project\_ML.R

pritam

2022-01-10

#Importing library  
library(party)

## Loading required package: grid

## Loading required package: mvtnorm

## Loading required package: modeltools

## Loading required package: stats4

## Loading required package: strucchange

## Loading required package: zoo

##   
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':  
##   
## as.Date, as.Date.numeric

## Loading required package: sandwich

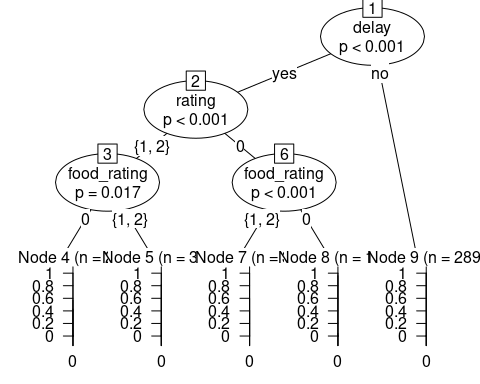
#Reading data  
rating\_dataset=read.csv("/home/pritam/Downloads/rating\_final2.csv", header = T, colClasses="factor")  
str(rating\_dataset)

## 'data.frame': 1161 obs. of 6 variables:  
## $ userID : Factor w/ 138 levels "U1001","U1002",..: 77 77 77 77 68 68 68 68 68 67 ...  
## $ placeID : Factor w/ 130 levels "132560","132561",..: 124 85 32 106 127 25 15 23 12 6 ...  
## $ rating : Factor w/ 3 levels "0","1","2": 3 3 3 2 2 1 2 1 2 3 ...  
## $ food\_rating : Factor w/ 3 levels "0","1","2": 3 3 3 3 2 1 2 1 2 3 ...  
## $ service\_rating: Factor w/ 3 levels "0","1","2": 3 2 3 3 3 1 2 1 2 3 ...  
## $ delay : Factor w/ 2 levels "no","yes": 1 2 1 1 1 2 2 2 2 1 ...

#splitting data into training and testing  
pd=sample(2,nrow(rating\_dataset), replace = T, prob=c(0.7,0.3))  
train\_data=rating\_dataset[pd==1,]  
test\_data=rating\_dataset[pd==2,]  
#decision tree  
output\_tree=ctree(service\_rating~rating+food\_rating+delay, data=train\_data)  
output\_tree

##   
## Conditional inference tree with 5 terminal nodes  
##   
## Response: service\_rating   
## Inputs: rating, food\_rating, delay   
## Number of observations: 823   
##   
## 1) delay == {yes}; criterion = 1, statistic = 822  
## 2) rating == {1, 2}; criterion = 1, statistic = 234.89  
## 3) food\_rating == {0}; criterion = 0.983, statistic = 10.385  
## 4)\* weights = 28   
## 3) food\_rating == {1, 2}  
## 5)\* weights = 326   
## 2) rating == {0}  
## 6) food\_rating == {1, 2}; criterion = 1, statistic = 38.794  
## 7)\* weights = 32   
## 6) food\_rating == {0}  
## 8)\* weights = 148   
## 1) delay == {no}  
## 9)\* weights = 289

plot(output\_tree)



#prediction using test data  
predict(output\_tree, test\_data, type = "prob")

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## [1] 0 0 1  
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## [[282]]  
## [1] 0.59375 0.40625 0.00000  
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## [[283]]  
## [1] 0.95945946 0.04054054 0.00000000  
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## [[284]]  
## [1] 0.1809816 0.8190184 0.0000000  
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## [[285]]  
## [1] 0.4285714 0.5714286 0.0000000  
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## [[286]]  
## [1] 0.95945946 0.04054054 0.00000000  
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## [[290]]  
## [1] 0.4285714 0.5714286 0.0000000  
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## [1] 0 0 1  
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## [[293]]  
## [1] 0.4285714 0.5714286 0.0000000  
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## [[295]]  
## [1] 0.4285714 0.5714286 0.0000000  
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## [1] 0.95945946 0.04054054 0.00000000  
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## [1] 0.1809816 0.8190184 0.0000000  
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## [1] 0 0 1  
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## [1] 0.95945946 0.04054054 0.00000000  
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## [1] 0.1809816 0.8190184 0.0000000  
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## [[319]]  
## [1] 0 0 1  
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## [1] 0 0 1  
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## [[322]]  
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## [[323]]  
## [1] 0.95945946 0.04054054 0.00000000  
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## [[325]]  
## [1] 0 0 1  
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## [1] 0.1809816 0.8190184 0.0000000  
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## [[332]]  
## [1] 0.4285714 0.5714286 0.0000000  
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## [1] 0.95945946 0.04054054 0.00000000  
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## [[337]]  
## [1] 0.1809816 0.8190184 0.0000000  
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## [[338]]  
## [1] 0.95945946 0.04054054 0.00000000

test\_pred=predict(output\_tree, test\_data)  
  
#confusion matrix  
tab=table(predict(output\_tree), train\_data$service\_rating)  
print (tab)

##   
## 0 1 2  
## 0 161 19 0  
## 1 71 283 0  
## 2 0 0 289

#Accuracy of training data  
sum(diag(tab)/sum(tab))

## [1] 0.890644

#misclassification error  
1-sum(diag(tab)/sum(tab))

## [1] 0.109356

#accuracy of testing data  
test\_pred=predict(output\_tree, newdata=test\_data)  
tab=table(test\_pred,test\_data$service\_rating)  
tab

##   
## test\_pred 0 1 2  
## 0 54 13 0  
## 1 29 111 0  
## 2 0 0 131

sum(diag(tab)/sum(tab))

## [1] 0.8757396

1-sum(diag(tab)/sum(tab))

## [1] 0.1242604