



جامعة المستقبل

كلية التقنيات الطبية و الصحية

قسم تقنيات البصريات

الكورس الثاني

المحاضرة الاولى العملي

التطبيقات الاحصائية

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المبرمج مصطفى مرتضى خلف

1- Questionnaire form

The questionnaire is a set of various questions that are related to each other in a way that investigates the goal that the researcher seeks through the problem he poses in his research and sends a questionnaire. The questionnaire was mailed or in any other way to a group of individuals or institutions chosen by him the researcher for his research so that it can be filled out and then returned to the researcher. The number of questions it contains must be limited the questionnaire form is sufficient and sufficient to achieve the research goal, regardless of its number. Below is a sample questionnaire form.

استبيان حول مرض سكري الدم

تم إعداد هذا الاستبيان لقياس مدى معرفة الناس بالمرض وكيفية الإصابة منه والوقاية منه و سيكون هذا الاستبيان على قدر من الخصوصية .

ما هو مرض سكري الدم ؟؟

هل يمكن لأسباب وراثية ان تسبب مرض السكري :

نعم لا

لا اعلم

ما هي الفئة العمرية المعرضة للإصابة بهذا المرض ؟

الأطفال الشباب كبار السن

لا يقتصر على فئة عمرية معينة لا اعلم

ما هي العوامل التي تؤدي الى ارتفاع سكري الدم ؟؟ (يمكن اختيار أكثر من إجابة)

تناول السكريات و المشروبات التكوين

لا اعلم الحالة النفسية

يمكن إضافة أشياء أخرى :

ما هي انواع مرض السكري ؟؟

هل يمكن الشفاء من سكري الدم ؟

نعم لا

لا اعلم حسب النوع المصاب به

ما رأيك بالدور التوعوي الذي تقوم به هيئة الصحة في الدولة بالنسبة لهذا المرض ؟

ممتاز جيد جدا ليس بالمستوى المطلوب متدني

تعليقات إضافية :

.....



2- Data Encoding

This process involves converting the answers to each question in the questionnaire into numbers to facilitate their entry into the SPSS program and thus conduct the appropriate statistical analysis on this data and reach the results. According to the SPSS program, each question in the questionnaire will be a variable, representing the columns. The individuals who answer the questionnaire questions will represent the cases, i.e., the rows. Each questionnaire form specific to the answers of a particular person will represent one row, and so on. The data in the questionnaire form is encoded according to the following steps:

1- The questionnaire forms are numbered after they are answered by the concerned persons, for example if

We had ten questionnaire forms. The first form was given number (1) and then given

The second form is number (2), and so on to the tenth form, giving it the number (10), meaning we will have ten rows (ten observations under each variable).

2 - Questions whose answers are either yes or no are coded as questions with only two answers

By giving a correct number, for example (1) if the answer is (yes) and (2) if the answer is (no) or if the question is about the gender of the person, male or female.

3- As for the questions that are specific to knowing people's opinions on a specific topic, we will put a number for each

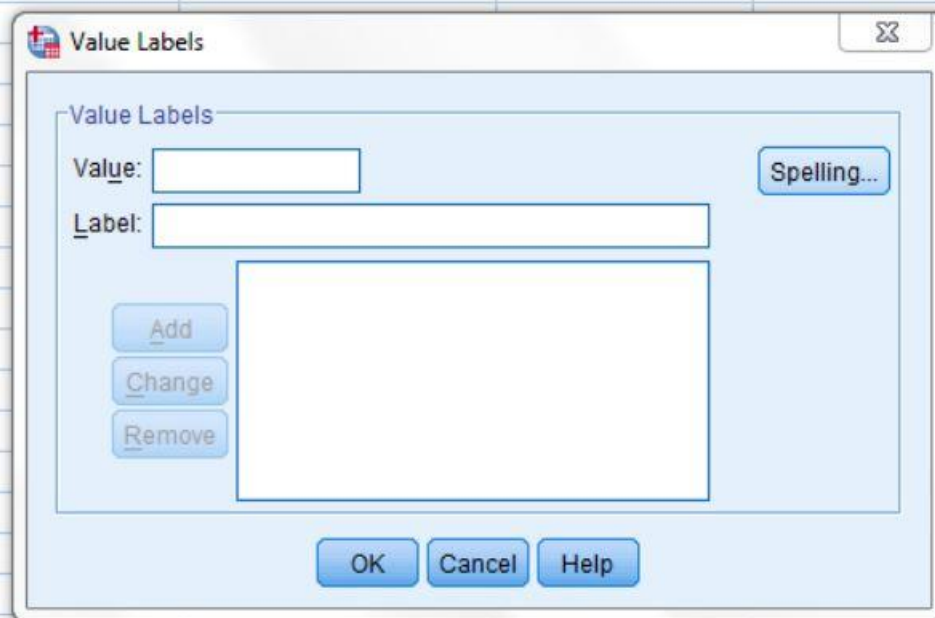
One of the cases of the question is as shown in the table:

Variable states	I strongly agree	I agree	neutral	I refuse	I refuse Hardly
NU.	1	2	3	4	5

❖ The step of input data:

- 1- Open the new file in SPSS program.
- 2- From the data page, we click on View Variable. The variables properties window will appear. In the Name box, we write the opinion, then we open the Values box. A window will appear as below.

We write the first number in the Value field, for example (5), then we write in the Label field the status that corresponds to this number, which is (I strongly agree), then we press Add, and so on with the rest of the numbers, as shown below.



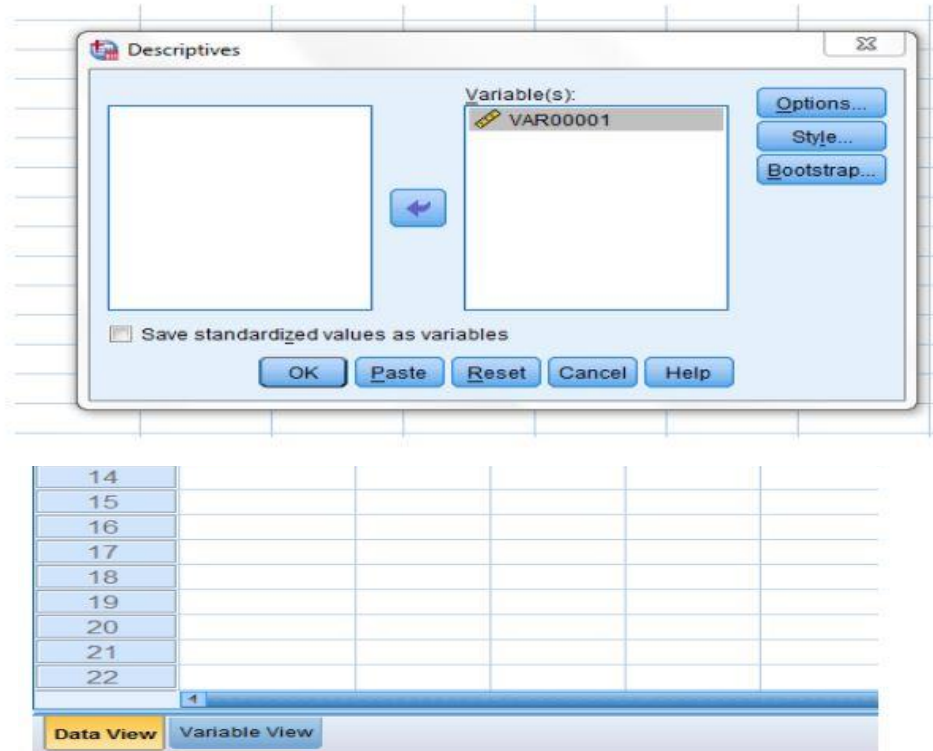


- 3- Click OK to return to the Variables Properties window.
 - 4- We move to the Decimals field and make the number of decimals equal to zero.
 - 5- We move to the Width field and make the number of integers one number only.
 - 6- We return to the data window by clicking on View Data and entering the data for each form.
- Descriptive statistics measures:

Here we will explain the most important descriptive statistics standards that are applied to the data:

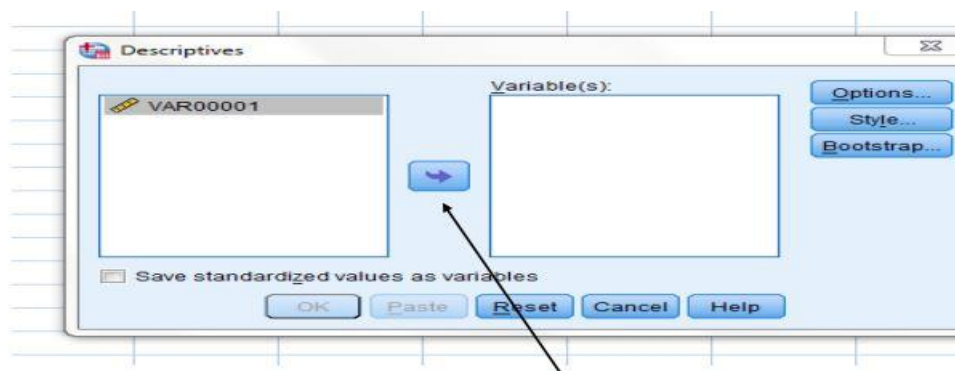
Mean	Sum	Std. deviation	Variance	Range	Minimum	Maximum	S.E Mean	Kurtosis	Skewness
------	-----	----------------	----------	-------	---------	---------	----------	----------	----------

An illustrative example: For the data below, it is required to calculate the mean, variance, standard deviation, range, minimum, maximum, and sum.

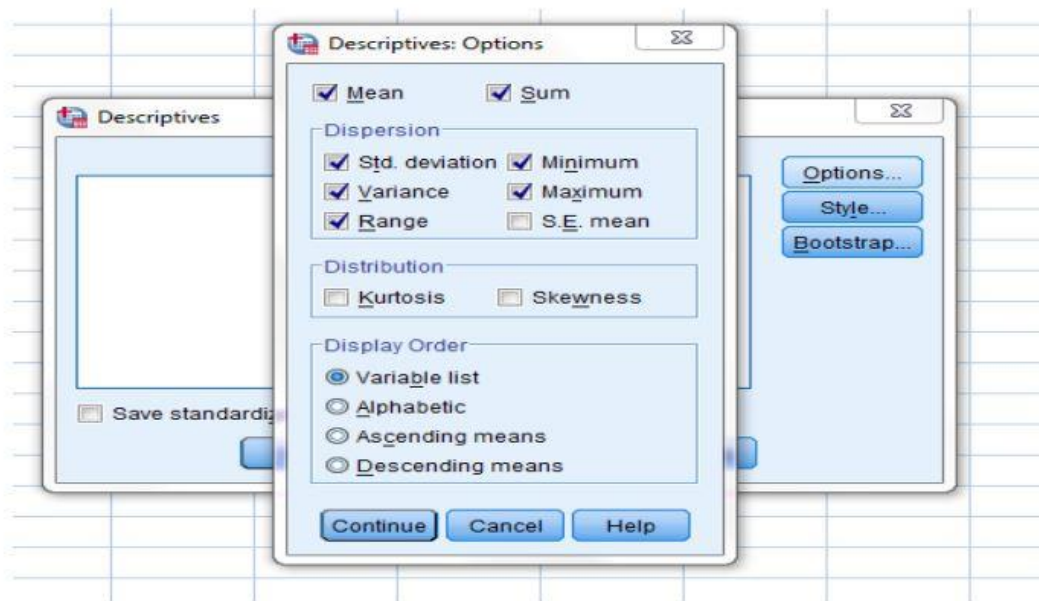


Solution steps:

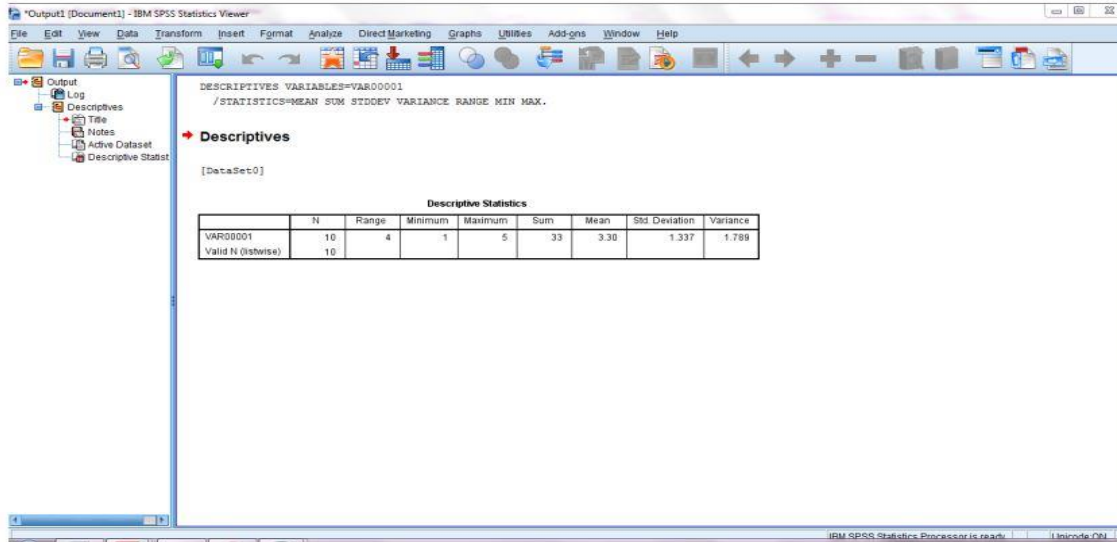
- 1- We open the Analyze menu, choose Statistics Descriptive from it, then choose Descriptive. The window appears.
- 2- We enter the variable 00001VAR into the (s)(Variable) box through Click on the arrow as shown



- 3- Then we click on Options. A window with descriptive statistics metrics will appear. We indicate the required metrics as below



- 4- Then we click on the Continue option and then click Ok.
- 5- The results appear in the output window as below



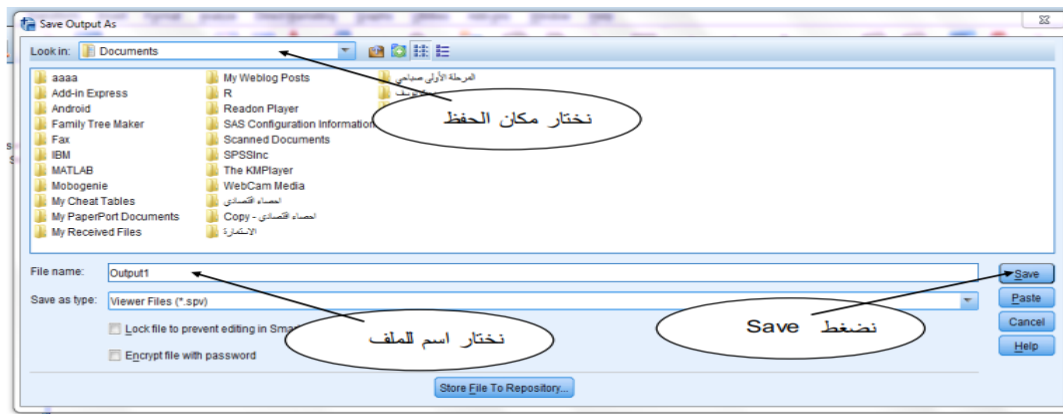
► Descriptives

[DataSet0]

Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
VAR00001	10	4	1	5	33	3.30	1.337	1.789
Valid N (listwise)	10							

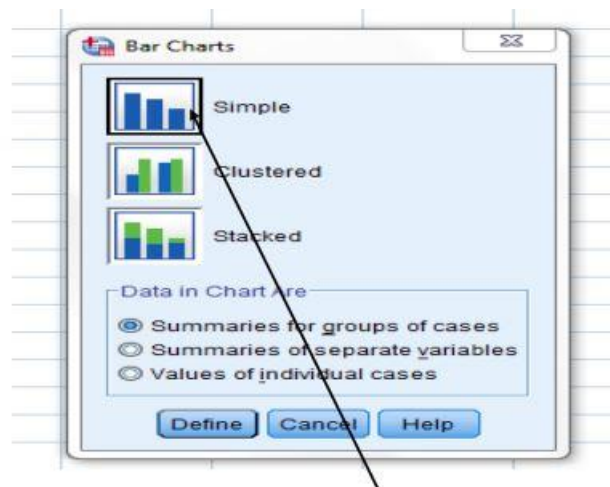
- 6- We save the results from the output window by opening the File menu. We choose Save and the window appear



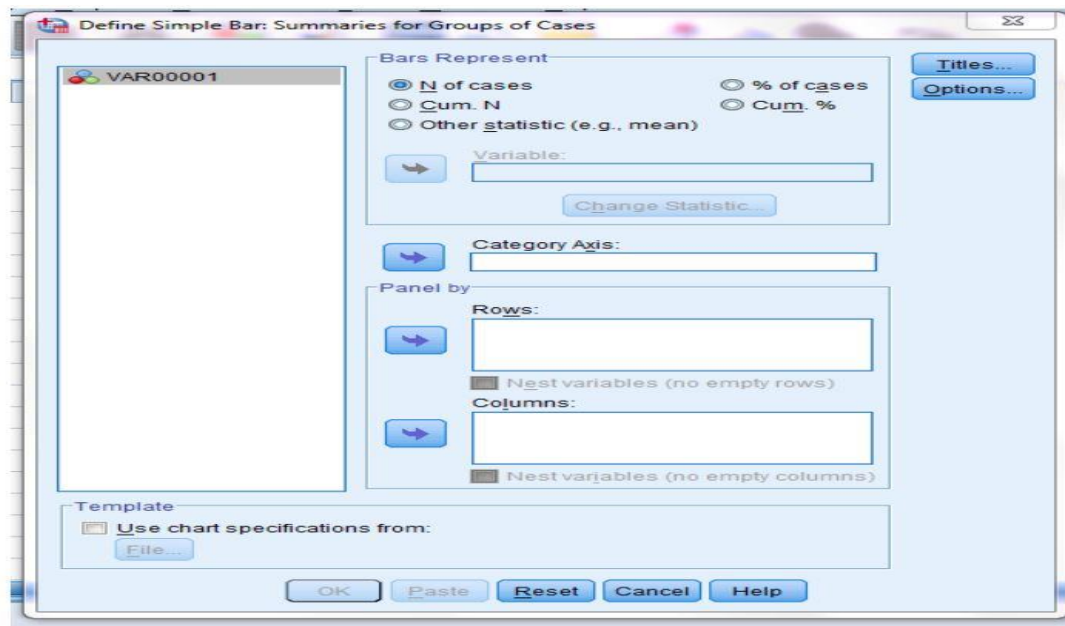
➤ Graphical representation:

The above data can be represented by drawing either a bar graph, a pie chart, etc., according to the following steps:

- 1- We open the Graphs menu. We choose Dialogs Legacy. A group of options appear. We choose Bar. A window appears as below.



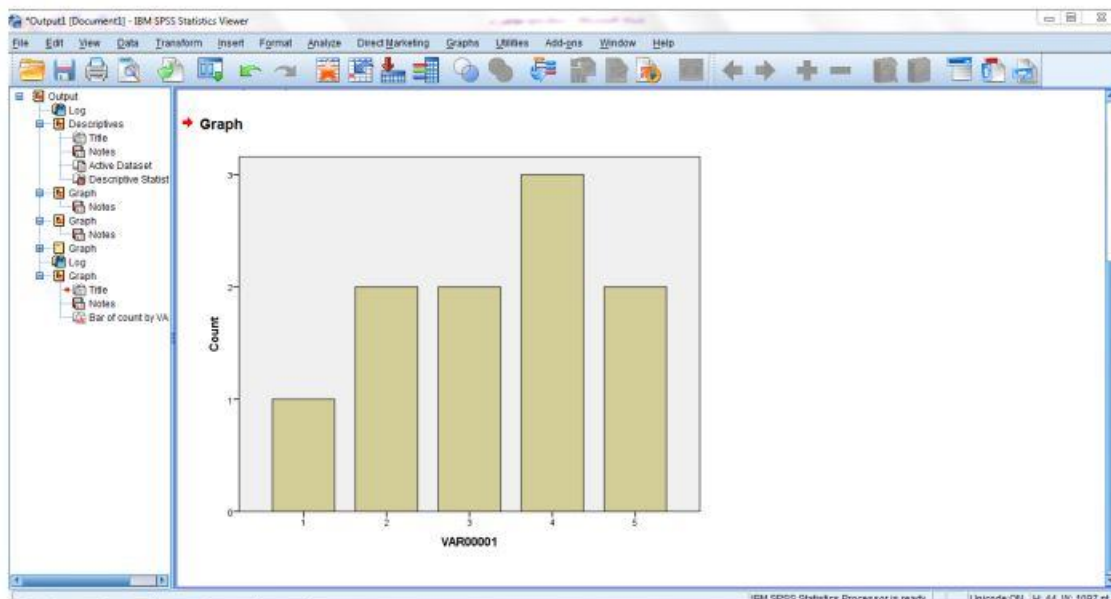
- 2- We choose the Simple option, then click Define. A new window will appear as below



3- We move the variable under the Axis Category using the arrow



4- Then we click OK. The drawing will appear in the output window



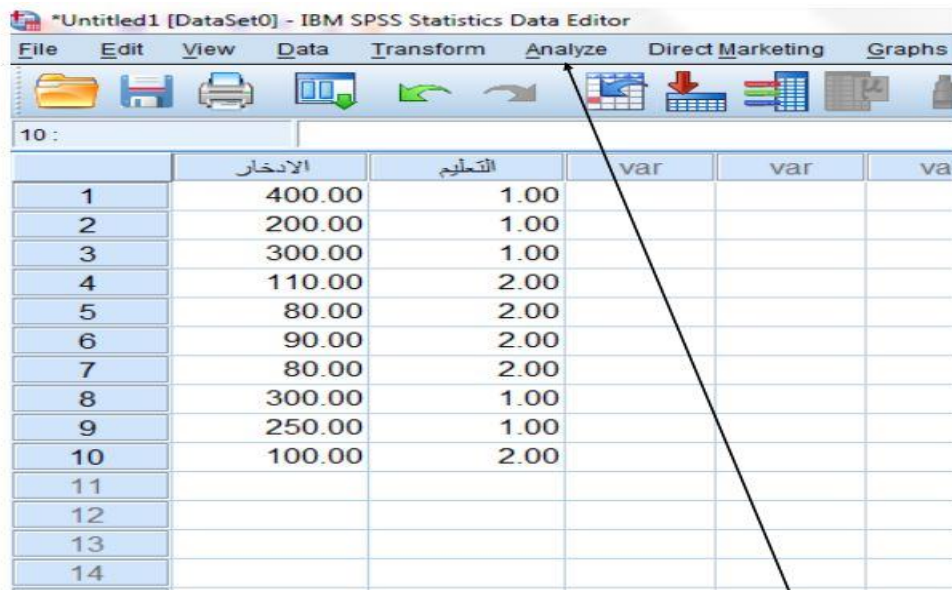
➤ One Way ANOVA Analysis of Variance

We use analysis of variance to explain a particular economic phenomenon by specifying a dependent variable that is explained by another variable. For example, we explain individual savings between the educated and the uneducated, and the data were as in the table below.

مستوى التعليم	الادخار
متعلم	400
متعلم	200
متعلم	300
غير متعلم	110
غير متعلم	80
غير متعلم	90

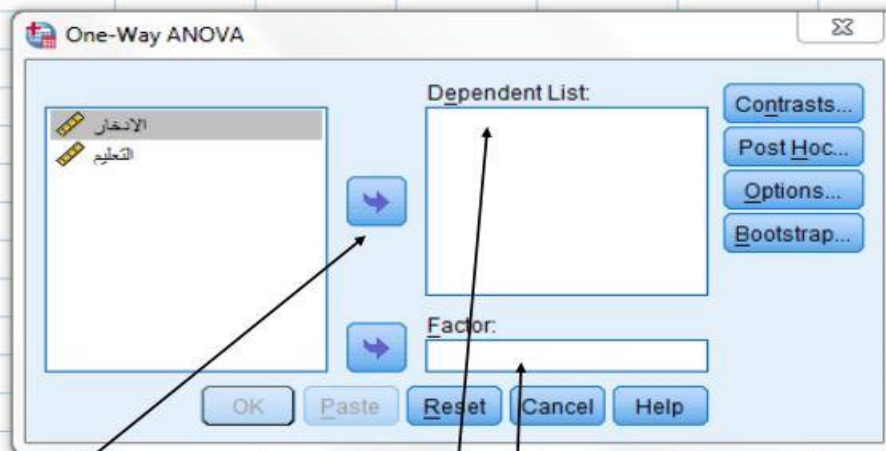
We perform variance analysis according to the following steps:

- 1- We enter the data into the SPSS program as we learned previously. For the savings column, we will enter the values in the usual way. As for the education level column, we will encode the answer by giving a number (1) to the learner and giving a number (2) to the non-educator as below

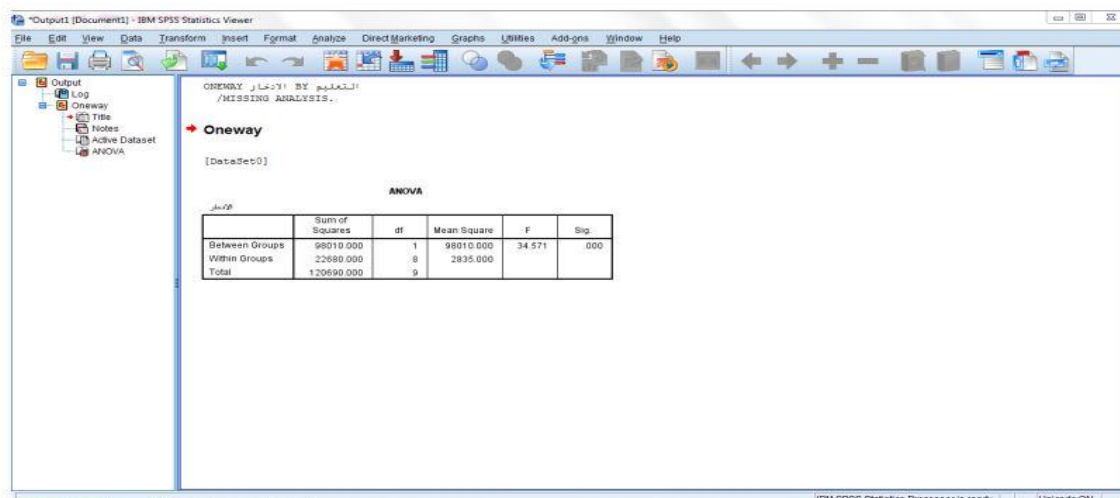


	الادخار	التعليم	var	var	var
1	400.00	1.00			
2	200.00	1.00			
3	300.00	1.00			
4	110.00	2.00			
5	80.00	2.00			
6	90.00	2.00			
7	80.00	2.00			
8	300.00	1.00			
9	250.00	1.00			
10	100.00	2.00			
11					
12					
13					
14					

- 2- We open the Analyze menu. A window appears. We choose Means Compare instruction. Another window appears. We choose ANOVA One Way instruction. The window appears.
- 3- We enter the saving variable under the List Dependent box by clicking on



the arrow, then we enter the education variable under the Factor box also using the arrow, then we click OK. The results appear in the output window as shown below.



IBM SPSS Statistics Viewer

Output

Log

Oneway

Title

Notes

Active Dataset

ANOVA

CRIMINAL BY الإختار BY التعليم
/MISSING ANALYSIS.

→ Oneway

[DataSet0]

ANOVA

الإختار	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	98010.000	1	98010.000	34.571	.000
Within Groups	22680.000	8	2835.000		
Total	120690.000	9			

IBM SPSS Statistics Processor is ready. Unicode DM



When using ANOVA to explain the behavior of a particular economic phenomenon, the null and alternative hypotheses must be determined. The (F) statistic is used to test hypotheses, where the calculated value is compared with the tabulated value of the statistic. The null hypothesis is rejected if the calculated F value is greater than the tabulated value. In the above example, the null hypothesis was rejected (education). It does not affect saving) because the calculated F₃₉ value (34.71) is greater than the tabulated value (5.32) and the alternative hypothesis (education affects saving) is accepted.

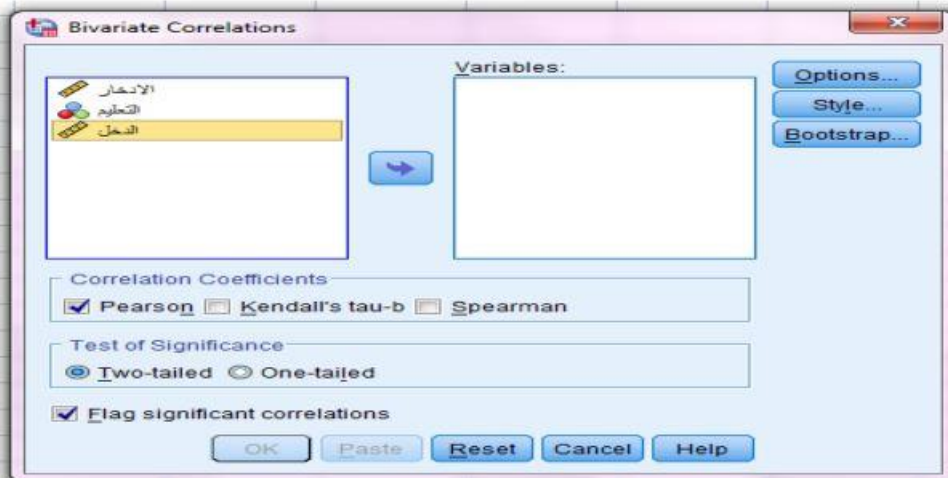
➤ Correlate

Correlation is used for the purpose of measuring the relationship between a number of variables whose value ranges between the correct positive one and the correct negative one. If the value approaches one, this means that the relationship between the variables under study is very strong. However, if it approaches zero, this means the relationship is very weak. If we have a new variable in the example The former represents income, and we want to know the relationship between income and saving, as shown below

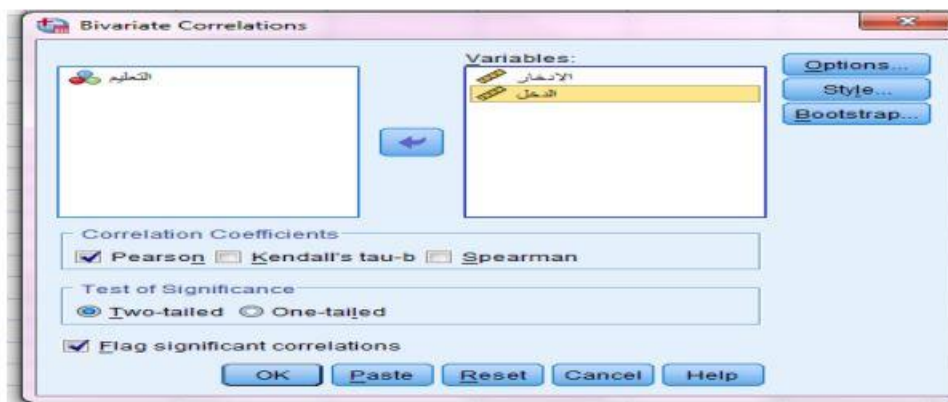
We follow the following steps:

	الادخار	التعليم	الدخل	var
1	400.00	1.00	800.00	
2	200.00	1.00	500.00	
3	300.00	1.00	550.00	
4	110.00	2.00	250.00	
5	80.00	2.00	200.00	
6	90.00	2.00	201.00	
7	80.00	2.00	250.00	
8	300.00	1.00	500.00	
9	250.00	1.00	400.00	
10	100.00	2.00	450.00	
11				
12				
13				
14				

- 1- We open the Analyze menu. A window appears. We choose the Correlate instruction. Another window appears. We choose the Bivariate instruction. The window below appears.



- 2- We enter the variables Savings and Income under the Variables box using the arrow as below





3- Finally, we click OK, and the results appear in the output window

The screenshot shows the IBM SPSS Statistics Viewer interface. The main window displays the ANOVA results for the variable 'الاجار' (Al-Ajar). Below the ANOVA table, the 'Correlations' section is expanded, showing a table of Pearson correlations between 'الاجار' and 'الاجل' (Al-Ajal).

الاجار	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	98010.000	1	98010.000	34.571	.000
Within Groups	22680.000	8	2835.000		
Total	120690.000	9			

	الاجار	الاجل
الاجار	Pearson Correlation	1
	Sig. (2-tailed)	.000
	N	10
الاجل	Pearson Correlation	.895**
	Sig. (2-tailed)	.000
	N	10

** . Correlation is significant at the 0.01 level (2-tailed).

➔ **Correlations**

	الاجار	الاجل
الاجار	Pearson Correlation	1
	Sig. (2-tailed)	.000
	N	10
الاجل	Pearson Correlation	.895**
	Sig. (2-tailed)	.000
	N	10

** . Correlation is significant at the 0.01 level (2-tailed).

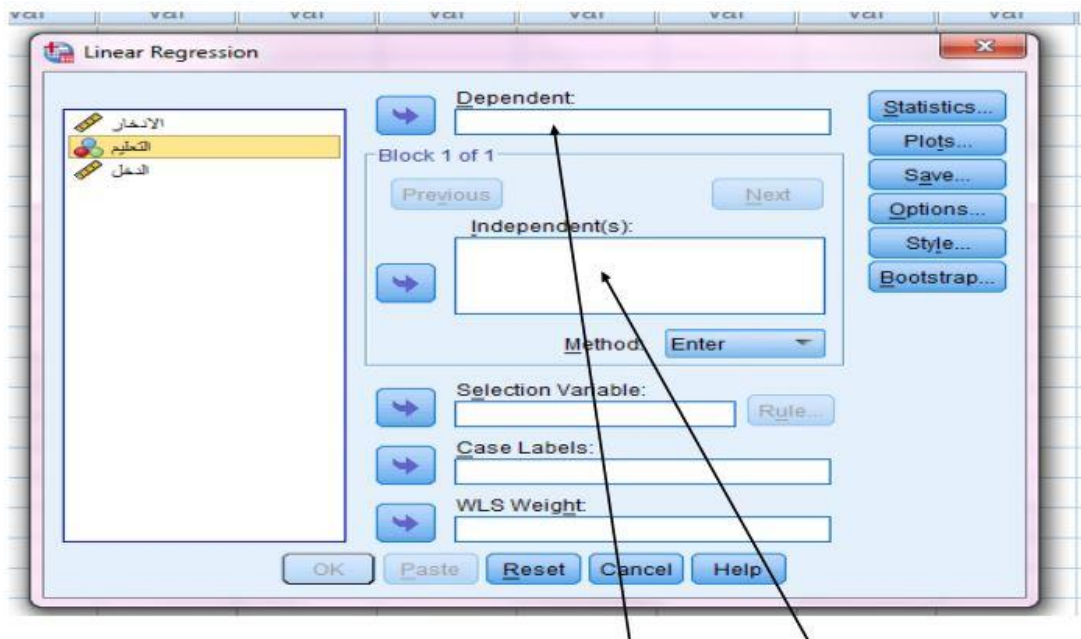
➔ **Regression**

Finding the relationship between two variables in the form of a linear relationship, where the variable y represents the dependent variable and the variable

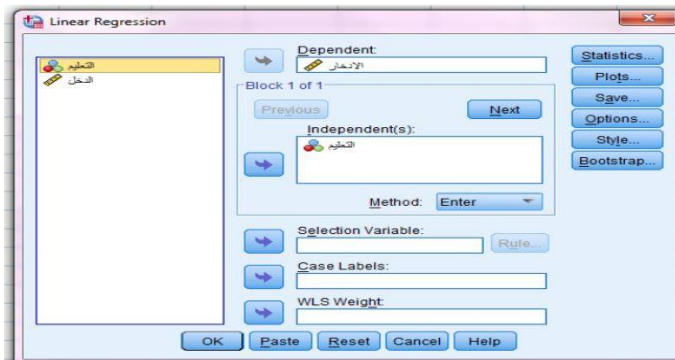
$$y = \alpha + \beta X$$

According to the data of the previous example, if we wanted to study the linear relationship between saving and the level of education, assuming that saving represents the dependent variable and the level of education represents the independent variable, we follow the following steps:

- 1- We open the Analyze menu, choose Regression, then choose Linear. The window appears as below

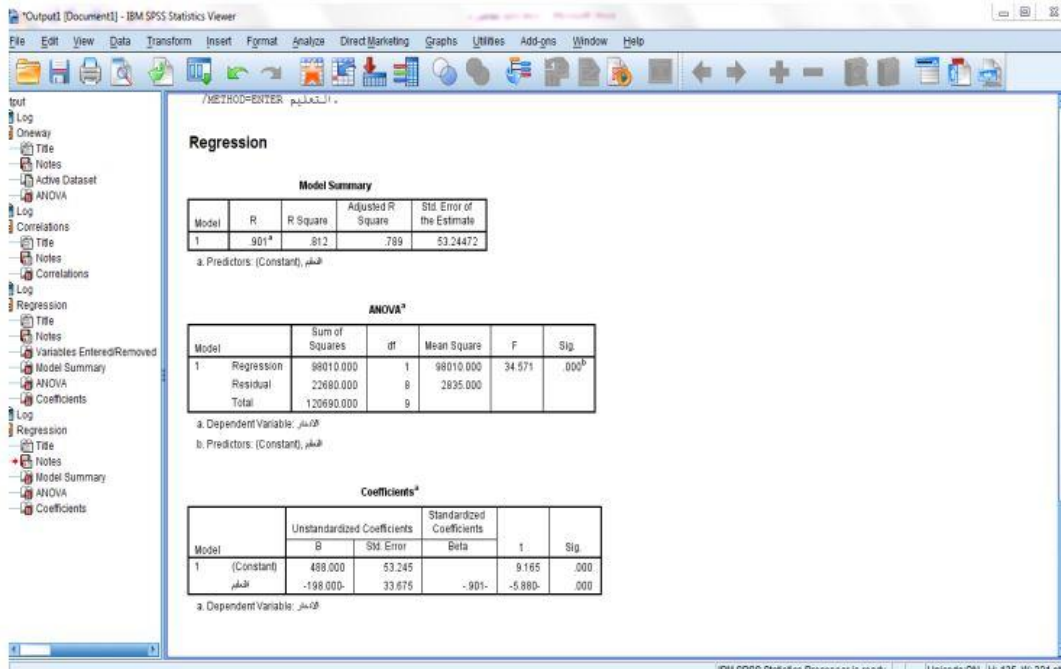


- 2- We enter the (dependent) variable, saving, under the Dependent box, and the independent variable, the level of education, under the (Independent) box, as shown below.





3- Then we click OK and the results appear in the output window.



Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	488.000	53.245			9.165	.000
	التعليم	-198.000-	33.675	-.901-		-5.880-	.000

a. Dependent Variable: الأرباح

In the previous figure, it is shown that the linear regression equation is:

$$y = 488 - 198X$$