

Package ‘r2pmml’

November 10, 2024

Version 0.29.0

Date 2024-11-10

Type Package

License AGPL-3

Title Convert R Models to PMML

Description R wrapper for the JPMML-R library <<https://github.com/jpmml/jpmml-r>>, which converts R models to Predictive Model Markup Language (PMML).

URL <https://github.com/jpmml/r2pmml>

LazyLoad yes

NeedsCompilation yes

RoxygenNote 7.2.1

Imports methods

Suggests caret, e1071, earth, evtree, glmnet, lightgbm, mlbench, mlr, partykit, randomForest, ranger, xgboost

SystemRequirements Java (>= 8.0)

Author Villu Ruusmann [aut, cre]

Maintainer Villu Ruusmann <villu.ruusmann@gmail.com>

Repository CRAN

Date/Publication 2024-11-10 18:00:05 UTC

Contents

as.fmap	2
as.fmap.data.frame	2
as.fmap.matrix	3
as.scorecard	4
decorate	4
decorate.default	5
decorate.earth	5
decorate.elm	6

decorate.glmnet	6
decorate.party	7
decorate.randomForest	7
decorate.ranger	8
decorate.svm.formula	8
decorate.train	9
decorate.WrappedModel	9
decorate.xgb.Booster	10
r2pmml	11
verify	12
verify.default	13
verify.glm	13
verify.train	14
verify.xgb.Booster	14
write.fmap	15

Index 16

as.fmap	<i>Dispatches execution to the most appropriate XGBoost feature map generation function.</i>
---------	--

Description

Dispatches execution to the most appropriate XGBoost feature map generation function.

Usage

```
as.fmap(x)
```

Arguments

x	A dataset object.
---	-------------------

as.fmap.data.frame	<i>Generates an XGBoost feature map based on feature data.</i>
--------------------	--

Description

Generates an XGBoost feature map based on feature data.

Usage

```
## S3 method for class 'data.frame'
as.fmap(x)
```

Arguments

x A "data.frame" object with independent variables.

Value

A "data.frame" object.

Examples

```
data(iris)
iris.df = iris[, 1:4]
iris.fmap = as.fmap(iris.df)
```

as.fmap.matrix	<i>Generates an XGBoost feature map based on feature data.</i>
----------------	--

Description

Generates an XGBoost feature map based on feature data.

Usage

```
## S3 method for class 'matrix'
as.fmap(x)
```

Arguments

x A "matrix" object with independent variables.

Value

A "data.frame" object.

Examples

```
data(iris)
iris.matrix = model.matrix(Species ~ . - 1, data = iris)
iris.fmap = as.fmap(iris.matrix)
```

as.scorecard	<i>Converts a "glm" object to a "scorecard" object.</i>
--------------	---

Description

Converts a "glm" object to a "scorecard" object.

Usage

```
as.scorecard(glm, odds = 10, base_points = 500, pdo = 100)
```

Arguments

glm	A "glm" object with binomial family link function.
odds	Odds ratio at base odds.
base_points	Points where odds ratio is defined.
pdo	Points to double the odds.

Value

A "scorecard" object.

decorate	<i>Dispatches execution to the most appropriate model decoration function.</i>
----------	--

Description

Dispatches execution to the most appropriate model decoration function.

Usage

```
decorate(x, ...)
```

Arguments

x	A model object.
...	Arguments to pass on to the selected function.

decorate.default	<i>Decorates a model object with "preProcess" and "pmml_options" elements.</i>
------------------	--

Description

Decorates a model object with "preProcess" and "pmml_options" elements.

Usage

```
## Default S3 method:
decorate(x, preProcess = NULL, pmml_options = NULL, ...)
```

Arguments

x	The model object.
preProcess	A "train::preProcess" object.
pmml_options	A list of model type-dependent PMML conversion options.
...	Further arguments.

decorate.earth	<i>Decorates an "earth" object with an "xlevels" element.</i>
----------------	---

Description

Decorates an "earth" object with an "xlevels" element.

Usage

```
## S3 method for class 'earth'
decorate(x, data, ...)
```

Arguments

x	An "earth" object.
data	The training dataset.
...	Arguments to pass on to the "decorate.default" function.

decorate.elm	<i>Decorates an "elm" object with a "model" element.</i>
--------------	--

Description

Decorates an "elm" object with a "model" element.

Usage

```
## S3 method for class 'elm'
decorate(x, data, ...)
```

Arguments

x	An "elm" object.
data	The training dataset.
...	Arguments to pass on to the "decorate.default" function.

decorate.glmnet	<i>Decorates a "glmnet" object with a "lambda.s" element.</i>
-----------------	---

Description

Decorates a "glmnet" object with a "lambda.s" element.

Usage

```
## S3 method for class 'glmnet'
decorate(x, lambda.s, ...)
```

Arguments

x	A "glmnet" object.
lambda.s	The best lambda value. Must be one of listed "glmnet\$lambda" values.
...	Arguments to pass on to the "decorate.default" function.

Examples

```
library("glmnet")
library("r2pmml")

data(iris)
iris_X = as.matrix(iris[, -ncol(iris)])
iris_y = iris[, ncol(iris)]
iris.glmnet = glmnet(x = iris_X, y = iris_y, family = "multinomial")
iris.glmnet = decorate(iris.glmnet, lambda.s = iris.glmnet$lambda[49])
r2pmml(iris.glmnet, file.path(tempdir(), "Iris-GLMNet.pmml"))
```

decorate.party	<i>Decorates a "party" object with a "predicted" element.</i>
----------------	---

Description

Decorates a "party" object with a "predicted" element.

Usage

```
## S3 method for class 'party'
decorate(x, ...)
```

Arguments

x	A "party" object.
...	Arguments to pass on to the "decorate.default" function.

Examples

```
library("evtree")
library("r2pmml")

data(iris)
iris.party = evtree(Species ~ ., data = iris,
  control = evtree.control(max_depth = 3))
iris.party = decorate(iris.party)
r2pmml(iris.party, file.path(tempdir(), "Iris-Party.pmml"))
```

decorate.randomForest	<i>Decorates a "randomForest" object with PMML conversion options.</i>
-----------------------	--

Description

Decorates a "randomForest" object with PMML conversion options.

Usage

```
## S3 method for class 'randomForest'
decorate(x, compact = FALSE, ...)
```

Arguments

x	A "randomForest" object.
compact	A flag controlling if decision trees should be transformed from binary splits (FALSE) to multi-way splits (TRUE) representation.
...	Arguments to pass on to the "decorate.default" function.

decorate.ranger *Decorates a "ranger" object with a "variable.levels" element.*

Description

Decorates a "ranger" object with a "variable.levels" element.

Usage

```
## S3 method for class 'ranger'
decorate(x, data, ...)
```

Arguments

x	A "ranger" object.
data	The training dataset.
...	Arguments to pass on to the "decorate.default" function.

Examples

```
library("ranger")
library("r2pmml")

data(iris)
iris.ranger = ranger(Species ~ ., data = iris, num.trees = 17,
  write.forest = TRUE, probability = TRUE)
iris.ranger = decorate(iris.ranger, data = iris)
r2pmml(iris.ranger, file.path(tempdir(), "Iris-Ranger.pmml"))
```

decorate.svm.formula *Decorates a "svm.formula" object with an "xlevels" element.*

Description

Decorates a "svm.formula" object with an "xlevels" element.

Usage

```
## S3 method for class 'svm.formula'
decorate(x, data, ...)
```

Arguments

x	A "svm.formula" object.
data	The training dataset.
...	Arguments to pass on to the "decorate.default" function.

decorate.train	<i>Decorates the final model of a "train" object with model type-dependent elements.</i>
----------------	--

Description

Decorates the final model of a "train" object with model type-dependent elements.

Usage

```
## S3 method for class 'train'
decorate(x, ...)
```

Arguments

x	A "train" object.
...	Arguments to pass on to the "decorate.default" function.

decorate.WrappedModel	<i>Decorates a "WrappedModel" object with "invert_levels" element. Additionally, decorates the learned model with model type-dependent elements.</i>
-----------------------	--

Description

Decorates a "WrappedModel" object with "invert_levels" element. Additionally, decorates the learned model with model type-dependent elements.

Usage

```
## S3 method for class 'WrappedModel'
decorate(x, invert_levels = FALSE, ...)
```

Arguments

x	A "WrappedModel" object.
invert_levels	A flag indicating if the learned model should assume normal (FALSE) or inverted (TRUE) ordering of category values for the binary categorical target field.
...	Arguments to pass on to the "decorate.default" function

decorate.xgb.Booster *Decorates an "xgb.Booster" object with "fmap", "schema", "ntreelimit" and "pmml_options" elements.*

Description

Decorates an "xgb.Booster" object with "fmap", "schema", "ntreelimit" and "pmml_options" elements.

Usage

```
## S3 method for class 'xgb.Booster'
decorate(
  x,
  fmap,
  response_name = NULL,
  response_levels = c(),
  missing = NULL,
  ntreelimit = NULL,
  compact = FALSE,
  ...
)
```

Arguments

x	An "xgb.Booster" object.
fmap	An XGBoost feature map as a "data.frame" object.
response_name	The name of the target field.
response_levels	A list of category values for a categorical target field.
missing	The string representation of missing input field values.
ntreelimit	The number of decision trees (aka boosting rounds) to convert.
compact	A flag controlling if decision trees should be transformed from binary splits (FALSE) to multi-way splits (TRUE) representation.
...	Arguments to pass on to the "decorate.default" function.

Examples

```
library("xgboost")
library("r2pmml")

data(iris)
iris_X = iris[, -ncol(iris)]
iris_y = iris[, ncol(iris)]
# Convert from factor to integer[0, num_class]
iris_y = (as.integer(iris_y) - 1)
```

```

iris.matrix = model.matrix(~ . - 1, data = iris_X)
iris.DMatrix = xgb.DMatrix(iris.matrix, label = iris_y)
iris.fmap = as.fmap(iris.matrix)
iris.xgboost = xgboost(data = iris.DMatrix,
  objective = "multi:softprob", num_class = 3, nrounds = 11)
iris.xgboost = decorate(iris.xgboost, iris.fmap,
  response_name = "Species", response_levels = c("setosa", "versicolor", "virginica"))
pmmlFile = file.path(tempdir(), "Iris-XGBoost.pmml")
r2pmml(iris.xgboost, pmmlFile, compact = FALSE)
compactPmmlFile = file.path(tempdir(), "Iris-XGBoost-compact.pmml")
r2pmml(iris.xgboost, compactPmmlFile, compact = TRUE)

```

r2pmml

Converts an R model object to PMML.

Description

Converts an R model object to PMML.

Usage

```

r2pmml(
  x,
  file,
  schema = NULL,
  converter = NULL,
  converter_classpath = NULL,
  verbose = FALSE,
  ...
)

```

Arguments

x	An R model object.
file	A filesystem path to the result file.
schema	The PMML schema version for the PMML document.
converter	The name of a custom JPMML-R converter class.
converter_classpath	A list of filesystem paths to library JAR files that provide and support the custom JPMML-R converter class.
verbose	A flag controlling the verbosity of the conversion process.
...	Arguments to be passed on to the "r2pmml::decorate" function.

Examples

```

library("mlbench")
library("randomForest")
library("r2pmml")

data(iris)
iris.rf = randomForest(Species ~ ., data = iris, ntree = 7)
# Convert "randomForest" object to R-style (deep binary splits) MiningModel
pmmlFile = file.path(tempdir(), "Iris-RandomForest.pmml")
r2pmml(iris.rf, pmmlFile)
# Convert "randomForest" object to PMML-style (shallow multi-way splits) MiningModel
compactPmmlFile = file.path(tempdir(), "Iris-RandomForest-compact.pmml")
r2pmml(iris.rf, compactPmmlFile, compact = TRUE)

data(BostonHousing)
housing.glm = glm(medv ~ ., data = BostonHousing, family = "gaussian")
# Convert "glm" object into GeneralRegressionModel
genRegPmmlFile = file.path(tempdir(), "Housing-GLM.pmml")
r2pmml(housing.glm, genRegPmmlFile)
# Convert "glm" object into RegressionModel
regPmmlFile = file.path(tempdir(), "Housing-LM.pmml")
r2pmml(housing.glm, regPmmlFile, converter = "org.jpmmml.rexp.LMConverter")

```

verify

Dispatches execution to the most appropriate model verification function.

Description

Dispatches execution to the most appropriate model verification function.

Usage

```
verify(x, newdata, ...)
```

Arguments

x	A model object.
newdata	The verification dataset.
...	Arguments to pass on to the selected function.

verify.default	<i>Enhances a model object with verification data.</i>
----------------	--

Description

Enhances a model object with verification data.

Usage

```
## Default S3 method:
verify(x, newdata, ...)
```

Arguments

x	A model object.
newdata	The verification dataset.
...	Further arguments.

verify.glm	<i>Enhances a "glm" object with verification data.</i>
------------	--

Description

Enhances a "glm" object with verification data.

Usage

```
## S3 method for class 'glm'
verify(x, newdata, precision = 1e-13, zeroThreshold = 1e-13, ...)
```

Arguments

x	A "glm" object.
newdata	The verification dataset.
precision	Maximal relative error.
zeroThreshold	Maximal absolute error near the zero value.
...	Further arguments.

Examples

```
library("mlbench")
library("r2pmml")

data(BostonHousing)
housing.glm = glm(medv ~ ., data = BostonHousing, family = "gaussian")
housing.glm = verify(housing.glm, newdata = BostonHousing[sample(nrow(BostonHousing), 10), ])
r2pmml(housing.glm, file.path(tempdir(), "Housing-GLM-verified.pmml"))
```

verify.train	<i>Enhances a "train" object with verification data.</i>
--------------	--

Description

Enhances a "train" object with verification data.

Usage

```
## S3 method for class 'train'
verify(x, newdata, precision = 1e-13, zeroThreshold = 1e-13, ...)
```

Arguments

x	A "train" object.
newdata	The verification dataset.
precision	Maximal relative error.
zeroThreshold	Maximal absolute error near the zero value.
...	Arguments to pass on to the "predict.train" method.

verify.xgb.Booster	<i>Enhances an "xgb.Booster" object with verification data.</i>
--------------------	---

Description

Enhances an "xgb.Booster" object with verification data.

Usage

```
## S3 method for class 'xgb.Booster'
verify(
  x,
  newdata,
  precision = 1e-06,
  zeroThreshold = 1e-06,
  response_name = NULL,
  response_levels = c(),
  ...
)
```

Arguments

x	An "xgb.Booster" object.
newdata	The verification dataset.
precision	Maximal relative error.
zeroThreshold	Maximal absolute error near the zero value.
response_name	The name of the target field.
response_levels	A list of category values for a categorical target field.
...	Arguments to pass on to the "predict.xgb.Booster" method.

write.fmap	<i>Writes XGBoost feature map to a file.</i>
------------	--

Description

Writes XGBoost feature map to a file.

Usage

```
write.fmap(fmap, file)
```

Arguments

fmap	An XGBoost feature map as a "data.frame" object.
file	A filesystem path to the result file.

Index

`as.fmap`, [2](#)
`as.fmap.data.frame`, [2](#)
`as.fmap.matrix`, [3](#)
`as.scorecard`, [4](#)

`decorate`, [4](#)
`decorate.default`, [5](#)
`decorate.earth`, [5](#)
`decorate.elm`, [6](#)
`decorate.glmnet`, [6](#)
`decorate.party`, [7](#)
`decorate.randomForest`, [7](#)
`decorate.ranger`, [8](#)
`decorate.svm.formula`, [8](#)
`decorate.train`, [9](#)
`decorate.WrappedModel`, [9](#)
`decorate.xgb.Booster`, [10](#)

`r2pmml`, [11](#)

`verify`, [12](#)
`verify.default`, [13](#)
`verify.glm`, [13](#)
`verify.train`, [14](#)
`verify.xgb.Booster`, [14](#)

`write.fmap`, [15](#)