

# Is it appropriate to use Proc Univariate for conducting normality tests, following the SAS principle of “SAS: Use Proc Univariate for Normality Tests”?

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Using Proc Univariate for conducting normality tests is an appropriate approach following the SAS principle of "SAS: Use Proc Univariate for Normality Tests." This SAS principle recommends using Proc Univariate for normality tests as it is a reliable and efficient tool for assessing the normality of data distributions. Proc Univariate provides a comprehensive set of statistical tests and graphical methods for evaluating normality, making it a suitable option for researchers and analysts. By adhering to this principle, SAS users can ensure accurate and consistent results when conducting normality tests.

## **SAS: Use Proc Univariate for Normality Tests**

**You can use proc univariate in SAS with the normal statement to perform several normality tests on a variable in a dataset.**

**This procedure uses the following basic syntax:**

```
proc univariate data=my_data normal;  
var my_variable;  
run;
```

**The following example shows how to use this procedure in practice.**

**Example: Proc Univariate for Normality Tests in SAS**

**Suppose we have the following dataset in SAS that contains information about various basketball players:**

```
/*create dataset*/
```

```
data my_data;  
input team $ points rebounds;  
datalines;  
A 12 8  
A 12 8  
A 12 8  
A 23 9  
A 20 12  
A 14 7  
A 14 7  
B 20 2  
B 20 5  
B 29 4  
B 14 7  
B 20 2  
B 20 2  
B 20 5  
;  
run;  
  
/*view dataset*/  
proc printdata=my_data;
```

Obs	team	points	rebounds
1	A	12	8
2	A	12	8
3	A	12	8
4	A	23	9
5	A	20	12
6	A	14	7
7	A	14	7
8	B	20	2
9	B	20	5
10	B	29	4
11	B	14	7
12	B	20	2
13	B	20	2
14	B	20	5

**We can use proc univariate with the normal statement to perform various normality tests on the points variable:**

```
proc univariate data=my_data normal;  
var points;  
run;
```

**Several tables will be shown in the output but the one titled Tests for Normality contains the results of the normality tests:**

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.867166	Pr < W	0.0383
Kolmogorov-Smirnov	D	0.23714	Pr > D	0.0318
Cramer-von Mises	W-Sq	0.152465	Pr > W-Sq	0.0200
Anderson-Darling	A-Sq	0.847207	Pr > A-Sq	0.0223

**By default, SAS performs four normality tests and displays each of their test statistics and corresponding p-values:**

**Shapiro-Wilk Test:  $W = .867$ ,  $p = .0383$   
Kolmogorov-Smirnov Test:  $D = .237$ ,  $p = .0318$   
Cramer-von Mises Test:  $W-Sq = .152$ ,  $p = .0200$   
Anderson-Darling Test:  $A-Sq = .847$ ,  $p = .0223$**

**Each normality test uses the following null and alternative hypotheses:**

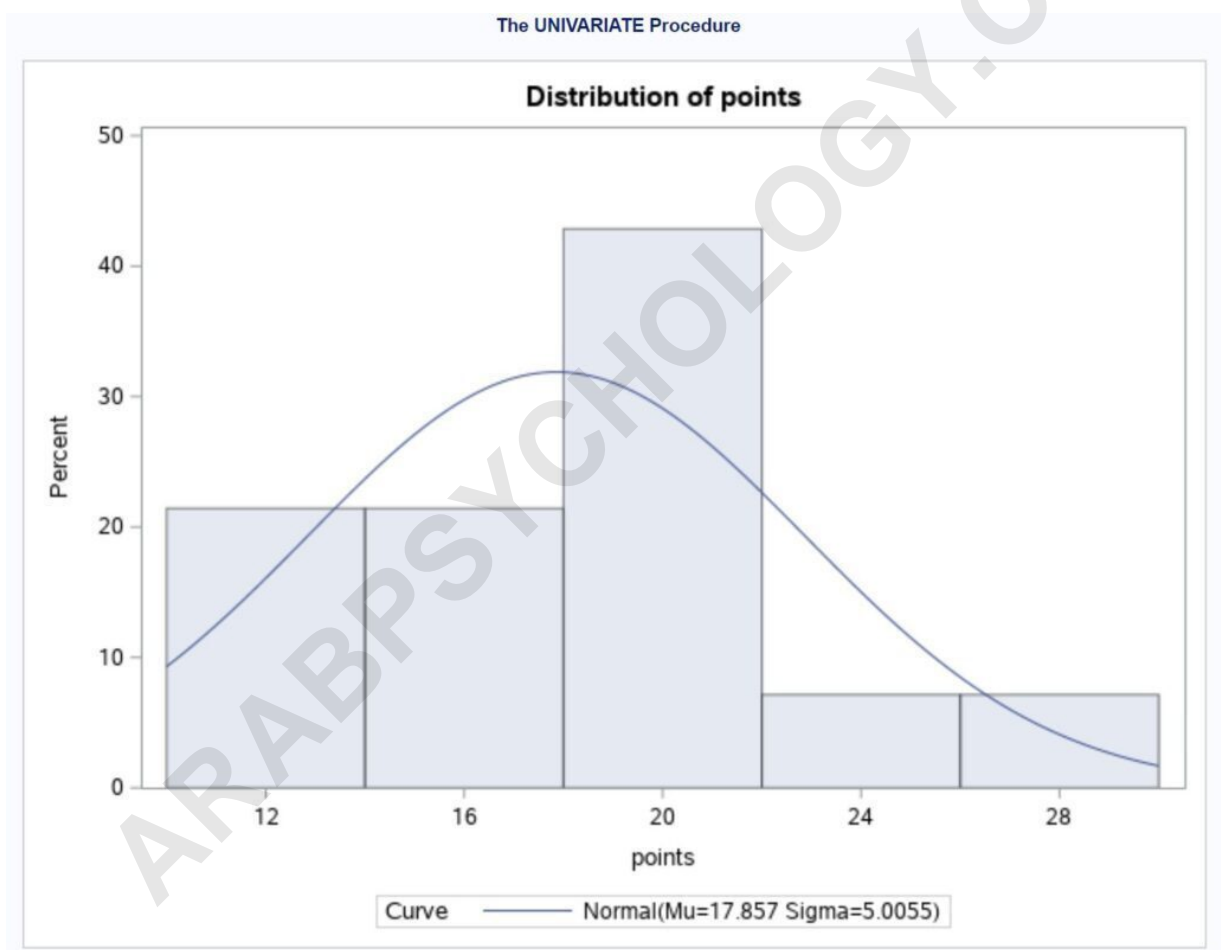
**$H_0$ : The data are normally distributed.  
 $H_A$ : The data are not normally distributed.**

**Since the for each normality test is less than .05, we would reject the null hypothesis for each normality test.**

**Note that you can also create a histogram with a normal**

curve overlaid on it to visualize the distribution of values for the points variable:

```
proc univariate data=my_data;  
histogram points / normal;  
run;
```



From the histogram we can see that the distribution of values doesn't follow the normal curve very well, which agrees with the results of the normality tests that we

**performed.**

**The following tutorials explain how to perform other common tasks in SAS:**

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