

# Package: llogistic (via r-universe)

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**Title** The L-Logistic Distribution

**Version** 1.0.3

**Description** Density, distribution function, quantile function and random generation for the L-Logistic distribution with parameters  $m$  and  $\phi$ . The parameter  $m$  is the median of the distribution.

**Imports** stats

**Depends** R ( $\geq 3.3.0$ )

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.1.0

**NeedsCompilation** no

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**Repository** <https://rosineide.r-universe.dev>

**RemoteUrl** <https://github.com/cran/llogistic>

**RemoteRef** HEAD

**RemoteSha** b186f220a7f74c5bdacd1e32444a209890c5b3bb

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llogistic

*The L-Logistic Distribution*


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### Description

Density, distribution function, quantile function and random generation for the L-Logistic distribution with parameters  $m$  and  $\phi$ .

### Usage

```
dllogistic(x, m, phi, log = FALSE)
```

```
plogistic(q, m, phi, lower.tail = TRUE, log.p = FALSE)
```

```
qllogistic(p, m, phi, lower.tail = TRUE, log.p = FALSE)
```

```
rllogistic(n, m, phi)
```

### Arguments

<code>x, q</code>	vector of quantiles.
<code>m, phi</code>	parameters of the L-Logistic distribution. The parameter $m$ lies in the interval $(0,1)$ and $\phi$ is positive.
<code>log, log.p</code>	logical; if TRUE, probabilities $p$ are given as $\log(p)$ .
<code>lower.tail</code>	logical; if TRUE (default), probabilities are $P[X \leq x]$ , otherwise, $P[X > x]$ .
<code>p</code>	vector of probabilities.
<code>n</code>	number of observations.

### Details

The llogistic distribution has density

$$f(x) = \phi(1-m)^{\phi} m^{\phi} x^{\phi} (1-x)^{\phi} (\phi-1) / ((1-m)^{\phi} x^{\phi} + m^{\phi} (1-x)^{\phi})^2,$$

for  $0 < x < 1$ , where  $m$  is a median of the distribution and  $\phi$  is a shape parameter.

### Value

`dllogistic(x,m,phi)` gives the density function, `rllogistic(n,m,phi)` gives  $n$  random variates and `qllogistic(p,m,phi)` gives the quantile.

### Source

The L-Logistic distribution was introduced by Tadikamalla and Johnson (1982), which refer to this distribution as Logit-Logistic distribution. Here, we have a new parameterization of the Logit-Logistic with the median as a parameter.

**References**

Paz, R.F., Balakrishnan, N and Bazán, Jorge L. (2016). L-Logistic Distribution: Properties, Inference and an Application to Study Poverty and Inequality in Brazil. São Carlos: Universidade Federal de São Carlos. Technical-Scientific Report No. 261, Theory and Method. Sponsored by the Department of Statistical, <URL:<http://www.pipges.ufscar.br/publicacoes/relatorios-tecnicos/arquivos-1/rt261.pdf>>.

TADIKAMALLA, P. R.; JOHNSON, N. L. (1982). Systems of frequency curves generated by transformations of logistic variables. *Biometrika*, v. 69, n. 2, p. 461.

**Examples**

```
dllogistic(0.3, 0.5, 2)
pllogistic(0.7, 0.5, 2)
qllogistic(0.2, 0.5, 2)
rllogistic(10, 0.5, 2)
```

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