

17-10-2025
Date

Lab-10 Perform compression using mnist dataset using autoencoders -

Aim:

To compress MNIST handwritten set digit images into a lower-dimensional representation using autoencoders.

Objective:

To build an autoencoder neural network

To train the Autoencoder on the MNIST dataset

To reduce the dimensionality of images to a latent space (compressed representation).

To reconstruct the images

To visualize the original, compressed and reconstructed images

To plot the training loss over epochs

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S.No	Date	Title	Signature
9.	30.09.2025	Building a RNN	30/9 write neatly
8	09.10.2025	Long Short Term Memory	9/10/25
10.	17.10.2025	perform compression using airist dataset using auto encoders	
11.	17.10.2025	Experiment using Variations (VAE)	
12	27.10.2025	Implement a Deep convolutional GAN to generate color Images	copy
13	27.10.2025	Understanding the Architecture of a pre-trained model	
14	27.10.2025	Implement a pre-trained CNN model as a feature extractor	
15	27.10.2025	Implement a Yolo model object detection	copy

Completed
3/11/25

pseudocode

load mnist dataset .

Normalize pixel values to range (0,1)

Define autoencoder architecture .

compile an autoencoder model .

Train the autoencoder with training data

After training

visualize

plot the training loss ,

observation

Training Behaviours :

The autoencoder successfully learned

to reconstruct digit image .

compression effect .

The encoder reduced 784 - dimensional input into 932 - dimensional latent space

visualization

plots showed strong .

Visual and reconstructed -

Interpretation

The model efficiency performed non-linear elimination reduction, PCA which is domain /

Result :

~~Obj~~ successfully implemented an autoencoder for compress of MNIST image .

output

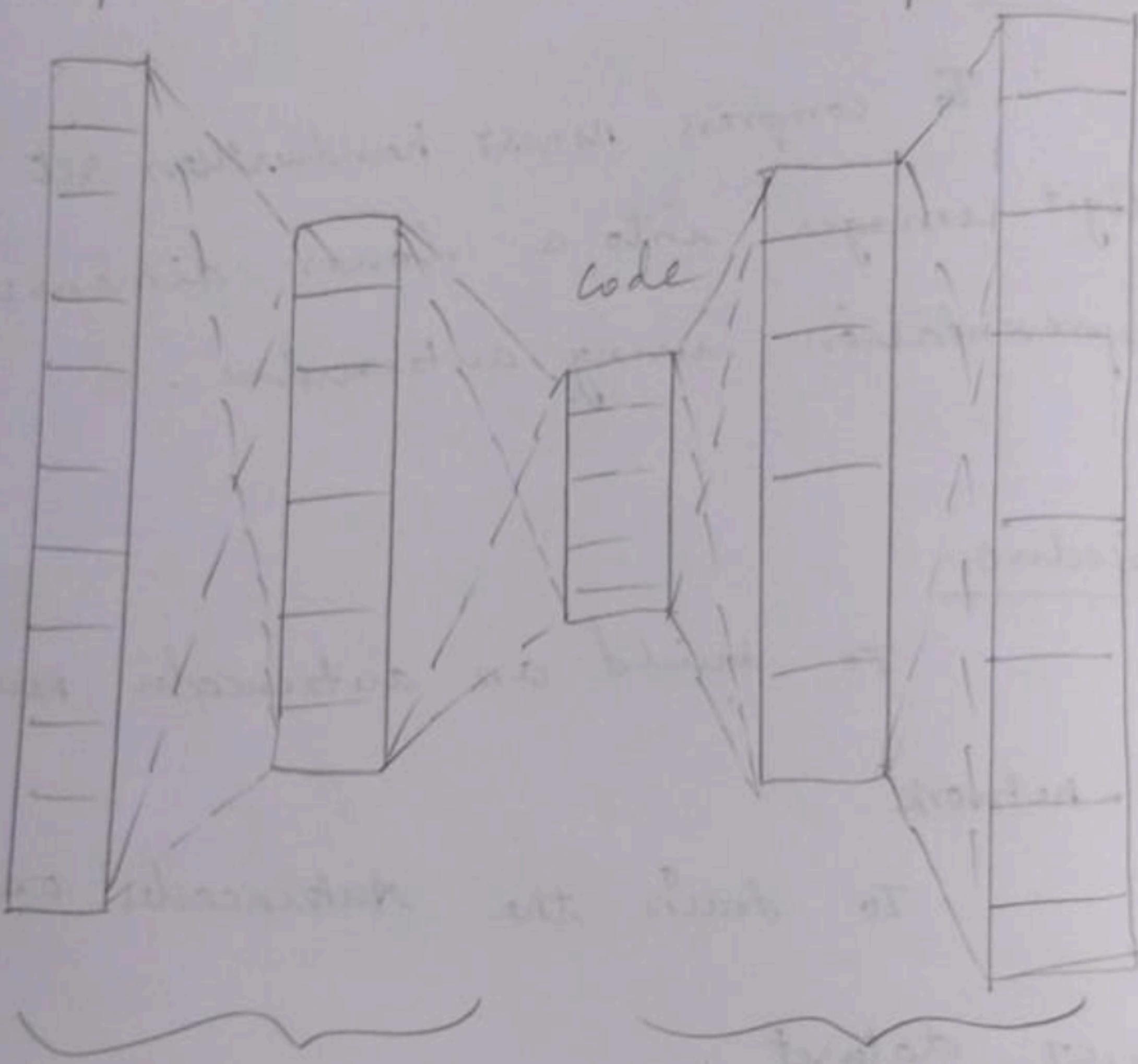
0	0.9519	0.9490	0.9504	480
1	0.9426	0.9692	0.9557	1135
2	0.8175	0.6916	0.7534	1032
3	0.0288	0.5871	0.6074	1016
4	0.6875	0.4517	0.3661	982
5	0.6042	0.5135	0.5552	892
6	0.8322	0.8956	0.8627	958
7	0.8750	0.8716	0.8512	965
8	0.6165	0.7608	0.8627	1028
9	0.5572	0.7334	0.8733	1051

Accuracy

Macro avg	0.7513	0.7460	0.7439	1000
weighted avg	0.7555	0.7510	0.7485	1000

Architecture diagram

Input Output



encoder

decoder