NDK_MLR_PARAM

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- C/C++
- .Net

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int __stdcall NDK_MLR_PARAM(double ** X,
                                           size_t   nXSize,
                                           size_t   nXVars,
                                           LPBYTE mask,
                                           size_t   nMaskLen,
                                           double * Y,
                                           size_t   nYSize,
                                           double   intercept,
                                           double   alpha,
                                           WORD   nRetType,
                                           WORD   nParamIndex,
                                           double * retVal
)

Calculates the OLS regression coefficients values.

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 independent (explanatory) variables data matrix, such that each column represents one variable.
[in]	**nXSize**	is the number of observations (rows) in X.
[in]	**nXVars**	is the number of independent (explanatory) variables (columns) in X.
[in]	**mask**	is the boolean array to choose the explanatory variables in the model. If missing, all variables in X are included.
[in]	**nMaskLen**	is the number of elements in the "mask."
[in]	**Y**	is the response or the dependent variable data array (one dimensional array of cells).
[in]	**nYSize**	is the number of observations in Y.
[in]	**intercept**	is the constant or intercept value to fix (e.g. zero). If missing (i.e. NaN), an intercept will not be fixed and is computed normally.
[in]	**alpha**	is the statistical significance of the test (i.e. alpha). If missing or omitted, an alpha value of 5% is assumed.
[in]	**nRetType**	is a switch to select the return output (1=value (default), 2=std. error, 3=t-

stat, 4=P-value, 5=upper limit (CI), 6=lower limit (CI)):

1. Value (mean)
2. Std error
3. Test score
4. P-value
5. Upper limit of the confidence interval
6. Lower limit of the confidence interval

[in] **nParamIndex** is a switch to designate the target parameter (0=intercept (default), 1=first variable, 2=2nd variable, etc.).

[out] **retVal** is the computed statistics of the regression coefficient.

Remarks

1. $$\mathbf{y} = \mathbf{X}\boldsymbol\beta + \boldsymbol\varepsilon$$ $$\hat{\boldsymbol\beta} = (\mathbf{X}^{\rm T}\mathbf{X})^{-1} \mathbf{X}^{\rm T}\mathbf{y} = \big(\, \tfrac{1}{n} {\textstyle\sum} \mathbf{x}_i \mathbf{x}^{\rm T}_i \,\big)^{-1} \big(\, \tfrac{1}{n}{\textstyle\sum} \mathbf{x}_i y_i \,\big)$$ Where:
   - $\hat{\boldsymbol\beta}$ is the estimated regression coefficients.
2. The sample data may include missing values.
3. Each column in the input matrix corresponds to a separate variable.
4. Each row in the input matrix corresponds to an observation.
5. Observations (i.e. row) with missing values in X or Y are removed.
6. The number of rows of the response variable (Y) must be equal to the number of rows of the explanatory variables (X).
7. The MLR_PARAM function is available starting with version 1.60 APACHE.

Requirements

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

```
int NDK_MLR_PARAM(double[]    pXData,
                  double[]    nXSize,
                  UIntPtr     nXVars,
                  byte[]      mask,
                  UIntPtr     nMaskLen,
                  double[]    pYData,
                  UIntPtr     nYSize,
                  double      intercept,
```

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

```
              double      alpha,
              short       nRetType,
              short       ParamIndex,
              ref double  retVal
              )
```

Calculates the OLS regression coefficients values.

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 independent (explanatory) variables data matrix, such that each column represents one variable.

[in] **nXSize**   is the number of observations (rows) in pXData.

[in] **nXVars**   is the number of independent (explanatory) variables (columns) in pXData.

[in] **mask**   is the boolean array to choose the explanatory variables in the model. If missing, all variables in pXData are included.

[in] **nMaskLen**   is the number of elements in the "mask."

[in] **pYData**   is the response or the dependent variable data array (one dimensional array of cells).

[in] **nYSize**   is the number of observations in pYData.

[in] **intercept**   is the constant or intercept value to fix (e.g. zero). If missing (i.e. NaN), an intercept will not be fixed and is computed normally.

[in] **alpha**   is the statistical significance of the test (i.e. alpha). If missing or omitted, an alpha value of 5% is assumed.

[in] **nRetType**   is a switch to select the return output (1=value (default), 2=std. error, 3=t-stat, 4=P-value, 5=upper limit (CI), 6=lower limit (CI)):

1. Value (mean)
2. Std error
3. Test score
4. P-value
5. Upper limit of the confidence interval
6. Lower limit of the confidence interval

[in] **nParamIndex** is a switch to designate the target parameter (0=intercept (default), 1=first variable, 2=2nd variable, etc.).

[out] **retVal**   is the computed statistics of the regression coefficient.

Remarks

1. $$\mathbf{y} = \mathbf{X}\boldsymbol\beta + \boldsymbol\varepsilon$$ $$\hat{\boldsymbol\beta} = (\mathbf{X}^{\rm T}\mathbf{X})^{-1} \mathbf{X}^{\rm T}\mathbf{y} = \big(\, \tfrac{1}{n}$$

$$\{\textstyle\sum\} \mathbf{x}_i \mathbf{x}^{\rm T}_i \,\big)^{-1} \big(\, \tfrac{1}{n}{\textstyle\sum} \mathbf{x}_i y_i \,\big)\]$$ Where:

- $\hat{\boldsymbol\beta}$ is the estimated regression coefficients.

2. The sample data may include missing values.
3. Each column in the input matrix corresponds to a separate variable.
4. Each row in the input matrix corresponds to an observation.
5. Observations (i.e. row) with missing values in X or Y are removed.
6. The number of rows of the response variable (Y) must be equal to the number of rows of the explanatory variables (X).
7. The MLR_PARAM function is available starting with version 1.60 APACHE.

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")]