Multinomial logit models in R

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The multinomial logit (or conditional logit) is a widely used model in econometrics to explain the choice of an alternative among a set of exclusive alternatives since the seminal works of McFadden. It is based on the hypothesis that the unobservable part of the utility functions are independently and identically distributed with the type 1 extreme value distribution. It is very easy to implement, but suffers serious drawbacks, especially the "Independence of Irrelevant Alternative Hypothesis".

Several extensions of this basic logit model has been developed in the literature.

random parameter logit in this model, the coefficients are assumed to be different among individuals: some hypothesis about the distribution of the coefficients are made and the parameters of these distributions are estimated by simulation,

heteroscedastic logit in this model, the error terms of the utility functions are still independent, but heteroscedastic,

nested logit in this model, there is a hierarchy in the choice, *i.e.* there are different nests.

Currently, a specific form of the multinomial logit model is implemented in R, with individual-specific variables, with the `multinom` function in the `nnet` package. We provide a package called `mlogit` which enables the estimation of the multinomial logit model with both individual and alternative specific variables.

Several packages currently in development that depends on `mlogit` implement some of the extensions of the multinomial logit model:

- The `rlogit` package enables the estimation of the random parameter logit model. A large set of distributions is provided (normal, log-normal, censored-normal, uniform, triangular), the correlation between coefficients may be taken into account and there is support for panel data,

- The `hlogit` the estimation of the heteroscedastic logit model.

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