

# Package ‘pGLS’

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**Version** 0.0-1

**Title** Generalized Least Square in comparative Phylogenetics

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**Depends** MASS

**Description** Based on the Generalized Least Square model for comparative Phylogenetics (ref).

**License** GPL (>= 2)

**Repository** CRAN

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**NeedsCompilation** no

## R topics documented:

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data_fs	<i>Some physical characteristics of 92 species</i>
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## Description

This data set gives some measurements of ear canals (in millimeters), body mass and agility of 91 known species and 1 fossil record compiled by Tim Ryan at Penn State.

## Usage

data\_fs

**Format**

A vector containing 92 observations with one missing (FS, a hypothetical fossil record).

**References**

Spoor F, Garland T, Krovitz G, Ryan TM, Silcox MT, and Walker A. (2007)  
The primate semicircular canal system and locomotion. *P Natl Acad Sci (USA)* 104:10808-10812.

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pGLS

*An Generalized Least Square model for comparative Phylogenetics*

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**Description**

pGLS An Generalized Least Square model for Comparative Phylogenetics

**Usage**

`pGLS(formula,data,covarmatrix,na.action, intercept = TRUE)`

**Arguments**

<code>formula</code>	a formula describing the model to be fit. Note, that an intercept is included at default.
<code>data</code>	the data frame including the predictors (X's) and the response (Y)
<code>covarmatrix</code>	the var-covariance matrix that is derived from phylogeny or other sources
<code>na.action</code>	a dummy term for data cleaning.
<code>intercept</code>	TRUE (default) if the specified model is with a intercept. It is rare to fit a such model without intercepts.

**Value**

A list object of class "z" containing the results of GLS fitting. The components are:

<code>pred</code>	fitted values and standard errors of the fitted values.
<code>coefficients</code>	estimated coefficients.
<code>cov.coeff</code>	estimated covariance matrix of the coefficients
<code>"sigma^2"</code>	estimated variance
<code>pred.cond.</code>	(for unknown species only)predicted y-values conditioning on the known species. Note if there are no unknown species present in the data, conditional prediction is not calculated.
<code>R-Sq</code>	fraction of total variance explained by the GLS model

**Author(s)**

Xianyun Mao <xianyunmao at gmai1.com> replace 1 by l.

## References

- Garland, T., Jr., and A. R. Ives. (2000)  
Using the past to predict the present: Confidence intervals for regression equations in phylogenetic comparative methods. *American Naturalist* 155:346-364.
- Martins, E. P., and T. F. Hansen. (1996)  
The statistical analysis of interspecific data: a review and evaluation of comparative methods. Pages 22-75 in E. P. Martins, ed. *Phylogenies and the comparative method in animal behavior*. Oxford University Press, Oxford.
- Box, G. E. P., G. M. Jenkins, and G. C. Reinsel. (1994)  
Pages 282-285 *Time series analysis: forecasting and control*. Prentice Hall, Englewood Cliffs, N.J.
- Anderson, T.W. (2003).  
*An Introduction to Multivariate Statistical Analysis*. Wiley-Interscience; 3rd edition

## Examples

```
data(pGLS)
pGLS(logAGIL~logBM+logASCR,data_fs,var_fs,na.pass)
```

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var_fs	<i>Variance-covariance matrix of the 92 species in data_fs</i>
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## Description

This data set gives the distance matrix (variance-covariance matrix) of the 92 species in data\_fs

## Usage

```
var_fs
```

## Format

A matrix of size 92\*92.

## Source

Prepared by Tim Ryan.

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