R Notebook

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| Title: “IST707 HW6 Use Classification Algortithms for handwriting recognition” |
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| Date: 08/25/2020 |

Exercise: compare naïve Bayes , decision tree, SVMs, kNN, and Random Forest algorithmse for handwriting recognition.

In this homework assignment, you are going to use the decision tree algorithm to solve the disputed essay problem. Last week you used clustering techniques to tackle this problem.

Organize your report using the following template:

Section 1: Introduction Briefly describe the classification problem and general data preprocessing. Note that some data preprocessing steps maybe specific to a particular algorithm. Report those steps under each algorithm section.

Section 2: Decision tree Build a decision tree model. Tune the parameters, such as the pruning options, and report the 3-fold CV accuracy.

Section 3: Naïve Bayes Build a naïve Bayes model. Tune the parameters, such as the discretization options, to compare results.

Section 4: kNN Build a kNN model. Tune the parameters, such as the discretization options, to compare results.

Section 5: SVM Build a SVM model. Tune the parameters, such as the discretization options, to compare results.

Section 6: Random Forest Build a Random Forest model. Tune the parameters, such as the discretization options, to compare results.

Section 7: Algorithm performance comparison Compare the results from the two algorithms. Which one reached higher accuracy? Which one runs faster? Can you explain why?

Section 8: Kaggle test result (1 extra point) Report the test accuracy for the naïve Bayes and decision tree models. Discuss whether overfitting occurs in these models.

Grading rubrics: 1. Are the models constructed correctly? 2. Is the result analysis conclusion convincing? 3. Is sufficient details provided for others to repeat the analysis? 4. Does the analysis include irrelevant content? 5. Successful submission to Kaggle?

# import libraries   
#create a function to ensure the libraries are imported  
EnsurePackage <- function(x){  
 x <- as.character(x)  
 if (!require(x,character.only = TRUE)){  
 install.packages(pkgs=x, repos = "http://cran.us.r-project.org")  
 require(x, character.only = TRUE)  
 }  
 }

# usage example, to load the necessary library for further processing...  
EnsurePackage("class") # kNN

## Loading required package: class

EnsurePackage("e1071")

## Loading required package: e1071

EnsurePackage("sqldf")

## Loading required package: sqldf

## Loading required package: gsubfn

## Loading required package: proto

## Loading required package: RSQLite

EnsurePackage("FactoMineR")

## Loading required package: FactoMineR

EnsurePackage("rpart.plot") # Decision Tree

## Loading required package: rpart.plot

## Loading required package: rpart

EnsurePackage("randomForest") # Random Forest

## Loading required package: randomForest

## randomForest 4.6-14

## Type rfNews() to see new features/changes/bug fixes.

EnsurePackage("caret") # Plot ConfusionMatrix

## Loading required package: caret

## Loading required package: lattice

## Loading required package: ggplot2

##   
## Attaching package: 'ggplot2'

## The following object is masked from 'package:randomForest':  
##   
## margin

EnsurePackage("ggplot2")  
EnsurePackage("kernlab")

## Loading required package: kernlab

##   
## Attaching package: 'kernlab'

## The following object is masked from 'package:ggplot2':  
##   
## alpha

EnsurePackage("dplyr")

## Loading required package: dplyr

##   
## Attaching package: 'dplyr'

## The following object is masked from 'package:randomForest':  
##   
## combine

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

EnsurePackage("RColorBrewer")

## Loading required package: RColorBrewer

EnsurePackage("stringr")

## Loading required package: stringr

cat("All Packages are available")

## All Packages are available

#Load Train CSV into data frame  
 train\_data <- "/Users/sathishrajendiran/Documents/R/HW6/digit\_train.csv"  
 digitTrainDF <- data.frame(read.csv(train\_data,na.strings=c(""," ","NA")),stringsAsFactors=FALSE)  
 dim(digitTrainDF) #42000 785

## [1] 42000 785

digitTrainDF$label <- as.factor(digitTrainDF$label)  
   
 # Preview the structure   
 str(digitTrainDF)

## 'data.frame': 42000 obs. of 785 variables:  
## $ label : Factor w/ 10 levels "0","1","2","3",..: 2 1 2 5 1 1 8 4 6 4 ...  
## $ pixel0 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel1 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel2 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel3 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel4 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel5 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel6 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel7 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel8 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel9 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel10 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel11 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel12 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel13 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel14 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel15 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel16 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel17 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel18 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel19 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel20 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel21 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel22 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel23 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel24 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel25 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel26 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel27 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel28 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel29 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel30 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel31 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel32 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel33 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel34 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel35 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel36 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel37 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel38 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel39 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel40 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel41 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel42 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel43 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel44 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel45 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel46 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel47 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel48 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel49 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel50 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel51 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel52 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel53 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel54 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel55 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel56 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel57 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel58 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel59 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel60 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel61 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel62 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel63 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel64 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel65 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel66 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel67 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel68 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel69 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel70 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel71 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel72 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel73 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel74 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel75 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel76 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel77 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel78 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel79 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel80 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel81 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel82 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel83 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel84 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel85 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel86 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel87 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel88 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel89 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel90 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel91 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel92 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel93 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel94 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel95 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel96 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel97 : int 0 0 0 0 0 0 0 0 0 0 ...  
## [list output truncated]

# Analyze the spread   
 summary(digitTrainDF)

## label pixel0 pixel1 pixel2 pixel3 pixel4   
## 1 : 4684 Min. :0 Min. :0 Min. :0 Min. :0 Min. :0   
## 7 : 4401 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0   
## 3 : 4351 Median :0 Median :0 Median :0 Median :0 Median :0   
## 9 : 4188 Mean :0 Mean :0 Mean :0 Mean :0 Mean :0   
## 2 : 4177 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0   
## 6 : 4137 Max. :0 Max. :0 Max. :0 Max. :0 Max. :0   
## (Other):16062   
## pixel5 pixel6 pixel7 pixel8 pixel9 pixel10   
## Min. :0 Min. :0 Min. :0 Min. :0 Min. :0 Min. :0   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0   
## Median :0 Median :0 Median :0 Median :0 Median :0 Median :0   
## Mean :0 Mean :0 Mean :0 Mean :0 Mean :0 Mean :0   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0   
## Max. :0 Max. :0 Max. :0 Max. :0 Max. :0 Max. :0   
##   
## pixel11 pixel12 pixel13 pixel14   
## Min. :0 Min. : 0.000 Min. : 0.00000 Min. :0.00e+00   
## 1st Qu.:0 1st Qu.: 0.000 1st Qu.: 0.00000 1st Qu.:0.00e+00   
## Median :0 Median : 0.000 Median : 0.00000 Median :0.00e+00   
## Mean :0 Mean : 0.003 Mean : 0.01119 Mean :5.14e-03   
## 3rd Qu.:0 3rd Qu.: 0.000 3rd Qu.: 0.00000 3rd Qu.:0.00e+00   
## Max. :0 Max. :116.000 Max. :254.00000 Max. :2.16e+02   
##   
## pixel15 pixel16 pixel17 pixel18 pixel19 pixel20   
## Min. :0.000000 Min. :0 Min. :0 Min. :0 Min. :0 Min. :0   
## 1st Qu.:0.000000 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0   
## Median :0.000000 Median :0 Median :0 Median :0 Median :0 Median :0   
## Mean :0.000214 Mean :0 Mean :0 Mean :0 Mean :0 Mean :0   
## 3rd Qu.:0.000000 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0   
## Max. :9.000000 Max. :0 Max. :0 Max. :0 Max. :0 Max. :0   
##   
## pixel21 pixel22 pixel23 pixel24 pixel25 pixel26   
## Min. :0 Min. :0 Min. :0 Min. :0 Min. :0 Min. :0   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0   
## Median :0 Median :0 Median :0 Median :0 Median :0 Median :0   
## Mean :0 Mean :0 Mean :0 Mean :0 Mean :0 Mean :0   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0   
## Max. :0 Max. :0 Max. :0 Max. :0 Max. :0 Max. :0   
##   
## pixel27 pixel28 pixel29 pixel30 pixel31 pixel32   
## Min. :0 Min. :0 Min. :0 Min. :0 Min. :0 Min. :0.00e+00   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0.00e+00   
## Median :0 Median :0 Median :0 Median :0 Median :0 Median :0.00e+00   
## Mean :0 Mean :0 Mean :0 Mean :0 Mean :0 Mean :3.81e-04   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0.00e+00   
## Max. :0 Max. :0 Max. :0 Max. :0 Max. :0 Max. :1.60e+01   
##   
## pixel33 pixel34 pixel35 pixel36   
## Min. : 0.00000 Min. : 0.00000 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median : 0.00000 Median : 0.00000 Median : 0.00000 Median : 0.0000   
## Mean : 0.00131 Mean : 0.01055 Mean : 0.02726 Mean : 0.0509   
## 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :47.00000 Max. :157.00000 Max. :254.00000 Max. :255.0000   
##   
## pixel37 pixel38 pixel39 pixel40   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 0.0664 Mean : 0.1296 Mean : 0.1741 Mean : 0.1913   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :243.0000 Max. :255.0000 Max. :255.0000 Max. :255.0000   
##   
## pixel41 pixel42 pixel43 pixel44   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 0.1906 Mean : 0.1961 Mean : 0.1714 Mean : 0.1645   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.0000 Max. :255.0000 Max. :255.0000 Max. :255.0000   
##   
## pixel45 pixel46 pixel47 pixel48   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.00000 Min. : 0.00000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000   
## Median : 0.0000 Median : 0.0000 Median : 0.00000 Median : 0.00000   
## Mean : 0.1517 Mean : 0.1053 Mean : 0.06079 Mean : 0.04507   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000   
## Max. :255.0000 Max. :255.0000 Max. :255.00000 Max. :244.00000   
##   
## pixel49 pixel50 pixel51 pixel52   
## Min. : 0.0000 Min. : 0.00000 Min. :0.00e+00 Min. :0   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.:0.00e+00 1st Qu.:0   
## Median : 0.0000 Median : 0.00000 Median :0.00e+00 Median :0   
## Mean : 0.0154 Mean : 0.01052 Mean :5.05e-03 Mean :0   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.:0.00e+00 3rd Qu.:0   
## Max. :255.0000 Max. :184.00000 Max. :1.97e+02 Max. :0   
##   
## pixel53 pixel54 pixel55 pixel56 pixel57 pixel58   
## Min. :0 Min. :0 Min. :0 Min. :0 Min. :0 Min. : 0.00000   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.: 0.00000   
## Median :0 Median :0 Median :0 Median :0 Median :0 Median : 0.00000   
## Mean :0 Mean :0 Mean :0 Mean :0 Mean :0 Mean : 0.00152   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.: 0.00000   
## Max. :0 Max. :0 Max. :0 Max. :0 Max. :0 Max. :64.00000   
##   
## pixel59 pixel60 pixel61 pixel62   
## Min. :0.0e+00 Min. :0.00e+00 Min. :0.00e+00 Min. : 0.00000   
## 1st Qu.:0.0e+00 1st Qu.:0.00e+00 1st Qu.:0.00e+00 1st Qu.: 0.00000   
## Median :0.0e+00 Median :0.00e+00 Median :0.00e+00 Median : 0.00000   
## Mean :6.9e-04 Mean :7.33e-03 Mean :9.02e-03 Mean : 0.06112   
## 3rd Qu.:0.0e+00 3rd Qu.:0.00e+00 3rd Qu.:0.00e+00 3rd Qu.: 0.00000   
## Max. :2.9e+01 Max. :1.34e+02 Max. :1.28e+02 Max. :234.00000   
##   
## pixel63 pixel64 pixel65 pixel66   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 0.1511 Mean : 0.2959 Mean : 0.5337 Mean : 0.8694   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.0000 Max. :255.0000 Max. :255.0000 Max. :255.0000   
##   
## pixel67 pixel68 pixel69 pixel70   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.00   
## Mean : 1.346 Mean : 1.981 Mean : 2.699 Mean : 3.39   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.00   
##   
## pixel71 pixel72 pixel73 pixel74   
## Min. : 0.000 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.000 Median : 0.00 Median : 0.000 Median : 0.000   
## Mean : 3.802 Mean : 3.74 Mean : 3.333 Mean : 2.684   
## 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.000 Max. :255.00 Max. :255.000 Max. :255.000   
##   
## pixel75 pixel76 pixel77 pixel78   
## Min. : 0.000 Min. : 0.000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.000 Median : 0.000 Median : 0.0000 Median : 0.0000   
## Mean : 1.993 Mean : 1.196 Mean : 0.6012 Mean : 0.2938   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.000 Max. :255.000 Max. :255.0000 Max. :255.0000   
##   
## pixel79 pixel80 pixel81 pixel82   
## Min. : 0.00000 Min. : 0.00000 Min. : 0.0000 Min. :0   
## 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.:0   
## Median : 0.00000 Median : 0.00000 Median : 0.0000 Median :0   
## Mean : 0.09848 Mean : 0.03495 Mean : 0.0084 Mean :0   
## 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.:0   
## Max. :255.00000 Max. :255.00000 Max. :165.0000 Max. :0   
##   
## pixel83 pixel84 pixel85 pixel86 pixel87   
## Min. :0 Min. :0 Min. :0 Min. :0.00e+00 Min. : 0.00000   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0.00e+00 1st Qu.: 0.00000   
## Median :0 Median :0 Median :0 Median :0.00e+00 Median : 0.00000   
## Mean :0 Mean :0 Mean :0 Mean :3.62e-03 Mean : 0.00417   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0.00e+00 3rd Qu.: 0.00000   
## Max. :0 Max. :0 Max. :0 Max. :1.41e+02 Max. :84.00000   
##   
## pixel88 pixel89 pixel90 pixel91   
## Min. : 0.0000 Min. : 0.00000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.00000 Median : 0.0000 Median : 0.0000   
## Mean : 0.0164 Mean : 0.08976 Mean : 0.2358 Mean : 0.5407   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :139.0000 Max. :255.00000 Max. :255.0000 Max. :255.0000   
##   
## pixel92 pixel93 pixel94 pixel95   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 1.193 Mean : 2.293 Mean : 3.768 Mean : 5.714   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel96 pixel97 pixel98 pixel99   
## Min. : 0.000 Min. : 0.00 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.000 Median : 0.00 Median : 0.00 Median : 0.0   
## Mean : 7.751 Mean : 10.05 Mean : 12.07 Mean : 13.4   
## 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.0   
## Max. :255.000 Max. :255.00 Max. :255.00 Max. :255.0   
##   
## pixel100 pixel101 pixel102 pixel103   
## Min. : 0.00 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.000 Median : 0.000   
## Mean : 13.07 Mean : 11.57 Mean : 9.296 Mean : 6.708   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.000 Max. :255.000   
##   
## pixel104 pixel105 pixel106 pixel107   
## Min. : 0.00 Min. : 0.00 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 0.00 Median : 0.00 Median : 0.000 Median : 0.0000   
## Mean : 4.14 Mean : 2.27 Mean : 1.092 Mean : 0.4246   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.0000   
## Max. :255.00 Max. :255.00 Max. :255.000 Max. :255.0000   
##   
## pixel108 pixel109 pixel110 pixel111  
## Min. : 0.000 Min. : 0.00000 Min. :0.00e+00 Min. :0   
## 1st Qu.: 0.000 1st Qu.: 0.00000 1st Qu.:0.00e+00 1st Qu.:0   
## Median : 0.000 Median : 0.00000 Median :0.00e+00 Median :0   
## Mean : 0.168 Mean : 0.02374 Mean :2.88e-03 Mean :0   
## 3rd Qu.: 0.000 3rd Qu.: 0.00000 3rd Qu.:0.00e+00 3rd Qu.:0   
## Max. :255.000 Max. :164.00000 Max. :1.21e+02 Max. :0   
##   
## pixel112 pixel113 pixel114 pixel115   
## Min. :0 Min. : 0.0000 Min. : 0.00000 Min. : 0.00000   
## 1st Qu.:0 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000   
## Median :0 Median : 0.0000 Median : 0.00000 Median : 0.00000   
## Mean :0 Mean : 0.0009 Mean : 0.00274 Mean : 0.01607   
## 3rd Qu.:0 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000   
## Max. :0 Max. :38.0000 Max. :51.00000 Max. :114.00000   
##   
## pixel116 pixel117 pixel118 pixel119   
## Min. : 0.00000 Min. : 0.0000 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.00 1st Qu.: 0.000   
## Median : 0.00000 Median : 0.0000 Median : 0.00 Median : 0.000   
## Mean : 0.08826 Mean : 0.3887 Mean : 1.03 Mean : 2.455   
## 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.00 3rd Qu.: 0.000   
## Max. :226.00000 Max. :255.0000 Max. :255.00 Max. :255.000   
##   
## pixel120 pixel121 pixel122 pixel123   
## Min. : 0.000 Min. : 0.000 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.0 Median : 0.00   
## Mean : 4.953 Mean : 8.677 Mean : 13.8 Mean : 20.33   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.0 Max. :255.00   
##   
## pixel124 pixel125 pixel126 pixel127   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 28.04 Mean : 36.08 Mean : 42.71 Mean : 46.09   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 10.00 3rd Qu.: 29.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel128 pixel129 pixel130 pixel131   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 44.54 Mean : 38.95 Mean : 30.96 Mean : 22.91   
## 3rd Qu.: 21.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel132 pixel133 pixel134 pixel135   
## Min. : 0.00 Min. : 0.000 Min. : 0.000 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0   
## Median : 0.00 Median : 0.000 Median : 0.000 Median : 0.0   
## Mean : 14.87 Mean : 8.692 Mean : 4.551 Mean : 2.1   
## 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0   
## Max. :255.00 Max. :255.000 Max. :255.000 Max. :255.0   
##   
## pixel136 pixel137 pixel138 pixel139  
## Min. : 0.0000 Min. : 0.0000 Min. : 0.00000 Min. :0   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.:0   
## Median : 0.0000 Median : 0.0000 Median : 0.00000 Median :0   
## Mean : 0.8388 Mean : 0.2028 Mean : 0.03548 Mean :0   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.:0   
## Max. :255.0000 Max. :254.0000 Max. :230.00000 Max. :0   
##   
## pixel140 pixel141 pixel142 pixel143   
## Min. :0 Min. :0 Min. : 0.00000 Min. : 0.000   
## 1st Qu.:0 1st Qu.:0 1st Qu.: 0.00000 1st Qu.: 0.000   
## Median :0 Median :0 Median : 0.00000 Median : 0.000   
## Mean :0 Mean :0 Mean : 0.00943 Mean : 0.048   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.: 0.00000 3rd Qu.: 0.000   
## Max. :0 Max. :0 Max. :95.00000 Max. :255.000   
##   
## pixel144 pixel145 pixel146 pixel147   
## Min. : 0.0000 Min. : 0.000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.0000 Median : 0.000 Median : 0.000 Median : 0.00   
## Mean : 0.4116 Mean : 1.438 Mean : 3.558 Mean : 7.15   
## 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :255.0000 Max. :255.000 Max. :255.000 Max. :255.00   
##   
## pixel148 pixel149 pixel150 pixel151   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 12.93 Mean : 21.42 Mean : 32.22 Mean : 45.36   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 27.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel152 pixel153 pixel154 pixel155   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.0 Median : 0.00   
## Mean : 60.18 Mean : 75.01 Mean : 86.3 Mean : 91.59   
## 3rd Qu.:114.00 3rd Qu.:175.00 3rd Qu.:213.0 3rd Qu.:225.00   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.00   
##   
## pixel156 pixel157 pixel158 pixel159   
## Min. : 0.00 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.0 Median : 0.00 Median : 0.00   
## Mean : 89.45 Mean : 80.3 Mean : 65.76 Mean : 49.65   
## 3rd Qu.:220.00 3rd Qu.:194.0 3rd Qu.:138.00 3rd Qu.: 51.00   
## Max. :255.00 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel160 pixel161 pixel162 pixel163   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.000   
## Mean : 34.39 Mean : 21.46 Mean : 12.23 Mean : 6.375   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.000   
##   
## pixel164 pixel165 pixel166 pixel167   
## Min. : 0.000 Min. : 0.0000 Min. : 0.000 Min. :0.00e+00   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.:0.00e+00   
## Median : 0.000 Median : 0.0000 Median : 0.000 Median :0.00e+00   
## Mean : 2.906 Mean : 0.7934 Mean : 0.126 Mean :4.29e-04   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.:0.00e+00   
## Max. :255.000 Max. :255.0000 Max. :253.000 Max. :1.80e+01   
##   
## pixel168 pixel169 pixel170 pixel171   
## Min. :0 Min. :0.0e+00 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.:0 1st Qu.:0.0e+00 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median :0 Median :0.0e+00 Median : 0.0000 Median : 0.0000   
## Mean :0 Mean :9.5e-05 Mean : 0.0231 Mean : 0.2284   
## 3rd Qu.:0 3rd Qu.:0.0e+00 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :0 Max. :4.0e+00 Max. :177.0000 Max. :255.0000   
##   
## pixel172 pixel173 pixel174 pixel175   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.00   
## Mean : 1.155 Mean : 3.268 Mean : 7.367 Mean : 14.11   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.00   
##   
## pixel176 pixel177 pixel178 pixel179   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0   
## Mean : 24.13 Mean : 37.88 Mean : 54.01 Mean : 72   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 74.00 3rd Qu.:163   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255   
##   
## pixel180 pixel181 pixel182 pixel183   
## Min. : 0.00 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 7.00 Median : 61.0 Median :112.0 Median :128.0   
## Mean : 90.47 Mean :107.5 Mean :119.7 Mean :124.9   
## 3rd Qu.:223.00 3rd Qu.:250.0 3rd Qu.:252.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel184 pixel185 pixel186 pixel187   
## Min. : 0.0 Min. : 0.0 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.0   
## Median :119.0 Median : 75.0 Median : 14.00 Median : 0.0   
## Mean :121.9 Mean :111.6 Mean : 95.59 Mean : 74.6   
## 3rd Qu.:252.0 3rd Qu.:252.0 3rd Qu.:235.00 3rd Qu.:178.0   
## Max. :255.0 Max. :255.0 Max. :255.00 Max. :255.0   
##   
## pixel188 pixel189 pixel190 pixel191   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.0 Median : 0.00   
## Mean : 53.74 Mean : 34.96 Mean : 20.7 Mean : 11.12   
## 3rd Qu.: 69.25 3rd Qu.: 0.00 3rd Qu.: 0.0 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.00   
##   
## pixel192 pixel193 pixel194 pixel195   
## Min. : 0.000 Min. : 0.000 Min. : 0.0000 Min. : 0.00000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.00000   
## Median : 0.000 Median : 0.000 Median : 0.0000 Median : 0.00000   
## Mean : 5.254 Mean : 1.773 Mean : 0.3457 Mean : 0.02502   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.00000   
## Max. :255.000 Max. :255.000 Max. :254.0000 Max. :253.00000   
##   
## pixel196 pixel197 pixel198 pixel199   
## Min. :0 Min. : 0.00000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.:0 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median :0 Median : 0.00000 Median : 0.0000 Median : 0.0000   
## Mean :0 Mean : 0.01781 Mean : 0.1125 Mean : 0.6214   
## 3rd Qu.:0 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :0 Max. :128.00000 Max. :254.0000 Max. :255.0000   
##   
## pixel200 pixel201 pixel202 pixel203   
## Min. : 0.000 Min. : 0.000 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.00 Median : 0.00   
## Mean : 2.452 Mean : 5.981 Mean : 12.39 Mean : 22.36   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.00 Max. :255.00   
##   
## pixel204 pixel205 pixel206 pixel207   
## Min. : 0.0 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.0 Median : 0.00 Median : 0.00 Median : 28.00   
## Mean : 36.6 Mean : 54.74 Mean : 74.79 Mean : 95.42   
## 3rd Qu.: 0.0 3rd Qu.: 80.00 3rd Qu.:170.00 3rd Qu.:226.00   
## Max. :255.0 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel208 pixel209 pixel210 pixel211 pixel212   
## Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 85 Median :130.0 Median :152.0 Median :156.0 Median :149.0   
## Mean :113 Mean :126.3 Mean :133.6 Mean :135.5 Mean :132.9   
## 3rd Qu.:250 3rd Qu.:252.0 3rd Qu.:253.0 3rd Qu.:253.0 3rd Qu.:252.0   
## Max. :255 Max. :255.0 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel213 pixel214 pixel215 pixel216   
## Min. : 0 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median :130 Median : 84.0 Median : 14.00 Median : 0.00   
## Mean :126 Mean :112.7 Mean : 92.73 Mean : 68.89   
## 3rd Qu.:252 3rd Qu.:251.0 3rd Qu.:227.00 3rd Qu.:152.00   
## Max. :255 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel217 pixel218 pixel219 pixel220   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.000   
## Mean : 46.21 Mean : 27.63 Mean : 14.79 Mean : 6.777   
## 3rd Qu.: 31.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.000   
##   
## pixel221 pixel222 pixel223 pixel224   
## Min. : 0.000 Min. : 0.0000 Min. : 0.00000 Min. : 0.00000   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000   
## Median : 0.000 Median : 0.0000 Median : 0.00000 Median : 0.00000   
## Mean : 2.381 Mean : 0.4858 Mean : 0.02155 Mean : 0.00126   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000   
## Max. :255.000 Max. :255.0000 Max. :196.00000 Max. :53.00000   
##   
## pixel225 pixel226 pixel227 pixel228   
## Min. : 0.00000 Min. : 0.0000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00000 Median : 0.0000 Median : 0.000 Median : 0.000   
## Mean : 0.06662 Mean : 0.3836 Mean : 1.401 Mean : 3.971   
## 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00000 Max. :255.0000 Max. :255.000 Max. :255.000   
##   
## pixel229 pixel230 pixel231 pixel232   
## Min. : 0.000 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 8.704 Mean : 16.91 Mean : 29.64 Mean : 47.38   
## 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 36.00   
## Max. :255.000 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel233 pixel234 pixel235 pixel236   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 0.00 Median : 15.00 Median : 72.0 Median :113.0   
## Mean : 69.18 Mean : 92.12 Mean :110.2 Mean :120.6   
## 3rd Qu.:152.25 3rd Qu.:224.00 3rd Qu.:249.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.0   
##   
## pixel237 pixel238 pixel239 pixel240 pixel241   
## Min. : 0.0 Min. : 0.0 Min. : 0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median :124.0 Median :121.0 Median :117 Median :117.0 Median :115.0   
## Mean :123.9 Mean :123.2 Mean :122 Mean :122.2 Mean :121.8   
## 3rd Qu.:252.0 3rd Qu.:252.0 3rd Qu.:252 3rd Qu.:252.0 3rd Qu.:252.0   
## Max. :255.0 Max. :255.0 Max. :255 Max. :255.0 Max. :255.0   
##   
## pixel242 pixel243 pixel244 pixel245   
## Min. : 0.0 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 94.0 Median : 34.0 Median : 0.00 Median : 0.00   
## Mean :116.1 Mean :100.2 Mean : 76.63 Mean : 52.02   
## 3rd Qu.:252.0 3rd Qu.:240.0 3rd Qu.:188.00 3rd Qu.: 62.00   
## Max. :255.0 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel246 pixel247 pixel248 pixel249   
## Min. : 0.00 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.000 Median : 0.000   
## Mean : 31.16 Mean : 15.89 Mean : 6.913 Mean : 2.481   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.000 Max. :255.000   
##   
## pixel250 pixel251 pixel252 pixel253   
## Min. : 0.0000 Min. : 0.00000 Min. :0.00e+00 Min. : 0.00000   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.:0.00e+00 1st Qu.: 0.00000   
## Median : 0.0000 Median : 0.00000 Median :0.00e+00 Median : 0.00000   
## Mean : 0.4845 Mean : 0.01774 Mean :9.55e-03 Mean : 0.09826   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.:0.00e+00 3rd Qu.: 0.00000   
## Max. :254.0000 Max. :190.00000 Max. :1.84e+02 Max. :254.00000   
##   
## pixel254 pixel255 pixel256 pixel257   
## Min. : 0.0000 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.0000 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 0.5517 Mean : 1.805 Mean : 4.648 Mean : 9.881   
## 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.0000 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel258 pixel259 pixel260 pixel261   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 19.54 Mean : 34.52 Mean : 55.56 Mean : 79.87   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 79.00 3rd Qu.:196.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel262 pixel263 pixel264 pixel265 pixel266   
## Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 36 Median : 76.0 Median : 73.0 Median : 52.0 Median : 36.00   
## Mean :101 Mean :111.9 Mean :111.1 Mean :104.1 Mean : 98.53   
## 3rd Qu.:241 3rd Qu.:251.0 3rd Qu.:250.0 3rd Qu.:243.0 3rd Qu.:235.00   
## Max. :255 Max. :255.0 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel267 pixel268 pixel269 pixel270   
## Min. : 0.00 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 37.00 Median : 55.0 Median : 76.0 Median : 75.0   
## Mean : 98.87 Mean :103.9 Mean :110.7 Mean :111.3   
## 3rd Qu.:234.00 3rd Qu.:241.0 3rd Qu.:250.0 3rd Qu.:251.0   
## Max. :255.00 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel271 pixel272 pixel273 pixel274   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 30.00 Median : 0.00 Median : 0.0 Median : 0.00   
## Mean : 99.14 Mean : 76.66 Mean : 52.1 Mean : 30.89   
## 3rd Qu.:239.00 3rd Qu.:188.00 3rd Qu.: 60.0 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.00   
##   
## pixel275 pixel276 pixel277 pixel278   
## Min. : 0.00 Min. : 0.000 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 0.00 Median : 0.000 Median : 0.000 Median : 0.0000   
## Mean : 15.04 Mean : 5.851 Mean : 1.838 Mean : 0.3306   
## 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000   
## Max. :255.00 Max. :255.000 Max. :255.000 Max. :254.0000   
##   
## pixel279 pixel280 pixel281 pixel282   
## Min. : 0.00000 Min. : 0.00000 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median : 0.00000 Median : 0.00000 Median : 0.00000 Median : 0.0000   
## Mean : 0.03129 Mean : 0.01488 Mean : 0.09914 Mean : 0.5403   
## 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :220.00000 Max. :226.00000 Max. :255.00000 Max. :255.0000   
##   
## pixel283 pixel284 pixel285 pixel286   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.00   
## Mean : 1.709 Mean : 4.309 Mean : 9.806 Mean : 20.48   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.00   
##   
## pixel287 pixel288 pixel289 pixel290   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 37.5   
## Mean : 37.33 Mean : 60.88 Mean : 85.24 Mean :101.8   
## 3rd Qu.: 0.00 3rd Qu.:113.00 3rd Qu.:213.00 3rd Qu.:243.0   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.0   
##   
## pixel291 pixel292 pixel293 pixel294   
## Min. : 0.0 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 45.0 Median : 21.00 Median : 3.00 Median : 0.00   
## Mean :103.6 Mean : 93.18 Mean : 82.03 Mean : 78.92   
## 3rd Qu.:244.0 3rd Qu.:224.00 3rd Qu.:192.00 3rd Qu.:183.00   
## Max. :255.0 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel295 pixel296 pixel297 pixel298   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 3.00 Median : 25.00 Median : 54.0 Median : 60.0   
## Mean : 83.99 Mean : 93.76 Mean :104.5 Mean :106.5   
## 3rd Qu.:201.00 3rd Qu.:223.00 3rd Qu.:243.0 3rd Qu.:246.0   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.0   
##   
## pixel299 pixel300 pixel301 pixel302   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 14.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 94.19 Mean : 71.39 Mean : 47.89 Mean : 28.21   
## 3rd Qu.:232.00 3rd Qu.:165.00 3rd Qu.: 34.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel303 pixel304 pixel305 pixel306   
## Min. : 0.0 Min. : 0.000 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.0 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 0.0 Median : 0.000 Median : 0.000 Median : 0.0000   
## Mean : 13.5 Mean : 4.627 Mean : 1.157 Mean : 0.2201   
## 3rd Qu.: 0.0 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000   
## Max. :255.0 Max. :255.000 Max. :255.000 Max. :254.0000   
##   
## pixel307 pixel308 pixel309 pixel310   
## Min. : 0.00000 Min. :0.00e+00 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.: 0.00000 1st Qu.:0.00e+00 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median : 0.00000 Median :0.00e+00 Median : 0.00000 Median : 0.0000   
## Mean : 0.03067 Mean :6.33e-03 Mean : 0.06705 Mean : 0.4398   
## 3rd Qu.: 0.00000 3rd Qu.:0.00e+00 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :243.00000 Max. :1.50e+02 Max. :254.00000 Max. :255.0000   
##   
## pixel311 pixel312 pixel313 pixel314   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.00   
## Mean : 1.288 Mean : 3.567 Mean : 9.441 Mean : 21.09   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.00   
##   
## pixel315 pixel316 pixel317 pixel318   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 30.00   
## Mean : 40.07 Mean : 65.19 Mean : 88.65 Mean : 99.96   
## 3rd Qu.: 5.00 3rd Qu.:134.00 3rd Qu.:221.00 3rd Qu.:241.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel319 pixel320 pixel321 pixel322   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 20.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 94.94 Mean : 81.14 Mean : 72.99 Mean : 76.01   
## 3rd Qu.:230.00 3rd Qu.:192.00 3rd Qu.:160.00 3rd Qu.:178.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel323 pixel324 pixel325 pixel326 pixel327   
## Min. : 0.0 Min. : 0.00 Min. : 0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 2.0 Median : 37.00 Median : 66 Median : 57.0 Median : 1.0   
## Mean : 85.6 Mean : 97.82 Mean :108 Mean :105.7 Mean : 88.7   
## 3rd Qu.:211.0 3rd Qu.:232.00 3rd Qu.:245 3rd Qu.:246.0 3rd Qu.:222.0   
## Max. :255.0 Max. :255.00 Max. :255 Max. :255.0 Max. :255.0   
##   
## pixel328 pixel329 pixel330 pixel331   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 64.59 Mean : 42.46 Mean : 25.37 Mean : 12.66   
## 3rd Qu.:131.00 3rd Qu.: 10.00 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel332 pixel333 pixel334 pixel335   
## Min. : 0.00 Min. : 0.0000 Min. : 0.0000 Min. :0.00e+00   
## 1st Qu.: 0.00 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.:0.00e+00   
## Median : 0.00 Median : 0.0000 Median : 0.0000 Median :0.00e+00   
## Mean : 4.13 Mean : 0.6492 Mean : 0.1351 Mean :9.64e-03   
## 3rd Qu.: 0.00 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.:0.00e+00   
## Max. :255.00 Max. :255.0000 Max. :253.0000 Max. :1.12e+02   
##   
## pixel336 pixel337 pixel338 pixel339   
## Min. :0.00e+00 Min. : 0.00000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.:0.00e+00 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median :0.00e+00 Median : 0.00000 Median : 0.0000 Median : 0.0000   
## Mean :3.88e-03 Mean : 0.03502 Mean : 0.2666 Mean : 0.8958   
## 3rd Qu.:0.00e+00 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :1.63e+02 Max. :255.00000 Max. :255.0000 Max. :255.0000   
##   
## pixel340 pixel341 pixel342 pixel343   
## Min. : 0.000 Min. : 0.000 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.00 Median : 0.00   
## Mean : 2.978 Mean : 9.557 Mean : 22.85 Mean : 44.02   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 17.25   
## Max. :255.000 Max. :255.000 Max. :255.00 Max. :255.00   
##   
## pixel344 pixel345 pixel346 pixel347   
## Min. : 0.0 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.0 Median : 1.00 Median : 26.00 Median : 9.00   
## Mean : 69.6 Mean : 91.09 Mean : 98.91 Mean : 91.42   
## 3rd Qu.:158.0 3rd Qu.:229.00 3rd Qu.:240.00 3rd Qu.:225.00   
## Max. :255.0 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel348 pixel349 pixel350 pixel351   
## Min. : 0.00 Min. : 0.0 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 0.0 Median : 0.00 Median : 39.0   
## Mean : 79.76 Mean : 79.7 Mean : 89.51 Mean :102.1   
## 3rd Qu.:190.00 3rd Qu.:188.0 3rd Qu.:228.00 3rd Qu.:247.0   
## Max. :255.00 Max. :255.0 Max. :255.00 Max. :255.0   
##   
## pixel352 pixel353 pixel354 pixel355   
## Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 89.0 Median :103.0 Median : 62.0 Median : 0.00   
## Mean :113.9 Mean :118.5 Mean :107.8 Mean : 84.27   
## 3rd Qu.:250.0 3rd Qu.:252.0 3rd Qu.:249.0 3rd Qu.:207.00   
## Max. :255.0 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel356 pixel357 pixel358 pixel359   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 58.37 Mean : 38.36 Mean : 23.99 Mean : 12.95   
## 3rd Qu.: 99.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel360 pixel361 pixel362 pixel363   
## Min. : 0.000 Min. : 0.0000 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median : 0.000 Median : 0.0000 Median : 0.00000 Median : 0.0000   
## Mean : 4.459 Mean : 0.4759 Mean : 0.07445 Mean : 0.0109   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :255.000 Max. :255.0000 Max. :252.00000 Max. :110.0000   
##   
## pixel364 pixel365 pixel366 pixel367   
## Min. :0.0e+00 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.:0.0e+00 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median :0.0e+00 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean :7.6e-04 Mean : 0.0135 Mean : 0.1292 Mean : 0.6131   
## 3rd Qu.:0.0e+00 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :3.2e+01 Max. :253.0000 Max. :255.0000 Max. :255.0000   
##   
## pixel368 pixel369 pixel370 pixel371   
## Min. : 0.000 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 0.000 Median : 0.0 Median : 0.0 Median : 0.00   
## Mean : 2.815 Mean : 10.7 Mean : 25.7 Mean : 47.93   
## 3rd Qu.: 0.000 3rd Qu.: 0.0 3rd Qu.: 0.0 3rd Qu.: 34.00   
## Max. :255.000 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel372 pixel373 pixel374 pixel375   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 2.00 Median : 21.00 Median : 9.00   
## Mean : 72.83 Mean : 91.76 Mean : 97.15 Mean : 91.12   
## 3rd Qu.:173.00 3rd Qu.:230.00 3rd Qu.:237.00 3rd Qu.:226.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel376 pixel377 pixel378 pixel379   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 6.00 Median : 29.00 Median : 64.0 Median :124.0   
## Mean : 86.84 Mean : 96.88 Mean :111.5 Mean :124.5   
## 3rd Qu.:213.00 3rd Qu.:232.00 3rd Qu.:252.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.0   
##   
## pixel380 pixel381 pixel382 pixel383   
## Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median :144.0 Median :135.0 Median : 64.0 Median : 0.00   
## Mean :130.7 Mean :127.5 Mean :109.5 Mean : 81.27   
## 3rd Qu.:252.0 3rd Qu.:252.0 3rd Qu.:251.0 3rd Qu.:194.00   
## Max. :255.0 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel384 pixel385 pixel386 pixel387   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.0   
## Mean : 55.37 Mean : 37.48 Mean : 24.29 Mean : 13.9   
## 3rd Qu.: 82.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.0   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.0   
##   
## pixel388 pixel389 pixel390 pixel391   
## Min. : 0.000 Min. : 0.000 Min. : 0.00000 Min. : 0.00000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00000 1st Qu.: 0.00000   
## Median : 0.000 Median : 0.000 Median : 0.00000 Median : 0.00000   
## Mean : 5.257 Mean : 0.616 Mean : 0.07252 Mean : 0.01288   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00000 3rd Qu.: 0.00000   
## Max. :255.000 Max. :255.000 Max. :252.00000 Max. :247.00000   
##   
## pixel392 pixel393 pixel394 pixel395   
## Min. :0 Min. : 0.000 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.:0 1st Qu.: 0.000 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median :0 Median : 0.000 Median : 0.00000 Median : 0.0000   
## Mean :0 Mean : 0.005 Mean : 0.05248 Mean : 0.4321   
## 3rd Qu.:0 3rd Qu.: 0.000 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :0 Max. :188.000 Max. :254.00000 Max. :255.0000   
##   
## pixel396 pixel397 pixel398 pixel399   
## Min. : 0.000 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 2.936 Mean : 12.36 Mean : 28.52 Mean : 50.57   
## 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 48.00   
## Max. :255.000 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel400 pixel401 pixel402 pixel403   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 15.00 Median : 16.00   
## Mean : 73.58 Mean : 89.73 Mean : 94.56 Mean : 92.68   
## 3rd Qu.:180.00 3rd Qu.:228.00 3rd Qu.:233.00 3rd Qu.:226.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel404 pixel405 pixel406 pixel407 pixel408   
## Min. : 0.00 Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 35.00 Median : 92 Median :144.0 Median :173.0 Median :164.0   
## Mean : 97.16 Mean :115 Mean :130.1 Mean :139.8 Mean :137.4   
## 3rd Qu.:231.00 3rd Qu.:252 3rd Qu.:253.0 3rd Qu.:253.0 3rd Qu.:253.0   
## Max. :255.00 Max. :255 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel409 pixel410 pixel411 pixel412   
## Min. : 0.0 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median :141.0 Median : 60.0 Median : 0.00 Median : 0.00   
## Mean :128.7 Mean :107.7 Mean : 79.75 Mean : 56.31   
## 3rd Qu.:252.0 3rd Qu.:250.0 3rd Qu.:191.00 3rd Qu.: 86.00   
## Max. :255.0 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel413 pixel414 pixel415 pixel416   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.000   
## Mean : 39.24 Mean : 25.75 Mean : 14.86 Mean : 5.844   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.000   
##   
## pixel417 pixel418 pixel419 pixel420  
## Min. : 0.0000 Min. : 0.00000 Min. : 0.00000 Min. :0   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.:0   
## Median : 0.0000 Median : 0.00000 Median : 0.00000 Median :0   
## Mean : 0.8296 Mean : 0.07433 Mean : 0.00193 Mean :0   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.:0   
## Max. :255.0000 Max. :209.00000 Max. :51.00000 Max. :0   
##   
## pixel421 pixel422 pixel423 pixel424   
## Min. :0 Min. : 0.00000 Min. : 0.0000 Min. : 0.000   
## 1st Qu.:0 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.000   
## Median :0 Median : 0.00000 Median : 0.0000 Median : 0.000   
## Mean :0 Mean : 0.03567 Mean : 0.4788 Mean : 3.477   
## 3rd Qu.:0 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.000   
## Max. :0 Max. :254.00000 Max. :255.0000 Max. :255.000   
##   
## pixel425 pixel426 pixel427 pixel428   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.0   
## Mean : 14.31 Mean : 30.78 Mean : 51.02 Mean : 71.1   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 48.00 3rd Qu.:169.0   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.0   
##   
## pixel429 pixel430 pixel431 pixel432   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 7.00 Median : 19.00 Median : 56.0   
## Mean : 85.14 Mean : 90.78 Mean : 93.73 Mean :104.6   
## 3rd Qu.:216.00 3rd Qu.:224.00 3rd Qu.:227.00 3rd Qu.:242.0   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.0   
##   
## pixel433 pixel434 pixel435 pixel436 pixel437   
## Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0 1st Qu.: 0.0   
## Median :121.0 Median :167.0 Median :170.0 Median :149 Median :116.0   
## Mean :123.1 Mean :135.5 Mean :139.1 Mean :132 Mean :121.7   
## 3rd Qu.:252.0 3rd Qu.:253.0 3rd Qu.:253.0 3rd Qu.:253 3rd Qu.:252.0   
## Max. :255.0 Max. :255.0 Max. :255.0 Max. :255 Max. :255.0   
##   
## pixel438 pixel439 pixel440 pixel441   
## Min. : 0.0 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 42.0 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean :101.9 Mean : 78.86 Mean : 58.85 Mean : 41.73   
## 3rd Qu.:241.0 3rd Qu.:191.00 3rd Qu.:103.00 3rd Qu.: 2.00   
## Max. :255.0 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel442 pixel443 pixel444 pixel445   
## Min. : 0.00 Min. : 0.0 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.0 Median : 0.000 Median : 0.000   
## Mean : 27.17 Mean : 15.1 Mean : 5.895 Mean : 1.058   
## 3rd Qu.: 0.00 3rd Qu.: 0.0 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.0 Max. :255.000 Max. :255.000   
##   
## pixel446 pixel447 pixel448 pixel449   
## Min. : 0.0000 Min. : 0.00000 Min. :0 Min. : 0.00000   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.:0 1st Qu.: 0.00000   
## Median : 0.0000 Median : 0.00000 Median :0 Median : 0.00000   
## Mean : 0.1438 Mean : 0.01098 Mean :0 Mean : 0.00188   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.:0 3rd Qu.: 0.00000   
## Max. :255.0000 Max. :190.00000 Max. :0 Max. :47.00000   
##   
## pixel450 pixel451 pixel452 pixel453   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.0000 Median : 0.0000 Median : 0.000 Median : 0.00   
## Mean : 0.0666 Mean : 0.6474 Mean : 4.449 Mean : 16.35   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :254.0000 Max. :255.0000 Max. :255.000 Max. :255.00   
##   
## pixel454 pixel455 pixel456 pixel457   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 0.00 Median : 0.00 Median : 0.0 Median : 0.0   
## Mean : 32.25 Mean : 49.76 Mean : 66.2 Mean : 77.7   
## 3rd Qu.: 0.00 3rd Qu.: 40.00 3rd Qu.:140.0 3rd Qu.:192.0   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.0   
##   
## pixel458 pixel459 pixel460 pixel461   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 0.00 Median : 7.00 Median : 39.0 Median : 87.0   
## Mean : 83.55 Mean : 88.88 Mean :100.5 Mean :115.4   
## 3rd Qu.:206.00 3rd Qu.:218.00 3rd Qu.:240.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.0   
##   
## pixel462 pixel463 pixel464 pixel465 pixel466   
## Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median :129 Median :133.0 Median :111.0 Median : 75.0 Median : 27.00   
## Mean :126 Mean :127.5 Mean :121.3 Mean :111.4 Mean : 95.93   
## 3rd Qu.:253 3rd Qu.:253.0 3rd Qu.:252.0 3rd Qu.:251.0 3rd Qu.:229.00   
## Max. :255 Max. :255.0 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel467 pixel468 pixel469 pixel470   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 78.36 Mean : 60.52 Mean : 42.63 Mean : 27.05   
## 3rd Qu.:191.00 3rd Qu.:113.00 3rd Qu.: 6.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel471 pixel472 pixel473 pixel474   
## Min. : 0.00 Min. : 0.00 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 0.00 Median : 0.00 Median : 0.000 Median : 0.0000   
## Mean : 14.34 Mean : 5.59 Mean : 1.243 Mean : 0.1886   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.0000   
## Max. :255.00 Max. :255.00 Max. :255.000 Max. :254.0000   
##   
## pixel475 pixel476 pixel477 pixel478   
## Min. : 0.00000 Min. :0 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.: 0.00000 1st Qu.:0 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median : 0.00000 Median :0 Median : 0.00000 Median : 0.0000   
## Mean : 0.02012 Mean :0 Mean : 0.00371 Mean : 0.1051   
## 3rd Qu.: 0.00000 3rd Qu.:0 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :223.00000 Max. :0 Max. :71.00000 Max. :254.0000   
##   
## pixel479 pixel480 pixel481 pixel482   
## Min. : 0.0000 Min. : 0.000 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.0000 Median : 0.000 Median : 0.00 Median : 0.00   
## Mean : 0.9673 Mean : 5.888 Mean : 18.16 Mean : 33.28   
## 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.0000 Max. :255.000 Max. :255.00 Max. :255.00   
##   
## pixel483 pixel484 pixel485 pixel486   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.0 Median : 0.00   
## Mean : 48.02 Mean : 60.62 Mean : 69.4 Mean : 74.59   
## 3rd Qu.: 32.00 3rd Qu.:110.00 3rd Qu.:156.0 3rd Qu.:177.00   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.00   
##   
## pixel487 pixel488 pixel489 pixel490   
## Min. : 0.00 Min. : 0.00 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 0.00 Median : 0.00 Median : 35.0 Median : 76.0   
## Mean : 80.26 Mean : 88.92 Mean :101.2 Mean :112.1   
## 3rd Qu.:196.00 3rd Qu.:226.00 3rd Qu.:245.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255.00 Max. :255.0 Max. :255.0   
##   
## pixel491 pixel492 pixel493 pixel494   
## Min. : 0.0 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 88.0 Median : 81.0 Median : 56.0 Median : 18.00   
## Mean :115.4 Mean :112.6 Mean :105.2 Mean : 93.53   
## 3rd Qu.:252.0 3rd Qu.:252.0 3rd Qu.:244.0 3rd Qu.:227.00   
## Max. :255.0 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel495 pixel496 pixel497 pixel498   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 78.66 Mean : 60.41 Mean : 41.52 Mean : 25.25   
## 3rd Qu.:194.00 3rd Qu.:113.00 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel499 pixel500 pixel501 pixel502   
## Min. : 0.00 Min. : 0.000 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 0.00 Median : 0.000 Median : 0.000 Median : 0.0000   
## Mean : 12.82 Mean : 5.052 Mean : 1.328 Mean : 0.2043   
## 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000   
## Max. :255.00 Max. :255.000 Max. :255.000 Max. :253.0000   
##   
## pixel503 pixel504 pixel505 pixel506   
## Min. : 0.0000 Min. : 0.00000 Min. :0.00e+00 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.:0.00e+00 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.00000 Median :0.00e+00 Median : 0.0000   
## Mean : 0.0181 Mean : 0.00264 Mean :5.33e-03 Mean : 0.1716   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.:0.00e+00 3rd Qu.: 0.0000   
## Max. :121.0000 Max. :60.00000 Max. :1.26e+02 Max. :255.0000   
##   
## pixel507 pixel508 pixel509 pixel510   
## Min. : 0.000 Min. : 0.000 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.00 Median : 0.00   
## Mean : 1.509 Mean : 7.523 Mean : 20.15 Mean : 34.72   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.00 Max. :255.00   
##   
## pixel511 pixel512 pixel513 pixel514   
## Min. : 0.0 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.0 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 48.3 Mean : 58.56 Mean : 65.86 Mean : 71.46   
## 3rd Qu.: 32.0 3rd Qu.: 98.00 3rd Qu.:137.00 3rd Qu.:168.00   
## Max. :255.0 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel515 pixel516 pixel517 pixel518   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 0.00 Median : 16.00 Median : 54.0   
## Mean : 76.27 Mean : 82.62 Mean : 94.35 Mean :106.1   
## 3rd Qu.:189.00 3rd Qu.:206.00 3rd Qu.:232.00 3rd Qu.:250.0   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.0   
##   
## pixel519 pixel520 pixel521 pixel522 pixel523   
## Min. : 0.0 Min. : 0.0 Min. : 0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 80.0 Median : 81.0 Median : 58 Median : 15.0 Median : 0.0   
## Mean :112.6 Mean :112.2 Mean :106 Mean : 94.6 Mean : 78.1   
## 3rd Qu.:252.0 3rd Qu.:250.0 3rd Qu.:244 3rd Qu.:232.0 3rd Qu.:194.2   
## Max. :255.0 Max. :255.0 Max. :255 Max. :255.0 Max. :255.0   
##   
## pixel524 pixel525 pixel526 pixel527   
## Min. : 0.00 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.0 Median : 0.00 Median : 0.00   
## Mean : 57.81 Mean : 38.4 Mean : 22.68 Mean : 11.29   
## 3rd Qu.: 94.00 3rd Qu.: 0.0 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel528 pixel529 pixel530 pixel531   
## Min. : 0.000 Min. : 0.000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.000 Median : 0.000 Median : 0.0000 Median : 0.0000   
## Mean : 4.453 Mean : 1.246 Mean : 0.1621 Mean : 0.0111   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.000 Max. :255.000 Max. :255.0000 Max. :151.0000   
##   
## pixel532 pixel533 pixel534 pixel535   
## Min. :0 Min. : 0.0000 Min. : 0.0000 Min. : 0.000   
## 1st Qu.:0 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.000   
## Median :0 Median : 0.0000 Median : 0.0000 Median : 0.000   
## Mean :0 Mean : 0.0096 Mean : 0.2757 Mean : 2.037   
## 3rd Qu.:0 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.000   
## Max. :0 Max. :255.0000 Max. :255.0000 Max. :255.000   
##   
## pixel536 pixel537 pixel538 pixel539   
## Min. : 0.000 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 8.624 Mean : 21.59 Mean : 36.88 Mean : 51.12   
## 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 48.00   
## Max. :255.000 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel540 pixel541 pixel542 pixel543   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 62.61 Mean : 71.28 Mean : 77.61 Mean : 82.16   
## 3rd Qu.:124.00 3rd Qu.:168.00 3rd Qu.:192.00 3rd Qu.:209.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel544 pixel545 pixel546 pixel547   
## Min. : 0.00 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 3.00 Median : 36.0 Median : 77.0 Median :103.0   
## Mean : 89.26 Mean :100.3 Mean :112.4 Mean :118.6   
## 3rd Qu.:226.00 3rd Qu.:242.0 3rd Qu.:252.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel548 pixel549 pixel550 pixel551   
## Min. : 0.0 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median :100.0 Median : 64.0 Median : 10.00 Median : 0.00   
## Mean :117.2 Mean :108.7 Mean : 93.43 Mean : 73.22   
## 3rd Qu.:252.0 3rd Qu.:249.0 3rd Qu.:232.00 3rd Qu.:174.00   
## Max. :255.0 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel552 pixel553 pixel554 pixel555   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 51.85 Mean : 33.29 Mean : 18.95 Mean : 9.13   
## 3rd Qu.: 57.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel556 pixel557 pixel558 pixel559   
## Min. : 0.000 Min. : 0.000 Min. : 0.0000 Min. :0.00e+00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.:0.00e+00   
## Median : 0.000 Median : 0.000 Median : 0.0000 Median :0.00e+00   
## Mean : 3.536 Mean : 1.026 Mean : 0.1598 Mean :5.43e-03   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.:0.00e+00   
## Max. :255.000 Max. :255.000 Max. :253.0000 Max. :1.28e+02   
##   
## pixel560 pixel561 pixel562 pixel563   
## Min. :0 Min. :0.00e+00 Min. : 0.0000 Min. : 0.000   
## 1st Qu.:0 1st Qu.:0.00e+00 1st Qu.: 0.0000 1st Qu.: 0.000   
## Median :0 Median :0.00e+00 Median : 0.0000 Median : 0.000   
## Mean :0 Mean :9.17e-03 Mean : 0.3236 Mean : 2.294   
## 3rd Qu.:0 3rd Qu.:0.00e+00 3rd Qu.: 0.0000 3rd Qu.: 0.000   
## Max. :0 Max. :1.78e+02 Max. :255.0000 Max. :255.000   
##   
## pixel564 pixel565 pixel566 pixel567   
## Min. : 0.000 Min. : 0.00 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 0.000 Median : 0.00 Median : 0.0 Median : 0.00   
## Mean : 8.577 Mean : 20.66 Mean : 36.9 Mean : 53.74   
## 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.0 3rd Qu.: 64.00   
## Max. :255.000 Max. :255.00 Max. :255.0 Max. :255.00   
##   
## pixel568 pixel569 pixel570 pixel571   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 22.00   
## Mean : 68.99 Mean : 81.35 Mean : 90.21 Mean : 97.62   
## 3rd Qu.:159.00 3rd Qu.:207.00 3rd Qu.:229.00 3rd Qu.:241.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel572 pixel573 pixel574 pixel575 pixel576   
## Min. : 0.0 Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 56.0 Median : 96 Median :128.0 Median :129.0 Median :109.0   
## Mean :106.2 Mean :117 Mean :125.6 Mean :126.7 Mean :119.7   
## 3rd Qu.:250.0 3rd Qu.:252 3rd Qu.:252.0 3rd Qu.:253.0 3rd Qu.:252.0   
## Max. :255.0 Max. :255 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel577 pixel578 pixel579 pixel580   
## Min. : 0.0 Min. : 0.00 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00   
## Median : 53.0 Median : 0.00 Median : 0.0 Median : 0.00   
## Mean :105.3 Mean : 85.09 Mean : 62.3 Mean : 41.47   
## 3rd Qu.:246.0 3rd Qu.:213.00 3rd Qu.:122.0 3rd Qu.: 5.00   
## Max. :255.0 Max. :255.00 Max. :255.0 Max. :255.00   
##   
## pixel581 pixel582 pixel583 pixel584   
## Min. : 0.00 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.000 Median : 0.000   
## Mean : 25.23 Mean : 13.66 Mean : 6.501 Mean : 2.634   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.000 Max. :255.000   
##   
## pixel585 pixel586 pixel587 pixel588   
## Min. : 0.000 Min. : 0.0000 Min. : 0.00000 Min. :0.0e+00   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.:0.0e+00   
## Median : 0.000 Median : 0.0000 Median : 0.00000 Median :0.0e+00   
## Mean : 0.755 Mean : 0.1042 Mean : 0.00119 Mean :7.6e-04   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.:0.0e+00   
## Max. :255.000 Max. :255.0000 Max. :50.00000 Max. :3.2e+01   
##   
## pixel589 pixel590 pixel591 pixel592   
## Min. :0.00e+00 Min. : 0.0000 Min. : 0.000 Min. : 0.000   
## 1st Qu.:0.00e+00 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median :0.00e+00 Median : 0.0000 Median : 0.000 Median : 0.000   
## Mean :7.07e-03 Mean : 0.2723 Mean : 1.907 Mean : 6.756   
## 3rd Qu.:0.00e+00 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :1.07e+02 Max. :255.0000 Max. :255.000 Max. :255.000   
##   
## pixel593 pixel594 pixel595 pixel596   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 16.95 Mean : 32.56 Mean : 51.39 Mean : 70.45   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 50.00 3rd Qu.:169.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel597 pixel598 pixel599 pixel600 pixel601   
## Min. : 0.00 Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 0.00 Median : 32 Median : 82.0 Median :117.0 Median :144.0   
## Mean : 87.45 Mean :101 Mean :112.4 Mean :122.6 Mean :130.8   
## 3rd Qu.:226.00 3rd Qu.:246 3rd Qu.:252.0 3rd Qu.:252.0 3rd Qu.:252.0   
## Max. :255.00 Max. :255 Max. :255.0 Max. :255.0 Max. :255.0   
##   
## pixel602 pixel603 pixel604 pixel605   
## Min. : 0 Min. : 0.0 Min. : 0.0 Min. : 0.00   
## 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.00   
## Median :151 Median :130.0 Median : 81.0 Median : 10.00   
## Mean :133 Mean :126.3 Mean :111.6 Mean : 90.95   
## 3rd Qu.:253 3rd Qu.:252.0 3rd Qu.:250.0 3rd Qu.:222.25   
## Max. :255 Max. :255.0 Max. :255.0 Max. :255.00   
##   
## pixel606 pixel607 pixel608 pixel609   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 67.71 Mean : 46.19 Mean : 28.82 Mean : 16.23   
## 3rd Qu.:145.00 3rd Qu.: 28.00 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel610 pixel611 pixel612 pixel613   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.0000   
## Mean : 8.397 Mean : 4.122 Mean : 1.635 Mean : 0.4292   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.0000   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.0000   
##   
## pixel614 pixel615 pixel616 pixel617   
## Min. : 0.00000 Min. :0.0e+00 Min. :0.00e+00 Min. :0.00e+00   
## 1st Qu.: 0.00000 1st Qu.:0.0e+00 1st Qu.:0.00e+00 1st Qu.:0.00e+00   
## Median : 0.00000 Median :0.0e+00 Median :0.00e+00 Median :0.00e+00   
## Mean : 0.06571 Mean :9.3e-04 Mean :7.38e-04 Mean :3.33e-04   
## 3rd Qu.: 0.00000 3rd Qu.:0.0e+00 3rd Qu.:0.00e+00 3rd Qu.:0.00e+00   
## Max. :251.00000 Max. :3.9e+01 Max. :3.10e+01 Max. :1.00e+01   
##   
## pixel618 pixel619 pixel620 pixel621   
## Min. : 0.0000 Min. : 0.000 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.0000 Median : 0.000 Median : 0.00 Median : 0.00   
## Mean : 0.1705 Mean : 1.158 Mean : 4.03 Mean : 10.91   
## 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.0000 Max. :255.000 Max. :255.00 Max. :255.00   
##   
## pixel622 pixel623 pixel624 pixel625   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 23.26 Mean : 40.24 Mean : 60.69 Mean : 80.79   
## 3rd Qu.: 0.00 3rd Qu.: 2.00 3rd Qu.:114.00 3rd Qu.:208.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel626 pixel627 pixel628 pixel629 pixel630   
## Min. : 0.00 Min. : 0 Min. : 0.0 Min. : 0 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0 1st Qu.: 0.0 1st Qu.: 0 1st Qu.: 0.0   
## Median : 17.00 Median : 79 Median :121.0 Median :130 Median :118.0   
## Mean : 98.92 Mean :113 Mean :122.7 Mean :126 Mean :121.9   
## 3rd Qu.:245.00 3rd Qu.:252 3rd Qu.:252.0 3rd Qu.:252 3rd Qu.:252.0   
## Max. :255.00 Max. :255 Max. :255.0 Max. :255 Max. :255.0   
##   
## pixel631 pixel632 pixel633 pixel634   
## Min. : 0.0 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 65.0 Median : 4.00 Median : 0.00 Median : 0.00   
## Mean :108.5 Mean : 89.06 Mean : 66.84 Mean : 45.73   
## 3rd Qu.:250.0 3rd Qu.:218.00 3rd Qu.:142.00 3rd Qu.: 30.00   
## Max. :255.0 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel635 pixel636 pixel637 pixel638   
## Min. : 0.00 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.000 Median : 0.000   
## Mean : 28.86 Mean : 16.69 Mean : 8.914 Mean : 4.548   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.000 Max. :255.000   
##   
## pixel639 pixel640 pixel641 pixel642   
## Min. : 0.000 Min. : 0.0000 Min. : 0.0000 Min. : 0.00000   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.00000   
## Median : 0.000 Median : 0.0000 Median : 0.0000 Median : 0.00000   
## Mean : 2.102 Mean : 0.7971 Mean : 0.2019 Mean : 0.02333   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.00000   
## Max. :255.000 Max. :255.0000 Max. :253.0000 Max. :225.00000   
##   
## pixel643 pixel644 pixel645 pixel646   
## Min. : 0.00000 Min. :0 Min. :0 Min. : 0.00000   
## 1st Qu.: 0.00000 1st Qu.:0 1st Qu.:0 1st Qu.: 0.00000   
## Median : 0.00000 Median :0 Median :0 Median : 0.00000   
## Mean : 0.00171 Mean :0 Mean :0 Mean : 0.06069   
## 3rd Qu.: 0.00000 3rd Qu.:0 3rd Qu.:0 3rd Qu.: 0.00000   
## Max. :72.00000 Max. :0 Max. :0 Max. :217.00000   
##   
## pixel647 pixel648 pixel649 pixel650   
## Min. : 0.0000 Min. : 0.000 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00   
## Median : 0.0000 Median : 0.000 Median : 0.000 Median : 0.00   
## Mean : 0.4729 Mean : 1.809 Mean : 5.026 Mean : 12.01   
## 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00   
## Max. :255.0000 Max. :255.000 Max. :255.000 Max. :255.00   
##   
## pixel651 pixel652 pixel653 pixel654   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 23.71 Mean : 39.84 Mean : 58.29 Mean : 76.57   
## 3rd Qu.: 0.00 3rd Qu.: 5.00 3rd Qu.:104.00 3rd Qu.:184.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel655 pixel656 pixel657 pixel658   
## Min. : 0.00 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 27.0 Median : 30.00 Median : 6.00   
## Mean : 91.62 Mean : 99.9 Mean : 99.82 Mean : 91.57   
## 3rd Qu.:228.00 3rd Qu.:241.0 3rd Qu.:240.00 3rd Qu.:222.00   
## Max. :255.00 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel659 pixel660 pixel661 pixel662   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 76.47 Mean : 58.16 Mean : 40.59 Mean : 25.69   
## 3rd Qu.:178.00 3rd Qu.:103.00 3rd Qu.: 12.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel663 pixel664 pixel665 pixel666   
## Min. : 0.00 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 15.21 Mean : 8.414 Mean : 4.275 Mean : 2.105   
## 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel667 pixel668 pixel669 pixel670   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.00000 Min. : 0.00000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000   
## Median : 0.0000 Median : 0.0000 Median : 0.00000 Median : 0.00000   
## Mean : 0.9506 Mean : 0.3095 Mean : 0.06471 Mean : 0.01238   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000   
## Max. :255.0000 Max. :255.0000 Max. :241.00000 Max. :150.00000   
##   
## pixel671 pixel672 pixel673 pixel674 pixel675   
## Min. :0 Min. :0 Min. :0 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median :0 Median :0 Median :0 Median : 0.00000 Median : 0.0000   
## Mean :0 Mean :0 Mean :0 Mean : 0.01805 Mean : 0.1389   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :0 Max. :0 Max. :0 Max. :253.00000 Max. :253.0000   
##   
## pixel676 pixel677 pixel678 pixel679   
## Min. : 0.0000 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.0000 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 0.5567 Mean : 1.637 Mean : 4.152 Mean : 8.925   
## 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.0000 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel680 pixel681 pixel682 pixel683   
## Min. : 0.00 Min. : 0.0 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.0   
## Median : 0.00 Median : 0.0 Median : 0.00 Median : 0.0   
## Mean : 16.42 Mean : 26.4 Mean : 37.14 Mean : 46.2   
## 3rd Qu.: 0.00 3rd Qu.: 0.0 3rd Qu.: 0.00 3rd Qu.: 25.0   
## Max. :255.00 Max. :255.0 Max. :255.00 Max. :255.0   
##   
## pixel684 pixel685 pixel686 pixel687   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.00   
## Mean : 51.24 Mean : 51.04 Mean : 45.93 Mean : 37.29   
## 3rd Qu.: 64.00 3rd Qu.: 63.00 3rd Qu.: 31.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.00   
##   
## pixel688 pixel689 pixel690 pixel691   
## Min. : 0.00 Min. : 0.00 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.00 1st Qu.: 0.000   
## Median : 0.00 Median : 0.00 Median : 0.00 Median : 0.000   
## Mean : 28.02 Mean : 19.44 Mean : 12.16 Mean : 7.313   
## 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.00 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.00 Max. :255.00 Max. :255.000   
##   
## pixel692 pixel693 pixel694 pixel695   
## Min. : 0 Min. : 0.000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0 Median : 0.000 Median : 0.0000 Median : 0.0000   
## Mean : 4 Mean : 1.992 Mean : 0.9327 Mean : 0.4042   
## 3rd Qu.: 0 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255 Max. :255.000 Max. :255.0000 Max. :255.0000   
##   
## pixel696 pixel697 pixel698 pixel699  
## Min. : 0.0000 Min. : 0.00000 Min. : 0.00000 Min. :0   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.:0   
## Median : 0.0000 Median : 0.00000 Median : 0.00000 Median :0   
## Mean : 0.1003 Mean : 0.02307 Mean : 0.00276 Mean :0   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.:0   
## Max. :254.0000 Max. :241.00000 Max. :98.00000 Max. :0   
##   
## pixel700 pixel701 pixel702 pixel703   
## Min. :0 Min. :0 Min. : 0.00000 Min. : 0.0000   
## 1st Qu.:0 1st Qu.:0 1st Qu.: 0.00000 1st Qu.: 0.0000   
## Median :0 Median :0 Median : 0.00000 Median : 0.0000   
## Mean :0 Mean :0 Mean : 0.00224 Mean : 0.0209   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.: 0.00000 3rd Qu.: 0.0000   
## Max. :0 Max. :0 Max. :42.00000 Max. :254.0000   
##   
## pixel704 pixel705 pixel706 pixel707   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.0000 Median : 0.0000 Median : 0.000 Median : 0.000   
## Mean : 0.1489 Mean : 0.4729 Mean : 1.306 Mean : 2.991   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.0000 Max. :255.0000 Max. :255.000 Max. :255.000   
##   
## pixel708 pixel709 pixel710 pixel711   
## Min. : 0.000 Min. : 0.000 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.000 Median : 0.000 Median : 0.00 Median : 0.00   
## Mean : 5.843 Mean : 9.439 Mean : 13.48 Mean : 16.56   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.000 Max. :255.000 Max. :255.00 Max. :255.00   
##   
## pixel712 pixel713 pixel714 pixel715   
## Min. : 0.00 Min. : 0.0 Min. : 0.00 Min. : 0.00   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.: 0.00 1st Qu.: 0.00   
## Median : 0.00 Median : 0.0 Median : 0.00 Median : 0.00   
## Mean : 18.13 Mean : 17.9 Mean : 16.11 Mean : 13.64   
## 3rd Qu.: 0.00 3rd Qu.: 0.0 3rd Qu.: 0.00 3rd Qu.: 0.00   
## Max. :255.00 Max. :255.0 Max. :255.00 Max. :255.00   
##   
## pixel716 pixel717 pixel718 pixel719   
## Min. : 0.00 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.00 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 10.89 Mean : 8.055 Mean : 5.334 Mean : 3.186   
## 3rd Qu.: 0.00 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.00 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel720 pixel721 pixel722 pixel723   
## Min. : 0.000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 1.721 Mean : 0.8351 Mean : 0.3787 Mean : 0.1461   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.000 Max. :255.0000 Max. :255.0000 Max. :255.0000   
##   
## pixel724 pixel725 pixel726 pixel727  
## Min. : 0.0000 Min. : 0.0000 Min. :0.00e+00 Min. :0   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.:0.00e+00 1st Qu.:0   
## Median : 0.0000 Median : 0.0000 Median :0.00e+00 Median :0   
## Mean : 0.0244 Mean : 0.0051 Mean :2.48e-03 Mean :0   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.:0.00e+00 3rd Qu.:0   
## Max. :196.0000 Max. :127.0000 Max. :1.04e+02 Max. :0   
##   
## pixel728 pixel729 pixel730 pixel731 pixel732   
## Min. :0 Min. :0 Min. :0 Min. :0 Min. : 0.00000   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.: 0.00000   
## Median :0 Median :0 Median :0 Median :0 Median : 0.00000   
## Mean :0 Mean :0 Mean :0 Mean :0 Mean : 0.03505   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.: 0.00000   
## Max. :0 Max. :0 Max. :0 Max. :0 Max. :255.00000   
##   
## pixel733 pixel734 pixel735 pixel736   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.0000 Median : 0.0000 Median : 0.000 Median : 0.000   
## Mean : 0.1397 Mean : 0.5031 Mean : 1.146 Mean : 2.162   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.0000 Max. :255.0000 Max. :255.000 Max. :255.000   
##   
## pixel737 pixel738 pixel739 pixel740   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 3.243 Mean : 4.637 Mean : 5.979 Mean : 6.605   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel741 pixel742 pixel743 pixel744   
## Min. : 0.000 Min. : 0.000 Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.000   
## Median : 0.000 Median : 0.000 Median : 0.000 Median : 0.000   
## Mean : 6.444 Mean : 5.681 Mean : 4.657 Mean : 3.773   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :255.000 Max. :255.000 Max. :255.000 Max. :255.000   
##   
## pixel745 pixel746 pixel747 pixel748   
## Min. : 0.000 Min. : 0.000 Min. : 0.00 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.0000   
## Median : 0.000 Median : 0.000 Median : 0.00 Median : 0.0000   
## Mean : 2.749 Mean : 1.796 Mean : 1.09 Mean : 0.5632   
## 3rd Qu.: 0.000 3rd Qu.: 0.000 3rd Qu.: 0.00 3rd Qu.: 0.0000   
## Max. :255.000 Max. :255.000 Max. :255.00 Max. :255.0000   
##   
## pixel749 pixel750 pixel751 pixel752   
## Min. : 0.0000 Min. : 0.00000 Min. : 0.00000 Min. :0.00e+00   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.:0.00e+00   
## Median : 0.0000 Median : 0.00000 Median : 0.00000 Median :0.00e+00   
## Mean : 0.2396 Mean : 0.09352 Mean : 0.02483 Mean :8.57e-04   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.:0.00e+00   
## Max. :255.0000 Max. :255.00000 Max. :253.00000 Max. :2.80e+01   
##   
## pixel753 pixel754 pixel755 pixel756 pixel757 pixel758  
## Min. : 0.0000 Min. :0 Min. :0 Min. :0 Min. :0 Min. :0   
## 1st Qu.: 0.0000 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0   
## Median : 0.0000 Median :0 Median :0 Median :0 Median :0 Median :0   
## Mean : 0.0014 Mean :0 Mean :0 Mean :0 Mean :0 Mean :0   
## 3rd Qu.: 0.0000 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0   
## Max. :59.0000 Max. :0 Max. :0 Max. :0 Max. :0 Max. :0   
##   
## pixel759 pixel760 pixel761 pixel762   
## Min. :0 Min. :0 Min. :0.00e+00 Min. : 0.00000   
## 1st Qu.:0 1st Qu.:0 1st Qu.:0.00e+00 1st Qu.: 0.00000   
## Median :0 Median :0 Median :0.00e+00 Median : 0.00000   
## Mean :0 Mean :0 Mean :6.14e-03 Mean : 0.03583   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0.00e+00 3rd Qu.: 0.00000   
## Max. :0 Max. :0 Max. :1.77e+02 Max. :231.00000   
##   
## pixel763 pixel764 pixel765 pixel766   
## Min. : 0.00000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.00000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.00000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 0.08236 Mean : 0.1149 Mean : 0.1787 Mean : 0.3014   
## 3rd Qu.: 0.00000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :253.00000 Max. :254.0000 Max. :254.0000 Max. :255.0000   
##   
## pixel767 pixel768 pixel769 pixel770   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 0.4136 Mean : 0.5137 Mean : 0.5588 Mean : 0.6779   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.0000 Max. :255.0000 Max. :255.0000 Max. :255.0000   
##   
## pixel771 pixel772 pixel773 pixel774   
## Min. : 0.0000 Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000 Median : 0.0000 Median : 0.0000   
## Mean : 0.6028 Mean : 0.4892 Mean : 0.3402 Mean : 0.2193   
## 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000 3rd Qu.: 0.0000   
## Max. :255.0000 Max. :255.0000 Max. :255.0000 Max. :254.0000   
##   
## pixel775 pixel776 pixel777 pixel778   
## Min. : 0.0000 Min. : 0.00000 Min. : 0.00000 Min. : 0.00000   
## 1st Qu.: 0.0000 1st Qu.: 0.00000 1st Qu.: 0.00000 1st Qu.: 0.00000   
## Median : 0.0000 Median : 0.00000 Median : 0.00000 Median : 0.00000   
## Mean : 0.1171 Mean : 0.05902 Mean : 0.02019 Mean : 0.01724   
## 3rd Qu.: 0.0000 3rd Qu.: 0.00000 3rd Qu.: 0.00000 3rd Qu.: 0.00000   
## Max. :254.0000 Max. :253.00000 Max. :253.00000 Max. :254.00000   
##   
## pixel779 pixel780 pixel781 pixel782 pixel783  
## Min. : 0.00000 Min. :0 Min. :0 Min. :0 Min. :0   
## 1st Qu.: 0.00000 1st Qu.:0 1st Qu.:0 1st Qu.:0 1st Qu.:0   
## Median : 0.00000 Median :0 Median :0 Median :0 Median :0   
## Mean : 0.00286 Mean :0 Mean :0 Mean :0 Mean :0   
## 3rd Qu.: 0.00000 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0 3rd Qu.:0   
## Max. :62.00000 Max. :0 Max. :0 Max. :0 Max. :0   
##

# Preview top few rows   
 head(digitTrainDF)

## label pixel0 pixel1 pixel2 pixel3 pixel4 pixel5 pixel6 pixel7 pixel8 pixel9  
## 1 1 0 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0 0 0  
## 3 1 0 0 0 0 0 0 0 0 0 0  
## 4 4 0 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0 0 0  
## pixel10 pixel11 pixel12 pixel13 pixel14 pixel15 pixel16 pixel17 pixel18  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel19 pixel20 pixel21 pixel22 pixel23 pixel24 pixel25 pixel26 pixel27  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel28 pixel29 pixel30 pixel31 pixel32 pixel33 pixel34 pixel35 pixel36  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel37 pixel38 pixel39 pixel40 pixel41 pixel42 pixel43 pixel44 pixel45  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel46 pixel47 pixel48 pixel49 pixel50 pixel51 pixel52 pixel53 pixel54  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel55 pixel56 pixel57 pixel58 pixel59 pixel60 pixel61 pixel62 pixel63  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel64 pixel65 pixel66 pixel67 pixel68 pixel69 pixel70 pixel71 pixel72  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel73 pixel74 pixel75 pixel76 pixel77 pixel78 pixel79 pixel80 pixel81  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel82 pixel83 pixel84 pixel85 pixel86 pixel87 pixel88 pixel89 pixel90  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel91 pixel92 pixel93 pixel94 pixel95 pixel96 pixel97 pixel98 pixel99  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel100 pixel101 pixel102 pixel103 pixel104 pixel105 pixel106 pixel107  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel108 pixel109 pixel110 pixel111 pixel112 pixel113 pixel114 pixel115  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel116 pixel117 pixel118 pixel119 pixel120 pixel121 pixel122 pixel123  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 18 30  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 1 25 130  
## 6 0 0 0 0 0 0 0 0  
## pixel124 pixel125 pixel126 pixel127 pixel128 pixel129 pixel130 pixel131  
## 1 0 0 0 0 0 0 0 0  
## 2 137 137 192 86 72 1 0 0  
## 3 3 141 139 3 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 155 254 254 254 157 30 2 0  
## 6 3 141 202 254 193 44 0 0  
## pixel132 pixel133 pixel134 pixel135 pixel136 pixel137 pixel138 pixel139  
## 1 188 255 94 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel140 pixel141 pixel142 pixel143 pixel144 pixel145 pixel146 pixel147  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 220 179  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel148 pixel149 pixel150 pixel151 pixel152 pixel153 pixel154 pixel155  
## 1 0 0 0 0 0 0 0 0  
## 2 13 86 250 254 254 254 254 217  
## 3 0 0 0 0 9 254 254 8  
## 4 6 0 0 0 0 0 0 0  
## 5 8 103 253 253 253 253 253 253  
## 6 0 0 0 5 165 254 179 163  
## pixel156 pixel157 pixel158 pixel159 pixel160 pixel161 pixel162 pixel163  
## 1 0 0 0 191 250 253 93 0  
## 2 246 151 32 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 9 77 0 0 0 0 0  
## 5 253 253 114 2 0 0 0 0  
## 6 249 244 72 0 0 0 0 0  
## pixel164 pixel165 pixel166 pixel167 pixel168 pixel169 pixel170 pixel171  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel172 pixel173 pixel174 pixel175 pixel176 pixel177 pixel178 pixel179  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 16 179 254 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 28 247 17 0 0 0  
## 5 0 0 0 11 208 253 253 253  
## 6 0 0 0 0 0 0 0 135  
## pixel180 pixel181 pixel182 pixel183 pixel184 pixel185 pixel186 pixel187  
## 1 0 0 0 0 0 0 123 248  
## 2 254 254 254 254 254 254 231 54  
## 3 9 254 254 8 0 0 0 0  
## 4 0 0 0 0 0 27 202 0  
## 5 253 253 253 253 253 253 253 107  
## 6 254 150 0 0 189 254 243 31  
## pixel188 pixel189 pixel190 pixel191 pixel192 pixel193 pixel194 pixel195  
## 1 253 167 10 0 0 0 0 0  
## 2 15 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel196 pixel197 pixel198 pixel199 pixel200 pixel201 pixel202 pixel203  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 72  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 242  
## 5 0 0 0 0 0 0 0 31  
## 6 0 0 0 0 0 0 0 0  
## pixel204 pixel205 pixel206 pixel207 pixel208 pixel209 pixel210 pixel211  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 254 254 254 254 254 254  
## 3 0 0 0 0 9 254 254 106  
## 4 155 0 0 0 0 0 0 0  
## 5 253 253 253 253 253 253 253 253  
## 6 0 0 82 248 209 5 0 0  
## pixel212 pixel213 pixel214 pixel215 pixel216 pixel217 pixel218 pixel219  
## 1 0 80 247 253 208 13 0 0  
## 2 254 254 254 254 104 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 27 254 63 0 0 0 0  
## 5 253 253 253 215 101 3 0 0  
## 6 164 236 254 115 0 0 0 0  
## pixel220 pixel221 pixel222 pixel223 pixel224 pixel225 pixel226 pixel227  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel228 pixel229 pixel230 pixel231 pixel232 pixel233 pixel234 pixel235  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 61 191 254 254 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 160 207 6 0 0  
## 5 0 0 23 210 253 253 253 248  
## 6 0 0 0 0 0 8 211 254  
## pixel236 pixel237 pixel238 pixel239 pixel240 pixel241 pixel242 pixel243  
## 1 0 0 0 0 29 207 253 235  
## 2 254 109 83 199 254 254 254 254  
## 3 9 254 254 184 0 0 0 0  
## 4 0 0 0 0 0 27 254 65  
## 5 161 222 222 246 253 253 253 253  
## 6 58 0 0 0 0 33 230 212  
## pixel244 pixel245 pixel246 pixel247 pixel248 pixel249 pixel250 pixel251  
## 1 77 0 0 0 0 0 0 0  
## 2 243 85 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 253 39 0 0 0 0 0 0  
## 6 6 0 0 0 0 0 0 0  
## pixel252 pixel253 pixel254 pixel255 pixel256 pixel257 pixel258 pixel259  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 172 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 127  
## 5 0 0 0 0 0 0 136 253  
## 6 0 0 0 0 0 0 0 0  
## pixel260 pixel261 pixel262 pixel263 pixel264 pixel265 pixel266 pixel267  
## 1 0 0 0 0 0 0 0 54  
## 2 254 254 202 147 147 45 0 11  
## 3 0 0 0 0 9 254 254 184  
## 4 254 21 0 0 0 0 0 0  
## 5 253 253 229 77 0 0 0 70  
## 6 0 119 254 156 3 0 0 0  
## pixel268 pixel269 pixel270 pixel271 pixel272 pixel273 pixel274 pixel275  
## 1 209 253 253 88 0 0 0 0  
## 2 29 200 254 254 254 171 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 20 239 65 0 0 0 0  
## 5 218 253 253 253 253 215 91 0  
## 6 0 18 230 254 33 0 0 0  
## pixel276 pixel277 pixel278 pixel279 pixel280 pixel281 pixel282 pixel283  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel284 pixel285 pixel286 pixel287 pixel288 pixel289 pixel290 pixel291  
## 1 0 0 0 0 0 0 0 0  
## 2 0 1 174 254 254 89 67 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 77 254 21 0 0  
## 5 0 5 214 253 253 253 195 0  
## 6 0 0 0 0 10 212 254 35  
## pixel292 pixel293 pixel294 pixel295 pixel296 pixel297 pixel298 pixel299  
## 1 0 0 93 254 253 238 170 17  
## 2 0 0 0 0 0 128 252 254  
## 3 9 254 254 184 0 0 0 0  
## 4 0 0 0 0 0 0 195 65  
## 5 0 0 0 0 104 224 253 253  
## 6 0 0 0 0 0 33 254 254  
## pixel300 pixel301 pixel302 pixel303 pixel304 pixel305 pixel306 pixel307  
## 1 0 0 0 0 0 0 0 0  
## 2 254 212 76 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 253 253 215 29 0 0 0 0  
## 6 33 0 0 0 0 0 0 0  
## pixel308 pixel309 pixel310 pixel311 pixel312 pixel313 pixel314 pixel315  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 47 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 70  
## 5 0 0 0 0 0 116 253 253  
## 6 0 0 0 0 0 0 0 0  
## pixel316 pixel317 pixel318 pixel319 pixel320 pixel321 pixel322 pixel323  
## 1 0 0 0 0 0 23 210 254  
## 2 254 29 0 0 0 0 0 0  
## 3 0 0 0 0 6 185 254 184  
## 4 254 21 0 0 0 0 0 0  
## 5 253 247 75 0 0 0 0 0  
## 6 116 254 154 3 0 0 0 0  
## pixel324 pixel325 pixel326 pixel327 pixel328 pixel329 pixel330 pixel331  
## 1 253 159 0 0 0 0 0 0  
## 2 0 0 83 254 254 254 153 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 195 142 0 0 0 0  
## 5 0 26 200 253 253 253 253 216  
## 6 0 33 254 254 33 0 0 0  
## pixel332 pixel333 pixel334 pixel335 pixel336 pixel337 pixel338 pixel339  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 4 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel340 pixel341 pixel342 pixel343 pixel344 pixel345 pixel346 pixel347  
## 1 0 0 0 0 0 0 0 0  
## 2 0 80 254 254 240 24 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 56 251 21 0 0  
## 5 0 254 253 253 253 195 0 0  
## 6 0 0 0 0 124 254 115 0  
## pixel348 pixel349 pixel350 pixel351 pixel352 pixel353 pixel354 pixel355  
## 1 16 209 253 254 240 81 0 0  
## 2 0 0 0 0 0 0 25 240  
## 3 0 89 254 184 0 0 0 0  
## 4 0 0 0 0 0 0 195 227  
## 5 0 0 0 0 0 0 26 200  
## 6 0 0 0 0 0 160 254 239  
## pixel356 pixel357 pixel358 pixel359 pixel360 pixel361 pixel362 pixel363  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 153 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 253 253 253 253 5 0 0 0  
## 6 23 0 0 0 0 0 0 0  
## pixel364 pixel365 pixel366 pixel367 pixel368 pixel369 pixel370 pixel371  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 64 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 254 253 253  
## 6 0 0 0 0 0 0 0 0  
## pixel372 pixel373 pixel374 pixel375 pixel376 pixel377 pixel378 pixel379  
## 1 0 0 0 0 27 253 253 254  
## 2 186 7 0 0 0 0 0 0  
## 3 0 0 0 0 4 146 254 184  
## 4 222 153 5 0 0 0 0 0  
## 5 253 99 0 0 0 0 0 0  
## 6 203 254 35 0 0 0 0 0  
## pixel380 pixel381 pixel382 pixel383 pixel384 pixel385 pixel386 pixel387  
## 1 13 0 0 0 0 0 0 0  
## 2 0 0 0 166 254 254 224 12  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 120 240 13 0 0 0  
## 5 0 0 0 25 231 253 253 253  
## 6 0 197 254 178 0 0 0 0  
## pixel388 pixel389 pixel390 pixel391 pixel392 pixel393 pixel394 pixel395  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 36 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel396 pixel397 pixel398 pixel399 pixel400 pixel401 pixel402 pixel403  
## 1 0 0 0 0 0 0 0 20  
## 2 14 232 254 254 254 29 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 67 251 40 0  
## 5 0 254 253 253 253 99 0 0  
## 6 0 0 0 23 239 221 11 0  
## pixel404 pixel405 pixel406 pixel407 pixel408 pixel409 pixel410 pixel411  
## 1 206 254 254 198 7 0 0 0  
## 2 0 0 0 0 0 0 0 75  
## 3 9 254 254 184 0 0 0 0  
## 4 0 0 0 0 0 0 94 255  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 198 255 123  
## pixel412 pixel413 pixel414 pixel415 pixel416 pixel417 pixel418 pixel419  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 254 17 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 69 0 0 0 0 0 0 0  
## 5 223 253 253 253 129 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel420 pixel421 pixel422 pixel423 pixel424 pixel425 pixel426 pixel427  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 18 254 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 254 253 253  
## 6 0 0 0 0 0 0 0 23  
## pixel428 pixel429 pixel430 pixel431 pixel432 pixel433 pixel434 pixel435  
## 1 0 0 0 168 253 253 196 7  
## 2 254 29 0 0 0 0 0 0  
## 3 0 0 0 0 9 254 254 184  
## 4 0 234 184 0 0 0 0 0  
## 5 253 99 0 0 0 0 0 0  
## 6 238 178 0 0 0 0 0 0  
## pixel436 pixel437 pixel438 pixel439 pixel440 pixel441 pixel442 pixel443  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 48 254 254 254 17  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 19 245 69 0 0 0  
## 5 0 0 0 0 127 253 253 253  
## 6 10 219 254 96 0 0 0 0  
## pixel444 pixel445 pixel446 pixel447 pixel448 pixel449 pixel450 pixel451  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 129 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel452 pixel453 pixel454 pixel455 pixel456 pixel457 pixel458 pixel459  
## 1 0 0 0 0 0 0 20 203  
## 2 2 163 254 254 254 29 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 234 169 0  
## 5 0 254 253 253 253 99 0 0  
## 6 0 0 0 30 249 204 0 0  
## pixel460 pixel461 pixel462 pixel463 pixel464 pixel465 pixel466 pixel467  
## 1 253 248 76 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 48  
## 3 9 254 254 184 0 0 0 0  
## 4 0 0 0 0 0 0 3 199  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 25 235 254 62  
## pixel468 pixel469 pixel470 pixel471 pixel472 pixel473 pixel474 pixel475  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 254 17 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 182 10 0 0 0 0 0 0  
## 5 139 253 253 253 90 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel476 pixel477 pixel478 pixel479 pixel480 pixel481 pixel482 pixel483  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 94 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 254 253 253  
## 6 0 0 0 0 0 0 0 26  
## pixel484 pixel485 pixel486 pixel487 pixel488 pixel489 pixel490 pixel491  
## 1 0 22 188 253 245 93 0 0  
## 2 254 200 12 0 0 0 0 0  
## 3 0 0 0 0 9 254 254 184  
## 4 0 154 205 4 0 0 26 72  
## 5 253 99 0 0 0 0 0 0  
## 6 243 204 0 0 0 0 0 0  
## pixel492 pixel493 pixel494 pixel495 pixel496 pixel497 pixel498 pixel499  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 16 209 254 254 150 1  
## 3 0 0 0 0 0 0 0 0  
## 4 128 203 208 254 254 131 0 0  
## 5 0 0 0 78 248 253 253 253  
## 6 91 254 248 36 0 0 0 0  
## pixel500 pixel501 pixel502 pixel503 pixel504 pixel505 pixel506 pixel507  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 5 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel508 pixel509 pixel510 pixel511 pixel512 pixel513 pixel514 pixel515  
## 1 0 0 0 0 0 103 253 253  
## 2 0 15 206 254 254 254 202 66  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 61 254 129  
## 5 0 254 253 253 253 216 34 0  
## 6 0 0 0 33 254 204 0 0  
## pixel516 pixel517 pixel518 pixel519 pixel520 pixel521 pixel522 pixel523  
## 1 191 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 21 161 254  
## 3 9 254 254 184 0 0 0 0  
## 4 113 186 245 251 189 75 56 136  
## 5 0 0 0 0 0 0 33 152  
## 6 0 0 0 67 241 254 133 0  
## pixel524 pixel525 pixel526 pixel527 pixel528 pixel529 pixel530 pixel531  
## 1 0 0 0 0 0 0 0 0  
## 2 254 245 31 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 254 73 0 0 0 0 0 0  
## 5 253 253 253 107 1 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel532 pixel533 pixel534 pixel535 pixel536 pixel537 pixel538 pixel539  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 60 212  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 206 253 253  
## 6 0 0 0 0 0 0 0 33  
## pixel540 pixel541 pixel542 pixel543 pixel544 pixel545 pixel546 pixel547  
## 1 89 240 253 195 25 0 0 0  
## 2 254 254 254 194 48 48 34 41  
## 3 0 0 0 0 156 254 254 184  
## 4 0 15 216 233 233 159 104 52  
## 5 253 253 140 0 0 0 0 0  
## 6 254 214 7 0 0 0 50 242  
## pixel548 pixel549 pixel550 pixel551 pixel552 pixel553 pixel554 pixel555  
## 1 0 0 0 0 0 0 0 0  
## 2 48 209 254 254 254 171 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 38 254 73 0 0  
## 5 30 139 234 253 253 253 154 2  
## 6 254 194 24 0 0 0 0 0  
## pixel556 pixel557 pixel558 pixel559 pixel560 pixel561 pixel562 pixel563  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel564 pixel565 pixel566 pixel567 pixel568 pixel569 pixel570 pixel571  
## 1 0 0 0 15 220 253 253 80  
## 2 0 0 0 86 243 254 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 16 205 253 253 253 250 208  
## 6 0 0 0 5 193 254 78 0  
## pixel572 pixel573 pixel574 pixel575 pixel576 pixel577 pixel578 pixel579  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 233 243 254 254 254 254  
## 3 185 255 255 184 0 0 0 0  
## 4 0 0 0 0 0 0 0 18  
## 5 106 106 106 200 237 253 253 253  
## 6 0 19 128 254 195 36 0 0  
## pixel580 pixel581 pixel582 pixel583 pixel584 pixel585 pixel586 pixel587  
## 1 0 0 0 0 0 0 0 0  
## 2 254 86 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 254 73 0 0 0 0 0 0  
## 5 253 209 22 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel588 pixel589 pixel590 pixel591 pixel592 pixel593 pixel594 pixel595  
## 1 0 0 0 0 0 0 0 94  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 82 253  
## 6 0 0 0 0 0 0 0 0  
## pixel596 pixel597 pixel598 pixel599 pixel600 pixel601 pixel602 pixel603  
## 1 253 253 253 94 0 0 0 0  
## 2 114 254 254 254 254 254 254 254  
## 3 0 0 0 0 185 254 254 184  
## 4 0 0 0 0 0 0 0 0  
## 5 253 253 253 253 253 253 253 253  
## 6 103 254 222 74 143 235 254 228  
## pixel604 pixel605 pixel606 pixel607 pixel608 pixel609 pixel610 pixel611  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 254 239 86 11 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 18 254 73 0 0  
## 5 253 253 253 253 209 22 0 0  
## 6 83 0 0 0 0 0 0 0  
## pixel612 pixel613 pixel614 pixel615 pixel616 pixel617 pixel618 pixel619  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel620 pixel621 pixel622 pixel623 pixel624 pixel625 pixel626 pixel627  
## 1 0 0 0 89 251 253 250 131  
## 2 0 0 0 0 13 182 254 254  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 1 91 253 253 253 253  
## 6 0 0 0 0 30 242 254 254  
## pixel628 pixel629 pixel630 pixel631 pixel632 pixel633 pixel634 pixel635  
## 1 0 0 0 0 0 0 0 0  
## 2 254 254 254 254 254 254 243 70  
## 3 185 254 254 184 0 0 0 0  
## 4 0 0 0 0 0 0 0 5  
## 5 253 253 253 253 253 253 213 90  
## 6 254 254 252 84 0 0 0 0  
## pixel636 pixel637 pixel638 pixel639 pixel640 pixel641 pixel642 pixel643  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 206 106 0 0 0 0 0 0  
## 5 7 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel644 pixel645 pixel646 pixel647 pixel648 pixel649 pixel650 pixel651  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 1  
## 6 0 0 0 0 0 0 0 0  
## pixel652 pixel653 pixel654 pixel655 pixel656 pixel657 pixel658 pixel659  
## 1 214 218 95 0 0 0 0 0  
## 2 0 8 76 146 254 255 254 255  
## 3 0 0 0 0 63 254 254 62  
## 4 0 0 0 0 0 0 0 0  
## 5 18 129 208 253 253 253 253 159  
## 6 0 23 64 158 200 174 61 0  
## pixel660 pixel661 pixel662 pixel663 pixel664 pixel665 pixel666 pixel667  
## 1 0 0 0 0 0 0 0 0  
## 2 146 19 15 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 186 159 0 0  
## 5 129 90 4 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel668 pixel669 pixel670 pixel671 pixel672 pixel673 pixel674 pixel675  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel676 pixel677 pixel678 pixel679 pixel680 pixel681 pixel682 pixel683  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel684 pixel685 pixel686 pixel687 pixel688 pixel689 pixel690 pixel691  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 6  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel692 pixel693 pixel694 pixel695 pixel696 pixel697 pixel698 pixel699  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 209 101 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel700 pixel701 pixel702 pixel703 pixel704 pixel705 pixel706 pixel707  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel708 pixel709 pixel710 pixel711 pixel712 pixel713 pixel714 pixel715  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel716 pixel717 pixel718 pixel719 pixel720 pixel721 pixel722 pixel723  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel724 pixel725 pixel726 pixel727 pixel728 pixel729 pixel730 pixel731  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel732 pixel733 pixel734 pixel735 pixel736 pixel737 pixel738 pixel739  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel740 pixel741 pixel742 pixel743 pixel744 pixel745 pixel746 pixel747  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel748 pixel749 pixel750 pixel751 pixel752 pixel753 pixel754 pixel755  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel756 pixel757 pixel758 pixel759 pixel760 pixel761 pixel762 pixel763  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel764 pixel765 pixel766 pixel767 pixel768 pixel769 pixel770 pixel771  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel772 pixel773 pixel774 pixel775 pixel776 pixel777 pixel778 pixel779  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel780 pixel781 pixel782 pixel783  
## 1 0 0 0 0  
## 2 0 0 0 0  
## 3 0 0 0 0  
## 4 0 0 0 0  
## 5 0 0 0 0  
## 6 0 0 0 0

# 1. Training Set Preparation  
 set.seed(100)   
  
 # lets split the Training data set int into training and test datasets.creates a value for dividing the data into train and test.  
 # In this case the value is defined as 80% of the number of rows in the dataset  
 sample\_size = floor(0.80\*nrow(digitTrainDF))   
 # sample\_size #value of the sample size 55  
 #   
 # set seed to ensure you always have same random numbers generated #324 has 100% training accuracy   
 train\_index = sample(seq\_len(nrow(digitTrainDF)),size = sample\_size)  
  
 train\_set =digitTrainDF[train\_index,] #creates the training dataset with row numbers stored in train\_index  
 # # table(train\_data$author)  
 test\_set=digitTrainDF[-train\_index,] # creates the test dataset excluding the row numbers mentioned in train\_index  
 # # table(test\_data$author)  
 cat("\nImages by Labels:")

##   
## Images by Labels:

table(digitTrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain\_set - Images by Labels:")

##   
## Train\_set - Images by Labels:

table(train\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 3315 3746 3341 3529 3253 3020 3307 3500 3213 3376

cat("\nTest\_set - Images by Labels:")

##   
## Test\_set - Images by Labels:

table(test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 817 938 836 822 819 775 830 901 850 812

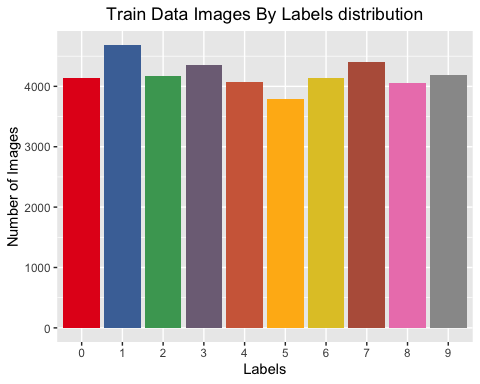
dim(train\_set)

## [1] 33600 785

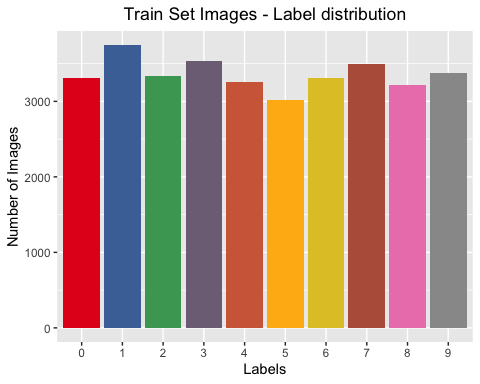
dim(test\_set)

## [1] 8400 785

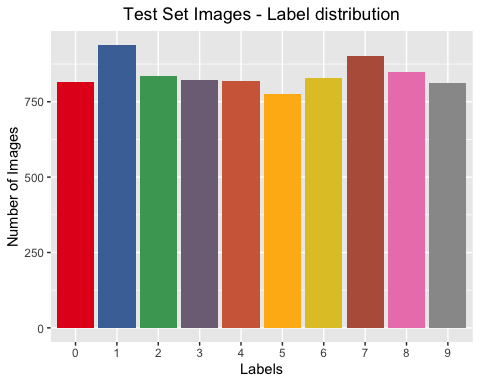
# # compare number of images by labels  
 x <- data.frame(table(digitTrainDF$label))  
 colourCount = length(unique(digitTrainDF$label))  
 getPalette = colorRampPalette(brewer.pal(9, "Set1"))  
   
 gp\_all <- ggplot(x, aes(x=Var1, y=Freq)) + geom\_bar(position="dodge",stat = "identity", fill=getPalette(colourCount))  
 gp\_all <- gp\_all + ggtitle("Train Data Images By Labels distribution") + xlab("Labels") + ylab("Number of Images")  
 gp\_all <- gp\_all + theme(plot.title = element\_text(hjust = 0.5),axis.title = element\_text())  
 gp\_all



# compare number of images by labels  
 tn\_set <- data.frame(table(train\_set$label))  
 colourCount = length(unique(train\_set$label))  
 getPalette = colorRampPalette(brewer.pal(9, "Set1"))  
   
 gp\_tnset <- ggplot(tn\_set, aes(x=Var1, y=Freq)) + geom\_bar(position="dodge",stat = "identity", fill=getPalette(colourCount))  
 gp\_tnset <- gp\_tnset + ggtitle("Train Set Images - Label distribution") + xlab("Labels") + ylab("Number of Images")  
 gp\_tnset <- gp\_tnset + theme(plot.title = element\_text(hjust = 0.5),axis.title = element\_text())  
 gp\_tnset



# compare number of images by labels  
 tst\_set <- data.frame(table(test\_set$label))  
 colourCount = length(unique(test\_set$label))  
 getPalette = colorRampPalette(brewer.pal(9, "Set1"))  
   
 gp\_tst\_set <- ggplot(tst\_set, aes(x=Var1, y=Freq)) + geom\_bar(position="dodge",stat = "identity",   
 fill=getPalette(colourCount))  
 gp\_tst\_set <- gp\_tst\_set + ggtitle("Test Set Images - Label distribution") + xlab("Labels") + ylab("Number of Images")  
 gp\_tst\_set <- gp\_tst\_set + theme(plot.title = element\_text(hjust = 0.5),axis.title = element\_text())  
 gp\_tst\_set



#Load Test Data CSV as Validation data frame  
 validation\_data <- "/Users/sathishrajendiran/Documents/R/HW6/digit\_test.csv"  
 digitValidationDF <- data.frame(read.csv(validation\_data,na.strings=c(""," ","NA"))  
 ,stringsAsFactors=FALSE)  
 dim(digitValidationDF) #28000 784

## [1] 28000 784

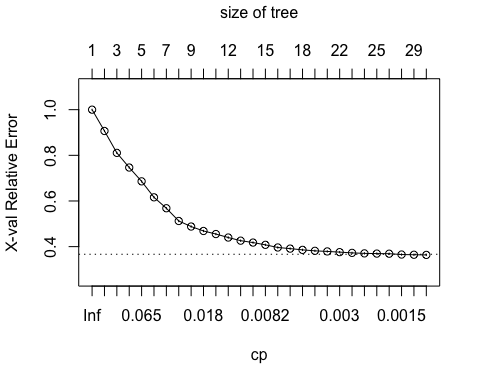
digitValidationDF[,"label"] <- ''  
 digitValidationDF$label <- as.factor(digitValidationDF$label)  
 digitValidationDF <- digitValidationDF[,c(which(colnames(digitValidationDF)=="label")  
 ,which(colnames(digitValidationDF)!="label"))]  
 # Preview top few rows   
 head(digitValidationDF)

## label pixel0 pixel1 pixel2 pixel3 pixel4 pixel5 pixel6 pixel7 pixel8 pixel9  
## 1 0 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0 0  
## pixel10 pixel11 pixel12 pixel13 pixel14 pixel15 pixel16 pixel17 pixel18  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel19 pixel20 pixel21 pixel22 pixel23 pixel24 pixel25 pixel26 pixel27  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel28 pixel29 pixel30 pixel31 pixel32 pixel33 pixel34 pixel35 pixel36  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel37 pixel38 pixel39 pixel40 pixel41 pixel42 pixel43 pixel44 pixel45  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel46 pixel47 pixel48 pixel49 pixel50 pixel51 pixel52 pixel53 pixel54  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel55 pixel56 pixel57 pixel58 pixel59 pixel60 pixel61 pixel62 pixel63  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel64 pixel65 pixel66 pixel67 pixel68 pixel69 pixel70 pixel71 pixel72  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel73 pixel74 pixel75 pixel76 pixel77 pixel78 pixel79 pixel80 pixel81  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel82 pixel83 pixel84 pixel85 pixel86 pixel87 pixel88 pixel89 pixel90  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0 0  
## pixel91 pixel92 pixel93 pixel94 pixel95 pixel96 pixel97 pixel98 pixel99  
## 1 0 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 13 80 175 242 205  
## 6 0 0 0 0 0 0 0 0 0  
## pixel100 pixel101 pixel102 pixel103 pixel104 pixel105 pixel106 pixel107  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 93 11 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel108 pixel109 pixel110 pixel111 pixel112 pixel113 pixel114 pixel115  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel116 pixel117 pixel118 pixel119 pixel120 pixel121 pixel122 pixel123  
## 1 0 0 0 0 0 0 10 17  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 10 171  
## 6 0 0 0 0 0 0 0 0  
## pixel124 pixel125 pixel126 pixel127 pixel128 pixel129 pixel130 pixel131  
## 1 17 17 17 81 180 180 35 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 254 253 253 253 254 214 30 0  
## 6 0 0 0 0 0 0 0 0  
## pixel132 pixel133 pixel134 pixel135 pixel136 pixel137 pixel138 pixel139  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel140 pixel141 pixel142 pixel143 pixel144 pixel145 pixel146 pixel147  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel148 pixel149 pixel150 pixel151 pixel152 pixel153 pixel154 pixel155  
## 1 0 0 139 253 253 253 253 253  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 126 253 249 134 134 212  
## 6 0 0 0 0 0 0 0 0  
## pixel156 pixel157 pixel158 pixel159 pixel160 pixel161 pixel162 pixel163  
## 1 253 253 48 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 254 253 182 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel164 pixel165 pixel166 pixel167 pixel168 pixel169 pixel170 pixel171  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel172 pixel173 pixel174 pixel175 pixel176 pixel177 pixel178 pixel179  
## 1 0 0 0 0 0 60 228 253  
## 2 0 0 0 0 0 0 0 29  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 136 253  
## 6 0 0 0 0 0 0 0 0  
## pixel180 pixel181 pixel182 pixel183 pixel184 pixel185 pixel186 pixel187  
## 1 253 253 253 253 253 253 207 197  
## 2 85 85 85 85 85 85 85 85  
## 3 0 6 100 213 254 245 255 149  
## 4 0 0 0 0 0 0 0 0  
## 5 90 0 0 6 133 253 249 18  
## 6 0 0 0 0 0 0 0 0  
## pixel188 pixel189 pixel190 pixel191 pixel192 pixel193 pixel194 pixel195  
## 1 46 0 0 0 0 0 0 0  
## 2 71 0 0 0 0 0 0 0  
## 3 17 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel196 pixel197 pixel198 pixel199 pixel200 pixel201 pixel202 pixel203  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 73 224  
## pixel204 pixel205 pixel206 pixel207 pixel208 pixel209 pixel210 pixel211  
## 1 0 213 253 253 253 253 253 253  
## 2 0 107 128 168 250 250 250 252  
## 3 0 0 0 0 26 181 233 102  
## 4 0 0 0 0 40 0 2 12  
## 5 0 0 0 25 0 0 0 0  
## 6 254 254 156 156 89 59 14 0  
## pixel212 pixel213 pixel214 pixel215 pixel216 pixel217 pixel218 pixel219  
## 1 253 253 253 253 223 52 0 0  
## 2 250 250 250 250 231 127 63 0  
## 3 40 29 102 166 187 0 0 0  
## 4 45 109 109 30 0 0 0 0  
## 5 20 218 254 133 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel220 pixel221 pixel222 pixel223 pixel224 pixel225 pixel226 pixel227  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel228 pixel229 pixel230 pixel231 pixel232 pixel233 pixel234 pixel235  
## 1 0 0 0 0 0 66 231 253  
## 2 0 0 0 85 168 237 252 250  
## 3 0 0 0 0 0 0 0 57  
## 4 0 0 0 0 0 0 0 149  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 118 253 250 241 254 253  
## pixel236 pixel237 pixel238 pixel239 pixel240 pixel241 pixel242 pixel243  
## 1 253 253 108 40 40 115 244 253  
## 2 250 250 250 252 250 250 250 250  
## 3 236 181 35 0 0 0 0 12  
## 4 207 58 116 227 254 253 253 209  
## 5 0 0 0 0 47 226 253 193  
## 6 253 253 223 215 169 50 2 0  
## pixel244 pixel245 pixel246 pixel247 pixel248 pixel249 pixel250 pixel251  
## 1 253 134 3 0 0 0 0 0  
## 2 252 250 209 56 0 0 0 0  
## 3 207 13 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel252 pixel253 pixel254 pixel255 pixel256 pixel257 pixel258 pixel259  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 127  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 147 253  
## pixel260 pixel261 pixel262 pixel263 pixel264 pixel265 pixel266 pixel267  
## 1 0 0 63 114 114 114 37 0  
## 2 250 250 252 250 250 250 250 252  
## 3 0 0 27 228 187 0 0 0  
## 4 0 0 98 228 254 185 174 91  
## 5 0 13 12 0 0 0 0 0  
## 6 183 30 78 115 145 174 174 223  
## pixel268 pixel269 pixel270 pixel271 pixel272 pixel273 pixel274 pixel275  
## 1 0 0 205 253 253 253 15 0  
## 2 250 250 250 250 252 250 250 83  
## 3 0 0 0 96 225 9 0 0  
## 4 92 111 217 254 156 0 0 0  
## 5 5 208 253 109 0 0 0 0  
## 6 253 253 181 101 0 0 0 0  
## pixel276 pixel277 pixel278 pixel279 pixel280 pixel281 pixel282 pixel283  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel284 pixel285 pixel286 pixel287 pixel288 pixel289 pixel290 pixel291  
## 1 0 0 0 0 0 0 0 0  
## 2 0 8 113 252 252 252 247 210  
## 3 0 0 0 0 0 0 167 230  
## 4 0 0 0 0 0 0 20 141  
## 5 0 0 0 0 0 0 19 30  
## 6 0 47 235 253 153 0 0 0  
## pixel292 pixel293 pixel294 pixel295 pixel296 pixel297 pixel298 pixel299  
## 1 0 0 0 0 0 0 57 253  
## 2 210 210 210 177 0 0 0 0  
## 3 18 0 0 0 0 0 74 242  
## 4 24 9 0 0 0 0 43 253  
## 5 0 0 0 0 20 253 235 43  
## 6 0 0 0 35 79 196 253 253  
## pixel300 pixel301 pixel302 pixel303 pixel304 pixel305 pixel306 pixel307  
## 1 253 253 15 0 0 0 0 0  
## 2 43 252 252 83 0 0 0 0  
## 3 106 0 0 0 0 0 0 0  
## 4 253 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 152 6 0 0 0 0 0 0  
## pixel308 pixel309 pixel310 pixel311 pixel312 pixel313 pixel314 pixel315  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 43 250 250  
## 3 0 0 0 0 0 0 0 0  
## 4 0 33 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 156 253 253  
## pixel316 pixel317 pixel318 pixel319 pixel320 pixel321 pixel322 pixel323  
## 1 0 0 0 0 0 0 0 0  
## 2 250 250 210 0 0 0 0 0  
## 3 0 83 247 60 0 0 0 0  
## 4 0 23 139 104 0 0 0 0  
## 5 0 0 0 0 14 133 157 122  
## 6 117 0 0 0 0 0 0 0  
## pixel324 pixel325 pixel326 pixel327 pixel328 pixel329 pixel330 pixel331  
## 1 0 0 42 253 253 253 15 0  
## 2 0 0 0 0 28 194 250 138  
## 3 0 67 232 102 0 0 0 0  
## 4 0 0 50 253 253 0 0 0  
## 5 230 254 159 0 0 0 0 0  
## 6 0 18 73 230 254 114 0 0  
## pixel332 pixel333 pixel334 pixel335 pixel336 pixel337 pixel338 pixel339  
## 1 0 0 0 0 0 0 0 0  
## 2 14 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel340 pixel341 pixel342 pixel343 pixel344 pixel345 pixel346 pixel347  
## 1 0 0 0 0 0 0 0 0  
## 2 0 43 250 250 250 250 210 0  
## 3 0 0 0 0 0 133 211 0  
## 4 0 0 0 0 0 180 246 20  
## 5 0 0 0 0 0 0 0 0  
## 6 0 156 254 235 15 0 0 0  
## pixel348 pixel349 pixel350 pixel351 pixel352 pixel353 pixel354 pixel355  
## 1 0 0 0 0 0 0 95 253  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 16 127 225 165 4  
## 4 0 0 0 0 0 0 166 253  
## 5 122 253 253 253 254 187 9 0  
## 6 0 0 0 0 0 0 10 209  
## pixel356 pixel357 pixel358 pixel359 pixel360 pixel361 pixel362 pixel363  
## 1 253 253 15 0 0 0 0 0  
## 2 0 85 250 250 41 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 220 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 255 76 0 0 0 0 0 0  
## pixel364 pixel365 pixel366 pixel367 pixel368 pixel369 pixel370 pixel371  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 43 250 250  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 107 233 124  
## pixel372 pixel373 pixel374 pixel375 pixel376 pixel377 pixel378 pixel379  
## 1 0 0 0 0 0 0 0 0  
## 2 137 83 70 0 0 0 0 0  
## 3 0 133 217 0 15 58 140 189  
## 4 14 147 72 0 0 0 0 0  
## 5 0 0 0 0 45 204 253 253  
## 6 0 0 0 0 0 0 0 0  
## pixel380 pixel381 pixel382 pixel383 pixel384 pixel385 pixel386 pixel387  
## 1 0 0 205 253 253 253 15 0  
## 2 0 0 0 0 0 28 167 250  
## 3 181 227 24 0 0 0 0 0  
## 4 0 40 243 253 253 0 0 0  
## 5 254 178 0 0 0 0 0 0  
## 6 0 0 159 253 171 9 7 20  
## pixel388 pixel389 pixel390 pixel391 pixel392 pixel393 pixel394 pixel395  
## 1 0 0 0 0 0 0 0 0  
## 2 41 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 5 0 0 0 0 0 0 0  
## pixel396 pixel397 pixel398 pixel399 pixel400 pixel401 pixel402 pixel403  
## 1 0 0 0 0 0 0 0 0  
## 2 0 219 250 144 14 0 0 0  
## 3 0 0 0 0 0 71 246 225  
## 4 0 0 0 0 121 248 52 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 37  
## pixel404 pixel405 pixel406 pixel407 pixel408 pixel409 pixel410 pixel411  
## 1 61 99 96 0 0 45 224 253  
## 2 0 0 0 0 0 0 0 0  
## 3 235 253 182 61 231 85 0 0  
## 4 0 0 0 0 47 215 254 216  
## 5 0 9 104 247 254 250 108 0  
## 6 109 101 175 176 175 175 217 253  
## pixel412 pixel413 pixel414 pixel415 pixel416 pixel417 pixel418 pixel419  
## 1 253 195 10 0 0 0 0 0  
## 2 0 0 127 250 217 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 26 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 254 187 199 253 58 0 0 0  
## pixel420 pixel421 pixel422 pixel423 pixel424 pixel425 pixel426 pixel427  
## 1 0 0 0 0 0 0 11 25  
## 2 0 0 0 0 0 254 238 105  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel428 pixel429 pixel430 pixel431 pixel432 pixel433 pixel434 pixel435  
## 1 105 83 189 189 228 253 251 189  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 73 143 119 58 1 153  
## 4 217 215 0 0 0 0 0 40  
## 5 0 0 0 0 0 0 0 73  
## 6 0 0 0 207 253 253 253 229  
## pixel436 pixel437 pixel438 pixel439 pixel440 pixel441 pixel442 pixel443  
## 1 189 218 253 253 210 27 0 0  
## 2 0 0 0 0 0 15 148 252  
## 3 212 2 0 0 0 0 0 0  
## 4 209 253 245 49 0 0 0 0  
## 5 255 254 218 14 0 0 0 0  
## 6 232 253 253 200 57 19 19 57  
## pixel444 pixel445 pixel446 pixel447 pixel448 pixel449 pixel450 pixel451  
## 1 0 0 0 0 0 0 0 0  
## 2 252 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 5 0 0 0 0 0 0 0  
## pixel452 pixel453 pixel454 pixel455 pixel456 pixel457 pixel458 pixel459  
## 1 42 116 173 253 253 253 253 253  
## 2 0 252 166 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 40 243 67 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 139  
## pixel460 pixel461 pixel462 pixel463 pixel464 pixel465 pixel466 pixel467  
## 1 253 253 253 253 253 253 253 253  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 88 254 69 0 0 0  
## 4 0 19 146 243 254 225 44 0  
## 5 0 0 0 0 145 253 253 110  
## 6 185 140 58 23 154 253 185 36  
## pixel468 pixel469 pixel470 pixel471 pixel472 pixel473 pixel474 pixel475  
## 1 221 116 7 0 0 0 0 0  
## 2 85 140 250 250 179 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel476 pixel477 pixel478 pixel479 pixel480 pixel481 pixel482 pixel483  
## 1 0 0 0 0 118 253 253 253  
## 2 0 0 0 0 0 252 208 63  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 40  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel484 pixel485 pixel486 pixel487 pixel488 pixel489 pixel490 pixel491  
## 1 253 245 212 222 253 253 253 253  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 40 244 157  
## 4 243 131 0 12 154 226 253 246  
## 5 0 0 0 19 114 158 12 0  
## 6 0 0 0 0 0 0 0 59  
## pixel492 pixel493 pixel494 pixel495 pixel496 pixel497 pixel498 pixel499  
## 1 253 253 253 253 253 253 160 15  
## 2 0 0 85 127 252 250 250 250  
## 3 1 0 0 0 0 0 0 0  
## 4 151 43 0 0 0 0 0 0  
## 5 20 253 253 109 0 0 0 0  
## 6 239 213 53 0 0 0 0 0  
## pixel500 pixel501 pixel502 pixel503 pixel504 pixel505 pixel506 pixel507  
## 1 0 0 0 0 0 0 0 0  
## 2 41 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel508 pixel509 pixel510 pixel511 pixel512 pixel513 pixel514 pixel515  
## 1 254 253 253 253 189 99 0 32  
## 2 0 252 250 209 56 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 217 248 181 228  
## 5 0 0 0 0 0 13 121 234  
## 6 0 0 0 0 0 0 0 0  
## pixel516 pixel517 pixel518 pixel519 pixel520 pixel521 pixel522 pixel523  
## 1 202 253 253 253 240 122 122 190  
## 2 0 0 141 170 168 168 223 250  
## 3 6 212 211 12 0 0 0 0  
## 4 253 253 214 72 0 0 0 0  
## 5 242 28 0 0 20 253 253 97  
## 6 0 0 8 239 243 42 0 0  
## pixel524 pixel525 pixel526 pixel527 pixel528 pixel529 pixel530 pixel531  
## 1 253 253 253 174 0 0 0 0  
## 2 252 250 250 137 14 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel532 pixel533 pixel534 pixel535 pixel536 pixel537 pixel538 pixel539  
## 1 0 0 0 0 255 253 253 253  
## 2 0 0 0 0 0 252 250 250  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel540 pixel541 pixel542 pixel543 pixel544 pixel545 pixel546 pixel547  
## 1 238 222 222 222 241 253 253 230  
## 2 223 210 212 210 210 210 244 252  
## 3 0 0 0 0 95 237 46 0  
## 4 166 254 254 255 254 172 20 0  
## 5 38 194 254 248 49 0 17 68  
## 6 0 0 0 0 0 13 183 254  
## pixel548 pixel549 pixel550 pixel551 pixel552 pixel553 pixel554 pixel555  
## 1 70 0 0 17 175 229 253 253  
## 2 250 250 250 250 252 250 144 14  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 206 254 231 36 0 0 0 0  
## 6 135 0 0 0 0 0 0 0  
## pixel556 pixel557 pixel558 pixel559 pixel560 pixel561 pixel562 pixel563  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel564 pixel565 pixel566 pixel567 pixel568 pixel569 pixel570 pixel571  
## 1 158 253 253 253 253 253 253 253  
## 2 0 43 252 252 252 252 254 252  
## 3 0 0 0 0 0 0 0 43  
## 4 0 0 0 0 3 89 108 109  
## 5 0 0 0 37 194 253 253 235  
## 6 0 0 0 0 0 0 0 0  
## pixel572 pixel573 pixel574 pixel575 pixel576 pixel577 pixel578 pixel579  
## 1 253 205 106 65 0 0 0 0  
## 2 252 252 252 255 252 252 252 217  
## 3 243 156 0 0 0 0 0 0  
## 4 24 9 0 0 0 0 0 0  
## 5 196 195 244 253 254 247 93 0  
## 6 0 40 253 222 18 0 0 0  
## pixel580 pixel581 pixel582 pixel583 pixel584 pixel585 pixel586 pixel587  
## 1 0 62 244 157 0 0 0 0  
## 2 177 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel588 pixel589 pixel590 pixel591 pixel592 pixel593 pixel594 pixel595  
## 1 0 0 0 0 6 26 179 179  
## 2 0 0 0 0 0 28 166 208  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 79  
## 6 0 0 0 0 0 0 0 0  
## pixel596 pixel597 pixel598 pixel599 pixel600 pixel601 pixel602 pixel603  
## 1 179 179 179 30 15 10 0 0  
## 2 250 250 252 250 250 250 250 238  
## 3 0 0 11 213 213 5 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 254 253 253 253 254 253 253 253  
## 6 0 0 0 0 0 152 253 83  
## pixel604 pixel605 pixel606 pixel607 pixel608 pixel609 pixel610 pixel611  
## 1 0 0 0 0 0 0 14 6  
## 2 166 166 166 27 0 0 0 0  
## 3 0 0 0 6 8 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 207 75 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel612 pixel613 pixel614 pixel615 pixel616 pixel617 pixel618 pixel619  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel620 pixel621 pixel622 pixel623 pixel624 pixel625 pixel626 pixel627  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 63 125 125 146 250  
## 3 0 0 0 0 0 0 163 244  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 6 128 211 253 253  
## 6 0 0 0 0 0 0 0 0  
## pixel628 pixel629 pixel630 pixel631 pixel632 pixel633 pixel634 pixel635  
## 1 0 0 0 0 0 0 0 0  
## 2 250 165 125 105 0 0 0 0  
## 3 35 0 0 0 0 0 0 139  
## 4 0 0 0 0 0 0 0 0  
## 5 224 175 157 97 6 0 0 0  
## 6 79 254 231 0 0 0 0 0  
## pixel636 pixel637 pixel638 pixel639 pixel640 pixel641 pixel642 pixel643  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 208 97 12 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel644 pixel645 pixel646 pixel647 pixel648 pixel649 pixel650 pixel651  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel652 pixel653 pixel654 pixel655 pixel656 pixel657 pixel658 pixel659  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 14 83 83 27 0 0  
## 3 0 60 248 90 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 2 167 253 111 0  
## pixel660 pixel661 pixel662 pixel663 pixel664 pixel665 pixel666 pixel667  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 16 136 172 168 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel668 pixel669 pixel670 pixel671 pixel672 pixel673 pixel674 pixel675  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel676 pixel677 pixel678 pixel679 pixel680 pixel681 pixel682 pixel683  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 5 195 147 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 88  
## pixel684 pixel685 pixel686 pixel687 pixel688 pixel689 pixel690 pixel691  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 253 240 40 0 0 0 0 0  
## pixel692 pixel693 pixel694 pixel695 pixel696 pixel697 pixel698 pixel699  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel700 pixel701 pixel702 pixel703 pixel704 pixel705 pixel706 pixel707  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel708 pixel709 pixel710 pixel711 pixel712 pixel713 pixel714 pixel715  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 26 237 41 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 118 253 213 0 0  
## pixel716 pixel717 pixel718 pixel719 pixel720 pixel721 pixel722 pixel723  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel724 pixel725 pixel726 pixel727 pixel728 pixel729 pixel730 pixel731  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel732 pixel733 pixel734 pixel735 pixel736 pixel737 pixel738 pixel739  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 72  
## pixel740 pixel741 pixel742 pixel743 pixel744 pixel745 pixel746 pixel747  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 185 101 0 0 0 0 0 0  
## pixel748 pixel749 pixel750 pixel751 pixel752 pixel753 pixel754 pixel755  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel756 pixel757 pixel758 pixel759 pixel760 pixel761 pixel762 pixel763  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel764 pixel765 pixel766 pixel767 pixel768 pixel769 pixel770 pixel771  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel772 pixel773 pixel774 pixel775 pixel776 pixel777 pixel778 pixel779  
## 1 0 0 0 0 0 0 0 0  
## 2 0 0 0 0 0 0 0 0  
## 3 0 0 0 0 0 0 0 0  
## 4 0 0 0 0 0 0 0 0  
## 5 0 0 0 0 0 0 0 0  
## 6 0 0 0 0 0 0 0 0  
## pixel780 pixel781 pixel782 pixel783  
## 1 0 0 0 0  
## 2 0 0 0 0  
## 3 0 0 0 0  
## 4 0 0 0 0  
## 5 0 0 0 0  
## 6 0 0 0 0

# Section 2: Build and tune decision tree models  
   
 # grow tree  
 rtree <- rpart(label~. ,data=train\_set, method='class', cp=0,minsplit = 1, maxdepth = 5)  
  
 #summarize rtree values  
 summary(rtree)

## Call:  
## rpart(formula = label ~ ., data = train\_set, method = "class",   
## cp = 0, minsplit = 1, maxdepth = 5)  
## n= 33600   
##   
## CP nsplit rel error xerror xstd  
## 1 0.0929858645 0 1.0000000 1.0000000 0.001932471  
## 2 0.0905071347 1 0.9070141 0.9066792 0.002429847  
## 3 0.0714142159 2 0.8165070 0.8106786 0.002755949  
## 4 0.0667917197 3 0.7450928 0.7465331 0.002901633  
## 5 0.0638105447 4 0.6783011 0.6859717 0.002995475  
## 6 0.0501775306 5 0.6144905 0.6160314 0.003056193  
## 7 0.0446841294 6 0.5643130 0.5681986 0.003069847  
## 8 0.0404970858 7 0.5196289 0.5123602 0.003057664  
## 9 0.0200308166 8 0.4791318 0.4880418 0.003042825  
## 10 0.0155088095 9 0.4591010 0.4686139 0.003026743  
## 11 0.0148388826 10 0.4435921 0.4551819 0.003013394  
## 12 0.0136665104 11 0.4287533 0.4398741 0.002995925  
## 13 0.0098144302 12 0.4150868 0.4261406 0.002978173  
## 14 0.0087760434 13 0.4052723 0.4178000 0.002966417  
## 15 0.0077376566 14 0.3964963 0.4078850 0.002951468  
## 16 0.0058618611 15 0.3887586 0.3962618 0.002932577  
## 17 0.0046559925 16 0.3828968 0.3913378 0.002924123  
## 18 0.0031821531 17 0.3782408 0.3858109 0.002914309  
## 19 0.0031151604 18 0.3750586 0.3815904 0.002906582  
## 20 0.0030146714 20 0.3688283 0.3789777 0.002901696  
## 21 0.0029141824 21 0.3658136 0.3759630 0.002895962  
## 22 0.0025792189 22 0.3628994 0.3726134 0.002889468  
## 23 0.0021772627 23 0.3603202 0.3704696 0.002885243  
## 24 0.0021437663 24 0.3581430 0.3694982 0.002883311  
## 25 0.0021102700 25 0.3559992 0.3690293 0.002882374  
## 26 0.0010383868 27 0.3517787 0.3653782 0.002874993  
## 27 0.0005694379 28 0.3507403 0.3644403 0.002873072  
## 28 0.0000000000 30 0.3496014 0.3637034 0.002871555  
##   
## Variable importance  
## pixel433 pixel461 pixel434 pixel462 pixel406 pixel409 pixel435 pixel155   
## 3 3 3 2 2 2 2 2   
## pixel347 pixel239 pixel376 pixel156 pixel346 pixel154 pixel656 pixel404   
## 2 2 2 2 2 2 2 2   
## pixel657 pixel488 pixel432 pixel375 pixel238 pixel153 pixel157 pixel655   
## 2 2 1 1 1 1 1 1   
## pixel489 pixel381 pixel240 pixel437 pixel658 pixel431 pixel183 pixel319   
## 1 1 1 1 1 1 1 1   
## pixel405 pixel516 pixel211 pixel654 pixel267 pixel408 pixel487 pixel410   
## 1 1 1 1 1 1 1 1   
## pixel382 pixel430 pixel291 pixel292 pixel659 pixel377 pixel320 pixel460   
## 1 1 1 1 1 1 1 1   
## pixel403 pixel374 pixel350 pixel237 pixel324 pixel378 pixel96 pixel323   
## 1 1 1 1 1 1 1 1   
## pixel550 pixel455 pixel296 pixel295 pixel569 pixel269 pixel351 pixel124   
## 1 1 1 1 1 1 1 1   
## pixel97 pixel551 pixel483 pixel322 pixel349 pixel427   
## 1 1 1 1 1 1   
##   
## Node number 1: 33600 observations, complexity param=0.09298586  
## predicted class=1 expected loss=0.8885119 P(node) =1  
## class counts: 3315 3746 3341 3529 3253 3020 3307 3500 3213 3376  
## probabilities: 0.099 0.111 0.099 0.105 0.097 0.090 0.098 0.104 0.096 0.100   
## left son=2 (11081 obs) right son=3 (22519 obs)  
## Primary splits:  
## pixel409 < 0.5 to the left, improve=1344.696, (0 missing)  
## pixel350 < 125.5 to the right, improve=1335.043, (0 missing)  
## pixel461 < 0.5 to the left, improve=1318.234, (0 missing)  
## pixel378 < 128.5 to the right, improve=1287.309, (0 missing)  
## pixel433 < 0.5 to the left, improve=1274.926, (0 missing)  
## Surrogate splits:  
## pixel381 < 0.5 to the left, agree=0.880, adj=0.636, (0 split)  
## pixel437 < 0.5 to the left, agree=0.874, adj=0.619, (0 split)  
## pixel408 < 56.5 to the left, agree=0.841, adj=0.517, (0 split)  
## pixel410 < 0.5 to the left, agree=0.839, adj=0.513, (0 split)  
## pixel382 < 0.5 to the left, agree=0.832, adj=0.489, (0 split)  
##   
## Node number 2: 11081 observations, complexity param=0.09050713  
## predicted class=1 expected loss=0.7030954 P(node) =0.3297917  
## class counts: 2761 3290 902 715 176 1289 615 358 831 144  
## probabilities: 0.249 0.297 0.081 0.065 0.016 0.116 0.056 0.032 0.075 0.013   
## left son=4 (4172 obs) right son=5 (6909 obs)  
## Primary splits:  
## pixel434 < 0.5 to the left, improve=1697.169, (0 missing)  
## pixel462 < 0.5 to the left, improve=1652.165, (0 missing)  
## pixel406 < 1.5 to the left, improve=1632.185, (0 missing)  
## pixel433 < 0.5 to the left, improve=1621.046, (0 missing)  
## pixel378 < 128.5 to the left, improve=1607.983, (0 missing)  
## Surrogate splits:  
## pixel433 < 1.5 to the left, agree=0.940, adj=0.841, (0 split)  
## pixel462 < 0.5 to the left, agree=0.933, adj=0.822, (0 split)  
## pixel406 < 0.5 to the left, agree=0.932, adj=0.819, (0 split)  
## pixel435 < 0.5 to the left, agree=0.919, adj=0.785, (0 split)  
## pixel461 < 0.5 to the left, agree=0.905, adj=0.748, (0 split)  
##   
## Node number 3: 22519 observations, complexity param=0.07141422  
## predicted class=9 expected loss=0.8564768 P(node) =0.6702083  
## class counts: 554 456 2439 2814 3077 1731 2692 3142 2382 3232  
## probabilities: 0.025 0.020 0.108 0.125 0.137 0.077 0.120 0.140 0.106 0.144   
## left son=6 (10165 obs) right son=7 (12354 obs)  
## Primary splits:  
## pixel155 < 0.5 to the right, improve=1318.288, (0 missing)  
## pixel154 < 0.5 to the right, improve=1273.715, (0 missing)  
## pixel542 < 1.5 to the right, improve=1221.881, (0 missing)  
## pixel156 < 0.5 to the right, improve=1194.433, (0 missing)  
## pixel153 < 0.5 to the right, improve=1141.299, (0 missing)  
## Surrogate splits:  
## pixel156 < 0.5 to the right, agree=0.928, adj=0.841, (0 split)  
## pixel154 < 0.5 to the right, agree=0.924, adj=0.831, (0 split)  
## pixel153 < 0.5 to the right, agree=0.853, adj=0.674, (0 split)  
## pixel157 < 0.5 to the right, agree=0.843, adj=0.652, (0 split)  
## pixel183 < 167.5 to the right, agree=0.824, adj=0.610, (0 split)  
##   
## Node number 4: 4172 observations, complexity param=0.00311516  
## predicted class=0 expected loss=0.3494727 P(node) =0.1241667  
## class counts: 2714 12 210 250 41 400 233 219 41 52  
## probabilities: 0.651 0.003 0.050 0.060 0.010 0.096 0.056 0.052 0.010 0.012   
## left son=8 (2736 obs) right son=9 (1436 obs)  
## Primary splits:  
## pixel455 < 5.5 to the right, improve=427.5052, (0 missing)  
## pixel427 < 7.5 to the right, improve=382.4187, (0 missing)  
## pixel483 < 6.5 to the right, improve=379.5086, (0 missing)  
## pixel511 < 8.5 to the right, improve=358.4045, (0 missing)  
## pixel329 < 9.5 to the right, improve=352.5576, (0 missing)  
## Surrogate splits:  
## pixel483 < 4.5 to the right, agree=0.930, adj=0.798, (0 split)  
## pixel427 < 0.5 to the right, agree=0.926, adj=0.785, (0 split)  
## pixel399 < 0.5 to the right, agree=0.864, adj=0.606, (0 split)  
## pixel511 < 0.5 to the right, agree=0.861, adj=0.596, (0 split)  
## pixel428 < 0.5 to the right, agree=0.820, adj=0.478, (0 split)  
##   
## Node number 5: 6909 observations, complexity param=0.02003082  
## predicted class=1 expected loss=0.5255464 P(node) =0.205625  
## class counts: 47 3278 692 465 135 889 382 139 790 92  
## probabilities: 0.007 0.474 0.100 0.067 0.020 0.129 0.055 0.020 0.114 0.013   
## left son=10 (4437 obs) right son=11 (2472 obs)  
## Primary splits:  
## pixel375 < 0.5 to the left, improve=851.1697, (0 missing)  
## pixel403 < 1.5 to the left, improve=819.5935, (0 missing)  
## pixel347 < 1.5 to the left, improve=808.9104, (0 missing)  
## pixel374 < 0.5 to the left, improve=791.3591, (0 missing)  
## pixel346 < 0.5 to the left, improve=787.3292, (0 missing)  
## Surrogate splits:  
## pixel347 < 0.5 to the left, agree=0.911, adj=0.751, (0 split)  
## pixel403 < 39.5 to the left, agree=0.887, adj=0.683, (0 split)  
## pixel374 < 0.5 to the left, agree=0.882, adj=0.669, (0 split)  
## pixel376 < 142.5 to the left, agree=0.858, adj=0.602, (0 split)  
## pixel346 < 0.5 to the left, agree=0.857, adj=0.599, (0 split)  
##   
## Node number 6: 10165 observations, complexity param=0.05017753  
## predicted class=3 expected loss=0.7773733 P(node) =0.3025298  
## class counts: 409 175 2040 2263 353 1015 1820 41 1820 229  
## probabilities: 0.040 0.017 0.201 0.223 0.035 0.100 0.179 0.004 0.179 0.023   
## left son=12 (4306 obs) right son=13 (5859 obs)  
## Primary splits:  
## pixel656 < 2.5 to the left, improve=1010.0810, (0 missing)  
## pixel657 < 0.5 to the left, improve=1009.4240, (0 missing)  
## pixel655 < 1.5 to the left, improve= 903.3878, (0 missing)  
## pixel658 < 0.5 to the left, improve= 894.5109, (0 missing)  
## pixel488 < 1.5 to the left, improve= 870.3973, (0 missing)  
## Surrogate splits:  
## pixel657 < 0.5 to the left, agree=0.952, adj=0.887, (0 split)  
## pixel655 < 0.5 to the left, agree=0.947, adj=0.874, (0 split)  
## pixel658 < 0.5 to the left, agree=0.891, adj=0.743, (0 split)  
## pixel654 < 0.5 to the left, agree=0.877, adj=0.710, (0 split)  
## pixel659 < 0.5 to the left, agree=0.814, adj=0.561, (0 split)  
##   
## Node number 7: 12354 observations, complexity param=0.06679172  
## predicted class=7 expected loss=0.7489882 P(node) =0.3676786  
## class counts: 145 281 399 551 2724 716 872 3101 562 3003  
## probabilities: 0.012 0.023 0.032 0.045 0.220 0.058 0.071 0.251 0.045 0.243   
## left son=14 (3799 obs) right son=15 (8555 obs)  
## Primary splits:  
## pixel239 < 0.5 to the left, improve=1205.045, (0 missing)  
## pixel238 < 1.5 to the left, improve=1107.371, (0 missing)  
## pixel431 < 0.5 to the right, improve=1066.075, (0 missing)  
## pixel430 < 0.5 to the right, improve=1061.810, (0 missing)  
## pixel432 < 0.5 to the right, improve=1032.611, (0 missing)  
## Surrogate splits:  
## pixel238 < 9.5 to the left, agree=0.921, adj=0.743, (0 split)  
## pixel240 < 4.5 to the left, agree=0.905, adj=0.691, (0 split)  
## pixel211 < 0.5 to the left, agree=0.876, adj=0.598, (0 split)  
## pixel267 < 0.5 to the left, agree=0.846, adj=0.498, (0 split)  
## pixel237 < 0.5 to the left, agree=0.835, adj=0.464, (0 split)  
##   
## Node number 8: 2736 observations, complexity param=0.001038387  
## predicted class=0 expected loss=0.1396199 P(node) =0.08142857  
## class counts: 2354 1 75 25 29 75 78 50 13 36  
## probabilities: 0.860 0.000 0.027 0.009 0.011 0.027 0.029 0.018 0.005 0.013   
## left son=16 (2567 obs) right son=17 (169 obs)  
## Primary splits:  
## pixel489 < 127 to the left, improve=120.05900, (0 missing)  
## pixel488 < 90 to the left, improve=115.33120, (0 missing)  
## pixel490 < 81.5 to the left, improve=101.11010, (0 missing)  
## pixel462 < 3 to the left, improve= 97.47316, (0 missing)  
## pixel461 < 1.5 to the left, improve= 96.03934, (0 missing)  
## Surrogate splits:  
## pixel488 < 146.5 to the left, agree=0.986, adj=0.769, (0 split)  
## pixel490 < 129 to the left, agree=0.983, adj=0.728, (0 split)  
## pixel462 < 3 to the left, agree=0.980, adj=0.675, (0 split)  
## pixel461 < 1.5 to the left, agree=0.977, adj=0.621, (0 split)  
## pixel491 < 228.5 to the left, agree=0.963, adj=0.402, (0 split)  
##   
## Node number 9: 1436 observations, complexity param=0.00311516  
## predicted class=0 expected loss=0.7493036 P(node) =0.0427381  
## class counts: 360 11 135 225 12 325 155 169 28 16  
## probabilities: 0.251 0.008 0.094 0.157 0.008 0.226 0.108 0.118 0.019 0.011   
## left son=18 (678 obs) right son=19 (758 obs)  
## Primary splits:  
## pixel323 < 8 to the left, improve=100.51660, (0 missing)  
## pixel324 < 15.5 to the left, improve= 99.82978, (0 missing)  
## pixel352 < 3 to the left, improve= 96.76055, (0 missing)  
## pixel322 < 7.5 to the left, improve= 95.77169, (0 missing)  
## pixel351 < 1.5 to the left, improve= 92.71304, (0 missing)  
## Surrogate splits:  
## pixel324 < 8.5 to the left, agree=0.921, adj=0.832, (0 split)  
## pixel322 < 27.5 to the left, agree=0.911, adj=0.811, (0 split)  
## pixel350 < 2 to the left, agree=0.874, adj=0.733, (0 split)  
## pixel351 < 0.5 to the left, agree=0.870, adj=0.724, (0 split)  
## pixel352 < 0.5 to the left, agree=0.835, adj=0.650, (0 split)  
##   
## Node number 10: 4437 observations, complexity param=0.00981443  
## predicted class=1 expected loss=0.3024566 P(node) =0.1320536  
## class counts: 8 3095 539 151 65 108 130 131 176 34  
## probabilities: 0.002 0.698 0.121 0.034 0.015 0.024 0.029 0.030 0.040 0.008   
## left son=20 (3661 obs) right son=21 (776 obs)  
## Primary splits:  
## pixel550 < 0.5 to the left, improve=489.6967, (0 missing)  
## pixel578 < 0.5 to the left, improve=482.5537, (0 missing)  
## pixel551 < 0.5 to the left, improve=472.5734, (0 missing)  
## pixel579 < 1 to the left, improve=470.5009, (0 missing)  
## pixel206 < 0.5 to the left, improve=461.9255, (0 missing)  
## Surrogate splits:  
## pixel551 < 0.5 to the left, agree=0.950, adj=0.716, (0 split)  
## pixel522 < 4.5 to the left, agree=0.943, adj=0.671, (0 split)  
## pixel578 < 0.5 to the left, agree=0.941, adj=0.664, (0 split)  
## pixel549 < 111 to the left, agree=0.931, adj=0.606, (0 split)  
## pixel523 < 0.5 to the left, agree=0.926, adj=0.579, (0 split)  
##   
## Node number 11: 2472 observations, complexity param=0.01550881  
## predicted class=5 expected loss=0.6840615 P(node) =0.07357143  
## class counts: 39 183 153 314 70 781 252 8 614 58  
## probabilities: 0.016 0.074 0.062 0.127 0.028 0.316 0.102 0.003 0.248 0.023   
## left son=22 (1020 obs) right son=23 (1452 obs)  
## Primary splits:  
## pixel351 < 23.5 to the left, improve=295.2273, (0 missing)  
## pixel352 < 0.5 to the left, improve=277.5623, (0 missing)  
## pixel379 < 53.5 to the left, improve=271.3360, (0 missing)  
## pixel380 < 1.5 to the left, improve=227.7037, (0 missing)  
## pixel324 < 10.5 to the left, improve=208.0100, (0 missing)  
## Surrogate splits:  
## pixel352 < 0.5 to the left, agree=0.913, adj=0.788, (0 split)  
## pixel324 < 23.5 to the left, agree=0.890, adj=0.732, (0 split)  
## pixel379 < 53.5 to the left, agree=0.875, adj=0.698, (0 split)  
## pixel378 < 116.5 to the left, agree=0.841, adj=0.614, (0 split)  
## pixel350 < 7.5 to the left, agree=0.837, adj=0.605, (0 split)  
##   
## Node number 12: 4306 observations, complexity param=0.04049709  
## predicted class=6 expected loss=0.591268 P(node) =0.1281548  
## class counts: 49 37 1555 262 275 139 1760 19 101 109  
## probabilities: 0.011 0.009 0.361 0.061 0.064 0.032 0.409 0.004 0.023 0.025   
## left son=24 (1983 obs) right son=25 (2323 obs)  
## Primary splits:  
## pixel319 < 0.5 to the left, improve=799.5826, (0 missing)  
## pixel270 < 0.5 to the right, improve=792.1594, (0 missing)  
## pixel271 < 1 to the right, improve=792.1347, (0 missing)  
## pixel347 < 1.5 to the left, improve=780.3763, (0 missing)  
## pixel346 < 0.5 to the left, improve=749.2233, (0 missing)  
## Surrogate splits:  
## pixel291 < 0.5 to the left, agree=0.897, adj=0.777, (0 split)  
## pixel347 < 2.5 to the left, agree=0.896, adj=0.774, (0 split)  
## pixel292 < 0.5 to the left, agree=0.895, adj=0.773, (0 split)  
## pixel320 < 0.5 to the left, agree=0.890, adj=0.762, (0 split)  
## pixel346 < 0.5 to the left, agree=0.880, adj=0.739, (0 split)  
##   
## Node number 13: 5859 observations, complexity param=0.04468413  
## predicted class=3 expected loss=0.6584741 P(node) =0.174375  
## class counts: 360 138 485 2001 78 876 60 22 1719 120  
## probabilities: 0.061 0.024 0.083 0.342 0.013 0.150 0.010 0.004 0.293 0.020   
## left son=26 (3411 obs) right son=27 (2448 obs)  
## Primary splits:  
## pixel488 < 2.5 to the left, improve=839.3113, (0 missing)  
## pixel487 < 0.5 to the left, improve=780.0739, (0 missing)  
## pixel515 < 0.5 to the left, improve=754.2877, (0 missing)  
## pixel489 < 1.5 to the left, improve=727.0906, (0 missing)  
## pixel516 < 0.5 to the left, improve=685.3814, (0 missing)  
## Surrogate splits:  
## pixel489 < 0.5 to the left, agree=0.921, adj=0.812, (0 split)  
## pixel461 < 80.5 to the left, agree=0.902, adj=0.766, (0 split)  
## pixel487 < 3.5 to the left, agree=0.900, adj=0.762, (0 split)  
## pixel516 < 0.5 to the left, agree=0.895, adj=0.749, (0 split)  
## pixel460 < 108.5 to the left, agree=0.884, adj=0.722, (0 split)  
##   
## Node number 14: 3799 observations, complexity param=0.01483888  
## predicted class=4 expected loss=0.4058963 P(node) =0.1130655  
## class counts: 10 158 76 54 2257 73 631 263 53 224  
## probabilities: 0.003 0.042 0.020 0.014 0.594 0.019 0.166 0.069 0.014 0.059   
## left son=28 (3312 obs) right son=29 (487 obs)  
## Primary splits:  
## pixel96 < 0.5 to the left, improve=514.8702, (0 missing)  
## pixel97 < 1 to the left, improve=478.0586, (0 missing)  
## pixel124 < 1 to the left, improve=450.8962, (0 missing)  
## pixel123 < 0.5 to the left, improve=418.4337, (0 missing)  
## pixel543 < 74.5 to the left, improve=407.8297, (0 missing)  
## Surrogate splits:  
## pixel124 < 57.5 to the left, agree=0.963, adj=0.715, (0 split)  
## pixel97 < 1 to the left, agree=0.960, adj=0.690, (0 split)  
## pixel68 < 1 to the left, agree=0.951, adj=0.620, (0 split)  
## pixel95 < 0.5 to the left, agree=0.950, adj=0.610, (0 split)  
## pixel123 < 0.5 to the left, agree=0.949, adj=0.600, (0 split)  
##   
## Node number 15: 8555 observations, complexity param=0.06381054  
## predicted class=7 expected loss=0.6682642 P(node) =0.2546131  
## class counts: 135 123 323 497 467 643 241 2838 509 2779  
## probabilities: 0.016 0.014 0.038 0.058 0.055 0.075 0.028 0.332 0.059 0.325   
## left son=30 (4023 obs) right son=31 (4532 obs)  
## Primary splits:  
## pixel432 < 0.5 to the left, improve=973.2714, (0 missing)  
## pixel431 < 0.5 to the left, improve=970.2722, (0 missing)  
## pixel405 < 0.5 to the left, improve=964.0567, (0 missing)  
## pixel404 < 0.5 to the right, improve=914.8655, (0 missing)  
## pixel430 < 0.5 to the left, improve=870.0733, (0 missing)  
## Surrogate splits:  
## pixel431 < 0.5 to the left, agree=0.920, adj=0.830, (0 split)  
## pixel433 < 17.5 to the left, agree=0.913, adj=0.816, (0 split)  
## pixel405 < 1.5 to the left, agree=0.846, adj=0.673, (0 split)  
## pixel430 < 0.5 to the left, agree=0.843, adj=0.666, (0 split)  
## pixel404 < 0.5 to the left, agree=0.827, adj=0.633, (0 split)  
##   
## Node number 16: 2567 observations  
## predicted class=0 expected loss=0.09154655 P(node) =0.07639881  
## class counts: 2332 1 22 22 7 46 59 50 10 18  
## probabilities: 0.908 0.000 0.009 0.009 0.003 0.018 0.023 0.019 0.004 0.007   
##   
## Node number 17: 169 observations, complexity param=0.0005694379  
## predicted class=2 expected loss=0.6863905 P(node) =0.005029762  
## class counts: 22 0 53 3 22 29 19 0 3 18  
## probabilities: 0.130 0.000 0.314 0.018 0.130 0.172 0.112 0.000 0.018 0.107   
## left son=34 (77 obs) right son=35 (92 obs)  
## Primary splits:  
## pixel371 < 4.5 to the left, improve=18.46284, (0 missing)  
## pixel494 < 1.5 to the right, improve=17.04890, (0 missing)  
## pixel344 < 2 to the left, improve=16.76535, (0 missing)  
## pixel372 < 30 to the left, improve=16.19552, (0 missing)  
## pixel467 < 2 to the right, improve=15.82161, (0 missing)  
## Surrogate splits:  
## pixel399 < 4.5 to the left, agree=0.876, adj=0.727, (0 split)  
## pixel344 < 8 to the left, agree=0.870, adj=0.714, (0 split)  
## pixel372 < 70 to the left, agree=0.852, adj=0.675, (0 split)  
## pixel343 < 3 to the left, agree=0.840, adj=0.649, (0 split)  
## pixel398 < 2 to the left, agree=0.811, adj=0.584, (0 split)  
##   
## Node number 18: 678 observations, complexity param=0.002143766  
## predicted class=0 expected loss=0.5309735 P(node) =0.02017857  
## class counts: 318 3 64 5 7 97 96 76 4 8  
## probabilities: 0.469 0.004 0.094 0.007 0.010 0.143 0.142 0.112 0.006 0.012   
## left son=36 (442 obs) right son=37 (236 obs)  
## Primary splits:  
## pixel517 < 9.5 to the left, improve=94.34019, (0 missing)  
## pixel518 < 0.5 to the left, improve=93.63199, (0 missing)  
## pixel489 < 1 to the left, improve=88.95295, (0 missing)  
## pixel490 < 1 to the left, improve=88.48710, (0 missing)  
## pixel519 < 14.5 to the left, improve=83.78557, (0 missing)  
## Surrogate splits:  
## pixel518 < 48.5 to the left, agree=0.941, adj=0.831, (0 split)  
## pixel489 < 1 to the left, agree=0.919, adj=0.767, (0 split)  
## pixel516 < 65 to the left, agree=0.906, adj=0.729, (0 split)  
## pixel490 < 1 to the left, agree=0.901, adj=0.716, (0 split)  
## pixel488 < 13.5 to the left, agree=0.886, adj=0.674, (0 split)  
##   
## Node number 19: 758 observations, complexity param=0.00211027  
## predicted class=5 expected loss=0.6992084 P(node) =0.02255952  
## class counts: 42 8 71 220 5 228 59 93 24 8  
## probabilities: 0.055 0.011 0.094 0.290 0.007 0.301 0.078 0.123 0.032 0.011   
## left son=38 (681 obs) right son=39 (77 obs)  
## Primary splits:  
## pixel284 < 1.5 to the left, improve=55.24670, (0 missing)  
## pixel285 < 94.5 to the left, improve=50.01601, (0 missing)  
## pixel486 < 105.5 to the right, improve=49.56494, (0 missing)  
## pixel312 < 2.5 to the left, improve=47.46002, (0 missing)  
## pixel286 < 37.5 to the left, improve=46.05197, (0 missing)  
## Surrogate splits:  
## pixel285 < 94.5 to the left, agree=0.982, adj=0.818, (0 split)  
## pixel256 < 16 to the left, agree=0.974, adj=0.740, (0 split)  
## pixel312 < 2.5 to the left, agree=0.968, adj=0.688, (0 split)  
## pixel257 < 91 to the left, agree=0.964, adj=0.649, (0 split)  
## pixel283 < 0.5 to the left, agree=0.963, adj=0.636, (0 split)  
##   
## Node number 20: 3661 observations, complexity param=0.002177263  
## predicted class=1 expected loss=0.1704452 P(node) =0.1089583  
## class counts: 1 3037 188 62 32 59 16 117 129 20  
## probabilities: 0.000 0.830 0.051 0.017 0.009 0.016 0.004 0.032 0.035 0.005   
## left son=40 (3357 obs) right son=41 (304 obs)  
## Primary splits:  
## pixel206 < 0.5 to the left, improve=207.9974, (0 missing)  
## pixel234 < 4.5 to the left, improve=206.6271, (0 missing)  
## pixel233 < 0.5 to the left, improve=193.7318, (0 missing)  
## pixel262 < 1 to the left, improve=191.8775, (0 missing)  
## pixel205 < 0.5 to the left, improve=185.5330, (0 missing)  
## Surrogate splits:  
## pixel207 < 153.5 to the left, agree=0.971, adj=0.648, (0 split)  
## pixel205 < 0.5 to the left, agree=0.967, adj=0.609, (0 split)  
## pixel234 < 0.5 to the left, agree=0.962, adj=0.539, (0 split)  
## pixel178 < 1.5 to the left, agree=0.957, adj=0.487, (0 split)  
## pixel233 < 1.5 to the left, agree=0.957, adj=0.484, (0 split)  
##   
## Node number 21: 776 observations, complexity param=0.003014671  
## predicted class=2 expected loss=0.5476804 P(node) =0.02309524  
## class counts: 7 58 351 89 33 49 114 14 47 14  
## probabilities: 0.009 0.075 0.452 0.115 0.043 0.063 0.147 0.018 0.061 0.018   
## left son=42 (571 obs) right son=43 (205 obs)  
## Primary splits:  
## pixel372 < 2 to the left, improve=92.76795, (0 missing)  
## pixel344 < 15.5 to the left, improve=86.92131, (0 missing)  
## pixel371 < 1 to the left, improve=80.68979, (0 missing)  
## pixel345 < 4.5 to the left, improve=73.48815, (0 missing)  
## pixel316 < 40.5 to the left, improve=72.17545, (0 missing)  
## Surrogate splits:  
## pixel344 < 3.5 to the left, agree=0.963, adj=0.859, (0 split)  
## pixel400 < 27 to the left, agree=0.943, adj=0.785, (0 split)  
## pixel371 < 1 to the left, agree=0.929, adj=0.732, (0 split)  
## pixel345 < 6.5 to the left, agree=0.924, adj=0.712, (0 split)  
## pixel316 < 40.5 to the left, agree=0.921, adj=0.702, (0 split)  
##   
## Node number 22: 1020 observations, complexity param=0.002579219  
## predicted class=5 expected loss=0.3392157 P(node) =0.03035714  
## class counts: 19 16 38 67 19 674 134 0 44 9  
## probabilities: 0.019 0.016 0.037 0.066 0.019 0.661 0.131 0.000 0.043 0.009   
## left son=44 (841 obs) right son=45 (179 obs)  
## Primary splits:  
## pixel515 < 93.5 to the left, improve=103.27840, (0 missing)  
## pixel514 < 22 to the left, improve= 99.41842, (0 missing)  
## pixel487 < 55.5 to the left, improve= 96.89634, (0 missing)  
## pixel486 < 40.5 to the left, improve= 94.03826, (0 missing)  
## pixel102 < 1.5 to the left, improve= 92.14771, (0 missing)  
## Surrogate splits:  
## pixel487 < 157.5 to the left, agree=0.919, adj=0.536, (0 split)  
## pixel514 < 87.5 to the left, agree=0.919, adj=0.536, (0 split)  
## pixel543 < 215.5 to the left, agree=0.906, adj=0.464, (0 split)  
## pixel516 < 105.5 to the left, agree=0.896, adj=0.408, (0 split)  
## pixel101 < 10 to the left, agree=0.878, adj=0.307, (0 split)  
##   
## Node number 23: 1452 observations, complexity param=0.00211027  
## predicted class=8 expected loss=0.607438 P(node) =0.04321429  
## class counts: 20 167 115 247 51 107 118 8 570 49  
## probabilities: 0.014 0.115 0.079 0.170 0.035 0.074 0.081 0.006 0.393 0.034   
## left son=46 (501 obs) right son=47 (951 obs)  
## Primary splits:  
## pixel657 < 1.5 to the left, improve=108.41570, (0 missing)  
## pixel318 < 11.5 to the left, improve=105.18890, (0 missing)  
## pixel290 < 11.5 to the left, improve=101.66150, (0 missing)  
## pixel658 < 2.5 to the left, improve= 95.02674, (0 missing)  
## pixel515 < 2.5 to the left, improve= 94.99853, (0 missing)  
## Surrogate splits:  
## pixel656 < 1 to the left, agree=0.904, adj=0.723, (0 split)  
## pixel658 < 0.5 to the left, agree=0.904, adj=0.723, (0 split)  
## pixel629 < 20.5 to the left, agree=0.842, adj=0.543, (0 split)  
## pixel630 < 8.5 to the left, agree=0.817, adj=0.471, (0 split)  
## pixel659 < 0.5 to the left, agree=0.798, adj=0.413, (0 split)  
##   
## Node number 24: 1983 observations, complexity param=0.002914182  
## predicted class=2 expected loss=0.290469 P(node) =0.05901786  
## class counts: 0 24 1407 133 98 33 198 16 29 45  
## probabilities: 0.000 0.012 0.710 0.067 0.049 0.017 0.100 0.008 0.015 0.023   
## left son=48 (1680 obs) right son=49 (303 obs)  
## Primary splits:  
## pixel344 < 35.5 to the left, improve=191.6415, (0 missing)  
## pixel316 < 55.5 to the left, improve=164.8255, (0 missing)  
## pixel343 < 12 to the left, improve=164.8208, (0 missing)  
## pixel568 < 0.5 to the right, improve=156.9250, (0 missing)  
## pixel567 < 4.5 to the right, improve=154.7788, (0 missing)  
## Surrogate splits:  
## pixel316 < 65 to the left, agree=0.964, adj=0.766, (0 split)  
## pixel345 < 1 to the left, agree=0.959, adj=0.733, (0 split)  
## pixel343 < 1 to the left, agree=0.956, adj=0.713, (0 split)  
## pixel372 < 100 to the left, agree=0.953, adj=0.690, (0 split)  
## pixel317 < 41.5 to the left, agree=0.948, adj=0.660, (0 split)  
##   
## Node number 25: 2323 observations, complexity param=0.003182153  
## predicted class=6 expected loss=0.3275936 P(node) =0.0691369  
## class counts: 49 13 148 129 177 106 1562 3 72 64  
## probabilities: 0.021 0.006 0.064 0.056 0.076 0.046 0.672 0.001 0.031 0.028   
## left son=50 (440 obs) right son=51 (1883 obs)  
## Primary splits:  
## pixel270 < 7 to the right, improve=248.9232, (0 missing)  
## pixel269 < 4.5 to the right, improve=231.8088, (0 missing)  
## pixel242 < 19.5 to the right, improve=228.5247, (0 missing)  
## pixel297 < 2.5 to the right, improve=218.8402, (0 missing)  
## pixel271 < 1 to the right, improve=209.8616, (0 missing)  
## Surrogate splits:  
## pixel242 < 30.5 to the right, agree=0.950, adj=0.736, (0 split)  
## pixel298 < 100.5 to the right, agree=0.935, adj=0.655, (0 split)  
## pixel271 < 15 to the right, agree=0.925, adj=0.602, (0 split)  
## pixel243 < 1 to the right, agree=0.923, adj=0.593, (0 split)  
## pixel269 < 42.5 to the right, agree=0.907, adj=0.509, (0 split)  
##   
## Node number 26: 3411 observations, complexity param=0.01366651  
## predicted class=3 expected loss=0.4588097 P(node) =0.1015179  
## class counts: 290 13 91 1846 27 810 20 8 230 76  
## probabilities: 0.085 0.004 0.027 0.541 0.008 0.237 0.006 0.002 0.067 0.022   
## left son=52 (2039 obs) right son=53 (1372 obs)  
## Primary splits:  
## pixel296 < 6.5 to the right, improve=426.5195, (0 missing)  
## pixel290 < 22.5 to the left, improve=423.2648, (0 missing)  
## pixel297 < 4.5 to the right, improve=371.5284, (0 missing)  
## pixel269 < 0.5 to the right, improve=352.3361, (0 missing)  
## pixel263 < 0.5 to the left, improve=345.5473, (0 missing)  
## Surrogate splits:  
## pixel297 < 0.5 to the right, agree=0.855, adj=0.640, (0 split)  
## pixel295 < 0.5 to the right, agree=0.851, adj=0.629, (0 split)  
## pixel269 < 4.5 to the right, agree=0.842, adj=0.606, (0 split)  
## pixel323 < 53.5 to the right, agree=0.836, adj=0.592, (0 split)  
## pixel324 < 97.5 to the right, agree=0.835, adj=0.589, (0 split)  
##   
## Node number 27: 2448 observations, complexity param=0.005861861  
## predicted class=8 expected loss=0.3917484 P(node) =0.07285714  
## class counts: 70 125 394 155 51 66 40 14 1489 44  
## probabilities: 0.029 0.051 0.161 0.063 0.021 0.027 0.016 0.006 0.608 0.018   
## left son=54 (705 obs) right son=55 (1743 obs)  
## Primary splits:  
## pixel376 < 0.5 to the left, improve=241.2457, (0 missing)  
## pixel347 < 0.5 to the left, improve=216.7975, (0 missing)  
## pixel348 < 0.5 to the left, improve=205.0081, (0 missing)  
## pixel319 < 0.5 to the left, improve=192.9904, (0 missing)  
## pixel377 < 0.5 to the left, improve=183.2749, (0 missing)  
## Surrogate splits:  
## pixel348 < 0.5 to the left, agree=0.866, adj=0.536, (0 split)  
## pixel377 < 2.5 to the left, agree=0.857, adj=0.505, (0 split)  
## pixel404 < 3.5 to the left, agree=0.855, adj=0.498, (0 split)  
## pixel405 < 63.5 to the left, agree=0.826, adj=0.397, (0 split)  
## pixel375 < 0.5 to the left, agree=0.824, adj=0.387, (0 split)  
##   
## Node number 28: 3312 observations, complexity param=0.004655992  
## predicted class=4 expected loss=0.3209541 P(node) =0.09857143  
## class counts: 10 157 58 52 2249 67 180 263 52 224  
## probabilities: 0.003 0.047 0.018 0.016 0.679 0.020 0.054 0.079 0.016 0.068   
## left son=56 (2795 obs) right son=57 (517 obs)  
## Primary splits:  
## pixel322 < 34.5 to the left, improve=256.5658, (0 missing)  
## pixel429 < 36.5 to the right, improve=255.7342, (0 missing)  
## pixel295 < 144.5 to the left, improve=238.4376, (0 missing)  
## pixel183 < 85.5 to the left, improve=230.9062, (0 missing)  
## pixel294 < 65.5 to the left, improve=229.5362, (0 missing)  
## Surrogate splits:  
## pixel323 < 161.5 to the left, agree=0.932, adj=0.567, (0 split)  
## pixel295 < 99.5 to the left, agree=0.929, adj=0.545, (0 split)  
## pixel294 < 104 to the left, agree=0.923, adj=0.507, (0 split)  
## pixel321 < 103.5 to the left, agree=0.914, adj=0.449, (0 split)  
## pixel267 < 1 to the left, agree=0.908, adj=0.408, (0 split)  
##   
## Node number 29: 487 observations, complexity param=0.0005694379  
## predicted class=6 expected loss=0.07392197 P(node) =0.01449405  
## class counts: 0 1 18 2 8 6 451 0 1 0  
## probabilities: 0.000 0.002 0.037 0.004 0.016 0.012 0.926 0.000 0.002 0.000   
## left son=58 (21 obs) right son=59 (466 obs)  
## Primary splits:  
## pixel186 < 5 to the right, improve=31.89076, (0 missing)  
## pixel214 < 24.5 to the right, improve=31.57933, (0 missing)  
## pixel242 < 78.5 to the right, improve=28.59778, (0 missing)  
## pixel158 < 4.5 to the right, improve=28.43991, (0 missing)  
## pixel157 < 19.5 to the right, improve=28.07234, (0 missing)  
## Surrogate splits:  
## pixel158 < 4.5 to the right, agree=0.996, adj=0.905, (0 split)  
## pixel130 < 10.5 to the right, agree=0.994, adj=0.857, (0 split)  
## pixel157 < 19.5 to the right, agree=0.994, adj=0.857, (0 split)  
## pixel129 < 81.5 to the right, agree=0.992, adj=0.810, (0 split)  
## pixel214 < 24.5 to the right, agree=0.992, adj=0.810, (0 split)  
##   
## Node number 30: 4023 observations, complexity param=0.007737657  
## predicted class=7 expected loss=0.3656475 P(node) =0.1197321  
## class counts: 97 20 117 173 74 318 51 2552 33 588  
## probabilities: 0.024 0.005 0.029 0.043 0.018 0.079 0.013 0.634 0.008 0.146   
## left son=60 (901 obs) right son=61 (3122 obs)  
## Primary splits:  
## pixel377 < 7 to the right, improve=488.8879, (0 missing)  
## pixel376 < 28.5 to the right, improve=461.3577, (0 missing)  
## pixel349 < 47.5 to the right, improve=394.7461, (0 missing)  
## pixel378 < 82 to the right, improve=394.3384, (0 missing)  
## pixel350 < 52.5 to the right, improve=367.5728, (0 missing)  
## Surrogate splits:  
## pixel376 < 64.5 to the right, agree=0.957, adj=0.810, (0 split)  
## pixel378 < 79 to the right, agree=0.940, adj=0.734, (0 split)  
## pixel349 < 101.5 to the right, agree=0.931, adj=0.691, (0 split)  
## pixel350 < 51.5 to the right, agree=0.921, adj=0.647, (0 split)  
## pixel404 < 1.5 to the right, agree=0.919, adj=0.639, (0 split)  
##   
## Node number 31: 4532 observations, complexity param=0.008776043  
## predicted class=9 expected loss=0.516549 P(node) =0.134881  
## class counts: 38 103 206 324 393 325 190 286 476 2191  
## probabilities: 0.008 0.023 0.045 0.071 0.087 0.072 0.042 0.063 0.105 0.483   
## left son=62 (1169 obs) right son=63 (3363 obs)  
## Primary splits:  
## pixel569 < 0.5 to the right, improve=396.2662, (0 missing)  
## pixel542 < 3.5 to the right, improve=367.1146, (0 missing)  
## pixel570 < 3.5 to the right, improve=364.7791, (0 missing)  
## pixel541 < 3.5 to the right, improve=355.2620, (0 missing)  
## pixel597 < 7.5 to the right, improve=355.1998, (0 missing)  
## Surrogate splits:  
## pixel568 < 0.5 to the right, agree=0.929, adj=0.725, (0 split)  
## pixel597 < 33.5 to the right, agree=0.923, adj=0.701, (0 split)  
## pixel570 < 41.5 to the right, agree=0.918, adj=0.683, (0 split)  
## pixel541 < 5.5 to the right, agree=0.917, adj=0.678, (0 split)  
## pixel542 < 31.5 to the right, agree=0.910, adj=0.649, (0 split)  
##   
## Node number 34: 77 observations  
## predicted class=2 expected loss=0.3636364 P(node) =0.002291667  
## class counts: 3 0 49 3 4 8 5 0 2 3  
## probabilities: 0.039 0.000 0.636 0.039 0.052 0.104 0.065 0.000 0.026 0.039   
##   
## Node number 35: 92 observations  
## predicted class=5 expected loss=0.7717391 P(node) =0.002738095  
## class counts: 19 0 4 0 18 21 14 0 1 15  
## probabilities: 0.207 0.000 0.043 0.000 0.196 0.228 0.152 0.000 0.011 0.163   
##   
## Node number 36: 442 observations  
## predicted class=0 expected loss=0.3076923 P(node) =0.01315476  
## class counts: 306 1 13 4 1 21 21 70 1 4  
## probabilities: 0.692 0.002 0.029 0.009 0.002 0.048 0.048 0.158 0.002 0.009   
##   
## Node number 37: 236 observations  
## predicted class=5 expected loss=0.6779661 P(node) =0.00702381  
## class counts: 12 2 51 1 6 76 75 6 3 4  
## probabilities: 0.051 0.008 0.216 0.004 0.025 0.322 0.318 0.025 0.013 0.017   
##   
## Node number 38: 681 observations  
## predicted class=5 expected loss=0.6681351 P(node) =0.02026786  
## class counts: 42 8 71 211 5 226 59 28 23 8  
## probabilities: 0.062 0.012 0.104 0.310 0.007 0.332 0.087 0.041 0.034 0.012   
##   
## Node number 39: 77 observations  
## predicted class=7 expected loss=0.1558442 P(node) =0.002291667  
## class counts: 0 0 0 9 0 2 0 65 1 0  
## probabilities: 0.000 0.000 0.000 0.117 0.000 0.026 0.000 0.844 0.013 0.000   
##   
## Node number 40: 3357 observations  
## predicted class=1 expected loss=0.1069407 P(node) =0.09991071  
## class counts: 0 2998 84 29 27 50 9 48 100 12  
## probabilities: 0.000 0.893 0.025 0.009 0.008 0.015 0.003 0.014 0.030 0.004   
##   
## Node number 41: 304 observations  
## predicted class=2 expected loss=0.6578947 P(node) =0.009047619  
## class counts: 1 39 104 33 5 9 7 69 29 8  
## probabilities: 0.003 0.128 0.342 0.109 0.016 0.030 0.023 0.227 0.095 0.026   
##   
## Node number 42: 571 observations  
## predicted class=2 expected loss=0.3922942 P(node) =0.01699405  
## class counts: 0 58 347 86 3 7 20 13 34 3  
## probabilities: 0.000 0.102 0.608 0.151 0.005 0.012 0.035 0.023 0.060 0.005   
##   
## Node number 43: 205 observations  
## predicted class=6 expected loss=0.5414634 P(node) =0.00610119  
## class counts: 7 0 4 3 30 42 94 1 13 11  
## probabilities: 0.034 0.000 0.020 0.015 0.146 0.205 0.459 0.005 0.063 0.054   
##   
## Node number 44: 841 observations  
## predicted class=5 expected loss=0.235434 P(node) =0.02502976  
## class counts: 17 15 29 67 17 643 26 0 18 9  
## probabilities: 0.020 0.018 0.034 0.080 0.020 0.765 0.031 0.000 0.021 0.011   
##   
## Node number 45: 179 observations  
## predicted class=6 expected loss=0.396648 P(node) =0.005327381  
## class counts: 2 1 9 0 2 31 108 0 26 0  
## probabilities: 0.011 0.006 0.050 0.000 0.011 0.173 0.603 0.000 0.145 0.000   
##   
## Node number 46: 501 observations  
## predicted class=6 expected loss=0.7764471 P(node) =0.01491071  
## class counts: 7 79 99 29 30 74 112 1 49 21  
## probabilities: 0.014 0.158 0.198 0.058 0.060 0.148 0.224 0.002 0.098 0.042   
##   
## Node number 47: 951 observations  
## predicted class=8 expected loss=0.4521556 P(node) =0.02830357  
## class counts: 13 88 16 218 21 33 6 7 521 28  
## probabilities: 0.014 0.093 0.017 0.229 0.022 0.035 0.006 0.007 0.548 0.029   
##   
## Node number 48: 1680 observations  
## predicted class=2 expected loss=0.177381 P(node) =0.05  
## class counts: 0 24 1382 127 13 15 86 14 12 7  
## probabilities: 0.000 0.014 0.823 0.076 0.008 0.009 0.051 0.008 0.007 0.004   
##   
## Node number 49: 303 observations  
## predicted class=6 expected loss=0.630363 P(node) =0.009017857  
## class counts: 0 0 25 6 85 18 112 2 17 38  
## probabilities: 0.000 0.000 0.083 0.020 0.281 0.059 0.370 0.007 0.056 0.125   
##   
## Node number 50: 440 observations  
## predicted class=2 expected loss=0.7227273 P(node) =0.01309524  
## class counts: 40 1 122 76 84 10 27 2 35 43  
## probabilities: 0.091 0.002 0.277 0.173 0.191 0.023 0.061 0.005 0.080 0.098   
##   
## Node number 51: 1883 observations  
## predicted class=6 expected loss=0.1848115 P(node) =0.05604167  
## class counts: 9 12 26 53 93 96 1535 1 37 21  
## probabilities: 0.005 0.006 0.014 0.028 0.049 0.051 0.815 0.001 0.020 0.011   
##   
## Node number 52: 2039 observations  
## predicted class=3 expected loss=0.2305051 P(node) =0.06068452  
## class counts: 126 12 26 1569 6 125 2 6 111 56  
## probabilities: 0.062 0.006 0.013 0.769 0.003 0.061 0.001 0.003 0.054 0.027   
##   
## Node number 53: 1372 observations  
## predicted class=5 expected loss=0.5007289 P(node) =0.04083333  
## class counts: 164 1 65 277 21 685 18 2 119 20  
## probabilities: 0.120 0.001 0.047 0.202 0.015 0.499 0.013 0.001 0.087 0.015   
##   
## Node number 54: 705 observations  
## predicted class=2 expected loss=0.5035461 P(node) =0.02098214  
## class counts: 8 34 350 41 25 15 13 12 175 32  
## probabilities: 0.011 0.048 0.496 0.058 0.035 0.021 0.018 0.017 0.248 0.045   
##   
## Node number 55: 1743 observations  
## predicted class=8 expected loss=0.2461274 P(node) =0.051875  
## class counts: 62 91 44 114 26 51 27 2 1314 12  
## probabilities: 0.036 0.052 0.025 0.065 0.015 0.029 0.015 0.001 0.754 0.007   
##   
## Node number 56: 2795 observations  
## predicted class=4 expected loss=0.2200358 P(node) =0.08318452  
## class counts: 4 84 37 24 2180 22 162 55 29 198  
## probabilities: 0.001 0.030 0.013 0.009 0.780 0.008 0.058 0.020 0.010 0.071   
##   
## Node number 57: 517 observations  
## predicted class=7 expected loss=0.5976789 P(node) =0.0153869  
## class counts: 6 73 21 28 69 45 18 208 23 26  
## probabilities: 0.012 0.141 0.041 0.054 0.133 0.087 0.035 0.402 0.044 0.050   
##   
## Node number 58: 21 observations  
## predicted class=2 expected loss=0.1428571 P(node) =0.000625  
## class counts: 0 0 18 2 0 0 1 0 0 0  
## probabilities: 0.000 0.000 0.857 0.095 0.000 0.000 0.048 0.000 0.000 0.000   
##   
## Node number 59: 466 observations  
## predicted class=6 expected loss=0.03433476 P(node) =0.01386905  
## class counts: 0 1 0 0 8 6 450 0 1 0  
## probabilities: 0.000 0.002 0.000 0.000 0.017 0.013 0.966 0.000 0.002 0.000   
##   
## Node number 60: 901 observations  
## predicted class=5 expected loss=0.6759156 P(node) =0.02681548  
## class counts: 34 11 9 147 31 292 22 61 22 272  
## probabilities: 0.038 0.012 0.010 0.163 0.034 0.324 0.024 0.068 0.024 0.302   
##   
## Node number 61: 3122 observations  
## predicted class=7 expected loss=0.202114 P(node) =0.09291667  
## class counts: 63 9 108 26 43 26 29 2491 11 316  
## probabilities: 0.020 0.003 0.035 0.008 0.014 0.008 0.009 0.798 0.004 0.101   
##   
## Node number 62: 1169 observations  
## predicted class=8 expected loss=0.7331052 P(node) =0.03479167  
## class counts: 35 82 148 85 38 179 178 62 312 50  
## probabilities: 0.030 0.070 0.127 0.073 0.033 0.153 0.152 0.053 0.267 0.043   
##   
## Node number 63: 3363 observations  
## predicted class=9 expected loss=0.363366 P(node) =0.1000893  
## class counts: 3 21 58 239 355 146 12 224 164 2141  
## probabilities: 0.001 0.006 0.017 0.071 0.106 0.043 0.004 0.067 0.049 0.637

plotcp(rtree) # plot cross-validation results

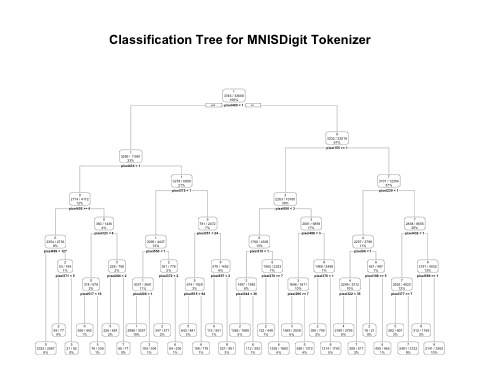


printcp(rtree) # plot cross-validation results

##   
## Classification tree:  
## rpart(formula = label ~ ., data = train\_set, method = "class",   
## cp = 0, minsplit = 1, maxdepth = 5)  
##   
## Variables actually used in tree construction:  
## [1] pixel155 pixel186 pixel206 pixel239 pixel270 pixel284 pixel296 pixel319  
## [9] pixel322 pixel323 pixel344 pixel351 pixel371 pixel372 pixel375 pixel376  
## [17] pixel377 pixel409 pixel432 pixel434 pixel455 pixel488 pixel489 pixel515  
## [25] pixel517 pixel550 pixel569 pixel656 pixel657 pixel96   
##   
## Root node error: 29854/33600 = 0.88851  
##   
## n= 33600   
##   
## CP nsplit rel error xerror xstd  
## 1 0.09298586 0 1.00000 1.00000 0.0019325  
## 2 0.09050713 1 0.90701 0.90668 0.0024298  
## 3 0.07141422 2 0.81651 0.81068 0.0027559  
## 4 0.06679172 3 0.74509 0.74653 0.0029016  
## 5 0.06381054 4 0.67830 0.68597 0.0029955  
## 6 0.05017753 5 0.61449 0.61603 0.0030562  
## 7 0.04468413 6 0.56431 0.56820 0.0030698  
## 8 0.04049709 7 0.51963 0.51236 0.0030577  
## 9 0.02003082 8 0.47913 0.48804 0.0030428  
## 10 0.01550881 9 0.45910 0.46861 0.0030267  
## 11 0.01483888 10 0.44359 0.45518 0.0030134  
## 12 0.01366651 11 0.42875 0.43987 0.0029959  
## 13 0.00981443 12 0.41509 0.42614 0.0029782  
## 14 0.00877604 13 0.40527 0.41780 0.0029664  
## 15 0.00773766 14 0.39650 0.40789 0.0029515  
## 16 0.00586186 15 0.38876 0.39626 0.0029326  
## 17 0.00465599 16 0.38290 0.39134 0.0029241  
## 18 0.00318215 17 0.37824 0.38581 0.0029143  
## 19 0.00311516 18 0.37506 0.38159 0.0029066  
## 20 0.00301467 20 0.36883 0.37898 0.0029017  
## 21 0.00291418 21 0.36581 0.37596 0.0028960  
## 22 0.00257922 22 0.36290 0.37261 0.0028895  
## 23 0.00217726 23 0.36032 0.37047 0.0028852  
## 24 0.00214377 24 0.35814 0.36950 0.0028833  
## 25 0.00211027 25 0.35600 0.36903 0.0028824  
## 26 0.00103839 27 0.35178 0.36538 0.0028750  
## 27 0.00056944 28 0.35074 0.36444 0.0028731  
## 28 0.00000000 30 0.34960 0.36370 0.0028716

# Plot tree | lets Plot decision trees  
 rpart.plot(rtree,main="Classification Tree for MNISDigit Tokenizer", extra= 102) # plot decision tree

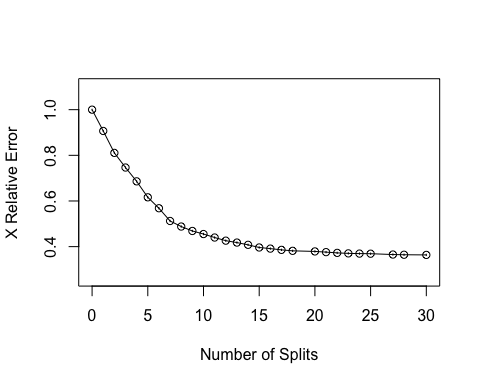
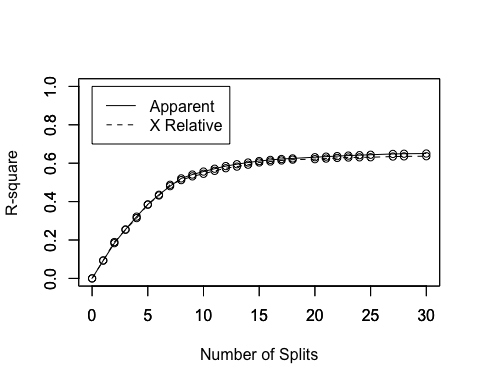
## Warning: All boxes will be white (the box.palette argument will be ignored) because  
## the number of classes in the response 10 is greater than length(box.palette) 6.  
## To silence this warning use box.palette=0 or trace=-1.



rsq.rpart(rtree) # plot approximate R-squared and relative error for different splits (2 plots)

##   
## Classification tree:  
## rpart(formula = label ~ ., data = train\_set, method = "class",   
## cp = 0, minsplit = 1, maxdepth = 5)  
##   
## Variables actually used in tree construction:  
## [1] pixel155 pixel186 pixel206 pixel239 pixel270 pixel284 pixel296 pixel319  
## [9] pixel322 pixel323 pixel344 pixel351 pixel371 pixel372 pixel375 pixel376  
## [17] pixel377 pixel409 pixel432 pixel434 pixel455 pixel488 pixel489 pixel515  
## [25] pixel517 pixel550 pixel569 pixel656 pixel657 pixel96   
##   
## Root node error: 29854/33600 = 0.88851  
##   
## n= 33600   
##   
## CP nsplit rel error xerror xstd  
## 1 0.09298586 0 1.00000 1.00000 0.0019325  
## 2 0.09050713 1 0.90701 0.90668 0.0024298  
## 3 0.07141422 2 0.81651 0.81068 0.0027559  
## 4 0.06679172 3 0.74509 0.74653 0.0029016  
## 5 0.06381054 4 0.67830 0.68597 0.0029955  
## 6 0.05017753 5 0.61449 0.61603 0.0030562  
## 7 0.04468413 6 0.56431 0.56820 0.0030698  
## 8 0.04049709 7 0.51963 0.51236 0.0030577  
## 9 0.02003082 8 0.47913 0.48804 0.0030428  
## 10 0.01550881 9 0.45910 0.46861 0.0030267  
## 11 0.01483888 10 0.44359 0.45518 0.0030134  
## 12 0.01366651 11 0.42875 0.43987 0.0029959  
## 13 0.00981443 12 0.41509 0.42614 0.0029782  
## 14 0.00877604 13 0.40527 0.41780 0.0029664  
## 15 0.00773766 14 0.39650 0.40789 0.0029515  
## 16 0.00586186 15 0.38876 0.39626 0.0029326  
## 17 0.00465599 16 0.38290 0.39134 0.0029241  
## 18 0.00318215 17 0.37824 0.38581 0.0029143  
## 19 0.00311516 18 0.37506 0.38159 0.0029066  
## 20 0.00301467 20 0.36883 0.37898 0.0029017  
## 21 0.00291418 21 0.36581 0.37596 0.0028960  
## 22 0.00257922 22 0.36290 0.37261 0.0028895  
## 23 0.00217726 23 0.36032 0.37047 0.0028852  
## 24 0.00214377 24 0.35814 0.36950 0.0028833  
## 25 0.00211027 25 0.35600 0.36903 0.0028824  
## 26 0.00103839 27 0.35178 0.36538 0.0028750  
## 27 0.00056944 28 0.35074 0.36444 0.0028731  
## 28 0.00000000 30 0.34960 0.36370 0.0028716

## Warning in rsq.rpart(rtree): may not be applicable for this method



# Section 3: Prediction | Test Phase  
  
 cat("\nTrain Data Images:")

##   
## Train Data Images:

table(digitTrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain\_Set - Images by Labels:")

##   
## Train\_Set - Images by Labels:

table(train\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 3315 3746 3341 3529 3253 3020 3307 3500 3213 3376

cat("\nTest\_Set - Images by Labels:")

##   
## Test\_Set - Images by Labels:

table(test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 817 938 836 822 819 775 830 901 850 812

predict\_unseen <- predict(rtree, test\_set, type = 'class')  
 # predict\_unseen  
 table\_test\_matrix <- table(test\_set$label, predict\_unseen)  
 cat("\n\nPrediction results : Confusion Matrix \n\n")

##   
##   
## Prediction results : Confusion Matrix

# table\_mat  
 confusionMatrix(table\_test\_matrix)

## Confusion Matrix and Statistics  
##   
## predict\_unseen  
## 0 1 2 3 4 5 6 7 8 9  
## 0 658 0 21 30 1 66 9 8 22 2  
## 1 0 754 41 6 20 8 20 17 66 6  
## 2 7 21 587 9 10 61 41 39 49 12  
## 3 7 4 100 351 3 146 22 9 113 67  
## 4 1 9 39 1 516 22 68 33 34 96  
## 5 21 17 12 29 7 503 68 22 60 36  
## 6 19 4 30 2 27 51 623 11 57 6  
## 7 31 10 39 2 20 27 0 701 18 53  
## 8 1 24 92 32 10 48 48 3 552 40  
## 9 3 4 22 12 53 76 25 100 14 503  
##   
## Overall Statistics  
##   
## Accuracy : 0.6843   
## 95% CI : (0.6742, 0.6942)  
## No Information Rate : 0.12   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.6492   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.87968 0.89020 0.59715 0.74051 0.77361 0.49901  
## Specificity 0.97922 0.97564 0.96643 0.94058 0.96082 0.96320  
## Pos Pred Value 0.80539 0.80384 0.70215 0.42701 0.63004 0.64903  
## Neg Pred Value 0.98813 0.98754 0.94765 0.98377 0.98008 0.93377  
## Prevalence 0.08905 0.10083 0.11702 0.05643 0.07940 0.12000  
## Detection Rate 0.07833 0.08976 0.06988 0.04179 0.06143 0.05988  
## Detection Prevalence 0.09726 0.11167 0.09952 0.09786 0.09750 0.09226  
## Balanced Accuracy 0.92945 0.93292 0.78179 0.84054 0.86722 0.73111  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.67424 0.74337 0.56041 0.61267  
## Specificity 0.97231 0.97318 0.95981 0.95923  
## Pos Pred Value 0.75060 0.77802 0.64941 0.61946  
## Neg Pred Value 0.96024 0.96773 0.94265 0.95809  
## Prevalence 0.11000 0.11226 0.11726 0.09774  
## Detection Rate 0.07417 0.08345 0.06571 0.05988  
## Detection Prevalence 0.09881 0.10726 0.10119 0.09667  
## Balanced Accuracy 0.82328 0.85828 0.76011 0.78595

str(digitTrainDF)

## 'data.frame': 42000 obs. of 785 variables:  
## $ label : Factor w/ 10 levels "0","1","2","3",..: 2 1 2 5 1 1 8 4 6 4 ...  
## $ pixel0 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel1 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel2 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel3 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel4 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel5 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel6 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel7 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel8 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel9 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel10 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel11 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel12 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel13 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel14 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel15 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel16 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel17 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel18 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel19 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel20 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel21 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel22 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel23 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel24 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel25 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel26 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel27 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel28 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel29 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel30 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel31 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel32 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel33 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel34 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel35 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel36 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel37 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel38 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel39 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel40 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel41 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel42 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel43 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel44 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel45 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel46 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel47 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel48 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel49 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel50 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel51 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel52 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel53 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel54 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel55 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel56 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel57 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel58 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel59 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel60 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel61 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel62 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel63 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel64 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel65 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel66 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel67 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel68 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel69 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel70 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel71 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel72 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel73 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel74 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel75 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel76 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel77 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel78 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel79 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel80 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel81 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel82 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel83 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel84 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel85 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel86 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel87 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel88 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel89 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel90 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel91 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel92 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel93 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel94 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel95 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel96 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel97 : int 0 0 0 0 0 0 0 0 0 0 ...  
## [list output truncated]

str(test\_set)

## 'data.frame': 8400 obs. of 785 variables:  
## $ label : Factor w/ 10 levels "0","1","2","3",..: 2 8 6 10 1 5 4 7 1 8 ...  
## $ pixel0 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel1 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel2 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel3 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel4 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel5 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel6 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel7 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel8 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel9 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel10 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel11 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel12 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel13 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel14 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel15 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel16 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel17 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel18 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel19 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel20 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel21 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel22 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel23 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel24 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel25 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel26 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel27 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel28 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel29 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel30 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel31 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel32 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel33 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel34 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel35 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel36 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel37 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel38 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel39 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel40 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel41 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel42 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel43 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel44 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel45 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel46 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel47 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel48 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel49 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel50 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel51 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel52 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel53 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel54 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel55 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel56 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel57 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel58 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel59 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel60 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel61 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel62 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel63 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel64 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel65 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel66 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel67 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel68 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel69 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel70 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel71 : int 0 0 0 0 0 0 0 191 0 0 ...  
## $ pixel72 : int 0 0 0 0 0 0 0 128 0 0 ...  
## $ pixel73 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel74 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel75 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel76 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel77 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel78 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel79 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel80 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel81 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel82 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel83 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel84 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel85 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel86 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel87 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel88 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel89 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel90 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel91 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel92 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel93 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel94 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel95 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel96 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel97 : int 0 0 0 0 0 0 0 0 0 0 ...  
## [list output truncated]

str(train\_set)

## 'data.frame': 33600 obs. of 785 variables:  
## $ label : Factor w/ 10 levels "0","1","2","3",..: 10 3 2 5 1 1 7 4 1 10 ...  
## $ pixel0 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel1 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel2 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel3 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel4 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel5 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel6 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel7 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel8 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel9 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel10 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel11 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel12 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel13 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel14 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel15 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel16 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel17 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel18 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel19 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel20 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel21 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel22 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel23 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel24 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel25 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel26 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel27 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel28 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel29 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel30 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel31 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel32 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel33 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel34 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel35 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel36 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel37 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel38 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel39 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel40 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel41 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel42 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel43 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel44 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel45 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel46 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel47 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel48 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel49 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel50 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel51 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel52 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel53 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel54 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel55 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel56 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel57 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel58 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel59 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel60 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel61 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel62 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel63 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel64 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel65 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel66 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel67 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel68 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel69 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel70 : int 0 0 0 0 0 0 9 0 0 0 ...  
## $ pixel71 : int 0 0 0 0 0 0 233 0 0 0 ...  
## $ pixel72 : int 0 0 0 0 0 0 255 0 0 0 ...  
## $ pixel73 : int 0 0 0 0 0 0 154 0 0 0 ...  
## $ pixel74 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel75 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel76 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel77 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel78 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel79 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel80 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel81 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel82 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel83 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel84 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel85 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel86 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel87 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel88 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel89 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel90 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel91 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel92 : int 0 103 0 0 0 0 0 0 0 0 ...  
## $ pixel93 : int 0 121 0 0 0 0 0 0 0 0 ...  
## $ pixel94 : int 0 121 0 0 0 0 0 0 0 0 ...  
## $ pixel95 : int 0 121 0 0 0 0 0 0 0 0 ...  
## $ pixel96 : int 0 109 0 0 0 0 0 0 0 0 ...  
## $ pixel97 : int 0 0 0 0 0 0 13 0 0 0 ...  
## [list output truncated]

str(digitValidationDF)

## 'data.frame': 28000 obs. of 785 variables:  
## $ label : Factor w/ 1 level "": 1 1 1 1 1 1 1 1 1 1 ...  
## $ pixel0 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel1 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel2 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel3 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel4 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel5 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel6 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel7 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel8 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel9 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel10 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel11 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel12 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel13 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel14 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel15 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel16 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel17 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel18 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel19 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel20 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel21 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel22 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel23 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel24 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel25 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel26 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel27 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel28 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel29 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel30 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel31 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel32 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel33 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel34 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel35 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel36 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel37 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel38 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel39 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel40 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel41 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel42 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel43 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel44 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel45 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel46 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel47 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel48 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel49 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel50 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel51 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel52 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel53 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel54 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel55 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel56 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel57 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel58 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel59 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel60 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel61 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel62 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel63 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel64 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel65 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel66 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel67 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel68 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel69 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel70 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel71 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel72 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel73 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel74 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel75 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel76 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel77 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel78 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel79 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel80 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel81 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel82 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel83 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel84 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel85 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel86 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel87 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel88 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel89 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel90 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel91 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel92 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel93 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel94 : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ pixel95 : int 0 0 0 0 13 0 0 0 0 0 ...  
## $ pixel96 : int 0 0 0 0 80 0 0 0 0 0 ...  
## $ pixel97 : int 0 0 0 0 175 0 0 0 0 0 ...  
## [list output truncated]

# Section 3: Prediction | Validation Phase  
 cat("\nTest Data Images:")

##   
## Test Data Images:

table(digitValidationDF$label)

##   
##   
## 28000

cat("\nTrain Data Images:")

##   
## Train Data Images:

table(digitTrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain\_Set - Images by Labels:")

##   
## Train\_Set - Images by Labels:

table(train\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 3315 3746 3341 3529 3253 3020 3307 3500 3213 3376

cat("\nTest\_Set - Images by Labels:")

##   
## Test\_Set - Images by Labels:

table(test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 817 938 836 822 819 775 830 901 850 812

predict\_final <- predict(rtree, digitValidationDF, type = 'class')  
 table\_final <- table(digitValidationDF$label, predict\_final)  
 cat("\n\nPrediction results : \n\n")

##   
##   
## Prediction results :

table\_final

## predict\_final  
## 0 1 2 3 4 5 6 7 8 9  
## 2500 2872 3089 1622 2399 3335 2947 3071 3331 2834

#View the final validation results and export to csv  
 predict\_finaldf <- data.frame(predict\_final)  
 cat("\n\nPrediction results by Label : \n\n")

##   
##   
## Prediction results by Label :

View(predict\_finaldf)  
   
 #Export to CSV  
 write.csv(x=predict\_finaldf, file="/Users/sathishrajendiran/Documents/R/HW6/predict\_finaldf.csv")

# Random Forest prediction of Digit Tokenizer data  
 EnsurePackage("randomForest")  
  
 # View(fedPapersDF1)  
 cat("\n All Images by Labels:")

##   
## All Images by Labels:

table(test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 817 938 836 822 819 775 830 901 850 812

fit <- randomForest(y=test\_set$label, x=test\_set[2:ncol(test\_set)], data=test\_set, ntree=100  
 , keep.forest=FALSE, importance=TRUE)  
 print(fit) # view results

##   
## Call:  
## randomForest(x = test\_set[2:ncol(test\_set)], y = test\_set$label, ntree = 100, importance = TRUE, keep.forest = FALSE, data = test\_set)   
## Type of random forest: classification  
## Number of trees: 100  
## No. of variables tried at each split: 28  
##   
## OOB estimate of error rate: 6.36%  
## Confusion matrix:  
## 0 1 2 3 4 5 6 7 8 9 class.error  
## 0 800 0 1 0 1 2 3 0 9 1 0.02080783  
## 1 0 918 9 1 2 4 1 1 1 1 0.02132196  
## 2 7 4 763 7 12 4 8 11 14 6 0.08732057  
## 3 4 5 13 736 1 24 3 9 21 6 0.10462287  
## 4 6 2 6 0 768 0 11 1 5 20 0.06227106  
## 5 8 3 4 20 1 716 6 3 6 8 0.07612903  
## 6 10 3 1 1 3 9 801 0 2 0 0.03493976  
## 7 3 6 11 2 6 0 0 853 2 18 0.05327414  
## 8 2 10 5 13 11 18 5 3 769 14 0.09529412  
## 9 4 2 4 8 21 6 2 15 8 742 0.08620690

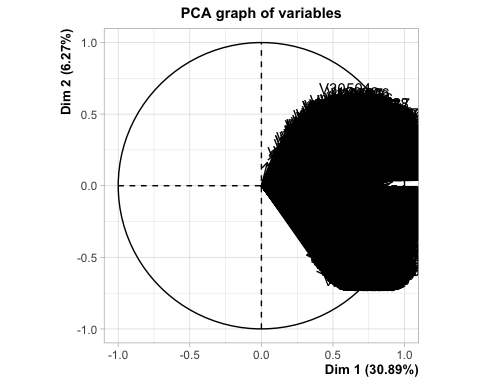
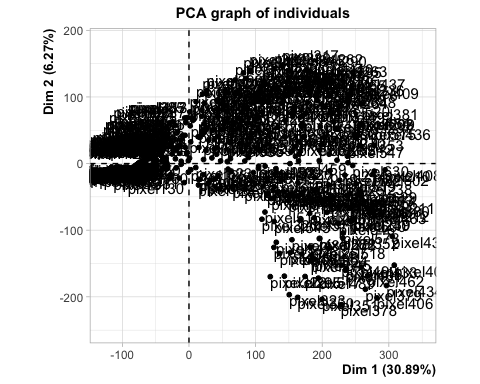
importance(fit) # importance of each predictor

## 0 1 2 3 4  
## pixel0 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel1 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel2 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel3 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel4 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel5 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel6 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel7 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel8 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel9 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel10 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel11 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel12 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel13 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel14 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel15 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel16 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel17 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel18 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel19 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel20 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel21 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel22 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
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## pixel606 3.734979260 12.039785715  
## pixel607 4.665245337 6.964378166  
## pixel608 3.955520140 7.213279923  
## pixel609 3.206897118 3.498578531  
## pixel610 2.903643770 2.334564967  
## pixel611 3.578979913 1.587758208  
## pixel612 1.926698026 0.489085252  
## pixel613 1.428550518 0.064193548  
## pixel614 0.000000000 0.016900585  
## pixel615 0.000000000 0.000000000  
## pixel616 0.000000000 0.000000000  
## pixel617 0.000000000 0.000000000  
## pixel618 0.000000000 0.062677091  
## pixel619 1.625939971 0.383034298  
## pixel620 0.901746786 0.736998472  
## pixel621 3.182010597 1.961759881  
## pixel622 3.922933403 5.916848339  
## pixel623 6.351390249 10.835909092  
## pixel624 4.491656135 23.890504522  
## pixel625 3.760732811 25.538045324  
## pixel626 4.660026408 22.140056104  
## pixel627 6.080725330 18.102726756  
## pixel628 5.843530802 16.289598430  
## pixel629 5.057407233 12.843970862  
## pixel630 6.034157297 14.284228817  
## pixel631 4.489846049 16.789298674  
## pixel632 5.757211887 11.039359884  
## pixel633 4.924706109 7.978560107  
## pixel634 3.755777834 7.116345642  
## pixel635 3.890507641 5.630931617  
## pixel636 2.828829901 3.271791815  
## pixel637 4.036758162 2.711308911  
## pixel638 2.946932327 1.408868155  
## pixel639 1.934898298 0.560279279  
## pixel640 1.005037815 0.365177747  
## pixel641 0.000000000 0.091609152  
## pixel642 0.000000000 0.000000000  
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## pixel644 0.000000000 0.000000000  
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## pixel647 0.000000000 0.064411413  
## pixel648 0.234609192 0.557402300  
## pixel649 0.719122729 1.598697284  
## pixel650 2.754917541 2.207557829  
## pixel651 3.533952918 5.702462837  
## pixel652 4.533082518 9.417253901  
## pixel653 6.361546996 11.085571465  
## pixel654 5.985580713 22.373253255  
## pixel655 6.821459810 33.429990730  
## pixel656 6.245966470 35.516086226  
## pixel657 7.481793862 29.064444361  
## pixel658 7.147747983 29.463059130  
## pixel659 4.234870671 22.524112517  
## pixel660 5.278989621 11.466607427  
## pixel661 3.796520253 5.995968491  
## pixel662 3.676561639 5.995096321  
## pixel663 2.789749327 3.155839946  
## pixel664 3.024684490 3.144860534  
## pixel665 2.678486835 1.416715800  
## pixel666 2.763556766 0.586264167  
## pixel667 0.004815683 0.385201767  
## pixel668 0.000000000 0.065134665  
## pixel669 0.000000000 0.049022887  
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## pixel675 0.000000000 0.019746940  
## pixel676 -1.758536995 0.206436616  
## pixel677 0.447154799 0.482326773  
## pixel678 2.554457562 0.843339294  
## pixel679 3.807997510 2.498244470  
## pixel680 3.874055287 5.555604816  
## pixel681 4.862106143 5.839010611  
## pixel682 6.365787799 8.324365969  
## pixel683 4.609447075 11.759663502  
## pixel684 4.079886494 11.621615919  
## pixel685 4.998384759 10.896433123  
## pixel686 5.073616519 6.913296523  
## pixel687 2.767364412 4.067142318  
## pixel688 3.491652889 4.273579621  
## pixel689 2.957790796 4.028975127  
## pixel690 3.950572443 3.664163117  
## pixel691 1.942537775 2.398552428  
## pixel692 1.981704835 1.693547950  
## pixel693 1.685180543 0.742616259  
## pixel694 0.590307754 0.345042054  
## pixel695 1.005037815 0.204894788  
## pixel696 0.000000000 0.197013447  
## pixel697 0.000000000 0.040206398  
## pixel698 0.000000000 0.000000000  
## pixel699 0.000000000 0.000000000  
## pixel700 0.000000000 0.000000000  
## pixel701 0.000000000 0.000000000  
## pixel702 0.000000000 0.000000000  
## pixel703 0.000000000 0.019909091  
## pixel704 0.000000000 0.183137639  
## pixel705 1.005037815 0.201093331  
## pixel706 1.353218774 0.570723160  
## pixel707 2.433767063 1.594924028  
## pixel708 3.332243377 2.932933529  
## pixel709 3.579090267 5.428319343  
## pixel710 4.977369747 4.490523258  
## pixel711 2.457650754 7.087061168  
## pixel712 3.781769604 6.591604267  
## pixel713 4.148504952 5.666133829  
## pixel714 2.983571587 4.773385270  
## pixel715 4.118189226 5.667324496  
## pixel716 2.758489170 4.513976238  
## pixel717 3.013309776 4.108794105  
## pixel718 2.284742677 3.076265768  
## pixel719 2.103221773 1.298722460  
## pixel720 1.690647101 0.699650875  
## pixel721 1.005037815 0.490635871  
## pixel722 0.000000000 0.023333333  
## pixel723 0.000000000 0.036111111  
## pixel724 1.005037815 0.083965872  
## pixel725 0.000000000 0.000000000  
## pixel726 0.000000000 0.035555556  
## pixel727 0.000000000 0.000000000  
## pixel728 0.000000000 0.000000000  
## pixel729 0.000000000 0.000000000  
## pixel730 0.000000000 0.000000000  
## pixel731 0.000000000 0.000000000  
## pixel732 0.000000000 0.000000000  
## pixel733 0.000000000 0.000000000  
## pixel734 0.000000000 0.050480851  
## pixel735 1.277108402 0.279027382  
## pixel736 0.905337066 0.335672428  
## pixel737 1.420976593 1.019141109  
## pixel738 -0.366297228 0.872356722  
## pixel739 1.917648174 1.488346538  
## pixel740 2.858058132 2.419102608  
## pixel741 1.793939861 4.065682204  
## pixel742 1.337440258 1.172451725  
## pixel743 2.164384614 1.293561736  
## pixel744 2.626338599 1.564633175  
## pixel745 2.014942296 0.557524545  
## pixel746 1.516946236 0.382799551  
## pixel747 1.289298674 0.515930066  
## pixel748 1.005037815 0.175197236  
## pixel749 0.000000000 0.095268252  
## pixel750 0.000000000 0.010000000  
## pixel751 0.000000000 0.030394737  
## pixel752 0.000000000 0.010000000  
## pixel753 0.000000000 0.000000000  
## pixel754 0.000000000 0.000000000  
## pixel755 0.000000000 0.000000000  
## pixel756 0.000000000 0.000000000  
## pixel757 0.000000000 0.000000000  
## pixel758 0.000000000 0.000000000  
## pixel759 0.000000000 0.000000000  
## pixel760 0.000000000 0.000000000  
## pixel761 0.000000000 0.000000000  
## pixel762 0.000000000 0.000000000  
## pixel763 0.000000000 0.000000000  
## pixel764 0.000000000 0.000000000  
## pixel765 0.000000000 0.000000000  
## pixel766 0.000000000 0.000000000  
## pixel767 0.000000000 0.000000000  
## pixel768 0.000000000 0.019407508  
## pixel769 0.000000000 0.000000000  
## pixel770 0.000000000 0.076604423  
## pixel771 0.000000000 0.033333333  
## pixel772 -1.005037815 0.054434117  
## pixel773 0.000000000 0.058500000  
## pixel774 0.000000000 0.000000000  
## pixel775 0.000000000 0.019022152  
## pixel776 0.000000000 0.000000000  
## pixel777 0.000000000 0.019644466  
## pixel778 0.000000000 0.000000000  
## pixel779 0.000000000 0.019727091  
## pixel780 0.000000000 0.000000000  
## pixel781 0.000000000 0.000000000  
## pixel782 0.000000000 0.000000000  
## pixel783 0.000000000 0.000000000

rf\_importance <- data.frame(importance(fit)) # importance of each predictor  
 rf\_importance

## X0 X1 X2 X3 X4  
## pixel0 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel1 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel2 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel3 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel4 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel5 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel6 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel7 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel8 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel9 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel10 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel11 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel12 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel13 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel14 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel15 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel16 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel17 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel18 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel19 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel20 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel21 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel22 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel23 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel24 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel25 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel26 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel27 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel28 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel29 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel30 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel31 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel32 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel33 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel34 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel35 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel36 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel37 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel38 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel39 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel40 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel41 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel42 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel43 0.0000000000 0.0000000 0.000000000 0.00000000 1.005037815  
## pixel44 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel45 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel46 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel47 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel48 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel49 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel50 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel51 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel52 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
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## pixel55 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel56 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel57 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel58 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel59 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel60 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel61 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel62 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel63 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel64 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel65 0.0000000000 0.0000000 -1.005037815 0.00000000 0.000000000  
## pixel66 0.0000000000 0.0000000 -1.005037815 0.00000000 1.493519044  
## pixel67 0.0000000000 0.0000000 -1.005037815 0.00000000 1.428247973  
## pixel68 1.0050378153 0.0000000 0.000000000 0.00000000 1.005037815  
## pixel69 1.5980861294 0.0000000 1.005037815 0.00000000 1.700533915  
## pixel70 1.4015496702 0.0000000 1.005037815 0.00000000 1.589436842  
## pixel71 1.0050378153 0.0000000 -1.005037815 0.00000000 1.219945395  
## pixel72 0.0000000000 0.0000000 1.005037815 1.00503782 0.000000000  
## pixel73 1.0050378153 0.0000000 -0.021035607 0.00000000 1.005037815  
## pixel74 0.0000000000 0.0000000 0.000000000 0.00000000 1.428073513  
## pixel75 1.0050378153 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel76 0.0000000000 0.0000000 1.005037815 0.00000000 0.000000000  
## pixel77 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel78 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel79 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel80 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel81 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel82 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel83 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel84 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel85 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel86 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel87 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel88 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel89 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel90 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel91 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel92 1.0050378153 0.0000000 -1.005037815 0.00000000 1.005037815  
## pixel93 1.3495988391 1.0050378 0.000000000 1.00503782 1.406008115  
## pixel94 -1.0050378153 1.0050378 1.005037815 1.00503782 1.005037815  
## pixel95 1.0050378153 0.0000000 2.292938199 0.55857697 2.005755271  
## pixel96 1.0050378153 1.4534705 1.519249648 1.51920201 3.104864724  
## pixel97 -1.0050378153 2.3871201 1.642719793 1.42833679 2.825231812  
## pixel98 -0.8865794102 1.6636587 2.622869604 2.79754050 2.626944078  
## pixel99 1.3289247687 1.4283930 0.177177966 1.25318142 1.936307499  
## pixel100 1.3673086339 1.2420541 1.540523278 0.29110138 2.006758883  
## pixel101 1.8393659780 1.0360913 -0.159974712 1.32753338 2.033695475  
## pixel102 2.3670403007 1.8293719 -0.228057839 0.70072024 1.116066360  
## pixel103 2.2382890315 1.3576697 -0.995584785 1.75712296 0.574575183  
## pixel104 -0.4763355065 0.0000000 -1.357487477 0.00000000 1.428521649  
## pixel105 1.3361254753 0.0000000 1.685117628 0.00000000 0.000000000  
## pixel106 0.0000000000 1.0050378 0.000000000 0.00000000 0.000000000  
## pixel107 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel108 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel109 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel110 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel111 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel112 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel113 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel114 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel115 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel116 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel117 1.0050378153 1.0050378 1.005037815 0.00000000 0.000000000  
## pixel118 -1.0050378153 0.0000000 0.000000000 1.00503782 0.000000000  
## pixel119 -1.0050378153 1.0050378 1.005037815 0.00000000 0.000000000  
## pixel120 2.0410220095 0.0000000 0.597509542 0.99273604 0.000000000  
## pixel121 0.9463374300 2.2622839 2.385528330 1.81944706 2.012055546  
## pixel122 0.6890561475 1.5825553 1.631862491 1.74199387 1.359142650  
## pixel123 0.3705646924 1.1742601 2.967838654 2.36439134 2.303588222  
## pixel124 0.2677210403 2.7241876 2.916643049 1.50977999 3.214529005  
## pixel125 0.0032940975 2.3573468 4.257767058 3.08930769 3.065479293  
## pixel126 1.2843480530 2.2402159 4.272699099 2.23886357 2.892233604  
## pixel127 -0.7429583627 2.2870021 3.715037944 1.88219963 3.202880099  
## pixel128 1.5050085075 2.5301411 2.773368118 1.87426556 2.741007436  
## pixel129 2.0156844770 1.8782999 2.277689274 2.11194649 1.485455418  
## pixel130 0.2144136801 0.5830255 1.308497755 -0.90290488 0.949792300  
## pixel131 1.3184650787 1.3279504 0.588561231 0.47371251 1.245770096  
## pixel132 -0.8306559494 0.5884798 -0.508738405 1.09432806 -0.044637569  
## pixel133 -1.1529884652 1.0050378 -0.330384879 1.42819264 -0.432818469  
## pixel134 -1.0050378153 1.0050378 1.005037815 1.75617789 -0.035761477  
## pixel135 0.0000000000 1.0050378 1.005037815 1.00503782 0.000000000  
## pixel136 0.0000000000 1.0050378 0.000000000 0.00000000 0.000000000  
## pixel137 1.0050378153 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel138 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel139 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel140 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel141 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel142 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel143 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel144 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel145 0.0000000000 0.0000000 -1.005037815 1.00503782 0.000000000  
## pixel146 1.3936783831 1.0050378 2.040465464 -1.00503782 1.005037815  
## pixel147 0.6411644456 1.4375502 1.646939900 2.42215394 1.005037815  
## pixel148 3.0912477278 2.3900107 1.314353508 2.17955364 1.015016788  
## pixel149 1.7290977428 2.8123323 2.033591305 2.81723221 1.422639806  
## pixel150 0.9964366217 3.2919503 3.431755752 2.29374991 2.232520493  
## pixel151 1.3009405762 3.4330336 3.144166541 2.82399911 1.661931110  
## pixel152 2.8591869683 2.4686337 4.200948229 4.23594612 4.330178189  
## pixel153 1.6371561088 1.8212961 3.664305431 4.13664810 3.702479023  
## pixel154 2.6441639651 2.9067656 3.846602590 3.69892465 3.872503805  
## pixel155 2.1724269927 2.9375623 3.502830626 3.97956499 3.830028102  
## pixel156 2.7484575274 3.0071739 4.170325622 3.15698199 4.000239565  
## pixel157 3.3375974992 1.9303111 3.625193743 0.65881970 1.316004810  
## pixel158 1.7539440709 3.1625856 1.970000364 1.93433902 2.460654665  
## pixel159 1.0924571468 2.2824859 1.044866903 1.76254391 1.449520321  
## pixel160 0.8496473543 2.2047332 2.007305492 1.45946341 2.067571421  
## pixel161 0.4593341962 1.4098828 1.445857785 2.29792963 0.898198401  
## pixel162 -0.5741117967 1.4621882 0.980578575 2.63563374 -1.394142264  
## pixel163 1.1800264221 1.3735302 1.005037815 2.31231650 0.000000000  
## pixel164 1.3436906214 1.5230472 1.751822543 1.40778808 0.000000000  
## pixel165 0.0000000000 1.0050378 0.000000000 0.00000000 0.000000000  
## pixel166 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
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## pixel170 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel171 0.0000000000 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel172 1.3644387124 0.0000000 0.000000000 0.00000000 0.000000000  
## pixel173 1.6552116874 1.0050378 -1.047855006 1.42810214 0.000000000  
## pixel174 1.5653006492 0.0000000 1.387774214 2.32881863 0.060821544  
## pixel175 1.0050378153 1.0648562 -0.038542106 3.01748135 0.851679703  
## pixel176 1.8427373683 2.4536183 2.282351473 2.93728462 1.613017339  
## pixel177 1.5775094222 3.8729651 3.293046890 3.72238455 0.660132436  
## pixel178 0.9717765580 4.0002668 2.702719561 3.17402840 2.917623304  
## pixel179 1.6970148860 3.4742025 3.901714550 4.10417817 2.974040836  
## pixel180 1.0644388352 2.2179953 2.187847462 4.52134892 3.091048578  
## pixel181 2.3857364077 2.3069542 4.336476510 3.44232291 4.663152955  
## pixel182 2.1922422916 3.1585389 2.750231629 3.41243490 5.987172722  
## pixel183 2.5027350281 3.0435804 1.519019670 2.28432633 5.020846677  
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## pixel709 1.6433066036 1.9775129 1.642883473 0.33120411 0.029726516  
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## pixel711 1.2002351115 2.0113041 1.645076099 1.08172020 2.177349918  
## pixel712 1.4007246277 1.7450145 1.261485156 0.28137382 2.523628409  
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## pixel126 2.093116830 2.70388600 2.321642825 0.501334357 2.17647316  
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## pixel155 3.608882857 2.73138426 4.514878633 3.899739749 5.89642981  
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## pixel396 1.653326105 0.316996967  
## pixel397 2.986476738 2.439986352  
## pixel398 3.984740104 5.118187326  
## pixel399 3.657413760 15.904501488  
## pixel400 4.149316268 28.900650332  
## pixel401 4.494235659 41.187666384  
## pixel402 4.870329424 27.567731123  
## pixel403 6.692258241 36.065008291  
## pixel404 6.675121904 35.411139173  
## pixel405 5.477597796 57.604151233  
## pixel406 6.221511675 54.051267072  
## pixel407 4.204213235 24.774829360  
## pixel408 5.130597138 45.816559109  
## pixel409 4.859057575 55.096746111  
## pixel410 4.112548947 29.569907736  
## pixel411 3.159882462 14.624781243  
## pixel412 4.033544048 12.316359218  
## pixel413 3.535412335 15.306874447  
## pixel414 2.780864643 16.442518837  
## pixel415 2.729281466 7.681688773  
## pixel416 2.260743403 0.803317452  
## pixel417 0.388062009 0.519352150  
## pixel418 0.000000000 0.105669116  
## pixel419 0.000000000 0.000000000  
## pixel420 0.000000000 0.000000000  
## pixel421 0.000000000 0.000000000  
## pixel422 0.000000000 0.100753929  
## pixel423 1.005037815 0.181732614  
## pixel424 -0.006680525 0.515844072  
## pixel425 3.378847972 3.364142072  
## pixel426 3.022828002 11.451616009  
## pixel427 4.705822642 29.656429227  
## pixel428 4.584494074 53.887572875  
## pixel429 3.952570836 28.506176677  
## pixel430 4.442459331 29.297685345  
## pixel431 6.995155303 36.210090531  
## pixel432 5.778406897 36.009674811  
## pixel433 5.188602763 51.519578406  
## pixel434 5.812029875 40.482217647  
## pixel435 4.721495026 28.833846079  
## pixel436 5.253565438 35.418375079  
## pixel437 5.258016729 47.249602976  
## pixel438 4.103324529 14.724485825  
## pixel439 5.085759894 13.467020825  
## pixel440 3.193017728 11.718772300  
## pixel441 2.869928394 13.974787745  
## pixel442 3.952974195 8.106471850  
## pixel443 4.992444418 3.680632909  
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## pixel447 0.000000000 0.000000000  
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## pixel449 0.000000000 0.000000000  
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## pixel454 3.729973771 8.254263329  
## pixel455 4.229062736 23.171788611  
## pixel456 3.414330214 24.742175684  
## pixel457 4.214571050 32.492101297  
## pixel458 5.470735387 40.962472771  
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## pixel460 5.497766899 37.935109625  
## pixel461 6.039302050 76.042888083  
## pixel462 4.656911253 41.272312105  
## pixel463 5.884592191 29.115033988  
## pixel464 3.990919926 24.450560758  
## pixel465 4.956742588 23.872011105  
## pixel466 4.214301931 18.783457054  
## pixel467 4.135828968 12.452585266  
## pixel468 4.376625580 9.667294928  
## pixel469 3.468947323 19.979839356  
## pixel470 4.890501584 6.586191049  
## pixel471 3.630830211 2.897601018  
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## pixel484 4.878036102 19.684685083  
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## pixel486 4.382553314 34.479653800  
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## pixel488 4.966828277 43.356769807  
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## pixel492 5.071273095 14.301169493  
## pixel493 4.793529759 19.623824147  
## pixel494 4.228390413 17.359926469  
## pixel495 3.443722929 14.821841439  
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## pixel498 3.850817049 4.321740115  
## pixel499 2.902091664 3.919896475  
## pixel500 3.278471306 1.442575798  
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## pixel504 0.000000000 0.000000000  
## pixel505 0.000000000 0.000000000  
## pixel506 0.000000000 0.154045079  
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## pixel510 3.277653238 14.625349287  
## pixel511 5.534533689 18.530397449  
## pixel512 3.549640279 18.628824206  
## pixel513 6.886954129 32.887076167  
## pixel514 5.410851606 38.261783798  
## pixel515 5.225656628 49.968004683  
## pixel516 7.323254137 30.418907879  
## pixel517 5.849070454 27.352937560  
## pixel518 6.519001284 17.199123143  
## pixel519 4.432080926 14.617670166  
## pixel520 3.707925390 10.875451384  
## pixel521 4.517978367 18.582657319  
## pixel522 4.995172432 18.796014263  
## pixel523 3.531305536 17.326090306  
## pixel524 4.324810502 11.833687517  
## pixel525 3.960752005 7.438528041  
## pixel526 4.637851130 4.628275925  
## pixel527 3.198344001 2.892623237  
## pixel528 2.727926273 0.798587556  
## pixel529 -1.005037815 0.382995779  
## pixel530 0.000000000 0.027761905  
## pixel531 0.000000000 0.000000000  
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## pixel535 0.658201490 0.609602372  
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## pixel537 4.721666875 7.225656640  
## pixel538 3.907135812 21.738096055  
## pixel539 6.019042836 14.516834975  
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## pixel541 5.101987691 31.922067408  
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## pixel544 6.220633485 22.858755344  
## pixel545 7.665699854 17.900549303  
## pixel546 6.033866579 16.529651276  
## pixel547 6.366305150 12.882306312  
## pixel548 4.176758132 16.154293055  
## pixel549 4.820387719 22.984840621  
## pixel550 4.172058938 32.893764902  
## pixel551 3.566406100 27.195544887  
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## pixel553 4.569155756 10.783190243  
## pixel554 4.578633501 4.904331860  
## pixel555 3.011681754 2.484885021  
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## pixel558 0.000000000 0.017500000  
## pixel559 0.000000000 0.000000000  
## pixel560 0.000000000 0.000000000  
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## pixel565 3.893956190 3.220854030  
## pixel566 4.145244718 10.929608699  
## pixel567 3.329039049 26.272017149  
## pixel568 4.214291381 27.513177052  
## pixel569 5.699277171 51.101303666  
## pixel570 4.559798739 38.881515923  
## pixel571 6.757577711 27.552372347  
## pixel572 8.953616463 18.771408928  
## pixel573 6.213320688 17.271186471  
## pixel574 6.787958824 17.691723154  
## pixel575 5.303376433 12.092754552  
## pixel576 4.172233978 10.225332562  
## pixel577 3.595422115 16.410808041  
## pixel578 4.422452824 19.409997358  
## pixel579 3.526136589 10.056819664  
## pixel580 4.009993309 8.906392424  
## pixel581 4.446904840 10.194365603  
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## pixel596 3.634588623 31.683042401  
## pixel597 3.373016673 32.474928233  
## pixel598 4.860245659 20.092421091  
## pixel599 5.532853511 14.916746448  
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## pixel601 5.696704400 12.791529850  
## pixel602 6.251522495 12.364210013  
## pixel603 6.197853102 11.408384957  
## pixel604 4.167456521 10.173356285  
## pixel605 4.457966977 9.031437714  
## pixel606 3.734979260 12.039785715  
## pixel607 4.665245337 6.964378166  
## pixel608 3.955520140 7.213279923  
## pixel609 3.206897118 3.498578531  
## pixel610 2.903643770 2.334564967  
## pixel611 3.578979913 1.587758208  
## pixel612 1.926698026 0.489085252  
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## pixel619 1.625939971 0.383034298  
## pixel620 0.901746786 0.736998472  
## pixel621 3.182010597 1.961759881  
## pixel622 3.922933403 5.916848339  
## pixel623 6.351390249 10.835909092  
## pixel624 4.491656135 23.890504522  
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## pixel626 4.660026408 22.140056104  
## pixel627 6.080725330 18.102726756  
## pixel628 5.843530802 16.289598430  
## pixel629 5.057407233 12.843970862  
## pixel630 6.034157297 14.284228817  
## pixel631 4.489846049 16.789298674  
## pixel632 5.757211887 11.039359884  
## pixel633 4.924706109 7.978560107  
## pixel634 3.755777834 7.116345642  
## pixel635 3.890507641 5.630931617  
## pixel636 2.828829901 3.271791815  
## pixel637 4.036758162 2.711308911  
## pixel638 2.946932327 1.408868155  
## pixel639 1.934898298 0.560279279  
## pixel640 1.005037815 0.365177747  
## pixel641 0.000000000 0.091609152  
## pixel642 0.000000000 0.000000000  
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## pixel647 0.000000000 0.064411413  
## pixel648 0.234609192 0.557402300  
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## pixel650 2.754917541 2.207557829  
## pixel651 3.533952918 5.702462837  
## pixel652 4.533082518 9.417253901  
## pixel653 6.361546996 11.085571465  
## pixel654 5.985580713 22.373253255  
## pixel655 6.821459810 33.429990730  
## pixel656 6.245966470 35.516086226  
## pixel657 7.481793862 29.064444361  
## pixel658 7.147747983 29.463059130  
## pixel659 4.234870671 22.524112517  
## pixel660 5.278989621 11.466607427  
## pixel661 3.796520253 5.995968491  
## pixel662 3.676561639 5.995096321  
## pixel663 2.789749327 3.155839946  
## pixel664 3.024684490 3.144860534  
## pixel665 2.678486835 1.416715800  
## pixel666 2.763556766 0.586264167  
## pixel667 0.004815683 0.385201767  
## pixel668 0.000000000 0.065134665  
## pixel669 0.000000000 0.049022887  
## pixel670 0.000000000 0.000000000  
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## pixel672 0.000000000 0.000000000  
## pixel673 0.000000000 0.000000000  
## pixel674 0.000000000 0.067264626  
## pixel675 0.000000000 0.019746940  
## pixel676 -1.758536995 0.206436616  
## pixel677 0.447154799 0.482326773  
## pixel678 2.554457562 0.843339294  
## pixel679 3.807997510 2.498244470  
## pixel680 3.874055287 5.555604816  
## pixel681 4.862106143 5.839010611  
## pixel682 6.365787799 8.324365969  
## pixel683 4.609447075 11.759663502  
## pixel684 4.079886494 11.621615919  
## pixel685 4.998384759 10.896433123  
## pixel686 5.073616519 6.913296523  
## pixel687 2.767364412 4.067142318  
## pixel688 3.491652889 4.273579621  
## pixel689 2.957790796 4.028975127  
## pixel690 3.950572443 3.664163117  
## pixel691 1.942537775 2.398552428  
## pixel692 1.981704835 1.693547950  
## pixel693 1.685180543 0.742616259  
## pixel694 0.590307754 0.345042054  
## pixel695 1.005037815 0.204894788  
## pixel696 0.000000000 0.197013447  
## pixel697 0.000000000 0.040206398  
## pixel698 0.000000000 0.000000000  
## pixel699 0.000000000 0.000000000  
## pixel700 0.000000000 0.000000000  
## pixel701 0.000000000 0.000000000  
## pixel702 0.000000000 0.000000000  
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## pixel704 0.000000000 0.183137639  
## pixel705 1.005037815 0.201093331  
## pixel706 1.353218774 0.570723160  
## pixel707 2.433767063 1.594924028  
## pixel708 3.332243377 2.932933529  
## pixel709 3.579090267 5.428319343  
## pixel710 4.977369747 4.490523258  
## pixel711 2.457650754 7.087061168  
## pixel712 3.781769604 6.591604267  
## pixel713 4.148504952 5.666133829  
## pixel714 2.983571587 4.773385270  
## pixel715 4.118189226 5.667324496  
## pixel716 2.758489170 4.513976238  
## pixel717 3.013309776 4.108794105  
## pixel718 2.284742677 3.076265768  
## pixel719 2.103221773 1.298722460  
## pixel720 1.690647101 0.699650875  
## pixel721 1.005037815 0.490635871  
## pixel722 0.000000000 0.023333333  
## pixel723 0.000000000 0.036111111  
## pixel724 1.005037815 0.083965872  
## pixel725 0.000000000 0.000000000  
## pixel726 0.000000000 0.035555556  
## pixel727 0.000000000 0.000000000  
## pixel728 0.000000000 0.000000000  
## pixel729 0.000000000 0.000000000  
## pixel730 0.000000000 0.000000000  
## pixel731 0.000000000 0.000000000  
## pixel732 0.000000000 0.000000000  
## pixel733 0.000000000 0.000000000  
## pixel734 0.000000000 0.050480851  
## pixel735 1.277108402 0.279027382  
## pixel736 0.905337066 0.335672428  
## pixel737 1.420976593 1.019141109  
## pixel738 -0.366297228 0.872356722  
## pixel739 1.917648174 1.488346538  
## pixel740 2.858058132 2.419102608  
## pixel741 1.793939861 4.065682204  
## pixel742 1.337440258 1.172451725  
## pixel743 2.164384614 1.293561736  
## pixel744 2.626338599 1.564633175  
## pixel745 2.014942296 0.557524545  
## pixel746 1.516946236 0.382799551  
## pixel747 1.289298674 0.515930066  
## pixel748 1.005037815 0.175197236  
## pixel749 0.000000000 0.095268252  
## pixel750 0.000000000 0.010000000  
## pixel751 0.000000000 0.030394737  
## pixel752 0.000000000 0.010000000  
## pixel753 0.000000000 0.000000000  
## pixel754 0.000000000 0.000000000  
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## pixel761 0.000000000 0.000000000  
## pixel762 0.000000000 0.000000000  
## pixel763 0.000000000 0.000000000  
## pixel764 0.000000000 0.000000000  
## pixel765 0.000000000 0.000000000  
## pixel766 0.000000000 0.000000000  
## pixel767 0.000000000 0.000000000  
## pixel768 0.000000000 0.019407508  
## pixel769 0.000000000 0.000000000  
## pixel770 0.000000000 0.076604423  
## pixel771 0.000000000 0.033333333  
## pixel772 -1.005037815 0.054434117  
## pixel773 0.000000000 0.058500000  
## pixel774 0.000000000 0.000000000  
## pixel775 0.000000000 0.019022152  
## pixel776 0.000000000 0.000000000  
## pixel777 0.000000000 0.019644466  
## pixel778 0.000000000 0.000000000  
## pixel779 0.000000000 0.019727091  
## pixel780 0.000000000 0.000000000  
## pixel781 0.000000000 0.000000000  
## pixel782 0.000000000 0.000000000  
## pixel783 0.000000000 0.000000000

pca\_digits <- PCA(t(select(digitTrainDF,-label)),ncp=30)



digitPCATrainDF <- data.frame(digitTrainDF$label,pca\_digits$var$coord)  
# percent <- .25

dim(digitPCATrainDF)

## [1] 42000 31

head(digitPCATrainDF)

## digitTrainDF.label Dim.1 Dim.2 Dim.3 Dim.4 Dim.5  
## V1 1 0.4194792 -0.4065312 0.19845470 0.11710413 0.15651771  
## V2 0 0.5011760 0.3736609 0.43426065 -0.05942137 -0.01177575  
## V3 1 0.5337991 -0.4671366 -0.07703681 -0.05916359 -0.16242954  
## V4 4 0.2692951 0.2444655 -0.02019394 0.14750215 0.27393732  
## V5 0 0.4523621 0.3727595 0.44904742 -0.06598445 -0.07533546  
## V6 0 0.5760222 0.3498239 0.11572976 0.06601334 -0.04899301  
## Dim.6 Dim.7 Dim.8 Dim.9 Dim.10 Dim.11  
## V1 0.36037674 -0.22643505 0.20422283 0.06738622 0.19140570 -0.037549440  
## V2 0.17821989 0.44304846 -0.03167073 -0.05589990 0.05329093 0.008385718  
## V3 -0.35354355 0.29016239 -0.08626053 -0.16269560 0.05651239 0.193793260  
## V4 0.05467318 0.12759619 0.05905055 0.12454257 -0.12992790 0.092554614  
## V5 0.25533528 0.44275453 0.01919423 -0.08392181 0.10966312 0.027686074  
## V6 0.11842983 -0.03892248 -0.24321484 0.11151221 -0.02219110 -0.028123204  
## Dim.12 Dim.13 Dim.14 Dim.15 Dim.16 Dim.17  
## V1 0.13045896 0.21011048 0.08938449 -0.08033858 -0.091348106 -0.05286479  
## V2 0.02141720 0.04697978 -0.08779285 -0.11122950 0.009403937 -0.14604080  
## V3 0.01499417 0.05623095 0.05599291 -0.06424392 -0.053862938 0.08089857  
## V4 -0.05426536 0.02721514 -0.08687856 -0.12607401 -0.044921282 -0.01199033  
## V5 0.10779265 0.02629178 -0.13616950 -0.03442729 0.032851110 -0.08783253  
## V6 0.13431949 -0.24447845 0.08446108 -0.23561153 0.072192491 -0.02948957  
## Dim.18 Dim.19 Dim.20 Dim.21 Dim.22 Dim.23  
## V1 -0.116186953 0.060709138 0.05683393 0.015672459 -0.10892915 0.10361990  
## V2 0.047470818 -0.004797354 -0.07102197 -0.053211754 0.14251405 -0.01358069  
## V3 0.052210276 0.077342609 -0.07095040 -0.042910220 -0.01390575 0.11046768  
## V4 -0.097537034 0.023433538 0.13397783 -0.094746724 0.12602600 0.20229335  
## V5 0.089565810 -0.016513984 -0.08673106 -0.003732557 0.06192140 -0.06200958  
## V6 0.004559481 -0.189773396 -0.04276604 -0.015777441 -0.12858022 0.06093521  
## Dim.24 Dim.25 Dim.26 Dim.27 Dim.28 Dim.29  
## V1 0.045939438 0.041861250 -0.17116203 0.004834982 0.11070712 0.053391512  
## V2 0.014082346 0.003809972 0.01037108 -0.093086552 0.01067615 -0.006092005  
## V3 -0.022960647 0.043930824 -0.09223479 -0.031240958 0.07220414 -0.017413786  
## V4 -0.110022733 0.078758161 -0.09963828 0.090140462 0.02475539 0.126641013  
## V5 0.060723958 0.014308421 0.03267752 0.016914684 -0.02821635 -0.036087547  
## V6 0.009354114 0.064320549 -0.19530001 -0.045781159 0.02343216 -0.001560729  
## Dim.30  
## V1 -0.043496254  
## V2 0.027709061  
## V3 -0.001360268  
## V4 -0.104681864  
## V5 -0.014780573  
## V6 -0.008298442

colnames(digitPCATrainDF) <- c("label","dim1","dim2","dim3","dim4","dim5","dim6","dim7","dim8","dim9","dim10","dim11","dim12","dim13"  
 ,"dim14","dim15","dim16","dim17","dim18","dim19","dim20","dim21","dim22","dim23","dim24","dim25"  
 ,"dim26","dim27","dim28","dim29","dim30")  
str(digitPCATrainDF)

## 'data.frame': 42000 obs. of 31 variables:  
## $ label: Factor w/ 10 levels "0","1","2","3",..: 2 1 2 5 1 1 8 4 6 4 ...  
## $ dim1 : num 0.419 0.501 0.534 0.269 0.452 ...  
## $ dim2 : num -0.407 0.374 -0.467 0.244 0.373 ...  
## $ dim3 : num 0.1985 0.4343 -0.077 -0.0202 0.449 ...  
## $ dim4 : num 0.1171 -0.0594 -0.0592 0.1475 -0.066 ...  
## $ dim5 : num 0.1565 -0.0118 -0.1624 0.2739 -0.0753 ...  
## $ dim6 : num 0.3604 0.1782 -0.3535 0.0547 0.2553 ...  
## $ dim7 : num -0.226 0.443 0.29 0.128 0.443 ...  
## $ dim8 : num 0.2042 -0.0317 -0.0863 0.0591 0.0192 ...  
## $ dim9 : num 0.0674 -0.0559 -0.1627 0.1245 -0.0839 ...  
## $ dim10: num 0.1914 0.0533 0.0565 -0.1299 0.1097 ...  
## $ dim11: num -0.03755 0.00839 0.19379 0.09255 0.02769 ...  
## $ dim12: num 0.1305 0.0214 0.015 -0.0543 0.1078 ...  
## $ dim13: num 0.2101 0.047 0.0562 0.0272 0.0263 ...  
## $ dim14: num 0.0894 -0.0878 0.056 -0.0869 -0.1362 ...  
## $ dim15: num -0.0803 -0.1112 -0.0642 -0.1261 -0.0344 ...  
## $ dim16: num -0.0913 0.0094 -0.0539 -0.0449 0.0329 ...  
## $ dim17: num -0.0529 -0.146 0.0809 -0.012 -0.0878 ...  
## $ dim18: num -0.1162 0.0475 0.0522 -0.0975 0.0896 ...  
## $ dim19: num 0.0607 -0.0048 0.0773 0.0234 -0.0165 ...  
## $ dim20: num 0.0568 -0.071 -0.071 0.134 -0.0867 ...  
## $ dim21: num 0.01567 -0.05321 -0.04291 -0.09475 -0.00373 ...  
## $ dim22: num -0.1089 0.1425 -0.0139 0.126 0.0619 ...  
## $ dim23: num 0.1036 -0.0136 0.1105 0.2023 -0.062 ...  
## $ dim24: num 0.0459 0.0141 -0.023 -0.11 0.0607 ...  
## $ dim25: num 0.04186 0.00381 0.04393 0.07876 0.01431 ...  
## $ dim26: num -0.1712 0.0104 -0.0922 -0.0996 0.0327 ...  
## $ dim27: num 0.00483 -0.09309 -0.03124 0.09014 0.01691 ...  
## $ dim28: num 0.1107 0.0107 0.0722 0.0248 -0.0282 ...  
## $ dim29: num 0.05339 -0.00609 -0.01741 0.12664 -0.03609 ...  
## $ dim30: num -0.0435 0.02771 -0.00136 -0.10468 -0.01478 ...

# Prepare train and test data from the revised PCA Train dataset.  
 sample\_size = floor(0.80\*nrow(digitPCATrainDF))   
 # set seed to ensure you always have same random numbers generated #324 has 100% training accuracy   
 train\_index = sample(seq\_len(nrow(digitPCATrainDF)),size = sample\_size)  
  
 pca\_train\_set =digitPCATrainDF[train\_index,] #creates the training dataset with row numbers stored in train\_index  
 # # table(train\_data$author)  
 pca\_test\_set=digitPCATrainDF[-train\_index,] # creates the test dataset excluding the row numbers mentioned in train\_index  
 # # table(test\_data$author)  
 #   
 cat("\nImages by Labels:")

##   
## Images by Labels:

table(digitPCATrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain\_set - Images by Labels:")

##   
## Train\_set - Images by Labels:

table(pca\_train\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 3263 3743 3384 3445 3259 3060 3371 3487 3271 3317

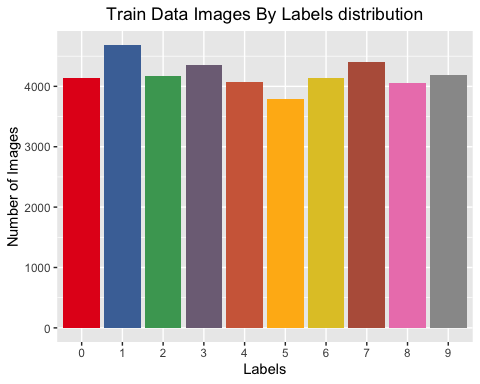
cat("\nTest\_set - Images by Labels:")

##   
## Test\_set - Images by Labels:

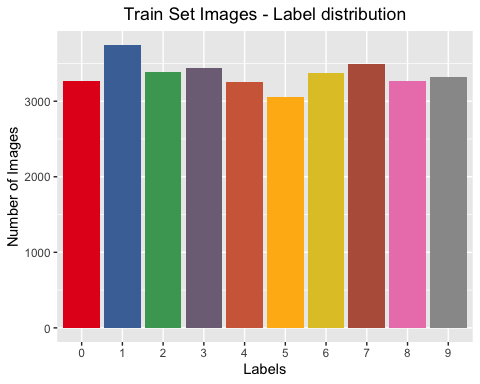
table(pca\_test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 869 941 793 906 813 735 766 914 792 871

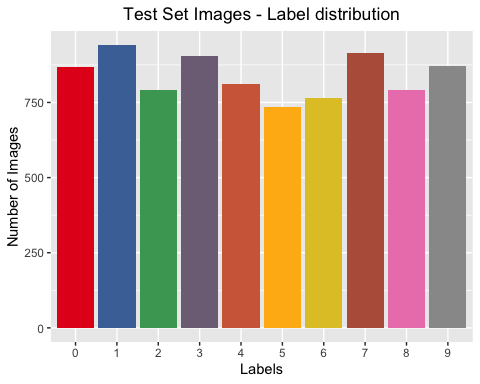
# # compare number of images by labels  
 pca\_x <- data.frame(table(digitPCATrainDF$label))  
 colourCount = length(unique(digitPCATrainDF$label))  
 getPalette = colorRampPalette(brewer.pal(9, "Set1"))  
   
 pca\_gp\_all <- ggplot(pca\_x, aes(x=Var1, y=Freq)) + geom\_bar(position="dodge",stat = "identity", fill=getPalette(colourCount))  
 pca\_gp\_all <- pca\_gp\_all + ggtitle("Train Data Images By Labels distribution") + xlab("Labels") + ylab("Number of Images")  
 pca\_gp\_all <- pca\_gp\_all + theme(plot.title = element\_text(hjust = 0.5),axis.title = element\_text())  
 pca\_gp\_all



# # compare number of images by labels  
 pca\_tn\_set <- data.frame(table(pca\_train\_set$label))  
 colourCount = length(unique(pca\_train\_set$label))  
 getPalette = colorRampPalette(brewer.pal(9, "Set1"))  
   
 pca\_gp\_tnset <- ggplot(pca\_tn\_set, aes(x=Var1, y=Freq)) + geom\_bar(position="dodge",stat = "identity", fill=getPalette(colourCount))  
 pca\_gp\_tnset <- pca\_gp\_tnset + ggtitle("Train Set Images - Label distribution") + xlab("Labels") + ylab("Number of Images")  
 pca\_gp\_tnset <- pca\_gp\_tnset + theme(plot.title = element\_text(hjust = 0.5),axis.title = element\_text())  
 pca\_gp\_tnset



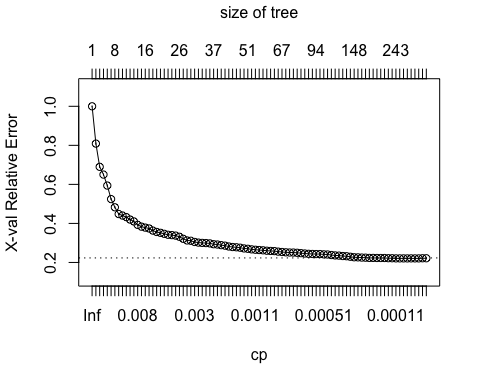
# # compare number of images by labels  
 pca\_tst\_set <- data.frame(table(pca\_test\_set$label))  
 colourCount = length(unique(pca\_test\_set$label))  
 getPalette = colorRampPalette(brewer.pal(9, "Set1"))  
   
 pca\_gp\_tst\_set <- ggplot(pca\_tst\_set, aes(x=Var1, y=Freq)) + geom\_bar(position="dodge",stat = "identity", fill=getPalette(colourCount))  
 pca\_gp\_tst\_set <- pca\_gp\_tst\_set + ggtitle("Test Set Images - Label distribution") + xlab("Labels") + ylab("Number of Images")  
 pca\_gp\_tst\_set <- pca\_gp\_tst\_set + theme(plot.title = element\_text(hjust = 0.5),axis.title = element\_text())  
 pca\_gp\_tst\_set



# Section 2: Build and tune decision tree models  
   
 # grow tree  
 pca\_rtree <- rpart(label~. ,data=pca\_train\_set, method='class', cp=0,minsplit = 1, maxdepth = 10)  
  
 #summarize rtree values  
 summary(pca\_rtree)

## Call:  
## rpart(formula = label ~ ., data = pca\_train\_set, method = "class",   
## cp = 0, minsplit = 1, maxdepth = 10)  
## n= 33600   
##   
## CP nsplit rel error xerror xstd  
## 1 9.771578e-02 0 1.0000000 1.0000000 0.001931600  
## 2 7.850755e-02 2 0.8045684 0.8088555 0.002760315  
## 3 7.683290e-02 3 0.7260609 0.6898215 0.002990296  
## 4 6.648357e-02 4 0.6492280 0.6501658 0.003032354  
## 5 6.413906e-02 5 0.5827444 0.5939646 0.003064935  
## 6 4.193321e-02 6 0.5186054 0.5246341 0.003062657  
## 7 3.436380e-02 7 0.4766721 0.4826004 0.003038435  
## 8 1.396657e-02 8 0.4423083 0.4481026 0.003005366  
## 9 1.292829e-02 9 0.4283418 0.4402988 0.002996195  
## 10 1.289480e-02 10 0.4154135 0.4324949 0.002986390  
## 11 1.008139e-02 11 0.4025187 0.4197006 0.002968924  
## 12 8.875641e-03 12 0.3924373 0.4100881 0.002954648  
## 13 7.167498e-03 13 0.3835616 0.3925713 0.002926040  
## 14 7.000033e-03 14 0.3763941 0.3833272 0.002909564  
## 15 6.665104e-03 15 0.3693941 0.3785042 0.002900583  
## 16 6.129216e-03 16 0.3627290 0.3741166 0.002892181  
## 17 5.626821e-03 17 0.3565998 0.3631644 0.002870228  
## 18 5.492849e-03 18 0.3509730 0.3561644 0.002855454  
## 19 5.358877e-03 19 0.3454801 0.3518103 0.002845967  
## 20 5.141173e-03 20 0.3401212 0.3466859 0.002834507  
## 21 4.923469e-03 22 0.3298389 0.3417289 0.002823113  
## 22 4.822990e-03 23 0.3249154 0.3400543 0.002819194  
## 23 4.655525e-03 24 0.3200924 0.3375088 0.002813171  
## 24 4.153130e-03 25 0.3154369 0.3314466 0.002798497  
## 25 3.650735e-03 27 0.3071307 0.3210972 0.002772355  
## 26 3.315805e-03 28 0.3034799 0.3126905 0.002750083  
## 27 3.181833e-03 29 0.3001641 0.3110828 0.002745716  
## 28 2.779918e-03 30 0.2969823 0.3049201 0.002728650  
## 29 2.712932e-03 31 0.2942024 0.3016378 0.002719348  
## 30 2.662692e-03 32 0.2914894 0.3001306 0.002715026  
## 31 2.578960e-03 34 0.2861640 0.2993268 0.002712708  
## 32 2.411495e-03 35 0.2835851 0.2975852 0.002707654  
## 33 2.344509e-03 36 0.2811736 0.2933985 0.002695331  
## 34 2.260776e-03 37 0.2788291 0.2918244 0.002690632  
## 35 1.976086e-03 39 0.2743075 0.2887095 0.002681230  
## 36 1.942593e-03 40 0.2723314 0.2860636 0.002673132  
## 37 1.892354e-03 41 0.2703889 0.2816760 0.002659477  
## 38 1.825368e-03 45 0.2613457 0.2790300 0.002651104  
## 39 1.775128e-03 47 0.2576950 0.2777238 0.002646932  
## 40 1.741635e-03 48 0.2559199 0.2755133 0.002639812  
## 41 1.339719e-03 49 0.2541782 0.2718291 0.002627780  
## 42 1.306226e-03 50 0.2528385 0.2699534 0.002621574  
## 43 1.172254e-03 51 0.2515323 0.2670730 0.002611937  
## 44 1.105268e-03 53 0.2491878 0.2649965 0.002604909  
## 45 1.038282e-03 54 0.2480825 0.2636568 0.002600338  
## 46 1.004789e-03 58 0.2439294 0.2622501 0.002595507  
## 47 9.378035e-04 59 0.2429246 0.2600395 0.002587853  
## 48 9.043105e-04 60 0.2419868 0.2589008 0.002583879  
## 49 8.708176e-04 62 0.2401782 0.2581639 0.002581296  
## 50 8.038316e-04 64 0.2384365 0.2554175 0.002571592  
## 51 7.368456e-04 66 0.2368289 0.2535419 0.002564893  
## 52 7.033526e-04 68 0.2353552 0.2519677 0.002559225  
## 53 6.949794e-04 70 0.2339485 0.2509294 0.002555465  
## 54 6.698597e-04 74 0.2311686 0.2507285 0.002554735  
## 55 6.196202e-04 75 0.2304987 0.2495227 0.002550341  
## 56 6.028737e-04 78 0.2286231 0.2476806 0.002543580  
## 57 5.693807e-04 82 0.2262116 0.2458385 0.002536761  
## 58 5.526342e-04 88 0.2227953 0.2442643 0.002530888  
## 59 5.358877e-04 90 0.2216901 0.2434605 0.002527873  
## 60 5.247234e-04 93 0.2200824 0.2429916 0.002526109  
## 61 5.191412e-04 97 0.2177714 0.2429916 0.002526109  
## 62 5.023947e-04 99 0.2167331 0.2414509 0.002520285  
## 63 4.689018e-04 103 0.2147235 0.2407811 0.002517740  
## 64 4.354088e-04 104 0.2142546 0.2380681 0.002507352  
## 65 4.019158e-04 107 0.2129484 0.2359581 0.002499182  
## 66 3.516763e-04 123 0.2054795 0.2349868 0.002495394  
## 67 3.349298e-04 125 0.2047761 0.2328767 0.002487107  
## 68 3.014368e-04 129 0.2034029 0.2318719 0.002483132  
## 69 2.679439e-04 137 0.2009914 0.2291255 0.002472173  
## 70 2.344509e-04 147 0.1983120 0.2265465 0.002461755  
## 71 2.177044e-04 157 0.1959674 0.2260776 0.002459848  
## 72 2.009579e-04 159 0.1955320 0.2250394 0.002455609  
## 73 1.842114e-04 177 0.1917473 0.2244700 0.002453276  
## 74 1.786292e-04 179 0.1913789 0.2232307 0.002448177  
## 75 1.674649e-04 187 0.1899052 0.2231972 0.002448038  
## 76 1.590917e-04 207 0.1865559 0.2228623 0.002446655  
## 77 1.563006e-04 214 0.1853167 0.2227953 0.002446378  
## 78 1.507184e-04 217 0.1848478 0.2227953 0.002446378  
## 79 1.339719e-04 219 0.1845463 0.2218240 0.002442353  
## 80 1.172254e-04 233 0.1826707 0.2215896 0.002441378  
## 81 1.004789e-04 242 0.1815655 0.2208527 0.002438309  
## 82 8.373246e-05 282 0.1774793 0.2207857 0.002438030  
## 83 7.815029e-05 286 0.1771444 0.2208192 0.002438170  
## 84 6.698597e-05 289 0.1769099 0.2207188 0.002437750  
## 85 5.582164e-05 351 0.1727233 0.2208862 0.002438449  
## 86 5.023947e-05 354 0.1725558 0.2207857 0.002438030  
## 87 3.349298e-05 356 0.1724554 0.2207857 0.002438030  
## 88 1.674649e-05 467 0.1687376 0.2214891 0.002440961  
## 89 0.000000e+00 469 0.1687042 0.2214891 0.002440961  
##   
## Variable importance  
## dim2 dim3 dim5 dim6 dim4 dim7 dim9 dim11 dim8 dim10 dim13 dim16 dim12   
## 16 11 9 8 8 7 5 4 4 3 3 3 3   
## dim14 dim1 dim20 dim15 dim17 dim19 dim21 dim23 dim24 dim18 dim25 dim28 dim26   
## 2 2 2 1 1 1 1 1 1 1 1 1 1   
## dim27 dim29   
## 1 1   
##   
## Node number 1: 33600 observations, complexity param=0.09771578  
## predicted class=1 expected loss=0.8886012 P(node) =1  
## class counts: 3263 3743 3384 3445 3259 3060 3371 3487 3271 3317  
## probabilities: 0.097 0.111 0.101 0.103 0.097 0.091 0.100 0.104 0.097 0.099   
## left son=2 (3570 obs) right son=3 (30030 obs)  
## Primary splits:  
## dim2 < -0.3391321 to the left, improve=2667.9290, (0 missing)  
## dim3 < -0.1293541 to the right, improve=2210.3240, (0 missing)  
## dim6 < -0.2166219 to the left, improve=1348.7550, (0 missing)  
## dim5 < 0.03720964 to the left, improve=1029.0320, (0 missing)  
## dim7 < 0.0726702 to the right, improve= 967.6447, (0 missing)  
## Surrogate splits:  
## dim6 < 0.3432242 to the right, agree=0.900, adj=0.062, (0 split)  
## dim13 < -0.2357899 to the left, agree=0.896, adj=0.023, (0 split)  
##   
## Node number 2: 3570 observations, complexity param=0.0006949794  
## predicted class=1 expected loss=0.1137255 P(node) =0.10625  
## class counts: 0 3164 80 32 15 26 37 58 117 41  
## probabilities: 0.000 0.886 0.022 0.009 0.004 0.007 0.010 0.016 0.033 0.011   
## left son=4 (2944 obs) right son=5 (626 obs)  
## Primary splits:  
## dim2 < -0.4004336 to the left, improve=93.11735, (0 missing)  
## dim16 < 0.0953172 to the left, improve=89.92550, (0 missing)  
## dim15 < 0.039943 to the left, improve=87.76261, (0 missing)  
## dim10 < -0.1512765 to the right, improve=64.10128, (0 missing)  
## dim3 < 0.2465312 to the left, improve=49.43333, (0 missing)  
## Surrogate splits:  
## dim13 < 0.1379362 to the left, agree=0.862, adj=0.216, (0 split)  
## dim8 < -0.0926811 to the right, agree=0.850, adj=0.145, (0 split)  
## dim12 < 0.1254828 to the left, agree=0.845, adj=0.115, (0 split)  
## dim10 < 0.2303907 to the left, agree=0.838, adj=0.075, (0 split)  
## dim7 < -0.2001144 to the right, agree=0.837, adj=0.069, (0 split)  
##   
## Node number 3: 30030 observations, complexity param=0.09771578  
## predicted class=7 expected loss=0.8858142 P(node) =0.89375  
## class counts: 3263 579 3304 3413 3244 3034 3334 3429 3154 3276  
## probabilities: 0.109 0.019 0.110 0.114 0.108 0.101 0.111 0.114 0.105 0.109   
## left son=6 (19995 obs) right son=7 (10035 obs)  
## Primary splits:  
## dim3 < -0.1023297 to the right, improve=2233.9930, (0 missing)  
## dim6 < -0.2166219 to the right, improve=1430.3260, (0 missing)  
## dim5 < 0.03592576 to the left, improve=1121.0890, (0 missing)  
## dim2 < 0.1641256 to the right, improve= 983.7994, (0 missing)  
## dim7 < 0.0696222 to the right, improve= 886.4414, (0 missing)  
## Surrogate splits:  
## dim10 < -0.2421504 to the right, agree=0.676, adj=0.030, (0 split)  
## dim12 < 0.2706899 to the left, agree=0.669, adj=0.011, (0 split)  
## dim11 < -0.2414364 to the right, agree=0.668, adj=0.005, (0 split)  
## dim13 < -0.2653239 to the right, agree=0.667, adj=0.002, (0 split)  
## dim25 < -0.3197421 to the right, agree=0.666, adj=0.000, (0 split)  
##   
## Node number 4: 2944 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.04517663 P(node) =0.08761905  
## class counts: 0 2811 13 7 5 8 18 26 43 13  
## probabilities: 0.000 0.955 0.004 0.002 0.002 0.003 0.006 0.009 0.015 0.004   
## left son=8 (2904 obs) right son=9 (40 obs)  
## Primary splits:  
## dim16 < 0.09566492 to the left, improve=23.63606, (0 missing)  
## dim15 < 0.04926898 to the left, improve=23.54637, (0 missing)  
## dim25 < 0.08992097 to the left, improve=20.10075, (0 missing)  
## dim17 < -0.2009125 to the right, improve=16.55912, (0 missing)  
## dim10 < -0.1543772 to the right, improve=15.66387, (0 missing)  
## Surrogate splits:  
## dim28 < 0.2174194 to the left, agree=0.987, adj=0.050, (0 split)  
## dim17 < -0.2878697 to the right, agree=0.987, adj=0.025, (0 split)  
##   
## Node number 5: 626 observations, complexity param=0.0006949794  
## predicted class=1 expected loss=0.4361022 P(node) =0.01863095  
## class counts: 0 353 67 25 10 18 19 32 74 28  
## probabilities: 0.000 0.564 0.107 0.040 0.016 0.029 0.030 0.051 0.118 0.045   
## left son=10 (364 obs) right son=11 (262 obs)  
## Primary splits:  
## dim23 < 0.0349799 to the right, improve=72.27170, (0 missing)  
## dim6 < -0.2805161 to the left, improve=71.58287, (0 missing)  
## dim10 < 0.07155809 to the right, improve=68.60070, (0 missing)  
## dim16 < 0.05108616 to the left, improve=55.65295, (0 missing)  
## dim13 < 0.04980496 to the right, improve=51.89684, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5764707 to the left, agree=0.760, adj=0.427, (0 split)  
## dim10 < 0.04397657 to the right, agree=0.756, adj=0.416, (0 split)  
## dim14 < -0.007812234 to the right, agree=0.706, adj=0.298, (0 split)  
## dim13 < 0.06389647 to the right, agree=0.688, adj=0.256, (0 split)  
## dim26 < -0.05386108 to the left, agree=0.687, adj=0.252, (0 split)  
##   
## Node number 6: 19995 observations, complexity param=0.07850755  
## predicted class=3 expected loss=0.8367092 P(node) =0.5950893  
## class counts: 3255 395 3148 3265 573 2693 3238 280 2800 348  
## probabilities: 0.163 0.020 0.157 0.163 0.029 0.135 0.162 0.014 0.140 0.017   
## left son=12 (16495 obs) right son=13 (3500 obs)  
## Primary splits:  
## dim6 < -0.1821696 to the right, improve=1470.718, (0 missing)  
## dim2 < 0.2046515 to the right, improve=1323.143, (0 missing)  
## dim5 < 0.06651668 to the left, improve=1185.220, (0 missing)  
## dim4 < -0.1450465 to the right, improve=1000.787, (0 missing)  
## dim3 < 0.2247911 to the right, improve= 719.854, (0 missing)  
## Surrogate splits:  
## dim17 < -0.3067211 to the right, agree=0.826, adj=0.003, (0 split)  
## dim27 < 0.2680224 to the left, agree=0.825, adj=0.001, (0 split)  
##   
## Node number 7: 10035 observations, complexity param=0.06648357  
## predicted class=7 expected loss=0.6861983 P(node) =0.2986607  
## class counts: 8 184 156 148 2671 341 96 3149 354 2928  
## probabilities: 0.001 0.018 0.016 0.015 0.266 0.034 0.010 0.314 0.035 0.292   
## left son=14 (6137 obs) right son=15 (3898 obs)  
## Primary splits:  
## dim7 < 0.05124527 to the left, improve=1363.7410, (0 missing)  
## dim9 < 0.06483292 to the left, improve= 716.2545, (0 missing)  
## dim5 < -0.03091226 to the right, improve= 658.1220, (0 missing)  
## dim11 < 0.1074324 to the right, improve= 538.5939, (0 missing)  
## dim3 < -0.3444866 to the right, improve= 342.8808, (0 missing)  
## Surrogate splits:  
## dim9 < 0.1247555 to the left, agree=0.697, adj=0.221, (0 split)  
## dim8 < -0.08514602 to the right, agree=0.672, adj=0.156, (0 split)  
## dim5 < -0.1458332 to the right, agree=0.662, adj=0.131, (0 split)  
## dim6 < 0.1309461 to the left, agree=0.662, adj=0.130, (0 split)  
## dim12 < -0.1043614 to the right, agree=0.660, adj=0.124, (0 split)  
##   
## Node number 8: 2904 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.03581267 P(node) =0.08642857  
## class counts: 0 2800 4 6 3 5 8 23 42 13  
## probabilities: 0.000 0.964 0.001 0.002 0.001 0.002 0.003 0.008 0.014 0.004   
## left son=16 (2846 obs) right son=17 (58 obs)  
## Primary splits:  
## dim15 < 0.04926898 to the left, improve=19.250780, (0 missing)  
## dim25 < 0.08992097 to the left, improve=16.688210, (0 missing)  
## dim10 < -0.1543772 to the right, improve=15.421240, (0 missing)  
## dim2 < -0.4577113 to the left, improve=10.042020, (0 missing)  
## dim18 < -0.1670775 to the right, improve= 9.428184, (0 missing)  
## Surrogate splits:  
## dim10 < -0.1795756 to the right, agree=0.982, adj=0.103, (0 split)  
## dim20 < 0.1611735 to the left, agree=0.981, adj=0.052, (0 split)  
## dim9 < 0.151875 to the left, agree=0.981, adj=0.034, (0 split)  
## dim11 < -0.2606173 to the right, agree=0.981, adj=0.034, (0 split)  
## dim23 < -0.160215 to the right, agree=0.981, adj=0.034, (0 split)  
##   
## Node number 9: 40 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.725 P(node) =0.001190476  
## class counts: 0 11 9 1 2 3 10 3 1 0  
## probabilities: 0.000 0.275 0.225 0.025 0.050 0.075 0.250 0.075 0.025 0.000   
## left son=18 (10 obs) right son=19 (30 obs)  
## Primary splits:  
## dim25 < -0.02677791 to the left, improve=8.050000, (0 missing)  
## dim4 < -0.1341194 to the left, improve=7.537500, (0 missing)  
## dim17 < -0.1334222 to the right, improve=6.778775, (0 missing)  
## dim20 < 0.09493566 to the left, improve=6.778775, (0 missing)  
## dim21 < 0.08513672 to the right, improve=5.783333, (0 missing)  
## Surrogate splits:  
## dim4 < -0.1341194 to the left, agree=0.950, adj=0.8, (0 split)  
## dim21 < 0.08513672 to the right, agree=0.900, adj=0.6, (0 split)  
## dim28 < 0.07190878 to the right, agree=0.900, adj=0.6, (0 split)  
## dim3 < 0.1269275 to the right, agree=0.875, adj=0.5, (0 split)  
## dim9 < -0.04928199 to the left, agree=0.875, adj=0.5, (0 split)  
##   
## Node number 10: 364 observations, complexity param=0.0005693807  
## predicted class=1 expected loss=0.1785714 P(node) =0.01083333  
## class counts: 0 299 27 8 2 14 5 5 4 0  
## probabilities: 0.000 0.821 0.074 0.022 0.005 0.038 0.014 0.014 0.011 0.000   
## left son=20 (323 obs) right son=21 (41 obs)  
## Primary splits:  
## dim16 < 0.05104201 to the left, improve=37.70477, (0 missing)  
## dim13 < 0.02000552 to the right, improve=27.02357, (0 missing)  
## dim10 < 0.07164687 to the right, improve=24.72780, (0 missing)  
## dim17 < 0.009265721 to the right, improve=24.20380, (0 missing)  
## dim26 < -0.01689409 to the left, improve=24.10768, (0 missing)  
## Surrogate splits:  
## dim27 < 0.08628313 to the left, agree=0.918, adj=0.268, (0 split)  
## dim3 < 0.2516848 to the left, agree=0.909, adj=0.195, (0 split)  
## dim17 < -0.08245515 to the right, agree=0.909, adj=0.195, (0 split)  
## dim21 < 0.1191882 to the left, agree=0.904, adj=0.146, (0 split)  
## dim15 < 0.1851274 to the left, agree=0.901, adj=0.122, (0 split)  
##   
## Node number 11: 262 observations, complexity param=0.0006949794  
## predicted class=8 expected loss=0.7328244 P(node) =0.007797619  
## class counts: 0 54 40 17 8 4 14 27 70 28  
## probabilities: 0.000 0.206 0.153 0.065 0.031 0.015 0.053 0.103 0.267 0.107   
## left son=22 (43 obs) right son=23 (219 obs)  
## Primary splits:  
## dim6 < -0.2231999 to the left, improve=22.53223, (0 missing)  
## dim5 < 0.1275724 to the right, improve=22.00715, (0 missing)  
## dim3 < 0.1751237 to the right, improve=21.59107, (0 missing)  
## dim7 < 0.04723139 to the right, improve=20.78394, (0 missing)  
## dim10 < -0.07523836 to the right, improve=20.28268, (0 missing)  
## Surrogate splits:  
## dim5 < -0.2805875 to the left, agree=0.844, adj=0.047, (0 split)  
## dim2 < -0.3985432 to the left, agree=0.840, adj=0.023, (0 split)  
## dim9 < -0.1853154 to the left, agree=0.840, adj=0.023, (0 split)  
## dim10 < 0.1613176 to the right, agree=0.840, adj=0.023, (0 split)  
## dim29 < -0.1535275 to the left, agree=0.840, adj=0.023, (0 split)  
##   
## Node number 12: 16495 observations, complexity param=0.0768329  
## predicted class=0 expected loss=0.8069718 P(node) =0.4909226  
## class counts: 3184 143 2966 2965 521 2530 813 275 2756 342  
## probabilities: 0.193 0.009 0.180 0.180 0.032 0.153 0.049 0.017 0.167 0.021   
## left son=24 (4060 obs) right son=25 (12435 obs)  
## Primary splits:  
## dim2 < 0.2046515 to the right, improve=1469.7320, (0 missing)  
## dim5 < 0.0710885 to the left, improve=1007.3420, (0 missing)  
## dim4 < -0.1880569 to the right, improve= 812.4371, (0 missing)  
## dim8 < -0.08660906 to the right, improve= 724.3654, (0 missing)  
## dim7 < 0.05913461 to the right, improve= 629.5452, (0 missing)  
## Surrogate splits:  
## dim7 < 0.1851105 to the right, agree=0.803, adj=0.199, (0 split)  
## dim1 < 0.3503714 to the left, agree=0.770, adj=0.064, (0 split)  
## dim15 < -0.210006 to the left, agree=0.763, adj=0.039, (0 split)  
## dim3 < 0.3949413 to the right, agree=0.760, adj=0.026, (0 split)  
## dim8 < 0.2412483 to the right, agree=0.757, adj=0.015, (0 split)  
##   
## Node number 13: 3500 observations, complexity param=0.007167498  
## predicted class=6 expected loss=0.3071429 P(node) =0.1041667  
## class counts: 71 252 182 300 52 163 2425 5 44 6  
## probabilities: 0.020 0.072 0.052 0.086 0.015 0.047 0.693 0.001 0.013 0.002   
## left son=26 (722 obs) right son=27 (2778 obs)  
## Primary splits:  
## dim4 < -0.073042 to the left, improve=491.0741, (0 missing)  
## dim5 < 0.0173269 to the left, improve=240.6098, (0 missing)  
## dim11 < 0.03767775 to the right, improve=231.5066, (0 missing)  
## dim13 < 0.1465841 to the right, improve=219.5086, (0 missing)  
## dim10 < 0.1520215 to the right, improve=203.1413, (0 missing)  
## Surrogate splits:  
## dim11 < 0.06559073 to the right, agree=0.855, adj=0.295, (0 split)  
## dim13 < 0.1736506 to the right, agree=0.839, adj=0.222, (0 split)  
## dim10 < 0.1513822 to the right, agree=0.835, adj=0.199, (0 split)  
## dim5 < -0.07303339 to the left, agree=0.821, adj=0.132, (0 split)  
## dim30 < 0.09003325 to the right, agree=0.821, adj=0.130, (0 split)  
##   
## Node number 14: 6137 observations, complexity param=0.0343638  
## predicted class=9 expected loss=0.604367 P(node) =0.1826488  
## class counts: 5 48 54 99 2426 312 72 443 250 2428  
## probabilities: 0.001 0.008 0.009 0.016 0.395 0.051 0.012 0.072 0.041 0.396   
## left son=28 (3793 obs) right son=29 (2344 obs)  
## Primary splits:  
## dim16 < -0.01526041 to the right, improve=386.4989, (0 missing)  
## dim11 < 0.1070746 to the right, improve=375.9028, (0 missing)  
## dim5 < -0.01108537 to the right, improve=307.1105, (0 missing)  
## dim19 < -0.01913365 to the right, improve=259.2631, (0 missing)  
## dim1 < 0.6269015 to the left, improve=232.9260, (0 missing)  
## Surrogate splits:  
## dim25 < -0.07041493 to the right, agree=0.637, adj=0.049, (0 split)  
## dim3 < -0.3638705 to the right, agree=0.635, adj=0.046, (0 split)  
## dim19 < -0.1419942 to the right, agree=0.632, adj=0.036, (0 split)  
## dim17 < -0.09458598 to the right, agree=0.630, adj=0.031, (0 split)  
## dim29 < 0.09200638 to the left, agree=0.627, adj=0.023, (0 split)  
##   
## Node number 15: 3898 observations, complexity param=0.004655525  
## predicted class=7 expected loss=0.3057978 P(node) =0.1160119  
## class counts: 3 136 102 49 245 29 24 2706 104 500  
## probabilities: 0.001 0.035 0.026 0.013 0.063 0.007 0.006 0.694 0.027 0.128   
## left son=30 (531 obs) right son=31 (3367 obs)  
## Primary splits:  
## dim5 < 0.1387511 to the right, improve=262.9284, (0 missing)  
## dim9 < -0.02517922 to the left, improve=244.9854, (0 missing)  
## dim11 < 0.09091994 to the right, improve=195.3808, (0 missing)  
## dim3 < -0.2780997 to the right, improve=192.6088, (0 missing)  
## dim6 < -0.2967058 to the left, improve=186.8480, (0 missing)  
## Surrogate splits:  
## dim24 < -0.1501278 to the left, agree=0.868, adj=0.030, (0 split)  
## dim12 < -0.3055222 to the left, agree=0.867, adj=0.026, (0 split)  
## dim16 < -0.2379761 to the left, agree=0.867, adj=0.024, (0 split)  
## dim23 < -0.232025 to the left, agree=0.866, adj=0.015, (0 split)  
## dim11 < 0.3186248 to the right, agree=0.865, adj=0.011, (0 split)  
##   
## Node number 16: 2846 observations, complexity param=0.0001507184  
## predicted class=1 expected loss=0.02529866 P(node) =0.08470238  
## class counts: 0 2774 4 2 2 1 2 12 41 8  
## probabilities: 0.000 0.975 0.001 0.001 0.001 0.000 0.001 0.004 0.014 0.003   
## left son=32 (2831 obs) right son=33 (15 obs)  
## Primary splits:  
## dim15 < -0.1796409 to the right, improve=10.151970, (0 missing)  
## dim25 < 0.08992097 to the left, improve=10.002700, (0 missing)  
## dim21 < -0.1469274 to the right, improve= 9.027119, (0 missing)  
## dim2 < -0.4577113 to the left, improve= 6.315343, (0 missing)  
## dim16 < -0.1022223 to the right, improve= 5.623741, (0 missing)  
##   
## Node number 17: 58 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.5517241 P(node) =0.00172619  
## class counts: 0 26 0 4 1 4 6 11 1 5  
## probabilities: 0.000 0.448 0.000 0.069 0.017 0.069 0.103 0.190 0.017 0.086   
## left son=34 (46 obs) right son=35 (12 obs)  
## Primary splits:  
## dim18 < -0.06011072 to the right, improve=9.729385, (0 missing)  
## dim17 < -0.1325231 to the right, improve=7.082228, (0 missing)  
## dim20 < -0.09497662 to the right, improve=7.048236, (0 missing)  
## dim14 < -0.01860879 to the right, improve=6.901256, (0 missing)  
## dim12 < -0.01102471 to the right, improve=6.439737, (0 missing)  
## Surrogate splits:  
## dim30 < 0.09351959 to the left, agree=0.879, adj=0.417, (0 split)  
## dim4 < -0.1006836 to the right, agree=0.862, adj=0.333, (0 split)  
## dim9 < -0.0687086 to the right, agree=0.862, adj=0.333, (0 split)  
## dim20 < -0.1269842 to the right, agree=0.862, adj=0.333, (0 split)  
## dim7 < 0.2330985 to the left, agree=0.845, adj=0.250, (0 split)  
##   
## Node number 18: 10 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.1 P(node) =0.000297619  
## class counts: 0 0 9 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.900 0.000 0.000 0.100 0.000 0.000 0.000 0.000   
## left son=36 (9 obs) right son=37 (1 obs)  
## Primary splits:  
## dim4 < 0.1019518 to the left, improve=1.8, (0 missing)  
## dim8 < 0.1414498 to the left, improve=1.8, (0 missing)  
## dim9 < 0.08855302 to the left, improve=1.8, (0 missing)  
## dim10 < 0.08596989 to the left, improve=1.8, (0 missing)  
## dim11 < 0.102404 to the left, improve=1.8, (0 missing)  
##   
## Node number 19: 30 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.6333333 P(node) =0.0008928571  
## class counts: 0 11 0 1 2 2 10 3 1 0  
## probabilities: 0.000 0.367 0.000 0.033 0.067 0.067 0.333 0.100 0.033 0.000   
## left son=38 (17 obs) right son=39 (13 obs)  
## Primary splits:  
## dim17 < -0.1309112 to the right, improve=5.900452, (0 missing)  
## dim20 < 0.09493566 to the left, improve=5.900452, (0 missing)  
## dim11 < -0.0367732 to the left, improve=5.833333, (0 missing)  
## dim6 < -0.08230532 to the right, improve=5.808612, (0 missing)  
## dim10 < -0.00569517 to the left, improve=5.782805, (0 missing)  
## Surrogate splits:  
## dim20 < 0.07994676 to the left, agree=0.900, adj=0.769, (0 split)  
## dim10 < -0.00569517 to the left, agree=0.867, adj=0.692, (0 split)  
## dim6 < -0.08230532 to the right, agree=0.800, adj=0.538, (0 split)  
## dim27 < 0.1013737 to the left, agree=0.800, adj=0.538, (0 split)  
## dim28 < -0.05678165 to the right, agree=0.800, adj=0.538, (0 split)  
##   
## Node number 20: 323 observations, complexity param=0.0001172254  
## predicted class=1 expected loss=0.08049536 P(node) =0.009613095  
## class counts: 0 297 8 5 2 3 0 5 3 0  
## probabilities: 0.000 0.920 0.025 0.015 0.006 0.009 0.000 0.015 0.009 0.000   
## left son=40 (293 obs) right son=41 (30 obs)  
## Primary splits:  
## dim13 < -0.002305182 to the right, improve=14.249890, (0 missing)  
## dim30 < 0.09757953 to the left, improve= 9.980513, (0 missing)  
## dim12 < 0.1695067 to the left, improve= 8.289098, (0 missing)  
## dim15 < 0.062128 to the left, improve= 8.263457, (0 missing)  
## dim9 < 0.1499083 to the left, improve= 8.038119, (0 missing)  
## Surrogate splits:  
## dim26 < 0.02993759 to the left, agree=0.944, adj=0.400, (0 split)  
## dim10 < 0.02010243 to the right, agree=0.932, adj=0.267, (0 split)  
## dim12 < 0.1695067 to the left, agree=0.929, adj=0.233, (0 split)  
## dim11 < -0.1783765 to the right, agree=0.926, adj=0.200, (0 split)  
## dim3 < 0.2428973 to the left, agree=0.923, adj=0.167, (0 split)  
##   
## Node number 21: 41 observations, complexity param=0.0003349298  
## predicted class=2 expected loss=0.5365854 P(node) =0.001220238  
## class counts: 0 2 19 3 0 11 5 0 1 0  
## probabilities: 0.000 0.049 0.463 0.073 0.000 0.268 0.122 0.000 0.024 0.000   
## left son=42 (18 obs) right son=43 (23 obs)  
## Primary splits:  
## dim5 < 0.1319238 to the right, improve=12.292680, (0 missing)  
## dim11 < -0.02753145 to the left, improve=10.403790, (0 missing)  
## dim3 < 0.1537983 to the right, improve= 9.699381, (0 missing)  
## dim21 < 0.03731538 to the right, improve= 8.611731, (0 missing)  
## dim4 < 0.02635574 to the left, improve= 8.196989, (0 missing)  
## Surrogate splits:  
## dim11 < -0.02753145 to the left, agree=0.951, adj=0.889, (0 split)  
## dim3 < 0.1537983 to the right, agree=0.927, adj=0.833, (0 split)  
## dim21 < 0.03731538 to the right, agree=0.854, adj=0.667, (0 split)  
## dim4 < 0.02635574 to the left, agree=0.829, adj=0.611, (0 split)  
## dim18 < 0.03750248 to the right, agree=0.829, adj=0.611, (0 split)  
##   
## Node number 22: 43 observations, complexity param=0.0002344509  
## predicted class=1 expected loss=0.2325581 P(node) =0.001279762  
## class counts: 0 33 0 1 0 0 7 1 0 1  
## probabilities: 0.000 0.767 0.000 0.023 0.000 0.000 0.163 0.023 0.000 0.023   
## left son=44 (36 obs) right son=45 (7 obs)  
## Primary splits:  
## dim4 < 0.05136564 to the left, improve=10.798450, (0 missing)  
## dim17 < -0.06330078 to the right, improve= 9.308254, (0 missing)  
## dim9 < 0.02237658 to the left, improve= 9.308254, (0 missing)  
## dim7 < 0.02307854 to the right, improve= 7.557973, (0 missing)  
## dim5 < 0.02690629 to the left, improve= 7.307222, (0 missing)  
## Surrogate splits:  
## dim9 < 0.04699109 to the left, agree=0.977, adj=0.857, (0 split)  
## dim17 < -0.1391532 to the right, agree=0.977, adj=0.857, (0 split)  
## dim5 < 0.02690629 to the left, agree=0.953, adj=0.714, (0 split)  
## dim7 < 0.003471328 to the right, agree=0.953, adj=0.714, (0 split)  
## dim12 < -0.04209548 to the right, agree=0.930, adj=0.571, (0 split)  
##   
## Node number 23: 219 observations, complexity param=0.0006949794  
## predicted class=8 expected loss=0.6803653 P(node) =0.006517857  
## class counts: 0 21 40 16 8 4 7 26 70 27  
## probabilities: 0.000 0.096 0.183 0.073 0.037 0.018 0.032 0.119 0.320 0.123   
## left son=46 (63 obs) right son=47 (156 obs)  
## Primary splits:  
## dim5 < 0.1038716 to the right, improve=26.00666, (0 missing)  
## dim7 < 0.04825984 to the right, improve=23.66937, (0 missing)  
## dim3 < -0.1133858 to the right, improve=21.19917, (0 missing)  
## dim10 < -0.07523836 to the right, improve=20.41474, (0 missing)  
## dim16 < 0.08090499 to the right, improve=19.13372, (0 missing)  
## Surrogate splits:  
## dim21 < 0.05576182 to the right, agree=0.836, adj=0.429, (0 split)  
## dim3 < 0.159381 to the right, agree=0.813, adj=0.349, (0 split)  
## dim25 < -0.05293957 to the left, agree=0.804, adj=0.317, (0 split)  
## dim28 < 0.1273278 to the right, agree=0.795, adj=0.286, (0 split)  
## dim16 < 0.08311489 to the right, agree=0.790, adj=0.270, (0 split)  
##   
## Node number 24: 4060 observations, complexity param=0.008875641  
## predicted class=0 expected loss=0.3778325 P(node) =0.1208333  
## class counts: 2526 0 78 13 384 385 266 149 64 195  
## probabilities: 0.622 0.000 0.019 0.003 0.095 0.095 0.066 0.037 0.016 0.048   
## left son=48 (2907 obs) right son=49 (1153 obs)  
## Primary splits:  
## dim3 < 0.1148092 to the right, improve=577.0024, (0 missing)  
## dim5 < 0.08872027 to the left, improve=509.3241, (0 missing)  
## dim4 < -0.2218781 to the right, improve=268.3171, (0 missing)  
## dim11 < 0.1614762 to the left, improve=267.2882, (0 missing)  
## dim12 < -0.06581861 to the right, improve=193.3203, (0 missing)  
## Surrogate splits:  
## dim5 < 0.1647639 to the left, agree=0.840, adj=0.435, (0 split)  
## dim12 < -0.09961397 to the right, agree=0.775, adj=0.208, (0 split)  
## dim11 < 0.149661 to the left, agree=0.769, adj=0.188, (0 split)  
## dim9 < 0.09901102 to the left, agree=0.748, adj=0.112, (0 split)  
## dim8 < 0.2532761 to the left, agree=0.747, adj=0.108, (0 split)  
##   
## Node number 25: 12435 observations, complexity param=0.06413906  
## predicted class=3 expected loss=0.7626055 P(node) =0.3700893  
## class counts: 658 143 2888 2952 137 2145 547 126 2692 147  
## probabilities: 0.053 0.011 0.232 0.237 0.011 0.172 0.044 0.010 0.216 0.012   
## left son=50 (4284 obs) right son=51 (8151 obs)  
## Primary splits:  
## dim5 < 0.09453158 to the right, improve=900.1945, (0 missing)  
## dim4 < -0.145003 to the right, improve=675.4655, (0 missing)  
## dim9 < -0.03281608 to the right, improve=667.9284, (0 missing)  
## dim8 < -0.1036733 to the left, improve=481.5440, (0 missing)  
## dim7 < -0.03603089 to the right, improve=469.8818, (0 missing)  
## Surrogate splits:  
## dim7 < 0.05102205 to the right, agree=0.706, adj=0.146, (0 split)  
## dim14 < -0.1685669 to the left, agree=0.679, adj=0.067, (0 split)  
## dim8 < -0.2634077 to the left, agree=0.674, adj=0.053, (0 split)  
## dim28 < 0.1661599 to the right, agree=0.664, adj=0.023, (0 split)  
## dim6 < 0.3068479 to the right, agree=0.663, adj=0.021, (0 split)  
##   
## Node number 26: 722 observations, complexity param=0.006129216  
## predicted class=3 expected loss=0.6398892 P(node) =0.0214881  
## class counts: 10 232 42 260 7 86 46 3 34 2  
## probabilities: 0.014 0.321 0.058 0.360 0.010 0.119 0.064 0.004 0.047 0.003   
## left son=52 (276 obs) right son=53 (446 obs)  
## Primary splits:  
## dim3 < 0.007643279 to the left, improve=125.0602, (0 missing)  
## dim10 < 0.1260622 to the right, improve=124.6700, (0 missing)  
## dim25 < 0.05439198 to the right, improve=111.9173, (0 missing)  
## dim6 < -0.2974439 to the left, improve=101.7719, (0 missing)  
## dim9 < -0.01127737 to the left, improve=100.6316, (0 missing)  
## Surrogate splits:  
## dim10 < 0.1006571 to the right, agree=0.874, adj=0.670, (0 split)  
## dim25 < 0.05439198 to the right, agree=0.812, adj=0.507, (0 split)  
## dim17 < 0.08440852 to the right, agree=0.795, adj=0.464, (0 split)  
## dim2 < -0.1583742 to the left, agree=0.787, adj=0.442, (0 split)  
## dim6 < -0.3002735 to the left, agree=0.785, adj=0.438, (0 split)  
##   
## Node number 27: 2778 observations, complexity param=0.0006028737  
## predicted class=6 expected loss=0.1436285 P(node) =0.08267857  
## class counts: 61 20 140 40 45 77 2379 2 10 4  
## probabilities: 0.022 0.007 0.050 0.014 0.016 0.028 0.856 0.001 0.004 0.001   
## left son=54 (124 obs) right son=55 (2654 obs)  
## Primary splits:  
## dim5 < -0.1138479 to the left, improve=70.90605, (0 missing)  
## dim6 < -0.2440638 to the right, improve=49.02437, (0 missing)  
## dim13 < 0.1913729 to the right, improve=42.05139, (0 missing)  
## dim1 < 0.4010552 to the left, improve=40.72282, (0 missing)  
## dim3 < 0.284258 to the right, improve=38.90956, (0 missing)  
## Surrogate splits:  
## dim25 < 0.181143 to the right, agree=0.957, adj=0.040, (0 split)  
## dim8 < -0.2923709 to the left, agree=0.956, adj=0.016, (0 split)  
## dim15 < 0.2621815 to the right, agree=0.956, adj=0.016, (0 split)  
## dim3 < 0.4455593 to the right, agree=0.956, adj=0.008, (0 split)  
## dim26 < 0.2264392 to the right, agree=0.956, adj=0.008, (0 split)  
##   
## Node number 28: 3793 observations, complexity param=0.005141173  
## predicted class=4 expected loss=0.4911679 P(node) =0.1128869  
## class counts: 5 47 15 25 1930 306 46 314 201 904  
## probabilities: 0.001 0.012 0.004 0.007 0.509 0.081 0.012 0.083 0.053 0.238   
## left son=56 (2376 obs) right son=57 (1417 obs)  
## Primary splits:  
## dim5 < -0.009848169 to the right, improve=262.16630, (0 missing)  
## dim11 < 0.081886 to the right, improve=171.39930, (0 missing)  
## dim1 < 0.6399963 to the left, improve=111.17790, (0 missing)  
## dim13 < 0.06054927 to the left, improve=105.93450, (0 missing)  
## dim12 < 0.05881142 to the right, improve= 91.98065, (0 missing)  
## Surrogate splits:  
## dim25 < -0.04096282 to the right, agree=0.678, adj=0.138, (0 split)  
## dim13 < 0.06003375 to the left, agree=0.674, adj=0.128, (0 split)  
## dim10 < -0.1981294 to the right, agree=0.674, adj=0.128, (0 split)  
## dim2 < -0.02177593 to the right, agree=0.659, adj=0.088, (0 split)  
## dim17 < -0.06322476 to the right, agree=0.658, adj=0.085, (0 split)  
##   
## Node number 29: 2344 observations, complexity param=0.006665104  
## predicted class=9 expected loss=0.3498294 P(node) =0.0697619  
## class counts: 0 1 39 74 496 6 26 129 49 1524  
## probabilities: 0.000 0.000 0.017 0.032 0.212 0.003 0.011 0.055 0.021 0.650   
## left son=58 (374 obs) right son=59 (1970 obs)  
## Primary splits:  
## dim11 < 0.1385868 to the right, improve=211.00360, (0 missing)  
## dim19 < 0.0191596 to the right, improve=126.77680, (0 missing)  
## dim27 < 0.005503468 to the left, improve=105.27470, (0 missing)  
## dim3 < -0.189761 to the right, improve=103.36920, (0 missing)  
## dim1 < 0.525655 to the left, improve= 73.01876, (0 missing)  
## Surrogate splits:  
## dim5 < 0.3740083 to the right, agree=0.849, adj=0.056, (0 split)  
## dim1 < 0.4369935 to the left, agree=0.846, adj=0.037, (0 split)  
## dim2 < 0.3931221 to the right, agree=0.844, adj=0.021, (0 split)  
## dim14 < 0.2143355 to the right, agree=0.844, adj=0.021, (0 split)  
## dim22 < 0.2468348 to the right, agree=0.843, adj=0.016, (0 split)  
##   
## Node number 30: 531 observations, complexity param=0.001825368  
## predicted class=9 expected loss=0.606403 P(node) =0.01580357  
## class counts: 1 0 65 19 123 1 23 70 20 209  
## probabilities: 0.002 0.000 0.122 0.036 0.232 0.002 0.043 0.132 0.038 0.394   
## left son=60 (190 obs) right son=61 (341 obs)  
## Primary splits:  
## dim2 < 0.1171011 to the left, improve=59.24867, (0 missing)  
## dim12 < -0.1025274 to the right, improve=53.55790, (0 missing)  
## dim20 < 0.01143709 to the right, improve=44.90866, (0 missing)  
## dim11 < 0.1427946 to the right, improve=44.68350, (0 missing)  
## dim4 < 0.05880793 to the right, improve=41.34330, (0 missing)  
## Surrogate splits:  
## dim13 < 0.07165551 to the right, agree=0.716, adj=0.205, (0 split)  
## dim18 < -0.1327453 to the left, agree=0.714, adj=0.200, (0 split)  
## dim6 < -0.06198881 to the left, agree=0.706, adj=0.179, (0 split)  
## dim14 < -0.1374977 to the left, agree=0.706, adj=0.179, (0 split)  
## dim15 < 0.1068003 to the right, agree=0.704, adj=0.174, (0 split)  
##   
## Node number 31: 3367 observations, complexity param=0.001892354  
## predicted class=7 expected loss=0.2171072 P(node) =0.1002083  
## class counts: 2 136 37 30 122 28 1 2636 84 291  
## probabilities: 0.001 0.040 0.011 0.009 0.036 0.008 0.000 0.783 0.025 0.086   
## left son=62 (811 obs) right son=63 (2556 obs)  
## Primary splits:  
## dim9 < -0.02714237 to the left, improve=261.5244, (0 missing)  
## dim6 < -0.2967058 to the left, improve=202.5963, (0 missing)  
## dim11 < 0.09091994 to the right, improve=150.9834, (0 missing)  
## dim3 < -0.1662687 to the right, improve=111.8578, (0 missing)  
## dim7 < 0.1582222 to the left, improve= 95.5938, (0 missing)  
## Surrogate splits:  
## dim2 < -0.2026399 to the left, agree=0.798, adj=0.160, (0 split)  
## dim6 < -0.1402981 to the left, agree=0.796, adj=0.154, (0 split)  
## dim13 < -0.1096423 to the left, agree=0.790, adj=0.129, (0 split)  
## dim11 < 0.1197458 to the right, agree=0.781, adj=0.092, (0 split)  
## dim10 < 0.2522048 to the right, agree=0.775, adj=0.064, (0 split)  
##   
## Node number 32: 2831 observations, complexity param=0.0001339719  
## predicted class=1 expected loss=0.02225362 P(node) =0.08425595  
## class counts: 0 2768 4 2 2 1 2 12 32 8  
## probabilities: 0.000 0.978 0.001 0.001 0.001 0.000 0.001 0.004 0.011 0.003   
## left son=64 (2823 obs) right son=65 (8 obs)  
## Primary splits:  
## dim21 < -0.1469274 to the right, improve=9.099284, (0 missing)  
## dim25 < 0.1045493 to the left, improve=8.794563, (0 missing)  
## dim18 < -0.1670775 to the right, improve=5.099565, (0 missing)  
## dim22 < 0.2013774 to the left, improve=4.957692, (0 missing)  
## dim2 < -0.4543995 to the left, improve=4.839753, (0 missing)  
##   
## Node number 33: 15 observations, complexity param=0.0001507184  
## predicted class=8 expected loss=0.4 P(node) =0.0004464286  
## class counts: 0 6 0 0 0 0 0 0 9 0  
## probabilities: 0.000 0.400 0.000 0.000 0.000 0.000 0.000 0.000 0.600 0.000   
## left son=66 (6 obs) right son=67 (9 obs)  
## Primary splits:  
## dim8 < 0.1154814 to the right, improve=7.200000, (0 missing)  
## dim30 < -0.02319981 to the right, improve=5.485714, (0 missing)  
## dim1 < 0.5752761 to the left, improve=5.485714, (0 missing)  
## dim2 < -0.4704934 to the left, improve=5.485714, (0 missing)  
## dim13 < 0.004892265 to the left, improve=5.485714, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5682932 to the left, agree=0.933, adj=0.833, (0 split)  
## dim2 < -0.4853549 to the left, agree=0.933, adj=0.833, (0 split)  
## dim13 < 0.004892265 to the left, agree=0.933, adj=0.833, (0 split)  
## dim30 < -0.02319981 to the right, agree=0.933, adj=0.833, (0 split)  
## dim6 < -0.06899509 to the left, agree=0.867, adj=0.667, (0 split)  
##   
## Node number 34: 46 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.4347826 P(node) =0.001369048  
## class counts: 0 26 0 3 1 4 6 1 0 5  
## probabilities: 0.000 0.565 0.000 0.065 0.022 0.087 0.130 0.022 0.000 0.109   
## left son=68 (32 obs) right son=69 (14 obs)  
## Primary splits:  
## dim17 < 0.02380308 to the right, improve=7.766304, (0 missing)  
## dim5 < -0.1213104 to the right, improve=6.693936, (0 missing)  
## dim10 < -0.1603696 to the right, improve=6.415695, (0 missing)  
## dim14 < -0.02342971 to the right, improve=6.277085, (0 missing)  
## dim9 < 0.06165015 to the left, improve=6.185947, (0 missing)  
## Surrogate splits:  
## dim19 < -0.08086705 to the right, agree=0.848, adj=0.500, (0 split)  
## dim27 < -0.04250453 to the left, agree=0.826, adj=0.429, (0 split)  
## dim9 < 0.04770104 to the left, agree=0.804, adj=0.357, (0 split)  
## dim15 < 0.1202217 to the left, agree=0.804, adj=0.357, (0 split)  
## dim20 < 0.1179493 to the left, agree=0.804, adj=0.357, (0 split)  
##   
## Node number 35: 12 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.1666667 P(node) =0.0003571429  
## class counts: 0 0 0 1 0 0 0 10 1 0  
## probabilities: 0.000 0.000 0.000 0.083 0.000 0.000 0.000 0.833 0.083 0.000   
## left son=70 (2 obs) right son=71 (10 obs)  
## Primary splits:  
## dim3 < -0.0466518 to the right, improve=2.5, (0 missing)  
## dim10 < -0.05111009 to the right, improve=2.5, (0 missing)  
## dim25 < 0.112976 to the right, improve=2.5, (0 missing)  
## dim29 < 0.02521844 to the right, improve=2.5, (0 missing)  
## dim5 < -0.1051055 to the left, improve=2.5, (0 missing)  
## Surrogate splits:  
## dim5 < -0.1051055 to the left, agree=1, adj=1, (0 split)  
## dim7 < 0.1006571 to the left, agree=1, adj=1, (0 split)  
## dim10 < -0.05111009 to the right, agree=1, adj=1, (0 split)  
## dim25 < 0.112976 to the right, agree=1, adj=1, (0 split)  
## dim29 < 0.02521844 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 36: 9 observations  
## predicted class=2 expected loss=0 P(node) =0.0002678571  
## class counts: 0 0 9 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 37: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 38: 17 observations, complexity param=0.0001004789  
## predicted class=1 expected loss=0.4705882 P(node) =0.0005059524  
## class counts: 0 9 0 1 2 2 0 3 0 0  
## probabilities: 0.000 0.529 0.000 0.059 0.118 0.118 0.000 0.176 0.000 0.000   
## left son=76 (12 obs) right son=77 (5 obs)  
## Primary splits:  
## dim23 < -0.04776784 to the right, improve=3.543137, (0 missing)  
## dim18 < -0.01669297 to the right, improve=2.759804, (0 missing)  
## dim30 < -0.01412037 to the right, improve=2.743137, (0 missing)  
## dim2 < -0.5025063 to the left, improve=2.631016, (0 missing)  
## dim5 < -0.09864829 to the right, improve=2.557423, (0 missing)  
## Surrogate splits:  
## dim1 < 0.6024563 to the left, agree=0.882, adj=0.6, (0 split)  
## dim10 < -0.05946956 to the right, agree=0.882, adj=0.6, (0 split)  
## dim14 < 0.0125001 to the right, agree=0.882, adj=0.6, (0 split)  
## dim8 < 0.04988115 to the right, agree=0.824, adj=0.4, (0 split)  
## dim21 < -0.08728252 to the right, agree=0.824, adj=0.4, (0 split)  
##   
## Node number 39: 13 observations, complexity param=6.698597e-05  
## predicted class=6 expected loss=0.2307692 P(node) =0.0003869048  
## class counts: 0 2 0 0 0 0 10 0 1 0  
## probabilities: 0.000 0.154 0.000 0.000 0.000 0.000 0.769 0.000 0.077 0.000   
## left son=78 (3 obs) right son=79 (10 obs)  
## Primary splits:  
## dim6 < -0.02487706 to the right, improve=3.589744, (0 missing)  
## dim3 < 0.1020738 to the right, improve=3.104895, (0 missing)  
## dim8 < 0.2539589 to the right, improve=3.104895, (0 missing)  
## dim14 < 0.1039231 to the right, improve=3.104895, (0 missing)  
## dim1 < 0.4907432 to the left, improve=3.104895, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4907432 to the left, agree=0.923, adj=0.667, (0 split)  
## dim3 < 0.1020738 to the right, agree=0.923, adj=0.667, (0 split)  
## dim4 < 0.1193868 to the left, agree=0.923, adj=0.667, (0 split)  
## dim8 < 0.1466945 to the right, agree=0.923, adj=0.667, (0 split)  
## dim10 < -0.01264697 to the left, agree=0.923, adj=0.667, (0 split)  
##   
## Node number 40: 293 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.02047782 P(node) =0.008720238  
## class counts: 0 287 1 1 0 1 0 0 3 0  
## probabilities: 0.000 0.980 0.003 0.003 0.000 0.003 0.000 0.000 0.010 0.000   
## left son=80 (291 obs) right son=81 (2 obs)  
## Primary splits:  
## dim15 < -0.1615171 to the right, improve=3.904906, (0 missing)  
## dim9 < 0.1499083 to the left, improve=2.925525, (0 missing)  
## dim30 < 0.1192046 to the left, improve=2.925525, (0 missing)  
## dim1 < 0.6000691 to the left, improve=2.024196, (0 missing)  
## dim19 < -0.1620423 to the right, improve=1.959465, (0 missing)  
##   
## Node number 41: 30 observations, complexity param=0.0001172254  
## predicted class=1 expected loss=0.6666667 P(node) =0.0008928571  
## class counts: 0 10 7 4 2 2 0 5 0 0  
## probabilities: 0.000 0.333 0.233 0.133 0.067 0.067 0.000 0.167 0.000 0.000   
## left son=82 (7 obs) right son=83 (23 obs)  
## Primary splits:  
## dim5 < 0.1204672 to the right, improve=6.878261, (0 missing)  
## dim27 < 0.03153353 to the right, improve=6.286364, (0 missing)  
## dim19 < 0.098591 to the left, improve=5.320000, (0 missing)  
## dim3 < 0.02420694 to the right, improve=4.275000, (0 missing)  
## dim17 < 0.0497062 to the right, improve=4.205430, (0 missing)  
## Surrogate splits:  
## dim27 < 0.03153353 to the right, agree=0.967, adj=0.857, (0 split)  
## dim3 < 0.1567254 to the right, agree=0.900, adj=0.571, (0 split)  
## dim4 < -0.2164881 to the left, agree=0.833, adj=0.286, (0 split)  
## dim12 < -0.0727956 to the left, agree=0.833, adj=0.286, (0 split)  
## dim14 < 0.01946757 to the right, agree=0.833, adj=0.286, (0 split)  
##   
## Node number 42: 18 observations  
## predicted class=2 expected loss=0 P(node) =0.0005357143  
## class counts: 0 0 18 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 43: 23 observations, complexity param=0.0001674649  
## predicted class=5 expected loss=0.5217391 P(node) =0.0006845238  
## class counts: 0 2 1 3 0 11 5 0 1 0  
## probabilities: 0.000 0.087 0.043 0.130 0.000 0.478 0.217 0.000 0.043 0.000   
## left son=86 (18 obs) right son=87 (5 obs)  
## Primary splits:  
## dim17 < -0.1165274 to the right, improve=5.555556, (0 missing)  
## dim5 < -0.1009491 to the left, improve=3.900000, (0 missing)  
## dim15 < 0.02873921 to the left, improve=3.727273, (0 missing)  
## dim13 < -0.02097479 to the left, improve=3.428571, (0 missing)  
## dim4 < 0.1332897 to the left, improve=3.060606, (0 missing)  
## Surrogate splits:  
## dim5 < -0.1009491 to the left, agree=0.870, adj=0.4, (0 split)  
## dim10 < 0.1463836 to the left, agree=0.870, adj=0.4, (0 split)  
## dim24 < -0.12768 to the right, agree=0.870, adj=0.4, (0 split)  
## dim6 < -0.2266687 to the right, agree=0.826, adj=0.2, (0 split)  
## dim11 < -0.008226392 to the right, agree=0.826, adj=0.2, (0 split)  
##   
## Node number 44: 36 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.08333333 P(node) =0.001071429  
## class counts: 0 33 0 1 0 0 0 1 0 1  
## probabilities: 0.000 0.917 0.000 0.028 0.000 0.000 0.000 0.028 0.000 0.028   
## left son=88 (34 obs) right son=89 (2 obs)  
## Primary splits:  
## dim30 < 0.09169956 to the left, improve=2.725490, (0 missing)  
## dim4 < -0.2542934 to the right, improve=1.838095, (0 missing)  
## dim14 < -0.1100221 to the right, improve=1.838095, (0 missing)  
## dim18 < -0.1080393 to the right, improve=1.838095, (0 missing)  
## dim7 < 0.2286733 to the left, improve=1.838095, (0 missing)  
##   
## Node number 45: 7 observations  
## predicted class=6 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 0 0 0 0 7 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 46: 63 observations, complexity param=0.0005358877  
## predicted class=2 expected loss=0.3968254 P(node) =0.001875  
## class counts: 0 16 38 0 1 0 1 3 4 0  
## probabilities: 0.000 0.254 0.603 0.000 0.016 0.000 0.016 0.048 0.063 0.000   
## left son=92 (16 obs) right son=93 (47 obs)  
## Primary splits:  
## dim7 < -0.1386362 to the left, improve=19.88517, (0 missing)  
## dim16 < -0.03506317 to the left, improve=18.06349, (0 missing)  
## dim13 < 0.1767108 to the right, improve=17.79702, (0 missing)  
## dim6 < 0.3016226 to the right, improve=16.43571, (0 missing)  
## dim4 < 0.1424369 to the right, improve=14.77151, (0 missing)  
## Surrogate splits:  
## dim6 < 0.2687939 to the right, agree=0.968, adj=0.875, (0 split)  
## dim13 < 0.1695822 to the right, agree=0.952, adj=0.812, (0 split)  
## dim16 < -0.05700717 to the left, agree=0.921, adj=0.687, (0 split)  
## dim4 < 0.1497064 to the right, agree=0.905, adj=0.625, (0 split)  
## dim8 < 0.05118784 to the right, agree=0.857, adj=0.437, (0 split)  
##   
## Node number 47: 156 observations, complexity param=0.0005693807  
## predicted class=8 expected loss=0.5769231 P(node) =0.004642857  
## class counts: 0 5 2 16 7 4 6 23 66 27  
## probabilities: 0.000 0.032 0.013 0.103 0.045 0.026 0.038 0.147 0.423 0.173   
## left son=94 (91 obs) right son=95 (65 obs)  
## Primary splits:  
## dim15 < -0.02565915 to the right, improve=26.17143, (0 missing)  
## dim3 < -0.1098937 to the right, improve=23.85317, (0 missing)  
## dim10 < -0.07523836 to the right, improve=23.57236, (0 missing)  
## dim7 < 0.05889207 to the right, improve=17.17930, (0 missing)  
## dim13 < -0.01809541 to the left, improve=17.17308, (0 missing)  
## Surrogate splits:  
## dim10 < -0.03257508 to the left, agree=0.801, adj=0.523, (0 split)  
## dim3 < 0.00574062 to the left, agree=0.776, adj=0.462, (0 split)  
## dim17 < -0.05400407 to the right, agree=0.724, adj=0.338, (0 split)  
## dim20 < 0.006810118 to the left, agree=0.724, adj=0.338, (0 split)  
## dim7 < -0.03034455 to the right, agree=0.699, adj=0.277, (0 split)  
##   
## Node number 48: 2907 observations, complexity param=0.005492849  
## predicted class=0 expected loss=0.1678707 P(node) =0.08651786  
## class counts: 2419 0 57 3 12 255 94 5 43 19  
## probabilities: 0.832 0.000 0.020 0.001 0.004 0.088 0.032 0.002 0.015 0.007   
## left son=96 (2706 obs) right son=97 (201 obs)  
## Primary splits:  
## dim4 < -0.2191805 to the right, improve=263.41450, (0 missing)  
## dim20 < 0.09221203 to the left, improve=181.90020, (0 missing)  
## dim2 < 0.2496224 to the right, improve=120.20790, (0 missing)  
## dim5 < 0.02829253 to the left, improve= 91.01067, (0 missing)  
## dim10 < -0.04768891 to the right, improve= 89.80195, (0 missing)  
## Surrogate splits:  
## dim20 < 0.195756 to the left, agree=0.950, adj=0.279, (0 split)  
## dim10 < -0.2652608 to the right, agree=0.934, adj=0.050, (0 split)  
## dim25 < 0.23638 to the left, agree=0.932, adj=0.020, (0 split)  
## dim30 < -0.2097341 to the right, agree=0.931, adj=0.005, (0 split)  
##   
## Node number 49: 1153 observations, complexity param=0.002662692  
## predicted class=4 expected loss=0.6773634 P(node) =0.03431548  
## class counts: 107 0 21 10 372 130 172 144 21 176  
## probabilities: 0.093 0.000 0.018 0.009 0.323 0.113 0.149 0.125 0.018 0.153   
## left son=98 (270 obs) right son=99 (883 obs)  
## Primary splits:  
## dim11 < 0.1834396 to the right, improve=127.83870, (0 missing)  
## dim5 < 0.09967153 to the left, improve=119.02730, (0 missing)  
## dim12 < 0.1310617 to the left, improve= 93.13054, (0 missing)  
## dim4 < -0.07709731 to the right, improve= 82.62967, (0 missing)  
## dim8 < 0.05756915 to the right, improve= 76.36837, (0 missing)  
## Surrogate splits:  
## dim24 < 0.1682555 to the right, agree=0.781, adj=0.067, (0 split)  
## dim19 < 0.134897 to the right, agree=0.771, adj=0.022, (0 split)  
## dim18 < 0.2254478 to the right, agree=0.769, adj=0.015, (0 split)  
## dim1 < 0.1289107 to the left, agree=0.768, adj=0.007, (0 split)  
## dim6 < 0.1702742 to the right, agree=0.768, adj=0.007, (0 split)  
##   
## Node number 50: 4284 observations, complexity param=0.01292829  
## predicted class=2 expected loss=0.4712885 P(node) =0.1275  
## class counts: 18 110 2265 350 111 156 407 53 752 62  
## probabilities: 0.004 0.026 0.529 0.082 0.026 0.036 0.095 0.012 0.176 0.014   
## left son=100 (2950 obs) right son=101 (1334 obs)  
## Primary splits:  
## dim4 < -0.1232858 to the right, improve=477.7591, (0 missing)  
## dim8 < -0.1036733 to the left, improve=435.7025, (0 missing)  
## dim14 < 0.01681405 to the left, improve=229.9798, (0 missing)  
## dim9 < -0.02085266 to the right, improve=220.9120, (0 missing)  
## dim10 < -0.05851027 to the right, improve=214.4973, (0 missing)  
## Surrogate splits:  
## dim10 < -0.0820206 to the right, agree=0.754, adj=0.210, (0 split)  
## dim21 < -0.1790063 to the right, agree=0.703, adj=0.047, (0 split)  
## dim16 < 0.1625456 to the left, agree=0.702, adj=0.044, (0 split)  
## dim28 < 0.1309224 to the left, agree=0.702, adj=0.044, (0 split)  
## dim1 < 0.7038529 to the left, agree=0.695, adj=0.019, (0 split)  
##   
## Node number 51: 8151 observations, complexity param=0.04193321  
## predicted class=3 expected loss=0.6807754 P(node) =0.2425893  
## class counts: 640 33 623 2602 26 1989 140 73 1940 85  
## probabilities: 0.079 0.004 0.076 0.319 0.003 0.244 0.017 0.009 0.238 0.010   
## left son=102 (4953 obs) right son=103 (3198 obs)  
## Primary splits:  
## dim9 < -0.01819776 to the right, improve=616.2512, (0 missing)  
## dim4 < -0.2049574 to the left, improve=487.7095, (0 missing)  
## dim5 < -0.2359935 to the left, improve=367.7009, (0 missing)  
## dim3 < 0.1400556 to the right, improve=362.7694, (0 missing)  
## dim2 < 0.07847863 to the right, improve=339.5670, (0 missing)  
## Surrogate splits:  
## dim12 < -0.08435203 to the right, agree=0.650, adj=0.109, (0 split)  
## dim3 < 0.07443517 to the right, agree=0.642, adj=0.088, (0 split)  
## dim20 < 0.08991332 to the left, agree=0.632, adj=0.062, (0 split)  
## dim11 < -0.04016419 to the right, agree=0.632, adj=0.062, (0 split)  
## dim29 < 0.06610535 to the left, agree=0.629, adj=0.053, (0 split)  
##   
## Node number 52: 276 observations, complexity param=0.0008038316  
## predicted class=1 expected loss=0.2282609 P(node) =0.008214286  
## class counts: 0 213 6 30 7 9 0 3 7 1  
## probabilities: 0.000 0.772 0.022 0.109 0.025 0.033 0.000 0.011 0.025 0.004   
## left son=104 (226 obs) right son=105 (50 obs)  
## Primary splits:  
## dim17 < 0.01735698 to the right, improve=42.98100, (0 missing)  
## dim2 < -0.02032534 to the left, improve=31.03455, (0 missing)  
## dim6 < -0.2723613 to the left, improve=30.70398, (0 missing)  
## dim8 < -0.01207286 to the left, improve=28.56051, (0 missing)  
## dim25 < 0.04665272 to the right, improve=27.35529, (0 missing)  
## Surrogate splits:  
## dim25 < 0.003571987 to the right, agree=0.891, adj=0.40, (0 split)  
## dim18 < -0.07418389 to the right, agree=0.884, adj=0.36, (0 split)  
## dim8 < 0.01719402 to the left, agree=0.880, adj=0.34, (0 split)  
## dim6 < -0.2334749 to the left, agree=0.877, adj=0.32, (0 split)  
## dim20 < 0.01648741 to the left, agree=0.873, adj=0.30, (0 split)  
##   
## Node number 53: 446 observations, complexity param=0.001172254  
## predicted class=3 expected loss=0.4843049 P(node) =0.01327381  
## class counts: 10 19 36 230 0 77 46 0 27 1  
## probabilities: 0.022 0.043 0.081 0.516 0.000 0.173 0.103 0.000 0.061 0.002   
## left son=106 (292 obs) right son=107 (154 obs)  
## Primary splits:  
## dim21 < -0.01517285 to the right, improve=42.50519, (0 missing)  
## dim11 < -0.01610824 to the right, improve=37.08023, (0 missing)  
## dim4 < -0.2381564 to the left, improve=36.45729, (0 missing)  
## dim7 < -0.1774245 to the right, improve=33.71948, (0 missing)  
## dim9 < 0.1028946 to the right, improve=32.45073, (0 missing)  
## Surrogate splits:  
## dim7 < -0.1340381 to the right, agree=0.787, adj=0.383, (0 split)  
## dim11 < -0.07604054 to the right, agree=0.715, adj=0.175, (0 split)  
## dim14 < 0.104084 to the left, agree=0.715, adj=0.175, (0 split)  
## dim9 < -0.0001672396 to the right, agree=0.704, adj=0.143, (0 split)  
## dim24 < 0.07519331 to the left, agree=0.704, adj=0.143, (0 split)  
##   
## Node number 54: 124 observations, complexity param=0.0006028737  
## predicted class=5 expected loss=0.6370968 P(node) =0.003690476  
## class counts: 30 1 0 17 0 45 31 0 0 0  
## probabilities: 0.242 0.008 0.000 0.137 0.000 0.363 0.250 0.000 0.000 0.000   
## left son=108 (48 obs) right son=109 (76 obs)  
## Primary splits:  
## dim4 < 0.1437033 to the right, improve=18.17346, (0 missing)  
## dim14 < -0.07863306 to the right, improve=17.40958, (0 missing)  
## dim18 < -0.02954973 to the left, improve=14.38062, (0 missing)  
## dim2 < 0.1336622 to the right, improve=14.25187, (0 missing)  
## dim20 < 0.0794019 to the left, improve=11.58207, (0 missing)  
## Surrogate splits:  
## dim18 < 0.01395217 to the left, agree=0.790, adj=0.458, (0 split)  
## dim14 < -0.04693538 to the left, agree=0.758, adj=0.375, (0 split)  
## dim2 < 0.1162763 to the right, agree=0.726, adj=0.292, (0 split)  
## dim27 < -0.06459466 to the left, agree=0.726, adj=0.292, (0 split)  
## dim8 < 0.1388143 to the right, agree=0.718, adj=0.271, (0 split)  
##   
## Node number 55: 2654 observations, complexity param=0.0005191412  
## predicted class=6 expected loss=0.1152977 P(node) =0.0789881  
## class counts: 31 19 140 23 45 32 2348 2 10 4  
## probabilities: 0.012 0.007 0.053 0.009 0.017 0.012 0.885 0.001 0.004 0.002   
## left son=110 (74 obs) right son=111 (2580 obs)  
## Primary splits:  
## dim13 < 0.1913729 to the right, improve=42.71514, (0 missing)  
## dim1 < 0.4010552 to the left, improve=41.92399, (0 missing)  
## dim10 < 0.05696846 to the right, improve=33.60836, (0 missing)  
## dim14 < -0.2000277 to the left, improve=33.05770, (0 missing)  
## dim26 < -0.07555472 to the left, improve=32.91578, (0 missing)  
## Surrogate splits:  
## dim26 < -0.2362323 to the left, agree=0.972, adj=0.014, (0 split)  
##   
## Node number 56: 2376 observations, complexity param=0.00482299  
## predicted class=4 expected loss=0.3127104 P(node) =0.07071429  
## class counts: 1 8 15 14 1633 30 46 81 87 461  
## probabilities: 0.000 0.003 0.006 0.006 0.687 0.013 0.019 0.034 0.037 0.194   
## left son=112 (1918 obs) right son=113 (458 obs)  
## Primary splits:  
## dim11 < -0.1130281 to the right, improve=187.33500, (0 missing)  
## dim19 < -0.03638173 to the right, improve=110.27860, (0 missing)  
## dim20 < -0.07198129 to the right, improve= 79.16276, (0 missing)  
## dim4 < -0.1410461 to the right, improve= 68.44754, (0 missing)  
## dim27 < 0.04045802 to the left, improve= 59.91198, (0 missing)  
## Surrogate splits:  
## dim17 < 0.2518264 to the left, agree=0.810, adj=0.015, (0 split)  
## dim9 < 0.3076787 to the left, agree=0.810, adj=0.013, (0 split)  
## dim3 < -0.4487299 to the right, agree=0.809, adj=0.009, (0 split)  
## dim26 < 0.2423472 to the left, agree=0.809, adj=0.007, (0 split)  
## dim1 < 0.8477545 to the left, agree=0.808, adj=0.004, (0 split)  
##   
## Node number 57: 1417 observations, complexity param=0.005141173  
## predicted class=9 expected loss=0.6873677 P(node) =0.04217262  
## class counts: 4 39 0 11 297 276 0 233 114 443  
## probabilities: 0.003 0.028 0.000 0.008 0.210 0.195 0.000 0.164 0.080 0.313   
## left son=114 (469 obs) right son=115 (948 obs)  
## Primary splits:  
## dim3 < -0.194795 to the right, improve=100.23260, (0 missing)  
## dim16 < 0.1331414 to the right, improve= 97.39705, (0 missing)  
## dim11 < 0.2094413 to the right, improve= 85.37999, (0 missing)  
## dim5 < -0.1925363 to the left, improve= 73.75619, (0 missing)  
## dim19 < 0.09913599 to the right, improve= 73.33718, (0 missing)  
## Surrogate splits:  
## dim13 < 0.1491158 to the right, agree=0.705, adj=0.109, (0 split)  
## dim16 < 0.1740585 to the right, agree=0.705, adj=0.109, (0 split)  
## dim15 < 0.1761782 to the right, agree=0.702, adj=0.100, (0 split)  
## dim30 < -0.05873752 to the left, agree=0.701, adj=0.096, (0 split)  
## dim6 < -0.2740436 to the left, agree=0.692, adj=0.070, (0 split)  
##   
## Node number 58: 374 observations, complexity param=0.0006028737  
## predicted class=4 expected loss=0.2727273 P(node) =0.01113095  
## class counts: 0 1 5 9 272 1 2 10 1 73  
## probabilities: 0.000 0.003 0.013 0.024 0.727 0.003 0.005 0.027 0.003 0.195   
## left son=116 (281 obs) right son=117 (93 obs)  
## Primary splits:  
## dim5 < -0.07323165 to the right, improve=28.95810, (0 missing)  
## dim27 < 0.003975792 to the left, improve=22.19465, (0 missing)  
## dim26 < -0.06081491 to the right, improve=21.43764, (0 missing)  
## dim17 < -0.05641673 to the right, improve=18.78469, (0 missing)  
## dim11 < 0.2264155 to the right, improve=17.18903, (0 missing)  
## Surrogate splits:  
## dim1 < 0.6115413 to the left, agree=0.802, adj=0.204, (0 split)  
## dim26 < -0.1231646 to the right, agree=0.781, adj=0.118, (0 split)  
## dim27 < 0.05280899 to the left, agree=0.775, adj=0.097, (0 split)  
## dim25 < -0.1216185 to the right, agree=0.773, adj=0.086, (0 split)  
## dim3 < -0.3805275 to the right, agree=0.765, adj=0.054, (0 split)  
##   
## Node number 59: 1970 observations, complexity param=0.0004019158  
## predicted class=9 expected loss=0.2634518 P(node) =0.05863095  
## class counts: 0 0 34 65 224 5 24 119 48 1451  
## probabilities: 0.000 0.000 0.017 0.033 0.114 0.003 0.012 0.060 0.024 0.737   
## left son=118 (488 obs) right son=119 (1482 obs)  
## Primary splits:  
## dim19 < 0.02136304 to the right, improve=83.99880, (0 missing)  
## dim3 < -0.1897452 to the right, improve=74.57503, (0 missing)  
## dim24 < 0.07511081 to the right, improve=53.01474, (0 missing)  
## dim27 < -0.03374713 to the left, improve=52.33280, (0 missing)  
## dim4 < 0.1320753 to the right, improve=47.43305, (0 missing)  
## Surrogate splits:  
## dim14 < -0.1998039 to the left, agree=0.780, adj=0.113, (0 split)  
## dim27 < -0.05755551 to the left, agree=0.774, adj=0.086, (0 split)  
## dim24 < 0.1230738 to the right, agree=0.772, adj=0.078, (0 split)  
## dim28 < 0.1058915 to the right, agree=0.765, adj=0.051, (0 split)  
## dim3 < -0.1132733 to the right, agree=0.757, adj=0.020, (0 split)  
##   
## Node number 60: 190 observations, complexity param=0.001339719  
## predicted class=2 expected loss=0.6842105 P(node) =0.005654762  
## class counts: 0 0 60 19 26 0 5 57 14 9  
## probabilities: 0.000 0.000 0.316 0.100 0.137 0.000 0.026 0.300 0.074 0.047   
## left son=120 (89 obs) right son=121 (101 obs)  
## Primary splits:  
## dim13 < 0.03946482 to the right, improve=23.70335, (0 missing)  
## dim1 < 0.519456 to the left, improve=15.32117, (0 missing)  
## dim12 < 0.04806739 to the left, improve=15.17860, (0 missing)  
## dim3 < -0.1722374 to the right, improve=11.80539, (0 missing)  
## dim4 < -0.05299826 to the right, improve=11.45183, (0 missing)  
## Surrogate splits:  
## dim15 < 0.07975218 to the right, agree=0.705, adj=0.371, (0 split)  
## dim1 < 0.46953 to the left, agree=0.684, adj=0.326, (0 split)  
## dim29 < -0.02485394 to the right, agree=0.679, adj=0.315, (0 split)  
## dim14 < -0.0003520017 to the right, agree=0.653, adj=0.258, (0 split)  
## dim3 < -0.1697976 to the right, agree=0.647, adj=0.247, (0 split)  
##   
## Node number 61: 341 observations, complexity param=0.001825368  
## predicted class=9 expected loss=0.4134897 P(node) =0.01014881  
## class counts: 1 0 5 0 97 1 18 13 6 200  
## probabilities: 0.003 0.000 0.015 0.000 0.284 0.003 0.053 0.038 0.018 0.587   
## left son=122 (121 obs) right son=123 (220 obs)  
## Primary splits:  
## dim12 < -0.09783783 to the right, improve=60.16185, (0 missing)  
## dim11 < 0.1505071 to the right, improve=50.42811, (0 missing)  
## dim20 < 0.01215018 to the right, improve=45.53730, (0 missing)  
## dim4 < 0.06048178 to the right, improve=44.44521, (0 missing)  
## dim16 < 0.07408007 to the right, improve=23.59650, (0 missing)  
## Surrogate splits:  
## dim20 < 0.04889213 to the right, agree=0.792, adj=0.413, (0 split)  
## dim4 < 0.08512693 to the right, agree=0.751, adj=0.298, (0 split)  
## dim11 < 0.1505071 to the right, agree=0.730, adj=0.240, (0 split)  
## dim9 < -0.03595909 to the left, agree=0.727, adj=0.231, (0 split)  
## dim6 < -0.0505729 to the left, agree=0.713, adj=0.190, (0 split)  
##   
## Node number 62: 811 observations, complexity param=0.001892354  
## predicted class=7 expected loss=0.6596794 P(node) =0.0241369  
## class counts: 0 119 11 12 103 21 0 276 70 199  
## probabilities: 0.000 0.147 0.014 0.015 0.127 0.026 0.000 0.340 0.086 0.245   
## left son=124 (115 obs) right son=125 (696 obs)  
## Primary splits:  
## dim6 < -0.2967058 to the left, improve=119.66930, (0 missing)  
## dim11 < 0.0340934 to the right, improve= 86.95330, (0 missing)  
## dim13 < 0.1312103 to the right, improve= 84.21517, (0 missing)  
## dim10 < 0.1772485 to the right, improve= 72.30547, (0 missing)  
## dim2 < -0.01257361 to the left, improve= 65.72404, (0 missing)  
## Surrogate splits:  
## dim13 < 0.1312103 to the right, agree=0.951, adj=0.652, (0 split)  
## dim10 < 0.2206315 to the right, agree=0.924, adj=0.461, (0 split)  
## dim17 < 0.1173286 to the right, agree=0.919, adj=0.426, (0 split)  
## dim2 < -0.278429 to the left, agree=0.889, adj=0.217, (0 split)  
## dim3 < -0.1374946 to the right, agree=0.887, adj=0.200, (0 split)  
##   
## Node number 63: 2556 observations, complexity param=0.0005023947  
## predicted class=7 expected loss=0.07668232 P(node) =0.07607143  
## class counts: 2 17 26 18 19 7 1 2360 14 92  
## probabilities: 0.001 0.007 0.010 0.007 0.007 0.003 0.000 0.923 0.005 0.036   
## left son=126 (20 obs) right son=127 (2536 obs)  
## Primary splits:  
## dim6 < -0.233579 to the left, improve=28.13631, (0 missing)  
## dim3 < -0.1669371 to the right, improve=20.94000, (0 missing)  
## dim19 < -0.1225348 to the right, improve=20.53867, (0 missing)  
## dim4 < -0.408076 to the left, improve=14.23096, (0 missing)  
## dim5 < 0.02084559 to the right, improve=14.06986, (0 missing)  
## Surrogate splits:  
## dim2 < -0.3211776 to the left, agree=0.994, adj=0.2, (0 split)  
##   
## Node number 64: 2823 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.01983705 P(node) =0.08401786  
## class counts: 0 2767 4 2 1 1 2 12 27 7  
## probabilities: 0.000 0.980 0.001 0.001 0.000 0.000 0.001 0.004 0.010 0.002   
## left son=128 (2798 obs) right son=129 (25 obs)  
## Primary splits:  
## dim25 < 0.1045493 to the left, improve=6.533984, (0 missing)  
## dim18 < -0.1670775 to the right, improve=5.130703, (0 missing)  
## dim3 < -0.216625 to the right, improve=4.532035, (0 missing)  
## dim13 < 0.247675 to the left, improve=4.524943, (0 missing)  
## dim22 < 0.2134169 to the left, improve=4.507213, (0 missing)  
##   
## Node number 65: 8 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.375 P(node) =0.0002380952  
## class counts: 0 1 0 0 1 0 0 0 5 1  
## probabilities: 0.000 0.125 0.000 0.000 0.125 0.000 0.000 0.000 0.625 0.125   
## left son=130 (3 obs) right son=131 (5 obs)  
## Primary splits:  
## dim1 < 0.5815549 to the left, improve=2.500000, (0 missing)  
## dim8 < 0.13332 to the right, improve=2.500000, (0 missing)  
## dim12 < 0.07753448 to the right, improve=2.500000, (0 missing)  
## dim11 < 0.05990629 to the right, improve=1.833333, (0 missing)  
## dim13 < -0.08156789 to the left, improve=1.833333, (0 missing)  
## Surrogate splits:  
## dim8 < 0.13332 to the right, agree=1.000, adj=1.000, (0 split)  
## dim12 < 0.07753448 to the right, agree=1.000, adj=1.000, (0 split)  
## dim3 < -0.0672715 to the left, agree=0.875, adj=0.667, (0 split)  
## dim4 < -0.04385731 to the left, agree=0.875, adj=0.667, (0 split)  
## dim10 < -0.1502 to the left, agree=0.875, adj=0.667, (0 split)  
##   
## Node number 66: 6 observations  
## predicted class=1 expected loss=0 P(node) =0.0001785714  
## class counts: 0 6 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 67: 9 observations  
## predicted class=8 expected loss=0 P(node) =0.0002678571  
## class counts: 0 0 0 0 0 0 0 0 9 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 68: 32 observations, complexity param=0.0001590917  
## predicted class=1 expected loss=0.21875 P(node) =0.000952381  
## class counts: 0 25 0 0 1 1 0 0 0 5  
## probabilities: 0.000 0.781 0.000 0.000 0.031 0.031 0.000 0.000 0.000 0.156   
## left son=136 (26 obs) right son=137 (6 obs)  
## Primary splits:  
## dim5 < -0.1213104 to the right, improve=8.035256, (0 missing)  
## dim10 < -0.1403595 to the right, improve=8.035256, (0 missing)  
## dim26 < -0.05330908 to the right, improve=5.419286, (0 missing)  
## dim28 < -0.0869433 to the right, improve=4.625000, (0 missing)  
## dim21 < -0.003266443 to the right, improve=3.356602, (0 missing)  
## Surrogate splits:  
## dim10 < -0.1603696 to the right, agree=0.969, adj=0.833, (0 split)  
## dim28 < -0.0869433 to the right, agree=0.938, adj=0.667, (0 split)  
## dim14 < -0.07063284 to the right, agree=0.906, adj=0.500, (0 split)  
## dim26 < -0.05330908 to the right, agree=0.906, adj=0.500, (0 split)  
## dim8 < 0.1944405 to the left, agree=0.875, adj=0.333, (0 split)  
##   
## Node number 69: 14 observations, complexity param=0.0001004789  
## predicted class=6 expected loss=0.5714286 P(node) =0.0004166667  
## class counts: 0 1 0 3 0 3 6 1 0 0  
## probabilities: 0.000 0.071 0.000 0.214 0.000 0.214 0.429 0.071 0.000 0.000   
## left son=138 (8 obs) right son=139 (6 obs)  
## Primary splits:  
## dim17 < -0.1244537 to the right, improve=4.500000, (0 missing)  
## dim28 < -0.04748368 to the right, improve=4.500000, (0 missing)  
## dim20 < 0.1240545 to the left, improve=4.500000, (0 missing)  
## dim15 < 0.1114961 to the right, improve=3.750000, (0 missing)  
## dim7 < 0.02390344 to the right, improve=3.428571, (0 missing)  
## Surrogate splits:  
## dim20 < 0.1240545 to the left, agree=1.000, adj=1.000, (0 split)  
## dim28 < -0.04748368 to the right, agree=1.000, adj=1.000, (0 split)  
## dim7 < 0.02390344 to the right, agree=0.929, adj=0.833, (0 split)  
## dim18 < 0.07755469 to the left, agree=0.929, adj=0.833, (0 split)  
## dim6 < -0.1521971 to the right, agree=0.857, adj=0.667, (0 split)  
##   
## Node number 70: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500 0.000   
## left son=140 (1 obs) right son=141 (1 obs)  
## Primary splits:  
## dim1 < 0.6476881 to the left, improve=1, (0 missing)  
## dim2 < -0.4281873 to the left, improve=1, (0 missing)  
## dim3 < 0.03808304 to the right, improve=1, (0 missing)  
## dim4 < 0.07415282 to the left, improve=1, (0 missing)  
## dim5 < -0.1309153 to the left, improve=1, (0 missing)  
##   
## Node number 71: 10 observations  
## predicted class=7 expected loss=0 P(node) =0.000297619  
## class counts: 0 0 0 0 0 0 0 10 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 76: 12 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.25 P(node) =0.0003571429  
## class counts: 0 9 0 0 1 2 0 0 0 0  
## probabilities: 0.000 0.750 0.000 0.000 0.083 0.167 0.000 0.000 0.000 0.000   
## left son=152 (10 obs) right son=153 (2 obs)  
## Primary splits:  
## dim15 < 0.07321604 to the left, improve=3.033333, (0 missing)  
## dim23 < 0.07673326 to the left, improve=3.033333, (0 missing)  
## dim5 < -0.09864829 to the right, improve=3.033333, (0 missing)  
## dim29 < -0.08018085 to the right, improve=3.033333, (0 missing)  
## dim30 < -0.03485155 to the right, improve=3.033333, (0 missing)  
## Surrogate splits:  
## dim5 < -0.09864829 to the right, agree=1.000, adj=1.0, (0 split)  
## dim23 < 0.07673326 to the left, agree=1.000, adj=1.0, (0 split)  
## dim29 < -0.08018085 to the right, agree=1.000, adj=1.0, (0 split)  
## dim30 < -0.03485155 to the right, agree=1.000, adj=1.0, (0 split)  
## dim1 < 0.4949909 to the right, agree=0.917, adj=0.5, (0 split)  
##   
## Node number 77: 5 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 0 1 1 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.200 0.200 0.000 0.000 0.600 0.000 0.000   
## left son=154 (2 obs) right son=155 (3 obs)  
## Primary splits:  
## dim1 < 0.6156273 to the right, improve=1.8, (0 missing)  
## dim11 < -0.03963312 to the right, improve=1.8, (0 missing)  
## dim6 < 0.1092384 to the left, improve=1.8, (0 missing)  
## dim14 < -0.002711315 to the left, improve=1.8, (0 missing)  
## dim17 < 0.05807395 to the left, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim6 < 0.1092384 to the left, agree=1, adj=1, (0 split)  
## dim11 < -0.03963312 to the right, agree=1, adj=1, (0 split)  
## dim14 < -0.002711315 to the left, agree=1, adj=1, (0 split)  
## dim17 < 0.05807395 to the left, agree=1, adj=1, (0 split)  
## dim22 < 0.05857532 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 78: 3 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 2 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.667 0.000 0.000 0.000 0.000 0.000 0.000 0.333 0.000   
## left son=156 (2 obs) right son=157 (1 obs)  
## Primary splits:  
## dim1 < 0.5374235 to the left, improve=1.333333, (0 missing)  
## dim2 < -0.4651591 to the left, improve=1.333333, (0 missing)  
## dim4 < 0.1081879 to the left, improve=1.333333, (0 missing)  
## dim5 < 0.04224675 to the left, improve=1.333333, (0 missing)  
## dim11 < 0.003172218 to the left, improve=1.333333, (0 missing)  
##   
## Node number 79: 10 observations  
## predicted class=6 expected loss=0 P(node) =0.000297619  
## class counts: 0 0 0 0 0 0 10 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 80: 291 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.0137457 P(node) =0.008660714  
## class counts: 0 287 1 1 0 1 0 0 1 0  
## probabilities: 0.000 0.986 0.003 0.003 0.000 0.003 0.000 0.000 0.003 0.000   
## left son=160 (289 obs) right son=161 (2 obs)  
## Primary splits:  
## dim15 < 0.12294 to the left, improve=2.952033, (0 missing)  
## dim30 < 0.1192046 to the left, improve=2.952033, (0 missing)  
## dim9 < 0.1499083 to the left, improve=2.952033, (0 missing)  
## dim19 < -0.1620423 to the right, improve=1.972651, (0 missing)  
## dim24 < -0.1443555 to the right, improve=1.972651, (0 missing)  
## Surrogate splits:  
## dim30 < 0.1192046 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 81: 2 observations  
## predicted class=8 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 82: 7 observations  
## predicted class=2 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 7 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 83: 23 observations, complexity param=0.0001172254  
## predicted class=1 expected loss=0.5652174 P(node) =0.0006845238  
## class counts: 0 10 0 4 2 2 0 5 0 0  
## probabilities: 0.000 0.435 0.000 0.174 0.087 0.087 0.000 0.217 0.000 0.000   
## left son=166 (18 obs) right son=167 (5 obs)  
## Primary splits:  
## dim19 < 0.09435295 to the left, improve=5.410628, (0 missing)  
## dim30 < 0.03194071 to the left, improve=4.972720, (0 missing)  
## dim3 < -0.1203047 to the right, improve=4.005072, (0 missing)  
## dim24 < -0.02800877 to the left, improve=3.703557, (0 missing)  
## dim29 < 0.05008478 to the left, improve=3.506588, (0 missing)  
## Surrogate splits:  
## dim30 < 0.03194071 to the left, agree=0.957, adj=0.8, (0 split)  
## dim3 < -0.2125926 to the right, agree=0.913, adj=0.6, (0 split)  
## dim7 < 0.2513623 to the left, agree=0.913, adj=0.6, (0 split)  
## dim10 < -0.1302141 to the right, agree=0.870, adj=0.4, (0 split)  
## dim22 < -0.07344027 to the right, agree=0.870, adj=0.4, (0 split)  
##   
## Node number 86: 18 observations, complexity param=5.582164e-05  
## predicted class=5 expected loss=0.3888889 P(node) =0.0005357143  
## class counts: 0 2 1 3 0 11 0 0 1 0  
## probabilities: 0.000 0.111 0.056 0.167 0.000 0.611 0.000 0.000 0.056 0.000   
## left son=172 (9 obs) right son=173 (9 obs)  
## Primary splits:  
## dim4 < 0.1304102 to the left, improve=3.555556, (0 missing)  
## dim12 < 0.1045427 to the right, improve=3.277778, (0 missing)  
## dim24 < -0.027133 to the right, improve=2.944444, (0 missing)  
## dim11 < 0.007644588 to the left, improve=2.844444, (0 missing)  
## dim14 < 0.08485131 to the right, improve=2.694444, (0 missing)  
## Surrogate splits:  
## dim15 < 0.02626948 to the left, agree=0.889, adj=0.778, (0 split)  
## dim8 < -0.02888619 to the left, agree=0.833, adj=0.667, (0 split)  
## dim9 < 0.05303534 to the left, agree=0.833, adj=0.667, (0 split)  
## dim13 < 0.008287145 to the left, agree=0.833, adj=0.667, (0 split)  
## dim1 < 0.507029 to the right, agree=0.778, adj=0.556, (0 split)  
##   
## Node number 87: 5 observations  
## predicted class=6 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 5 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 88: 34 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.02941176 P(node) =0.001011905  
## class counts: 0 33 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.971 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.029   
## left son=176 (33 obs) right son=177 (1 obs)  
## Primary splits:  
## dim14 < -0.1100221 to the right, improve=1.9411760, (0 missing)  
## dim8 < 0.138427 to the left, improve=1.9411760, (0 missing)  
## dim5 < -0.2858414 to the right, improve=0.9411765, (0 missing)  
## dim7 < 0.02265293 to the right, improve=0.9411765, (0 missing)  
## dim19 < -0.08147218 to the right, improve=0.9411765, (0 missing)  
##   
## Node number 89: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.500 0.000 0.000   
## left son=178 (1 obs) right son=179 (1 obs)  
## Primary splits:  
## dim1 < 0.6837891 to the left, improve=1, (0 missing)  
## dim2 < -0.3622176 to the right, improve=1, (0 missing)  
## dim3 < -0.05008357 to the right, improve=1, (0 missing)  
## dim4 < -0.2463706 to the right, improve=1, (0 missing)  
## dim5 < -0.0457696 to the right, improve=1, (0 missing)  
##   
## Node number 92: 16 observations  
## predicted class=1 expected loss=0 P(node) =0.0004761905  
## class counts: 0 16 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 93: 47 observations, complexity param=7.815029e-05  
## predicted class=2 expected loss=0.1914894 P(node) =0.00139881  
## class counts: 0 0 38 0 1 0 1 3 4 0  
## probabilities: 0.000 0.000 0.809 0.000 0.021 0.000 0.021 0.064 0.085 0.000   
## left son=186 (35 obs) right son=187 (12 obs)  
## Primary splits:  
## dim3 < 0.07662189 to the right, improve=6.702128, (0 missing)  
## dim25 < 0.03965087 to the left, improve=3.905380, (0 missing)  
## dim1 < 0.60463 to the left, improve=3.664032, (0 missing)  
## dim16 < -0.04435 to the right, improve=3.664032, (0 missing)  
## dim29 < -0.02327672 to the right, improve=3.540223, (0 missing)  
## Surrogate splits:  
## dim4 < 0.1344356 to the left, agree=0.872, adj=0.500, (0 split)  
## dim1 < 0.60463 to the left, agree=0.851, adj=0.417, (0 split)  
## dim10 < 0.1182998 to the left, agree=0.851, adj=0.417, (0 split)  
## dim16 < 0.04092192 to the right, agree=0.851, adj=0.417, (0 split)  
## dim20 < 0.02793101 to the left, agree=0.830, adj=0.333, (0 split)  
##   
## Node number 94: 91 observations, complexity param=0.0005693807  
## predicted class=9 expected loss=0.7032967 P(node) =0.002708333  
## class counts: 0 4 2 12 6 4 2 23 11 27  
## probabilities: 0.000 0.044 0.022 0.132 0.066 0.044 0.022 0.253 0.121 0.297   
## left son=188 (29 obs) right son=189 (62 obs)  
## Primary splits:  
## dim7 < 0.1026176 to the right, improve=10.920230, (0 missing)  
## dim3 < -0.106711 to the right, improve=10.304780, (0 missing)  
## dim10 < -0.07017519 to the right, improve=10.128570, (0 missing)  
## dim11 < -0.1473662 to the right, improve=10.123810, (0 missing)  
## dim13 < -0.04041461 to the left, improve= 8.539683, (0 missing)  
## Surrogate splits:  
## dim11 < -0.1766711 to the left, agree=0.780, adj=0.310, (0 split)  
## dim18 < -0.1095346 to the left, agree=0.780, adj=0.310, (0 split)  
## dim27 < -0.08614722 to the left, agree=0.780, adj=0.310, (0 split)  
## dim13 < -0.1513739 to the left, agree=0.769, adj=0.276, (0 split)  
## dim4 < -0.1495565 to the left, agree=0.736, adj=0.172, (0 split)  
##   
## Node number 95: 65 observations, complexity param=0.0001004789  
## predicted class=8 expected loss=0.1538462 P(node) =0.001934524  
## class counts: 0 1 0 4 1 0 4 0 55 0  
## probabilities: 0.000 0.015 0.000 0.062 0.015 0.000 0.062 0.000 0.846 0.000   
## left son=190 (9 obs) right son=191 (56 obs)  
## Primary splits:  
## dim6 < -0.1138474 to the left, improve=8.045604, (0 missing)  
## dim1 < 0.5118554 to the left, improve=7.644676, (0 missing)  
## dim17 < -0.2179285 to the left, improve=6.938462, (0 missing)  
## dim16 < 0.1290027 to the right, improve=6.071795, (0 missing)  
## dim13 < -0.01809541 to the left, improve=5.708303, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5118554 to the left, agree=0.954, adj=0.667, (0 split)  
## dim9 < 0.08723336 to the right, agree=0.954, adj=0.667, (0 split)  
## dim17 < -0.1872562 to the left, agree=0.954, adj=0.667, (0 split)  
## dim16 < 0.1290027 to the right, agree=0.938, adj=0.556, (0 split)  
## dim13 < -0.09865251 to the left, agree=0.908, adj=0.333, (0 split)  
##   
## Node number 96: 2706 observations, complexity param=0.0009043105  
## predicted class=0 expected loss=0.1116038 P(node) =0.08053571  
## class counts: 2404 0 56 3 12 76 94 4 42 15  
## probabilities: 0.888 0.000 0.021 0.001 0.004 0.028 0.035 0.001 0.016 0.006   
## left son=192 (2533 obs) right son=193 (173 obs)  
## Primary splits:  
## dim5 < 0.1207022 to the left, improve=88.70448, (0 missing)  
## dim2 < 0.2421494 to the right, improve=42.47489, (0 missing)  
## dim3 < 0.2044086 to the right, improve=35.43095, (0 missing)  
## dim20 < 0.08150975 to the left, improve=34.98924, (0 missing)  
## dim8 < -0.1355058 to the right, improve=31.43615, (0 missing)  
## Surrogate splits:  
## dim24 < -0.211069 to the right, agree=0.939, adj=0.040, (0 split)  
## dim21 < 0.1543324 to the left, agree=0.938, adj=0.029, (0 split)  
## dim12 < 0.2953316 to the left, agree=0.937, adj=0.017, (0 split)  
## dim26 < -0.1562558 to the right, agree=0.937, adj=0.012, (0 split)  
## dim4 < -0.2175951 to the right, agree=0.936, adj=0.006, (0 split)  
##   
## Node number 97: 201 observations, complexity param=0.0004019158  
## predicted class=5 expected loss=0.1094527 P(node) =0.005982143  
## class counts: 15 0 1 0 0 179 0 1 1 4  
## probabilities: 0.075 0.000 0.005 0.000 0.000 0.891 0.000 0.005 0.005 0.020   
## left son=194 (14 obs) right son=195 (187 obs)  
## Primary splits:  
## dim7 < 0.2542211 to the right, improve=21.25588, (0 missing)  
## dim6 < 0.2018751 to the right, improve=14.83965, (0 missing)  
## dim20 < -0.003553015 to the left, improve=14.79569, (0 missing)  
## dim10 < -0.01430278 to the right, improve=10.80351, (0 missing)  
## dim2 < 0.305015 to the right, improve=10.46144, (0 missing)  
## Surrogate splits:  
## dim6 < 0.2632426 to the right, agree=0.950, adj=0.286, (0 split)  
## dim13 < 0.1844572 to the right, agree=0.950, adj=0.286, (0 split)  
## dim14 < -0.2317251 to the left, agree=0.950, adj=0.286, (0 split)  
## dim10 < 0.03332308 to the right, agree=0.945, adj=0.214, (0 split)  
## dim20 < -0.01765489 to the left, agree=0.945, adj=0.214, (0 split)  
##   
## Node number 98: 270 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.1259259 P(node) =0.008035714  
## class counts: 1 0 1 1 236 2 4 2 5 18  
## probabilities: 0.004 0.000 0.004 0.004 0.874 0.007 0.015 0.007 0.019 0.067   
## left son=196 (242 obs) right son=197 (28 obs)  
## Primary splits:  
## dim8 < 0.07705468 to the right, improve=10.420970, (0 missing)  
## dim4 < -0.07766336 to the right, improve= 9.422773, (0 missing)  
## dim1 < 0.5636138 to the left, improve= 7.492593, (0 missing)  
## dim25 < 0.08957552 to the left, improve= 5.066236, (0 missing)  
## dim19 < -0.03207124 to the right, improve= 4.952700, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5636138 to the left, agree=0.919, adj=0.214, (0 split)  
## dim7 < 0.2985452 to the left, agree=0.907, adj=0.107, (0 split)  
## dim13 < -0.1894688 to the right, agree=0.907, adj=0.107, (0 split)  
## dim4 < -0.2706369 to the right, agree=0.904, adj=0.071, (0 split)  
## dim5 < -0.1145239 to the right, agree=0.904, adj=0.071, (0 split)  
##   
## Node number 99: 883 observations, complexity param=0.002662692  
## predicted class=6 expected loss=0.8097395 P(node) =0.02627976  
## class counts: 106 0 20 9 136 128 168 142 16 158  
## probabilities: 0.120 0.000 0.023 0.010 0.154 0.145 0.190 0.161 0.018 0.179   
## left son=198 (204 obs) right son=199 (679 obs)  
## Primary splits:  
## dim12 < 0.08495483 to the right, improve=83.02822, (0 missing)  
## dim5 < 0.1362038 to the left, improve=82.53380, (0 missing)  
## dim4 < 0.04938587 to the right, improve=76.32525, (0 missing)  
## dim26 < 0.08453406 to the left, improve=65.14430, (0 missing)  
## dim8 < 0.01161032 to the left, improve=59.25396, (0 missing)  
## Surrogate splits:  
## dim8 < -0.05220857 to the left, agree=0.809, adj=0.172, (0 split)  
## dim21 < 0.09036379 to the right, agree=0.805, adj=0.157, (0 split)  
## dim23 < -0.1201065 to the left, agree=0.804, adj=0.152, (0 split)  
## dim28 < -0.1194658 to the left, agree=0.804, adj=0.152, (0 split)  
## dim6 < -0.1213043 to the left, agree=0.800, adj=0.132, (0 split)  
##   
## Node number 100: 2950 observations, complexity param=0.00415313  
## predicted class=2 expected loss=0.3081356 P(node) =0.08779762  
## class counts: 17 106 2041 27 99 50 402 46 142 20  
## probabilities: 0.006 0.036 0.692 0.009 0.034 0.017 0.136 0.016 0.048 0.007   
## left son=200 (1715 obs) right son=201 (1235 obs)  
## Primary splits:  
## dim8 < -0.07816197 to the left, improve=264.7420, (0 missing)  
## dim14 < 0.06642454 to the left, improve=197.7112, (0 missing)  
## dim7 < 0.2754292 to the left, improve=154.0518, (0 missing)  
## dim12 < 0.1518921 to the left, improve=143.6258, (0 missing)  
## dim9 < -0.08565463 to the right, improve=132.5699, (0 missing)  
## Surrogate splits:  
## dim16 < -0.06044512 to the right, agree=0.697, adj=0.276, (0 split)  
## dim6 < -0.01133121 to the right, agree=0.680, adj=0.236, (0 split)  
## dim1 < 0.4642789 to the right, agree=0.676, adj=0.226, (0 split)  
## dim3 < 0.06399661 to the right, agree=0.669, adj=0.211, (0 split)  
## dim13 < 0.1157568 to the left, agree=0.662, adj=0.192, (0 split)  
##   
## Node number 101: 1334 observations, complexity param=0.004923469  
## predicted class=8 expected loss=0.5427286 P(node) =0.03970238  
## class counts: 1 4 224 323 12 106 5 7 610 42  
## probabilities: 0.001 0.003 0.168 0.242 0.009 0.079 0.004 0.005 0.457 0.031   
## left son=202 (214 obs) right son=203 (1120 obs)  
## Primary splits:  
## dim4 < -0.3681339 to the left, improve=111.35770, (0 missing)  
## dim2 < -0.1856249 to the left, improve=109.87190, (0 missing)  
## dim14 < -0.04878913 to the left, improve= 99.92261, (0 missing)  
## dim21 < -0.03706488 to the right, improve= 96.93175, (0 missing)  
## dim9 < -0.003422065 to the right, improve= 65.02895, (0 missing)  
## Surrogate splits:  
## dim14 < -0.2536813 to the left, agree=0.846, adj=0.042, (0 split)  
## dim15 < 0.3051718 to the right, agree=0.843, adj=0.023, (0 split)  
## dim18 < -0.1681713 to the left, agree=0.841, adj=0.009, (0 split)  
## dim20 < -0.2015323 to the left, agree=0.840, adj=0.005, (0 split)  
##   
## Node number 102: 4953 observations, complexity param=0.0128948  
## predicted class=3 expected loss=0.5370483 P(node) =0.1474107  
## class counts: 538 26 446 2293 11 1055 109 43 379 53  
## probabilities: 0.109 0.005 0.090 0.463 0.002 0.213 0.022 0.009 0.077 0.011   
## left son=204 (2225 obs) right son=205 (2728 obs)  
## Primary splits:  
## dim4 < 0.002431577 to the right, improve=535.7526, (0 missing)  
## dim5 < -0.235915 to the left, improve=272.0973, (0 missing)  
## dim2 < 0.08161099 to the right, improve=271.7227, (0 missing)  
## dim8 < 0.08445033 to the left, improve=217.4226, (0 missing)  
## dim3 < 0.08833965 to the right, improve=202.9504, (0 missing)  
## Surrogate splits:  
## dim3 < 0.1324993 to the left, agree=0.678, adj=0.284, (0 split)  
## dim15 < 0.1180449 to the right, agree=0.676, adj=0.278, (0 split)  
## dim10 < -0.01304555 to the right, agree=0.674, adj=0.275, (0 split)  
## dim23 < 0.03508807 to the right, agree=0.665, adj=0.254, (0 split)  
## dim8 < 0.08674688 to the right, agree=0.662, adj=0.249, (0 split)  
##   
## Node number 103: 3198 observations, complexity param=0.01396657  
## predicted class=8 expected loss=0.5118824 P(node) =0.09517857  
## class counts: 102 7 177 309 15 934 31 30 1561 32  
## probabilities: 0.032 0.002 0.055 0.097 0.005 0.292 0.010 0.009 0.488 0.010   
## left son=206 (1221 obs) right son=207 (1977 obs)  
## Primary splits:  
## dim2 < 0.05581277 to the right, improve=292.3431, (0 missing)  
## dim13 < 0.01706584 to the left, improve=261.5157, (0 missing)  
## dim15 < 0.01874409 to the right, improve=253.7246, (0 missing)  
## dim1 < 0.581575 to the left, improve=246.7098, (0 missing)  
## dim4 < -0.2072669 to the left, improve=222.8318, (0 missing)  
## Surrogate splits:  
## dim3 < 0.1766326 to the right, agree=0.741, adj=0.323, (0 split)  
## dim4 < -0.1828867 to the left, agree=0.705, adj=0.228, (0 split)  
## dim1 < 0.4794753 to the left, agree=0.694, adj=0.198, (0 split)  
## dim10 < -0.06648021 to the left, agree=0.684, adj=0.172, (0 split)  
## dim8 < -0.01310657 to the right, agree=0.676, adj=0.152, (0 split)  
##   
## Node number 104: 226 observations, complexity param=0.0001674649  
## predicted class=1 expected loss=0.07522124 P(node) =0.00672619  
## class counts: 0 209 2 2 6 1 0 1 4 1  
## probabilities: 0.000 0.925 0.009 0.009 0.027 0.004 0.000 0.004 0.018 0.004   
## left son=208 (214 obs) right son=209 (12 obs)  
## Primary splits:  
## dim2 < -0.002704785 to the left, improve=13.601360, (0 missing)  
## dim5 < 0.08527418 to the left, improve=11.075880, (0 missing)  
## dim6 < -0.2341864 to the left, improve=10.755150, (0 missing)  
## dim7 < -0.07566937 to the right, improve= 9.694193, (0 missing)  
## dim22 < -0.009306837 to the right, improve= 9.120139, (0 missing)  
## Surrogate splits:  
## dim10 < -0.01540107 to the right, agree=0.978, adj=0.583, (0 split)  
## dim5 < 0.09117465 to the left, agree=0.973, adj=0.500, (0 split)  
## dim7 < -0.1163715 to the right, agree=0.969, adj=0.417, (0 split)  
## dim12 < -0.1579879 to the right, agree=0.969, adj=0.417, (0 split)  
## dim6 < -0.2341864 to the left, agree=0.965, adj=0.333, (0 split)  
##   
## Node number 105: 50 observations, complexity param=0.0002009579  
## predicted class=3 expected loss=0.44 P(node) =0.001488095  
## class counts: 0 4 4 28 1 8 0 2 3 0  
## probabilities: 0.000 0.080 0.080 0.560 0.020 0.160 0.000 0.040 0.060 0.000   
## left son=210 (44 obs) right son=211 (6 obs)  
## Primary splits:  
## dim9 < -0.1180719 to the right, improve=7.074545, (0 missing)  
## dim11 < 0.09681752 to the right, improve=4.805897, (0 missing)  
## dim4 < -0.2559325 to the left, improve=4.632077, (0 missing)  
## dim27 < -0.04617976 to the left, improve=4.500306, (0 missing)  
## dim21 < -0.1164965 to the right, improve=4.074545, (0 missing)  
## Surrogate splits:  
## dim8 < -0.1603639 to the right, agree=0.92, adj=0.333, (0 split)  
## dim11 < -0.09612069 to the right, agree=0.92, adj=0.333, (0 split)  
## dim3 < -0.003927897 to the left, agree=0.90, adj=0.167, (0 split)  
## dim6 < -0.1935253 to the left, agree=0.90, adj=0.167, (0 split)  
## dim19 < -0.1194762 to the right, agree=0.90, adj=0.167, (0 split)  
##   
## Node number 106: 292 observations, complexity param=0.0004019158  
## predicted class=3 expected loss=0.3047945 P(node) =0.008690476  
## class counts: 6 10 31 203 0 15 18 0 9 0  
## probabilities: 0.021 0.034 0.106 0.695 0.000 0.051 0.062 0.000 0.031 0.000   
## left son=212 (225 obs) right son=213 (67 obs)  
## Primary splits:  
## dim5 < 0.09897705 to the left, improve=27.46531, (0 missing)  
## dim2 < -0.1828977 to the left, improve=23.47676, (0 missing)  
## dim27 < 0.1088202 to the left, improve=22.97301, (0 missing)  
## dim17 < -0.1775395 to the left, improve=21.20143, (0 missing)  
## dim4 < -0.2360227 to the left, improve=20.36539, (0 missing)  
## Surrogate splits:  
## dim27 < 0.1015671 to the left, agree=0.836, adj=0.284, (0 split)  
## dim17 < -0.1717672 to the right, agree=0.815, adj=0.194, (0 split)  
## dim24 < -0.150476 to the right, agree=0.808, adj=0.164, (0 split)  
## dim9 < -0.03091742 to the right, agree=0.805, adj=0.149, (0 split)  
## dim22 < -0.09395498 to the right, agree=0.795, adj=0.104, (0 split)  
##   
## Node number 107: 154 observations, complexity param=0.0007368456  
## predicted class=5 expected loss=0.5974026 P(node) =0.004583333  
## class counts: 4 9 5 27 0 62 28 0 18 1  
## probabilities: 0.026 0.058 0.032 0.175 0.000 0.403 0.182 0.000 0.117 0.006   
## left son=214 (38 obs) right son=215 (116 obs)  
## Primary splits:  
## dim11 < 0.02997717 to the right, improve=17.89245, (0 missing)  
## dim4 < -0.3417248 to the left, improve=16.43781, (0 missing)  
## dim27 < 0.02660353 to the left, improve=13.64502, (0 missing)  
## dim24 < 0.04417433 to the left, improve=13.04502, (0 missing)  
## dim8 < 0.01842387 to the right, improve=12.21709, (0 missing)  
## Surrogate splits:  
## dim4 < -0.3417248 to the left, agree=0.864, adj=0.447, (0 split)  
## dim1 < 0.4556962 to the left, agree=0.786, adj=0.132, (0 split)  
## dim14 < -0.06365122 to the left, agree=0.786, adj=0.132, (0 split)  
## dim2 < -0.1517677 to the left, agree=0.779, adj=0.105, (0 split)  
## dim8 < 0.08733301 to the right, agree=0.779, adj=0.105, (0 split)  
##   
## Node number 108: 48 observations, complexity param=0.0005693807  
## predicted class=0 expected loss=0.5 P(node) =0.001428571  
## class counts: 24 0 0 0 0 2 22 0 0 0  
## probabilities: 0.500 0.000 0.000 0.000 0.000 0.042 0.458 0.000 0.000 0.000   
## left son=216 (29 obs) right son=217 (19 obs)  
## Primary splits:  
## dim20 < 0.0794019 to the left, improve=13.869630, (0 missing)  
## dim18 < -0.05635652 to the left, improve=11.744440, (0 missing)  
## dim28 < 0.01860037 to the right, improve= 9.744444, (0 missing)  
## dim14 < -0.06204877 to the right, improve= 9.033333, (0 missing)  
## dim5 < -0.2022894 to the left, improve= 8.395833, (0 missing)  
## Surrogate splits:  
## dim13 < -0.08182453 to the right, agree=0.812, adj=0.526, (0 split)  
## dim14 < -0.08834312 to the right, agree=0.812, adj=0.526, (0 split)  
## dim2 < 0.1171938 to the right, agree=0.792, adj=0.474, (0 split)  
## dim16 < 0.0304761 to the left, agree=0.792, adj=0.474, (0 split)  
## dim28 < -0.0379008 to the right, agree=0.792, adj=0.474, (0 split)  
##   
## Node number 109: 76 observations, complexity param=0.0004019158  
## predicted class=5 expected loss=0.4342105 P(node) =0.002261905  
## class counts: 6 1 0 17 0 43 9 0 0 0  
## probabilities: 0.079 0.013 0.000 0.224 0.000 0.566 0.118 0.000 0.000 0.000   
## left son=218 (19 obs) right son=219 (57 obs)  
## Primary splits:  
## dim21 < 0.05817757 to the right, improve=12.596490, (0 missing)  
## dim7 < 0.04767935 to the right, improve= 8.922782, (0 missing)  
## dim10 < -0.05810376 to the left, improve= 7.865298, (0 missing)  
## dim6 < -0.2658937 to the left, improve= 7.051504, (0 missing)  
## dim12 < 0.110361 to the right, improve= 6.801084, (0 missing)  
## Surrogate splits:  
## dim7 < 0.04767935 to the right, agree=0.816, adj=0.263, (0 split)  
## dim10 < -0.1507939 to the left, agree=0.816, adj=0.263, (0 split)  
## dim9 < 0.2587329 to the right, agree=0.789, adj=0.158, (0 split)  
## dim26 < -0.1191868 to the left, agree=0.789, adj=0.158, (0 split)  
## dim12 < 0.110361 to the right, agree=0.776, adj=0.105, (0 split)  
##   
## Node number 110: 74 observations, complexity param=0.0005191412  
## predicted class=2 expected loss=0.5135135 P(node) =0.002202381  
## class counts: 0 5 36 7 3 1 21 1 0 0  
## probabilities: 0.000 0.068 0.486 0.095 0.041 0.014 0.284 0.014 0.000 0.000   
## left son=220 (53 obs) right son=221 (21 obs)  
## Primary splits:  
## dim26 < 0.0207543 to the left, improve=13.97317, (0 missing)  
## dim10 < -0.0528934 to the right, improve=11.71367, (0 missing)  
## dim1 < 0.4591769 to the left, improve=11.58351, (0 missing)  
## dim16 < -0.1101184 to the right, improve=10.84821, (0 missing)  
## dim12 < 0.005060991 to the left, improve=10.42330, (0 missing)  
## Surrogate splits:  
## dim16 < -0.1287905 to the right, agree=0.878, adj=0.571, (0 split)  
## dim9 < -0.07883233 to the right, agree=0.811, adj=0.333, (0 split)  
## dim10 < -0.1457641 to the right, agree=0.811, adj=0.333, (0 split)  
## dim22 < 0.05023645 to the left, agree=0.811, adj=0.333, (0 split)  
## dim12 < 0.008369162 to the left, agree=0.797, adj=0.286, (0 split)  
##   
## Node number 111: 2580 observations, complexity param=0.0003349298  
## predicted class=6 expected loss=0.09806202 P(node) =0.07678571  
## class counts: 31 14 104 16 42 31 2327 1 10 4  
## probabilities: 0.012 0.005 0.040 0.006 0.016 0.012 0.902 0.000 0.004 0.002   
## left son=222 (72 obs) right son=223 (2508 obs)  
## Primary splits:  
## dim3 < 0.2961365 to the right, improve=31.17406, (0 missing)  
## dim6 < -0.2430339 to the right, improve=28.87800, (0 missing)  
## dim10 < 0.05888387 to the right, improve=27.62863, (0 missing)  
## dim20 < -0.1210163 to the left, improve=26.26522, (0 missing)  
## dim22 < -0.07128013 to the left, improve=25.59805, (0 missing)  
## Surrogate splits:  
## dim25 < -0.1871266 to the left, agree=0.972, adj=0.014, (0 split)  
## dim30 < 0.1750086 to the right, agree=0.972, adj=0.014, (0 split)  
##   
## Node number 112: 1918 observations, complexity param=0.0005247234  
## predicted class=4 expected loss=0.2116788 P(node) =0.05708333  
## class counts: 1 8 14 12 1512 26 45 42 62 196  
## probabilities: 0.001 0.004 0.007 0.006 0.788 0.014 0.023 0.022 0.032 0.102   
## left son=224 (1260 obs) right son=225 (658 obs)  
## Primary splits:  
## dim11 < 0.004291815 to the right, improve=45.76080, (0 missing)  
## dim19 < -0.0365312 to the right, improve=36.97981, (0 missing)  
## dim20 < -0.08512317 to the right, improve=36.94831, (0 missing)  
## dim7 < -0.1244146 to the left, improve=32.52577, (0 missing)  
## dim12 < -0.05910052 to the right, improve=30.29407, (0 missing)  
## Surrogate splits:  
## dim1 < 0.6745682 to the left, agree=0.674, adj=0.049, (0 split)  
## dim26 < 0.115314 to the left, agree=0.670, adj=0.038, (0 split)  
## dim27 < 0.08646313 to the left, agree=0.666, adj=0.026, (0 split)  
## dim8 < -0.1858584 to the right, agree=0.664, adj=0.020, (0 split)  
## dim9 < 0.2913668 to the left, agree=0.663, adj=0.018, (0 split)  
##   
## Node number 113: 458 observations, complexity param=0.001038282  
## predicted class=9 expected loss=0.4213974 P(node) =0.01363095  
## class counts: 0 0 1 2 121 4 1 39 25 265  
## probabilities: 0.000 0.000 0.002 0.004 0.264 0.009 0.002 0.085 0.055 0.579   
## left son=226 (190 obs) right son=227 (268 obs)  
## Primary splits:  
## dim19 < -0.03076794 to the right, improve=38.52356, (0 missing)  
## dim16 < 0.1326808 to the right, improve=33.61109, (0 missing)  
## dim9 < 0.1737565 to the right, improve=28.13228, (0 missing)  
## dim21 < 0.04718272 to the left, improve=24.66126, (0 missing)  
## dim3 < -0.2728534 to the right, improve=23.65869, (0 missing)  
## Surrogate splits:  
## dim24 < 0.008179063 to the right, agree=0.655, adj=0.168, (0 split)  
## dim14 < -0.1039941 to the left, agree=0.642, adj=0.137, (0 split)  
## dim20 < 0.02792478 to the right, agree=0.642, adj=0.137, (0 split)  
## dim28 < -0.0797809 to the left, agree=0.638, adj=0.126, (0 split)  
## dim1 < 0.5309745 to the left, agree=0.633, adj=0.116, (0 split)  
##   
## Node number 114: 469 observations, complexity param=0.001038282  
## predicted class=5 expected loss=0.554371 P(node) =0.01395833  
## class counts: 4 36 0 8 44 209 0 33 87 48  
## probabilities: 0.009 0.077 0.000 0.017 0.094 0.446 0.000 0.070 0.186 0.102   
## left son=228 (173 obs) right son=229 (296 obs)  
## Primary splits:  
## dim5 < -0.1856006 to the left, improve=49.20993, (0 missing)  
## dim19 < 0.04994015 to the right, improve=43.74741, (0 missing)  
## dim1 < 0.6622283 to the left, improve=39.67259, (0 missing)  
## dim16 < 0.1328328 to the right, improve=39.20600, (0 missing)  
## dim22 < 0.04063569 to the left, improve=38.05736, (0 missing)  
## Surrogate splits:  
## dim19 < 0.05588681 to the right, agree=0.791, adj=0.434, (0 split)  
## dim16 < 0.1588427 to the right, agree=0.693, adj=0.168, (0 split)  
## dim14 < -0.068085 to the left, agree=0.678, adj=0.127, (0 split)  
## dim27 < 0.07136966 to the right, agree=0.676, adj=0.121, (0 split)  
## dim18 < -0.08274133 to the left, agree=0.672, adj=0.110, (0 split)  
##   
## Node number 115: 948 observations, complexity param=0.003315805  
## predicted class=9 expected loss=0.5833333 P(node) =0.02821429  
## class counts: 0 3 0 3 253 67 0 200 27 395  
## probabilities: 0.000 0.003 0.000 0.003 0.267 0.071 0.000 0.211 0.028 0.417   
## left son=230 (119 obs) right son=231 (829 obs)  
## Primary splits:  
## dim11 < 0.2094413 to the right, improve=77.60885, (0 missing)  
## dim9 < 0.0814665 to the left, improve=72.92718, (0 missing)  
## dim1 < 0.6407457 to the left, improve=63.43874, (0 missing)  
## dim28 < 0.02149426 to the right, improve=46.87202, (0 missing)  
## dim17 < 0.0740579 to the right, improve=46.04614, (0 missing)  
## Surrogate splits:  
## dim24 < 0.1429681 to the right, agree=0.877, adj=0.017, (0 split)  
## dim27 < -0.1149619 to the left, agree=0.877, adj=0.017, (0 split)  
## dim30 < 0.1833034 to the right, agree=0.876, adj=0.008, (0 split)  
##   
## Node number 116: 281 observations, complexity param=0.0001674649  
## predicted class=4 expected loss=0.1601423 P(node) =0.008363095  
## class counts: 0 0 5 5 236 1 2 9 0 23  
## probabilities: 0.000 0.000 0.018 0.018 0.840 0.004 0.007 0.032 0.000 0.082   
## left son=232 (228 obs) right son=233 (53 obs)  
## Primary splits:  
## dim8 < -0.01700356 to the right, improve=6.528337, (0 missing)  
## dim19 < -0.09592203 to the right, improve=6.439997, (0 missing)  
## dim4 < -0.2581208 to the right, improve=6.166057, (0 missing)  
## dim20 < -0.1431142 to the left, improve=5.834763, (0 missing)  
## dim11 < 0.1969954 to the right, improve=5.701141, (0 missing)  
## Surrogate splits:  
## dim3 < -0.3651245 to the right, agree=0.829, adj=0.094, (0 split)  
## dim14 < -0.2345297 to the right, agree=0.829, adj=0.094, (0 split)  
## dim1 < 0.7055364 to the left, agree=0.822, adj=0.057, (0 split)  
## dim4 < -0.293138 to the right, agree=0.822, adj=0.057, (0 split)  
## dim7 < -0.3053727 to the right, agree=0.819, adj=0.038, (0 split)  
##   
## Node number 117: 93 observations, complexity param=0.0006028737  
## predicted class=9 expected loss=0.4623656 P(node) =0.002767857  
## class counts: 0 1 0 4 36 0 0 1 1 50  
## probabilities: 0.000 0.011 0.000 0.043 0.387 0.000 0.000 0.011 0.011 0.538   
## left son=234 (49 obs) right son=235 (44 obs)  
## Primary splits:  
## dim26 < -0.05145365 to the right, improve=19.03230, (0 missing)  
## dim13 < -0.03176346 to the right, improve=18.63992, (0 missing)  
## dim6 < -0.04147771 to the left, improve=16.94555, (0 missing)  
## dim28 < 0.05587818 to the right, improve=15.56791, (0 missing)  
## dim17 < -0.05524754 to the right, improve=12.58961, (0 missing)  
## Surrogate splits:  
## dim13 < -0.03373711 to the right, agree=0.796, adj=0.568, (0 split)  
## dim6 < 0.01621751 to the left, agree=0.742, adj=0.455, (0 split)  
## dim7 < -0.08585601 to the left, agree=0.731, adj=0.432, (0 split)  
## dim27 < 0.02604585 to the left, agree=0.731, adj=0.432, (0 split)  
## dim29 < 0.07937698 to the left, agree=0.720, adj=0.409, (0 split)  
##   
## Node number 118: 488 observations, complexity param=0.0004019158  
## predicted class=9 expected loss=0.579918 P(node) =0.01452381  
## class counts: 0 0 28 39 127 4 10 60 15 205  
## probabilities: 0.000 0.000 0.057 0.080 0.260 0.008 0.020 0.123 0.031 0.420   
## left son=236 (285 obs) right son=237 (203 obs)  
## Primary splits:  
## dim18 < 0.02808376 to the left, improve=28.72026, (0 missing)  
## dim29 < 0.006513581 to the left, improve=26.98688, (0 missing)  
## dim12 < 0.2371191 to the right, improve=24.17900, (0 missing)  
## dim30 < 0.01326001 to the right, improve=22.21699, (0 missing)  
## dim3 < -0.2393738 to the right, improve=20.35246, (0 missing)  
## Surrogate splits:  
## dim8 < 0.1857959 to the left, agree=0.670, adj=0.207, (0 split)  
## dim2 < 0.109437 to the left, agree=0.658, adj=0.177, (0 split)  
## dim24 < -0.002733715 to the right, agree=0.658, adj=0.177, (0 split)  
## dim20 < -0.08493504 to the right, agree=0.656, adj=0.172, (0 split)  
## dim29 < 0.06649537 to the left, agree=0.656, adj=0.172, (0 split)  
##   
## Node number 119: 1482 observations, complexity param=0.0003014368  
## predicted class=9 expected loss=0.1592443 P(node) =0.04410714  
## class counts: 0 0 6 26 97 1 14 59 33 1246  
## probabilities: 0.000 0.000 0.004 0.018 0.065 0.001 0.009 0.040 0.022 0.841   
## left son=238 (255 obs) right son=239 (1227 obs)  
## Primary splits:  
## dim3 < -0.1867364 to the right, improve=40.12314, (0 missing)  
## dim9 < 0.2301699 to the right, improve=34.70848, (0 missing)  
## dim13 < 0.1253888 to the right, improve=33.00500, (0 missing)  
## dim1 < 0.4851322 to the left, improve=22.60736, (0 missing)  
## dim4 < 0.2197465 to the right, improve=17.61033, (0 missing)  
## Surrogate splits:  
## dim4 < 0.1806878 to the right, agree=0.847, adj=0.110, (0 split)  
## dim13 < 0.1566025 to the right, agree=0.839, adj=0.067, (0 split)  
## dim1 < 0.4394663 to the left, agree=0.839, adj=0.063, (0 split)  
## dim5 < 0.3151933 to the right, agree=0.839, adj=0.063, (0 split)  
## dim14 < 0.1578636 to the right, agree=0.838, adj=0.059, (0 split)  
##   
## Node number 120: 89 observations, complexity param=0.0002009579  
## predicted class=2 expected loss=0.4269663 P(node) =0.00264881  
## class counts: 0 0 51 18 0 0 2 8 9 1  
## probabilities: 0.000 0.000 0.573 0.202 0.000 0.000 0.022 0.090 0.101 0.011   
## left son=240 (47 obs) right son=241 (42 obs)  
## Primary splits:  
## dim4 < -0.07550123 to the right, improve=11.377500, (0 missing)  
## dim26 < 0.02594749 to the left, improve= 8.363056, (0 missing)  
## dim3 < -0.1964049 to the right, improve= 5.813541, (0 missing)  
## dim16 < 0.0898378 to the left, improve= 5.626145, (0 missing)  
## dim29 < 0.2089819 to the left, improve= 4.758675, (0 missing)  
## Surrogate splits:  
## dim26 < 0.08150446 to the left, agree=0.831, adj=0.643, (0 split)  
## dim18 < -0.03568103 to the left, agree=0.719, adj=0.405, (0 split)  
## dim21 < 0.02845672 to the left, agree=0.697, adj=0.357, (0 split)  
## dim25 < -0.03128715 to the left, agree=0.685, adj=0.333, (0 split)  
## dim24 < -0.02640516 to the right, agree=0.674, adj=0.310, (0 split)  
##   
## Node number 121: 101 observations, complexity param=0.0007368456  
## predicted class=7 expected loss=0.5148515 P(node) =0.003005952  
## class counts: 0 0 9 1 26 0 3 49 5 8  
## probabilities: 0.000 0.000 0.089 0.010 0.257 0.000 0.030 0.485 0.050 0.079   
## left son=242 (33 obs) right son=243 (68 obs)  
## Primary splits:  
## dim12 < 0.04168957 to the right, improve=19.80595, (0 missing)  
## dim8 < 0.01463019 to the right, improve=13.66816, (0 missing)  
## dim14 < -0.07273107 to the right, improve=13.02620, (0 missing)  
## dim16 < -0.01908565 to the right, improve=11.51279, (0 missing)  
## dim2 < -0.06855406 to the right, improve=10.06123, (0 missing)  
## Surrogate splits:  
## dim16 < 0.00893736 to the right, agree=0.772, adj=0.303, (0 split)  
## dim6 < 0.0839556 to the right, agree=0.762, adj=0.273, (0 split)  
## dim13 < -0.2068257 to the left, agree=0.762, adj=0.273, (0 split)  
## dim15 < -0.06872573 to the left, agree=0.752, adj=0.242, (0 split)  
## dim4 < -0.001015793 to the right, agree=0.743, adj=0.212, (0 split)  
##   
## Node number 122: 121 observations, complexity param=0.0002344509  
## predicted class=4 expected loss=0.3801653 P(node) =0.00360119  
## class counts: 1 0 1 0 75 1 18 5 3 17  
## probabilities: 0.008 0.000 0.008 0.000 0.620 0.008 0.149 0.041 0.025 0.140   
## left son=244 (99 obs) right son=245 (22 obs)  
## Primary splits:  
## dim11 < -0.02568143 to the right, improve=9.312213, (0 missing)  
## dim29 < 0.02546032 to the left, improve=9.141172, (0 missing)  
## dim15 < -0.02284298 to the left, improve=7.940496, (0 missing)  
## dim30 < -0.1075102 to the right, improve=7.596153, (0 missing)  
## dim6 < -0.07026432 to the right, improve=7.578591, (0 missing)  
## Surrogate splits:  
## dim19 < -0.1496477 to the right, agree=0.860, adj=0.227, (0 split)  
## dim3 < -0.3283531 to the right, agree=0.851, adj=0.182, (0 split)  
## dim25 < 0.1422429 to the left, agree=0.843, adj=0.136, (0 split)  
## dim2 < 0.1185412 to the right, agree=0.835, adj=0.091, (0 split)  
## dim9 < 0.1058713 to the left, agree=0.835, adj=0.091, (0 split)  
##   
## Node number 123: 220 observations, complexity param=0.0004354088  
## predicted class=9 expected loss=0.1681818 P(node) =0.006547619  
## class counts: 0 0 4 0 22 0 0 8 3 183  
## probabilities: 0.000 0.000 0.018 0.000 0.100 0.000 0.000 0.036 0.014 0.832   
## left son=246 (19 obs) right son=247 (201 obs)  
## Primary splits:  
## dim11 < 0.1687231 to the right, improve=20.93602, (0 missing)  
## dim16 < 0.08500496 to the right, improve=16.48186, (0 missing)  
## dim14 < 0.1049737 to the right, improve=15.14279, (0 missing)  
## dim4 < 0.0862469 to the right, improve=13.36543, (0 missing)  
## dim20 < 0.01253702 to the right, improve= 7.57758, (0 missing)  
## Surrogate splits:  
## dim16 < 0.08500496 to the right, agree=0.941, adj=0.316, (0 split)  
## dim14 < 0.1408789 to the right, agree=0.932, adj=0.211, (0 split)  
## dim4 < 0.2696845 to the right, agree=0.927, adj=0.158, (0 split)  
## dim17 < -0.1140582 to the left, agree=0.923, adj=0.105, (0 split)  
## dim22 < 0.118617 to the right, agree=0.918, adj=0.053, (0 split)  
##   
## Node number 124: 115 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.0173913 P(node) =0.003422619  
## class counts: 0 113 0 0 1 0 0 0 0 1  
## probabilities: 0.000 0.983 0.000 0.000 0.009 0.000 0.000 0.000 0.000 0.009   
## left son=248 (113 obs) right son=249 (2 obs)  
## Primary splits:  
## dim2 < -0.1469184 to the left, improve=2.947826, (0 missing)  
## dim9 < -0.2472766 to the right, improve=1.965370, (0 missing)  
## dim11 < -0.0439649 to the right, improve=1.965370, (0 missing)  
## dim13 < 0.04438103 to the right, improve=1.965370, (0 missing)  
## dim22 < -0.05523448 to the right, improve=1.965370, (0 missing)  
##   
## Node number 125: 696 observations, complexity param=0.001892354  
## predicted class=7 expected loss=0.6034483 P(node) =0.02071429  
## class counts: 0 6 11 12 102 21 0 276 70 198  
## probabilities: 0.000 0.009 0.016 0.017 0.147 0.030 0.000 0.397 0.101 0.284   
## left son=250 (270 obs) right son=251 (426 obs)  
## Primary splits:  
## dim11 < 0.0340934 to the right, improve=74.26511, (0 missing)  
## dim27 < -0.03064562 to the left, improve=65.62843, (0 missing)  
## dim2 < 0.08001863 to the left, improve=65.24366, (0 missing)  
## dim7 < 0.1535535 to the right, improve=49.92212, (0 missing)  
## dim6 < 0.1929655 to the right, improve=49.57301, (0 missing)  
## Surrogate splits:  
## dim2 < 0.1142299 to the right, agree=0.795, adj=0.470, (0 split)  
## dim17 < -0.05366546 to the left, agree=0.734, adj=0.315, (0 split)  
## dim4 < 0.1299959 to the right, agree=0.713, adj=0.259, (0 split)  
## dim24 < 0.05327535 to the right, agree=0.710, adj=0.252, (0 split)  
## dim14 < 0.0756563 to the right, agree=0.708, adj=0.248, (0 split)  
##   
## Node number 126: 20 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.2 P(node) =0.0005952381  
## class counts: 0 16 1 1 0 0 0 1 0 1  
## probabilities: 0.000 0.800 0.050 0.050 0.000 0.000 0.000 0.050 0.000 0.050   
## left son=252 (16 obs) right son=253 (4 obs)  
## Primary splits:  
## dim10 < 0.08728799 to the right, improve=4.000000, (0 missing)  
## dim20 < 0.05643956 to the left, improve=4.000000, (0 missing)  
## dim5 < -0.2401029 to the right, improve=3.117647, (0 missing)  
## dim11 < 0.04299565 to the right, improve=3.117647, (0 missing)  
## dim14 < -0.07755379 to the right, improve=3.117647, (0 missing)  
## Surrogate splits:  
## dim20 < 0.05643956 to the left, agree=1.00, adj=1.00, (0 split)  
## dim5 < -0.2401029 to the right, agree=0.95, adj=0.75, (0 split)  
## dim6 < -0.3159852 to the left, agree=0.95, adj=0.75, (0 split)  
## dim9 < 0.07611861 to the left, agree=0.95, adj=0.75, (0 split)  
## dim11 < 0.04299565 to the right, agree=0.95, adj=0.75, (0 split)  
##   
## Node number 127: 2536 observations, complexity param=0.0001786292  
## predicted class=7 expected loss=0.06979495 P(node) =0.07547619  
## class counts: 2 1 25 17 19 7 1 2359 14 91  
## probabilities: 0.001 0.000 0.010 0.007 0.007 0.003 0.000 0.930 0.006 0.036   
## left son=254 (2475 obs) right son=255 (61 obs)  
## Primary splits:  
## dim19 < -0.1225348 to the right, improve=20.94711, (0 missing)  
## dim5 < 0.02084559 to the right, improve=14.50404, (0 missing)  
## dim4 < -0.408076 to the left, improve=14.39121, (0 missing)  
## dim3 < -0.1669371 to the right, improve=14.02823, (0 missing)  
## dim11 < 0.2577565 to the right, improve=11.86675, (0 missing)  
## Surrogate splits:  
## dim26 < -0.204797 to the right, agree=0.976, adj=0.016, (0 split)  
##   
## Node number 128: 2798 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.01608292 P(node) =0.08327381  
## class counts: 0 2753 3 0 1 0 2 12 20 7  
## probabilities: 0.000 0.984 0.001 0.000 0.000 0.000 0.001 0.004 0.007 0.003   
## left son=256 (2795 obs) right son=257 (3 obs)  
## Primary splits:  
## dim3 < -0.216625 to the right, improve=4.553902, (0 missing)  
## dim13 < 0.247675 to the left, improve=4.551755, (0 missing)  
## dim22 < 0.2134169 to the left, improve=4.538875, (0 missing)  
## dim18 < -0.1670775 to the right, improve=4.474650, (0 missing)  
## dim14 < -0.1650431 to the right, improve=3.929142, (0 missing)  
##   
## Node number 129: 25 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.44 P(node) =0.0007440476  
## class counts: 0 14 1 2 0 1 0 0 7 0  
## probabilities: 0.000 0.560 0.040 0.080 0.000 0.040 0.000 0.000 0.280 0.000   
## left son=258 (20 obs) right son=259 (5 obs)  
## Primary splits:  
## dim24 < -0.03945033 to the right, improve=3.760000, (0 missing)  
## dim2 < -0.4662057 to the left, improve=3.713247, (0 missing)  
## dim10 < -0.009863815 to the left, improve=3.284675, (0 missing)  
## dim16 < -0.08325567 to the right, improve=2.793333, (0 missing)  
## dim18 < -0.07245882 to the left, improve=2.699130, (0 missing)  
## Surrogate splits:  
## dim16 < -0.04593309 to the right, agree=0.92, adj=0.6, (0 split)  
## dim4 < 0.1690643 to the left, agree=0.88, adj=0.4, (0 split)  
## dim14 < -0.02309189 to the right, agree=0.88, adj=0.4, (0 split)  
## dim22 < -0.09885285 to the right, agree=0.88, adj=0.4, (0 split)  
## dim25 < 0.1587192 to the left, agree=0.88, adj=0.4, (0 split)  
##   
## Node number 130: 3 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.6666667 P(node) =8.928571e-05  
## class counts: 0 1 0 0 1 0 0 0 0 1  
## probabilities: 0.000 0.333 0.000 0.000 0.333 0.000 0.000 0.000 0.000 0.333   
## left son=260 (1 obs) right son=261 (2 obs)  
## Primary splits:  
## dim1 < 0.5226416 to the right, improve=1, (0 missing)  
## dim2 < -0.4201466 to the right, improve=1, (0 missing)  
## dim3 < -0.06325429 to the right, improve=1, (0 missing)  
## dim4 < -0.04287858 to the right, improve=1, (0 missing)  
## dim5 < -0.02921236 to the right, improve=1, (0 missing)  
##   
## Node number 131: 5 observations  
## predicted class=8 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 5 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 136: 26 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.03846154 P(node) =0.0007738095  
## class counts: 0 25 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.962 0.000 0.000 0.038 0.000 0.000 0.000 0.000 0.000   
## left son=272 (25 obs) right son=273 (1 obs)  
## Primary splits:  
## dim10 < -0.1403595 to the right, improve=1.9230770, (0 missing)  
## dim29 < -0.1171094 to the right, improve=1.9230770, (0 missing)  
## dim7 < -0.07728148 to the right, improve=0.9230769, (0 missing)  
## dim26 < -0.06550184 to the right, improve=0.9230769, (0 missing)  
## dim9 < 0.1104234 to the left, improve=0.9230769, (0 missing)  
##   
## Node number 137: 6 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.1666667 P(node) =0.0001785714  
## class counts: 0 0 0 0 0 1 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.167 0.000 0.000 0.000 0.833   
## left son=274 (1 obs) right son=275 (5 obs)  
## Primary splits:  
## dim1 < 0.520868 to the left, improve=1.666667, (0 missing)  
## dim5 < -0.2153281 to the left, improve=1.666667, (0 missing)  
## dim6 < 0.02147278 to the left, improve=1.666667, (0 missing)  
## dim8 < 0.0235697 to the left, improve=1.666667, (0 missing)  
## dim12 < -0.07322346 to the left, improve=1.666667, (0 missing)  
##   
## Node number 138: 8 observations, complexity param=0.0001004789  
## predicted class=3 expected loss=0.625 P(node) =0.0002380952  
## class counts: 0 1 0 3 0 3 0 1 0 0  
## probabilities: 0.000 0.125 0.000 0.375 0.000 0.375 0.000 0.125 0.000 0.000   
## left son=276 (5 obs) right son=277 (3 obs)  
## Primary splits:  
## dim4 < 0.1662663 to the left, improve=2.7, (0 missing)  
## dim10 < 0.07403385 to the left, improve=2.7, (0 missing)  
## dim13 < -0.04833607 to the left, improve=2.7, (0 missing)  
## dim23 < 0.1023728 to the left, improve=2.7, (0 missing)  
## dim9 < 0.08054425 to the right, improve=2.7, (0 missing)  
## Surrogate splits:  
## dim10 < 0.07403385 to the left, agree=1, adj=1, (0 split)  
## dim13 < -0.04833607 to the left, agree=1, adj=1, (0 split)  
## dim22 < -0.06086561 to the right, agree=1, adj=1, (0 split)  
## dim23 < 0.1023728 to the left, agree=1, adj=1, (0 split)  
## dim24 < 0.03476148 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 139: 6 observations  
## predicted class=6 expected loss=0 P(node) =0.0001785714  
## class counts: 0 0 0 0 0 0 6 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 140: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 141: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 152: 10 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.1 P(node) =0.000297619  
## class counts: 0 9 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.900 0.000 0.000 0.100 0.000 0.000 0.000 0.000 0.000   
## left son=304 (9 obs) right son=305 (1 obs)  
## Primary splits:  
## dim16 < 0.1505482 to the left, improve=1.8, (0 missing)  
## dim26 < 0.09499963 to the left, improve=1.8, (0 missing)  
## dim27 < 0.09818126 to the left, improve=1.8, (0 missing)  
## dim29 < 0.0393075 to the left, improve=1.8, (0 missing)  
## dim7 < -0.06035168 to the right, improve=1.8, (0 missing)  
##   
## Node number 153: 2 observations  
## predicted class=5 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 2 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 154: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.500 0.000 0.000 0.000 0.000 0.000   
## left son=308 (1 obs) right son=309 (1 obs)  
## Primary splits:  
## dim1 < 0.6379229 to the right, improve=1, (0 missing)  
## dim2 < -0.4827863 to the right, improve=1, (0 missing)  
## dim3 < -0.01699812 to the right, improve=1, (0 missing)  
## dim4 < 0.009572898 to the left, improve=1, (0 missing)  
## dim5 < -0.01475973 to the left, improve=1, (0 missing)  
##   
## Node number 155: 3 observations  
## predicted class=7 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 156: 2 observations  
## predicted class=1 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 2 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 157: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 160: 289 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.006920415 P(node) =0.00860119  
## class counts: 0 287 0 1 0 0 0 0 1 0  
## probabilities: 0.000 0.993 0.000 0.003 0.000 0.000 0.000 0.000 0.003 0.000   
## left son=320 (288 obs) right son=321 (1 obs)  
## Primary splits:  
## dim19 < -0.1620423 to the right, improve=1.9861830, (0 missing)  
## dim1 < 0.6617399 to the left, improve=1.9861830, (0 missing)  
## dim9 < 0.1587184 to the left, improve=1.9861830, (0 missing)  
## dim24 < 0.1371699 to the left, improve=1.9861830, (0 missing)  
## dim18 < -0.1596526 to the right, improve=0.9862074, (0 missing)  
##   
## Node number 161: 2 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 1 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.500 0.000 0.000 0.000 0.000   
## left son=322 (1 obs) right son=323 (1 obs)  
## Primary splits:  
## dim1 < 0.4697394 to the left, improve=1, (0 missing)  
## dim2 < -0.3454229 to the left, improve=1, (0 missing)  
## dim3 < 0.03175965 to the left, improve=1, (0 missing)  
## dim4 < 0.06600805 to the left, improve=1, (0 missing)  
## dim5 < 0.06143427 to the right, improve=1, (0 missing)  
##   
## Node number 166: 18 observations, complexity param=0.0001004789  
## predicted class=1 expected loss=0.4444444 P(node) =0.0005357143  
## class counts: 0 10 0 4 2 2 0 0 0 0  
## probabilities: 0.000 0.556 0.000 0.222 0.111 0.111 0.000 0.000 0.000 0.000   
## left son=332 (10 obs) right son=333 (8 obs)  
## Primary splits:  
## dim29 < 0.05161303 to the left, improve=4.061111, (0 missing)  
## dim2 < -0.3540216 to the left, improve=3.944444, (0 missing)  
## dim12 < 0.1633197 to the left, improve=3.838384, (0 missing)  
## dim9 < 0.1441261 to the left, improve=3.377778, (0 missing)  
## dim24 < -0.02800877 to the left, improve=3.370851, (0 missing)  
## Surrogate splits:  
## dim4 < 0.1220728 to the left, agree=0.889, adj=0.750, (0 split)  
## dim24 < -0.03110477 to the left, agree=0.889, adj=0.750, (0 split)  
## dim3 < 0.001320716 to the left, agree=0.833, adj=0.625, (0 split)  
## dim15 < -0.001600772 to the left, agree=0.833, adj=0.625, (0 split)  
## dim2 < -0.3601177 to the left, agree=0.778, adj=0.500, (0 split)  
##   
## Node number 167: 5 observations  
## predicted class=7 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 5 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 172: 9 observations, complexity param=5.582164e-05  
## predicted class=3 expected loss=0.6666667 P(node) =0.0002678571  
## class counts: 0 2 1 3 0 2 0 0 1 0  
## probabilities: 0.000 0.222 0.111 0.333 0.000 0.222 0.000 0.000 0.111 0.000   
## left son=344 (3 obs) right son=345 (6 obs)  
## Primary splits:  
## dim24 < 0.000792937 to the right, improve=2.555556, (0 missing)  
## dim30 < -0.0453143 to the left, improve=2.555556, (0 missing)  
## dim9 < 0.04170809 to the right, improve=2.555556, (0 missing)  
## dim11 < 0.096808 to the right, improve=2.188889, (0 missing)  
## dim29 < 0.0150662 to the right, improve=2.188889, (0 missing)  
## Surrogate splits:  
## dim9 < 0.04170809 to the right, agree=1.000, adj=1.000, (0 split)  
## dim30 < -0.0453143 to the left, agree=1.000, adj=1.000, (0 split)  
## dim2 < -0.3562622 to the right, agree=0.889, adj=0.667, (0 split)  
## dim6 < 0.0002899161 to the right, agree=0.889, adj=0.667, (0 split)  
## dim7 < -0.02662298 to the left, agree=0.889, adj=0.667, (0 split)  
##   
## Node number 173: 9 observations  
## predicted class=5 expected loss=0 P(node) =0.0002678571  
## class counts: 0 0 0 0 0 9 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 176: 33 observations  
## predicted class=1 expected loss=0 P(node) =0.0009821429  
## class counts: 0 33 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 177: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 178: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 179: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 186: 35 observations  
## predicted class=2 expected loss=0 P(node) =0.001041667  
## class counts: 0 0 35 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 187: 12 observations, complexity param=7.815029e-05  
## predicted class=8 expected loss=0.6666667 P(node) =0.0003571429  
## class counts: 0 0 3 0 1 0 1 3 4 0  
## probabilities: 0.000 0.000 0.250 0.000 0.083 0.000 0.083 0.250 0.333 0.000   
## left son=374 (9 obs) right son=375 (3 obs)  
## Primary splits:  
## dim6 < 0.1636163 to the left, improve=3.000000, (0 missing)  
## dim29 < 0.008327932 to the right, improve=3.000000, (0 missing)  
## dim5 < 0.2487243 to the right, improve=2.771429, (0 missing)  
## dim15 < 0.04194288 to the right, improve=2.542857, (0 missing)  
## dim13 < 0.00542866 to the left, improve=2.542857, (0 missing)  
## Surrogate splits:  
## dim10 < -0.08330551 to the right, agree=0.917, adj=0.667, (0 split)  
## dim15 < 0.1461622 to the left, agree=0.917, adj=0.667, (0 split)  
## dim22 < 0.06721242 to the left, agree=0.917, adj=0.667, (0 split)  
## dim5 < 0.1228609 to the right, agree=0.833, adj=0.333, (0 split)  
## dim7 < 0.1106134 to the left, agree=0.833, adj=0.333, (0 split)  
##   
## Node number 188: 29 observations, complexity param=0.0001339719  
## predicted class=7 expected loss=0.3448276 P(node) =0.0008630952  
## class counts: 0 2 2 5 0 0 0 19 0 1  
## probabilities: 0.000 0.069 0.069 0.172 0.000 0.000 0.000 0.655 0.000 0.034   
## left son=376 (9 obs) right son=377 (20 obs)  
## Primary splits:  
## dim11 < -0.06799623 to the right, improve=6.123755, (0 missing)  
## dim6 < 0.07178953 to the left, improve=5.854058, (0 missing)  
## dim10 < -0.06930451 to the right, improve=4.423755, (0 missing)  
## dim8 < -0.1086831 to the left, improve=4.295977, (0 missing)  
## dim29 < 0.06065027 to the right, improve=4.002687, (0 missing)  
## Surrogate splits:  
## dim6 < 0.01392998 to the left, agree=0.931, adj=0.778, (0 split)  
## dim10 < -0.06930451 to the right, agree=0.931, adj=0.778, (0 split)  
## dim27 < -0.03765413 to the right, agree=0.897, adj=0.667, (0 split)  
## dim4 < -0.1543657 to the left, agree=0.862, adj=0.556, (0 split)  
## dim22 < -0.0258865 to the left, agree=0.862, adj=0.556, (0 split)  
##   
## Node number 189: 62 observations, complexity param=0.0002679439  
## predicted class=9 expected loss=0.5806452 P(node) =0.001845238  
## class counts: 0 2 0 7 6 4 2 4 11 26  
## probabilities: 0.000 0.032 0.000 0.113 0.097 0.065 0.032 0.065 0.177 0.419   
## left son=378 (34 obs) right son=379 (28 obs)  
## Primary splits:  
## dim3 < -0.1071739 to the right, improve=11.061810, (0 missing)  
## dim10 < -0.113395 to the right, improve= 9.662646, (0 missing)  
## dim4 < 0.1998978 to the left, improve= 8.262722, (0 missing)  
## dim14 < -0.08973182 to the right, improve= 6.415307, (0 missing)  
## dim22 < 0.002392509 to the left, improve= 6.392669, (0 missing)  
## Surrogate splits:  
## dim10 < -0.175628 to the right, agree=0.839, adj=0.643, (0 split)  
## dim14 < -0.09553263 to the right, agree=0.774, adj=0.500, (0 split)  
## dim5 < -0.08096475 to the right, agree=0.742, adj=0.429, (0 split)  
## dim7 < 0.05686956 to the left, agree=0.726, adj=0.393, (0 split)  
## dim20 < -0.01860287 to the right, agree=0.726, adj=0.393, (0 split)  
##   
## Node number 190: 9 observations, complexity param=0.0001004789  
## predicted class=6 expected loss=0.5555556 P(node) =0.0002678571  
## class counts: 0 1 0 3 0 0 4 0 1 0  
## probabilities: 0.000 0.111 0.000 0.333 0.000 0.000 0.444 0.000 0.111 0.000   
## left son=380 (5 obs) right son=381 (4 obs)  
## Primary splits:  
## dim4 < 0.07176192 to the left, improve=3.2, (0 missing)  
## dim8 < 0.01028476 to the left, improve=3.2, (0 missing)  
## dim28 < -0.04775687 to the right, improve=3.2, (0 missing)  
## dim17 < -0.2636121 to the right, improve=3.2, (0 missing)  
## dim7 < 0.06896739 to the right, improve=3.0, (0 missing)  
## Surrogate splits:  
## dim8 < 0.01028476 to the left, agree=1.000, adj=1.00, (0 split)  
## dim17 < -0.2636121 to the right, agree=1.000, adj=1.00, (0 split)  
## dim28 < -0.04775687 to the right, agree=1.000, adj=1.00, (0 split)  
## dim12 < -0.00158033 to the right, agree=0.889, adj=0.75, (0 split)  
## dim20 < 0.05336264 to the left, agree=0.889, adj=0.75, (0 split)  
##   
## Node number 191: 56 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.03571429 P(node) =0.001666667  
## class counts: 0 0 0 1 1 0 0 0 54 0  
## probabilities: 0.000 0.000 0.000 0.018 0.018 0.000 0.000 0.000 0.964 0.000   
## left son=382 (2 obs) right son=383 (54 obs)  
## Primary splits:  
## dim29 < -0.09051453 to the left, improve=2.892857, (0 missing)  
## dim3 < -0.2220846 to the left, improve=1.929221, (0 missing)  
## dim13 < -0.08489997 to the left, improve=1.929221, (0 missing)  
## dim14 < -0.1836263 to the left, improve=1.929221, (0 missing)  
## dim18 < -0.1661787 to the left, improve=1.929221, (0 missing)  
## Surrogate splits:  
## dim13 < -0.07156768 to the left, agree=0.982, adj=0.5, (0 split)  
## dim18 < -0.1026509 to the left, agree=0.982, adj=0.5, (0 split)  
##   
## Node number 192: 2533 observations, complexity param=0.0001786292  
## predicted class=0 expected loss=0.07185156 P(node) =0.0753869  
## class counts: 2351 0 44 3 1 69 26 4 26 9  
## probabilities: 0.928 0.000 0.017 0.001 0.000 0.027 0.010 0.002 0.010 0.004   
## left son=384 (2155 obs) right son=385 (378 obs)  
## Primary splits:  
## dim2 < 0.2415357 to the right, improve=27.34546, (0 missing)  
## dim20 < 0.09227643 to the left, improve=25.23752, (0 missing)  
## dim4 < -0.1409469 to the right, improve=21.62217, (0 missing)  
## dim8 < -0.2010354 to the right, improve=20.11080, (0 missing)  
## dim11 < 0.176738 to the left, improve=17.40484, (0 missing)  
## Surrogate splits:  
## dim9 < 0.1762297 to the left, agree=0.859, adj=0.053, (0 split)  
## dim4 < 0.4314788 to the left, agree=0.854, adj=0.024, (0 split)  
## dim20 < 0.1940518 to the left, agree=0.854, adj=0.024, (0 split)  
## dim8 < -0.1964871 to the right, agree=0.854, adj=0.019, (0 split)  
## dim7 < -0.2259212 to the right, agree=0.853, adj=0.013, (0 split)  
##   
## Node number 193: 173 observations, complexity param=0.0009043105  
## predicted class=6 expected loss=0.6069364 P(node) =0.00514881  
## class counts: 53 0 12 0 11 7 68 0 16 6  
## probabilities: 0.306 0.000 0.069 0.000 0.064 0.040 0.393 0.000 0.092 0.035   
## left son=386 (51 obs) right son=387 (122 obs)  
## Primary splits:  
## dim15 < -0.09359465 to the left, improve=27.54979, (0 missing)  
## dim6 < -0.05267366 to the right, improve=26.48969, (0 missing)  
## dim28 < 0.02601688 to the right, improve=26.15322, (0 missing)  
## dim4 < -0.05981471 to the left, improve=26.09816, (0 missing)  
## dim12 < 0.1044419 to the left, improve=24.14056, (0 missing)  
## Surrogate splits:  
## dim4 < -0.1094729 to the left, agree=0.832, adj=0.431, (0 split)  
## dim28 < 0.04309372 to the right, agree=0.803, adj=0.333, (0 split)  
## dim10 < -0.0798613 to the left, agree=0.786, adj=0.275, (0 split)  
## dim14 < -0.1259398 to the left, agree=0.786, adj=0.275, (0 split)  
## dim23 < 0.1219055 to the right, agree=0.780, adj=0.255, (0 split)  
##   
## Node number 194: 14 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.1428571 P(node) =0.0004166667  
## class counts: 12 0 1 0 0 0 0 0 0 1  
## probabilities: 0.857 0.000 0.071 0.000 0.000 0.000 0.000 0.000 0.000 0.071   
## left son=388 (12 obs) right son=389 (2 obs)  
## Primary splits:  
## dim1 < 0.4732967 to the left, improve=2.571429, (0 missing)  
## dim9 < 0.07115866 to the left, improve=2.571429, (0 missing)  
## dim7 < 0.2965999 to the right, improve=2.571429, (0 missing)  
## dim22 < 0.1850897 to the left, improve=1.725275, (0 missing)  
## dim18 < 0.09510664 to the left, improve=1.725275, (0 missing)  
## Surrogate splits:  
## dim7 < 0.2965999 to the right, agree=1.000, adj=1.0, (0 split)  
## dim9 < 0.07115866 to the left, agree=1.000, adj=1.0, (0 split)  
## dim6 < 0.08465319 to the right, agree=0.929, adj=0.5, (0 split)  
## dim10 < -0.02564097 to the right, agree=0.929, adj=0.5, (0 split)  
## dim15 < -0.1465749 to the right, agree=0.929, adj=0.5, (0 split)  
##   
## Node number 195: 187 observations, complexity param=6.698597e-05  
## predicted class=5 expected loss=0.04278075 P(node) =0.005565476  
## class counts: 3 0 0 0 0 179 0 1 1 3  
## probabilities: 0.016 0.000 0.000 0.000 0.000 0.957 0.000 0.005 0.005 0.016   
## left son=390 (5 obs) right son=391 (182 obs)  
## Primary splits:  
## dim2 < 0.3080914 to the right, improve=4.871681, (0 missing)  
## dim20 < -0.03181616 to the right, improve=3.225666, (0 missing)  
## dim3 < 0.1163213 to the right, improve=2.821072, (0 missing)  
## dim6 < 0.2633027 to the right, improve=2.799451, (0 missing)  
## dim30 < -0.1899603 to the right, improve=2.478338, (0 missing)  
## Surrogate splits:  
## dim6 < 0.2633027 to the right, agree=0.984, adj=0.4, (0 split)  
##   
## Node number 196: 242 observations, complexity param=8.373246e-05  
## predicted class=4 expected loss=0.0661157 P(node) =0.007202381  
## class counts: 0 0 0 0 226 1 2 2 0 11  
## probabilities: 0.000 0.000 0.000 0.000 0.934 0.004 0.008 0.008 0.000 0.045   
## left son=392 (233 obs) right son=393 (9 obs)  
## Primary splits:  
## dim4 < -0.1936389 to the right, improve=5.911873, (0 missing)  
## dim5 < 0.4553876 to the left, improve=4.218069, (0 missing)  
## dim25 < 0.08226728 to the left, improve=2.413020, (0 missing)  
## dim19 < -0.08228732 to the right, improve=2.397712, (0 missing)  
## dim6 < -0.09356712 to the right, improve=1.975580, (0 missing)  
## Surrogate splits:  
## dim24 < -0.1690937 to the right, agree=0.967, adj=0.111, (0 split)  
##   
## Node number 197: 28 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.6428571 P(node) =0.0008333333  
## class counts: 1 0 1 1 10 1 2 0 5 7  
## probabilities: 0.036 0.000 0.036 0.036 0.357 0.036 0.071 0.000 0.179 0.250   
## left son=394 (15 obs) right son=395 (13 obs)  
## Primary splits:  
## dim4 < 0.01986809 to the right, improve=5.479487, (0 missing)  
## dim25 < -0.01990332 to the left, improve=5.339572, (0 missing)  
## dim16 < -0.07736741 to the right, improve=5.119048, (0 missing)  
## dim2 < 0.3852337 to the right, improve=4.833333, (0 missing)  
## dim10 < 0.01021464 to the right, improve=4.447368, (0 missing)  
## Surrogate splits:  
## dim9 < 0.01227478 to the right, agree=0.857, adj=0.692, (0 split)  
## dim17 < 0.005128925 to the right, agree=0.857, adj=0.692, (0 split)  
## dim10 < 0.03169946 to the right, agree=0.821, adj=0.615, (0 split)  
## dim16 < -0.07194318 to the right, agree=0.821, adj=0.615, (0 split)  
## dim20 < 0.0009440947 to the right, agree=0.821, adj=0.615, (0 split)  
##   
## Node number 198: 204 observations, complexity param=0.0009378035  
## predicted class=6 expected loss=0.3088235 P(node) =0.006071429  
## class counts: 31 0 0 0 10 8 141 10 0 4  
## probabilities: 0.152 0.000 0.000 0.000 0.049 0.039 0.691 0.049 0.000 0.020   
## left son=396 (56 obs) right son=397 (148 obs)  
## Primary splits:  
## dim8 < 0.106805 to the right, improve=47.69920, (0 missing)  
## dim5 < 0.0872091 to the left, improve=46.96435, (0 missing)  
## dim21 < -0.02736143 to the left, improve=35.52077, (0 missing)  
## dim11 < -0.1115053 to the left, improve=23.43608, (0 missing)  
## dim13 < 0.09347493 to the right, improve=22.23965, (0 missing)  
## Surrogate splits:  
## dim5 < 0.001663645 to the left, agree=0.936, adj=0.768, (0 split)  
## dim21 < -0.04548218 to the left, agree=0.882, adj=0.571, (0 split)  
## dim13 < 0.09347493 to the right, agree=0.858, adj=0.482, (0 split)  
## dim10 < 0.06828035 to the right, agree=0.824, adj=0.357, (0 split)  
## dim27 < 0.04257804 to the right, agree=0.814, adj=0.321, (0 split)  
##   
## Node number 199: 679 observations, complexity param=0.00257896  
## predicted class=9 expected loss=0.7731959 P(node) =0.02020833  
## class counts: 75 0 20 9 126 120 27 132 16 154  
## probabilities: 0.110 0.000 0.029 0.013 0.186 0.177 0.040 0.194 0.024 0.227   
## left son=398 (580 obs) right son=399 (99 obs)  
## Primary splits:  
## dim26 < 0.09007322 to the left, improve=62.98505, (0 missing)  
## dim5 < 0.13653 to the left, improve=57.42776, (0 missing)  
## dim4 < -0.0666569 to the right, improve=52.80976, (0 missing)  
## dim9 < 0.1423349 to the left, improve=50.18059, (0 missing)  
## dim13 < 0.09635252 to the left, improve=48.29124, (0 missing)  
## Surrogate splits:  
## dim13 < 0.1981828 to the left, agree=0.898, adj=0.303, (0 split)  
## dim29 < 0.1881817 to the left, agree=0.891, adj=0.253, (0 split)  
## dim1 < 0.2602784 to the right, agree=0.884, adj=0.202, (0 split)  
## dim14 < 0.2566465 to the left, agree=0.878, adj=0.162, (0 split)  
## dim9 < 0.1959928 to the left, agree=0.873, adj=0.131, (0 split)  
##   
## Node number 200: 1715 observations, complexity param=0.0005526342  
## predicted class=2 expected loss=0.08921283 P(node) =0.05104167  
## class counts: 1 2 1562 9 2 2 30 26 80 1  
## probabilities: 0.001 0.001 0.911 0.005 0.001 0.001 0.017 0.015 0.047 0.001   
## left son=400 (1599 obs) right son=401 (116 obs)  
## Primary splits:  
## dim14 < 0.1006949 to the left, improve=48.58739, (0 missing)  
## dim9 < -0.1289155 to the right, improve=47.00196, (0 missing)  
## dim7 < 0.3182201 to the left, improve=32.64934, (0 missing)  
## dim16 < 0.2297169 to the left, improve=17.75150, (0 missing)  
## dim6 < 0.3441687 to the left, improve=17.72649, (0 missing)  
## Surrogate splits:  
## dim9 < -0.1782324 to the right, agree=0.935, adj=0.034, (0 split)  
## dim13 < 0.1973973 to the left, agree=0.934, adj=0.017, (0 split)  
## dim1 < 0.8191469 to the left, agree=0.933, adj=0.009, (0 split)  
## dim7 < -0.2229167 to the right, agree=0.933, adj=0.009, (0 split)  
## dim16 < 0.3083697 to the left, agree=0.933, adj=0.009, (0 split)  
##   
## Node number 201: 1235 observations, complexity param=0.00415313  
## predicted class=2 expected loss=0.6121457 P(node) =0.03675595  
## class counts: 16 104 479 18 97 48 372 20 62 19  
## probabilities: 0.013 0.084 0.388 0.015 0.079 0.039 0.301 0.016 0.050 0.015   
## left son=402 (594 obs) right son=403 (641 obs)  
## Primary splits:  
## dim14 < -0.02818058 to the left, improve=158.97080, (0 missing)  
## dim7 < 0.1759818 to the left, improve=110.68650, (0 missing)  
## dim6 < 0.261619 to the right, improve=108.52220, (0 missing)  
## dim12 < 0.1816669 to the left, improve=103.21090, (0 missing)  
## dim2 < 0.03446974 to the left, improve= 88.99515, (0 missing)  
## Surrogate splits:  
## dim12 < 0.06270925 to the left, agree=0.704, adj=0.386, (0 split)  
## dim13 < 0.004844772 to the left, agree=0.657, adj=0.286, (0 split)  
## dim24 < -0.008376181 to the right, agree=0.652, adj=0.276, (0 split)  
## dim9 < 0.01999654 to the right, agree=0.638, adj=0.247, (0 split)  
## dim15 < 0.01571233 to the right, agree=0.628, adj=0.226, (0 split)  
##   
## Node number 202: 214 observations, complexity param=0.0004689018  
## predicted class=3 expected loss=0.2429907 P(node) =0.006369048  
## class counts: 0 0 5 162 0 18 0 1 15 13  
## probabilities: 0.000 0.000 0.023 0.757 0.000 0.084 0.000 0.005 0.070 0.061   
## left son=404 (188 obs) right son=405 (26 obs)  
## Primary splits:  
## dim2 < 0.1123017 to the left, improve=22.498330, (0 missing)  
## dim14 < 0.01165673 to the left, improve=13.765390, (0 missing)  
## dim9 < -0.09234027 to the right, improve=13.224570, (0 missing)  
## dim20 < 0.1170563 to the left, improve=12.271690, (0 missing)  
## dim15 < 0.290574 to the left, improve= 7.514645, (0 missing)  
## Surrogate splits:  
## dim9 < -0.1457097 to the right, agree=0.907, adj=0.231, (0 split)  
## dim20 < 0.1170563 to the left, agree=0.907, adj=0.231, (0 split)  
## dim10 < -0.2917899 to the right, agree=0.897, adj=0.154, (0 split)  
## dim18 < 0.1248303 to the left, agree=0.893, adj=0.115, (0 split)  
## dim1 < 0.3264405 to the right, agree=0.888, adj=0.077, (0 split)  
##   
## Node number 203: 1120 observations, complexity param=0.003650735  
## predicted class=8 expected loss=0.46875 P(node) =0.03333333  
## class counts: 1 4 219 161 12 88 5 6 595 29  
## probabilities: 0.001 0.004 0.196 0.144 0.011 0.079 0.004 0.005 0.531 0.026   
## left son=406 (153 obs) right son=407 (967 obs)  
## Primary splits:  
## dim2 < -0.1856249 to the left, improve=106.71770, (0 missing)  
## dim21 < -0.02202758 to the right, improve= 96.55816, (0 missing)  
## dim7 < 0.07643695 to the right, improve= 67.96801, (0 missing)  
## dim8 < -0.1722857 to the left, improve= 58.85875, (0 missing)  
## dim14 < -0.05917259 to the left, improve= 54.48838, (0 missing)  
## Surrogate splits:  
## dim30 < 0.1849277 to the right, agree=0.872, adj=0.065, (0 split)  
## dim21 < 0.203611 to the right, agree=0.871, adj=0.052, (0 split)  
## dim15 < -0.2712453 to the left, agree=0.867, adj=0.026, (0 split)  
## dim17 < -0.2657096 to the left, agree=0.864, adj=0.007, (0 split)  
## dim27 < 0.1824206 to the right, agree=0.864, adj=0.007, (0 split)  
##   
## Node number 204: 2225 observations, complexity param=0.01008139  
## predicted class=5 expected loss=0.6867416 P(node) =0.06622024  
## class counts: 480 13 375 312 10 697 107 35 182 14  
## probabilities: 0.216 0.006 0.169 0.140 0.004 0.313 0.048 0.016 0.082 0.006   
## left son=408 (901 obs) right son=409 (1324 obs)  
## Primary splits:  
## dim2 < 0.03838949 to the right, improve=189.0951, (0 missing)  
## dim8 < 0.002395813 to the left, improve=176.1634, (0 missing)  
## dim13 < 0.1019409 to the left, improve=137.6875, (0 missing)  
## dim5 < -0.07889451 to the left, improve=126.0895, (0 missing)  
## dim3 < 0.08453341 to the right, improve=118.6594, (0 missing)  
## Surrogate splits:  
## dim7 < 0.01429878 to the right, agree=0.677, adj=0.202, (0 split)  
## dim3 < 0.1780028 to the right, agree=0.676, adj=0.201, (0 split)  
## dim4 < 0.3292063 to the right, agree=0.665, adj=0.173, (0 split)  
## dim22 < 0.03590189 to the right, agree=0.661, adj=0.162, (0 split)  
## dim12 < -0.06177446 to the left, agree=0.652, adj=0.140, (0 split)  
##   
## Node number 205: 2728 observations, complexity param=0.002712932  
## predicted class=3 expected loss=0.273827 P(node) =0.08119048  
## class counts: 58 13 71 1981 1 358 2 8 197 39  
## probabilities: 0.021 0.005 0.026 0.726 0.000 0.131 0.001 0.003 0.072 0.014   
## left son=410 (2238 obs) right son=411 (490 obs)  
## Primary splits:  
## dim2 < 0.07837585 to the left, improve=180.82280, (0 missing)  
## dim11 < -0.03756084 to the right, improve=130.85050, (0 missing)  
## dim5 < -0.2669074 to the right, improve=101.38230, (0 missing)  
## dim20 < 0.134109 to the left, improve= 97.82646, (0 missing)  
## dim22 < -0.09251625 to the right, improve= 77.37435, (0 missing)  
## Surrogate splits:  
## dim20 < 0.191065 to the left, agree=0.834, adj=0.078, (0 split)  
## dim1 < 0.3279257 to the right, agree=0.828, adj=0.045, (0 split)  
## dim7 < 0.2584469 to the left, agree=0.826, adj=0.033, (0 split)  
## dim15 < 0.2284944 to the left, agree=0.824, adj=0.022, (0 split)  
## dim8 < 0.2203935 to the left, agree=0.824, adj=0.020, (0 split)  
##   
## Node number 206: 1221 observations, complexity param=0.002260776  
## predicted class=5 expected loss=0.4594595 P(node) =0.03633929  
## class counts: 99 0 72 108 3 660 25 2 243 9  
## probabilities: 0.081 0.000 0.059 0.088 0.002 0.541 0.020 0.002 0.199 0.007   
## left son=412 (598 obs) right son=413 (623 obs)  
## Primary splits:  
## dim4 < -0.1735794 to the left, improve=101.84530, (0 missing)  
## dim6 < 0.1391481 to the left, improve= 59.08279, (0 missing)  
## dim23 < 0.01536315 to the right, improve= 50.25443, (0 missing)  
## dim7 < 0.2104749 to the right, improve= 49.01428, (0 missing)  
## dim13 < 0.03192883 to the left, improve= 48.16171, (0 missing)  
## Surrogate splits:  
## dim10 < -0.02887396 to the left, agree=0.739, adj=0.467, (0 split)  
## dim20 < 0.06996821 to the right, agree=0.680, adj=0.346, (0 split)  
## dim21 < -0.006376082 to the left, agree=0.629, adj=0.242, (0 split)  
## dim3 < 0.1089124 to the right, agree=0.618, adj=0.221, (0 split)  
## dim1 < 0.5908707 to the left, agree=0.616, adj=0.216, (0 split)  
##   
## Node number 207: 1977 observations, complexity param=0.005626821  
## predicted class=8 expected loss=0.3333333 P(node) =0.05883929  
## class counts: 3 7 105 201 12 274 6 28 1318 23  
## probabilities: 0.002 0.004 0.053 0.102 0.006 0.139 0.003 0.014 0.667 0.012   
## left son=414 (212 obs) right son=415 (1765 obs)  
## Primary splits:  
## dim5 < -0.2505934 to the left, improve=212.91310, (0 missing)  
## dim13 < 0.004392275 to the left, improve=130.04910, (0 missing)  
## dim19 < 0.08891047 to the right, improve=111.56280, (0 missing)  
## dim1 < 0.5809231 to the left, improve= 99.90060, (0 missing)  
## dim15 < 0.01839603 to the right, improve= 93.91044, (0 missing)  
## Surrogate splits:  
## dim19 < 0.1477276 to the right, agree=0.914, adj=0.198, (0 split)  
## dim26 < -0.1536241 to the left, agree=0.896, adj=0.028, (0 split)  
## dim29 < 0.2119127 to the right, agree=0.894, adj=0.009, (0 split)  
## dim27 < -0.2309054 to the left, agree=0.893, adj=0.005, (0 split)  
##   
## Node number 208: 214 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.02336449 P(node) =0.006369048  
## class counts: 0 209 2 0 1 0 0 0 2 0  
## probabilities: 0.000 0.977 0.009 0.000 0.005 0.000 0.000 0.000 0.009 0.000   
## left son=416 (210 obs) right son=417 (4 obs)  
## Primary splits:  
## dim6 < -0.230275 to the left, improve=3.369693, (0 missing)  
## dim24 < -0.05328476 to the right, improve=2.993640, (0 missing)  
## dim7 < -0.1458994 to the right, improve=1.953798, (0 missing)  
## dim19 < -0.154206 to the right, improve=1.953798, (0 missing)  
## dim8 < 0.2049391 to the left, improve=1.953798, (0 missing)  
## Surrogate splits:  
## dim5 < 0.08527418 to the left, agree=0.986, adj=0.25, (0 split)  
##   
## Node number 209: 12 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.5833333 P(node) =0.0003571429  
## class counts: 0 0 0 2 5 1 0 1 2 1  
## probabilities: 0.000 0.000 0.000 0.167 0.417 0.083 0.000 0.083 0.167 0.083   
## left son=418 (5 obs) right son=419 (7 obs)  
## Primary splits:  
## dim5 < 0.1366157 to the right, improve=3.571429, (0 missing)  
## dim4 < -0.1859039 to the right, improve=2.666667, (0 missing)  
## dim2 < 0.1569073 to the right, improve=2.657143, (0 missing)  
## dim20 < -0.07201502 to the left, improve=2.500000, (0 missing)  
## dim12 < -0.09973117 to the left, improve=2.257143, (0 missing)  
## Surrogate splits:  
## dim4 < -0.1859039 to the right, agree=0.917, adj=0.8, (0 split)  
## dim20 < -0.07201502 to the left, agree=0.917, adj=0.8, (0 split)  
## dim1 < 0.4844878 to the left, agree=0.833, adj=0.6, (0 split)  
## dim2 < 0.1569073 to the right, agree=0.833, adj=0.6, (0 split)  
## dim7 < -0.1793984 to the left, agree=0.833, adj=0.6, (0 split)  
##   
## Node number 210: 44 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.3636364 P(node) =0.001309524  
## class counts: 0 4 4 28 1 2 0 2 3 0  
## probabilities: 0.000 0.091 0.091 0.636 0.023 0.045 0.000 0.045 0.068 0.000   
## left son=420 (23 obs) right son=421 (21 obs)  
## Primary splits:  
## dim4 < -0.2559325 to the left, improve=5.894316, (0 missing)  
## dim29 < 0.1380459 to the right, improve=3.845455, (0 missing)  
## dim5 < 0.2062463 to the left, improve=3.395455, (0 missing)  
## dim27 < 0.06424212 to the right, improve=3.121645, (0 missing)  
## dim7 < 0.1873182 to the right, improve=2.758275, (0 missing)  
## Surrogate splits:  
## dim20 < 0.01047617 to the left, agree=0.818, adj=0.619, (0 split)  
## dim11 < 0.1069546 to the right, agree=0.795, adj=0.571, (0 split)  
## dim27 < -0.03984665 to the left, agree=0.795, adj=0.571, (0 split)  
## dim7 < 0.05953676 to the left, agree=0.750, adj=0.476, (0 split)  
## dim29 < 0.03273255 to the left, agree=0.727, adj=0.429, (0 split)  
##   
## Node number 211: 6 observations  
## predicted class=5 expected loss=0 P(node) =0.0001785714  
## class counts: 0 0 0 0 0 6 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 212: 225 observations, complexity param=0.0001339719  
## predicted class=3 expected loss=0.1644444 P(node) =0.006696429  
## class counts: 5 10 8 188 0 9 2 0 3 0  
## probabilities: 0.022 0.044 0.036 0.836 0.000 0.040 0.009 0.000 0.013 0.000   
## left son=424 (13 obs) right son=425 (212 obs)  
## Primary splits:  
## dim2 < -0.2284954 to the left, improve=9.640361, (0 missing)  
## dim11 < -0.1370558 to the left, improve=8.253127, (0 missing)  
## dim25 < 0.0289266 to the right, improve=6.901748, (0 missing)  
## dim22 < -0.03209939 to the left, improve=6.680078, (0 missing)  
## dim14 < 0.1709828 to the left, improve=6.542444, (0 missing)  
## Surrogate splits:  
## dim7 < 0.2522468 to the right, agree=0.964, adj=0.385, (0 split)  
## dim10 < 0.1828402 to the right, agree=0.947, adj=0.077, (0 split)  
## dim19 < 0.2074279 to the right, agree=0.947, adj=0.077, (0 split)  
##   
## Node number 213: 67 observations, complexity param=0.0004019158  
## predicted class=2 expected loss=0.6567164 P(node) =0.001994048  
## class counts: 1 0 23 15 0 6 16 0 6 0  
## probabilities: 0.015 0.000 0.343 0.224 0.000 0.090 0.239 0.000 0.090 0.000   
## left son=426 (25 obs) right son=427 (42 obs)  
## Primary splits:  
## dim2 < -0.06842636 to the left, improve=17.01296, (0 missing)  
## dim10 < -0.02716998 to the right, improve=16.06257, (0 missing)  
## dim14 < 0.02849031 to the left, improve=11.92871, (0 missing)  
## dim20 < -0.03577424 to the left, improve=11.40751, (0 missing)  
## dim24 < -0.09492381 to the left, improve=11.11360, (0 missing)  
## Surrogate splits:  
## dim10 < -0.04847668 to the right, agree=0.925, adj=0.80, (0 split)  
## dim20 < -0.07784793 to the left, agree=0.896, adj=0.72, (0 split)  
## dim24 < -0.09492381 to the left, agree=0.881, adj=0.68, (0 split)  
## dim16 < 0.041663 to the right, agree=0.836, adj=0.56, (0 split)  
## dim29 < 0.02780032 to the right, agree=0.836, adj=0.56, (0 split)  
##   
## Node number 214: 38 observations, complexity param=0.0001172254  
## predicted class=3 expected loss=0.3684211 P(node) =0.001130952  
## class counts: 0 5 0 24 0 2 2 0 5 0  
## probabilities: 0.000 0.132 0.000 0.632 0.000 0.053 0.053 0.000 0.132 0.000   
## left son=428 (21 obs) right son=429 (17 obs)  
## Primary splits:  
## dim4 < -0.3231749 to the left, improve=8.256966, (0 missing)  
## dim27 < 0.01219807 to the left, improve=7.936079, (0 missing)  
## dim7 < 0.03604602 to the left, improve=5.738866, (0 missing)  
## dim18 < 0.02449955 to the left, improve=5.526901, (0 missing)  
## dim10 < 0.08181267 to the left, improve=5.380306, (0 missing)  
## Surrogate splits:  
## dim27 < 0.01219807 to the left, agree=0.947, adj=0.882, (0 split)  
## dim18 < 0.02449955 to the left, agree=0.816, adj=0.588, (0 split)  
## dim2 < -0.1711224 to the right, agree=0.763, adj=0.471, (0 split)  
## dim6 < -0.2870624 to the right, agree=0.763, adj=0.471, (0 split)  
## dim7 < -0.02813032 to the left, agree=0.763, adj=0.471, (0 split)  
##   
## Node number 215: 116 observations, complexity param=0.0005693807  
## predicted class=5 expected loss=0.4827586 P(node) =0.003452381  
## class counts: 4 4 5 3 0 60 26 0 13 1  
## probabilities: 0.034 0.034 0.043 0.026 0.000 0.517 0.224 0.000 0.112 0.009   
## left son=430 (72 obs) right son=431 (44 obs)  
## Primary splits:  
## dim4 < -0.1356973 to the left, improve=16.631230, (0 missing)  
## dim27 < 0.02735076 to the left, improve=15.422500, (0 missing)  
## dim5 < 0.007226698 to the left, improve=10.146310, (0 missing)  
## dim13 < -0.02106015 to the right, improve= 9.998553, (0 missing)  
## dim6 < -0.3229165 to the right, improve= 9.915478, (0 missing)  
## Surrogate splits:  
## dim6 < -0.3229165 to the right, agree=0.733, adj=0.295, (0 split)  
## dim5 < 0.1358648 to the left, agree=0.707, adj=0.227, (0 split)  
## dim13 < 0.1045159 to the left, agree=0.707, adj=0.227, (0 split)  
## dim16 < -0.1232675 to the right, agree=0.681, adj=0.159, (0 split)  
## dim27 < 0.05651202 to the left, agree=0.681, adj=0.159, (0 split)  
##   
## Node number 216: 29 observations, complexity param=0.0001004789  
## predicted class=0 expected loss=0.2068966 P(node) =0.0008630952  
## class counts: 23 0 0 0 0 2 4 0 0 0  
## probabilities: 0.793 0.000 0.000 0.000 0.000 0.069 0.138 0.000 0.000 0.000   
## left son=432 (25 obs) right son=433 (4 obs)  
## Primary splits:  
## dim25 < 0.1704749 to the left, improve=4.808966, (0 missing)  
## dim16 < -0.1266436 to the right, improve=4.607427, (0 missing)  
## dim2 < -0.0722828 to the right, improve=3.254151, (0 missing)  
## dim3 < 0.0357878 to the right, improve=3.254151, (0 missing)  
## dim18 < 0.01183723 to the left, improve=3.004030, (0 missing)  
## Surrogate splits:  
## dim16 < -0.1266436 to the right, agree=0.966, adj=0.75, (0 split)  
## dim23 < -0.110661 to the right, agree=0.931, adj=0.50, (0 split)  
##   
## Node number 217: 19 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.05263158 P(node) =0.0005654762  
## class counts: 1 0 0 0 0 0 18 0 0 0  
## probabilities: 0.053 0.000 0.000 0.000 0.000 0.000 0.947 0.000 0.000 0.000   
## left son=434 (1 obs) right son=435 (18 obs)  
## Primary splits:  
## dim5 < -0.2933685 to the left, improve=1.8947370, (0 missing)  
## dim18 < -0.1091045 to the left, improve=1.8947370, (0 missing)  
## dim14 < -0.06427407 to the right, improve=1.8947370, (0 missing)  
## dim21 < 0.06341548 to the right, improve=1.8947370, (0 missing)  
## dim3 < 0.2322418 to the right, improve=0.8947368, (0 missing)  
##   
## Node number 218: 19 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.2105263 P(node) =0.0005654762  
## class counts: 0 0 0 15 0 3 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.789 0.000 0.158 0.053 0.000 0.000 0.000   
## left son=436 (14 obs) right son=437 (5 obs)  
## Primary splits:  
## dim7 < -0.07035103 to the right, improve=3.831579, (0 missing)  
## dim14 < 0.01910927 to the right, improve=3.831579, (0 missing)  
## dim9 < 0.1054478 to the right, improve=3.423246, (0 missing)  
## dim27 < -0.1096213 to the right, improve=3.423246, (0 missing)  
## dim10 < -0.009563526 to the left, improve=3.264912, (0 missing)  
## Surrogate splits:  
## dim10 < -0.009563526 to the left, agree=0.947, adj=0.8, (0 split)  
## dim14 < 0.02953016 to the right, agree=0.947, adj=0.8, (0 split)  
## dim17 < -0.008200869 to the right, agree=0.947, adj=0.8, (0 split)  
## dim9 < 0.1054478 to the right, agree=0.895, adj=0.6, (0 split)  
## dim26 < 0.05534236 to the left, agree=0.895, adj=0.6, (0 split)  
##   
## Node number 219: 57 observations, complexity param=0.0001674649  
## predicted class=5 expected loss=0.2982456 P(node) =0.001696429  
## class counts: 6 1 0 2 0 40 8 0 0 0  
## probabilities: 0.105 0.018 0.000 0.035 0.000 0.702 0.140 0.000 0.000 0.000   
## left son=438 (5 obs) right son=439 (52 obs)  
## Primary splits:  
## dim2 < 0.2178994 to the right, improve=7.203104, (0 missing)  
## dim24 < 0.01969542 to the left, improve=5.797397, (0 missing)  
## dim15 < -0.2294079 to the left, improve=5.653757, (0 missing)  
## dim14 < -0.08609312 to the right, improve=5.434942, (0 missing)  
## dim6 < -0.2658937 to the right, improve=5.176608, (0 missing)  
## Surrogate splits:  
## dim15 < -0.2294079 to the left, agree=0.982, adj=0.8, (0 split)  
## dim5 < -0.1161905 to the right, agree=0.947, adj=0.4, (0 split)  
## dim11 < -0.1842706 to the left, agree=0.930, adj=0.2, (0 split)  
##   
## Node number 220: 53 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.3396226 P(node) =0.001577381  
## class counts: 0 5 35 5 3 1 4 0 0 0  
## probabilities: 0.000 0.094 0.660 0.094 0.057 0.019 0.075 0.000 0.000 0.000   
## left son=440 (26 obs) right son=441 (27 obs)  
## Primary splits:  
## dim18 < -0.06747061 to the left, improve=5.714938, (0 missing)  
## dim21 < 0.08275261 to the left, improve=5.514055, (0 missing)  
## dim10 < -0.1228835 to the right, improve=5.419497, (0 missing)  
## dim5 < 0.06836991 to the right, improve=5.236713, (0 missing)  
## dim1 < 0.4646766 to the left, improve=5.054182, (0 missing)  
## Surrogate splits:  
## dim23 < -0.05752263 to the left, agree=0.811, adj=0.615, (0 split)  
## dim5 < 0.09163371 to the right, agree=0.792, adj=0.577, (0 split)  
## dim15 < 0.05075117 to the right, agree=0.774, adj=0.538, (0 split)  
## dim8 < -0.03682675 to the right, agree=0.755, adj=0.500, (0 split)  
## dim10 < -0.08911069 to the right, agree=0.736, adj=0.462, (0 split)  
##   
## Node number 221: 21 observations, complexity param=6.698597e-05  
## predicted class=6 expected loss=0.1904762 P(node) =0.000625  
## class counts: 0 0 1 2 0 0 17 1 0 0  
## probabilities: 0.000 0.000 0.048 0.095 0.000 0.000 0.810 0.048 0.000 0.000   
## left son=442 (3 obs) right son=443 (18 obs)  
## Primary splits:  
## dim1 < 0.3873341 to the left, improve=3.730159, (0 missing)  
## dim4 < -0.007811389 to the left, improve=3.730159, (0 missing)  
## dim7 < 0.07315771 to the right, improve=3.268170, (0 missing)  
## dim10 < -0.09541346 to the right, improve=2.619048, (0 missing)  
## dim20 < 0.02756583 to the right, improve=2.570028, (0 missing)  
## Surrogate splits:  
## dim7 < 0.07315771 to the right, agree=0.952, adj=0.667, (0 split)  
## dim15 < 0.08991911 to the right, agree=0.952, adj=0.667, (0 split)  
## dim20 < 0.02756583 to the right, agree=0.952, adj=0.667, (0 split)  
## dim4 < -0.007811389 to the left, agree=0.905, adj=0.333, (0 split)  
## dim24 < -0.1255802 to the left, agree=0.905, adj=0.333, (0 split)  
##   
## Node number 222: 72 observations, complexity param=0.0003349298  
## predicted class=6 expected loss=0.6527778 P(node) =0.002142857  
## class counts: 6 0 23 6 0 12 25 0 0 0  
## probabilities: 0.083 0.000 0.319 0.083 0.000 0.167 0.347 0.000 0.000 0.000   
## left son=444 (20 obs) right son=445 (52 obs)  
## Primary splits:  
## dim2 < -0.1041917 to the left, improve=17.31838, (0 missing)  
## dim10 < -0.02106304 to the right, improve=15.91378, (0 missing)  
## dim7 < 0.003506797 to the right, improve=12.93197, (0 missing)  
## dim27 < 0.01291421 to the right, improve=12.82146, (0 missing)  
## dim20 < -0.04536582 to the left, improve=12.41361, (0 missing)  
## Surrogate splits:  
## dim27 < 0.08565168 to the right, agree=0.917, adj=0.70, (0 split)  
## dim5 < 0.1271943 to the right, agree=0.903, adj=0.65, (0 split)  
## dim10 < 0.01148 to the right, agree=0.903, adj=0.65, (0 split)  
## dim17 < -0.1689593 to the left, agree=0.833, adj=0.40, (0 split)  
## dim18 < -0.06056991 to the left, agree=0.833, adj=0.40, (0 split)  
##   
## Node number 223: 2508 observations, complexity param=0.0002679439  
## predicted class=6 expected loss=0.08213716 P(node) =0.07464286  
## class counts: 25 14 81 10 42 19 2302 1 10 4  
## probabilities: 0.010 0.006 0.032 0.004 0.017 0.008 0.918 0.000 0.004 0.002   
## left son=446 (27 obs) right son=447 (2481 obs)  
## Primary splits:  
## dim11 < 0.1137049 to the right, improve=22.33444, (0 missing)  
## dim10 < 0.05726643 to the right, improve=22.18785, (0 missing)  
## dim6 < -0.2430339 to the right, improve=21.02359, (0 missing)  
## dim17 < 0.1786434 to the right, improve=20.12734, (0 missing)  
## dim14 < -0.1975234 to the left, improve=18.00137, (0 missing)  
## Surrogate splits:  
## dim5 < 0.4874567 to the right, agree=0.99, adj=0.037, (0 split)  
##   
## Node number 224: 1260 observations, complexity param=0.0002344509  
## predicted class=4 expected loss=0.118254 P(node) =0.0375  
## class counts: 0 7 9 8 1111 21 14 16 15 59  
## probabilities: 0.000 0.006 0.007 0.006 0.882 0.017 0.011 0.013 0.012 0.047   
## left son=448 (1150 obs) right son=449 (110 obs)  
## Primary splits:  
## dim13 < 0.121931 to the left, improve=13.23769, (0 missing)  
## dim6 < -0.2604 to the left, improve=13.12619, (0 missing)  
## dim12 < -0.1754708 to the right, improve=12.43005, (0 missing)  
## dim4 < -0.3501195 to the right, improve=11.99927, (0 missing)  
## dim3 < -0.1414781 to the left, improve=11.38081, (0 missing)  
## Surrogate splits:  
## dim25 < -0.1463253 to the right, agree=0.915, adj=0.027, (0 split)  
## dim6 < 0.2960502 to the left, agree=0.914, adj=0.018, (0 split)  
## dim15 < -0.2790647 to the right, agree=0.914, adj=0.018, (0 split)  
## dim23 < -0.2282688 to the right, agree=0.914, adj=0.018, (0 split)  
## dim28 < -0.1808497 to the right, agree=0.914, adj=0.018, (0 split)  
##   
## Node number 225: 658 observations, complexity param=0.0005247234  
## predicted class=4 expected loss=0.3905775 P(node) =0.01958333  
## class counts: 1 1 5 4 401 5 31 26 47 137  
## probabilities: 0.002 0.002 0.008 0.006 0.609 0.008 0.047 0.040 0.071 0.208   
## left son=450 (301 obs) right son=451 (357 obs)  
## Primary splits:  
## dim7 < -0.1201734 to the left, improve=39.09826, (0 missing)  
## dim19 < -0.03625648 to the right, improve=37.14572, (0 missing)  
## dim12 < 0.03612928 to the right, improve=34.42376, (0 missing)  
## dim20 < -0.02769711 to the right, improve=30.07835, (0 missing)  
## dim14 < 0.01408652 to the left, improve=23.79897, (0 missing)  
## Surrogate splits:  
## dim24 < -0.02016326 to the right, agree=0.663, adj=0.262, (0 split)  
## dim28 < -0.04913066 to the left, agree=0.635, adj=0.203, (0 split)  
## dim12 < 0.04499603 to the right, agree=0.623, adj=0.176, (0 split)  
## dim3 < -0.2086451 to the left, agree=0.616, adj=0.159, (0 split)  
## dim16 < 0.1144442 to the right, agree=0.606, adj=0.140, (0 split)  
##   
## Node number 226: 190 observations, complexity param=0.0008708176  
## predicted class=4 expected loss=0.5157895 P(node) =0.005654762  
## class counts: 0 0 1 2 92 3 1 26 4 61  
## probabilities: 0.000 0.000 0.005 0.011 0.484 0.016 0.005 0.137 0.021 0.321   
## left son=452 (165 obs) right son=453 (25 obs)  
## Primary splits:  
## dim9 < 0.152527 to the left, improve=23.27707, (0 missing)  
## dim3 < -0.2728534 to the right, improve=22.79964, (0 missing)  
## dim4 < -0.1613059 to the right, improve=19.35606, (0 missing)  
## dim18 < 0.009147457 to the left, improve=19.19139, (0 missing)  
## dim7 < 0.01089621 to the left, improve=17.85987, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4403803 to the right, agree=0.958, adj=0.68, (0 split)  
## dim4 < -0.197946 to the right, agree=0.932, adj=0.48, (0 split)  
## dim7 < 0.006858479 to the left, agree=0.916, adj=0.36, (0 split)  
## dim14 < 0.1276861 to the left, agree=0.916, adj=0.36, (0 split)  
## dim18 < 0.1416655 to the left, agree=0.911, adj=0.32, (0 split)  
##   
## Node number 227: 268 observations, complexity param=0.0003014368  
## predicted class=9 expected loss=0.238806 P(node) =0.00797619  
## class counts: 0 0 0 0 29 1 0 13 21 204  
## probabilities: 0.000 0.000 0.000 0.000 0.108 0.004 0.000 0.049 0.078 0.761   
## left son=454 (34 obs) right son=455 (234 obs)  
## Primary splits:  
## dim3 < -0.1548889 to the right, improve=17.81987, (0 missing)  
## dim16 < 0.1246433 to the right, improve=12.44684, (0 missing)  
## dim10 < 0.0523652 to the left, improve=12.30059, (0 missing)  
## dim6 < 0.1384576 to the right, improve=11.46264, (0 missing)  
## dim2 < -0.01483781 to the left, improve=11.43252, (0 missing)  
## Surrogate splits:  
## dim2 < -0.03852679 to the left, agree=0.899, adj=0.206, (0 split)  
## dim6 < 0.1384576 to the right, agree=0.899, adj=0.206, (0 split)  
## dim17 < -0.06089641 to the left, agree=0.896, adj=0.176, (0 split)  
## dim9 < -0.212086 to the left, agree=0.892, adj=0.147, (0 split)  
## dim13 < 0.1029578 to the right, agree=0.892, adj=0.147, (0 split)  
##   
## Node number 228: 173 observations, complexity param=0.0002344509  
## predicted class=5 expected loss=0.1676301 P(node) =0.00514881  
## class counts: 0 3 0 1 1 144 0 5 13 6  
## probabilities: 0.000 0.017 0.000 0.006 0.006 0.832 0.000 0.029 0.075 0.035   
## left son=456 (165 obs) right son=457 (8 obs)  
## Primary splits:  
## dim1 < 0.6905646 to the left, improve=11.256270, (0 missing)  
## dim19 < 0.0127713 to the right, improve= 9.431890, (0 missing)  
## dim8 < -0.08872504 to the right, improve= 7.470818, (0 missing)  
## dim10 < -0.2050148 to the right, improve= 6.592634, (0 missing)  
## dim6 < 0.06826482 to the left, improve= 5.570095, (0 missing)  
## Surrogate splits:  
## dim8 < -0.1377849 to the right, agree=0.96, adj=0.125, (0 split)  
##   
## Node number 229: 296 observations, complexity param=0.001038282  
## predicted class=8 expected loss=0.75 P(node) =0.008809524  
## class counts: 4 33 0 7 43 65 0 28 74 42  
## probabilities: 0.014 0.111 0.000 0.024 0.145 0.220 0.000 0.095 0.250 0.142   
## left son=458 (42 obs) right son=459 (254 obs)  
## Primary splits:  
## dim6 < -0.2735389 to the left, improve=29.36161, (0 missing)  
## dim1 < 0.6172175 to the left, improve=29.26106, (0 missing)  
## dim8 < 0.03033575 to the left, improve=22.82823, (0 missing)  
## dim17 < 0.0469465 to the right, improve=21.78897, (0 missing)  
## dim10 < 0.1734391 to the right, improve=21.49895, (0 missing)  
## Surrogate splits:  
## dim10 < 0.205899 to the right, agree=0.919, adj=0.429, (0 split)  
## dim28 < -0.1085245 to the left, agree=0.912, adj=0.381, (0 split)  
## dim25 < 0.1097976 to the right, agree=0.902, adj=0.310, (0 split)  
## dim4 < -0.1830673 to the left, agree=0.875, adj=0.119, (0 split)  
## dim29 < 0.1082442 to the right, agree=0.872, adj=0.095, (0 split)  
##   
## Node number 230: 119 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.09243697 P(node) =0.003541667  
## class counts: 0 0 0 0 108 0 0 2 0 9  
## probabilities: 0.000 0.000 0.000 0.000 0.908 0.000 0.000 0.017 0.000 0.076   
## left son=460 (110 obs) right son=461 (9 obs)  
## Primary splits:  
## dim9 < 0.02653651 to the left, improve=7.226483, (0 missing)  
## dim28 < -0.05559149 to the right, improve=5.539615, (0 missing)  
## dim26 < -0.1030566 to the right, improve=5.165459, (0 missing)  
## dim1 < 0.6427061 to the left, improve=4.624048, (0 missing)  
## dim6 < 0.0005770385 to the left, improve=4.415399, (0 missing)  
## Surrogate splits:  
## dim15 < -0.1391269 to the right, agree=0.958, adj=0.444, (0 split)  
## dim28 < -0.08408504 to the right, agree=0.950, adj=0.333, (0 split)  
## dim1 < 0.6708442 to the left, agree=0.941, adj=0.222, (0 split)  
## dim14 < -0.1842536 to the right, agree=0.933, adj=0.111, (0 split)  
##   
## Node number 231: 829 observations, complexity param=0.002779918  
## predicted class=9 expected loss=0.5343788 P(node) =0.02467262  
## class counts: 0 3 0 3 145 67 0 198 27 386  
## probabilities: 0.000 0.004 0.000 0.004 0.175 0.081 0.000 0.239 0.033 0.466   
## left son=462 (642 obs) right son=463 (187 obs)  
## Primary splits:  
## dim9 < 0.0814665 to the left, improve=66.77427, (0 missing)  
## dim1 < 0.5792438 to the left, improve=56.30636, (0 missing)  
## dim17 < 0.0740579 to the right, improve=50.32979, (0 missing)  
## dim11 < -0.02120567 to the left, improve=48.07245, (0 missing)  
## dim7 < -0.02637005 to the right, improve=41.77411, (0 missing)  
## Surrogate splits:  
## dim4 < -0.1451923 to the right, agree=0.808, adj=0.150, (0 split)  
## dim1 < 0.4583125 to the right, agree=0.802, adj=0.123, (0 split)  
## dim2 < 0.2380182 to the left, agree=0.802, adj=0.123, (0 split)  
## dim29 < -0.1162346 to the right, agree=0.794, adj=0.086, (0 split)  
## dim11 < -0.2326375 to the right, agree=0.785, adj=0.048, (0 split)  
##   
## Node number 232: 228 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.1052632 P(node) =0.006785714  
## class counts: 0 0 5 1 204 1 2 7 0 8  
## probabilities: 0.000 0.000 0.022 0.004 0.895 0.004 0.009 0.031 0.000 0.035   
## left son=464 (4 obs) right son=465 (224 obs)  
## Primary splits:  
## dim25 < -0.1455746 to the left, improve=4.690320, (0 missing)  
## dim1 < 0.3030809 to the right, improve=3.935439, (0 missing)  
## dim29 < -0.1905832 to the left, improve=3.550070, (0 missing)  
## dim12 < -0.1247286 to the right, improve=3.490406, (0 missing)  
## dim11 < 0.2028924 to the right, improve=3.129978, (0 missing)  
##   
## Node number 233: 53 observations, complexity param=0.0001674649  
## predicted class=4 expected loss=0.3962264 P(node) =0.001577381  
## class counts: 0 0 0 4 32 0 0 2 0 15  
## probabilities: 0.000 0.000 0.000 0.075 0.604 0.000 0.000 0.038 0.000 0.283   
## left son=466 (41 obs) right son=467 (12 obs)  
## Primary splits:  
## dim13 < -0.1070229 to the right, improve=10.698880, (0 missing)  
## dim16 < -0.1200231 to the right, improve= 5.992774, (0 missing)  
## dim6 < 0.1676285 to the left, improve= 5.768725, (0 missing)  
## dim20 < -0.1330458 to the left, improve= 5.628032, (0 missing)  
## dim19 < -0.05286125 to the right, improve= 4.609310, (0 missing)  
## Surrogate splits:  
## dim16 < -0.1200231 to the right, agree=0.849, adj=0.333, (0 split)  
## dim1 < 0.6563451 to the left, agree=0.811, adj=0.167, (0 split)  
## dim7 < 0.02899102 to the left, agree=0.811, adj=0.167, (0 split)  
## dim10 < 0.176212 to the left, agree=0.811, adj=0.167, (0 split)  
## dim17 < -0.2136146 to the right, agree=0.811, adj=0.167, (0 split)  
##   
## Node number 234: 49 observations, complexity param=0.0002009579  
## predicted class=4 expected loss=0.3469388 P(node) =0.001458333  
## class counts: 0 1 0 4 32 0 0 1 1 10  
## probabilities: 0.000 0.020 0.000 0.082 0.653 0.000 0.000 0.020 0.020 0.204   
## left son=468 (43 obs) right son=469 (6 obs)  
## Primary splits:  
## dim13 < -0.1090269 to the right, improve=7.301376, (0 missing)  
## dim6 < 0.009147907 to the left, improve=6.332293, (0 missing)  
## dim28 < 0.02617787 to the right, improve=5.411565, (0 missing)  
## dim11 < 0.1962364 to the right, improve=5.208823, (0 missing)  
## dim17 < -0.05909693 to the right, improve=4.917617, (0 missing)  
## Surrogate splits:  
## dim17 < -0.1587407 to the right, agree=0.918, adj=0.333, (0 split)  
## dim19 < -0.2088352 to the right, agree=0.918, adj=0.333, (0 split)  
## dim29 < 0.1321179 to the left, agree=0.918, adj=0.333, (0 split)  
## dim1 < 0.679122 to the left, agree=0.898, adj=0.167, (0 split)  
## dim27 < 0.06272649 to the left, agree=0.898, adj=0.167, (0 split)  
##   
## Node number 235: 44 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.09090909 P(node) =0.001309524  
## class counts: 0 0 0 0 4 0 0 0 0 40  
## probabilities: 0.000 0.000 0.000 0.000 0.091 0.000 0.000 0.000 0.000 0.909   
## left son=470 (3 obs) right son=471 (41 obs)  
## Primary splits:  
## dim20 < 0.09190992 to the right, improve=5.321508, (0 missing)  
## dim21 < -0.122389 to the left, improve=5.321508, (0 missing)  
## dim29 < -0.0150517 to the left, improve=3.822727, (0 missing)  
## dim12 < 0.1707649 to the right, improve=3.822727, (0 missing)  
## dim17 < 0.006877918 to the right, improve=3.822727, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5139546 to the left, agree=0.977, adj=0.667, (0 split)  
## dim12 < 0.1707649 to the right, agree=0.977, adj=0.667, (0 split)  
## dim14 < 0.1747023 to the right, agree=0.977, adj=0.667, (0 split)  
## dim28 < 0.07237369 to the right, agree=0.977, adj=0.667, (0 split)  
## dim21 < -0.122389 to the left, agree=0.955, adj=0.333, (0 split)  
##   
## Node number 236: 285 observations, complexity param=0.0004019158  
## predicted class=4 expected loss=0.6807018 P(node) =0.008482143  
## class counts: 0 0 21 35 91 2 10 47 12 67  
## probabilities: 0.000 0.000 0.074 0.123 0.319 0.007 0.035 0.165 0.042 0.235   
## left son=472 (155 obs) right son=473 (130 obs)  
## Primary splits:  
## dim12 < 0.09046436 to the left, improve=24.41068, (0 missing)  
## dim4 < -0.04361657 to the right, improve=18.27177, (0 missing)  
## dim9 < -0.05019097 to the right, improve=18.01054, (0 missing)  
## dim21 < -0.07045937 to the left, improve=17.04689, (0 missing)  
## dim7 < -0.02900626 to the left, improve=16.29720, (0 missing)  
## Surrogate splits:  
## dim3 < -0.2687496 to the right, agree=0.758, adj=0.469, (0 split)  
## dim9 < -0.1155956 to the right, agree=0.691, adj=0.323, (0 split)  
## dim10 < -0.02497722 to the right, agree=0.684, adj=0.308, (0 split)  
## dim20 < -0.01291843 to the left, agree=0.649, adj=0.231, (0 split)  
## dim23 < -0.01235384 to the left, agree=0.639, adj=0.208, (0 split)  
##   
## Node number 237: 203 observations, complexity param=0.0003014368  
## predicted class=9 expected loss=0.320197 P(node) =0.006041667  
## class counts: 0 0 7 4 36 2 0 13 3 138  
## probabilities: 0.000 0.000 0.034 0.020 0.177 0.010 0.000 0.064 0.015 0.680   
## left son=474 (34 obs) right son=475 (169 obs)  
## Primary splits:  
## dim4 < 0.1320753 to the right, improve=14.557320, (0 missing)  
## dim3 < -0.1781018 to the right, improve=12.460670, (0 missing)  
## dim6 < 0.1882169 to the right, improve=10.224260, (0 missing)  
## dim30 < 0.05851114 to the right, improve= 8.705112, (0 missing)  
## dim29 < 0.006513581 to the left, improve= 8.507278, (0 missing)  
## Surrogate splits:  
## dim29 < -0.04856938 to the left, agree=0.887, adj=0.324, (0 split)  
## dim6 < 0.1954221 to the right, agree=0.872, adj=0.235, (0 split)  
## dim13 < 0.2186532 to the right, agree=0.867, adj=0.206, (0 split)  
## dim25 < 0.1320245 to the right, agree=0.852, adj=0.118, (0 split)  
## dim28 < 0.13684 to the right, agree=0.852, adj=0.118, (0 split)  
##   
## Node number 238: 255 observations, complexity param=0.0002009579  
## predicted class=9 expected loss=0.4901961 P(node) =0.007589286  
## class counts: 0 0 6 17 37 1 14 23 27 130  
## probabilities: 0.000 0.000 0.024 0.067 0.145 0.004 0.055 0.090 0.106 0.510   
## left son=476 (144 obs) right son=477 (111 obs)  
## Primary splits:  
## dim18 < 0.05054347 to the left, improve=17.30965, (0 missing)  
## dim15 < 0.1028804 to the left, improve=13.93042, (0 missing)  
## dim13 < 0.04784459 to the right, improve=12.34551, (0 missing)  
## dim4 < -0.08681461 to the right, improve=11.79706, (0 missing)  
## dim2 < 0.1157319 to the left, improve=11.17837, (0 missing)  
## Surrogate splits:  
## dim8 < 0.1917911 to the left, agree=0.694, adj=0.297, (0 split)  
## dim2 < 0.1305953 to the left, agree=0.671, adj=0.243, (0 split)  
## dim5 < 0.1381217 to the left, agree=0.639, adj=0.171, (0 split)  
## dim15 < 0.09514225 to the left, agree=0.639, adj=0.171, (0 split)  
## dim26 < -0.06158978 to the right, agree=0.639, adj=0.171, (0 split)  
##   
## Node number 239: 1227 observations, complexity param=0.0003014368  
## predicted class=9 expected loss=0.09046455 P(node) =0.03651786  
## class counts: 0 0 0 9 60 0 0 36 6 1116  
## probabilities: 0.000 0.000 0.000 0.007 0.049 0.000 0.000 0.029 0.005 0.910   
## left son=478 (24 obs) right son=479 (1203 obs)  
## Primary splits:  
## dim9 < 0.2297447 to the right, improve=32.632840, (0 missing)  
## dim1 < 0.4801677 to the left, improve=19.711680, (0 missing)  
## dim12 < 0.2936382 to the right, improve=16.664050, (0 missing)  
## dim11 < -0.2824868 to the left, improve=10.683670, (0 missing)  
## dim7 < 0.01743061 to the right, improve= 9.325538, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4330017 to the left, agree=0.985, adj=0.250, (0 split)  
## dim14 < 0.208532 to the right, agree=0.981, adj=0.042, (0 split)  
## dim20 < 0.2340421 to the right, agree=0.981, adj=0.042, (0 split)  
##   
## Node number 240: 47 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.1489362 P(node) =0.00139881  
## class counts: 0 0 40 2 0 0 2 3 0 0  
## probabilities: 0.000 0.000 0.851 0.043 0.000 0.000 0.043 0.064 0.000 0.000   
## left son=480 (45 obs) right son=481 (2 obs)  
## Primary splits:  
## dim1 < 0.3363646 to the right, improve=3.440189, (0 missing)  
## dim23 < -0.1869998 to the right, improve=3.440189, (0 missing)  
## dim3 < -0.3037472 to the right, improve=2.351300, (0 missing)  
## dim21 < 0.09281139 to the left, improve=2.351300, (0 missing)  
## dim22 < 0.1197075 to the left, improve=2.351300, (0 missing)  
## Surrogate splits:  
## dim23 < -0.1869998 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 241: 42 observations, complexity param=0.0002009579  
## predicted class=3 expected loss=0.6190476 P(node) =0.00125  
## class counts: 0 0 11 16 0 0 0 5 9 1  
## probabilities: 0.000 0.000 0.262 0.381 0.000 0.000 0.000 0.119 0.214 0.024   
## left son=482 (9 obs) right son=483 (33 obs)  
## Primary splits:  
## dim30 < 0.09167598 to the right, improve=6.031746, (0 missing)  
## dim10 < 0.07135032 to the right, improve=5.403249, (0 missing)  
## dim17 < -0.03904422 to the right, improve=5.113228, (0 missing)  
## dim7 < 0.1650759 to the right, improve=5.053114, (0 missing)  
## dim19 < 0.01238547 to the right, improve=4.933333, (0 missing)  
## Surrogate splits:  
## dim7 < 0.239086 to the right, agree=0.857, adj=0.333, (0 split)  
## dim19 < 0.219027 to the right, agree=0.833, adj=0.222, (0 split)  
## dim2 < -0.1935589 to the left, agree=0.810, adj=0.111, (0 split)  
## dim6 < -0.1459944 to the left, agree=0.810, adj=0.111, (0 split)  
## dim8 < -0.05519331 to the left, agree=0.810, adj=0.111, (0 split)  
##   
## Node number 242: 33 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.3030303 P(node) =0.0009821429  
## class counts: 0 0 2 0 23 0 2 1 1 4  
## probabilities: 0.000 0.000 0.061 0.000 0.697 0.000 0.061 0.030 0.030 0.121   
## left son=484 (27 obs) right son=485 (6 obs)  
## Primary splits:  
## dim27 < 0.006027497 to the left, improve=5.329966, (0 missing)  
## dim14 < -0.0725315 to the right, improve=3.885115, (0 missing)  
## dim13 < -0.1194726 to the left, improve=3.715653, (0 missing)  
## dim4 < -0.01092096 to the right, improve=3.489510, (0 missing)  
## dim30 < -0.07752935 to the right, improve=3.268025, (0 missing)  
## Surrogate splits:  
## dim30 < -0.07752935 to the right, agree=0.939, adj=0.667, (0 split)  
## dim4 < -0.1739084 to the right, agree=0.909, adj=0.500, (0 split)  
## dim14 < -0.0725315 to the right, agree=0.909, adj=0.500, (0 split)  
## dim1 < 0.4971991 to the right, agree=0.879, adj=0.333, (0 split)  
## dim5 < 0.1571057 to the right, agree=0.879, adj=0.333, (0 split)  
##   
## Node number 243: 68 observations, complexity param=0.0001004789  
## predicted class=7 expected loss=0.2941176 P(node) =0.00202381  
## class counts: 0 0 7 1 3 0 1 48 4 4  
## probabilities: 0.000 0.000 0.103 0.015 0.044 0.000 0.015 0.706 0.059 0.059   
## left son=486 (17 obs) right son=487 (51 obs)  
## Primary splits:  
## dim1 < 0.517999 to the left, improve=8.333333, (0 missing)  
## dim2 < 0.05099107 to the right, improve=7.941176, (0 missing)  
## dim5 < 0.2583899 to the right, improve=7.928727, (0 missing)  
## dim26 < -0.0932575 to the left, improve=5.904491, (0 missing)  
## dim9 < -0.1072324 to the left, improve=5.856041, (0 missing)  
## Surrogate splits:  
## dim5 < 0.251286 to the right, agree=0.838, adj=0.353, (0 split)  
## dim8 < 0.1628041 to the right, agree=0.838, adj=0.353, (0 split)  
## dim22 < -0.1331 to the left, agree=0.838, adj=0.353, (0 split)  
## dim4 < 0.08867431 to the right, agree=0.824, adj=0.294, (0 split)  
## dim26 < -0.09363179 to the left, agree=0.824, adj=0.294, (0 split)  
##   
## Node number 244: 99 observations, complexity param=0.0002009579  
## predicted class=4 expected loss=0.2828283 P(node) =0.002946429  
## class counts: 0 0 1 0 71 1 16 1 3 6  
## probabilities: 0.000 0.000 0.010 0.000 0.717 0.010 0.162 0.010 0.030 0.061   
## left son=488 (71 obs) right son=489 (28 obs)  
## Primary splits:  
## dim29 < 0.02546032 to the left, improve=11.208290, (0 missing)  
## dim30 < -0.1075102 to the right, improve=10.432320, (0 missing)  
## dim15 < -0.02284298 to the left, improve= 8.304169, (0 missing)  
## dim28 < -0.05028053 to the right, improve= 7.768343, (0 missing)  
## dim1 < 0.3481352 to the right, improve= 7.687120, (0 missing)  
## Surrogate splits:  
## dim5 < 0.3364736 to the left, agree=0.859, adj=0.500, (0 split)  
## dim30 < -0.06749695 to the right, agree=0.828, adj=0.393, (0 split)  
## dim15 < 0.01728322 to the left, agree=0.798, adj=0.286, (0 split)  
## dim6 < -0.06700345 to the right, agree=0.788, adj=0.250, (0 split)  
## dim9 < 0.08357804 to the left, agree=0.778, adj=0.214, (0 split)  
##   
## Node number 245: 22 observations, complexity param=6.698597e-05  
## predicted class=9 expected loss=0.5 P(node) =0.0006547619  
## class counts: 1 0 0 0 4 0 2 4 0 11  
## probabilities: 0.045 0.000 0.000 0.000 0.182 0.000 0.091 0.182 0.000 0.500   
## left son=490 (11 obs) right son=491 (11 obs)  
## Primary splits:  
## dim25 < 0.07201051 to the left, improve=2.818182, (0 missing)  
## dim6 < 0.07657366 to the left, improve=2.693182, (0 missing)  
## dim29 < 0.01562265 to the right, improve=2.675325, (0 missing)  
## dim27 < -0.03156417 to the left, improve=2.526515, (0 missing)  
## dim10 < -0.07229057 to the left, improve=2.518182, (0 missing)  
## Surrogate splits:  
## dim6 < 0.05599163 to the left, agree=0.818, adj=0.636, (0 split)  
## dim18 < -0.01819117 to the left, agree=0.773, adj=0.545, (0 split)  
## dim3 < -0.2051273 to the right, agree=0.727, adj=0.455, (0 split)  
## dim4 < -0.1065914 to the right, agree=0.727, adj=0.455, (0 split)  
## dim14 < -0.02152109 to the right, agree=0.727, adj=0.455, (0 split)  
##   
## Node number 246: 19 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.1578947 P(node) =0.0005654762  
## class counts: 0 0 0 0 16 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.842 0.000 0.000 0.000 0.000 0.158   
## left son=492 (16 obs) right son=493 (3 obs)  
## Primary splits:  
## dim4 < -0.05564234 to the right, improve=5.052632, (0 missing)  
## dim16 < -0.0235773 to the right, improve=5.052632, (0 missing)  
## dim20 < -0.06514166 to the right, improve=5.052632, (0 missing)  
## dim14 < -0.09930982 to the right, improve=3.170279, (0 missing)  
## dim23 < 0.04967058 to the left, improve=3.170279, (0 missing)  
## Surrogate splits:  
## dim16 < -0.0235773 to the right, agree=1.000, adj=1.000, (0 split)  
## dim20 < -0.06514166 to the right, agree=1.000, adj=1.000, (0 split)  
## dim14 < -0.09930982 to the right, agree=0.947, adj=0.667, (0 split)  
## dim23 < 0.04967058 to the left, agree=0.947, adj=0.667, (0 split)  
## dim8 < 0.1507723 to the left, agree=0.895, adj=0.333, (0 split)  
##   
## Node number 247: 201 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.1044776 P(node) =0.005982143  
## class counts: 0 0 4 0 6 0 0 8 3 180  
## probabilities: 0.000 0.000 0.020 0.000 0.030 0.000 0.000 0.040 0.015 0.896   
## left son=494 (5 obs) right son=495 (196 obs)  
## Primary splits:  
## dim13 < 0.1399804 to the right, improve=6.467753, (0 missing)  
## dim9 < -0.1801284 to the left, improve=5.406302, (0 missing)  
## dim18 < -0.09510905 to the left, improve=5.324394, (0 missing)  
## dim30 < 0.07320474 to the right, improve=5.189208, (0 missing)  
## dim4 < 0.1273955 to the right, improve=4.968769, (0 missing)  
## Surrogate splits:  
## dim28 < -0.1160095 to the left, agree=0.985, adj=0.4, (0 split)  
##   
## Node number 248: 113 observations  
## predicted class=1 expected loss=0 P(node) =0.003363095  
## class counts: 0 113 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 249: 2 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 1 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500   
## left son=498 (1 obs) right son=499 (1 obs)  
## Primary splits:  
## dim1 < 0.5818313 to the right, improve=1, (0 missing)  
## dim2 < -0.07053906 to the right, improve=1, (0 missing)  
## dim3 < -0.1391649 to the right, improve=1, (0 missing)  
## dim4 < -0.1797904 to the right, improve=1, (0 missing)  
## dim5 < -0.07240591 to the right, improve=1, (0 missing)  
##   
## Node number 250: 270 observations, complexity param=0.001892354  
## predicted class=9 expected loss=0.5555556 P(node) =0.008035714  
## class counts: 0 1 0 2 94 8 0 21 24 120  
## probabilities: 0.000 0.004 0.000 0.007 0.348 0.030 0.000 0.078 0.089 0.444   
## left son=500 (80 obs) right son=501 (190 obs)  
## Primary splits:  
## dim14 < 0.1120723 to the right, improve=39.13036, (0 missing)  
## dim28 < 0.03724755 to the right, improve=23.32739, (0 missing)  
## dim5 < -0.02617604 to the right, improve=22.72905, (0 missing)  
## dim1 < 0.5292683 to the left, improve=22.04074, (0 missing)  
## dim26 < -0.02758002 to the right, improve=21.46028, (0 missing)  
## Surrogate splits:  
## dim11 < 0.2235892 to the right, agree=0.804, adj=0.337, (0 split)  
## dim2 < 0.3219424 to the right, agree=0.767, adj=0.213, (0 split)  
## dim1 < 0.5131351 to the left, agree=0.741, adj=0.125, (0 split)  
## dim18 < -0.1192924 to the left, agree=0.737, adj=0.112, (0 split)  
## dim10 < -0.207922 to the left, agree=0.733, adj=0.100, (0 split)  
##   
## Node number 251: 426 observations, complexity param=0.0006196202  
## predicted class=7 expected loss=0.4014085 P(node) =0.01267857  
## class counts: 0 5 11 10 8 13 0 255 46 78  
## probabilities: 0.000 0.012 0.026 0.023 0.019 0.031 0.000 0.599 0.108 0.183   
## left son=502 (229 obs) right son=503 (197 obs)  
## Primary splits:  
## dim7 < 0.1372744 to the right, improve=36.24090, (0 missing)  
## dim27 < 0.001209808 to the left, improve=29.74322, (0 missing)  
## dim15 < -0.0567877 to the right, improve=26.14747, (0 missing)  
## dim6 < 0.1458953 to the right, improve=25.44839, (0 missing)  
## dim19 < -0.008593833 to the right, improve=24.41832, (0 missing)  
## Surrogate splits:  
## dim27 < 3.161089e-05 to the left, agree=0.690, adj=0.330, (0 split)  
## dim19 < -0.004057062 to the right, agree=0.674, adj=0.294, (0 split)  
## dim9 < -0.1007395 to the right, agree=0.646, adj=0.234, (0 split)  
## dim16 < 0.01469256 to the left, agree=0.646, adj=0.234, (0 split)  
## dim1 < 0.6410064 to the left, agree=0.629, adj=0.198, (0 split)  
##   
## Node number 252: 16 observations  
## predicted class=1 expected loss=0 P(node) =0.0004761905  
## class counts: 0 16 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 253: 4 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.75 P(node) =0.0001190476  
## class counts: 0 0 1 1 0 0 0 1 0 1  
## probabilities: 0.000 0.000 0.250 0.250 0.000 0.000 0.000 0.250 0.000 0.250   
## left son=506 (2 obs) right son=507 (2 obs)  
## Primary splits:  
## dim1 < 0.5407099 to the right, improve=1, (0 missing)  
## dim2 < 0.04015509 to the right, improve=1, (0 missing)  
## dim3 < -0.1397141 to the right, improve=1, (0 missing)  
## dim4 < -0.1277391 to the right, improve=1, (0 missing)  
## dim5 < -0.2611234 to the right, improve=1, (0 missing)  
## Surrogate splits:  
## dim6 < -0.2494295 to the left, agree=1, adj=1, (0 split)  
## dim7 < 0.0947959 to the left, agree=1, adj=1, (0 split)  
## dim8 < -0.0435851 to the left, agree=1, adj=1, (0 split)  
## dim12 < 0.04210164 to the left, agree=1, adj=1, (0 split)  
## dim19 < 0.022661 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 254: 2475 observations, complexity param=0.0001786292  
## predicted class=7 expected loss=0.05818182 P(node) =0.07366071  
## class counts: 0 1 24 16 14 5 1 2331 14 69  
## probabilities: 0.000 0.000 0.010 0.006 0.006 0.002 0.000 0.942 0.006 0.028   
## left son=508 (13 obs) right son=509 (2462 obs)  
## Primary splits:  
## dim4 < -0.408076 to the left, improve=14.667450, (0 missing)  
## dim3 < -0.1669371 to the right, improve=12.524920, (0 missing)  
## dim5 < 0.02084559 to the right, improve=11.690360, (0 missing)  
## dim28 < 0.185552 to the right, improve= 9.528685, (0 missing)  
## dim11 < 0.2282539 to the right, improve= 9.215040, (0 missing)  
##   
## Node number 255: 61 observations, complexity param=0.0001786292  
## predicted class=7 expected loss=0.5409836 P(node) =0.001815476  
## class counts: 2 0 1 1 5 2 0 28 0 22  
## probabilities: 0.033 0.000 0.016 0.016 0.082 0.033 0.000 0.459 0.000 0.361   
## left son=510 (16 obs) right son=511 (45 obs)  
## Primary splits:  
## dim14 < 0.1774365 to the right, improve=9.372678, (0 missing)  
## dim1 < 0.4926107 to the left, improve=8.145610, (0 missing)  
## dim9 < 0.1349919 to the right, improve=8.068249, (0 missing)  
## dim24 < -0.006564609 to the right, improve=7.807086, (0 missing)  
## dim19 < -0.1842229 to the right, improve=6.384025, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4835803 to the left, agree=0.885, adj=0.562, (0 split)  
## dim24 < 0.05616742 to the right, agree=0.869, adj=0.500, (0 split)  
## dim7 < 0.1881658 to the right, agree=0.803, adj=0.250, (0 split)  
## dim29 < 0.08024652 to the right, agree=0.803, adj=0.250, (0 split)  
## dim9 < 0.188021 to the right, agree=0.787, adj=0.187, (0 split)  
##   
## Node number 256: 2795 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.01502683 P(node) =0.08318452  
## class counts: 0 2753 3 0 1 0 2 10 20 6  
## probabilities: 0.000 0.985 0.001 0.000 0.000 0.000 0.001 0.004 0.007 0.002   
## left son=512 (2792 obs) right son=513 (3 obs)  
## Primary splits:  
## dim13 < 0.247675 to the left, improve=4.559390, (0 missing)  
## dim22 < 0.2134169 to the left, improve=4.546496, (0 missing)  
## dim16 < -0.1799683 to the right, improve=3.928985, (0 missing)  
## dim18 < -0.1974817 to the right, improve=3.928985, (0 missing)  
## dim19 < 0.147629 to the left, improve=3.380083, (0 missing)  
##   
## Node number 257: 3 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 2 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.667 0.000 0.333   
## left son=514 (2 obs) right son=515 (1 obs)  
## Primary splits:  
## dim1 < 0.6651108 to the left, improve=1.333333, (0 missing)  
## dim2 < -0.4122751 to the left, improve=1.333333, (0 missing)  
## dim4 < -0.1465433 to the right, improve=1.333333, (0 missing)  
## dim5 < -0.1968758 to the right, improve=1.333333, (0 missing)  
## dim6 < -0.08759841 to the right, improve=1.333333, (0 missing)  
##   
## Node number 258: 20 observations, complexity param=5.023947e-05  
## predicted class=1 expected loss=0.3 P(node) =0.0005952381  
## class counts: 0 14 1 1 0 1 0 0 3 0  
## probabilities: 0.000 0.700 0.050 0.050 0.000 0.050 0.000 0.000 0.150 0.000   
## left son=516 (16 obs) right son=517 (4 obs)  
## Primary splits:  
## dim2 < -0.4127867 to the left, improve=3.100000, (0 missing)  
## dim16 < 0.05593714 to the left, improve=2.972549, (0 missing)  
## dim20 < 0.1154912 to the left, improve=2.972549, (0 missing)  
## dim10 < 0.06805834 to the left, improve=2.933333, (0 missing)  
## dim15 < -0.1038797 to the right, improve=2.711111, (0 missing)  
## Surrogate splits:  
## dim13 < -0.1171249 to the right, agree=0.95, adj=0.75, (0 split)  
## dim8 < -0.07239768 to the right, agree=0.90, adj=0.50, (0 split)  
## dim3 < 0.1688169 to the left, agree=0.85, adj=0.25, (0 split)  
## dim4 < -0.02898287 to the right, agree=0.85, adj=0.25, (0 split)  
## dim10 < 0.140871 to the left, agree=0.85, adj=0.25, (0 split)  
##   
## Node number 259: 5 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.2 P(node) =0.0001488095  
## class counts: 0 0 0 1 0 0 0 0 4 0  
## probabilities: 0.000 0.000 0.000 0.200 0.000 0.000 0.000 0.000 0.800 0.000   
## left son=518 (1 obs) right son=519 (4 obs)  
## Primary splits:  
## dim1 < 0.638089 to the right, improve=1.6, (0 missing)  
## dim3 < 0.07371711 to the left, improve=1.6, (0 missing)  
## dim6 < 0.2280967 to the right, improve=1.6, (0 missing)  
## dim15 < -0.0979284 to the left, improve=1.6, (0 missing)  
## dim16 < -0.05303055 to the right, improve=1.6, (0 missing)  
##   
## Node number 260: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 261: 2 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 1 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500   
## left son=522 (1 obs) right son=523 (1 obs)  
## Primary splits:  
## dim1 < 0.5073357 to the right, improve=1, (0 missing)  
## dim2 < -0.4201466 to the right, improve=1, (0 missing)  
## dim3 < -0.06325429 to the right, improve=1, (0 missing)  
## dim4 < -0.04287858 to the right, improve=1, (0 missing)  
## dim5 < -0.07059928 to the right, improve=1, (0 missing)  
##   
## Node number 272: 25 observations  
## predicted class=1 expected loss=0 P(node) =0.0007440476  
## class counts: 0 25 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 273: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 274: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 275: 5 observations  
## predicted class=9 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 276: 5 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 1 0 3 0 0 0 1 0 0  
## probabilities: 0.000 0.200 0.000 0.600 0.000 0.000 0.000 0.200 0.000 0.000   
## left son=552 (3 obs) right son=553 (2 obs)  
## Primary splits:  
## dim4 < 0.04315444 to the left, improve=1.8, (0 missing)  
## dim7 < 0.1237944 to the left, improve=1.8, (0 missing)  
## dim14 < -0.004668604 to the left, improve=1.8, (0 missing)  
## dim19 < -0.1218467 to the left, improve=1.8, (0 missing)  
## dim30 < -0.115455 to the left, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim3 < -0.002871773 to the right, agree=1, adj=1, (0 split)  
## dim7 < 0.1237944 to the left, agree=1, adj=1, (0 split)  
## dim9 < 0.07387444 to the right, agree=1, adj=1, (0 split)  
## dim11 < 0.0007479781 to the right, agree=1, adj=1, (0 split)  
## dim14 < -0.004668604 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 277: 3 observations  
## predicted class=5 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 3 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 304: 9 observations  
## predicted class=1 expected loss=0 P(node) =0.0002678571  
## class counts: 0 9 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 305: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 308: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 309: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 320: 288 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.003472222 P(node) =0.008571429  
## class counts: 0 287 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.997 0.000 0.000 0.000 0.000 0.000 0.000 0.003 0.000   
## left son=640 (287 obs) right son=641 (1 obs)  
## Primary splits:  
## dim24 < 0.1371699 to the left, improve=1.9930560, (0 missing)  
## dim18 < -0.1596526 to the right, improve=0.9930556, (0 missing)  
## dim27 < 0.1229417 to the left, improve=0.9930556, (0 missing)  
## dim9 < -0.2248851 to the right, improve=0.6597222, (0 missing)  
## dim15 < -0.1209771 to the right, improve=0.4930556, (0 missing)  
##   
## Node number 321: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 322: 1 observations  
## predicted class=2 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 323: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 332: 10 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.1 P(node) =0.000297619  
## class counts: 0 9 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.900 0.000 0.000 0.100 0.000 0.000 0.000 0.000 0.000   
## left son=664 (9 obs) right son=665 (1 obs)  
## Primary splits:  
## dim1 < 0.6502259 to the left, improve=1.8, (0 missing)  
## dim2 < -0.3491021 to the left, improve=1.8, (0 missing)  
## dim8 < 0.2699101 to the left, improve=1.8, (0 missing)  
## dim30 < 0.0111026 to the left, improve=1.8, (0 missing)  
## dim7 < -0.07827184 to the right, improve=1.8, (0 missing)  
##   
## Node number 333: 8 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.5 P(node) =0.0002380952  
## class counts: 0 1 0 4 1 2 0 0 0 0  
## probabilities: 0.000 0.125 0.000 0.500 0.125 0.250 0.000 0.000 0.000 0.000   
## left son=666 (4 obs) right son=667 (4 obs)  
## Primary splits:  
## dim8 < -0.1096449 to the left, improve=2.75, (0 missing)  
## dim6 < 0.1050061 to the right, improve=2.75, (0 missing)  
## dim21 < -0.03396035 to the left, improve=2.75, (0 missing)  
## dim24 < -0.002143295 to the right, improve=2.75, (0 missing)  
## dim14 < -0.01946223 to the right, improve=2.75, (0 missing)  
## Surrogate splits:  
## dim6 < 0.1050061 to the right, agree=1.000, adj=1.00, (0 split)  
## dim14 < -0.01946223 to the right, agree=1.000, adj=1.00, (0 split)  
## dim21 < -0.03396035 to the left, agree=1.000, adj=1.00, (0 split)  
## dim24 < -0.002143295 to the right, agree=1.000, adj=1.00, (0 split)  
## dim7 < 0.00949298 to the left, agree=0.875, adj=0.75, (0 split)  
##   
## Node number 344: 3 observations  
## predicted class=3 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 3 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 345: 6 observations, complexity param=5.582164e-05  
## predicted class=1 expected loss=0.6666667 P(node) =0.0001785714  
## class counts: 0 2 1 0 0 2 0 0 1 0  
## probabilities: 0.000 0.333 0.167 0.000 0.000 0.333 0.000 0.000 0.167 0.000   
## left son=690 (4 obs) right son=691 (2 obs)  
## Primary splits:  
## dim1 < 0.6283043 to the left, improve=1.833333, (0 missing)  
## dim10 < 0.1131675 to the left, improve=1.833333, (0 missing)  
## dim22 < 0.1415385 to the left, improve=1.833333, (0 missing)  
## dim9 < 0.007662378 to the right, improve=1.833333, (0 missing)  
## dim30 < 0.05080259 to the left, improve=1.833333, (0 missing)  
## Surrogate splits:  
## dim10 < 0.1131675 to the left, agree=1, adj=1, (0 split)  
## dim12 < -0.09536237 to the right, agree=1, adj=1, (0 split)  
## dim17 < -0.08381384 to the right, agree=1, adj=1, (0 split)  
## dim20 < 0.1294046 to the left, agree=1, adj=1, (0 split)  
## dim22 < 0.1415385 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 374: 9 observations, complexity param=7.815029e-05  
## predicted class=8 expected loss=0.5555556 P(node) =0.0002678571  
## class counts: 0 0 3 0 1 0 1 0 4 0  
## probabilities: 0.000 0.000 0.333 0.000 0.111 0.000 0.111 0.000 0.444 0.000   
## left son=748 (5 obs) right son=749 (4 obs)  
## Primary splits:  
## dim5 < 0.2078733 to the right, improve=3.2, (0 missing)  
## dim29 < 0.008327932 to the right, improve=3.0, (0 missing)  
## dim14 < 0.04870606 to the left, improve=2.0, (0 missing)  
## dim16 < -0.01234662 to the right, improve=2.0, (0 missing)  
## dim13 < 0.00542866 to the left, improve=1.9, (0 missing)  
## Surrogate splits:  
## dim13 < 0.00542866 to the left, agree=0.889, adj=0.75, (0 split)  
## dim14 < 0.04870606 to the left, agree=0.889, adj=0.75, (0 split)  
## dim15 < 0.05878433 to the right, agree=0.889, adj=0.75, (0 split)  
## dim16 < -0.01234662 to the right, agree=0.889, adj=0.75, (0 split)  
## dim1 < 0.5840859 to the left, agree=0.778, adj=0.50, (0 split)  
##   
## Node number 375: 3 observations  
## predicted class=7 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 376: 9 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.4444444 P(node) =0.0002678571  
## class counts: 0 2 1 5 0 0 0 1 0 0  
## probabilities: 0.000 0.222 0.111 0.556 0.000 0.000 0.000 0.111 0.000 0.000   
## left son=752 (4 obs) right son=753 (5 obs)  
## Primary splits:  
## dim24 < 0.0008028562 to the left, improve=3.055556, (0 missing)  
## dim3 < -0.1156248 to the right, improve=2.555556, (0 missing)  
## dim22 < -0.06008911 to the right, improve=2.555556, (0 missing)  
## dim7 < 0.2166422 to the right, improve=2.555556, (0 missing)  
## dim17 < 0.07232576 to the right, improve=2.555556, (0 missing)  
## Surrogate splits:  
## dim3 < -0.1156248 to the left, agree=0.889, adj=0.75, (0 split)  
## dim7 < 0.2166422 to the right, agree=0.889, adj=0.75, (0 split)  
## dim14 < -0.06700044 to the left, agree=0.889, adj=0.75, (0 split)  
## dim17 < 0.07232576 to the right, agree=0.889, adj=0.75, (0 split)  
## dim19 < 0.009685878 to the right, agree=0.889, adj=0.75, (0 split)  
##   
## Node number 377: 20 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.1 P(node) =0.0005952381  
## class counts: 0 0 1 0 0 0 0 18 0 1  
## probabilities: 0.000 0.000 0.050 0.000 0.000 0.000 0.000 0.900 0.000 0.050   
## left son=754 (2 obs) right son=755 (18 obs)  
## Primary splits:  
## dim9 < 0.02710684 to the right, improve=2.700000, (0 missing)  
## dim17 < 0.1109827 to the right, improve=2.700000, (0 missing)  
## dim6 < -0.009262509 to the left, improve=1.805263, (0 missing)  
## dim24 < -0.09161723 to the right, improve=1.805263, (0 missing)  
## dim29 < -0.08461064 to the left, improve=1.805263, (0 missing)  
## Surrogate splits:  
## dim17 < 0.1109827 to the right, agree=1.00, adj=1.0, (0 split)  
## dim18 < 0.08614486 to the right, agree=0.95, adj=0.5, (0 split)  
## dim30 < 0.01577091 to the left, agree=0.95, adj=0.5, (0 split)  
##   
## Node number 378: 34 observations, complexity param=0.0002009579  
## predicted class=8 expected loss=0.6764706 P(node) =0.001011905  
## class counts: 0 1 0 7 5 4 2 1 11 3  
## probabilities: 0.000 0.029 0.000 0.206 0.147 0.118 0.059 0.029 0.324 0.088   
## left son=756 (20 obs) right son=757 (14 obs)  
## Primary splits:  
## dim4 < 0.1299463 to the left, improve=5.710084, (0 missing)  
## dim9 < 0.01599455 to the right, improve=5.213747, (0 missing)  
## dim18 < 0.04827405 to the left, improve=5.028831, (0 missing)  
## dim16 < -0.01495753 to the right, improve=4.896801, (0 missing)  
## dim8 < 0.02045956 to the right, improve=4.811275, (0 missing)  
## Surrogate splits:  
## dim13 < 0.03370276 to the left, agree=0.853, adj=0.643, (0 split)  
## dim24 < -0.03388183 to the right, agree=0.824, adj=0.571, (0 split)  
## dim3 < 0.04463678 to the left, agree=0.794, adj=0.500, (0 split)  
## dim18 < 0.04827405 to the left, agree=0.794, adj=0.500, (0 split)  
## dim10 < 0.009166906 to the left, agree=0.765, adj=0.429, (0 split)  
##   
## Node number 379: 28 observations, complexity param=6.698597e-05  
## predicted class=9 expected loss=0.1785714 P(node) =0.0008333333  
## class counts: 0 1 0 0 1 0 0 3 0 23  
## probabilities: 0.000 0.036 0.000 0.000 0.036 0.000 0.000 0.107 0.000 0.821   
## left son=758 (5 obs) right son=759 (23 obs)  
## Primary splits:  
## dim13 < -0.04305578 to the left, improve=4.001242, (0 missing)  
## dim5 < -0.03730699 to the right, improve=3.857143, (0 missing)  
## dim14 < 0.003223127 to the right, improve=3.620952, (0 missing)  
## dim18 < -0.0763658 to the left, improve=3.620952, (0 missing)  
## dim29 < -0.07243073 to the left, improve=3.201242, (0 missing)  
## Surrogate splits:  
## dim18 < -0.03838054 to the left, agree=0.964, adj=0.8, (0 split)  
## dim2 < -0.3455838 to the right, agree=0.893, adj=0.4, (0 split)  
## dim5 < -0.05820912 to the right, agree=0.893, adj=0.4, (0 split)  
## dim8 < -0.04605869 to the left, agree=0.893, adj=0.4, (0 split)  
## dim11 < -0.1473662 to the left, agree=0.893, adj=0.4, (0 split)  
##   
## Node number 380: 5 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 1 0 3 0 0 0 0 1 0  
## probabilities: 0.000 0.200 0.000 0.600 0.000 0.000 0.000 0.000 0.200 0.000   
## left son=760 (3 obs) right son=761 (2 obs)  
## Primary splits:  
## dim1 < 0.5847098 to the left, improve=1.8, (0 missing)  
## dim22 < -0.01217831 to the left, improve=1.8, (0 missing)  
## dim6 < -0.1701037 to the left, improve=1.8, (0 missing)  
## dim13 < 0.01688279 to the left, improve=1.8, (0 missing)  
## dim25 < 0.04027015 to the left, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim6 < -0.1701037 to the left, agree=1, adj=1, (0 split)  
## dim7 < 0.02271955 to the right, agree=1, adj=1, (0 split)  
## dim12 < 0.122888 to the right, agree=1, adj=1, (0 split)  
## dim13 < 0.01688279 to the left, agree=1, adj=1, (0 split)  
## dim15 < -0.09792528 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 381: 4 observations  
## predicted class=6 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 0 0 0 4 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 382: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.500 0.000 0.000 0.000 0.000 0.000   
## left son=764 (1 obs) right son=765 (1 obs)  
## Primary splits:  
## dim1 < 0.5918837 to the right, improve=1, (0 missing)  
## dim2 < -0.3608322 to the left, improve=1, (0 missing)  
## dim3 < -0.05686963 to the right, improve=1, (0 missing)  
## dim4 < -0.166641 to the left, improve=1, (0 missing)  
## dim5 < -0.02255418 to the left, improve=1, (0 missing)  
##   
## Node number 383: 54 observations  
## predicted class=8 expected loss=0 P(node) =0.001607143  
## class counts: 0 0 0 0 0 0 0 0 54 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 384: 2155 observations, complexity param=8.373246e-05  
## predicted class=0 expected loss=0.03433875 P(node) =0.0641369  
## class counts: 2081 0 14 2 1 19 18 4 12 4  
## probabilities: 0.966 0.000 0.006 0.001 0.000 0.009 0.008 0.002 0.006 0.002   
## left son=768 (2148 obs) right son=769 (7 obs)  
## Primary splits:  
## dim16 < -0.1882304 to the right, improve=8.055245, (0 missing)  
## dim11 < 0.2627095 to the left, improve=7.700667, (0 missing)  
## dim5 < -0.01671332 to the left, improve=5.438989, (0 missing)  
## dim20 < 0.08152494 to the left, improve=5.216833, (0 missing)  
## dim8 < -0.2140462 to the right, improve=5.029100, (0 missing)  
##   
## Node number 385: 378 observations, complexity param=0.0001786292  
## predicted class=0 expected loss=0.2857143 P(node) =0.01125  
## class counts: 270 0 30 1 0 50 8 0 14 5  
## probabilities: 0.714 0.000 0.079 0.003 0.000 0.132 0.021 0.000 0.037 0.013   
## left son=770 (290 obs) right son=771 (88 obs)  
## Primary splits:  
## dim5 < -0.04971929 to the left, improve=23.74091, (0 missing)  
## dim10 < 0.003501366 to the right, improve=23.48706, (0 missing)  
## dim4 < -0.1454664 to the right, improve=23.26974, (0 missing)  
## dim20 < 0.09079005 to the left, improve=23.14392, (0 missing)  
## dim14 < 0.03823505 to the left, improve=19.78296, (0 missing)  
## Surrogate splits:  
## dim8 < -0.1254734 to the right, agree=0.804, adj=0.159, (0 split)  
## dim11 < 0.1842429 to the left, agree=0.802, adj=0.148, (0 split)  
## dim16 < 0.1209957 to the left, agree=0.796, adj=0.125, (0 split)  
## dim23 < 0.1224054 to the left, agree=0.794, adj=0.114, (0 split)  
## dim10 < -0.1682172 to the right, agree=0.783, adj=0.068, (0 split)  
##   
## Node number 386: 51 observations, complexity param=6.698597e-05  
## predicted class=0 expected loss=0.1960784 P(node) =0.001517857  
## class counts: 41 0 4 0 0 2 2 0 2 0  
## probabilities: 0.804 0.000 0.078 0.000 0.000 0.039 0.039 0.000 0.039 0.000   
## left son=772 (42 obs) right son=773 (9 obs)  
## Primary splits:  
## dim28 < -0.06881585 to the right, improve=6.744164, (0 missing)  
## dim2 < 0.2541435 to the right, improve=5.388982, (0 missing)  
## dim8 < -0.07602535 to the right, improve=4.933674, (0 missing)  
## dim11 < 0.1516473 to the left, improve=4.781863, (0 missing)  
## dim5 < 0.2533656 to the left, improve=4.511473, (0 missing)  
## Surrogate splits:  
## dim19 < 0.04856055 to the left, agree=0.922, adj=0.556, (0 split)  
## dim2 < 0.2072747 to the right, agree=0.882, adj=0.333, (0 split)  
## dim5 < 0.2658999 to the left, agree=0.882, adj=0.333, (0 split)  
## dim8 < -0.1090715 to the right, agree=0.882, adj=0.333, (0 split)  
## dim9 < 0.1939152 to the left, agree=0.863, adj=0.222, (0 split)  
##   
## Node number 387: 122 observations, complexity param=0.0003014368  
## predicted class=6 expected loss=0.4590164 P(node) =0.003630952  
## class counts: 12 0 8 0 11 5 66 0 14 6  
## probabilities: 0.098 0.000 0.066 0.000 0.090 0.041 0.541 0.000 0.115 0.049   
## left son=774 (49 obs) right son=775 (73 obs)  
## Primary splits:  
## dim6 < -0.03593868 to the right, improve=18.232650, (0 missing)  
## dim12 < 0.07354731 to the left, improve=16.295210, (0 missing)  
## dim14 < 0.01949719 to the left, improve=14.828420, (0 missing)  
## dim5 < 0.2132139 to the left, improve=10.075140, (0 missing)  
## dim7 < 0.0330714 to the right, improve= 9.730011, (0 missing)  
## Surrogate splits:  
## dim14 < -0.01516354 to the left, agree=0.803, adj=0.510, (0 split)  
## dim12 < 0.08024498 to the left, agree=0.779, adj=0.449, (0 split)  
## dim11 < 0.1161929 to the right, agree=0.770, adj=0.429, (0 split)  
## dim26 < 6.423739e-05 to the right, agree=0.754, adj=0.388, (0 split)  
## dim5 < 0.2132139 to the left, agree=0.730, adj=0.327, (0 split)  
##   
## Node number 388: 12 observations  
## predicted class=0 expected loss=0 P(node) =0.0003571429  
## class counts: 12 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 389: 2 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 1 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.500   
## left son=778 (1 obs) right son=779 (1 obs)  
## Primary splits:  
## dim1 < 0.5095096 to the right, improve=1, (0 missing)  
## dim2 < 0.2766683 to the right, improve=1, (0 missing)  
## dim3 < 0.2143442 to the left, improve=1, (0 missing)  
## dim4 < -0.2544126 to the left, improve=1, (0 missing)  
## dim5 < -0.075991 to the right, improve=1, (0 missing)  
##   
## Node number 390: 5 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.4 P(node) =0.0001488095  
## class counts: 3 0 0 0 0 1 0 0 0 1  
## probabilities: 0.600 0.000 0.000 0.000 0.000 0.200 0.000 0.000 0.000 0.200   
## left son=780 (3 obs) right son=781 (2 obs)  
## Primary splits:  
## dim7 < 0.1275904 to the right, improve=1.8, (0 missing)  
## dim16 < -0.07542656 to the right, improve=1.8, (0 missing)  
## dim17 < -0.04567009 to the right, improve=1.8, (0 missing)  
## dim23 < 0.05300678 to the right, improve=1.8, (0 missing)  
## dim30 < -0.1211571 to the right, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim5 < -0.01267834 to the left, agree=1, adj=1, (0 split)  
## dim11 < 0.09749765 to the left, agree=1, adj=1, (0 split)  
## dim12 < -0.08445062 to the left, agree=1, adj=1, (0 split)  
## dim16 < -0.07542656 to the right, agree=1, adj=1, (0 split)  
## dim17 < -0.04567009 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 391: 182 observations, complexity param=3.349298e-05  
## predicted class=5 expected loss=0.02197802 P(node) =0.005416667  
## class counts: 0 0 0 0 0 178 0 1 1 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.978 0.000 0.005 0.005 0.011   
## left son=782 (180 obs) right son=783 (2 obs)  
## Primary splits:  
## dim3 < 0.1163213 to the right, improve=2.912454, (0 missing)  
## dim1 < 0.269166 to the right, improve=1.956469, (0 missing)  
## dim28 < -0.2075046 to the right, improve=1.956469, (0 missing)  
## dim8 < 0.2508121 to the left, improve=1.956469, (0 missing)  
## dim13 < 0.2303344 to the left, improve=1.956469, (0 missing)  
##   
## Node number 392: 233 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.04291845 P(node) =0.006934524  
## class counts: 0 0 0 0 223 0 2 2 0 6  
## probabilities: 0.000 0.000 0.000 0.000 0.957 0.000 0.009 0.009 0.000 0.026   
## left son=784 (230 obs) right son=785 (3 obs)  
## Primary splits:  
## dim5 < 0.4553876 to the left, improve=4.387771, (0 missing)  
## dim6 < -0.09356712 to the right, improve=2.094162, (0 missing)  
## dim25 < 0.08957552 to the left, improve=1.925308, (0 missing)  
## dim9 < 0.2332947 to the left, improve=1.907836, (0 missing)  
## dim13 < 0.2749428 to the left, improve=1.907836, (0 missing)  
##   
## Node number 393: 9 observations, complexity param=8.373246e-05  
## predicted class=9 expected loss=0.4444444 P(node) =0.0002678571  
## class counts: 0 0 0 0 3 1 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.333 0.111 0.000 0.000 0.000 0.556   
## left son=786 (4 obs) right son=787 (5 obs)  
## Primary splits:  
## dim21 < -0.05440453 to the left, improve=3.611111, (0 missing)  
## dim6 < 0.07857294 to the right, improve=3.611111, (0 missing)  
## dim8 < 0.165804 to the right, improve=3.444444, (0 missing)  
## dim12 < -0.0007533578 to the right, improve=3.444444, (0 missing)  
## dim13 < -0.03306262 to the right, improve=2.311111, (0 missing)  
## Surrogate splits:  
## dim6 < 0.07857294 to the right, agree=1.000, adj=1.00, (0 split)  
## dim8 < 0.165804 to the right, agree=0.889, adj=0.75, (0 split)  
## dim12 < -0.0007533578 to the right, agree=0.889, adj=0.75, (0 split)  
## dim13 < -0.03306262 to the right, agree=0.889, adj=0.75, (0 split)  
## dim23 < 0.06239444 to the right, agree=0.889, adj=0.75, (0 split)  
##   
## Node number 394: 15 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.3333333 P(node) =0.0004464286  
## class counts: 1 0 1 0 10 0 2 0 0 1  
## probabilities: 0.067 0.000 0.067 0.000 0.667 0.000 0.133 0.000 0.000 0.067   
## left son=788 (4 obs) right son=789 (11 obs)  
## Primary splits:  
## dim15 < 0.05904761 to the right, improve=3.548485, (0 missing)  
## dim13 < -0.009375813 to the right, improve=3.200000, (0 missing)  
## dim25 < -0.01990332 to the left, improve=3.200000, (0 missing)  
## dim7 < 0.2875027 to the left, improve=3.033333, (0 missing)  
## dim12 < -0.1139289 to the right, improve=2.466667, (0 missing)  
## Surrogate splits:  
## dim12 < -0.1139289 to the right, agree=0.933, adj=0.75, (0 split)  
## dim13 < -0.0201674 to the left, agree=0.933, adj=0.75, (0 split)  
## dim2 < 0.2531763 to the left, agree=0.867, adj=0.50, (0 split)  
## dim3 < 0.08819036 to the right, agree=0.867, adj=0.50, (0 split)  
## dim5 < 0.0367885 to the left, agree=0.867, adj=0.50, (0 split)  
##   
## Node number 395: 13 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.5384615 P(node) =0.0003869048  
## class counts: 0 0 0 1 0 1 0 0 5 6  
## probabilities: 0.000 0.000 0.000 0.077 0.000 0.077 0.000 0.000 0.385 0.462   
## left son=790 (6 obs) right son=791 (7 obs)  
## Primary splits:  
## dim16 < -0.07736741 to the right, improve=4.772894, (0 missing)  
## dim5 < 0.2635957 to the left, improve=3.653846, (0 missing)  
## dim4 < -0.105017 to the left, improve=3.653846, (0 missing)  
## dim12 < -0.1174541 to the left, improve=3.487179, (0 missing)  
## dim7 < 0.065872 to the left, improve=3.439560, (0 missing)  
## Surrogate splits:  
## dim4 < -0.105017 to the left, agree=0.846, adj=0.667, (0 split)  
## dim5 < 0.2635957 to the left, agree=0.846, adj=0.667, (0 split)  
## dim7 < 0.065872 to the left, agree=0.846, adj=0.667, (0 split)  
## dim12 < -0.1174541 to the right, agree=0.846, adj=0.667, (0 split)  
## dim19 < 0.02325668 to the left, agree=0.846, adj=0.667, (0 split)  
##   
## Node number 396: 56 observations, complexity param=0.0001842114  
## predicted class=0 expected loss=0.4821429 P(node) =0.001666667  
## class counts: 29 0 0 0 4 8 1 10 0 4  
## probabilities: 0.518 0.000 0.000 0.000 0.071 0.143 0.018 0.179 0.000 0.071   
## left son=792 (24 obs) right son=793 (32 obs)  
## Primary splits:  
## dim11 < -0.09440959 to the left, improve=10.610120, (0 missing)  
## dim4 < 0.09776539 to the right, improve=10.250000, (0 missing)  
## dim7 < 0.1912285 to the right, improve= 9.696544, (0 missing)  
## dim3 < 0.0160337 to the right, improve= 8.214286, (0 missing)  
## dim1 < 0.2431058 to the right, improve= 7.790816, (0 missing)  
## Surrogate splits:  
## dim4 < 0.1525518 to the right, agree=0.839, adj=0.625, (0 split)  
## dim7 < 0.1912285 to the right, agree=0.839, adj=0.625, (0 split)  
## dim17 < -0.008019805 to the left, agree=0.732, adj=0.375, (0 split)  
## dim8 < 0.2349739 to the left, agree=0.714, adj=0.333, (0 split)  
## dim10 < 0.07181234 to the right, agree=0.696, adj=0.292, (0 split)  
##   
## Node number 397: 148 observations, complexity param=0.0001674649  
## predicted class=6 expected loss=0.05405405 P(node) =0.004404762  
## class counts: 2 0 0 0 6 0 140 0 0 0  
## probabilities: 0.014 0.000 0.000 0.000 0.041 0.000 0.946 0.000 0.000 0.000   
## left son=794 (9 obs) right son=795 (139 obs)  
## Primary splits:  
## dim7 < 0.06567126 to the left, improve=10.852850, (0 missing)  
## dim30 < 0.08668715 to the right, improve= 9.395199, (0 missing)  
## dim21 < -0.1041052 to the left, improve= 7.463964, (0 missing)  
## dim17 < 0.1367784 to the right, improve= 6.539445, (0 missing)  
## dim11 < -0.1596158 to the left, improve= 5.977853, (0 missing)  
## Surrogate splits:  
## dim30 < 0.07140392 to the right, agree=0.973, adj=0.556, (0 split)  
## dim11 < -0.1596158 to the left, agree=0.966, adj=0.444, (0 split)  
## dim21 < -0.1041052 to the left, agree=0.966, adj=0.444, (0 split)  
## dim5 < 0.0792191 to the left, agree=0.959, adj=0.333, (0 split)  
## dim17 < 0.1367784 to the right, agree=0.959, adj=0.333, (0 split)  
##   
## Node number 398: 580 observations, complexity param=0.002411495  
## predicted class=9 expected loss=0.75 P(node) =0.0172619  
## class counts: 75 0 20 8 124 119 27 46 16 145  
## probabilities: 0.129 0.000 0.034 0.014 0.214 0.205 0.047 0.079 0.028 0.250   
## left son=796 (279 obs) right son=797 (301 obs)  
## Primary splits:  
## dim5 < 0.09882696 to the left, improve=47.25624, (0 missing)  
## dim4 < -0.07698138 to the right, improve=42.92527, (0 missing)  
## dim12 < -0.2273198 to the right, improve=32.25317, (0 missing)  
## dim9 < -0.1675592 to the right, improve=32.19001, (0 missing)  
## dim2 < 0.2861616 to the left, improve=30.21161, (0 missing)  
## Surrogate splits:  
## dim11 < 0.02722016 to the left, agree=0.688, adj=0.351, (0 split)  
## dim2 < 0.2790529 to the left, agree=0.664, adj=0.301, (0 split)  
## dim17 < -0.0144249 to the left, agree=0.655, adj=0.283, (0 split)  
## dim4 < -0.07698138 to the left, agree=0.647, adj=0.265, (0 split)  
## dim1 < 0.5385702 to the right, agree=0.645, adj=0.262, (0 split)  
##   
## Node number 399: 99 observations, complexity param=0.0001172254  
## predicted class=7 expected loss=0.1313131 P(node) =0.002946429  
## class counts: 0 0 0 1 2 1 0 86 0 9  
## probabilities: 0.000 0.000 0.000 0.010 0.020 0.010 0.000 0.869 0.000 0.091   
## left son=798 (84 obs) right son=799 (15 obs)  
## Primary splits:  
## dim9 < 0.06613892 to the right, improve=8.623665, (0 missing)  
## dim14 < 0.03194779 to the right, improve=7.933720, (0 missing)  
## dim1 < 0.4018119 to the right, improve=7.768763, (0 missing)  
## dim15 < -0.03874831 to the left, improve=5.395094, (0 missing)  
## dim13 < 0.0903164 to the right, improve=5.352394, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4853364 to the left, agree=0.919, adj=0.467, (0 split)  
## dim13 < 0.02655224 to the right, agree=0.889, adj=0.267, (0 split)  
## dim3 < 0.08594938 to the left, agree=0.879, adj=0.200, (0 split)  
## dim14 < -0.05866998 to the right, agree=0.879, adj=0.200, (0 split)  
## dim15 < -0.03874831 to the left, agree=0.879, adj=0.200, (0 split)  
##   
## Node number 400: 1599 observations, complexity param=0.0004019158  
## predicted class=2 expected loss=0.05378361 P(node) =0.04758929  
## class counts: 1 1 1513 8 2 1 16 25 31 1  
## probabilities: 0.001 0.001 0.946 0.005 0.001 0.001 0.010 0.016 0.019 0.001   
## left son=800 (1586 obs) right son=801 (13 obs)  
## Primary splits:  
## dim7 < 0.3182201 to the left, improve=22.746340, (0 missing)  
## dim6 < 0.3441687 to the left, improve=16.304880, (0 missing)  
## dim9 < -0.09508557 to the right, improve=16.212450, (0 missing)  
## dim22 < 0.1577008 to the left, improve=14.160890, (0 missing)  
## dim3 < 0.002694718 to the right, improve= 8.547668, (0 missing)  
## Surrogate splits:  
## dim1 < 0.2762675 to the right, agree=0.993, adj=0.154, (0 split)  
## dim23 < -0.2248152 to the right, agree=0.992, adj=0.077, (0 split)  
##   
## Node number 401: 116 observations, complexity param=0.0005526342  
## predicted class=2 expected loss=0.5775862 P(node) =0.003452381  
## class counts: 0 1 49 1 0 1 14 1 49 0  
## probabilities: 0.000 0.009 0.422 0.009 0.000 0.009 0.121 0.009 0.422 0.000   
## left son=802 (51 obs) right son=803 (65 obs)  
## Primary splits:  
## dim3 < 0.191498 to the right, improve=19.19545, (0 missing)  
## dim4 < 0.03888517 to the right, improve=18.39700, (0 missing)  
## dim8 < -0.2583646 to the left, improve=15.57098, (0 missing)  
## dim23 < -0.02871257 to the right, improve=15.44206, (0 missing)  
## dim19 < 0.03871864 to the right, improve=15.00042, (0 missing)  
## Surrogate splits:  
## dim19 < 0.04161233 to the right, agree=0.776, adj=0.490, (0 split)  
## dim6 < 0.1550446 to the right, agree=0.672, adj=0.255, (0 split)  
## dim23 < 0.04668715 to the right, agree=0.672, adj=0.255, (0 split)  
## dim28 < 0.05078849 to the right, agree=0.672, adj=0.255, (0 split)  
## dim18 < 0.06567794 to the right, agree=0.664, adj=0.235, (0 split)  
##   
## Node number 402: 594 observations, complexity param=0.0004354088  
## predicted class=2 expected loss=0.3215488 P(node) =0.01767857  
## class counts: 9 7 403 12 55 15 48 10 22 13  
## probabilities: 0.015 0.012 0.678 0.020 0.093 0.025 0.081 0.017 0.037 0.022   
## left son=804 (489 obs) right son=805 (105 obs)  
## Primary splits:  
## dim20 < 0.05988231 to the left, improve=33.16734, (0 missing)  
## dim2 < 0.1267241 to the left, improve=26.45095, (0 missing)  
## dim1 < 0.3783411 to the right, improve=24.04898, (0 missing)  
## dim8 < 0.1100979 to the left, improve=23.33505, (0 missing)  
## dim25 < -0.01807538 to the left, improve=20.82481, (0 missing)  
## Surrogate splits:  
## dim9 < 0.2425702 to the left, agree=0.835, adj=0.067, (0 split)  
## dim19 < 0.1506164 to the left, agree=0.833, adj=0.057, (0 split)  
## dim1 < 0.1288439 to the right, agree=0.830, adj=0.038, (0 split)  
## dim2 < 0.2032527 to the left, agree=0.828, adj=0.029, (0 split)  
## dim26 < -0.1532765 to the right, agree=0.827, adj=0.019, (0 split)  
##   
## Node number 403: 641 observations, complexity param=0.003181833  
## predicted class=6 expected loss=0.4945398 P(node) =0.01907738  
## class counts: 7 97 76 6 42 33 324 10 40 6  
## probabilities: 0.011 0.151 0.119 0.009 0.066 0.051 0.505 0.016 0.062 0.009   
## left son=806 (107 obs) right son=807 (534 obs)  
## Primary splits:  
## dim6 < 0.2680061 to the right, improve=104.49000, (0 missing)  
## dim2 < -0.03496594 to the left, improve= 99.30334, (0 missing)  
## dim7 < 0.03185182 to the left, improve= 93.49110, (0 missing)  
## dim13 < 0.1933191 to the right, improve= 87.73300, (0 missing)  
## dim17 < 0.01310931 to the right, improve= 68.33015, (0 missing)  
## Surrogate splits:  
## dim7 < -0.1619171 to the left, agree=0.920, adj=0.523, (0 split)  
## dim10 < 0.1593018 to the right, agree=0.886, adj=0.318, (0 split)  
## dim2 < -0.2321547 to the left, agree=0.883, adj=0.299, (0 split)  
## dim13 < 0.231247 to the right, agree=0.883, adj=0.299, (0 split)  
## dim28 < 0.1435965 to the right, agree=0.867, adj=0.206, (0 split)  
##   
## Node number 404: 188 observations, complexity param=0.0001674649  
## predicted class=3 expected loss=0.1542553 P(node) =0.005595238  
## class counts: 0 0 5 159 0 1 0 0 15 8  
## probabilities: 0.000 0.000 0.027 0.846 0.000 0.005 0.000 0.000 0.080 0.043   
## left son=808 (165 obs) right son=809 (23 obs)  
## Primary splits:  
## dim14 < 0.01165673 to the left, improve=12.302710, (0 missing)  
## dim16 < 0.1147401 to the left, improve= 7.959925, (0 missing)  
## dim2 < -0.2219238 to the left, improve= 6.829325, (0 missing)  
## dim11 < 0.02706835 to the right, improve= 6.151216, (0 missing)  
## dim24 < 0.02114584 to the right, improve= 5.435229, (0 missing)  
## Surrogate splits:  
## dim11 < -0.08539594 to the right, agree=0.910, adj=0.261, (0 split)  
## dim15 < 0.260901 to the left, agree=0.899, adj=0.174, (0 split)  
## dim22 < -0.1699381 to the right, agree=0.899, adj=0.174, (0 split)  
## dim6 < -0.148329 to the right, agree=0.894, adj=0.130, (0 split)  
## dim16 < 0.2197112 to the left, agree=0.894, adj=0.130, (0 split)  
##   
## Node number 405: 26 observations, complexity param=0.0001339719  
## predicted class=5 expected loss=0.3461538 P(node) =0.0007738095  
## class counts: 0 0 0 3 0 17 0 1 0 5  
## probabilities: 0.000 0.000 0.000 0.115 0.000 0.654 0.000 0.038 0.000 0.192   
## left son=810 (16 obs) right son=811 (10 obs)  
## Primary splits:  
## dim3 < 0.08521822 to the right, improve=7.138462, (0 missing)  
## dim20 < 0.04913135 to the right, improve=5.063462, (0 missing)  
## dim6 < 0.08690466 to the right, improve=4.262271, (0 missing)  
## dim16 < -0.04412304 to the right, improve=4.186081, (0 missing)  
## dim10 < -0.1832084 to the left, improve=3.853613, (0 missing)  
## Surrogate splits:  
## dim20 < 0.04913135 to the right, agree=0.923, adj=0.8, (0 split)  
## dim10 < -0.1832084 to the left, agree=0.885, adj=0.7, (0 split)  
## dim11 < 0.07037637 to the right, agree=0.846, adj=0.6, (0 split)  
## dim6 < 0.08690466 to the left, agree=0.808, adj=0.5, (0 split)  
## dim8 < 0.0659721 to the left, agree=0.808, adj=0.5, (0 split)  
##   
## Node number 406: 153 observations, complexity param=0.0004019158  
## predicted class=2 expected loss=0.1568627 P(node) =0.004553571  
## class counts: 0 0 129 3 0 0 0 1 20 0  
## probabilities: 0.000 0.000 0.843 0.020 0.000 0.000 0.000 0.007 0.131 0.000   
## left son=812 (128 obs) right son=813 (25 obs)  
## Primary splits:  
## dim21 < -0.04010473 to the right, improve=21.261180, (0 missing)  
## dim5 < 0.122278 to the right, improve=11.194080, (0 missing)  
## dim14 < 0.05686244 to the left, improve= 9.602984, (0 missing)  
## dim8 < -0.001065113 to the left, improve= 8.532672, (0 missing)  
## dim16 < 0.207751 to the left, improve= 8.289132, (0 missing)  
## Surrogate splits:  
## dim5 < 0.122278 to the right, agree=0.882, adj=0.28, (0 split)  
## dim19 < -0.07212606 to the right, agree=0.876, adj=0.24, (0 split)  
## dim12 < -0.1175626 to the right, agree=0.869, adj=0.20, (0 split)  
## dim28 < -0.08137718 to the right, agree=0.869, adj=0.20, (0 split)  
## dim14 < 0.1008692 to the left, agree=0.863, adj=0.16, (0 split)  
##   
## Node number 407: 967 observations, complexity param=0.0007033526  
## predicted class=8 expected loss=0.4053775 P(node) =0.02877976  
## class counts: 1 4 90 158 12 88 5 5 575 29  
## probabilities: 0.001 0.004 0.093 0.163 0.012 0.091 0.005 0.005 0.595 0.030   
## left son=814 (508 obs) right son=815 (459 obs)  
## Primary splits:  
## dim21 < -0.05218043 to the right, improve=54.94121, (0 missing)  
## dim14 < -0.05341951 to the left, improve=50.93875, (0 missing)  
## dim1 < 0.5018468 to the left, improve=49.78096, (0 missing)  
## dim8 < -0.189056 to the left, improve=44.21654, (0 missing)  
## dim9 < -0.003422065 to the right, improve=38.92500, (0 missing)  
## Surrogate splits:  
## dim14 < -0.01650825 to the left, agree=0.647, adj=0.257, (0 split)  
## dim7 < -0.009444985 to the right, agree=0.636, adj=0.233, (0 split)  
## dim10 < -0.1288652 to the left, agree=0.634, adj=0.229, (0 split)  
## dim16 < 0.1215647 to the left, agree=0.628, adj=0.216, (0 split)  
## dim1 < 0.5683522 to the left, agree=0.626, adj=0.211, (0 split)  
##   
## Node number 408: 901 observations, complexity param=0.007000033  
## predicted class=0 expected loss=0.5449501 P(node) =0.02681548  
## class counts: 410 0 273 50 5 109 14 20 15 5  
## probabilities: 0.455 0.000 0.303 0.055 0.006 0.121 0.016 0.022 0.017 0.006   
## left son=816 (565 obs) right son=817 (336 obs)  
## Primary splits:  
## dim5 < -0.09327529 to the left, improve=163.32960, (0 missing)  
## dim8 < -0.07108427 to the right, improve=111.38850, (0 missing)  
## dim14 < 0.02372453 to the left, improve= 58.15808, (0 missing)  
## dim24 < 0.07747646 to the left, improve= 51.56168, (0 missing)  
## dim23 < 0.07042351 to the left, improve= 45.37524, (0 missing)  
## Surrogate splits:  
## dim8 < -0.08685887 to the right, agree=0.766, adj=0.372, (0 split)  
## dim24 < 0.07235343 to the left, agree=0.720, adj=0.250, (0 split)  
## dim11 < 0.2046649 to the left, agree=0.705, adj=0.208, (0 split)  
## dim10 < 0.1353665 to the left, agree=0.693, adj=0.176, (0 split)  
## dim7 < 0.00953828 to the left, agree=0.668, adj=0.110, (0 split)  
##   
## Node number 409: 1324 observations, complexity param=0.005358877  
## predicted class=5 expected loss=0.5558912 P(node) =0.03940476  
## class counts: 70 13 102 262 5 588 93 15 167 9  
## probabilities: 0.053 0.010 0.077 0.198 0.004 0.444 0.070 0.011 0.126 0.007   
## left son=818 (523 obs) right son=819 (801 obs)  
## Primary splits:  
## dim8 < 0.002052079 to the left, improve=145.11270, (0 missing)  
## dim16 < 0.0538931 to the left, improve=112.12830, (0 missing)  
## dim6 < 0.05331642 to the right, improve=102.85330, (0 missing)  
## dim13 < 0.03316637 to the left, improve=102.09310, (0 missing)  
## dim15 < 0.08792092 to the right, improve= 78.22017, (0 missing)  
## Surrogate splits:  
## dim13 < 0.01343177 to the left, agree=0.736, adj=0.333, (0 split)  
## dim16 < -0.002755457 to the left, agree=0.726, adj=0.306, (0 split)  
## dim18 < 0.03700342 to the right, agree=0.713, adj=0.273, (0 split)  
## dim1 < 0.5959071 to the right, agree=0.708, adj=0.260, (0 split)  
## dim14 < 0.03312943 to the right, agree=0.708, adj=0.260, (0 split)  
##   
## Node number 410: 2238 observations, complexity param=0.0005023947  
## predicted class=3 expected loss=0.1791778 P(node) =0.06660714  
## class counts: 8 13 50 1837 0 133 1 1 175 20  
## probabilities: 0.004 0.006 0.022 0.821 0.000 0.059 0.000 0.000 0.078 0.009   
## left son=820 (1829 obs) right son=821 (409 obs)  
## Primary splits:  
## dim11 < -0.03794263 to the right, improve=82.25230, (0 missing)  
## dim5 < -0.2792908 to the right, improve=71.71422, (0 missing)  
## dim4 < -0.2423198 to the left, improve=50.31333, (0 missing)  
## dim22 < -0.08645281 to the right, improve=38.00020, (0 missing)  
## dim3 < 0.1404656 to the right, improve=31.92281, (0 missing)  
## Surrogate splits:  
## dim24 < 0.1934894 to the left, agree=0.820, adj=0.015, (0 split)  
## dim1 < 0.7984488 to the left, agree=0.819, adj=0.010, (0 split)  
## dim3 < -0.0686538 to the right, agree=0.819, adj=0.007, (0 split)  
## dim7 < 0.269827 to the left, agree=0.819, adj=0.007, (0 split)  
## dim14 < 0.2580633 to the left, agree=0.819, adj=0.007, (0 split)  
##   
## Node number 411: 490 observations, complexity param=0.001942593  
## predicted class=5 expected loss=0.5408163 P(node) =0.01458333  
## class counts: 50 0 21 144 1 225 1 7 22 19  
## probabilities: 0.102 0.000 0.043 0.294 0.002 0.459 0.002 0.014 0.045 0.039   
## left son=822 (262 obs) right son=823 (228 obs)  
## Primary splits:  
## dim20 < 0.04882051 to the left, improve=52.51708, (0 missing)  
## dim6 < 0.09978884 to the right, improve=44.37230, (0 missing)  
## dim22 < 0.003766963 to the right, improve=30.09661, (0 missing)  
## dim14 < 0.03599463 to the left, improve=17.55236, (0 missing)  
## dim11 < -0.0280112 to the left, improve=17.38754, (0 missing)  
## Surrogate splits:  
## dim17 < 0.02094137 to the left, agree=0.649, adj=0.246, (0 split)  
## dim10 < -0.1798612 to the right, agree=0.643, adj=0.232, (0 split)  
## dim6 < 0.08001975 to the right, agree=0.639, adj=0.224, (0 split)  
## dim3 < 0.2408619 to the left, agree=0.635, adj=0.215, (0 split)  
## dim29 < -0.008760283 to the left, agree=0.635, adj=0.215, (0 split)  
##   
## Node number 412: 598 observations, complexity param=0.0008038316  
## predicted class=5 expected loss=0.2207358 P(node) =0.01779762  
## class counts: 17 0 0 80 0 466 0 0 32 3  
## probabilities: 0.028 0.000 0.000 0.134 0.000 0.779 0.000 0.000 0.054 0.005   
## left son=824 (62 obs) right son=825 (536 obs)  
## Primary splits:  
## dim6 < 0.1987815 to the right, improve=40.93491, (0 missing)  
## dim13 < 0.07166034 to the right, improve=21.77835, (0 missing)  
## dim7 < 0.2308716 to the right, improve=17.78318, (0 missing)  
## dim20 < 0.06494837 to the left, improve=16.64270, (0 missing)  
## dim14 < -0.174265 to the left, improve=14.94212, (0 missing)  
## Surrogate splits:  
## dim7 < 0.2594659 to the right, agree=0.911, adj=0.145, (0 split)  
## dim11 < 0.2472143 to the right, agree=0.905, adj=0.081, (0 split)  
## dim16 < -0.2194352 to the left, agree=0.905, adj=0.081, (0 split)  
## dim1 < 0.2812071 to the left, agree=0.900, adj=0.032, (0 split)  
## dim8 < -0.1799295 to the left, agree=0.900, adj=0.032, (0 split)  
##   
## Node number 413: 623 observations, complexity param=0.002260776  
## predicted class=8 expected loss=0.6613162 P(node) =0.01854167  
## class counts: 82 0 72 28 3 194 25 2 211 6  
## probabilities: 0.132 0.000 0.116 0.045 0.005 0.311 0.040 0.003 0.339 0.010   
## left son=826 (203 obs) right son=827 (420 obs)  
## Primary splits:  
## dim5 < -0.1643139 to the left, improve=64.44546, (0 missing)  
## dim19 < 0.06753874 to the right, improve=49.57409, (0 missing)  
## dim6 < 0.06003811 to the left, improve=48.06963, (0 missing)  
## dim13 < -0.03507763 to the left, improve=47.28674, (0 missing)  
## dim23 < 0.009789579 to the right, improve=38.08501, (0 missing)  
## Surrogate splits:  
## dim19 < 0.08609035 to the right, agree=0.750, adj=0.232, (0 split)  
## dim26 < -0.04416611 to the left, agree=0.719, adj=0.138, (0 split)  
## dim8 < 0.1589114 to the right, agree=0.713, adj=0.118, (0 split)  
## dim13 < -0.08198765 to the left, agree=0.703, adj=0.089, (0 split)  
## dim17 < 0.1190055 to the right, agree=0.692, adj=0.054, (0 split)  
##   
## Node number 414: 212 observations, complexity param=0.0003014368  
## predicted class=5 expected loss=0.1179245 P(node) =0.006309524  
## class counts: 1 1 0 3 0 187 1 0 19 0  
## probabilities: 0.005 0.005 0.000 0.014 0.000 0.882 0.005 0.000 0.090 0.000   
## left son=828 (198 obs) right son=829 (14 obs)  
## Primary splits:  
## dim16 < -0.07399666 to the right, improve=15.504570, (0 missing)  
## dim11 < 0.1435371 to the left, improve=15.056360, (0 missing)  
## dim13 < 0.08563601 to the left, improve= 9.018785, (0 missing)  
## dim5 < -0.3105261 to the left, improve= 7.780843, (0 missing)  
## dim6 < 0.05026328 to the left, improve= 6.210035, (0 missing)  
## Surrogate splits:  
## dim11 < 0.1451229 to the left, agree=0.962, adj=0.429, (0 split)  
## dim23 < -0.176492 to the right, agree=0.943, adj=0.143, (0 split)  
## dim6 < 0.1840033 to the left, agree=0.939, adj=0.071, (0 split)  
##   
## Node number 415: 1765 observations, complexity param=0.002344509  
## predicted class=8 expected loss=0.2640227 P(node) =0.05252976  
## class counts: 2 6 105 198 12 87 5 28 1299 23  
## probabilities: 0.001 0.003 0.059 0.112 0.007 0.049 0.003 0.016 0.736 0.013   
## left son=830 (130 obs) right son=831 (1635 obs)  
## Primary splits:  
## dim4 < -0.2831032 to the left, improve=95.41514, (0 missing)  
## dim13 < -0.01207492 to the left, improve=89.20266, (0 missing)  
## dim1 < 0.5683572 to the left, improve=77.79906, (0 missing)  
## dim6 < 0.2515094 to the right, improve=59.10046, (0 missing)  
## dim3 < 0.2058028 to the right, improve=55.73886, (0 missing)  
## Surrogate splits:  
## dim14 < -0.2081489 to the left, agree=0.934, adj=0.100, (0 split)  
## dim10 < -0.2803671 to the left, agree=0.929, adj=0.031, (0 split)  
## dim6 < -0.1625232 to the left, agree=0.927, adj=0.015, (0 split)  
## dim13 < -0.2305785 to the left, agree=0.927, adj=0.015, (0 split)  
##   
## Node number 416: 210 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.00952381 P(node) =0.00625  
## class counts: 0 208 0 0 1 0 0 0 1 0  
## probabilities: 0.000 0.990 0.000 0.000 0.005 0.000 0.000 0.000 0.005 0.000   
## left son=832 (209 obs) right son=833 (1 obs)  
## Primary splits:  
## dim7 < -0.1458994 to the right, improve=1.980998, (0 missing)  
## dim19 < -0.154206 to the right, improve=1.980998, (0 missing)  
## dim21 < -0.113014 to the right, improve=1.980998, (0 missing)  
## dim24 < -0.1008893 to the right, improve=1.980998, (0 missing)  
## dim8 < 0.2049391 to the left, improve=1.980998, (0 missing)  
##   
## Node number 417: 4 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 1 2 0 0 0 0 0 1 0  
## probabilities: 0.000 0.250 0.500 0.000 0.000 0.000 0.000 0.000 0.250 0.000   
## left son=834 (2 obs) right son=835 (2 obs)  
## Primary splits:  
## dim6 < -0.2081962 to the left, improve=1.5, (0 missing)  
## dim8 < -0.08421422 to the left, improve=1.5, (0 missing)  
## dim2 < -0.120537 to the left, improve=1.5, (0 missing)  
## dim9 < -0.01322099 to the right, improve=1.5, (0 missing)  
## dim15 < 0.168837 to the left, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim2 < -0.120537 to the left, agree=1, adj=1, (0 split)  
## dim8 < -0.08421422 to the left, agree=1, adj=1, (0 split)  
## dim9 < -0.01322099 to the right, agree=1, adj=1, (0 split)  
## dim15 < 0.168837 to the left, agree=1, adj=1, (0 split)  
## dim17 < 0.07152338 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 418: 5 observations  
## predicted class=4 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 5 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 419: 7 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.7142857 P(node) =0.0002083333  
## class counts: 0 0 0 2 0 1 0 1 2 1  
## probabilities: 0.000 0.000 0.000 0.286 0.000 0.143 0.000 0.143 0.286 0.143   
## left son=838 (5 obs) right son=839 (2 obs)  
## Primary splits:  
## dim7 < 0.05690163 to the left, improve=1.828571, (0 missing)  
## dim11 < -0.003381313 to the left, improve=1.828571, (0 missing)  
## dim19 < 0.03810278 to the left, improve=1.828571, (0 missing)  
## dim5 < 0.09571099 to the left, improve=1.828571, (0 missing)  
## dim22 < -0.03113264 to the right, improve=1.828571, (0 missing)  
## Surrogate splits:  
## dim5 < 0.09571099 to the left, agree=1.000, adj=1.0, (0 split)  
## dim11 < -0.003381313 to the left, agree=1.000, adj=1.0, (0 split)  
## dim19 < 0.03810278 to the left, agree=1.000, adj=1.0, (0 split)  
## dim2 < 0.06146022 to the right, agree=0.857, adj=0.5, (0 split)  
## dim16 < 0.05014509 to the left, agree=0.857, adj=0.5, (0 split)  
##   
## Node number 420: 23 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.04347826 P(node) =0.0006845238  
## class counts: 0 1 0 22 0 0 0 0 0 0  
## probabilities: 0.000 0.043 0.000 0.957 0.000 0.000 0.000 0.000 0.000 0.000   
## left son=840 (1 obs) right son=841 (22 obs)  
## Primary splits:  
## dim14 < 0.06696585 to the right, improve=1.9130430, (0 missing)  
## dim15 < 0.25249 to the right, improve=1.9130430, (0 missing)  
## dim29 < 0.1962209 to the right, improve=1.9130430, (0 missing)  
## dim30 < 0.1296027 to the right, improve=1.9130430, (0 missing)  
## dim28 < -0.1381491 to the left, improve=0.9130435, (0 missing)  
##   
## Node number 421: 21 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.7142857 P(node) =0.000625  
## class counts: 0 3 4 6 1 2 0 2 3 0  
## probabilities: 0.000 0.143 0.190 0.286 0.048 0.095 0.000 0.095 0.143 0.000   
## left son=842 (7 obs) right son=843 (14 obs)  
## Primary splits:  
## dim18 < -0.04145748 to the left, improve=3.380952, (0 missing)  
## dim2 < -0.05131195 to the left, improve=3.256277, (0 missing)  
## dim29 < 0.1380459 to the right, improve=2.793651, (0 missing)  
## dim26 < 0.10036 to the left, improve=2.561625, (0 missing)  
## dim10 < 0.0001220639 to the right, improve=2.430403, (0 missing)  
## Surrogate splits:  
## dim16 < -0.04002718 to the left, agree=0.857, adj=0.571, (0 split)  
## dim1 < 0.453701 to the left, agree=0.810, adj=0.429, (0 split)  
## dim7 < 0.1442551 to the right, agree=0.810, adj=0.429, (0 split)  
## dim24 < -0.07375689 to the left, agree=0.810, adj=0.429, (0 split)  
## dim29 < 0.1380459 to the right, agree=0.810, adj=0.429, (0 split)  
##   
## Node number 424: 13 observations, complexity param=0.0001004789  
## predicted class=1 expected loss=0.5384615 P(node) =0.0003869048  
## class counts: 0 6 3 2 0 0 0 0 2 0  
## probabilities: 0.000 0.462 0.231 0.154 0.000 0.000 0.000 0.000 0.154 0.000   
## left son=848 (7 obs) right son=849 (6 obs)  
## Primary splits:  
## dim30 < 0.103819 to the left, improve=3.542125, (0 missing)  
## dim19 < 0.1140754 to the right, improve=3.323077, (0 missing)  
## dim10 < -0.01803527 to the left, improve=3.323077, (0 missing)  
## dim9 < -0.04754672 to the left, improve=3.173077, (0 missing)  
## dim23 < -0.004328833 to the right, improve=3.173077, (0 missing)  
## Surrogate splits:  
## dim2 < -0.2494288 to the left, agree=0.846, adj=0.667, (0 split)  
## dim6 < -0.2168574 to the left, agree=0.846, adj=0.667, (0 split)  
## dim8 < -0.04846395 to the left, agree=0.846, adj=0.667, (0 split)  
## dim9 < -0.04754672 to the left, agree=0.846, adj=0.667, (0 split)  
## dim22 < 0.02627903 to the left, agree=0.846, adj=0.667, (0 split)  
##   
## Node number 425: 212 observations, complexity param=0.0001339719  
## predicted class=3 expected loss=0.1226415 P(node) =0.006309524  
## class counts: 5 4 5 186 0 9 2 0 1 0  
## probabilities: 0.024 0.019 0.024 0.877 0.000 0.042 0.009 0.000 0.005 0.000   
## left son=850 (10 obs) right son=851 (202 obs)  
## Primary splits:  
## dim11 < -0.1370558 to the left, improve=8.975528, (0 missing)  
## dim14 < 0.1709828 to the left, improve=5.883712, (0 missing)  
## dim26 < 0.08527638 to the right, improve=5.450861, (0 missing)  
## dim22 < -0.07219768 to the left, improve=5.209455, (0 missing)  
## dim17 < -0.1637074 to the left, improve=4.398547, (0 missing)  
## Surrogate splits:  
## dim26 < 0.08527638 to the right, agree=0.967, adj=0.3, (0 split)  
## dim15 < -0.2432388 to the left, agree=0.962, adj=0.2, (0 split)  
##   
## Node number 426: 25 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.08 P(node) =0.0007440476  
## class counts: 0 0 23 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.920 0.080 0.000 0.000 0.000 0.000 0.000 0.000   
## left son=852 (23 obs) right son=853 (2 obs)  
## Primary splits:  
## dim25 < -0.09723214 to the right, improve=3.680000, (0 missing)  
## dim9 < 0.1844747 to the left, improve=3.680000, (0 missing)  
## dim12 < 0.06714214 to the left, improve=3.680000, (0 missing)  
## dim10 < -0.03405068 to the right, improve=2.346667, (0 missing)  
## dim8 < -0.1280989 to the right, improve=1.763333, (0 missing)  
## Surrogate splits:  
## dim9 < 0.1844747 to the left, agree=1.00, adj=1.0, (0 split)  
## dim12 < 0.06714214 to the left, agree=1.00, adj=1.0, (0 split)  
## dim10 < -0.03405068 to the right, agree=0.96, adj=0.5, (0 split)  
##   
## Node number 427: 42 observations, complexity param=0.0004019158  
## predicted class=6 expected loss=0.6190476 P(node) =0.00125  
## class counts: 1 0 0 13 0 6 16 0 6 0  
## probabilities: 0.024 0.000 0.000 0.310 0.000 0.143 0.381 0.000 0.143 0.000   
## left son=854 (16 obs) right son=855 (26 obs)  
## Primary splits:  
## dim14 < -0.03788782 to the left, improve=10.883240, (0 missing)  
## dim12 < 0.03058208 to the left, improve= 8.904762, (0 missing)  
## dim4 < -0.1544343 to the left, improve= 8.014711, (0 missing)  
## dim2 < 0.03457263 to the left, improve= 7.409524, (0 missing)  
## dim28 < -0.03258031 to the right, improve= 6.933766, (0 missing)  
## Surrogate splits:  
## dim2 < 0.03457263 to the left, agree=0.905, adj=0.750, (0 split)  
## dim4 < -0.2350608 to the left, agree=0.833, adj=0.563, (0 split)  
## dim5 < 0.1690091 to the left, agree=0.833, adj=0.563, (0 split)  
## dim8 < 0.04518935 to the right, agree=0.833, adj=0.563, (0 split)  
## dim12 < 0.03058208 to the left, agree=0.833, adj=0.563, (0 split)  
##   
## Node number 428: 21 observations  
## predicted class=3 expected loss=0 P(node) =0.000625  
## class counts: 0 0 0 21 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 429: 17 observations, complexity param=0.0001172254  
## predicted class=1 expected loss=0.7058824 P(node) =0.0005059524  
## class counts: 0 5 0 3 0 2 2 0 5 0  
## probabilities: 0.000 0.294 0.000 0.176 0.000 0.118 0.118 0.000 0.294 0.000   
## left son=858 (5 obs) right son=859 (12 obs)  
## Primary splits:  
## dim20 < -0.09524774 to the left, improve=4.558824, (0 missing)  
## dim25 < 0.07102992 to the right, improve=3.755793, (0 missing)  
## dim8 < -0.05275907 to the left, improve=3.755793, (0 missing)  
## dim12 < -0.1057582 to the right, improve=3.475490, (0 missing)  
## dim9 < -0.05682297 to the left, improve=3.392157, (0 missing)  
## Surrogate splits:  
## dim8 < -0.05275907 to the left, agree=0.941, adj=0.8, (0 split)  
## dim9 < -0.1070093 to the left, agree=0.941, adj=0.8, (0 split)  
## dim13 < 0.2182422 to the right, agree=0.941, adj=0.8, (0 split)  
## dim19 < 0.1025068 to the right, agree=0.941, adj=0.8, (0 split)  
## dim22 < 0.05647433 to the right, agree=0.941, adj=0.8, (0 split)  
##   
## Node number 430: 72 observations, complexity param=0.0002009579  
## predicted class=5 expected loss=0.2777778 P(node) =0.002142857  
## class counts: 3 2 1 3 0 52 1 0 9 1  
## probabilities: 0.042 0.028 0.014 0.042 0.000 0.722 0.014 0.000 0.125 0.014   
## left son=860 (61 obs) right son=861 (11 obs)  
## Primary splits:  
## dim8 < 0.04678583 to the left, improve=9.669689, (0 missing)  
## dim27 < 0.02735076 to the right, improve=7.680014, (0 missing)  
## dim24 < -0.001681395 to the left, improve=5.725917, (0 missing)  
## dim2 < -0.008210213 to the right, improve=5.526068, (0 missing)  
## dim7 < 0.01002075 to the left, improve=5.416667, (0 missing)  
## Surrogate splits:  
## dim7 < 0.02822086 to the left, agree=0.903, adj=0.364, (0 split)  
## dim27 < 0.1028913 to the left, agree=0.903, adj=0.364, (0 split)  
## dim23 < 0.1085295 to the left, agree=0.889, adj=0.273, (0 split)  
## dim24 < -0.1005291 to the right, agree=0.889, adj=0.273, (0 split)  
## dim29 < -0.1380398 to the right, agree=0.889, adj=0.273, (0 split)  
##   
## Node number 431: 44 observations, complexity param=0.0001172254  
## predicted class=6 expected loss=0.4318182 P(node) =0.001309524  
## class counts: 1 2 4 0 0 8 25 0 4 0  
## probabilities: 0.023 0.045 0.091 0.000 0.000 0.182 0.568 0.000 0.091 0.000   
## left son=862 (20 obs) right son=863 (24 obs)  
## Primary splits:  
## dim6 < -0.2600296 to the right, improve=6.600000, (0 missing)  
## dim21 < -0.06746056 to the right, improve=5.551282, (0 missing)  
## dim2 < -0.07762425 to the left, improve=5.395833, (0 missing)  
## dim7 < -0.09943536 to the right, improve=5.080952, (0 missing)  
## dim8 < -0.1022802 to the right, improve=4.916667, (0 missing)  
## Surrogate splits:  
## dim21 < -0.06643798 to the right, agree=0.795, adj=0.55, (0 split)  
## dim3 < 0.250684 to the right, agree=0.773, adj=0.50, (0 split)  
## dim7 < -0.1576209 to the right, agree=0.773, adj=0.50, (0 split)  
## dim17 < -0.01376077 to the right, agree=0.705, adj=0.35, (0 split)  
## dim2 < -0.1458733 to the left, agree=0.682, adj=0.30, (0 split)  
##   
## Node number 432: 25 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.08 P(node) =0.0007440476  
## class counts: 23 0 0 0 0 1 1 0 0 0  
## probabilities: 0.920 0.000 0.000 0.000 0.000 0.040 0.040 0.000 0.000 0.000   
## left son=864 (24 obs) right son=865 (1 obs)  
## Primary splits:  
## dim2 < -0.1067234 to the right, improve=1.843333, (0 missing)  
## dim3 < 0.007592726 to the right, improve=1.843333, (0 missing)  
## dim6 < -0.3109657 to the right, improve=1.843333, (0 missing)  
## dim13 < 0.2514037 to the left, improve=1.843333, (0 missing)  
## dim16 < 0.1246417 to the left, improve=1.843333, (0 missing)  
##   
## Node number 433: 4 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.25 P(node) =0.0001190476  
## class counts: 0 0 0 0 0 1 3 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.250 0.750 0.000 0.000 0.000   
## left son=866 (1 obs) right son=867 (3 obs)  
## Primary splits:  
## dim2 < 0.007235657 to the left, improve=1.5, (0 missing)  
## dim3 < 0.1642708 to the left, improve=1.5, (0 missing)  
## dim4 < 0.2170602 to the right, improve=1.5, (0 missing)  
## dim6 < -0.2203812 to the right, improve=1.5, (0 missing)  
## dim7 < 0.06490098 to the right, improve=1.5, (0 missing)  
##   
## Node number 434: 1 observations  
## predicted class=0 expected loss=0 P(node) =2.97619e-05  
## class counts: 1 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 435: 18 observations  
## predicted class=6 expected loss=0 P(node) =0.0005357143  
## class counts: 0 0 0 0 0 0 18 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 436: 14 observations  
## predicted class=3 expected loss=0 P(node) =0.0004166667  
## class counts: 0 0 0 14 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 437: 5 observations, complexity param=3.349298e-05  
## predicted class=5 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 0 1 0 3 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.200 0.000 0.600 0.200 0.000 0.000 0.000   
## left son=874 (2 obs) right son=875 (3 obs)  
## Primary splits:  
## dim6 < -0.2565026 to the left, improve=1.8, (0 missing)  
## dim21 < 0.06774769 to the left, improve=1.8, (0 missing)  
## dim25 < -0.04746929 to the left, improve=1.8, (0 missing)  
## dim29 < 0.04310242 to the left, improve=1.8, (0 missing)  
## dim3 < 0.1328193 to the right, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim3 < 0.1328193 to the right, agree=1, adj=1, (0 split)  
## dim18 < 0.2182482 to the right, agree=1, adj=1, (0 split)  
## dim21 < 0.06774769 to the left, agree=1, adj=1, (0 split)  
## dim25 < -0.04746929 to the left, agree=1, adj=1, (0 split)  
## dim29 < 0.04310242 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 438: 5 observations  
## predicted class=0 expected loss=0 P(node) =0.0001488095  
## class counts: 5 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 439: 52 observations, complexity param=0.0001004789  
## predicted class=5 expected loss=0.2307692 P(node) =0.001547619  
## class counts: 1 1 0 2 0 40 8 0 0 0  
## probabilities: 0.019 0.019 0.000 0.038 0.000 0.769 0.154 0.000 0.000 0.000   
## left son=878 (12 obs) right son=879 (40 obs)  
## Primary splits:  
## dim6 < -0.2658937 to the left, improve=6.234615, (0 missing)  
## dim14 < -0.08609312 to the right, improve=5.930070, (0 missing)  
## dim24 < -0.09575567 to the right, improve=5.808425, (0 missing)  
## dim30 < 0.08002381 to the left, improve=4.449695, (0 missing)  
## dim16 < 0.1876718 to the left, improve=4.301282, (0 missing)  
## Surrogate splits:  
## dim5 < -0.1549155 to the right, agree=0.846, adj=0.333, (0 split)  
## dim1 < 0.5031293 to the left, agree=0.808, adj=0.167, (0 split)  
## dim7 < 0.02131039 to the right, agree=0.808, adj=0.167, (0 split)  
## dim18 < -0.0369045 to the left, agree=0.808, adj=0.167, (0 split)  
## dim19 < -0.1028598 to the left, agree=0.808, adj=0.167, (0 split)  
##   
## Node number 440: 26 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.03846154 P(node) =0.0007738095  
## class counts: 0 1 25 0 0 0 0 0 0 0  
## probabilities: 0.000 0.038 0.962 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
## left son=880 (1 obs) right son=881 (25 obs)  
## Primary splits:  
## dim7 < 0.2563707 to the right, improve=1.9230770, (0 missing)  
## dim10 < 0.1708779 to the right, improve=1.9230770, (0 missing)  
## dim23 < 0.02868475 to the right, improve=1.9230770, (0 missing)  
## dim8 < -0.09841939 to the left, improve=0.9230769, (0 missing)  
## dim27 < -0.06940286 to the left, improve=0.9230769, (0 missing)  
##   
## Node number 441: 27 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.6296296 P(node) =0.0008035714  
## class counts: 0 4 10 5 3 1 4 0 0 0  
## probabilities: 0.000 0.148 0.370 0.185 0.111 0.037 0.148 0.000 0.000 0.000   
## left son=882 (7 obs) right son=883 (20 obs)  
## Primary splits:  
## dim1 < 0.3983119 to the left, improve=4.614815, (0 missing)  
## dim20 < -0.01803685 to the left, improve=4.148148, (0 missing)  
## dim21 < 0.08275261 to the left, improve=4.032206, (0 missing)  
## dim17 < -0.09680945 to the left, improve=3.767756, (0 missing)  
## dim12 < 0.02509206 to the right, improve=3.471958, (0 missing)  
## Surrogate splits:  
## dim14 < -0.1491146 to the left, agree=0.889, adj=0.571, (0 split)  
## dim16 < 0.1209476 to the right, agree=0.852, adj=0.429, (0 split)  
## dim24 < -0.1532218 to the left, agree=0.852, adj=0.429, (0 split)  
## dim25 < 0.07286697 to the right, agree=0.852, adj=0.429, (0 split)  
## dim17 < -0.1584847 to the left, agree=0.815, adj=0.286, (0 split)  
##   
## Node number 442: 3 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 1 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.333 0.667 0.000 0.000 0.000 0.000 0.000 0.000   
## left son=884 (1 obs) right son=885 (2 obs)  
## Primary splits:  
## dim2 < 0.09803457 to the right, improve=1.333333, (0 missing)  
## dim3 < 0.01978495 to the left, improve=1.333333, (0 missing)  
## dim4 < 0.0337949 to the right, improve=1.333333, (0 missing)  
## dim6 < -0.2820157 to the left, improve=1.333333, (0 missing)  
## dim7 < 0.05234748 to the left, improve=1.333333, (0 missing)  
##   
## Node number 443: 18 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.05555556 P(node) =0.0005357143  
## class counts: 0 0 0 0 0 0 17 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.944 0.056 0.000 0.000   
## left son=886 (17 obs) right son=887 (1 obs)  
## Primary splits:  
## dim3 < -0.008611001 to the right, improve=1.888889, (0 missing)  
## dim4 < -0.01741616 to the right, improve=1.888889, (0 missing)  
## dim5 < -0.02280062 to the right, improve=1.888889, (0 missing)  
## dim7 < -0.22225 to the right, improve=1.888889, (0 missing)  
## dim15 < -0.2316512 to the right, improve=1.888889, (0 missing)  
##   
## Node number 444: 20 observations  
## predicted class=2 expected loss=0 P(node) =0.0005952381  
## class counts: 0 0 20 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 445: 52 observations, complexity param=0.0003349298  
## predicted class=6 expected loss=0.5192308 P(node) =0.001547619  
## class counts: 6 0 3 6 0 12 25 0 0 0  
## probabilities: 0.115 0.000 0.058 0.115 0.000 0.231 0.481 0.000 0.000 0.000   
## left son=890 (40 obs) right son=891 (12 obs)  
## Primary splits:  
## dim8 < -0.07359406 to the right, improve=11.220510, (0 missing)  
## dim14 < 0.05466824 to the right, improve= 8.226819, (0 missing)  
## dim16 < -0.04661891 to the right, improve= 7.643762, (0 missing)  
## dim22 < -0.09098681 to the right, improve= 6.898291, (0 missing)  
## dim15 < 0.01113417 to the right, improve= 6.423077, (0 missing)  
## Surrogate splits:  
## dim14 < 0.05466824 to the left, agree=0.942, adj=0.750, (0 split)  
## dim22 < -0.09098681 to the right, agree=0.865, adj=0.417, (0 split)  
## dim3 < 0.3694328 to the left, agree=0.846, adj=0.333, (0 split)  
## dim21 < -0.04781982 to the right, agree=0.846, adj=0.333, (0 split)  
## dim20 < 0.1360615 to the left, agree=0.827, adj=0.250, (0 split)  
##   
## Node number 446: 27 observations, complexity param=0.0002679439  
## predicted class=2 expected loss=0.5185185 P(node) =0.0008035714  
## class counts: 0 0 13 0 8 0 5 1 0 0  
## probabilities: 0.000 0.000 0.481 0.000 0.296 0.000 0.185 0.037 0.000 0.000   
## left son=892 (16 obs) right son=893 (11 obs)  
## Primary splits:  
## dim26 < -0.03391802 to the left, improve=7.918771, (0 missing)  
## dim5 < 0.1252952 to the right, improve=7.074074, (0 missing)  
## dim1 < 0.5335834 to the left, improve=6.296296, (0 missing)  
## dim3 < -0.07324142 to the right, improve=5.518519, (0 missing)  
## dim15 < 0.04910864 to the right, improve=5.214226, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5335834 to the left, agree=0.926, adj=0.818, (0 split)  
## dim5 < 0.1252952 to the right, agree=0.852, adj=0.636, (0 split)  
## dim15 < 0.009093203 to the right, agree=0.852, adj=0.636, (0 split)  
## dim3 < -0.05454528 to the right, agree=0.815, adj=0.545, (0 split)  
## dim7 < -0.07780679 to the right, agree=0.815, adj=0.545, (0 split)  
##   
## Node number 447: 2481 observations, complexity param=0.0002679439  
## predicted class=6 expected loss=0.07416364 P(node) =0.07383929  
## class counts: 25 14 68 10 34 19 2297 0 10 4  
## probabilities: 0.010 0.006 0.027 0.004 0.014 0.008 0.926 0.000 0.004 0.002   
## left son=894 (24 obs) right son=895 (2457 obs)  
## Primary splits:  
## dim17 < 0.1786434 to the right, improve=18.85163, (0 missing)  
## dim6 < -0.2430339 to the right, improve=18.47057, (0 missing)  
## dim20 < -0.1210163 to the left, improve=16.57146, (0 missing)  
## dim10 < 0.05726643 to the right, improve=16.55119, (0 missing)  
## dim15 < -0.1699613 to the left, improve=13.73582, (0 missing)  
## Surrogate splits:  
## dim23 < -0.2229684 to the left, agree=0.991, adj=0.083, (0 split)  
##   
## Node number 448: 1150 observations, complexity param=0.0001674649  
## predicted class=4 expected loss=0.09043478 P(node) =0.03422619  
## class counts: 0 0 7 6 1046 4 14 11 10 52  
## probabilities: 0.000 0.000 0.006 0.005 0.910 0.003 0.012 0.010 0.009 0.045   
## left son=896 (1113 obs) right son=897 (37 obs)  
## Primary splits:  
## dim12 < -0.1754708 to the right, improve=16.059230, (0 missing)  
## dim4 < -0.3501195 to the right, improve=11.749150, (0 missing)  
## dim6 < -0.3823401 to the right, improve=10.974740, (0 missing)  
## dim11 < 0.081886 to the right, improve= 7.790242, (0 missing)  
## dim27 < 0.1059897 to the left, improve= 7.404948, (0 missing)  
## Surrogate splits:  
## dim6 < -0.3823401 to the right, agree=0.971, adj=0.108, (0 split)  
##   
## Node number 449: 110 observations, complexity param=0.0002344509  
## predicted class=4 expected loss=0.4090909 P(node) =0.00327381  
## class counts: 0 7 2 2 65 17 0 5 5 7  
## probabilities: 0.000 0.064 0.018 0.018 0.591 0.155 0.000 0.045 0.045 0.064   
## left son=898 (89 obs) right son=899 (21 obs)  
## Primary splits:  
## dim21 < -0.1034433 to the right, improve=16.11260, (0 missing)  
## dim18 < -0.0648023 to the right, improve=14.86781, (0 missing)  
## dim10 < -0.06091465 to the left, improve=14.60000, (0 missing)  
## dim29 < -0.01522228 to the right, improve=13.27385, (0 missing)  
## dim7 < -0.06929794 to the right, improve=13.04545, (0 missing)  
## Surrogate splits:  
## dim18 < -0.09304338 to the right, agree=0.891, adj=0.429, (0 split)  
## dim19 < -0.1154148 to the right, agree=0.891, adj=0.429, (0 split)  
## dim1 < 0.4193473 to the right, agree=0.864, adj=0.286, (0 split)  
## dim17 < -0.02360355 to the right, agree=0.864, adj=0.286, (0 split)  
## dim16 < 0.1978628 to the left, agree=0.855, adj=0.238, (0 split)  
##   
## Node number 450: 301 observations, complexity param=0.0002679439  
## predicted class=4 expected loss=0.1528239 P(node) =0.008958333  
## class counts: 0 0 0 0 255 2 5 0 1 38  
## probabilities: 0.000 0.000 0.000 0.000 0.847 0.007 0.017 0.000 0.003 0.126   
## left son=900 (251 obs) right son=901 (50 obs)  
## Primary splits:  
## dim16 < 0.01836146 to the right, improve=13.941770, (0 missing)  
## dim20 < -0.03921963 to the right, improve=10.517330, (0 missing)  
## dim19 < -0.08730923 to the right, improve= 8.810903, (0 missing)  
## dim4 < -0.2989515 to the right, improve= 7.895660, (0 missing)  
## dim10 < 0.109985 to the left, improve= 6.463787, (0 missing)  
## Surrogate splits:  
## dim15 < 0.2331043 to the left, agree=0.844, adj=0.06, (0 split)  
## dim9 < -0.1852632 to the right, agree=0.841, adj=0.04, (0 split)  
## dim24 < 0.1940831 to the left, agree=0.841, adj=0.04, (0 split)  
## dim25 < -0.1062876 to the right, agree=0.841, adj=0.04, (0 split)  
## dim29 < 0.1934816 to the left, agree=0.841, adj=0.04, (0 split)  
##   
## Node number 451: 357 observations, complexity param=0.0005247234  
## predicted class=4 expected loss=0.5910364 P(node) =0.010625  
## class counts: 1 1 5 4 146 3 26 26 46 99  
## probabilities: 0.003 0.003 0.014 0.011 0.409 0.008 0.073 0.073 0.129 0.277   
## left son=902 (189 obs) right son=903 (168 obs)  
## Primary splits:  
## dim20 < 0.01269425 to the right, improve=31.42865, (0 missing)  
## dim19 < 0.01999557 to the right, improve=23.26040, (0 missing)  
## dim4 < -0.07987138 to the right, improve=22.54494, (0 missing)  
## dim17 < 0.08770352 to the right, improve=22.16117, (0 missing)  
## dim12 < -0.08496487 to the right, improve=21.69981, (0 missing)  
## Surrogate splits:  
## dim12 < 0.05928289 to the right, agree=0.675, adj=0.310, (0 split)  
## dim4 < -0.07987138 to the right, agree=0.667, adj=0.292, (0 split)  
## dim19 < -0.03625648 to the right, agree=0.636, adj=0.226, (0 split)  
## dim16 < 0.05701951 to the right, agree=0.622, adj=0.196, (0 split)  
## dim17 < 0.0001055253 to the right, agree=0.616, adj=0.185, (0 split)  
##   
## Node number 452: 165 observations, complexity param=0.0008708176  
## predicted class=4 expected loss=0.4484848 P(node) =0.004910714  
## class counts: 0 0 1 2 91 3 1 4 4 59  
## probabilities: 0.000 0.000 0.006 0.012 0.552 0.018 0.006 0.024 0.024 0.358   
## left son=904 (102 obs) right son=905 (63 obs)  
## Primary splits:  
## dim3 < -0.2728534 to the right, improve=24.16420, (0 missing)  
## dim18 < -0.03859469 to the left, improve=15.95665, (0 missing)  
## dim30 < 0.02817373 to the right, improve=13.62900, (0 missing)  
## dim21 < 0.0292167 to the left, improve=13.61984, (0 missing)  
## dim4 < -0.05764962 to the right, improve=13.37856, (0 missing)  
## Surrogate splits:  
## dim21 < 0.08560249 to the left, agree=0.788, adj=0.444, (0 split)  
## dim10 < 0.09665521 to the left, agree=0.733, adj=0.302, (0 split)  
## dim18 < 0.02583427 to the left, agree=0.703, adj=0.222, (0 split)  
## dim11 < -0.2109025 to the right, agree=0.685, adj=0.175, (0 split)  
## dim4 < -0.06201992 to the right, agree=0.673, adj=0.143, (0 split)  
##   
## Node number 453: 25 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.12 P(node) =0.0007440476  
## class counts: 0 0 0 0 1 0 0 22 0 2  
## probabilities: 0.000 0.000 0.000 0.000 0.040 0.000 0.000 0.880 0.000 0.080   
## left son=906 (2 obs) right son=907 (23 obs)  
## Primary splits:  
## dim3 < -0.1598028 to the right, improve=2.526957, (0 missing)  
## dim4 < 0.004956721 to the right, improve=2.526957, (0 missing)  
## dim6 < -0.07973767 to the left, improve=2.526957, (0 missing)  
## dim8 < 0.2507464 to the right, improve=2.526957, (0 missing)  
## dim14 < -0.1255837 to the left, improve=2.526957, (0 missing)  
## Surrogate splits:  
## dim6 < -0.07973767 to the left, agree=1, adj=1, (0 split)  
## dim8 < 0.2507464 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 454: 34 observations, complexity param=0.0002344509  
## predicted class=8 expected loss=0.4705882 P(node) =0.001011905  
## class counts: 0 0 0 0 6 1 0 0 18 9  
## probabilities: 0.000 0.000 0.000 0.000 0.176 0.029 0.000 0.000 0.529 0.265   
## left son=908 (17 obs) right son=909 (17 obs)  
## Primary splits:  
## dim1 < 0.5938749 to the left, improve=8.647059, (0 missing)  
## dim2 < 0.1115992 to the right, improve=7.557143, (0 missing)  
## dim9 < 0.02674989 to the right, improve=7.500000, (0 missing)  
## dim4 < -0.06486088 to the right, improve=7.069444, (0 missing)  
## dim17 < 0.06551063 to the right, improve=6.764706, (0 missing)  
## Surrogate splits:  
## dim2 < 0.08532301 to the right, agree=0.912, adj=0.824, (0 split)  
## dim6 < 0.04401764 to the left, agree=0.824, adj=0.647, (0 split)  
## dim17 < 0.06551063 to the right, agree=0.824, adj=0.647, (0 split)  
## dim4 < -0.06486088 to the right, agree=0.794, adj=0.588, (0 split)  
## dim13 < -0.01534044 to the left, agree=0.794, adj=0.588, (0 split)  
##   
## Node number 455: 234 observations, complexity param=0.0001563006  
## predicted class=9 expected loss=0.1666667 P(node) =0.006964286  
## class counts: 0 0 0 0 23 0 0 13 3 195  
## probabilities: 0.000 0.000 0.000 0.000 0.098 0.000 0.000 0.056 0.013 0.833   
## left son=910 (30 obs) right son=911 (204 obs)  
## Primary splits:  
## dim16 < 0.1246433 to the right, improve=9.488436, (0 missing)  
## dim2 < 0.3474928 to the right, improve=6.994188, (0 missing)  
## dim9 < 0.1712175 to the right, improve=6.894562, (0 missing)  
## dim28 < -0.1092199 to the left, improve=5.157836, (0 missing)  
## dim1 < 0.5421775 to the left, improve=4.988202, (0 missing)  
## Surrogate splits:  
## dim14 < -0.2248797 to the left, agree=0.880, adj=0.067, (0 split)  
## dim20 < 0.1332421 to the right, agree=0.880, adj=0.067, (0 split)  
## dim21 < -0.09921331 to the left, agree=0.876, adj=0.033, (0 split)  
## dim24 < -0.1898823 to the left, agree=0.876, adj=0.033, (0 split)  
## dim26 < 0.1661447 to the right, agree=0.876, adj=0.033, (0 split)  
##   
## Node number 456: 165 observations, complexity param=1.674649e-05  
## predicted class=5 expected loss=0.1272727 P(node) =0.004910714  
## class counts: 0 3 0 1 1 144 0 5 6 5  
## probabilities: 0.000 0.018 0.000 0.006 0.006 0.873 0.000 0.030 0.036 0.030   
## left son=912 (127 obs) right son=913 (38 obs)  
## Primary splits:  
## dim19 < 0.0127713 to the right, improve=7.165420, (0 missing)  
## dim10 < -0.2050148 to the right, improve=7.094489, (0 missing)  
## dim17 < 0.07126572 to the right, improve=5.478710, (0 missing)  
## dim6 < -0.3145171 to the left, improve=5.282604, (0 missing)  
## dim20 < 0.1720968 to the left, improve=5.171493, (0 missing)  
## Surrogate splits:  
## dim9 < 0.1039277 to the left, agree=0.812, adj=0.184, (0 split)  
## dim17 < 0.07126572 to the left, agree=0.812, adj=0.184, (0 split)  
## dim12 < 0.1997456 to the left, agree=0.800, adj=0.132, (0 split)  
## dim4 < -0.2616729 to the right, agree=0.794, adj=0.105, (0 split)  
## dim6 < -0.2689491 to the right, agree=0.794, adj=0.105, (0 split)  
##   
## Node number 457: 8 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.125 P(node) =0.0002380952  
## class counts: 0 0 0 0 0 0 0 0 7 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.875 0.125   
## left son=914 (7 obs) right son=915 (1 obs)  
## Primary splits:  
## dim4 < -0.04718313 to the right, improve=1.75, (0 missing)  
## dim6 < -0.0676531 to the right, improve=1.75, (0 missing)  
## dim13 < -0.1264816 to the right, improve=1.75, (0 missing)  
## dim26 < -0.06323911 to the right, improve=1.75, (0 missing)  
## dim1 < 0.7904489 to the left, improve=1.75, (0 missing)  
##   
## Node number 458: 42 observations, complexity param=0.0002344509  
## predicted class=1 expected loss=0.2142857 P(node) =0.00125  
## class counts: 0 33 0 0 9 0 0 0 0 0  
## probabilities: 0.000 0.786 0.000 0.000 0.214 0.000 0.000 0.000 0.000 0.000   
## left son=916 (33 obs) right son=917 (9 obs)  
## Primary splits:  
## dim10 < 0.146364 to the right, improve=10.425690, (0 missing)  
## dim13 < 0.09033216 to the right, improve=10.425690, (0 missing)  
## dim8 < -0.02712715 to the left, improve= 9.642857, (0 missing)  
## dim26 < -0.0340305 to the left, improve= 9.642857, (0 missing)  
## dim25 < 0.02068747 to the right, improve= 8.642857, (0 missing)  
## Surrogate splits:  
## dim13 < 0.09033216 to the right, agree=1.000, adj=1.000, (0 split)  
## dim28 < -0.07077684 to the left, agree=0.952, adj=0.778, (0 split)  
## dim4 < -0.1486167 to the left, agree=0.929, adj=0.667, (0 split)  
## dim8 < -0.02712715 to the left, agree=0.929, adj=0.667, (0 split)  
## dim20 < 0.03910123 to the left, agree=0.929, adj=0.667, (0 split)  
##   
## Node number 459: 254 observations, complexity param=0.001038282  
## predicted class=8 expected loss=0.7086614 P(node) =0.007559524  
## class counts: 4 0 0 7 34 65 0 28 74 42  
## probabilities: 0.016 0.000 0.000 0.028 0.134 0.256 0.000 0.110 0.291 0.165   
## left son=918 (165 obs) right son=919 (89 obs)  
## Primary splits:  
## dim1 < 0.6172175 to the left, improve=32.24722, (0 missing)  
## dim8 < 0.03033575 to the right, improve=22.37768, (0 missing)  
## dim17 < 0.1043659 to the left, improve=18.55508, (0 missing)  
## dim16 < 0.2021404 to the right, improve=18.24604, (0 missing)  
## dim10 < -0.1058024 to the right, improve=17.92514, (0 missing)  
## Surrogate splits:  
## dim8 < -0.05731003 to the right, agree=0.787, adj=0.393, (0 split)  
## dim22 < 0.1229197 to the left, agree=0.693, adj=0.124, (0 split)  
## dim2 < -0.1579704 to the right, agree=0.685, adj=0.101, (0 split)  
## dim6 < 0.1687501 to the left, agree=0.681, adj=0.090, (0 split)  
## dim4 < 0.08292041 to the right, agree=0.677, adj=0.079, (0 split)  
##   
## Node number 460: 110 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.03636364 P(node) =0.00327381  
## class counts: 0 0 0 0 106 0 0 0 0 4  
## probabilities: 0.000 0.000 0.000 0.000 0.964 0.000 0.000 0.000 0.000 0.036   
## left son=920 (107 obs) right son=921 (3 obs)  
## Primary splits:  
## dim26 < -0.1030566 to the right, improve=5.727782, (0 missing)  
## dim29 < 0.09399889 to the left, improve=3.783165, (0 missing)  
## dim20 < -0.1480278 to the right, improve=1.874229, (0 missing)  
## dim8 < 0.1441443 to the left, improve=1.784563, (0 missing)  
## dim6 < 0.02249195 to the left, improve=1.591444, (0 missing)  
##   
## Node number 461: 9 observations, complexity param=6.698597e-05  
## predicted class=9 expected loss=0.4444444 P(node) =0.0002678571  
## class counts: 0 0 0 0 2 0 0 2 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.222 0.000 0.000 0.222 0.000 0.556   
## left son=922 (4 obs) right son=923 (5 obs)  
## Primary splits:  
## dim21 < -0.05369574 to the left, improve=3.333333, (0 missing)  
## dim9 < 0.1301797 to the right, improve=2.476190, (0 missing)  
## dim13 < 0.09849472 to the right, improve=2.476190, (0 missing)  
## dim18 < 0.03150335 to the right, improve=2.476190, (0 missing)  
## dim26 < -0.02237486 to the right, improve=2.476190, (0 missing)  
## Surrogate splits:  
## dim4 < 0.1245181 to the left, agree=0.889, adj=0.75, (0 split)  
## dim12 < 0.06095366 to the right, agree=0.889, adj=0.75, (0 split)  
## dim20 < -0.06665038 to the right, agree=0.889, adj=0.75, (0 split)  
## dim27 < 0.01802984 to the right, agree=0.889, adj=0.75, (0 split)  
## dim29 < -0.06011862 to the left, agree=0.889, adj=0.75, (0 split)  
##   
## Node number 462: 642 observations, complexity param=0.001306226  
## predicted class=9 expected loss=0.4719626 P(node) =0.01910714  
## class counts: 0 3 0 3 135 67 0 68 27 339  
## probabilities: 0.000 0.005 0.000 0.005 0.210 0.104 0.000 0.106 0.042 0.528   
## left son=924 (93 obs) right son=925 (549 obs)  
## Primary splits:  
## dim16 < 0.1333137 to the right, improve=41.41022, (0 missing)  
## dim1 < 0.5487111 to the left, improve=35.46221, (0 missing)  
## dim19 < 0.1148653 to the right, improve=30.95694, (0 missing)  
## dim5 < -0.2665658 to the left, improve=30.13791, (0 missing)  
## dim17 < 0.07595721 to the right, improve=29.46754, (0 missing)  
## Surrogate splits:  
## dim1 < 0.464991 to the left, agree=0.875, adj=0.140, (0 split)  
## dim19 < 0.19395 to the right, agree=0.872, adj=0.118, (0 split)  
## dim5 < -0.3491777 to the left, agree=0.868, adj=0.086, (0 split)  
## dim8 < 0.2122509 to the right, agree=0.868, adj=0.086, (0 split)  
## dim24 < -0.1588891 to the left, agree=0.863, adj=0.054, (0 split)  
##   
## Node number 463: 187 observations, complexity param=0.0003516763  
## predicted class=7 expected loss=0.3048128 P(node) =0.005565476  
## class counts: 0 0 0 0 10 0 0 130 0 47  
## probabilities: 0.000 0.000 0.000 0.000 0.053 0.000 0.000 0.695 0.000 0.251   
## left son=926 (124 obs) right son=927 (63 obs)  
## Primary splits:  
## dim2 < 0.1115988 to the right, improve=17.72226, (0 missing)  
## dim7 < -0.1118802 to the right, improve=15.12020, (0 missing)  
## dim1 < 0.580148 to the left, improve=12.60109, (0 missing)  
## dim15 < -0.01408629 to the left, improve=11.33949, (0 missing)  
## dim8 < 0.1589581 to the left, improve=10.01401, (0 missing)  
## Surrogate splits:  
## dim10 < -0.1286454 to the right, agree=0.802, adj=0.413, (0 split)  
## dim4 < 0.01034987 to the left, agree=0.791, adj=0.381, (0 split)  
## dim14 < -0.1191332 to the right, agree=0.781, adj=0.349, (0 split)  
## dim11 < -0.01747747 to the left, agree=0.733, adj=0.206, (0 split)  
## dim19 < 0.03595146 to the left, agree=0.722, adj=0.175, (0 split)  
##   
## Node number 464: 4 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 0 2 1 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.500 0.250 0.000 0.250 0.000 0.000 0.000 0.000   
## left son=928 (2 obs) right son=929 (2 obs)  
## Primary splits:  
## dim14 < -0.08671803 to the left, improve=1.5, (0 missing)  
## dim17 < 0.05504388 to the left, improve=1.5, (0 missing)  
## dim26 < -0.03454156 to the left, improve=1.5, (0 missing)  
## dim29 < -0.09842213 to the left, improve=1.5, (0 missing)  
## dim3 < -0.1560393 to the right, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim2 < -0.04949563 to the right, agree=1, adj=1, (0 split)  
## dim3 < -0.1560393 to the right, agree=1, adj=1, (0 split)  
## dim8 < 0.110178 to the right, agree=1, adj=1, (0 split)  
## dim13 < 0.1079267 to the left, agree=1, adj=1, (0 split)  
## dim17 < 0.05504388 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 465: 224 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.08928571 P(node) =0.006666667  
## class counts: 0 0 3 0 204 0 2 7 0 8  
## probabilities: 0.000 0.000 0.013 0.000 0.911 0.000 0.009 0.031 0.000 0.036   
## left son=930 (221 obs) right son=931 (3 obs)  
## Primary splits:  
## dim1 < 0.3030809 to the right, improve=4.019810, (0 missing)  
## dim12 < -0.1247286 to the right, improve=3.214679, (0 missing)  
## dim17 < 0.134998 to the right, improve=2.942695, (0 missing)  
## dim6 < -0.1408664 to the right, improve=2.813369, (0 missing)  
## dim28 < -0.09324591 to the right, improve=2.404079, (0 missing)  
##   
## Node number 466: 41 observations, complexity param=0.0001339719  
## predicted class=4 expected loss=0.2195122 P(node) =0.001220238  
## class counts: 0 0 0 4 32 0 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.098 0.780 0.000 0.000 0.000 0.000 0.122   
## left son=932 (35 obs) right son=933 (6 obs)  
## Primary splits:  
## dim6 < 0.1676285 to the left, improve=6.872009, (0 missing)  
## dim20 < -0.1330458 to the left, improve=6.375742, (0 missing)  
## dim3 < -0.2074224 to the left, improve=5.496612, (0 missing)  
## dim4 < -0.2525397 to the right, improve=4.051417, (0 missing)  
## dim12 < -0.02424126 to the left, improve=3.391057, (0 missing)  
## Surrogate splits:  
## dim20 < -0.1035661 to the right, agree=0.976, adj=0.833, (0 split)  
## dim3 < -0.1670513 to the left, agree=0.951, adj=0.667, (0 split)  
## dim12 < -0.1662135 to the right, agree=0.927, adj=0.500, (0 split)  
## dim1 < 0.4655704 to the right, agree=0.902, adj=0.333, (0 split)  
## dim2 < -0.1193263 to the right, agree=0.902, adj=0.333, (0 split)  
##   
## Node number 467: 12 observations, complexity param=6.698597e-05  
## predicted class=9 expected loss=0.1666667 P(node) =0.0003571429  
## class counts: 0 0 0 0 0 0 0 2 0 10  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.167 0.000 0.833   
## left son=934 (2 obs) right son=935 (10 obs)  
## Primary splits:  
## dim11 < 0.2002767 to the right, improve=3.333333, (0 missing)  
## dim19 < -0.01922006 to the right, improve=3.333333, (0 missing)  
## dim2 < 0.08341165 to the left, improve=3.333333, (0 missing)  
## dim27 < -0.006964757 to the left, improve=3.333333, (0 missing)  
## dim5 < 0.04677509 to the right, improve=2.000000, (0 missing)  
## Surrogate splits:  
## dim2 < 0.08341165 to the left, agree=1.000, adj=1.0, (0 split)  
## dim19 < -0.01922006 to the right, agree=1.000, adj=1.0, (0 split)  
## dim27 < -0.006964757 to the left, agree=1.000, adj=1.0, (0 split)  
## dim5 < 0.04677509 to the right, agree=0.917, adj=0.5, (0 split)  
## dim8 < -0.1300529 to the left, agree=0.917, adj=0.5, (0 split)  
##   
## Node number 468: 43 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.255814 P(node) =0.001279762  
## class counts: 0 1 0 4 32 0 0 1 1 4  
## probabilities: 0.000 0.023 0.000 0.093 0.744 0.000 0.000 0.023 0.023 0.093   
## left son=936 (35 obs) right son=937 (8 obs)  
## Primary splits:  
## dim25 < -0.08735071 to the right, improve=5.614950, (0 missing)  
## dim10 < 0.06205702 to the left, improve=5.570291, (0 missing)  
## dim6 < 0.07282838 to the left, improve=5.345066, (0 missing)  
## dim20 < -0.1041864 to the right, improve=5.129988, (0 missing)  
## dim3 < -0.1821912 to the right, improve=4.831552, (0 missing)  
## Surrogate splits:  
## dim10 < 0.05111452 to the left, agree=0.884, adj=0.375, (0 split)  
## dim15 < -0.1068643 to the right, agree=0.884, adj=0.375, (0 split)  
## dim6 < 0.07282838 to the left, agree=0.860, adj=0.250, (0 split)  
## dim9 < 0.1135695 to the left, agree=0.860, adj=0.250, (0 split)  
## dim18 < 0.1316715 to the left, agree=0.860, adj=0.250, (0 split)  
##   
## Node number 469: 6 observations  
## predicted class=9 expected loss=0 P(node) =0.0001785714  
## class counts: 0 0 0 0 0 0 0 0 0 6  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 470: 3 observations  
## predicted class=4 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 3 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 471: 41 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.02439024 P(node) =0.001220238  
## class counts: 0 0 0 0 1 0 0 0 0 40  
## probabilities: 0.000 0.000 0.000 0.000 0.024 0.000 0.000 0.000 0.000 0.976   
## left son=942 (1 obs) right son=943 (40 obs)  
## Primary splits:  
## dim6 < -0.04707479 to the left, improve=1.95122, (0 missing)  
## dim21 < -0.1261524 to the left, improve=1.95122, (0 missing)  
## dim27 < -0.02123505 to the left, improve=1.95122, (0 missing)  
## dim29 < -0.02230587 to the left, improve=1.95122, (0 missing)  
## dim11 < 0.3174477 to the right, improve=1.95122, (0 missing)  
##   
## Node number 472: 155 observations, complexity param=0.0004019158  
## predicted class=7 expected loss=0.7483871 P(node) =0.004613095  
## class counts: 0 0 20 35 17 1 6 39 12 25  
## probabilities: 0.000 0.000 0.129 0.226 0.110 0.006 0.039 0.252 0.077 0.161   
## left son=944 (68 obs) right son=945 (87 obs)  
## Primary splits:  
## dim4 < -0.06796804 to the left, improve=11.599160, (0 missing)  
## dim17 < -0.03036206 to the left, improve=10.380120, (0 missing)  
## dim7 < -0.02700649 to the left, improve= 9.925663, (0 missing)  
## dim24 < 0.006724285 to the left, improve= 9.511091, (0 missing)  
## dim5 < 0.1187723 to the right, improve= 8.939785, (0 missing)  
## Surrogate splits:  
## dim10 < 0.03410957 to the right, agree=0.723, adj=0.368, (0 split)  
## dim17 < -0.069586 to the left, agree=0.671, adj=0.250, (0 split)  
## dim24 < 0.006724285 to the left, agree=0.665, adj=0.235, (0 split)  
## dim13 < -0.06387597 to the left, agree=0.652, adj=0.206, (0 split)  
## dim2 < -0.0489546 to the right, agree=0.645, adj=0.191, (0 split)  
##   
## Node number 473: 130 observations, complexity param=0.0004019158  
## predicted class=4 expected loss=0.4307692 P(node) =0.003869048  
## class counts: 0 0 1 0 74 1 4 8 0 42  
## probabilities: 0.000 0.000 0.008 0.000 0.569 0.008 0.031 0.062 0.000 0.323   
## left son=946 (89 obs) right son=947 (41 obs)  
## Primary splits:  
## dim11 < -0.07498366 to the right, improve=17.78271, (0 missing)  
## dim25 < -0.03008544 to the right, improve=14.16767, (0 missing)  
## dim14 < -0.1006631 to the right, improve=13.90192, (0 missing)  
## dim2 < -0.0001494123 to the right, improve=13.73769, (0 missing)  
## dim27 < 0.03046425 to the left, improve=12.98828, (0 missing)  
## Surrogate splits:  
## dim3 < -0.3792199 to the right, agree=0.785, adj=0.317, (0 split)  
## dim27 < 0.03046425 to the left, agree=0.754, adj=0.220, (0 split)  
## dim14 < -0.1942856 to the right, agree=0.746, adj=0.195, (0 split)  
## dim26 < 0.1873834 to the left, agree=0.731, adj=0.146, (0 split)  
## dim28 < 0.04220079 to the left, agree=0.731, adj=0.146, (0 split)  
##   
## Node number 474: 34 observations, complexity param=0.0002009579  
## predicted class=4 expected loss=0.5588235 P(node) =0.001011905  
## class counts: 0 0 5 0 15 0 0 7 1 6  
## probabilities: 0.000 0.000 0.147 0.000 0.441 0.000 0.000 0.206 0.029 0.176   
## left son=948 (18 obs) right son=949 (16 obs)  
## Primary splits:  
## dim12 < -0.002324429 to the right, improve=6.895425, (0 missing)  
## dim29 < 0.06332109 to the left, improve=6.477435, (0 missing)  
## dim6 < 0.2832232 to the left, improve=6.403361, (0 missing)  
## dim11 < -0.1343681 to the right, improve=6.290724, (0 missing)  
## dim14 < -0.2037916 to the left, improve=5.290724, (0 missing)  
## Surrogate splits:  
## dim9 < -0.1189808 to the left, agree=0.853, adj=0.687, (0 split)  
## dim10 < -0.1253643 to the left, agree=0.853, adj=0.687, (0 split)  
## dim25 < -0.007098891 to the right, agree=0.794, adj=0.562, (0 split)  
## dim1 < 0.5359213 to the right, agree=0.765, adj=0.500, (0 split)  
## dim7 < -0.1350668 to the left, agree=0.765, adj=0.500, (0 split)  
##   
## Node number 475: 169 observations, complexity param=0.0001674649  
## predicted class=9 expected loss=0.2189349 P(node) =0.005029762  
## class counts: 0 0 2 4 21 2 0 6 2 132  
## probabilities: 0.000 0.000 0.012 0.024 0.124 0.012 0.000 0.036 0.012 0.781   
## left son=950 (5 obs) right son=951 (164 obs)  
## Primary splits:  
## dim9 < 0.2307341 to the right, improve=8.020999, (0 missing)  
## dim3 < -0.1781018 to the right, improve=7.611460, (0 missing)  
## dim21 < -0.1933956 to the left, improve=7.106365, (0 missing)  
## dim1 < 0.386772 to the left, improve=7.102236, (0 missing)  
## dim13 < -0.1188237 to the left, improve=6.861693, (0 missing)  
## Surrogate splits:  
## dim27 < -0.1095217 to the left, agree=0.976, adj=0.2, (0 split)  
##   
## Node number 476: 144 observations, complexity param=0.0002009579  
## predicted class=9 expected loss=0.6944444 P(node) =0.004285714  
## class counts: 0 0 6 16 19 1 14 19 25 44  
## probabilities: 0.000 0.000 0.042 0.111 0.132 0.007 0.097 0.132 0.174 0.306   
## left son=952 (81 obs) right son=953 (63 obs)  
## Primary splits:  
## dim17 < -0.01219203 to the right, improve=9.950176, (0 missing)  
## dim9 < -0.09818797 to the right, improve=9.264141, (0 missing)  
## dim4 < -0.08096108 to the right, improve=8.926235, (0 missing)  
## dim13 < 0.04784459 to the right, improve=8.292328, (0 missing)  
## dim15 < 0.1092184 to the left, improve=8.150087, (0 missing)  
## Surrogate splits:  
## dim6 < 0.06501604 to the left, agree=0.694, adj=0.302, (0 split)  
## dim9 < -0.07925858 to the right, agree=0.667, adj=0.238, (0 split)  
## dim5 < -0.05482528 to the right, agree=0.660, adj=0.222, (0 split)  
## dim18 < -0.08736033 to the right, agree=0.660, adj=0.222, (0 split)  
## dim23 < 0.03509954 to the left, agree=0.660, adj=0.222, (0 split)  
##   
## Node number 477: 111 observations, complexity param=0.0002009579  
## predicted class=9 expected loss=0.2252252 P(node) =0.003303571  
## class counts: 0 0 0 1 18 0 0 4 2 86  
## probabilities: 0.000 0.000 0.000 0.009 0.162 0.000 0.000 0.036 0.018 0.775   
## left son=954 (40 obs) right son=955 (71 obs)  
## Primary splits:  
## dim11 < 0.01564865 to the right, improve=7.465487, (0 missing)  
## dim12 < 0.006020037 to the right, improve=6.123587, (0 missing)  
## dim7 < -0.2087559 to the left, improve=6.069342, (0 missing)  
## dim13 < 0.1698515 to the right, improve=5.255321, (0 missing)  
## dim16 < -0.06557886 to the right, improve=4.402287, (0 missing)  
## Surrogate splits:  
## dim17 < 0.02537211 to the left, agree=0.775, adj=0.375, (0 split)  
## dim4 < 0.1848298 to the right, agree=0.703, adj=0.175, (0 split)  
## dim7 < -0.1738319 to the left, agree=0.694, adj=0.150, (0 split)  
## dim9 < 0.1463164 to the right, agree=0.694, adj=0.150, (0 split)  
## dim16 < -0.05127007 to the right, agree=0.694, adj=0.150, (0 split)  
##   
## Node number 478: 24 observations, complexity param=0.0001004789  
## predicted class=7 expected loss=0.125 P(node) =0.0007142857  
## class counts: 0 0 0 0 0 0 0 21 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.875 0.000 0.125   
## left son=956 (21 obs) right son=957 (3 obs)  
## Primary splits:  
## dim7 < -0.01835809 to the right, improve=5.250000, (0 missing)  
## dim11 < 0.04824965 to the left, improve=5.250000, (0 missing)  
## dim2 < -0.02555628 to the right, improve=3.340909, (0 missing)  
## dim1 < 0.6217547 to the left, improve=3.340909, (0 missing)  
## dim4 < -0.1322373 to the left, improve=3.340909, (0 missing)  
## Surrogate splits:  
## dim11 < 0.04824965 to the left, agree=1.000, adj=1.000, (0 split)  
## dim1 < 0.6217547 to the left, agree=0.958, adj=0.667, (0 split)  
## dim2 < -0.02555628 to the right, agree=0.958, adj=0.667, (0 split)  
## dim4 < -0.1322373 to the left, agree=0.958, adj=0.667, (0 split)  
## dim5 < -0.1059938 to the right, agree=0.917, adj=0.333, (0 split)  
##   
## Node number 479: 1203 observations, complexity param=0.0002177044  
## predicted class=9 expected loss=0.07481297 P(node) =0.03580357  
## class counts: 0 0 0 9 60 0 0 15 6 1113  
## probabilities: 0.000 0.000 0.000 0.007 0.050 0.000 0.000 0.012 0.005 0.925   
## left son=958 (31 obs) right son=959 (1172 obs)  
## Primary splits:  
## dim12 < 0.2936382 to the right, improve=17.113390, (0 missing)  
## dim24 < 0.05429206 to the right, improve= 9.334401, (0 missing)  
## dim13 < 0.1540268 to the right, improve= 7.649285, (0 missing)  
## dim11 < -0.2848901 to the left, improve= 7.359499, (0 missing)  
## dim10 < -0.3422569 to the left, improve= 5.989069, (0 missing)  
##   
## Node number 480: 45 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.1111111 P(node) =0.001339286  
## class counts: 0 0 40 2 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.889 0.044 0.000 0.000 0.000 0.067 0.000 0.000   
## left son=960 (39 obs) right son=961 (6 obs)  
## Primary splits:  
## dim1 < 0.5665701 to the left, improve=3.206838, (0 missing)  
## dim3 < -0.3037472 to the right, improve=2.481137, (0 missing)  
## dim21 < 0.09281139 to the left, improve=2.481137, (0 missing)  
## dim10 < -0.09172884 to the right, improve=2.155556, (0 missing)  
## dim29 < -0.07773215 to the right, improve=2.155556, (0 missing)  
## Surrogate splits:  
## dim21 < 0.08505805 to the left, agree=0.933, adj=0.500, (0 split)  
## dim29 < -0.07773215 to the right, agree=0.889, adj=0.167, (0 split)  
##   
## Node number 481: 2 observations  
## predicted class=6 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 482: 9 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.1111111 P(node) =0.0002678571  
## class counts: 0 0 8 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.889 0.111 0.000 0.000 0.000 0.000 0.000 0.000   
## left son=964 (8 obs) right son=965 (1 obs)  
## Primary splits:  
## dim1 < 0.6382068 to the left, improve=1.777778, (0 missing)  
## dim11 < 0.04615828 to the left, improve=1.777778, (0 missing)  
## dim4 < -0.2916312 to the right, improve=1.777778, (0 missing)  
## dim7 < 0.1249167 to the right, improve=1.777778, (0 missing)  
## dim15 < 0.003470838 to the right, improve=1.777778, (0 missing)  
##   
## Node number 483: 33 observations, complexity param=0.0002009579  
## predicted class=3 expected loss=0.5454545 P(node) =0.0009821429  
## class counts: 0 0 3 15 0 0 0 5 9 1  
## probabilities: 0.000 0.000 0.091 0.455 0.000 0.000 0.000 0.152 0.273 0.030   
## left son=966 (20 obs) right son=967 (13 obs)  
## Primary splits:  
## dim17 < -0.01457166 to the right, improve=5.389744, (0 missing)  
## dim19 < 0.01238547 to the right, improve=5.106227, (0 missing)  
## dim16 < 0.0151087 to the left, improve=4.789744, (0 missing)  
## dim10 < 0.07135032 to the right, improve=4.688725, (0 missing)  
## dim5 < 0.2134717 to the right, improve=4.050125, (0 missing)  
## Surrogate splits:  
## dim3 < -0.1528331 to the left, agree=0.818, adj=0.538, (0 split)  
## dim5 < 0.1841205 to the right, agree=0.788, adj=0.462, (0 split)  
## dim10 < 0.07135032 to the right, agree=0.788, adj=0.462, (0 split)  
## dim1 < 0.5488826 to the left, agree=0.758, adj=0.385, (0 split)  
## dim19 < -0.01242656 to the right, agree=0.758, adj=0.385, (0 split)  
##   
## Node number 484: 27 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.1481481 P(node) =0.0008035714  
## class counts: 0 0 0 0 23 0 2 1 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.852 0.000 0.074 0.037 0.000 0.037   
## left son=968 (25 obs) right son=969 (2 obs)  
## Primary splits:  
## dim27 < -0.1137274 to the right, improve=2.425185, (0 missing)  
## dim26 < 0.08986828 to the left, improve=2.425185, (0 missing)  
## dim6 < 0.008075439 to the right, improve=1.935185, (0 missing)  
## dim8 < 0.0221523 to the right, improve=1.935185, (0 missing)  
## dim13 < -0.1037427 to the left, improve=1.935185, (0 missing)  
##   
## Node number 485: 6 observations, complexity param=6.698597e-05  
## predicted class=9 expected loss=0.5 P(node) =0.0001785714  
## class counts: 0 0 2 0 0 0 0 0 1 3  
## probabilities: 0.000 0.000 0.333 0.000 0.000 0.000 0.000 0.000 0.167 0.500   
## left son=970 (3 obs) right son=971 (3 obs)  
## Primary splits:  
## dim19 < 0.01610047 to the right, improve=2.333333, (0 missing)  
## dim29 < -0.009722051 to the right, improve=2.333333, (0 missing)  
## dim1 < 0.5399781 to the left, improve=2.166667, (0 missing)  
## dim6 < -0.07034428 to the left, improve=2.166667, (0 missing)  
## dim25 < 0.01175242 to the left, improve=2.166667, (0 missing)  
## Surrogate splits:  
## dim29 < -0.009722051 to the right, agree=1.000, adj=1.000, (0 split)  
## dim1 < 0.5399781 to the left, agree=0.833, adj=0.667, (0 split)  
## dim2 < 0.08881721 to the left, agree=0.833, adj=0.667, (0 split)  
## dim3 < -0.2563442 to the right, agree=0.833, adj=0.667, (0 split)  
## dim4 < -0.00195489 to the right, agree=0.833, adj=0.667, (0 split)  
##   
## Node number 486: 17 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.6470588 P(node) =0.0005059524  
## class counts: 0 0 6 1 3 0 1 3 1 2  
## probabilities: 0.000 0.000 0.353 0.059 0.176 0.000 0.059 0.176 0.059 0.118   
## left son=972 (7 obs) right son=973 (10 obs)  
## Primary splits:  
## dim3 < -0.17411 to the right, improve=2.268908, (0 missing)  
## dim11 < 0.08624781 to the right, improve=2.065611, (0 missing)  
## dim21 < -0.02061816 to the left, improve=2.050654, (0 missing)  
## dim26 < -0.07430999 to the left, improve=2.017825, (0 missing)  
## dim18 < 0.07017124 to the right, improve=1.945098, (0 missing)  
## Surrogate splits:  
## dim10 < 0.1054237 to the right, agree=0.824, adj=0.571, (0 split)  
## dim1 < 0.4898568 to the right, agree=0.765, adj=0.429, (0 split)  
## dim2 < 0.05995944 to the left, agree=0.765, adj=0.429, (0 split)  
## dim5 < 0.2583899 to the right, agree=0.765, adj=0.429, (0 split)  
## dim9 < -0.0946813 to the left, agree=0.765, adj=0.429, (0 split)  
##   
## Node number 487: 51 observations, complexity param=0.0001004789  
## predicted class=7 expected loss=0.1176471 P(node) =0.001517857  
## class counts: 0 0 1 0 0 0 0 45 3 2  
## probabilities: 0.000 0.000 0.020 0.000 0.000 0.000 0.000 0.882 0.059 0.039   
## left son=974 (4 obs) right son=975 (47 obs)  
## Primary splits:  
## dim27 < 0.0690615 to the right, improve=5.689821, (0 missing)  
## dim9 < -0.1072324 to the right, improve=5.647267, (0 missing)  
## dim18 < 0.03113403 to the left, improve=5.311275, (0 missing)  
## dim3 < -0.1244205 to the right, improve=3.977941, (0 missing)  
## dim24 < -0.1492746 to the right, improve=3.936275, (0 missing)  
## Surrogate splits:  
## dim3 < -0.1244205 to the right, agree=0.980, adj=0.75, (0 split)  
## dim9 < -0.1228794 to the left, agree=0.980, adj=0.75, (0 split)  
## dim18 < 0.03113403 to the right, agree=0.980, adj=0.75, (0 split)  
## dim23 < 0.1006916 to the right, agree=0.961, adj=0.50, (0 split)  
## dim24 < -0.1903933 to the left, agree=0.961, adj=0.50, (0 split)  
##   
## Node number 488: 71 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.1126761 P(node) =0.002113095  
## class counts: 0 0 1 0 63 1 3 0 1 2  
## probabilities: 0.000 0.000 0.014 0.000 0.887 0.014 0.042 0.000 0.014 0.028   
## left son=976 (68 obs) right son=977 (3 obs)  
## Primary splits:  
## dim1 < 0.3387652 to the right, improve=4.010494, (0 missing)  
## dim19 < -0.09832054 to the right, improve=3.510921, (0 missing)  
## dim30 < -0.1075102 to the right, improve=3.510921, (0 missing)  
## dim16 < -0.2005607 to the right, improve=2.568892, (0 missing)  
## dim23 < 0.03838049 to the left, improve=2.410553, (0 missing)  
## Surrogate splits:  
## dim30 < -0.1075102 to the right, agree=0.986, adj=0.667, (0 split)  
##   
## Node number 489: 28 observations, complexity param=0.0002009579  
## predicted class=6 expected loss=0.5357143 P(node) =0.0008333333  
## class counts: 0 0 0 0 8 0 13 1 2 4  
## probabilities: 0.000 0.000 0.000 0.000 0.286 0.000 0.464 0.036 0.071 0.143   
## left son=978 (12 obs) right son=979 (16 obs)  
## Primary splits:  
## dim4 < 0.079844 to the right, improve=8.303571, (0 missing)  
## dim8 < 0.03233486 to the right, improve=7.615751, (0 missing)  
## dim12 < 0.02350376 to the right, improve=6.040871, (0 missing)  
## dim25 < 0.01539518 to the left, improve=5.720238, (0 missing)  
## dim6 < 0.06458007 to the right, improve=5.309524, (0 missing)  
## Surrogate splits:  
## dim7 < 0.1497884 to the right, agree=0.893, adj=0.750, (0 split)  
## dim8 < 0.03233486 to the left, agree=0.893, adj=0.750, (0 split)  
## dim25 < 0.01539518 to the left, agree=0.857, adj=0.667, (0 split)  
## dim12 < 0.02350376 to the right, agree=0.821, adj=0.583, (0 split)  
## dim24 < -0.06503543 to the left, agree=0.821, adj=0.583, (0 split)  
##   
## Node number 490: 11 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.7272727 P(node) =0.000327381  
## class counts: 1 0 0 0 3 0 2 3 0 2  
## probabilities: 0.091 0.000 0.000 0.000 0.273 0.000 0.182 0.273 0.000 0.182   
## left son=980 (8 obs) right son=981 (3 obs)  
## Primary splits:  
## dim3 < -0.2125867 to the right, improve=2.795455, (0 missing)  
## dim10 < 0.06939552 to the left, improve=2.478788, (0 missing)  
## dim14 < 0.06782563 to the left, improve=2.345455, (0 missing)  
## dim15 < 0.06214979 to the right, improve=2.188312, (0 missing)  
## dim6 < -0.1216862 to the right, improve=2.101010, (0 missing)  
## Surrogate splits:  
## dim13 < 0.07792028 to the left, agree=0.909, adj=0.667, (0 split)  
## dim19 < 0.1623106 to the left, agree=0.909, adj=0.667, (0 split)  
## dim5 < 0.178832 to the right, agree=0.818, adj=0.333, (0 split)  
## dim7 < 0.1065842 to the left, agree=0.818, adj=0.333, (0 split)  
## dim9 < 0.1169234 to the left, agree=0.818, adj=0.333, (0 split)  
##   
## Node number 491: 11 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.1818182 P(node) =0.000327381  
## class counts: 0 0 0 0 1 0 0 1 0 9  
## probabilities: 0.000 0.000 0.000 0.000 0.091 0.000 0.000 0.091 0.000 0.818   
## left son=982 (1 obs) right son=983 (10 obs)  
## Primary splits:  
## dim2 < 0.3160536 to the right, improve=1.654545, (0 missing)  
## dim5 < 0.3745786 to the right, improve=1.654545, (0 missing)  
## dim12 < 0.141035 to the right, improve=1.654545, (0 missing)  
## dim16 < 0.1006105 to the right, improve=1.654545, (0 missing)  
## dim18 < 0.05024265 to the right, improve=1.654545, (0 missing)  
##   
## Node number 492: 16 observations  
## predicted class=4 expected loss=0 P(node) =0.0004761905  
## class counts: 0 0 0 0 16 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 493: 3 observations  
## predicted class=9 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 494: 5 observations, complexity param=6.698597e-05  
## predicted class=7 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 2 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.400 0.000 0.000 0.000 0.000 0.600 0.000 0.000   
## left son=988 (2 obs) right son=989 (3 obs)  
## Primary splits:  
## dim5 < 0.201369 to the right, improve=2.4, (0 missing)  
## dim7 < 0.2198145 to the right, improve=2.4, (0 missing)  
## dim14 < 0.02504496 to the left, improve=2.4, (0 missing)  
## dim16 < -0.06419414 to the left, improve=2.4, (0 missing)  
## dim18 < -0.08379668 to the left, improve=2.4, (0 missing)  
## Surrogate splits:  
## dim7 < 0.2198145 to the right, agree=1.0, adj=1.0, (0 split)  
## dim14 < 0.02504496 to the left, agree=1.0, adj=1.0, (0 split)  
## dim16 < -0.06419414 to the left, agree=1.0, adj=1.0, (0 split)  
## dim18 < -0.08379668 to the left, agree=1.0, adj=1.0, (0 split)  
## dim1 < 0.5213149 to the right, agree=0.8, adj=0.5, (0 split)  
##   
## Node number 495: 196 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.08163265 P(node) =0.005833333  
## class counts: 0 0 2 0 6 0 0 5 3 180  
## probabilities: 0.000 0.000 0.010 0.000 0.031 0.000 0.000 0.026 0.015 0.918   
## left son=990 (3 obs) right son=991 (193 obs)  
## Primary splits:  
## dim9 < -0.1801284 to the left, improve=5.528762, (0 missing)  
## dim30 < 0.07320474 to the right, improve=4.469206, (0 missing)  
## dim18 < -0.1203897 to the left, improve=3.700620, (0 missing)  
## dim16 < 0.1187026 to the right, improve=2.982993, (0 missing)  
## dim2 < 0.2184436 to the left, improve=2.952690, (0 missing)  
##   
## Node number 498: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 499: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 500: 80 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.2 P(node) =0.002380952  
## class counts: 0 0 0 0 64 3 0 4 3 6  
## probabilities: 0.000 0.000 0.000 0.000 0.800 0.037 0.000 0.050 0.037 0.075   
## left son=1000 (59 obs) right son=1001 (21 obs)  
## Primary splits:  
## dim28 < -0.003053203 to the right, improve=6.509342, (0 missing)  
## dim2 < 0.1425084 to the right, improve=5.893652, (0 missing)  
## dim5 < -0.07809137 to the right, improve=5.217767, (0 missing)  
## dim11 < 0.08814676 to the right, improve=4.880224, (0 missing)  
## dim16 < -0.06833876 to the right, improve=4.793885, (0 missing)  
## Surrogate splits:  
## dim16 < -0.03685247 to the right, agree=0.825, adj=0.333, (0 split)  
## dim23 < -0.03713446 to the left, agree=0.825, adj=0.333, (0 split)  
## dim6 < 0.110321 to the left, agree=0.812, adj=0.286, (0 split)  
## dim2 < 0.08679297 to the right, agree=0.800, adj=0.238, (0 split)  
## dim20 < -0.0710934 to the right, agree=0.788, adj=0.190, (0 split)  
##   
## Node number 501: 190 observations, complexity param=0.0005358877  
## predicted class=9 expected loss=0.4 P(node) =0.005654762  
## class counts: 0 1 0 2 30 5 0 17 21 114  
## probabilities: 0.000 0.005 0.000 0.011 0.158 0.026 0.000 0.089 0.111 0.600   
## left son=1002 (34 obs) right son=1003 (156 obs)  
## Primary splits:  
## dim6 < -0.03175167 to the left, improve=19.71761, (0 missing)  
## dim13 < -0.04901252 to the right, improve=17.59718, (0 missing)  
## dim26 < -0.0304044 to the right, improve=16.82523, (0 missing)  
## dim2 < -0.03097143 to the left, improve=16.12378, (0 missing)  
## dim28 < 0.07823331 to the right, improve=15.63847, (0 missing)  
## Surrogate splits:  
## dim2 < -0.07176653 to the left, agree=0.874, adj=0.294, (0 split)  
## dim17 < 0.07143434 to the right, agree=0.853, adj=0.176, (0 split)  
## dim18 < -0.09886206 to the left, agree=0.847, adj=0.147, (0 split)  
## dim20 < 0.1407137 to the right, agree=0.842, adj=0.118, (0 split)  
## dim27 < -0.1127668 to the left, agree=0.842, adj=0.118, (0 split)  
##   
## Node number 502: 229 observations, complexity param=0.0001004789  
## predicted class=7 expected loss=0.1746725 P(node) =0.006815476  
## class counts: 0 3 8 4 2 3 0 189 5 15  
## probabilities: 0.000 0.013 0.035 0.017 0.009 0.013 0.000 0.825 0.022 0.066   
## left son=1004 (208 obs) right son=1005 (21 obs)  
## Primary splits:  
## dim15 < -0.0485747 to the right, improve=9.386697, (0 missing)  
## dim8 < 0.1594074 to the right, improve=5.934127, (0 missing)  
## dim10 < 0.07931708 to the right, improve=5.131405, (0 missing)  
## dim16 < 0.1345716 to the right, improve=5.115268, (0 missing)  
## dim2 < 0.1434508 to the left, improve=5.060444, (0 missing)  
## Surrogate splits:  
## dim17 < -0.09938944 to the right, agree=0.926, adj=0.190, (0 split)  
## dim24 < 0.1118533 to the left, agree=0.921, adj=0.143, (0 split)  
## dim1 < 0.422142 to the right, agree=0.917, adj=0.095, (0 split)  
## dim2 < 0.2791015 to the left, agree=0.917, adj=0.095, (0 split)  
## dim8 < 0.1594074 to the left, agree=0.917, adj=0.095, (0 split)  
##   
## Node number 503: 197 observations, complexity param=0.0006196202  
## predicted class=7 expected loss=0.6649746 P(node) =0.005863095  
## class counts: 0 2 3 6 6 10 0 66 41 63  
## probabilities: 0.000 0.010 0.015 0.030 0.030 0.051 0.000 0.335 0.208 0.320   
## left son=1006 (73 obs) right son=1007 (124 obs)  
## Primary splits:  
## dim6 < 0.1458953 to the right, improve=18.86073, (0 missing)  
## dim19 < -0.008405258 to the right, improve=13.81712, (0 missing)  
## dim27 < -0.03064562 to the left, improve=12.20772, (0 missing)  
## dim17 < 0.02234873 to the right, improve=11.51945, (0 missing)  
## dim16 < 0.02602205 to the right, improve=11.36440, (0 missing)  
## Surrogate splits:  
## dim18 < 0.04731369 to the right, agree=0.751, adj=0.329, (0 split)  
## dim27 < -0.03395988 to the left, agree=0.741, adj=0.301, (0 split)  
## dim13 < 0.06845573 to the right, agree=0.711, adj=0.219, (0 split)  
## dim4 < 0.09728421 to the right, agree=0.701, adj=0.192, (0 split)  
## dim22 < 0.06527867 to the right, agree=0.701, adj=0.192, (0 split)  
##   
## Node number 506: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.500 0.000 0.000   
## left son=1012 (1 obs) right son=1013 (1 obs)  
## Primary splits:  
## dim1 < 0.5861241 to the right, improve=1, (0 missing)  
## dim2 < -0.1335791 to the right, improve=1, (0 missing)  
## dim3 < -0.2146058 to the right, improve=1, (0 missing)  
## dim4 < -0.2241929 to the left, improve=1, (0 missing)  
## dim5 < -0.2611234 to the left, improve=1, (0 missing)  
##   
## Node number 507: 2 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 1 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.500   
## left son=1014 (1 obs) right son=1015 (1 obs)  
## Primary splits:  
## dim1 < 0.5070042 to the left, improve=1, (0 missing)  
## dim2 < -0.0527169 to the right, improve=1, (0 missing)  
## dim3 < -0.1932489 to the right, improve=1, (0 missing)  
## dim4 < -0.03619865 to the right, improve=1, (0 missing)  
## dim5 < -0.145371 to the right, improve=1, (0 missing)  
##   
## Node number 508: 13 observations, complexity param=0.0001339719  
## predicted class=3 expected loss=0.4615385 P(node) =0.0003869048  
## class counts: 0 0 4 7 0 0 0 1 0 1  
## probabilities: 0.000 0.000 0.308 0.538 0.000 0.000 0.000 0.077 0.000 0.077   
## left son=1016 (7 obs) right son=1017 (6 obs)  
## Primary splits:  
## dim20 < 0.0599188 to the left, improve=4.846154, (0 missing)  
## dim28 < 0.09157915 to the right, improve=4.512821, (0 missing)  
## dim9 < 0.08918895 to the left, improve=3.560440, (0 missing)  
## dim21 < 0.05483648 to the left, improve=3.560440, (0 missing)  
## dim8 < -0.07457816 to the left, improve=3.131868, (0 missing)  
## Surrogate splits:  
## dim9 < 0.08918895 to the left, agree=0.923, adj=0.833, (0 split)  
## dim21 < 0.05483648 to the left, agree=0.923, adj=0.833, (0 split)  
## dim2 < -0.06240685 to the left, agree=0.846, adj=0.667, (0 split)  
## dim8 < -0.07457816 to the right, agree=0.846, adj=0.667, (0 split)  
## dim12 < -0.001761658 to the left, agree=0.846, adj=0.667, (0 split)  
##   
## Node number 509: 2462 observations, complexity param=0.0001004789  
## predicted class=7 expected loss=0.05361495 P(node) =0.07327381  
## class counts: 0 1 20 9 14 5 1 2330 14 68  
## probabilities: 0.000 0.000 0.008 0.004 0.006 0.002 0.000 0.946 0.006 0.028   
## left son=1018 (291 obs) right son=1019 (2171 obs)  
## Primary splits:  
## dim5 < 0.02084559 to the right, improve=9.696447, (0 missing)  
## dim11 < 0.2282539 to the right, improve=9.282875, (0 missing)  
## dim3 < -0.1579483 to the right, improve=9.048574, (0 missing)  
## dim9 < 0.06363494 to the right, improve=6.927425, (0 missing)  
## dim16 < -0.2214204 to the right, improve=5.780791, (0 missing)  
## Surrogate splits:  
## dim15 < 0.1845861 to the right, agree=0.886, adj=0.034, (0 split)  
## dim19 < 0.2004104 to the right, agree=0.886, adj=0.034, (0 split)  
## dim4 < -0.3441897 to the left, agree=0.885, adj=0.024, (0 split)  
## dim1 < 0.2673578 to the left, agree=0.884, adj=0.017, (0 split)  
## dim12 < -0.318712 to the left, agree=0.884, adj=0.017, (0 split)  
##   
## Node number 510: 16 observations  
## predicted class=7 expected loss=0 P(node) =0.0004761905  
## class counts: 0 0 0 0 0 0 0 16 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 511: 45 observations, complexity param=0.0001786292  
## predicted class=9 expected loss=0.5111111 P(node) =0.001339286  
## class counts: 2 0 1 1 5 2 0 12 0 22  
## probabilities: 0.044 0.000 0.022 0.022 0.111 0.044 0.000 0.267 0.000 0.489   
## left son=1022 (11 obs) right son=1023 (34 obs)  
## Primary splits:  
## dim9 < 0.1349919 to the right, improve=4.999287, (0 missing)  
## dim29 < -0.0800545 to the left, improve=4.766667, (0 missing)  
## dim20 < -0.0861342 to the left, improve=4.466667, (0 missing)  
## dim19 < -0.1833732 to the right, improve=4.132051, (0 missing)  
## dim8 < 0.06348393 to the right, improve=3.918182, (0 missing)  
## Surrogate splits:  
## dim13 < 0.07384786 to the right, agree=0.889, adj=0.545, (0 split)  
## dim16 < 0.09286231 to the right, agree=0.822, adj=0.273, (0 split)  
## dim23 < 0.114729 to the right, agree=0.822, adj=0.273, (0 split)  
## dim18 < 0.0892249 to the right, agree=0.800, adj=0.182, (0 split)  
## dim20 < -0.1061398 to the left, agree=0.800, adj=0.182, (0 split)  
##   
## Node number 512: 2792 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.01396848 P(node) =0.08309524  
## class counts: 0 2753 3 0 1 0 2 10 19 4  
## probabilities: 0.000 0.986 0.001 0.000 0.000 0.000 0.001 0.004 0.007 0.001   
## left son=1024 (2789 obs) right son=1025 (3 obs)  
## Primary splits:  
## dim22 < 0.2134169 to the left, improve=4.554140, (0 missing)  
## dim16 < -0.1799683 to the right, improve=3.933133, (0 missing)  
## dim18 < -0.1974817 to the right, improve=3.933133, (0 missing)  
## dim19 < 0.147629 to the left, improve=3.387691, (0 missing)  
## dim14 < -0.09395817 to the right, improve=2.674573, (0 missing)  
##   
## Node number 513: 3 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 1 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.333 0.667   
## left son=1026 (1 obs) right son=1027 (2 obs)  
## Primary splits:  
## dim3 < 0.06740855 to the right, improve=1.333333, (0 missing)  
## dim4 < 0.1975398 to the right, improve=1.333333, (0 missing)  
## dim5 < 0.07985968 to the right, improve=1.333333, (0 missing)  
## dim9 < 0.07795809 to the right, improve=1.333333, (0 missing)  
## dim11 < -0.02170851 to the right, improve=1.333333, (0 missing)  
##   
## Node number 514: 2 observations  
## predicted class=7 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 515: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 516: 16 observations, complexity param=5.023947e-05  
## predicted class=1 expected loss=0.125 P(node) =0.0004761905  
## class counts: 0 14 0 0 0 0 0 0 2 0  
## probabilities: 0.000 0.875 0.000 0.000 0.000 0.000 0.000 0.000 0.125 0.000   
## left son=1032 (14 obs) right son=1033 (2 obs)  
## Primary splits:  
## dim20 < 0.1154912 to the left, improve=3.500000, (0 missing)  
## dim16 < 0.06109184 to the left, improve=1.633333, (0 missing)  
## dim18 < 0.1240899 to the left, improve=1.633333, (0 missing)  
## dim29 < 0.06235081 to the left, improve=1.633333, (0 missing)  
## dim15 < -0.1038797 to the right, improve=1.633333, (0 missing)  
##   
## Node number 517: 4 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.75 P(node) =0.0001190476  
## class counts: 0 0 1 1 0 1 0 0 1 0  
## probabilities: 0.000 0.000 0.250 0.250 0.000 0.250 0.000 0.000 0.250 0.000   
## left son=1034 (1 obs) right son=1035 (3 obs)  
## Primary splits:  
## dim7 < 0.08500865 to the right, improve=1, (0 missing)  
## dim16 < 0.06368962 to the right, improve=1, (0 missing)  
## dim2 < -0.4023446 to the left, improve=1, (0 missing)  
## dim8 < -0.008277486 to the left, improve=1, (0 missing)  
## dim10 < 0.1832149 to the left, improve=1, (0 missing)  
##   
## Node number 518: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 519: 4 observations  
## predicted class=8 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 0 0 0 0 0 4 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 522: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 523: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 552: 3 observations  
## predicted class=3 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 3 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 553: 2 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 1 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.500 0.000 0.000   
## left son=1106 (1 obs) right son=1107 (1 obs)  
## Primary splits:  
## dim1 < 0.6094884 to the right, improve=1, (0 missing)  
## dim2 < -0.5077147 to the left, improve=1, (0 missing)  
## dim3 < -0.03713503 to the right, improve=1, (0 missing)  
## dim4 < 0.07190282 to the right, improve=1, (0 missing)  
## dim5 < 0.04595469 to the right, improve=1, (0 missing)  
##   
## Node number 640: 287 observations  
## predicted class=1 expected loss=0 P(node) =0.008541667  
## class counts: 0 287 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 641: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 664: 9 observations  
## predicted class=1 expected loss=0 P(node) =0.0002678571  
## class counts: 0 9 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 665: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 666: 4 observations  
## predicted class=3 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 4 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 667: 4 observations, complexity param=3.349298e-05  
## predicted class=5 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 1 0 0 1 2 0 0 0 0  
## probabilities: 0.000 0.250 0.000 0.000 0.250 0.500 0.000 0.000 0.000 0.000   
## left son=1334 (2 obs) right son=1335 (2 obs)  
## Primary splits:  
## dim2 < -0.3567254 to the left, improve=1.5, (0 missing)  
## dim11 < 0.01830066 to the left, improve=1.5, (0 missing)  
## dim13 < -0.1066985 to the left, improve=1.5, (0 missing)  
## dim18 < 0.01158621 to the left, improve=1.5, (0 missing)  
## dim19 < 0.02800752 to the left, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim5 < -0.1186216 to the right, agree=1, adj=1, (0 split)  
## dim10 < 0.090709 to the right, agree=1, adj=1, (0 split)  
## dim11 < 0.01830066 to the left, agree=1, adj=1, (0 split)  
## dim12 < 0.05645217 to the right, agree=1, adj=1, (0 split)  
## dim13 < -0.1066985 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 690: 4 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 2 1 0 0 0 0 0 1 0  
## probabilities: 0.000 0.500 0.250 0.000 0.000 0.000 0.000 0.000 0.250 0.000   
## left son=1380 (2 obs) right son=1381 (2 obs)  
## Primary splits:  
## dim16 < 0.1182914 to the left, improve=1.5, (0 missing)  
## dim23 < 0.07268837 to the left, improve=1.5, (0 missing)  
## dim27 < 0.03194026 to the left, improve=1.5, (0 missing)  
## dim4 < -0.05436092 to the right, improve=1.5, (0 missing)  
## dim9 < 0.007662378 to the right, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim4 < -0.05436092 to the right, agree=1, adj=1, (0 split)  
## dim9 < 0.007662378 to the right, agree=1, adj=1, (0 split)  
## dim12 < 0.09427578 to the right, agree=1, adj=1, (0 split)  
## dim13 < 0.07962553 to the left, agree=1, adj=1, (0 split)  
## dim14 < 0.05624656 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 691: 2 observations  
## predicted class=5 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 2 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 748: 5 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 3 0 1 0 1 0 0 0  
## probabilities: 0.000 0.000 0.600 0.000 0.200 0.000 0.200 0.000 0.000 0.000   
## left son=1496 (3 obs) right son=1497 (2 obs)  
## Primary splits:  
## dim8 < 0.01349502 to the left, improve=1.8, (0 missing)  
## dim30 < 0.02828242 to the left, improve=1.8, (0 missing)  
## dim11 < -0.02051316 to the left, improve=1.8, (0 missing)  
## dim20 < 0.09938999 to the left, improve=1.8, (0 missing)  
## dim24 < 0.01212145 to the left, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim7 < -0.004464644 to the right, agree=1, adj=1, (0 split)  
## dim10 < 0.0926432 to the right, agree=1, adj=1, (0 split)  
## dim11 < -0.02051316 to the left, agree=1, adj=1, (0 split)  
## dim17 < -0.02338358 to the right, agree=1, adj=1, (0 split)  
## dim20 < 0.09938999 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 749: 4 observations  
## predicted class=8 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 0 0 0 0 0 4 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 752: 4 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 2 1 0 0 0 0 1 0 0  
## probabilities: 0.000 0.500 0.250 0.000 0.000 0.000 0.000 0.250 0.000 0.000   
## left son=1504 (2 obs) right son=1505 (2 obs)  
## Primary splits:  
## dim12 < 0.05294305 to the right, improve=1.5, (0 missing)  
## dim15 < 0.05651808 to the right, improve=1.5, (0 missing)  
## dim1 < 0.5887493 to the left, improve=1.5, (0 missing)  
## dim2 < -0.3676834 to the left, improve=1.5, (0 missing)  
## dim5 < -0.0180845 to the left, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5887493 to the left, agree=1, adj=1, (0 split)  
## dim2 < -0.3676834 to the left, agree=1, adj=1, (0 split)  
## dim5 < -0.0180845 to the left, agree=1, adj=1, (0 split)  
## dim10 < -0.05074074 to the left, agree=1, adj=1, (0 split)  
## dim15 < 0.05651808 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 753: 5 observations  
## predicted class=3 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 5 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 754: 2 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 1 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.500   
## left son=1508 (1 obs) right son=1509 (1 obs)  
## Primary splits:  
## dim1 < 0.5654823 to the right, improve=1, (0 missing)  
## dim2 < -0.3733171 to the left, improve=1, (0 missing)  
## dim3 < -0.07809012 to the right, improve=1, (0 missing)  
## dim4 < 0.00215295 to the left, improve=1, (0 missing)  
## dim5 < -0.01221077 to the right, improve=1, (0 missing)  
##   
## Node number 755: 18 observations  
## predicted class=7 expected loss=0 P(node) =0.0005357143  
## class counts: 0 0 0 0 0 0 0 18 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 756: 20 observations, complexity param=0.0001674649  
## predicted class=3 expected loss=0.65 P(node) =0.0005952381  
## class counts: 0 0 0 7 5 1 2 1 1 3  
## probabilities: 0.000 0.000 0.000 0.350 0.250 0.050 0.100 0.050 0.050 0.150   
## left son=1512 (8 obs) right son=1513 (12 obs)  
## Primary splits:  
## dim8 < -0.05418859 to the left, improve=5.083333, (0 missing)  
## dim10 < -0.1178184 to the right, improve=4.027473, (0 missing)  
## dim26 < 0.05653119 to the right, improve=3.625000, (0 missing)  
## dim11 < -0.01146078 to the right, improve=3.500000, (0 missing)  
## dim9 < 0.01599455 to the right, improve=3.419192, (0 missing)  
## Surrogate splits:  
## dim1 < 0.6205192 to the right, agree=0.90, adj=0.750, (0 split)  
## dim30 < -0.0899271 to the left, agree=0.90, adj=0.750, (0 split)  
## dim25 < 0.09255789 to the right, agree=0.85, adj=0.625, (0 split)  
## dim3 < 0.02734293 to the right, agree=0.80, adj=0.500, (0 split)  
## dim4 < 0.0330226 to the left, agree=0.80, adj=0.500, (0 split)  
##   
## Node number 757: 14 observations, complexity param=0.0001004789  
## predicted class=8 expected loss=0.2857143 P(node) =0.0004166667  
## class counts: 0 1 0 0 0 3 0 0 10 0  
## probabilities: 0.000 0.071 0.000 0.000 0.000 0.214 0.000 0.000 0.714 0.000   
## left son=1514 (4 obs) right son=1515 (10 obs)  
## Primary splits:  
## dim8 < 0.05475979 to the right, improve=4.642857, (0 missing)  
## dim9 < 0.0251261 to the right, improve=4.642857, (0 missing)  
## dim16 < -0.01485319 to the right, improve=4.324675, (0 missing)  
## dim2 < -0.3458379 to the right, improve=4.324675, (0 missing)  
## dim18 < 0.01629029 to the left, improve=3.342857, (0 missing)  
## Surrogate splits:  
## dim9 < 0.0251261 to the right, agree=1.000, adj=1.00, (0 split)  
## dim2 < -0.3458379 to the right, agree=0.929, adj=0.75, (0 split)  
## dim13 < 0.1941127 to the right, agree=0.929, adj=0.75, (0 split)  
## dim16 < -0.01485319 to the right, agree=0.929, adj=0.75, (0 split)  
## dim18 < 0.01629029 to the left, agree=0.929, adj=0.75, (0 split)  
##   
## Node number 758: 5 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 1 0 0 0 0 0 3 0 1  
## probabilities: 0.000 0.200 0.000 0.000 0.000 0.000 0.000 0.600 0.000 0.200   
## left son=1516 (2 obs) right son=1517 (3 obs)  
## Primary splits:  
## dim12 < -0.01039328 to the right, improve=1.8, (0 missing)  
## dim3 < -0.1684206 to the left, improve=1.8, (0 missing)  
## dim5 < -0.003477035 to the left, improve=1.8, (0 missing)  
## dim15 < 0.09931228 to the left, improve=1.8, (0 missing)  
## dim21 < -0.1535908 to the left, improve=1.8, (0 missing)  
## Surrogate splits:  
## dim3 < -0.1684206 to the left, agree=1, adj=1, (0 split)  
## dim5 < -0.003477035 to the left, agree=1, adj=1, (0 split)  
## dim15 < 0.09931228 to the left, agree=1, adj=1, (0 split)  
## dim21 < -0.1535908 to the left, agree=1, adj=1, (0 split)  
## dim24 < 0.002660056 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 759: 23 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.04347826 P(node) =0.0006845238  
## class counts: 0 0 0 0 1 0 0 0 0 22  
## probabilities: 0.000 0.000 0.000 0.000 0.043 0.000 0.000 0.000 0.000 0.957   
## left son=1518 (1 obs) right son=1519 (22 obs)  
## Primary splits:  
## dim1 < 0.5530962 to the left, improve=1.913043, (0 missing)  
## dim7 < -0.1740541 to the left, improve=1.913043, (0 missing)  
## dim29 < -0.0983644 to the left, improve=1.913043, (0 missing)  
## dim4 < 0.1849368 to the right, improve=1.913043, (0 missing)  
## dim5 < 0.04429599 to the right, improve=1.913043, (0 missing)  
##   
## Node number 760: 3 observations  
## predicted class=3 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 3 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 761: 2 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 1 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.500 0.000   
## left son=1522 (1 obs) right son=1523 (1 obs)  
## Primary splits:  
## dim1 < 0.7217125 to the right, improve=1, (0 missing)  
## dim2 < -0.3515472 to the right, improve=1, (0 missing)  
## dim3 < 0.01382467 to the left, improve=1, (0 missing)  
## dim4 < -0.04641708 to the right, improve=1, (0 missing)  
## dim5 < -0.02637137 to the right, improve=1, (0 missing)  
##   
## Node number 764: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 765: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 768: 2148 observations, complexity param=8.373246e-05  
## predicted class=0 expected loss=0.03119181 P(node) =0.06392857  
## class counts: 2081 0 12 1 1 18 18 4 10 3  
## probabilities: 0.969 0.000 0.006 0.000 0.000 0.008 0.008 0.002 0.005 0.001   
## left son=1536 (2145 obs) right son=1537 (3 obs)  
## Primary splits:  
## dim11 < 0.2627095 to the left, improve=5.796528, (0 missing)  
## dim5 < -0.01671332 to the left, improve=5.195286, (0 missing)  
## dim8 < -0.2140462 to the right, improve=5.060274, (0 missing)  
## dim12 < 0.2932826 to the left, improve=5.037865, (0 missing)  
## dim20 < 0.08152494 to the left, improve=4.382313, (0 missing)  
##   
## Node number 769: 7 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.7142857 P(node) =0.0002083333  
## class counts: 0 0 2 1 0 1 0 0 2 1  
## probabilities: 0.000 0.000 0.286 0.143 0.000 0.143 0.000 0.000 0.286 0.143   
## left son=1538 (5 obs) right son=1539 (2 obs)  
## Primary splits:  
## dim13 < -0.01409841 to the left, improve=1.828571, (0 missing)  
## dim11 < 0.1732965 to the left, improve=1.828571, (0 missing)  
## dim14 < 0.1369588 to the right, improve=1.828571, (0 missing)  
## dim21 < 0.03200871 to the right, improve=1.828571, (0 missing)  
## dim23 < -0.03461943 to the left, improve=1.828571, (0 missing)  
## Surrogate splits:  
## dim11 < 0.1732965 to the left, agree=1.000, adj=1.0, (0 split)  
## dim19 < -0.05792099 to the right, agree=1.000, adj=1.0, (0 split)  
## dim21 < 0.03200871 to the right, agree=1.000, adj=1.0, (0 split)  
## dim25 < 0.07820372 to the left, agree=1.000, adj=1.0, (0 split)  
## dim4 < -0.08692337 to the right, agree=0.857, adj=0.5, (0 split)  
##   
## Node number 770: 290 observations, complexity param=0.0001786292  
## predicted class=0 expected loss=0.1689655 P(node) =0.008630952  
## class counts: 241 0 3 0 0 37 2 0 5 2  
## probabilities: 0.831 0.000 0.010 0.000 0.000 0.128 0.007 0.000 0.017 0.007   
## left son=1540 (235 obs) right son=1541 (55 obs)  
## Primary splits:  
## dim4 < -0.1112335 to the right, improve=22.42732, (0 missing)  
## dim10 < 0.004324701 to the right, improve=19.60000, (0 missing)  
## dim20 < 0.09079005 to the left, improve=19.01013, (0 missing)  
## dim14 < 0.05963031 to the left, improve=15.39152, (0 missing)  
## dim22 < -0.1133942 to the right, improve=12.52214, (0 missing)  
## Surrogate splits:  
## dim6 < 0.2353296 to the left, agree=0.852, adj=0.218, (0 split)  
## dim20 < 0.1014208 to the left, agree=0.845, adj=0.182, (0 split)  
## dim14 < 0.1259389 to the left, agree=0.831, adj=0.109, (0 split)  
## dim17 < 0.2027086 to the left, agree=0.828, adj=0.091, (0 split)  
## dim24 < 0.1086246 to the left, agree=0.828, adj=0.091, (0 split)  
##   
## Node number 771: 88 observations, complexity param=0.0001786292  
## predicted class=0 expected loss=0.6704545 P(node) =0.002619048  
## class counts: 29 0 27 1 0 13 6 0 9 3  
## probabilities: 0.330 0.000 0.307 0.011 0.000 0.148 0.068 0.000 0.102 0.034   
## left son=1542 (19 obs) right son=1543 (69 obs)  
## Primary splits:  
## dim1 < 0.3417058 to the left, improve=12.14709, (0 missing)  
## dim8 < -0.07096954 to the left, improve=11.90260, (0 missing)  
## dim13 < 0.006929423 to the right, improve=11.89520, (0 missing)  
## dim7 < 0.2596188 to the right, improve=11.75428, (0 missing)  
## dim14 < -0.1372185 to the left, improve=11.61364, (0 missing)  
## Surrogate splits:  
## dim7 < 0.2596188 to the right, agree=0.920, adj=0.632, (0 split)  
## dim14 < -0.1411039 to the left, agree=0.875, adj=0.421, (0 split)  
## dim6 < 0.1039655 to the right, agree=0.852, adj=0.316, (0 split)  
## dim23 < -0.06701325 to the left, agree=0.852, adj=0.316, (0 split)  
## dim16 < 0.1681056 to the right, agree=0.841, adj=0.263, (0 split)  
##   
## Node number 772: 42 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.04761905 P(node) =0.00125  
## class counts: 40 0 1 0 0 0 0 0 1 0  
## probabilities: 0.952 0.000 0.024 0.000 0.000 0.000 0.000 0.000 0.024 0.000   
## left son=1544 (41 obs) right son=1545 (1 obs)  
## Primary splits:  
## dim9 < -0.182258 to the right, improve=1.905923, (0 missing)  
## dim13 < -0.1025398 to the right, improve=1.905923, (0 missing)  
## dim20 < -0.1307029 to the right, improve=1.905923, (0 missing)  
## dim4 < 0.2647844 to the left, improve=1.905923, (0 missing)  
## dim5 < 0.2533656 to the left, improve=1.905923, (0 missing)  
##   
## Node number 773: 9 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.6666667 P(node) =0.0002678571  
## class counts: 1 0 3 0 0 2 2 0 1 0  
## probabilities: 0.111 0.000 0.333 0.000 0.000 0.222 0.222 0.000 0.111 0.000   
## left son=1546 (3 obs) right son=1547 (6 obs)  
## Primary splits:  
## dim8 < -0.1007266 to the left, improve=2.555556, (0 missing)  
## dim12 < -0.01002811 to the left, improve=2.555556, (0 missing)  
## dim10 < -0.04302757 to the right, improve=2.555556, (0 missing)  
## dim11 < 0.09184808 to the right, improve=2.555556, (0 missing)  
## dim14 < 0.01132379 to the left, improve=2.188889, (0 missing)  
## Surrogate splits:  
## dim10 < -0.04302757 to the right, agree=1.000, adj=1.000, (0 split)  
## dim11 < 0.09184808 to the right, agree=1.000, adj=1.000, (0 split)  
## dim12 < -0.01002811 to the left, agree=1.000, adj=1.000, (0 split)  
## dim4 < 0.04309644 to the right, agree=0.889, adj=0.667, (0 split)  
## dim6 < -0.01721882 to the right, agree=0.889, adj=0.667, (0 split)  
##   
## Node number 774: 49 observations, complexity param=0.0003014368  
## predicted class=8 expected loss=0.7142857 P(node) =0.001458333  
## class counts: 10 0 6 0 6 2 6 0 14 5  
## probabilities: 0.204 0.000 0.122 0.000 0.122 0.041 0.122 0.000 0.286 0.102   
## left son=1548 (31 obs) right son=1549 (18 obs)  
## Primary splits:  
## dim7 < 0.1095066 to the right, improve=9.191939, (0 missing)  
## dim1 < 0.4503757 to the left, improve=6.190021, (0 missing)  
## dim17 < -0.1426197 to the left, improve=5.840188, (0 missing)  
## dim4 < 0.1080733 to the right, improve=5.767187, (0 missing)  
## dim22 < -0.0171242 to the right, improve=5.382121, (0 missing)  
## Surrogate splits:  
## dim9 < -0.1911951 to the right, agree=0.816, adj=0.500, (0 split)  
## dim10 < 0.006110713 to the right, agree=0.816, adj=0.500, (0 split)  
## dim22 < -0.03019786 to the right, agree=0.816, adj=0.500, (0 split)  
## dim1 < 0.4503757 to the left, agree=0.796, adj=0.444, (0 split)  
## dim23 < -0.007244285 to the left, agree=0.776, adj=0.389, (0 split)  
##   
## Node number 775: 73 observations, complexity param=0.0001674649  
## predicted class=6 expected loss=0.1780822 P(node) =0.002172619  
## class counts: 2 0 2 0 5 3 60 0 0 1  
## probabilities: 0.027 0.000 0.027 0.000 0.068 0.041 0.822 0.000 0.000 0.014   
## left son=1550 (7 obs) right son=1551 (66 obs)  
## Primary splits:  
## dim17 < 0.05436887 to the right, improve=8.680306, (0 missing)  
## dim4 < -0.05052224 to the left, improve=5.013639, (0 missing)  
## dim18 < -0.17797 to the left, improve=4.838748, (0 missing)  
## dim12 < -0.05666831 to the left, improve=4.790008, (0 missing)  
## dim14 < -0.02750801 to the left, improve=3.766479, (0 missing)  
## Surrogate splits:  
## dim18 < -0.17797 to the left, agree=0.945, adj=0.429, (0 split)  
## dim27 < 0.1148435 to the right, agree=0.945, adj=0.429, (0 split)  
## dim21 < -0.1804215 to the left, agree=0.932, adj=0.286, (0 split)  
## dim8 < 0.1685936 to the right, agree=0.918, adj=0.143, (0 split)  
## dim10 < 0.1705466 to the right, agree=0.918, adj=0.143, (0 split)  
##   
## Node number 778: 1 observations  
## predicted class=2 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 779: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 780: 3 observations  
## predicted class=0 expected loss=0 P(node) =8.928571e-05  
## class counts: 3 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 781: 2 observations, complexity param=3.349298e-05  
## predicted class=5 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 1 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.500   
## left son=1562 (1 obs) right son=1563 (1 obs)  
## Primary splits:  
## dim1 < 0.5459406 to the left, improve=1, (0 missing)  
## dim2 < 0.33877 to the right, improve=1, (0 missing)  
## dim3 < 0.2473572 to the left, improve=1, (0 missing)  
## dim4 < -0.2668661 to the left, improve=1, (0 missing)  
## dim5 < 0.145973 to the right, improve=1, (0 missing)  
##   
## Node number 782: 180 observations  
## predicted class=5 expected loss=0.01111111 P(node) =0.005357143  
## class counts: 0 0 0 0 0 178 0 0 1 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.989 0.000 0.000 0.006 0.006   
##   
## Node number 783: 2 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 1 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.500 0.000 0.500   
## left son=1566 (1 obs) right son=1567 (1 obs)  
## Primary splits:  
## dim1 < 0.4663733 to the left, improve=1, (0 missing)  
## dim2 < 0.2556515 to the right, improve=1, (0 missing)  
## dim3 < 0.1156303 to the left, improve=1, (0 missing)  
## dim4 < -0.274404 to the right, improve=1, (0 missing)  
## dim5 < 0.04957032 to the left, improve=1, (0 missing)  
##   
## Node number 784: 230 observations  
## predicted class=4 expected loss=0.03043478 P(node) =0.006845238  
## class counts: 0 0 0 0 223 0 0 2 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.970 0.000 0.000 0.009 0.000 0.022   
##   
## Node number 785: 3 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 2 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.667 0.000 0.000 0.333   
## left son=1570 (2 obs) right son=1571 (1 obs)  
## Primary splits:  
## dim2 < 0.3319273 to the left, improve=1.333333, (0 missing)  
## dim3 < -0.01347442 to the left, improve=1.333333, (0 missing)  
## dim5 < 0.4884248 to the left, improve=1.333333, (0 missing)  
## dim6 < -0.04565332 to the left, improve=1.333333, (0 missing)  
## dim11 < 0.2489623 to the left, improve=1.333333, (0 missing)  
##   
## Node number 786: 4 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.25 P(node) =0.0001190476  
## class counts: 0 0 0 0 3 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.750 0.250 0.000 0.000 0.000 0.000   
## left son=1572 (3 obs) right son=1573 (1 obs)  
## Primary splits:  
## dim7 < 0.03977535 to the left, improve=1.5, (0 missing)  
## dim10 < 0.03918538 to the left, improve=1.5, (0 missing)  
## dim15 < 0.1288204 to the left, improve=1.5, (0 missing)  
## dim16 < 0.08914122 to the left, improve=1.5, (0 missing)  
## dim19 < 0.0668484 to the left, improve=1.5, (0 missing)  
##   
## Node number 787: 5 observations  
## predicted class=9 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 788: 4 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.5 P(node) =0.0001190476  
## class counts: 1 0 1 0 0 0 2 0 0 0  
## probabilities: 0.250 0.000 0.250 0.000 0.000 0.000 0.500 0.000 0.000 0.000   
## left son=1576 (2 obs) right son=1577 (2 obs)  
## Primary splits:  
## dim7 < 0.1654844 to the left, improve=1.5, (0 missing)  
## dim9 < 0.04283262 to the left, improve=1.5, (0 missing)  
## dim22 < -0.03917443 to the left, improve=1.5, (0 missing)  
## dim3 < 0.09604245 to the right, improve=1.5, (0 missing)  
## dim6 < 0.004549872 to the right, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim3 < 0.09604245 to the right, agree=1, adj=1, (0 split)  
## dim6 < 0.004549872 to the right, agree=1, adj=1, (0 split)  
## dim9 < 0.04283262 to the left, agree=1, adj=1, (0 split)  
## dim16 < 0.05283075 to the right, agree=1, adj=1, (0 split)  
## dim17 < 0.02884896 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 789: 11 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.09090909 P(node) =0.000327381  
## class counts: 0 0 0 0 10 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.909 0.000 0.000 0.000 0.000 0.091   
## left son=1578 (10 obs) right son=1579 (1 obs)  
## Primary splits:  
## dim7 < 0.295509 to the left, improve=1.818182, (0 missing)  
## dim20 < 0.1518242 to the left, improve=1.818182, (0 missing)  
## dim25 < 0.1002496 to the left, improve=1.818182, (0 missing)  
## dim27 < 0.08224509 to the left, improve=1.818182, (0 missing)  
## dim8 < -0.09305195 to the right, improve=1.818182, (0 missing)  
##   
## Node number 790: 6 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.1666667 P(node) =0.0001785714  
## class counts: 0 0 0 0 0 1 0 0 5 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.167 0.000 0.000 0.833 0.000   
## left son=1580 (1 obs) right son=1581 (5 obs)  
## Primary splits:  
## dim4 < -0.35765 to the left, improve=1.666667, (0 missing)  
## dim5 < 0.2275358 to the right, improve=1.666667, (0 missing)  
## dim6 < -0.05319482 to the left, improve=1.666667, (0 missing)  
## dim10 < 0.04215441 to the right, improve=1.666667, (0 missing)  
## dim12 < -0.1533159 to the left, improve=1.666667, (0 missing)  
##   
## Node number 791: 7 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.1428571 P(node) =0.0002083333  
## class counts: 0 0 0 1 0 0 0 0 0 6  
## probabilities: 0.000 0.000 0.000 0.143 0.000 0.000 0.000 0.000 0.000 0.857   
## left son=1582 (1 obs) right son=1583 (6 obs)  
## Primary splits:  
## dim6 < 0.1672164 to the right, improve=1.714286, (0 missing)  
## dim15 < 0.05441027 to the right, improve=1.714286, (0 missing)  
## dim2 < 0.2283626 to the left, improve=1.714286, (0 missing)  
## dim4 < -0.1921401 to the left, improve=1.714286, (0 missing)  
## dim5 < -0.02784628 to the left, improve=1.714286, (0 missing)  
##   
## Node number 792: 24 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.04166667 P(node) =0.0007142857  
## class counts: 23 0 0 0 1 0 0 0 0 0  
## probabilities: 0.958 0.000 0.000 0.000 0.042 0.000 0.000 0.000 0.000 0.000   
## left son=1584 (23 obs) right son=1585 (1 obs)  
## Primary splits:  
## dim3 < -0.04017459 to the right, improve=1.916667, (0 missing)  
## dim7 < 0.0002804678 to the right, improve=1.916667, (0 missing)  
## dim13 < -0.07269878 to the right, improve=1.916667, (0 missing)  
## dim1 < 0.6400162 to the left, improve=1.916667, (0 missing)  
## dim17 < 0.1142151 to the left, improve=1.916667, (0 missing)  
##   
## Node number 793: 32 observations, complexity param=0.0001842114  
## predicted class=7 expected loss=0.6875 P(node) =0.000952381  
## class counts: 6 0 0 0 3 8 1 10 0 4  
## probabilities: 0.188 0.000 0.000 0.000 0.094 0.250 0.031 0.313 0.000 0.125   
## left son=1586 (15 obs) right son=1587 (17 obs)  
## Primary splits:  
## dim3 < 0.04151927 to the right, improve=6.090441, (0 missing)  
## dim22 < -0.03284558 to the right, improve=5.687500, (0 missing)  
## dim1 < 0.2642984 to the right, improve=5.337500, (0 missing)  
## dim7 < 0.03728389 to the left, improve=4.461310, (0 missing)  
## dim15 < -0.0007126542 to the right, improve=4.062500, (0 missing)  
## Surrogate splits:  
## dim17 < 0.01845039 to the right, agree=0.812, adj=0.600, (0 split)  
## dim1 < 0.2945225 to the left, agree=0.781, adj=0.533, (0 split)  
## dim13 < 0.1531176 to the right, agree=0.781, adj=0.533, (0 split)  
## dim15 < -0.0007126542 to the left, agree=0.781, adj=0.533, (0 split)  
## dim26 < 0.01569001 to the right, agree=0.781, adj=0.533, (0 split)  
##   
## Node number 794: 9 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.3333333 P(node) =0.0002678571  
## class counts: 2 0 0 0 6 0 1 0 0 0  
## probabilities: 0.222 0.000 0.000 0.000 0.667 0.000 0.111 0.000 0.000 0.000   
## left son=1588 (3 obs) right son=1589 (6 obs)  
## Primary splits:  
## dim3 < -0.03817329 to the right, improve=3.111111, (0 missing)  
## dim21 < 0.0001008348 to the right, improve=3.111111, (0 missing)  
## dim10 < -0.05125089 to the left, improve=3.111111, (0 missing)  
## dim17 < 0.07468626 to the left, improve=3.111111, (0 missing)  
## dim20 < -0.05740904 to the left, improve=3.111111, (0 missing)  
## Surrogate splits:  
## dim10 < -0.05125089 to the left, agree=1, adj=1, (0 split)  
## dim17 < 0.07468626 to the left, agree=1, adj=1, (0 split)  
## dim20 < -0.05740904 to the left, agree=1, adj=1, (0 split)  
## dim21 < 0.0001008348 to the right, agree=1, adj=1, (0 split)  
## dim22 < -0.01605177 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 795: 139 observations  
## predicted class=6 expected loss=0 P(node) =0.004136905  
## class counts: 0 0 0 0 0 0 139 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 796: 279 observations, complexity param=0.001741635  
## predicted class=5 expected loss=0.6451613 P(node) =0.008303571  
## class counts: 67 0 11 7 6 99 0 38 10 41  
## probabilities: 0.240 0.000 0.039 0.025 0.022 0.355 0.000 0.136 0.036 0.147   
## left son=1592 (145 obs) right son=1593 (134 obs)  
## Primary splits:  
## dim9 < -0.02632918 to the right, improve=40.41830, (0 missing)  
## dim4 < -0.1391275 to the right, improve=32.52837, (0 missing)  
## dim19 < 0.02250533 to the left, improve=20.76122, (0 missing)  
## dim11 < -0.1016941 to the left, improve=18.21210, (0 missing)  
## dim15 < -0.05320871 to the right, improve=17.93548, (0 missing)  
## Surrogate splits:  
## dim4 < -0.1391275 to the right, agree=0.710, adj=0.396, (0 split)  
## dim15 < -0.04426005 to the left, agree=0.706, adj=0.388, (0 split)  
## dim19 < 0.01965594 to the left, agree=0.688, adj=0.351, (0 split)  
## dim20 < 0.03630554 to the left, agree=0.677, adj=0.328, (0 split)  
## dim12 < -0.07224105 to the right, agree=0.670, adj=0.313, (0 split)  
##   
## Node number 797: 301 observations, complexity param=0.001976086  
## predicted class=4 expected loss=0.6079734 P(node) =0.008958333  
## class counts: 8 0 9 1 118 20 27 8 6 104  
## probabilities: 0.027 0.000 0.030 0.003 0.392 0.066 0.090 0.027 0.020 0.346   
## left son=1594 (228 obs) right son=1595 (73 obs)  
## Primary splits:  
## dim12 < -0.2017806 to the right, improve=36.83329, (0 missing)  
## dim4 < 0.04888519 to the right, improve=26.29386, (0 missing)  
## dim16 < -0.1021749 to the right, improve=25.41620, (0 missing)  
## dim17 < 0.0595739 to the right, improve=22.50216, (0 missing)  
## dim7 < 0.152451 to the left, improve=20.81489, (0 missing)  
## Surrogate splits:  
## dim28 < 0.1160758 to the left, agree=0.771, adj=0.055, (0 split)  
## dim3 < -0.09259731 to the right, agree=0.767, adj=0.041, (0 split)  
## dim5 < 0.1023077 to the right, agree=0.761, adj=0.014, (0 split)  
## dim6 < 0.1853234 to the left, agree=0.761, adj=0.014, (0 split)  
## dim11 < 0.1808759 to the left, agree=0.761, adj=0.014, (0 split)  
##   
## Node number 798: 84 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.03571429 P(node) =0.0025  
## class counts: 0 0 0 1 1 0 0 81 0 1  
## probabilities: 0.000 0.000 0.000 0.012 0.012 0.000 0.000 0.964 0.000 0.012   
## left son=1596 (2 obs) right son=1597 (82 obs)  
## Primary splits:  
## dim14 < -0.04571929 to the left, improve=2.881533, (0 missing)  
## dim4 < 0.006459809 to the right, improve=2.881533, (0 missing)  
## dim2 < 0.2154585 to the left, improve=1.929432, (0 missing)  
## dim13 < -0.1133947 to the left, improve=1.929432, (0 missing)  
## dim7 < 0.3886148 to the left, improve=1.929432, (0 missing)  
##   
## Node number 799: 15 observations, complexity param=0.0001172254  
## predicted class=9 expected loss=0.4666667 P(node) =0.0004464286  
## class counts: 0 0 0 0 1 1 0 5 0 8  
## probabilities: 0.000 0.000 0.000 0.000 0.067 0.067 0.000 0.333 0.000 0.533   
## left son=1598 (6 obs) right son=1599 (9 obs)  
## Primary splits:  
## dim16 < -0.08031772 to the right, improve=4.155556, (0 missing)  
## dim11 < -0.01545263 to the left, improve=3.933333, (0 missing)  
## dim12 < -0.02639249 to the right, improve=2.969048, (0 missing)  
## dim14 < 0.05365591 to the right, improve=2.897619, (0 missing)  
## dim25 < -0.09082842 to the left, improve=2.766667, (0 missing)  
## Surrogate splits:  
## dim11 < -0.01545263 to the left, agree=0.933, adj=0.833, (0 split)  
## dim5 < -0.09156935 to the left, agree=0.800, adj=0.500, (0 split)  
## dim14 < 0.05365591 to the right, agree=0.800, adj=0.500, (0 split)  
## dim15 < -0.08261077 to the left, agree=0.800, adj=0.500, (0 split)  
## dim20 < 0.03418416 to the right, agree=0.800, adj=0.500, (0 split)  
##   
## Node number 800: 1586 observations, complexity param=0.0002679439  
## predicted class=2 expected loss=0.04602774 P(node) =0.04720238  
## class counts: 0 1 1513 8 2 1 4 25 31 1  
## probabilities: 0.000 0.001 0.954 0.005 0.001 0.001 0.003 0.016 0.020 0.001   
## left son=1600 (1571 obs) right son=1601 (15 obs)  
## Primary splits:  
## dim6 < 0.3441687 to the left, improve=16.478220, (0 missing)  
## dim9 < -0.09508557 to the right, improve=14.916300, (0 missing)  
## dim22 < 0.1842077 to the left, improve= 9.702842, (0 missing)  
## dim3 < 0.002694718 to the right, improve= 8.629390, (0 missing)  
## dim16 < 0.2347179 to the left, improve= 6.288696, (0 missing)  
##   
## Node number 801: 13 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.07692308 P(node) =0.0003869048  
## class counts: 1 0 0 0 0 0 12 0 0 0  
## probabilities: 0.077 0.000 0.000 0.000 0.000 0.000 0.923 0.000 0.000 0.000   
## left son=1602 (1 obs) right son=1603 (12 obs)  
## Primary splits:  
## dim1 < 0.5118322 to the right, improve=1.846154, (0 missing)  
## dim3 < 0.2885396 to the right, improve=1.846154, (0 missing)  
## dim6 < 0.1664835 to the right, improve=1.846154, (0 missing)  
## dim11 < 0.1921945 to the right, improve=1.846154, (0 missing)  
## dim16 < 0.05758613 to the right, improve=1.846154, (0 missing)  
##   
## Node number 802: 51 observations, complexity param=0.0001674649  
## predicted class=2 expected loss=0.2352941 P(node) =0.001517857  
## class counts: 0 0 39 0 0 1 5 0 6 0  
## probabilities: 0.000 0.000 0.765 0.000 0.000 0.020 0.098 0.000 0.118 0.000   
## left son=1604 (44 obs) right son=1605 (7 obs)  
## Primary splits:  
## dim2 < 0.1352535 to the left, improve=8.058187, (0 missing)  
## dim6 < -0.07046345 to the right, improve=7.894118, (0 missing)  
## dim28 < -0.01910296 to the right, improve=6.319858, (0 missing)  
## dim7 < 0.1555883 to the left, improve=6.205229, (0 missing)  
## dim23 < -0.07960746 to the right, improve=5.960784, (0 missing)  
## Surrogate splits:  
## dim6 < -0.07046345 to the right, agree=0.941, adj=0.571, (0 split)  
## dim7 < 0.1555883 to the left, agree=0.941, adj=0.571, (0 split)  
## dim8 < -0.1278788 to the left, agree=0.922, adj=0.429, (0 split)  
## dim5 < 0.3076455 to the left, agree=0.902, adj=0.286, (0 split)  
## dim26 < -0.06969963 to the right, agree=0.902, adj=0.286, (0 split)  
##   
## Node number 803: 65 observations, complexity param=0.0001674649  
## predicted class=8 expected loss=0.3384615 P(node) =0.001934524  
## class counts: 0 1 10 1 0 0 9 1 43 0  
## probabilities: 0.000 0.015 0.154 0.015 0.000 0.000 0.138 0.015 0.662 0.000   
## left son=1606 (24 obs) right son=1607 (41 obs)  
## Primary splits:  
## dim7 < 0.03325454 to the right, improve=12.599090, (0 missing)  
## dim1 < 0.4959209 to the left, improve=11.976410, (0 missing)  
## dim4 < 0.1043462 to the right, improve=11.075480, (0 missing)  
## dim8 < -0.3213837 to the left, improve=10.705530, (0 missing)  
## dim15 < 0.05858552 to the right, improve= 7.633791, (0 missing)  
## Surrogate splits:  
## dim4 < 0.1043462 to the right, agree=0.800, adj=0.458, (0 split)  
## dim5 < 0.2202619 to the right, agree=0.785, adj=0.417, (0 split)  
## dim15 < 0.03252668 to the right, agree=0.785, adj=0.417, (0 split)  
## dim1 < 0.4847934 to the left, agree=0.769, adj=0.375, (0 split)  
## dim8 < -0.3213837 to the left, agree=0.754, adj=0.333, (0 split)  
##   
## Node number 804: 489 observations  
## predicted class=2 expected loss=0.2290389 P(node) =0.01455357  
## class counts: 8 6 377 11 25 8 20 9 16 9  
## probabilities: 0.016 0.012 0.771 0.022 0.051 0.016 0.041 0.018 0.033 0.018   
##   
## Node number 805: 105 observations, complexity param=0.0004354088  
## predicted class=4 expected loss=0.7142857 P(node) =0.003125  
## class counts: 1 1 26 1 30 7 28 1 6 4  
## probabilities: 0.010 0.010 0.248 0.010 0.286 0.067 0.267 0.010 0.057 0.038   
## left son=1610 (64 obs) right son=1611 (41 obs)  
## Primary splits:  
## dim6 < -0.03494772 to the right, improve=15.537530, (0 missing)  
## dim25 < -0.1080114 to the left, improve=12.335570, (0 missing)  
## dim19 < -0.0225484 to the left, improve=10.301590, (0 missing)  
## dim17 < 0.03393569 to the right, improve=10.004940, (0 missing)  
## dim23 < -0.03180579 to the left, improve= 9.638095, (0 missing)  
## Surrogate splits:  
## dim17 < -0.05007756 to the right, agree=0.752, adj=0.366, (0 split)  
## dim1 < 0.5445009 to the left, agree=0.724, adj=0.293, (0 split)  
## dim9 < 0.197428 to the left, agree=0.714, adj=0.268, (0 split)  
## dim16 < 0.1326898 to the left, agree=0.714, adj=0.268, (0 split)  
## dim5 < 0.1365382 to the right, agree=0.705, adj=0.244, (0 split)  
##   
## Node number 806: 107 observations, complexity param=6.698597e-05  
## predicted class=1 expected loss=0.1121495 P(node) =0.003184524  
## class counts: 0 95 2 0 3 0 0 3 3 1  
## probabilities: 0.000 0.888 0.019 0.000 0.028 0.000 0.000 0.028 0.028 0.009   
## left son=1612 (95 obs) right son=1613 (12 obs)  
## Primary splits:  
## dim13 < 0.1659735 to the right, improve=10.876190, (0 missing)  
## dim7 < -0.122504 to the left, improve= 9.588700, (0 missing)  
## dim12 < 0.03403409 to the right, improve= 9.367766, (0 missing)  
## dim9 < -0.07090146 to the right, improve= 8.899470, (0 missing)  
## dim16 < -0.03985679 to the left, improve= 8.449426, (0 missing)  
## Surrogate splits:  
## dim7 < -0.1516302 to the left, agree=0.981, adj=0.833, (0 split)  
## dim9 < -0.09142118 to the right, agree=0.963, adj=0.667, (0 split)  
## dim10 < 0.007629121 to the right, agree=0.963, adj=0.667, (0 split)  
## dim3 < -0.02431004 to the right, agree=0.953, adj=0.583, (0 split)  
## dim4 < 0.1180786 to the right, agree=0.953, adj=0.583, (0 split)  
##   
## Node number 807: 534 observations, complexity param=0.0005358877  
## predicted class=6 expected loss=0.3932584 P(node) =0.01589286  
## class counts: 7 2 74 6 39 33 324 7 37 5  
## probabilities: 0.013 0.004 0.139 0.011 0.073 0.062 0.607 0.013 0.069 0.009   
## left son=1614 (174 obs) right son=1615 (360 obs)  
## Primary splits:  
## dim2 < 0.02648448 to the left, improve=55.31235, (0 missing)  
## dim7 < 0.07000284 to the left, improve=54.56528, (0 missing)  
## dim12 < 0.1622862 to the left, improve=48.05415, (0 missing)  
## dim5 < 0.2732078 to the left, improve=42.87587, (0 missing)  
## dim6 < 0.05531536 to the left, improve=41.61626, (0 missing)  
## Surrogate splits:  
## dim7 < -0.03549636 to the left, agree=0.775, adj=0.310, (0 split)  
## dim13 < 0.1865054 to the right, agree=0.755, adj=0.247, (0 split)  
## dim6 < 0.05990315 to the right, agree=0.740, adj=0.201, (0 split)  
## dim5 < 0.1876017 to the left, agree=0.734, adj=0.184, (0 split)  
## dim8 < 0.1335462 to the right, agree=0.721, adj=0.144, (0 split)  
##   
## Node number 808: 165 observations, complexity param=0.0001004789  
## predicted class=3 expected loss=0.07878788 P(node) =0.004910714  
## class counts: 0 0 4 152 0 1 0 0 4 4  
## probabilities: 0.000 0.000 0.024 0.921 0.000 0.006 0.000 0.000 0.024 0.024   
## left son=1616 (3 obs) right son=1617 (162 obs)  
## Primary splits:  
## dim2 < -0.2233265 to the left, improve=5.505948, (0 missing)  
## dim7 < 0.1618692 to the left, improve=4.553788, (0 missing)  
## dim19 < -0.1779194 to the right, improve=3.648113, (0 missing)  
## dim11 < 0.01436772 to the right, improve=2.648587, (0 missing)  
## dim24 < -0.1018949 to the right, improve=2.635843, (0 missing)  
## Surrogate splits:  
## dim7 < 0.1618692 to the right, agree=0.988, adj=0.333, (0 split)  
##   
## Node number 809: 23 observations, complexity param=0.0001674649  
## predicted class=8 expected loss=0.5217391 P(node) =0.0006845238  
## class counts: 0 0 1 7 0 0 0 0 11 4  
## probabilities: 0.000 0.000 0.043 0.304 0.000 0.000 0.000 0.000 0.478 0.174   
## left son=1618 (13 obs) right son=1619 (10 obs)  
## Primary splits:  
## dim1 < 0.5720005 to the left, improve=7.023411, (0 missing)  
## dim25 < -0.04665703 to the right, improve=6.051383, (0 missing)  
## dim16 < 0.03125436 to the left, improve=5.726708, (0 missing)  
## dim27 < -0.02012939 to the left, improve=5.726708, (0 missing)  
## dim12 < -0.1575837 to the left, improve=4.758454, (0 missing)  
## Surrogate splits:  
## dim25 < -0.04665703 to the right, agree=0.957, adj=0.9, (0 split)  
## dim2 < -0.04063391 to the right, agree=0.870, adj=0.7, (0 split)  
## dim16 < 0.03125436 to the left, agree=0.826, adj=0.6, (0 split)  
## dim22 < -0.08297422 to the left, agree=0.826, adj=0.6, (0 split)  
## dim23 < -0.03247805 to the right, agree=0.826, adj=0.6, (0 split)  
##   
## Node number 810: 16 observations  
## predicted class=5 expected loss=0 P(node) =0.0004761905  
## class counts: 0 0 0 0 0 16 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 811: 10 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.5 P(node) =0.000297619  
## class counts: 0 0 0 3 0 1 0 1 0 5  
## probabilities: 0.000 0.000 0.000 0.300 0.000 0.100 0.000 0.100 0.000 0.500   
## left son=1622 (5 obs) right son=1623 (5 obs)  
## Primary splits:  
## dim11 < 0.04716439 to the left, improve=3.600000, (0 missing)  
## dim1 < 0.5200912 to the right, improve=3.257143, (0 missing)  
## dim24 < 0.03528424 to the right, improve=3.257143, (0 missing)  
## dim15 < 0.1164533 to the left, improve=2.400000, (0 missing)  
## dim14 < -0.1063128 to the left, improve=2.233333, (0 missing)  
## Surrogate splits:  
## dim14 < -0.1063128 to the left, agree=0.9, adj=0.8, (0 split)  
## dim15 < 0.1164533 to the left, agree=0.9, adj=0.8, (0 split)  
## dim19 < -0.0184046 to the right, agree=0.9, adj=0.8, (0 split)  
## dim24 < -0.05575215 to the right, agree=0.9, adj=0.8, (0 split)  
## dim1 < 0.4780481 to the right, agree=0.8, adj=0.6, (0 split)  
##   
## Node number 812: 128 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.0390625 P(node) =0.003809524  
## class counts: 0 0 123 2 0 0 0 1 2 0  
## probabilities: 0.000 0.000 0.961 0.016 0.000 0.000 0.000 0.008 0.016 0.000   
## left son=1624 (126 obs) right son=1625 (2 obs)  
## Primary splits:  
## dim27 < -0.07881343 to the right, improve=3.845486, (0 missing)  
## dim25 < -0.1705359 to the right, improve=2.829613, (0 missing)  
## dim18 < -0.1928691 to the right, improve=1.923351, (0 missing)  
## dim11 < 0.08814478 to the left, improve=1.923351, (0 missing)  
## dim20 < -0.1822598 to the right, improve=1.907603, (0 missing)  
##   
## Node number 813: 25 observations, complexity param=0.0001339719  
## predicted class=8 expected loss=0.28 P(node) =0.0007440476  
## class counts: 0 0 6 1 0 0 0 0 18 0  
## probabilities: 0.000 0.000 0.240 0.040 0.000 0.000 0.000 0.000 0.720 0.000   
## left son=1626 (8 obs) right son=1627 (17 obs)  
## Primary splits:  
## dim25 < 0.00712495 to the right, improve=5.677647, (0 missing)  
## dim6 < 0.124569 to the right, improve=5.360000, (0 missing)  
## dim14 < -0.07223652 to the left, improve=5.226667, (0 missing)  
## dim15 < -0.1217015 to the left, improve=5.226667, (0 missing)  
## dim17 < -0.07141719 to the left, improve=5.226667, (0 missing)  
## Surrogate splits:  
## dim17 < -0.01765028 to the left, agree=0.88, adj=0.625, (0 split)  
## dim1 < 0.5139891 to the left, agree=0.84, adj=0.500, (0 split)  
## dim6 < 0.1624629 to the right, agree=0.84, adj=0.500, (0 split)  
## dim13 < 0.03521128 to the right, agree=0.84, adj=0.500, (0 split)  
## dim14 < -0.07223652 to the left, agree=0.84, adj=0.500, (0 split)  
##   
## Node number 814: 508 observations, complexity param=0.0007033526  
## predicted class=8 expected loss=0.6003937 P(node) =0.01511905  
## class counts: 0 1 83 120 3 74 3 4 203 17  
## probabilities: 0.000 0.002 0.163 0.236 0.006 0.146 0.006 0.008 0.400 0.033   
## left son=1628 (54 obs) right son=1629 (454 obs)  
## Primary splits:  
## dim8 < -0.1782152 to the left, improve=35.90721, (0 missing)  
## dim20 < -0.03183079 to the left, improve=28.38864, (0 missing)  
## dim19 < 0.02098365 to the right, improve=26.00127, (0 missing)  
## dim9 < -0.003422065 to the right, improve=24.70613, (0 missing)  
## dim2 < 0.07807099 to the left, improve=24.43357, (0 missing)  
## Surrogate splits:  
## dim6 < 0.3265097 to the right, agree=0.913, adj=0.185, (0 split)  
## dim9 < 0.3062417 to the right, agree=0.898, adj=0.037, (0 split)  
## dim19 < 0.2729696 to the right, agree=0.898, adj=0.037, (0 split)  
## dim18 < 0.2194563 to the right, agree=0.896, adj=0.019, (0 split)  
##   
## Node number 815: 459 observations  
## predicted class=8 expected loss=0.1895425 P(node) =0.01366071  
## class counts: 1 3 7 38 9 14 2 1 372 12  
## probabilities: 0.002 0.007 0.015 0.083 0.020 0.031 0.004 0.002 0.810 0.026   
##   
## Node number 816: 565 observations, complexity param=0.0005693807  
## predicted class=0 expected loss=0.3274336 P(node) =0.01681548  
## class counts: 380 0 34 29 0 90 7 12 10 3  
## probabilities: 0.673 0.000 0.060 0.051 0.000 0.159 0.012 0.021 0.018 0.005   
## left son=1632 (407 obs) right son=1633 (158 obs)  
## Primary splits:  
## dim14 < 0.02513693 to the left, improve=54.48680, (0 missing)  
## dim4 < 0.1613346 to the right, improve=46.81863, (0 missing)  
## dim26 < -0.06712081 to the right, improve=30.61126, (0 missing)  
## dim18 < 0.02759687 to the left, improve=29.98367, (0 missing)  
## dim3 < 0.02996537 to the right, improve=28.76146, (0 missing)  
## Surrogate splits:  
## dim16 < -0.1211273 to the right, agree=0.777, adj=0.203, (0 split)  
## dim6 < 0.09772245 to the left, agree=0.763, adj=0.152, (0 split)  
## dim4 < 0.1345241 to the right, agree=0.750, adj=0.108, (0 split)  
## dim24 < 0.07952627 to the left, agree=0.749, adj=0.101, (0 split)  
## dim3 < -0.02221388 to the right, agree=0.742, adj=0.076, (0 split)  
##   
## Node number 817: 336 observations  
## predicted class=2 expected loss=0.2886905 P(node) =0.01  
## class counts: 30 0 239 21 5 19 7 8 5 2  
## probabilities: 0.089 0.000 0.711 0.062 0.015 0.057 0.021 0.024 0.015 0.006   
##   
## Node number 818: 523 observations, complexity param=0.001775128  
## predicted class=3 expected loss=0.5583174 P(node) =0.01556548  
## class counts: 22 4 84 231 0 71 5 10 92 4  
## probabilities: 0.042 0.008 0.161 0.442 0.000 0.136 0.010 0.019 0.176 0.008   
## left son=1636 (366 obs) right son=1637 (157 obs)  
## Primary splits:  
## dim23 < -0.03592725 to the right, improve=43.10836, (0 missing)  
## dim5 < -0.2649264 to the right, improve=39.14537, (0 missing)  
## dim13 < 0.02001965 to the left, improve=37.04317, (0 missing)  
## dim9 < 0.1501728 to the right, improve=33.43192, (0 missing)  
## dim12 < -0.06042517 to the right, improve=30.31106, (0 missing)  
## Surrogate splits:  
## dim22 < -0.1081854 to the right, agree=0.751, adj=0.172, (0 split)  
## dim29 < 0.1370099 to the left, agree=0.725, adj=0.083, (0 split)  
## dim9 < 0.005325806 to the right, agree=0.723, adj=0.076, (0 split)  
## dim24 < 0.1307533 to the left, agree=0.717, adj=0.057, (0 split)  
## dim13 < 0.1000317 to the left, agree=0.715, adj=0.051, (0 split)  
##   
## Node number 819: 801 observations  
## predicted class=5 expected loss=0.3545568 P(node) =0.02383929  
## class counts: 48 9 18 31 5 517 88 5 75 5  
## probabilities: 0.060 0.011 0.022 0.039 0.006 0.645 0.110 0.006 0.094 0.006   
##   
## Node number 820: 1829 observations, complexity param=0.0005023947  
## predicted class=3 expected loss=0.1006014 P(node) =0.05443452  
## class counts: 3 4 30 1645 0 65 1 1 75 5  
## probabilities: 0.002 0.002 0.016 0.899 0.000 0.036 0.001 0.001 0.041 0.003   
## left son=1640 (1776 obs) right son=1641 (53 obs)  
## Primary splits:  
## dim5 < -0.2750225 to the right, improve=40.81283, (0 missing)  
## dim22 < -0.1016692 to the right, improve=36.19603, (0 missing)  
## dim4 < -0.07748088 to the left, improve=21.64503, (0 missing)  
## dim27 < -0.1461376 to the right, improve=14.08921, (0 missing)  
## dim15 < -0.120211 to the right, improve=13.05737, (0 missing)  
## Surrogate splits:  
## dim7 < -0.3590941 to the right, agree=0.972, adj=0.019, (0 split)  
##   
## Node number 821: 409 observations, complexity param=0.0005023947  
## predicted class=3 expected loss=0.5305623 P(node) =0.01217262  
## class counts: 5 9 20 192 0 68 0 0 100 15  
## probabilities: 0.012 0.022 0.049 0.469 0.000 0.166 0.000 0.000 0.244 0.037   
## left son=1642 (152 obs) right son=1643 (257 obs)  
## Primary splits:  
## dim9 < 0.1518891 to the right, improve=41.76477, (0 missing)  
## dim2 < -0.1094118 to the right, improve=31.27893, (0 missing)  
## dim3 < 0.2200193 to the right, improve=26.80173, (0 missing)  
## dim7 < -0.0457274 to the right, improve=26.40028, (0 missing)  
## dim5 < -0.2240375 to the right, improve=25.39440, (0 missing)  
## Surrogate splits:  
## dim3 < 0.2485442 to the right, agree=0.719, adj=0.243, (0 split)  
## dim7 < -0.04524823 to the right, agree=0.677, adj=0.132, (0 split)  
## dim12 < 0.1008865 to the right, agree=0.675, adj=0.125, (0 split)  
## dim10 < -0.07774588 to the left, agree=0.663, adj=0.092, (0 split)  
## dim25 < -0.1169808 to the left, agree=0.663, adj=0.092, (0 split)  
##   
## Node number 822: 262 observations, complexity param=0.0001339719  
## predicted class=3 expected loss=0.5839695 P(node) =0.007797619  
## class counts: 48 0 21 109 0 51 1 3 16 13  
## probabilities: 0.183 0.000 0.080 0.416 0.000 0.195 0.004 0.011 0.061 0.050   
## left son=1644 (163 obs) right son=1645 (99 obs)  
## Primary splits:  
## dim16 < -0.06573481 to the right, improve=17.14638, (0 missing)  
## dim22 < -0.09113847 to the right, improve=16.24125, (0 missing)  
## dim11 < -0.02779013 to the left, improve=14.92602, (0 missing)  
## dim4 < -0.1051648 to the right, improve=14.76750, (0 missing)  
## dim6 < 0.08210749 to the right, improve=14.57558, (0 missing)  
## Surrogate splits:  
## dim24 < -0.1232506 to the right, agree=0.710, adj=0.232, (0 split)  
## dim28 < -0.02299961 to the right, agree=0.702, adj=0.212, (0 split)  
## dim25 < 0.1078722 to the left, agree=0.683, adj=0.162, (0 split)  
## dim6 < 0.0946441 to the left, agree=0.679, adj=0.152, (0 split)  
## dim11 < 0.09078956 to the left, agree=0.676, adj=0.141, (0 split)  
##   
## Node number 823: 228 observations, complexity param=0.0002344509  
## predicted class=5 expected loss=0.2368421 P(node) =0.006785714  
## class counts: 2 0 0 35 1 174 0 4 6 6  
## probabilities: 0.009 0.000 0.000 0.154 0.004 0.763 0.000 0.018 0.026 0.026   
## left son=1646 (20 obs) right son=1647 (208 obs)  
## Primary splits:  
## dim6 < 0.1333734 to the right, improve=10.360590, (0 missing)  
## dim14 < -0.1251762 to the left, improve= 8.284297, (0 missing)  
## dim20 < 0.130713 to the left, improve= 7.453849, (0 missing)  
## dim22 < 0.003271554 to the right, improve= 6.937517, (0 missing)  
## dim21 < -0.02890241 to the right, improve= 6.872132, (0 missing)  
## Surrogate splits:  
## dim21 < -0.142408 to the left, agree=0.921, adj=0.10, (0 split)  
## dim1 < 0.2042434 to the left, agree=0.917, adj=0.05, (0 split)  
## dim10 < 0.1168536 to the right, agree=0.917, adj=0.05, (0 split)  
## dim14 < -0.1828894 to the left, agree=0.917, adj=0.05, (0 split)  
## dim17 < 0.2795845 to the right, agree=0.917, adj=0.05, (0 split)  
##   
## Node number 824: 62 observations, complexity param=0.0004019158  
## predicted class=3 expected loss=0.4677419 P(node) =0.001845238  
## class counts: 12 0 0 33 0 9 0 0 7 1  
## probabilities: 0.194 0.000 0.000 0.532 0.000 0.145 0.000 0.000 0.113 0.016   
## left son=1648 (12 obs) right son=1649 (50 obs)  
## Primary splits:  
## dim7 < 0.1846805 to the right, improve=14.400000, (0 missing)  
## dim1 < 0.3589416 to the left, improve=11.538460, (0 missing)  
## dim16 < -0.05397945 to the right, improve=10.774190, (0 missing)  
## dim10 < 0.1038336 to the right, improve= 9.362092, (0 missing)  
## dim24 < 0.05565009 to the right, improve= 8.586667, (0 missing)  
## Surrogate splits:  
## dim1 < 0.3589416 to the left, agree=0.968, adj=0.833, (0 split)  
## dim24 < 0.05565009 to the right, agree=0.935, adj=0.667, (0 split)  
## dim10 < 0.1038336 to the right, agree=0.919, adj=0.583, (0 split)  
## dim3 < 0.3070897 to the right, agree=0.871, adj=0.333, (0 split)  
## dim14 < -0.2296642 to the left, agree=0.871, adj=0.333, (0 split)  
##   
## Node number 825: 536 observations, complexity param=0.0002344509  
## predicted class=5 expected loss=0.1473881 P(node) =0.01595238  
## class counts: 5 0 0 47 0 457 0 0 25 2  
## probabilities: 0.009 0.000 0.000 0.088 0.000 0.853 0.000 0.000 0.047 0.004   
## left son=1650 (50 obs) right son=1651 (486 obs)  
## Primary splits:  
## dim13 < 0.1512979 to the right, improve=23.416570, (0 missing)  
## dim21 < 0.1335709 to the right, improve=17.636980, (0 missing)  
## dim15 < -0.0239229 to the right, improve=11.998830, (0 missing)  
## dim14 < -0.05135863 to the left, improve=10.370860, (0 missing)  
## dim9 < -0.05919192 to the right, improve= 7.336017, (0 missing)  
## Surrogate splits:  
## dim21 < 0.1737712 to the right, agree=0.916, adj=0.10, (0 split)  
## dim7 < 0.2022359 to the right, agree=0.912, adj=0.06, (0 split)  
## dim30 < 0.2173818 to the right, agree=0.912, adj=0.06, (0 split)  
## dim2 < 0.05742083 to the left, agree=0.909, adj=0.02, (0 split)  
## dim11 < -0.2094007 to the left, agree=0.909, adj=0.02, (0 split)  
##   
## Node number 826: 203 observations, complexity param=0.001172254  
## predicted class=5 expected loss=0.3793103 P(node) =0.006041667  
## class counts: 54 0 4 6 0 126 1 2 8 2  
## probabilities: 0.266 0.000 0.020 0.030 0.000 0.621 0.005 0.010 0.039 0.010   
## left son=1652 (55 obs) right son=1653 (148 obs)  
## Primary splits:  
## dim7 < -0.05130817 to the right, improve=37.31772, (0 missing)  
## dim1 < 0.4572342 to the left, improve=31.84275, (0 missing)  
## dim4 < 0.02901767 to the right, improve=29.06201, (0 missing)  
## dim3 < 0.2052932 to the right, improve=26.89424, (0 missing)  
## dim23 < -0.02071699 to the left, improve=25.32742, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4522826 to the left, agree=0.842, adj=0.418, (0 split)  
## dim29 < -0.03676925 to the left, agree=0.828, adj=0.364, (0 split)  
## dim2 < 0.1855153 to the right, agree=0.793, adj=0.236, (0 split)  
## dim27 < 0.1166228 to the right, agree=0.793, adj=0.236, (0 split)  
## dim6 < 0.1635393 to the right, agree=0.788, adj=0.218, (0 split)  
##   
## Node number 827: 420 observations, complexity param=0.001004789  
## predicted class=8 expected loss=0.5166667 P(node) =0.0125  
## class counts: 28 0 68 22 3 68 24 0 203 4  
## probabilities: 0.067 0.000 0.162 0.052 0.007 0.162 0.057 0.000 0.483 0.010   
## left son=1654 (107 obs) right son=1655 (313 obs)  
## Primary splits:  
## dim13 < -0.05582895 to the left, improve=30.29530, (0 missing)  
## dim6 < 0.05974943 to the left, improve=30.14792, (0 missing)  
## dim23 < 0.03523867 to the right, improve=29.06473, (0 missing)  
## dim4 < 0.1608394 to the right, improve=28.93052, (0 missing)  
## dim1 < 0.5907447 to the left, improve=28.81531, (0 missing)  
## Surrogate splits:  
## dim19 < 0.1586608 to the right, agree=0.776, adj=0.121, (0 split)  
## dim15 < 0.1473376 to the right, agree=0.774, adj=0.112, (0 split)  
## dim26 < 0.1751762 to the right, agree=0.762, adj=0.065, (0 split)  
## dim10 < 0.1869081 to the right, agree=0.757, adj=0.047, (0 split)  
## dim9 < -0.02157877 to the right, agree=0.755, adj=0.037, (0 split)  
##   
## Node number 828: 198 observations, complexity param=6.698597e-05  
## predicted class=5 expected loss=0.06565657 P(node) =0.005892857  
## class counts: 1 1 0 2 0 185 1 0 8 0  
## probabilities: 0.005 0.005 0.000 0.010 0.000 0.934 0.005 0.000 0.040 0.000   
## left son=1656 (190 obs) right son=1657 (8 obs)  
## Primary splits:  
## dim13 < 0.1629739 to the left, improve=5.906300, (0 missing)  
## dim15 < -0.1115648 to the left, improve=3.577622, (0 missing)  
## dim18 < -0.2018292 to the right, improve=3.009528, (0 missing)  
## dim7 < 0.07113576 to the left, improve=2.675634, (0 missing)  
## dim11 < 0.1435371 to the left, improve=2.295571, (0 missing)  
## Surrogate splits:  
## dim15 < -0.1115648 to the right, agree=0.975, adj=0.375, (0 split)  
## dim11 < 0.1435371 to the left, agree=0.965, adj=0.125, (0 split)  
##   
## Node number 829: 14 observations, complexity param=6.698597e-05  
## predicted class=8 expected loss=0.2142857 P(node) =0.0004166667  
## class counts: 0 0 0 1 0 2 0 0 11 0  
## probabilities: 0.000 0.000 0.000 0.071 0.000 0.143 0.000 0.000 0.786 0.000   
## left son=1658 (3 obs) right son=1659 (11 obs)  
## Primary splits:  
## dim11 < 0.01263635 to the left, improve=3.666667, (0 missing)  
## dim22 < -0.002939984 to the right, improve=3.666667, (0 missing)  
## dim4 < 0.03713556 to the left, improve=3.666667, (0 missing)  
## dim13 < 0.01445755 to the left, improve=3.666667, (0 missing)  
## dim28 < -0.02886904 to the right, improve=3.166667, (0 missing)  
## Surrogate splits:  
## dim4 < 0.03713556 to the left, agree=1.000, adj=1.000, (0 split)  
## dim13 < 0.01445755 to the left, agree=1.000, adj=1.000, (0 split)  
## dim22 < -0.002939984 to the right, agree=1.000, adj=1.000, (0 split)  
## dim2 < -0.05414709 to the right, agree=0.929, adj=0.667, (0 split)  
## dim5 < -0.3039333 to the left, agree=0.929, adj=0.667, (0 split)  
##   
## Node number 830: 130 observations, complexity param=0.0002679439  
## predicted class=3 expected loss=0.2846154 P(node) =0.003869048  
## class counts: 0 1 1 93 0 9 0 0 23 3  
## probabilities: 0.000 0.008 0.008 0.715 0.000 0.069 0.000 0.000 0.177 0.023   
## left son=1660 (94 obs) right son=1661 (36 obs)  
## Primary splits:  
## dim11 < -0.04782411 to the right, improve=14.687580, (0 missing)  
## dim14 < 0.02187877 to the left, improve=13.112600, (0 missing)  
## dim1 < 0.5923675 to the left, improve=10.553130, (0 missing)  
## dim2 < -0.1003682 to the right, improve= 7.759756, (0 missing)  
## dim25 < -0.006036876 to the right, improve= 6.815385, (0 missing)  
## Surrogate splits:  
## dim1 < 0.6115101 to the left, agree=0.808, adj=0.306, (0 split)  
## dim14 < 0.05292606 to the left, agree=0.785, adj=0.222, (0 split)  
## dim2 < -0.1632816 to the right, agree=0.769, adj=0.167, (0 split)  
## dim23 < -0.1257104 to the right, agree=0.769, adj=0.167, (0 split)  
## dim12 < 0.1185789 to the left, agree=0.754, adj=0.111, (0 split)  
##   
## Node number 831: 1635 observations  
## predicted class=8 expected loss=0.2195719 P(node) =0.04866071  
## class counts: 2 5 104 105 12 78 5 28 1276 20  
## probabilities: 0.001 0.003 0.064 0.064 0.007 0.048 0.003 0.017 0.780 0.012   
##   
## Node number 832: 209 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.004784689 P(node) =0.006220238  
## class counts: 0 208 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.995 0.000 0.000 0.000 0.000 0.000 0.000 0.005 0.000   
## left son=1664 (208 obs) right son=1665 (1 obs)  
## Primary splits:  
## dim21 < -0.113014 to the right, improve=1.9904310, (0 missing)  
## dim12 < -0.1315312 to the right, improve=0.6570973, (0 missing)  
## dim20 < -0.1344786 to the right, improve=0.4904306, (0 missing)  
## dim25 < 0.001201396 to the right, improve=0.3237640, (0 missing)  
## dim11 < 0.001248788 to the right, improve=0.2126528, (0 missing)  
##   
## Node number 833: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 834: 2 observations  
## predicted class=2 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 2 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 835: 2 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 1 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.500 0.000   
## left son=1670 (1 obs) right son=1671 (1 obs)  
## Primary splits:  
## dim1 < 0.4794855 to the left, improve=1, (0 missing)  
## dim2 < -0.07387099 to the right, improve=1, (0 missing)  
## dim3 < -0.05711739 to the left, improve=1, (0 missing)  
## dim4 < -0.2799764 to the right, improve=1, (0 missing)  
## dim5 < 0.07366631 to the left, improve=1, (0 missing)  
##   
## Node number 838: 5 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.6 P(node) =0.0001488095  
## class counts: 0 0 0 2 0 1 0 1 0 1  
## probabilities: 0.000 0.000 0.000 0.400 0.000 0.200 0.000 0.200 0.000 0.200   
## left son=1676 (2 obs) right son=1677 (3 obs)  
## Primary splits:  
## dim2 < 0.1214416 to the left, improve=1.600000, (0 missing)  
## dim6 < -0.2274305 to the left, improve=1.600000, (0 missing)  
## dim13 < 0.07273121 to the right, improve=1.600000, (0 missing)  
## dim22 < -0.03116688 to the right, improve=1.600000, (0 missing)  
## dim1 < 0.5820802 to the left, improve=1.266667, (0 missing)  
## Surrogate splits:  
## dim6 < -0.2274305 to the left, agree=1.0, adj=1.0, (0 split)  
## dim13 < 0.07273121 to the right, agree=1.0, adj=1.0, (0 split)  
## dim22 < -0.03116688 to the right, agree=1.0, adj=1.0, (0 split)  
## dim1 < 0.5820802 to the left, agree=0.8, adj=0.5, (0 split)  
## dim5 < -0.02784793 to the left, agree=0.8, adj=0.5, (0 split)  
##   
## Node number 839: 2 observations  
## predicted class=8 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 840: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 841: 22 observations  
## predicted class=3 expected loss=0 P(node) =0.0006547619  
## class counts: 0 0 0 22 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 842: 7 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.4285714 P(node) =0.0002083333  
## class counts: 0 0 4 0 1 0 0 2 0 0  
## probabilities: 0.000 0.000 0.571 0.000 0.143 0.000 0.000 0.286 0.000 0.000   
## left son=1684 (4 obs) right son=1685 (3 obs)  
## Primary splits:  
## dim6 < -0.228395 to the right, improve=2.666667, (0 missing)  
## dim15 < 0.05664895 to the right, improve=2.666667, (0 missing)  
## dim20 < 0.09899675 to the left, improve=2.400000, (0 missing)  
## dim26 < 0.009476521 to the left, improve=2.400000, (0 missing)  
## dim1 < 0.4412645 to the left, improve=1.500000, (0 missing)  
## Surrogate splits:  
## dim15 < 0.05664895 to the right, agree=1.000, adj=1.000, (0 split)  
## dim1 < 0.4412645 to the left, agree=0.857, adj=0.667, (0 split)  
## dim2 < 0.03354513 to the left, agree=0.857, adj=0.667, (0 split)  
## dim3 < -0.03833757 to the right, agree=0.857, adj=0.667, (0 split)  
## dim4 < -0.1270608 to the right, agree=0.857, adj=0.667, (0 split)  
##   
## Node number 843: 14 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.5714286 P(node) =0.0004166667  
## class counts: 0 3 0 6 0 2 0 0 3 0  
## probabilities: 0.000 0.214 0.000 0.429 0.000 0.143 0.000 0.000 0.214 0.000   
## left son=1686 (11 obs) right son=1687 (3 obs)  
## Primary splits:  
## dim28 < -0.01502826 to the left, improve=3.311688, (0 missing)  
## dim2 < -0.05196294 to the left, improve=3.190476, (0 missing)  
## dim26 < 0.10036 to the left, improve=2.757143, (0 missing)  
## dim19 < 0.1085913 to the right, improve=2.457143, (0 missing)  
## dim8 < 0.1123596 to the right, improve=2.457143, (0 missing)  
## Surrogate splits:  
## dim5 < 0.2157437 to the left, agree=0.929, adj=0.667, (0 split)  
## dim26 < 0.10036 to the left, agree=0.929, adj=0.667, (0 split)  
## dim2 < 0.1662052 to the left, agree=0.857, adj=0.333, (0 split)  
## dim12 < -0.0974403 to the right, agree=0.857, adj=0.333, (0 split)  
## dim13 < -0.1015631 to the right, agree=0.857, adj=0.333, (0 split)  
##   
## Node number 848: 7 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.1428571 P(node) =0.0002083333  
## class counts: 0 6 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.857 0.000 0.143 0.000 0.000 0.000 0.000 0.000 0.000   
## left son=1696 (6 obs) right son=1697 (1 obs)  
## Primary splits:  
## dim9 < 0.160966 to the left, improve=1.714286, (0 missing)  
## dim20 < -0.04209802 to the left, improve=1.714286, (0 missing)  
## dim24 < 0.05685045 to the left, improve=1.714286, (0 missing)  
## dim28 < 0.07218263 to the left, improve=1.714286, (0 missing)  
## dim7 < 0.03309869 to the right, improve=1.714286, (0 missing)  
##   
## Node number 849: 6 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.5 P(node) =0.0001785714  
## class counts: 0 0 3 1 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.500 0.167 0.000 0.000 0.000 0.000 0.333 0.000   
## left son=1698 (3 obs) right son=1699 (3 obs)  
## Primary splits:  
## dim19 < 0.05314732 to the right, improve=2.333333, (0 missing)  
## dim26 < -0.08726964 to the left, improve=2.333333, (0 missing)  
## dim6 < -0.209921 to the left, improve=2.333333, (0 missing)  
## dim10 < 0.01805398 to the left, improve=2.333333, (0 missing)  
## dim20 < -0.09255956 to the left, improve=2.333333, (0 missing)  
## Surrogate splits:  
## dim6 < -0.209921 to the left, agree=1, adj=1, (0 split)  
## dim7 < 0.133112 to the right, agree=1, adj=1, (0 split)  
## dim10 < 0.01805398 to the left, agree=1, adj=1, (0 split)  
## dim20 < -0.09255956 to the left, agree=1, adj=1, (0 split)  
## dim24 < -0.01984917 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 850: 10 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.5 P(node) =0.000297619  
## class counts: 5 1 1 1 0 1 1 0 0 0  
## probabilities: 0.500 0.100 0.100 0.100 0.000 0.100 0.100 0.000 0.000 0.000   
## left son=1700 (5 obs) right son=1701 (5 obs)  
## Primary splits:  
## dim26 < 0.01270836 to the right, improve=3.000000, (0 missing)  
## dim29 < -0.0627063 to the left, improve=3.000000, (0 missing)  
## dim7 < 0.03958443 to the left, improve=2.333333, (0 missing)  
## dim12 < 0.0168464 to the left, improve=2.333333, (0 missing)  
## dim14 < 0.05473999 to the left, improve=2.333333, (0 missing)  
## Surrogate splits:  
## dim29 < -0.0627063 to the left, agree=1.0, adj=1.0, (0 split)  
## dim7 < 0.03958443 to the left, agree=0.9, adj=0.8, (0 split)  
## dim12 < 0.0168464 to the left, agree=0.9, adj=0.8, (0 split)  
## dim13 < 0.08300629 to the right, agree=0.9, adj=0.8, (0 split)  
## dim14 < 0.05473999 to the left, agree=0.9, adj=0.8, (0 split)  
##   
## Node number 851: 202 observations, complexity param=0.0001004789  
## predicted class=3 expected loss=0.08415842 P(node) =0.006011905  
## class counts: 0 3 4 185 0 8 1 0 1 0  
## probabilities: 0.000 0.015 0.020 0.916 0.000 0.040 0.005 0.000 0.005 0.000   
## left son=1702 (199 obs) right son=1703 (3 obs)  
## Primary splits:  
## dim14 < 0.1935467 to the left, improve=5.365043, (0 missing)  
## dim17 < -0.1637074 to the left, improve=4.697043, (0 missing)  
## dim22 < -0.07800581 to the right, improve=2.756718, (0 missing)  
## dim8 < -0.1477493 to the right, improve=2.686370, (0 missing)  
## dim6 < -0.3826041 to the right, improve=2.668812, (0 missing)  
##   
## Node number 852: 23 observations  
## predicted class=2 expected loss=0 P(node) =0.0006845238  
## class counts: 0 0 23 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 853: 2 observations  
## predicted class=3 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 854: 16 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.1875 P(node) =0.0004761905  
## class counts: 0 0 0 13 0 0 0 0 3 0  
## probabilities: 0.000 0.000 0.000 0.812 0.000 0.000 0.000 0.000 0.188 0.000   
## left son=1708 (14 obs) right son=1709 (2 obs)  
## Primary splits:  
## dim27 < 0.1246789 to the left, improve=3.017857, (0 missing)  
## dim5 < 0.1005529 to the right, improve=3.017857, (0 missing)  
## dim14 < -0.08025434 to the left, improve=1.875000, (0 missing)  
## dim15 < 0.04951019 to the right, improve=1.875000, (0 missing)  
## dim10 < -0.1918166 to the right, improve=1.695513, (0 missing)  
## Surrogate splits:  
## dim9 < -0.06527129 to the right, agree=0.938, adj=0.5, (0 split)  
##   
## Node number 855: 26 observations, complexity param=0.0001674649  
## predicted class=6 expected loss=0.3846154 P(node) =0.0007738095  
## class counts: 1 0 0 0 0 6 16 0 3 0  
## probabilities: 0.038 0.000 0.000 0.000 0.000 0.231 0.615 0.000 0.115 0.000   
## left son=1710 (9 obs) right son=1711 (17 obs)  
## Primary splits:  
## dim4 < -0.1544343 to the left, improve=6.188537, (0 missing)  
## dim18 < 0.05492677 to the right, improve=4.657343, (0 missing)  
## dim7 < 0.1308177 to the left, improve=3.698901, (0 missing)  
## dim20 < 0.08095266 to the right, improve=3.341137, (0 missing)  
## dim24 < 0.08384685 to the right, improve=3.341137, (0 missing)  
## Surrogate splits:  
## dim18 < 0.05424807 to the right, agree=0.846, adj=0.556, (0 split)  
## dim5 < 0.120156 to the left, agree=0.769, adj=0.333, (0 split)  
## dim7 < 0.07354594 to the right, agree=0.769, adj=0.333, (0 split)  
## dim9 < -0.253708 to the left, agree=0.769, adj=0.333, (0 split)  
## dim14 < 0.003166336 to the left, agree=0.769, adj=0.333, (0 split)  
##   
## Node number 858: 5 observations  
## predicted class=1 expected loss=0 P(node) =0.0001488095  
## class counts: 0 5 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 859: 12 observations, complexity param=0.0001004789  
## predicted class=8 expected loss=0.5833333 P(node) =0.0003571429  
## class counts: 0 0 0 3 0 2 2 0 5 0  
## probabilities: 0.000 0.000 0.000 0.250 0.000 0.167 0.167 0.000 0.417 0.000   
## left son=1718 (5 obs) right son=1719 (7 obs)  
## Primary splits:  
## dim20 < -0.006764958 to the left, improve=3.242857, (0 missing)  
## dim18 < 0.1320422 to the right, improve=2.442857, (0 missing)  
## dim2 < 0.07170832 to the right, improve=2.300000, (0 missing)  
## dim29 < -0.1111045 to the right, improve=2.300000, (0 missing)  
## dim12 < -0.0629962 to the right, improve=2.250000, (0 missing)  
## Surrogate splits:  
## dim2 < -0.1651756 to the left, agree=0.833, adj=0.6, (0 split)  
## dim6 < -0.23484 to the left, agree=0.833, adj=0.6, (0 split)  
## dim7 < 0.03346099 to the left, agree=0.833, adj=0.6, (0 split)  
## dim9 < 0.02586671 to the right, agree=0.833, adj=0.6, (0 split)  
## dim10 < 0.01101137 to the right, agree=0.833, adj=0.6, (0 split)  
##   
## Node number 860: 61 observations  
## predicted class=5 expected loss=0.147541 P(node) =0.001815476  
## class counts: 1 2 0 1 0 52 1 0 3 1  
## probabilities: 0.016 0.033 0.000 0.016 0.000 0.852 0.016 0.000 0.049 0.016   
##   
## Node number 861: 11 observations, complexity param=6.698597e-05  
## predicted class=8 expected loss=0.4545455 P(node) =0.000327381  
## class counts: 2 0 1 2 0 0 0 0 6 0  
## probabilities: 0.182 0.000 0.091 0.182 0.000 0.000 0.000 0.000 0.545 0.000   
## left son=1722 (4 obs) right son=1723 (7 obs)  
## Primary splits:  
## dim18 < -0.02093165 to the left, improve=2.694805, (0 missing)  
## dim9 < 0.008127399 to the right, improve=2.575758, (0 missing)  
## dim12 < -0.1617388 to the left, improve=2.464646, (0 missing)  
## dim15 < -0.01330577 to the left, improve=2.464646, (0 missing)  
## dim29 < -0.1892914 to the left, improve=2.464646, (0 missing)  
## Surrogate splits:  
## dim13 < 0.1820175 to the right, agree=0.909, adj=0.75, (0 split)  
## dim17 < -0.0412075 to the left, agree=0.909, adj=0.75, (0 split)  
## dim3 < 0.1723152 to the right, agree=0.818, adj=0.50, (0 split)  
## dim7 < 0.08161156 to the right, agree=0.818, adj=0.50, (0 split)  
## dim8 < 0.05553749 to the left, agree=0.818, adj=0.50, (0 split)  
##   
## Node number 862: 20 observations, complexity param=0.0001172254  
## predicted class=5 expected loss=0.65 P(node) =0.0005952381  
## class counts: 1 1 3 0 0 7 4 0 4 0  
## probabilities: 0.050 0.050 0.150 0.000 0.000 0.350 0.200 0.000 0.200 0.000   
## left son=1724 (12 obs) right son=1725 (8 obs)  
## Primary splits:  
## dim27 < 0.03979382 to the right, improve=4.650000, (0 missing)  
## dim5 < 0.00511316 to the right, improve=4.542857, (0 missing)  
## dim2 < -0.04734147 to the left, improve=4.150000, (0 missing)  
## dim23 < 0.08670932 to the left, improve=4.150000, (0 missing)  
## dim8 < -0.05030526 to the right, improve=4.000000, (0 missing)  
## Surrogate splits:  
## dim5 < 0.00511316 to the right, agree=0.9, adj=0.75, (0 split)  
## dim2 < -0.04734147 to the left, agree=0.8, adj=0.50, (0 split)  
## dim3 < 0.2521719 to the left, agree=0.8, adj=0.50, (0 split)  
## dim8 < -0.05030526 to the right, agree=0.8, adj=0.50, (0 split)  
## dim13 < 0.02881295 to the right, agree=0.8, adj=0.50, (0 split)  
##   
## Node number 863: 24 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.125 P(node) =0.0007142857  
## class counts: 0 1 1 0 0 1 21 0 0 0  
## probabilities: 0.000 0.042 0.042 0.000 0.000 0.042 0.875 0.000 0.000 0.000   
## left son=1726 (2 obs) right son=1727 (22 obs)  
## Primary splits:  
## dim29 < 0.02718242 to the right, improve=2.590909, (0 missing)  
## dim2 < -0.06477337 to the left, improve=1.900000, (0 missing)  
## dim5 < -0.1299888 to the left, improve=1.760870, (0 missing)  
## dim13 < -0.03843645 to the left, improve=1.760870, (0 missing)  
## dim14 < -0.1407234 to the left, improve=1.760870, (0 missing)  
## Surrogate splits:  
## dim22 < 0.07273642 to the right, agree=0.958, adj=0.5, (0 split)  
##   
## Node number 864: 24 observations, complexity param=3.349298e-05  
## predicted class=0 expected loss=0.04166667 P(node) =0.0007142857  
## class counts: 23 0 0 0 0 0 1 0 0 0  
## probabilities: 0.958 0.000 0.000 0.000 0.000 0.000 0.042 0.000 0.000 0.000   
## left son=1728 (23 obs) right son=1729 (1 obs)  
## Primary splits:  
## dim6 < -0.3109657 to the right, improve=1.9166670, (0 missing)  
## dim17 < 0.1152264 to the left, improve=1.9166670, (0 missing)  
## dim24 < 0.1385394 to the left, improve=1.9166670, (0 missing)  
## dim13 < -0.1223281 to the right, improve=0.9166667, (0 missing)  
## dim28 < 9.474779e-05 to the right, improve=0.9166667, (0 missing)  
##   
## Node number 865: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 866: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 867: 3 observations  
## predicted class=6 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 3 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 874: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 0 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.000 0.000 0.500 0.000 0.000 0.000   
## left son=1748 (1 obs) right son=1749 (1 obs)  
## Primary splits:  
## dim1 < 0.5750881 to the left, improve=1, (0 missing)  
## dim2 < -0.04603629 to the left, improve=1, (0 missing)  
## dim3 < 0.1712839 to the right, improve=1, (0 missing)  
## dim4 < -0.02910973 to the left, improve=1, (0 missing)  
## dim5 < -0.1425945 to the right, improve=1, (0 missing)  
##   
## Node number 875: 3 observations  
## predicted class=5 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 3 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 878: 12 observations, complexity param=0.0001004789  
## predicted class=6 expected loss=0.5 P(node) =0.0003571429  
## class counts: 1 1 0 1 0 3 6 0 0 0  
## probabilities: 0.083 0.083 0.000 0.083 0.000 0.250 0.500 0.000 0.000 0.000   
## left son=1756 (5 obs) right son=1757 (7 obs)  
## Primary splits:  
## dim8 < -0.09620612 to the left, improve=3.485714, (0 missing)  
## dim24 < 0.02757863 to the left, improve=3.333333, (0 missing)  
## dim10 < 0.06281248 to the left, improve=2.857143, (0 missing)  
## dim14 < -0.05163028 to the right, improve=2.857143, (0 missing)  
## dim26 < 0.0194939 to the left, improve=2.333333, (0 missing)  
## Surrogate splits:  
## dim24 < 0.01091029 to the right, agree=0.917, adj=0.8, (0 split)  
## dim26 < 0.0194939 to the left, agree=0.917, adj=0.8, (0 split)  
## dim5 < -0.1344983 to the right, agree=0.833, adj=0.6, (0 split)  
## dim9 < 0.1710675 to the right, agree=0.833, adj=0.6, (0 split)  
## dim10 < 0.06281248 to the left, agree=0.833, adj=0.6, (0 split)  
##   
## Node number 879: 40 observations, complexity param=3.349298e-05  
## predicted class=5 expected loss=0.075 P(node) =0.001190476  
## class counts: 0 0 0 1 0 37 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.025 0.000 0.925 0.050 0.000 0.000 0.000   
## left son=1758 (2 obs) right son=1759 (38 obs)  
## Primary splits:  
## dim16 < 0.1876718 to the right, improve=2.702632, (0 missing)  
## dim24 < -0.09940633 to the right, improve=2.370721, (0 missing)  
## dim20 < 0.1477972 to the left, improve=2.370721, (0 missing)  
## dim12 < 0.1180435 to the right, improve=1.855128, (0 missing)  
## dim14 < -0.1403562 to the right, improve=1.803846, (0 missing)  
##   
## Node number 880: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 881: 25 observations  
## predicted class=2 expected loss=0 P(node) =0.0007440476  
## class counts: 0 0 25 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 882: 7 observations  
## predicted class=2 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 7 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 883: 20 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.75 P(node) =0.0005952381  
## class counts: 0 4 3 5 3 1 4 0 0 0  
## probabilities: 0.000 0.200 0.150 0.250 0.150 0.050 0.200 0.000 0.000 0.000   
## left son=1766 (5 obs) right son=1767 (15 obs)  
## Primary splits:  
## dim21 < 0.03971021 to the right, improve=4.600000, (0 missing)  
## dim7 < -0.02182083 to the right, improve=3.694505, (0 missing)  
## dim17 < 0.03582114 to the left, improve=3.141176, (0 missing)  
## dim2 < 0.1679945 to the left, improve=3.141176, (0 missing)  
## dim12 < 0.0200285 to the right, improve=3.057143, (0 missing)  
## Surrogate splits:  
## dim4 < -0.03859398 to the left, agree=0.9, adj=0.6, (0 split)  
## dim10 < -0.137647 to the left, agree=0.9, adj=0.6, (0 split)  
## dim12 < 0.0200285 to the right, agree=0.9, adj=0.6, (0 split)  
## dim16 < -0.05498897 to the left, agree=0.9, adj=0.6, (0 split)  
## dim20 < 0.02681542 to the right, agree=0.9, adj=0.6, (0 split)  
##   
## Node number 884: 1 observations  
## predicted class=2 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 885: 2 observations  
## predicted class=3 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 886: 17 observations  
## predicted class=6 expected loss=0 P(node) =0.0005059524  
## class counts: 0 0 0 0 0 0 17 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 887: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 890: 40 observations, complexity param=0.0001004789  
## predicted class=6 expected loss=0.375 P(node) =0.001190476  
## class counts: 5 0 3 6 0 1 25 0 0 0  
## probabilities: 0.125 0.000 0.075 0.150 0.000 0.025 0.625 0.000 0.000 0.000   
## left son=1780 (18 obs) right son=1781 (22 obs)  
## Primary splits:  
## dim16 < -0.07878875 to the right, improve=9.044444, (0 missing)  
## dim25 < -0.05972087 to the left, improve=8.011765, (0 missing)  
## dim15 < 0.01224933 to the right, improve=7.488889, (0 missing)  
## dim8 < 0.05010522 to the left, improve=6.695238, (0 missing)  
## dim7 < 0.0663613 to the right, improve=6.350000, (0 missing)  
## Surrogate splits:  
## dim7 < -0.07194256 to the right, agree=0.825, adj=0.611, (0 split)  
## dim8 < 0.05010522 to the left, agree=0.825, adj=0.611, (0 split)  
## dim25 < 0.04116603 to the left, agree=0.800, adj=0.556, (0 split)  
## dim15 < 0.01224933 to the right, agree=0.775, adj=0.500, (0 split)  
## dim18 < -0.002479469 to the left, agree=0.775, adj=0.500, (0 split)  
##   
## Node number 891: 12 observations, complexity param=3.349298e-05  
## predicted class=5 expected loss=0.08333333 P(node) =0.0003571429  
## class counts: 1 0 0 0 0 11 0 0 0 0  
## probabilities: 0.083 0.000 0.000 0.000 0.000 0.917 0.000 0.000 0.000 0.000   
## left son=1782 (1 obs) right son=1783 (11 obs)  
## Primary splits:  
## dim2 < 0.2824974 to the right, improve=1.833333, (0 missing)  
## dim4 < 0.117422 to the right, improve=1.833333, (0 missing)  
## dim9 < -0.02945301 to the left, improve=1.833333, (0 missing)  
## dim15 < -0.2244759 to the left, improve=1.833333, (0 missing)  
## dim19 < 0.06568925 to the right, improve=1.833333, (0 missing)  
##   
## Node number 892: 16 observations, complexity param=6.698597e-05  
## predicted class=2 expected loss=0.1875 P(node) =0.0004761905  
## class counts: 0 0 13 0 0 0 2 1 0 0  
## probabilities: 0.000 0.000 0.812 0.000 0.000 0.000 0.125 0.062 0.000 0.000   
## left son=1784 (14 obs) right son=1785 (2 obs)  
## Primary splits:  
## dim2 < 0.1785128 to the left, improve=3.267857, (0 missing)  
## dim5 < 0.444005 to the left, improve=3.267857, (0 missing)  
## dim7 < 0.1967796 to the left, improve=3.267857, (0 missing)  
## dim21 < 0.07069104 to the left, improve=3.267857, (0 missing)  
## dim17 < -0.1564736 to the right, improve=3.267857, (0 missing)  
## Surrogate splits:  
## dim5 < 0.444005 to the left, agree=1.000, adj=1.0, (0 split)  
## dim7 < 0.1967796 to the left, agree=1.000, adj=1.0, (0 split)  
## dim17 < -0.1564736 to the right, agree=1.000, adj=1.0, (0 split)  
## dim21 < 0.07069104 to the left, agree=1.000, adj=1.0, (0 split)  
## dim12 < 0.05321647 to the left, agree=0.938, adj=0.5, (0 split)  
##   
## Node number 893: 11 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.2727273 P(node) =0.000327381  
## class counts: 0 0 0 0 8 0 3 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.727 0.000 0.273 0.000 0.000 0.000   
## left son=1786 (8 obs) right son=1787 (3 obs)  
## Primary splits:  
## dim5 < 0.1846226 to the left, improve=4.363636, (0 missing)  
## dim6 < -0.2238078 to the left, improve=4.363636, (0 missing)  
## dim20 < 0.05905317 to the left, improve=4.363636, (0 missing)  
## dim24 < 0.04811916 to the right, improve=4.363636, (0 missing)  
## dim3 < -0.06684598 to the left, improve=2.863636, (0 missing)  
## Surrogate splits:  
## dim6 < -0.2238078 to the left, agree=1.000, adj=1.000, (0 split)  
## dim20 < 0.05905317 to the left, agree=1.000, adj=1.000, (0 split)  
## dim24 < 0.04811916 to the right, agree=1.000, adj=1.000, (0 split)  
## dim3 < -0.06684598 to the left, agree=0.909, adj=0.667, (0 split)  
## dim8 < 0.2251118 to the left, agree=0.909, adj=0.667, (0 split)  
##   
## Node number 894: 24 observations, complexity param=0.0002344509  
## predicted class=4 expected loss=0.375 P(node) =0.0007142857  
## class counts: 0 0 1 0 15 0 7 0 0 1  
## probabilities: 0.000 0.000 0.042 0.000 0.625 0.000 0.292 0.000 0.000 0.042   
## left son=1788 (16 obs) right son=1789 (8 obs)  
## Primary splits:  
## dim7 < 0.05258882 to the left, improve=8.875000, (0 missing)  
## dim19 < -0.09590114 to the right, improve=7.166667, (0 missing)  
## dim4 < 0.2269309 to the left, improve=7.166667, (0 missing)  
## dim20 < -0.002584326 to the left, improve=5.625000, (0 missing)  
## dim3 < 0.0370542 to the left, improve=4.455556, (0 missing)  
## Surrogate splits:  
## dim4 < 0.2269309 to the left, agree=0.917, adj=0.750, (0 split)  
## dim19 < -0.09590114 to the right, agree=0.917, adj=0.750, (0 split)  
## dim3 < 0.0370542 to the left, agree=0.875, adj=0.625, (0 split)  
## dim12 < -0.08816354 to the left, agree=0.833, adj=0.500, (0 split)  
## dim15 < 0.05480278 to the left, agree=0.833, adj=0.500, (0 split)  
##   
## Node number 895: 2457 observations  
## predicted class=6 expected loss=0.06796907 P(node) =0.073125  
## class counts: 25 14 67 10 19 19 2290 0 10 3  
## probabilities: 0.010 0.006 0.027 0.004 0.008 0.008 0.932 0.000 0.004 0.001   
##   
## Node number 896: 1113 observations, complexity param=0.0001674649  
## predicted class=4 expected loss=0.07187781 P(node) =0.033125  
## class counts: 0 0 6 5 1033 4 6 10 8 41  
## probabilities: 0.000 0.000 0.005 0.004 0.928 0.004 0.005 0.009 0.007 0.037   
## left son=1792 (1102 obs) right son=1793 (11 obs)  
## Primary splits:  
## dim4 < -0.3501195 to the right, improve=12.209260, (0 missing)  
## dim8 < -0.226108 to the right, improve= 7.028958, (0 missing)  
## dim3 < -0.1377659 to the left, improve= 4.637537, (0 missing)  
## dim11 < 0.05524684 to the right, improve= 4.557050, (0 missing)  
## dim1 < 0.6626608 to the left, improve= 4.094916, (0 missing)  
##   
## Node number 897: 37 observations, complexity param=0.0001674649  
## predicted class=4 expected loss=0.6486486 P(node) =0.00110119  
## class counts: 0 0 1 1 13 0 8 1 2 11  
## probabilities: 0.000 0.000 0.027 0.027 0.351 0.000 0.216 0.027 0.054 0.297   
## left son=1794 (11 obs) right son=1795 (26 obs)  
## Primary splits:  
## dim11 < 0.1620212 to the right, improve=8.781705, (0 missing)  
## dim6 < -0.3522235 to the left, improve=7.176577, (0 missing)  
## dim27 < 0.08428443 to the right, improve=5.952921, (0 missing)  
## dim4 < -0.04001676 to the right, improve=5.917317, (0 missing)  
## dim15 < -0.00438138 to the left, improve=5.702067, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4280994 to the left, agree=0.865, adj=0.545, (0 split)  
## dim27 < -0.0357373 to the left, agree=0.865, adj=0.545, (0 split)  
## dim29 < 0.03917352 to the right, agree=0.865, adj=0.545, (0 split)  
## dim19 < 0.1204167 to the right, agree=0.838, adj=0.455, (0 split)  
## dim18 < 0.1242966 to the right, agree=0.811, adj=0.364, (0 split)  
##   
## Node number 898: 89 observations, complexity param=0.0001674649  
## predicted class=4 expected loss=0.2808989 P(node) =0.00264881  
## class counts: 0 7 1 1 64 2 0 4 3 7  
## probabilities: 0.000 0.079 0.011 0.011 0.719 0.022 0.000 0.045 0.034 0.079   
## left son=1796 (17 obs) right son=1797 (72 obs)  
## Primary splits:  
## dim29 < -0.0117245 to the right, improve=10.586910, (0 missing)  
## dim28 < -0.1038793 to the left, improve=10.369760, (0 missing)  
## dim4 < -0.03277395 to the left, improve= 9.427189, (0 missing)  
## dim10 < 0.1226827 to the right, improve= 9.322208, (0 missing)  
## dim7 < -0.0194478 to the right, improve= 9.038211, (0 missing)  
## Surrogate splits:  
## dim4 < -0.1236241 to the left, agree=0.921, adj=0.588, (0 split)  
## dim28 < -0.09003982 to the left, agree=0.921, adj=0.588, (0 split)  
## dim7 < -0.01518524 to the right, agree=0.899, adj=0.471, (0 split)  
## dim10 < 0.1308026 to the right, agree=0.899, adj=0.471, (0 split)  
## dim6 < -0.2705109 to the left, agree=0.888, adj=0.412, (0 split)  
##   
## Node number 899: 21 observations, complexity param=6.698597e-05  
## predicted class=5 expected loss=0.2857143 P(node) =0.000625  
## class counts: 0 0 1 1 1 15 0 1 2 0  
## probabilities: 0.000 0.000 0.048 0.048 0.048 0.714 0.000 0.048 0.095 0.000   
## left son=1798 (16 obs) right son=1799 (5 obs)  
## Primary splits:  
## dim20 < -0.003264141 to the left, improve=4.429762, (0 missing)  
## dim4 < -0.07605669 to the right, improve=3.757703, (0 missing)  
## dim19 < 0.03554001 to the right, improve=3.375350, (0 missing)  
## dim18 < -0.0700744 to the left, improve=3.371429, (0 missing)  
## dim12 < -0.03012481 to the left, improve=3.257703, (0 missing)  
## Surrogate splits:  
## dim8 < 0.05871854 to the right, agree=0.905, adj=0.6, (0 split)  
## dim18 < -0.05269245 to the left, agree=0.905, adj=0.6, (0 split)  
## dim24 < -0.1038623 to the right, agree=0.905, adj=0.6, (0 split)  
## dim25 < 0.1054104 to the left, agree=0.905, adj=0.6, (0 split)  
## dim2 < 0.02484563 to the left, agree=0.857, adj=0.4, (0 split)  
##   
## Node number 900: 251 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.0876494 P(node) =0.007470238  
## class counts: 0 0 0 0 229 2 5 0 1 14  
## probabilities: 0.000 0.000 0.000 0.000 0.912 0.008 0.020 0.000 0.004 0.056   
## left son=1800 (248 obs) right son=1801 (3 obs)  
## Primary splits:  
## dim6 < -0.3851091 to the right, improve=5.453573, (0 missing)  
## dim3 < -0.1201019 to the left, improve=3.580780, (0 missing)  
## dim8 < 0.2683826 to the left, improve=3.383436, (0 missing)  
## dim4 < -0.2590198 to the right, improve=3.011622, (0 missing)  
## dim12 < -0.07358908 to the right, improve=2.669789, (0 missing)  
##   
## Node number 901: 50 observations, complexity param=0.0002679439  
## predicted class=4 expected loss=0.48 P(node) =0.001488095  
## class counts: 0 0 0 0 26 0 0 0 0 24  
## probabilities: 0.000 0.000 0.000 0.000 0.520 0.000 0.000 0.000 0.000 0.480   
## left son=1802 (32 obs) right son=1803 (18 obs)  
## Primary splits:  
## dim19 < -0.04894025 to the right, improve=12.133610, (0 missing)  
## dim24 < 0.03818727 to the right, improve=11.633080, (0 missing)  
## dim10 < 0.1060192 to the left, improve=10.299900, (0 missing)  
## dim20 < 0.0121422 to the right, improve= 9.278182, (0 missing)  
## dim2 < 0.1471899 to the left, improve= 8.807619, (0 missing)  
## Surrogate splits:  
## dim2 < 0.1561677 to the left, agree=0.84, adj=0.556, (0 split)  
## dim20 < -0.05911037 to the right, agree=0.84, adj=0.556, (0 split)  
## dim10 < 0.1060192 to the left, agree=0.82, adj=0.500, (0 split)  
## dim18 < 0.03912884 to the left, agree=0.78, adj=0.389, (0 split)  
## dim24 < 0.012973 to the right, agree=0.78, adj=0.389, (0 split)  
##   
## Node number 902: 189 observations  
## predicted class=4 expected loss=0.3650794 P(node) =0.005625  
## class counts: 1 0 1 0 120 0 19 13 9 26  
## probabilities: 0.005 0.000 0.005 0.000 0.635 0.000 0.101 0.069 0.048 0.138   
##   
## Node number 903: 168 observations, complexity param=0.0005247234  
## predicted class=9 expected loss=0.5654762 P(node) =0.005  
## class counts: 0 1 4 4 26 3 7 13 37 73  
## probabilities: 0.000 0.006 0.024 0.024 0.155 0.018 0.042 0.077 0.220 0.435   
## left son=1806 (82 obs) right son=1807 (86 obs)  
## Primary splits:  
## dim2 < 0.1373017 to the left, improve=19.23961, (0 missing)  
## dim3 < -0.1761551 to the right, improve=18.15364, (0 missing)  
## dim13 < 0.01738262 to the right, improve=17.44146, (0 missing)  
## dim10 < 0.07959937 to the left, improve=14.48522, (0 missing)  
## dim25 < 0.02519767 to the left, improve=14.02978, (0 missing)  
## Surrogate splits:  
## dim10 < 0.07959937 to the left, agree=0.714, adj=0.415, (0 split)  
## dim13 < -0.01638804 to the right, agree=0.714, adj=0.415, (0 split)  
## dim26 < 0.03365645 to the right, agree=0.714, adj=0.415, (0 split)  
## dim27 < -0.01668768 to the left, agree=0.714, adj=0.415, (0 split)  
## dim9 < -0.05075117 to the left, agree=0.696, adj=0.378, (0 split)  
##   
## Node number 904: 102 observations, complexity param=0.0002009579  
## predicted class=4 expected loss=0.245098 P(node) =0.003035714  
## class counts: 0 0 1 0 77 3 1 2 4 14  
## probabilities: 0.000 0.000 0.010 0.000 0.755 0.029 0.010 0.020 0.039 0.137   
## left son=1808 (92 obs) right son=1809 (10 obs)  
## Primary splits:  
## dim12 < -0.161164 to the right, improve=8.612276, (0 missing)  
## dim4 < -0.1505939 to the right, improve=8.034671, (0 missing)  
## dim18 < -0.02990424 to the left, improve=7.431854, (0 missing)  
## dim30 < -0.02422268 to the right, improve=6.439742, (0 missing)  
## dim20 < -0.1409354 to the right, improve=5.430517, (0 missing)  
## Surrogate splits:  
## dim4 < -0.2230185 to the right, agree=0.931, adj=0.3, (0 split)  
## dim7 < 0.04143132 to the left, agree=0.912, adj=0.1, (0 split)  
## dim23 < 0.1510669 to the left, agree=0.912, adj=0.1, (0 split)  
##   
## Node number 905: 63 observations, complexity param=0.0002679439  
## predicted class=9 expected loss=0.2857143 P(node) =0.001875  
## class counts: 0 0 0 2 14 0 0 2 0 45  
## probabilities: 0.000 0.000 0.000 0.032 0.222 0.000 0.000 0.032 0.000 0.714   
## left son=1810 (10 obs) right son=1811 (53 obs)  
## Primary splits:  
## dim20 < 0.08960693 to the right, improve=10.381310, (0 missing)  
## dim12 < 0.1865975 to the right, improve=10.237230, (0 missing)  
## dim16 < 0.1292578 to the right, improve= 9.972194, (0 missing)  
## dim28 < -0.08279622 to the left, improve= 6.285714, (0 missing)  
## dim13 < -0.08386145 to the left, improve= 6.024642, (0 missing)  
## Surrogate splits:  
## dim12 < 0.1865975 to the right, agree=0.905, adj=0.4, (0 split)  
## dim13 < -0.090912 to the left, agree=0.905, adj=0.4, (0 split)  
## dim16 < 0.1292578 to the right, agree=0.889, adj=0.3, (0 split)  
## dim18 < -0.1236582 to the left, agree=0.889, adj=0.3, (0 split)  
## dim9 < 0.1102062 to the right, agree=0.873, adj=0.2, (0 split)  
##   
## Node number 906: 2 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 1 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500   
## left son=1812 (1 obs) right son=1813 (1 obs)  
## Primary splits:  
## dim1 < 0.4521503 to the right, improve=1, (0 missing)  
## dim2 < 0.2297032 to the left, improve=1, (0 missing)  
## dim3 < -0.1263267 to the right, improve=1, (0 missing)  
## dim4 < -0.115791 to the right, improve=1, (0 missing)  
## dim5 < 0.08912464 to the right, improve=1, (0 missing)  
##   
## Node number 907: 23 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.04347826 P(node) =0.0006845238  
## class counts: 0 0 0 0 0 0 0 22 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.957 0.000 0.043   
## left son=1814 (22 obs) right son=1815 (1 obs)  
## Primary splits:  
## dim7 < -0.1166823 to the right, improve=1.913043, (0 missing)  
## dim14 < -0.1255837 to the right, improve=1.913043, (0 missing)  
## dim19 < -0.0283872 to the right, improve=1.913043, (0 missing)  
## dim26 < -0.02488712 to the right, improve=1.913043, (0 missing)  
## dim1 < 0.5990676 to the left, improve=1.913043, (0 missing)  
##   
## Node number 908: 17 observations, complexity param=0.0001674649  
## predicted class=9 expected loss=0.4705882 P(node) =0.0005059524  
## class counts: 0 0 0 0 5 1 0 0 2 9  
## probabilities: 0.000 0.000 0.000 0.000 0.294 0.059 0.000 0.000 0.118 0.529   
## left son=1816 (5 obs) right son=1817 (12 obs)  
## Primary splits:  
## dim9 < 0.02674989 to the right, improve=5.637255, (0 missing)  
## dim5 < 0.2482159 to the right, improve=4.162896, (0 missing)  
## dim10 < 0.02997315 to the left, improve=3.870588, (0 missing)  
## dim29 < 0.01210771 to the left, improve=3.237255, (0 missing)  
## dim17 < 0.09721212 to the left, improve=2.770588, (0 missing)  
## Surrogate splits:  
## dim5 < 0.2482159 to the right, agree=0.941, adj=0.8, (0 split)  
## dim10 < 0.02997315 to the left, agree=0.882, adj=0.6, (0 split)  
## dim21 < -0.002262123 to the left, agree=0.824, adj=0.4, (0 split)  
## dim23 < -0.1043992 to the left, agree=0.824, adj=0.4, (0 split)  
## dim28 < -0.07810939 to the left, agree=0.824, adj=0.4, (0 split)  
##   
## Node number 909: 17 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.05882353 P(node) =0.0005059524  
## class counts: 0 0 0 0 1 0 0 0 16 0  
## probabilities: 0.000 0.000 0.000 0.000 0.059 0.000 0.000 0.000 0.941 0.000   
## left son=1818 (1 obs) right son=1819 (16 obs)  
## Primary splits:  
## dim6 < -0.1057576 to the left, improve=1.882353, (0 missing)  
## dim7 < -0.1976195 to the left, improve=1.882353, (0 missing)  
## dim14 < -0.09805636 to the left, improve=1.882353, (0 missing)  
## dim23 < -0.1504096 to the left, improve=1.882353, (0 missing)  
## dim28 < -0.06583213 to the left, improve=1.882353, (0 missing)  
##   
## Node number 910: 30 observations, complexity param=0.0001563006  
## predicted class=4 expected loss=0.5 P(node) =0.0008928571  
## class counts: 0 0 0 0 15 0 0 0 0 15  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500   
## left son=1820 (19 obs) right son=1821 (11 obs)  
## Primary splits:  
## dim19 < -0.08328605 to the right, improve=5.813397, (0 missing)  
## dim27 < 0.03599524 to the left, improve=5.813397, (0 missing)  
## dim8 < -0.01067274 to the right, improve=5.454545, (0 missing)  
## dim29 < 0.0289549 to the right, improve=5.454545, (0 missing)  
## dim2 < 0.09411398 to the left, improve=3.888889, (0 missing)  
## Surrogate splits:  
## dim9 < -0.1189023 to the right, agree=0.767, adj=0.364, (0 split)  
## dim8 < -0.0360962 to the right, agree=0.733, adj=0.273, (0 split)  
## dim24 < -0.1018837 to the right, agree=0.733, adj=0.273, (0 split)  
## dim25 < 0.07245645 to the left, agree=0.733, adj=0.273, (0 split)  
## dim26 < -0.002981703 to the right, agree=0.733, adj=0.273, (0 split)  
##   
## Node number 911: 204 observations, complexity param=0.0001563006  
## predicted class=9 expected loss=0.1176471 P(node) =0.006071429  
## class counts: 0 0 0 0 8 0 0 13 3 180  
## probabilities: 0.000 0.000 0.000 0.000 0.039 0.000 0.000 0.064 0.015 0.882   
## left son=1822 (7 obs) right son=1823 (197 obs)  
## Primary splits:  
## dim9 < 0.1712175 to the right, improve=8.539870, (0 missing)  
## dim2 < 0.3474928 to the right, improve=7.576521, (0 missing)  
## dim7 < 0.03647705 to the right, improve=5.174116, (0 missing)  
## dim1 < 0.5421775 to the left, improve=4.413566, (0 missing)  
## dim30 < 0.1347443 to the right, improve=4.094719, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4353472 to the left, agree=0.975, adj=0.286, (0 split)  
##   
## Node number 912: 127 observations, complexity param=1.674649e-05  
## predicted class=5 expected loss=0.02362205 P(node) =0.003779762  
## class counts: 0 0 0 0 0 124 0 0 2 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.976 0.000 0.000 0.016 0.008   
## left son=1824 (126 obs) right son=1825 (1 obs)  
## Primary splits:  
## dim10 < -0.2283128 to the right, improve=1.953256, (0 missing)  
## dim29 < 0.1936795 to the left, improve=1.953256, (0 missing)  
## dim20 < 0.1720968 to the left, improve=1.937383, (0 missing)  
## dim2 < -0.1980764 to the right, improve=1.905893, (0 missing)  
## dim25 < -0.1487718 to the right, improve=1.506157, (0 missing)  
##   
## Node number 913: 38 observations  
## predicted class=5 expected loss=0.4736842 P(node) =0.001130952  
## class counts: 0 3 0 1 1 20 0 5 4 4  
## probabilities: 0.000 0.079 0.000 0.026 0.026 0.526 0.000 0.132 0.105 0.105   
##   
## Node number 914: 7 observations  
## predicted class=8 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 0 0 0 0 0 0 7 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 915: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 916: 33 observations, complexity param=3.349298e-05  
## predicted class=1 expected loss=0.03030303 P(node) =0.0009821429  
## class counts: 0 32 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.970 0.000 0.000 0.030 0.000 0.000 0.000 0.000 0.000   
## left son=1832 (32 obs) right son=1833 (1 obs)  
## Primary splits:  
## dim7 < -0.1376542 to the right, improve=1.9393940, (0 missing)  
## dim19 < -0.1265708 to the right, improve=1.9393940, (0 missing)  
## dim30 < -0.02370474 to the right, improve=1.9393940, (0 missing)  
## dim18 < 0.05924417 to the left, improve=1.9393940, (0 missing)  
## dim5 < -0.150398 to the right, improve=0.9393939, (0 missing)  
##   
## Node number 917: 9 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.1111111 P(node) =0.0002678571  
## class counts: 0 1 0 0 8 0 0 0 0 0  
## probabilities: 0.000 0.111 0.000 0.000 0.889 0.000 0.000 0.000 0.000 0.000   
## left son=1834 (1 obs) right son=1835 (8 obs)  
## Primary splits:  
## dim7 < 0.01804845 to the right, improve=1.777778, (0 missing)  
## dim17 < 0.1620681 to the right, improve=1.777778, (0 missing)  
## dim2 < -0.2490693 to the left, improve=1.777778, (0 missing)  
## dim14 < -0.1444751 to the left, improve=1.777778, (0 missing)  
## dim27 < -0.07954775 to the left, improve=1.777778, (0 missing)  
##   
## Node number 918: 165 observations, complexity param=0.0006698597  
## predicted class=5 expected loss=0.6181818 P(node) =0.004910714  
## class counts: 1 0 0 4 31 63 0 25 12 29  
## probabilities: 0.006 0.000 0.000 0.024 0.188 0.382 0.000 0.152 0.073 0.176   
## left son=1836 (99 obs) right son=1837 (66 obs)  
## Primary splits:  
## dim10 < -0.04786784 to the right, improve=18.85657, (0 missing)  
## dim21 < 0.04847835 to the left, improve=18.81481, (0 missing)  
## dim17 < -0.006912829 to the left, improve=16.20502, (0 missing)  
## dim16 < 0.1808437 to the right, improve=14.57261, (0 missing)  
## dim22 < 0.04063569 to the left, improve=14.23655, (0 missing)  
## Surrogate splits:  
## dim21 < 0.1001625 to the left, agree=0.812, adj=0.530, (0 split)  
## dim4 < 0.1626408 to the left, agree=0.758, adj=0.394, (0 split)  
## dim6 < 0.0602431 to the left, agree=0.739, adj=0.348, (0 split)  
## dim18 < 0.03115891 to the left, agree=0.721, adj=0.303, (0 split)  
## dim22 < 0.04266614 to the left, agree=0.715, adj=0.288, (0 split)  
##   
## Node number 919: 89 observations, complexity param=0.0002009579  
## predicted class=8 expected loss=0.3033708 P(node) =0.00264881  
## class counts: 3 0 0 3 3 2 0 3 62 13  
## probabilities: 0.034 0.000 0.000 0.034 0.034 0.022 0.000 0.034 0.697 0.146   
## left son=1838 (73 obs) right son=1839 (16 obs)  
## Primary splits:  
## dim10 < -0.1075156 to the right, improve=8.970948, (0 missing)  
## dim4 < 0.1689015 to the left, improve=7.488210, (0 missing)  
## dim15 < 0.0753666 to the left, improve=5.854465, (0 missing)  
## dim11 < -0.0007145855 to the left, improve=5.407757, (0 missing)  
## dim24 < 0.1049786 to the left, improve=5.003531, (0 missing)  
## Surrogate splits:  
## dim4 < 0.2023652 to the left, agree=0.921, adj=0.563, (0 split)  
## dim11 < 0.04910117 to the left, agree=0.854, adj=0.187, (0 split)  
## dim15 < 0.0753666 to the left, agree=0.854, adj=0.187, (0 split)  
## dim17 < 0.104027 to the left, agree=0.854, adj=0.187, (0 split)  
## dim16 < -0.0072623 to the right, agree=0.843, adj=0.125, (0 split)  
##   
## Node number 920: 107 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.009345794 P(node) =0.003184524  
## class counts: 0 0 0 0 106 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.991 0.000 0.000 0.000 0.000 0.009   
## left son=1840 (106 obs) right son=1841 (1 obs)  
## Primary splits:  
## dim29 < 0.1014385 to the left, improve=1.9813080, (0 missing)  
## dim13 < -0.1817078 to the right, improve=0.9813084, (0 missing)  
## dim28 < -0.0742731 to the right, improve=0.9813084, (0 missing)  
## dim1 < 0.6557206 to the left, improve=0.4813084, (0 missing)  
## dim23 < 0.03689989 to the left, improve=0.4813084, (0 missing)  
##   
## Node number 921: 3 observations  
## predicted class=9 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 922: 4 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 0 0 0 2 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.500 0.000 0.000   
## left son=1844 (2 obs) right son=1845 (2 obs)  
## Primary splits:  
## dim1 < 0.5843561 to the right, improve=2, (0 missing)  
## dim6 < -0.015019 to the left, improve=2, (0 missing)  
## dim7 < -0.1348996 to the left, improve=2, (0 missing)  
## dim8 < 0.08624261 to the right, improve=2, (0 missing)  
## dim9 < 0.1163118 to the left, improve=2, (0 missing)  
## Surrogate splits:  
## dim6 < -0.015019 to the left, agree=1, adj=1, (0 split)  
## dim7 < -0.1348996 to the left, agree=1, adj=1, (0 split)  
## dim8 < 0.08624261 to the right, agree=1, adj=1, (0 split)  
## dim9 < 0.1163118 to the left, agree=1, adj=1, (0 split)  
## dim13 < 0.04333214 to the left, agree=1, adj=1, (0 split)  
##   
## Node number 923: 5 observations  
## predicted class=9 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 924: 93 observations, complexity param=0.0004019158  
## predicted class=5 expected loss=0.4193548 P(node) =0.002767857  
## class counts: 0 0 0 0 7 54 0 13 4 15  
## probabilities: 0.000 0.000 0.000 0.000 0.075 0.581 0.000 0.140 0.043 0.161   
## left son=1848 (62 obs) right son=1849 (31 obs)  
## Primary splits:  
## dim10 < -0.1615875 to the right, improve=20.93548, (0 missing)  
## dim4 < 0.2257339 to the left, improve=19.27476, (0 missing)  
## dim17 < 0.1396906 to the left, improve=14.48002, (0 missing)  
## dim18 < -0.01568692 to the left, improve=14.16701, (0 missing)  
## dim6 < 0.144801 to the left, improve=13.41955, (0 missing)  
## Surrogate splits:  
## dim4 < 0.2452615 to the left, agree=0.935, adj=0.806, (0 split)  
## dim6 < 0.0588544 to the left, agree=0.828, adj=0.484, (0 split)  
## dim9 < -0.05471099 to the left, agree=0.806, adj=0.419, (0 split)  
## dim17 < 0.09699795 to the left, agree=0.806, adj=0.419, (0 split)  
## dim2 < -0.02587856 to the right, agree=0.785, adj=0.355, (0 split)  
##   
## Node number 925: 549 observations, complexity param=0.001105268  
## predicted class=9 expected loss=0.4098361 P(node) =0.01633929  
## class counts: 0 3 0 3 128 13 0 55 23 324  
## probabilities: 0.000 0.005 0.000 0.005 0.233 0.024 0.000 0.100 0.042 0.590   
## left son=1850 (69 obs) right son=1851 (480 obs)  
## Primary splits:  
## dim14 < 0.07486248 to the right, improve=27.68784, (0 missing)  
## dim21 < -0.09122403 to the left, improve=26.74522, (0 missing)  
## dim28 < 0.03548047 to the right, improve=25.15636, (0 missing)  
## dim17 < 0.07595721 to the right, improve=25.12121, (0 missing)  
## dim1 < 0.6407457 to the left, improve=23.91807, (0 missing)  
## Surrogate splits:  
## dim2 < 0.3468316 to the right, agree=0.887, adj=0.101, (0 split)  
## dim15 < 0.1796814 to the right, agree=0.883, adj=0.072, (0 split)  
## dim13 < 0.2504069 to the right, agree=0.882, adj=0.058, (0 split)  
## dim19 < -0.1688621 to the left, agree=0.880, adj=0.043, (0 split)  
## dim12 < -0.2228637 to the left, agree=0.878, adj=0.029, (0 split)  
##   
## Node number 926: 124 observations, complexity param=6.698597e-05  
## predicted class=7 expected loss=0.1370968 P(node) =0.003690476  
## class counts: 0 0 0 0 3 0 0 107 0 14  
## probabilities: 0.000 0.000 0.000 0.000 0.024 0.000 0.000 0.863 0.000 0.113   
## left son=1852 (107 obs) right son=1853 (17 obs)  
## Primary splits:  
## dim24 < -0.04943403 to the right, improve=7.450983, (0 missing)  
## dim8 < 0.2459206 to the left, improve=6.332513, (0 missing)  
## dim19 < -0.1567523 to the right, improve=5.705426, (0 missing)  
## dim7 < -0.1188442 to the right, improve=4.536045, (0 missing)  
## dim16 < -0.003587585 to the right, improve=4.283370, (0 missing)  
## Surrogate splits:  
## dim19 < -0.1567523 to the right, agree=0.903, adj=0.294, (0 split)  
## dim4 < -0.2818726 to the right, agree=0.887, adj=0.176, (0 split)  
## dim2 < 0.4413259 to the left, agree=0.879, adj=0.118, (0 split)  
## dim1 < 0.7097092 to the left, agree=0.871, adj=0.059, (0 split)  
## dim23 < 0.1440177 to the left, agree=0.871, adj=0.059, (0 split)  
##   
## Node number 927: 63 observations, complexity param=0.0003516763  
## predicted class=9 expected loss=0.4761905 P(node) =0.001875  
## class counts: 0 0 0 0 7 0 0 23 0 33  
## probabilities: 0.000 0.000 0.000 0.000 0.111 0.000 0.000 0.365 0.000 0.524   
## left son=1854 (27 obs) right son=1855 (36 obs)  
## Primary splits:  
## dim8 < 0.05484493 to the left, improve=8.447090, (0 missing)  
## dim30 < -0.01768967 to the left, improve=7.577577, (0 missing)  
## dim7 < -0.03148018 to the right, improve=7.135836, (0 missing)  
## dim1 < 0.5896262 to the left, improve=6.711111, (0 missing)  
## dim17 < 0.1227233 to the right, improve=6.606116, (0 missing)  
## Surrogate splits:  
## dim10 < -0.1029352 to the left, agree=0.794, adj=0.519, (0 split)  
## dim5 < -0.1550197 to the left, agree=0.778, adj=0.481, (0 split)  
## dim21 < -0.08059702 to the left, agree=0.778, adj=0.481, (0 split)  
## dim7 < -0.04623415 to the right, agree=0.730, adj=0.370, (0 split)  
## dim6 < 0.002982582 to the right, agree=0.714, adj=0.333, (0 split)  
##   
## Node number 928: 2 observations  
## predicted class=2 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 2 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 929: 2 observations, complexity param=3.349298e-05  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.000 0.500 0.000 0.000 0.000 0.000   
## left son=1858 (1 obs) right son=1859 (1 obs)  
## Primary splits:  
## dim1 < 0.4781042 to the right, improve=1, (0 missing)  
## dim2 < -0.1924037 to the right, improve=1, (0 missing)  
## dim3 < -0.1783692 to the left, improve=1, (0 missing)  
## dim4 < 0.1955114 to the right, improve=1, (0 missing)  
## dim5 < 0.1263625 to the left, improve=1, (0 missing)  
##   
## Node number 930: 221 observations  
## predicted class=4 expected loss=0.07692308 P(node) =0.006577381  
## class counts: 0 0 3 0 204 0 2 5 0 7  
## probabilities: 0.000 0.000 0.014 0.000 0.923 0.000 0.009 0.023 0.000 0.032   
##   
## Node number 931: 3 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 2 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.667 0.000 0.333   
## left son=1862 (2 obs) right son=1863 (1 obs)  
## Primary splits:  
## dim1 < 0.2987699 to the left, improve=1.333333, (0 missing)  
## dim3 < -0.1461935 to the right, improve=1.333333, (0 missing)  
## dim4 < -0.07672479 to the right, improve=1.333333, (0 missing)  
## dim5 < 0.2013681 to the left, improve=1.333333, (0 missing)  
## dim7 < -0.02422094 to the left, improve=1.333333, (0 missing)  
##   
## Node number 932: 35 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.08571429 P(node) =0.001041667  
## class counts: 0 0 0 0 32 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.914 0.000 0.000 0.000 0.000 0.086   
## left son=1864 (33 obs) right son=1865 (2 obs)  
## Primary splits:  
## dim4 < -0.2525397 to the right, improve=3.546320, (0 missing)  
## dim30 < -0.09871489 to the right, improve=2.214881, (0 missing)  
## dim16 < -0.1388251 to the right, improve=1.721008, (0 missing)  
## dim17 < -0.1927952 to the right, improve=1.721008, (0 missing)  
## dim19 < -0.2393654 to the right, improve=1.721008, (0 missing)  
## Surrogate splits:  
## dim30 < -0.09871489 to the right, agree=0.971, adj=0.5, (0 split)  
##   
## Node number 933: 6 observations, complexity param=6.698597e-05  
## predicted class=3 expected loss=0.3333333 P(node) =0.0001785714  
## class counts: 0 0 0 4 0 0 0 0 0 2  
## probabilities: 0.000 0.000 0.000 0.667 0.000 0.000 0.000 0.000 0.000 0.333   
## left son=1866 (4 obs) right son=1867 (2 obs)  
## Primary splits:  
## dim17 < -0.01088387 to the left, improve=2.666667, (0 missing)  
## dim18 < 0.05160327 to the left, improve=2.666667, (0 missing)  
## dim20 < -0.1330458 to the left, improve=2.666667, (0 missing)  
## dim25 < 0.03541622 to the left, improve=2.666667, (0 missing)  
## dim21 < -0.0536806 to the right, improve=2.666667, (0 missing)  
## Surrogate splits:  
## dim18 < 0.05160327 to the left, agree=1.000, adj=1.0, (0 split)  
## dim20 < -0.1330458 to the left, agree=1.000, adj=1.0, (0 split)  
## dim21 < -0.0536806 to the right, agree=1.000, adj=1.0, (0 split)  
## dim25 < 0.03541622 to the left, agree=1.000, adj=1.0, (0 split)  
## dim13 < 0.008012095 to the right, agree=0.833, adj=0.5, (0 split)  
##   
## Node number 934: 2 observations  
## predicted class=7 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 935: 10 observations  
## predicted class=9 expected loss=0 P(node) =0.000297619  
## class counts: 0 0 0 0 0 0 0 0 0 10  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 936: 35 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.1142857 P(node) =0.001041667  
## class counts: 0 0 0 3 31 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.086 0.886 0.000 0.000 0.029 0.000 0.000   
## left son=1872 (4 obs) right son=1873 (31 obs)  
## Primary splits:  
## dim16 < -0.1164378 to the left, improve=3.821659, (0 missing)  
## dim3 < -0.1821912 to the right, improve=3.821659, (0 missing)  
## dim6 < 0.1075217 to the right, improve=3.438961, (0 missing)  
## dim10 < 0.05998627 to the right, improve=3.438961, (0 missing)  
## dim20 < -0.1255823 to the left, improve=3.438961, (0 missing)  
## Surrogate splits:  
## dim25 < 0.1024484 to the right, agree=0.971, adj=0.75, (0 split)  
## dim3 < -0.1821912 to the right, agree=0.943, adj=0.50, (0 split)  
## dim6 < 0.1075217 to the right, agree=0.943, adj=0.50, (0 split)  
## dim10 < 0.05998627 to the right, agree=0.943, adj=0.50, (0 split)  
## dim19 < 0.08502686 to the right, agree=0.943, adj=0.50, (0 split)  
##   
## Node number 937: 8 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.5 P(node) =0.0002380952  
## class counts: 0 1 0 1 1 0 0 0 1 4  
## probabilities: 0.000 0.125 0.000 0.125 0.125 0.000 0.000 0.000 0.125 0.500   
## left son=1874 (3 obs) right son=1875 (5 obs)  
## Primary splits:  
## dim11 < 0.2010056 to the right, improve=1.9, (0 missing)  
## dim6 < 0.09443278 to the right, improve=1.9, (0 missing)  
## dim3 < -0.1663065 to the right, improve=1.5, (0 missing)  
## dim4 < 0.1685478 to the right, improve=1.5, (0 missing)  
## dim13 < 0.09373425 to the right, improve=1.5, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5573008 to the left, agree=0.875, adj=0.667, (0 split)  
## dim6 < 0.1252893 to the right, agree=0.875, adj=0.667, (0 split)  
## dim9 < 0.0688598 to the right, agree=0.875, adj=0.667, (0 split)  
## dim15 < -0.001503839 to the right, agree=0.875, adj=0.667, (0 split)  
## dim19 < -0.06241608 to the left, agree=0.875, adj=0.667, (0 split)  
##   
## Node number 942: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 943: 40 observations  
## predicted class=9 expected loss=0 P(node) =0.001190476  
## class counts: 0 0 0 0 0 0 0 0 0 40  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 944: 68 observations, complexity param=0.0004019158  
## predicted class=3 expected loss=0.5294118 P(node) =0.00202381  
## class counts: 0 0 0 32 2 1 0 22 0 11  
## probabilities: 0.000 0.000 0.000 0.471 0.029 0.015 0.000 0.324 0.000 0.162   
## left son=1888 (43 obs) right son=1889 (25 obs)  
## Primary splits:  
## dim20 < 0.0111459 to the left, improve=18.491520, (0 missing)  
## dim3 < -0.2448045 to the right, improve=12.343920, (0 missing)  
## dim7 < -0.006941261 to the left, improve=11.591640, (0 missing)  
## dim6 < 0.06344673 to the right, improve=10.237250, (0 missing)  
## dim21 < 0.0164408 to the left, improve= 9.332402, (0 missing)  
## Surrogate splits:  
## dim3 < -0.2448045 to the right, agree=0.838, adj=0.56, (0 split)  
## dim7 < -0.003577492 to the left, agree=0.794, adj=0.44, (0 split)  
## dim21 < 0.03179985 to the left, agree=0.794, adj=0.44, (0 split)  
## dim24 < 0.06454561 to the left, agree=0.750, adj=0.32, (0 split)  
## dim1 < 0.5204238 to the right, agree=0.735, adj=0.28, (0 split)  
##   
## Node number 945: 87 observations, complexity param=0.0004019158  
## predicted class=2 expected loss=0.7701149 P(node) =0.002589286  
## class counts: 0 0 20 3 15 0 6 17 12 14  
## probabilities: 0.000 0.000 0.230 0.034 0.172 0.000 0.069 0.195 0.138 0.161   
## left son=1890 (28 obs) right son=1891 (59 obs)  
## Primary splits:  
## dim5 < 0.1564866 to the right, improve=12.636760, (0 missing)  
## dim6 < 0.0587995 to the left, improve=10.978060, (0 missing)  
## dim8 < 0.08896614 to the right, improve=10.851420, (0 missing)  
## dim1 < 0.5898477 to the left, improve= 7.848425, (0 missing)  
## dim24 < -0.02334341 to the right, improve= 7.794537, (0 missing)  
## Surrogate splits:  
## dim1 < 0.5898477 to the left, agree=0.782, adj=0.321, (0 split)  
## dim28 < -0.06939188 to the left, agree=0.782, adj=0.321, (0 split)  
## dim8 < 0.08896614 to the right, agree=0.770, adj=0.286, (0 split)  
## dim16 < -0.1245875 to the left, agree=0.759, adj=0.250, (0 split)  
## dim26 < -0.04030921 to the left, agree=0.736, adj=0.179, (0 split)  
##   
## Node number 946: 89 observations, complexity param=0.0002679439  
## predicted class=4 expected loss=0.2359551 P(node) =0.00264881  
## class counts: 0 0 1 0 68 1 1 3 0 15  
## probabilities: 0.000 0.000 0.011 0.000 0.764 0.011 0.011 0.034 0.000 0.169   
## left son=1892 (79 obs) right son=1893 (10 obs)  
## Primary splits:  
## dim16 < -0.1127914 to the right, improve=11.209870, (0 missing)  
## dim5 < -0.04775751 to the right, improve=10.441440, (0 missing)  
## dim2 < -0.2265944 to the right, improve= 8.213348, (0 missing)  
## dim14 < -0.2267281 to the right, improve= 7.990047, (0 missing)  
## dim29 < 0.02131255 to the left, improve= 7.606361, (0 missing)  
## Surrogate splits:  
## dim2 < -0.2476959 to the right, agree=0.944, adj=0.5, (0 split)  
## dim17 < -0.07916404 to the right, agree=0.921, adj=0.3, (0 split)  
## dim29 < 0.1089139 to the left, agree=0.921, adj=0.3, (0 split)  
## dim5 < -0.1631368 to the right, agree=0.910, adj=0.2, (0 split)  
## dim14 < -0.2567691 to the right, agree=0.910, adj=0.2, (0 split)  
##   
## Node number 947: 41 observations, complexity param=0.0001339719  
## predicted class=9 expected loss=0.3414634 P(node) =0.001220238  
## class counts: 0 0 0 0 6 0 3 5 0 27  
## probabilities: 0.000 0.000 0.000 0.000 0.146 0.000 0.073 0.122 0.000 0.659   
## left son=1894 (11 obs) right son=1895 (30 obs)  
## Primary splits:  
## dim8 < -0.1033202 to the left, improve=6.924316, (0 missing)  
## dim4 < 0.08670981 to the right, improve=6.377741, (0 missing)  
## dim2 < -0.003626035 to the right, improve=5.867034, (0 missing)  
## dim3 < -0.2447818 to the right, improve=5.312195, (0 missing)  
## dim9 < -0.07072978 to the right, improve=5.275831, (0 missing)  
## Surrogate splits:  
## dim2 < -0.003626035 to the right, agree=0.829, adj=0.364, (0 split)  
## dim9 < -0.06012716 to the right, agree=0.829, adj=0.364, (0 split)  
## dim22 < 0.0045645 to the right, agree=0.829, adj=0.364, (0 split)  
## dim24 < -0.06618473 to the left, agree=0.829, adj=0.364, (0 split)  
## dim1 < 0.5308381 to the left, agree=0.780, adj=0.182, (0 split)  
##   
## Node number 948: 18 observations, complexity param=0.0001339719  
## predicted class=4 expected loss=0.2222222 P(node) =0.0005357143  
## class counts: 0 0 0 0 14 0 0 0 0 4  
## probabilities: 0.000 0.000 0.000 0.000 0.778 0.000 0.000 0.000 0.000 0.222   
## left son=1896 (14 obs) right son=1897 (4 obs)  
## Primary splits:  
## dim29 < 0.06545934 to the left, improve=6.222222, (0 missing)  
## dim14 < -0.1694921 to the right, improve=4.622222, (0 missing)  
## dim24 < -0.06514449 to the right, improve=4.622222, (0 missing)  
## dim18 < 0.1057181 to the left, improve=4.355556, (0 missing)  
## dim28 < -0.05532283 to the right, improve=4.355556, (0 missing)  
## Surrogate splits:  
## dim14 < -0.2037916 to the right, agree=0.944, adj=0.75, (0 split)  
## dim18 < 0.1057181 to the left, agree=0.944, adj=0.75, (0 split)  
## dim24 < -0.06514449 to the right, agree=0.944, adj=0.75, (0 split)  
## dim28 < -0.05532283 to the right, agree=0.944, adj=0.75, (0 split)  
## dim15 < -0.09860729 to the right, agree=0.889, adj=0.50, (0 split)  
##   
## Node number 949: 16 observations, complexity param=0.0001674649  
## predicted class=7 expected loss=0.5625 P(node) =0.0004761905  
## class counts: 0 0 5 0 1 0 0 7 1 2  
## probabilities: 0.000 0.000 0.313 0.000 0.062 0.000 0.000 0.437 0.062 0.125   
## left son=1898 (9 obs) right son=1899 (7 obs)  
## Primary splits:  
## dim2 < -0.1239329 to the right, improve=5.444444, (0 missing)  
## dim11 < -0.106812 to the right, improve=5.444444, (0 missing)  
## dim6 < 0.2096215 to the left, improve=5.444444, (0 missing)  
## dim23 < -0.0147171 to the left, improve=5.444444, (0 missing)  
## dim5 < 0.1349237 to the right, improve=5.000000, (0 missing)  
## Surrogate splits:  
## dim6 < 0.2096215 to the left, agree=1.000, adj=1.000, (0 split)  
## dim11 < -0.106812 to the right, agree=1.000, adj=1.000, (0 split)  
## dim23 < -0.0147171 to the left, agree=1.000, adj=1.000, (0 split)  
## dim7 < -0.01807403 to the left, agree=0.875, adj=0.714, (0 split)  
## dim13 < 0.06781897 to the left, agree=0.875, adj=0.714, (0 split)  
##   
## Node number 950: 5 observations  
## predicted class=7 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 5 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 951: 164 observations  
## predicted class=9 expected loss=0.195122 P(node) =0.004880952  
## class counts: 0 0 2 4 21 2 0 1 2 132  
## probabilities: 0.000 0.000 0.012 0.024 0.128 0.012 0.000 0.006 0.012 0.805   
##   
## Node number 952: 81 observations, complexity param=0.0002009579  
## predicted class=9 expected loss=0.617284 P(node) =0.002410714  
## class counts: 0 0 5 2 16 0 12 15 0 31  
## probabilities: 0.000 0.000 0.062 0.025 0.198 0.000 0.148 0.185 0.000 0.383   
## left son=1904 (34 obs) right son=1905 (47 obs)  
## Primary splits:  
## dim4 < 0.04267831 to the right, improve=8.537323, (0 missing)  
## dim20 < -0.04776837 to the right, improve=6.790997, (0 missing)  
## dim6 < -0.08321265 to the left, improve=6.683157, (0 missing)  
## dim15 < 0.1100185 to the left, improve=6.597443, (0 missing)  
## dim27 < 0.005556552 to the left, improve=5.621092, (0 missing)  
## Surrogate splits:  
## dim21 < 0.06638042 to the right, agree=0.728, adj=0.353, (0 split)  
## dim8 < 0.09979517 to the left, agree=0.716, adj=0.324, (0 split)  
## dim2 < 0.1010428 to the left, agree=0.704, adj=0.294, (0 split)  
## dim12 < -0.0795408 to the left, agree=0.704, adj=0.294, (0 split)  
## dim13 < 0.1018873 to the right, agree=0.704, adj=0.294, (0 split)  
##   
## Node number 953: 63 observations, complexity param=0.0002009579  
## predicted class=8 expected loss=0.6031746 P(node) =0.001875  
## class counts: 0 0 1 14 3 1 2 4 25 13  
## probabilities: 0.000 0.000 0.016 0.222 0.048 0.016 0.032 0.063 0.397 0.206   
## left son=1906 (34 obs) right son=1907 (29 obs)  
## Primary splits:  
## dim9 < -0.09818797 to the right, improve=9.235841, (0 missing)  
## dim13 < 0.02480139 to the left, improve=8.122222, (0 missing)  
## dim25 < -0.0899404 to the right, improve=7.061593, (0 missing)  
## dim4 < -0.1429748 to the left, improve=6.771429, (0 missing)  
## dim2 < 0.03328126 to the left, improve=6.673917, (0 missing)  
## Surrogate splits:  
## dim25 < -0.02932919 to the right, agree=0.778, adj=0.517, (0 split)  
## dim13 < -0.03425015 to the left, agree=0.730, adj=0.414, (0 split)  
## dim15 < -0.004274713 to the right, agree=0.730, adj=0.414, (0 split)  
## dim4 < 0.003110822 to the left, agree=0.714, adj=0.379, (0 split)  
## dim11 < -0.04550764 to the right, agree=0.698, adj=0.345, (0 split)  
##   
## Node number 954: 40 observations, complexity param=0.0002009579  
## predicted class=9 expected loss=0.475 P(node) =0.001190476  
## class counts: 0 0 0 1 16 0 0 1 1 21  
## probabilities: 0.000 0.000 0.000 0.025 0.400 0.000 0.000 0.025 0.025 0.525   
## left son=1908 (19 obs) right son=1909 (21 obs)  
## Primary splits:  
## dim12 < -0.06881148 to the right, improve=10.439850, (0 missing)  
## dim7 < -0.1194703 to the left, improve= 7.625000, (0 missing)  
## dim16 < -0.1156624 to the right, improve= 7.027473, (0 missing)  
## dim25 < 0.04321041 to the left, improve= 6.580201, (0 missing)  
## dim17 < 0.06738914 to the right, improve= 4.500000, (0 missing)  
## Surrogate splits:  
## dim7 < -0.1371731 to the left, agree=0.850, adj=0.684, (0 split)  
## dim16 < -0.1156624 to the right, agree=0.775, adj=0.526, (0 split)  
## dim25 < 0.04179297 to the left, agree=0.775, adj=0.526, (0 split)  
## dim28 < -0.04277208 to the left, agree=0.700, adj=0.368, (0 split)  
## dim3 < -0.1562765 to the left, agree=0.675, adj=0.316, (0 split)  
##   
## Node number 955: 71 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.08450704 P(node) =0.002113095  
## class counts: 0 0 0 0 2 0 0 3 1 65  
## probabilities: 0.000 0.000 0.000 0.000 0.028 0.000 0.000 0.042 0.014 0.915   
## left son=1910 (5 obs) right son=1911 (66 obs)  
## Primary splits:  
## dim17 < 0.1777286 to the right, improve=4.186684, (0 missing)  
## dim11 < -0.204109 to the left, improve=2.643601, (0 missing)  
## dim19 < 0.002450262 to the right, improve=2.504730, (0 missing)  
## dim13 < 0.1717749 to the right, improve=2.277593, (0 missing)  
## dim9 < -0.2740873 to the left, improve=1.838632, (0 missing)  
## Surrogate splits:  
## dim19 < 0.002450262 to the right, agree=0.958, adj=0.4, (0 split)  
## dim11 < -0.1936633 to the left, agree=0.944, adj=0.2, (0 split)  
## dim13 < 0.1890235 to the right, agree=0.944, adj=0.2, (0 split)  
## dim14 < 0.1866476 to the right, agree=0.944, adj=0.2, (0 split)  
##   
## Node number 956: 21 observations  
## predicted class=7 expected loss=0 P(node) =0.000625  
## class counts: 0 0 0 0 0 0 0 21 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 957: 3 observations  
## predicted class=9 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 958: 31 observations, complexity param=0.0002177044  
## predicted class=4 expected loss=0.4193548 P(node) =0.000922619  
## class counts: 0 0 0 0 18 0 0 0 0 13  
## probabilities: 0.000 0.000 0.000 0.000 0.581 0.000 0.000 0.000 0.000 0.419   
## left son=1916 (15 obs) right son=1917 (16 obs)  
## Primary splits:  
## dim28 < 0.01063042 to the left, improve=7.230108, (0 missing)  
## dim30 < 0.02038311 to the right, improve=6.886248, (0 missing)  
## dim16 < -0.07629463 to the right, improve=6.820584, (0 missing)  
## dim4 < -0.1203545 to the right, improve=6.180808, (0 missing)  
## dim11 < -0.05500383 to the right, improve=5.424047, (0 missing)  
## Surrogate splits:  
## dim10 < -0.03409732 to the left, agree=0.839, adj=0.667, (0 split)  
## dim11 < -0.05500383 to the right, agree=0.774, adj=0.533, (0 split)  
## dim23 < 0.01203906 to the left, agree=0.774, adj=0.533, (0 split)  
## dim4 < -0.1084941 to the right, agree=0.742, adj=0.467, (0 split)  
## dim9 < -0.1182883 to the right, agree=0.742, adj=0.467, (0 split)  
##   
## Node number 959: 1172 observations, complexity param=0.0001339719  
## predicted class=9 expected loss=0.06143345 P(node) =0.03488095  
## class counts: 0 0 0 9 42 0 0 15 6 1100  
## probabilities: 0.000 0.000 0.000 0.008 0.036 0.000 0.000 0.013 0.005 0.939   
## left son=1918 (4 obs) right son=1919 (1168 obs)  
## Primary splits:  
## dim11 < -0.2848901 to the left, improve=7.452809, (0 missing)  
## dim13 < 0.1914835 to the right, improve=7.136639, (0 missing)  
## dim10 < -0.3422569 to the left, improve=6.244609, (0 missing)  
## dim24 < 0.05429206 to the right, improve=5.799492, (0 missing)  
## dim18 < -0.1431556 to the left, improve=4.014526, (0 missing)  
##   
## Node number 960: 39 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.02564103 P(node) =0.001160714  
## class counts: 0 0 38 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.974 0.000 0.000 0.000 0.000 0.026 0.000 0.000   
## left son=1920 (38 obs) right son=1921 (1 obs)  
## Primary splits:  
## dim3 < -0.3130819 to the right, improve=1.9487180, (0 missing)  
## dim10 < -0.170367 to the right, improve=1.9487180, (0 missing)  
## dim18 < 0.1571713 to the left, improve=1.9487180, (0 missing)  
## dim26 < 0.1328485 to the left, improve=1.9487180, (0 missing)  
## dim5 < 0.153222 to the right, improve=0.6153846, (0 missing)  
##   
## Node number 961: 6 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.6666667 P(node) =0.0001785714  
## class counts: 0 0 2 2 0 0 0 2 0 0  
## probabilities: 0.000 0.000 0.333 0.333 0.000 0.000 0.000 0.333 0.000 0.000   
## left son=1922 (2 obs) right son=1923 (4 obs)  
## Primary splits:  
## dim13 < 0.1403824 to the right, improve=2, (0 missing)  
## dim17 < 0.003320973 to the left, improve=2, (0 missing)  
## dim26 < 0.01205618 to the right, improve=2, (0 missing)  
## dim30 < 0.05765703 to the right, improve=2, (0 missing)  
## dim15 < -0.0226623 to the left, improve=2, (0 missing)  
## Surrogate splits:  
## dim15 < -0.0226623 to the left, agree=1.000, adj=1.0, (0 split)  
## dim24 < -0.02402964 to the left, agree=1.000, adj=1.0, (0 split)  
## dim26 < 0.01205618 to the right, agree=1.000, adj=1.0, (0 split)  
## dim30 < 0.05765703 to the right, agree=1.000, adj=1.0, (0 split)  
## dim8 < -0.05035973 to the left, agree=0.833, adj=0.5, (0 split)  
##   
## Node number 964: 8 observations  
## predicted class=2 expected loss=0 P(node) =0.0002380952  
## class counts: 0 0 8 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 965: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 966: 20 observations, complexity param=0.0001004789  
## predicted class=3 expected loss=0.35 P(node) =0.0005952381  
## class counts: 0 0 0 13 0 0 0 5 1 1  
## probabilities: 0.000 0.000 0.000 0.650 0.000 0.000 0.000 0.250 0.050 0.050   
## left son=1932 (14 obs) right son=1933 (6 obs)  
## Primary splits:  
## dim12 < -0.05811905 to the left, improve=3.628571, (0 missing)  
## dim5 < 0.1595611 to the right, improve=3.494118, (0 missing)  
## dim9 < 0.1153042 to the left, improve=3.494118, (0 missing)  
## dim18 < -0.01540302 to the right, improve=2.600000, (0 missing)  
## dim20 < 0.04161527 to the left, improve=2.600000, (0 missing)  
## Surrogate splits:  
## dim5 < 0.1595611 to the right, agree=0.85, adj=0.5, (0 split)  
## dim10 < 0.15871 to the left, agree=0.85, adj=0.5, (0 split)  
## dim13 < 0.08770594 to the right, agree=0.85, adj=0.5, (0 split)  
## dim21 < 0.08791488 to the left, agree=0.85, adj=0.5, (0 split)  
## dim22 < 0.008805822 to the left, agree=0.85, adj=0.5, (0 split)  
##   
## Node number 967: 13 observations, complexity param=0.0001004789  
## predicted class=8 expected loss=0.3846154 P(node) =0.0003869048  
## class counts: 0 0 3 2 0 0 0 0 8 0  
## probabilities: 0.000 0.000 0.231 0.154 0.000 0.000 0.000 0.000 0.615 0.000   
## left son=1934 (5 obs) right son=1935 (8 obs)  
## Primary splits:  
## dim16 < -0.05388362 to the left, improve=4.676923, (0 missing)  
## dim11 < -0.05323829 to the left, improve=3.876923, (0 missing)  
## dim2 < -0.08284608 to the left, improve=3.799145, (0 missing)  
## dim24 < 0.06266949 to the right, improve=2.713287, (0 missing)  
## dim7 < 0.1930812 to the right, improve=2.349650, (0 missing)  
## Surrogate splits:  
## dim2 < -0.08284608 to the left, agree=0.923, adj=0.8, (0 split)  
## dim10 < 0.05176899 to the right, agree=0.846, adj=0.6, (0 split)  
## dim11 < -0.05323829 to the left, agree=0.846, adj=0.6, (0 split)  
## dim19 < 0.09185199 to the right, agree=0.846, adj=0.6, (0 split)  
## dim22 < -0.06476485 to the left, agree=0.846, adj=0.6, (0 split)  
##   
## Node number 968: 25 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.08 P(node) =0.0007440476  
## class counts: 0 0 0 0 23 0 1 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.920 0.000 0.040 0.000 0.000 0.040   
## left son=1936 (24 obs) right son=1937 (1 obs)  
## Primary splits:  
## dim11 < -0.1737611 to the right, improve=1.843333, (0 missing)  
## dim8 < -0.05423934 to the right, improve=1.843333, (0 missing)  
## dim24 < -0.2118342 to the right, improve=1.843333, (0 missing)  
## dim26 < 0.1151469 to the left, improve=1.843333, (0 missing)  
## dim18 < -0.1218479 to the right, improve=0.960000, (0 missing)  
##   
## Node number 969: 2 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 1 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.500 0.500 0.000 0.000   
## left son=1938 (1 obs) right son=1939 (1 obs)  
## Primary splits:  
## dim1 < 0.5157951 to the left, improve=1, (0 missing)  
## dim2 < 0.003461914 to the left, improve=1, (0 missing)  
## dim3 < -0.2767735 to the right, improve=1, (0 missing)  
## dim4 < 0.06084354 to the right, improve=1, (0 missing)  
## dim5 < 0.1828588 to the right, improve=1, (0 missing)  
##   
## Node number 970: 3 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 2 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.667 0.000 0.000 0.000 0.000 0.000 0.333 0.000   
## left son=1940 (2 obs) right son=1941 (1 obs)  
## Primary splits:  
## dim1 < 0.5546502 to the left, improve=1.333333, (0 missing)  
## dim2 < 0.05023388 to the left, improve=1.333333, (0 missing)  
## dim5 < 0.2156146 to the left, improve=1.333333, (0 missing)  
## dim6 < -0.01845759 to the left, improve=1.333333, (0 missing)  
## dim12 < 0.1314084 to the left, improve=1.333333, (0 missing)  
##   
## Node number 971: 3 observations  
## predicted class=9 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 972: 7 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.2857143 P(node) =0.0002083333  
## class counts: 0 0 5 0 1 0 0 0 1 0  
## probabilities: 0.000 0.000 0.714 0.000 0.143 0.000 0.000 0.000 0.143 0.000   
## left son=1944 (5 obs) right son=1945 (2 obs)  
## Primary splits:  
## dim24 < -0.05694441 to the right, improve=2.142857, (0 missing)  
## dim29 < 0.05925579 to the left, improve=2.142857, (0 missing)  
## dim11 < 0.08624781 to the left, improve=1.476190, (0 missing)  
## dim18 < 0.07521552 to the left, improve=1.476190, (0 missing)  
## dim13 < -0.08918011 to the right, improve=1.476190, (0 missing)  
## Surrogate splits:  
## dim29 < 0.05925579 to the left, agree=1.000, adj=1.0, (0 split)  
## dim4 < -0.05672203 to the right, agree=0.857, adj=0.5, (0 split)  
## dim7 < 0.1090887 to the right, agree=0.857, adj=0.5, (0 split)  
## dim9 < 0.03411426 to the left, agree=0.857, adj=0.5, (0 split)  
## dim16 < 0.009590678 to the left, agree=0.857, adj=0.5, (0 split)  
##   
## Node number 973: 10 observations, complexity param=6.698597e-05  
## predicted class=7 expected loss=0.7 P(node) =0.000297619  
## class counts: 0 0 1 1 2 0 1 3 0 2  
## probabilities: 0.000 0.000 0.100 0.100 0.200 0.000 0.100 0.300 0.000 0.200   
## left son=1946 (7 obs) right son=1947 (3 obs)  
## Primary splits:  
## dim2 < 0.03781101 to the right, improve=2.571429, (0 missing)  
## dim30 < 0.03686906 to the right, improve=2.166667, (0 missing)  
## dim15 < 0.0761088 to the left, improve=2.000000, (0 missing)  
## dim26 < -0.09012826 to the right, improve=2.000000, (0 missing)  
## dim11 < 0.01522091 to the right, improve=1.833333, (0 missing)  
## Surrogate splits:  
## dim1 < 0.4820837 to the left, agree=0.9, adj=0.667, (0 split)  
## dim28 < -0.0237025 to the right, agree=0.9, adj=0.667, (0 split)  
## dim30 < 0.03686906 to the left, agree=0.9, adj=0.667, (0 split)  
## dim6 < -0.03055558 to the right, agree=0.8, adj=0.333, (0 split)  
## dim7 < 0.1908745 to the left, agree=0.8, adj=0.333, (0 split)  
##   
## Node number 974: 4 observations, complexity param=3.349298e-05  
## predicted class=8 expected loss=0.25 P(node) =0.0001190476  
## class counts: 0 0 1 0 0 0 0 0 3 0  
## probabilities: 0.000 0.000 0.250 0.000 0.000 0.000 0.000 0.000 0.750 0.000   
## left son=1948 (1 obs) right son=1949 (3 obs)  
## Primary splits:  
## dim1 < 0.6040935 to the left, improve=1.5, (0 missing)  
## dim6 < -0.05129878 to the left, improve=1.5, (0 missing)  
## dim8 < -0.05966703 to the left, improve=1.5, (0 missing)  
## dim12 < -0.1009788 to the left, improve=1.5, (0 missing)  
## dim14 < -0.1590754 to the left, improve=1.5, (0 missing)  
##   
## Node number 975: 47 observations, complexity param=3.349298e-05  
## predicted class=7 expected loss=0.04255319 P(node) =0.00139881  
## class counts: 0 0 0 0 0 0 0 45 0 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.957 0.000 0.043   
## left son=1950 (44 obs) right son=1951 (3 obs)  
## Primary splits:  
## dim19 < -0.03808627 to the right, improve=2.496454, (0 missing)  
## dim5 < 0.2766321 to the left, improve=2.496454, (0 missing)  
## dim14 < 0.03517395 to the left, improve=2.496454, (0 missing)  
## dim9 < -0.1072324 to the right, improve=1.873265, (0 missing)  
## dim15 < -0.09756943 to the right, improve=1.873265, (0 missing)  
## Surrogate splits:  
## dim5 < 0.2766321 to the left, agree=0.957, adj=0.333, (0 split)  
## dim14 < 0.03517395 to the left, agree=0.957, adj=0.333, (0 split)  
##   
## Node number 976: 68 observations  
## predicted class=4 expected loss=0.07352941 P(node) =0.00202381  
## class counts: 0 0 1 0 63 0 1 0 1 2  
## probabilities: 0.000 0.000 0.015 0.000 0.926 0.000 0.015 0.000 0.015 0.029   
##   
## Node number 977: 3 observations, complexity param=3.349298e-05  
## predicted class=6 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 1 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.333 0.667 0.000 0.000 0.000   
## left son=1954 (1 obs) right son=1955 (2 obs)  
## Primary splits:  
## dim1 < 0.3134669 to the right, improve=1.333333, (0 missing)  
## dim4 < 0.06491808 to the left, improve=1.333333, (0 missing)  
## dim5 < 0.3209416 to the right, improve=1.333333, (0 missing)  
## dim6 < 0.009794781 to the left, improve=1.333333, (0 missing)  
## dim7 < 0.1361834 to the left, improve=1.333333, (0 missing)  
##   
## Node number 978: 12 observations  
## predicted class=6 expected loss=0 P(node) =0.0003571429  
## class counts: 0 0 0 0 0 0 12 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 979: 16 observations, complexity param=0.0001004789  
## predicted class=4 expected loss=0.5 P(node) =0.0004761905  
## class counts: 0 0 0 0 8 0 1 1 2 4  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.062 0.062 0.125 0.250   
## left son=1958 (13 obs) right son=1959 (3 obs)  
## Primary splits:  
## dim16 < -0.1242426 to the right, improve=3.086538, (0 missing)  
## dim22 < -0.03595039 to the right, improve=3.086538, (0 missing)  
## dim25 < 0.1076786 to the left, improve=2.958333, (0 missing)  
## dim23 < -0.04743497 to the left, improve=2.688492, (0 missing)  
## dim15 < 0.0739797 to the left, improve=2.661364, (0 missing)  
## Surrogate splits:  
## dim22 < -0.05641887 to the right, agree=0.938, adj=0.667, (0 split)  
## dim10 < -0.1054588 to the right, agree=0.875, adj=0.333, (0 split)  
## dim24 < 0.05246258 to the left, agree=0.875, adj=0.333, (0 split)  
##   
## Node number 980: 8 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.625 P(node) =0.0002380952  
## class counts: 1 0 0 0 3 0 2 0 0 2  
## probabilities: 0.125 0.000 0.000 0.000 0.375 0.000 0.250 0.000 0.000 0.250   
## left son=1960 (3 obs) right son=1961 (5 obs)  
## Primary splits:  
## dim14 < 0.06782563 to the left, improve=2.550000, (0 missing)  
## dim29 < -0.03130692 to the right, improve=2.083333, (0 missing)  
## dim12 < 0.07870468 to the left, improve=2.083333, (0 missing)  
## dim21 < 0.04927899 to the left, improve=2.083333, (0 missing)  
## dim6 < -0.1215158 to the right, improve=2.083333, (0 missing)  
## Surrogate splits:  
## dim2 < 0.1903499 to the left, agree=0.875, adj=0.667, (0 split)  
## dim3 < -0.1705536 to the left, agree=0.875, adj=0.667, (0 split)  
## dim7 < 0.07035192 to the left, agree=0.875, adj=0.667, (0 split)  
## dim9 < 0.1284488 to the right, agree=0.875, adj=0.667, (0 split)  
## dim11 < -0.08483575 to the left, agree=0.875, adj=0.667, (0 split)  
##   
## Node number 981: 3 observations  
## predicted class=7 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 982: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 983: 10 observations, complexity param=3.349298e-05  
## predicted class=9 expected loss=0.1 P(node) =0.000297619  
## class counts: 0 0 0 0 1 0 0 0 0 9  
## probabilities: 0.000 0.000 0.000 0.000 0.100 0.000 0.000 0.000 0.000 0.900   
## left son=1966 (1 obs) right son=1967 (9 obs)  
## Primary splits:  
## dim5 < 0.3745786 to the right, improve=1.8, (0 missing)  
## dim12 < 0.141035 to the right, improve=1.8, (0 missing)  
## dim16 < 0.1006105 to the right, improve=1.8, (0 missing)  
## dim22 < 0.02443318 to the right, improve=1.8, (0 missing)  
## dim18 < -0.1180446 to the left, improve=1.8, (0 missing)  
##   
## Node number 988: 2 observations  
## predicted class=2 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 2 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 989: 3 observations  
## predicted class=7 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 990: 3 observations  
## predicted class=8 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 3 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 991: 193 observations, complexity param=6.698597e-05  
## predicted class=9 expected loss=0.06735751 P(node) =0.005744048  
## class counts: 0 0 2 0 6 0 0 5 0 180  
## probabilities: 0.000 0.000 0.010 0.000 0.031 0.000 0.000 0.026 0.000 0.933   
## left son=1982 (5 obs) right son=1983 (188 obs)  
## Primary splits:  
## dim30 < 0.07320474 to the right, improve=4.572671, (0 missing)  
## dim18 < -0.1203897 to the left, improve=3.804586, (0 missing)  
## dim14 < 0.1347941 to the right, improve=2.525533, (0 missing)  
## dim4 < 0.1273955 to the right, improve=2.447024, (0 missing)  
## dim2 < 0.4676763 to the right, improve=2.327916, (0 missing)  
## Surrogate splits:  
## dim2 < 0.4676763 to the right, agree=0.979, adj=0.2, (0 split)  
##   
## Node number 1000: 59 observations, complexity param=3.349298e-05  
## predicted class=4 expected loss=0.05084746 P(node) =0.001755952  
## class counts: 0 0 0 0 56 1 0 0 1 1  
## probabilities: 0.000 0.000 0.000 0.000 0.949 0.017 0.000 0.000 0.017 0.017   
## left son=2000 (58 obs) right son=2001 (1 obs)  
## Primary splits:  
## dim2 < 0.00938815 to the right, improve=1.900058, (0 missing)  
## dim8 < 0.1534048 to the left, improve=1.900058, (0 missing)  
## dim11 < 0.04200535 to the right, improve=1.900058, (0 missing)  
## dim12 < 0.1996646 to the left, improve=1.900058, (0 missing)  
## dim19 < 0.1091404 to the left, improve=1.900058, (0 missing)  
##   
## Node number 1001: 21 observations, complexity param=6.698597e-05  
## predicted class=4 expected loss=0.6190476 P(node) =0.000625  
## class counts: 0 0 0 0 8 2 0 4 2 5  
## probabilities: 0.000 0.000 0.000 0.000 0.381 0.095 0.000 0.190 0.095 0.238   
## left son=2002 (7 obs) right son=2003 (14 obs)  
## Primary splits:  
## dim11 < 0.2358839 to the right, improve=5.190476, (0 missing)  
## dim1 < 0.5891342 to the left, improve=3.394048, (0 missing)  
## dim26 < -0.009562158 to the right, improve=3.330586, (0 missing)  
## dim14 < 0.1476898 to the right, improve=3.234432, (0 missing)  
## dim5 < -0.07471611 to the right, improve=3.138278, (0 missing)  
## Surrogate splits:  
## dim2 < 0.1726074 to the right, agree=0.810, adj=0.429, (0 split)  
## dim5 < 0.06810225 to the right, agree=0.810, adj=0.429, (0 split)  
## dim13 < -0.04579545 to the left, agree=0.810, adj=0.429, (0 split)  
## dim3 < -0.2970256 to the left, agree=0.762, adj=0.286, (0 split)  
## dim4 < 0.1433273 to the right, agree=0.762, adj=0.286, (0 split)  
##   
## Node number 1002: 34 observations, complexity param=0.0003014368  
## predicted class=4 expected loss=0.4705882 P(node) =0.001011905  
## class counts: 0 1 0 0 18 1 0 10 2 2  
## probabilities: 0.000 0.029 0.000 0.000 0.529 0.029 0.000 0.294 0.059 0.059   
## left son=2004 (21 obs) right son=2005 (13 obs)  
## Primary splits:  
## dim27 < -0.02755059 to the right, improve=9.205990, (0 missing)  
## dim16 < -0.1210725 to the right, improve=8.235294, (0 missing)  
## dim29 < -0.03335142 to the right, improve=7.857516, (0 missing)  
## dim7 < 0.2022316 to the left, improve=6.639140, (0 missing)  
## dim19 < 0.09084921 to the left, improve=6.562217, (0 missing)  
## Surrogate splits:  
## dim4 < -0.01649441 to the right, agree=0.853, adj=0.615, (0 split)  
## dim7 < 0.2022316 to the left, agree=0.853, adj=0.615, (0 split)  
## dim16 < -0.1210725 to the right, agree=0.853, adj=0.615, (0 split)  
## dim2 < -0.1714707 to the right, agree=0.824, adj=0.538, (0 split)  
## dim18 < -0.1023496 to the right, agree=0.824, adj=0.538, (0 split)  
##   
## Node number 1003: 156 observations, complexity param=0.0001339719  
## predicted class=9 expected loss=0.2820513 P(node) =0.004642857  
## class counts: 0 0 0 2 12 4 0 7 19 112  
## probabilities: 0.000 0.000 0.000 0.013 0.077 0.026 0.000 0.045 0.122 0.718   
## left son=2006 (45 obs) right son=2007 (111 obs)  
## Primary splits:  
## dim13 < -0.04901252 to the right, improve=17.165510, (0 missing)  
## dim26 < 0.001690044 to the right, improve=14.591470, (0 missing)  
## dim5 < 0.05342315 to the right, improve=10.725640, (0 missing)  
## dim28 < 0.0782678 to the right, improve=10.175960, (0 missing)  
## dim24 < -0.09081799 to the left, improve= 9.876401, (0 missing)  
## Surrogate splits:  
## dim24 < -0.09313775 to the left, agree=0.801, adj=0.311, (0 split)  
## dim5 < 0.04427228 to the right, agree=0.788, adj=0.267, (0 split)  
## dim26 < 0.002103893 to the right, agree=0.788, adj=0.267, (0 split)  
## dim28 < 0.0782678 to the right, agree=0.788, adj=0.267, (0 split)  
## dim3 < -0.2027814 to the right, agree=0.769, adj=0.200, (0 split)  
##   
## Node number 1004: 208 observations, complexity param=6.698597e-05  
## predicted class=7 expected loss=0.1201923 P(node) =0.006190476  
## class counts: 0 3 7 2 1 1 0 183 4 7  
## probabilities: 0.000 0.014 0.034 0.010 0.005 0.005 0.000 0.880 0.019 0.034   
## left son=2008 (6 obs) right son=2009 (202 obs)  
## Primary splits:  
## dim6 < -0.1929954 to the left, improve=4.879950, (0 missing)  
## dim16 < 0.1345716 to the right, improve=4.512255, (0 missing)  
## dim17 < 0.09907817 to the right, improve=4.335145, (0 missing)  
## dim4 < -0.3345577 to the left, improve=3.243293, (0 missing)  
## dim18 < 0.1725762 to the right, improve=2.746002, (0 missing)  
##   
## Node number 1005: 21 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.6190476 P(node) =0.000625  
## class counts: 0 0 1 2 1 2 0 6 1 8  
## probabilities: 0.000 0.000 0.048 0.095 0.048 0.095 0.000 0.286 0.048 0.381   
## left son=2010 (12 obs) right son=2011 (9 obs)  
## Primary splits:  
## dim21 < 0.01108017 to the right, improve=3.103175, (0 missing)  
## dim4 < 0.02054485 to the left, improve=3.079670, (0 missing)  
## dim25 < -0.04370414 to the right, improve=2.857143, (0 missing)  
## dim2 < -0.1091422 to the left, improve=2.714286, (0 missing)  
## dim26 < -0.0599454 to the right, improve=2.714286, (0 missing)  
## Surrogate splits:  
## dim27 < 0.03211134 to the left, agree=0.905, adj=0.778, (0 split)  
## dim4 < -0.02363303 to the left, agree=0.857, adj=0.667, (0 split)  
## dim23 < 0.005671659 to the right, agree=0.857, adj=0.667, (0 split)  
## dim2 < -0.03992094 to the left, agree=0.810, adj=0.556, (0 split)  
## dim8 < 0.1469454 to the left, agree=0.810, adj=0.556, (0 split)  
##   
## Node number 1006: 73 observations, complexity param=0.0001339719  
## predicted class=7 expected loss=0.3287671 P(node) =0.002172619  
## class counts: 0 1 2 3 0 0 0 49 9 9  
## probabilities: 0.000 0.014 0.027 0.041 0.000 0.000 0.000 0.671 0.123 0.123   
## left son=2012 (21 obs) right son=2013 (52 obs)  
## Primary splits:  
## dim4 < -0.02617347 to the left, improve=9.255407, (0 missing)  
## dim26 < 0.036814 to the right, improve=7.264147, (0 missing)  
## dim17 < 0.02079502 to the right, improve=7.115297, (0 missing)  
## dim19 < -0.01763755 to the right, improve=5.468327, (0 missing)  
## dim9 < -0.155784 to the right, improve=5.181217, (0 missing)  
## Surrogate splits:  
## dim26 < 0.036814 to the right, agree=0.890, adj=0.619, (0 split)  
## dim17 < -0.06744996 to the left, agree=0.836, adj=0.429, (0 split)  
## dim10 < -0.06905753 to the right, agree=0.808, adj=0.333, (0 split)  
## dim5 < 0.02129564 to the right, agree=0.795, adj=0.286, (0 split)  
## dim19 < -0.1102978 to the left, agree=0.781, adj=0.238, (0 split)  
##   
## Node number 1007: 124 observations, complexity param=0.0006196202  
## predicted class=9 expected loss=0.5645161 P(node) =0.003690476  
## class counts: 0 1 1 3 6 10 0 17 32 54  
## probabilities: 0.000 0.008 0.008 0.024 0.048 0.081 0.000 0.137 0.258 0.435   
## left son=2014 (51 obs) right son=2015 (73 obs)  
## Primary splits:  
## dim16 < 0.02727317 to the right, improve=14.241240, (0 missing)  
## dim3 < -0.1617442 to the right, improve=10.970290, (0 missing)  
## dim26 < 0.01344433 to the right, improve=10.000000, (0 missing)  
## dim13 < 0.04006124 to the right, improve= 9.659082, (0 missing)  
## dim1 < 0.7109495 to the left, improve= 9.285435, (0 missing)  
## Surrogate splits:  
## dim24 < -0.08743473 to the left, agree=0.718, adj=0.314, (0 split)  
## dim27 < 0.06404661 to the right, agree=0.702, adj=0.275, (0 split)  
## dim2 < 0.0232834 to the right, agree=0.694, adj=0.255, (0 split)  
## dim3 < -0.1579577 to the right, agree=0.685, adj=0.235, (0 split)  
## dim4 < 0.08108095 to the right, agree=0.685, adj=0.235, (0 split)  
##   
## Node number 1012: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1013: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1014: 1 observations  
## predicted class=2 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1015: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1016: 7 observations  
## predicted class=3 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 0 7 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1017: 6 observations, complexity param=3.349298e-05  
## predicted class=2 expected loss=0.3333333 P(node) =0.0001785714  
## class counts: 0 0 4 0 0 0 0 1 0 1  
## probabilities: 0.000 0.000 0.667 0.000 0.000 0.000 0.000 0.167 0.000 0.167   
## left son=2034 (4 obs) right son=2035 (2 obs)  
## Primary splits:  
## dim1 < 0.5097674 to the left, improve=2, (0 missing)  
## dim3 < -0.2011351 to the right, improve=2, (0 missing)  
## dim6 < -0.08190176 to the right, improve=2, (0 missing)  
## dim8 < -0.1224527 to the left, improve=2, (0 missing)  
## dim10 < 0.1706999 to the left, improve=2, (0 missing)  
## Surrogate splits:  
## dim3 < -0.2011351 to the right, agree=1, adj=1, (0 split)  
## dim6 < -0.08190176 to the right, agree=1, adj=1, (0 split)  
## dim8 < -0.1224527 to the left, agree=1, adj=1, (0 split)  
## dim10 < 0.1706999 to the left, agree=1, adj=1, (0 split)  
## dim11 < -0.004767028 to the right, agree=1, adj=1, (0 split)  
##   
## Node number 1018: 291 observations, complexity param=0.0001004789  
## predicted class=7 expected loss=0.2061856 P(node) =0.008660714  
## class counts: 0 0 19 2 9 2 0 231 8 20  
## probabilities: 0.000 0.000 0.065 0.007 0.031 0.007 0.000 0.794 0.027 0.069   
## left son=2036 (7 obs) right son=2037 (284 obs)  
## Primary splits:  
## dim11 < 0.1702444 to the right, improve=9.576504, (0 missing)  
## dim7 < 0.2494985 to the right, improve=7.211584, (0 missing)  
## dim27 < 0.02419721 to the right, improve=6.491571, (0 missing)  
## dim4 < -0.04399081 to the right, improve=6.437639, (0 missing)  
## dim15 < -0.09944099 to the right, improve=5.724427, (0 missing)  
## Surrogate splits:  
## dim23 < -0.1696708 to the left, agree=0.979, adj=0.143, (0 split)  
##   
## Node number 1019: 2171 observations  
## predicted class=7 expected loss=0.03316444 P(node) =0.0646131  
## class counts: 0 1 1 7 5 3 1 2099 6 48  
## probabilities: 0.000 0.000 0.000 0.003 0.002 0.001 0.000 0.967 0.003 0.022   
##   
## Node number 1022: 11 observations, complexity param=6.698597e-05  
## predicted class=7 expected loss=0.4545455 P(node) =0.000327381  
## class counts: 1 0 0 1 1 2 0 6 0 0  
## probabilities: 0.091 0.000 0.000 0.091 0.091 0.182 0.000 0.545 0.000 0.000   
## left son=2044 (3 obs) right son=2045 (8 obs)  
## Primary splits:  
## dim4 < 0.18858 to the right, improve=2.507576, (0 missing)  
## dim6 < -0.03167808 to the left, improve=2.507576, (0 missing)  
## dim27 < 0.0008675788 to the left, improve=2.507576, (0 missing)  
## dim1 < 0.5408618 to the right, improve=2.424242, (0 missing)  
## dim9 < 0.2273483 to the right, improve=1.840909, (0 missing)  
## Surrogate splits:  
## dim27 < 0.0008675788 to the left, agree=1.000, adj=1.000, (0 split)  
## dim14 < -0.1165623 to the left, agree=0.909, adj=0.667, (0 split)  
## dim25 < -0.07743641 to the left, agree=0.909, adj=0.667, (0 split)  
## dim26 < -0.1264289 to the left, agree=0.909, adj=0.667, (0 split)  
## dim1 < 0.5715261 to the right, agree=0.818, adj=0.333, (0 split)  
##   
## Node number 1023: 34 observations, complexity param=0.0001004789  
## predicted class=9 expected loss=0.3529412 P(node) =0.001011905  
## class counts: 1 0 1 0 4 0 0 6 0 22  
## probabilities: 0.029 0.000 0.029 0.000 0.118 0.000 0.000 0.176 0.000 0.647   
## left son=2046 (3 obs) right son=2047 (31 obs)  
## Primary splits:  
## dim26 < 0.05821373 to the right, improve=4.047438, (0 missing)  
## dim8 < 0.0714559 to the right, improve=3.890756, (0 missing)  
## dim29 < -0.08520077 to the left, improve=3.541988, (0 missing)  
## dim27 < -0.0267243 to the left, improve=2.778621, (0 missing)  
## dim12 < 0.1610598 to the right, improve=2.676471, (0 missing)  
## Surrogate splits:  
## dim8 < 0.1824467 to the right, agree=0.971, adj=0.667, (0 split)  
## dim22 < 0.1501182 to the right, agree=0.971, adj=0.667, (0 split)  
## dim27 < -0.0267243 to the left, agree=0.941, adj=0.333, (0 split)  
## dim30 < -0.1303946 to the left, agree=0.941, adj=0.333, (0 split)  
##   
## Node number 1024: 2789 observations  
## predicted class=1 expected loss=0.01290785 P(node) =0.08300595  
## class counts: 0 2753 3 0 1 0 2 9 17 4  
## probabilities: 0.000 0.987 0.001 0.000 0.000 0.000 0.001 0.003 0.006 0.001   
##   
## Node number 1025: 3 observations  
## predicted class=8 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 1 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.333 0.667 0.000   
##   
## Node number 1026: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1027: 2 observations  
## predicted class=9 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 0 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1032: 14 observations  
## predicted class=1 expected loss=0 P(node) =0.0004166667  
## class counts: 0 14 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1033: 2 observations  
## predicted class=8 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1034: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1035: 3 observations  
## predicted class=2 expected loss=0.6666667 P(node) =8.928571e-05  
## class counts: 0 0 1 0 0 1 0 0 1 0  
## probabilities: 0.000 0.000 0.333 0.000 0.000 0.333 0.000 0.000 0.333 0.000   
##   
## Node number 1106: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1107: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1334: 2 observations  
## predicted class=1 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 1 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.500 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1335: 2 observations  
## predicted class=5 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 2 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1380: 2 observations  
## predicted class=1 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 2 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1381: 2 observations  
## predicted class=2 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 1 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.500 0.000   
##   
## Node number 1496: 3 observations  
## predicted class=2 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 3 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1497: 2 observations  
## predicted class=4 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 1 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.500 0.000 0.000 0.000   
##   
## Node number 1504: 2 observations  
## predicted class=1 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 2 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1505: 2 observations  
## predicted class=2 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 1 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500 0.000 0.000   
##   
## Node number 1508: 1 observations  
## predicted class=2 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1509: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1512: 8 observations  
## predicted class=3 expected loss=0.125 P(node) =0.0002380952  
## class counts: 0 0 0 7 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.875 0.000 0.000 0.000 0.000 0.125 0.000   
##   
## Node number 1513: 12 observations  
## predicted class=4 expected loss=0.5833333 P(node) =0.0003571429  
## class counts: 0 0 0 0 5 1 2 1 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.417 0.083 0.167 0.083 0.000 0.250   
##   
## Node number 1514: 4 observations  
## predicted class=5 expected loss=0.25 P(node) =0.0001190476  
## class counts: 0 1 0 0 0 3 0 0 0 0  
## probabilities: 0.000 0.250 0.000 0.000 0.000 0.750 0.000 0.000 0.000 0.000   
##   
## Node number 1515: 10 observations  
## predicted class=8 expected loss=0 P(node) =0.000297619  
## class counts: 0 0 0 0 0 0 0 0 10 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1516: 2 observations  
## predicted class=1 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 1 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.500   
##   
## Node number 1517: 3 observations  
## predicted class=7 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1518: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1519: 22 observations  
## predicted class=9 expected loss=0 P(node) =0.0006547619  
## class counts: 0 0 0 0 0 0 0 0 0 22  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1522: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1523: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1536: 2145 observations  
## predicted class=0 expected loss=0.02983683 P(node) =0.06383929  
## class counts: 2081 0 12 1 1 18 18 4 7 3  
## probabilities: 0.970 0.000 0.006 0.000 0.000 0.008 0.008 0.002 0.003 0.001   
##   
## Node number 1537: 3 observations  
## predicted class=8 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 3 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1538: 5 observations  
## predicted class=2 expected loss=0.6 P(node) =0.0001488095  
## class counts: 0 0 2 1 0 1 0 0 0 1  
## probabilities: 0.000 0.000 0.400 0.200 0.000 0.200 0.000 0.000 0.000 0.200   
##   
## Node number 1539: 2 observations  
## predicted class=8 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1540: 235 observations  
## predicted class=0 expected loss=0.07234043 P(node) =0.006994048  
## class counts: 218 0 2 0 0 8 2 0 4 1  
## probabilities: 0.928 0.000 0.009 0.000 0.000 0.034 0.009 0.000 0.017 0.004   
##   
## Node number 1541: 55 observations  
## predicted class=5 expected loss=0.4727273 P(node) =0.001636905  
## class counts: 23 0 1 0 0 29 0 0 1 1  
## probabilities: 0.418 0.000 0.018 0.000 0.000 0.527 0.000 0.000 0.018 0.018   
##   
## Node number 1542: 19 observations  
## predicted class=0 expected loss=0.05263158 P(node) =0.0005654762  
## class counts: 18 0 0 0 0 1 0 0 0 0  
## probabilities: 0.947 0.000 0.000 0.000 0.000 0.053 0.000 0.000 0.000 0.000   
##   
## Node number 1543: 69 observations  
## predicted class=2 expected loss=0.6086957 P(node) =0.002053571  
## class counts: 11 0 27 1 0 12 6 0 9 3  
## probabilities: 0.159 0.000 0.391 0.014 0.000 0.174 0.087 0.000 0.130 0.043   
##   
## Node number 1544: 41 observations  
## predicted class=0 expected loss=0.02439024 P(node) =0.001220238  
## class counts: 40 0 1 0 0 0 0 0 0 0  
## probabilities: 0.976 0.000 0.024 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1545: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1546: 3 observations  
## predicted class=2 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 3 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1547: 6 observations  
## predicted class=5 expected loss=0.6666667 P(node) =0.0001785714  
## class counts: 1 0 0 0 0 2 2 0 1 0  
## probabilities: 0.167 0.000 0.000 0.000 0.000 0.333 0.333 0.000 0.167 0.000   
##   
## Node number 1548: 31 observations  
## predicted class=0 expected loss=0.6774194 P(node) =0.000922619  
## class counts: 10 0 5 0 5 0 6 0 0 5  
## probabilities: 0.323 0.000 0.161 0.000 0.161 0.000 0.194 0.000 0.000 0.161   
##   
## Node number 1549: 18 observations  
## predicted class=8 expected loss=0.2222222 P(node) =0.0005357143  
## class counts: 0 0 1 0 1 2 0 0 14 0  
## probabilities: 0.000 0.000 0.056 0.000 0.056 0.111 0.000 0.000 0.778 0.000   
##   
## Node number 1550: 7 observations  
## predicted class=4 expected loss=0.2857143 P(node) =0.0002083333  
## class counts: 0 0 0 0 5 1 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.714 0.143 0.000 0.000 0.000 0.143   
##   
## Node number 1551: 66 observations  
## predicted class=6 expected loss=0.09090909 P(node) =0.001964286  
## class counts: 2 0 2 0 0 2 60 0 0 0  
## probabilities: 0.030 0.000 0.030 0.000 0.000 0.030 0.909 0.000 0.000 0.000   
##   
## Node number 1562: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1563: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1566: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1567: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1570: 2 observations  
## predicted class=6 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1571: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1572: 3 observations  
## predicted class=4 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 3 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1573: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1576: 2 observations  
## predicted class=0 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 1 0 1 0 0 0 0 0 0 0  
## probabilities: 0.500 0.000 0.500 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1577: 2 observations  
## predicted class=6 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1578: 10 observations  
## predicted class=4 expected loss=0 P(node) =0.000297619  
## class counts: 0 0 0 0 10 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1579: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1580: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1581: 5 observations  
## predicted class=8 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 5 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1582: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1583: 6 observations  
## predicted class=9 expected loss=0 P(node) =0.0001785714  
## class counts: 0 0 0 0 0 0 0 0 0 6  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1584: 23 observations  
## predicted class=0 expected loss=0 P(node) =0.0006845238  
## class counts: 23 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1585: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1586: 15 observations  
## predicted class=7 expected loss=0.4 P(node) =0.0004464286  
## class counts: 6 0 0 0 0 0 0 9 0 0  
## probabilities: 0.400 0.000 0.000 0.000 0.000 0.000 0.000 0.600 0.000 0.000   
##   
## Node number 1587: 17 observations  
## predicted class=5 expected loss=0.5294118 P(node) =0.0005059524  
## class counts: 0 0 0 0 3 8 1 1 0 4  
## probabilities: 0.000 0.000 0.000 0.000 0.176 0.471 0.059 0.059 0.000 0.235   
##   
## Node number 1588: 3 observations  
## predicted class=0 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 2 0 0 0 0 0 1 0 0 0  
## probabilities: 0.667 0.000 0.000 0.000 0.000 0.000 0.333 0.000 0.000 0.000   
##   
## Node number 1589: 6 observations  
## predicted class=4 expected loss=0 P(node) =0.0001785714  
## class counts: 0 0 0 0 6 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1592: 145 observations  
## predicted class=0 expected loss=0.5862069 P(node) =0.004315476  
## class counts: 60 0 9 3 3 8 0 36 2 24  
## probabilities: 0.414 0.000 0.062 0.021 0.021 0.055 0.000 0.248 0.014 0.166   
##   
## Node number 1593: 134 observations  
## predicted class=5 expected loss=0.3208955 P(node) =0.003988095  
## class counts: 7 0 2 4 3 91 0 2 8 17  
## probabilities: 0.052 0.000 0.015 0.030 0.022 0.679 0.000 0.015 0.060 0.127   
##   
## Node number 1594: 228 observations  
## predicted class=4 expected loss=0.4912281 P(node) =0.006785714  
## class counts: 8 0 7 0 116 16 27 6 5 43  
## probabilities: 0.035 0.000 0.031 0.000 0.509 0.070 0.118 0.026 0.022 0.189   
##   
## Node number 1595: 73 observations  
## predicted class=9 expected loss=0.1643836 P(node) =0.002172619  
## class counts: 0 0 2 1 2 4 0 2 1 61  
## probabilities: 0.000 0.000 0.027 0.014 0.027 0.055 0.000 0.027 0.014 0.836   
##   
## Node number 1596: 2 observations  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.500 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1597: 82 observations  
## predicted class=7 expected loss=0.01219512 P(node) =0.002440476  
## class counts: 0 0 0 0 0 0 0 81 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.988 0.000 0.012   
##   
## Node number 1598: 6 observations  
## predicted class=7 expected loss=0.3333333 P(node) =0.0001785714  
## class counts: 0 0 0 0 1 1 0 4 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.167 0.167 0.000 0.667 0.000 0.000   
##   
## Node number 1599: 9 observations  
## predicted class=9 expected loss=0.1111111 P(node) =0.0002678571  
## class counts: 0 0 0 0 0 0 0 1 0 8  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.111 0.000 0.889   
##   
## Node number 1600: 1571 observations  
## predicted class=2 expected loss=0.03882877 P(node) =0.04675595  
## class counts: 0 0 1510 8 2 1 4 14 31 1  
## probabilities: 0.000 0.000 0.961 0.005 0.001 0.001 0.003 0.009 0.020 0.001   
##   
## Node number 1601: 15 observations  
## predicted class=7 expected loss=0.2666667 P(node) =0.0004464286  
## class counts: 0 1 3 0 0 0 0 11 0 0  
## probabilities: 0.000 0.067 0.200 0.000 0.000 0.000 0.000 0.733 0.000 0.000   
##   
## Node number 1602: 1 observations  
## predicted class=0 expected loss=0 P(node) =2.97619e-05  
## class counts: 1 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1603: 12 observations  
## predicted class=6 expected loss=0 P(node) =0.0003571429  
## class counts: 0 0 0 0 0 0 12 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1604: 44 observations  
## predicted class=2 expected loss=0.1136364 P(node) =0.001309524  
## class counts: 0 0 39 0 0 1 0 0 4 0  
## probabilities: 0.000 0.000 0.886 0.000 0.000 0.023 0.000 0.000 0.091 0.000   
##   
## Node number 1605: 7 observations  
## predicted class=6 expected loss=0.2857143 P(node) =0.0002083333  
## class counts: 0 0 0 0 0 0 5 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.714 0.000 0.286 0.000   
##   
## Node number 1606: 24 observations  
## predicted class=2 expected loss=0.5833333 P(node) =0.0007142857  
## class counts: 0 0 10 0 0 0 9 0 5 0  
## probabilities: 0.000 0.000 0.417 0.000 0.000 0.000 0.375 0.000 0.208 0.000   
##   
## Node number 1607: 41 observations  
## predicted class=8 expected loss=0.07317073 P(node) =0.001220238  
## class counts: 0 1 0 1 0 0 0 1 38 0  
## probabilities: 0.000 0.024 0.000 0.024 0.000 0.000 0.000 0.024 0.927 0.000   
##   
## Node number 1610: 64 observations  
## predicted class=2 expected loss=0.609375 P(node) =0.001904762  
## class counts: 1 1 25 1 25 4 1 1 3 2  
## probabilities: 0.016 0.016 0.391 0.016 0.391 0.062 0.016 0.016 0.047 0.031   
##   
## Node number 1611: 41 observations  
## predicted class=6 expected loss=0.3414634 P(node) =0.001220238  
## class counts: 0 0 1 0 5 3 27 0 3 2  
## probabilities: 0.000 0.000 0.024 0.000 0.122 0.073 0.659 0.000 0.073 0.049   
##   
## Node number 1612: 95 observations  
## predicted class=1 expected loss=0.01052632 P(node) =0.002827381  
## class counts: 0 94 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.989 0.011 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1613: 12 observations  
## predicted class=4 expected loss=0.75 P(node) =0.0003571429  
## class counts: 0 1 1 0 3 0 0 3 3 1  
## probabilities: 0.000 0.083 0.083 0.000 0.250 0.000 0.000 0.250 0.250 0.083   
##   
## Node number 1614: 174 observations  
## predicted class=2 expected loss=0.7126437 P(node) =0.005178571  
## class counts: 1 2 50 3 28 31 34 7 17 1  
## probabilities: 0.006 0.011 0.287 0.017 0.161 0.178 0.195 0.040 0.098 0.006   
##   
## Node number 1615: 360 observations  
## predicted class=6 expected loss=0.1944444 P(node) =0.01071429  
## class counts: 6 0 24 3 11 2 290 0 20 4  
## probabilities: 0.017 0.000 0.067 0.008 0.031 0.006 0.806 0.000 0.056 0.011   
##   
## Node number 1616: 3 observations  
## predicted class=2 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 3 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1617: 162 observations  
## predicted class=3 expected loss=0.0617284 P(node) =0.004821429  
## class counts: 0 0 1 152 0 1 0 0 4 4  
## probabilities: 0.000 0.000 0.006 0.938 0.000 0.006 0.000 0.000 0.025 0.025   
##   
## Node number 1618: 13 observations  
## predicted class=3 expected loss=0.4615385 P(node) =0.0003869048  
## class counts: 0 0 1 7 0 0 0 0 1 4  
## probabilities: 0.000 0.000 0.077 0.538 0.000 0.000 0.000 0.000 0.077 0.308   
##   
## Node number 1619: 10 observations  
## predicted class=8 expected loss=0 P(node) =0.000297619  
## class counts: 0 0 0 0 0 0 0 0 10 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1622: 5 observations  
## predicted class=3 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 0 3 0 1 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.600 0.000 0.200 0.000 0.200 0.000 0.000   
##   
## Node number 1623: 5 observations  
## predicted class=9 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1624: 126 observations  
## predicted class=2 expected loss=0.02380952 P(node) =0.00375  
## class counts: 0 0 123 0 0 0 0 1 2 0  
## probabilities: 0.000 0.000 0.976 0.000 0.000 0.000 0.000 0.008 0.016 0.000   
##   
## Node number 1625: 2 observations  
## predicted class=3 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1626: 8 observations  
## predicted class=2 expected loss=0.25 P(node) =0.0002380952  
## class counts: 0 0 6 0 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.750 0.000 0.000 0.000 0.000 0.000 0.250 0.000   
##   
## Node number 1627: 17 observations  
## predicted class=8 expected loss=0.05882353 P(node) =0.0005059524  
## class counts: 0 0 0 1 0 0 0 0 16 0  
## probabilities: 0.000 0.000 0.000 0.059 0.000 0.000 0.000 0.000 0.941 0.000   
##   
## Node number 1628: 54 observations  
## predicted class=2 expected loss=0.1851852 P(node) =0.001607143  
## class counts: 0 1 44 6 0 0 0 1 2 0  
## probabilities: 0.000 0.019 0.815 0.111 0.000 0.000 0.000 0.019 0.037 0.000   
##   
## Node number 1629: 454 observations  
## predicted class=8 expected loss=0.5572687 P(node) =0.0135119  
## class counts: 0 0 39 114 3 74 3 3 201 17  
## probabilities: 0.000 0.000 0.086 0.251 0.007 0.163 0.007 0.007 0.443 0.037   
##   
## Node number 1632: 407 observations  
## predicted class=0 expected loss=0.1572482 P(node) =0.0121131  
## class counts: 343 0 12 2 0 36 7 2 4 1  
## probabilities: 0.843 0.000 0.029 0.005 0.000 0.088 0.017 0.005 0.010 0.002   
##   
## Node number 1633: 158 observations  
## predicted class=5 expected loss=0.6582278 P(node) =0.004702381  
## class counts: 37 0 22 27 0 54 0 10 6 2  
## probabilities: 0.234 0.000 0.139 0.171 0.000 0.342 0.000 0.063 0.038 0.013   
##   
## Node number 1636: 366 observations  
## predicted class=3 expected loss=0.431694 P(node) =0.01089286  
## class counts: 10 2 72 208 0 45 0 10 16 3  
## probabilities: 0.027 0.005 0.197 0.568 0.000 0.123 0.000 0.027 0.044 0.008   
##   
## Node number 1637: 157 observations  
## predicted class=8 expected loss=0.5159236 P(node) =0.004672619  
## class counts: 12 2 12 23 0 26 5 0 76 1  
## probabilities: 0.076 0.013 0.076 0.146 0.000 0.166 0.032 0.000 0.484 0.006   
##   
## Node number 1640: 1776 observations  
## predicted class=3 expected loss=0.08277027 P(node) =0.05285714  
## class counts: 3 4 30 1629 0 30 1 1 73 5  
## probabilities: 0.002 0.002 0.017 0.917 0.000 0.017 0.001 0.001 0.041 0.003   
##   
## Node number 1641: 53 observations  
## predicted class=5 expected loss=0.3396226 P(node) =0.001577381  
## class counts: 0 0 0 16 0 35 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.302 0.000 0.660 0.000 0.000 0.038 0.000   
##   
## Node number 1642: 152 observations  
## predicted class=3 expected loss=0.1842105 P(node) =0.00452381  
## class counts: 1 1 7 124 0 10 0 0 6 3  
## probabilities: 0.007 0.007 0.046 0.816 0.000 0.066 0.000 0.000 0.039 0.020   
##   
## Node number 1643: 257 observations  
## predicted class=8 expected loss=0.6342412 P(node) =0.00764881  
## class counts: 4 8 13 68 0 58 0 0 94 12  
## probabilities: 0.016 0.031 0.051 0.265 0.000 0.226 0.000 0.000 0.366 0.047   
##   
## Node number 1644: 163 observations  
## predicted class=0 expected loss=0.7300613 P(node) =0.00485119  
## class counts: 44 0 21 40 0 36 1 3 10 8  
## probabilities: 0.270 0.000 0.129 0.245 0.000 0.221 0.006 0.018 0.061 0.049   
##   
## Node number 1645: 99 observations  
## predicted class=3 expected loss=0.3030303 P(node) =0.002946429  
## class counts: 4 0 0 69 0 15 0 0 6 5  
## probabilities: 0.040 0.000 0.000 0.697 0.000 0.152 0.000 0.000 0.061 0.051   
##   
## Node number 1646: 20 observations  
## predicted class=3 expected loss=0.4 P(node) =0.0005952381  
## class counts: 2 0 0 12 0 5 0 0 1 0  
## probabilities: 0.100 0.000 0.000 0.600 0.000 0.250 0.000 0.000 0.050 0.000   
##   
## Node number 1647: 208 observations  
## predicted class=5 expected loss=0.1875 P(node) =0.006190476  
## class counts: 0 0 0 23 1 169 0 4 5 6  
## probabilities: 0.000 0.000 0.000 0.111 0.005 0.812 0.000 0.019 0.024 0.029   
##   
## Node number 1648: 12 observations  
## predicted class=0 expected loss=0 P(node) =0.0003571429  
## class counts: 12 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1649: 50 observations  
## predicted class=3 expected loss=0.34 P(node) =0.001488095  
## class counts: 0 0 0 33 0 9 0 0 7 1  
## probabilities: 0.000 0.000 0.000 0.660 0.000 0.180 0.000 0.000 0.140 0.020   
##   
## Node number 1650: 50 observations  
## predicted class=3 expected loss=0.52 P(node) =0.001488095  
## class counts: 3 0 0 24 0 17 0 0 6 0  
## probabilities: 0.060 0.000 0.000 0.480 0.000 0.340 0.000 0.000 0.120 0.000   
##   
## Node number 1651: 486 observations  
## predicted class=5 expected loss=0.09465021 P(node) =0.01446429  
## class counts: 2 0 0 23 0 440 0 0 19 2  
## probabilities: 0.004 0.000 0.000 0.047 0.000 0.905 0.000 0.000 0.039 0.004   
##   
## Node number 1652: 55 observations  
## predicted class=0 expected loss=0.2545455 P(node) =0.001636905  
## class counts: 41 0 3 0 0 6 1 2 2 0  
## probabilities: 0.745 0.000 0.055 0.000 0.000 0.109 0.018 0.036 0.036 0.000   
##   
## Node number 1653: 148 observations  
## predicted class=5 expected loss=0.1891892 P(node) =0.004404762  
## class counts: 13 0 1 6 0 120 0 0 6 2  
## probabilities: 0.088 0.000 0.007 0.041 0.000 0.811 0.000 0.000 0.041 0.014   
##   
## Node number 1654: 107 observations  
## predicted class=2 expected loss=0.5981308 P(node) =0.003184524  
## class counts: 0 0 43 9 0 31 8 0 13 3  
## probabilities: 0.000 0.000 0.402 0.084 0.000 0.290 0.075 0.000 0.121 0.028   
##   
## Node number 1655: 313 observations  
## predicted class=8 expected loss=0.3929712 P(node) =0.009315476  
## class counts: 28 0 25 13 3 37 16 0 190 1  
## probabilities: 0.089 0.000 0.080 0.042 0.010 0.118 0.051 0.000 0.607 0.003   
##   
## Node number 1656: 190 observations  
## predicted class=5 expected loss=0.03684211 P(node) =0.005654762  
## class counts: 0 1 0 2 0 183 0 0 4 0  
## probabilities: 0.000 0.005 0.000 0.011 0.000 0.963 0.000 0.000 0.021 0.000   
##   
## Node number 1657: 8 observations  
## predicted class=8 expected loss=0.5 P(node) =0.0002380952  
## class counts: 1 0 0 0 0 2 1 0 4 0  
## probabilities: 0.125 0.000 0.000 0.000 0.000 0.250 0.125 0.000 0.500 0.000   
##   
## Node number 1658: 3 observations  
## predicted class=5 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 1 0 2 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.333 0.000 0.667 0.000 0.000 0.000 0.000   
##   
## Node number 1659: 11 observations  
## predicted class=8 expected loss=0 P(node) =0.000327381  
## class counts: 0 0 0 0 0 0 0 0 11 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1660: 94 observations  
## predicted class=3 expected loss=0.1276596 P(node) =0.002797619  
## class counts: 0 1 1 82 0 6 0 0 4 0  
## probabilities: 0.000 0.011 0.011 0.872 0.000 0.064 0.000 0.000 0.043 0.000   
##   
## Node number 1661: 36 observations  
## predicted class=8 expected loss=0.4722222 P(node) =0.001071429  
## class counts: 0 0 0 11 0 3 0 0 19 3  
## probabilities: 0.000 0.000 0.000 0.306 0.000 0.083 0.000 0.000 0.528 0.083   
##   
## Node number 1664: 208 observations  
## predicted class=1 expected loss=0 P(node) =0.006190476  
## class counts: 0 208 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1665: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1670: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1671: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1676: 2 observations  
## predicted class=3 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1677: 3 observations  
## predicted class=5 expected loss=0.6666667 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 1 0 1 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.333 0.000 0.333 0.000 0.333   
##   
## Node number 1684: 4 observations  
## predicted class=2 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 4 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1685: 3 observations  
## predicted class=7 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 1 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.333 0.000 0.000 0.667 0.000 0.000   
##   
## Node number 1686: 11 observations  
## predicted class=3 expected loss=0.4545455 P(node) =0.000327381  
## class counts: 0 3 0 6 0 2 0 0 0 0  
## probabilities: 0.000 0.273 0.000 0.545 0.000 0.182 0.000 0.000 0.000 0.000   
##   
## Node number 1687: 3 observations  
## predicted class=8 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 3 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1696: 6 observations  
## predicted class=1 expected loss=0 P(node) =0.0001785714  
## class counts: 0 6 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1697: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1698: 3 observations  
## predicted class=2 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 3 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1699: 3 observations  
## predicted class=8 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 1 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.333 0.000 0.000 0.000 0.000 0.667 0.000   
##   
## Node number 1700: 5 observations  
## predicted class=0 expected loss=0 P(node) =0.0001488095  
## class counts: 5 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1701: 5 observations  
## predicted class=1 expected loss=0.8 P(node) =0.0001488095  
## class counts: 0 1 1 1 0 1 1 0 0 0  
## probabilities: 0.000 0.200 0.200 0.200 0.000 0.200 0.200 0.000 0.000 0.000   
##   
## Node number 1702: 199 observations  
## predicted class=3 expected loss=0.07035176 P(node) =0.005922619  
## class counts: 0 3 4 185 0 5 1 0 1 0  
## probabilities: 0.000 0.015 0.020 0.930 0.000 0.025 0.005 0.000 0.005 0.000   
##   
## Node number 1703: 3 observations  
## predicted class=5 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 3 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1708: 14 observations  
## predicted class=3 expected loss=0.07142857 P(node) =0.0004166667  
## class counts: 0 0 0 13 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.929 0.000 0.000 0.000 0.000 0.071 0.000   
##   
## Node number 1709: 2 observations  
## predicted class=8 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1710: 9 observations  
## predicted class=5 expected loss=0.3333333 P(node) =0.0002678571  
## class counts: 1 0 0 0 0 6 1 0 1 0  
## probabilities: 0.111 0.000 0.000 0.000 0.000 0.667 0.111 0.000 0.111 0.000   
##   
## Node number 1711: 17 observations  
## predicted class=6 expected loss=0.1176471 P(node) =0.0005059524  
## class counts: 0 0 0 0 0 0 15 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.882 0.000 0.118 0.000   
##   
## Node number 1718: 5 observations  
## predicted class=3 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 0 3 0 0 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.600 0.000 0.000 0.400 0.000 0.000 0.000   
##   
## Node number 1719: 7 observations  
## predicted class=8 expected loss=0.2857143 P(node) =0.0002083333  
## class counts: 0 0 0 0 0 2 0 0 5 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.286 0.000 0.000 0.714 0.000   
##   
## Node number 1722: 4 observations  
## predicted class=3 expected loss=0.5 P(node) =0.0001190476  
## class counts: 1 0 1 2 0 0 0 0 0 0  
## probabilities: 0.250 0.000 0.250 0.500 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1723: 7 observations  
## predicted class=8 expected loss=0.1428571 P(node) =0.0002083333  
## class counts: 1 0 0 0 0 0 0 0 6 0  
## probabilities: 0.143 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.857 0.000   
##   
## Node number 1724: 12 observations  
## predicted class=8 expected loss=0.6666667 P(node) =0.0003571429  
## class counts: 1 1 3 0 0 0 3 0 4 0  
## probabilities: 0.083 0.083 0.250 0.000 0.000 0.000 0.250 0.000 0.333 0.000   
##   
## Node number 1725: 8 observations  
## predicted class=5 expected loss=0.125 P(node) =0.0002380952  
## class counts: 0 0 0 0 0 7 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.875 0.125 0.000 0.000 0.000   
##   
## Node number 1726: 2 observations  
## predicted class=1 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 1 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.500 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.000   
##   
## Node number 1727: 22 observations  
## predicted class=6 expected loss=0.04545455 P(node) =0.0006547619  
## class counts: 0 0 1 0 0 0 21 0 0 0  
## probabilities: 0.000 0.000 0.045 0.000 0.000 0.000 0.955 0.000 0.000 0.000   
##   
## Node number 1728: 23 observations  
## predicted class=0 expected loss=0 P(node) =0.0006845238  
## class counts: 23 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1729: 1 observations  
## predicted class=6 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1748: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1749: 1 observations  
## predicted class=6 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1756: 5 observations  
## predicted class=5 expected loss=0.4 P(node) =0.0001488095  
## class counts: 1 1 0 0 0 3 0 0 0 0  
## probabilities: 0.200 0.200 0.000 0.000 0.000 0.600 0.000 0.000 0.000 0.000   
##   
## Node number 1757: 7 observations  
## predicted class=6 expected loss=0.1428571 P(node) =0.0002083333  
## class counts: 0 0 0 1 0 0 6 0 0 0  
## probabilities: 0.000 0.000 0.000 0.143 0.000 0.000 0.857 0.000 0.000 0.000   
##   
## Node number 1758: 2 observations  
## predicted class=3 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 1 0 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.500 0.000 0.000 0.500 0.000 0.000 0.000   
##   
## Node number 1759: 38 observations  
## predicted class=5 expected loss=0.02631579 P(node) =0.001130952  
## class counts: 0 0 0 0 0 37 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.974 0.026 0.000 0.000 0.000   
##   
## Node number 1766: 5 observations  
## predicted class=3 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 5 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1767: 15 observations  
## predicted class=1 expected loss=0.7333333 P(node) =0.0004464286  
## class counts: 0 4 3 0 3 1 4 0 0 0  
## probabilities: 0.000 0.267 0.200 0.000 0.200 0.067 0.267 0.000 0.000 0.000   
##   
## Node number 1780: 18 observations  
## predicted class=3 expected loss=0.6666667 P(node) =0.0005357143  
## class counts: 5 0 3 6 0 1 3 0 0 0  
## probabilities: 0.278 0.000 0.167 0.333 0.000 0.056 0.167 0.000 0.000 0.000   
##   
## Node number 1781: 22 observations  
## predicted class=6 expected loss=0 P(node) =0.0006547619  
## class counts: 0 0 0 0 0 0 22 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1782: 1 observations  
## predicted class=0 expected loss=0 P(node) =2.97619e-05  
## class counts: 1 0 0 0 0 0 0 0 0 0  
## probabilities: 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1783: 11 observations  
## predicted class=5 expected loss=0 P(node) =0.000327381  
## class counts: 0 0 0 0 0 11 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1784: 14 observations  
## predicted class=2 expected loss=0.07142857 P(node) =0.0004166667  
## class counts: 0 0 13 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.929 0.000 0.000 0.000 0.000 0.071 0.000 0.000   
##   
## Node number 1785: 2 observations  
## predicted class=6 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1786: 8 observations  
## predicted class=4 expected loss=0 P(node) =0.0002380952  
## class counts: 0 0 0 0 8 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1787: 3 observations  
## predicted class=6 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 3 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1788: 16 observations  
## predicted class=4 expected loss=0.0625 P(node) =0.0004761905  
## class counts: 0 0 0 0 15 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.938 0.000 0.000 0.000 0.000 0.062   
##   
## Node number 1789: 8 observations  
## predicted class=6 expected loss=0.125 P(node) =0.0002380952  
## class counts: 0 0 1 0 0 0 7 0 0 0  
## probabilities: 0.000 0.000 0.125 0.000 0.000 0.000 0.875 0.000 0.000 0.000   
##   
## Node number 1792: 1102 observations  
## predicted class=4 expected loss=0.06352087 P(node) =0.03279762  
## class counts: 0 0 6 3 1032 4 6 10 7 34  
## probabilities: 0.000 0.000 0.005 0.003 0.936 0.004 0.005 0.009 0.006 0.031   
##   
## Node number 1793: 11 observations  
## predicted class=9 expected loss=0.3636364 P(node) =0.000327381  
## class counts: 0 0 0 2 1 0 0 0 1 7  
## probabilities: 0.000 0.000 0.000 0.182 0.091 0.000 0.000 0.000 0.091 0.636   
##   
## Node number 1794: 11 observations  
## predicted class=4 expected loss=0 P(node) =0.000327381  
## class counts: 0 0 0 0 11 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1795: 26 observations  
## predicted class=9 expected loss=0.5769231 P(node) =0.0007738095  
## class counts: 0 0 1 1 2 0 8 1 2 11  
## probabilities: 0.000 0.000 0.038 0.038 0.077 0.000 0.308 0.038 0.077 0.423   
##   
## Node number 1796: 17 observations  
## predicted class=1 expected loss=0.5882353 P(node) =0.0005059524  
## class counts: 0 7 1 1 2 0 0 2 3 1  
## probabilities: 0.000 0.412 0.059 0.059 0.118 0.000 0.000 0.118 0.176 0.059   
##   
## Node number 1797: 72 observations  
## predicted class=4 expected loss=0.1388889 P(node) =0.002142857  
## class counts: 0 0 0 0 62 2 0 2 0 6  
## probabilities: 0.000 0.000 0.000 0.000 0.861 0.028 0.000 0.028 0.000 0.083   
##   
## Node number 1798: 16 observations  
## predicted class=5 expected loss=0.0625 P(node) =0.0004761905  
## class counts: 0 0 0 1 0 15 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.062 0.000 0.938 0.000 0.000 0.000 0.000   
##   
## Node number 1799: 5 observations  
## predicted class=8 expected loss=0.6 P(node) =0.0001488095  
## class counts: 0 0 1 0 1 0 0 1 2 0  
## probabilities: 0.000 0.000 0.200 0.000 0.200 0.000 0.000 0.200 0.400 0.000   
##   
## Node number 1800: 248 observations  
## predicted class=4 expected loss=0.0766129 P(node) =0.007380952  
## class counts: 0 0 0 0 229 2 2 0 1 14  
## probabilities: 0.000 0.000 0.000 0.000 0.923 0.008 0.008 0.000 0.004 0.056   
##   
## Node number 1801: 3 observations  
## predicted class=6 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 3 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1802: 32 observations  
## predicted class=4 expected loss=0.21875 P(node) =0.000952381  
## class counts: 0 0 0 0 25 0 0 0 0 7  
## probabilities: 0.000 0.000 0.000 0.000 0.781 0.000 0.000 0.000 0.000 0.219   
##   
## Node number 1803: 18 observations  
## predicted class=9 expected loss=0.05555556 P(node) =0.0005357143  
## class counts: 0 0 0 0 1 0 0 0 0 17  
## probabilities: 0.000 0.000 0.000 0.000 0.056 0.000 0.000 0.000 0.000 0.944   
##   
## Node number 1806: 82 observations  
## predicted class=8 expected loss=0.5487805 P(node) =0.002440476  
## class counts: 0 1 2 4 16 0 3 4 37 15  
## probabilities: 0.000 0.012 0.024 0.049 0.195 0.000 0.037 0.049 0.451 0.183   
##   
## Node number 1807: 86 observations  
## predicted class=9 expected loss=0.3255814 P(node) =0.002559524  
## class counts: 0 0 2 0 10 3 4 9 0 58  
## probabilities: 0.000 0.000 0.023 0.000 0.116 0.035 0.047 0.105 0.000 0.674   
##   
## Node number 1808: 92 observations  
## predicted class=4 expected loss=0.173913 P(node) =0.002738095  
## class counts: 0 0 1 0 76 1 1 2 4 7  
## probabilities: 0.000 0.000 0.011 0.000 0.826 0.011 0.011 0.022 0.043 0.076   
##   
## Node number 1809: 10 observations  
## predicted class=9 expected loss=0.3 P(node) =0.000297619  
## class counts: 0 0 0 0 1 2 0 0 0 7  
## probabilities: 0.000 0.000 0.000 0.000 0.100 0.200 0.000 0.000 0.000 0.700   
##   
## Node number 1810: 10 observations  
## predicted class=4 expected loss=0.2 P(node) =0.000297619  
## class counts: 0 0 0 0 8 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.800 0.000 0.000 0.200 0.000 0.000   
##   
## Node number 1811: 53 observations  
## predicted class=9 expected loss=0.1509434 P(node) =0.001577381  
## class counts: 0 0 0 2 6 0 0 0 0 45  
## probabilities: 0.000 0.000 0.000 0.038 0.113 0.000 0.000 0.000 0.000 0.849   
##   
## Node number 1812: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1813: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1814: 22 observations  
## predicted class=7 expected loss=0 P(node) =0.0006547619  
## class counts: 0 0 0 0 0 0 0 22 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1815: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1816: 5 observations  
## predicted class=4 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 0 0 5 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1817: 12 observations  
## predicted class=9 expected loss=0.25 P(node) =0.0003571429  
## class counts: 0 0 0 0 0 1 0 0 2 9  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.083 0.000 0.000 0.167 0.750   
##   
## Node number 1818: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1819: 16 observations  
## predicted class=8 expected loss=0 P(node) =0.0004761905  
## class counts: 0 0 0 0 0 0 0 0 16 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1820: 19 observations  
## predicted class=4 expected loss=0.2631579 P(node) =0.0005654762  
## class counts: 0 0 0 0 14 0 0 0 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.737 0.000 0.000 0.000 0.000 0.263   
##   
## Node number 1821: 11 observations  
## predicted class=9 expected loss=0.09090909 P(node) =0.000327381  
## class counts: 0 0 0 0 1 0 0 0 0 10  
## probabilities: 0.000 0.000 0.000 0.000 0.091 0.000 0.000 0.000 0.000 0.909   
##   
## Node number 1822: 7 observations  
## predicted class=7 expected loss=0.1428571 P(node) =0.0002083333  
## class counts: 0 0 0 0 0 0 0 6 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.857 0.000 0.143   
##   
## Node number 1823: 197 observations  
## predicted class=9 expected loss=0.09137056 P(node) =0.005863095  
## class counts: 0 0 0 0 8 0 0 7 3 179  
## probabilities: 0.000 0.000 0.000 0.000 0.041 0.000 0.000 0.036 0.015 0.909   
##   
## Node number 1824: 126 observations  
## predicted class=5 expected loss=0.01587302 P(node) =0.00375  
## class counts: 0 0 0 0 0 124 0 0 2 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.984 0.000 0.000 0.016 0.000   
##   
## Node number 1825: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1832: 32 observations  
## predicted class=1 expected loss=0 P(node) =0.000952381  
## class counts: 0 32 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1833: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1834: 1 observations  
## predicted class=1 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 1 0 0 0 0 0 0 0 0  
## probabilities: 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1835: 8 observations  
## predicted class=4 expected loss=0 P(node) =0.0002380952  
## class counts: 0 0 0 0 8 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1836: 99 observations  
## predicted class=5 expected loss=0.3838384 P(node) =0.002946429  
## class counts: 0 0 0 4 9 61 0 10 7 8  
## probabilities: 0.000 0.000 0.000 0.040 0.091 0.616 0.000 0.101 0.071 0.081   
##   
## Node number 1837: 66 observations  
## predicted class=4 expected loss=0.6666667 P(node) =0.001964286  
## class counts: 1 0 0 0 22 2 0 15 5 21  
## probabilities: 0.015 0.000 0.000 0.000 0.333 0.030 0.000 0.227 0.076 0.318   
##   
## Node number 1838: 73 observations  
## predicted class=8 expected loss=0.1917808 P(node) =0.002172619  
## class counts: 3 0 0 3 2 2 0 0 59 4  
## probabilities: 0.041 0.000 0.000 0.041 0.027 0.027 0.000 0.000 0.808 0.055   
##   
## Node number 1839: 16 observations  
## predicted class=9 expected loss=0.4375 P(node) =0.0004761905  
## class counts: 0 0 0 0 1 0 0 3 3 9  
## probabilities: 0.000 0.000 0.000 0.000 0.062 0.000 0.000 0.188 0.188 0.562   
##   
## Node number 1840: 106 observations  
## predicted class=4 expected loss=0 P(node) =0.003154762  
## class counts: 0 0 0 0 106 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1841: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1844: 2 observations  
## predicted class=4 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 2 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1845: 2 observations  
## predicted class=7 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1848: 62 observations  
## predicted class=5 expected loss=0.1451613 P(node) =0.001845238  
## class counts: 0 0 0 0 3 53 0 0 4 2  
## probabilities: 0.000 0.000 0.000 0.000 0.048 0.855 0.000 0.000 0.065 0.032   
##   
## Node number 1849: 31 observations  
## predicted class=7 expected loss=0.5806452 P(node) =0.000922619  
## class counts: 0 0 0 0 4 1 0 13 0 13  
## probabilities: 0.000 0.000 0.000 0.000 0.129 0.032 0.000 0.419 0.000 0.419   
##   
## Node number 1850: 69 observations  
## predicted class=4 expected loss=0.3333333 P(node) =0.002053571  
## class counts: 0 1 0 1 46 0 0 5 3 13  
## probabilities: 0.000 0.014 0.000 0.014 0.667 0.000 0.000 0.072 0.043 0.188   
##   
## Node number 1851: 480 observations  
## predicted class=9 expected loss=0.3520833 P(node) =0.01428571  
## class counts: 0 2 0 2 82 13 0 50 20 311  
## probabilities: 0.000 0.004 0.000 0.004 0.171 0.027 0.000 0.104 0.042 0.648   
##   
## Node number 1852: 107 observations  
## predicted class=7 expected loss=0.06542056 P(node) =0.003184524  
## class counts: 0 0 0 0 2 0 0 100 0 5  
## probabilities: 0.000 0.000 0.000 0.000 0.019 0.000 0.000 0.935 0.000 0.047   
##   
## Node number 1853: 17 observations  
## predicted class=9 expected loss=0.4705882 P(node) =0.0005059524  
## class counts: 0 0 0 0 1 0 0 7 0 9  
## probabilities: 0.000 0.000 0.000 0.000 0.059 0.000 0.000 0.412 0.000 0.529   
##   
## Node number 1854: 27 observations  
## predicted class=7 expected loss=0.2962963 P(node) =0.0008035714  
## class counts: 0 0 0 0 0 0 0 19 0 8  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.704 0.000 0.296   
##   
## Node number 1855: 36 observations  
## predicted class=9 expected loss=0.3055556 P(node) =0.001071429  
## class counts: 0 0 0 0 7 0 0 4 0 25  
## probabilities: 0.000 0.000 0.000 0.000 0.194 0.000 0.000 0.111 0.000 0.694   
##   
## Node number 1858: 1 observations  
## predicted class=3 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 1 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1859: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1862: 2 observations  
## predicted class=7 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 2 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1863: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1864: 33 observations  
## predicted class=4 expected loss=0.03030303 P(node) =0.0009821429  
## class counts: 0 0 0 0 32 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.970 0.000 0.000 0.000 0.000 0.030   
##   
## Node number 1865: 2 observations  
## predicted class=9 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 0 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1866: 4 observations  
## predicted class=3 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 4 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1867: 2 observations  
## predicted class=9 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 0 0 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1872: 4 observations  
## predicted class=3 expected loss=0.25 P(node) =0.0001190476  
## class counts: 0 0 0 3 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.750 0.250 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1873: 31 observations  
## predicted class=4 expected loss=0.03225806 P(node) =0.000922619  
## class counts: 0 0 0 0 30 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.968 0.000 0.000 0.032 0.000 0.000   
##   
## Node number 1874: 3 observations  
## predicted class=1 expected loss=0.6666667 P(node) =8.928571e-05  
## class counts: 0 1 0 1 1 0 0 0 0 0  
## probabilities: 0.000 0.333 0.000 0.333 0.333 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1875: 5 observations  
## predicted class=9 expected loss=0.2 P(node) =0.0001488095  
## class counts: 0 0 0 0 0 0 0 0 1 4  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.200 0.800   
##   
## Node number 1888: 43 observations  
## predicted class=3 expected loss=0.2790698 P(node) =0.001279762  
## class counts: 0 0 0 31 1 0 0 1 0 10  
## probabilities: 0.000 0.000 0.000 0.721 0.023 0.000 0.000 0.023 0.000 0.233   
##   
## Node number 1889: 25 observations  
## predicted class=7 expected loss=0.16 P(node) =0.0007440476  
## class counts: 0 0 0 1 1 1 0 21 0 1  
## probabilities: 0.000 0.000 0.000 0.040 0.040 0.040 0.000 0.840 0.000 0.040   
##   
## Node number 1890: 28 observations  
## predicted class=2 expected loss=0.3214286 P(node) =0.0008333333  
## class counts: 0 0 19 0 0 0 6 3 0 0  
## probabilities: 0.000 0.000 0.679 0.000 0.000 0.000 0.214 0.107 0.000 0.000   
##   
## Node number 1891: 59 observations  
## predicted class=4 expected loss=0.7457627 P(node) =0.001755952  
## class counts: 0 0 1 3 15 0 0 14 12 14  
## probabilities: 0.000 0.000 0.017 0.051 0.254 0.000 0.000 0.237 0.203 0.237   
##   
## Node number 1892: 79 observations  
## predicted class=4 expected loss=0.1392405 P(node) =0.00235119  
## class counts: 0 0 1 0 68 0 1 2 0 7  
## probabilities: 0.000 0.000 0.013 0.000 0.861 0.000 0.013 0.025 0.000 0.089   
##   
## Node number 1893: 10 observations  
## predicted class=9 expected loss=0.2 P(node) =0.000297619  
## class counts: 0 0 0 0 0 1 0 1 0 8  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.100 0.000 0.100 0.000 0.800   
##   
## Node number 1894: 11 observations  
## predicted class=7 expected loss=0.5454545 P(node) =0.000327381  
## class counts: 0 0 0 0 3 0 2 5 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.273 0.000 0.182 0.455 0.000 0.091   
##   
## Node number 1895: 30 observations  
## predicted class=9 expected loss=0.1333333 P(node) =0.0008928571  
## class counts: 0 0 0 0 3 0 1 0 0 26  
## probabilities: 0.000 0.000 0.000 0.000 0.100 0.000 0.033 0.000 0.000 0.867   
##   
## Node number 1896: 14 observations  
## predicted class=4 expected loss=0 P(node) =0.0004166667  
## class counts: 0 0 0 0 14 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1897: 4 observations  
## predicted class=9 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 0 0 0 0 0 0 4  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1898: 9 observations  
## predicted class=2 expected loss=0.4444444 P(node) =0.0002678571  
## class counts: 0 0 5 0 1 0 0 0 1 2  
## probabilities: 0.000 0.000 0.556 0.000 0.111 0.000 0.000 0.000 0.111 0.222   
##   
## Node number 1899: 7 observations  
## predicted class=7 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 0 0 0 0 0 7 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1904: 34 observations  
## predicted class=6 expected loss=0.6470588 P(node) =0.001011905  
## class counts: 0 0 4 1 10 0 12 4 0 3  
## probabilities: 0.000 0.000 0.118 0.029 0.294 0.000 0.353 0.118 0.000 0.088   
##   
## Node number 1905: 47 observations  
## predicted class=9 expected loss=0.4042553 P(node) =0.00139881  
## class counts: 0 0 1 1 6 0 0 11 0 28  
## probabilities: 0.000 0.000 0.021 0.021 0.128 0.000 0.000 0.234 0.000 0.596   
##   
## Node number 1906: 34 observations  
## predicted class=3 expected loss=0.6764706 P(node) =0.001011905  
## class counts: 0 0 0 11 3 0 2 4 3 11  
## probabilities: 0.000 0.000 0.000 0.324 0.088 0.000 0.059 0.118 0.088 0.324   
##   
## Node number 1907: 29 observations  
## predicted class=8 expected loss=0.2413793 P(node) =0.0008630952  
## class counts: 0 0 1 3 0 1 0 0 22 2  
## probabilities: 0.000 0.000 0.034 0.103 0.000 0.034 0.000 0.000 0.759 0.069   
##   
## Node number 1908: 19 observations  
## predicted class=4 expected loss=0.2105263 P(node) =0.0005654762  
## class counts: 0 0 0 0 15 0 0 0 1 3  
## probabilities: 0.000 0.000 0.000 0.000 0.789 0.000 0.000 0.000 0.053 0.158   
##   
## Node number 1909: 21 observations  
## predicted class=9 expected loss=0.1428571 P(node) =0.000625  
## class counts: 0 0 0 1 1 0 0 1 0 18  
## probabilities: 0.000 0.000 0.000 0.048 0.048 0.000 0.000 0.048 0.000 0.857   
##   
## Node number 1910: 5 observations  
## predicted class=4 expected loss=0.6 P(node) =0.0001488095  
## class counts: 0 0 0 0 2 0 0 2 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.400 0.000 0.000 0.400 0.000 0.200   
##   
## Node number 1911: 66 observations  
## predicted class=9 expected loss=0.03030303 P(node) =0.001964286  
## class counts: 0 0 0 0 0 0 0 1 1 64  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.015 0.015 0.970   
##   
## Node number 1916: 15 observations  
## predicted class=4 expected loss=0.06666667 P(node) =0.0004464286  
## class counts: 0 0 0 0 14 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.933 0.000 0.000 0.000 0.000 0.067   
##   
## Node number 1917: 16 observations  
## predicted class=9 expected loss=0.25 P(node) =0.0004761905  
## class counts: 0 0 0 0 4 0 0 0 0 12  
## probabilities: 0.000 0.000 0.000 0.000 0.250 0.000 0.000 0.000 0.000 0.750   
##   
## Node number 1918: 4 observations  
## predicted class=7 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 0 0 0 0 0 4 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1919: 1168 observations  
## predicted class=9 expected loss=0.05821918 P(node) =0.0347619  
## class counts: 0 0 0 9 42 0 0 11 6 1100  
## probabilities: 0.000 0.000 0.000 0.008 0.036 0.000 0.000 0.009 0.005 0.942   
##   
## Node number 1920: 38 observations  
## predicted class=2 expected loss=0 P(node) =0.001130952  
## class counts: 0 0 38 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1921: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1922: 2 observations  
## predicted class=3 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1923: 4 observations  
## predicted class=2 expected loss=0.5 P(node) =0.0001190476  
## class counts: 0 0 2 0 0 0 0 2 0 0  
## probabilities: 0.000 0.000 0.500 0.000 0.000 0.000 0.000 0.500 0.000 0.000   
##   
## Node number 1932: 14 observations  
## predicted class=3 expected loss=0.1428571 P(node) =0.0004166667  
## class counts: 0 0 0 12 0 0 0 1 1 0  
## probabilities: 0.000 0.000 0.000 0.857 0.000 0.000 0.000 0.071 0.071 0.000   
##   
## Node number 1933: 6 observations  
## predicted class=7 expected loss=0.3333333 P(node) =0.0001785714  
## class counts: 0 0 0 1 0 0 0 4 0 1  
## probabilities: 0.000 0.000 0.000 0.167 0.000 0.000 0.000 0.667 0.000 0.167   
##   
## Node number 1934: 5 observations  
## predicted class=2 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 3 2 0 0 0 0 0 0  
## probabilities: 0.000 0.000 0.600 0.400 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1935: 8 observations  
## predicted class=8 expected loss=0 P(node) =0.0002380952  
## class counts: 0 0 0 0 0 0 0 0 8 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1936: 24 observations  
## predicted class=4 expected loss=0.04166667 P(node) =0.0007142857  
## class counts: 0 0 0 0 23 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.958 0.000 0.042 0.000 0.000 0.000   
##   
## Node number 1937: 1 observations  
## predicted class=9 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1938: 1 observations  
## predicted class=6 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 1 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1939: 1 observations  
## predicted class=7 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 1 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1940: 2 observations  
## predicted class=2 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 2 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1941: 1 observations  
## predicted class=8 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1944: 5 observations  
## predicted class=2 expected loss=0 P(node) =0.0001488095  
## class counts: 0 0 5 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1945: 2 observations  
## predicted class=4 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 1 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.500 0.000 0.000 0.000 0.500 0.000   
##   
## Node number 1946: 7 observations  
## predicted class=4 expected loss=0.7142857 P(node) =0.0002083333  
## class counts: 0 0 1 1 2 0 1 0 0 2  
## probabilities: 0.000 0.000 0.143 0.143 0.286 0.000 0.143 0.000 0.000 0.286   
##   
## Node number 1947: 3 observations  
## predicted class=7 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 3 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1948: 1 observations  
## predicted class=2 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 1 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1949: 3 observations  
## predicted class=8 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 3 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000   
##   
## Node number 1950: 44 observations  
## predicted class=7 expected loss=0 P(node) =0.001309524  
## class counts: 0 0 0 0 0 0 0 44 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000   
##   
## Node number 1951: 3 observations  
## predicted class=9 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 1 0 2  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.333 0.000 0.667   
##   
## Node number 1954: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 1955: 2 observations  
## predicted class=6 expected loss=0 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 2 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000   
##   
## Node number 1958: 13 observations  
## predicted class=4 expected loss=0.3846154 P(node) =0.0003869048  
## class counts: 0 0 0 0 8 0 1 1 2 1  
## probabilities: 0.000 0.000 0.000 0.000 0.615 0.000 0.077 0.077 0.154 0.077   
##   
## Node number 1959: 3 observations  
## predicted class=9 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 0 0 0 0 0 3  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1960: 3 observations  
## predicted class=4 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 3 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1961: 5 observations  
## predicted class=6 expected loss=0.6 P(node) =0.0001488095  
## class counts: 1 0 0 0 0 0 2 0 0 2  
## probabilities: 0.200 0.000 0.000 0.000 0.000 0.000 0.400 0.000 0.000 0.400   
##   
## Node number 1966: 1 observations  
## predicted class=4 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 1 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 1967: 9 observations  
## predicted class=9 expected loss=0 P(node) =0.0002678571  
## class counts: 0 0 0 0 0 0 0 0 0 9  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000   
##   
## Node number 1982: 5 observations  
## predicted class=4 expected loss=0.4 P(node) =0.0001488095  
## class counts: 0 0 0 0 3 0 0 1 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.600 0.000 0.000 0.200 0.000 0.200   
##   
## Node number 1983: 188 observations  
## predicted class=9 expected loss=0.04787234 P(node) =0.005595238  
## class counts: 0 0 2 0 3 0 0 4 0 179  
## probabilities: 0.000 0.000 0.011 0.000 0.016 0.000 0.000 0.021 0.000 0.952   
##   
## Node number 2000: 58 observations  
## predicted class=4 expected loss=0.03448276 P(node) =0.00172619  
## class counts: 0 0 0 0 56 0 0 0 1 1  
## probabilities: 0.000 0.000 0.000 0.000 0.966 0.000 0.000 0.000 0.017 0.017   
##   
## Node number 2001: 1 observations  
## predicted class=5 expected loss=0 P(node) =2.97619e-05  
## class counts: 0 0 0 0 0 1 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000   
##   
## Node number 2002: 7 observations  
## predicted class=4 expected loss=0 P(node) =0.0002083333  
## class counts: 0 0 0 0 7 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 2003: 14 observations  
## predicted class=9 expected loss=0.6428571 P(node) =0.0004166667  
## class counts: 0 0 0 0 1 2 0 4 2 5  
## probabilities: 0.000 0.000 0.000 0.000 0.071 0.143 0.000 0.286 0.143 0.357   
##   
## Node number 2004: 21 observations  
## predicted class=4 expected loss=0.1904762 P(node) =0.000625  
## class counts: 0 0 0 0 17 1 0 0 2 1  
## probabilities: 0.000 0.000 0.000 0.000 0.810 0.048 0.000 0.000 0.095 0.048   
##   
## Node number 2005: 13 observations  
## predicted class=7 expected loss=0.2307692 P(node) =0.0003869048  
## class counts: 0 1 0 0 1 0 0 10 0 1  
## probabilities: 0.000 0.077 0.000 0.000 0.077 0.000 0.000 0.769 0.000 0.077   
##   
## Node number 2006: 45 observations  
## predicted class=8 expected loss=0.6444444 P(node) =0.001339286  
## class counts: 0 0 0 2 7 4 0 4 16 12  
## probabilities: 0.000 0.000 0.000 0.044 0.156 0.089 0.000 0.089 0.356 0.267   
##   
## Node number 2007: 111 observations  
## predicted class=9 expected loss=0.0990991 P(node) =0.003303571  
## class counts: 0 0 0 0 5 0 0 3 3 100  
## probabilities: 0.000 0.000 0.000 0.000 0.045 0.000 0.000 0.027 0.027 0.901   
##   
## Node number 2008: 6 observations  
## predicted class=1 expected loss=0.5 P(node) =0.0001785714  
## class counts: 0 3 0 0 1 0 0 1 0 1  
## probabilities: 0.000 0.500 0.000 0.000 0.167 0.000 0.000 0.167 0.000 0.167   
##   
## Node number 2009: 202 observations  
## predicted class=7 expected loss=0.0990099 P(node) =0.006011905  
## class counts: 0 0 7 2 0 1 0 182 4 6  
## probabilities: 0.000 0.000 0.035 0.010 0.000 0.005 0.000 0.901 0.020 0.030   
##   
## Node number 2010: 12 observations  
## predicted class=7 expected loss=0.5 P(node) =0.0003571429  
## class counts: 0 0 1 2 0 0 0 6 1 2  
## probabilities: 0.000 0.000 0.083 0.167 0.000 0.000 0.000 0.500 0.083 0.167   
##   
## Node number 2011: 9 observations  
## predicted class=9 expected loss=0.3333333 P(node) =0.0002678571  
## class counts: 0 0 0 0 1 2 0 0 0 6  
## probabilities: 0.000 0.000 0.000 0.000 0.111 0.222 0.000 0.000 0.000 0.667   
##   
## Node number 2012: 21 observations  
## predicted class=8 expected loss=0.6190476 P(node) =0.000625  
## class counts: 0 1 1 3 0 0 0 4 8 4  
## probabilities: 0.000 0.048 0.048 0.143 0.000 0.000 0.000 0.190 0.381 0.190   
##   
## Node number 2013: 52 observations  
## predicted class=7 expected loss=0.1346154 P(node) =0.001547619  
## class counts: 0 0 1 0 0 0 0 45 1 5  
## probabilities: 0.000 0.000 0.019 0.000 0.000 0.000 0.000 0.865 0.019 0.096   
##   
## Node number 2014: 51 observations  
## predicted class=8 expected loss=0.5098039 P(node) =0.001517857  
## class counts: 0 0 1 1 2 9 0 7 25 6  
## probabilities: 0.000 0.000 0.020 0.020 0.039 0.176 0.000 0.137 0.490 0.118   
##   
## Node number 2015: 73 observations  
## predicted class=9 expected loss=0.3424658 P(node) =0.002172619  
## class counts: 0 1 0 2 4 1 0 10 7 48  
## probabilities: 0.000 0.014 0.000 0.027 0.055 0.014 0.000 0.137 0.096 0.658   
##   
## Node number 2034: 4 observations  
## predicted class=2 expected loss=0 P(node) =0.0001190476  
## class counts: 0 0 4 0 0 0 0 0 0 0  
## probabilities: 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 2035: 2 observations  
## predicted class=7 expected loss=0.5 P(node) =5.952381e-05  
## class counts: 0 0 0 0 0 0 0 1 0 1  
## probabilities: 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.500 0.000 0.500   
##   
## Node number 2036: 7 observations  
## predicted class=4 expected loss=0.1428571 P(node) =0.0002083333  
## class counts: 0 0 0 0 6 0 0 0 1 0  
## probabilities: 0.000 0.000 0.000 0.000 0.857 0.000 0.000 0.000 0.143 0.000   
##   
## Node number 2037: 284 observations  
## predicted class=7 expected loss=0.1866197 P(node) =0.008452381  
## class counts: 0 0 19 2 3 2 0 231 7 20  
## probabilities: 0.000 0.000 0.067 0.007 0.011 0.007 0.000 0.813 0.025 0.070   
##   
## Node number 2044: 3 observations  
## predicted class=5 expected loss=0.3333333 P(node) =8.928571e-05  
## class counts: 1 0 0 0 0 2 0 0 0 0  
## probabilities: 0.333 0.000 0.000 0.000 0.000 0.667 0.000 0.000 0.000 0.000   
##   
## Node number 2045: 8 observations  
## predicted class=7 expected loss=0.25 P(node) =0.0002380952  
## class counts: 0 0 0 1 1 0 0 6 0 0  
## probabilities: 0.000 0.000 0.000 0.125 0.125 0.000 0.000 0.750 0.000 0.000   
##   
## Node number 2046: 3 observations  
## predicted class=4 expected loss=0 P(node) =8.928571e-05  
## class counts: 0 0 0 0 3 0 0 0 0 0  
## probabilities: 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000   
##   
## Node number 2047: 31 observations  
## predicted class=9 expected loss=0.2903226 P(node) =0.000922619  
## class counts: 1 0 1 0 1 0 0 6 0 22  
## probabilities: 0.032 0.000 0.032 0.000 0.032 0.000 0.000 0.194 0.000 0.710

plotcp(pca\_rtree) # plot cross-validation results



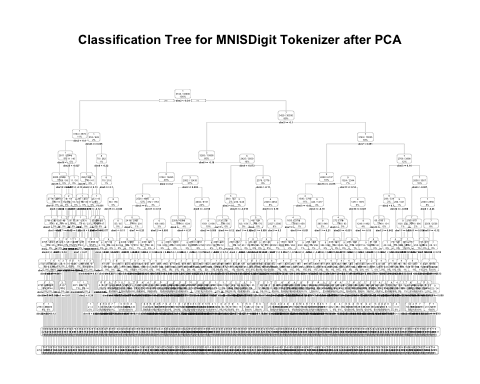
printcp(pca\_rtree) # plot cross-validation results

##   
## Classification tree:  
## rpart(formula = label ~ ., data = pca\_train\_set, method = "class",   
## cp = 0, minsplit = 1, maxdepth = 10)  
##   
## Variables actually used in tree construction:  
## [1] dim1 dim10 dim11 dim12 dim13 dim14 dim15 dim16 dim17 dim18 dim19 dim2   
## [13] dim20 dim21 dim22 dim23 dim24 dim25 dim26 dim27 dim28 dim29 dim3 dim30  
## [25] dim4 dim5 dim6 dim7 dim8 dim9   
##   
## Root node error: 29857/33600 = 0.8886  
##   
## n= 33600   
##   
## CP nsplit rel error xerror xstd  
## 1 9.7716e-02 0 1.00000 1.00000 0.0019316  
## 2 7.8508e-02 2 0.80457 0.80886 0.0027603  
## 3 7.6833e-02 3 0.72606 0.68982 0.0029903  
## 4 6.6484e-02 4 0.64923 0.65017 0.0030324  
## 5 6.4139e-02 5 0.58274 0.59396 0.0030649  
## 6 4.1933e-02 6 0.51861 0.52463 0.0030627  
## 7 3.4364e-02 7 0.47667 0.48260 0.0030384  
## 8 1.3967e-02 8 0.44231 0.44810 0.0030054  
## 9 1.2928e-02 9 0.42834 0.44030 0.0029962  
## 10 1.2895e-02 10 0.41541 0.43249 0.0029864  
## 11 1.0081e-02 11 0.40252 0.41970 0.0029689  
## 12 8.8756e-03 12 0.39244 0.41009 0.0029546  
## 13 7.1675e-03 13 0.38356 0.39257 0.0029260  
## 14 7.0000e-03 14 0.37639 0.38333 0.0029096  
## 15 6.6651e-03 15 0.36939 0.37850 0.0029006  
## 16 6.1292e-03 16 0.36273 0.37412 0.0028922  
## 17 5.6268e-03 17 0.35660 0.36316 0.0028702  
## 18 5.4928e-03 18 0.35097 0.35616 0.0028555  
## 19 5.3589e-03 19 0.34548 0.35181 0.0028460  
## 20 5.1412e-03 20 0.34012 0.34669 0.0028345  
## 21 4.9235e-03 22 0.32984 0.34173 0.0028231  
## 22 4.8230e-03 23 0.32492 0.34005 0.0028192  
## 23 4.6555e-03 24 0.32009 0.33751 0.0028132  
## 24 4.1531e-03 25 0.31544 0.33145 0.0027985  
## 25 3.6507e-03 27 0.30713 0.32110 0.0027724  
## 26 3.3158e-03 28 0.30348 0.31269 0.0027501  
## 27 3.1818e-03 29 0.30016 0.31108 0.0027457  
## 28 2.7799e-03 30 0.29698 0.30492 0.0027287  
## 29 2.7129e-03 31 0.29420 0.30164 0.0027193  
## 30 2.6627e-03 32 0.29149 0.30013 0.0027150  
## 31 2.5790e-03 34 0.28616 0.29933 0.0027127  
## 32 2.4115e-03 35 0.28359 0.29759 0.0027077  
## 33 2.3445e-03 36 0.28117 0.29340 0.0026953  
## 34 2.2608e-03 37 0.27883 0.29182 0.0026906  
## 35 1.9761e-03 39 0.27431 0.28871 0.0026812  
## 36 1.9426e-03 40 0.27233 0.28606 0.0026731  
## 37 1.8924e-03 41 0.27039 0.28168 0.0026595  
## 38 1.8254e-03 45 0.26135 0.27903 0.0026511  
## 39 1.7751e-03 47 0.25770 0.27772 0.0026469  
## 40 1.7416e-03 48 0.25592 0.27551 0.0026398  
## 41 1.3397e-03 49 0.25418 0.27183 0.0026278  
## 42 1.3062e-03 50 0.25284 0.26995 0.0026216  
## 43 1.1723e-03 51 0.25153 0.26707 0.0026119  
## 44 1.1053e-03 53 0.24919 0.26500 0.0026049  
## 45 1.0383e-03 54 0.24808 0.26366 0.0026003  
## 46 1.0048e-03 58 0.24393 0.26225 0.0025955  
## 47 9.3780e-04 59 0.24292 0.26004 0.0025879  
## 48 9.0431e-04 60 0.24199 0.25890 0.0025839  
## 49 8.7082e-04 62 0.24018 0.25816 0.0025813  
## 50 8.0383e-04 64 0.23844 0.25542 0.0025716  
## 51 7.3685e-04 66 0.23683 0.25354 0.0025649  
## 52 7.0335e-04 68 0.23536 0.25197 0.0025592  
## 53 6.9498e-04 70 0.23395 0.25093 0.0025555  
## 54 6.6986e-04 74 0.23117 0.25073 0.0025547  
## 55 6.1962e-04 75 0.23050 0.24952 0.0025503  
## 56 6.0287e-04 78 0.22862 0.24768 0.0025436  
## 57 5.6938e-04 82 0.22621 0.24584 0.0025368  
## 58 5.5263e-04 88 0.22280 0.24426 0.0025309  
## 59 5.3589e-04 90 0.22169 0.24346 0.0025279  
## 60 5.2472e-04 93 0.22008 0.24299 0.0025261  
## 61 5.1914e-04 97 0.21777 0.24299 0.0025261  
## 62 5.0239e-04 99 0.21673 0.24145 0.0025203  
## 63 4.6890e-04 103 0.21472 0.24078 0.0025177  
## 64 4.3541e-04 104 0.21425 0.23807 0.0025074  
## 65 4.0192e-04 107 0.21295 0.23596 0.0024992  
## 66 3.5168e-04 123 0.20548 0.23499 0.0024954  
## 67 3.3493e-04 125 0.20478 0.23288 0.0024871  
## 68 3.0144e-04 129 0.20340 0.23187 0.0024831  
## 69 2.6794e-04 137 0.20099 0.22913 0.0024722  
## 70 2.3445e-04 147 0.19831 0.22655 0.0024618  
## 71 2.1770e-04 157 0.19597 0.22608 0.0024598  
## 72 2.0096e-04 159 0.19553 0.22504 0.0024556  
## 73 1.8421e-04 177 0.19175 0.22447 0.0024533  
## 74 1.7863e-04 179 0.19138 0.22323 0.0024482  
## 75 1.6746e-04 187 0.18991 0.22320 0.0024480  
## 76 1.5909e-04 207 0.18656 0.22286 0.0024467  
## 77 1.5630e-04 214 0.18532 0.22280 0.0024464  
## 78 1.5072e-04 217 0.18485 0.22280 0.0024464  
## 79 1.3397e-04 219 0.18455 0.22182 0.0024424  
## 80 1.1723e-04 233 0.18267 0.22159 0.0024414  
## 81 1.0048e-04 242 0.18157 0.22085 0.0024383  
## 82 8.3732e-05 282 0.17748 0.22079 0.0024380  
## 83 7.8150e-05 286 0.17714 0.22082 0.0024382  
## 84 6.6986e-05 289 0.17691 0.22072 0.0024378  
## 85 5.5822e-05 351 0.17272 0.22089 0.0024384  
## 86 5.0239e-05 354 0.17256 0.22079 0.0024380  
## 87 3.3493e-05 356 0.17246 0.22079 0.0024380  
## 88 1.6746e-05 467 0.16874 0.22149 0.0024410  
## 89 0.0000e+00 469 0.16870 0.22149 0.0024410

# Plot tree | lets Plot decision trees  
 rpart.plot(pca\_rtree,main="Classification Tree for MNISDigit Tokenizer after PCA", extra= 102) # plot decision tree

## Warning: All boxes will be white (the box.palette argument will be ignored) because  
## the number of classes in the response 10 is greater than length(box.palette) 6.  
## To silence this warning use box.palette=0 or trace=-1.

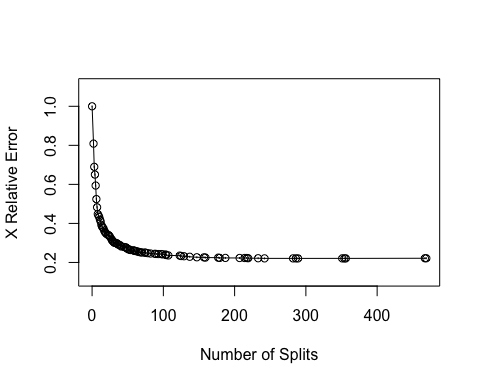
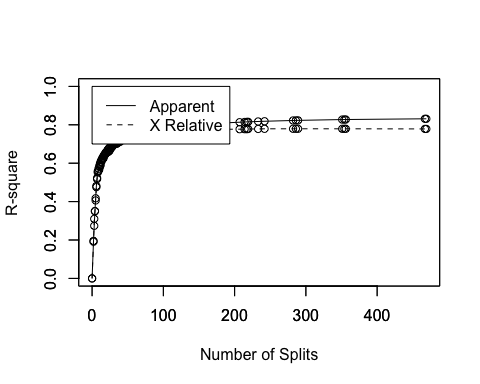
## Warning: labs do not fit even at cex 0.15, there may be some overplotting



rsq.rpart(pca\_rtree) # plot approximate R-squared and relative error for different splits (2 plots)

##   
## Classification tree:  
## rpart(formula = label ~ ., data = pca\_train\_set, method = "class",   
## cp = 0, minsplit = 1, maxdepth = 10)  
##   
## Variables actually used in tree construction:  
## [1] dim1 dim10 dim11 dim12 dim13 dim14 dim15 dim16 dim17 dim18 dim19 dim2   
## [13] dim20 dim21 dim22 dim23 dim24 dim25 dim26 dim27 dim28 dim29 dim3 dim30  
## [25] dim4 dim5 dim6 dim7 dim8 dim9   
##   
## Root node error: 29857/33600 = 0.8886  
##   
## n= 33600   
##   
## CP nsplit rel error xerror xstd  
## 1 9.7716e-02 0 1.00000 1.00000 0.0019316  
## 2 7.8508e-02 2 0.80457 0.80886 0.0027603  
## 3 7.6833e-02 3 0.72606 0.68982 0.0029903  
## 4 6.6484e-02 4 0.64923 0.65017 0.0030324  
## 5 6.4139e-02 5 0.58274 0.59396 0.0030649  
## 6 4.1933e-02 6 0.51861 0.52463 0.0030627  
## 7 3.4364e-02 7 0.47667 0.48260 0.0030384  
## 8 1.3967e-02 8 0.44231 0.44810 0.0030054  
## 9 1.2928e-02 9 0.42834 0.44030 0.0029962  
## 10 1.2895e-02 10 0.41541 0.43249 0.0029864  
## 11 1.0081e-02 11 0.40252 0.41970 0.0029689  
## 12 8.8756e-03 12 0.39244 0.41009 0.0029546  
## 13 7.1675e-03 13 0.38356 0.39257 0.0029260  
## 14 7.0000e-03 14 0.37639 0.38333 0.0029096  
## 15 6.6651e-03 15 0.36939 0.37850 0.0029006  
## 16 6.1292e-03 16 0.36273 0.37412 0.0028922  
## 17 5.6268e-03 17 0.35660 0.36316 0.0028702  
## 18 5.4928e-03 18 0.35097 0.35616 0.0028555  
## 19 5.3589e-03 19 0.34548 0.35181 0.0028460  
## 20 5.1412e-03 20 0.34012 0.34669 0.0028345  
## 21 4.9235e-03 22 0.32984 0.34173 0.0028231  
## 22 4.8230e-03 23 0.32492 0.34005 0.0028192  
## 23 4.6555e-03 24 0.32009 0.33751 0.0028132  
## 24 4.1531e-03 25 0.31544 0.33145 0.0027985  
## 25 3.6507e-03 27 0.30713 0.32110 0.0027724  
## 26 3.3158e-03 28 0.30348 0.31269 0.0027501  
## 27 3.1818e-03 29 0.30016 0.31108 0.0027457  
## 28 2.7799e-03 30 0.29698 0.30492 0.0027287  
## 29 2.7129e-03 31 0.29420 0.30164 0.0027193  
## 30 2.6627e-03 32 0.29149 0.30013 0.0027150  
## 31 2.5790e-03 34 0.28616 0.29933 0.0027127  
## 32 2.4115e-03 35 0.28359 0.29759 0.0027077  
## 33 2.3445e-03 36 0.28117 0.29340 0.0026953  
## 34 2.2608e-03 37 0.27883 0.29182 0.0026906  
## 35 1.9761e-03 39 0.27431 0.28871 0.0026812  
## 36 1.9426e-03 40 0.27233 0.28606 0.0026731  
## 37 1.8924e-03 41 0.27039 0.28168 0.0026595  
## 38 1.8254e-03 45 0.26135 0.27903 0.0026511  
## 39 1.7751e-03 47 0.25770 0.27772 0.0026469  
## 40 1.7416e-03 48 0.25592 0.27551 0.0026398  
## 41 1.3397e-03 49 0.25418 0.27183 0.0026278  
## 42 1.3062e-03 50 0.25284 0.26995 0.0026216  
## 43 1.1723e-03 51 0.25153 0.26707 0.0026119  
## 44 1.1053e-03 53 0.24919 0.26500 0.0026049  
## 45 1.0383e-03 54 0.24808 0.26366 0.0026003  
## 46 1.0048e-03 58 0.24393 0.26225 0.0025955  
## 47 9.3780e-04 59 0.24292 0.26004 0.0025879  
## 48 9.0431e-04 60 0.24199 0.25890 0.0025839  
## 49 8.7082e-04 62 0.24018 0.25816 0.0025813  
## 50 8.0383e-04 64 0.23844 0.25542 0.0025716  
## 51 7.3685e-04 66 0.23683 0.25354 0.0025649  
## 52 7.0335e-04 68 0.23536 0.25197 0.0025592  
## 53 6.9498e-04 70 0.23395 0.25093 0.0025555  
## 54 6.6986e-04 74 0.23117 0.25073 0.0025547  
## 55 6.1962e-04 75 0.23050 0.24952 0.0025503  
## 56 6.0287e-04 78 0.22862 0.24768 0.0025436  
## 57 5.6938e-04 82 0.22621 0.24584 0.0025368  
## 58 5.5263e-04 88 0.22280 0.24426 0.0025309  
## 59 5.3589e-04 90 0.22169 0.24346 0.0025279  
## 60 5.2472e-04 93 0.22008 0.24299 0.0025261  
## 61 5.1914e-04 97 0.21777 0.24299 0.0025261  
## 62 5.0239e-04 99 0.21673 0.24145 0.0025203  
## 63 4.6890e-04 103 0.21472 0.24078 0.0025177  
## 64 4.3541e-04 104 0.21425 0.23807 0.0025074  
## 65 4.0192e-04 107 0.21295 0.23596 0.0024992  
## 66 3.5168e-04 123 0.20548 0.23499 0.0024954  
## 67 3.3493e-04 125 0.20478 0.23288 0.0024871  
## 68 3.0144e-04 129 0.20340 0.23187 0.0024831  
## 69 2.6794e-04 137 0.20099 0.22913 0.0024722  
## 70 2.3445e-04 147 0.19831 0.22655 0.0024618  
## 71 2.1770e-04 157 0.19597 0.22608 0.0024598  
## 72 2.0096e-04 159 0.19553 0.22504 0.0024556  
## 73 1.8421e-04 177 0.19175 0.22447 0.0024533  
## 74 1.7863e-04 179 0.19138 0.22323 0.0024482  
## 75 1.6746e-04 187 0.18991 0.22320 0.0024480  
## 76 1.5909e-04 207 0.18656 0.22286 0.0024467  
## 77 1.5630e-04 214 0.18532 0.22280 0.0024464  
## 78 1.5072e-04 217 0.18485 0.22280 0.0024464  
## 79 1.3397e-04 219 0.18455 0.22182 0.0024424  
## 80 1.1723e-04 233 0.18267 0.22159 0.0024414  
## 81 1.0048e-04 242 0.18157 0.22085 0.0024383  
## 82 8.3732e-05 282 0.17748 0.22079 0.0024380  
## 83 7.8150e-05 286 0.17714 0.22082 0.0024382  
## 84 6.6986e-05 289 0.17691 0.22072 0.0024378  
## 85 5.5822e-05 351 0.17272 0.22089 0.0024384  
## 86 5.0239e-05 354 0.17256 0.22079 0.0024380  
## 87 3.3493e-05 356 0.17246 0.22079 0.0024380  
## 88 1.6746e-05 467 0.16874 0.22149 0.0024410  
## 89 0.0000e+00 469 0.16870 0.22149 0.0024410

## Warning in rsq.rpart(pca\_rtree): may not be applicable for this method



# Section 3: Prediction | Test Phase  
  
 cat("\nTrain Data Images:")

##   
## Train Data Images:

table(digitPCATrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain\_Set - Images by Labels:")

##   
## Train\_Set - Images by Labels:

table(pca\_train\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 3263 3743 3384 3445 3259 3060 3371 3487 3271 3317

cat("\nTest\_Set - Images by Labels:")

##   
## Test\_Set - Images by Labels:

table(pca\_test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 869 941 793 906 813 735 766 914 792 871

pca\_predict\_unseen <- predict(pca\_rtree, pca\_test\_set, type = 'class')  
 # predict\_unseen  
 pca\_table\_test\_matrix <- table(pca\_test\_set$label, pca\_predict\_unseen)  
 cat("\n\nPrediction results : Confusion Matrix \n\n")

##   
##   
## Prediction results : Confusion Matrix

# table\_mat  
 confusionMatrix(pca\_table\_test\_matrix)

## Confusion Matrix and Statistics  
##   
## pca\_predict\_unseen  
## 0 1 2 3 4 5 6 7 8 9  
## 0 785 1 12 2 4 33 14 3 14 1  
## 1 0 910 6 4 3 6 4 1 5 2  
## 2 12 8 645 33 5 15 26 5 42 2  
## 3 16 0 14 703 8 48 5 6 94 12  
## 4 2 5 30 6 619 13 16 14 19 89  
## 5 31 3 30 38 14 500 16 7 86 10  
## 6 14 4 27 6 19 25 653 0 13 5  
## 7 9 8 21 10 26 16 2 746 28 48  
## 8 13 7 34 36 16 39 10 10 604 23  
## 9 10 1 7 13 77 21 6 35 29 672  
##   
## Overall Statistics  
##   
## Accuracy : 0.8139   
## 95% CI : (0.8054, 0.8222)  
## No Information Rate : 0.1127   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.7932   
##   
## Mcnemar's Test P-Value : 1.008e-13   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.88004 0.9609 0.78087 0.82609 0.78255 0.69832  
## Specificity 0.98881 0.9958 0.98046 0.97311 0.97450 0.96942  
## Pos Pred Value 0.90334 0.9671 0.81337 0.77594 0.76138 0.68027  
## Neg Pred Value 0.98579 0.9950 0.97621 0.98025 0.97733 0.97182  
## Prevalence 0.10619 0.1127 0.09833 0.10131 0.09417 0.08524  
## Detection Rate 0.09345 0.1083 0.07679 0.08369 0.07369 0.05952  
## Detection Prevalence 0.10345 0.1120 0.09440 0.10786 0.09679 0.08750  
## Balanced Accuracy 0.93443 0.9784 0.88067 0.89960 0.87853 0.83387  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.86835 0.90206 0.64668 0.7778  
## Specificity 0.98522 0.97782 0.97482 0.9736  
## Pos Pred Value 0.85248 0.81619 0.76263 0.7715  
## Neg Pred Value 0.98703 0.98918 0.95662 0.9745  
## Prevalence 0.08952 0.09845 0.11119 0.1029  
## Detection Rate 0.07774 0.08881 0.07190 0.0800  
## Detection Prevalence 0.09119 0.10881 0.09429 0.1037  
## Balanced Accuracy 0.92679 0.93994 0.81075 0.8757

# Section 3: Prediction | Validation Phase  
 cat("\nTest Data Images:")

##   
## Test Data Images:

table(digitPCATrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain Data Images:")

##   
## Train Data Images:

table(digitTrainDF$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 4132 4684 4177 4351 4072 3795 4137 4401 4063 4188

cat("\nTrain\_Set - Images by Labels:")

##   
## Train\_Set - Images by Labels:

table(pca\_train\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 3263 3743 3384 3445 3259 3060 3371 3487 3271 3317

cat("\nTest\_Set - Images by Labels:")

##   
## Test\_Set - Images by Labels:

table(pca\_test\_set$label)

##   
## 0 1 2 3 4 5 6 7 8 9   
## 869 941 793 906 813 735 766 914 792 871

pca\_predict\_final <- predict(rtree, digitValidationDF, type = 'class')  
 pca\_table\_final <- table(digitValidationDF$label, pca\_predict\_final)  
 cat("\n\nPrediction results : \n\n")

##   
##   
## Prediction results :

pca\_table\_final

## pca\_predict\_final  
## 0 1 2 3 4 5 6 7 8 9  
## 2500 2872 3089 1622 2399 3335 2947 3071 3331 2834

#View the final validation results and export to csv  
 pca\_predict\_finaldf <- data.frame(pca\_predict\_final)  
 cat("\n\nPrediction results by Label : \n\n")

##   
##   
## Prediction results by Label :

View(pca\_predict\_finaldf)  
   
 #Export to CSV  
 write.csv(x=pca\_predict\_finaldf, file="/Users/sathishrajendiran/Documents/R/HW6/pca\_predict\_finaldf.csv")

# kNN - Training the KNN model  
pca\_training\_kNN <- trainControl(method = "repeatedcv", number = 10, repeats = 3)  
set.seed(3033)  
pca\_knn\_fit <- train(label ~ ., data = pca\_train\_set, method = "knn", trControl=pca\_training\_kNN, preProcess = c("center", "scale")  
 , tuneLength = 10)  
pca\_knn\_fit

## k-Nearest Neighbors   
##   
## 33600 samples  
## 30 predictor  
## 10 classes: '0', '1', '2', '3', '4', '5', '6', '7', '8', '9'   
##   
## Pre-processing: centered (30), scaled (30)   
## Resampling: Cross-Validated (10 fold, repeated 3 times)   
## Summary of sample sizes: 30240, 30241, 30240, 30241, 30239, 30238, ...   
## Resampling results across tuning parameters:  
##   
## k Accuracy Kappa   
## 5 0.9704167 0.9671188  
## 7 0.9691070 0.9656629  
## 9 0.9678670 0.9642846  
## 11 0.9670038 0.9633249  
## 13 0.9658034 0.9619907  
## 15 0.9646031 0.9606562  
## 17 0.9638094 0.9597739  
## 19 0.9629562 0.9588254  
## 21 0.9622519 0.9580425  
## 23 0.9612499 0.9569288  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was k = 5.

#kNN - Prediction  
pca\_knn\_test\_pred <- predict(pca\_knn\_fit, newdata =pca\_test\_set)  
View(data.frame(pca\_knn\_test\_pred, pca\_test\_set$label))  
summary(pca\_knn\_test\_pred)

## 0 1 2 3 4 5 6 7 8 9   
## 884 967 782 900 797 732 776 913 759 890

#SVM - Building the Model | Linear Kernel  
  
pca\_svm\_model <- svm(label ~ ., data = pca\_train\_set, kernel= 'linear', cost =100, scale = FALSE, Probability = TRUE, Cross = 3,type = 'C')  
summary(pca\_svm\_model)

##   
## Call:  
## svm(formula = label ~ ., data = pca\_train\_set, kernel = "linear",   
## cost = 100, Probability = TRUE, Cross = 3, type = "C", scale = FALSE)  
##   
##   
## Parameters:  
## SVM-Type: C-classification   
## SVM-Kernel: linear   
## cost: 100   
##   
## Number of Support Vectors: 7114  
##   
## ( 975 464 607 968 298 1037 242 774 1101 648 )  
##   
##   
## Number of Classes: 10   
##   
## Levels:   
## 0 1 2 3 4 5 6 7 8 9

#SVM - Prediction  
  
pca\_svmPred <- predict(pca\_svm\_model, pca\_test\_set, type = 'prob')  
pca\_svmPred <- as.data.frame(pca\_svmPred)  
colnames(pca\_svmPred) <- 'results'  
  
  
svmResults <- pca\_test\_set %>% select(label) %>% bind\_cols(pca\_svmPred) %>% mutate(real = factor(as.character(str\_remove(label, 'V'))), prediction = factor(as.character(str\_remove(results, 'V'))))  
  
confusionMatrix(svmResults$real, svmResults$prediction) #92%

## Confusion Matrix and Statistics  
##   
## Reference  
## Prediction 0 1 2 3 4 5 6 7 8 9  
## 0 846 0 0 1 1 10 7 0 3 1  
## 1 0 922 1 0 3 3 0 0 9 3  
## 2 3 2 730 9 7 1 16 9 14 2  
## 3 3 1 15 794 0 42 6 8 31 6  
## 4 1 3 4 0 761 1 7 5 6 25  
## 5 9 3 7 41 11 624 17 2 15 6  
## 6 12 1 4 0 4 12 732 0 1 0  
## 7 5 8 18 5 16 6 0 818 7 31  
## 8 5 9 11 14 5 32 6 2 695 13  
## 9 1 1 6 5 42 3 0 20 8 785  
##   
## Overall Statistics  
##   
## Accuracy : 0.9175   
## 95% CI : (0.9114, 0.9233)  
## No Information Rate : 0.1131   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.9083   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.9559 0.9705 0.91709 0.91369 0.89529 0.85014  
## Specificity 0.9969 0.9974 0.99171 0.98513 0.99311 0.98552  
## Pos Pred Value 0.9735 0.9798 0.92055 0.87638 0.93604 0.84898  
## Neg Pred Value 0.9948 0.9962 0.99132 0.98999 0.98827 0.98565  
## Prevalence 0.1054 0.1131 0.09476 0.10345 0.10119 0.08738  
## Detection Rate 0.1007 0.1098 0.08690 0.09452 0.09060 0.07429  
## Detection Prevalence 0.1035 0.1120 0.09440 0.10786 0.09679 0.08750  
## Balanced Accuracy 0.9764 0.9840 0.95440 0.94941 0.94420 0.91783  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.92541 0.94676 0.88086 0.90023  
## Specificity 0.99553 0.98726 0.98726 0.98858  
## Pos Pred Value 0.95561 0.89497 0.87753 0.90126  
## Neg Pred Value 0.99227 0.99386 0.98764 0.98844  
## Prevalence 0.09417 0.10286 0.09393 0.10381  
## Detection Rate 0.08714 0.09738 0.08274 0.09345  
## Detection Prevalence 0.09119 0.10881 0.09429 0.10369  
## Balanced Accuracy 0.96047 0.96701 0.93406 0.94440

#SVM - Building the Model | Linear linear | cost 10  
pca\_svm\_model\_linear1 <- svm(label ~ ., data = pca\_train\_set, kernel= 'linear', cost =100, scale = FALSE,   
 Probability = TRUE, Cross = 3,type = 'C')  
summary(pca\_svm\_model\_linear1)

##   
## Call:  
## svm(formula = label ~ ., data = pca\_train\_set, kernel = "linear",   
## cost = 100, Probability = TRUE, Cross = 3, type = "C", scale = FALSE)  
##   
##   
## Parameters:  
## SVM-Type: C-classification   
## SVM-Kernel: linear   
## cost: 100   
##   
## Number of Support Vectors: 7114  
##   
## ( 975 464 607 968 298 1037 242 774 1101 648 )  
##   
##   
## Number of Classes: 10   
##   
## Levels:   
## 0 1 2 3 4 5 6 7 8 9

#SVM - Prediction  
pca\_svmPred\_linear1 <- predict(pca\_svm\_model\_linear1, pca\_test\_set, type = 'prob')  
  
#Plot the results  
pca\_svmPred\_linear1 <- as.data.frame(pca\_svmPred\_linear1)  
colnames(pca\_svmPred\_linear1) <- 'results'  
svmResults\_linear1 <- pca\_test\_set %>% select(label) %>% bind\_cols(pca\_svmPred\_linear1) %>% mutate(real = factor(as.character(str\_remove(label, 'V'))),   
 prediction = factor(as.character(str\_remove(results, 'V'))))  
  
#Build Confusion matrix  
confusionMatrix(svmResults\_linear1$real, svmResults\_linear1$prediction) #92%

## Confusion Matrix and Statistics  
##   
## Reference  
## Prediction 0 1 2 3 4 5 6 7 8 9  
## 0 846 0 0 1 1 10 7 0 3 1  
## 1 0 922 1 0 3 3 0 0 9 3  
## 2 3 2 730 9 7 1 16 9 14 2  
## 3 3 1 15 794 0 42 6 8 31 6  
## 4 1 3 4 0 761 1 7 5 6 25  
## 5 9 3 7 41 11 624 17 2 15 6  
## 6 12 1 4 0 4 12 732 0 1 0  
## 7 5 8 18 5 16 6 0 818 7 31  
## 8 5 9 11 14 5 32 6 2 695 13  
## 9 1 1 6 5 42 3 0 20 8 785  
##   
## Overall Statistics  
##   
## Accuracy : 0.9175   
## 95% CI : (0.9114, 0.9233)  
## No Information Rate : 0.1131   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.9083   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.9559 0.9705 0.91709 0.91369 0.89529 0.85014  
## Specificity 0.9969 0.9974 0.99171 0.98513 0.99311 0.98552  
## Pos Pred Value 0.9735 0.9798 0.92055 0.87638 0.93604 0.84898  
## Neg Pred Value 0.9948 0.9962 0.99132 0.98999 0.98827 0.98565  
## Prevalence 0.1054 0.1131 0.09476 0.10345 0.10119 0.08738  
## Detection Rate 0.1007 0.1098 0.08690 0.09452 0.09060 0.07429  
## Detection Prevalence 0.1035 0.1120 0.09440 0.10786 0.09679 0.08750  
## Balanced Accuracy 0.9764 0.9840 0.95440 0.94941 0.94420 0.91783  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.92541 0.94676 0.88086 0.90023  
## Specificity 0.99553 0.98726 0.98726 0.98858  
## Pos Pred Value 0.95561 0.89497 0.87753 0.90126  
## Neg Pred Value 0.99227 0.99386 0.98764 0.98844  
## Prevalence 0.09417 0.10286 0.09393 0.10381  
## Detection Rate 0.08714 0.09738 0.08274 0.09345  
## Detection Prevalence 0.09119 0.10881 0.09429 0.10369  
## Balanced Accuracy 0.96047 0.96701 0.93406 0.94440

#SVM - Building the Model | Radial Kernel | cost 10  
pca\_svm\_model\_radial1 <- svm(label ~ ., data = pca\_train\_set, kernel= 'radial', cost =10, scale = FALSE, Probability = TRUE, Cross = 3,type = 'C')  
summary(pca\_svm\_model\_radial1)

##   
## Call:  
## svm(formula = label ~ ., data = pca\_train\_set, kernel = "radial",   
## cost = 10, Probability = TRUE, Cross = 3, type = "C", scale = FALSE)  
##   
##   
## Parameters:  
## SVM-Type: C-classification   
## SVM-Kernel: radial   
## cost: 10   
##   
## Number of Support Vectors: 10234  
##   
## ( 1313 745 968 1289 585 1442 478 1059 1445 910 )  
##   
##   
## Number of Classes: 10   
##   
## Levels:   
## 0 1 2 3 4 5 6 7 8 9

#SVM - Prediction  
  
pca\_svmPred\_radial1 <- predict(pca\_svm\_model\_radial1, pca\_test\_set, type = 'prob')  
pca\_svmPred\_radial1 <- as.data.frame(pca\_svmPred\_radial1)  
colnames(pca\_svmPred\_radial1) <- 'results'  
  
svmResults\_radial1 <- pca\_test\_set %>% select(label) %>% bind\_cols(pca\_svmPred\_radial1) %>% mutate(real = factor(as.character(str\_remove(label, 'V')))  
 , prediction = factor(as.character(str\_remove(results, 'V'))))  
  
#Build Confusion matrix  
confusionMatrix(svmResults\_radial1$real, svmResults\_radial1$prediction) #92.42 %

## Confusion Matrix and Statistics  
##   
## Reference  
## Prediction 0 1 2 3 4 5 6 7 8 9  
## 0 852 0 0 1 1 8 4 0 3 0  
## 1 0 923 1 2 3 4 0 0 5 3  
## 2 3 1 736 7 6 4 14 11 10 1  
## 3 4 1 15 795 1 40 7 10 27 6  
## 4 0 5 5 0 760 1 9 4 5 24  
## 5 9 8 5 37 13 631 17 2 9 4  
## 6 9 1 5 0 3 12 734 0 2 0  
## 7 5 8 11 4 16 4 0 829 9 28  
## 8 2 10 7 16 5 31 6 3 700 12  
## 9 1 1 5 8 39 4 0 17 12 784  
##   
## Overall Statistics  
##   
## Accuracy : 0.9219   
## 95% CI : (0.916, 0.9276)  
## No Information Rate : 0.114   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.9132   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.9627 0.9635 0.93165 0.91379 0.89728 0.85386  
## Specificity 0.9977 0.9976 0.99251 0.98526 0.99298 0.98642  
## Pos Pred Value 0.9804 0.9809 0.92812 0.87748 0.93481 0.85850  
## Neg Pred Value 0.9956 0.9953 0.99290 0.98999 0.98853 0.98591  
## Prevalence 0.1054 0.1140 0.09405 0.10357 0.10083 0.08798  
## Detection Rate 0.1014 0.1099 0.08762 0.09464 0.09048 0.07512  
## Detection Prevalence 0.1035 0.1120 0.09440 0.10786 0.09679 0.08750  
## Balanced Accuracy 0.9802 0.9805 0.96208 0.94953 0.94513 0.92014  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.92794 0.94635 0.89514 0.90951  
## Specificity 0.99579 0.98870 0.98792 0.98846  
## Pos Pred Value 0.95822 0.90700 0.88384 0.90011  
## Neg Pred Value 0.99253 0.99372 0.98922 0.98964  
## Prevalence 0.09417 0.10429 0.09310 0.10262  
## Detection Rate 0.08738 0.09869 0.08333 0.09333  
## Detection Prevalence 0.09119 0.10881 0.09429 0.10369  
## Balanced Accuracy 0.96187 0.96752 0.94153 0.94899

#SVM - Building the Model | Radial Kernel | cost 10  
pca\_svm\_model\_radial <- svm(label ~ ., data = pca\_train\_set, kernel= 'radial', cost =100, scale = FALSE, Probability = TRUE, Cross = 3,type = 'C')  
summary(pca\_svm\_model\_radial)

##   
## Call:  
## svm(formula = label ~ ., data = pca\_train\_set, kernel = "radial",   
## cost = 100, Probability = TRUE, Cross = 3, type = "C", scale = FALSE)  
##   
##   
## Parameters:  
## SVM-Type: C-classification   
## SVM-Kernel: radial   
## cost: 100   
##   
## Number of Support Vectors: 7323  
##   
## ( 973 501 660 968 364 1050 302 787 1054 664 )  
##   
##   
## Number of Classes: 10   
##   
## Levels:   
## 0 1 2 3 4 5 6 7 8 9

#SVM - Prediction  
  
pca\_svmPred\_radial <- predict(pca\_svm\_model\_radial, pca\_test\_set, type = 'prob')  
  
  
#Plot the results  
pca\_svmPred\_radial <- as.data.frame(pca\_svmPred\_radial)  
colnames(pca\_svmPred\_radial) <- 'results'  
svmResults\_radial <- pca\_test\_set %>% select(label) %>% bind\_cols(pca\_svmPred\_radial) %>% mutate(real = factor(as.character(str\_remove(label, 'V')))  
 , prediction = factor(as.character(str\_remove(results, 'V'))))  
#Build Confusion matrix  
pca\_SVM\_radialMatrix <- confusionMatrix(svmResults\_radial$real, svmResults\_radial$prediction) #94.48 %  
pca\_SVM\_radialMatrix

## Confusion Matrix and Statistics  
##   
## Reference  
## Prediction 0 1 2 3 4 5 6 7 8 9  
## 0 855 0 0 1 1 5 4 0 3 0  
## 1 0 924 1 1 2 2 1 0 8 2  
## 2 4 2 754 7 5 1 5 4 8 3  
## 3 2 1 12 835 0 16 5 8 20 7  
## 4 0 3 4 0 776 1 7 4 3 15  
## 5 6 2 4 16 6 680 13 0 5 3  
## 6 11 0 3 0 2 11 736 0 3 0  
## 7 5 6 9 6 11 3 0 851 5 18  
## 8 2 4 6 10 1 17 6 1 732 13  
## 9 1 0 2 6 28 2 0 11 10 811  
##   
## Overall Statistics  
##   
## Accuracy : 0.9469   
## 95% CI : (0.9419, 0.9516)  
## No Information Rate : 0.1121   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.941   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.9650 0.9809 0.94843 0.9467 0.93269 0.92141  
## Specificity 0.9981 0.9977 0.99487 0.9906 0.99511 0.99282  
## Pos Pred Value 0.9839 0.9819 0.95082 0.9216 0.95449 0.92517  
## Neg Pred Value 0.9959 0.9976 0.99461 0.9937 0.99262 0.99243  
## Prevalence 0.1055 0.1121 0.09464 0.1050 0.09905 0.08786  
## Detection Rate 0.1018 0.1100 0.08976 0.0994 0.09238 0.08095  
## Detection Prevalence 0.1035 0.1120 0.09440 0.1079 0.09679 0.08750  
## Balanced Accuracy 0.9816 0.9893 0.97165 0.9686 0.96390 0.95712  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.94723 0.9681 0.91844 0.93005  
## Specificity 0.99606 0.9916 0.99211 0.99203  
## Pos Pred Value 0.96084 0.9311 0.92424 0.93111  
## Neg Pred Value 0.99463 0.9963 0.99146 0.99190  
## Prevalence 0.09250 0.1046 0.09488 0.10381  
## Detection Rate 0.08762 0.1013 0.08714 0.09655  
## Detection Prevalence 0.09119 0.1088 0.09429 0.10369  
## Balanced Accuracy 0.97165 0.9799 0.95528 0.96104

pca\_SVM\_radialMatrix$overall

## Accuracy Kappa AccuracyLower AccuracyUpper AccuracyNull   
## 0.9469048 0.9409699 0.9418930 0.9516036 0.1121429   
## AccuracyPValue McnemarPValue   
## 0.0000000 NaN

# # digitValidationDF  
# pca\_digits\_validation <- PCA(t(select(digitValidationDF,-label)),ncp=30)  
# digitPCAValidationDF <- data.frame(digitValidationDF$label,pca\_digits\_validation$var$coord)  
# colnames(digitPCAValidationDF) <- c("label","dim1","dim2","dim3","dim4","dim5","dim6","dim7","dim8","dim9","dim10","dim11","dim12","dim13"  
# ,"dim14","dim15","dim16","dim17","dim18","dim19","dim20","dim21","dim22","dim23","dim24","dim25"  
# ,"dim26","dim27","dim28","dim29","dim30")  
# str(digitPCAValidationDF)

#SVM - Building the Model | polynomial polynomial | cost 10  
pca\_svm\_model\_polynomial <- svm(label ~ ., data = pca\_train\_set, kernel= 'polynomial', cost =100, scale = FALSE, Probability = TRUE, Cross = 3,type = 'C')  
summary(pca\_svm\_model\_polynomial)

##   
## Call:  
## svm(formula = label ~ ., data = pca\_train\_set, kernel = "polynomial",   
## cost = 100, Probability = TRUE, Cross = 3, type = "C", scale = FALSE)  
##   
##   
## Parameters:  
## SVM-Type: C-classification   
## SVM-Kernel: polynomial   
## cost: 100   
## degree: 3   
## coef.0: 0   
##   
## Number of Support Vectors: 31231  
##   
## ( 3211 3094 3259 3295 2925 3310 2605 3260 3060 3212 )  
##   
##   
## Number of Classes: 10   
##   
## Levels:   
## 0 1 2 3 4 5 6 7 8 9

#SVM - Prediction  
  
pca\_svmPred\_polynomial <- predict(pca\_svm\_model\_polynomial, pca\_test\_set, type = 'prob')  
  
#Plot the results  
pca\_svmPred\_polynomial <- as.data.frame(pca\_svmPred\_polynomial)  
colnames(pca\_svmPred\_polynomial) <- 'results'  
svmResults\_polynomial <- pca\_test\_set %>% select(label) %>% bind\_cols(pca\_svmPred\_polynomial) %>% mutate(real = factor(as.character(str\_remove(label, 'V')))  
 , prediction = factor(as.character(str\_remove(results, 'V'))))  
#Build Confusion matrix  
pca\_SVM\_ploynomialMatrix <- confusionMatrix(svmResults\_polynomial$real, svmResults\_polynomial$prediction) #94.48 %  
pca\_SVM\_ploynomialMatrix

## Confusion Matrix and Statistics  
##   
## Reference  
## Prediction 0 1 2 3 4 5 6 7 8 9  
## 0 770 0 32 10 0 23 27 0 6 1  
## 1 0 895 29 10 2 2 1 0 1 1  
## 2 3 5 750 7 6 1 2 7 11 1  
## 3 1 1 49 795 3 3 2 9 27 16  
## 4 0 5 10 0 663 2 10 3 7 113  
## 5 3 2 33 204 15 446 13 1 14 4  
## 6 3 1 60 2 6 18 674 0 2 0  
## 7 3 10 46 1 40 6 0 771 5 32  
## 8 0 6 41 88 13 8 2 3 603 28  
## 9 2 3 26 13 67 0 1 27 21 711  
##   
## Overall Statistics  
##   
## Accuracy : 0.8426   
## 95% CI : (0.8347, 0.8503)  
## No Information Rate : 0.1345   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.8249   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.98089 0.9644 0.69703 0.70354 0.81350 0.8762  
## Specificity 0.98700 0.9938 0.99413 0.98473 0.98022 0.9634  
## Pos Pred Value 0.88608 0.9511 0.94578 0.87748 0.81550 0.6068  
## Neg Pred Value 0.99801 0.9956 0.95714 0.95530 0.97997 0.9918  
## Prevalence 0.09345 0.1105 0.12810 0.13452 0.09702 0.0606  
## Detection Rate 0.09167 0.1065 0.08929 0.09464 0.07893 0.0531  
## Detection Prevalence 0.10345 0.1120 0.09440 0.10786 0.09679 0.0875  
## Balanced Accuracy 0.98395 0.9791 0.84558 0.84414 0.89686 0.9198  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.92077 0.93910 0.86514 0.78390  
## Specificity 0.98800 0.98113 0.97546 0.97865  
## Pos Pred Value 0.87990 0.84354 0.76136 0.81630  
## Neg Pred Value 0.99240 0.99332 0.98764 0.97397  
## Prevalence 0.08714 0.09774 0.08298 0.10798  
## Detection Rate 0.08024 0.09179 0.07179 0.08464  
## Detection Prevalence 0.09119 0.10881 0.09429 0.10369  
## Balanced Accuracy 0.95438 0.96012 0.92030 0.88127

pca\_SVM\_ploynomialMatrix$overall

## Accuracy Kappa AccuracyLower AccuracyUpper AccuracyNull   
## 0.8426190 0.8249495 0.8346534 0.8503463 0.1345238   
## AccuracyPValue McnemarPValue   
## 0.0000000 NaN

#naiveBayes - Building the Model  
pca\_NB\_model <- naiveBayes(label ~ ., data = pca\_train\_set, cost =100, scale = FALSE, Probability = TRUE, Cross = 3,type = 'C')  
summary(pca\_NB\_model)

## Length Class Mode   
## apriori 10 table numeric   
## tables 30 -none- list   
## levels 10 -none- character  
## isnumeric 30 -none- logical   
## call 9 -none- call

#naiveBayes - Prediction  
  
pca\_NB\_Pred <- predict(pca\_NB\_model, pca\_test\_set, type = 'class')  
pca\_NB\_Pred <- as.data.frame(pca\_NB\_Pred)  
colnames(pca\_NB\_Pred) <- 'results'  
  
pca\_NB\_results <- pca\_test\_set %>% select(label) %>% bind\_cols(pca\_NB\_Pred) %>% mutate(real = factor(as.character(str\_remove(label, 'V')))  
 , prediction = factor(as.character(str\_remove(results, 'V'))))  
#Build Confusion matrix  
pca\_NB\_Matrix <- confusionMatrix(pca\_NB\_results$real, pca\_NB\_results$prediction) #86.02 %  
pca\_NB\_Matrix

## Confusion Matrix and Statistics  
##   
## Reference  
## Prediction 0 1 2 3 4 5 6 7 8 9  
## 0 798 0 0 3 1 46 12 1 5 3  
## 1 0 892 8 12 3 14 2 1 8 1  
## 2 9 13 679 9 9 14 23 11 18 8  
## 3 6 3 32 728 5 55 3 14 36 24  
## 4 3 10 8 1 667 9 9 3 9 94  
## 5 13 2 15 45 15 611 11 3 14 6  
## 6 19 0 11 1 8 39 687 0 1 0  
## 7 10 13 24 5 43 4 1 767 6 41  
## 8 2 10 33 42 14 52 2 7 606 24  
## 9 3 5 12 6 64 16 11 17 21 716  
##   
## Overall Statistics  
##   
## Accuracy : 0.8513   
## 95% CI : (0.8435, 0.8589)  
## No Information Rate : 0.1129   
## P-Value [Acc > NIR] : < 2.2e-16   
##   
## Kappa : 0.8347   
##   
## Mcnemar's Test P-Value : NA   
##   
## Statistics by Class:  
##   
## Class: 0 Class: 1 Class: 2 Class: 3 Class: 4 Class: 5  
## Sensitivity 0.9247 0.9409 0.82603 0.85446 0.80458 0.71047  
## Specificity 0.9906 0.9934 0.98496 0.97642 0.98072 0.98355  
## Pos Pred Value 0.9183 0.9479 0.85624 0.80353 0.82042 0.83129  
## Neg Pred Value 0.9914 0.9925 0.98120 0.98345 0.97865 0.96751  
## Prevalence 0.1027 0.1129 0.09786 0.10143 0.09869 0.10238  
## Detection Rate 0.0950 0.1062 0.08083 0.08667 0.07940 0.07274  
## Detection Prevalence 0.1035 0.1120 0.09440 0.10786 0.09679 0.08750  
## Balanced Accuracy 0.9576 0.9672 0.90550 0.91544 0.89265 0.84701  
## Class: 6 Class: 7 Class: 8 Class: 9  
## Sensitivity 0.90276 0.93083 0.83702 0.78081  
## Specificity 0.98966 0.98060 0.97577 0.97929  
## Pos Pred Value 0.89687 0.83917 0.76515 0.82204  
## Neg Pred Value 0.99031 0.99239 0.98449 0.97330  
## Prevalence 0.09060 0.09810 0.08619 0.10917  
## Detection Rate 0.08179 0.09131 0.07214 0.08524  
## Detection Prevalence 0.09119 0.10881 0.09429 0.10369  
## Balanced Accuracy 0.94621 0.95571 0.90639 0.88005

x <- pca\_NB\_Matrix$overall  
x

## Accuracy Kappa AccuracyLower AccuracyUpper AccuracyNull   
## 0.8513095 0.8347258 0.8435199 0.8588546 0.1128571   
## AccuracyPValue McnemarPValue   
## 0.0000000 NaN

#Plotting the matrix  
  
flip <- function(matrix) {  
 apply(matrix,2,rev)  
}  
  
#random sampling  
plotdigit <- function(datarow, rm1=F) {  
 title <- datarow[1]  
 if(rm1){  
 datarow <- datarow[-1]  
 }  
 datarow <- as.numeric(datarow)  
 x <- rep(0:27)/27  
 y <- rep(0:27)/27  
 z <- matrix(datarow,ncol=28,byrow=T)  
 rotate <- function(x) t(apply(x,2,rev))  
 z <- rotate(z)  
 image(x,y,z,main=paste("actual value:",title),col=gray.colors(255,start=1,end=0),asp=1,xlim=c(0,1)  
 ,ylim=c(-0.1,1.1),useRaster=T,axes=F,xlab='',ylab='')  
}  
  
par(mfrow=c(3,4))  
set.seed(1)  
rows <- sample(1:42000,size=12)  
for(i in rows){  
 plotdigit(train\_set[i,],rm1=T)  
}

## Warning in min(x): no non-missing arguments to min; returning Inf

## Warning in max(x): no non-missing arguments to max; returning -Inf

