

Assignment 2 Writeup

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Q1. Internet Advertisement Classification

- a. **Set of support vectors obtained** : 307 support vectors { $0.000001 < \alpha < 0.999999$ }
- b. **Accuracy** : 98.202 %
- c. **Support Vectors** : 2133 { $0.000001 < \alpha < 0.999999$ }
Accuracy : 98.873%
- d. **Support Vectors linear** : 69
Accuracy linear : 98.20 %
Support Vectors linear : 646
Accuracy linear : 98.71 %

The accuracies obtained by LibSVM are almost at par with those obtained by the implementation using CVX package.

Q2. Digit Recognition

- a. --
- b. **Stopping Criteria used** : Error_Value < 0.0001
- c. **Binary Neural Network**
 - Training Time** : 8s
 - Accuracy Digit 3** : 96.83 %
 - Accuracy Digit 8** : 95.68 %
- d. **Multi-Class Neural Network:** We need 4 output units using which we can represent 16 different outputs (we need only 10). Also the training time is more than that of the binary setting (which is around 4 – 5 mins).

Here are the accuracies for each digit :

Digit	Accuracy(%)
0	95.71%
1	97.27%
2	91.28%
3	88.22%
4	90.94%
5	86.43%
6	91.44%
7	89.49%
8	86.04%
9	86.92%