NDK_CONVOLUTION

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- C/C++
- .Net

```
int __stdcall NDK_CONVOLUTION(double * X,
                              size_t    N1,
                              double * Y,
                              size_t    N2,
                              double * Z,
                              size_t *  W
                             )
```

Returns an array of cells for the convolution operator of two time series.

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 univariate time series data (a one dimensional array).
[in]	**N1**	is the number of observations in X.
[in]	**Y**	is the second univariate time series data (a one dimensional array)
[in]	**N2**	is the number of observations in Y.
[out]	**Z**	is the convolution time series output
[in,out]	**W**	is the maximum number of elements in Z.

Remarks

1. The time series must be homogeneous or equally spaced.
2. The two time series can have different sizes.
3. Presample values of X_t and Y_t are assumed to be zero
4. The convolution operator is described as follow: $$ Z_t=\sum_{j=\mathit{max}\left (1,t-M+1 \right)}^{\mathit{min}\left (N,t+M-1 \right)}X_jY_{M-t+j} $$ Where:
   - Z_t is the convolution time series
   - X_t is the first time series, with N observations
   - Y_t is the second time series, with M observations.
   - $t\in \left[1,N+M \right]$, i.e., $1\leq t \leq N+M$.

Requirements

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

Examples

```
int NDK_CONVOLUTION(double[]     pData1,
                    UIntPtr      nSize1,
                    double[]     pData2,
                    UIntPtr      nSize2,
                    out double   pResult,
                    out UIntPtr nWindowSize
                   )
```

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

Returns an array of cells for the convolution operator of two time series.

Return Value

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

NDK_SUCCESS operation successful
Error Error Code

Parameters

[in]	**pData1**	is the univariate time series data (a one dimensional array).
[in]	**nSize1**	is the number of observations in pData1.
[in]	**pData2**	is the second univariate time series data (a one dimensional array)
[in]	**nSize2**	is the number of observations in pData2.
[out]	**pResult**	is the convolution time series output
[in,out]	**nWindowSize**	is the maximum number of elements in Z.

Remarks

1. The time series must be homogeneous or equally spaced.
2. The two time series can have different sizes.
3. Presample values of \(X_t\) and \(Y_t\) are assumed to be zero
4. The convolution operator is described as follow: \[Z_t=\sum_{j=\mathit{max}\left (1,t-M+1 \right

)}^{\mathit{min}\left (N,t+M-1 \right)}X_jY_{M-t+j}\] Where:

- \(Z_t\) is the convolution time series
- \(X_t\) is the first time series, with \(N\) observations
- \(Y_t\) is the second time series, with \(M\) observations.
- \(t\in \left[1,N+M \right]\), i.e., \(1\leq t \leq N+M\).

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")]