

Programming Assignment 3

Logistic Regression and SVM

Group-40

Sahil Dureja - 50168872

Priyanka Singh - 50169994

Ajay Partap Singh - 50169802

1) Logistic Regression-One vs All Strategy

Results:

Training set Accuracy:86.208%

Validation set Accuracy:85.32%

Testing set Accuracy:85.34%

2) Logistic Regression-Direct Multi-Class Strategy (Extra Credit)

Results:

Training set Accuracy:93.39%

Validation set Accuracy:92.43%

Testing set Accuracy:92.67%

3) SVM

Case 1: Linear Kernel

Training set Accuracy:97.286%

Validation set Accuracy:93.64%

Testing set Accuracy:93.78%

Case 2: Radial basis function with value of gamma setting to 1

Training set Accuracy:100.0%

Validation set Accuracy:15.48%

Testing set Accuracy:17.14%

Case 3: Using radial basis function with value of gamma setting to default (all other parameters are kept default).

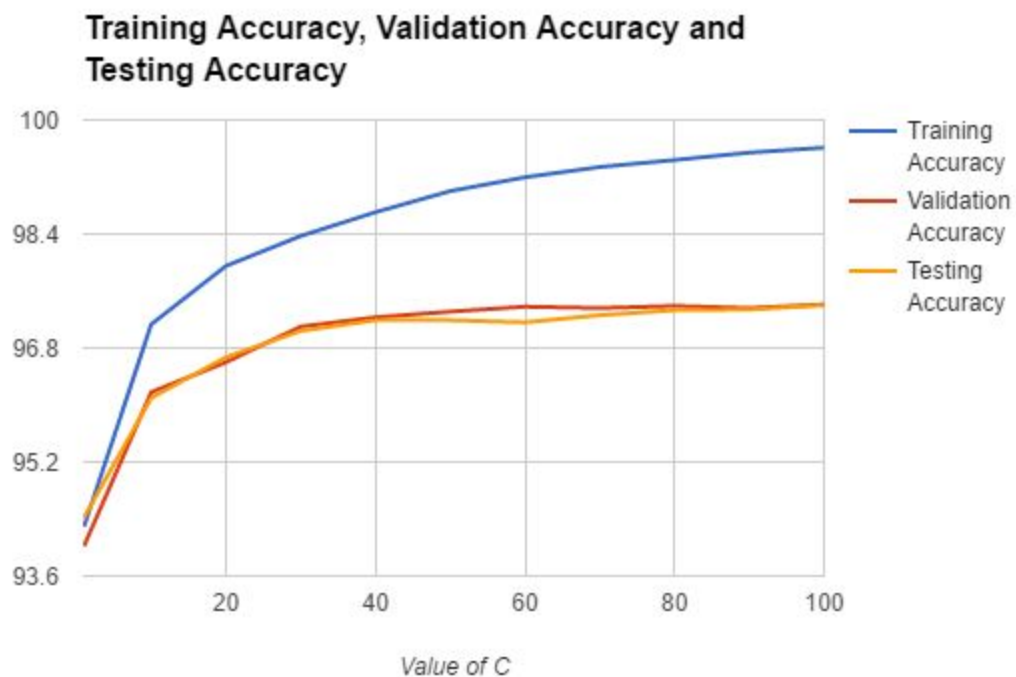
Training set Accuracy:94.294%

Validation set Accuracy:94.02%

Testing set Accuracy:94.42%

Case 4: Using radial basis function with value of gamma setting to default and varying value of C (1; 10; 20; 30; ; 100)

Value of C	Training Accuracy	Validation Accuracy	Testing Accuracy
1	94.294	94.02	94.42
10	97.132	96.18	96.1
20	97.952	96.6	96.67
30	98.372	97.1	97.04
40	98.706	97.23	97.19
50	99.002	97.31	97.19
60	99.196	97.38	97.16
70	99.34	97.36	97.26
80	99.438	97.39	97.33
90	99.542	97.36	97.34
100	99.612	97.41	97.4



As we can see from the graph the the prediction accuracies increase by increasing the value of C but the growth is slow after initial values of C. The validation and testing accuracies have almost the similar trend. Also testing and validation accuracies almost converge to same point in the end.