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CS3600

Project 4B Analysis

Q5

Car Results

- Max: 0.867147
- Average: 0.858246
- StdDev: 0.009362

Pen Results

- Max: 0.911378
- Average: 0.903488
- StdDev: 0.006718

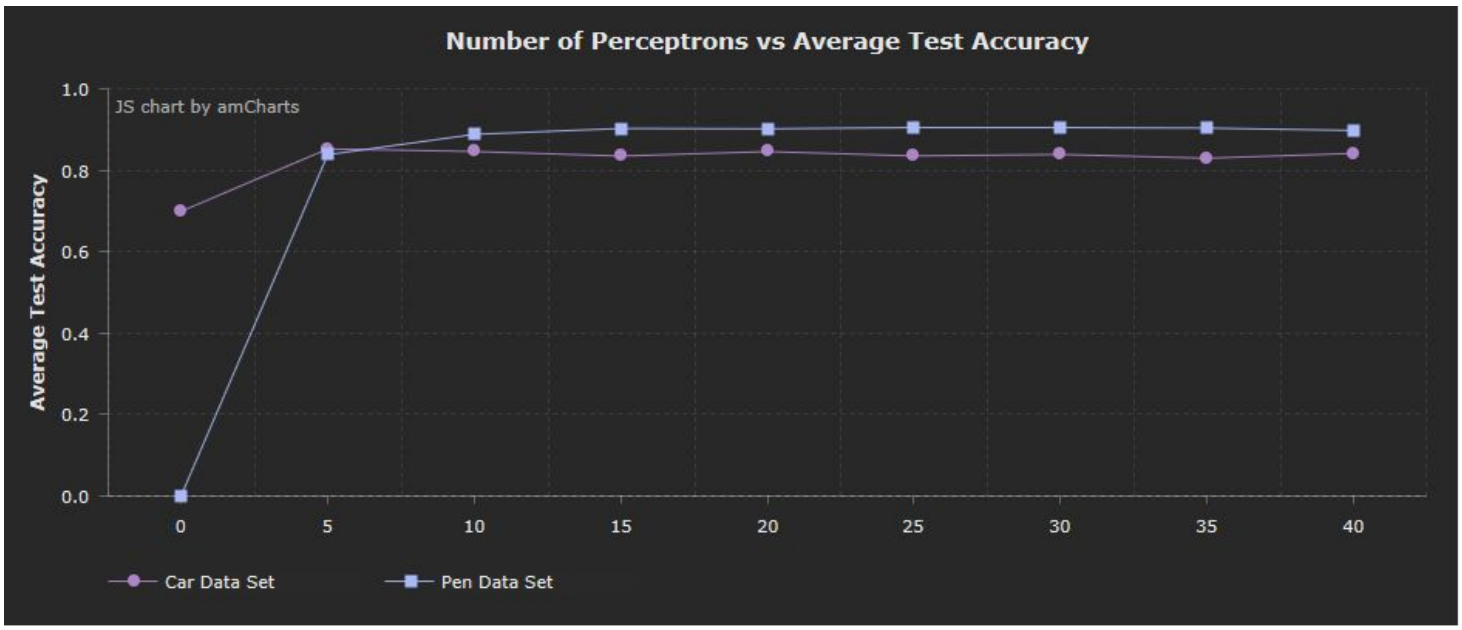
Q6

Car Results

Number of Perceptrons	Maximum Test Accuracy	Average Test Accuracy	Standard Deviation
0	0.698952879581151	0.698952879581151	0.0
5	0.863874345549738	0.852617801047120	0.008823193479765
10	0.874345549738219	0.846204188481675	0.018859071889348
15	0.856020942408377	0.835078534031413	0.017151092492460
20	0.862565445026178	0.846073298429319	0.010588349956102
25	0.847513089005235	0.835340314136125	0.011095586100797
30	0.850130890052356	0.839005235602094	0.007809651251401
35	0.839659685863874	0.829842931937172	0.005838928801883
40	0.847513089005235	0.841492146596858	0.005756186761072

Pen Results

Number of Perceptrons	Maximum Test Accuracy	Average Test Accuracy	Standard Deviation
0	0.0	0.0	0.0
5	0.846197827329902	0.838421955403087	0.007440291796760
10	0.891938250428816	0.888336192109777	0.002567174879433
15	0.905374499714122	0.902801600914808	0.002146939205891
20	0.908233276157804	0.901943967981703	0.005883803639651
25	0.908805031446540	0.904917095483133	0.004093544269792
30	0.912235563178959	0.904859919954259	0.004514332977278
35	0.905660377358490	0.903659233847913	0.002037567716547
40	0.903373356203544	0.897941680960548	0.005421132677476



From the graph above, it is evident that neural nets without hidden layer perceptrons can't really compute much, but that is something that one can assume. What is more interesting to me is that it seems like in both cases, after the number of perceptrons per hidden layer exceeded a certain amount, the test accuracy started to decrease. As we learned in class, one way reason for this could be the fact that when too many perceptrons are present we start to overfit the data and hence the net starts memorizing the inputs instead of actually computing each example. This is interesting to me, because initially I thought that the more perceptrons you had per layer the better your network would be, but as seen above that is not the case.