NDK_REGRESSION

Last Modified on 05/06/2016 12:47 pm CDT

- C/C++
- .Net

```
int __stdcall NDK_REGRESSION(double * X,
                             size_t   nX,
                             double * Y,
                             size_t   nY,
                             WORD   nRegressType,
                             WORD   POrder,
                             double   intercept,
                             double   target,
                             WORD   nRetType,
                             double   alpha,
                             double * retVal
                             )
```

calculates the value of the regression function for an intermediate x-value.

Returns

> status code of the operation

Return values

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

Remarks

1. NxTrend supports the following trend functions: $\begin{cases} \mathrm{Linear} & Y=\alpha + \beta \times X \\ \mathrm{Polynomial} & Y=\alpha + \beta_1 \times X + \beta_2 \times X^2 + \cdots + \beta_N \times X^N \\ \mathrm{Exponential:} & Y= \alpha \times e^{\beta \times X} \\ \mathrm{Logarithm:} & Y= \alpha + \beta \times \ln(X) \\ \mathrm{Power:} & Y= \alpha \times X^{\beta} \\ \end{cases}$

2. For exponential and logarithmic trends, the intercept value is not permitted to be fixed, and thus is ignored.

3. The Excel trend built-in function (i.e. "TREND") is a different function, not part of NumXL, and should not be confused with NxTrend.

4. The polynomial order argument must be a positive integer.

5. The trend function's coefficients that best fit your data are estimated using the "least squares" method.

6. The time series may include missing values (e.g. #N/A) at either end.

Parameters

[in]	**X**	is the x-component of the input data table (a one dimensional array).
[in]	**nX**	is the number of elements in X.
[in]	**Y**	is the y-component (i.e. function) of the input data table (a one dimensional array).
[in]	**nY**	is the number of elements in Y
[in]	**nRegressType**	is the model description flag for the trend function (1 = Linear (default), 2 = Polynomial, 3 = Exponential, 4 = Logarithmic, 5 = Power).
[in]	**POrder**	is the polynomial order. This is only relevant for a polynomial type of trend and is ignored for all others. If missing, POrder = 1.
[in]	**intercept**	is the constant or the intercept value to fix (e.g. zero). If missing (NaN), an intercept will not be fixed and is computed normally.
[in]	**target**	is the desired x-value to calculate regression value for (a single value).
[in]	**nRetType**	is a switch to select the return output (1 = Forecast value (default), 2 = Upper limit, 3 = Lower Limit, 4 = R-Squared).
[in]	**alpha**	is the statistical significance or confidence level (i.e. alpha). If missing or omitted, an alpha value of 5% is assumed
[out]	**retVal**	is the calculated value

Requirements

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

NDK_REGRESSION(double   X,
**   UIntPtr   nX,**
**   double[]   Y,**
**   UIntPtr   nY,**
**   short   nRegressType,**
**   short   POrder,**
**   double   intercept,**
**   double   target,**
**   UInt16   nRetType,**
**   double   alpha,**
**   ref double retVal**
**   )**

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

calculates the value of the regression function for an intermediate x-value.

Return Value

a value from **NDK_RETCODE** enumeration for the status of the call.

NDK_SUCCESS operation successful

Error   Error Code

Remarks

1. NxTrend supports the following trend functions:

$$\begin{cases} \mathrm{Linear} & Y=\alpha + \beta \times X \\ \mathrm{Polynomial} & Y=\alpha + \beta_1 \times X + \beta_2 \times X^2 + \cdots + \beta_N \times X^N \\ \mathrm{Exponential:} & Y= \alpha \times e^{\beta \times X} \\ \mathrm{Logarithm:} & Y= \alpha + \beta \times \ln(X) \\ \mathrm{Power:} & Y= \alpha \times X^{\beta} \\ \end{cases}$$

2. For exponential and logarithmic trends, the intercept value is not permitted to be fixed, and thus is ignored.
3. The Excel trend built-in function (i.e. "TREND") is a different function, not part of NumXL, and should not be confused with NxTrend.
4. The polynomial order argument must be a positive integer.
5. The trend function's coefficients that best fit your data are estimated using the "least squares" method.
6. The time series may include missing values (e.g. #N/A) at either end.

Parameters

[in]	**X**	is the x-component of the input data table (a one dimensional array).
[in]	**nX**	is the number of elements in X.
[in]	**Y**	is the y-component (i.e. function) of the input data table (a one dimensional array).
[in]	**nY**	is the number of elements in Y
[in]	**nRegressType**	is the model description flag for the trend function (1 = Linear (default), 2 = Polynomial, 3 = Exponential, 4 = Logarithmic, 5 = Power).
[in]	**POrder**	is the polynomial order. This is only relevant for a polynomial type of trend and is ignored for all others. If missing, POrder = 1.
[in]	**intercept**	is the constant or the intercept value to fix (e.g. zero). If missing (NaN), an intercept will not be fixed and is computed normally.
[in]	**target**	is the desired x-value to calculate regression value for (a single value).
[in]	**nRetType**	is a switch to select the return output (1 = Forecast value (default), 2 = Upper limit, 3 = Lower Limit, 4 = R-Squared).
[in]	**alpha**	is the statistical significance or confidence level (i.e. alpha). If missing or omitted, an alpha value of 5% is assumed
[out]	**retVal**	is the calculated value

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

See Also

[template("related")]