Package 'PGaGEV'

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Type Package

Title Power Garima-Generalized Extreme Value Distribution

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Language en-US

Maintainer Kittipong Klinjan <kittipong_k@rmutt.ac.th>

Description Density, distribution function, quantile function,
and random generation function based on Kittipong Klinjan,Tipat Sottiwan and Sirinapa Aryuyuen (2024)<DOI:10.28919/cmbn/8833>.

License GPL-3

Encoding UTF-8

Imports LambertW,stats

RoxygenNote 7.3.2

Suggests testthat (>= 3.0.0)

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NeedsCompilation no

Author Kittipong Klinjan [cre, aut],
Tipat Sottiwan [aut],
Sirinapa Aryuyuen [aut]

Repository CRAN

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Contents

dPGaGEV *The probability density function (PDF) of the power Garima-generalized extreme value distribution(PGaGEV).*

Description

This function calculated the PDF of PGaGEV distribution.

Usage

```
dPGaGEV(x, mu, sigma, xi, a, b, c)
```

Arguments

x	vector of quantiles.There are three cases as follows: 1) if xi>0, x=[(mu-sigma)/xi,Inf].2) if xi=0, x=[-Inf,Inf].3) if xi<0, x=[-Inf,(mu-sigma)/xi].
mu	location parameter.mu=[-Inf,Inf].
sigma	scale parameter number 1. sigma>0.
xi	shape parameter number 1. xi=[-Inf,Inf].
a	scale parameter number 2. a>0.
b	scale parameter number 3. b>0.
c	shape parameter number 2. c=[-Inf,Inf].

Details

The PDF of PGaGEV distribution based on the research paper in references.

Value

the PDF of PGaGEV distribution.

References

Kittipong Klinjan, Tipat Sottiwan and Sirinapa Aryuyuen (2024). Extreme value analysis with new generalized extreme value distributions: a case study for risk analysis on pm2.5 and pm10 in pathum thani, thailand, Commun. Math. Biol. Neurosci. 2024, 2024:100.DOI:10.28919/cmbn/8833.

Examples

```
dPGaGEV(1.2,2,1,0.5,0.5,0.5,0.5)  #xi=0.5
dPGaGEV(1.2,2,1,0,0.5,0.5,0.5)    #xi=0
dPGaGEV(1.2,2,1,-0.5,0.5,0.5,0.5) #xi=-0.5
x=c(1.2,1.3,1.4)
dPGaGEV(x,2,1,0.5,0.5,0.5,0.5)  #xi=0.5
```

pPGaGEV *The cumulative distribution function (CDF) of the power Garima-generalized extreme value distribution(PGaGEV).*

Description

This function calculated the CDF of PGaGEV distribution.

Usage

```
pPGaGEV(x, mu, sigma, xi, a, b, c)
```

Arguments

x	vector of quantiles.There are three cases as follows: 1) if xi>0, x=[(mu-sigma)/xi,Inf].2) if xi=0, x=[-Inf,Inf].3) if xi<0, x=[-Inf,(mu-sigma)/xi].
mu	location parameter.mu=[-Inf,Inf].
sigma	scale parameter number 1. sigma>0.
xi	shape parameter number 1. xi=[-Inf,Inf].
a	scale parameter number 2. a>0.
b	scale parameter number 3. b>0.
c	shape parameter number 2. c=[-Inf,Inf].

Details

The CDF of PGaGEV distribution based on the research paper in references.

Value

the CDF of PGaGEV distribution.

References

Kittipong Klinjan, Tipat Sottiwan and Sirinapa Aryuyuen (2024). Extreme value analysis with new generalized extreme value distributions: a case study for risk analysis on pm2.5 and pm10 in pathum thani, thailand, Commun. Math. Biol. Neurosci. 2024, 2024:100.DOI:10.28919/cmbn/8833.

Examples

```
pPGaGEV(1.2,2,1,0.5,0.5,0.5,.5) #xi=0.5
pPGaGEV(1.2,2,1,0.5,0.5,0.5,.5) #xi=0
pPGaGEV(1.2,2,1,0.5,0.5,0.5,.5) #xi=-0.5
x=c(1.2,1.3,1.4)
pPGaGEV(x,2,1,0.5,0.5,0.5,0.5)  #xi=0.5
```

qPGaGEV *The quantile function of the power Garima-generalized extreme value distribution(PGaGEV).*

Description

This function calculated the quantile values of PGaGEV distribution.

Usage

```
qPGaGEV(p, mu, sigma, xi, a, b, c)
```

Arguments

p	vector of probabilities.
mu	location parameter.mu=[-Inf,Inf].
sigma	scale parameter number 1. sigma>0.
xi	shape parameter number 1. xi=[-Inf,Inf].
a	scale parameter number 2. a>0.
b	scale parameter number 3. b>0.
c	shape parameter number 2. c=[-Inf,Inf].

Details

The quantile function of PGaGEV distribution based on the research paper in references.

Value

the quantile values of PGaGEV distribution.

References

Kittipong Klinjan, Tipat Sottiwan and Sirinapa Aryuyuen (2024). Extreme value analysis with new generalized extreme value distributions: a case study for risk analysis on pm2.5 and pm10 in pathum thani, thailand, Commun. Math. Biol. Neurosci. 2024, 2024:100.DOI:10.28919/cmbn/8833.

Examples

```
qPGaGEV(0.1639605,2,1,0.5,0.5,0.5,0.5)
x=c(1.2,1.3,1.4)
p <- pPGaGEV(x,2,1,0.5,0.5,0.5,0.5)
qPGaGEV(p,2,1,0.5,0.5,0.5,0.5)
```

rPGaGEV *The random generating function of the power Garima-generalized extreme value distribution(PGaGEV).*

Description

This function generatings random numbers of PGaGEV distribution.

Usage

```
rPGaGEV(n, mu, sigma, xi, a, b, c)
```

Arguments

n	number of observations.
mu	location parameter.mu=[-Inf,Inf].
sigma	scale parameter number 1. sigma>0.
xi	shape parameter number 1. xi=[-Inf,Inf], where xi not equal to zero.
a	scale parameter number 2. a>0.
b	scale parameter number 3. b>0.
c	shape parameter number 2. c=[-Inf,Inf].

Details

The n random value of PGaGEV distribution based on the research paper in references.

Value

the quantile values of PGaGEV distribution.

References

Kittipong Klinjan, Tipat Sottiwan and Sirinapa Aryuyuen (2024). Extreme value analysis with new generalized extreme value distributions: a case study for risk analysis on pm2.5 and pm10 in pathum thani, thailand, Commun. Math. Biol. Neurosci. 2024, 2024:100.DOI:10.28919/cmbn/8833.

Examples

```
rPGaGEV(30,2,1,0.5,0.5,0.5,0.5)   #xi>0
rPGaGEV(30,2,1,-0.5,0.5,0.5,0.5)  #xi<0
```

Index