

# Challenge 5 :- SVM Classification

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**Abstract-** Goal of this challenge is to classify 2- dimensional data using SVM(Support Vector Machines).

## I. INTRODUCTION

Train and test data set both consist of 200 data points. Every data point has 3 columns ('feature 0', 'feature 1' and 'Class'). 'Feature 0' and 'Feature 1' are being used as predictors to predict response that is 'Class'. Class takes a binary value(0 or 1). Both the classes are almost equally distributed as we can see in fig.1. So we don't have to worry about imbalance class problem.

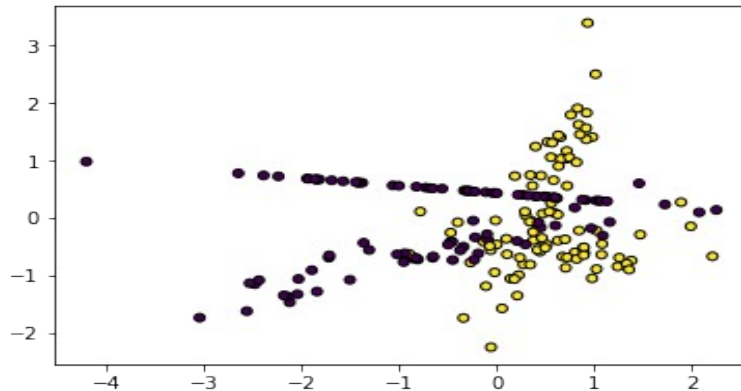


Fig.1:- Distribution of Training Data

## II. MODEL SELECTION AND TUNING

### A. Model Selection

SVM is being trained using 3 different classifiers namely linear, polynomial and radial basis function(rbf) with keeping other default specifications as it is and changing soft margin parameter  $C=1$ . We see that polynomial, linear and rbf gives an score of 0.82 , 0.79 and 0.84 respectively.

### B. Parameter Tuning

After selecting rbf as the best classifier from model selection we can do GridSearchCv which uses validation classification accuracy as the objective function and we optimize over C and gamma . The optimum value of C and gamma came out to be 3.5172 and 3.242 respectively. Score corresponding to these values is 0.91 and the boundaries are shown in Fig.2.

Fig.2:-Final Decision boundary using RBF

