writeup

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The code is an iPython/Jupyter notebook. Run all the cells from top to bottom.

0.0.1 I discussed this homework with no one. I haven't been outside in six days.

0.1 PROBLEM 1:

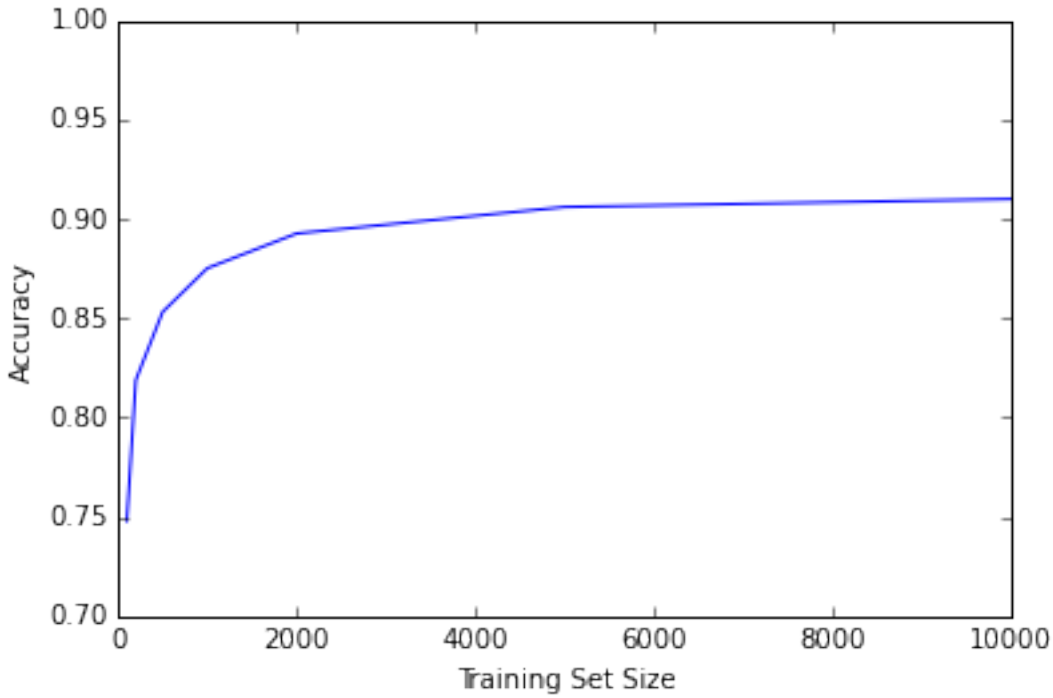
See cell 1, Shuffle Data

0.2 PROBLEM 2:

MNIST Validation Accuracy vs. Size of Training Set

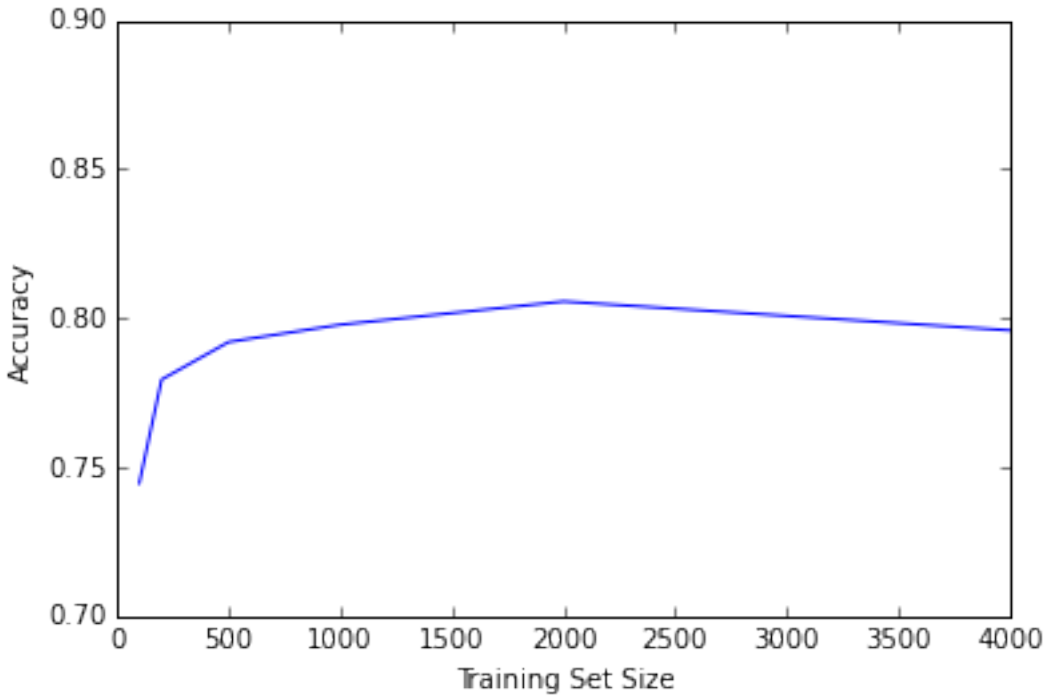
```
In [6]: %matplotlib inline

        import matplotlib
        import numpy as np
        import matplotlib.pyplot as plt
```

```
In [17]: xData = [100,200,500,1000,2000,5000,10000]
         yData = [0.748,0.8188,0.8531,0.8751,0.8926,0.9059,0.9099]
         plt.plot(xData, yData, 'b-')
         plt.axis([0, 10000, 0.7, 1])
         plt.xlabel('Training Set Size')
         plt.ylabel('Accuracy')
         plt.show()
```



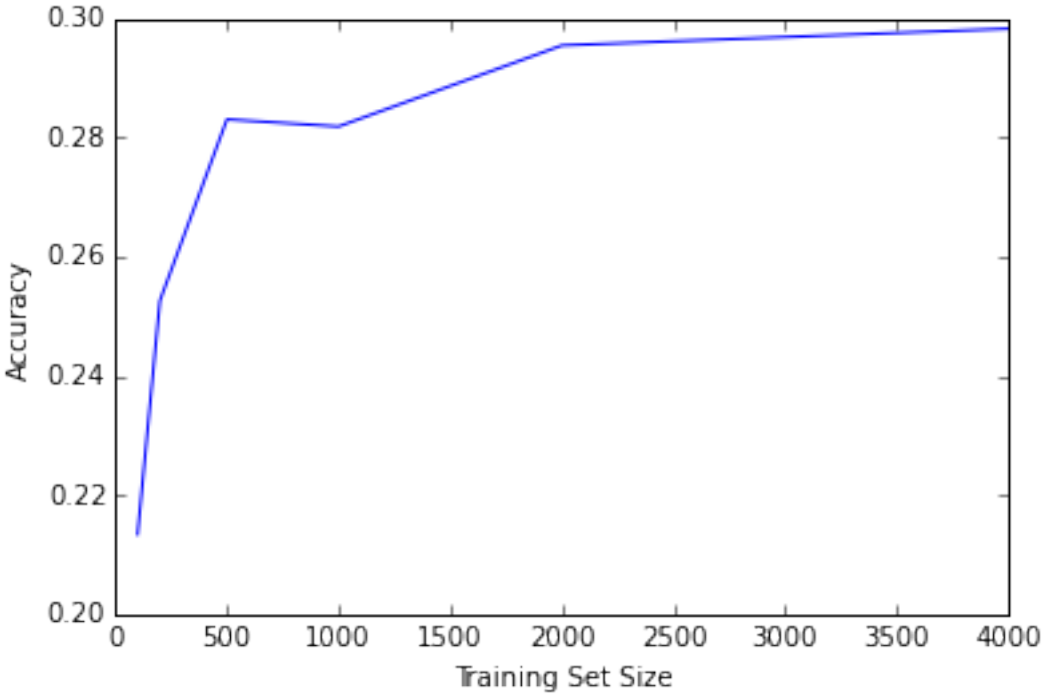
Spam Validation Accuracy vs. Training Set Size

```
In [21]: xData = [100,200,500,1000,2000,4000]
         yData = [0.7446, 0.7794, 0.7920, 0.7978, 0.8056, 0.7959]
         plt.plot(xData, yData, 'b-')
         plt.axis([0, 4000, 0.7, 0.9])
         plt.xlabel('Training Set Size')
         plt.ylabel('Accuracy')
         plt.show()
```



CIFAR Validation Accuracy vs. Training Set Size

```
In [19]: xData = [100,200,500,1000,2000,4000]
         yData = [0.2134, 0.2526, 0.283, 0.2818, 0.2954, 0.2982]
         plt.plot(xData, yData, 'b-')
         plt.axis([0, 4000, 0.2, 0.3])
         plt.xlabel('Training Set Size')
         plt.ylabel('Accuracy')
         plt.show()
```



0.3 PROBLEM 3

In [26]:
```
"""
Training set size: 1000, C: 100.0, accuracy: 0.8832
Training set size: 1000, C: 10.0, accuracy: 0.8832
Training set size: 1000, C: 1.0, accuracy: 0.8832
Training set size: 1000, C: 0.1, accuracy: 0.8832
Training set size: 1000, C: 0.01, accuracy: 0.8832
Training set size: 1000, C: 0.001, accuracy: 0.8832
Training set size: 1000, C: 0.0001, accuracy: 0.8832
Training set size: 1000, C: 1e-05, accuracy: 0.8832
Training set size: 1000, C: 1e-06, accuracy: 0.8874
Training set size: 1000, C: 1e-07, accuracy: 0.8683
Training set size: 1000, C: 1e-08, accuracy: 0.629
Training set size: 1000, C: 1e-09, accuracy: 0.1121
Training set size: 1000, C: 1e-10, accuracy: 0.1121
Training set size: 1000, C: 1e-11, accuracy: 0.1121

Best value is 1e-06.
"""

1e-06
```

Out[26]: 1e-06

0.4 PROBLEM 4:

```
In [27]: """
         Average accuracy: 0.8012311832478345, cValue: 1.0
         Average accuracy: 0.796017155832142, cValue: 0.1
         Average accuracy: 0.7780338070809856, cValue: 0.01
         Average accuracy: 0.7519296573505638, cValue: 0.001
         Average accuracy: 0.7177147983068428, cValue: 0.0001
         Average accuracy: 0.709977854399686, cValue: 1e-05
         Average accuracy: 0.709980470757529, cValue: 1e-06
         Average accuracy: 0.7099838346461843, cValue: 1e-07
         Average accuracy: 0.7099772937515768, cValue: 1e-08

         Best value is 1.0.
         """

         1.0

Out[27]: 1.0
```

0.5 PROBLEM 5

dantetam
- For MNIST, 0.91460
- For Spam, 0.84051

0.6 APPENDIX

```
In [ ]:
```