Normality Assumption Test Using STATCAL (R), SPSS, EViews & Minitab

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STATCAL | How to Input Data in STATCAL? | Input Numeric Data | Input Categorical Data | Graph | Descriptive | Statistics | Article

Numeric Data

Name of Variable

Score A
Score B
Score C

Set Number of Column

1 30

Set Number of Row

1 100

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
1	78.00	75.00	75.00															
2	75.00	98.00	57.00															

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Download STATCAL in www.statcal.com

Citations

APA

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In this article, we will explain step by step how to test normality assumption using STATCAL. Beside that, we will compare STATCAL's result with other software such as SPSS, Minitab and EViews.

1.1 Data

Table 1.1.1 is presented data of 10 persons of Score A, B and C.

Table 1.1.1

Person	Score A	Score B	Score C
1	78	75	75
2	75	98	57
3	87	46	54
4	67	88	45
5	57	65	77
6	85	45	75
7	75	78	64
8	85	75	57
9	75	75	65
10	67	75	74

Based on the data in Table 1.1.1, we will test normality assumption for Score A, B and C using STATCAL.

1.2 Input Numeric Data in STATCAL

Input numeric data in STATCAL as in Figure 1.2.1 until Figure 1.2.3.

Numeric Data

Set Number of Column

1 30

Set Number of Row

1 100

	V1	V2	V3	V4	V5	V6	V7	V8
1	78.00	75.00	75.00					
2	75.00	98.00	57.00					
3	87.00	46.00	54.00					
4	67.00	88.00	45.00					
5	57.00	65.00	77.00					
6	85.00	45.00	75.00					
7	75.00	78.00	64.00					
8	85.00	75.00	57.00					
9	75.00	75.00	65.00					
10	67.00	75.00	74.00					

Figure 1.2.1 Input Numeric Data

Name of Variable

Score A

Score B

Score C

Set Num

1 30

Set Num

1 100

1	7
2	7
3	8
4	6
5	5

Figure 1.2.2 Giving Name of Each Variable

Your Numeric Data

	Score A	Score B	Score C
1	78	75	75
2	75	98	57
3	87	46	54
4	67	88	45
5	57	65	77
6	85	45	75
7	75	78	64
8	85	75	57
9	75	75	65
10	67	75	74

Number of NA in Score A = 0

Number of NA in Score B = 0

Number of NA in Score C = 0

Figure 1.2.3 Your Numeric Data Must be Appeared in “Your Numeric Data” Part

1.3 Normality Assumption Test with STATCAL

For testing normality assumption test in STATCAL, choose **Statistics => Test of Normality** (Figure 1.3.1). In Figure 1.3.2, Score A, B and C are moved to the right box.

Figure 1.3.1 Normality Assumption Test Menu in STATCAL

Figure 1.3.2 Selection of Variable

1.4 STATCAL's Result

Result of normality assumption test based on STATCAL can be seen in **Result** part.

Test of Normality (Assumption)

↔ Choose Variable

📄 Result

🖨️ Print Result to Microsoft Excel

📺 Tutorial Video

📄 Related Article

Click to Print Result!!!

Boxplot

Figure 1.4.1 Boxplot

Kolmogorov-Smirnov Test (Asymptotic Approach)

Show 10 entries

Search:

	Variable	Statistic of Kolmogorov-Smirnov (KS)	P- Value of KS	Conclusion	n
1	Score A	0.19578	0.83801	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
2	Score B	0.27202	0.44993	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
3	Score C	0.21315	0.75389	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10

Figure 1.4.2 Normality Assumption Test Result Based on Kolmogorov-Smirnov Test (Asymptotic Approach)

Kolmogorov-Smirnov Test (Exact Approach)

Show entries Search:

	Variable	Statistic of Kolmogorov-Smirnov (KS)	P- Value of KS	Conclusion	n
1	Score A	0.19578	0.77032	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
2	Score B	0.27202	0.38011	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
3	Score C	0.21315	0.67945	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10

Figure 1.4.3 Normality Assumption Test Result Based on Kolmogorov-Smirnov Test (Exact Approach)

Shapiro-Wilk Test

Show entries Search:

	Variable	Statistic of Shapiro-Wilk (SW)	P-Value of SW	Conclusion	n
1	Score A	0.92999	0.44775	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
2	Score B	0.89909	0.21409	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
3	Score C	0.91277	0.30055	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10

Figure 1.4.4 Normality Assumption Test Result Based on Shapiro-Wilk Test

Jarque-Bera Test

Show entries Search:

	Variable	Statistic of Jarque-Bera (JB)	P- Value of JB	Conclusion	n
1	Score A	0.50873	0.77541	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
2	Score B	0.37441	0.82927	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
3	Score C	0.69167	0.70763	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10

Figure 1.4.5 Normality Assumption Test Result Based on Jarque-Bera Test

Anderson-Darling Test

Show entries Search:

	Variable	Statistic of Anderson-Darling (AD)	P- Value of AD	Conclusion	n
1	Score A	0.34313	0.4109	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
2	Score B	0.5662	0.10574	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10
3	Score C	0.39903	0.29496	p-value > 0.05, assumption of normality is received, at the level of significance 5%	10

Figure 1.4.6 Normality Assumption Test Result Based on Anderson-Darling Test

1.5 Comparison with SPSS

Given SPSS's result for normality assumption test based on Kolmogorov-Smirnov and Shapiro-Wilk test. We use SPSS version 17.

SPSS Data.sav [DataSet0] - SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities

1: ScoreA 78.0

	ScoreA	ScoreB	ScoreC	va
1	78.00	75.00	75.00	
2	75.00	98.00	57.00	
3	87.00	46.00	54.00	
4	67.00	88.00	45.00	
5	57.00	65.00	77.00	
6	85.00	45.00	75.00	
7	75.00	78.00	64.00	
8	85.00	75.00	57.00	
9	75.00	75.00	65.00	
10	67.00	75.00	74.00	

Figure 1.5.1 Data in SPSS

One-Sample Kolmogorov-Smirnov Test				
		ScoreA	ScoreB	ScoreC
N		10	10	10
Normal Parameters ^{a, b}	Mean	75.1000	72.0000	64.3000
	Std. Deviation	9.45692	16.52607	10.90413
Most Extreme Differences	Absolute	.196	.272	.213
	Positive	.104	.158	.148
	Negative	-.196	-.272	-.213
Kolmogorov-Smirnov Z		.619	.860	.674
Asymp. Sig. (2-tailed)		.838	.450	.754
Exact Sig. (2-tailed)		.770	.380	.679
Point Probability		.000	.000	.000

a. Test distribution is Normal.

b. Calculated from data.

Figure 1.5.2 Normality Assumption Test Result Based on Kolmogorov-Smirnov Test (Asymptotic & Exact Approach)

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ScoreA	.196	10	.200*	.930	10	.448
ScoreB	.272	10	.035	.899	10	.214
ScoreC	.213	10	.200*	.913	10	.301

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Figure 1.5.3 Normality Assumption Test Result Based on Shapiro-Wilk Test

1.6 Comparison with EViews

Given EViews's result for normality assumption test based on Jarque-Bera test. We use EViews version 7.

obs	SCOREA	SCOREB	SCOREC
1	78	75	75
2	75	98	57
3	87	46	54
4	67	88	45
5	57	65	77
6	85	45	75
7	75	78	64
8	85	75	57
9	75	75	65
10	67	75	74

Figure 1.6.1 Data in EViews

	SCOREA	SCOREB	SCOREC
Mean	75.10000	72.00000	64.30000
Median	75.00000	75.00000	64.50000
Maximum	87.00000	98.00000	77.00000
Minimum	57.00000	45.00000	45.00000
Std. Dev.	9.456920	16.52607	10.90413
Skewness	-0.462867	-0.404966	-0.329580
Kurtosis	2.396702	2.507463	1.892974
Jarque-Bera	0.508729	0.374410	0.691666
Probability	0.775409	0.829274	0.707631
Sum	751.0000	720.0000	643.0000
Sum Sq. Dev.	804.9000	2458.000	1070.100
Observations	10	10	10

Figure 1.6.2 Normality Assumption Test Result Based on Jarque-Bera Test

1.7 Comparison with Minitab

Given Minitab's result for normality assumption test based on Anderson-Darling test. We use Minitab version 16.

	C1	C2	C3
	Score A	Score B	Score C
1	78	75	75
2	75	98	57
3	87	46	54
4	67	88	45
5	57	65	77
6	85	45	75
7	75	78	64
8	85	75	57
9	75	75	65
10	67	75	74
11			

Figure 1.7.1 Data in Minitab

Figure 1.7.2 Normality Assumption Test Result Based on Anderson-Darling Test (Score A)

Figure 1.7.3 Normality Assumption Test Result Based on Anderson-Darling Test (Score B)

Figure 1.7.4 Normality Assumption Test Result Based on Anderson-Darling Test (Score C)