NDK_WMA

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- C/C++
- .Net

```
int __stdcall NDK_WMA(double * pData,
                      size_t   nSize,
                      BOOL     bAscending,
                      double * weights,
                      size_t   nwSize,
                      int      nHorizon,
                      double * retVal
                      )
```

Returns the weighted moving (rolling/running) average using the previous m data points.

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 univariate time series data (a one dimensional array).

[in] **nSize**   is the number of elements in pData.

[in] **bAscending** is the time order in the data series (i.e. the first data point's corresponding date (earliest date=1 (default), latest date=0)).

[in] **weights**   is the size of the equal-weighted window or an array of multiplying factors (i.e. weights) of the moving/rolling window.

[in] **nwSize**   is the number of elements in the weights array.

[in] **nHorizon**   is the forecast time/horizon beyond the end of pData. If missing, a default value of 0 (Latest or end of pData) is assumed.

[out] **retVal**   is the calculated value of the weighted moving average.

Remarks

1. The time series is homogeneous or equally spaced.
2. The time series may include missing values (NaN) at either end.
3. The window size (m) must be less than the time series size, or else an error value (#VALUE!) is returned.
4. The weights array should have a size greater than zero and consist of non-negative values.
5. The size argument must match the actual size of the passed weight array, or else an error value (#VALUE) is returned.

6. The **weighted moving average in Excel** (WMA) is defined as: \[
\mathit{wma}_t^k=\frac{\sum_{i=0}^{k-1} x_{t-k+i}\times w_i}{\sum_{i=0}^{k-1} w_i}\] Where:
   - \(w_i\) is the weight of the i-th data point in the moving/rolling window.
   - \(k\) is the size of the moving/rolling window.
   - \(x_t\) is the value of the time series at time t.
7. **IMPORTANT:** The first value in the weights array corresponds to the earliest point in the MA window.
8. **IMPORTANT:** To exclude current observation from the *moving average in Excel*, set the last value (weight) in the given array to zero.
9. The size of the weighted moving averqage time series is equal to the input time series.

Requirements

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

Examples

```
int NDK_WMA(double[]   pData,
            int        nSize,
            BOOL       bAscending,
            double[]   pWeights,
            int        nwSize,
            int        nHorizon,
            ref double retVal
            )
```

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

Returns the weighted moving (rolling/running) average using the previous m data points.

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 univariate time series data (a one dimensional array).
- [in] **nSize** is the number of elements in pData.
- [in] **bAscending** is the time order in the data series (i.e. the first data point's corresponding date (earliest date=1 (default), latest date=0)).
- [in] **pWeights** is the size of the equal-weighted window or an array of multiplying factors (i.e. weights) of the moving/rolling window.
- [in] **nwSize** is the number of elements in the weights array.
- [in] **nHorizon** is the forecast time/horizon beyond the end of pData. If missing, a default value of 0 (Latest or end of pData) is assumed.
- [out] **retVal** is the calculated value of the weighted moving average.

Remarks

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   - w_i is the weight of the i-th data point in the moving/rolling window.
   - k is the size of the moving/rolling window.
   - x_t is the value of the time series at time t.
7. **IMPORTANT:** The first value in the weights array corresponds to the earliest point in the MA window.
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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")]