NATIONAL UNIVERSITY OF SINGAPORE

BT5152: Decision Making Technology for Business | Assignment 5

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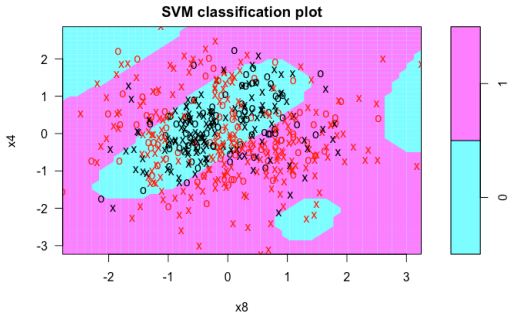
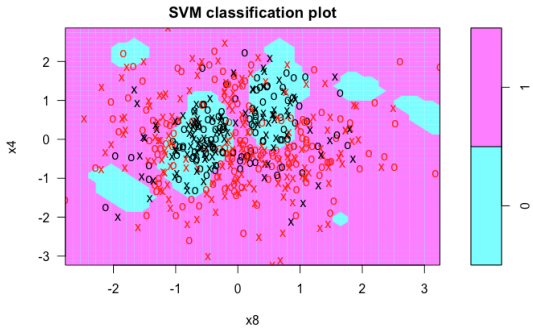
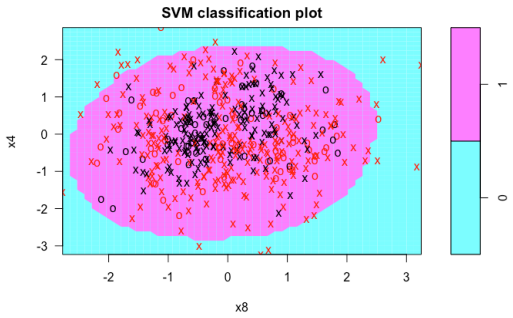
Q1 SVM – Polynomial Kernel on Test Data



Q1 SVM – RBF Kernel on Test Data



Q1 SVM – Sigmoid Kernel on Test Data



Tuning was done for each of the kernels by tweaking parameters by verifying with the below formulae

linear: $u'v$
polynomial: $(\gamma u'v + coef0)^{degree}$
radial basis: $e^{(} - \gamma|u - v|^2)$
sigmoid: $tanh(\gamma u'v + coef0)$

Model Results

Tuned SVM Model Name	Training Accuracy	Test Accuracy
Polynomial Kernel	0.708	0.692
RBF Kernel	0.829	0.822
Sigmoid Kernel	0.596	0.558

RBF Kernel seems to perform the best out of the 3 kernels.

Comparison with other models tried in A3

Model Name	L1 Training Data Accuracy	Test Data Accuracy
C50	0.741	0.753
KNN	0.621	0.593
Random Forest with post-pruned rpart	0.733	0.750
Stacked Model with GLM as Metaclassification model	0.751	0.760

On comparison with the algorithms tried in A3, RBF Kernel seems to perform equally well to the stacked model if not better. Hence RBF kernel could be an addition to the stacked model to improve the accuracy further.