

# Package ‘irls’

May 8, 2026

**Type** Package

**Title** Generalised Linear Models via Iteratively Reweighted Least Squares

**Version** 1.0

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**Maintainer** Michail Tsagris <mtsagris@uoc.gr>

## Description

Generalised linear models via the iteratively reweighted least squares algorithm. The functions perform logistic, Poisson and Gamma regression (ISBN:9780412317606), either for a single model or many regression models in a column-wise fashion.

**License** GPL (>= 2)

**Depends** R (>= 4.2)

**Imports** Rcpp (>= 1.0.13)

**LinkingTo** Rcpp (>= 1.0.13), RcppEigen

**Suggests** Rfast, Rfast2

**RoxygenNote** 7.3.3

**Encoding** UTF-8

**NeedsCompilation** yes

**Repository** CRAN

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## Contents

irls-package . . . . .	2
Column-wise GLMs with IRLS . . . . .	2
GLMs with IRLS . . . . .	4

<b>Index</b>	<b>6</b>
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irls-package

*Generalised Linear Models via Iteratively Reweighted Least Squares*

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### Description

Description: Generalised linear models via the iteratively reweighted least squares algorithm. The functions perform logistic, Poisson and Gamma regression, either for a single model or many regression models in a column-wise fashion.

### Details

Package: irls  
Type: Package  
Version: 1.0  
Date: 2025-12-03  
License: GPL-2

### Maintainers

Michail Tsagris <mtsagris@uoc.gr>.

### Author(s)

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### References

McCullagh, Peter, and John A. Nelder. Generalized linear models. CRC press, USA, 2nd edition, 1989.

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Column-wise GLMs with IRLS

*Column-wise GLMs with IRLS*

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### Description

GLMs with IRLS.

### Usage

```
col.irls(y, x, type = "logistic", maxiter = 100, tol = 1e-6, parallel = FALSE)
```

**Arguments**

<code>y</code>	A numerical vector with the response. Binary data for the binomial regression, count data for the Poisson regression and strictly positive continuous numbers for the Gamma regression.
<code>x</code>	A numerical matrix.
<code>type</code>	The type of regression model to perform, "logistic", "poisson" or "gamma".
<code>maxiter</code>	The maximum number of iterations to perform.
<code>tol</code>	The tolerance value to terminate the algorithm.
<code>parallel</code>	Should the models be performed in parallel?

**Details**

The function does logistic, Poisson and Gamma regression via the IRLS algorithm, for each column of `x`.

**Value**

A matrix with 3 or 4 columns with the  $\alpha$  (constant) and  $\beta$  parameters, the deviance and the  $\phi$  (dispersion) parameter in case of Gamma regression.

**Author(s)**

Michail Tsagris, Nikolaos Kontemeniotis and Christos Adam. R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

**References**

McCullagh, Peter, and John A. Nelder. Generalized linear models. CRC press, USA, 2nd edition, 1989.

**See Also**

[irls](#)

**Examples**

```
x <- as.matrix(iris[, 1:4])
y <- rbinom(150, 1, 0.5)
col.irls(y, x)
```

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 GLMs with IRLS

*GLMs with IRLS*


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**Description**

GLMs with IRLS.

**Usage**

```
irls(y, x, type = "logistic", maxiter = 100, tol = 1e-6)
```

**Arguments**

y	A numerical vector with the response. Binary data for the binomial regression, count data for the Poisson regression and strictly positive continuous numbers for the Gamma regression.
x	A numerical matrix or a vector.
type	The type of regression model to perform, "logistic", "poisson" or "gamma".
maxiter	The maximum number of iterations to perform.
tol	The tolerance value to terminate the algorithm.

**Details**

The function does logistic, Poisson and Gamma regression via the IRLS algorithm.

**Value**

A list including:

coefficients	The regression coefficients.
vcov	The variance covariance matrix of the coefficients.
se	The standard errors of the coefficients.
phi	The dispersion parameter <i>phi</i> of the Gamma regression.
deviance	The deviance of the regression model.
iters	The number of iterations required.

**Author(s)**

Michail Tsagris, Nikolaos Kontemeniotis and Christos Adam. R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

**References**

McCullagh, Peter, and John A. Nelder. Generalized linear models. CRC press, USA, 2nd edition, 1989.

**See Also**

[col.irls](#)

**Examples**

```
x <- as.matrix(iris[, 1:4])
y <- rbinom(150, 1, 0.5)
irls(y, x)
```

# Index

`col.irls`, [5](#)  
`col.irls` (Column-wise GLMs with IRLS), [2](#)  
Column-wise GLMs with IRLS, [2](#)  
  
GLMs with IRLS, [4](#)  
  
`irls`, [3](#)  
`irls` (GLMs with IRLS), [4](#)  
`irls-package`, [2](#)