Assignment 1 Report

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Data Preprocessing:

For data pre-processing phase I ran my perceptron numerous times and then changed the weights based on the best achievable score in the test phase.

Design:

The design is 5 input nodes, 4 for the data read from the input files and one for the bias and there is only one output Node. The bias is set to 1 and the learning rate is set to 0.01.

Justifications:

ANN Architecture - The design for the input nodes was based on the requirement for 4 inputs and a bias while the single output node was decided upon to simplify the finale classification of data. I was able to achieve a high level of accuracy before implementing output nodes so I decided it was not needed to change the design. The decision for the perceptron is by basing my decision on a single output where if output < 0.5 = setosa, if between 0.5 and 1.5 = versicolor, if above 1.5 = virginica.

Bias and Learning Rate - The learning rate and the bias were settled on based on running the program a few times and whichever combination resulted in the fewest drastic disparities between test while remaining high. Particularly for the learning rate I found that a smaller rate had too little effect while bigger learning rates made the output drastically smaller or bigger.

Part A - No Pocket

No Pocket Finale Weights:

[[0.16761088],[-0.11179888],[0.0886204],[0.72547367],[-0.71691523]]

Training Confusion Matrix:

3722	278	0	0.93
48-	2245	1275	0.56
1	1124	2876	0.72
0.89	0.62	0.69	0.74

Test Confusion Matrix:

10	0	0	1.0
0	8	0	1.0
0	2	10	0.83
1	0.8	1	0.93

Part B - Pocket Algorithm

Training Confusion Matrix:

3706	294	0	0.93
301	3484	215	0.87
0	906	3094	0.77
0.92	0.74	0.94	0.86

Test Confusion Matrix:

10	0	0	1.0
0	10	3	0.77
0	0	7	1.0
1.0	1.0	0.7	0.9

Pocket Finale Weights:

[[-0.22737348], [-0.10641548], [0.2631322], [0.76722179], [0.74099371]]