hw3

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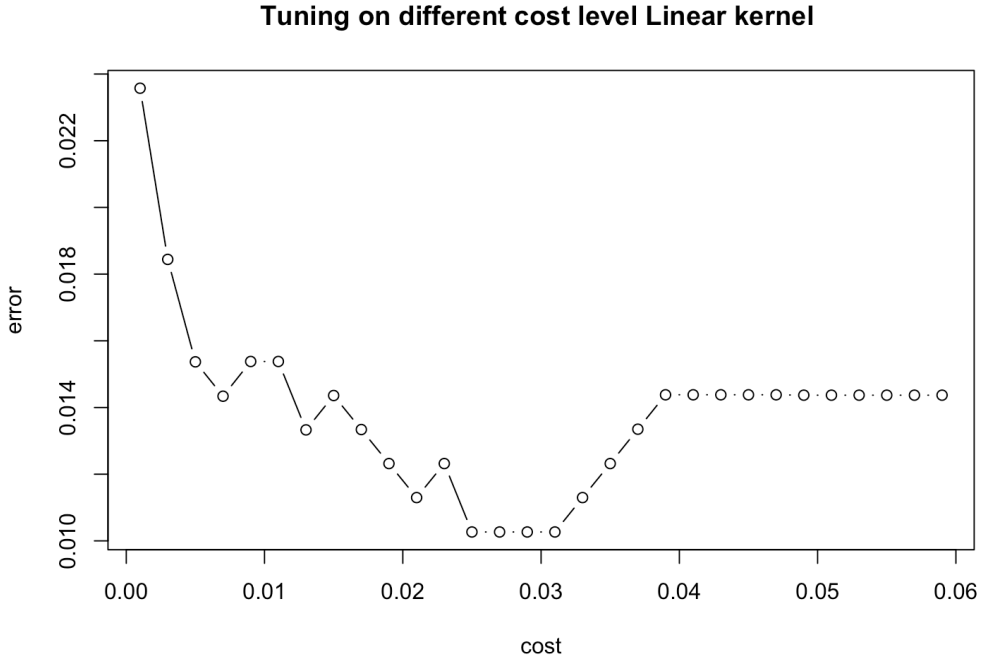
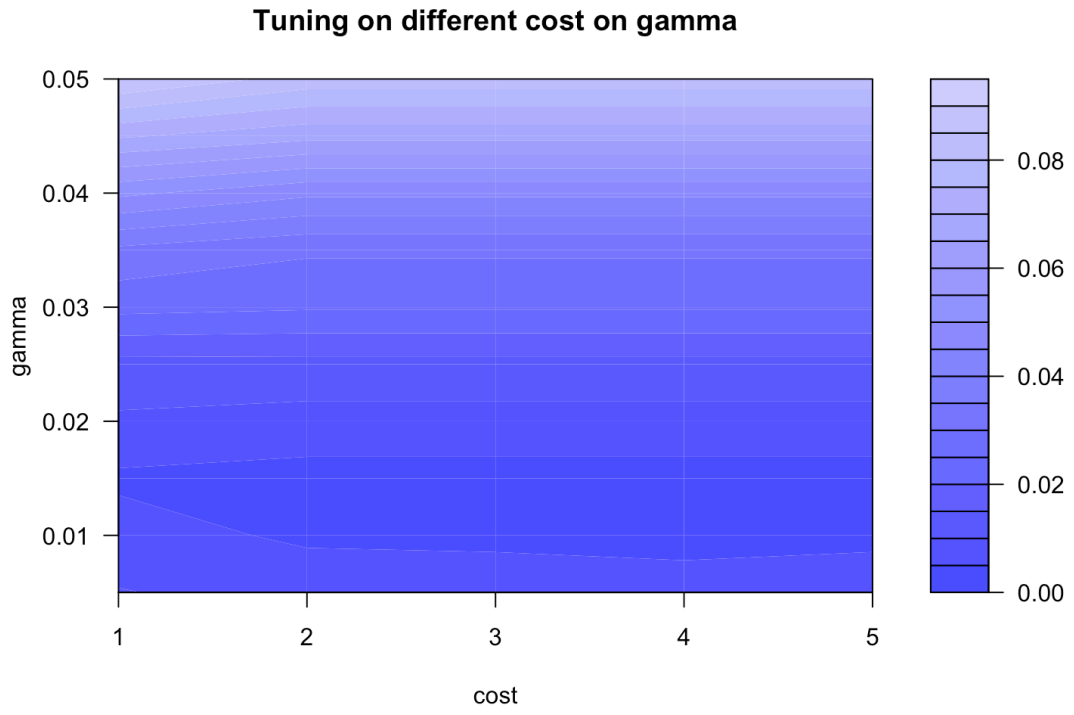
```
library("e1071")
setwd("~/Desktop/2017 spring/GR 5241/HW/hw3")
data5 = read.table("train.5.txt", sep = ",")
data5$y <- rep(1, nrow(data5))
data6 = read.table("train.6.txt", sep = ",")
data6$y <- rep(-1, nrow(data6))

data = rbind(data5, data6)
data$y <- factor(data$y)

#test data & test data
test = data[sample(nrow(data), 0.2*nrow(data)), ]
train = data[sample(nrow(data), 0.8*nrow(data)), ]

#cross validation
#model.c <- svm(y~., data = train, cross= c,kerne = "linear",scale = F)
model_c <- tune.svm(y~., data = train,cost = seq(0.001,0.05,0.002), cros
s = 10 ,kernel = "linear", scale = F)
m_c_fit = model_c$best.model



print(model_c)

## Parameter tuning of ‘svm’:

## sampling method: 10-fold cross validation

## -best parameters:

## cost

## 0.025

## best performance: 0.0102672


plot(model_c,main = "Tuning on different cost level Linear kernel ")
```




```
#Error rate
table1 = table(true = test$y,pred = predict(m_c_fit,test));table1

##     pred
## true  -1   1
##   -1 124   1
##   1    5  118

error = (table1[1,2]+table1[2,1])/nrow(test);error

## [1] 0.008196721

#Train an SVM with soft margin and RBF kernel.
model_rbf <- tune(svm, y ~., data = train,kernel = "radial", ranges  = l
ist(cost = seq(1,5,1),gamma = seq(0.005,0.05,0.005)),scale =F)
plot(model_rbf,type = "contour",main = "Tuning on different cost on gamm
a")

print(model_rbf)

## Parameter tuning of ‘svm’:

## sampling method: 10-fold cross validation

## -best parameters:

## cost gamma

##  2   0.015

## best performance: 0.003071744
```




```
m_rbf_fit = model_rbf$best.model
table2 = table(true = test$y,pred = predict(m_rbf_fit,test));table2

##     pred
## true  -1   1
##   -1 124  12
##   1    0 120

error_2 = (table2[1,2]+table2[2,1])/nrow(test);error

## [1] 0.008196721
```