation	.900*	1
	Sig. (2-tailed)	.015	
	N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

Activate Windows

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Correlations

		X	Y
X	Pearson Correlation	1	.900 [*]
	Sig. (2-tailed)		.015
	N	6	6
Y	Pearson Correlation	.900 [*]	1
	Sig. (2-tailed)	.015	
	N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

Person correlation

coefficient =0.9

Direct Strong Correlation

Output3 [Document3] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help



Output

Log

Correlations

Title

Notes

Active Dataset

Correlations

Log

Regression

Title

Notes

Active Dataset

Variables Entered/Removed

Model Summary

ANOVA

Coefficients

Log

Correlations

Title

Notes

Active Dataset

Correlations

Log

Nonparametric Correlations

Title

Notes

Active Dataset

Correlations

	Sig. (2-tailed)		.015
N		6	6
Y	Pearson Correlation	.900	1
	Sig. (2-tailed)	.015	
N		6	6

*. Correlation is significant at the 0.05 level (2-tailed).

NONPAR CORR

/VARIABLES=X Y

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

Nonparametric Correlations

[DataSet0]

Correlations			X	Y
Spearman's rho	X	Correlation Coefficient	1.000	.899
		Sig. (2-tailed)	.	.015
	N		6	6
Y	Correlation Coefficient	.899	1.000	
	Sig. (2-tailed)	.015	.	
	N		6	6

*. Correlation is significant at the 0.05 level (2-tailed).

Activate Windows

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Correlations

			X	Y
Spearman's rho	X	Correlation Coefficient	1.000	.899*
		Sig. (2-tailed)	.	.015
		N	6	6
	Y	Correlation Coefficient	.899*	1.000
		Sig. (2-tailed)	.015	.
		N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

**Spearman correlation
coefficient =0.899**

Direct Strong Correlation

Simple Linear Regression

Consider the following sample data for the variables x and y :



x	1	3	4	6	7	9
y	6	4	4	3	2	1



- Calculate the linear regression equation.
- Find the value of y and $x = 10$.

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	X	Numeric	8	2		None	None	8	Right	Scale	Input
2	Y	Numeric	8	2		None	None	8	Right	Scale	Input
3											
4											
5											
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25											

Data View

Variable View

IBM SPSS Statistics Processor is ready

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

6: Y1.00

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00															
2	3.00	4.00															
3	4.00	4.00															
4	6.00	3.00															
5	7.00	2.00															
6	9.00	1.00															
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23																	

Data ViewVariable View

Activate WindowsGo to Settings to activate Windows.

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

6 : Y 1.00

	X	Y
1	1.00	6.00
2	3.00	4.00
3	4.00	4.00
4	6.00	3.00
5	7.00	2.00
6	9.00	1.00
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20		
21		
22		
23		

Visible: 2 of 2 Variables

var var var var var var var var var var var var

Analyze

- Reports
- Descriptive Statistics
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression**
 - Automatic Linear Modeling...
 - Linear...**
 - Curve Estimation...
 - Partial Least Squares...
 - Binary Logistic...
 - Multinomial Logistic...
 - Ordinal...
 - Probit...
 - Nonlinear...
 - Weight Estimation...
 - 2-Stage Least Squares...
 - Optimal Scaling (CATREG)...
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
- Multiple Imputation
- Complex Samples
- Quality Control
- ROC Curve...

Linear...

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
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Linear Regression

Dependent:

Block 1 of 1

Independent(s):

Method: Enter

Selection Variable:

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

Activate Windows

Go to Settings to activate Windows.

Data View Variable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
6	9.00	1.00														
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23																

Linear Regression

Dependent: Y

Block 1 of 1

Previous Next

Independent(s):

Method: Enter

Selection Variable:

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 17 columns. The first two columns are labeled X and Y. The data is as follows:

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
6	9.00	1.00														
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The Linear Regression dialog box is open, showing the following settings:

- Dependent: Y
- Independent(s): X
- Method: Enter
- Selection Variable: (empty)
- Case Labels: (empty)
- WLS Weight: (empty)

Buttons: Statistics..., Plots..., Save..., Options..., Bootstrap..., Previous, Next, OK, Paste, Reset, Cancel, Help.

IBM SPSS Statistics Processor is ready

*Output2 [Document2] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Regression
 - Title
 - Notes
 - Active Dataset
 - Variables Entered
 - Model Summary
 - ANOVA
 - Coefficients

1 X^a . Enter

a. Dependent Variable: Y
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985 ^a	.970	.963	.33630

a. Predictors: (Constant), X

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.881	1	14.881	131.579	.000 ^b
	Residual	.452	4	.113		
	Total	15.333	5			

a. Dependent Variable: Y
b. Predictors: (Constant), X

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.310	.294		21.494	.000
	X	-.595	.052	-.985	-11.471	.000

a. Dependent Variable: Y

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.310	.294		21.494	.000
	X	-.595	.052	-.985	-11.471	.000

a. Dependent Variable: Y

$$Y = a_0 + a_1x$$

$$Y = 6.31 - 0.595x$$

At $x=10$

$$Y=6.31-0.595(10)$$

$$Y=-0.36$$

The following table shows number of crimes in police station in 2025 , approximate your calculation for 2 decimal places.

Month	January	February	March	April	May	June
Number of crimes	8	12	20	14	12	9

- i) Find the **linear regression equation** for this data.
- ii) **Predict** or (**Estimate**) number of crimes in September 2025 ?

IBM SPSS Statistics Data Editor

FileEditViewDataTransformAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp



6: Y9.00Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	8.00															
2	2.00	12.00															
3	3.00	20.00															
4	4.00	14.00															
5	5.00	12.00															
6	6.00	9.00															
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Data ViewVariable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

6 : Y 1.00

	X	Y
1	1.00	6.00
2	3.00	4.00
3	4.00	4.00
4	6.00	3.00
5	7.00	2.00
6	9.00	1.00
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21		
22		
23		

Visible: 2 of 2 Variables

var var var var var var var var var var var var

Analyze

- Reports
- Descriptive Statistics
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression**
 - Automatic Linear Modeling...
 - Linear...**
 - Curve Estimation...
 - Partial Least Squares...
 - Binary Logistic...
 - Multinomial Logistic...
 - Ordinal...
 - Probit...
 - Nonlinear...
 - Weight Estimation...
 - 2-Stage Least Squares...
 - Optimal Scaling (CATREG)...
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
- Multiple Imputation
- Complex Samples
- Quality Control
- ROC Curve...

Linear...

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
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Linear Regression

Dependent:

Block 1 of 1

Previous Next

Independent(s):

Method: Enter

Selection Variable: Rule...

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
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Linear Regression

Dependent: Y

Block 1 of 1

Previous Next

Independent(s):

Method: Enter

Selection Variable:

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

1

Data View Variable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6: Y 1.00 Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
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Linear Regression

Dependent: Y

Block 1 of 1

Previous Next

Independent(s): X

Method: Enter

Selection Variable: Rule...

Case Labels:

WLS Weight:

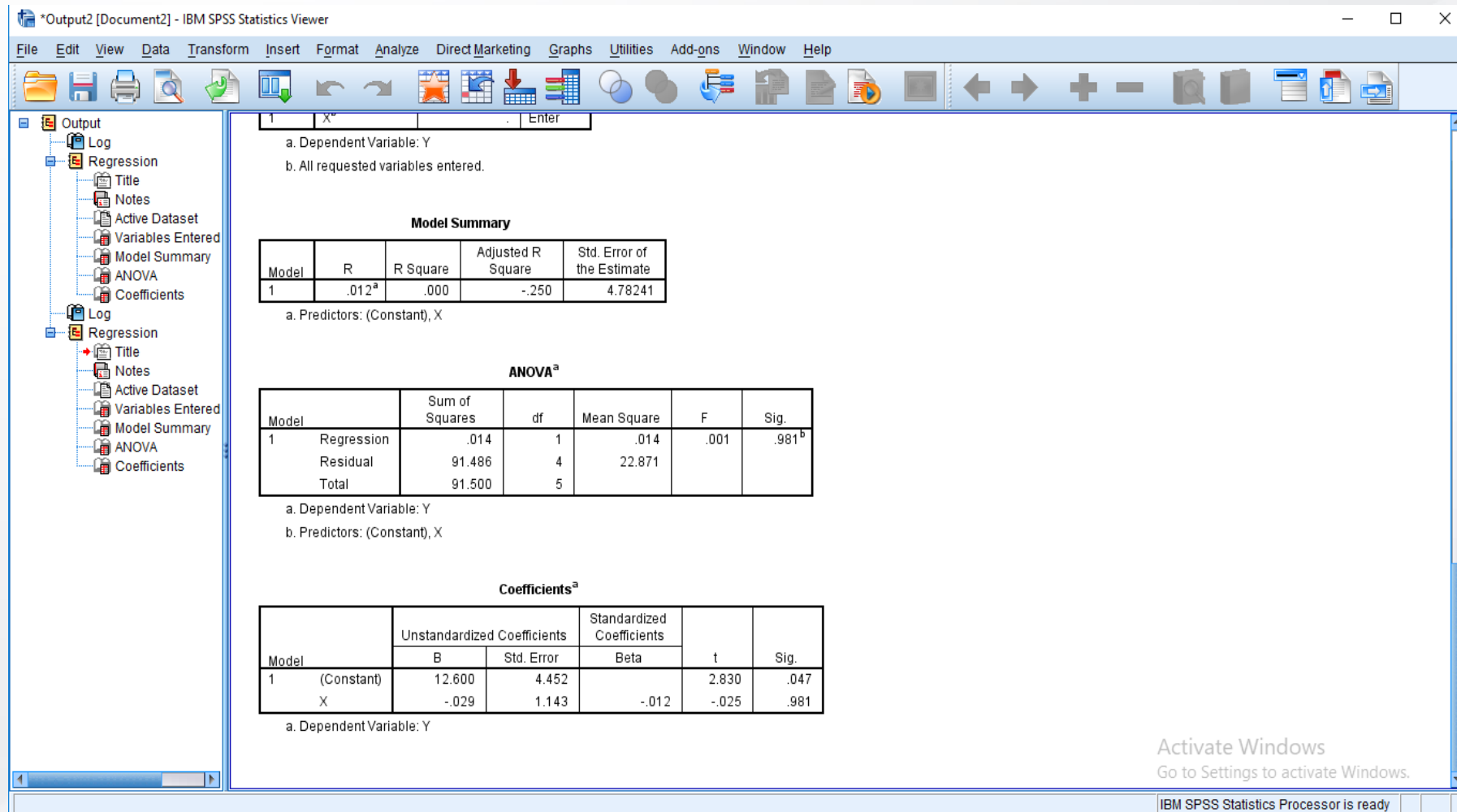
OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready



Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	12.600	4.452		2.830	.047
	X	-.029	1.143	-.012	-.025	.981

a. Dependent Variable: Y

$$Y = a_0 + a_1x$$

$$Y = 12.6 - 0.029x$$

ولإيجاد قيمة Y عندما تكون قيمة $X=9$ ، نعوض عن قيمة X في معادلة الانحدار المحسوبة ب 9 وهو الرقم الذي

يعبر عن قيمة تسلسل شهر سبتمبر 2025 نسبة إلى بداية التسلسل وهو يناير 2025

$$Y = -0.029 (9) + 12.6$$

$$Y = 12.33$$

عدد الجرائم المتوقعة لشهر سبتمبر 2025 هو 13 جريمة

The following table shows number of product in a commercial center during the first half of 2025 approximate your calculation for 2 decimal places.

Month	January	February	March	April	May	June
Number of sales	12	16	18	20	18	22

- Find person and spearman correlation coefficient.
- Find the **linear regression equation** for this data.
- Predict** or (**Estimate**) number of sales in February 2026.

IBM SPSS Statistics Data Editor

File

Edit

View

Data

Transform

Analyze

Direct Marketing

Graphs

Utilities

Add-ons

Window

Help

6: Y

22.00

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00															
2	2.00	16.00															
3	3.00	18.00															
4	4.00	20.00															
5	5.00	18.00															
6	6.00	22.00															
7																	
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Data View

Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Person correlation coefficients
Spearman correlation coefficients

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6 : Y 22.00

	X	Y
1	1.00	12.0
2	2.00	16.0
3	3.00	18.0
4	4.00	20.0
5	5.00	18.0
6	6.00	22.0
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Visible: 2 of 2 Variables

var var var var var var var var var var var var

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

Bivariate...
Partial...
Distances...

Data View Variable View

Bivariate... IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first two columns are labeled X and Y. The data values for X range from 1.00 to 6.00, and for Y from 12.00 to 22.00. A "Bivariate Correlations" dialog box is open, showing variables X and Y selected for analysis. The dialog includes options for correlation coefficients (Pearson, Kendall's tau-b, Spearman), test of significance (Two-tailed, One-tailed), and a checkbox for flagging significant correlations.

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6: Y 22.00 Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00															
2	2.00	16.00															
3	3.00	18.00															
4	4.00	20.00															
5	5.00	18.00															
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Bivariate Correlations

Variables:

X
Y

Options...
Bootstrap...

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☐ Spearman

Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00														
2	2.00	16.00														
3	3.00	18.00														
4	4.00	20.00														
5	5.00	18.00														
6	6.00	22.00														
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Bivariate Correlations

Variables:

- X
- Y

Options... Bootstrap...

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☐ Spearman

Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	12.00															
2	2.00	16.00															
3	3.00	18.00															
4	4.00	20.00															
5	5.00	18.00															
6	6.00	22.00															
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Bivariate Correlations

Variables: X Y

Options... Bootstrap...

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☒ Spearman

Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Output3 [Document3] - IBM SPSS Statistics Viewer

FileEditViewDataTransformInsertFormatAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp

Output

Log

Correlations

Title

Notes

Active Dataset

Correlations

CORRELATIONS

/VARIABLES=X Y

/PRINT=TWOTAIL NOSIG

/MISSING=PAIRWISE.

→ Correlations

[DataSet0]

Correlations

		X	Y
X	Pearson Correlation	1	.900*
	Sig. (2-tailed)		.015
	N	6	6
Y	Pearson Correlation	.900*	1
	Sig. (2-tailed)	.015	
	N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

Activate Windows

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Correlations

		X	Y
X	Pearson Correlation	1	.900 [*]
	Sig. (2-tailed)		.015
	N	6	6
Y	Pearson Correlation	.900 [*]	1
	Sig. (2-tailed)	.015	
	N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

Person correlation

coefficient =0.9

Direct Strong Correlation

Output3 [Document3] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

Log

Correlations

Title

Notes

Active Dataset

Correlations

Log

Regression

Title

Notes

Active Dataset

Variables Entered/Removed

Model Summary

ANOVA

Coefficients

Log

Correlations

Title

Notes

Active Dataset

Correlations

Log

Nonparametric Correlations

Title

Notes

Active Dataset

Correlations

		Sig. (2-tailed)		.015
	N		6	6
Y		Pearson Correlation	.900	1
		Sig. (2-tailed)	.015	
	N		6	6

*. Correlation is significant at the 0.05 level (2-tailed).

NONPAR CORR

/VARIABLES=X Y

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

Nonparametric Correlations

[DataSet0]

Correlations			X	Y
Spearman's rho	X	Correlation Coefficient	1.000	.899
		Sig. (2-tailed)	.	.015
		N	6	6
	Y	Correlation Coefficient	.899	1.000
		Sig. (2-tailed)	.015	.
		N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

Activate Windows

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Correlations

			X	Y
Spearman's rho	X	Correlation Coefficient	1.000	.899*
		Sig. (2-tailed)	.	.015
		N	6	6
	Y	Correlation Coefficient	.899*	1.000
		Sig. (2-tailed)	.015	.
		N	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

**Spearman correlation
coefficient =0.899**

Direct Strong Correlation

Simple Linear Regression

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

6 : Y 1.00

	X	Y
1	1.00	6.00
2	3.00	4.00
3	4.00	4.00
4	6.00	3.00
5	7.00	2.00
6	9.00	1.00
7		
8		
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17		
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19		
20		
21		
22		
23		

Visible: 2 of 2 Variables

var var var var var var var var var var var var

Analyze

- Reports
- Descriptive Statistics
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression**
 - Automatic Linear Modeling...
 - Linear...**
 - Curve Estimation...
 - Partial Least Squares...
 - Binary Logistic...
 - Multinomial Logistic...
 - Ordinal...
 - Probit...
 - Nonlinear...
 - Weight Estimation...
 - 2-Stage Least Squares...
 - Optimal Scaling (CATREG)...
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
- Multiple Imputation
- Complex Samples
- Quality Control
- ROC Curve...

Linear...

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
6	9.00	1.00														
7																
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Linear Regression

Dependent:

Block 1 of 1

Independent(s):

Method: Enter

Selection Variable:

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

Activate Windows

Go to Settings to activate Windows.

Data View Variable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6: Y 1.00 Visible: 2 of 2 Variables

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
6	9.00	1.00														
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22																
23																

Linear Regression

Dependent: Y

Block 1 of 1

Previous Next

Independent(s):

Method: Enter

Selection Variable:

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Bootstrap...

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 17 columns. The first two columns are labeled X and Y. The data is as follows:

	X	Y	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	6.00														
2	3.00	4.00														
3	4.00	4.00														
4	6.00	3.00														
5	7.00	2.00														
6	9.00	1.00														
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The Linear Regression dialog box is open, showing the following settings:

- Dependent: Y
- Independent(s): X
- Method: Enter
- Selection Variable: (empty)
- Case Labels: (empty)
- WLS Weight: (empty)

Buttons: OK, Paste, Reset, Cancel, Help, Statistics..., Plots..., Save..., Options..., Bootstrap...

IBM SPSS Statistics Processor is ready

a. Dependent Variable: Y
b. All requested variables entered.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.900 ^a	.810	.762	1.67900

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48.057	1	48.057	17.047	.015 ^b
	Residual	11.276	4	2.819		
	Total	59.333	5			

b. Predictors: (Constant), X

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	11.867	1.563		7.592	.002
X	1.657	.401	.900	4.129	.015

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	11.867	1.563		7.592	.002
X	1.657	.401	.900	4.129	.015

a. Dependent Variable: Y

$$y = 11.867 + 1.657 x$$

- تنبأ (قدر) عدد المبيعات لشهر فبراير 2026 م .

يتم التعويض في المعادلة

$$X=14$$

ترتيب شهر فبراير 2026 بالنسبة لترتيب الشهور

ويكون عدد المبيعات لشهر فبراير 2026 = 35

Graphs

SPSS12019sav.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 8 of 8 Variables

	q1	q2	q3	q4	x1	x2	x3	x4	var	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	4.00	2.00	2.00								
2	3.00	2.00	2.00	1.00	3.00	3.00	3.00	3.00								
3	2.00	2.00	1.00	1.00	5.00	4.00	4.00	4.00								
4	1.00	2.00	1.00	2.00	4.00	5.00	5.00	1.00								
5	2.00	1.00	2.00	1.00	5.00	5.00	5.00	2.00								
6	1.00	1.00	2.00	3.00	4.00	4.00	2.00	1.00								
7	1.00	2.00	3.00	1.00	5.00	5.00	4.00	2.00								
8	4.00	1.00	2.00	2.00	4.00	2.00	2.00	5.00								
9	1.00	2.00	4.00	1.00	3.00	5.00	3.00	5.00								
10	2.00	1.00	3.00	1.00	5.00	4.00	5.00	2.00								
11	1.00	1.00	2.00	1.00	1.00	5.00	2.00	2.00								
12	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00								
13	1.00	2.00	2.00	1.00	4.00	2.00	2.00	2.00								
14	2.00	2.00	2.00	3.00	5.00	3.00	3.00	3.00								
15	1.00	1.00	2.00	2.00	3.00	2.00	2.00	2.00								
16	3.00	1.00	1.00	1.00	4.00	1.00	1.00	1.00								
17	3.00	2.00	4.00	3.00	5.00	1.00	5.00	5.00								
18	1.00	2.00	1.00	2.00	5.00	5.00	4.00	4.00								
19	2.00	1.00	1.00	3.00	3.00	3.00	5.00	5.00								
20	1.00	2.00	1.00	2.00	3.00	3.00	5.00	4.00								
21																
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Data View Variable View

Go to Settings to activate Windows.

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

FileEditViewDataTransformAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp

Chart Builder...

Graphboard Template Chooser...

Legacy Dialogs

Bar...

3-D Bar...

Line...

Area...

Pie...

High-Low...

Boxplot...

Error Bar...

Population Pyramid...

Scatter/Dot...

Histogram...

Visible: 7 of 7 Variables

var

var

var

var

var

var

var

	q1	q2	q3	q4	X1	X2	X3										
1	1.00	1.00	3.00	1.00	5.00	5.00	5.00										
2	1.00	2.00	1.00	1.00	2.00	2.00	1.00										
3	2.00	1.00	1.00	2.00	3.00	1.00	4.00										
4	1.00	1.00	4.00	3.00	4.00	5.00	4.00										
5	3.00	1.00	2.00	2.00	4.00	5.00	4.00										
6	2.00	2.00	1.00	1.00	2.00	1.00	2.00										
7	4.00	1.00	1.00	2.00	4.00	5.00	4.00										
8	2.00	2.00	2.00	1.00	1.00	2.00	2.00										
9	3.00	1.00	1.00	3.00	4.00	5.00	4.00										
10	2.00	2.00	1.00	1.00	1.00	1.00	1.00										
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Data ViewVariable View

Bar...

IBM SPSS Statistics Processor is ready

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	5.00	5.00									
2	1.00	2.00	1.00	1.00	2.00	2.00	1.00									
3	2.00	1.00	1.00	2.00	3.00	1.00										
4	1.00	1.00	4.00	3.00	4.00	5.00										
5	3.00	1.00	2.00	2.00	4.00	5.00										
6	2.00	2.00	1.00	1.00	2.00	1.00										
7	4.00	1.00	1.00	2.00	4.00	5.00										
8	2.00	2.00	2.00	1.00	1.00	2.00										
9	3.00	1.00	1.00	3.00	4.00	5.00										
10	2.00	2.00	1.00	1.00	1.00	1.00										
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Bar Charts

Simple
Clustered
Stacked

Data in Chart Are

☒ Summaries for groups of cases
☐ Summaries of separate variables
☐ Values of individual cases

Define Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	5.00	5.00									
2	1.00	2.00	1.00	1.00	2.00	2.00	1.00									
3	2.00	1.00	1.00	2.00	3.00	1.00										
4	1.00	1.00	4.00	3.00	4.00	5.00										
5	3.00	1.00	2.00	2.00	4.00	5.00										
6	2.00	2.00	1.00	1.00	2.00	1.00										
7	4.00	1.00	1.00	2.00	4.00	5.00										
8	2.00	2.00	2.00	1.00	1.00	2.00										
9	3.00	1.00	1.00	3.00	4.00	5.00										
10	2.00	2.00	1.00	1.00	1.00	1.00										
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20																
21																
22																
23																

Bar Charts

Simple
Clustered
Stacked

Data in Chart Are

☒ Summaries for groups of cases
☐ Summaries of separate variables
☐ Values of individual cases

Define Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

File Edit View Data Transform Analyze Direct Marketing Window Help

Define Simple Bar: Summaries for Groups of Cases

Bars Represent

q1 q2 q3 q4 x1 x2 x3

☒ N of cases ☐ % of cases

☐ Cum. N ☐ Cum. %

☐ Other statistic (e.g., mean)

Variable:

Change Statistic...

Category Axis:

Panel by

Rows:

☒ Nest variables (no empty rows)

Columns:

☒ Nest variables (no empty columns)

Template

☒ Use chart specifications from:

File...

OK Paste Reset Cancel Help

Visible: 7 of 7 Variables

var var var var var

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

q1 q2 q3 q4

1.00 1.00 3.00 1.00

1.00 2.00 1.00 1.00

2.00 1.00 1.00 2.00

1.00 1.00 4.00 3.00

3.00 1.00 2.00 2.00

2.00 2.00 1.00 1.00

4.00 1.00 1.00 2.00

2.00 2.00 2.00 1.00

3.00 1.00 1.00 3.00

2.00 2.00 1.00 1.00

Data View Variable View

IBM SPSS Statistics Processor is ready

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Define Simple Bar: Summaries for Groups of Cases

Bars Represent

- ☒ N of cases
- ☐ % of cases
- ☐ Cum. N
- ☐ Cum. %
- ☐ Other statistic (e.g., mean)

Variable:

Change Statistic...

Category Axis:

q1

Panel by

Rows:

Columns:

Nest variables (no empty rows)

Nest variables (no empty columns)

Template

☐ Use chart specifications from:

File...

OK Paste Reset Cancel Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4
1	1.00	1.00	3.00	1.00
2	1.00	2.00	1.00	1.00
3	2.00	1.00	1.00	2.00
4	1.00	1.00	4.00	3.00
5	3.00	1.00	2.00	2.00
6	2.00	2.00	1.00	1.00
7	4.00	1.00	1.00	2.00
8	2.00	2.00	2.00	1.00
9	3.00	1.00	1.00	3.00
10	2.00	2.00	1.00	1.00
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Data View Variable View

IBM SPSS Statistics Processor is ready

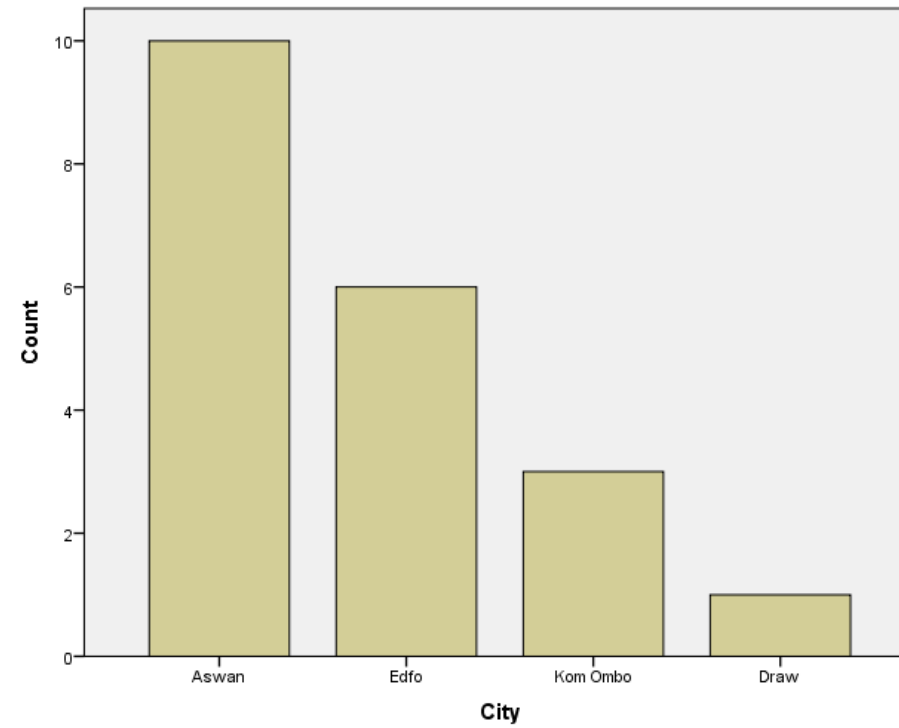
*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help



- Output
 - Log
 - Graph
 - Title
 - Notes
 - Active Dataset
 - Bar of count by q1

[DataSet1] C:\Users\Dr Fisal\Documents\SPSS12019sav.sav



Activ
Go to

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing **Graphs** Utilities Add-ons Window Help

Chart Builder...
Graphboard Template Chooser...

Legacy Dialogs

- Bar...
- 3-D Bar...
- Line...
- Area...
- Pie...**
- High-Low...
- Boxplot...
- Error Bar...
- Population Pyramid...
- Scatter/Dot...
- Histogram...

Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	5.00	5.0							
2	1.00	2.00	1.00	1.00	2.00	2.00	1.0							
3	2.00	1.00	1.00	2.00	3.00	1.00	4.0							
4	1.00	1.00	4.00	3.00	4.00	5.00	4.0							
5	3.00	1.00	2.00	2.00	4.00	5.00	4.0							
6	2.00	2.00	1.00	1.00	2.00	1.00	2.0							
7	4.00	1.00	1.00	2.00	4.00	5.00	4.0							
8	2.00	2.00	2.00	1.00	1.00	2.00	2.0							
9	3.00	1.00	1.00	3.00	4.00	5.00	4.0							
10	2.00	2.00	1.00	1.00	1.00	1.00	1.0							
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Data View Variable View

Pie... IBM SPSS Statistics Processor is ready

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	5.00	5.00									
2	1.00	2.00	1.00	1.00	2.00	2.00	1.00									
3	2.00	1.00	1.00	2.00	3.00	1.00	4.00									
4	1.00	1.00	4.00	3.00	4.00	5.00	4.00									
5	3.00	1.00	2.00	2.00	4.00	5.00	4.00									
6	2.00	2.00	1.00	1.00	2.00	1.00	2.00									
7	4.00	1.00	1.00	2.00	4.00	5.00	2.00									
8	2.00	2.00	2.00	1.00	1.00	2.00	2.00									
9	3.00	1.00	1.00	3.00	4.00	5.00	5.00									
10	2.00	2.00	1.00	1.00	1.00	1.00	1.00									
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Pie Charts

Data in Chart Are

- ☒ Summaries for groups of cases
- ☐ Summaries of separate variables
- ☐ Values of individual cases

Define Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4
1	1.00	1.00	3.00	1.00
2	1.00	2.00	1.00	1.00
3	2.00	1.00	1.00	2.00
4	1.00	1.00	4.00	3.00
5	3.00	1.00	2.00	2.00
6	2.00	2.00	1.00	1.00
7	4.00	1.00	1.00	2.00
8	2.00	2.00	2.00	1.00
9	3.00	1.00	1.00	3.00
10	2.00	2.00	1.00	1.00
11				
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19				
20				
21				
22				
23				

Define Pie: Summaries for Groups of Cases

Slices Represent

☒ N of cases ☐ % of cases

☐ Sum of variable

Variable:

Define Slices by:

Panel by

Rows:

☐ Nest variables (no empty rows)

Columns:

☐ Nest variables (no empty columns)

Template

☐ Use chart specifications from:

File...

OK Paste Reset Cancel Help

Activate Windows

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

final2017.sav [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Define Pie: Summaries for Groups of Cases

Slices Represent

☒ N of cases ☐ % of cases

☐ Sum of variable

Variable:

Define Slices by:

q2

Panel by

Rows:

Columns:

Template

☐ Use chart specifications from:

File...

OK Paste Reset Cancel Help

	q1	q2	q3	q4
1	1.00	1.00	3.00	1.00
2	1.00	2.00	1.00	1.00
3	2.00	1.00	1.00	2.00
4	1.00	1.00	4.00	3.00
5	3.00	1.00	2.00	2.00
6	2.00	2.00	1.00	1.00
7	4.00	1.00	1.00	2.00
8	2.00	2.00	2.00	1.00
9	3.00	1.00	1.00	3.00
10	2.00	2.00	1.00	1.00
11				
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22				
23				

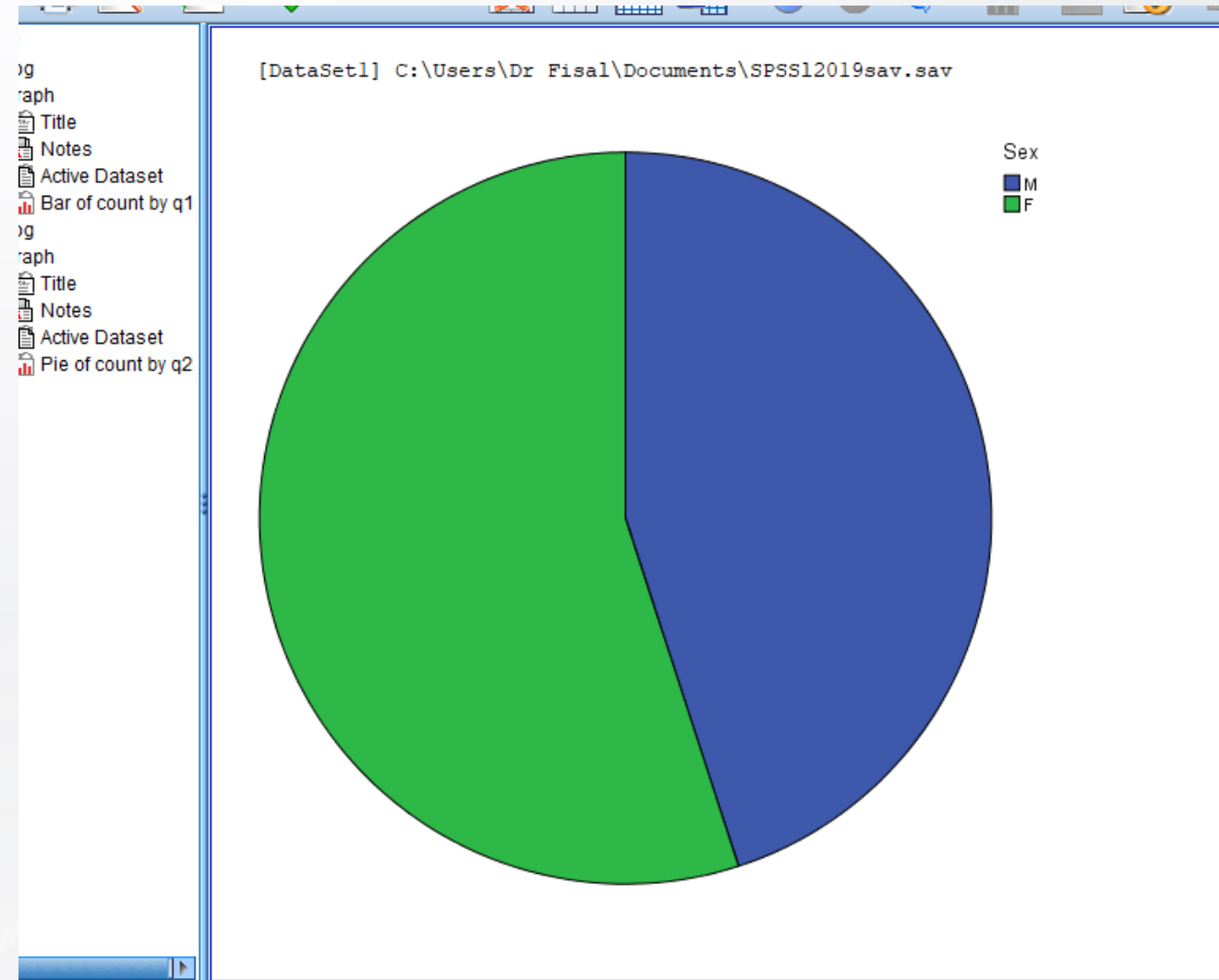
Visible: 7 of 7 Variables

var var var var var

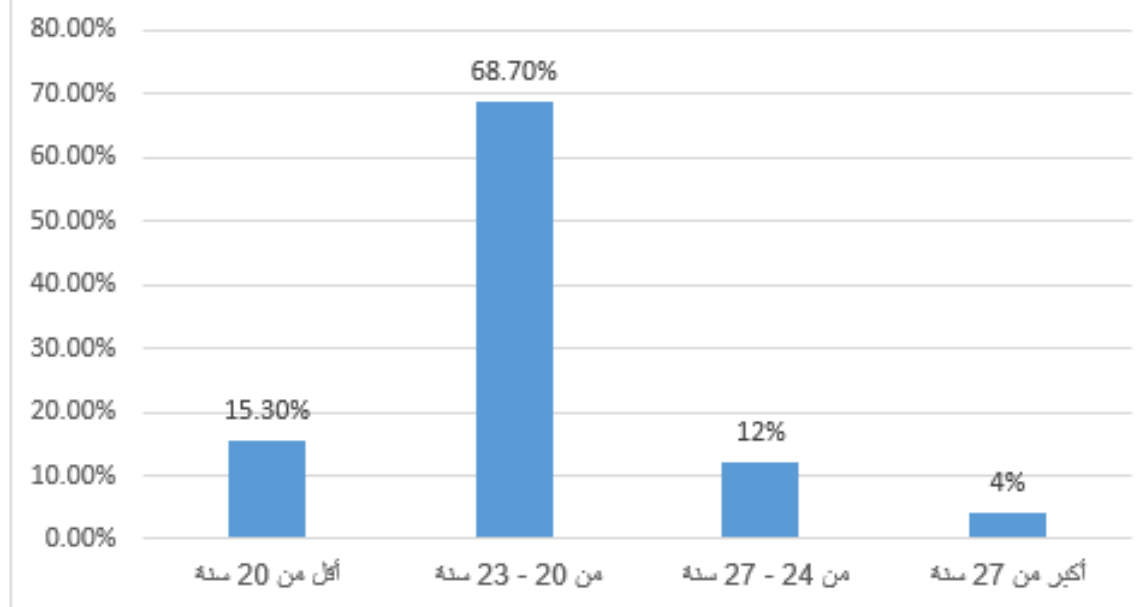
Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready



توزيع أفراد العينة حسب الفئة العمرية



The t-test

Outline

Definitions

Descriptive vs. Inferential Statistics

The t -test

- One-sample t -test
- Dependent (related) groups t -test
- Independent (unrelated) groups t -test

Comparing means

- Correlation and regression look for relationships between variables
- Tests comparing means look for differences between the means of two or more samples
- General null hypothesis: the samples come from the same population
- General research hypothesis: the samples come from different populations

Types of t-test

- One sample:
 - compare the mean of a sample to a predefined value
- Dependent (related) samples:
 - compare the means of two conditions in which the same (or closely matched) participants participated
- Independent (unrelated) samples:
 - compare the means of two groups of participants

Example: The following data represents the grades of 10 students in the Applied Statistics course, and it is required to determine whether the students' average grades are equal to 17 or not?

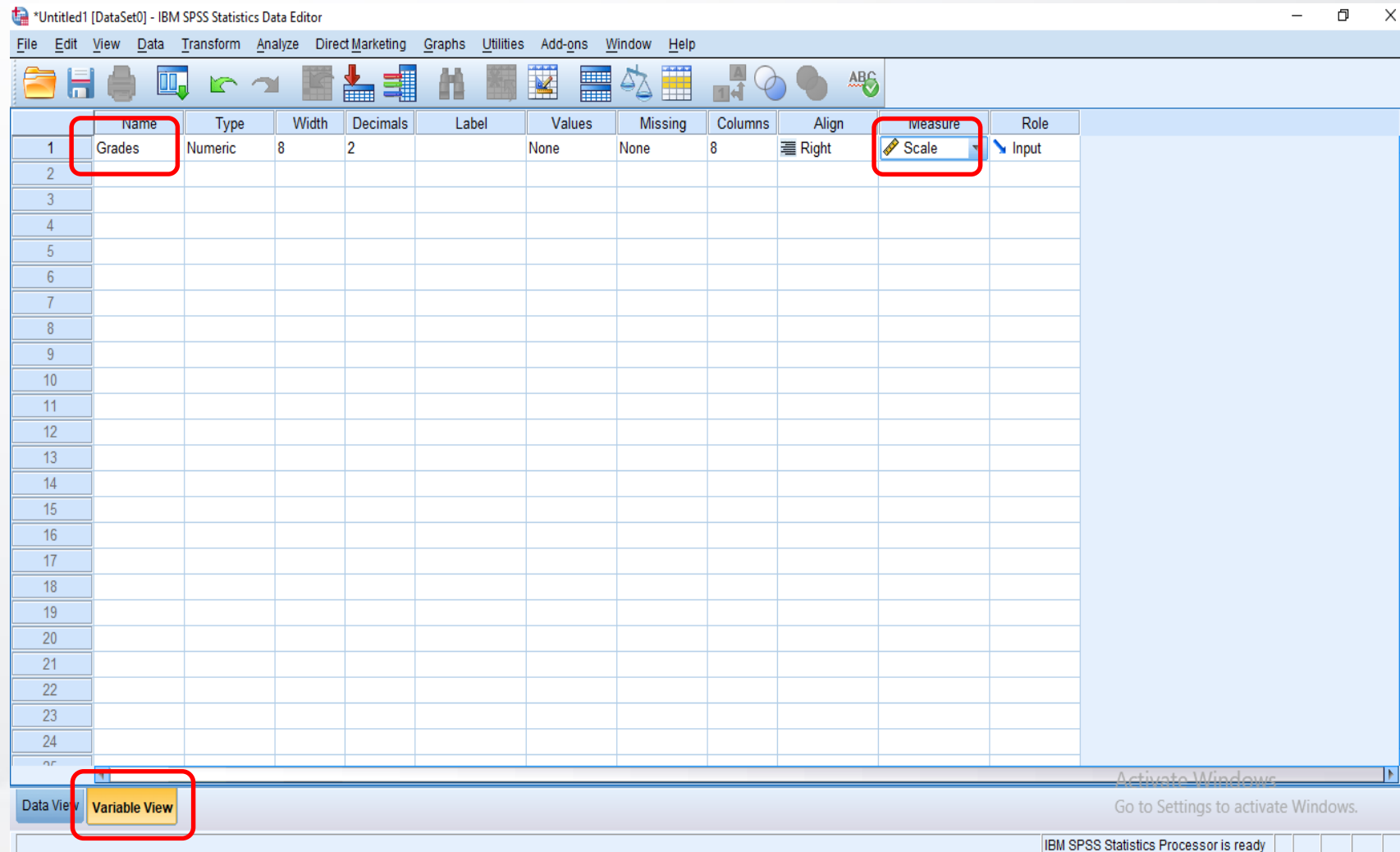
10 - 16 - 15 - 11 - 20 - 13 - 14 - 14 - 18 - 12

Null Hypothesis

The given data mean is 17
(there is no difference)

Alternative Hypothesis

The given data mean not equal 17
(there is difference)



*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

5: Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	12.00																
2	18.00																
3	14.00																
4	14.00																
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Data View Variable View

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

11: Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	12.00																
2	18.00																
3	14.00																
4	14.00																
5	13.00																
6	20.00																
7	11.00																
8	15.00																
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Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

11 : Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	12.00																
2	18.00																
3	14.00																
4	14.00																
5	13.00																
6	20.00																
7	11.00																
8	15.00																
9	16.00																
10	10.00																
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One-Sample T Test

Test Variable(s):

Grades

Test Value: 0

Options... Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset named "Untitled1 [DataSet0]". The dataset contains 23 rows and 17 columns. The first column is labeled "Grades" and contains numerical values. The second column is labeled "var" and contains empty cells. The remaining columns are also labeled "var" and contain empty cells. The status bar at the bottom indicates "Visible: 1 of 1 Variables".

A "One-Sample T Test" dialog box is open, showing the "Test Variable(s)" list with "Grades" selected. The "Test Value" is set to 0. The dialog box includes buttons for "Options...", "Bootstrap...", "OK", "Paste", "Reset", "Cancel", and "Help".

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	12.00																
2	18.00																
3	14.00																
4	14.00																
5	13.00																
6	20.00																
7	11.00																
8	15.00																
9	16.00																
10	10.00																
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*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

11: Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	12.00															
2	18.00															
3	14.00															
4	14.00															
5	13.00															
6	20.00															
7	11.00															
8	15.00															
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22																
23																

One-Sample T Test

Test Variable(S):
Grades

Options...
Bootstrap...

Test Value: 17

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output
Log
T-Test
Title
Notes
Active Dataset
One-Sample Stati
One-Sample Test

T-TEST
/TESTVAL=17
/MISSING=ANALYSIS
/VARIABLES=Grades
/CRITERIA=CI (.95) .

→ T-Test

[DataSet0]

Double-click to activate

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Grades	10	14.3000	3.09300	.97809

One-Sample Test

	Test Value = 17					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-2.760	9	.022	-2.70000	-4.9126	-.4874

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

One-Sample Test

	Test Value = 17					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-2.760	9	.022	-2.70000	-4.9126	-.4874

Statistical decision

The resulting probability value of the test is 0.022, which is less than 0.05 (the level of significance), so we reject the null hypothesis that the average score is equal to 17 and accept the alternative hypothesis that the average score is not equal to 17

Example: The following table shows the number of traffic accidents recorded in Aswan Governorate for the month of May 2025, It is required to verify that the average recorded traffic accidents are 32 or not?

اليوم	عدد الحوادث المروية
1	41
2	18
3	29
4	32
5	25
6	27
7	30
8	15
9	26
10	45
11	44
12	17
13	36
14	23
15	28
16	29
17	44
18	33
19	41
20	22
21	19
22	18
23	36
24	27
25	23
26	22
27	20

28	19
29	33
30	25
31	32

Null Hypothesis

The given data mean is 32
(there is no difference)

Alternative Hypothesis

The given data mean not equal 32
(there is difference)

Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

32 : Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00																
11	44.00																
12	17.00																
13	36.00																
14	23.00																
15	28.00																
16	29.00																
17	44.00																
18	33.00																
19	41.00																
20	22.00																
21	19.00																
22	18.00																
23	36.00																
24	27.00																
25	23.00																
26	22.00																
27	20.00																
28	19.00																
29	33.00																
30	25.00																
31	32.00																
32																	

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

32: Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00															
11	44.00															
12	17.00															
13	36.00															
14	23.00															
15	28.00															
16	29.00															
17	44.00															
18	33.00															
19	41.00															
20	22.00															
21	19.00															
22	18.00															
23	36.00															
24	27.00															
25	23.00															
26	22.00															
27	20.00															
28	19.00															
29	33.00															
30	25.00															
31	32.00															
32																

One-Sample T Test

Test Variable(s):

Grades

Test Value: 0

Options... Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

SPSS Data Editor window titled "Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor". The menu bar includes File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains icons for file operations, data manipulation, and analysis.

The main data grid shows a single variable named "Grades" with 32 rows of data. The values range from 17.00 to 45.00. The status bar at the bottom indicates "Visible: 1 of 1 Variables".

A "One-Sample T Test" dialog box is open, centered over the data grid. The "Test Variable(s)" list contains the variable "Grades". The "Test Value" is set to 0. The dialog box has buttons for "Options...", "Bootstrap...", "OK", "Paste", "Reset", "Cancel", and "Help".

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00																
11	44.00																
12	17.00																
13	36.00																
14	23.00																
15	28.00																
16	29.00																
17	44.00																
18	33.00																
19	41.00																
20	22.00																
21	19.00																
22	18.00																
23	36.00																
24	27.00																
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29	33.00																
30	25.00																
31	32.00																
32																	

At the bottom of the window, there are tabs for "Data View" and "Variable View". The status bar at the very bottom indicates "IBM SPSS Statistics Processor is ready".

*Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

32 : Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00															
11	44.00															
12	17.00															
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18	33.00															
19	41.00															
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23	36.00															
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28	19.00															
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30	25.00															
31	32.00															
32																

One-Sample T Test

Test Variable(s):
Grades

Test Value: 32

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Log
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One-Sample Test

Test Value = 32

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-2.363	30	.025	-3.64516	-6.7956	-.4947

T-TEST
/TESTVAL=32
/MISSING=ANALYSIS
/VARIABLES=Grades
/CRITERIA=CI (.95).

→ **T-Test**

[DataSet0]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Grades	31	28.3548	8.58894	1.54262

One-Sample Test

Test Value = 32

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-2.363	30	.025	-3.64516	-6.7956	-.4947

Activate Windows
Go to Settings to activate Windows.

One-Sample Test

	Test Value = 32					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-2.363	30	.025	-3.64516	-6.7956	-.4947

Statistical decision

The resulting probability value of the test is 0.025, which is a value less than 0.05 (the level of significance), so we reject the null hypothesis that the average recorded traffic accidents equal 32 and accept the alternative hypothesis that the average recorded traffic accidents is not equal to 32

Example: The following table shows the number of traffic accidents recorded in Aswan Governorate for the month of May 2025, It is required to verify that the average recorded traffic accidents are 29 or not?



اليوم	عدد الحوادث المرورية
1	41
2	18
3	29
4	32
5	25
6	27
7	30
8	15
9	26
10	45
11	44
12	17
13	36
14	23
15	28
16	29
17	44
18	33
19	41
20	22
21	19
22	18
23	36
24	27
25	23
26	22
27	20

28	19
29	33
30	25
31	32

Null Hypothesis

The given data mean is 29
(there is no difference)

Alternative Hypothesis

The given data mean not equal 29
(there is difference)

*Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

32 : Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00																
11	44.00																
12	17.00																
13	36.00																
14	23.00																
15	28.00																
16	29.00																
17	44.00																
18	33.00																
19	41.00																
20	22.00																
21	19.00																
22	18.00																
23	36.00																
24	27.00																
25	23.00																
26	22.00																
27	20.00																
28	19.00																
29	33.00																
30	25.00																
31	32.00																
32																	

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

32: Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00															
11	44.00															
12	17.00															
13	36.00															
14	23.00															
15	28.00															
16	29.00															
17	44.00															
18	33.00															
19	41.00															
20	22.00															
21	19.00															
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23	36.00															
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26	22.00															
27	20.00															
28	19.00															
29	33.00															
30	25.00															
31	32.00															
32																

One-Sample T Test

Test Variable(s):

Grades

Test Value: 0

Options... Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

SPSS Data Editor window titled "Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor". The menu bar includes File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains icons for file operations, data manipulation, and analysis.

The main data grid shows a single variable named "Grades" with 32 rows of data. The values range from 10 to 32. The status bar at the bottom indicates "Visible: 1 of 1 Variables".

A "One-Sample T Test" dialog box is open, showing the "Grades" variable selected for the test. The "Test Value" is set to 0. The dialog box includes buttons for "Options...", "Bootstrap...", "OK", "Paste", "Reset", "Cancel", and "Help".

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00																
11	44.00																
12	17.00																
13	36.00																
14	23.00																
15	28.00																
16	29.00																
17	44.00																
18	33.00																
19	41.00																
20	22.00																
21	19.00																
22	18.00																
23	36.00																
24	27.00																
25	23.00																
26	22.00																
27	20.00																
28	19.00																
29	33.00																
30	25.00																
31	32.00																
32																	

At the bottom of the window, there are tabs for "Data View" and "Variable View". The status bar at the very bottom indicates "IBM SPSS Statistics Processor is ready".

*Untitled2 [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

32 : Grades Visible: 1 of 1 Variables

	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
10	45.00															
11	44.00															
12	17.00															
13	36.00															
14	23.00															
15	28.00															
16	29.00															
17	44.00															
18	33.00															
19	41.00															
20	22.00															
21	19.00															
22	18.00															
23	36.00															
24	27.00															
25	23.00															
26	22.00															
27	20.00															
28	19.00															
29	33.00															
30	25.00															
31	32.00															
32																

One-Sample T Test

Test Variable(s):
Grades

Test Value: 29

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

SPSS Statistics Viewer window showing output for a One-Sample Test. The output includes a table of test statistics, a syntax command block, a T-Test label, a data set reference, a table of one-sample statistics, and a second table of test statistics (highlighted with a red box).

One-Sample Test

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-2.363	30	.025	-3.64516	-6.7956	-.4947

T-TEST
/TESTVAL=29
/MISSING=ANALYSIS
/VARIABLES=Grades
/CRITERIA=CI (.95) .

→ T-Test

[DataSet0]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Grades	31	28.3548	8.58894	1.54262

One-Sample Test

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Grades	-.418	30	.679	-.64516	-3.7956	2.5053

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Statistical decision

The resulting probability value of the test is 0.679, which is a value greater than 0.05 (the level of significance), so we accept the null hypothesis that the average recorded traffic accidents equal 29

Dependent Sample T test

A test to determine whether the mean of a set of data (a population) equals a given value

When conducting a pre and post test on the same group An example of a change in the average grades of students before and after academic advising

Example: The following data represents the grades of a group of students before and after conducting the academic advising program, and it is required to know the extent of the program's usefulness in student achievement..

قبل الارشاد	بعد الارشاد
10	12
50	52
20	25
8	10
115	120
75	80
45	50
170	175

Null Hypothesis

The average score of students before advising is equal to the average score of students after advising
(meaning there is no difference)

Alternative Hypothesis

The average score of students before advising is not equal to the average score of students after advising
(meaning there is a difference)

*Untitled2 [DataSet3] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

	Before	After	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	10.00	12.00														
2	50.00	52.00														
3	20.00	25.00														
4	8.00	10.00														
5	115.00	120.00														
6	75.00	80.00														
7	45.00	50.00														
8	170.00	175.00														
9																
10																
11																
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13																
14																
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1

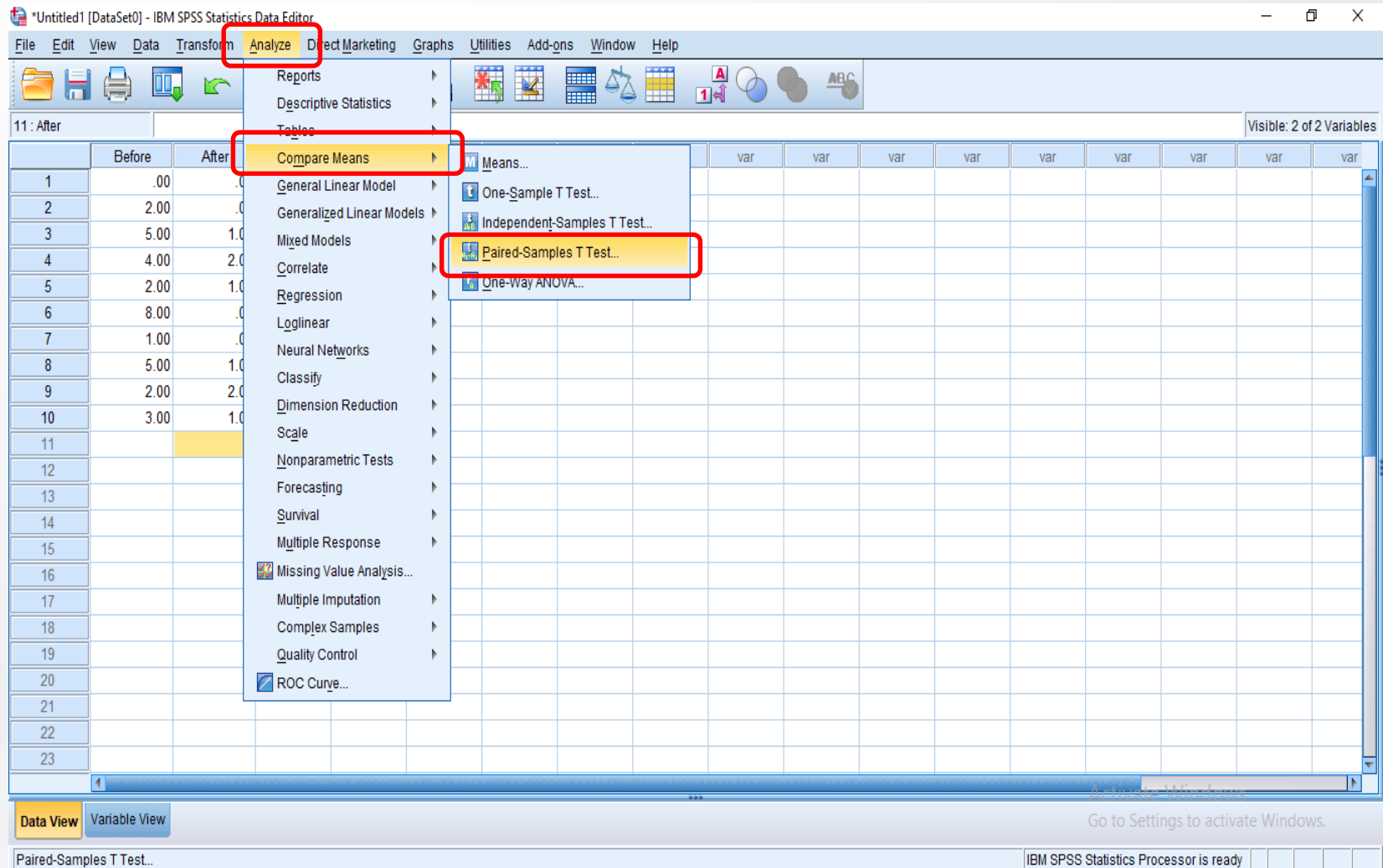
Activate Windows
Go to Settings to activate Windows.

Data View Variable View

IBM SPSS Statistics Process is ready.

Type here to search

5:29 AM
11/10/2019



*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

3: Visible: 2 of 2 Variables

	Before	After	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	.00	.00														
2	2.00	.00														
3	5.00	1.00														
4	4.00	2.00														
5	2.00	1.00														
6	8.00	.00														
7	1.00	.00														
8	5.00	1.00														
9	2.00	2.00														
10	3.00	1.00														
11																
12																
13																
14																
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16																
17																
18																
19																
20																
21																
22																
23																

Paired-Samples T Test

Paired Variables:

Pair	Variable1	Variable2
1		

Before
After

Options...
Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

3: Visible: 2 of 2 Variables

	Before	After	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	.00	.00															
2	2.00	.00															
3	5.00	1.00															
4	4.00	2.00															
5	2.00	1.00															
6	8.00	.00															
7	1.00	.00															
8	5.00	1.00															
9	2.00	2.00															
10	3.00	1.00															
11																	
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18																	
19																	
20																	
21																	
22																	
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Paired-Samples T Test

Paired Variables:

Pair	Variable 1	Variable 2
1	[Before]	
2		

Options... Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first two columns are labeled "Before" and "After". The data is as follows:

	Before	After	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	.00	.00															
2	2.00	.00															
3	5.00	1.00															
4	4.00	2.00															
5	2.00	1.00															
6	8.00	.00															
7	1.00	.00															
8	5.00	1.00															
9	2.00	2.00															
10	3.00	1.00															
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

The "Paired-Samples T Test" dialog box is open, showing the "Before" and "After" variables selected for the test. The "Paired Variables" table is as follows:

Pair	Variable1	Variable2
1	[Before]	[After]
2		

The "Data View" tab is active. The status bar indicates "IBM SPSS Statistics Processor is ready".

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Log Explore Title Notes Active Dataset Case Processing Descriptives Tests of Normality Before After T-Test

T-TEST PAIRS=Before WITH After (PAIRED)
/CRITERIA=CI (.9500)
/MISSING=ANALYSIS.

→ T-Test

[DataSet3]

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	61.6250	8	56.64157	20.02582
	After	65.5000	8	57.54005	20.34348

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	8	1.000	.000

Paired Samples Test

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Before - After	-3.87500	1.55265	.54894	-5.17305	-2.57695	-7.059	7	.000

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready H: 504, W: 629 pt.

Type here to search

5:33 AM
11/10/2019

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before - After	-3.87500	1.55265	.54894	-5.17305	-2.57695	-7.059	7	.000

Statistical decision

The resulting probabilistic value of the test is 0.000, which is a value less than 0.05 (the level of significance), so we reject the null hypothesis that there is no difference between the average scores of students before and after advising, and we accept the alternative hypothesis that there is a difference between the scores of students before and after advising

This difference is explained in favor after the advising
Average after advising is greater than before advising

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	61.6250	8	56.64157	20.02582
	After	65.5000	8	57.54005	20.34348

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output
Log
T-Test
Title
Notes
Active Dataset
Paired Samples S
Paired Samples C
Paired Samples T

T-TEST PAIRS=Before WITH After (PAIRED)
/CRITERIA=CI (.9500)
/MISSING=ANALYSIS.

→ T-Test

[DataSet0]

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Before	3.2000	10	2.34758	.74237
After	.8000	10	.78881	.24944

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Before & After	10	.084	.818

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Before - After	2.40000	2.41293	.76303	.67390	4.12610	3.145	9	.012

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	10	.084	.818

Note the calculation of the correlation coefficient between the two related groups to clarify its strength, and we find that its value here is 0.084, which is a very weak correlation, and we say here that it is not statistically significant.

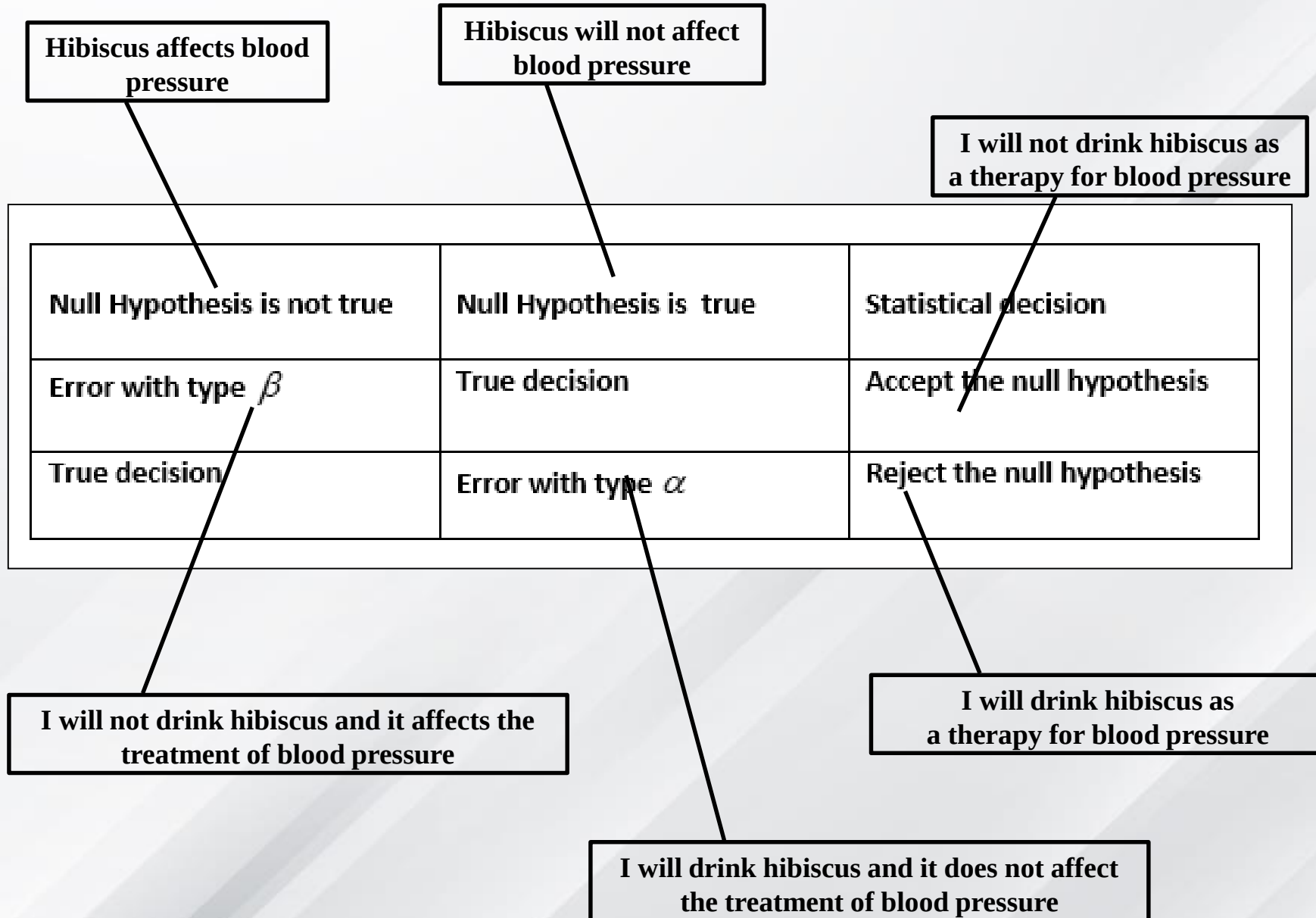
Experimenting with hibiscus drink on a group of high blood pressure patients and measuring their blood pressure before and after using it for a specific period regularly

Null Hypothesis

Measuring blood pressure before using hibiscus is equal to
measuring blood pressure after use
(meaning there is no difference)

Alternative Hypothesis

Measuring blood pressure before using hibiscus is not equal to
measuring blood pressure after use
(meaning there is a difference)



Two-Sample Independent T test

A test to determine whether the means of two independent sets of data (a population) are equal or not

An example of a change in the average score of male students compared to female students

Example: The following data represents the number of absences for two groups of students, divided into males and females

Male	Female
0	0
0	2
1	5
2	4
1	2
0	8
0	1
1	5
2	2
1	3

Null Hypothesis

The average absence times for males is equal to the average absence times for females (meaning there is no difference)

Alternative Hypothesis

The average absence times for males is not equal to the average absence times for females
(meaning there is a difference)

SPSS Data Editor interface showing the Variable View for a variable named "Gender". The variable is set to Numeric (8 digits, 2 decimals), with a missing value of None. The Measure is set to Nominal. A "Value Labels" dialog box is open, showing the mapping: 1.00 = "Male" and 2.00 = "Female". The OK button is highlighted.

SPSS Data Editor - *Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Value Labels

Value Labels

Value:

Label:

1.00 = "Male"

2.00 = "Female"

OK Cancel Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	8	2		None	None	8	Right	Nominal	Input
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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37											
38											
39											

Data View Variable View

Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	8	2		{1.00, Male}...	None	8	Right	Nominal	Input
2	Absent	Numeric	8	2		None	None	8	Right	Scale	Input
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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36											
37											
38											
39											

Data View Variable View

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

20 : Absent 3.00

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																	
2	1.00	.00																	
3	1.00	1.00																	
4	1.00	2.00																	
5	1.00	1.00																	
6	1.00	.00																	
7	1.00	.00																	
8	1.00	1.00																	
9	1.00	2.00																	
10	1.00	1.00																	
11	2.00	.00																	
12	2.00	2.00																	
13	2.00	5.00																	
14	2.00	4.00																	
15	2.00	2.00																	
16	2.00	8.00																	
17	2.00	1.00																	
18	2.00	5.00																	
19	2.00	2.00																	
20	2.00	3.00																	
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28																			
29																			
30																			
31																			
32																			
33																			
34																			
35																			
36																			
37																			

Data View Variable View

IBM SPSS Statistics

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

20 : Absent 3.00

	Gender	Absent
1	1.00	0.00
2	1.00	0.00
3	1.00	1.00
4	1.00	2.00
5	1.00	1.00
6	1.00	0.00
7	1.00	0.00
8	1.00	1.00
9	1.00	2.00
10	1.00	1.00
11	2.00	0.00
12	2.00	2.00
13	2.00	5.00
14	2.00	4.00
15	2.00	2.00
16	2.00	8.00
17	2.00	1.00
18	2.00	5.00
19	2.00	2.00
20	2.00	3.00
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37		

1

Analyze menu options:

- Reports
- Descriptive Statistics
- Tables
 - Compare Means**
 - Means...
 - One-Sample T Test...
 - Independent-Samples T Test...**
 - Paired-Samples T Test...
 - One-Way ANOVA...
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
 - Multiple Imputation
 - Complex Samples
 - Quality Control
- ROC Curve...

Data View Variable View

Independent-Samples T Test... IBM SPSS Statist...

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

20 : Absent 3.00

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																	
2	1.00	.00																	
3	1.00	1.00																	
4	1.00	2.00																	
5	1.00	1.00																	
6	1.00	.00																	
7	1.00	.00																	
8	1.00	1.00																	
9	1.00	2.00																	
10	1.00	1.00																	
11	2.00	.00																	
12	2.00	2.00																	
13	2.00	5.00																	
14	2.00	4.00																	
15	2.00	2.00																	
16	2.00	8.00																	
17	2.00	1.00																	
18	2.00	5.00																	
19	2.00	2.00																	
20	2.00	3.00																	
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36																			
37																			

Independent-Samples T Test

Test Variable(s):

Dependent Variable

Options Bootstrap...

Grouping Variable:

Define Groups...

OK Paste Reset Cancel Help

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

20 : Absent 3.00

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																	
2	1.00	.00																	
3	1.00	1.00																	
4	1.00	2.00																	
5	1.00	1.00																	
6	1.00	.00																	
7	1.00	.00																	
8	1.00	1.00																	
9	1.00	2.00																	
10	1.00	1.00																	
11	2.00	.00																	
12	2.00	2.00																	
13	2.00	5.00																	
14	2.00	4.00																	
15	2.00	2.00																	
16	2.00	8.00																	
17	2.00	1.00																	
18	2.00	5.00																	
19	2.00	2.00																	
20	2.00	3.00																	
21																			
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35																			
36																			
37																			

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Data View Variable View

IBM SPSS Statistics

Independent-Samples T Test

Test Variable(s): Absent

Gender

Grouping Variable

Independent Variable

Options... Bootstrap...

Define Groups... OK Paste Reset Cancel Help

SPSS Statistics Data Editor window showing a dataset with 20 rows and 20 columns. The first two columns are labeled 'Gender' and 'Absent'. The 'Absent' column contains values ranging from 0.00 to 8.00. The 'Gender' column contains values 1.00 and 2.00. The 20th row is highlighted in yellow, showing Gender = 2.00 and Absent = 3.00.

An 'Independent-Samples T Test' dialog box is open, showing the following settings:

- Test Variable(s): Absent
- Grouping Variable: Gender(2.0)
- Buttons: Options..., Bootstrap..., Define Groups..., OK, Paste, Reset, Cancel, Help

The 'Define Groups...' button is highlighted with a red rectangle. The 'OK' button is also highlighted with a red rectangle.

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																	
2	1.00	.00																	
3	1.00	1.00																	
4	1.00	2.00																	
5	1.00	1.00																	
6	1.00	.00																	
7	1.00	.00																	
8	1.00	1.00																	
9	1.00	2.00																	
10	1.00	1.00																	
11	2.00	.00																	
12	2.00	2.00																	
13	2.00	5.00																	
14	2.00	4.00																	
15	2.00	2.00																	
16	2.00	8.00																	
17	2.00	1.00																	
18	2.00	5.00																	
19	2.00	2.00																	
20	2.00	3.00																	
21																			
22																			
23																			
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28																			
29																			
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31																			
32																			
33																			
34																			
35																			
36																			
37																			

SPSS Statistics Data Editor window showing a dataset with 20 rows and 20 columns. The first two columns are labeled 'Gender' and 'Absent'. The 'Absent' column contains values ranging from .00 to 3.00. A dialog box for 'Independent-Samples T Test' is open, with the 'Define Groups' sub-dialog box also open. The 'Define Groups' dialog shows 'Use specified values' selected, with 'Group 1' and 'Group 2' fields empty. The 'Cut point' field is also empty. The 'Options...' and 'Bootstrap...' buttons are visible in the 'Define Groups' dialog. The 'Independent-Samples T Test' dialog has 'OK', 'Paste', 'Reset', 'Cancel', and 'Help' buttons at the bottom.

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																	
2	1.00	.00																	
3	1.00	1.00																	
4	1.00	2.00																	
5	1.00	1.00																	
6	1.00	.00																	
7	1.00	.00																	
8	1.00	1.00																	
9	1.00	2.00																	
10	1.00	1.00																	
11	2.00	.00																	
12	2.00	2.00																	
13	2.00	5.00																	
14	2.00	4.00																	
15	2.00	2.00																	
16	2.00	8.00																	
17	2.00	1.00																	
18	2.00	5.00																	
19	2.00	2.00																	
20	2.00	3.00																	
21																			
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24																			
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32																			
33																			
34																			
35																			
36																			
37																			

IBM SPSS Statistics Data Editor window showing a dataset named "Untitled1 [DataSet0]". The dataset has two variables: "Gender" and "Absent". The "Absent" variable has a value of 3.00 for the 20th case, which is highlighted in yellow.

The "Independent-Samples T Test" dialog box is open, showing the "Define Groups" sub-dialog. The "Use specified values" radio button is selected. The "Group 1" field contains the value 1, and the "Group 2" field contains the value 2. The "Cut point" field is empty. The "Options..." and "Bootstrap..." buttons are visible on the right side of the dialog box.

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																		
2	1.00	.00																		
3	1.00	1.00																		
4	1.00	2.00																		
5	1.00	1.00																		
6	1.00	.00																		
7	1.00	.00																		
8	1.00	1.00																		
9	1.00	2.00																		
10	1.00	1.00																		
11	2.00	.00																		
12	2.00	2.00																		
13	2.00	5.00																		
14	2.00	4.00																		
15	2.00	2.00																		
16	2.00	8.00																		
17	2.00	1.00																		
18	2.00	5.00																		
19	2.00	2.00																		
20	2.00	3.00																		
21																				
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29																				
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31																				
32																				
33																				
34																				
35																				
36																				
37																				

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

20 : Absent 3.00

	Gender	Absent	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.00																	
2	1.00	.00																	
3	1.00	1.00																	
4	1.00	2.00																	
5	1.00	1.00																	
6	1.00	.00																	
7	1.00	.00																	
8	1.00	1.00																	
9	1.00	2.00																	
10	1.00	1.00																	
11	2.00	.00																	
12	2.00	2.00																	
13	2.00	5.00																	
14	2.00	4.00																	
15	2.00	2.00																	
16	2.00	8.00																	
17	2.00	1.00																	
18	2.00	5.00																	
19	2.00	2.00																	
20	2.00	3.00																	
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36																			
37																			

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Data View Variable View

Independent-Samples T Test

Test Variable(s):
Absent

Grouping Variable:
Gender(1 2)

OK Paste Reset Cancel Help

Options... Bootstrap...

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output
Log
T-Test
Title
Notes
Active Dataset
Group Statistics
Independent Sam

T-TEST GROUPS=Gender(1 2)
/MISSING=ANALYSIS
/VARIABLES=Absent
/CRITERIA=CI (.95) .

→ T-Test

[DataSet0]

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Absent	Male	10	.8000	.78881	.24944
	Female	10	3.2000	2.34758	.74237

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
Absent	Equal variances assumed	7.514	.013	-3.065	18	.007	-2.40000	.78316	-4.04535	-.75465
	Equal variances not assumed			-3.065	11.007	.011	-2.40000	.78316	-4.12359	-.67641

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
Absent	Equal variances assumed	7.514	.013	-3.065	18	.007	-2.40000	.78316	-4.04535	-.75465
	Equal variances not assumed			-3.065	11.007	.011	-2.40000	.78316	-4.12359	-.67641

Statistical decision

The resulting probability value of the test is 0.011, which is a value less than 0.05 (the level of significance). Therefore, we reject the null hypothesis that there is no difference between the average absence times of males and females, and we accept the alternative hypothesis that there is a difference between male absences from females.

Example: The following data represent the degrees of achievement of the students of the scientific division and students of the literary division of the statistics course in one of the secondary schools

literary	Scientific
85	80
60	65
90	70
65	55
70	90
75	85
95	60
55	75
90	95
70	50

Null Hypothesis

The average score of the students of a scientific division is equal
to the average score of a literary division
(meaning there is no difference)

Alternative Hypothesis

The average score of the students of a scientific division is not
equal to the average score of a literary division
(there is a difference)

*Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Value Labels

Value:

Label:

Add Change Remove

Spelling...

OK Cancel Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Department	Numeric	8	2		None	None	8	Right	Nominal	Input
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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39											

Data View Variable View

Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor*

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Value Labels

Value Labels

Value:

Label:

Add Change Remove

*خطي = 1.00
*الذي = 2.00

Spelling...

OK Cancel Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	8	2		{1.00, M}...	None	8	Right	Nominal	Input
2	Absent	Numeric	8	2		None	None	8	Right	Scale	Input
3											
4											
5											
6											
7											
8											
9											
10											
11											
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Data View Variable View

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Type here to search

6:15 AM
11/10/2019

Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor

FileEditViewDataTransformAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Department	Numeric	8	2		... إدارة ,1.00}	None	8	Right	Nominal	Input
2	Grades	Numeric	8	2		None	None	8	Right	Scale	Input
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Data View

Variable View

4: *

*Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor																			
File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help																			
4:																			
	Department	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	80.00																	
2	1.00	65.00																	
3	1.00	70.00																	
4	1.00	55.00																	
5	1.00	90.00																	
6	1.00	85.00																	
7	1.00	60.00																	
8	1.00	75.00																	
9	1.00	95.00																	
10	1.00	50.00																	
11	2.00	85.00																	
12	2.00	60.00																	
13	2.00	90.00																	
14	2.00	65.00																	
15	2.00	70.00																	
16	2.00	75.00																	
17	2.00	95.00																	
18	2.00	55.00																	
19	2.00	90.00																	
20	2.00	70.00																	
21																			
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Data View Variable View																			
IBM SPSS Statistics																			

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
Grades	Equal variances assumed	.083	.776	-.463	18	.649	-3.00000	6.48503	-16.62453	10.62453
	Equal variances not assumed			-.463	17.856	.649	-3.00000	6.48503	-16.63242	10.63242

Statistical decision

The resulting probabilistic value of the test is 0.649, which is a value greater than 0.05 (the level of significance), so we accept the null hypothesis that there is no difference between the average scores of students of a scientific division from the average scores of students of a literary division in the statistics course

The problem arises when there are more than two groups and we want to identify the differences between them We'll have to compare two groups at a time, So if we had 4 groups we would have to make 6 comparisons A&B - A&C - A&D - B&C - B&D - C&D Thus, the probability of error increases

One Way Anova

A test to determine whether the mean of several independent sets of data is equal or not

Note that the previous t-test is conducted between two groups only

The idea of the variance test is that the groups represent one community, and therefore the total variance of the groups can be calculated once and the variance test once

Null hypothesis : Means equal (no differences)

Alternative hypothesis: Means are not equal (there are differences)

Example: The following data represent the scores of three groups of students in the Applied Criminal Statistics course, and it is required to determine whether the averages of the students' scores in the three groups are equal or not?

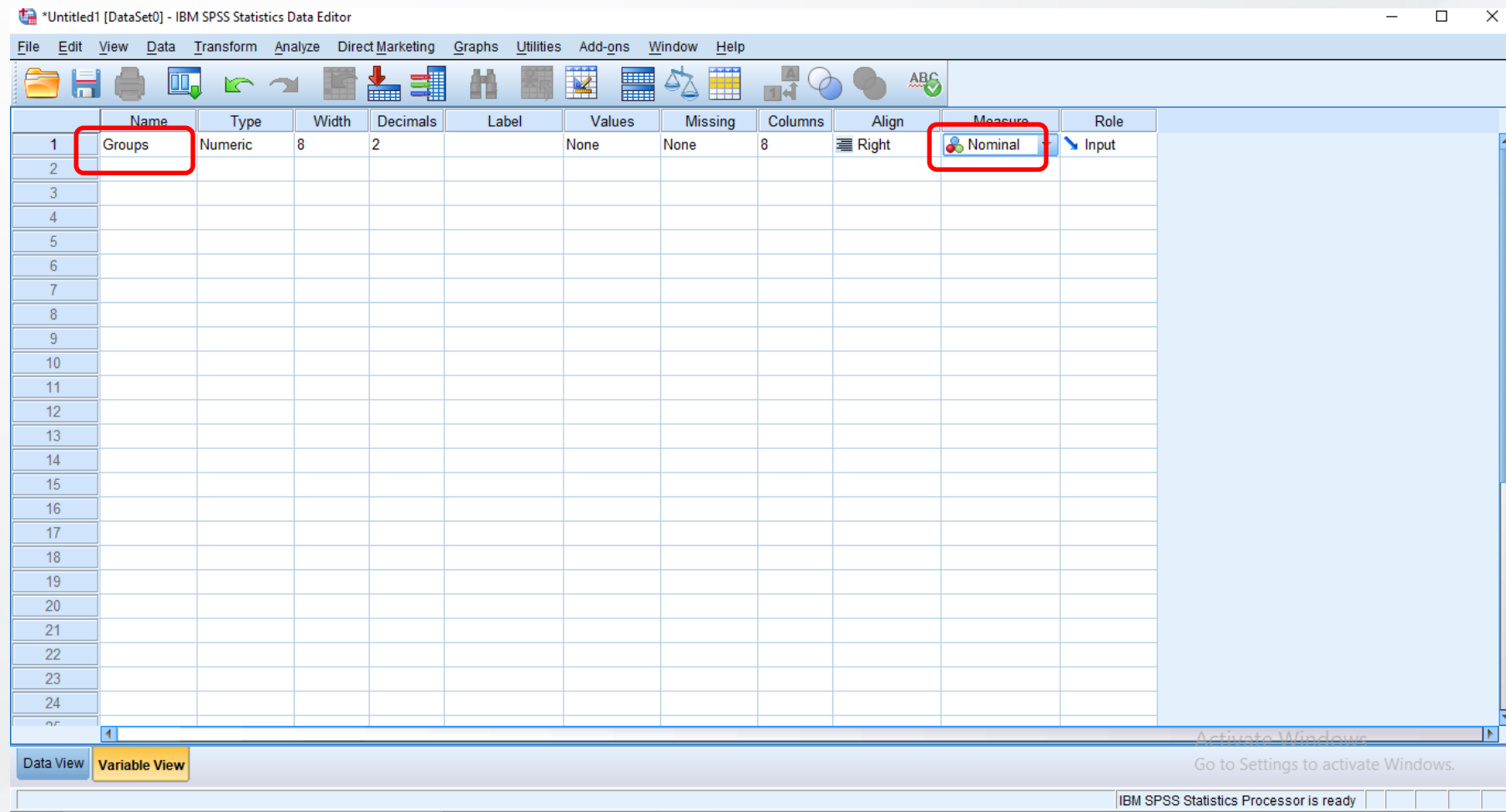
المجموعة الثالثة G3	المجموعة الثانية G2	المجموعة الأولى G1
70	80	75
72	82	77
74	84	79
76	86	81
78	88	83

Null Hypothesis

The averages of the three groups are equal
(there is no difference)

Alternative Hypothesis

The averages of the three groups are not
equal (there is difference)



IBM SPSS Statistics Data Editor window showing the Variable View for a dataset named "Untitled1 [DataSet0]". The Variable View displays the following variables:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Groups	Numeric	8	2		... المجموعة, 1.0	None	8	Right	Nominal	Input
2	Grades	Numeric	8	2		None	None	8	Right	Scale	Input

The "Values" column for the "Groups" variable is highlighted with a red box. A "Value Labels" dialog box is open, showing the following labels:

- 1.00 = "Group 1"
- 2.00 = "Group 2"
- 3.00 = "Group 3"

The labels are listed in a box, and the "Add" button is highlighted with a red box. The dialog box also includes fields for "Value:" and "Label:", a "Spelling..." button, and "OK", "Cancel", and "Help" buttons at the bottom.

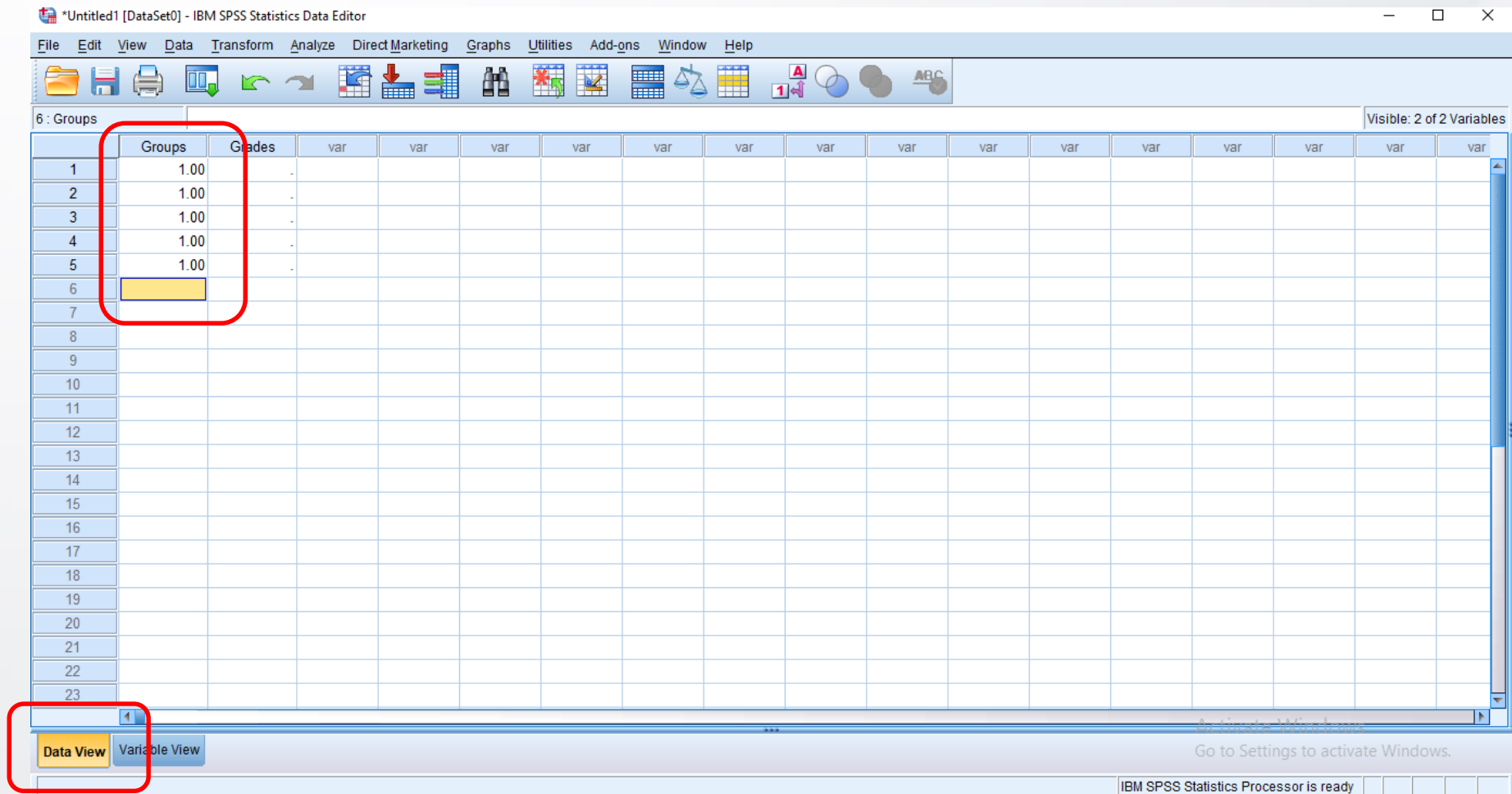
At the bottom of the window, the "Variable View" tab is selected. The status bar indicates "IBM SPSS Statistics Processor is ready".

IBM SPSS Statistics Data Editor window titled "Untitled1 [DataSet0]". The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with various icons for file operations, data manipulation, and analysis.

The main area displays the Variable View table, which defines the structure of the dataset. The table has columns for Name, Type, Width, Decimals, Label, Values, Missing, Columns, Align, Measure, and Role. Two variables are defined:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Groups	Numeric	8	2		... المجموعة , 1.0	None	8	Right	Nominal	Input
2	Grades	Numeric	8	2		None	None	8	Right	Scale	Input
3											
4											
5											
6											
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11											
12											
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The bottom of the window shows the "Data View" and "Variable View" tabs, with "Variable View" currently selected. A status bar at the bottom indicates "IBM SPSS Statistics Processor is ready".



*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 2 of 2 Variables

16 : Group

	Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	.															
2	1.00	.															
3	1.00	.															
4	1.00	.															
5	1.00	.															
6	2.00	.															
7	2.00	.															
8	2.00	.															
9	2.00	.															
10	2.00	.															
11	3.00	.															
12	3.00	.															
13	3.00	.															
14	3.00	.															
15	3.00	.															
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22																	
23																	

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window titled "Untitled1 [DataSet0]". The menu bar includes File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains icons for file operations, data manipulation, and analysis.

The data grid shows 23 rows and 18 columns. The first two columns are labeled "Groups" and "Grades". The remaining 16 columns are labeled "var". The data is as follows:

	Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	75.00															
2	1.00	77.00															
3	1.00	79.00															
4	1.00	81.00															
5	1.00	83.00															
6	2.00																
7	2.00	.															
8	2.00	.															
9	2.00	.															
10	2.00	.															
11	3.00	.															
12	3.00	.															
13	3.00	.															
14	3.00	.															
15	3.00	.															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

The status bar at the bottom indicates "Data View" is selected, "Variable View" is also available, and "IBM SPSS Statistics Processor is ready".

Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

15 : Grades 78.00 Visible: 2 of 2 Variables

	Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	75.00															
2	1.00	77.00															
3	1.00	79.00															
4	1.00	81.00															
5	1.00	83.00															
6	2.00	80.00															
7	2.00	82.00															
8	2.00	84.00															
9	2.00	86.00															
10	2.00	88.00															
11	3.00	70.00															
12	3.00	72.00															
13	3.00	74.00															
14	3.00	76.00															
15	3.00	78.00															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

15 : Grades 78.00

	Groups	Grades
1	1.00	76.0
2	1.00	77.0
3	1.00	79.0
4	1.00	81.0
5	1.00	83.0
6	2.00	80.0
7	2.00	82.0
8	2.00	84.0
9	2.00	86.0
10	2.00	88.0
11	3.00	70.0
12	3.00	72.0
13	3.00	74.0
14	3.00	76.0
15	3.00	78.0
16		
17		
18		
19		
20		
21		
22		
23		

Visible: 2 of 2 Variables

var var var var var var var var var

Analyze menu options:

- Descriptive Statistics
- Tables
- Compare Means**
 - Means...
 - One-Sample T Test...
 - Independent-Samples T Test...
 - Paired-Samples T Test...
 - One-Way ANOVA...**
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
- Multiple Imputation
- Complex Samples
- Quality Control
- ROC Curve...

Data View Variable View

One-Way ANOVA... IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 17 columns. The first two columns are 'Groups' and 'Grades'. The 'Grades' column contains values ranging from 70.00 to 88.00. A 'One-Way ANOVA' dialog box is open, with 'Groups' selected as the Factor and 'Grades' as the Dependent List. The dialog box includes buttons for 'Contrasts...', 'Post Hoc...', 'Options...', 'Bootstrap...', 'OK', 'Paste', 'Reset', 'Cancel', and 'Help'.

15 : Grades 78.00 Visible: 2 of 2 Variables

	Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	75.00															
2	1.00	77.00															
3	1.00	79.00															
4	1.00	81.00															
5	1.00	83.00															
6	2.00	80.00															
7	2.00	82.00															
8	2.00	84.00															
9	2.00	86.00															
10	2.00	88.00															
11	3.00	70.00															
12	3.00	72.00															
13	3.00	74.00															
14	3.00	76.00															
15	3.00	78.00															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

One-Way ANOVA

Groups
Grades

Dependent List:

Factor:

Contrasts...
Post Hoc...
Options...
Bootstrap...

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 2 variables: Groups and Grades. The data is as follows:

	Groups	Grades
1	1.00	75.00
2	1.00	77.00
3	1.00	79.00
4	1.00	81.00
5	1.00	83.00
6	2.00	80.00
7	2.00	82.00
8	2.00	84.00
9	2.00	86.00
10	2.00	88.00
11	3.00	70.00
12	3.00	72.00
13	3.00	74.00
14	3.00	76.00
15	3.00	78.00
16		
17		
18		
19		
20		
21		
22		
23		

The "One-Way ANOVA" dialog box is open, showing "Groups" as the factor and "Grades" as the dependent variable. The "Grades" variable is highlighted in the "Dependent List" box. The "Groups" variable is highlighted in the "Factor:" box. The "OK" button is highlighted.

IBM SPSS Statistics Processor is ready

SPSS One-Way ANOVA dialog box configuration:

- Dependent List: Grades
- Factor: Groups
- Buttons: Contrasts..., Post Hoc..., Options..., Bootstrap...

Background data table (Visible: 2 of 2 Variables):

	Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	75.00															
2	1.00	77.00															
3	1.00	79.00															
4	1.00	81.00															
5	1.00	83.00															
6	2.00	80.00															
7	2.00	82.00															
8	2.00	84.00															
9	2.00	86.00															
10	2.00	88.00															
11	3.00	70.00															
12	3.00	72.00															
13	3.00	74.00															
14	3.00	76.00															
15	3.00	78.00															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

15 : Grades 78.00 Visible: 2 of 2 Variables

	Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	75.00															
2	1.00	77.00															
3	1.00	79.00															
4	1.00	81.00															
5	1.00	83.00															
6	2.00	80.00															
7	2.00	82.00															
8	2.00	84.00															
9	2.00	86.00															
10	2.00	88.00															
11	3.00	70.00															
12	3.00	72.00															
13	3.00	74.00															
14	3.00	76.00															
15	3.00	78.00															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

One-Way ANOVA: Post Hoc Multiple Comparisons

Equal Variances Assumed

- ☐ LSD
- ☐ Bonferroni
- ☐ Sidak
- ☐ Scheffe
- ☐ R-E-G-W F
- ☐ R-E-G-W Q
- ☒ Tukey
- ☐ Tukey's-b
- ☐ Duncan
- ☐ Hochberg's GT2
- ☐ Gabriel
- ☐ Waller-Duncan
- Type I/Type II Error Ratio: 100
- ☐ Dunnett
- Control Category: Last
- Test
 - ☒ 2-sided
 - ☐ < Control
 - ☐ > Control

Equal Variances Not Assumed

- ☐ Tamhane's T2
- ☐ Dunnett's T3
- ☐ Games-Howell
- ☐ Dunnett's C

Significance level: 0.05

Continue Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first column is labeled 'Groups' and the second column is labeled 'Grades'. The data is as follows:

Groups	Grades	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	75.00															
2	1.00	77.00															
3	1.00	79.00															
4	1.00	81.00															
5	1.00	83.00															
6	2.00	80.00															
7	2.00	82.00															
8	2.00	84.00															
9	2.00	86.00															
10	2.00	88.00															
11	3.00	70.00															
12	3.00	72.00															
13	3.00	74.00															
14	3.00	76.00															
15	3.00	78.00															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

A dialog box titled "One-Way ANOVA: Post Hoc Multiple Comparisons" is open, showing options for "Equal Variances Assumed" and "Equal Variances Not Assumed". The "Continue" button is highlighted with a red rectangle.

Significance level: 0.05

Buttons: Continue, Cancel, Help

SPSS Statistics Viewer window showing the results of a One-way ANOVA test. The left sidebar shows the output tree with 'ANOVA' selected. The main area displays the ANOVA table and Post Hoc Tests results.

ANOVA

Grades	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	250.000	2	125.000	12.500	.001
Within Groups	120.000	12	10.000		
Total	370.000	14			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Grades

	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Group 1	Group 2	-5.00000	2.00000	.067	-10.3357	.3357
		Group 3	5.00000	2.00000	.067	-.3357	10.3357
	Group 2	Group 1	5.00000	2.00000	.067	-.3357	10.3357
		Group 3	10.00000*	2.00000	.001	4.6643	15.3357
Dunnett T3	Group 1	Group 2	-5.00000	2.00000	.099	-10.9160	.9160
		Group 3	5.00000	2.00000	.099	-.9160	10.9160
	Group 2	Group 1	5.00000	2.00000	.099	-.9160	10.9160

ANOVA

Grades

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	250.000	2	125.000	12.500	.001
Within Groups	120.000	12	10.000		
Total	370.000	14			

Statistical decision

The resulting probabilistic value of 0.001 is less than 0.05 (the level of significance), so we reject the null hypothesis that the average scores for the three groups are equal, and we accept the alternative hypothesis that the average scores of the three groups are unequal

Post Hoc tests

It remains to determine which of the groups results in statistical differences that are significant, in other words, which groups are the reason for the existence of the differences Tukey Test

*Output2 [Document2] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output Log Oneway Title Notes Active Dataset ANOVA Post Hoc Tests Title Multiple Com Homogeneous Subsets Grades

Total 370.000 14

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Grades

	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Group 1	Group 2	-5.00000	2.00000	.067	-10.3357	.3357
		Group 3	5.00000	2.00000	.067	-.3357	10.3357
	Group 2	Group 1	5.00000	2.00000	.067	-.3357	10.3357
		Group 3	10.00000*	2.00000	.001	4.6643	15.3357
	Group 3	Group 1	-5.00000	2.00000	.067	-10.3357	.3357
		Group 2	-10.00000*	2.00000	.001	-15.3357	-4.6643
Dunnett T3	Group 1	Group 2	-5.00000	2.00000	.099	-10.9160	.9160
		Group 3	5.00000	2.00000	.099	-.9160	10.9160
	Group 2	Group 1	5.00000	2.00000	.099	-.9160	10.9160
		Group 3	10.00000*	2.00000	.003	4.0840	15.9160
	Group 3	Group 1	-5.00000	2.00000	.099	-10.9160	.9160
		Group 2	-10.00000*	2.00000	.003	-15.9160	-4.0840

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Grades

Groups	N	Subset for alpha = 0.05	
		1	2

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Grades

			Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound				Upper Bound	
Tukey HSD	(I) Groups Group 1	(J) Groups Group 2	-5.00000	2.00000	.067	-10.3357	.3357
		Group 3	5.00000	2.00000	.067	-.3357	10.3357
	Group 2	Group 1	5.00000	2.00000	.067	-.3357	10.3357
		Group 3	10.00000*	2.00000	.001	4.6643	15.3357
	Group 3	Group 1	-5.00000	2.00000	.067	-10.3357	.3357
		Group 2	-10.00000*	2.00000	.001	-15.3357	-4.6643

Statistical decision

Looking at the results of the post-tests, we find that the resulting probabilistic value between the second group and the third group is 0.001 which is less than 0.05 (the level of significance), so we say that there are statistically significant differences between the second group and the third group, and that the differences between the rest of the groups are not statistically significant.

Nationality			Education level			
Egyptian	1		1	Less than Secondary		
Arab	2		2	Secondary		
foreigners	3		3	Graduate		
			4	Postgraduate		
Gender						
1	Male				City	
2	Female			1	Cairo	
				2	Alex	
				3	Aswan	
				4	Hurghada	

X1				X2			
1	Strongly Disagree			1	Strongly Disagree		
2	Disagree			2	Disagree		
3	Not Sure			3	Not Sure		
4	Agree			4	Agree		
5	Strongly Agree			5	Strongly Agree		
X1	Satisfication with place			X2	Satisfication with services		
X4				X3			
1	Strongly Disagree			1	Strongly Disagree		
2	Disagree			2	Disagree		
3	Not Sure			3	Not Sure		
4	Agree			4	Agree		
5	Strongly Agree			5	Strongly Agree		
X4	performance satisfaction			X3	Satisfaction with the employees		

Number	City	Gender	Education level	Nationality	X1	X2	X3	X4	
1	1	1	1	3	1	5	4	2	2
2	3	2	2	2	1	3	3	3	3
3	2	2	1	1	5	4	4	4	4
4	1	2	1	2	2	4	5	5	1
5	2	1	2	1	5	5	5	5	2
6	1	1	2	3	4	4	2	2	1
7	1	2	3	1	5	5	4	4	2
8	4	1	2	2	4	2	2	2	5
9	1	2	4	1	3	5	3	3	5
10	2	1	3	1	5	4	5	5	2
11	1	1	2	1	1	5	2	2	2
12	2	2	1	2	2	2	2	2	2
13	1	2	2	1	4	2	2	2	2
14	2	2	2	3	5	3	3	3	3
15	1	1	2	2	3	2	2	2	2
16	3	1	1	1	4	1	1	1	1
17	3	2	4	3	5	1	5	5	5
18	1	2	1	2	5	5	4	4	4
19	2	1	1	3	3	3	5	5	5
20	1	2	1	2	3	3	5	4	4
21	3	1	3	1	5	5	5	5	2
22	2	1	4	1	4	4	2	2	1
23	1	2	3	1	5	5	4	4	2
24	4	1	4	2	4	2	2	2	5
25	2	2	2	1	3	5	3	3	5
26	3	1	3	2	5	4	5	5	2
27	1	2	4	1	1	5	2	2	2
28	1	2	2	3	5	1	2	4	4
29	2	1	3	1	5	3	5	5	5
30	3	1	4	2	5	3	3	3	2

Study hypotheses test

- 1- There are no statistically significant differences at the significance level (0.05) between Satisfaction with place according to the variable (City - Gender - Educational level - Nationality).
- 2- There are no statistically significant differences at the significance level (0.05) between Satisfaction with services according to the variable (City - Gender - Educational level - Nationality).
- 3- There are no statistically significant differences at the significance level (0.05) between Performance Satisfaction according to the variable (City - Gender - Educational level - Nationality).
- 4- There are no statistically significant differences at the significance level (0.05) between Satisfaction with employees according to the variable (City - Gender - Educational level - Nationality).

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

29: q4 1.00 Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	4.00	1.00	5.00	4.00	2.00									
2	2.00	2.00	2.00	1.00	3.00	3.00	3.00									
3	1.00	2.00	1.00	1.00	5.00	4.00	4.00									
4	2.00	2.00	1.00	2.00	5.00	5.00	5.00									
5	1.00	1.00	2.00	1.00	1.00	5.00	5.00									
6	1.00	1.00	4.00	3.00	4.00	4.00	4.00									
7	1.00	2.00	4.00	1.00	4.00	4.00	4.00									
8	1.00	1.00	4.00	2.00	4.00	3.00	4.00									
9	1.00	2.00	4.00	1.00	5.00	5.00	5.00									
10	2.00	1.00	3.00	1.00	4.00	2.00	4.00									
11	1.00	2.00	2.00	1.00	2.00	2.00	2.00									
12	2.00	2.00	1.00	2.00	2.00	2.00	2.00									
13	1.00	1.00	1.00	3.00	2.00	2.00	2.00									
14	2.00	1.00	2.00	1.00	3.00	5.00	3.00									
15	1.00	1.00	2.00	3.00	3.00	5.00	3.00									
16	3.00	1.00	3.00	1.00	4.00	4.00	5.00									
17	2.00	1.00	4.00	3.00	5.00	5.00	5.00									
18	2.00	1.00	1.00	1.00	5.00	5.00	4.00									
19	2.00	1.00	1.00	2.00	2.00	4.00	5.00									
20	1.00	2.00	2.00	2.00	3.00	3.00	3.00									
21	4.00	2.00	1.00	3.00	3.00	2.00	3.00									
22	1.00	1.00	4.00	2.00	4.00	4.00	3.00									
23	2.00	1.00	1.00	3.00	5.00	3.00	5.00									

Data View Variable View

IBM SPSS Statistics Processor is ready

*25-6-2021.sav [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 8 of 8 Variables

	Q1	Q2	Q3	Q4	X1	X2	X3	X4	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	4.00	2.00	2.00										
2	1.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00										
3	1.00	2.00	1.00	2.00	5.00	4.00	4.00	4.00										
4	2.00	2.00	1.00	1.00	4.00	5.00	5.00	1.00										
5	1.00	1.00	2.00	2.00	5.00	5.00	5.00	2.00										
6	3.00	1.00	2.00	1.00	4.00	4.00	2.00	1.00										
7	1.00	2.00	3.00	1.00	5.00	5.00	4.00	2.00										
8	2.00	1.00	2.00	4.00	4.00	2.00												
9	1.00	2.00	4.00	1.00	3.00	5.00												
10	1.00	1.00	3.00	2.00	5.00	4.00												
11	1.00	1.00	2.00	1.00	1.00	5.00												
12	2.00	2.00	1.00	2.00	2.00	2.00												
13	1.00	2.00	2.00	1.00	4.00	2.00												
14	3.00	2.00	2.00	2.00	2.00	5.00	3.00											
15	2.00	1.00	2.00	1.00	3.00	2.00												
16	1.00	1.00	1.00	3.00	4.00	1.00												
17	3.00	2.00	4.00	3.00	5.00	1.00												
18	2.00	2.00	1.00	1.00	5.00	5.00												
19	3.00	1.00	1.00	2.00	3.00	3.00												
20	2.00	2.00	1.00	1.00	3.00	3.00	5.00	4.00										
21	1.00	1.00	3.00	3.00	5.00	5.00	5.00	2.00										
22	1.00	1.00	4.00	2.00	4.00	4.00	2.00	1.00										
23	1.00	2.00	3.00	1.00	5.00	5.00	4.00	2.00										
24	2.00	1.00	4.00	4.00	4.00	2.00	2.00	5.00										
25	1.00	2.00	2.00	2.00	3.00	5.00	3.00	5.00										
26	2.00	1.00	3.00	3.00	5.00	4.00	5.00	2.00										
27	1.00	2.00	4.00	1.00	5.00	2.00	2.00	2.00										
28	3.00	2.00	2.00	1.00	5.00	1.00	2.00	4.00										
29	1.00	1.00	3.00	2.00	5.00	3.00	5.00	5.00										

One-Way ANOVA

Dependent List:

Nationality [Q1]
Gender [Q2]
Education Level [Q3]
City [Q4]
Satisfaction with pl...
Satisfaction with se...
Performance satisfi...
Satisfaction with e...

Factor:

OK Paste Reset Cancel Help

Contrasts...
Post Hoc...
Options...
Bootstrap...

Data View Variable View

IBM SPSS Statistics Processor is ready

33°C Sunny 1:31 PM 6/23/2021

IBM SPSS Statistics Data Editor window showing a dataset with 29 rows and 18 columns. The columns are labeled Q1, Q2, Q3, Q4, X1, X2, X3, X4, and then 10 columns labeled 'var'. The data is displayed in a grid format.

A "One-Way ANOVA" dialog box is open, showing the "Dependent List" and "Factor" fields. The "Dependent List" contains "Satisfaction with pl...", "Satisfaction with se...", "Performance satisfi...", and "Satisfaction with e...". The "Factor" field contains "Gender [Q2]". A red box highlights the "Independent Variable" label, which is pointing to the "Gender [Q2]" factor.

The "One-Way ANOVA" dialog box also includes buttons for "Contrasts...", "Post Hoc...", "Options...", "Bootstrap...", "OK", "Paste", "Reset", "Cancel", and "Help".

The bottom of the window shows the "Data View" and "Variable View" tabs, and the Windows taskbar with the search bar and system tray.

IBM SPSS Statistics Data Editor window showing a dataset with 29 rows and 20 columns. The columns are labeled Q1, Q2, Q3, Q4, X1, X2, X3, X4, and then several 'var' columns. The data is displayed in a grid format.

The 'One-Way ANOVA' dialog box is open, showing the 'Dependent List' and 'Factor' sections. The 'Dependent List' contains 'Gender [Q2]', 'Education Level [Q3]', and 'City [Q4]'. The 'Factor' section contains 'Nationality [Q1]'. The 'OK' button is highlighted.

A red box highlights the 'Dependent Variables' section of the dialog box, which includes the 'Dependent List' and 'Factor' sections.

The Windows taskbar at the bottom shows the system clock as 1:36 PM on 6/23/2021, and the weather as 33°C Sunny.

IBM SPSS Statistics Data Editor window showing a dataset with 29 rows and 18 columns. The columns are labeled Q1, Q2, Q3, Q4, X1, X2, X3, X4, and seven unlabeled 'var' columns. The data is displayed in a grid view.

A "One-Way ANOVA" dialog box is open, showing the "Dependent List" and "Factor" sections. The "Dependent List" contains the following variables:

- Nationality [Q1]
- Education Level [Q3]
- City [Q4]

The "Factor" section contains the variable:

- Gender [Q2]

A red box highlights the "Independent Variable" label, which is pointing to the "Gender [Q2]" variable in the Factor list.

The bottom of the window shows the "Data View" tab selected, and the Windows taskbar at the bottom displays the system clock as 2:03 PM on 6/23/2021.

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

29 : q4 1.00 Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	4.00	1.00	5.00	4.00	2.00									
2	2.00	2.00	2.00	1.00	3.00	3.00	3.00									
3	1.00	2.00	1.00	1.00												
4	2.00	2.00	1.00	2.00												
5	1.00	1.00	2.00	1.00												
6	1.00	1.00	4.00	3.00												
7	1.00	2.00	4.00	1.00												
8	1.00	1.00	4.00	2.00												
9	1.00	2.00	4.00	1.00												
10	2.00	1.00	3.00	1.00												
11	1.00	2.00	2.00	1.00												
12	2.00	2.00	1.00	2.00												
13	1.00	1.00	1.00	3.00												
14	2.00	1.00	2.00	1.00												
15	1.00	1.00	2.00	3.00												
16	3.00	1.00	3.00	1.00												
17	2.00	1.00	4.00	3.00												
18	2.00	1.00	1.00	1.00												
19	2.00	1.00	1.00	2.00	2.00	4.00	5.00									
20	1.00	2.00	2.00	2.00	3.00	3.00	3.00									
21	4.00	2.00	1.00	3.00	3.00	2.00	3.00									
22	1.00	1.00	4.00	2.00	4.00	4.00	3.00									
23	2.00	1.00	1.00	3.00	5.00	3.00	5.00									

One-Way ANOVA: Post Hoc Multiple Comparisons

Equal Variances Assumed

- ☐ LSD
- ☐ Bonferroni
- ☐ Sidak
- ☐ Scheffe
- ☐ R-E-G-W F
- ☐ R-E-G-W Q
- ☐ S-N-K
- ☒ Tukey
- ☐ Tukey's-b
- ☐ Duncan
- ☐ Hochberg's GT2
- ☐ Gabriel
- ☐ Waller-Duncan
- ☐ Dunnett

Type I/Type II Error Ratio: 100

Control Category: Last

Test

☒ 2-sided ☐ < Control ☐ > Control

Equal Variances Not Assumed

- ☐ Tamhane's T2
- ☐ Dunnett's T3
- ☐ Games-Howell
- ☐ Dunnett's C

Significance level: 0.05

Continue Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

29 : q4 1.00 Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	4.00	1.00	5.00	4.00	2.00										
2	2.00	2.00	2.00	1.00	3.00	3.00	3.00										
3	1.00	2.00	1.00	1.00													
4	2.00	2.00	1.00	2.00													
5	1.00	1.00	2.00	1.00													
6	1.00	1.00	4.00	3.00													
7	1.00	2.00	4.00	1.00													
8	1.00	1.00	4.00	2.00													
9	1.00	2.00	4.00	1.00													
10	2.00	1.00	3.00	1.00													
11	1.00	2.00	2.00	1.00													
12	2.00	2.00	1.00	2.00													
13	1.00	1.00	1.00	3.00													
14	2.00	1.00	2.00	1.00													
15	1.00	1.00	2.00	3.00													
16	3.00	1.00	3.00	1.00													
17	2.00	1.00	4.00	3.00													
18	2.00	1.00	1.00	1.00													
19	2.00	1.00	1.00	2.00	2.00	4.00	5.00										
20	1.00	2.00	2.00	2.00	3.00	3.00	3.00										
21	4.00	2.00	1.00	3.00	3.00	2.00	3.00										
22	1.00	1.00	4.00	2.00	4.00	4.00	3.00										
23	2.00	1.00	1.00	3.00	5.00	3.00	5.00										

One-Way ANOVA: Post Hoc Multiple Comparisons

Equal Variances Assumed

☐ LSD ☐ S-N-K ☐ Waller-Duncan
☐ Bonferroni ☒ Tukey Type I/Type II Error Ratio: 100
☐ Sidak ☐ Tukey's-b ☐ Dunnett
☐ Scheffe ☐ Duncan Control Category: Last
☐ R-E-G-W F ☐ Hochberg's GT2 Test
☐ R-E-G-W Q ☐ Gabriel ☒ 2-sided ☐ < Control ☐ > Control

Equal Variances Not Assumed

☐ Tamhane's T2 ☐ Dunnett's T3 ☐ Games-Howell ☐ Dunnett's C

Significance level: 0.05

Continue Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Oneway
 - Title
 - Notes
 - Active Dataset
 - ANOVA
 - Post Hoc Tests
 - Title
 - Multiple Com
 - Homogeneous
 - Satisfica
 - Satisfica
 - Performa
 - Satisfica
- Log
- Oneway
 - Title
 - Notes
 - Active Dataset
 - Warnings
 - ANOVA

ONEWAY X1 X2 X3 X4 BY Q2
/MISSING ANALYSIS
/POSTHOC=DUKEY ALPHA(0.05).

➔ Oneway

[DataSet2] C:\Users\Dr.A1 Faisal\Documents\25-6-2021.sav

Warnings

Post hoc tests are not performed for Satisfaction with place because there are fewer than three groups.
Post hoc tests are not performed for Satisfaction with services because there are fewer than three groups.
Post hoc tests are not performed for Performance satisfaction because there are fewer than three groups.
Post hoc tests are not performed for Satisfaction with employees because there are fewer than three groups.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with place	Between Groups	.533	1	.533	.360	.553
	Within Groups	41.467	28	1.481		
	Total	42.000	29			
Satisfaction with services	Between Groups	.300	1	.300	.152	.699
	Within Groups	55.200	28	1.971		
	Total	55.500	29			
Performance satisfaction	Between Groups	.300	1	.300	.162	.691
	Within Groups	52.000	28	1.857		
	Total	52.300	29			
Satisfaction with employees	Between Groups	2.700	1	2.700	1.303	.263
	Within Groups	58.000	28	2.071		
	Total	60.700	29			

IBM SPSS Statistics Processor is ready

Type here to search

33°C Sunny 2:11 PM 6/23/2021

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Satisfication with place	Between Groups	.533	1	.533	.360	.553
	Within Groups	41.467	28	1.481		
	Total	42.000	29			
Satisfication with services	Between Groups	.300	1	.300	.152	.699
	Within Groups	55.200	28	1.971		
	Total	55.500	29			
Performance satisfication	Between Groups	.300	1	.300	.162	.691
	Within Groups	52.000	28	1.857		
	Total	52.300	29			
Satisfication with employees	Between Groups	2.700	1	2.700	1.303	.263
	Within Groups	58.000	28	2.071		
	Total	60.700	29			

Study hypotheses test

Gender

	Question	Significance	Statistical decision
1	Satisfaction with place	0.553	Not statistically significant
2	Satisfaction with services	0.699	Not statistically significant
3	Performance Satisfaction	0.691	Not statistically significant
4	Satisfaction with employees	0.263	Not statistically significant

IBM SPSS Statistics Data Editor window showing a dataset with 29 rows and 20 columns. The columns are labeled Q1, Q2, Q3, Q4, X1, X2, X3, X4, and then 12 columns labeled 'var'. The data is displayed in a grid format.

A "One-Way ANOVA" dialog box is open, showing the following configuration:

- Dependent List:** Satisfaction with pl..., Satisfaction with se..., Performance satisfi..., Satisfaction with e...
- Factor:** Nationality [Q1]
- Buttons:** Contrasts..., Post Hoc..., Options..., Bootstrap...

A red box highlights the text "Independent Variable" with an arrow pointing to the "Factor" field in the dialog box.

The bottom of the window shows the "Data View" tab selected, and the Windows taskbar at the bottom displays the system clock as 1:36 PM on 6/23/2021.

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output Log Oneway Title Notes Active Dataset ANOVA Post Hoc Tests Title Multiple Comparisons Homogeneous Title Satisfaction Satisfaction Performance Satisfaction

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with place	Between Groups	.974	2	.487	.320	.729
	Within Groups	41.026	27	1.519		
	Total	42.000	29			
Satisfaction with services	Between Groups	12.474	2	6.237	3.914	.032
	Within Groups	43.026	27	1.594		
	Total	55.500	29			
Performance satisfaction	Between Groups	.100	2	.050	.026	.974
	Within Groups	52.200	27	1.933		
	Total	52.300	29			
Satisfaction with employees	Between Groups	3.750	2	1.875	.889	.423
	Within Groups	56.950	27	2.109		
	Total	60.700	29			

Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Nationality	(J) Nationality	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Satisfaction with place	Egyptian	Arab	.04861	.51362	.995	-1.2249	1.3221	
		Foreigners	-.46250	.63156	.747	-2.0284	1.1034	
		Arab	-.04861	.51362	.995	-1.3221	1.2249	
		Foreigners	-.51111	.68756	.740	-2.2158	1.1936	
	Foreigners	Egyptian	.46250	.63156	.747	-1.1034	2.0284	
		Arab	.51111	.68756	.740	-1.1936	2.2158	
		Satisfaction with services	Egyptian	.95139	.52599	.186	-.3528	2.2555
			Foreigners	1.66250*	.64677	.041	.0589	3.2661
Arab	Egyptian		-.95139	.52599	.186	-2.2555	.3528	
	Foreigners		.71111	.70411	.577	-1.0347	2.4569	
Foreigners	Egyptian	-1.66250*	.64677	.041	-3.2661	-.0589		
	Arab	-.71111	.70411	.577	-2.4569	1.0347		
	Performance satisfaction	Egyptian	-.08333	.57935	.989	-1.5198	1.3531	
		Arab						

IBM SPSS Statistics Processor is ready

Type here to search

33°C Sunny 1:40 PM 6/23/2021

Less than 0.05 (the level of significance)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with place	Between Groups	.974	2	.487	.320	.729
	Within Groups	41.026	27	1.519		
	Total	42.000	29			
Satisfaction with services	Between Groups	12.474	2	6.237	3.914	.032
	Within Groups	43.026	27	1.594		
	Total	55.500	29			
Performance satisfaction	Between Groups	.100	2	.050	.026	.974
	Within Groups	52.200	27	1.933		
	Total	52.300	29			
Satisfaction with employees	Between Groups	3.750	2	1.875	.889	.423
	Within Groups	56.950	27	2.109		
	Total	60.700	29			

Study hypotheses test

Nationality

	Question	Significance	Statistical decision
1	Satisfaction with place	0.729	Not statistically significant
2	Satisfaction with services	0.032	Statistically significant
3	Performance Satisfaction	0.974	Not statistically significant
4	Satisfaction with employees	0.423	Not statistically significant

Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Nationality	(J) Nationality	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Satisfaction with place	Egyptian	Arab	.04861	.51362	.995	-1.2249	1.3221
		Foreigners	-.46250	.63156	.747	-2.0284	1.1034
	Arab	Egyptian	-.04861	.51362	.995	-1.3221	1.2249
		Foreigners	-.51111	.68756	.740	-2.2158	1.1936
	Foreigners	Egyptian	.46250	.63156	.747	-1.1034	2.0284
		Arab	.51111	.68756	.740	-1.1936	2.2158
Satisfaction with services	Egyptian	Arab	.95139	.52599	.186	-.3528	2.2555
		Foreigners	1.66250*	.64677	.041	.0589	3.2661
	Arab	Egyptian	-.95139	.52599	.186	-2.2555	.3528
		Foreigners	.71111	.70411	.577	-1.0347	2.4569
	Foreigners	Egyptian	-1.66250*	.64677	.041	-3.2661	-.0589
		Arab	-.71111	.70411	.577	-2.4569	1.0347
Performance satisfaction	Egyptian	Arab	-.08333	.57935	.989	-1.5198	1.3531
		Foreigners	-.15000	.71239	.976	-1.9163	1.6163

Statistical decision

Looking at the results of the post-tests of the satisfaction with services, we find that the resulting probabilistic value between the respondents with Egyptian and those with Foreigners is 0.041, which is less than 0.05 (the level of significance), so we say that there are statistically significant differences between the respondents with Egyptian and those with Foreigners and that The differences between the rest of the respondents are not statistically significant

IBM SPSS Statistics Data Editor window showing a dataset with 29 rows and 20 columns. The columns are labeled Q1, Q2, Q3, Q4, X1, X2, X3, X4, and 12 empty columns labeled 'var'. The data is displayed in a grid view.

The 'One-Way ANOVA' dialog box is open, showing the 'Dependent List' and 'Factor' sections. The 'Dependent List' contains 'Satisfaction with pl...', 'Satisfaction with se...', 'Performance satisfi...', and 'Satisfaction with e...'. The 'Factor' section contains 'Education Level [Q3]'. A red box highlights the 'Education Level [Q3]' factor, with the text 'Independent Variable' written next to it.

The 'Data View' tab is selected at the bottom of the window.

	Q1	Q2	Q3	Q4	X1	X2	X3	X4	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	3.00	1.00	5.00	4.00	2.00	2.00											
2	1.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00											
3	1.00	2.00	1.00	2.00	5.00	4.00	4.00	4.00											
4	2.00	2.00	1.00	1.00	4.00	5.00	5.00	1.00											
5	1.00	1.00	2.00	2.00	5.00	5.00	5.00	2.00											
6	3.00	1.00	2.00	1.00	4.00	4.00	2.00	1.00											
7	1.00	2.00	3.00	1.00	5.00	5.00	4.00	2.00											
8	2.00	1.00	2.00	4.00	4.00	2.00													
9	1.00	2.00	4.00	1.00	3.00	5.00													
10	1.00	1.00	3.00	2.00	5.00	4.00													
11	1.00	1.00	2.00	1.00	1.00	5.00													
12	2.00	2.00	1.00	2.00	2.00	2.00													
13	1.00	2.00	2.00	1.00	4.00	2.00													
14	3.00	2.00	2.00	2.00	5.00	3.00													
15	2.00	1.00	2.00	1.00	3.00	2.00													
16	1.00	1.00	1.00	3.00	4.00	1.00													
17	3.00	2.00	4.00	3.00	5.00	1.00													
18	2.00	2.00	1.00	1.00	5.00	5.00													
19	3.00	1.00	1.00	2.00	3.00	3.00													
20	2.00	2.00	1.00	1.00	3.00	3.00	5.00	4.00											
21	1.00	1.00	3.00	3.00	5.00	5.00	5.00	2.00											
22	1.00	1.00	4.00	2.00	4.00	4.00	2.00	1.00											
23	1.00	2.00	3.00	1.00	5.00	5.00	4.00	2.00											
24	2.00	1.00	4.00	4.00	4.00	2.00	2.00	5.00											
25	1.00	2.00	2.00	2.00	3.00	5.00	3.00	5.00											
26	2.00	1.00	3.00	3.00	5.00	4.00	5.00	2.00											
27	1.00	2.00	4.00	1.00	1.00	5.00	2.00	2.00											
28	3.00	2.00	2.00	1.00	5.00	1.00	2.00	4.00											
29	1.00	1.00	3.00	2.00	5.00	3.00	5.00	5.00											

IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output Log Oneway Title Notes Active Dataset ANOVA Post Hoc Tests Title Multiple Comparison Homogeneity of Variance

Oneway

[DataSet2] C:\Users\Dr.Al Faisal\Documents\25-6-2021.sav

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with place	Between Groups	9.138	3	3.046	2.410	.090
	Within Groups	32.862	26	1.264		
	Total	42.000	29			
Satisfaction with services	Between Groups	5.710	3	1.903	.994	.411
	Within Groups	49.790	26	1.915		
	Total	55.500	29			
Performance satisfaction	Between Groups	14.210	3	4.737	3.233	.039
	Within Groups	38.090	26	1.465		
	Total	52.300	29			
Satisfaction with employees	Between Groups	2.752	3	.917	.412	.746
	Within Groups	57.948	26	2.229		
	Total	60.700	29			

Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Education Level	(J) Education Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Satisfaction with place	Less than Secondary	Secondary	.01429	.55403	1.000	-1.5056	1.5342
		Graduate	-1.28571	.60093	.167	-2.9343	.3628
		Postgraduate	.04762	.62547	1.000	-1.6682	1.7635
	Secondary	Less than Secondary	-.01429	.55403	1.000	-1.5342	1.5056
		Graduate	-1.30000	.55403	.113	-2.8199	.2199
		Postgraduate	.03333	.58056	1.000	-1.5593	1.6260
Graduate	Less than Secondary	1.28571	.60093	.167	-.3628	2.9343	
	Secondary	1.30000	.55403	.113	-.2199	2.8199	

IBM SPSS Statistics Processor is ready

Type here to search

33°C Sunny 2:21 PM 6/23/2021

Less than 0.05 (the level of significance)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Satisfaction with place	Between Groups	9.138	3	3.046	2.410	.090
	Within Groups	32.862	26	1.264		
	Total	42.000	29			
Satisfaction with services	Between Groups	5.710	3	1.903	.994	.411
	Within Groups	49.790	26	1.915		
	Total	55.500	29			
Performance satisfaction	Between Groups	14.210	3	4.737	3.233	.039
	Within Groups	38.090	26	1.465		
	Total	52.300	29			
Satisfaction with employees	Between Groups	2.752	3	.917	.412	.746
	Within Groups	57.948	26	2.229		
	Total	60.700	29			

Study hypotheses test

Educational Level

	Question	Significance	Statistical decision
1	Satisfaction with place	0.09	Not statistically significant
2	Satisfaction with services	0.411	Not statistically significant
3	Performance Satisfaction	0.039	Statistically significant
4	Satisfaction with employees	0.746	Not statistically significant

		Graduate	.88238	.76938	.818	.8849	.71937
Performance satisfaction	Less than Secondary	Secondary	1.11429	.59648	.266	-.5221	2.7506
		Graduate	-.57143	.64698	.813	-2.3463	1.2034
		Postgraduate	.88095	.67339	.566	-.9664	2.7283
	Secondary	Less than Secondary	-1.11429	.59648	.266	-2.7506	.5221
		Graduate	-1.68571*	.59648	.042	-3.3221	-.0494
		Postgraduate	-.23333	.62504	.982	-1.9480	1.4813
	Graduate	Less than Secondary	.57143	.64698	.813	-1.2034	2.3463
		Secondary	1.68571*	.59648	.042	.0494	3.3221
		Postgraduate	1.45238	.67339	.162	-.3950	3.2997
	Postgraduate	Less than Secondary	-.88095	.67339	.566	-2.7283	.9664
		Secondary	.23333	.62504	.982	-1.4813	1.9480
		Graduate	-1.45238	.67339	.162	-3.2997	.3950
Satisfaction with employees	Less than Secondary	Secondary	.10000	.73571	.999	-1.9183	2.1183
		Graduate	.57143	.76700	.999	-1.6177	2.7606

Statistical decision

Looking at the results of the post-tests of the performance satisfaction, we find that the resulting probabilistic value between the respondents with Secondary level students and those with Graduate is 0.039, which is less than 0.05 (the level of significance), so we say that there are statistically significant differences between the respondents Secondary level students and those with Graduate and that The differences between the rest of the respondents are not statistically significant

Study hypotheses test

City

	Question	Significance	Statistical decision
1	Satisfaction with place	0.603	Not statistically significant
2	Satisfaction with services	0.164	Not statistically significant
3	Performance Satisfaction	0.256	Not statistically significant
4	Satisfaction with employees	0.109	Not statistically significant

Study hypotheses test

- 1- There are no statistically significant differences at the significance level (0.05) between Satisfaction with place according to the variable (City - Gender - Educational level - Nationality).
- 2- There are no statistically significant differences at the significance level (0.05) between Satisfaction with services according to the variable (City - Gender - Educational level). There are also statistically significant differences between Satisfaction with services according to Nationality variable, and this is due to the presence of differences between Egyptian and Foreigners .

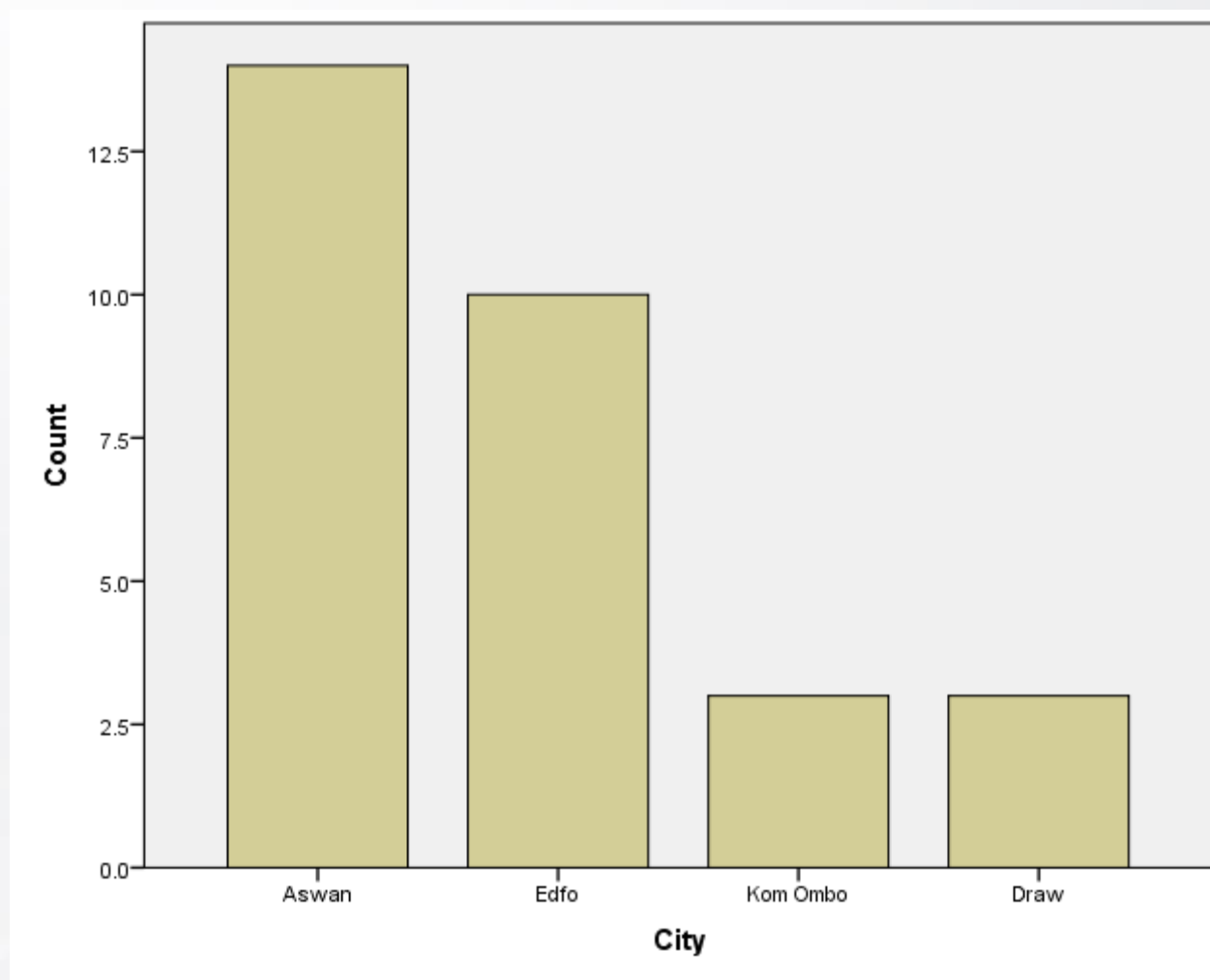
Study hypotheses test

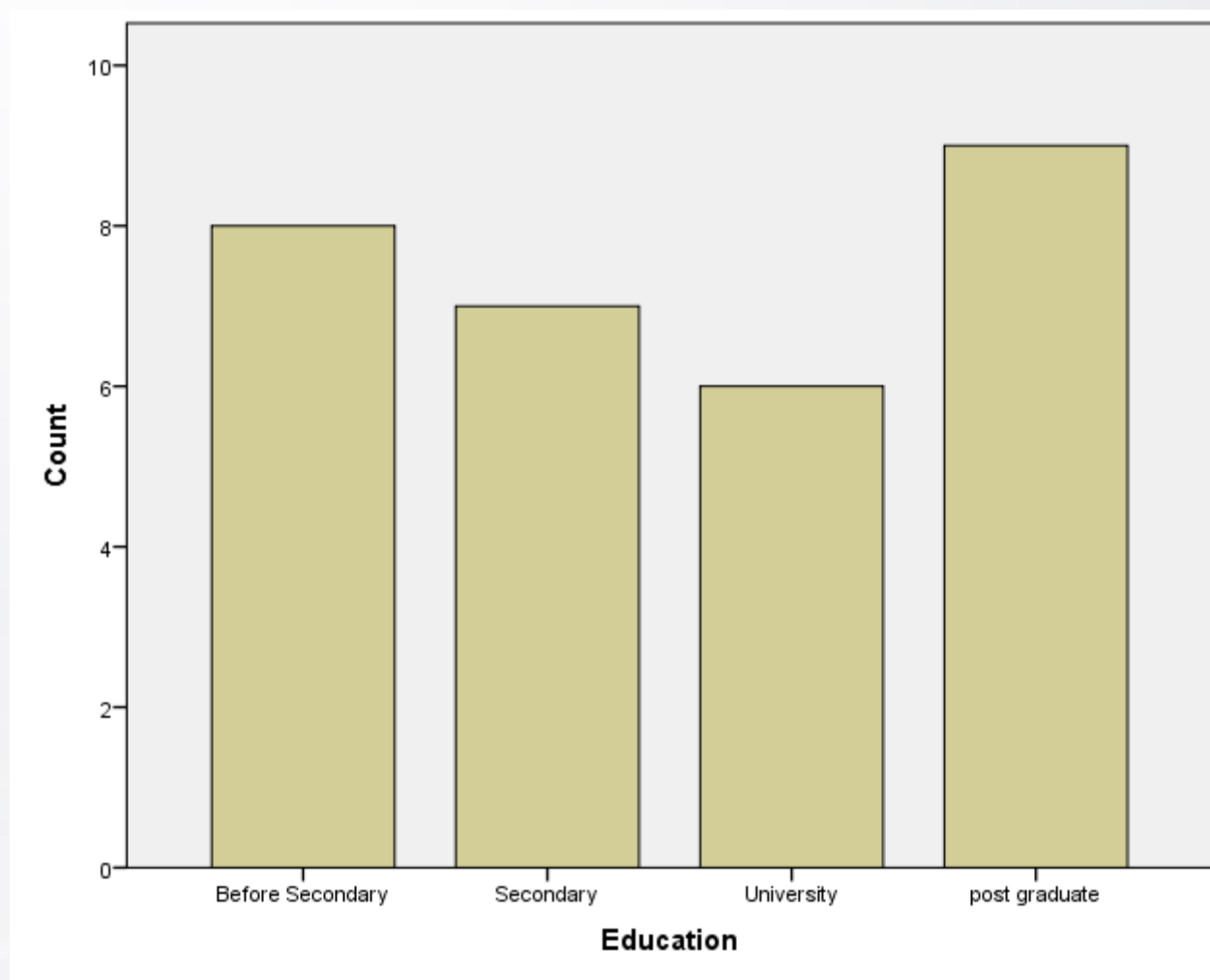
- 3- There are no statistically significant differences at the significance level (0.05) between Performance Satisfaction according to the variable (City - Gender - Nationality). There are also statistically significant differences between Performance Satisfaction according to the educational level variable, and this is due to the presence of differences between respondents who obtained a secondary qualification and those who obtained graduate studies.
- 4- There are no statistically significant differences at the significance level (0.05) between Satisfaction with employees according to the variable (City - Gender - Educational level - Nationality).

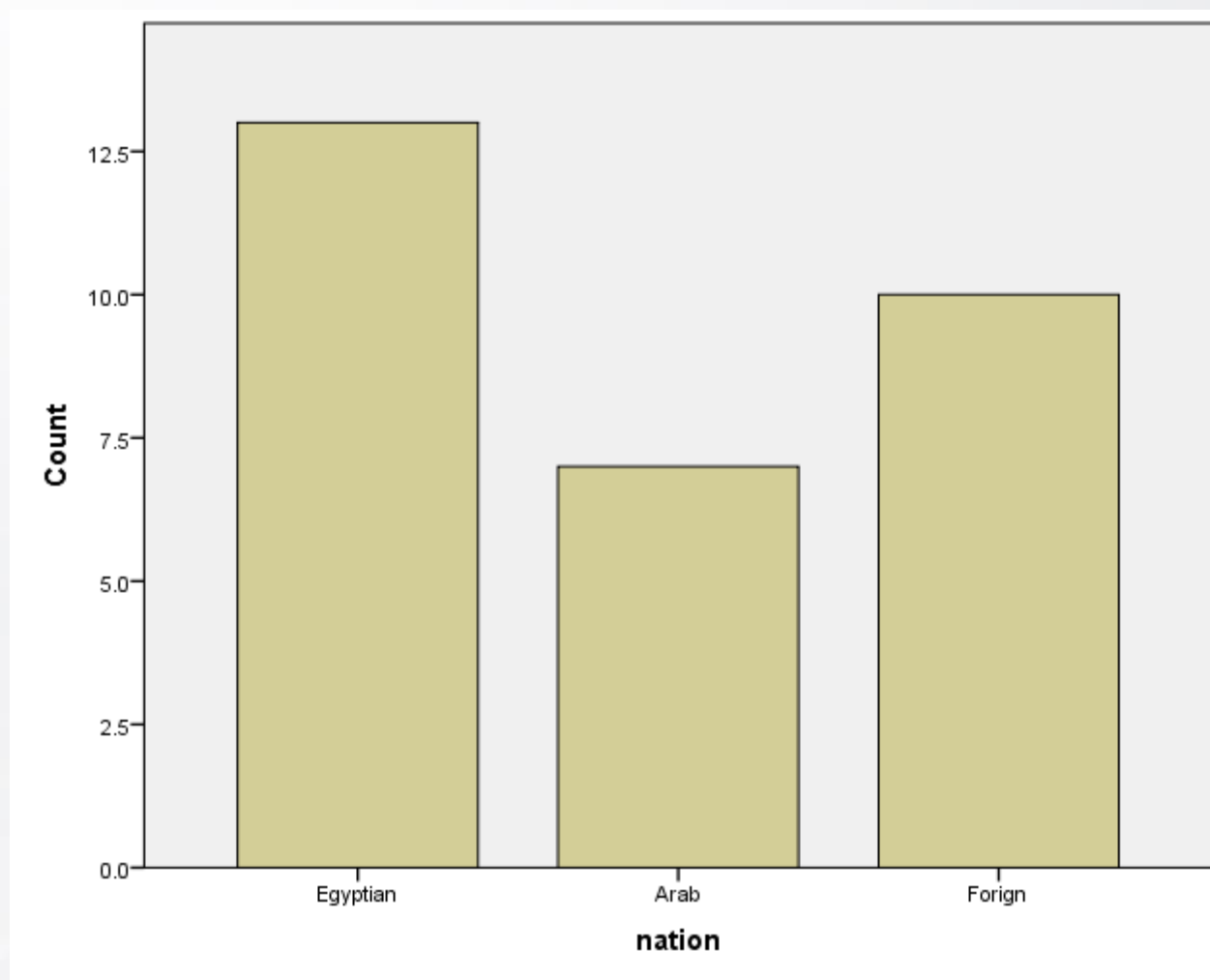
Statistics

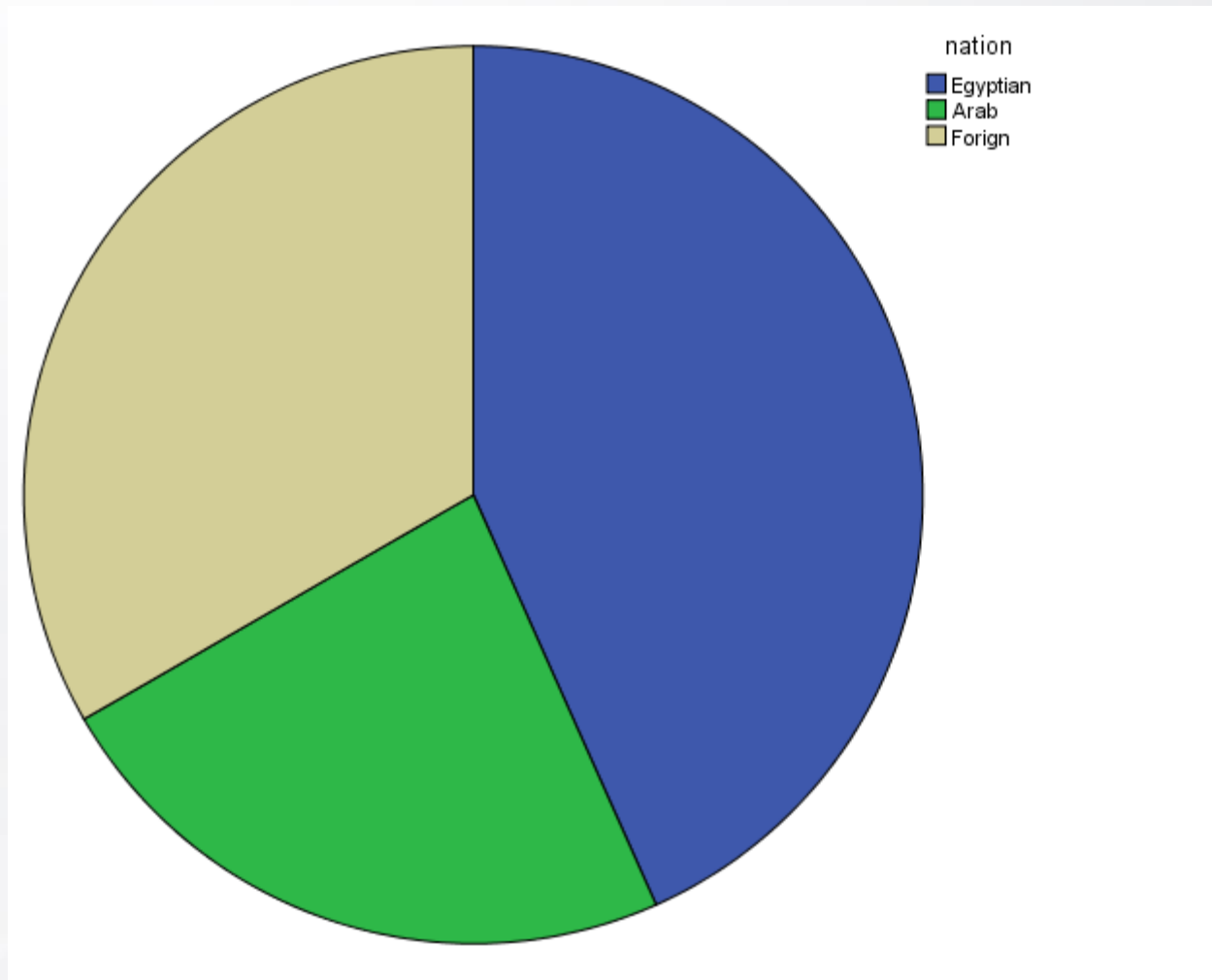
		Satisfaction with place	Satisfaction with services	Performance satisfaction	Satisfaction with employees
N	Valid	30	30	30	30
	Missing	0	0	0	0
Mean		4.0000	3.5000	3.3000	2.9000
Std. Deviation		1.20344	1.38340	1.34293	1.44676

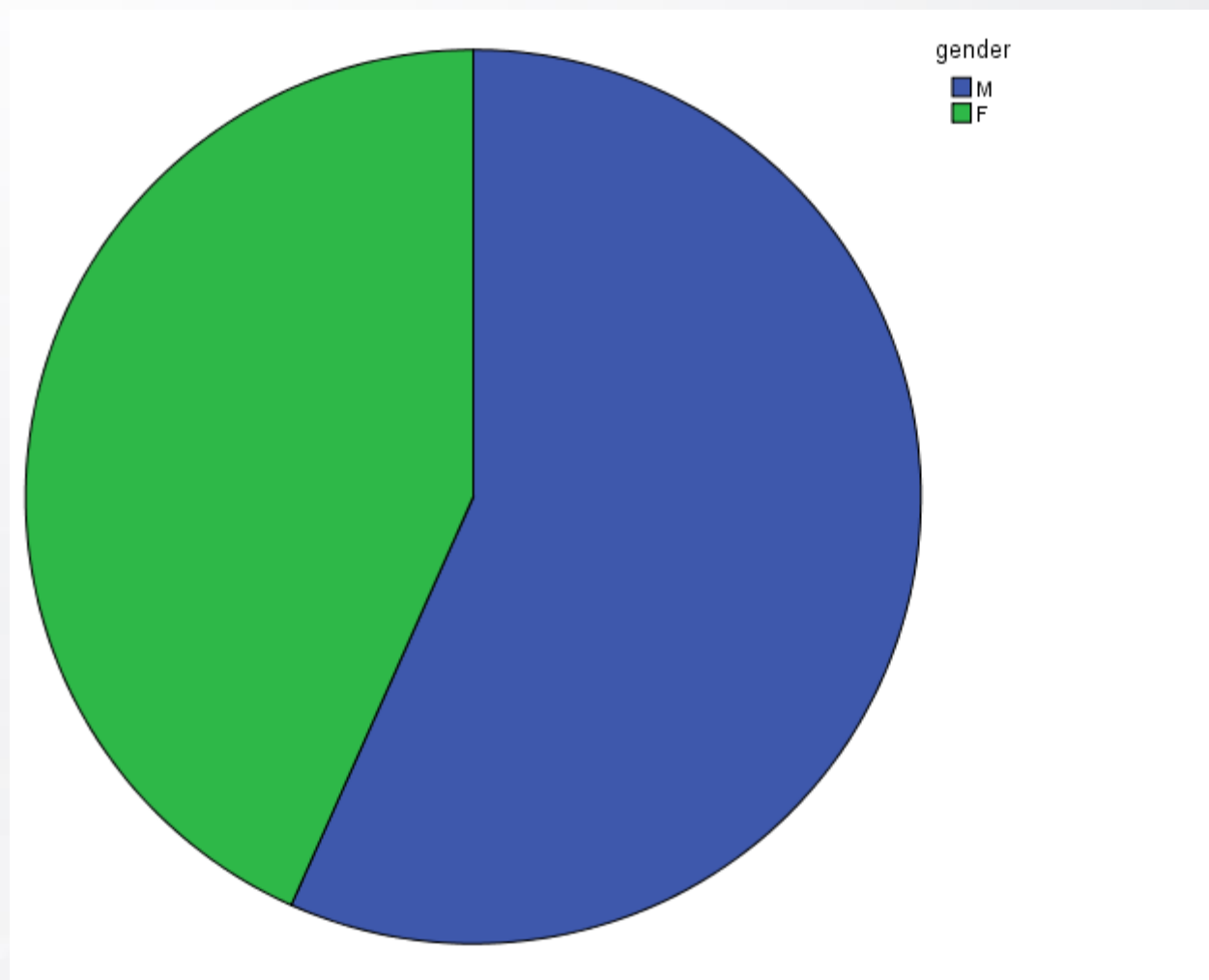
	Mean	Percentage	Strength	Standard Deviation
Satisfaction with place	4.0	80%	Strong	1.20
Satisfaction with services	3.5	70%	Strong	1.38
Performance Satisfaction	3.3	66%	Intermediate	1.34
Satisfaction with employees	2.9	58%	Intermediate	1.45











اختبار كاي تربيع Chi – Square Test

1) A test conducted to determine the quality of fit or congruence of a single variable with a given distribution Do the blood groups of the investigated sample agree with the distribution of blood groups for a given city?

اختبار كاي تربيع Chi – Square Test

2) A test conducted to determine whether there is a relationship (independence) between two nominal variables or a nominal variable and the other ordinal.

* Is there a relationship between income level and educational level?

*Or is there a relationship between educational attainment level
and family income?

*Or is there a relationship between gender (male - female) and smoking (smoker
- non-smoker)

Example: A researcher chose a sample of 800 people from a city and their distribution according to blood type was shown in the following table

فصيلة الدم	A	B	AB	O
عدد الأشخاص	200	150	100	350

Is this distribution consistent with the distribution of the following standard ratios:

فصيلة الدم	A	B	AB	O
النسبة القياسية	%25	%15	%15	%45

Null Hypothesis

The blood group distribution of the sample is
consistent with the standard distribution
(there is no difference)

Alternative Hypothesis

The blood group distribution of the sample is not
consistent with the standard distribution
(there is difference)

SPSS Data Editor window showing Variable View for a dataset named "Untitled1 [DataSet0]". The window includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with icons for file operations, data manipulation, and analysis.

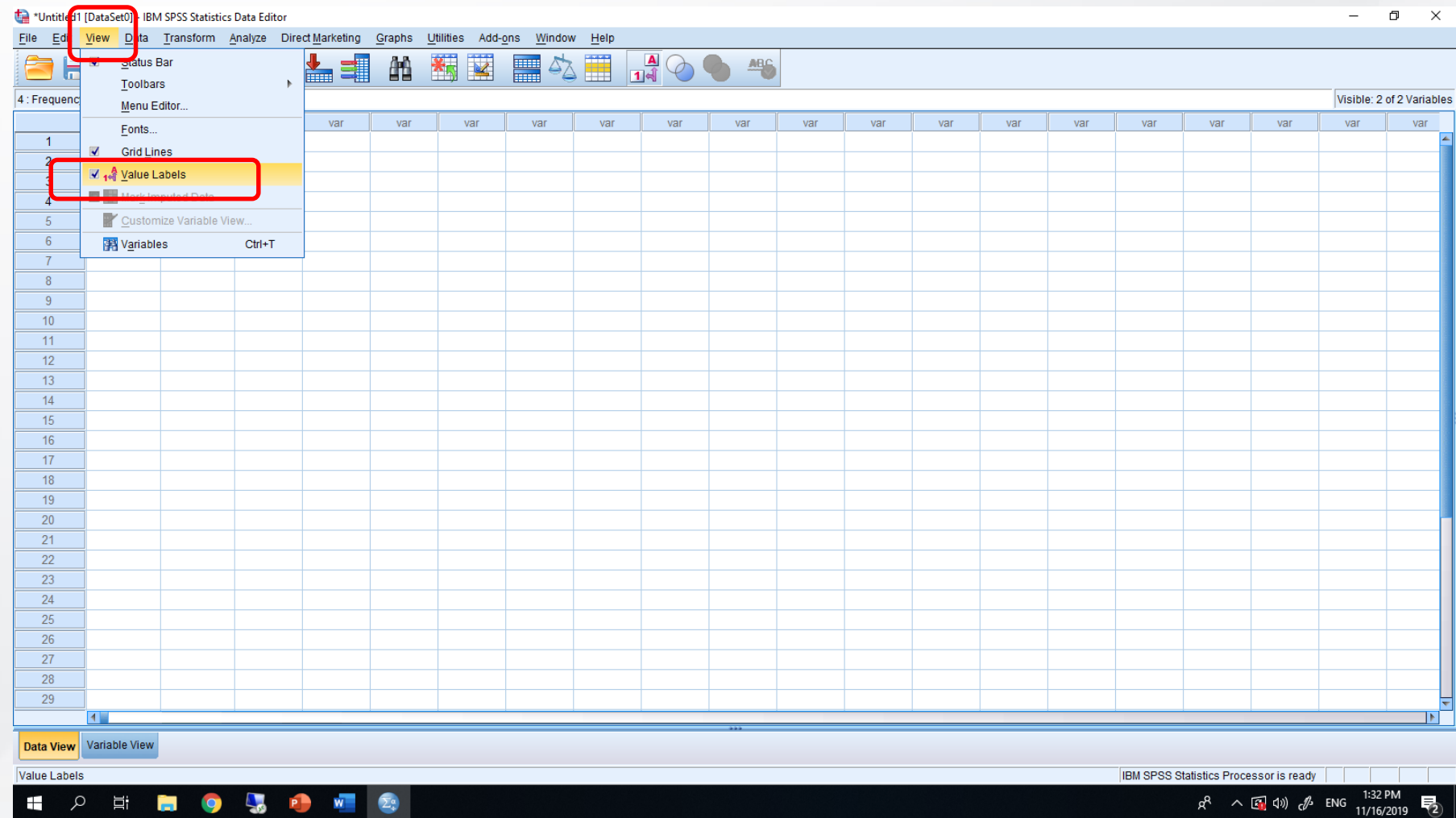
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Blood	Numeric	8	2		{1.00, A}...	None	8	Right	Nominal	Input
2	Frequency	Numeric	8	2		None	None	8	Right	Scale	Input
3											
4											
5											
6											
7											
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31											

The bottom of the window shows tabs for "Data View" and "Variable View", with "Variable View" currently selected. The status bar at the bottom indicates "IBM SPSS Statistics Processor is ready". The Windows taskbar at the very bottom shows the system clock as 1:30 PM on 11/16/2019.

SPSS Data Editor window showing a dataset with 20 rows and 20 columns. The first column is labeled 'Blood' and the second column is labeled 'Frequency'. The data is as follows:

Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	
5																			
6																			
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The bottom status bar shows: IBM SPSS Statistics Processor is ready. The system tray shows the date and time: 11/15/2019 1:31 PM.



IBM SPSS Statistics Data Editor window showing a dataset with 29 rows and 20 columns. The first column is labeled 'Blood' and the second column is labeled 'Frequency'. The data is as follows:

Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	A	200.00																	
2	B	150.00																	
3	AB	100.00																	
4	O	350.00																	
5																			
6																			
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29																			

The 'Frequency' column for row 4 (Blood type O) is highlighted in yellow and circled in red. The status bar at the bottom indicates 'IBM SPSS Statistics Processor is ready' and the date/time is 11/16/2019 1:33 PM.

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4 : Frequency

Define Variable Properties...
 Set Measurement Level for Unknown...
 Copy Data Properties...
 New Custom Attribute...
 Define Dates...
 Define Multiple Response Sets...
 Validation
 Identify Duplicate Cases...
 Identify Unusual Cases...
 Sort Cases...
 Sort Variables...
 Transpose...
 Merge Files
 Restructure...
 Aggregate...
 Orthogonal Design
 Copy Dataset
 Split File...
 Select Cases...
 Weight Cases...

Visible: 2 of 2 Variables

	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1																
2																
3																
4																
5																
6																
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Data View Variable View

Weight Cases... IBM SPSS Statistics Processor is ready

Windows taskbar: 11/16/2019 1:34 PM

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4 : Frequency 350.00 Visible: 2 of 2 Variables

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	
5																			
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Weight Cases

☐ Do not weight cases

☒ Weight cases by

Frequency Variable: Frequency

Current Status: Do not weight cases

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

1:35 PM 11/16/2019

IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4: Frequency 350.00

	Blood	Frequency
1	1.00	200.0
2	2.00	150.0
3	3.00	100.0
4	4.00	350.0
5		
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29		

Visible: 2 of 2 Variables

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

One Sample...
Independent Samples...
Related Samples...
Legacy Dialogs
Chi-square...
Binomial...
Runs...
1-Sample K-S...
2 Independent Samples...
K Independent Samples...
2 Related Samples...
K Related Samples...

Data View Variable View

Chi-square... IBM SPSS Statistics Processor is ready Weight On

11/16/2019 1:35 PM

IBM SPSS Statistics Data Editor window showing a dataset with 4 rows and 20 columns. The first column is labeled 'Blood' and the second is 'Frequency'. The data is as follows:

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	

The 'Chi-square Test' dialog box is open, showing the 'Test Variable List' with 'Blood' and 'Frequency'. The 'Expected Range' section has 'Get from data' selected. The 'Expected Values' section has 'All categories equal' selected. The 'Values' field is empty. The 'Add', 'Change', and 'Remove' buttons are visible. The 'OK', 'Paste', 'Reset', 'Cancel', and 'Help' buttons are at the bottom.

IBM SPSS Statistics Processor is ready | Weight On

1:36 PM 11/16/2019

IBM SPSS Statistics Data Editor window showing a dataset with 4 rows and 20 columns. The first two columns are labeled 'Blood' and 'Frequency'. The data is as follows:

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	

The 'Chi-square Test' dialog box is open, showing the following settings:

- Test Variable List: Blood
- Expected Range: ☒ Get from data
- Expected Values: ☒ All categories equal

The bottom of the screen shows the Windows taskbar with the following icons: Start, Search, Task View, File Explorer, Google Chrome, Microsoft Word, and IBM SPSS Statistics. The system clock shows 1:37 PM on 11/16/2019.

IBM SPSS Statistics Data Editor window titled "Untitled1 [DataSet0]". The menu bar includes File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains icons for file operations, data manipulation, and analysis.

The main data grid shows a table with the following data:

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	
5																			
6																			
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The "Chi-square Test" dialog box is open, showing the following settings:

- Test Variable List:** Blood
- Expected Range:**
 - ☒ Get from data
 - ☐ Use specified range (Lower: , Upper:)
- Expected Values:**
 - ☐ All categories equal
 - ☒ Values: 25

Buttons in the dialog include Exact..., Options..., Add, Change, Remove, OK, Paste, Reset, Cancel, and Help.

The bottom status bar shows "IBM SPSS Statistics Processor is ready" and "Weight On". The Windows taskbar at the bottom displays the system clock as 1:38 PM on 11/16/2019.

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4 : Frequency 350.00 Visible: 2 of 2 Variables

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	
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29																			

Chi-square Test

Test Variable List: Blood

Frequency

Expected Range: ☒ Get from data ☐ Use specified range Lower: Upper:

Expected Values: ☐ All categories equal ☒ Values: 25 15 Add Change Remove

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready Weight On

1:38 PM 11/16/2019

IBM SPSS Statistics Data Editor window showing a Chi-square Test dialog box overlaid on a data table.

The data table has the following structure:

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	
5																			
6																			
7																			
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29																			

The Chi-square Test dialog box is configured as follows:

- Test Variable List: Blood
- Expected Range: ☒ Get from data
- Expected Values: ☒ All categories equal
- Values: 25, 15, 15

The bottom status bar shows: IBM SPSS Statistics Processor is ready, Weight On, 1:38 PM, 11/16/2019.

IBM SPSS Statistics Data Editor window showing a Chi-square Test dialog box overlaid on a data table.

The data table has columns: Blood, Frequency, and several empty columns labeled 'var'. The data is as follows:

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	
5																			
6																			
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The Chi-square Test dialog box is open, showing the following settings:

- Test Variable List: Blood
- Expected Range: ☒ Get from data, ☐ Use specified range (Lower: , Upper:)
- Expected Values: ☐ All categories equal, ☒ Values: 25, 15, 15, 45

The bottom status bar shows: IBM SPSS Statistics Processor is ready, Weight On, 1:38 PM, 11/16/2019.

SPSS Statistics Data Editor window showing a dataset with 29 rows and 20 columns. The first two columns are 'Blood' and 'Frequency'. The data is as follows:

	Blood	Frequency
1	1.00	200.00
2	2.00	150.00
3	3.00	100.00
4	4.00	350.00
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		

The 'Chi-square Test' dialog box is open, showing the following settings:

- Test Variable List: Blood
- Expected Range: ☒ Get from data, ☐ Use specified range (Lower: , Upper:)
- Expected Values: ☐ All categories equal, ☒ Values: 25, 15, 15, 45

The taskbar at the bottom shows the Windows Start button, search icon, and several open applications including File Explorer, Google Chrome, and Microsoft Word. The system clock indicates 1:39 PM on 11/16/2019.

IBM SPSS Statistics Data Editor window showing a dataset with 4 rows and 20 columns. The first two columns are labeled 'Blood' and 'Frequency'. The data is as follows:

	Blood	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	200.00																	
2	2.00	150.00																	
3	3.00	100.00																	
4	4.00	350.00																	

The 'Chi-square Test' dialog box is open, showing 'Frequency' as the Test Variable List and 'Blood' as the Expected Range. The 'Chi-square Test: Options' sub-dialog box is also open, showing 'Descriptive' and 'Quartiles' under Statistics, and 'Exclude cases test-by-test' under Missing Values.

IBM SPSS Statistics Processor is ready | Weight On | 1:39 PM 11/16/2019

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Blood	800	2.7500	1.25078	1.00	4.00

Chi-Square Test

Frequencies

Blood

	Observed N	Expected N	Residual
A	200	200.0	.0
B	150	120.0	30.0
AB	100	120.0	-20.0
O	350	360.0	-10.0
Total	800		

Test Statistics

	Blood
Chi-Square	11.111 ^a
df	3
Asymp. Sig.	.011

Statistical decision

The resulting probability value of the test is 0.011, which is a value less than 0.05 (the level of significance), so we accept the alternative hypothesis that the distribution of blood groups for the sample does not agree with the standard distribution (there are differences)

Example: Within the literacy projects, the Ministry of Education conducted a training program to motivate the uneducated to change their attitudes towards the importance of education according to the following percentages that depended on training in 2018/2019:

سلي	محايد لم يتغير	ايجابي	تأثير التدريب
%12	%65	%23	النسبة المعتمدة

In 2019 / 2020, this training was conducted on 90 people, and the results of changing their attitudes after the training were as follows

المجموع	سلي	محايد لم يتغير	ايجابي	تأثير التدريب
90	4	34	52	عدد الأشخاص

Is it possible to judge that this year's program differs from the previous program or agrees with it?

Null Hypothesis

This year's program is consistent with the previous
program
(there is no difference)

Alternative Hypothesis

This year's program does not match the previous
program
(there is difference)

IBM SPSS Statistics Data Editor window titled "Untitled1 [DataSet0]". The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with various icons for file operations, data manipulation, and analysis.

The main area displays the Variable View table, which defines the structure of the dataset. The table has 12 columns: Name, Type, Width, Decimals, Label, Values, Missing, Columns, Align, Measure, and Role. Two variables are defined:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Change	Numeric	8	2		{1.00, Positi...	None	8	Right	Nominal	Input
2	Frequency	Numeric	8	2		None	None	8	Right	Scale	Input
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
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28											
29											
30											
31											

The bottom of the window shows the "Data View" and "Variable View" tabs, with "Variable View" currently selected. The status bar at the bottom indicates "IBM SPSS Statistics Processor is ready" and the system clock shows 2:03 PM on 11/16/2019.

SPSS Statistics Data Editor window showing a Chi-square Test dialog box overlaid on a data grid.

The data grid displays the following data:

	Change	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	52.00																	
2	2.00	34.00																	
3	3.00	4.00																	
4																			
5																			
6																			
7																			
8																			
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26																			
27																			
28																			
29																			

The Chi-square Test dialog box is configured as follows:

- Test Variable List: Change
- Expected Range: ☒ Get from data
- Expected Values: ☒ Values: 23, 65, 4

The bottom status bar indicates: IBM SPSS Statistics Processor is ready, Weight On, 2:05 PM, 11/16/2019.

SPSS Data Editor window showing a dataset with variables 'Change' and 'Frequency'. The 'Change' variable has values 1.00, 2.00, and 3.00. The 'Frequency' variable has values 52.00, 34.00, and 4.00. The 'Chi-square Test' dialog box is open, showing 'Change' as the Test Variable List. The 'Chi-square Test: Options' sub-dialog box is also open, showing 'Descriptive' and 'Quartiles' selected under Statistics, and 'Exclude cases test-by-test' selected under Missing Values.

SPSS Data Editor window: *Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

Menu: File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Toolbar: [Icons for file operations, data manipulation, and analysis]

1: Change 1.00 Visible: 2 of 2 Variables

	Change	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	52.00																	
2	2.00	34.00																	
3	3.00	4.00																	
4																			
5																			
6																			
7																			
8																			
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23																			
24																			
25																			
26																			
27																			
28																			
29																			

Chi-square Test

Frequency

Test Variable List: Change

Exact... Options...

Chi-square Test: Options

Statistics: ☒ Descriptive ☐ Quartiles

Missing Values: ☒ Exclude cases test-by-test ☐ Exclude cases listwise

Expected Range: ☒ Get from data ☐ Use specified

Lower: Upper:

Continue Cancel Help

Change Remove

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready Weight On

Windows taskbar: 2:05 PM 11/16/2019

*Output2 [Document2] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output
Log
NPar Tests
Title
Notes
Active Dataset
Descriptive Statist
Chi-Square Test
Title
Frequencies
Title
Change
Test Statistics:

/MISSING ANALYSIS.

→ **NPar Tests**

[DataSet0]

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Change	90	1.4667	.58444	1.00	3.00

Chi-Square Test

Frequencies

Change

	Observed N	Expected N	Residual
Positive	52	22.5	29.5
NA	34	63.6	-29.6
Negative	4	3.9	.1
Total	90		

Test Statistics

	Change
Chi-Square	52.446 ^a
df	2
Asymp. Sig.	.000

a. 1 cells (33.3%)
have expected
frequencies
less than 5.
The minimum
expected cell
frequency is
3.9.

IBM SPSS Statistics Processor is ready

2:05 PM
11/16/2019

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Change	90	1.4667	.58444	1.00	3.00

Chi-Square Test

Frequencies

Change

	Observed N	Expected N	Residual
Positive	52	22.5	29.5
NA	34	63.6	-29.6
Negative	4	3.9	.1
Total	90		

Test Statistics

	Change
Chi-Square	52.446 ^a
df	2
Asymp. Sig.	.000

Statistical decision

The resulting probabilistic value of the test is equal to 0.000, which is a value less than 0.05 (the level of significance), so we accept the alternative hypothesis that this year's program does not correspond to the previous program (there are differences)

اختبار كاي تربيع Chi – Square Test

1) A test conducted to determine the quality of fit or congruence of a single variable with a given distribution Do the blood groups of the investigated sample agree with the distribution of blood groups for a given city?

اختبار كاي تربيع Chi – Square Test

2) A test conducted to determine whether there is a relationship (independence) between two nominal variables or a nominal variable and the other ordinal.

* Is there a relationship between income level and educational level?

*Or is there a relationship between educational attainment level
and family income?

*Or is there a relationship between gender (male - female) and smoking (smoker
- non-smoker)

Example: The following table shows the relationship between the level of education and smoking for a sample of 50 people. It is required to know whether the level of education and smoking are independent variables or is there a relationship between them?

Education level Smoking	Illiterate	Intermediate education	high education	Total
Smoker	10	9	5	24
Non smoker	13	7	6	26
Total	23	16	11	50

Null Hypothesis

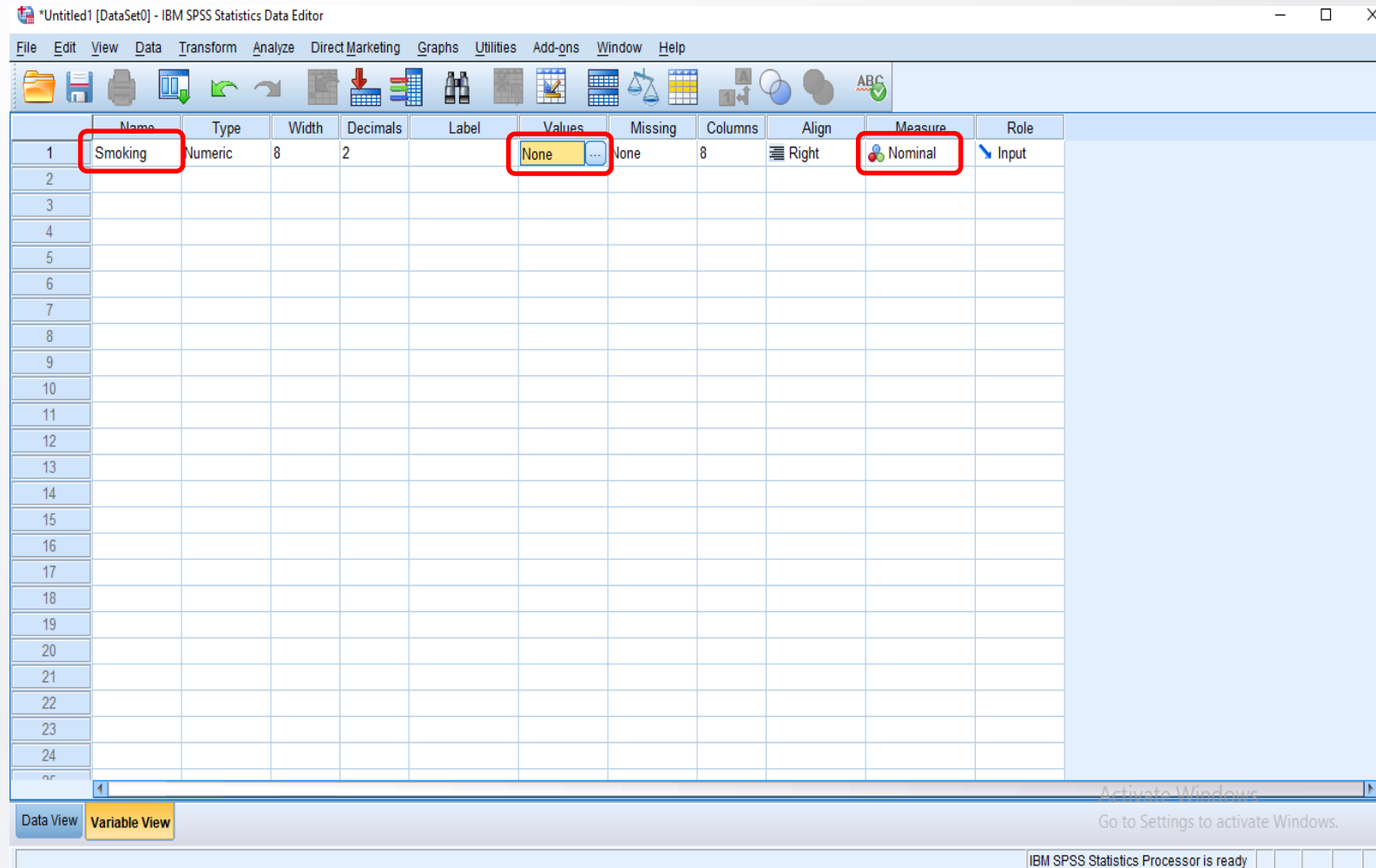
Education level and smoking are two independent variables

(there is no relation between them)

Alternative Hypothesis

Education level and smoking are two dependent variables

(there is a relationship between them)



SPSS Value Labels dialog box for the variable "Smoking".

The background shows the SPSS Data Editor with the variable "Smoking" defined as a numeric variable with a width of 8 and 2 decimal places. The "Value Labels" column shows "None".

The "Value Labels" dialog box is open, showing the following configuration:

- Value:
- Label:
- Buttons: Add, Change, Remove, Spelling...
- List of value labels (highlighted with a red box):
 - 1.00 = "Smoking"
 - 2.00 = "Not Smoking"
- Buttons: OK, Cancel, Help

At the bottom of the window, there is a status bar indicating "IBM SPSS Statistics Processor is ready".

IBM SPSS Statistics Data Editor window showing the Variable View for a dataset named "Untitled1 [DataSet0]". The variable "Education" is highlighted in the list, and its properties are shown in the "Value Labels" dialog box.

The Variable View table shows the following variables:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Smoking	Numeric	8	2		1.00 = "Not Education"	None	8	Right	Nominal	Input
2	Education	Numeric	8	2		None	None	8	Right	Ordinal	Input

The "Value Labels" dialog box for the "Education" variable shows the following value labels:

- 1.00 = "Not Education"
- 2.00 = "Basic"
- 3.00 = "University"

The dialog box also includes fields for "Value:" and "Label:", buttons for "Add", "Change", "Remove", "Spelling...", "OK", "Cancel", and "Help".

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Frequency

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Smoking	Numeric	8	2		{1.00, Smok...	None	8	Right	Nominal	Input
2	Education	Numeric	8	2		{1.00, Not E...	None	8	Right	Ordinal	Input
3	Frequency	Numeric	8	2		None	None	8	Right	Scale	Input
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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1

Data View Variable View

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4 : Smoking

Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	10.00																
2	1.00	2.00	9.00																
3	1.00	3.00	5.00																
4																			
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27																			
28																			
29																			

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor

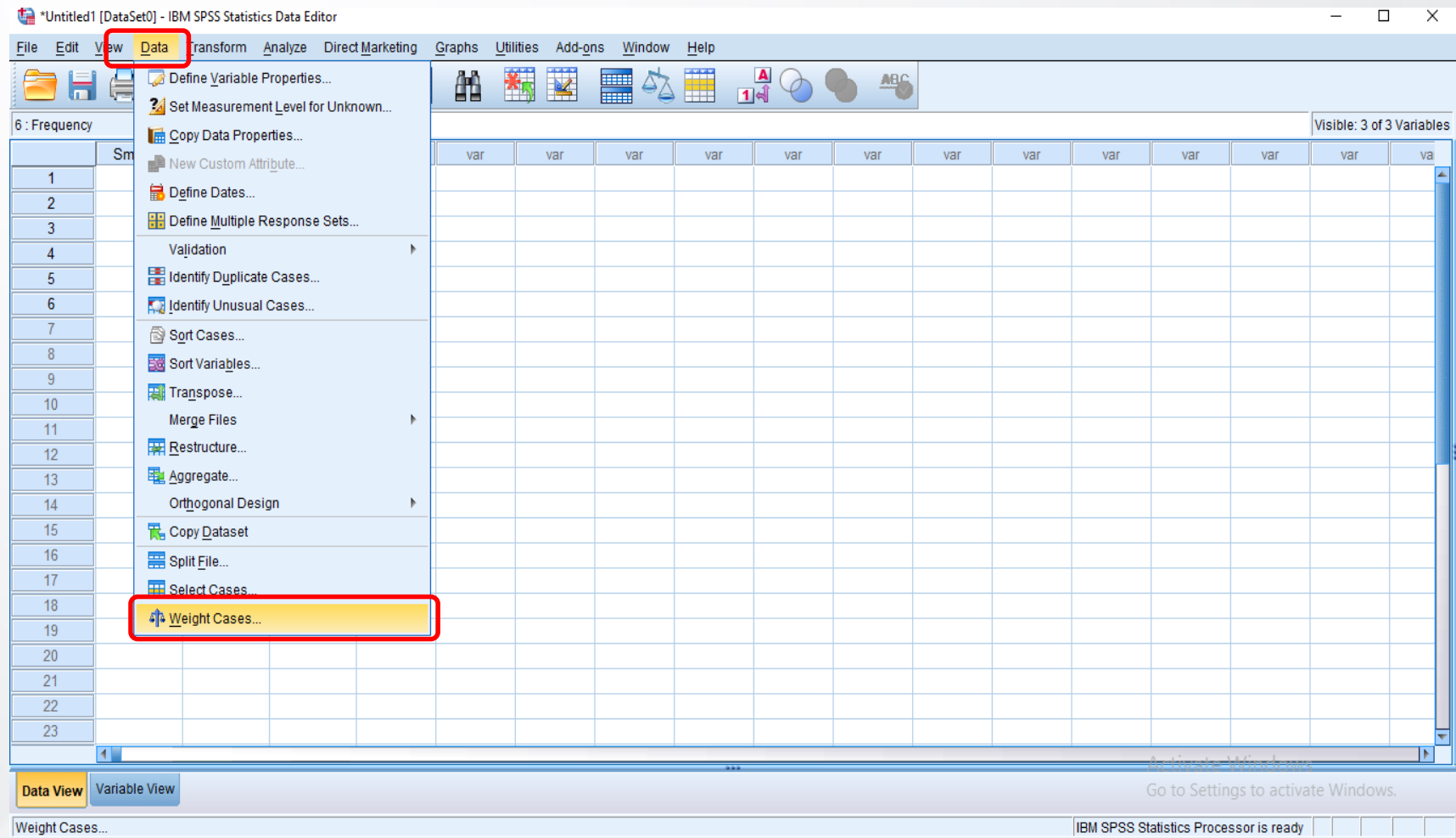
File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	10.00																
2	1.00	2.00	9.00																
3	1.00	3.00	5.00																
4	2.00	1.00	13.00																
5	2.00	2.00	7.00																
6	2.00	3.00	6.00																
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29																			

Data View Variable View

IBM SPSS Statistics Processor is ready



IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first three columns are labeled 'Smoking', 'Education', and 'Frequency'. The 'Frequency' column contains values: 13.00, 7.00, 6.00, 10.00, 9.00, 5.00, and then empty cells for rows 7 through 23. A 'Weight Cases' dialog box is open, showing the 'Weight cases by' option selected, with 'Frequency' listed as the variable to weight by. The 'Current Status' is 'Do not weight cases'.

6 : Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
8																	
9																	
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18																	
19																	
20																	
21																	
22																	
23																	

Weight Cases

☐ Do not weight cases

☒ Weight cases by

Frequency Variable:

Current Status: Do not weight cases

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 3 variables: Smoking, Education, and Frequency. The data is displayed in a table with 23 rows. The 'Frequency' column contains values for rows 1 through 6, with row 6 highlighted in yellow.

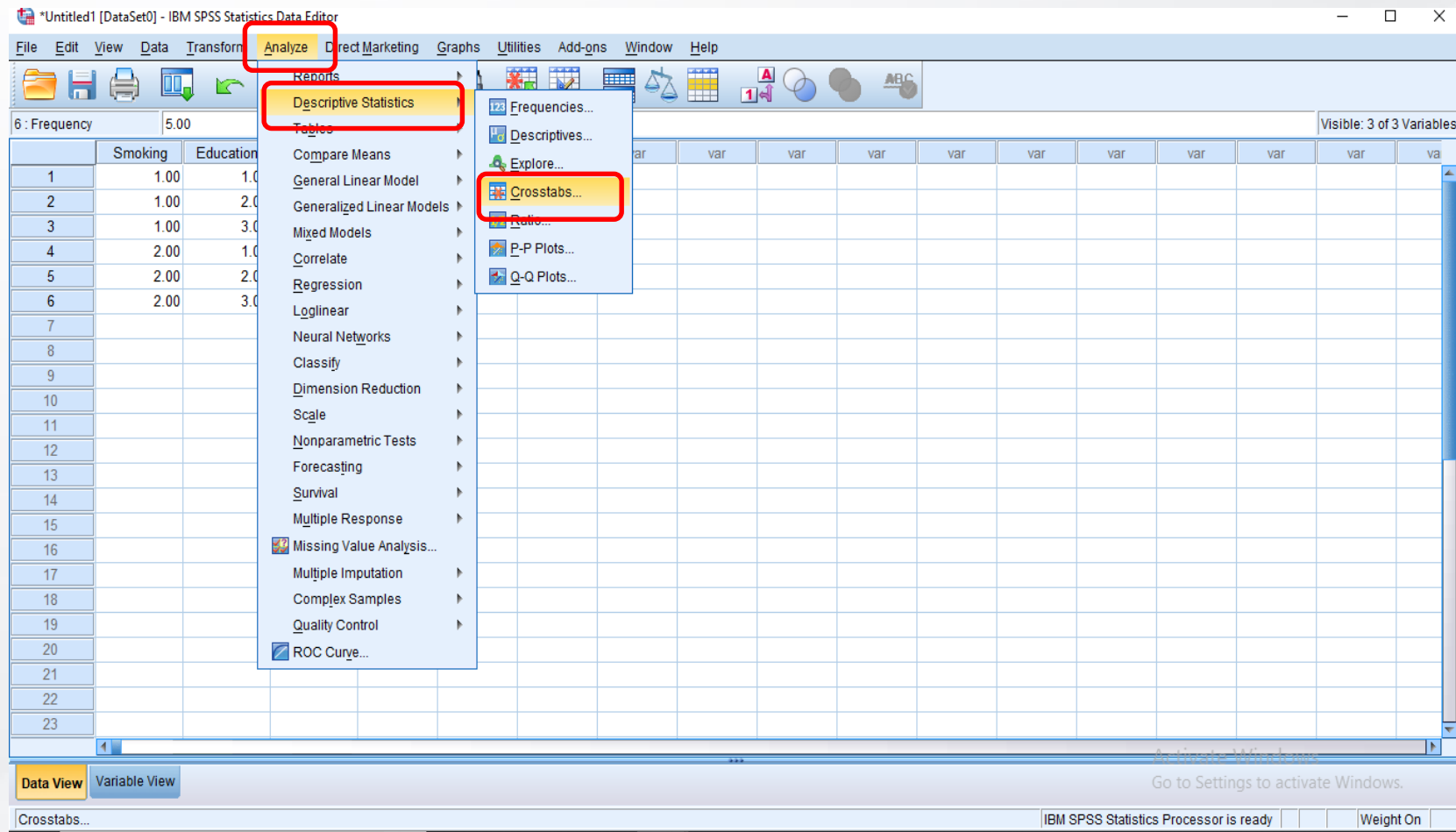
	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
8																	
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18																	
19																	
20																	
21																	
22																	
23																	

A 'Weight Cases' dialog box is open, showing the 'Frequency' variable selected in the list on the left. The 'Weight cases by' radio button is selected, and the 'Frequency Variable' field is empty. The 'Current Status' is 'Do not weight cases'. The 'OK' button is highlighted.

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 17 columns. The first three columns are labeled 'Smoking', 'Education', and 'Frequency'. The 'Frequency' column contains values: 13.00, 7.00, 6.00, 10.00, 9.00, 5.00, and then empty cells for rows 7 through 23. A 'Weight Cases' dialog box is open, showing 'Smoking' and 'Education' in the list of variables. The 'Weight cases by' radio button is selected, and 'Frequency' is entered in the 'Frequency Variable' field. The 'OK' button is highlighted. The status bar at the bottom indicates 'IBM SPSS Statistics Processor is ready'.

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
8																	
9																	
10																	
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17																	
18																	
19																	
20																	
21																	
22																	
23																	



IBM SPSS Statistics Data Editor window showing a dataset with variables Smoking, Education, and Frequency. A Crosstabs dialog box is open, showing the variables being analyzed. The dialog box includes options for Row(s), Column(s), and Layer 1 of 1. The variables are listed in the left pane, and the Row(s) and Column(s) fields are empty. The dialog box also includes buttons for Exact..., Statistics..., Cells..., Format..., and Bootstrap....

6 : Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00													
2	1.00	2.00	7.00													
3	1.00	3.00	6.00													
4	2.00	1.00	10.00													
5	2.00	2.00	9.00													
6	2.00	3.00	5.00													
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22																
23																

Crosstabs

Row(s):

Column(s):

Layer 1 of 1

Previous Next

Display layer variables in table layers

Display clustered bar charts

Suppress tables

OK Paste Reset Cancel Help

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready Weight On

IBM SPSS Statistics Data Editor window showing a dataset with variables Smoking, Education, and Frequency. A Crosstabs dialog box is open, showing the selection of Education as the Row(s) variable and Frequency as the Column(s) variable. The dialog also includes options for Display clustered bar charts, Suppress tables, and buttons for OK, Paste, Reset, Cancel, and Help.

6 : Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00													
2	1.00	2.00	7.00													
3	1.00	3.00	6.00													
4	2.00	1.00	10.00													
5	2.00	2.00	9.00													
6	2.00	3.00	5.00													
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22																
23																

Crosstabs

Row(s): Education

Column(s): Frequency

Layer 1 of 1

Display clustered bar charts

Suppress tables

OK Paste Reset Cancel Help

SPSS Statistics Data Editor window showing a frequency table and the Crosstabs dialog box.

Frequency Table:

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
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21																	
22																	
23																	

Crosstabs Dialog Box:

- Row(s): Smoking
- Column(s): Education
- Layer 1 of 1
- Buttons: Exact, Statistics... (highlighted), Cells..., Format..., Bootstrap...
- Options: ☐ Display clustered bar charts, ☐ Suppress tables
- Buttons: OK, Paste, Reset, Cancel, Help

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6: Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
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21																	
22																	
23																	

Crosstabs

Crosstabs: Statistics

Frequency

☒ Chi-square ☒ Correlations

Nominal

☐ Contingency coefficient ☐ Gamma

☐ Phi and Cramer's V ☐ Somers' d

☐ Lambda ☐ Kendall's tau-b

☐ Uncertainty coefficient ☐ Kendall's tau-c

Nominal by Interval

☐ Eta

☐ Kappa

☐ Risk

☐ McNemar

Cochran's and Mantel-Haenszel statistics

Test common odds ratio equals: 1

Display cluster ☐ Suppress table ☐

Continue Cancel Help

OK Paste Reset Cancel Help

Exact... Statistics... Cells... Format... Bootstrap...

Data View Variable View

IBM SPSS Statistics Processor is ready Weight On

*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

6 : Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00													
2	1.00	2.00	7.00													
3	1.00	3.00	6.00													
4	2.00	1.00	10.00													
5	2.00	2.00	9.00													
6	2.00	3.00	5.00													
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Crosstabs

Crosstabs: Statistics

☒ Chi-square ☒ Correlations

Nominal

☐ Contingency coefficient ☐ Gamma

☐ Phi and Cramer's V ☐ Somers' d

☐ Lambda ☐ Kendall's tau-b

☐ Uncertainty coefficient ☐ Kendall's tau-c

Nominal by Interval

☐ Eta

☐ Kappa

☐ Risk

☐ McNemar

☐ Cochran's and Mantel-Haenszel statistics

Test common odds ratio equals: 1

Display cluster ☐ Suppress table ☐

Continue Cancel Help

OK Paste Reset Cancel Help

Exact... Statistics... Cells... Format... Bootstrap...

Data View Variable View

IBM SPSS Statistics Processor is ready Weight On

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output

- Log
- Crosstabs
 - Title
 - Notes
 - Active Dataset
 - Case Processing
 - Smoking * Educat
 - Chi-Square Tests

→ **Crosstabs**

[DataSet0]

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Smoking * Education	50	100.0%	0	0.0%	50	100.0%

Smoking * Education Crosstabulation

Count

		Education			Total
		Not Education	Basic	University	
Smoking	Smoking	13	7	6	26
	Not Smoking	10	9	5	24
Total		23	16	11	50

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.653 ^a	2	.721
Likelihood Ratio	.654	2	.721
Linear-by-Linear Association	.073	1	.787
N of Valid Cases	50		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 3.85.

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.000 ^a	2	1.000
Likelihood Ratio	.000	2	1.000
Linear-by-Linear Association	.000	1	1.000
N of Valid Cases	6		

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is 1.00.

Statistical decision

The resulting probabilistic value of the test is 1.00, which is a value greater than 0.05 (the level of significance), so we accept the null hypothesis that there is no relationship between the level of education and smoking and that they are two independent variables

Example: The following table shows the relationship between gender (male - female) and exercise for a sample of 300 respondents. It is required to know whether gender and sport are independent variables, or is there a relationship between them?

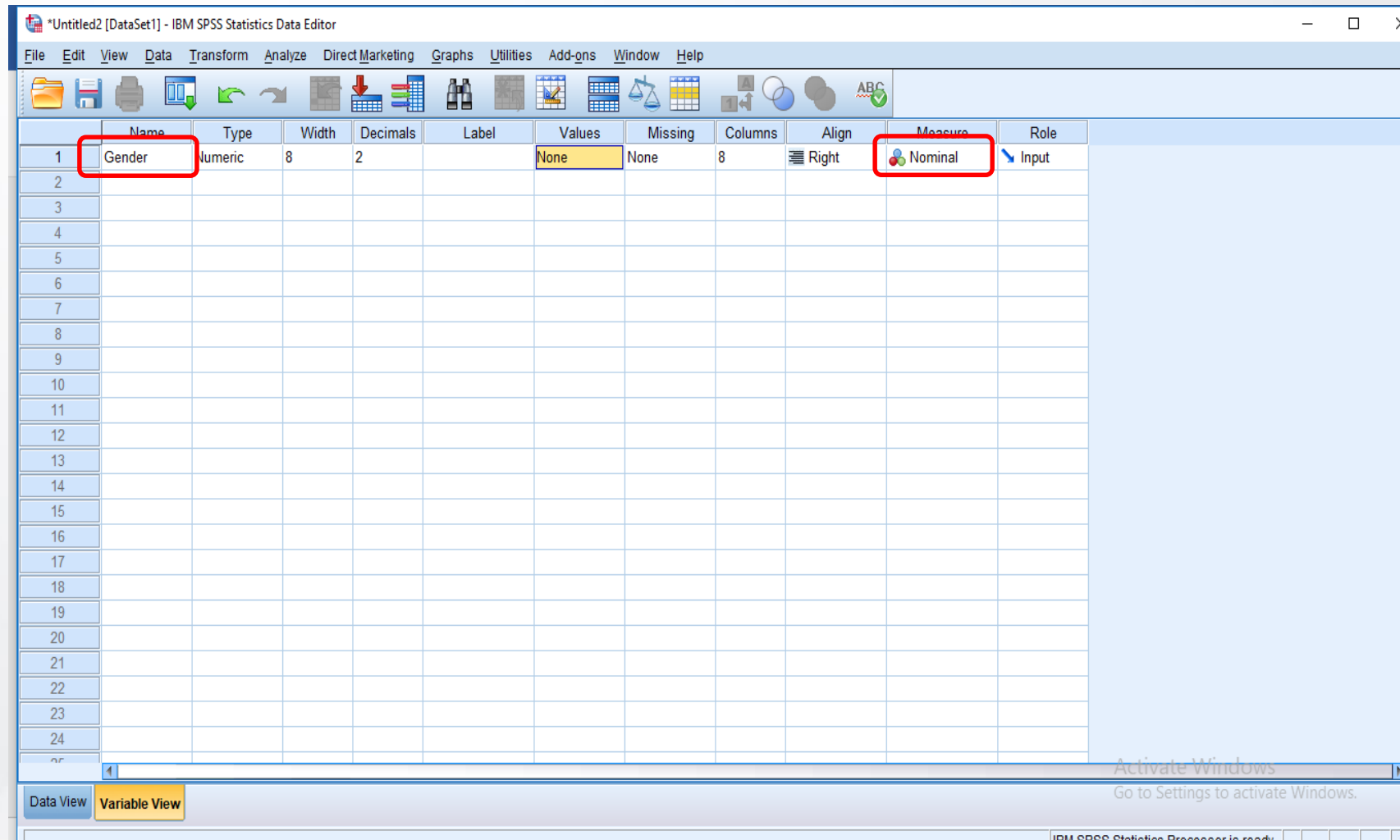
Gender Sport	Gender		Total
	Male	Female	
Playing	70	85	155
Not playing	90	55	145
Total	160	140	300

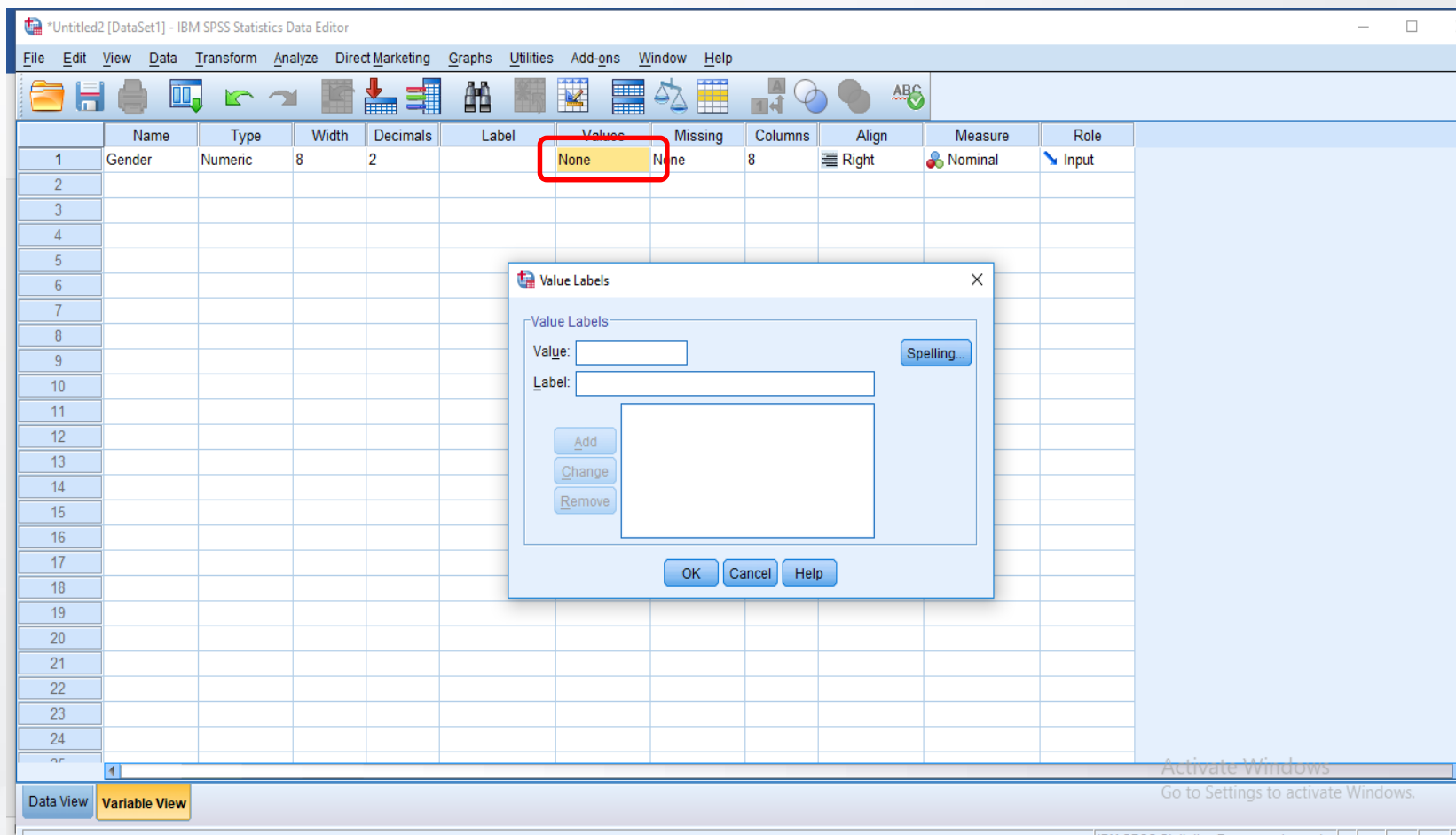
Null Hypothesis

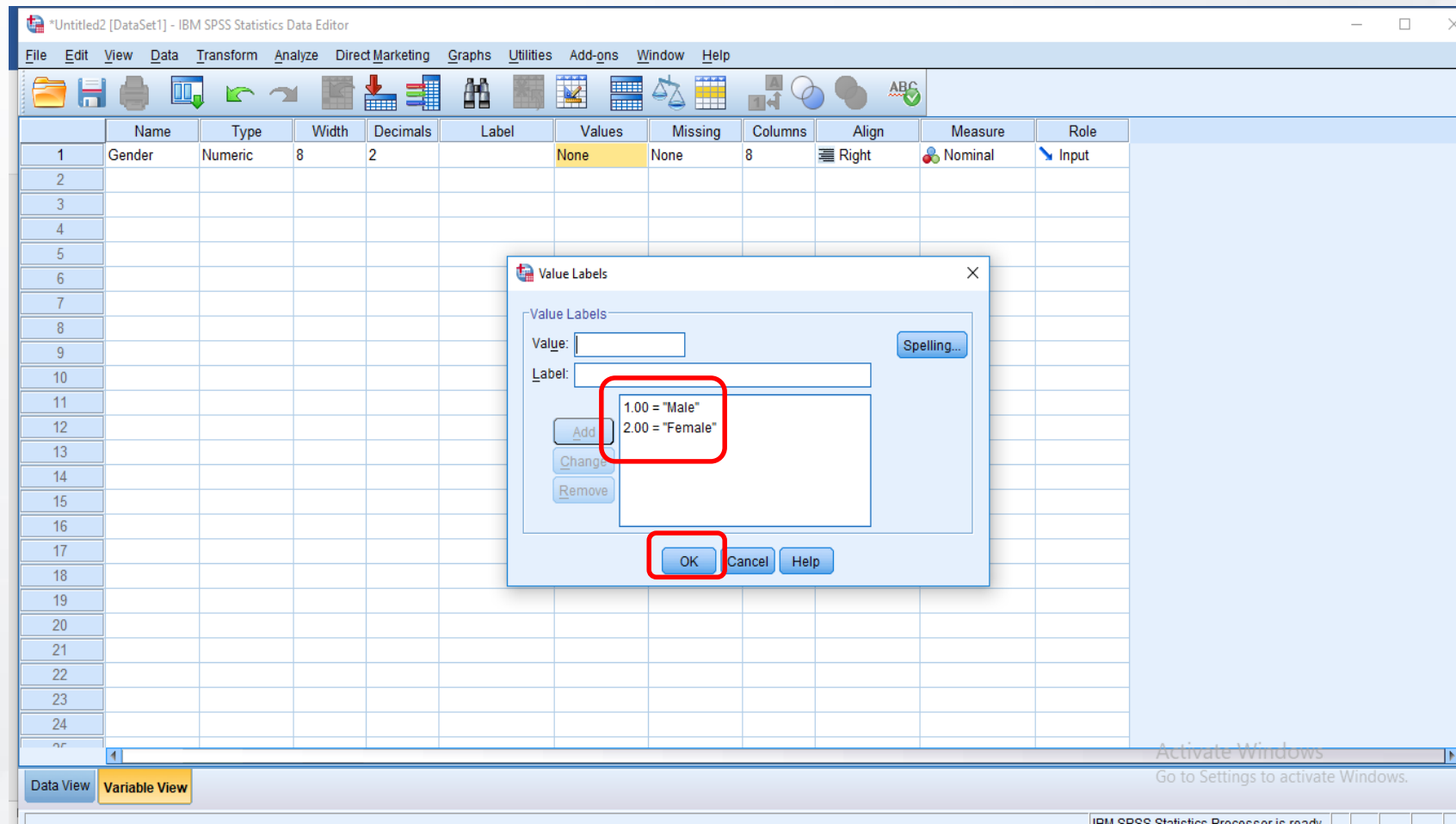
Gender (male-female) and sport are two
independent variables
(there is no relation between them)

Alternative Hypothesis

Gender (male - female) and sport are two dependent
variables (there is a relationship between them)







IBM SPSS Statistics Data Editor window titled "Untitled2 [DataSet1]". The interface includes a menu bar (File, Edit, View, Data, Transform, Analyze, Direct Marketing, Graphs, Utilities, Add-ons, Window, Help) and a toolbar with icons for file operations, data manipulation, and analysis.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	8	2		{1.00, Male}...	None	8	Right	Nominal	Input
2	Sport	Numeric	8	2		None	None	8	Right	Nominal	Input
3											
4											
5											
6											
7											
8											
9											
10											
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16											
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18											
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20											
21											
22											
23											
24											
25											

The bottom of the window shows tabs for "Data View" and "Variable View", with "Variable View" currently selected. A status bar at the bottom indicates "IBM SPSS Statistics Processor is ready".

IBM SPSS Statistics Data Editor window showing the Variable View for a dataset named *Untitled2 [DataSet1]. The Variable View displays the following variables:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	8	2		(1 00 Male)	None	8	Right	Nominal	Input
2	Sport	Numeric	8	2		None	None	8	Right	Nominal	Input

The "None" value for the Sport variable is highlighted with a red box.

A "Value Labels" dialog box is open, showing the following settings:

- Value:
- Label:
- Buttons: Add, Change, Remove, Spelling...
- List of labels: 1.00 = "Play", 2.00 = "Not play" (highlighted with a red box)
- Buttons: OK, Cancel, Help

The dialog box is titled "Value Labels".

At the bottom of the window, there is a status bar with "Data View" and "Variable View" tabs. The "Variable View" tab is selected.

Activate Windows
Go to Settings to activate Windows.

*Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Frequency

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	8	2		{1.00, Male}...	None	8	Right	Nominal	Input
2	Sport	Numeric	8	2		{1.00, Play}...	None	8	Right	Nominal	Input
3	Frequency	Numeric	8	2		None	None	8	Right	Scale	Input
4											
5											
6											
7											
8											
9											
10											
11											
12											
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25											

1

Data View Variable View

Activate Windows
Go to Settings to activate Windows.

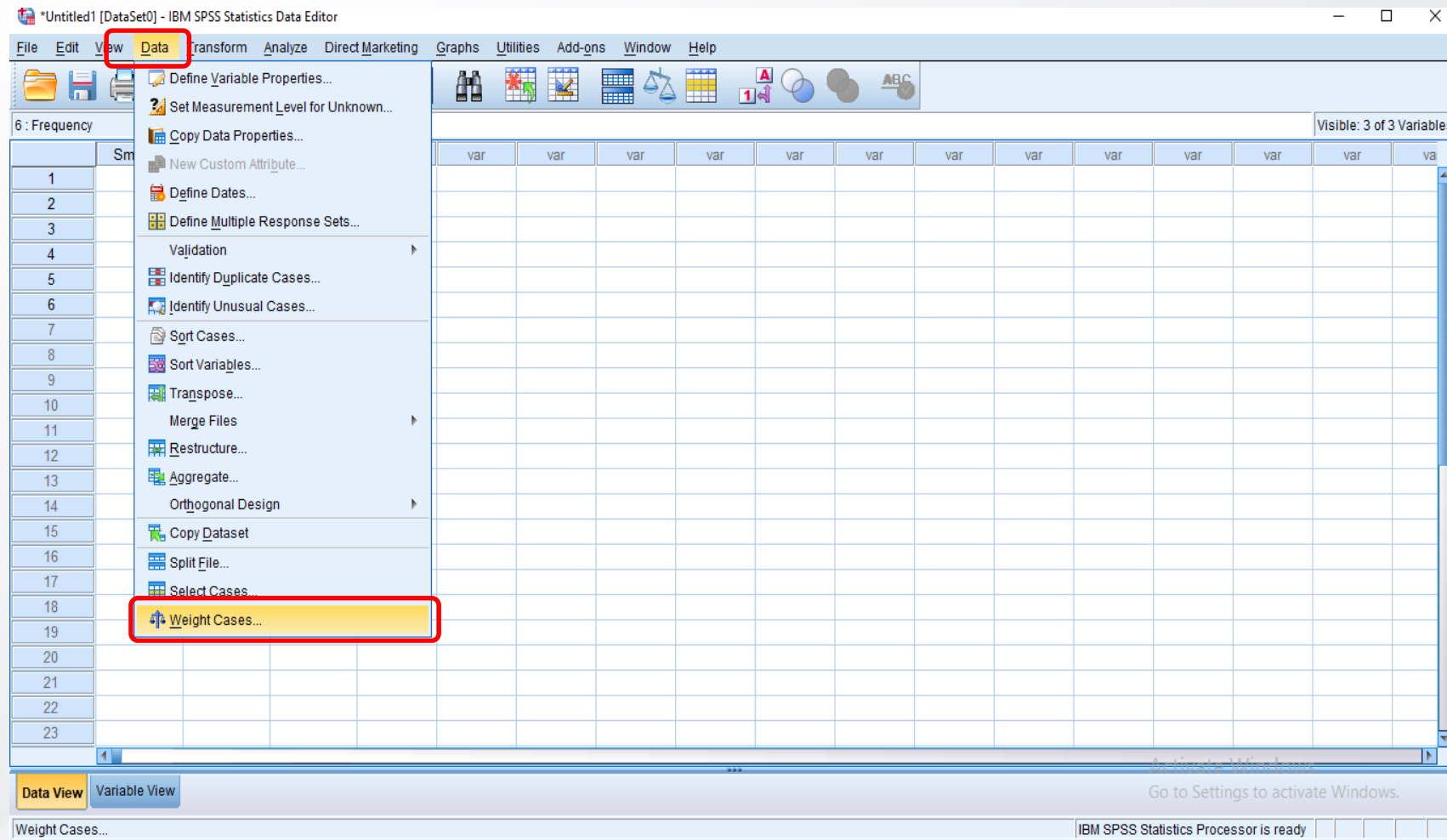
IBM SPSS Statistics Processor is ready

4: Frequency 55.00 Visible: 3 of 3 Variables

	Gender	Sports	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	70.00																
2	1.00	2.00	90.00																
3	2.00	1.00	85.00																
4	2.00	2.00	55																
5																			
6																			
7																			
8																			
9																			
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27																			
28																			
29																			

Data View Variable View

IBM SPSS Statistics Processor is ready



IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first three columns are labeled 'Smoking', 'Education', and 'Frequency'. The 'Frequency' column contains values: 13.00, 7.00, 6.00, 10.00, 9.00, 5.00, and then empty cells for rows 7 through 23. A 'Weight Cases' dialog box is open, showing the 'Weight cases by' option selected, with 'Frequency' listed as the variable to weight by. The 'Current Status' is 'Do not weight cases'.

6 : Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
8																	
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17																	
18																	
19																	
20																	
21																	
22																	
23																	

Weight Cases

☒ Do not weight cases
☐ Weight cases by

Frequency Variable:

Current Status: Do not weight cases

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

IBM SPSS Statistics Data Editor window showing a dataset with 3 variables: Smoking, Education, and Frequency. The data is displayed in a table with 23 rows. The 'Frequency' variable is highlighted in yellow for the 6th row, with a value of 5.00.

The 'Weight Cases' dialog box is open, showing the 'Frequency' variable selected as the 'Frequency Variable' under the 'Weight cases by' option. The 'Do not weight cases' option is also visible.

The 'Data View' tab is active at the bottom.

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
7																	
8																	
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18																	
19																	
20																	
21																	
22																	
23																	

IBM SPSS Statistics Data Editor window showing a dataset with 23 rows and 18 columns. The first three columns are labeled 'Smoking', 'Education', and 'Frequency'. The 'Frequency' column contains values: 13.00, 7.00, 6.00, 10.00, 9.00, 5.00, and then empty cells for rows 7 through 23. A 'Weight Cases' dialog box is open, showing the 'Weight cases by' option selected. The 'Frequency Variable' is listed in the 'Frequency Variable:' box. The 'OK' button is highlighted. The status bar at the bottom indicates 'IBM SPSS Statistics Processor is ready'.

6 : Frequency 5.00 Visible: 3 of 3 Variables

	Smoking	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	va
1	1.00	1.00	13.00														
2	1.00	2.00	7.00														
3	1.00	3.00	6.00														
4	2.00	1.00	10.00														
5	2.00	2.00	9.00														
6	2.00	3.00	5.00														
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21																	
22																	
23																	

Weight Cases

☐ Do not weight cases

☒ Weight cases by

Frequency Variable:

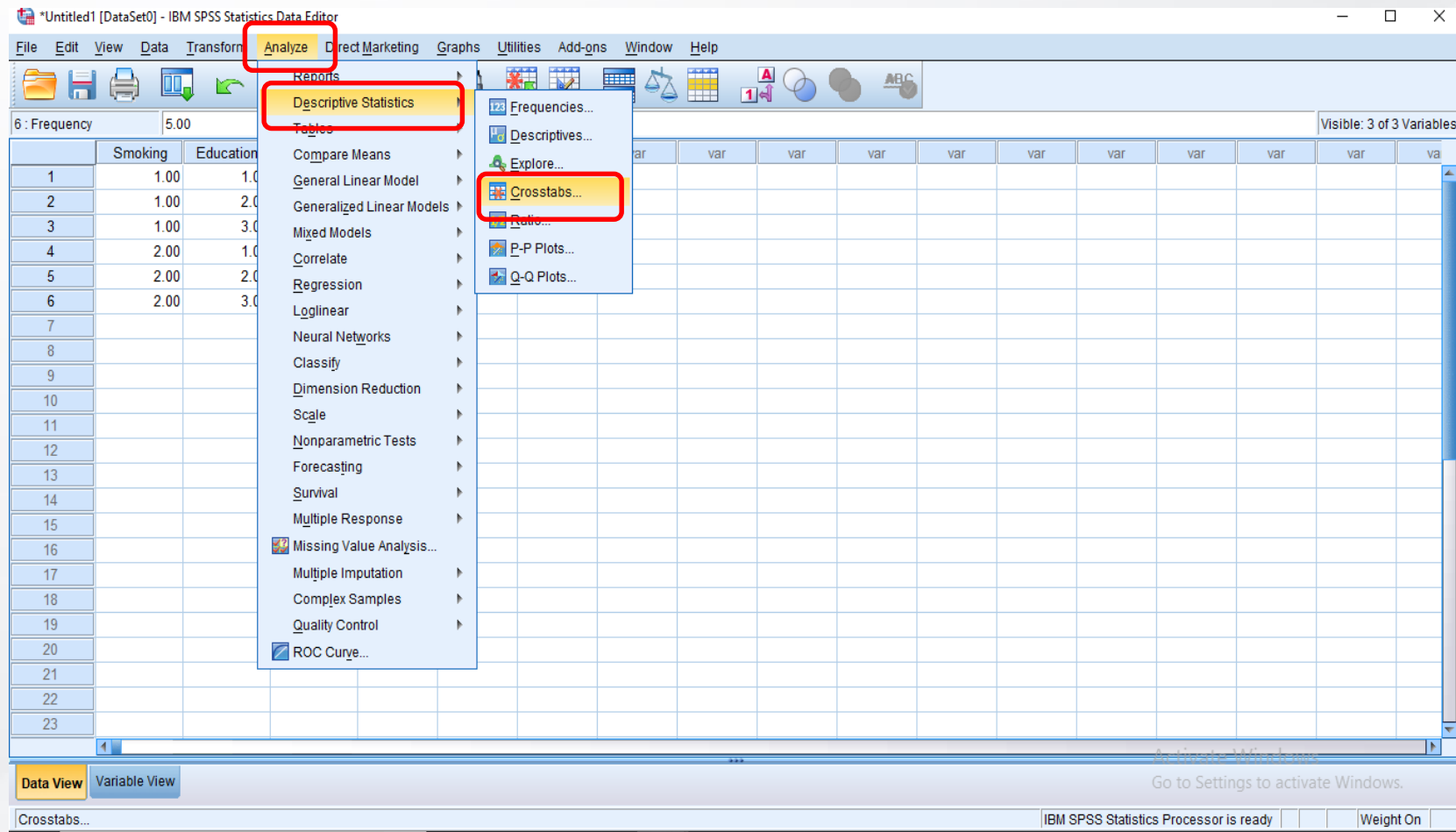
Frequency

Current Status: Do not weight cases

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready



*Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4 : Frequency 55.00 Visible: 3 of 3 Variables

	Gender	Sport	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	70.00													
2	1.00	2.00	85.00													
3	2.00	1.00	90.00													
4	2.00	2.00	55.00													
5																
6																
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22																
23																

Crosstabs

Frequency

Row(s): Gender

Column(s): Sport

Layer 1 of 1

Previous Next

Display layer variables in table layers

☐ Display clustered bar charts

☐ Suppress tables

OK Paste Reset Cancel Help

Exact... Statistics... Cells... Format... Bootstrap...

Activate Windows
Go to Settings to activate Windows.

Data View Variable View

*Untitled2 [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

4 : Frequency 55.00 Visible: 3 of 3 Variables

	Gender	Sport	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	70.00													
2	1.00	2.00	85.00													
3	2.00	1.00	90.00													
4	2.00	2.00	55.00													
5																
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23																

Crosstabs

Crosstabs: Statistics

Frequency

☒ Chi-square ☒ Correlations

Nominal

☐ Contingency coefficient ☐ Gamma

☐ Phi and Cramer's V ☐ Somers' d

☐ Lambda ☐ Kendall's tau-b

☐ Uncertainty coefficient ☐ Kendall's tau-c

Nominal by Interval

☐ Eta ☐ Kappa

☐ Risk

☐ McNemar

☐ Cochran's and Mantel-Haenszel statistics

Test common odds ratio equals: 1

☐ Display cluster ☐ Suppress table

Continue Cancel Help

OK Paste Reset Cancel Help

Exact... Statistics... Cells... Format... Bootstrap...

Data View Variable View

Activate Windows Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready. Wait On

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Gender Male 70 85 155
Female 90 55 145
Total 160 140 300

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.605 ^a	1	.003		
Continuity Correction ^b	7.939	1	.005		
Likelihood Ratio	8.652	1	.003		
Fisher's Exact Test				.004	.002
Linear-by-Linear Association	8.576	1	.003		
N of Valid Cases	300				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 67.67.
b. Computed only for a 2x2 table

Symmetric Measures

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Interval Pearson's R	-.169	.057	-2.966	.003 ^c
Ordinal by Ordinal Spearman Correlation	-.169	.057	-2.966	.003 ^c
N of Valid Cases	300			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Activate Windows
Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Less than 0.05 .
significance level

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	8.605 ^a	1	.003		
Continuity Correction ^b	7.939	1	.005		
Likelihood Ratio	8.652	1	.003		
Fisher's Exact Test				.004	.002
Linear-by-Linear Association	8.576	1	.003		
N of Valid Cases	300				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 67.67.

b. Computed only for a 2x2 table

Statistical decision

The resulting probability value of the test is 0.03, which is a value less than 0.05 (the level of significance), so we accept the alternative hypothesis that there is a relationship between gender (male - female) and exercise and that they are two dependent variables

*Output1 [Document1] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

it
 .og
 Crosstabs
 Title
 Notes
 Active Dataset
 Case Processing Summary
 Smoking * Education Crosstab
 Chi-Square Tests
 .og
 Crosstabs
 Title
 Notes
 Active Dataset
 Case Processing Summary
 Gender * Sport Crosstabulation
 Chi-Square Tests
 .og
 Crosstabs
 Title
 Notes
 Active Dataset
 Case Processing Summary
 Gender * Sport Crosstabulation
 Chi-Square Tests
 Symmetric Measures

		Play	Not play	Total
Gender	Male	70	85	155
	Female	90	55	145
Total		160	140	300

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.605 ^a	1	.003		
Continuity Correction ^b	7.939	1	.005		
Likelihood Ratio	8.652	1	.003		
Fisher's Exact Test				.004	.002
Linear-by-Linear Association	8.576	1	.003		
N of Valid Cases	300				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 67.67.
 b. Computed only for a 2x2 table

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Interval	Pearson's R	-.169	.057	-2.966	.003 ^c
Ordinal by Ordinal	Spearman Correlation	-.169	.057	-2.966	.003 ^c
N of Valid Cases		300			

a. Not assuming the null hypothesis.
 b. Using the asymptotic standard error assuming the null hypothesis.
 c. Based on normal approximation.

Activate Windows
 Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

The correlation coefficient indicates the existence of a relationship between the two variables, regardless of the degree, strength and type of correlation

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Interval	Pearson's R	-.169	.057	-2.966	.003 ^c
Ordinal by Ordinal	Spearman Correlation	-.169	.057	-2.966	.003 ^c
N of Valid Cases		300			

Example: The given questionnaire is required to know whether the gender (male - female) and the educational level of the 30 respondents are independent variables, or is there a relationship between them?

Nationality			Education level			
Egyptian	1		1	Less than Secondary		
Arab	2		2	Secondary		
foreigners	3		3	Graduate		
			4	Postgraduate		
Gender						
1	Male				City	
2	Female			1	Cairo	
				2	Alex	
				3	Aswan	
				4	Hurghada	

X1				X2			
1	Strongly Disagree			1	Strongly Disagree		
2	Disagree			2	Disagree		
3	Not Sure			3	Not Sure		
4	Agree			4	Agree		
5	Strongly Agree			5	Strongly Agree		
X1	Satisfication with place			X2	Satisfication with services		
X4				X3			
1	Strongly Disagree			1	Strongly Disagree		
2	Disagree			2	Disagree		
3	Not Sure			3	Not Sure		
4	Agree			4	Agree		
5	Strongly Agree			5	Strongly Agree		
X4	performance satisfaction			X3	Satisfaction with the employees		

Number	City	Gender	Education level	Nationality	X1	X2	X3	X4	
1	1	1	1	3	1	5	4	2	2
2	3	3	2	2	1	3	3	3	3
3	2	2	2	1	1	5	4	4	4
4	1	1	2	1	2	4	5	5	1
5	2	2	1	2	1	5	5	5	2
6	1	1	1	2	3	4	4	2	1
7	1	1	2	3	1	5	5	4	2
8	4	4	1	2	2	4	2	2	5
9	1	1	2	4	1	3	5	3	5
10	2	2	1	3	1	5	4	5	2
11	1	1	1	2	1	1	5	2	2
12	2	2	2	1	2	2	2	2	2
13	1	1	2	2	1	4	2	2	2
14	2	2	2	2	3	5	3	3	3
15	1	1	1	2	2	3	2	2	2
16	3	3	1	1	1	4	1	1	1
17	3	3	2	4	3	5	1	5	5
18	1	1	2	1	2	5	5	4	4
19	2	2	1	1	3	3	3	5	5
20	1	1	2	1	2	3	3	5	4
21	3	3	1	3	1	5	5	5	2
22	2	2	1	4	1	4	4	2	1
23	1	1	2	3	1	5	5	4	2
24	4	4	1	4	2	4	2	2	5
25	2	2	2	2	1	3	5	3	5
26	3	3	1	3	2	5	4	5	2
27	1	1	2	4	1	1	5	2	2
28	1	1	2	2	3	5	1	2	4
29	2	2	1	3	1	5	3	5	5
30	3	3	1	4	2	5	3	3	2

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

29: q4 1.00 Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	4.00	1.00	5.00	4.00	2.00									
2	2.00	2.00	2.00	1.00	3.00	3.00	3.00									
3	1.00	2.00	1.00	1.00	5.00	4.00	4.00									
4	2.00	2.00	1.00	2.00	5.00	5.00	5.00									
5	1.00	1.00	2.00	1.00	1.00	5.00	5.00									
6	1.00	1.00	4.00	3.00	4.00	4.00	4.00									
7	1.00	2.00	4.00	1.00	4.00	4.00	4.00									
8	1.00	1.00	4.00	2.00	4.00	3.00	4.00									
9	1.00	2.00	4.00	1.00	5.00	5.00	5.00									
10	2.00	1.00	3.00	1.00	4.00	2.00	4.00									
11	1.00	2.00	2.00	1.00	2.00	2.00	2.00									
12	2.00	2.00	1.00	2.00	2.00	2.00	2.00									
13	1.00	1.00	1.00	3.00	2.00	2.00	2.00									
14	2.00	1.00	2.00	1.00	3.00	5.00	3.00									
15	1.00	1.00	2.00	3.00	3.00	5.00	3.00									
16	3.00	1.00	3.00	1.00	4.00	4.00	5.00									
17	2.00	1.00	4.00	3.00	5.00	5.00	5.00									
18	2.00	1.00	1.00	1.00	5.00	5.00	4.00									
19	2.00	1.00	1.00	2.00	2.00	4.00	5.00									
20	1.00	2.00	2.00	2.00	3.00	3.00	3.00									
21	4.00	2.00	1.00	3.00	3.00	2.00	3.00									
22	1.00	1.00	4.00	2.00	4.00	4.00	3.00									
23	2.00	1.00	1.00	3.00	5.00	3.00	5.00									

Data View Variable View

IBM SPSS Statistics Processor is ready

Education level Gender	Less than Secondary	Secondary	Graduate	Postgraduate	Total
Male					
Female					
Total					

Null Hypothesis

Gender (male-female) and Education level are two independent variables
(there is no relation between them)

Alternative Hypothesis

Gender (male - female) and Education level are two dependent variables (there is a relationship between them)

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var
1	1.00	1.00	4.00	1.00	5.00	4.00	2.00									
2	2.00	2.00	2.00	1.00	3.00	3.00	3.00									
3	1.00	2.00	1.00	1.00	5.00	4.00	4.00									
4	2.00	2.00	1.00	2.00	5.00	5.00	5.00									
5	1.00	1.00	2.00	1.00	1.00	5.00	5.00									
6	1.00	1.00	4.00	3.00	4.00	4.00	4.00									
7	1.00	2.00	4.00	1.00	4.00	4.00	4.00									
8	1.00	1.00	4.00	2.00	4.00	3.00	4.00									
9	1.00	2.00	4.00	1.00	5.00	5.00	5.00									
10	2.00	1.00	3.00	1.00	4.00	2.00	4.00									
11	1.00	2.00	2.00	1.00	2.00	2.00	2.00									
12	2.00	2.00	1.00	2.00	2.00	2.00	2.00									
13	1.00	1.00	1.00	3.00	2.00	2.00	2.00									
14	2.00	1.00	2.00	1.00	3.00	5.00	3.00									
15	1.00	1.00	2.00	3.00	3.00	5.00	3.00									
16	3.00	1.00	3.00	1.00	4.00	4.00	5.00									
17	2.00	1.00	4.00	3.00	5.00	5.00	5.00									
18	2.00	1.00	1.00	1.00	5.00	5.00	4.00									
19	2.00	1.00	1.00	2.00	2.00	4.00	5.00									
20	1.00	2.00	2.00	2.00	3.00	3.00	3.00									
21	4.00	2.00	1.00	3.00	3.00	2.00	3.00									
22	1.00	1.00	4.00	2.00	4.00	4.00	3.00									
23	2.00	1.00	1.00	3.00	5.00	3.00	5.00									

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform **Analyze** Direct Marketing Graphs Utilities Add-ons Window Help

Reports
Descriptive Statistics
Tables
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate
Regression
Loglinear
Neural Networks
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Missing Value Analysis...
Multiple Imputation
Complex Samples
Quality Control
ROC Curve...

Custom Tables...
Multiple Response Sets...

Visible: 7 of 7 Variables

	q1	q2																
1	1.00	1.00																
2	2.00	2.00																
3	1.00	2.00																
4	2.00	2.00																
5	1.00	1.00																
6	1.00	1.00																
7	1.00	2.00																
8	1.00	1.00																
9	1.00	2.00																
10	2.00	1.00																
11	1.00	2.00																
12	2.00	2.00																
13	1.00	1.00																
14	2.00	1.00																
15	1.00	1.00																
16	3.00	1.00																
17	2.00	1.00																
18	2.00	1.00																
19	2.00	1.00																
20	1.00	2.00																
21	4.00	2.00	1.00	3.00	3.00	2.00	3.00											
22	1.00	1.00	4.00	2.00	4.00	4.00	3.00											
23	2.00	1.00	1.00	3.00	5.00	3.00	5.00											

1

Data View Variable View

Go to Settings to activate Windows.

Custom Tables... IBM SPSS Statistics Processor is ready

Drag Education level variable

Drag Gender variable

Anova Total 2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Custom Tables

Table Titles Test Statistics Options

Variables:

- City [q1]
- Sex [q2]
- Education [q3]
- nation [q4]
- General [x1]
- Night [x2]
- Travel [x3]

Columns

Rows

Define

N% Summary Statistics...

Categories and Totals...

Summary Statistics

Position: Columns

Source:

Category Position: Default

OK Paste Reset Cancel Help

	q1	q2	q3
1	1.00	1.00	4.00
2	2.00	2.00	2.00
3	1.00	2.00	1.00
4	2.00	2.00	1.00
5	1.00	1.00	2.00
6	1.00	1.00	4.00
7	1.00	2.00	4.00
8	1.00	1.00	4.00
9	1.00	2.00	4.00
10	2.00	1.00	3.00
11	1.00	2.00	2.00
12	2.00	2.00	1.00
13	1.00	1.00	1.00
14	2.00	1.00	2.00
15	1.00	1.00	2.00
16	3.00	1.00	3.00
17	2.00	1.00	4.00
18	2.00	1.00	1.00
19	2.00	1.00	1.00
20	1.00	2.00	2.00
21	4.00	2.00	1.00
22	1.00	1.00	4.00
23	2.00	1.00	1.00

Visible: 7 of 7 Variables

Data View Variable View

IBM SPSS Statistics Processor is ready

Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Custom Tables

Table Titles Test Statistics Options

Variables:

- City [q1]
- Sex [q2]
- Education [q3]
- nation [q4]
- Genaeal [x1]
- Night [x2]
- Travel [x3]

Columns

Sex	
M	F
Count	Count
nnnn	nnnn

Rows

Define

Summary Statistics

Position: Columns ☐ Hide

Source: Column Variables

Category Position: Default

OK Paste Reset Cancel Help

Visible: 7 of 7 Variables

	q1	q2	q3
1	1.00	1.00	4.00
2	2.00	2.00	2.00
3	1.00	2.00	1.00
4	2.00	2.00	1.00
5	1.00	1.00	2.00
6	1.00	1.00	4.00
7	1.00	2.00	4.00
8	1.00	1.00	4.00
9	1.00	2.00	4.00
10	2.00	1.00	3.00
11	1.00	2.00	2.00
12	2.00	2.00	1.00
13	1.00	1.00	1.00
14	2.00	1.00	2.00
15	1.00	1.00	2.00
16	3.00	1.00	3.00
17	2.00	1.00	4.00
18	2.00	1.00	1.00
19	2.00	1.00	1.00
20	1.00	2.00	2.00
21	4.00	2.00	1.00
22	1.00	1.00	4.00
23	2.00	1.00	1.00

Data View Variable View

Go to Settings to activate Windows.

IBM SPSS Statistics Processor is ready

*Anova Total2019.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 7 of 7 Variables

	q1	q2	q3	q4	x1	x2	x3	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	4.00	1.00															
2	2.00	2.00	2.00	1.00															
3	1.00	2.00	1.00	1.00															
4	2.00	2.00	1.00	2.00															
5	1.00	1.00	2.00	1.00															
6	1.00	1.00	4.00	3.00															
7	1.00	2.00	4.00	1.00															
8	1.00	1.00	4.00	2.00															
9	1.00	2.00	4.00	1.00															
10	2.00	1.00	3.00	1.00															
11	1.00	2.00	2.00	1.00															
12	2.00	2.00	1.00	2.00															
13	1.00	1.00	1.00	3.00															
14	2.00	1.00	2.00	1.00															
15	1.00	1.00	2.00	3.00															
16	3.00	1.00	3.00	1.00															
17	2.00	1.00	4.00	3.00															
18	2.00	1.00	1.00	1.00															
19	2.00	1.00	1.00	2.00															
20	1.00	2.00	2.00	2.00															
21	4.00	2.00	1.00	3.00															
22	1.00	1.00	4.00	2.00															
23	2.00	1.00	1.00	3.00															
24	4.00	1.00	2.00	1.00															
25	1.00	1.00	3.00	3.00															
26	3.00	2.00	3.00	3.00															
27	3.00	2.00	3.00	3.00	2.00	2.00	2.00												
28	4.00	2.00	3.00	2.00	5.00	4.00	5.00												
29	2.00	1.00	4.00	1.00	4.00	4.00	3.00												

Custom Tables

Table Titles Test Statistics Options

Normal Compact Layers

Variables:

- City [q1]
- Gender [q2]
- Education [q3]
- nation [q4]
- Genaeal [x1]
- Night [x2]
- Travel [x3]

Columns

		Gender	
		M	F
		Count	Count
Education	Before ...	nnnn	nnnn
	Secondary	nnnn	nnnn
	University	nnnn	nnnn
	post ...	nnnn	nnnn

Rows

Define

N% Summary Statistics...

Categories and Totals...

Summary Statistics

Position: Columns Hide

Source: Column Variables

Category Position: Default

OK Paste Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready

2:47 PM 11/16/2019

25-6-2021.sav [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Visible: 8 of 8 Variables

	Q1	Q2
1	1.00	1.00
2	1.00	2.00
3	1.00	2.00
4	2.00	2.00
5	1.00	1.00
6	3.00	1.00
7	1.00	2.00
8	2.00	1.00
9	1.00	2.00
10	1.00	1.00
11	1.00	1.00
12	2.00	2.00
13	1.00	2.00
14	3.00	2.00
15	2.00	1.00
16	1.00	1.00
17	3.00	2.00
18	2.00	2.00
19	3.00	1.00
20	2.00	2.00
21	1.00	1.00
22	1.00	1.00
23	1.00	2.00
24	2.00	1.00
25	1.00	2.00
26	2.00	1.00
27	1.00	2.00
28	3.00	2.00
29	1.00	1.00

*Output3 [Document3] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Output
Log
Custom Tables
Title
Notes
Active Dataset
Table 1

DATASET ACTIVATE DataSet2.
* Custom Tables.
CTABLES
/VARIABLES=Q3 Q2 DISPLAY=LABEL
/TABLE Q3 BY Q2 [COUNT F40.0]
/CATEGORIES VARIABLES=Q3 Q2 ORDER=A KEY=VALUE EMPTY=INCLUDE.

→ Custom Tables

[DataSet2] C:\Users\Dr.Al Faisal\Documents\25-6-2021.sav

		Gender	
		Male	Female
		Count	Count
Education Level	Less than Secondary	2	5
	Secondary	5	5
	Graduate	5	2
	Postgraduate	3	3

IBM SPSS Statistics Processor is ready

Data View Variable View

Type here to search

33°C Sunny 2:10 PM 6/27/2021

		Gender	
		Male	Female
		Count	Count
Education Level	Less than Secondary	2	5
	Secondary	5	5
	Graduate	5	2
	Postgraduate	3	3

Education level Gender	Less than Secondary	Secondary	Graduate	Postgraduate	Total
Male					
Female					
Total					

Education level Gender	Less than Secondary	Secondary	Graduate	Postgraduate	Total
Male	2	5	5	3	15
Female	5	5	2	3	15
Total	7	10	7	6	30

*Untitled4 [DataSet4] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

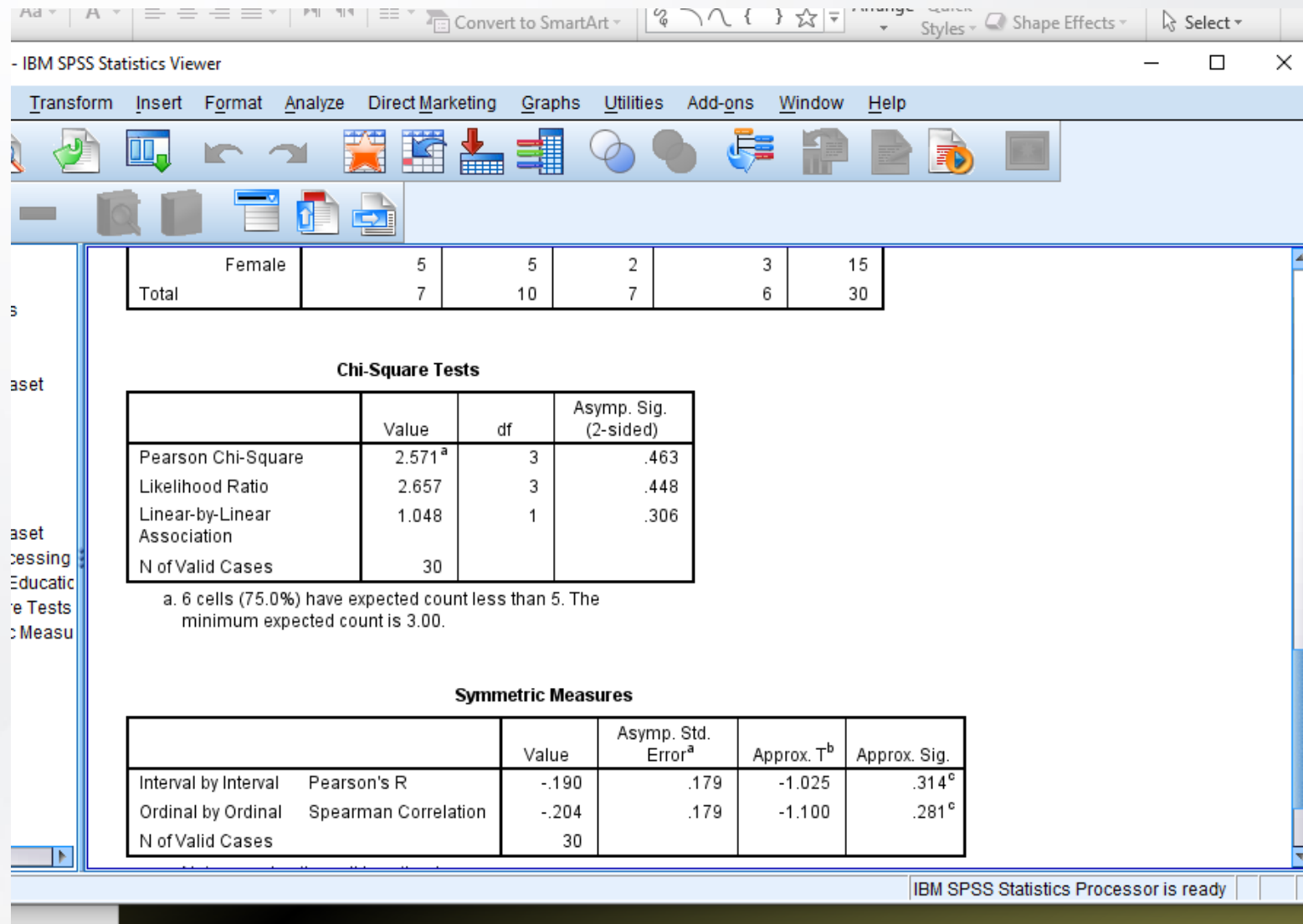
8 : Frequency 3.00 Visible: 3 of 3 Variables

	Gender	Education	Frequency	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1	1.00	1.00	2.00																
2	1.00	2.00	5.00																
3	1.00	3.00	5.00																
4	1.00	4.00	3.00																
5	2.00	1.00	5.00																
6	2.00	2.00	5.00																
7	2.00	3.00	2.00																
8	2.00	4.00	3.00																
9																			
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25																			
26																			
27																			
28																			
29																			

Data View Variable View

IBM SPSS Statistics Processor is ready. Weight on

Type here to search 33°C Sunny 2:24 PM 6/27/2021



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.571 ^a	3	.463
Likelihood Ratio	2.657	3	.448
Linear-by-Linear Association	1.048	1	.306
N of Valid Cases	30		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is 3.00.

Statistical decision

The resulting probabilistic value of the test is 0.463, which is a value greater than 0.05 (the level of significance), so we accept the null hypothesis that there is no relationship between gender (male - female) and educational level, that is, they are two independent variables



Thank You