MLNS Deep learning assignment report part 2

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Problem statement

Given Images having four digits written on them, calculate the sum of digits for the whole dataset using you own implementation.

Basic approach

→ Divide each Image in 4 parts such that each part contains only one digit.

→ Convert the Image to grayscale(Background is black and digit is white).

→ Resize the Images to 28×28 to make them compatible for MNIST testing.

→ Trained a CNN model on MNIST dataset downloaded from internet.

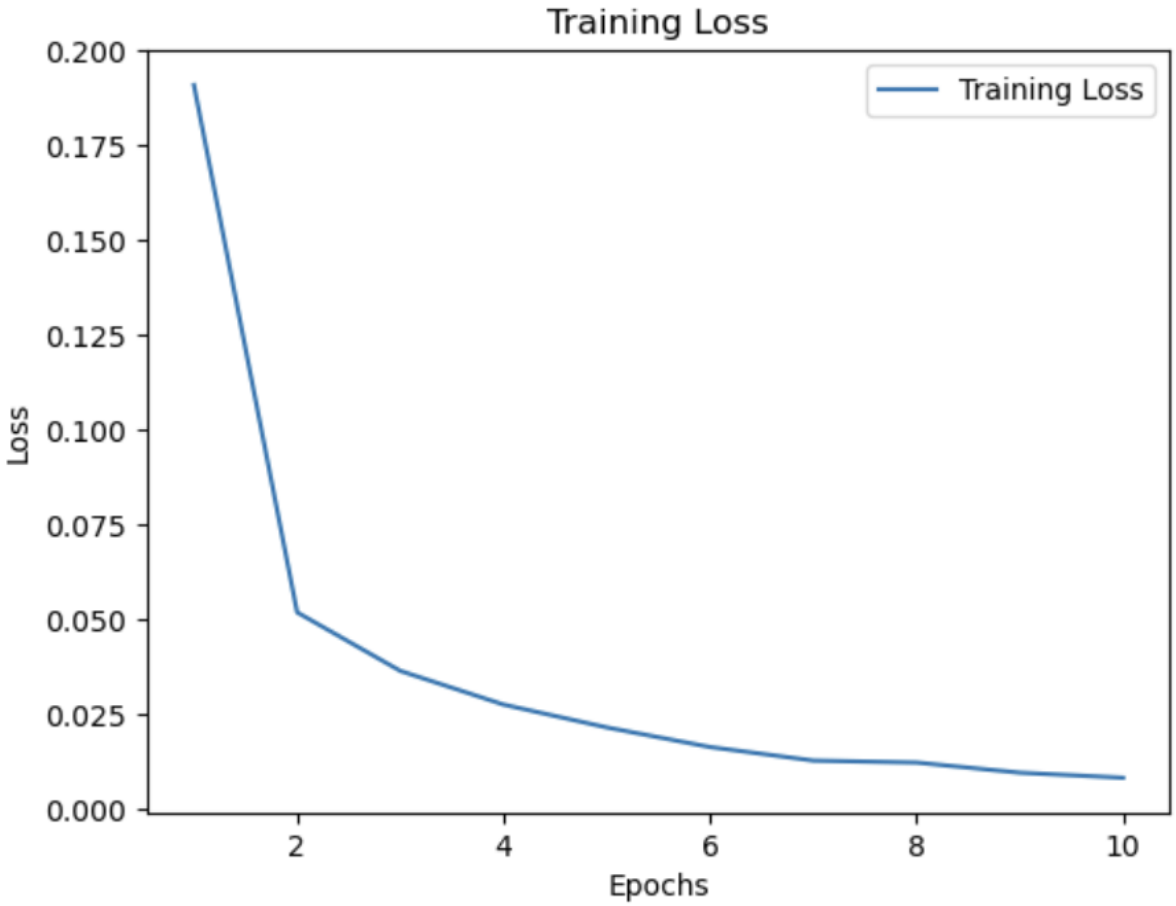
→ CNN contains two convolution layers and one maxpooling.

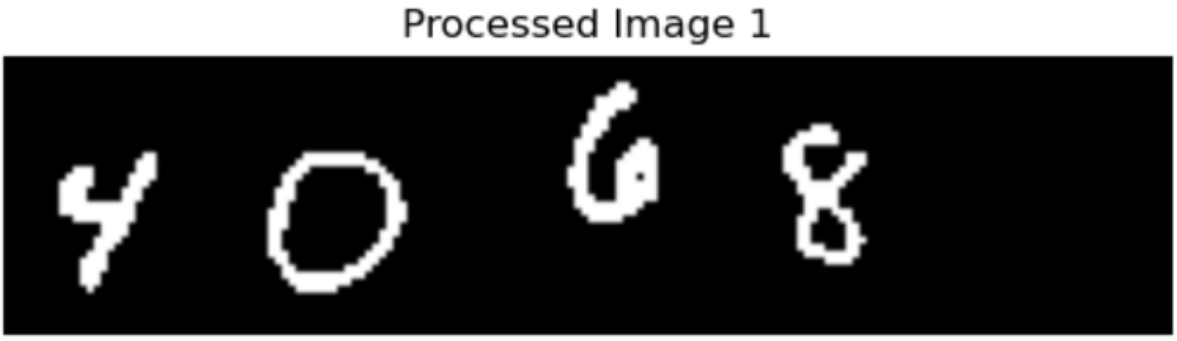
→ Saved the trained model to be used in inference file for testing.

→ Applied this trained model on each of 4 parts of the split image to recognize each digit.

→ After getting all the digits, summed them up to get the final answer.

Results


Training Loss
Training Loss
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Loss
2
4
6
8
10
Epochs

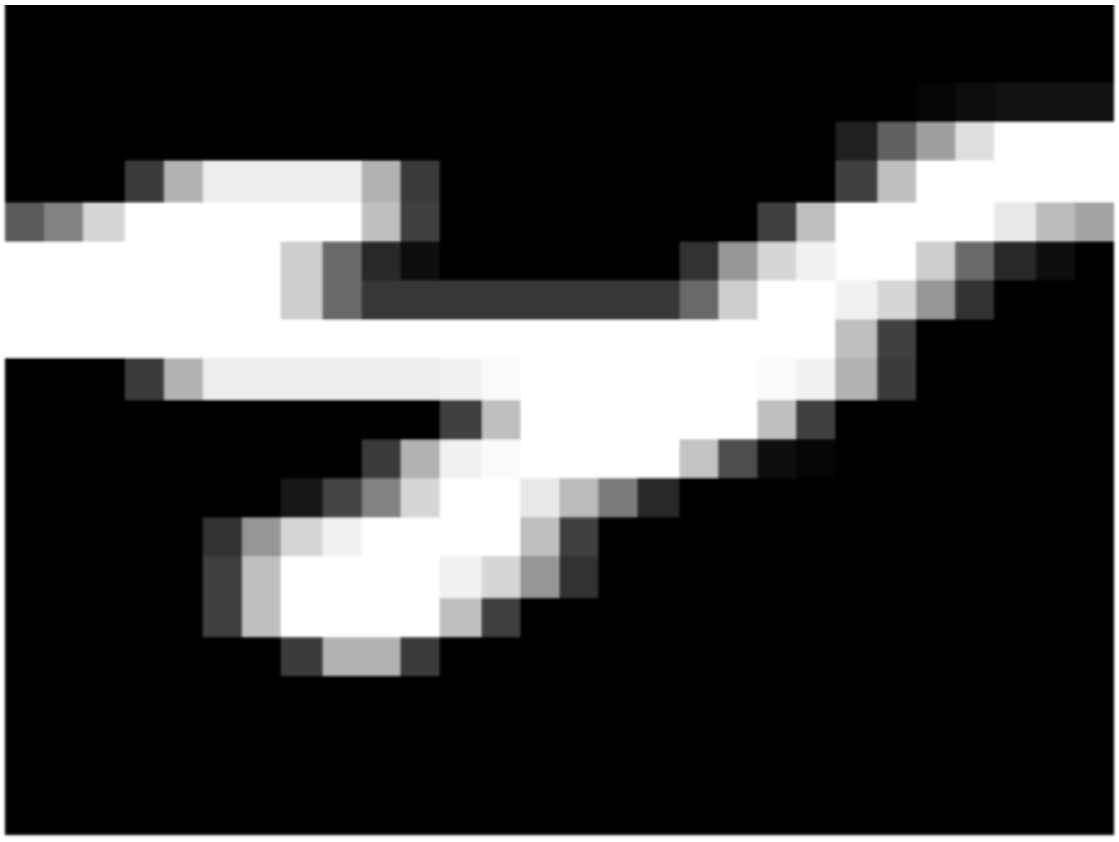

Processed Image 1

Digit 1

Digit 2

Digit 3

Digit 4

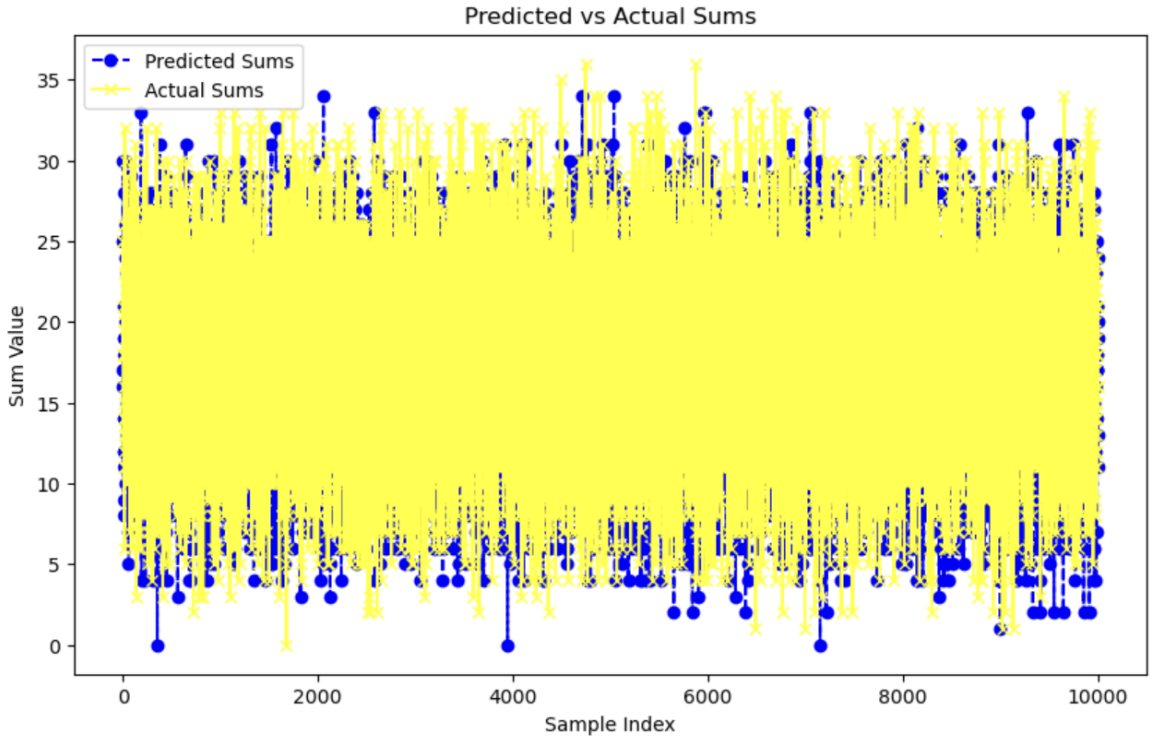


Digit 1: 4

Digit 4: 8

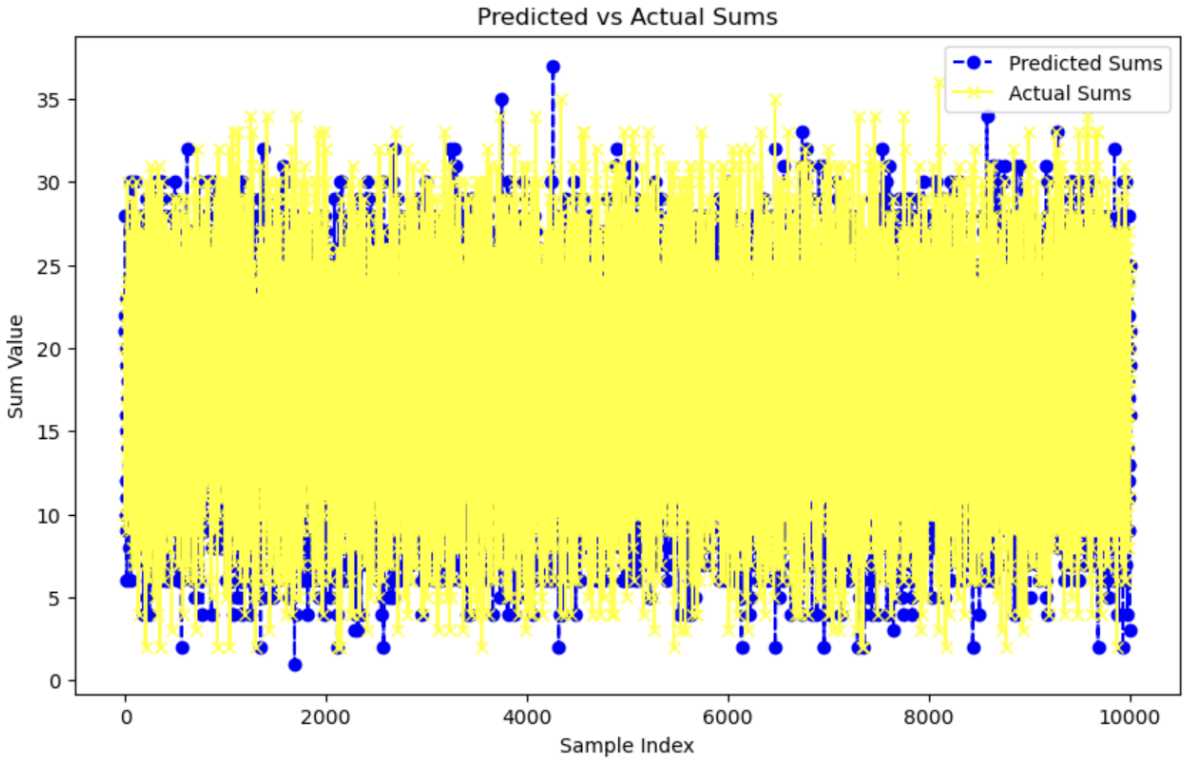
DATA0.npy

```
Accuracy: 5.92%
Average Loss (MSE): 44.1455
Percentage within +-0.5: 5.92%
Percentage within +-1: 17.380000000000003%
Percentage within +-2: 29.39%
```



DATA1.npy

```
Accuracy: 6.54%
Average Loss (MSE): 45.1019
Percentage within +-0.5: 6.54%
Percentage within +-1: 18.3%
Percentage within +-2: 30.049999999999997%
```



DATA2.npy

```
Accuracy: 6.59%
Average Loss (MSE): 44.0277
Percentage within +-0.5: 6.59%
Percentage within +-1: 18.23%
Percentage within +-2: 29.520000000000003%
```