

Logistic Regression:

Single Class:

Threshold = 0.5

Error Tolerance	Learning Rate	Accuracy
30	0.1	0.9907
20	0.1	0.9912
15	0.1	0.9911
10	0.1	0.9905
10	0.01	0.9875
8	0.01	0.9904
5	0.01	0.9907
2	0.01	0.9912

We see that as we decrease the Error Tolerance, for the same value of Learning Rate, the accuracy increases. Whereas, if we decrease the Learning Rate, for the same value of Error Tolerance, the accuracy also decreases.

We can change the Threshold and the run the experiment to know more about the model.

Multi Class:

Error Tolerance	Learning Rate	Accuracy
30	0.02	0.8573
20	0.02	0.8797
15	0.02	0.8899
8	0.02	0.8901
30	0.01	0.8345
20	0.01	0.8524
10	0.01	0.8866
8	0.01	0.8940

We see that as we decrease the Learning Rate, for the same value of Error Tolerance, the accuracy increases. Whereas, if we decrease the Error Tolerance, for the same value of Learning Rate, the accuracy increases.