h2omlestat metrics — Display performance metrics

Description

`h2omlestat metrics` reports the performance metrics after `h2oml` *gbm* and `h2oml` *rf*.

Quick start

Report the performance metrics

```
h2omlestat metrics
```

Same as above, but report performance metrics for the validation frame

```
h2omlestat metrics, valid
```

Report performance metrics for frame `myframe`

```
h2omlestat metrics, frame(myframe)
```

Menu

Statistics > H2O machine learning

Syntax

`h2omlestat metrics` [, *options*]

options	Description
`train`	specify that performance metrics be reported using training results
`valid`	specify that performance metrics be reported using validation results
`cv`	specify that performance metrics be reported using cross-validation results
`test`	specify that performance metrics be computed using the testing frame
`test(`*framename*`)`	specify that performance metrics be computed using data in testing frame *framename*
`frame(`*framename*`)`	specify that performance metrics be computed using data in H2O frame *framename*
`framelabel(`*string*`)`	label frame as *string* in the output

`collect` is allowed; see **[U] 11.1.10 Prefix commands**.

`train`, `valid`, `cv`, `test`, `test()`, `frame()`, and `framelabel()` do not appear in the dialog box.

Options

The following options are available with h2omlestat metrics but are not shown in the dialog box:

train, valid, cv, test, test(), and frame() specify the H2O frame for which performance metrics are reported. Only one of train, valid, cv, test, test(), or frame() is allowed.

train specifies that performance metrics be reported using training results. This is the default when neither validation nor cross-validation is performed during estimation and when a postestimation frame has not been set with h2omlpostestframe.

valid specifies that performance metrics be reported using validation results. This is the default when validation is performed during estimation and when a postestimation frame has not been set with h2omlpostestframe. valid may be specified only when the validframe() option is specified with h2oml *gbm* or h2oml *rf*.

cv specifies that performance metrics be reported using cross-validation results. This is the default when cross-validation is performed during estimation and when a postestimation frame has not been set with h2omlpostestframe. cv may be specified only when the cv or cv() option is specified with h2oml *gbm* or h2oml *rf*.

test specifies that performance metrics be computed on the testing frame specified with h2omlpostestframe. This is the default when a testing frame is specified with h2omlpostestframe. test may be specified only after a testing frame is set with h2omlpostestframe. test is necessary only when a subsequent h2omlpostestframe command is used to set a default postestimation frame other than the testing frame.

test(*framename*) specifies that performance metrics be computed using data in testing frame *framename* and is rarely used. This option is most useful when running a single postestimation command on the named frame. If multiple postestimation commands are to be run on the same test frame, h2omlpostestframe provides a more convenient and computationally efficient process for doing this.

frame(*framename*) specifies that performance metrics be computed using the data in H2O frame *framename*.

framelabel(*string*) specifies the label to be used for the frame in the output. This option is not allowed with the cv option.

Remarks and examples

h2omlestat metrics reports the performance metrics of a machine learning model after h2oml *gbm* or h2oml *rf*.

The default frame for which metrics are reported depends on options specified in the estimation command and on whether a postestimation frame has been set by using h2omlpostestframe.

If no postestimation frame has been set and if neither the cv() nor validframe() option was specified during estimation, performance metrics are reported for the training frame. If the validframe() option is specified during estimation, performance metrics are reported by the validation frame. If the cv() option is specified during estimation, performance metrics are reported for cross-validation. If a postestimation frame has been set by h2omlpostestframe, the performance metrics are reported for the specified postestimation frame by default; see [H2OML] **h2omlpostestframe**. You can also specify one of the train, valid, cv, test, test(), or frame() options with h2omlestat metrics to indicate the frame for which metrics are reported.

Example 1: Performance metrics on different frames

In this example, we demonstrate how to obtain performance metrics based on multiple frames after estimation.

We start by opening the 1978 automobile data (`auto.dta`) in Stata and then putting the data into an H2O frame. Recall that `h2o init` initiates an H2O cluster, `_h2oframe put` loads the current Stata dataset into an H2O frame, and `_h2oframe change` makes the specified frame the current H2O frame. We then use the `_h2oframe split` command to randomly split the `auto` frame into a training frame (80% of observations) and a testing frame (20% of observations), which we name `train` and `test`, respectively. We also change the current frame to `train`. For details, see *Prepare your data for H2O machine learning in Stata* in [H2OML] **h2oml** and [H2OML] **H2O setup**.

```
. use https://www.stata-press.com/data/r19/auto
(1978 automobile data)
. h2o init
  (output omitted)
. _h2oframe put, into(auto)
. _h2oframe split auto, into(train test) split(0.8 0.2) rseed(19)
. _h2oframe change train
```

We perform random forest binary classification with default hyperparameters and use 3-fold cross-validation.

```
. h2oml rfbinclass foreign price mpg length, cv(3, modulo) h2orseed(19)
  (output omitted)
```

By default, because cross-validation was used during estimation, `h2omlestat metrics` reports estimation metrics based on cross-validation.

```
. h2omlestat metrics
Performance metrics using H2O
Random forest binary classification
Response: foreign
Number of observations = 63
```

Metric	Cross-validation
Log loss	.4275175
Mean class error	.1777778
AUC	.8666667
AUCPR	.6008256
Gini coefficient	.7333333
MSE	.1446453
RMSE	.3803227

If we wish to compute and report results based on a testing frame, we can set the testing frame with the h2omlpostestframe command.

```
. h2omlpostestframe test
(testing frame test is now active for h2oml postestimation)
. h2omlestat metrics
Performance metrics using H2O
Random forest binary classification
Response:      foreign
Testing frame: test
Number of observations = 11
```

Metric	Testing
Log loss	.3117297
Mean class error	.0714286
AUC	.9285714
AUCPR	.8722936
Gini coefficient	.8571429
MSE	.1053455
RMSE	.3245696

Stored results

h2omlestat metrics stores the following in r():

Scalars

r(N)	number of observations

Macros

r(method)	gbm or randomforest
r(method_type)	regression or classification
r(class_type)	binary or multiclass (with classification)
r(method_full_name)	full method name
r(response)	name of response
r(title)	title in output
r(loss)	name of the loss function (only after h2oml *gbm*)

Matrices

r(metric)	performance metrics

Also see

[H2OML] **h2oml** — Introduction to commands for Stata integration with H2O machine learning