**Description**

The function *atamethod* requires the packages *forecast*, *Mcomp*, *tcltk2*, *reshape2*. The source files *atamethod\_M3.R*, *atamethod\_func\_M3.R*, *ata\_sub\_func\_M3.R* and *ataResultOutputCSV\_M3.R* should be copied to your working directory.

This function fits both the multiplicative and additive ATA(p,q) models allowing for various choices of model selection and optimization strategies. The function lets users choose from widely used error measures. The user can choose to obtain forecasts using a classical approach where the parameters of one pre-specified model are optimized and these values are plugged in the forecasting equation, the forecasts can be obtained similarly after a model selection is performed or forecasts from different models can be combined.

**Usage**

data(M3)

atamethod<- function(M3, sRange, parP, parQ, modelType, optimPar, errType, fcast)

**Arguments**

M3 : a ts object that contains the M3-competition data sets (3003)

sRange : the indexes of the M3-data sets that will be included in the analysis (the default is “full”).

n (nlength(X)): a single series is selected

1:3 : the 1st, 2nd and 3rd series are selected

c(1,5,8,11) : the 1st, 5th, 8th and 11th series are selected

parP : Level parameter

“opt” : p is optimized for the integers in the interval [1,length(X)] (Let X be the time-series data set at hand)

x:n (nlength(X)): p is optimized for the integers in the interval [x,n]

c(1,5,8,11) : p is optimized for the four values 1, 5, 8 and 11.

n (nlength(X)): p can take only one value

parQ : Trend parameter

“opt” : q is optimized for the integers in the interval [1,length(X)-1]

x:n (nlength(X)-1): q is optimized for the integers in the interval [x,n]

c(1,5,8,11) : q is optimized for the four values 1, 5, 8 and 11.

n (nlength(X)-1): q can take only one value

modelType : 'A' for an additive model

'M' for a multiplicative model

optimPar : how the parameters should be optimized (default='both')

'both': Fits both ATA(p\*,0) and ATA(p, 1) (this option should be used when combines forecasts are needed or model selection is needed)

'optPQ': Fits ATA(p,q) where both parameters are optimized simultaneously (for pq)

'pStar': Fits ATA(p\*,0) where p\* is the optimum value of p for q = 0

'pOne': Fits ATA(p, 1) where p is optimized for q = 1

'pStarQ': Fits ATA(p\*, q) where q is optimized for p = p\*

errType : error type

'MAE': mean absolute error

'MAPE': mean absolute percentage error

'sMAPE': symmetric mean absolute percentage error

'MSE': mean squared error

fcast : how the forecasts should be obtained

'single': when the options ' optPQ ', 'pStar', 'pOne' or 'pStarQ' are chosen for optimPar, this option should be used to obtain forecasts from the chosen model

'select': a simple model selection of the two models ATA(p\*,0) and ATA(p, 1) is carried out based on in-sample sMAPE (for this option optimPar should be 'both')

'comb': a simple average of the forecasts from the two models ATA(p\*,0) and ATA(p, 1) is used as a forecast (for this option optimPar should be 'both')

**Details**

**Value**

Returns an object with the following arguments:

**Examples**

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "A", optimPar = "optPQ", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "A", optimPar = "optPQ", errType = "MAE", fcast="single")

atamethod(M3,sRange=1006:1007, parP="opt", parQ="opt", modelType = "A", optimPar = "optPQ", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "M", optimPar = "optPQ", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ=1:3, modelType = "A", optimPar = "optPQ", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP=1:3, parQ="opt", modelType = "A", optimPar = "optPQ", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "A", optimPar = "pStar", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "M", optimPar = "pOne", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "A", optimPar = "pStarQ", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "A", optimPar = "both", errType = "sMAPE", fcast="single")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "M", optimPar = "optPQ", errType = "sMAPE", fcast="comb")

atamethod(M3,sRange=1:2, parP="opt", parQ="opt", modelType = "A", optimPar = "optPQ", errType = "sMAPE", fcast="select")