

Project 2 - Nicholas Gustafson

This model is based off of all combinations of values to the power of 8. So there are 80 different numbers computed and then we use gradient descent to figure out the best weights with this model. The reason why I choose not to use the power of 9 or 10 is because there is no added benefit revealed in the results from raising the complexity. I also want at least 100 iterations to bring down the J value before I start checking for convergence.

I had my alpha at 0.001 but I slowly increased it to 3 to achieve convergence at a faster rate. To get to convergence, the model only needed 100 iterations.

Final J on test set: 0.37348343585019006

Predicted Class			
Actual Class		N	Y
	N	14	2
	Y	4	15

The final result is a fairly accurate, but not a perfect model for the problem.

Accuracy: 0.8285714285714286

Precision: 0.8823529411764706

Recall: 0.7894736842105263

F1: 0.8333333333333334

	Initial values	Final values
Weights	0	[[2.14129294e+00] [1.68340502e+00] [-3.92032919e+00] [1.05143345e+00] [-2.44399555e+00] [1.84536375e-01] [-1.59793751e+00] [-2.18375109e-01] [-1.11535849e+00] [2.58822880e+00] [-2.22495281e+00] [-1.28634886e+00] [6.86327726e-02] [-6.09792104e-01] [1.81360962e-01] [-2.46677451e-01] [1.46371417e-01] [-8.97183300e-02] [-2.58167791e+00] [-7.69836253e-01] [-1.49827014e+00] [4.28604448e-02] [-7.02660520e-01] [-1.52673582e-02] [-3.59315077e-01] [-5.20543218e-02] [-2.04577777e-01] [-1.47407518e-01] [-8.59223583e-01] [-7.98918058e-01] [5.55039798e-02] [-3.29024138e-01] [5.05577402e-02] [-1.29909683e-01] [2.74837211e-02] [-5.30165772e-02] [-1.66681405e+00] [-7.19089348e-01] [-7.19680767e-01] [-9.25037984e-03] [-3.03543184e-01] [-1.15101980e-02] [-1.36330746e-01] [-2.07653210e-02] [-6.98468201e-02] [-5.38493810e-01] [-5.67044310e-01] [-4.59213273e-01] [3.18209612e-02] [-1.79465762e-01] [2.01384405e-02] [-6.77433775e-02] [6.10438075e-03] [-2.79072944e-02] [-1.15860294e+00] [-5.31762156e-01] [-3.87610486e-01] [1.13731070e-02] [-1.52988157e-01] [4.10069097e-03] [-6.09157314e-02] [-5.06087235e-03] [-2.80664951e-02] [-5.99988008e-01] [-4.23177816e-01] [-2.73539840e-01] [2.98589699e-02] [-1.04096524e-01] [1.52554182e-02] [-3.65330012e-02] [3.55685730e-03] [-1.42634301e-02] [-8.87345129e-01] [-4.05226996e-01] [-2.28717065e-01] [2.21335742e-02] [-8.77044076e-02] [1.01788931e-02] [-3.11726609e-02] [5.59187841e-04] [-1.27564811e-02]]
J Value	0.662425186274993	0.382203136944717

