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First build basic SVM which was designed initially to do binary classification To separate data to +1 and -1 depending on the function $f(x) = W^{'} basis(x) + b$ use a kernel instead of the basic formula. $f(x) = sum(\alpha * y * kernel(x_i, x))$

one v Rest

The accuracy is 95.0%

For one vs all SVM, i had to first segment all the data in partitions labeled as 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. After that, build pairs of data. form 0 to 9 versus all. Then I use SVM to train each pair and inputted testing data then get the values returned by f(x) each time.

one v one

The accuracy is 95.2%

some of parts of dealing with the data is similar with 'one v Rest'.I build pairs of data 01 , 02 , 03 ... 89 which is in total 45 pairs. for every pair, i had to classify in +1 and -1. then I trained my SVM which each individual pairs. The decision happens by majority vote. The label that appears the most for each testing data is assigned to it.

DAG

The accuracy is 95.0%

Firstly, all the data in partitions labeled as 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Totally I build 46 pairs. The process is similar with one v one. The end of decision is done based on a decision tree.