

ASSIGNMENT-3

Machine Learning

Ghazi Shazan Ahmad
IMT2019033

Problem Statement

- A neural network to classify handwritten images from the infamous MNIST dataset.
- The goal is to correctly identify images from a dataset of tens of thousands of handwritten images.

Model 1

- 4 layers in the Neural Network model
 - 2 hidden layers
1. (28*28, 128, "relu")
 2. (128, 128, "relu")
 3. (128, 10, "softmax")

Model 2

- 4 layers in the Neural Network model
 - 2 hidden layers
1. (28*28, 128, "relu")
 2. (128, 256, "relu")
 3. (256, 10, "softmax")

Model 3

- 3 layers in the Neural Network model
 - 1 hidden layer
1. (28*28, 128, "relu")
 2. (128, 10, "softmax")

Model 4

- 3 layers in the Neural Network model
 - 2 hidden layers
1. (28*28, 128, "relu")
 2. (200, 100, "relu")
 3. (100, 10, "softmax")

EDA and Preprocessing

- Standardized the pixel values by dividing each value with 255.
- The pixel values ranged from 0 to 255.
- Standardizing helped in reducing the run time of the model

Results

- Achieved an Accuracy_score of around 97%.
- Could have achieved 98-99% but because of time and resource constraints, it wasn't possible.
- Batch descent took too much time to converge
- Used stochastic gradient descent to speed up.