

# Handout



## Introduction:

The MLR package provides a way to easily use machine learning algorithms in R. The features are designed to reduce the amount of time spent coding machine learning algorithms from scratch to allow experimentation with machine learning and comparison between different models. This helps simplify the process of resampling models, optimizing hyperparameters, selecting features, and dealing with both pre and post processing of data. There are several supervised algorithms for classification, regression, and survival analysis. There are also a few un-supervised algorithms.

## Features and Basic Usage:

- Interfaces to R classification, regression, clustering and survival analysis methods
- Convenience methods and generic building blocks
- Resampling methods
  - Bootstrapping
  - Cross-validation
  - Subsampling
- Visualizations
- Simpler benchmarking of datasets and learners
- Hyperparameter tuning
- Variable selection with filters and wrappers
- Cost-sensitive learning, threshold tuning, and imbalance corrections
- OpenML connector
- Built-in parallelization
- Tutorial

## Other Information:

### Installation

```
install.packages("mlr")  
library(mlr) #Load the library
```

### Example

```
library(mlr)  
data(iris)
```

#### Define the task

```
task = makeClassifTask(id = "tutorial", data = iris, target = "Species")
```

### Define the learner

```
lrn = makeLearner("classif.lda")
```

### Define the resampling strategy

```
rdesc = makeResampleDesc(method = "CV", stratify = TRUE)
```

### Do the resampling

```
r = resample(learner = lrn, task = task, resampling = rdesc, show.info = FALSE)
```

### Get the mean misclassification error

```
r$aggr#> mmce.test.mean  
#> 0.02
```

## Popular Learners

Package	Learner
survival	surv.coxph
e1071	classif.naiveBayes, classif.svm, regr.svm
MASS	classif.lda, classif.qda
randomForest	classif.randomForest, regr.randomForest
kernlab	classif.gausspr, classif.ksvm, classif.lssvm, cluster.kkmeans, regr.gausspr, regr.ksvm, regr.rvm
glmnet	classif.cvglmnet, classif.glmnet, regr.cvglmnet, regr.glmnet, surv.cvglmnet, surv.glmnet
party	classif.cforest, classif.ctree, multilabel.cforest, regr.cforest, regr.ctree
party,modeltools	regr.mob
party,survival	surv.cforest
fpc	cluster.dbscan
rpart	classif.rpart, regr.rpart, surv.rpart
RWeka	classif.IBk, classif.J48, classif.JRip, classif.OneR, classif.PART, cluster.Cobweb, cluster.EM, cluster.FarthestFirst, cluster.SimpleKMeans, cluster.XMeans, regr.IBk
gbm	classif.gbm, regr.gbm, surv.gbm
nnet	classif.multinom, classif.nnet, regr.nnet
caret,pls	classif.plsdaCaret
pls	regr.pcr, regr.plsr
FNN	classif.fnn, regr.fnn
earth	regr.earth
neuralnet	classif.neuralnet
class	classif.knn, classif.lvq1

Additional Information (also citations)

<https://rpubs.com/ippromek/336804>

<https://arxiv.org/pdf/1609.06146.pdf>

<https://mlr.mlr-org.com/>

<https://www.r-bloggers.com/most-popular-learners-in-mlr/>