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Experiment 6

AIM: Write a program to perform weather forecasting using R using svm

Code:

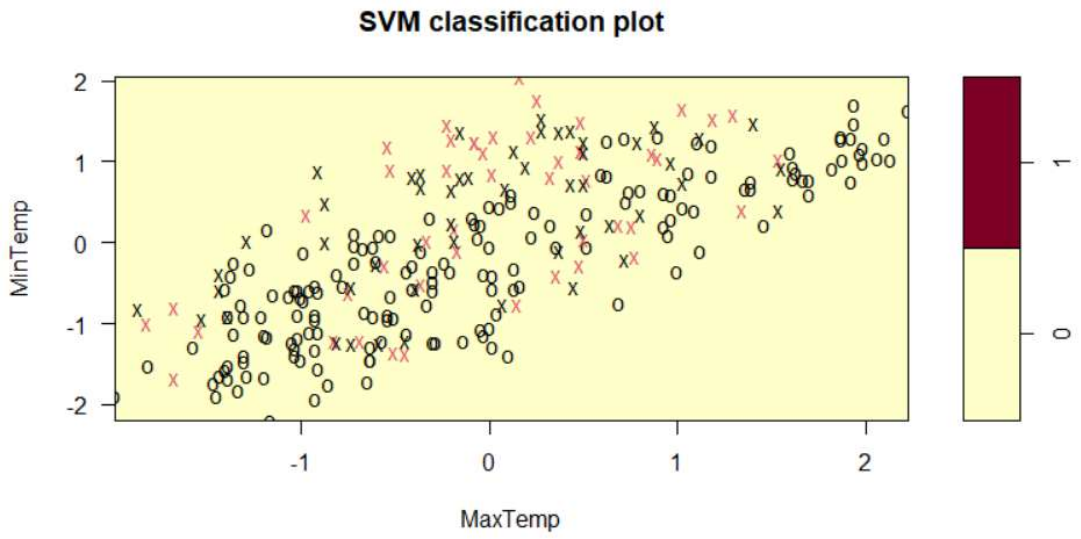
```
data<-read.csv("weather.csv")
summary(data)
head(data)
apply(apply(data,2,is.na),2,sum)
data<-na.omit(data)
data$RainTomorrow[data$RainTomorrow =='Yes']<-1
data$RainTomorrow[data$RainTomorrow =='No']<-0
data$RainTomorrow<-factor(data$RainTomorrow, levels = c(0, 1))
set.seed(123)
data<-data[c(3,4,24)]
data[-3]=scale(data[-3])
data2=sample.split(data$RainTomorrow,SplitRatio=0.80)
traindata<-subset(data,data2==TRUE)
testdata<-subset(data,data2==FALSE)
```

SVM with Linear kernel

```
model1<-svm(formula=RainTomorrow ~ .,data = traindata,type="C-classification",kernel="linear")
summary(model1)
pred1<-predict(model1,newdata=testdata[-3])
pred1
tab1<-table(testdata[,3],pred1)
tab1
plot(model1,traindata)
```

OUTPUT:

```
> summary(model1)

Call:
svm(formula = RainTomorrow ~ ., data = traindata, type = "C-classification",
    kernel = "linear")


Parameters:
   SVM-Type:  C-classification
 SVM-Kernel:  linear
       cost:  1

Number of Support Vectors:  100

 ( 48 52 )


Number of Classes:  2

Levels:
 0 1



> pred1<-predict(model1,newdata=testdata[-3])
> pred1
  4   9  10  12  13  14  30  34  37  38  39  40  51  63  65  66  70  73  74  77  81
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 89  91 100 107 108 109 112 113 118 126 153 160 162 172 173 178 182 189 195 219 220
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
224 233 242 245 259 262 271 280 281 282 283 285 292 298 324 326 328 331 341 353 354
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
357 358 365
  0   0   0
Levels: 0 1
> tab1<-table(testdata[,3],pred1)
> tab1
   pred1
     0  1
  0 54  0
  1 12  0
> plot(model1,traindata)
```



SVM WITH RADIAL KERNAL

model2<-svm(formula=RainTomorrow~.,data = traindata,type="C-classification",kernel="radial")

summary(model2)

pred2<-predict(model2,newdata=testdata[-3])

pred2

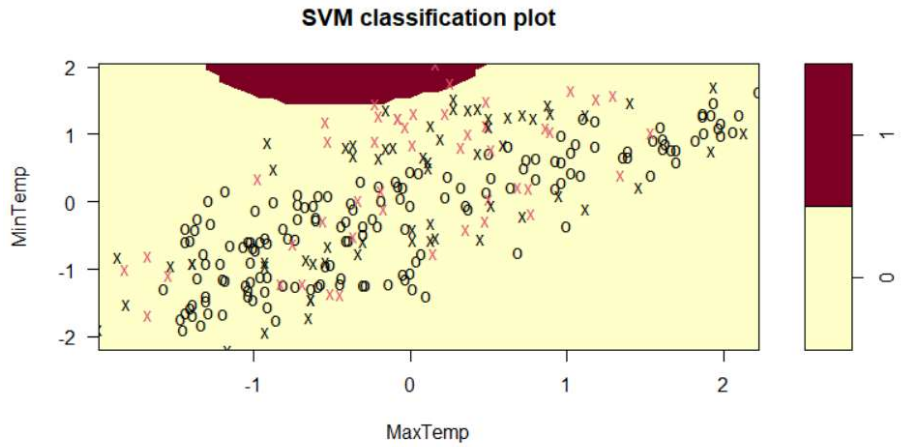
tab2<-table(testdata[,3],pred2)

tab2

plot(model2,traindata)

OUTPUT:

```
> summary(model2)

Call:
svm(formula = RainTomorrow ~ ., data = traindata, type = "C-classification",
    kernel = "radial")


Parameters:
   SVM-Type:  C-classification
 SVM-Kernel:  radial
       cost:  1

Number of Support Vectors:  110

 ( 48 62 )


Number of Classes:  2

Levels:
 0 1


> pred2<-predict(model2,newdata=testdata[-3])
> pred2
  4   9  10  12  13  14  30  34  37  38  39  40  51  63  65  66  70  73  74  77  81
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 89  91 100 107 108 109 112 113 118 126 153 160 162 172 173 178 182 189 195 219 220
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
224 233 242 245 259 262 271 280 281 282 283 285 292 298 324 326 328 331 341 353 354
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
357 358 365
  0   0   0
Levels: 0 1
> tab2<-table(testdata[,3],pred2)
> tab2
   pred2
     0  1
  0 54  0
  1 12  0
> plot(model2,traindata)
```



SVM WITH POLYNOMIAL KERNAL

model3<-svm(formula=RainTomorrow~.,data = traindata,type="C-classification",kernel="polynomial")

summary(model3)

pred3<-predict(model3,newdata=testdata[-3])

pred3

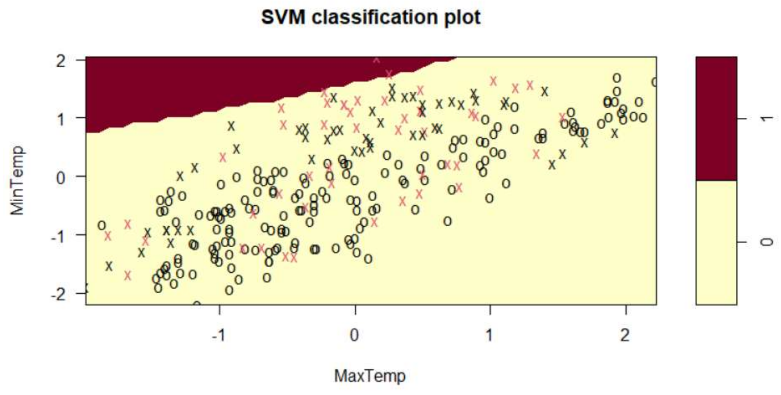
tab3<-table(testdata[,3],pred3)

tab3

plot(model3,traindata)

OUTPUT:

```
Call:
svm(formula = RainTomorrow ~ ., data = traindata, type = "C-classification",
    kernel = "polynomial")


Parameters:
   SVM-Type:  C-classification
 SVM-Kernel:  polynomial
       cost:  1
     degree:  3
     coef.0:  0

Number of Support Vectors:  98

 ( 48 50 )


Number of Classes:  2

Levels:
 0 1



> pred3<-predict(model3,newdata=testdata[-3])
> pred3
  4   9  10  12  13  14  30  34  37  38  39  40  51  63  65  66  70  73  74  77  81
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 89  91 100 107 108 109 112 113 118 126 153 160 162 172 173 178 182 189 195 219 220
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
224 233 242 245 259 262 271 280 281 282 283 285 292 298 324 326 328 331 341 353 354
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
357 358 365
  0   0   0
Levels: 0 1
> tab3<-table(testdata[,3],pred3)
> tab3
   pred3
     0  1
  0 54  0
  1 12  0
> plot(model3,traindata)
>
```



SVM WITH SIGMOID KERNAL

model4<-svm(formula=RainTomorrow~.,data = traindata,type="C-classification",kernel="sigmoid")

summary(model4)

pred4<-predict(model4,newdata=testdata[-3])

pred4

tab4<-table(testdata[,3],pred4)

plot(model4,traindata)

OUTPUT:

```
> model4<-svm(formula=RainTomorrow~.,data = traindata,type="C-classification",kernel="si
gmoid")
> summary(model4)

Call:
svm(formula = RainTomorrow ~ ., data = traindata, type = "C-classification",
    kernel = "sigmoid")


Parameters:
   SVM-Type:  C-classification
 SVM-Kernel:  sigmoid
       cost:  1
      coef.0:  0

Number of Support Vectors:  95

 ( 47 48 )


Number of Classes:  2

Levels:
 0 1


> pred4<-predict(model4,newdata=testdata[-3])
> pred4
  4   9  10  12  13  14  30  34  37  38  39  40  51  63  65  66  70  73  74  77  81
  1   0   0   0   0   0   0   0   0   0   0   0   1   0   0   1   1   1   1   0
 89  91 100 107 108 109 112 113 118 126 153 160 162 172 173 178 182 189 195 219 220
  1   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   1   0   0   0
224 233 242 245 259 262 271 280 281 282 283 285 292 298 324 326 328 331 341 353 354
  1   1   0   1   0   0   0   0   0   0   0   0   0   0   0   0   1   0   0   0   0
357 358 365
  0   0   0
Levels: 0 1
> tab4<-table(testdata[,3],pred4)
> plot(model4,traindata)
>
```