0.1 `mloglm`: Multinomial Log-Linear Regression for Contingency Table Models

Log-linear models are for modeling contingency tables, the cross-tabulation of discrete individual-level variables. Contingency table models take as the "unit of analysis" for the purpose of the statistical procedure, the cell of a contingency table. The "dependent variable" is then the count within each cell, and the explanatory variables indicate what categories the cells fall into. These models are highly efficient computationally since there are so few "observations," but they are asymptotically equivalent to logistic regression models run on the unpacked individual level data.

Syntax

```
> estimate <- zelig(Y ~ X1 + X2, model = "mloglm", data = mydata)
> Xval <- setx(estimate)
> results <- sim(estimate, x = Xval)
```

Examples

Model

Quantities of Interest

Output Values

The output of each Zelig command contains useful information which you may view. For example, if you run `estimate <- zelig(y ~ x, model = "mloglm", data)`, then you may examine the available information in `estimate` by using `names(estimate)`, see the `coefficients` by using `estimate$coefficients`, and a default summary of information through `summary(estimate)`. Other elements available through the `$` operator are listed below.

- From the `zelig()` output stored in `estimate`, you may extract:

    - `coefficients`: parameter estimates for the explanatory variables.
    - `deviance`: the residual deviance.
    - `fitted.values`: the $n \times m$ matrix of in-sample fitted values.
    - `df.residual`: the residual degrees of freedom.
    - `edf`: the effective degrees of freedom.
    - `AIC`: Akaike's An Information Criterion (minus twice the maximized log-likelihood plus twice the number of coefficients).
    - `Hessian`: the Hessian matrix.

- From `summary(estimate)`, you may extract:

  - `coefficients`: the parameter estimates with their associated standard errors, p-values, and t-statistics. covariances.

- From the `sim()` output stored in `results`:

  - `qi$ev`: the simulated expected (or fitted values) for the specified values of `x`.
  - `qi$rd`: the difference in the expected values (or first difference) for the values specified in `x` and `x1`.

How to Cite

To cite the *mloglm* Zelig model:

> Kosuke Imai, Gary King, and Oliva Lau. 2007. "mloglm: Multinomial Log-Linear Regression for Contingency Table Models" in Kosuke Imai, Gary King, and Olivia Lau, "Zelig: Everyone's Statistical Software," `http://gking.harvard.edu/zelig`

To cite Zelig as a whole, please reference these two sources:

> Kosuke Imai, Gary King, and Olivia Lau. 2007. "Zelig: Everyone's Statistical Software," `http://GKing.harvard.edu/zelig`.

> Imai, Kosuke, Gary King, and Olivia Lau. (2008). "Toward A Common Framework for Statistical Analysis and Development." Journal of Computational and Graphical Statistics, Vol. 17, No. 4 (December), pp. 892-913.

See also

The multinomial logit model is part of the nnet library by Brian D. Ripley. (**?**).Advanced users may wish to refer to the R-help for `help(multinom)` and **?**

Bibliography