ASSIGNMENT-10

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Predicting a levee failure:

a) Linear model.

b) Non-Linear model.

Linear Model Analysis:

##fitting to a linear model with cost=10.

>svmfit =svm(as.factor(V1)~., data=a , kernel="linear", cost =10,scale =FALSE )

##summary

Call:

svm(formula = as.factor(V1) ~ ., data = a,

kernel = "linear", cost = 10, scale = FALSE)

Parameters:

SVM-Type: C-classification

SVM-Kernel: linear

cost: 10

gamma: 0.07692308

Number of Support Vectors: 17

( 8 9 )

Number of Classes: 2

Levels:

0 1

##tuning to find the best cost.

>tune.out=tune(svm,as.factor(V1)~.,data=a ,kernel ="linear",ranges =list(cost=c(0.001 , 0.01, 0.1, 1,5,10,100) ))

##finding bestmodel after tuning

> bestmod =tune.out$best.model

##summary

Call:

best.tune(method = svm, train.x = as.factor(V1) ~

., data = a, ranges = list(cost = c(0.001,

0.01, 0.1, 1, 5, 10, 100)), kernel = "linear")

Parameters:

SVM-Type: C-classification

SVM-Kernel: linear

cost: 1

gamma: 0.07692308

Number of Support Vectors: 50

( 24 26 )

Number of Classes: 2

Levels:

0 1

##accuracy of the model

> svmfit1 =svm(as.factor(V1)~., data=train , kernel="linear", cost =0.1,scale =FALSE )

##predict

> ypred=predict(svmfit1 ,test )

##table

truth

predict 0 1

0 5 3

1 5 5

Non-Linear Model Analysis:

##tuning to find the best cost

> tune.out=tune(svm , V1~., data=train, kernel ="radial",ranges =list(cost=c(0.1 ,1 ,10 ,100 ,1000),gamma=c(0.5,1,2,3,4) ))

##finding the best cost after tuning

bestmod =tune.out$best.model

##summary

best.tune(method = svm, train.x = V1 ~ .,

data = train, ranges = list(cost = c(0.1,

1, 10, 100, 1000), gamma = c(0.5,

1, 2, 3, 4)), kernel = "radial")

Parameters:

SVM-Type: eps-regression

SVM-Kernel: radial

cost: 1

gamma: 0.5

epsilon: 0.1

Number of Support Vectors: 52

##accuracy of the model

> svmfit1 =svm(as.factor(V1)~., data=train , kernel="radial",gamma=0.5, cost =1,scale =FALSE )

##predict

> ypred=predict(svmfit1 ,test )

##table

table(predict =ypred , truth= test$V1 )

truth

predict 0 1

0 0 0

1 10 8