NDK_NORMALTEST

Last Modified on 04/20/2016 1:00 pm CDT

- C/C++
- .Net

```
int __stdcall NDK_NORMALTEST(double * X,
                             size_t   N,
                             double   alpha,
                             WORD     method,
                             WORD     retType,
                             double * retVal
                            )
```

Returns the p-value of the normality test (i.e. whether a data set is well-modeled by a normal distribution).

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful
NDK_FAILED Operation unsuccessful. See **Macros** for full list.

See Also

TEST_RETURN

Parameters

[in] **X** is the sample data (a one dimensional array).
[in] **N** is the number of observations in X.
[in] **alpha** is the statistical significance level. If missing, a default of 5% is assumed.
[in] **method** is the statistical test to perform (1=Jarque-Bera, 2=Shapiro-Wilk, 3=Chi-Square (Doornik and Hansen)).
[in] **retType** is a switch to select the return output:

Method	Value	Description
TEST_PVALUE	1	P-Value
TEST_SCORE	2	Test statistics (aka score)
TEST_CRITICALVALUE	3	Critical value.

[out] **retVal** is the calculated test statistics.

Remarks

1. The sample data may include missing values (e.g. a time series as a result of a lag or difference operator).

2. The Jarque-Bera test is more powerful the higher the number of values.
3. The test hypothesis for the data is from a normal distribution: $$H_{o}: x \sim N(.)$$ $$H_{1}: x \neq N(.)$$ Where:
   - $$H_{o}$$ is the null hypothesis.
   - $$H_{1}$$ is the alternate hypothesis.
   - $$N(.)$$ is the normal probability distribution function.
4. The Jarque-Bera test is a goodness-of-fit measure of departure from normality based on the sample kurtosis and skewness. The test is named after Carlos M. Jarque and Anil K. Bera. The test statistic JB is defined as: $$\mathit{JB} = \frac{n}{6} \left(S^2 + \frac{K^2}{4} \right)$$ Where:
   - $$S$$ is the sample skewness.
   - $$K$$ is the sample excess kurtosis.
   - $$n$$ is the number of non-missing values in the data sample.
5. The Jarque-Bera $$\mathit{JB}$$ statistic has an asymptotic chi-square distribution with two degrees of freedom and can be used to test the null hypothesis that the data is from a normal distribution. $$\mathit{JB} \sim \chi_{\nu=2}^2() \] Where:
   - $$\chi_{\nu}^2()$$ is the Chi-square probability distribution function.
   - $$\nu$$ is the degrees of freedom for the Chi-square distribution.
6. This is one-side (i.e. one-tail) test, so the computed p-value should be compared with the whole significance level ($$\alpha$$).

Requirements

Header	SFSDK.H
Library	SFSDK.LIB
DLL	SFSDK.DLL

Examples

```
int NDK_NORMALTEST(double[]   pData,
                   UIntPtr    nSize,
                   double     alpha,
                   UInt16     method,
                   UInt16     retType,
                   out double retVal
```

Namespace: NumXLAPI
Class: SFSDK
Scope: Public
Lifetime: Static

)

Returns the p-value of the normality test (i.e. whether a data set is well-modeled by a normal distribution).

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

NDK_FAILED Operation unsuccessful. See **Macros** for full list.

Parameters

[in] **pData** is the sample data (a one dimensional array).

[in] **nSize** is the number of observations in X.

[in] **alpha** is the statistical significance level. If missing, a default of 5% is assumed.

[in] **method** is the statistical test to perform (1=Jarque-Bera, 2=Shapiro-Wilk, 3=Chi-Square (Doornik and Hansen)).

[in] **retType** is a switch to select the return output:

Method	Value	Description
TEST_PVALUE	1	P-Value
TEST_SCORE	2	Test statistics (aka score)
TEST_CRITICALVALUE	3	Critical value.

[out] **retVal** is the calculated test statistics.

Remarks

1. The sample data may include missing values (e.g. a time series as a result of a lag or difference operator).
2. The Jarque-Bera test is more powerful the higher the number of values.
3. The test hypothesis for the data is from a normal distribution: $$H_{o}: x \sim N(.)$$ $$H_{1}: x \neq N(.)$$ Where:
   - H_{o} is the null hypothesis.
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   - $N(.)$ is the normal probability distribution function.
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   - S is the sample skewness.
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5. The Jarque-Bera JB statistic has an asymptotic chi-square distribution with two degrees of freedom and can be used to test the null hypothesis that the data is from a normal distribution. $$\mathit{JB} \sim \chi_{\nu=2}^2() $$ Where:

- $\chi_{\nu}^2()$ is the Chi-square probability distribution function.
- ν is the degrees of freedom for the Chi-square distribution.

6. This is one-side (i.e. one-tail) test, so the computed p-value should be compared with the whole significance level (α).

Exceptions

Exception Type	Condition
None	N/A

Requirements

Namespace	NumXLAPI
Class	SFSDK
Scope	Public
Lifetime	Static
Package	NumXLAPI.DLL

Examples

References

Hamilton, J .D.; Time Series Analysis , Princeton University Press (1994), ISBN 0-691-04289-6

Tsay, Ruey S.; Analysis of Financial Time Series John Wiley & SONS. (2005), ISBN 0-471-690740

Hull, John C.; Options, Futures and Other DerivativesFinancial Times/ Prentice Hall (2011), ISBN 978-0132777421

Hans-Peter Deutsch; , Derivatives and Internal Models, Palgrave Macmillan (2002), ISBN 0333977068

See Also

[template("related")]