How to Check for Normal Distribution Using the Shapiro-Wilk Test in SPSS

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The Shapiro-Wilk Test is a statistical test used to determine if a given data set follows a normal distribution. To perform this test in SPSS, first open the data set you want to test. Then, go to "Analyze" and select "Nonparametric Tests" followed by "Legacy Dialogs" and "Explore". In the "Explore" dialog box, select the variable you want to test and click on "Plots". Check the box next to "Normality plots with tests" and select "Shapiro-Wilk" from the drop-down menu. Finally, click "Continue" and then "OK" to run the test and view the results in the output window.

The **Shapiro-Wilk test** is a statistical that is used to determine whether or not given dataset follows a .

The Shapiro-Wilk test uses the following hypotheses:

H0: The data **is** normally distributed.
HA: The data **is not** normally distributed.

If the that results from the test is less than your chosen significance level (e.g. 0.05) then you can reject the null hypothesis and conclude that the data is not normally distributed.

To perform a Shapiro-Wilk test in SPSS, you can use **Analyze** > **Descriptive Statistics** > **Explore**.

The following example shows how to perform this test in practice.

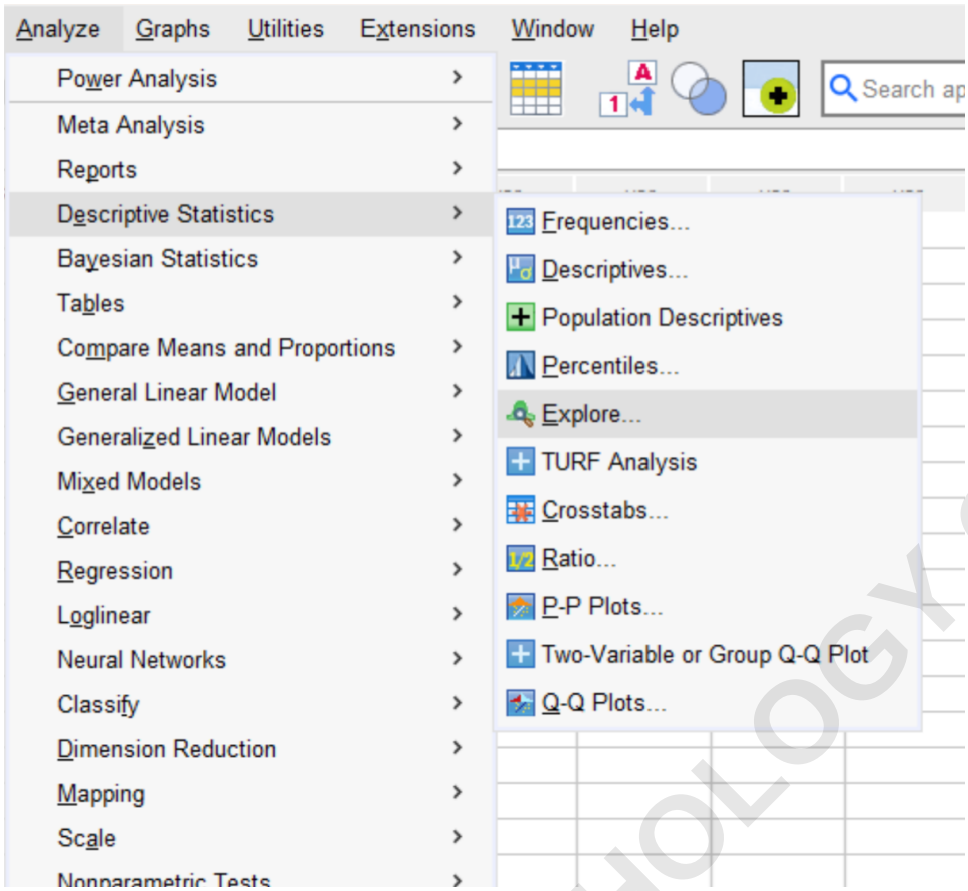
Example: How to Perform a Shapiro-Wilk Test in SPSS

Suppose we have the following dataset in SPSS that contains information about the final exam scores received by 25 different students in some class:

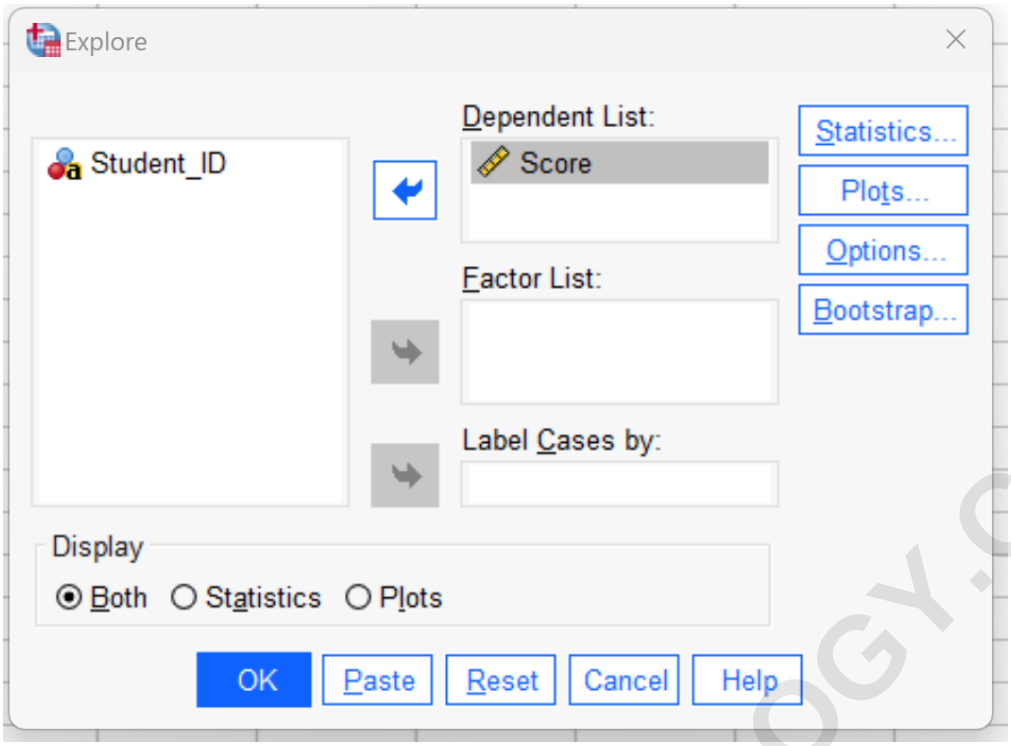
	Student_ID	Score	var	var
1	1	88		
2	2	95		
3	3	92		
4	4	97		
5	5	96		
6	6	97		
7	7	94		
8	8	86		
9	9	91		
10	10	95		
11	11	97		
12	12	88		
13	13	85		
14	14	76		
15	15	68		
16	16	65		
17	17	87		
18	18	82		
19	19	77		
20	20	70		
21	21	90		
22	22	59		
23	23	68		
24	24	90		
25	25	92		
26				
27				

Suppose that we would like to perform a Shapiro-Wilk test to determine if the exam scores are normally distributed.

To do so, click the **Analyze** tab, then click **Descriptive Statistics**, then click **Explore**:

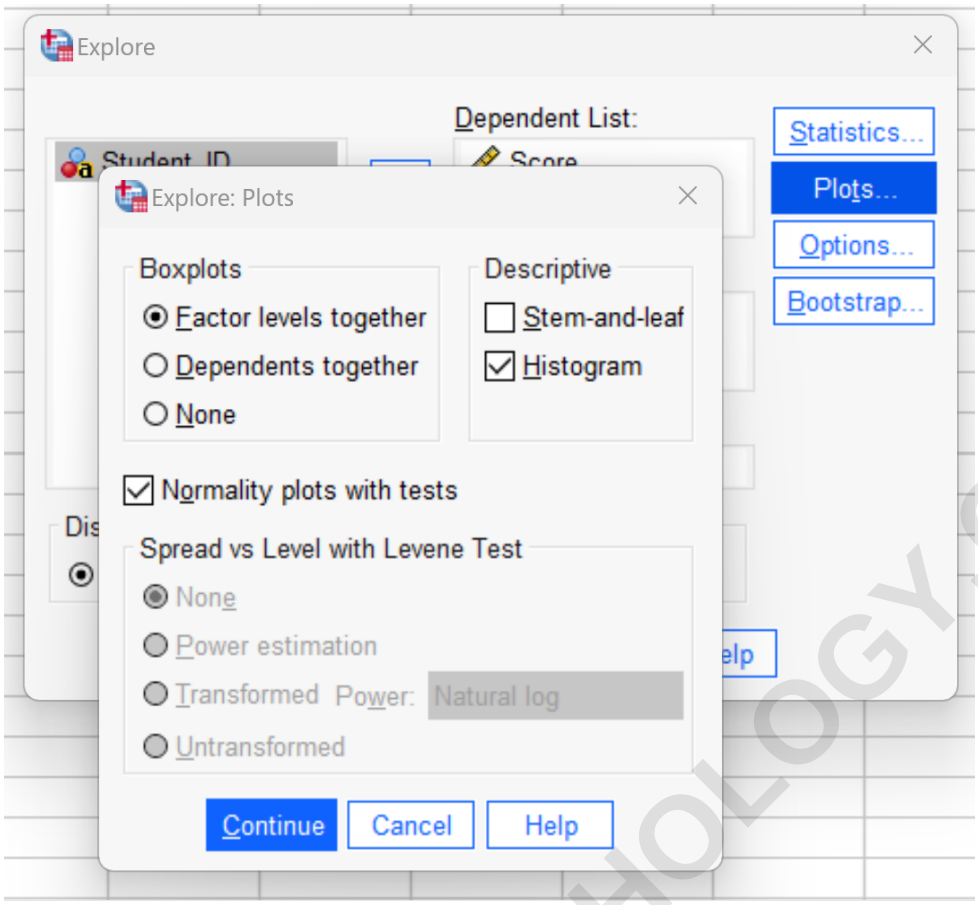


In the new window that appears, drag the **Score** variable into the **Dependent List** panel:



Then click the **Plots** button.

Check the box next to **Histogram** and **Normality plots with tests**:



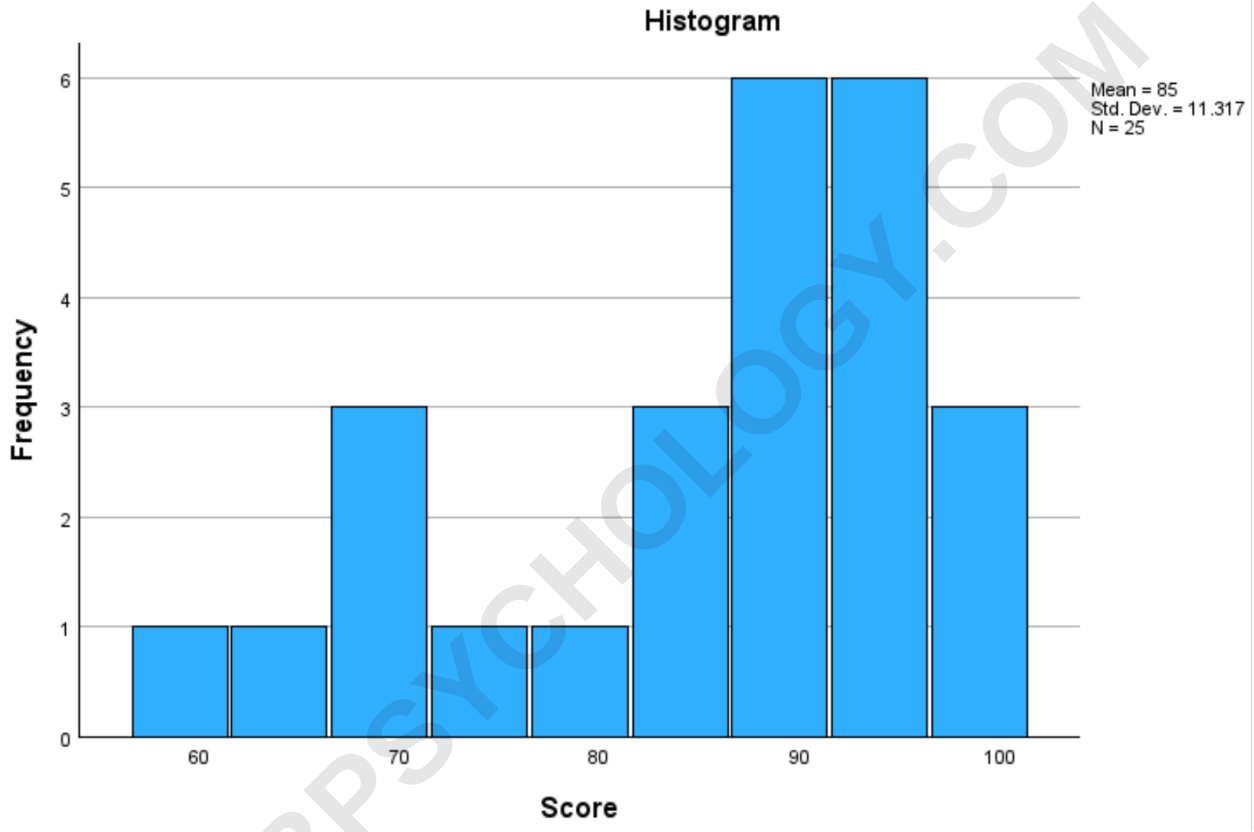
The following output will be generated that shows the results of the Shapiro-Wilk test along with a histogram that displays the distribution of exam scores:

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score	.180	25	.036	.877	25	.006

a. Lilliefors Significance Correction

Score



From the output we can see that the p-value of the Shapiro-Wilk test is **.006**.

Recall that the Shapiro-Wilk test uses the following hypotheses:

H0: The data **is** normally distributed.
HA: The data **is not** normally distributed.

Since the p-value of the test is less than .05, we have sufficient evidence to the null hypothesis.

Thus, we would conclude that the distribution of exam scores **is not** normally distributed.

From looking at the histogram, it's also clear that this distribution of exam scores does not follow a typical "bell curve" that is associated with a normal distribution.

The distribution of exam scores appear to be , with the "tail" of the distribution extending towards the left side of the graph.

The following tutorials explain how to perform other common operations in SPSS: