

Package: hubEvals (via r-universe)

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Title Basic tools for scoring hubverse forecasts

Version 0.0.0.9001

Description Using functionality from the scoringutils package, this software provides basic tools for scoring hubverse forecasts.

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Encoding UTF-8

Imports cli, dplyr, hubUtils, purrr, rlang, scoringutils (>= 1.2.2.9000)

Remotes epiforecasts/scoringutils, hubverse-org/hubExamples, hubverse-org/hubUtils

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.2

URL <https://hubverse-org.github.io/hubEvals/>

Depends R (>= 2.10)

LazyData true

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Suggests hubExamples, testthat (>= 3.0.0)

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Repository <https://hubverse-org.r-universe.dev>

RemoteUrl <https://github.com/hubverse-org/hubEvals>

RemoteRef HEAD

RemoteSha fbd87001d6c37da78dacec18adab8f064a41aff9

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score_model_out	<i>Score model output predictions</i>
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Description

Scores model outputs with a single output_type against observed data.

Usage

```
score_model_out(
  model_out_tbl,
  oracle_output,
  metrics = NULL,
  summarize = TRUE,
  by = "model_id",
  output_type_id_order = NULL
)
```

Arguments

model_out_tbl	Model output tibble with predictions
oracle_output	Predictions that would have been generated by an oracle model that knew the observed target data values in advance
metrics	Character vector of scoring metrics to compute. If NULL (the default), appropriate metrics are chosen automatically. See details for more.
summarize	Boolean indicator of whether summaries of forecast scores should be computed. Defaults to TRUE.
by	Character vector naming columns to summarize by. For example, specifying by = "model_id" (the default) will compute average scores for each model.
output_type_id_order	For ordinal variables in pmf format, this is a vector of levels for pmf forecasts, in increasing order of the levels. For all other output types, this is ignored.

Details

See the hubverse documentation for the expected format of the **oracle output data**.

Default metrics are provided by the `scoringutils` package. You can select metrics by passing in a character vector of metric names to the `metrics` argument.

The following metrics can be selected (all are used by default) for the different output_types:

Quantile forecasts: (output_type == "quantile")

- wis
- overprediction

- underprediction
- dispersion
- bias
- ae_median
- "interval_coverage_XX": interval coverage at the "XX" level. For example, "interval_coverage_95" is the 95% interval coverage rate, which would be calculated based on quantiles at the probability levels 0.025 and 0.975.

See `scoringutils::get_metrics.forecast_quantile` for details.

Nominal forecasts: (`output_type == "pmf"` and `output_type_id_order` is NULL)

- log_score

(scoring for ordinal forecasts will be added in the future).

See `scoringutils::get_metrics.forecast_nominal` for details.

Median forecasts: (`output_type == "median"`)

- ae_point: absolute error of the point forecast (recommended for the median, see Gneiting (2011))

See `scoringutils::get_metrics.forecast_point` for details.

Mean forecasts: (`output_type == "mean"`)

- se_point: squared error of the point forecast (recommended for the mean, see Gneiting (2011))

Value

A data.table with scores

References

Gneiting, Tilmann. 2011. "Making and Evaluating Point Forecasts." Journal of the American Statistical Association 106 (494): 746–62. <doi: 10.1198/jasa.2011.r10138>.

Examples

```
# compute WIS and interval coverage rates at 80% and 90% levels based on
# quantile forecasts, summarized by the mean score for each model
quantile_scores <- score_model_out(
  model_out_tbl = hubExamples::forecast_outputs |>
  dplyr::filter(.data[["output_type"]] == "quantile"),
  oracle_output = hubExamples::forecast_oracle_output,
  metrics = c("wis", "interval_coverage_80", "interval_coverage_90"),
  by = "model_id"
)
quantile_scores
```

```
# compute log scores based on pmf predictions for categorical targets,
# summarized by the mean score for each combination of model and location.
```

```
# Note: if the model_out_tbl had forecasts for multiple targets using a
# pmf output_type with different bins, it would be necessary to score the
# predictions for those targets separately.
pmf_scores <- score_model_out(
  model_out_tbl = hubExamples::forecast_outputs |>
    dplyr::filter(.data[["output_type"]] == "pmf"),
  oracle_output = hubExamples::forecast_oracle_output,
  metrics = "log_score",
  by = c("model_id", "location", "horizon")
)
head(pmf_scores)
```

transform_pmf_model_out

Transform pmf model output into a forecast object

Description

Transform pmf model output into a forecast object

Usage

```
transform_pmf_model_out(
  model_out_tbl,
  oracle_output,
  output_type_id_order = NULL
)
```

Arguments

`model_out_tbl` Model output tibble with predictions

`oracle_output` Predictions that would have been generated by an oracle model that knew the observed target data values in advance

`output_type_id_order`
For nominal variables, this should be NULL (the default). For ordinal variables, this is a vector of levels for pmf forecasts, in increasing order of the levels.

Value

forecast_quantile

`transform_point_model_out`

Transform either mean or median model output into a point forecast object:

Description

Transform either mean or median model output into a point forecast object:

Usage

```
transform_point_model_out(model_out_tbl, oracle_output, output_type)
```

Arguments

<code>model_out_tbl</code>	Model output tibble with predictions
<code>oracle_output</code>	Predictions that would have been generated by an oracle model that knew the observed target data values in advance
<code>output_type</code>	Forecast output type: "mean" or "median"

Details

This function transforms a model output tibble in the Hubverse format (with either "mean" or "median" output type) to a scoringutils "point" forecast object

Value

forecast_point

`transform_quantile_model_out`

Transform quantile model output into a forecast object

Description

Transform quantile model output into a forecast object

Usage

```
transform_quantile_model_out(model_out_tbl, oracle_output)
```

Arguments

<code>model_out_tbl</code>	Model output tibble with predictions
<code>oracle_output</code>	Predictions that would have been generated by an oracle model that knew the observed target data values in advance

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transform_quantile_model_out

Value

forecast_quantile

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