Package ‘FMAdist’

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Type Package

Title Frequentist Model Averaging Distribution

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Description

Creation of an input model (fitted distribution) via the frequentist model averaging “FMA” approach.

Usage

fmafit(x,Fset,J,type)

Arguments

x a numerical vector of nonzero length containing data values for fitting
Fset a list of character strings that specifies the set of candidate distributions; supported distributions are 'normal', 'lognormal', 'exponential', 'gamma', 'weibull', 'inverse gaussian', 'student t', 'uniform', 'cauchy', 'loglogistic', 'ED'
J number of groups to divide the data into for cross-validation; if not specified, J = 10
type a character string specifying the type of model averaging estimator: 'P' for probability, 'Q' for quantile; if not specified, type = 'P'

Details

fmafit first fits each candidate parametric distribution in Fset to the data X using maximum likelihood estimation, which yields a set of fitted distributions F = {F_1, F_2, ..., F_q}. The MLEs for each distribution are returned as MLE_list. Next a weight vector w = {w_1, w_2, ..., w_q} is obtained through cross-validation and also returned. The resulting model-average estimator of the true cumulative distribution of the data is

\[ F(x, w) = \sum_{m=1}^{q} (w_m)(F_m(x)). \]

The model average fitting can be either in the cumulative probability space or quantile space. The difference between the two types of model averaging is only in the weight vector associated with the candidate distributions, which is obtained through cross-validation in either the probability or quantile space.

Value

fmafit returns an object which is a list with four components:

w weight vector associated with distributions in Fset
rfma

MLE_list list of MLE parameter estimates for each candidate distribution with 'NA' for ED (the empirical distribution)

Fset same as the input argument
data sorted input argument x (needed for ED)

References


See Also

See rfma for random-variate generation from the fitted distribution obtained via “FMA” approach.

Examples

data<-rlnorm(500,meanlog=0,sdlog=0.25)
Fset<-c('gamma','weibull','normal','ED')
type<-'P' #by default type<-Q'
J<-5 #by default J<-10
myfit<-fmafit(data,Fset,J,type)

rfma(n, myfit)

Arguments

n number of random variates to generate
myfit a list object returned by fmafit containing the four components needed for random-variate generation: w, MLE_list, Fset, and data

Details

rfma generates random variates that have the distribution of the model-average estimator. Each time a random variate is needed, a distribution is selected with probability equal to the corresponding weight and then a random variate from the fitted distribution is generated.
Value
rfma generates random variates from the distribution specified by myfit

References

See Also
See fmafit for creation of an input model (fitted distribution) via the frequentist model averaging “FMA” approach.

Examples
```r
data<-rlnorm(500,meanlog=0,sdlog=0.25)
Fset<-c('gamma','weibull','normal','ED')
type<-'P' #by default type<-'Q'
J<5 #by default J<10
myfit<-fmafit(data,Fset,J,type)
n<100
sim_data<-rfma(n,myfit)
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