**Lab\_10- NWACHUKWU\_OGOCHUKWU\_GLORIA**

**6000\_LEVEL**

**NOTE**

A graph with numbers and dots

Description automatically generated

Checked whether the classes are linearly separable using the plot, They are not.

A diagram of a plot

Description automatically generated with medium confidence

The region of feature space assigned to the −1 class is shown in light colour, and the other region is assigned to the +1 class is shown in the darker colour.

The decision boundary between the two classes is linear (because we used the argument kernel="linear"), though due to the way in which the plotting function is implemented in this

library the decision boundary looks somewhat jagged in the plot. We see that in this case only one observation is misclassified.

The support vectors are plotted as crosses and the remaining observations are plotted as circles; we see here that there are seven support vectors.

Used summary(svmfit) to obtain some basic information about the support vector classifier

Parameters:

SVM-Type: C-classification

SVM-Kernel: linear

cost: 10

Number of Support Vectors: 7

( 4 3 )

This tells us, for instance, that a linear kernel was used with cost=10, and that there were seven support vectors, four in one class and three in the other

A diagram of a plot

Description automatically generated

I used a smaller value of the cost parameter that is cost = 0.1. You could see the difference with the one above i.e cost = 10. Now that a smaller value of the cost (cost

=0.1) parameter is being used, we have obtain a larger number of support vectors, because the margin is now wider.

A graph with red dots

Description automatically generated

Now the observations are just barely linearly separable. We fit the support vector classifier and plot the resulting hyperplane, using a very large value of cost so that no observations are misclassified.

A diagram of a plot

Description automatically generated