Package 'tlgarima'

June 8, 2026

Type Package

Title The Topp–Leone Garima Distribution

Version 0.1.0

Description Density, distribution function, quantile function, and random generating function of the Topp–Leone Garima distribution
based on Boonmeekham, A., Supapakorn, T., & Bodhisuwan, W. (2025)<doi:10.1134/S1995080225608471>.
In addition, maximum likelihood estimation for the Topp–Leone Garima distribution is provided.

License GPL-3

Language en-US

Encoding UTF-8

Imports stats, lamW

RoxygenNote 7.3.2

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation no

Author Arin Boonmeekham [aut],
Thidaporn Supapakorn [aut],
Winai Bodhisuwan [aut],
Atchanut Rattanalertnusorn [cre, ctb]

Maintainer Atchanut Rattanalertnusorn <atchanut_r@rmutt.ac.th>

Repository CRAN

Date/Publication 2026-06-08 17:50:02 UTC

Contents

mleTLGa *Maximum Likelihood Estimation*

Description

A maximum likelihood estimation function for the Topp–Leone Garima Distribution (TLGa distribution).

Usage

```
mleTLGa(x, param, method = "L-BFGS-B")
```

Arguments

x	data vector
param	parameter vector of the TLGa distribution.
method	a numerical optimization method, that is, the L-BFGS-B algorithm.

Value

a list of output(variables) as follows: estalpha is the estimated parameter alpha, esttheta is the estimated parameter theta, negll_value is the negative Loglikelihood function, stderr_of_estalpha is the standard error of the estimated parameter alpha. stderr_of_esttheta is the standard error of the estimated parameter theta.

References

Boonmeekham, A., Supapakorn, T., & Bodhisuwan, W. (2025). The Topp–Leone Garima Distribution: Properties and Application. Lobachevskii Journal of Mathematics, 46(7), 3510-3521. doi:10.1134/S1995080225608471.

Examples

```
x <- rTLGa(100,alpha = 1, theta = 2)
guess_params <- c(0.8, 1.5)
mleTLGa(x,param=guess_params)
```

TLGa *The Topp–Leone Garima Distribution (TLGa)*

Description

Density, distribution function, quantile function, and random generation function for TLGa distribution with two parameters (alpha and theta). The TLGa distribution is first presented by Arin Boonmeekham, Thidaporn Supapakorn, and Winai Bodhisuwan. See details in references.

Usage

```
dTLGa(x, alpha, theta, log = FALSE)

pTLGa(q, alpha, theta, lower.tail = TRUE, log.p = FALSE)

qTLGa(p, alpha, theta)

rTLGa(n, alpha, theta)
```

Arguments

x, q	vector of quantile.
alpha	shape parameter of the Topp–Leone generator of distributions, where $\alpha > 0$.
theta	shape parameter of the Garima distribution, where $\theta > 0$.
log, log.p	logical; (default = FALSE), if TRUE, then probabilities are given as log(p).
lower.tail	logical; if TRUE (default), probabilities are $P[X \leq x]$, otherwise, $P[X > x]$.
p	vector of probabilities.
n	number of observations.

Value

dTLGa gives the density, pTLGa gives the distribution function, qTLGa gives the quantile function, rTLGa generates random samples.

References

Boonmeekham, A., Supapakorn, T., & Bodhisuwan, W. (2025). The Topp–Leone Garima Distribution: Properties and Application. Lobachevskii Journal of Mathematics, 46(7), 3510-3521. doi:10.1134/S1995080225608471.

Examples

```
NULL
```

```
x <- seq(1,10,by=0.1)
x
fx <- dTLGa(x,alpha = 1, theta = 2)
fx
logfx <- dTLGa(x,alpha = 1, theta = 2,log = TRUE)
logfx
```

```
x <- seq(1,10,by=0.1)
x
Fx <- pTLGa(q=x ,alpha = 1, theta = 0.8)
Fx     #P(X<x)
Sx <- pTLGa(q=x ,alpha = 1, theta = 0.8, lower.tail = FALSE) # Survival function
Sx     #P(X>x) or 1-Fx
```

```
require(lamW)
x <- rTLGa(20,alpha=1.5,theta=3)
x
p <- pTLGa(x,alpha = 1.5, theta = 3)
p
q <- qTLGa(p,alpha=1.5,theta = 3)
q    # The value of q is equal to x.
```

```
require(lamW)
x <- rTLGa(50,alpha=2,theta=1.5)
x
```

Index