

Package: weighter (via r-universe)

August 25, 2024

Title Model averaging
Version 0.0.1
Description This package implementes model averaging.
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Encoding UTF-8
LazyData true
RoxygenNote 7.0.2
Suggests covr, testthat (>= 2.1.0)
Repository <https://mrc-ide.r-universe.dev>
RemoteUrl <https://github.com/mrc-ide/weighter>
RemoteRef master
RemoteSha bb66cf38df0a82cbd3c99fe87c80814fbb93a687

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groupvar_to_model	<i>Mapping of groupvars to model</i>
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Description

Mapping of groupvar to models run

Usage

```
groupvar_to_model(pred, groupvars)
```

Arguments

pred	data.frame with at least one column called model
groupvars	quoted variable names used to define groups within which models should be ranked.

Details

In some cases, we might not have the same set of models run for a grouping variable. For example, say the grouping variable is country, and we have Models m_1 , m_2 and m_3 run for country c_1 , and models m_1, m_2, m_3, m_4 run for country c_2 . For this example, `groupvar_to_model` returns a named list where names are formed by concatenating models and elements are countries for which a particular set of models has been run. ($m_1_m2_m3 = c_1$, $m_1_m2_m3_m4 = c_2$)

Value

list

Author(s)

Sangeeta Bhatia

model_ranks

Assign ranks to models

Description

Rank models according to the error

Usage

```
model_ranks(pred, groupvars, errvar)
```

Arguments

pred	data.frame with at least one column called model
groupvars	quoted variable names used to define groups within which models should be ranked.
errvar	quoted column name that contains the metric used to rank models

Details

When multiple models have made predictions, we want to rank them by their error, where error can be any metric e.g. Root mean squared error or likelihood. Each model is ranked within the groups defined by `groupvars`

Value

data.frame with the same structure as pred and an extra column called rank which contains the model ranks within the groups defined by groupvar

Author(s)

Sangeeta Bhatia

Examples

```
pred <- data.frame(
  models = as.factor(c("a", "b", "c", "a", "b", "c")),
  country = c("C1", "C1", "C1", "C2", "C2", "C2"),
  error = c(6L, 1L, 3L, 4L, 7L, 9L),
  date = c("1", "1", "1", "2", "2", "2"),
  stringsAsFactors = FALSE
)
model_ranks(pred, c("country", "date"), "error")
```

model_to_groupvar	<i>Mapping of models to groups for which they have been run</i>
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Description

Mapping of models to groups for which they have been run

Usage

```
model_to_groupvar(pred, groupvars)
```

Arguments

pred	data.frame with at least one column called model
groupvars	quoted variable names used to define groups within which models should be ranked.

Details

In some cases, we might not have the same set of models run for a grouping variable. For example, say the grouping variable is country, and we have Models M_1 , M_2 and M_3 run for country C_1 , and models M_1 , M_2 , M_3 , M_4 run country C_2 . For this example, this function will return the list $m_1 = c_1, c_2, m_2 = c_1, c_1, m_3 = c_1, c_2, m_4 = c_2$ This can be used to identify for which countries a give model has been run.

Value

list

Author(s)

Sangeeta Bhatia

model_weights

Compute Model Weights

Description

Compute Model Weights

Usage

```
model_weights(pred, groupvars, errvar)
```

Arguments

pred	data.frame with at least one column called model
groupvars	quoted variable names used to define groups within which models should be ranked.
errvar	quoted column name that contains the metric used to rank models

Details

Compute model weights within each group

Value

named list where the names are the combinations of models run for a group, and each element of the list is a data.frame containing model weights outputted from model_weights_in_group

Author(s)

Sangeeta Bhatia

See Also

model_weights_in_group

`model_weights_in_group`*Compute Model Weights*

Description

Compute model weights from model ranks

Usage

```
model_weights_in_group(pred, groupvars = "model", rankvar = "rank")
```

Arguments

<code>pred</code>	data.frame that has at least columns specified via parameters <code>groupvars</code> and <code>rank</code> . <code>pred</code> is expected to have the same number of elements of grouping variable within each group. That is, each model should have been run for the same number of elements of <code>groupvar</code> . If this is not the case, use <code>model_weights</code> instead.
<code>groupvars</code>	quoted variable names used to define groups within which model weights are computed. Defaults to <code>model</code> .
<code>rankvar</code>	quoted variable names that contain model ranks.

Details

In a group defined by `groupvars`, the weight of a model is defined as

$$weight(M) = \sum_{i=1}^M K(i)/i$$

where $K(i)$ is the number of times model M is ranked i among M_1, M_2, \dots, M models.

Value

a data.frame with columns `model` and `weight` where `weight` is the unnormalised weight of the model

Author(s)

Sangeeta Bhatia

See Also

`model_ranks` `model_weights`

Examples

```
pred <- data.frame(  
  model = as.factor(c("a", "b", "c", "a", "b", "c")),  
  country = c("C1", "C1", "C1", "C2", "C2", "C2"),  
  error = c(6L, 1L, 3L, 4L, 7L, 9L),  
  date = c("1", "1", "1", "2", "2", "2"),  
  stringsAsFactors = FALSE  
)  
ranked <- model_ranks(pred, c("country", "date"), "error")  
model_weights_in_group(ranked)
```

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