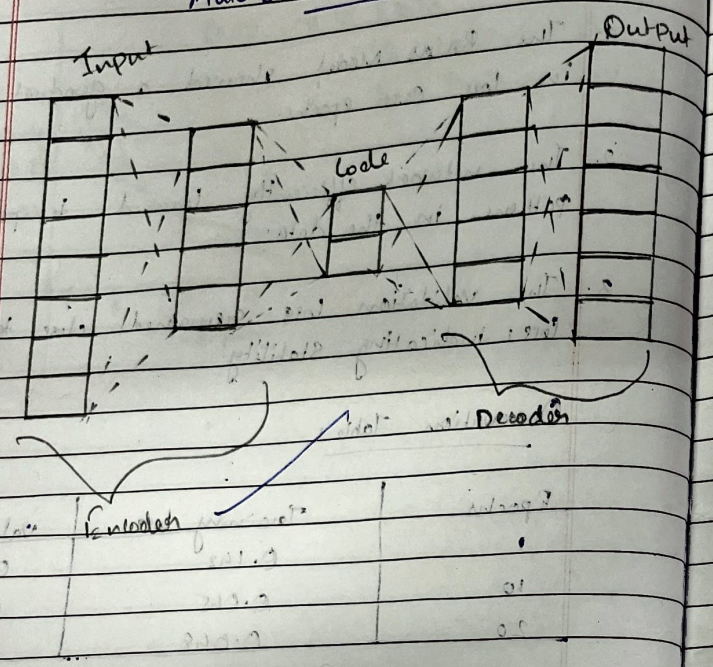
Auto Encoders Architecture



17-10-25
Date

LAB-10 Perform Compression on MNIST dataset using Auto encoder

Aim:

To perform image compression on the MNIST dataset using an Autoencoder Neural Network.

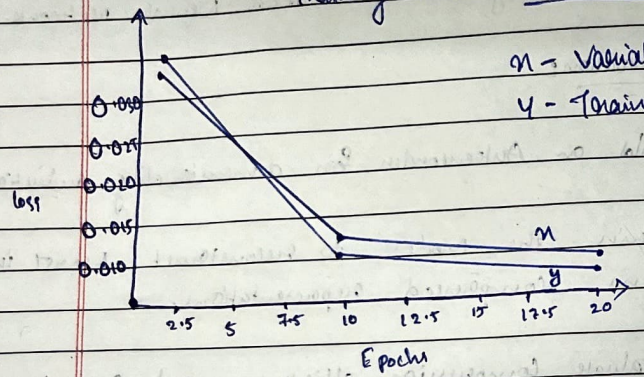
Observations:

1. Build an Autoencoder for dimensionality reduction.
2. Train the Model to reconstruct MNIST images from compressed representations.
3. Evaluate compression efficiency and reconstruction accuracy.

PSEUDO CODE:

- Load MNIST dataset
- Normalize Pixel values
- Define Encoder(Dense layer → Compressed code).
- Define Decoder (Dense layer → Reconstructed image).
- Combine encoder + decoder = Auto encoder.
- Compile (optimizer = 'adam', loss = 'mse')
- Train model (x_train, x_train)
- Evaluate → reconstruction loss.
- Visualize Original vs reconstructed images.
- Save Compressed features.

Training & Validation loss Over Epochs



Result:

Epochs	1	10	20
Traing loss	0.032	0.010	0.008
Val loss	0.031	0.011	0.009

Observation Tables:

Epochs	Training loss	Validation Loss
1	0.032	0.031
10	0.010	0.011
20	0.008	0.009

Observations:

1. Training and validation loss decreased steadily, showing efficient learning.
2. Reconstructed images closely matched original digits.
3. The encoander effectively compressed high dimensional images data into compact latent features.

Result:

The Autoencoander Successfully compressed MNIST images with minimal info loss, achieving efficient reconstruction.