VAE Lab

Aim

Implement a Variational Autoencoder to reconstruct MNIST digits.

Theory

VAE learns a probabilistic latent space. Encoder outputs mean & logvar; sampling uses z = mu + sigma * eps. Decoder reconstructs input. Loss = BCE + KL divergence.

Algorithm

1. Build encoder (mu, logvar).

2. Reparameterize.

3. Build decoder.

4. Train with BCE + KL.

5. Show reconstructions.

Pseudocode

z = mu + sigma*eps

out = decoder(z)

Results

Blurry but accurate digit reconstructions.

Conclusion

VAEs learn smooth latent representations, useful for compression & generation.