CSCI B-555: Machine Learning
Programming Project 1 Report

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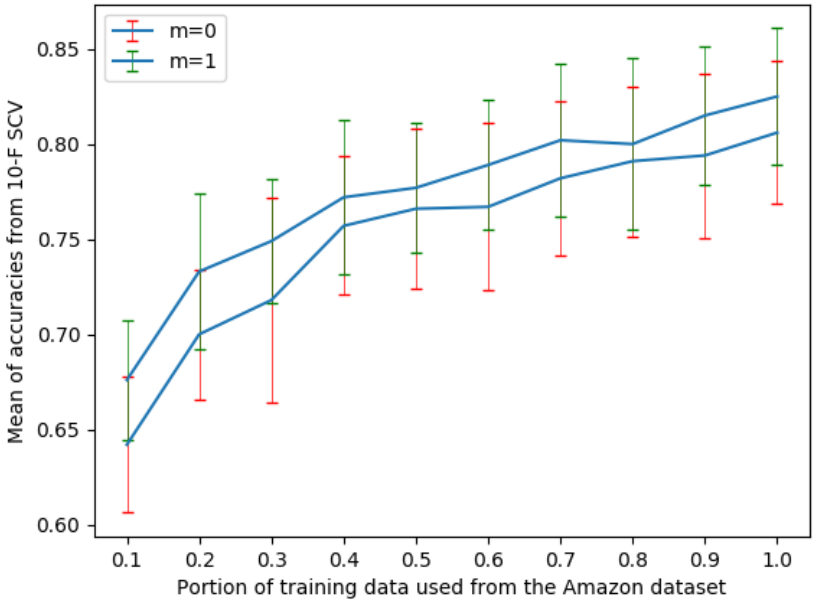
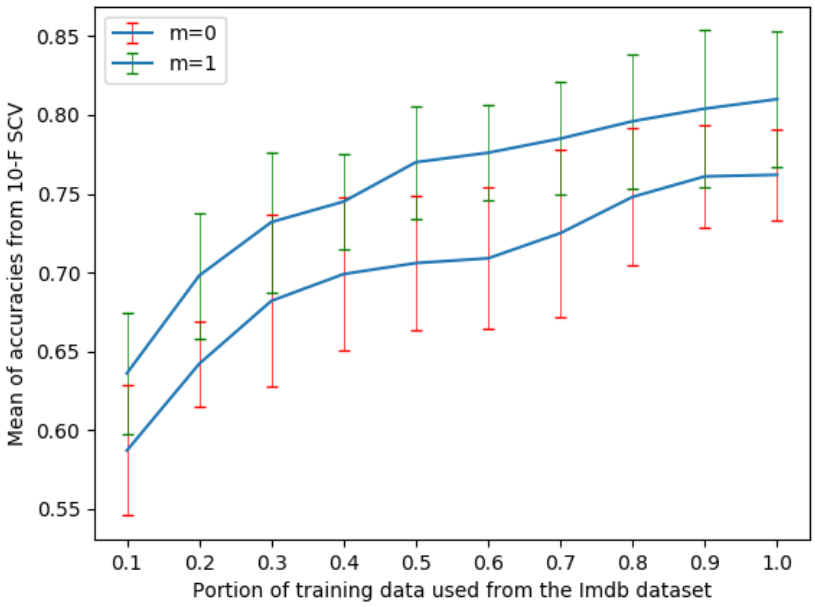
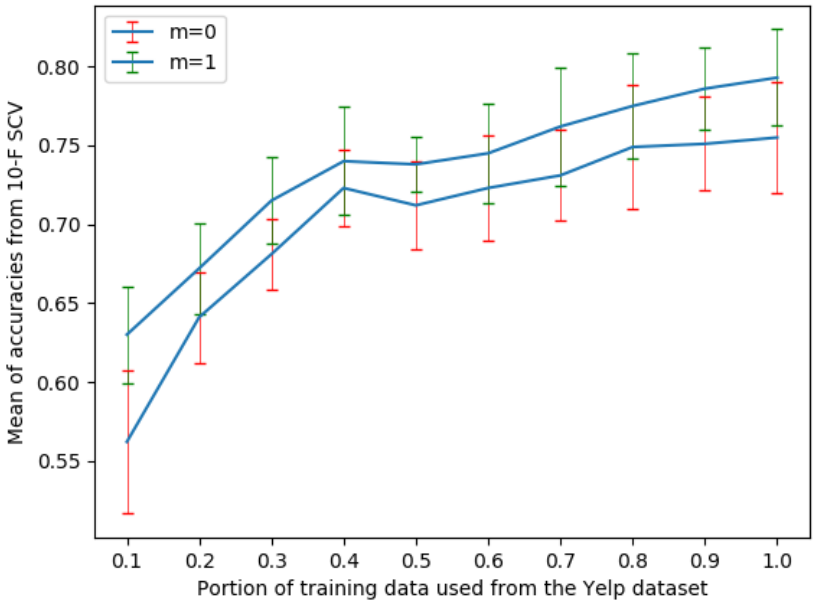
Experiment 1

1. With the results of the first experiment, we see that the accuracy of our classifier increases with more data.
2. The standard deviation of the measured accuracies reduce when we use more data and are higher when we use lesser data.

Thus we can make the following conclusion: Increasing the number of train samples tends to increase accuracy in a general sense (unless the classifier is trained to its best potential).



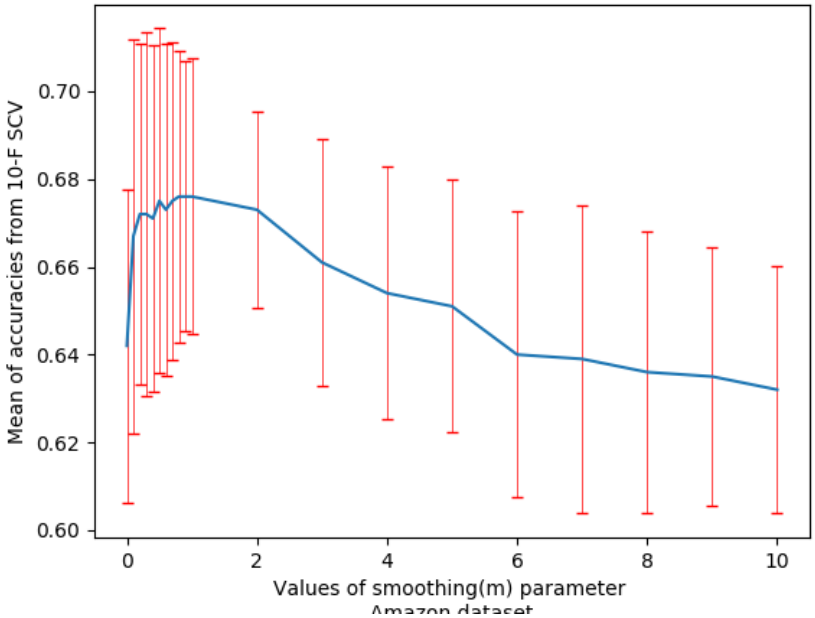


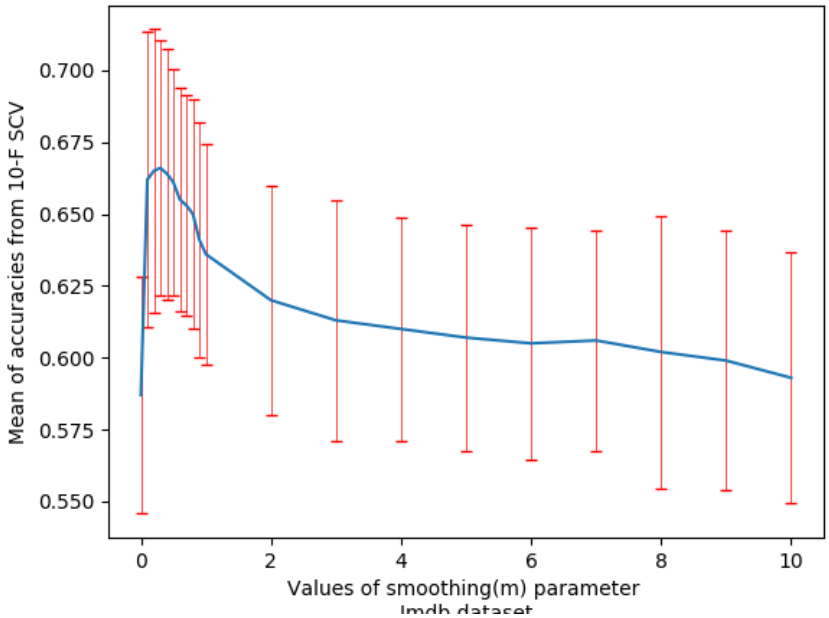


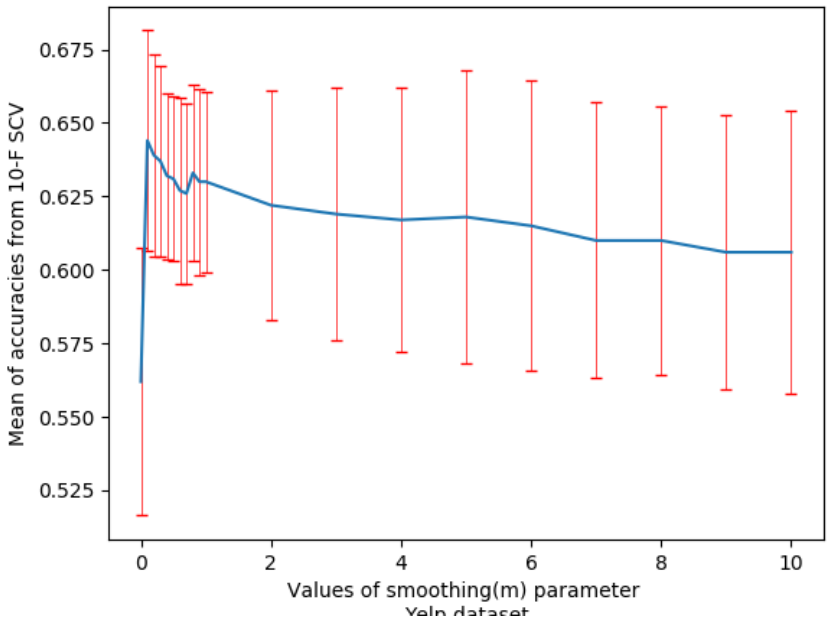
Experiment 2

1. With the results of the second experiment, we can observe that the smoothing parameter really helps the accuracy in the range of 0.1 - 1
2. Too great of a smoothing parameter would introduce bias in the distribution of data and hence we have lesser accuracies after $m = 1$.

Thus, we can make the following statement: It is good to have a prior that makes your data smoother, but only as long as the bias it introduces does not negatively affect the classifier.


Mean of accuracies from 10-F SCV
0.70
0.68
0.66
0.64
0.62
0.60
0
2
4
6
8
10
Values of smoothing(m) parameter


Mean of accuracies from 10-F SCV
0.700
0.675
0.650
0.625
0.600
0.575
0.550
0
2
4
6
8
10
Values of smoothing(m) parameter


0.675
0.650
0.625
0.600
0.575
0.550
0.525
Mean of accuracies from 10-F SCV
0
2
4
6
8
10
Values of smoothing(m) parameter
Yelp dataset