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CS 3600 Project 4b

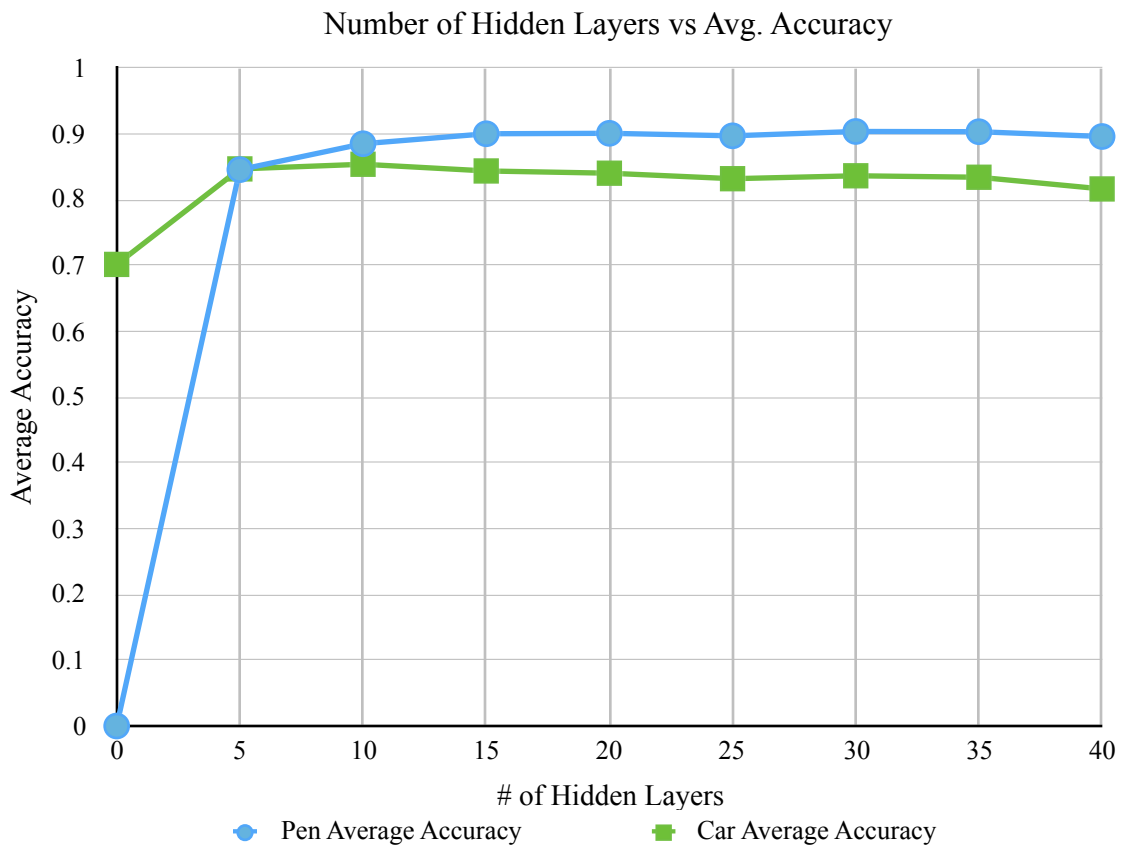
Question 5: Learning with Restarts Results

Accuracy Statistics	Pen Data	Car Data
Max	0.9093767867352773	0.8547120418848168
Average	0.8998284734133792	0.8405759162303663
Standard Deviation	0.0066643223520106978	0.0098524655845857682

Question 6: Varying the Hidden Layer

Project 4b Question 6 Results

Number of Hidden Layers	Pen Average Accuracy	Car Average Accuracy	Pen Data Max	Car Data Max	Pen Stdev	Car Stdev
0	0	0.7022251308900523	0	0.7022251308900523	0	0
5	0.8463693539165238	0.8475130890052356	0.8664951400800457	0.8579842931937173	0.01374545377679744	0.006181004687496143
10	0.8857632933104631	0.8545811518324606	0.8950829045168668	0.8612565445026178	0.005556920212609642	0.006032313414556864
15	0.9009719839090852	0.8443717277486911	0.9062321326647227	0.8599476439790575	0.006127659104205295	0.013717876970234423
20	0.9016580903373356	0.8409685863874345	0.9050886220697542	0.8606020942408377	0.003259506646938641 2	0.014439492534577585
25	0.8978273299028017	0.8325916230366491	0.9013722126929674	0.8462041884816754	0.003600696739584617 5	0.013169907045136393
30	0.9044596912 52144	0.8370418848167539	0.9076615208 69068	0.8540575916230366	0.0019083269603520467	0.009501932676901328
35	0.9040594625500284	0.8348167539267015	0.9068038879359634	0.8448952879581152	0.002312607023002483	0.009398598466500645
40	0.8967981703830761	0.8170157068062828	0.9073756432246999	0.8455497382198953	0.009836849933725137	0.020573484795657595



For pen data (in blue) it seemed that the average accuracy tended to increase gradually as the hidden layers increased. However, it seemed to level off around 30 layers. For the car data (in green), it seemed as if it was starting to decrease as the hidden layers increased. For the pen data, when the number of hidden layers is less than 15, it seems there is not enough hidden layers to fully represent the underlying patterns of the data set. Greater than 15 the NN tends to do better. For the car data, it appears 10 hidden layers is the optimal number of layers in this round of tests. It seemed to do the best representation of the underlying pattern in the data.