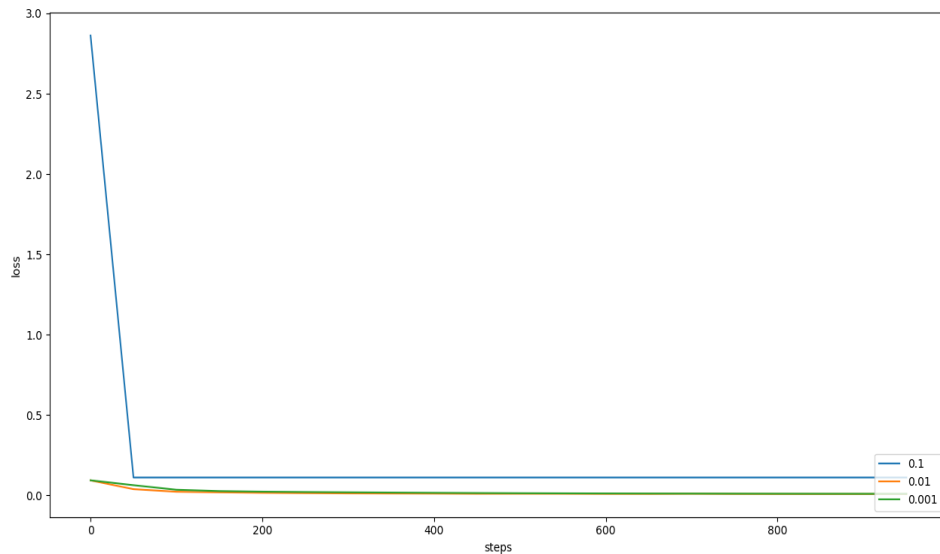


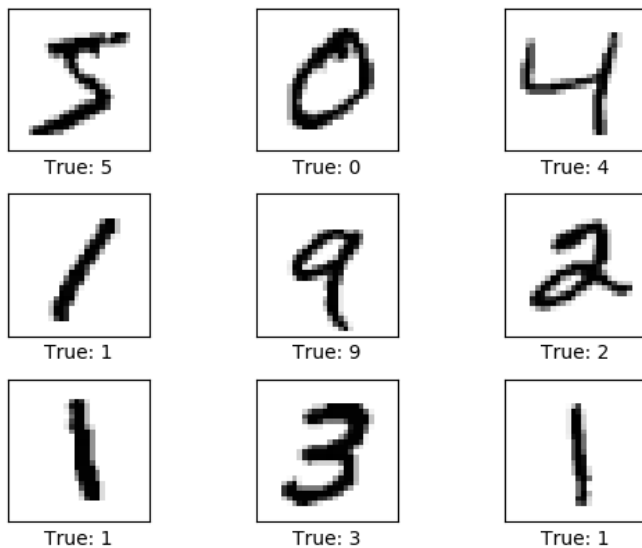
## Exercise 3 Report

The exercise required the use of transposed convolutional neural network layers to regenerate the image of MNIST dataset, using tensorflow. Different learning rates were used to generate results. Following graph was obtained from the training dataset

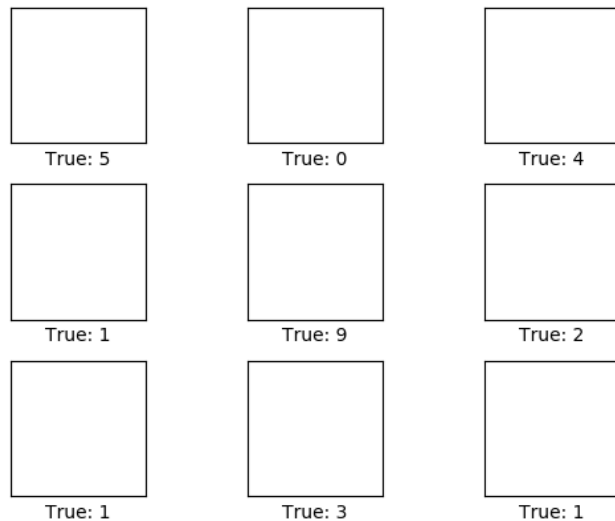


It can be seen from the result that in higher learning rates, the AdamOptimizer doesn't work efficiently. The loss was reduced to 11% when learning rate was 0.1 and remained constant after that. However, the smaller learning rates yielded better results, achieving a loss percentage of approximately 1%.

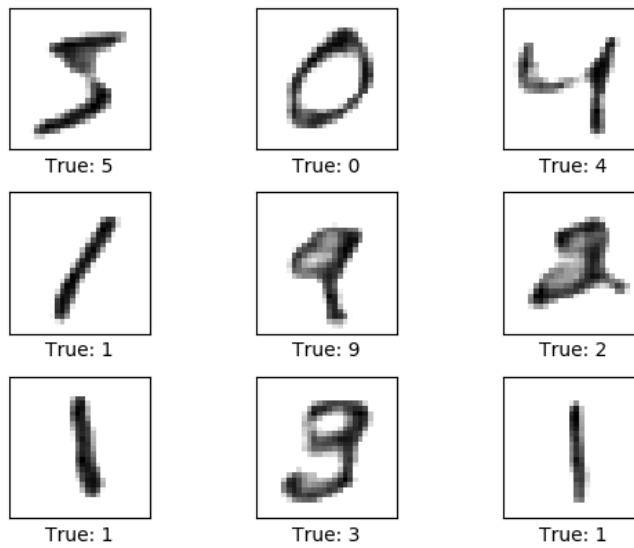
I sliced the mnist image data in to 9 images to see the actual output of the encoder. The original image, as well as generated image is displayed on the following page. When the learning rate was 0.1, the output was blank white images. However, in lower learning rates, the output was much better and accurate. The comparison can be seen on the following page between outputs at different learning rates.



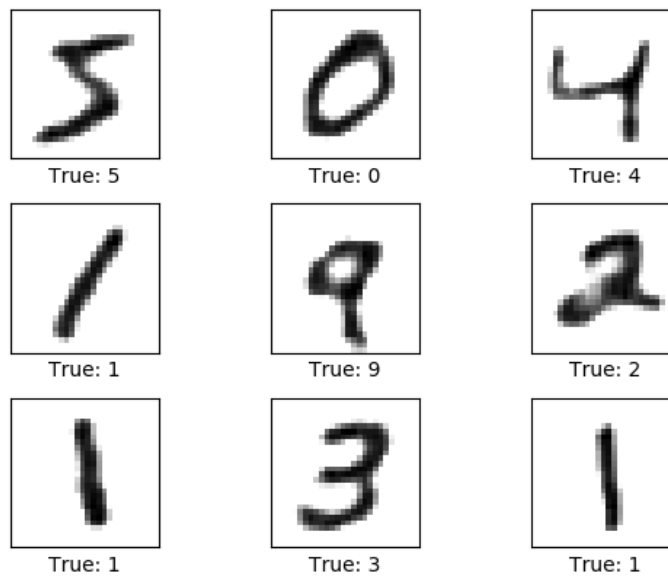
Original Image



Output image on learning rate of 0.1



Output image on learning rate of 0.01



Output image on learning rate of 0.001