

Lab 10:- Perform comparison on MNIST dataset using auto encoder.

Output:-

~~Trained epochs: 20~~

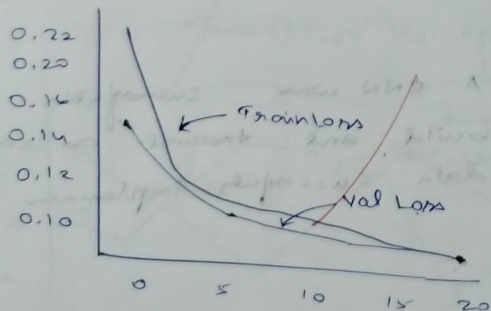
original image.

7 2 1 0

Reconstructed image.

7 2 1 0

Train and Validation Loss



44m:-

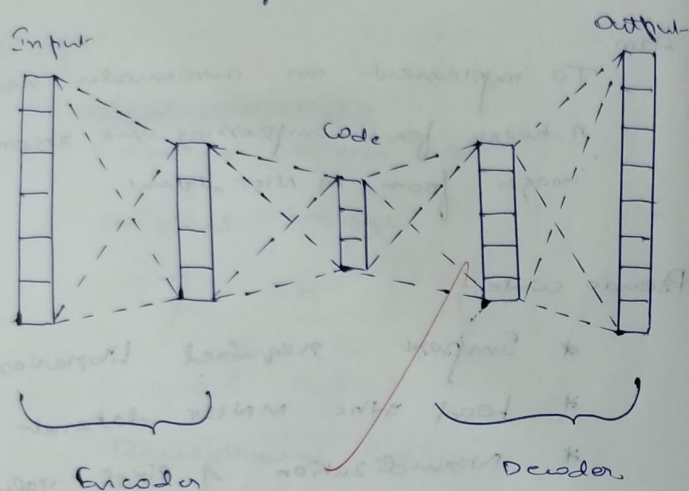
To implement an autoencoder neural network for compressing and reconstructing images from MNIST dataset.

Pseudo code:-

- * Import required libraries
- * Load the MNIST dataset
- * Normalization of pixel value
- * Flatten the image into vector
- * Define the auto encoder model:

- * compile the model with optimizer
- * Train the model.
- * use encoder part to compress image.
- * use decoder part to reconstruct image.

Architecture of Auto encoder.



Observation.

- * The autoencoder successfully learns to reconstruct MNIST digit after several epochs.
- * The training loss decreases gradually.
- * The compressed representation is much smaller in size compared to original.
- * The compression ratio depends on the bottleneck layer size.

Training :-

Epoch [1/20], Train Loss: 0.2920, Val Loss: 0.2920

Epoch [2/20], Train Loss: 0.2131, Val Loss: 0.1849

Epoch [3/20], Train Loss: 0.1683, Val Loss: 0.1539

Epoch [4/20], Train Loss: 0.1492, Val Loss: 0.1427

Epoch [5/20], Train Loss: 0.1343, Val Loss: 0.1297

Epoch [19/20], Train Loss: 0.1026, Val Loss: 0.097

Epoch [20/20], Train Loss: 0.1015, Val Loss: 0.099

Result:-

An autoencoder model was successfully implemented on MNIST dataset.