Support Vector Machines LAB

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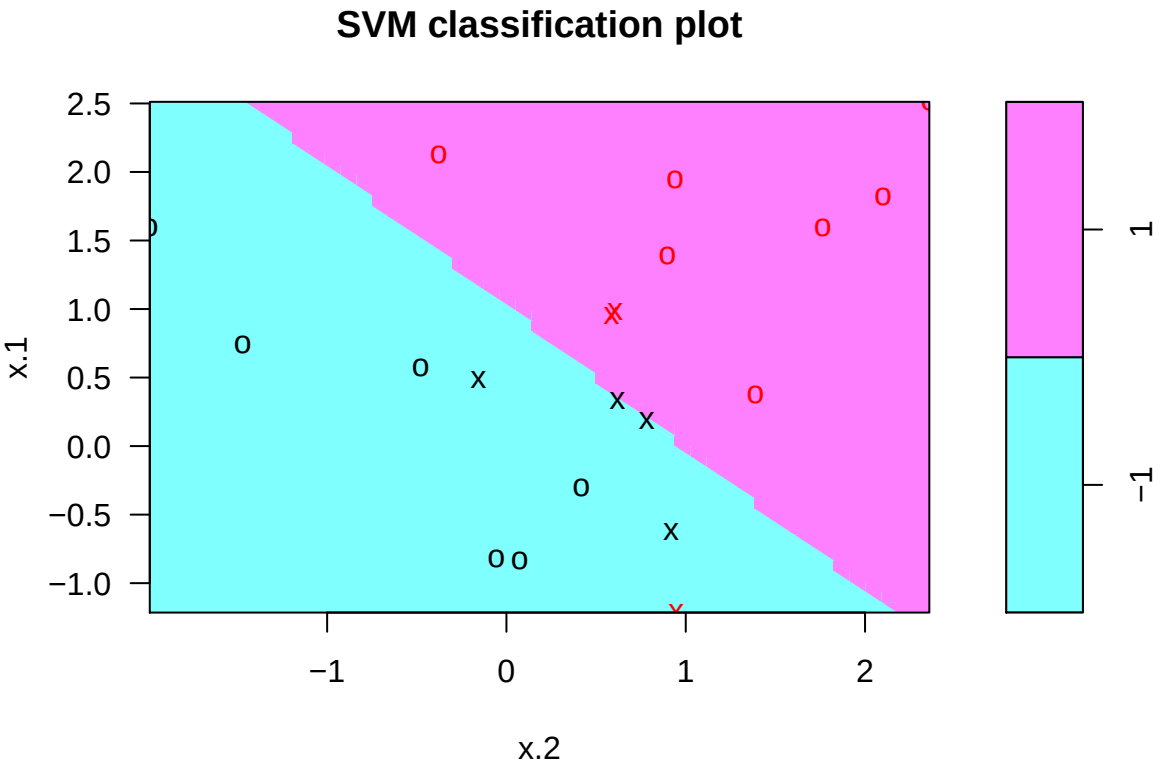
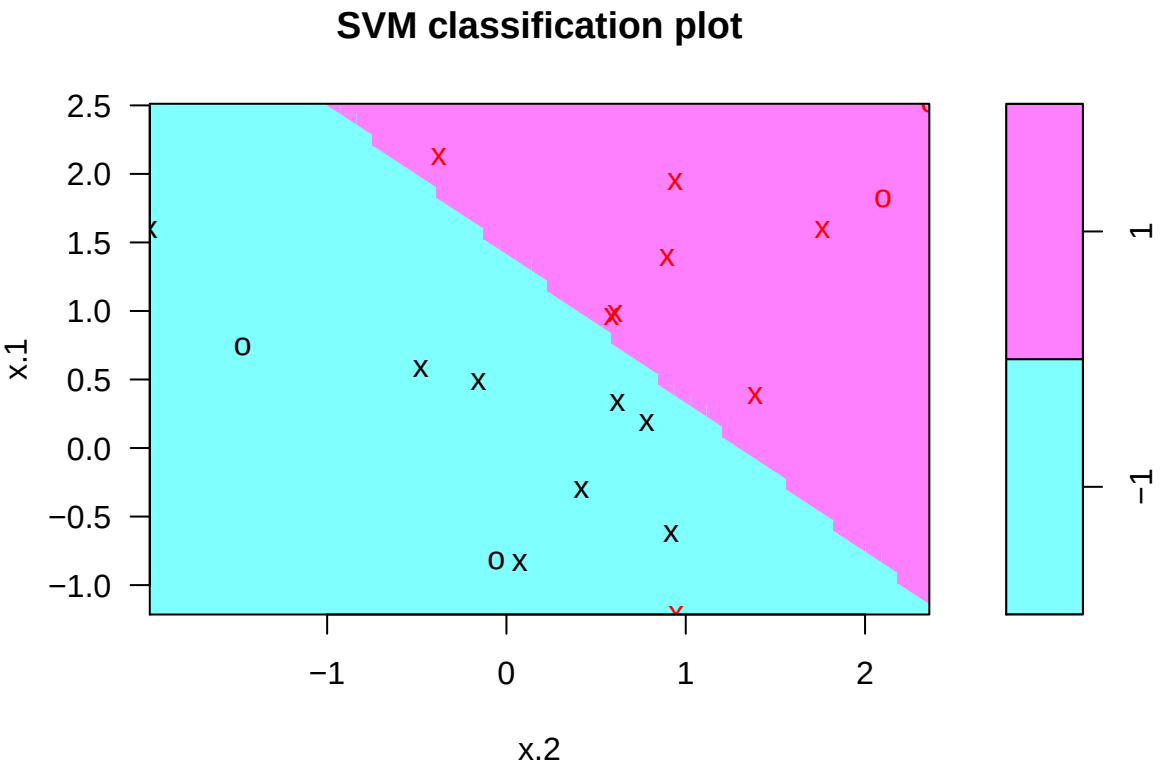
Support Vector Classifier

The code below is an implementation in R language extracted from **Introduction to Statistical Learning with applications in R** which reproduces a Support Vector Classifier.

The dataset is randomically generated and the two class classifier is plotted as regions in light blue and purple. The crosses in the graph represents the support vectors and the circles are all remaining observations.



When the cost is 0.1, The relationship is: As smaller value of cost, wider margin.



Performing Cross Validation with tune

```
set.seed(1)
tune.out = tune(svm, y~., data=dat, kernel="linear",
ranges= list(cost=c(0.001, 0.01,0.1,1,5,10,100)))
bestmod = tune.out$best.model
xtest = matrix(rnorm(20*2), ncol=2)
ytest = sample(c(-1,1), 20, rep=TRUE)
xtest [ytest ==1, ] = xtest[ytest==1,]+1
testdat = data.frame(x=xtest, y =as.factor(ytest))
ypred = predict(bestmod, testdat)
table(predict=ypred, truth=testdat$y)
```