NDK_INTERPOLATE

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- C/C++
- .Net

```
int __stdcall NDK_INTERPOLATE(double * X,
                              size_t   Nx,
                              double * Y,
                              size_t   Ny,
                              double * XT,
                              size_t   Nxt,
                              WORD     nMethod,
                              BOOL     extrapolate,
                              double * YVals,
                              size_t   Nyvals
                              )
```

estimate the value of the function represented by (x,y) data set at 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.

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 of the input data table (a one dimensional array)

[in] **Ny**   is the number of elements in Y

[in] **XT**   is the desired x-value(s) to interpolate for (a single value or a one dimensional array).

[in] **Nxt**   is the number of elements in XT

[in] **nMethod**   is the interpolation method (1=Forward Flat, 2=Backward Flat, 3=Linear, 4=Cubic Spline).

   1. Forward Flat
   2. Backward Flat
   3. Linear
   4. Cubic Spline

[in] **extrapolate** sets whether or not to allow extrapolation (1=Yes, 0=No). If missing, the default is to not allow extrapolation

[out] **YVals**   is the output buffer to store the interpolated values

[in]	**Nyvals**	is the number of elements in YVals (must equal to Nxt).

Remarks

1. The X and Y array sizes must be identical.
2. The X-array and Y-array both consist of numerical values. Dates in Excel are internally represented by numbers.
3. The values in the X-array can be unsorted and may have duplicate values.
4. In the case where X has duplicate values, **INTERPOLATE** will replace those duplicate values with a single entry, setting the corresponding y-value equal to the average.
5. The X and/or Y arrays may have missing values (#N/A). In this case, **INTERPOLATE** will remove those entries.
6. For cubic spline interpolation, we construct a set of natural cubic splines that are twice continuously differentiable functions to yield the least oscillation about the function f which is found by *interpolation in Excel*.

Requirements

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

int NDK_INTERPOLATE(double[] pXData,
            UIntPtr nXSize,
            double[] pYData,
            UIntPtr nYSize,
            double[] pXTargets,
            UIntPtr nXTargetSize,
            short   nMethod,
            bool   allowExtrp,
            double[] pYTargets,
            UIntPtr nYTargetSize
)
	Namespace: NumXLAPI
	Class: SFSDK
	Scope: Public
	Lifetime: Static

estimate the value of the function represented by (x,y) data set at 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

Parameters

[in]	**pXData**	is the x-component of the input data table (a one dimensional array)
[in]	**nXSize**	is the number of elements in pXData
[in]	**pYData**	is the y-component of the input data table (a one dimensional array)
[in]	**nYSize**	is the number of elements in pYData
[in]	**pXTargets**	is the desired x-value(s) to interpolate for (a single value or a one dimensional array).
[in]	**nXTargetSize**	is the number of elements in pXTargets
[in]	**nMethod**	is the interpolation method (1=Forward Flat, 2=Backward Flat, 3=Linear, 4=Cubic Spline).

1. Forward Flat
2. Backward Flat
3. Linear
4. Cubic Spline

[in]	**allowExtrp**	sets whether or not to allow extrapolation (1=Yes, 0=No). If missing, the default is to not allow extrapolation
[out]	**pYTargets**	is the output buffer to store the interpolated values
[in]	**nYTargetSize**	is the number of elements in YVals (must equal to Nxt).

Remarks

1. The pXData and pYData array sizes must be identical.
2. The X-array and Y-array both consist of numerical values. Dates in Excel are internally represented by numbers.
3. The values in the X-array can be unsorted and may have duplicate values.
4. In the case where X has duplicate values, **INTERPOLATE** will replace those duplicate values with a single entry, setting the corresponding y-value equal to the average.
5. The X and/or Y arrays may have missing values (#N/A). In this case, **INTERPOLATE** will remove those entries.
6. For cubic spline interpolation, we construct a set of natural cubic splines that are twice continuously differentiable functions to yield the least oscillation about the function f which is found by *interpolation in Excel*.

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")]