**CS 3600 Homework 4**

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# 1 Question 5

Here are the results using default parameter:

For Pen:

(i) Max = 0.906803887936

(ii) Average = 0.904745568897

(iii) STD = 0.00208043515136

For Car:

(i) Max = 0.861910994764

(ii) Average = 0.850392670157

(iii) STD = 0.00692110160545

# 2 Question 6

(a) The table:

| | Max Pen | Max Car | Average Pen | Average Car | STD Pen | STD Car |
|---|---|---|---|---|---|---|
| **Num Hidden Layer** | | | | | | |
| **[0]** | 0.000000 | 0.692408 | 0.000000 | 0.692408 | 0.000000 | 0.000000 |
| **[5]** | 0.857347 | 0.844241 | 0.840023 | 0.826440 | 0.009853 | 0.011877 |
| **[10]** | 0.897370 | 0.826571 | 0.890509 | 0.816885 | 0.004971 | 0.005726 |
| **[15]** | 0.901944 | 0.835733 | 0.892739 | 0.820681 | 0.006500 | 0.013444 |
| **[20]** | 0.908805 | 0.830497 | 0.905889 | 0.821073 | 0.002180 | 0.005294 |
| **[25]** | 0.909091 | 0.825262 | 0.903030 | 0.815445 | 0.003764 | 0.006725 |
| **[30]** | 0.905946 | 0.823298 | 0.902630 | 0.811649 | 0.002298 | 0.010384 |
| **[35]** | 0.909377 | 0.827225 | 0.903145 | 0.818586 | 0.007149 | 0.005258 |
| **[40]** | 0.905374 | 0.818717 | 0.901544 | 0.809817 | 0.003462 | 0.006983 |

Figure 1: Table of Statistics

(b) Learning Curve:

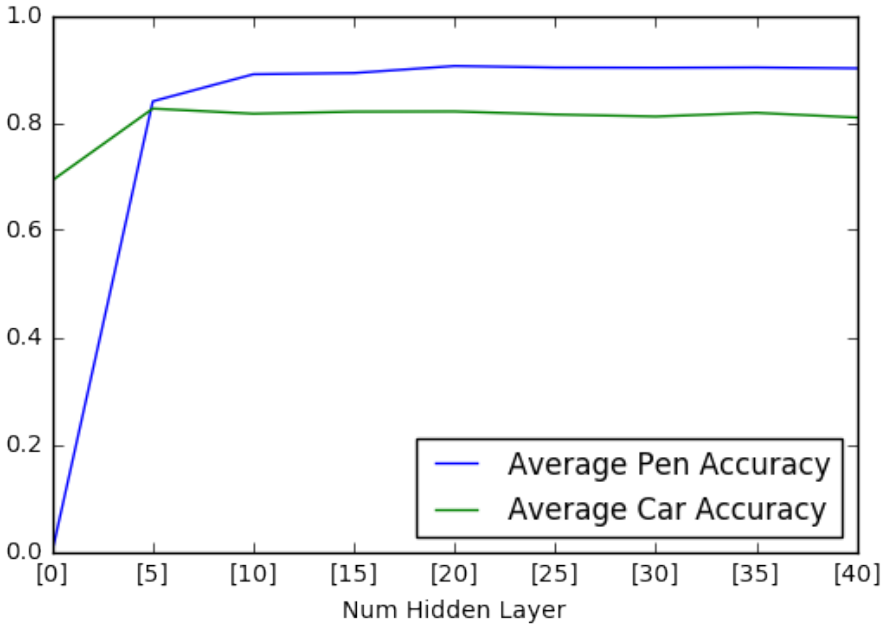


Figure 2: Table of Statistics

(c) Analysis:

As we can see from the graph above, by increasing the number of hidden layer, the average accuracy for both datasets increase. This is because as we grow the number of perceptrons in the hidden layer, the size of the weight matrix increases.

The average accuracy is also affected by the size of training data. We can observe from the graph that Pen's accuracy is higher than Car's because Pen has more training data.