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Image Reconstruction using Deep Learning

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### Results of Image Reconstruction of MNIST Dataset

We have used the mean squared loss error to analyse the loss related to the reconstruction of the images.

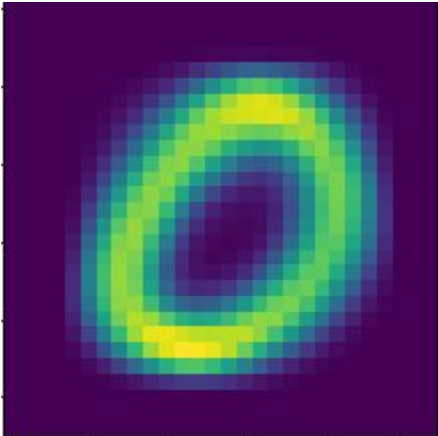
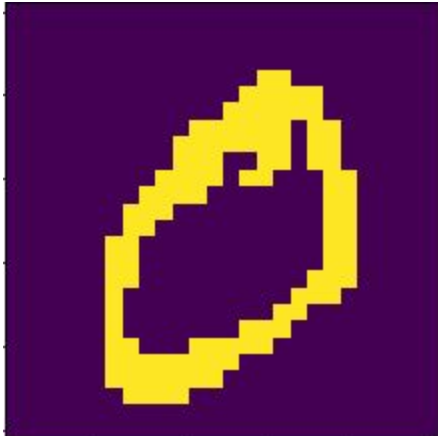
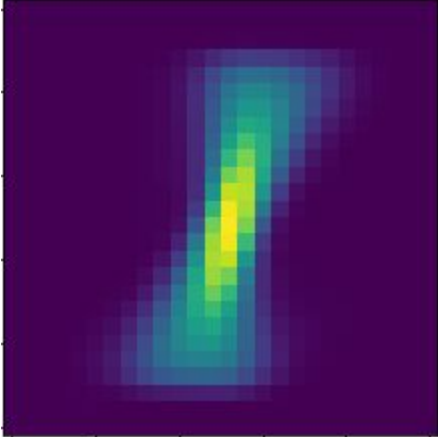
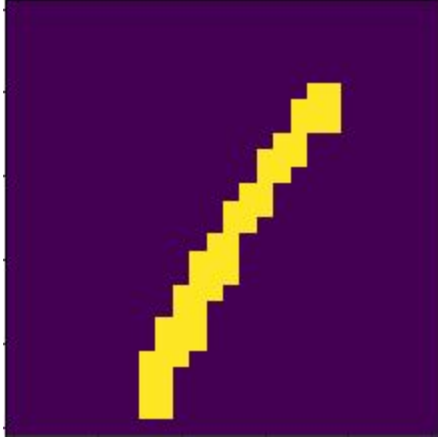
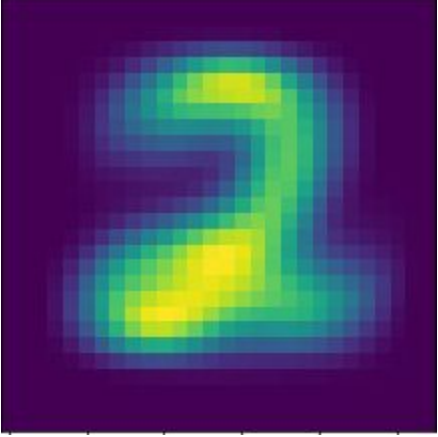
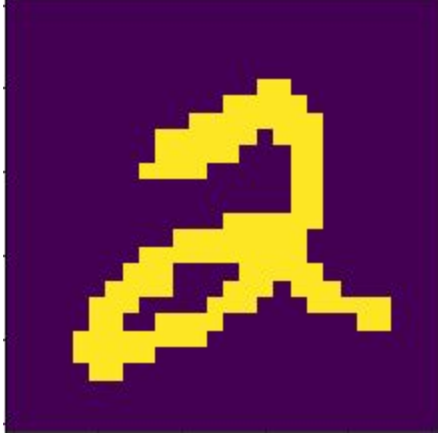
$$\text{MSE} = \frac{1}{n} \sum_{i=1}^n (Y_i - \hat{Y}_i)^2.$$

The mean squared loss is defined as

Where  $Y(i)$  is the actual value whereas  $\hat{Y}(i)$  represents the predicted value.

The loss values for different Numbers are as follows, after 10 epochs:

Number	Loss
0	45.26485708605607
1	24.280402896968397
2	49.76784210379958
3	48.56598197732157
4	41.72601965161481
5	45.051374558068616
6	39.28486629898554
7	34.590919544572316
8	43.75834480324509
9	36.40055784821873

Avg Number	Reconstructed Number
 Averaged image of the digit 0, showing a blurred, multi-colored representation of the digit on a dark background.	 Reconstructed image of the digit 0, showing a sharp, yellow, pixelated representation of the digit on a dark background.
 Averaged image of the digit 1, showing a blurred, multi-colored representation of the digit on a dark background.	 Reconstructed image of the digit 1, showing a sharp, yellow, pixelated representation of the digit on a dark background.
 Averaged image of the digit 2, showing a blurred, multi-colored representation of the digit on a dark background.	 Reconstructed image of the digit 2, showing a sharp, yellow, pixelated representation of the digit on a dark background.

