Package ‘MNLpred’

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**Title**  Simulated Predicted Probabilities for Multinomial Logit Models

**Version**  0.0.4

**Depends**  R (>= 3.5.0)


**License**  GPL-3

**Encoding**  UTF-8

**LazyData**  true

**RoxygenNote**  7.1.0

**Suggests**  knitr, rmarkdown, testthat, nnet, magrittr, ggplot2, scales

**VignetteBuilder**  knitr

**Imports**  MASS, stats

**NeedsCompilation**  no

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**Repository**  CRAN

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**R topics documented:**

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Description

A sample of 1,000 respondents in the Rolling Cross Sectional study in the German Longitudinal Election Study in 2017.

Usage

data(gles)

Format

An data frame with 1,000 observations and 6 variables:

- vote: Voting decision for party
- egoposition_immigration: Ego-position toward immigration (0 = very open to 10 = very restrictive)
- ostwest: Dummy for respondents from Eastern Germany (= 1)
- political_interest: Measurement for political interst (0 = low, 4 = high)
- income: Self-reported income satisfaction (0 = low, 4 = high)
- gender: Self-reported gender (binary coding with 1 = female)

Source

GESIS Datenarchiv

References


Examples

data(gles)
table(gles$vote)
Multinomial First Differences Predictions For Two Values (Observed Value Approach)

Description

Multinomial First Differences Predictions For Two Values (Observed Value Approach)

Usage

mnl_fd2_ova(
  model,
  data,
  xvari,
  value1,
  value2,
  nsim = 1000,
  seed = "random",
  probs = c(0.025, 0.975)
)

Arguments

model  the multinomial model, from a multinom()-function call (see the nnet package)
data   the data with which the model was estimated
xvari  the name of the variable that should be varied
value1 first value for the difference
value2 second value for the difference
nsim   numbers of simulations
seed   set a seed for replication purposes.
probs  a vector with two numbers, defining the significance levels. Default to 5% significance level: c(0.025, 0.975)

Value

The function returns a list with several elements. Most importantly the list includes the simulated draws ‘S’, the simulated predictions ‘P’, the first differences of the predictions ‘P_fd’, a data set for plotting ‘plotdata’ the predicted probabilities, and one for the first differences ‘plotdata_fd’.

Examples

library(nnet)
library(MASS)

dataset <- data.frame(y = c(rep("a", 10), rep("b", 10), rep("c", 10)),
                      x1 = rnorm(30),
                      x2 = rnorm(30),
                      x3 = rnorm(30),
                      x4 = rnorm(30))

mnl_fd2_ova(model, data, xvari, value1, value2, nsim = 1000, seed = "random", probs = c(0.025, 0.975))
x2 = rnorm(30, mean = 1),
x3 = sample(1:10, 30, replace = TRUE))

mod <- multinom(y ~ x1 + x2 + x3, data = dataset, Hess = TRUE)

fdi1 <- mnl_fd2_ova(model = mod, data = dataset,
                     xvari = "x1",
                     value1 = min(dataset$x1),
                     value2 = max(dataset$x1),
                     nsim = 10)

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**mnl_fd_ova**

*Multinomial First Differences Prediction (Observed Value Approach)*

**Description**

This function predicts values for two different scenarios over a range of values. It then takes the differences between the different simulations to return first differences for each value.

**Usage**

```r
mnl_fd_ova(
  model, 
  data, 
  xvari, 
  scenname, 
  scenvalues, 
  by = NULL, 
  nsim = 1000, 
  seed = "random", 
  probs = c(0.025, 0.975)
)
```

**Arguments**

- **model**: the multinomial model, from a `multinom()`-function call (see the `nnet` package)
- **data**: the data with which the model was estimated
- **xvari**: the name of the variable that should be varied (the x-axis variable in prediction plots)
- **scenname**: if you want to hold a specific variable stable over all scenarios, you can name it here (optional).
- **scenvalues**: determine the two values at which value you want to fix the scenario (scenname). The first differences will be computed by subtracting the values of the first supplied scenario from the second one.
by define the steps of the xvari.
nsim numbers of simulations
seed set a seed for replication purposes.
probs a vector with two numbers, defining the significance levels. Default to 5% significance level: c(0.025, 0.975)

Details

The function uses the `mnl_pred_ova` function for each scenario. The results of these predictions are also returned and can therefore be easily accessed. If you need predictions for multiple scenarios, you can use this function to both plot the predictions for each scenario and the differences between them.

Value

The function returns a list with several elements. Most importantly the list includes the simulated draws ‘S’, the simulated predictions ‘P’, and a data set for plotting ‘plotdata’.

Examples

```r
library(nnet)
library(MASS)

dataset <- data.frame(y = c(rep("a", 10), rep("b", 10), rep("c", 10)),
x1 = rnorm(30),
x2 = rnorm(30, mean = 1),
x3 = sample(1:10, 30, replace = TRUE))

mod <- multinom(y ~ x1 + x2 + x3, data = dataset, Hess = TRUE)

fdif <- mnl_fd_ova(model = mod, data = dataset,
xvari = "x1", scenname = "x3",
scenvalues = c(min(dataset$x3), max(dataset$x3)),
nsim = 10)
```

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**mnl_pred_ova**

*Multinomial Prediction Function (Observed Value Approach)*

**Description**

This function predicts probabilities for all choices of a multinomial logit model over a specified span of values.
Usage

```r
mnl_pred_ova(
  model, 
  data, 
  xvari, 
  by = NULL, 
  scenname = NULL, 
  scenvalue = NULL, 
  nsim = 1000, 
  seed = "random", 
  probs = c(0.025, 0.975)
)
```

Arguments

- `model`: the multinomial model, from a `multinom()`-function call (see the `nnet` package)
- `data`: the data with which the model was estimated
- `xvari`: the name of the variable that should be varied (the x-axis variable in prediction plots)
- `by`: define the steps of the `xvari`
- `scenname`: if you want to hold a specific variable stable over all scenarios, you can name it here (optional).
- `scenvalue`: determine at which value you want to fix the `scenname`.
- `nsim`: numbers of simulations
- `seed`: set a seed for replication purposes.
- `probs`: a vector with two numbers, defining the significance levels. Default to 5% significance level: `c(0.025, 0.975)`

Value

The function returns a list with several elements. Most importantly the list includes the simulated draws ‘S’, the simulated predictions ‘P’, and a data set for plotting ‘plotdata’.

Examples

```r
library(nnet)
library(MASS)

dataset <- data.frame(y = c(rep("a", 10), rep("b", 10), rep("c", 10)),
                     x1 = rnorm(30),
                     x2 = rnorm(30, mean = 1),
                     x3 = sample(1:10, 30, replace = TRUE))

mod <- multinom(y ~ x1 + x2 + x3, data = dataset, Hess = TRUE)

pred <- mnl_pred_ova(model = mod, data = dataset, xvari = "x1")
```
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\texttt{nsim = 10} \)
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