Package ‘poissonreg’

October 28, 2020

Title  Model Wrappers for Poisson Regression
Version  0.1.0
Description  Bindings for Poisson regression models for use with the
‘parsnip’ package. Models include simple generalized linear models,
Bayesian models, and zero-inflated Poisson models (Zeileis, Kleiber, and
License  MIT + file LICENSE
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    https://poissonreg.tidymodels.org/
BugReports  https://github.com/tidymodels/poissonreg/issues
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Description

poisson_reg() is a way to generate a specification of a model before fitting and allows the model to be created using different packages in R or Stan. The main arguments for the model are:

- `penalty`: The total amount of regularization in the model. Note that this must be zero for some engines.
- `mixture`: The mixture amounts of different types of regularization (see below). Note that this will be ignored for some engines.

These arguments are converted to their specific names at the time that the model is fit. Other options and argument can be set using `set_engine()`. If left to their defaults here (`NULL`), the values are taken from the underlying model functions. If parameters need to be modified, `update()` can be used in lieu of recreating the object from scratch.

Usage

```r
poisson_reg(mode = "regression", penalty = NULL, mixture = NULL)
```

## S3 method for class 'poisson_reg'
```r
update(
  object,
  parameters = NULL,
  penalty = NULL,
  mixture = NULL,
  fresh = FALSE,
  ...
)
```

Arguments

- `mode` A single character string for the type of model. The only possible value for this model is "regression".
- `penalty` A non-negative number representing the total amount of regularization (`glmnet` only).
- `mixture` A number between zero and one (inclusive) that is the proportion of L1 regularization (i.e. lasso) in the model. When `mixture = 1`, it is a pure lasso model while `mixture = 0` indicates that ridge regression is being used. (`glmnet` and `spark` only).
- `object` A boosted tree model specification.
- `parameters` A 1-row tibble or named list with `main` parameters to update. If the individual arguments are used, these will supersede the values in `parameters`. Also, using engine arguments in this object will result in an error.
Details

The data given to the function are not saved and are only used to determine the mode of the model. For poisson_reg(), the mode will always be "regression".

The model can be created using the fit() function using the following engines:

- R: "glm" (the default), "glmnet", "hurdle", or "zeroinfl"
- Stan: "stan"

Value

An updated model specification.

Engine Details

Engines may have pre-set default arguments when executing the model fit call. For this type of model, the template of the fit calls are:

```r
template <- function(formula, data, weights, family = stats::poisson) {
  stats::glm(formula = formula, data = data, weights = weights, family = family)
}
```

poisson_reg() %>%
  set_engine("glm") %>%
  translate()

```r
## Poisson Regression Model Specification (regression)
## Computational engine: glm
## Model fit template:
## stats::glm(formula = missing_arg(), data = missing_arg(), weights = missing_arg(),
##   family = stats::poisson)
```

poisson_reg() %>%
  set_engine("zeroinfl") %>%
  translate()

```r
## Poisson Regression Model Specification (regression)
## Computational engine: zeroinfl
## Model fit template:
## pscl::zeroinfl(formula = missing_arg(), data = missing_arg(),
##   weights = missing_arg())
```

poisson_reg() %>%
  set_engine("hurdle") %>%
  translate()
## Poisson Regression Model Specification (regression)

## Computational engine: hurdle

## Model fit template:
## pscl::hurdle(formula = missing_arg(), data = missing_arg(), weights = missing_arg())

poisson_reg() %>%
  set_engine("glmnet") %>%
  translate()

## Poisson Regression Model Specification (regression)

## Computational engine: glmnet

## Model fit template:
## glmnet::glmnet(x = missing_arg(), y = missing_arg(), weights = missing_arg(),
## family = "poisson")

poisson_reg() %>%
  set_engine("stan") %>%
  translate()

## Poisson Regression Model Specification (regression)

## Computational engine: stan

## Model fit template:
## rstanarm::stan_glm(formula = missing_arg(), data = missing_arg(),
## weights = missing_arg(), family = stats::poisson)

**Examples**

poisson_reg()

# Model from Agresti (2007) Table 7.6
log_lin_mod <-
  poisson_reg() %>%
  set_engine("glm") %>%
  fit(count ~ .^2, data = seniors)

summary(log_lin_mod$fit)

# library(pscl)

data("bioChemists", package = "pscl")

poisson_reg() %>%
Alcohol, Cigarette, and Marijuana Use for High School Seniors

Description
Alcohol, Cigarette, and Marijuana Use for High School Seniors

Details
Data are from Table 7.3 of Agresti (2007). The first three columns make up data from a 3-way contingency table.

Value
seniors    a tibble

Source

Examples
data(seniors)
str(seniors)
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