Regression Results: nagdmc_extr_reg

Purpose

nagdmc_extr_reg extracts the linear predictor, fitted value, residual and leverage for a single data record and a previously fitted regression model. The regression model must be fitted by using one of the functions: **nagdmc_linear_reg**, **nagdmc_binomial_reg**, **nagdmc_poisson_reg**, **nagdmc_basic_reg**, **nagdmc_logit_reg**, **nagdmc_probit_reg**, **nagdmc_loglinear_reg** or **nagdmc_stepwise_reg**.

Declaration

```
#include <nagdmc.h>
void nagdmc_extr_reg(double model[], double data[], double *eta, double *fv,
                     double *res, double *h, int *info);
```

Parameters

1:   **model[]** – `double`   *Input*

On entry: information on the fitted model obtained from one of the regression functions described in 'See Also'.

Constraint: **model** must not be 0.

2:   **data[]** – `double`   *Input*

On entry: the data for a single observation. The data must be in the same format as used in the call to the analysis routine which created the **model** array.

Constraint: **data** must not be 0.

3:   **eta** – `double *`   *Output*

On exit: if not 0, the estimated linear predictor.

4:   **fv** – `double *`   *Output*

On exit: if not 0, the estimated fitted value for the model.

5:   **res** – `double *`   *Output*

On exit: if not 0, the residual.

6:   **h** – `double *`   *Output*

On exit: if not 0, the leverage.

7:   **info** – `int *`   *Output*

On exit: **info** gives information on the success of the function call:

    0: the function successfully completed its task.

    i; $i = 1, 2$: the specification of the ith formal parameter was incorrect.

    46: information in **model** has been corrupted.

    99: the function failed to allocate enough memory.

Notation

eta	linear predictor, η_i.
fv	fitted value, f_i.
res	residual, r_i.
h	leverage, h_i.

Description

The **nag_extr_reg** function is a utility function that extracts the linear predictor (η_i), fitted values ($f_i = \hat{\mu}$), residuals (r_i) and leverage (h_i) for a single data record, based on a generalized linear model fitted previously.

Details on the calculation of the η_i, f_i, r_i and h_i can be found in the description sections of the model fitting routines **nagdmc_linear_reg**, **nagdmc_binomial_reg** and **nagdmc_poisson_reg**.

References and Further Reading

Cook R D and Weisberg S (1982) *Residuals and Influence in Regression* Chapman and Hall.

McCullagh P and Nelder J A (1983) *Generalized Linear Models* Chapman and Hall.

See Also

nagdmc_basic_reg	simplified version of **nagdmc_reg** using a restricted set of parameters.
nagdmc_binomial_reg	generalized linear model with binomial errors.
nagdmc_linear_reg	linear model with Normal errors.
nagdmc_logit_reg	simplified version of **nagdmc_binomial_reg** using a logit link and a and a restricted set of parameters.
nagdmc_loglinear_reg	simplified version of **nagdmc_poisson_reg** using a log link and a restricted set of parameters.
nagdmc_poisson_reg	generalized linear model with Poisson errors.
nagdmc_predict_reg	computes predictions given a fitted regression model.
nagdmc_probit_reg	simplified version of **nagdmc_binomial_reg** using a probit link and a restricted set of parameters.
nagdmc_stepwise_reg	stepwise linear regression with Normal errors.
binomial_reg_ex.c	the example calling program for a generalized linear model with binomial
linear_reg_ex.c	the example calling program for linear regression.
poisson_reg_ex.c	the example calling program for a generalized linear model with Poisson errors.
stepwise_reg_ex.c	the example calling program for stepwise linear regression.