# R Codes for Chapter 8 (Naïve Bayes)

# Without Cross Validation

install.packages("klaR")

install.packages("caret")

install.packages("e1071")

library(e1071)

library("klaR")

library("caret")

data1 <- read.csv("C:/MA 299/R/FlightDelays.csv")

# We need to factor categorical predictors using numbers to represents different levels

#Factor a first categorical variable DAY\_WEEK

data1$DAY\_WEEK.f <- factor(data1$DAY\_WEEK)

is.factor(data1$DAY\_WEEK.f)

data1$DAY\_WEEK.f

#Factor a second categorical variable Weather

data1$Weather.f <- factor(data1$Weather)

is.factor(data1$Weather.f)

data1$Weather.f

model <- naiveBayes(Flight.Status ~ CARRIER + DAY\_WEEK.f + DEST + ORIGIN + Weather.f, data = data1)

model

predict(model, data1[1:2201,])

predict(model, data1[1:2201,], type = "raw")

pred <- predict(model, data1)

table(pred, data1$Flight.Status)

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# With Cross Validation

install.packages("klaR")

install.packages("caret")

library("klaR")

library("caret")

#Read Data

data1 <- read.csv("C:/MA 299/R/FlightDelays.csv")

# We need to factor categorical predictors using numbers to represents different levels

#Factor a first categorical variable DAY\_WEEK

data1$DAY\_WEEK.f <- factor(data1$DAY\_WEEK)

is.factor(data1$DAY\_WEEK.f)

data1$DAY\_WEEK.f

#Factor a second categorical variable Weather

data1$Weather.f <- factor(data1$Weather)

is.factor(data1$Weather.f)

data1$Weather.f

#Create predictor matrix x

x <- data.frame(data1$CARRIER,data1$DAY\_WEEK.f,data1$DEST, data1$ORIGIN, data1$Weather.f)

summary(x)

#Define y

y = data1$Flight.Status

#10-fold CV with Naive Bayes

model <- train(x,y,"nb",trControl=trainControl(method='cv', number=10))

model

#EWD Discretization

dataset <- c(0, 4, 11, 17, 19, 22, 24, 26, 28, 100, 105, 109)

library(classInt)

x <- classIntervals(dataset, 4, style = 'equal')

x

#EFD Discretization

dataset <- c(0, 4, 11, 17, 19, 22, 24, 26, 28, 100, 105, 109)

library(classInt)

z <-classIntervals(dataset, 4, style = 'quantile')

z