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| setwd("C:/Users/Matrix/Desktop/New folder")  > filenameo <- "heart.csv"  > heartds <- read.csv(filenameo, header=TRUE)  > dim(heartds)  [1] 289 14  > heartds$output<- as.factor(heartds$output)  > sapply(heartds, class)  age sex cp trtbps chol fbs restecg thalachh exng oldpeak  "integer" "integer" "integer" "integer" "integer" "integer" "integer" "integer" "integer" "numeric"  slp caa thall output  "integer" "integer" "integer" "factor"  > head(heartds)  age sex cp trtbps chol fbs restecg thalachh exng oldpeak slp caa thall output  1 60 1 3 145 233 1 0 150 0 2.3 0 0 1 yes  2 35 1 2 130 250 0 1 187 0 3.5 0 0 2 yes  3 41 0 1 130 204 0 0 172 0 1.4 2 0 2 yes  4 55 1 1 120 236 0 1 178 0 0.8 2 0 2 yes  5 56 0 0 120 354 0 1 163 1 0.6 2 0 2 yes  6 55 1 0 140 192 0 1 148 0 0.4 1 0 1 yes  > summary(heartds)  age sex cp trtbps chol fbs  Min. :29.00 Min. :0.0000 Min. :0.000 Min. : 94.0 Min. :126 Min. :0.0000  1st Qu.:47.00 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:120.0 1st Qu.:212 1st Qu.:0.0000  Median :54.00 Median :1.0000 Median :1.000 Median :130.0 Median :243 Median :0.0000  Mean :54.01 Mean :0.6782 Mean :1.021 Mean :131.4 Mean :248 Mean :0.1453  3rd Qu.:60.00 3rd Qu.:1.0000 3rd Qu.:2.000 3rd Qu.:140.0 3rd Qu.:276 3rd Qu.:0.0000  Max. :77.00 Max. :1.0000 Max. :3.000 Max. :200.0 Max. :564 Max. :1.0000  restecg thalachh exng oldpeak slp caa  Min. :0.0000 Min. : 71.0 Min. :0.0000 Min. :0.000 Min. :0.000 Min. :0.0000  1st Qu.:0.0000 1st Qu.:136.0 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:1.000 1st Qu.:0.0000  Median :1.0000 Median :154.0 Median :0.0000 Median :0.600 Median :1.000 Median :0.0000  Mean :0.5156 Mean :150.2 Mean :0.3183 Mean :1.008 Mean :1.419 Mean :0.7128  3rd Qu.:1.0000 3rd Qu.:168.0 3rd Qu.:1.0000 3rd Qu.:1.600 3rd Qu.:2.000 3rd Qu.:1.0000  Max. :2.0000 Max. :202.0 Max. :1.0000 Max. :6.200 Max. :2.000 Max. :4.0000  thall output  Min. :0.000 no :124  1st Qu.:2.000 yes:165  Median :2.000  Mean :2.315  3rd Qu.:3.000  Max. :3.000  > filenametr <- "train.csv"  > trainds <- read.csv(filenametr, header=TRUE)  > dim(trainds)  [1] 231 14  > trainds$output<- as.factor(trainds$output)  > sapply(trainds, class)  age sex cp trtbps chol fbs restecg thalachh exng oldpeak  "integer" "integer" "integer" "integer" "integer" "integer" "integer" "integer" "integer" "numeric"  slp caa thall output  "integer" "integer" "integer" "factor"  > head(trainds)  age sex cp trtbps chol fbs restecg thalachh exng oldpeak slp caa thall output  1 60 1 3 145 233 1 0 150 0 2.3 0 0 1 yes  2 35 1 2 130 250 0 1 187 0 3.5 0 0 2 yes  3 41 0 1 130 204 0 0 172 0 1.4 2 0 2 yes  4 56 0 0 120 354 0 1 163 1 0.6 2 0 2 yes  5 55 1 0 140 192 0 1 148 0 0.4 1 0 1 yes  6 56 0 1 140 294 0 0 153 0 1.3 1 0 2 yes  > summary(trainds)  age sex cp trtbps chol fbs  Min. :29.00 Min. :0.0000 Min. :0 Min. : 94.0 Min. :126.0 Min. :0.0000  1st Qu.:47.00 1st Qu.:0.0000 1st Qu.:0 1st Qu.:120.0 1st Qu.:212.5 1st Qu.:0.0000  Median :54.00 Median :1.0000 Median :1 Median :130.0 Median :245.0 Median :0.0000  Mean :54.28 Mean :0.6623 Mean :1 Mean :131.9 Mean :249.7 Mean :0.1472  3rd Qu.:61.00 3rd Qu.:1.0000 3rd Qu.:2 3rd Qu.:140.0 3rd Qu.:279.5 3rd Qu.:0.0000  Max. :77.00 Max. :1.0000 Max. :3 Max. :200.0 Max. :564.0 Max. :1.0000  restecg thalachh exng oldpeak slp caa  Min. :0.0000 Min. : 71.0 Min. :0.000 Min. :0.0000 Min. :0.000 Min. :0.0000  1st Qu.:0.0000 1st Qu.:133.0 1st Qu.:0.000 1st Qu.:0.0000 1st Qu.:1.000 1st Qu.:0.0000  Median :1.0000 Median :155.0 Median :0.000 Median :0.6000 Median :1.000 Median :0.0000  Mean :0.5368 Mean :150.1 Mean :0.316 Mean :0.9874 Mean :1.429 Mean :0.7056  3rd Qu.:1.0000 3rd Qu.:168.0 3rd Qu.:1.000 3rd Qu.:1.6000 3rd Qu.:2.000 3rd Qu.:1.0000  Max. :2.0000 Max. :202.0 Max. :1.000 Max. :5.6000 Max. :2.000 Max. :4.0000  thall output  Min. :0.000 no : 99  1st Qu.:2.000 yes:132  Median :2.000  Mean :2.338  3rd Qu.:3.000  Max. :3.000  > filenamete <- "test.csv"  > testds <- read.csv(filenamete, header=TRUE)  > dim(testds)  [1] 58 14  > testds$output<- as.factor(testds$output)  > sapply(testds, class)  age sex cp trtbps chol fbs restecg thalachh exng oldpeak  "integer" "integer" "integer" "integer" "integer" "integer" "integer" "integer" "integer" "numeric"  slp caa thall output  "integer" "integer" "integer" "factor"  > head(testds)  age sex cp trtbps chol fbs restecg thalachh exng oldpeak slp caa thall output  1 55 1 1 120 236 0 1 178 0 0.8 2 0 2 yes  2 44 1 1 120 263 0 1 173 0 0.0 2 0 3 yes  3 48 0 2 130 275 0 1 139 0 0.2 2 0 2 yes  4 59 1 2 150 212 1 1 157 0 1.6 2 0 2 yes  5 51 1 2 110 175 0 1 123 0 0.6 2 0 2 yes  6 44 1 1 130 219 0 0 188 0 0.0 2 0 2 yes  > summary(testds)  age sex cp trtbps chol fbs  Min. :34.00 Min. :0.0000 Min. :0.000 Min. :100.0 Min. :157.0 Min. :0.0000  1st Qu.:45.75 1st Qu.:0.2500 1st Qu.:0.000 1st Qu.:113.5 1st Qu.:209.0 1st Qu.:0.0000  Median :55.00 Median :1.0000 Median :1.000 Median :125.5 Median :234.5 Median :0.0000  Mean :52.95 Mean :0.7414 Mean :1.103 Mean :129.1 Mean :240.9 Mean :0.1379  3rd Qu.:59.00 3rd Qu.:1.0000 3rd Qu.:2.000 3rd Qu.:138.0 3rd Qu.:264.5 3rd Qu.:0.0000  Max. :69.00 Max. :1.0000 Max. :3.000 Max. :178.0 Max. :409.0 Max. :1.0000  restecg thalachh exng oldpeak slp caa  Min. :0.000 Min. :103.0 Min. :0.0000 Min. :0.000 Min. :0.000 Min. :0.0000  1st Qu.:0.000 1st Qu.:138.2 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:1.000 1st Qu.:0.0000  Median :0.000 Median :150.5 Median :0.0000 Median :0.700 Median :1.000 Median :0.0000  Mean :0.431 Mean :150.6 Mean :0.3276 Mean :1.088 Mean :1.379 Mean :0.7414  3rd Qu.:1.000 3rd Qu.:164.5 3rd Qu.:1.0000 3rd Qu.:1.800 3rd Qu.:2.000 3rd Qu.:1.0000  Max. :1.000 Max. :188.0 Max. :1.0000 Max. :6.200 Max. :2.000 Max. :4.0000  thall output  Min. :0.000 no :25  1st Qu.:2.000 yes:33  Median :2.000  Mean :2.224  3rd Qu.:3.000  Max. :3.000  >  > library(MASS)  > library(car)  Error in library(car) : there is no package called ‘car’  > install.packages("car")  WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:  https://cran.rstudio.com/bin/windows/Rtools/  Installing package into ‘C:/Users/Matrix/AppData/Local/R/win-library/4.2’  (as ‘lib’ is unspecified)  also installing the dependencies ‘rprojroot’, ‘fs’, ‘diffobj’, ‘rematch2’, ‘brio’, ‘callr’, ‘desc’, ‘jsonlite’, ‘pkgload’, ‘praise’, ‘processx’, ‘ps’, ‘waldo’, ‘backports’, ‘testthat’, ‘broom’, ‘SparseM’, ‘MatrixModels’, ‘minqa’, ‘nloptr’, ‘RcppEigen’, ‘carData’, ‘abind’, ‘pbkrtest’, ‘quantreg’, ‘lme4’  There is a binary version available but the source version is later:  binary source needs\_compilation  lme4 1.1-31 1.1-32 TRUE  Binaries will be installed  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/rprojroot\_2.0.3.zip'  Content type 'application/zip' length 109326 bytes (106 KB)  downloaded 106 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/fs\_1.6.1.zip'  Content type 'application/zip' length 393009 bytes (383 KB)  downloaded 383 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/diffobj\_0.3.5.zip'  Content type 'application/zip' length 990691 bytes (967 KB)  downloaded 967 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/rematch2\_2.1.2.zip'  Content type 'application/zip' length 47486 bytes (46 KB)  downloaded 46 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/brio\_1.1.3.zip'  Content type 'application/zip' length 38209 bytes (37 KB)  downloaded 37 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/callr\_3.7.3.zip'  Content type 'application/zip' length 440480 bytes (430 KB)  downloaded 430 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/desc\_1.4.2.zip'  Content type 'application/zip' length 326980 bytes (319 KB)  downloaded 319 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/jsonlite\_1.8.4.zip'  Content type 'application/zip' length 1104984 bytes (1.1 MB)  downloaded 1.1 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/pkgload\_1.3.2.zip'  Content type 'application/zip' length 178852 bytes (174 KB)  downloaded 174 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/praise\_1.0.0.zip'  Content type 'application/zip' length 19838 bytes (19 KB)  downloaded 19 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/processx\_3.8.0.zip'  Content type 'application/zip' length 846977 bytes (827 KB)  downloaded 827 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/ps\_1.7.2.zip'  Content type 'application/zip' length 548277 bytes (535 KB)  downloaded 535 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/waldo\_0.4.0.zip'  Content type 'application/zip' length 101966 bytes (99 KB)  downloaded 99 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/backports\_1.4.1.zip'  Content type 'application/zip' length 102215 bytes (99 KB)  downloaded 99 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/testthat\_3.1.7.zip'  Content type 'application/zip' length 2112377 bytes (2.0 MB)  downloaded 2.0 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/broom\_1.0.4.zip'  Content type 'application/zip' length 1866987 bytes (1.8 MB)  downloaded 1.8 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/SparseM\_1.81.zip'  Content type 'application/zip' length 1026945 bytes (1002 KB)  downloaded 1002 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/MatrixModels\_0.5-1.zip'  Content type 'application/zip' length 425245 bytes (415 KB)  downloaded 415 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/minqa\_1.2.5.zip'  Content type 'application/zip' length 448263 bytes (437 KB)  downloaded 437 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/nloptr\_2.0.3.zip'  Content type 'application/zip' length 1001406 bytes (977 KB)  downloaded 977 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/RcppEigen\_0.3.3.9.3.zip'  Content type 'application/zip' length 2275746 bytes (2.2 MB)  downloaded 2.2 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/carData\_3.0-5.zip'  Content type 'application/zip' length 1821095 bytes (1.7 MB)  downloaded 1.7 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/abind\_1.4-5.zip'  Content type 'application/zip' length 63750 bytes (62 KB)  downloaded 62 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/pbkrtest\_0.5.2.zip'  Content type 'application/zip' length 191826 bytes (187 KB)  downloaded 187 KB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/quantreg\_5.94.zip'  Content type 'application/zip' length 1726175 bytes (1.6 MB)  downloaded 1.6 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/lme4\_1.1-31.zip'  Content type 'application/zip' length 4525485 bytes (4.3 MB)  downloaded 4.3 MB  trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/car\_3.1-1.zip'  Content type 'application/zip' length 1705651 bytes (1.6 MB)  downloaded 1.6 MB  package ‘rprojroot’ successfully unpacked and MD5 sums checked  package ‘fs’ successfully unpacked and MD5 sums checked  package ‘diffobj’ successfully unpacked and MD5 sums checked  package ‘rematch2’ successfully unpacked and MD5 sums checked  package ‘brio’ successfully unpacked and MD5 sums checked  package ‘callr’ successfully unpacked and MD5 sums checked  package ‘desc’ successfully unpacked and MD5 sums checked  package ‘jsonlite’ successfully unpacked and MD5 sums checked  package ‘pkgload’ successfully unpacked and MD5 sums checked  package ‘praise’ successfully unpacked and MD5 sums checked  package ‘processx’ successfully unpacked and MD5 sums checked  package ‘ps’ successfully unpacked and MD5 sums checked  package ‘waldo’ successfully unpacked and MD5 sums checked  package ‘backports’ successfully unpacked and MD5 sums checked  package ‘testthat’ successfully unpacked and MD5 sums checked  package ‘broom’ successfully unpacked and MD5 sums checked  package ‘SparseM’ successfully unpacked and MD5 sums checked  package ‘MatrixModels’ successfully unpacked and MD5 sums checked  package ‘minqa’ successfully unpacked and MD5 sums checked  package ‘nloptr’ successfully unpacked and MD5 sums checked  package ‘RcppEigen’ successfully unpacked and MD5 sums checked  package ‘carData’ successfully unpacked and MD5 sums checked  package ‘abind’ successfully unpacked and MD5 sums checked  package ‘pbkrtest’ successfully unpacked and MD5 sums checked  package ‘quantreg’ successfully unpacked and MD5 sums checked  package ‘lme4’ successfully unpacked and MD5 sums checked  package ‘car’ successfully unpacked and MD5 sums checked  The downloaded binary packages are in  C:\Users\Matrix\AppData\Local\Temp\Rtmpyo5Rj2\downloaded\_packages  > library(car)  Loading required package: carData  > risk.lda <- lda(output ~., data = heartds)  > risk.lda  Call:  lda(output ~ ., data = heartds)  Prior probabilities of groups:  no yes  0.4290657 0.5709343  Group means:  age sex cp trtbps chol fbs restecg thalachh exng oldpeak  no 56.14516 0.8306452 0.5483871 134.1371 255.5887 0.1532258 0.4112903 139.2742 0.5564516 1.5725806  yes 52.40606 0.5636364 1.3757576 129.3030 242.2303 0.1393939 0.5939394 158.4667 0.1393939 0.5830303  slp caa thall  no 1.185484 1.1774194 2.572581  yes 1.593939 0.3636364 2.121212  Coefficients of linear discriminants:  LD1  age 0.001967187  sex -0.780756664  cp 0.408037511  trtbps -0.007410000  chol -0.002035882  fbs 0.021995353  restecg 0.287931777  thalachh 0.012459334  exng -0.650371151  oldpeak -0.269451565  slp 0.198457641  caa -0.449526942  thall -0.473153257  > risk.lda.values <- predict(risk.lda)  > ldahist(risk.lda.values$x[,1], g = heartds$output)  > library(caret)  Loading required package: ggplot2  Loading required package: lattice  > risk.lda.predict <- train(output ~ ., method = "lda", data = heartds)  > confusionMatrix(heartds$output, predict(risk.lda.predict, heartds))  Confusion Matrix and Statistics  Reference  Prediction no yes  no 92 32  yes 10 155    Accuracy : 0.8547  95% CI : (0.8087, 0.8932)  No Information Rate : 0.6471  P-Value [Acc > NIR] : 2.066e-15    Kappa : 0.6967    Mcnemar's Test P-Value : 0.001194    Sensitivity : 0.9020  Specificity : 0.8289  Pos Pred Value : 0.7419  Neg Pred Value : 0.9394  Prevalence : 0.3529  Detection Rate : 0.3183  Detection Prevalence : 0.4291  Balanced Accuracy : 0.8654    'Positive' Class : no    > library(klaR)  Error in library(klaR) : there is no package called ‘klaR’  > partimat(output~age+Sex+cp+ trtbps +chol+ fbs+restecg+thalachh+exng+oldpeak+ slp+caa + thall , data=trainds, method="lda")  Error in partimat(output ~ age + Sex + cp + trtbps + chol + fbs + restecg + :  could not find function "partimat"  > partimat(output~age+Sex+cp+ trtbps +chol+ fbs+restecg+thalachh+exng+oldpeak+ slp+caa + +thall , data=trainds, method="lda")  Error in partimat(output ~ age + Sex + cp + trtbps + chol + fbs + restecg + :  could not find function "partimat" |
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