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logistic regression testing...
max iteration testcase0: Train accuracy: 0.998719, Test accuracy: 0.990566
max iteration testcase1: Train accuracy: 0.971813, Test accuracy: 0.931604
max iteration testcase2: Train accuracy: 0.880205, Test accuracy: 0.839623
max iteration testcase3: Train accuracy: 0.848815, Test accuracy: 0.813679
learning rate testcase0: Train accuracy: 0.880846, Test accuracy: 0.839623
learning rate testcase1: Train accuracy: 0.848815, Test accuracy: 0.813679
learning rate testcase2: Train accuracy: 0.843690, Test accuracy: 0.808962
logistic regression test done.
3rd order logistic regression testing...
max iteration testcase0: Train accuracy: 0.937860, Test accuracy: 0.891509
max iteration testcase1: Train accuracy: 0.852659, Test accuracy: 0.818396
max iteration testcase2: Train accuracy: 0.759129, Test accuracy: 0.740566
max iteration testcase3: Train accuracy: 0.718129, Test accuracy: 0.702830
learning rate testcase0: Train accuracy: 0.759129, Test accuracy: 0.740566
learning rate testcase1: Train accuracy: 0.718129, Test accuracy: 0.702830
learning rate testcase2: Train accuracy: 0.675208, Test accuracy: 0.653302
3rd order logistic regression test done.

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This project was to simulate the logistic regression algorithm. As seen above, we were able to show that through a number of iterations, a training accuracy of 99.9% was acquired. However, as the iterations progressed with the test cases, we find that the accuracy decreased over time; resulting in 84% accuracy. This is because the learning rate was not adjusted per test, resulting in a miss graphically as we were unable to obtain the definite point.

In the 3rd order logistic regression test, we find that our test accuracy dropped to a final of a 71%. This is because of the trade-off. While the 3rd order logistic regression provides a better way to identify, its downside is the approximation- generalization. Basically, this shortcoming results in an inaccurate test result.

In the end, I believe using the logistic regression without the 3rd order is a more fitting solution for the algorithm based on the resulting simulation.