Package 'MSML'

November 29, 2023

Title Model selection based on Machine Learning (ML)

Version 1.0.0.0

Description The MSML package is designed to determine the optimal model(s) by leveraging all available features.

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RoxygenNote 7.1.2

Depends R (>= 2.10)

LazyData true

R topics documented:

`data_test` *7 sets of PRSs for test dataset and target phenotype*

Description

A dataset containing 7 sets of PRSs for test dataset and target phenotype

Usage

```
data_test
```

Format

A data frame for test dataset:

V1 PRS1, for bin1

V2 PRS2, for bin1

V3 PRS3, for bin1

V4 PRS4, for bin1

V5 PRS5, for bin1

V6 PRS6, for bin1

V7 PRS7, for bin1

target Target Phenotype, value

---

data_train *7 sets of PRSs for training data set and target phenotype*

Description

A dataset containing 7 sets of PRSs for training data set and target phenotype

Usage

```
data_train
```

Format

A data frame for training dataset:

V1 PRS1, for bin1

V2 PRS2, for bin1

V3 PRS3, for bin1

V4 PRS4, for bin1

V5 PRS5, for bin1

V6 PRS6, for bin1

V7 PRS7, for bin1

target Target Phenotype, value

data_valid *7 sets of PRSs for validation dataset and target phenotype*

Description

A dataset containing 7 sets of PRSs for validation dataset and target phenotype

Usage

```
data_valid
```

Format

A data frame for validation dataset:

V1 PRS1, for bin1

V2 PRS2, for bin1

V3 PRS3, for bin1

V4 PRS4, for bin1

V5 PRS5, for bin1

V6 PRS6, for bin1

V7 PRS7, for bin1

target Target Phenotype, value

model_configuration

model_configuration function This function will generate features (e.g. PRSs) based on all possible combinations of model. The total number of models required to explore the combinations of these 'n' features can be calculated by summing the combinations for each possible number of features, ranging from 1 to 'n' (C(n,i)). where C(n,k) represents the binomial coefficient or "n choose k," with n denoting the total number of features and k indicating the number of features to include in each model.

Description

model_configuration function This function will generate features (e.g. PRSs) based on all possible combinations of model. The total number of models required to explore the combinations of these 'n' features can be calculated by summing the combinations for each possible number of features, ranging from 1 to 'n' (C(n,i)). where C(n,k) represents the binomial coefficient or "n choose k," with n denoting the total number of features and k indicating the number of features to include in each model.

Usage

```
model_configuration(data_train, data_valid, mv)
```

Arguments

data_train	This is the matrix for training dataset
data_valid	This is the matrix for validation dataset
mv	The total number of columns in data_train/data_valid

Value

This function will generate all possible model outcomes for validation and test dataset

Examples

```
data_train <- data_train
data_valid  <- data_valid
mv=8
out=model_configuration(data_train,data_valid,mv)
```

---

model_evaluation *model_evaluation function*

Description

This function will identify the best model in the validation and test dataset.

Usage

```
model_evaluation(dat, mv, tn, prev, pthreshold = 0.05, method = "R2ROC")
```

Arguments

dat	This is the matrix for all the combinations of the model
mv	The total number of columns in data_train/data_valid
tn	The total no of best models to be identified
prev	The prevalence of disease in the data

Value

This function will generate all possible model outcomes for validation and test dataset

Examples

```
dat <- predict_validation
mv=8
tn=15
prev=0.047
model_evaluation(dat,mv,tn,prev)
```

`predict_test` *target phenotype and 127 sets of model configurations based on the test dataset*

Description

A dataset containing target phenotype and 127 sets of model configurations based on the test dataset

Usage

```
predict_test
```

Format

A data frame for models_test:

V1 target, phenotype

V2 model1, based on configurations

V3 model2, based on configurations

V4 model3, based on configurations

V5 model4, based on configurations

V6 model5, based on configurations

V7 model6, based on configurations

V8 model7, based on configurations

V9 model8, based on configurations

V10 model9, based on configurations

V11 model10, based on configurations

V12 model11, based on configurations

V13 model12, based on configurations

V14 model13, based on configurations

V15 model14, based on configurations

V16 model15, based on configurations

V17 model16, based on configurations

V18 model17, based on configurations

V19 model18, based on configurations

V20 model19, based on configurations

V21 model10, based on configurations

V22 model21, based on configurations

V23 model22, based on configurations

V24 model23, based on configurations

V25 model24, based on configurations

V26 model25, based on configurations

V27 model26, based on configurations

V28 model27, based on configurations
V29 model28, based on configurations
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V31 model30, based on configurations
V32 model31, based on configurations
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V38 model37, based on configurations
V39 model38, based on configurations
V40 model39, based on configurations
V41 model40, based on configurations
V42 model41, based on configurations
V43 model42, based on configurations
V44 model43, based on configurations
V45 model44, based on configurations
V46 model45, based on configurations
V47 model46, based on configurations
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V61 model60, based on configurations
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V63 model62, based on configurations
V64 model63, based on configurations
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V81 model80, based on configurations
V82 model81, based on configurations
V83 model82, based on configurations
V84 model83, based on configurations
V885 model84, based on configurations
V86 model85, based on configurations
V87 model86, based on configurations
V88 model87, based on configurations
V89 model88, based on configurations
V90 model89, based on configurations
V91 model90, based on configurations
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V100 model99, based on configurations
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V103 model102, based on configurations
V104 model103, based on configurations
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V110 model109, based on configurations

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V118 model117, based on configurations

V119 model118, based on configurations

V120 model119, based on configurations

V121 model120, based on configurations

V122 model121, based on configurations

V123 model122, based on configurations

V124 model123, based on configurations

V125 model124, based on configurations

V126 model125, based on configurations

V127 model126, based on configurations

V128 model127, based on configurations

`predict_validation` *target phenotype and 127 sets of model configurations based on validation dataset*

Description

A dataset containing target phenotype and 127 sets of model configurations based on validation dataset

Usage

```
predict_validation
```

Format

A data frame for models_test:

V1 target, phenotype

V2 model1, based on configurations

V3 model2, based on configurations

V4 model3, based on configurations

V5 model4, based on configurations

V6 model5, based on configurations
V7 model6, based on configurations
V8 model7, based on configurations
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V47 model46, based on configurations
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V66 model65, based on configurations
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V73 model72, based on configurations
V74 model73, based on configurations
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V78 model77, based on configurations
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V80 model79, based on configurations
V81 model80, based on configurations
V82 model81, based on configurations
V83 model82, based on configurations
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V86 model85, based on configurations
V87 model86, based on configurations
V88 model87, based on configurations
V89 model88, based on configurations
V90 model89, based on configurations
V91 model90, based on configurations
V92 model91, based on configurations
V93 model92, based on configurations
V94 model93, based on configurations
V95 model94, based on configurations
V96 model95, based on configurations
V97 model96, based on configurations
V98 model97, based on configurations
V99 model98, based on configurations
V100 model99, based on configurations
V101 model100, based on configurations
V102 model101, based on configurations
V103 model102, based on configurations
V104 model103, based on configurations
V105 model104, based on configurations
V106 model105, based on configurations
V107 model106, based on configurations
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V112 model111, based on configurations
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V114 model113, based on configurations
V115 model114, based on configurations
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V117 model116, based on configurations
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V119 model118, based on configurations
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V122 model121, based on configurations
V123 model122, based on configurations
V124 model123, based on configurations
V125 model124, based on configurations
V126 model125, based on configurations
V127 model126, based on configurations
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Index