# NDK\_CONVOLUTION

Last Modified on 07/07/2016 12:06 pm CDT

- C/C++
- .Net

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

#### Returns

status code of the operation

#### **Return values**

NDK\_SUCCESSOperation successfulNDK\_FAILEDOperation unsuccessful. See Macros for full list.

### Parameters

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

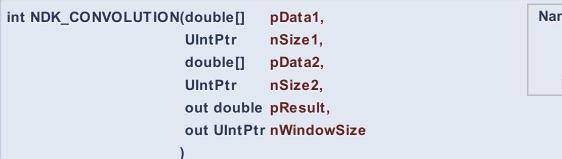
#### Remarks

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

#### Requirements

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

#### Examples



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] <b>nWindowSize</b> 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:

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

# 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")]