MV-Lab-5.R

saiup

2022-11-27

library(tidyverse)

## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.2 ──  
## ✔ ggplot2 3.3.6 ✔ purrr 0.3.4   
## ✔ tibble 3.1.8 ✔ dplyr 1.0.10  
## ✔ tidyr 1.2.1 ✔ stringr 1.4.1   
## ✔ readr 2.1.2 ✔ forcats 0.5.2   
## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()

library(ISLR2)  
library(stargazer)

##   
## Please cite as:   
##   
## Hlavac, Marek (2022). stargazer: Well-Formatted Regression and Summary Statistics Tables.  
## R package version 5.2.3. https://CRAN.R-project.org/package=stargazer

library(caret)

## Loading required package: lattice  
##   
## Attaching package: 'caret'  
##   
## The following object is masked from 'package:purrr':  
##   
## lift

library(leaps)  
  
##1- Train a linear model with response = medv and a singlepredictor lstat, with 10-fold cross-validation.  
  
set.seed(12)  
linear\_1<-train(form=medv~lstat,data=Boston,method='lm',trcontrol=trainControl(method='cv',number=10))

## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded

##No 2- Display the RMSE and MAE  
linear\_1

## Linear Regression   
##   
## 506 samples  
## 1 predictor  
##   
## No pre-processing  
## Resampling: Bootstrapped (25 reps)   
## Summary of sample sizes: 506, 506, 506, 506, 506, 506, ...   
## Resampling results:  
##   
## RMSE Rsquared MAE   
## 6.202228 0.542196 4.485401  
##   
## Tuning parameter 'intercept' was held constant at a value of TRUE

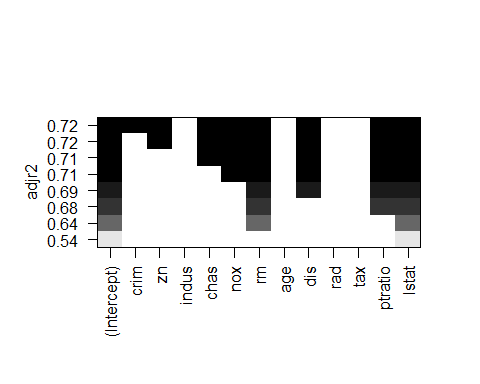
##No 3- Train a linear model with response = medv and every predictor, with 10-fold cross-validation  
  
linear\_2<-train(form=medv~.,data=Boston,method='lm',trcontrol=trainControl(method='cv',number=10))

## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded

##No 4- Display the RMSE and MAE  
linear\_2

## Linear Regression   
##   
## 506 samples  
## 12 predictor  
##   
## No pre-processing  
## Resampling: Bootstrapped (25 reps)   
## Summary of sample sizes: 506, 506, 506, 506, 506, 506, ...   
## Resampling results:  
##   
## RMSE Rsquared MAE   
## 5.057441 0.7072471 3.579293  
##   
## Tuning parameter 'intercept' was held constant at a value of TRUE

Model1<- regsubsets(medv ~ ., data = Boston)  
plot(Model1, scale ="adjr2")



Model2<-train(form=medv~crim+zn+chas+nox+rm+dis+ptratio+lstat,data=Boston, method='lm',trcontrol=trainControl(method='cv',number=10))

## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded  
  
## Warning: In lm.fit(x, y, offset = offset, singular.ok = singular.ok, ...) :  
## extra argument 'trcontrol' will be disregarded

Model2

## Linear Regression   
##   
## 506 samples  
## 8 predictor  
##   
## No pre-processing  
## Resampling: Bootstrapped (25 reps)   
## Summary of sample sizes: 506, 506, 506, 506, 506, 506, ...   
## Resampling results:  
##   
## RMSE Rsquared MAE   
## 5.026521 0.7078338 3.536713  
##   
## Tuning parameter 'intercept' was held constant at a value of TRUE

##The new model is better than the previous model