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Description Likelihood-based inference methods with doubly-truncated data are developed under various models. Nonparametric models are based on Efron and Petrosian (1999) <doi:10.1080/01621459.1999.10474187> and Emura, Konno, and Michimae (2015) <doi:10.1007/s10985-014-9297-5>. Parametric models from the special exponential family (SEF) are based on Hu and Emura (2015) <doi:10.1007/s00180-015-0564-z> and Emura, Hu and Konno (2017) <doi:10.1007/s00362-015-0730-y>. The parametric location-scale models are based on Dorre et al. (2020) <doi:10.1007/s00180-020-01027-6>.

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`double.truncation-package`

Analysis of Doubly-Truncated Data

Description

Likelihood-based inference methods with doubly-truncated data are developed under various models. Nonparametric models are based on Efron and Petrosian (1999) <doi:10.1080/01621459.1999.10474187> and Emura, Konno, and Michimae (2015) <doi:10.1007/s10985-014-9297-5>. Parametric models from the special exponential family (SEF) are based on Hu and Emura (2015) <doi:10.1007/s00180-015-0564-z> and Emura, Hu and Konno (2017) <doi:10.1007/s00362-015-0730-y>. The parametric location-scale models are based on Dorre et al. (2020) <doi:10.1007/s00180-020-01027-6>.

Details

Details are seen from the references.

Author(s)

Takeshi Emura, Ya-Hsuan Hu, Chung-Yan Huang Maintainer: Takeshi Emura <takeshiemura@gmail.com>

References

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Dorre A, Huang CY, Tseng YK, Emura T (2020) Likelihood-based analysis of doubly-truncated data under the location-scale and AFT model, Computation Stat, DOI:10.1007/s00180-020-01027-6

Efron B, Petrosian V (1999). Nonparametric methods for doubly truncated data. J Am Stat Assoc 94: 824-834

Emura T, Konno Y, Michimae H (2015). Statistical inference based on the nonparametric maximum likelihood estimator under double-truncation. Lifetime Data Analysis 21: 397-418

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

`NPMLE` *Nonparametric inference based on the self-consistency method*

Description

Nonparametric maximum likelihood estimates are computed based on the self-consistency method (Efron and Petrosian 1999). The SE is computed from the asymptotic variance derived in Emura et al. (2015).

Usage

```
NPMLE(u.trunc, y.trunc, v.trunc,epsilon=1e-08)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`epsilon`	error tolerance for the self-consistency algorithm

Details

Details are seen from the references.

Value

`f`	density
`F`	cumulative distribution
`SE`	standard error
`convergence`	Log-likelihood, and the number of iterations

Author(s)

Takeshi Emura

References

Efron B, Petrosian V (1999). Nonparametric methods for doubly truncated data. J Am Stat Assoc 94: 824-834

Emura T, Konno Y, Michimae H (2015). Statistical inference based on the nonparametric maximum likelihood estimator under double-truncation. Lifetime Data Analysis 21: 397-418

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
## A data example from Efron and Petrosian (1999) ##
y.trunc=c(0.75, 1.25, 1.50, 1.05, 2.40, 2.50, 2.25)
u.trunc=c(0.4, 0.8, 0.0, 0.3, 1.1, 2.3, 1.3)
v.trunc=c(2.0, 1.8, 2.3, 1.4, 3.0, 3.4, 2.6)
NPMLE(u.trunc,y.trunc,v.trunc)
```

PMLE.loglogistic *Parametric Inference for the log-logistic model*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.loglogistic(u.trunc, y.trunc, v.trunc,epsilon = 1e-5,D1=2,D2=2,d1=2,d2=2)
```

Arguments

u.trunc	lower truncation limit
y.trunc	variable of interest
v.trunc	upper truncation limit
epsilon	error tolerance for Newton-Raphson
D1	Randomize the intial value if |mu_h-mu_h+1|>D1
D2	Randomize the intial value if |sigma_h-sigma_h+1|>D2
d1	U(-d1,d1) is added to the intial value of mu
d2	U(-d2,d2) is added to the intial value of sigma

Details

Details are seen from the references.

Value

eta	estimates
SE	standard errors
convergence	Log-likelihood, degree of freedom, AIC, the number of iterations
Score	score vector at the converged value
Hessian	Hessian matrix at the converged value

Author(s)

Takeshi Emura

References

Dorre A, Huang CY, Tseng YK, Emura T (2020-) Likelihood-based analysis of doubly-truncated data under the location-scale and AFT model, Computation Stat, DOI:10.1007/s00180-020-01027-6

Examples

```
## A data example from Efron and Petrosian (1999) ##
y.trunc=c(0.75, 1.25, 1.50, 1.05, 2.40, 2.50, 2.25)
u.trunc=c(0.4, 0.8, 0.0, 0.3, 1.1, 2.3, 1.3)
v.trunc=c(2.0, 1.8, 2.3, 1.4, 3.0, 3.4, 2.6)
PMLE.loglogistic(u.trunc,y.trunc,v.trunc)
```

`PMLE.lognormal` *Parametric Inference for the lognormal model*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.lognormal(u.trunc, y.trunc, v.trunc,epsilon = 1e-5,D1=2,D2=2,d1=2,d2=2)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`epsilon`	error tolerance for Newton-Raphson
`D1`	Randomize the intial value if |mu_h-mu_h+1|>D1
`D2`	Randomize the intial value if |sigma_h-sigma_h+1|>D2
`d1`	U(-d1,d1) is added to the intial value of mu
`d2`	U(-d2,d2) is added to the intial value of sigma

Details

Details are seen from the references.

Value

`eta`	estimates
`SE`	standard errors
`convergence`	Log-likelihood, degree of freedom, AIC, the number of iterations
`Score`	score vector at the converged value
`Hessian`	Hessian matrix at the converged value

Author(s)

Takeshi Emura

References

Dorre A, Huang CY, Tseng YK, Emura T (2020-) Likelihood-based analysis of doubly-truncated data under the location-scale and AFT model, Computation Stat, DOI:10.1007/s00180-020-01027-6

Examples

```
## A data example from Efron and Petrosian (1999) ##
y.trunc=c(0.75, 1.25, 1.50, 1.05, 2.40, 2.50, 2.25)
u.trunc=c(0.4, 0.8, 0.0, 0.3, 1.1, 2.3, 1.3)
v.trunc=c(2.0, 1.8, 2.3, 1.4, 3.0, 3.4, 2.6)
PMLE.lognormal(u.trunc,y.trunc,v.trunc)
```

PMLE.SEF1.free — *Parametric inference for the one-parameter SEF model (free parameter space)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.SEF1.free(u.trunc, y.trunc, v.trunc,
 tau1 = min(y.trunc), tau2 = max(y.trunc), epsilon = 1e-04)
```

Arguments

u.trunc	lower truncation limit
y.trunc	variable of interest
v.trunc	upper truncation limit
tau1	lower support
tau2	upper support
epsilon	error tolerance for Newton-Raphson

Details

Details are seen from the references.

Value

`eta`	estimates
`SE`	standard errors
`convergence`	Log-likelihood, degree of freedom, AIC, the number of iterations
`Score`	score at the converged value
`Hessian`	Hessian at the converged value

Author(s)

Takeshi Emura

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
### Data generation: see Appendix of Hu and Emura (2015) ###
eta_true=-3
eta_u=-9
eta_v=-1
tau=10
n=300

a=u=v=y=c()

j=1
repeat{
  u1=runif(1,0,1)
  u[j]=tau+(1/eta_u)*log(1-u1)
  u2=runif(1,0,1)
  v[j]=tau+(1/eta_v)*log(1-u2)
  u3=runif(1,0,1)
  y[j]=tau+(1/eta_true)*log(1-u3)
  if(u[j]<=y[j]&&y[j]<=v[j]) a[j]=1 else a[j]=0
  if(sum(a)==n) break
  j=j+1
}
mean(a) ## inclusion probability around 0.5

v.trunc=v[a==1]
u.trunc=u[a==1]
y.trunc=y[a==1]

PMLE.SEF1.free(u.trunc,y.trunc,v.trunc)
```

`PMLE.SEF1.negative` *Parametric inference for the one-parameter SEF model (negative parameter space)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.SEF1.negative(u.trunc, y.trunc, v.trunc, tau1 = min(y.trunc), epsilon = 1e-04)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`tau1`	lower support
`epsilon`	error tolerance for Newton-Raphson

Details

Details are seen from the references.

Value

`eta`	estimates
`SE`	standard errors
`convergence`	Log-likelihood, degree of freedom, AIC, the number of iterations
`Score`	score at the converged value
`Hessian`	Hessian at the converged value

Author(s)

Takeshi Emura, Ya-Hsuan Hu

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
### Data generation: see Appendix of Hu and Emura (2015) ###
eta_true=-3
eta_u=-9
eta_v=-1
tau=10
n=300

a=u=v=y=c()

j=1
repeat{
  u1=runif(1,0,1)
  u[j]=tau+(1/eta_u)*log(1-u1)
  u2=runif(1,0,1)
  v[j]=tau+(1/eta_v)*log(1-u2)
  u3=runif(1,0,1)
  y[j]=tau+(1/eta_true)*log(1-u3)
  if(u[j]<=y[j]&&y[j]<=v[j]) a[j]=1 else a[j]=0
  if(sum(a)==n) break
  j=j+1
}
mean(a) ## inclusion probability around 0.5

v.trunc=v[a==1]
u.trunc=u[a==1]
y.trunc=y[a==1]

PMLE.SEF1.negative(u.trunc,y.trunc,v.trunc)
```

`PMLE.SEF1.positive` *Parametric Inference for the one-parameter SEF model (positive parameter space)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.SEF1.positive(u.trunc, y.trunc, v.trunc, tau2 = max(y.trunc), epsilon = 1e-04)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`tau2`	upper support
`epsilon`	error tolerance for Newton-Raphson

Details

Details are seen from the references.

Value

eta	estimates
SE	standard errors
convergence	Log-likelihood, degree of freedom, AIC, the number of iterations
Score	score at the converged value
Hessian	Hessian at the converged value

Author(s)

Takeshi Emura, Ya-Hsuan Hu

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
#### Data generation: Appendix of Hu and Emura (2015)
eta_true=3
eta_u=1
eta_v=9
tau=10
n=300

a=u=v=y=c()

j=1
repeat{
  u1=runif(1,0,1)
  u[j]=tau+(1/eta_u)*log(u1)
  u2=runif(1,0,1)
  v[j]=tau+(1/eta_v)*log(u2)
  u3=runif(1,0,1)
  y[j]=tau+(1/eta_true)*log(u3)
  if(u[j]<=y[j]&&y[j]<=v[j]) a[j]=1 else a[j]=0
  if(sum(a)==n) break
  j=j+1
}
mean(a) ## inclusion probability around 0.5
```

```
v.trunc=v[a==1]
u.trunc=u[a==1]
y.trunc=y[a==1]

PMLE.SEF1.positive(u.trunc,y.trunc,v.trunc)
```

`PMLE.SEF2.negative` *Parametric Inference for the two-parameter SEF model (negative parameter space for eta_2)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities. Since this is the model, estimates for the mean and SD are also computed.

Usage

```
PMLE.SEF2.negative(u.trunc, y.trunc, v.trunc, epsilon = 1e-04)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`epsilon`	error tolerance for Newton-Raphson

Details

Details are seen from the references.

Value

`eta`	estimates
`SE`	standard errors
`convergence`	Log-likelihood, degree of freedom, AIC, the number of iterations
`Score`	score vector at the converged value
`Hessian`	Hessian matrix at the converged value

Author(s)

Takeshi Emura, Ya-Hsuan Hu

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
### Data generation: see Appendix of Hu and Emura (2015)
n=300
eta1_true=30
eta2_true=-0.5
mu_true=30
mu_u=29.09
mu_v=30.91

a=u=v=y=c()

###generate n samples of (ui,yi,vi) subject to ui<=yi<=vi###
j=1
repeat{
  u[j]=rnorm(1,mu_u,1)
  v[j]=rnorm(1,mu_v,1)
  y[j]=rnorm(1,mu_true,1)
  if(u[j]<=y[j]&&y[j]<=v[j]) a[j]=1 else a[j]=0
  if(sum(a)==n) break ###we need n data set###
  j=j+1
}
mean(a) ### inclusion probability around 0.5 ###

v.trunc=v[a==1]
y.trunc=y[a==1]
u.trunc=u[a==1]

PMLE.SEF2.negative(u.trunc,y.trunc,v.trunc)
```

`PMLE.SEF3.free` *Parametric Inference for the three-parameter SEF model (free parameter space for eta_3)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.SEF3.free(u.trunc, y.trunc, v.trunc,
 tau1 = min(y.trunc), tau2 = max(y.trunc),
 epsilon = 1e-04, D1=20, D2=10, D3=1, d1=6, d2=0.5)
```

Arguments

u.trunc	lower truncation limit
y.trunc	variable of interest
v.trunc	upper truncation limit
tau1	lower support
tau2	upper support
epsilon	error tolerance for Newton-Raphson
D1	Divergence condition for eta_1
D2	Divergence condition of eta_2
D3	Divergence condition of eta_3
d1	Range of randomization for eta_1
d2	Range of randomization for eta_2

Details

Details are seen from the references.

Value

eta	estimates
SE	standard errors
convergence	Log-likelihood, degree of freedom, AIC, the number of iterations
Score	score vector at the converged value
Hessian	Hessian matrix at the converged value

Author(s)

Takeshi Emura, Ya-Hsuan Hu

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
## The first 10 samples of the childhood cancer data ##
y.trunc=c(6,7,15,43,85,92,96,104,108,123)
u.trunc=c(-1643,-24,-532,-1508,-691,-1235,-786,-261,-108,-120)
v.trunc=u.trunc+1825
PMLE.SEF3.free(u.trunc,y.trunc,v.trunc)
```

PMLE.SEF3.negative — *Parametric Inference for the three-parameter SEF model (negative parameter space for eta_3)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.SEF3.negative(u.trunc, y.trunc, v.trunc, tau1 = min(y.trunc),
 epsilon = 1e-04, D1=20, D2=10, D3=1, d1=6, d2=0.5)
```

Arguments

u.trunc	lower truncation limit
y.trunc	variable of interest
v.trunc	upper truncation limit
tau1	lower support
epsilon	error tolerance for Newton-Raphson
D1	Divergence condition for eta_1
D2	Divergence condition of eta_2
D3	Divergence condition of eta_3
d1	Range of randomization for eta_1
d2	Range of randomization for eta_2

Details

Details are seen from the references.

Value

eta	estimates
SE	standard errors
convergence	Log-likelihood, degree of freedom, AIC, the number of iterations
Score	score vector at the converged value
Hessian	Hessian matrix at the converged value

Author(s)

Takeshi Emura, Ya-Hsuan Hu

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
## The first 10 samples of the childhood cancer data ##
y.trunc=c(6,7,15,43,85,92,96,104,108,123)
u.trunc=c(-1643,-24,-532,-1508,-691,-1235,-786,-261,-108,-120)
v.trunc=u.trunc+1825
PMLE.SEF3.negative(u.trunc,y.trunc,v.trunc)
```

PMLE.SEF3.positive — *Parametric Inference for the three-parameter SEF model (positive parameter space for eta_3)*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.SEF3.positive(u.trunc, y.trunc, v.trunc, tau2 = max(y.trunc),
 epsilon = 1e-04, D1=20, D2=10, D3=1, d1=6, d2=0.5)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`tau2`	upper support
`epsilon`	error tolerance for Newton-Raphson
`D1`	Divergence condition for eta_1
`D2`	Divergence condition of eta_2
`D3`	Divergence condition of eta_3
`d1`	Range of randomization for eta_1
`d2`	Range of randomization for eta_2

Details

Details are seen from the references.

Value

eta	estimates
SE	standard errors
convergence	Log-likelihood, degree of freedom, AIC, the number of iterations
Score	score vector at the converged value
Hessian	Hessian matrix at the converged value

Author(s)

Takeshi Emura, Ya-Hsuan Hu

References

Hu YH, Emura T (2015) Maximum likelihood estimation for a special exponential family under random double-truncation, Computation Stat 30 (4): 1199-229

Emura T, Hu YH, Konno Y (2017) Asymptotic inference for maximum likelihood estimators under the special exponential family with double-truncation, Stat Pap 58 (3): 877-909

Dorre A, Emura T (2019) Analysis of Doubly Truncated Data, An Introduction, JSS Research Series in Statistics, Springer

Examples

```
## The first 10 samples of the childhood cancer data ##
y.trunc=c(6,7,15,43,85,92,96,104,108,123)
u.trunc=c(-1643,-24,-532,-1508,-691,-1235,-786,-261,-108,-120)
v.trunc=u.trunc+1825
PMLE.SEF3.positive(u.trunc,y.trunc,v.trunc)
```

`PMLE.Weibull` *Parametric Inference for the Weibull model*

Description

Maximum likelihood estimates and their standard errors (SEs) are computed. Also computed are the likelihood value, AIC, and other qnantities.

Usage

```
PMLE.Weibull(u.trunc, y.trunc, v.trunc,epsilon = 1e-5,D1=2,D2=2,d1=2,d2=2)
```

Arguments

`u.trunc`	lower truncation limit
`y.trunc`	variable of interest
`v.trunc`	upper truncation limit
`epsilon`	error tolerance for Newton-Raphson
`D1`	Randomize the intial value if |mu_h-mu_h+1|>D1
`D2`	Randomize the intial value if |sigma_h-sigma_h+1|>D2
`d1`	U(-d1,d1) is added to the intial value of mu
`d2`	U(-d2,d2) is added to the intial value of sigma

Details

Details are seen from the references.

Value

`eta`	estimates
`SE`	standard errors
`convergence`	Log-likelihood, degree of freedom, AIC, the number of iterations
`Score`	score vector at the converged value
`Hessian`	Hessian matrix at the converged value

Author(s)

Takeshi Emura

References

Dorre A, Huang CY, Tseng YK, Emura T (2020) Likelihood-based analysis of doubly-truncated data under the location-scale and AFT model, Computation Stat, DOI:10.1007/s00180-020-01027-6

Examples

```
## A data example from Efron and Petrosian (1999) ##
y.trunc=c(0.75, 1.25, 1.50, 1.05, 2.40, 2.50, 2.25)
u.trunc=c(0.4, 0.8, 0.0, 0.3, 1.1, 2.3, 1.3)
v.trunc=c(2.0, 1.8, 2.3, 1.4, 3.0, 3.4, 2.6)
PMLE.Weibull(u.trunc,y.trunc,v.trunc)
```

simu.Weibull *Simulating doubly-truncated data from the Weibull model*

Description

A data frame is generated by simulated data from the Weibull model.

Usage

```
simu.Weibull(n,mu,sigma,delta)
```

Arguments

n	sample size
mu	location parameter
sigma	scale parameter
delta	a positive parameter controlling the inclusion probability

Details

The data are generated from the random vector (U,Y,V) subject to the inclusion criterion U<=Y<=V. The random vector are defined as U=mu-delta+sigma*W, Y=mu+sigma*W, and U=mu+delta+sigma*W, where P(W>w)=exp(-exp(w)). See Section 5.1 of Dorre et al. (2020-) for details. The inclusion probability is P(U<=Y<=V).

Value

u	lower truncation limits
y	log-transformed lifetimes
v	upper truncation limits

Author(s)

Takeshi Emura

References

Dorre A, Huang CY, Tseng YK, Emura T (2020-) Likelihood-based analysis of doubly-truncated data under the location-scale and AFT model, Computation Stat, DOI:10.1007/s00180-020-01027-6

Examples

```
## A simulation from Dorre et al.(2020) ##
simu.Weibull(n=100,mu=5,sigma=2,delta=2.08)

Dat=simu.Weibull(n=100,mu=5,sigma=2,delta=2.08)
PMLE.Weibull(Dat$u,Dat$y,Dat$v)
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