Package ‘basecamb’

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.scale_variable

A helper function to scale a variable in a dataframe. Divides 'variable' by 'scaling_denominator'.

Usage

.scale_variable(data, variable, scaling_denominator)

Arguments

data data.frame
variable a char indicating the variable to be scaled
scaling_denominator a numeric indicating the scaling. The variable is divided by the scaling_denominator.

Value

the input dataframe with the newly scaled 'variable'
**apply_data_dictionary**  
*Clean column names, types and levels*

**Description**

Use a data dictionary data.frame to apply the following tidying steps to your data.frame:

- Remove superfluous columns
- Rename columns
- Ensure/coerce correct data type for each column
- Assign factorial levels, including renaming and grouping

**Usage**

```r
apply_data_dictionary(
  data,  
data_dictionary,  
  na_action_default = "keep_NA",  
  print_coerced_NA = TRUE
)
```

**Arguments**

- `data` : data.frame to be cleaned
- `data_dictionary` : data.frame with the following columns:
  - `old_column_name` : character with the old column name
  - `new_data_type` : character denoting the tidy data type. Supported types are:
    - character
    - integer
    - float
    - factor
    - date
  - `new_column_name` : tidy column name. Can be left blank to keep the old column name
  - `coding` (factor and date columns only):
    - factor columns: character denoting old value (key) and new value (value) in a standardised fashion:
      * key-value pairs are separated from other key-value-pairs by a comma (",")
      * key and value of the same pair are separated by an equal sign ("=")
      * quotations around individual keys and values are recommended for clarity, but do not affect functionality.
apply_function_to_imputed_data

- all values will be coerced to type character, with the exception of "NA" being parsed as type NA
- using "default" as a key will assign the specified value to all current values that do not match any of the specified keys, excluding NA
- using "NA" as a key will assign the specified value to all current NA values
- example coding: "'key1' = 'val1', 'key2' = 'val2', 'default' = 'Other', 'NA' = NA"
- if no coding is specified for a column, the coding remains unchanged
  - date columns: character denoting coding (see format argument in as.Date)

- Optional other columns (do not affect behaviour)

na_action_default
character: Specify what to do with NA values. Defaults to 'keep_NA'. Options are:
  - 'keep_NA' NA values remain NA values
  - 'assign_default' NA values are assigned the value specified as 'default'. Requires a 'default' value to be specified Can be overwritten for individual columns by specifying a value for key 'NA'

print_coerced_NA
logical indicating whether a message specifying the location of NAs that are introduced by apply_data_dictionary() to data should be printed.

Value

clean data.frame

Author(s)

J. Peter Marquardt

apply_function_to_imputed_data

Apply function to dataframes in a mice object

Description

Wrapper function to apply a function on each dataframe in an imputed dataset created with mice::mice().

Usage

apply_function_to_imputed_data(mice_data, fun, ...)

**assign_factorial_levels**

**Arguments**

- **mice_data** a mids object generated by `mice::mice()`.
- **fun** the function to apply to each dataframe. May only take one positional argument of type data.frame.
- ... other arguments passed to `fun()`

**Value**

a mids object with transformed data.

**Author(s)**

J. Peter Marquardt

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**assign_factorial_levels**

Assign custom values for key levels in factorial columns

**Description**

Use a named vector of keys (current value) and values for factorial columns to assign meaningful levels and/or group levels

**Usage**

```r
assign_factorial_levels(
  data,
  factor_keys_values,
  na_action_default = "keep_NA"
)
```

**Arguments**

- **data** data.frame to modify
- **factor_keys_values** named list with:
  - Keys: Names of factor columns
  - values: Named vectors with
    - keys: current value (string representation)
    - values: new value to be assigned
    - if a 'default' key is passed, all existing values not conforming to the new scheme will be converted to the 'default' value
    - if a 'NA' key is passed, all NA values will be converted to the value specified here. Overwrites `na_action_default` for the specified column.
assign_types_names

na_action_default

character: Specify what to do with NA values. Defaults to 'keep_NA'. Options are:

• 'keep_NA' NA values remain NA values
• 'assign_default' NA values are assigned the value specified as 'default'. Requires a 'default' value to be specified Can be overwritten for individual columns by specifying a value for key 'NA'

Value
data frame with new levels

Author(s)
J. Peter Marquardt

Examples
data <- data.frame(col1 = as.factor(rep(c('1', '2', '4'), 5)))
keys_1 <- list('col1' = c('1' = 'One', '2' = 'Two', '4' = 'Four'))
data_1 <- assign_factorial_levels(data, keys_1)
keys_2 <- list('col1' = c('1' = 'One', 'default' = 'Not_One'))
data_2 <- assign_factorial_levels(data, keys_2)

Description
Verbosely assign tidy name and data type for each column of a data.frame and get rid of superfluous columns. Uses a .csv file for assignments to encourage a data dictionary based workflow. CAVE! Requires 'Date’ type columns to already be read in as Date.

Usage
assign_types_names(data, meta_data)

Arguments
data data.frame to be tidied. Dates must already be of type date.
meta_data data.frame specifying old column names, new column names and datatypes of data. Has the following columns:

• old_column_name : character with the old column name.
• new_data_type : character denoting the tidy data type. Supported types are:
  – character (will be coerced using as.character()).
  – integer (will be coerced using as.integer()).
build_model_formula

- float (will be coerced using as.double()).
- factor (will be coerced using as.factor()). Will result in a warning if the new factor variable will have more than 10 levels.
- date (can only confirm correct datatype assignment or coerce characters with format '%Y-%m-%d').

• new_column_name: tidy column name. Can be left blank to keep the old column name.
• Optional other columns (do not affect behavior).

Value

clean data.frame

Author(s)

J. Peter Marquardt

Description

Build formula used in statistical models from vectors of strings with the option to specify an environment.

Usage

build_model_formula(
  outcome,
  predictors,
  censor_event = NULL,
  env = parent.frame()
)

Arguments

outcome character denoting the column with the outcome.
predictors vector of characters denoting the columns with the predictors.
censor_event character denoting the column with the censoring event, for use in Survival-type models.
env environment to be used in formula creation

Value

formula for use in statistical models
Author(s)

J. Peter Marquardt

Examples

```r
build_model_formula("outcome", c("pred_1", "pred_2"))
build_model_formula("outcome", c("pred_1", "pred_2"), censor_event = "cens_event")
```

---

**cox.zph.mids**  
Test cox proportional odds assumption on models using multiple imputation.

---

Description

Constructs a model and conducts a cox.zph test for each imputation of the data set.

Usage

```r
cox.zph.mids(
  model,
  imputations,
  p_level = 0.05,
  global_only = TRUE,
  return_raw = FALSE,
  p_only = TRUE,
  verbose = TRUE
)
```

Arguments

- `model`: cox proportional model to be evaluated
- `imputations`: mids object containing imputations
- `p_level`: value below which violation of proportional odds assumption is assumed. Defaults to .05
- `global_only`: return global p-value only. Implies `p_only` to be TRUE
- `return_raw`: return cox.zph objects in a list. If TRUE, function will not return anything else
- `p_only`: returns p-values of test only. If FALSE returns Chi² and degrees of freedom as well
- `verbose`: Set to FALSE to deactivate messages

Value

Depending on specified options, this function can return

- default: A vector of global p-values
- `global_only = FALSE`: a data.frame with p-values for all variables plus the global
- `return_raw = TRUE`: list of cox.zph objects
**deconstruct_formula**

**Author(s)**

J. Peter Marquardt

**Examples**

data <- data.frame(time = 101:200, status = rep(c(0,1), 50), pred = rep(c(1:9, NA), 10))
imputed_data <- mice::mice(data)
cox_mod <- Hmisc::fit.mult.impute(survival::Surv(time, status) ~ pred,
fitter = rms::cph, xtrans = imputed_data)
cox.zph.mids(cox_mod, imputed_data)

dehconstruct_formula

---

**Description**

Deconstruct a formula object into strings of its components. Predictors are split by '+', so interaction terms will be returned as a single string.

**Usage**

dehconstruct_formula(formula)

**Arguments**

- `formula` formula object for use in statistical models.

**Value**

A named list with fields:

- `outcome` (character)
- `predictors` (vector of characters)
- `censor_event` (character) (optional) censor event, only for formulas including a Surv() object

**Author(s)**

J. Peter Marquardt

**Examples**

dehconstruct_formula(stats::as.formula("outcome ~ predictor1 + predictor2 + predictor3"))
dehconstruct_formula(stats::as.formula("Surv(outcome, censor_event) ~ predictor"))
**filter_nth_entry**

*Filter dataframe for nth entry*

**Description**

Filter a dataframe for the nth entry of each subject in it. A typical use cases would be to filter a dataset for the first or last measurement of a subject.

**Usage**

```r
filter_nth_entry(data, ID_column, entry_column, n = 1, reverse_order = FALSE)
```

**Arguments**

- `data`: the data.frame to filter
- `ID_column`: character column identifying subjects
- `entry_column`: character column identifying order of entries. That column can by of types Date, numeric, or any other type suitable for order()
- `n`: integer number of entry to keep after ordering
- `reverse_order`: logical when TRUE sorts entries last to first before filtering

**Value**

data.frame with <= 1 entry per subject

**Author(s)**

J. Peter Marquardt

**Examples**

```r
data <- data.frame(list(ID = rep(1:5, 3), encounter = rep(1:3, each=5), value = rep(4:6, each=5)))
filter_nth_entry(data, 'ID', 'encounter')
filter_nth_entry(data, 'ID', 'encounter', n = 2)
filter_nth_entry(data, 'ID', 'encounter', reverse_order = TRUE)
```
fit_mult_impute_obs_outcome

Fit a model on multiply imputed data using only observations with non-missing outcome(s)

Description

This function is a wrapper for fitting models with \texttt{Hmisc::fit.mult.impute()} on a multiply imputed dataset generated with \texttt{mice::mice()}. Cases with a missing outcome in the original dataset are removed from the mids object by using the 'subset' argument in \texttt{Hmisc::fit.mult.impute()}.

Usage

\texttt{fit_mult_impute_obs_outcome(mids, formula, fitter, ...)}

Arguments

- \texttt{mids} a mids object, i.e. the imputed dataset.
- \texttt{formula} a formula that describes the model to be fit. The outcome (y variable) in the formula will be used to remove missing cases.
- \texttt{fitter} a modeling function (not in quotes) that is compatible with \texttt{Hmisc::fit.mult.impute()}.
- \texttt{...} additional arguments to \texttt{Hmisc::fit.mult.impute()}.

Value

\texttt{mod} a \texttt{fit.mult.impute} object.

Author(s)

Till D. Best

Examples

# create an imputed dataset
imputed_data <- mice::mice(airquality)

fit_mult_impute_obs_outcome(mids = imputed_data, formula = Ozone ~ Solar.R + Wind, fitter = glm)
or_model_summary  

Summarise a logistic regression model on the odds ratio scale

Description

This function summarises regression models that return data on the log-odds scale and returns a dataframe with estimates, and confidence intervals as odds ratios. P value are also provided. Additionally, intercepts can be removed from the summary. This comes in handy when ordinal logistic regression models are fit. Ordinal regression models (such as proportional odds models) usually result in many intercepts that are not really of interest. This function is also compatible with models obtained from multiply imputed datasets, for example models fitted with \texttt{Hmisc::fit.mult.impute()}.

Usage

\begin{verbatim}
or_model_summary(  
  model,  
  conf_int = 1.96,  
  print_intercept = FALSE,  
  round_est = 3,  
  round_p = 4  
)
\end{verbatim}

Arguments

- \texttt{model} \hspace{1cm} a model object with estimates on the log-odds scale.
- \texttt{conf_int} \hspace{1cm} a numeric used to calculate the confidence intervals. The default of 1.96 gives the 95\% confidence interval.
- \texttt{print_intercept} \hspace{1cm} a logical flag indicating whether intercepts shall be removed. All variables that start with "y=" will be removed. If there is a variable matching this pattern, it will also be removed!
- \texttt{round_est} \hspace{1cm} the number of decimals returned for estimates (odds ratios) and confidence intervals.
- \texttt{round_p} \hspace{1cm} the number of decimals provided for p-values.

Details

CAVE! The function does not check whether your estimates are on the log-odds scale. It will do the transformation no matter what!

Value

a dataframe with the adjusted odds ratio, confidence intervals and p-values.

Author(s)

Till D. Best
Examples

# fit a logistic model
mod <- glm(formula = am ~ mpg + cyl, data = mtcars, family = binomial())

or_model_summary(model = mod)

parse_date_columns

Parse values in date columns as Dates

Description

Parse date columns in a data.frame as Date. Use a named list to specify each date column (key) and the format (value) it is coded in.

Usage

parse_date_columns(data, date_formats)

Arguments

data data.frame to modify
date_formats named list with:
  • Keys: Names of date columns
  • values: character specifying the format

Value

data.frame with date columns in Date type

Author(s)

J. Peter Marquardt

Examples

data <- data.frame(date = rep('01/23/4567', 5))
data <- parse_date_columns(data, list(date = '%m/%d/%Y'))
Stratify a numeric vector into quantile groups

Description
.transforms a numeric vector into quantile groups. For each input value, the output value corresponds to the quantile that value is in. When grouping into n quantiles, the lowest 1/n of values are assigned 1, the highest 1/n are assigned n.

Usage
.quantile_group(data, n, na.rm = TRUE)

Arguments
.data a vector of type numeric with values to be grouped into quantiles
.n integer indicating number of quantiles, minimum of 2. Must be smaller than length(data)
.na.rm logical; if TRUE all NA values will be removed before calculating groups, if FALSE no NA values are permitted.

Details
.Tied values will be assigned to the lower quantile group rather than estimating a distribution. In extreme cases this can mean one or more quantile groups are not represented.

If uneven group sizes cannot be avoided, values will be assigned the higher quantile group.

Value
.vector of length length(data) with the quantile groups

Author(s)
J. Peter Marquardt

Examples
.quantile_group(10:1, 3)
.quantile_group(c(rep(1,3), 10:1, NA), 5)
remove_missing_from_mids

Remove missing cases from a mids object

Description

Deprecated, use `apply_function_to_imputed_data` instead.

Usage

```r
remove_missing_from_mids(mids, var)
```

Arguments

- `mids` mids objects that is filtered.
- `var` a string or vector of strings specifying the variable(s). All cases (i.e. rows) for which there are missing values are removed.

Details

`remove_missing_from_mids` is used to filter a mids object for missing cases in the original dataset in the variable `var`. This is useful for situations where you want to use as many observations as possible for imputation but only fit your model on a subset of these. Or, if you want to create one large imputed datset from which multiple analyses with multiple outcomes are derived.

Value

a mids object filtered for observed cases of `var`.

Author(s)

Till D. Best

See Also

`apply_function_to_imputed_data`
scale_continuous_predictors

*Scale continuous predictors*

Description

This function linearly scales variables in data objects according to a data dictionary. The data dictionary has at least two columns, "variable" and "scaling_denominator". "Variable" is divided by "scaling_denominator".

Usage

```
scale_continuous_predictors(data, scaling_dictionary)
```

Arguments

- `data` a data object with variables.
- `scaling_dictionary` a data.frame with two columns that are called "variable" and "scaling_denominator".

Value

The data with the newly scaled 'variables'.

Author(s)

Till D. Best
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