

Assignment 4

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Q1.

For this question I treated the problem as a binary classifier for each class. Therefore I created 10 stumps for each class and then applied the gradient boosting algorithm on each of these 10 stumps for 5 iterations as given in the question.

Final accuracy score:

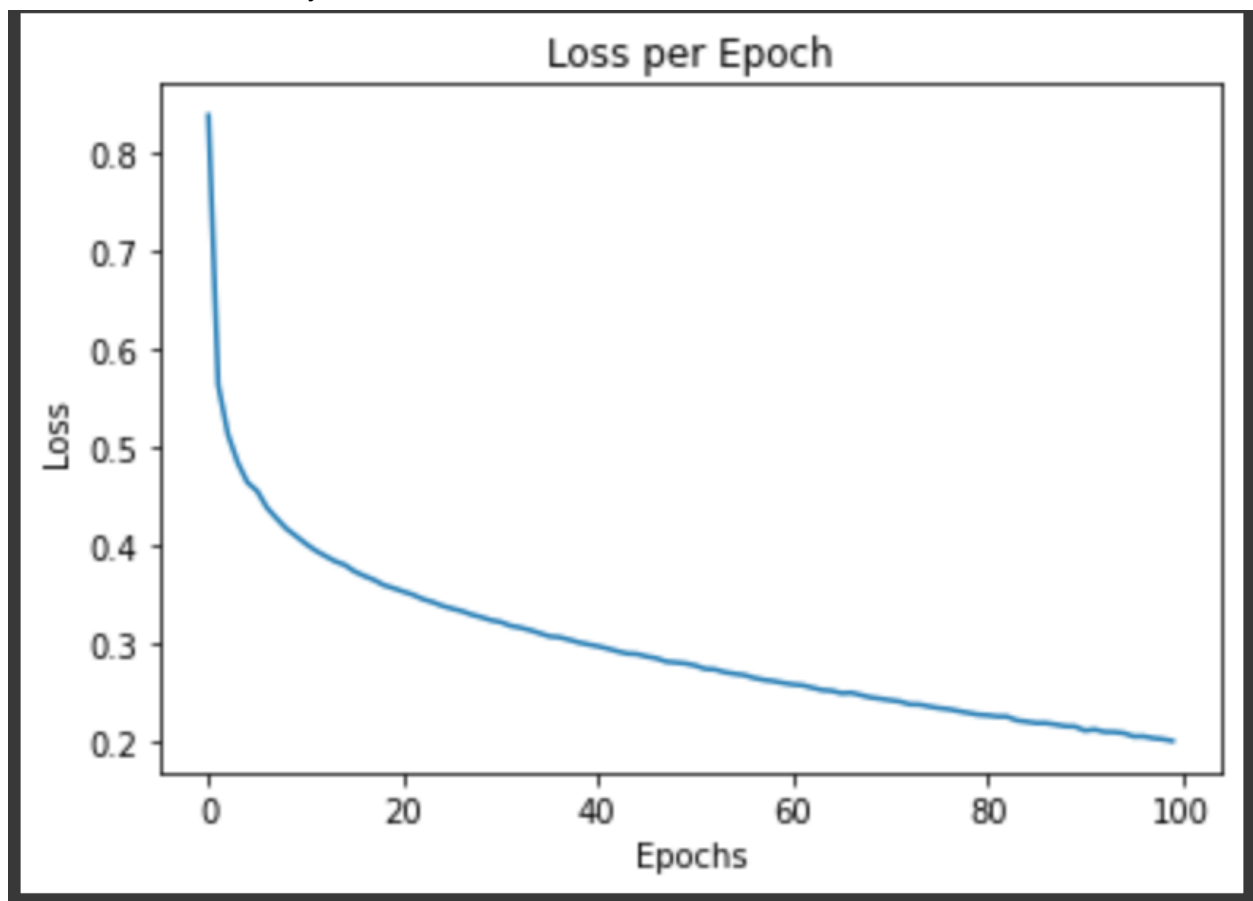
Total Accuracy: 0.5938

Q2.

For this question I created a neural network with 2 hidden layers, and an output layer, all using the relu activation function

The output layer had 10 nodes as its output.

The class wise accuracy was as follows



Class wise accuracy scores: [0.814 0.983 0.837 0.903 0.831 0.916 0.617 0.931 0.957 0.952]

Total Accuracy: 0.8741

Batch size: 256

Epochs: 100

Learning rate: 0.015

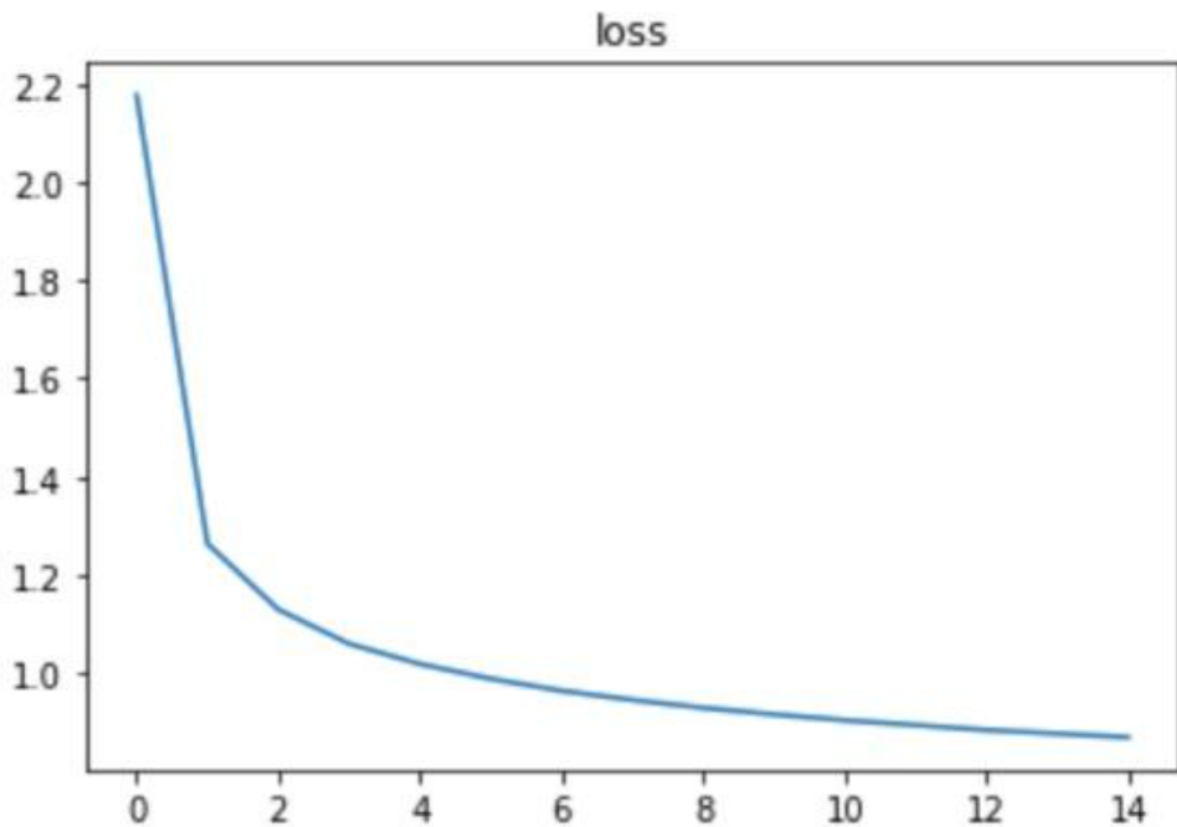
Q3.

a) Autoencoder:

Batch size: 256

Epochs: 15

Learning Rate 0.001



b) Neural Network:

Optimizer: Adam

Batch size: 256

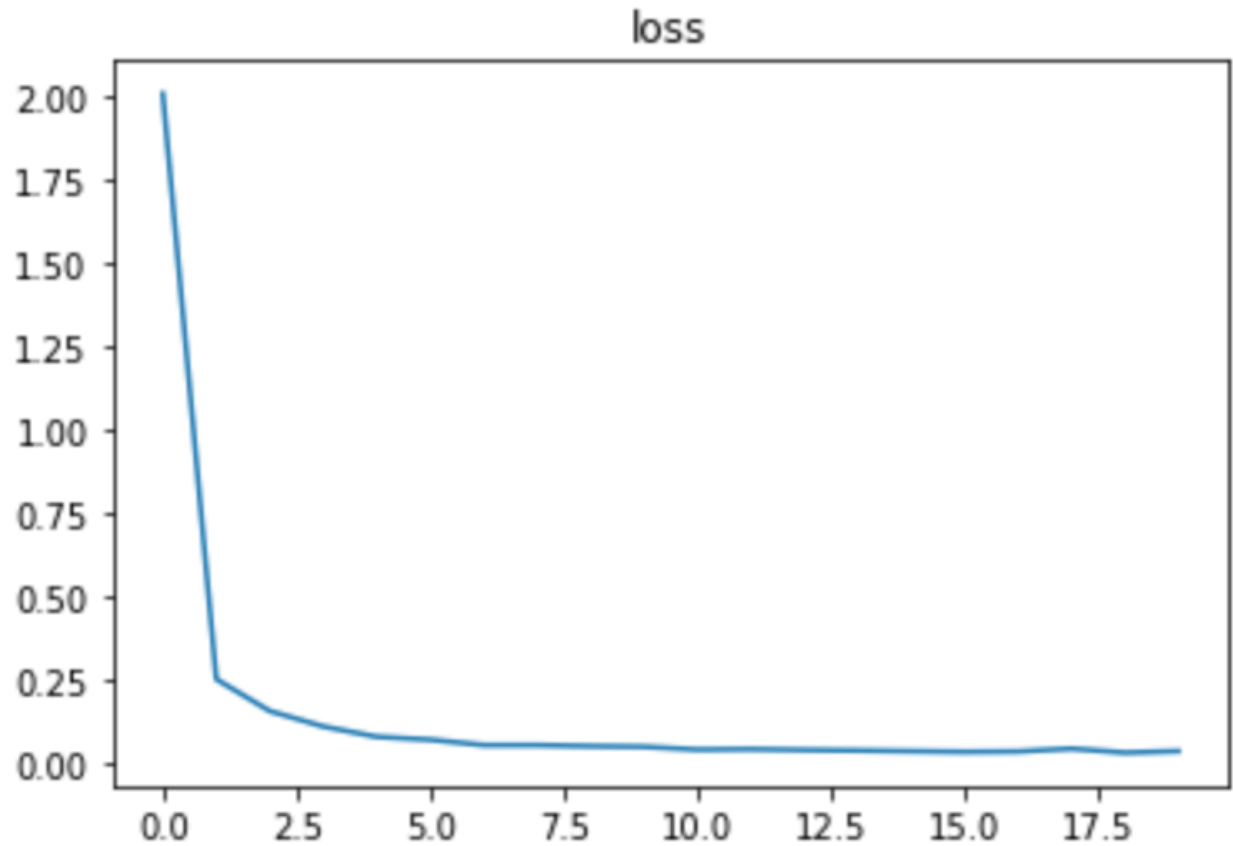
Epochs: 20

Activation: Relu

Output activation: Softmax

Accuracy and Class wise accuracy:

```
97.06  
[0.9877551 0.9938326 0.97383721 0.96534653 0.96537678 0.97982063  
0.97703549 0.95914397 0.93326489 0.96828543]
```



Q4.

Class wise accuracy and accuracy after bagging is as follows:

```
Accuracy after bagging: 0.9027  
Classwise accuracy: [0.95204082 0.97444934 0.87790698 0.87326733 0.89816701 0.83632287  
0.91649269 0.92217899 0.86344969 0.89692765]
```