

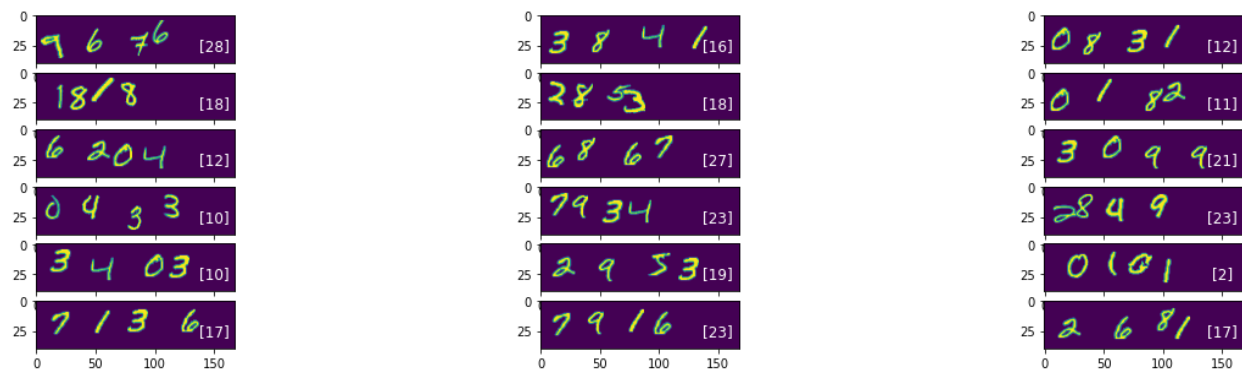
Deep Learning assignment

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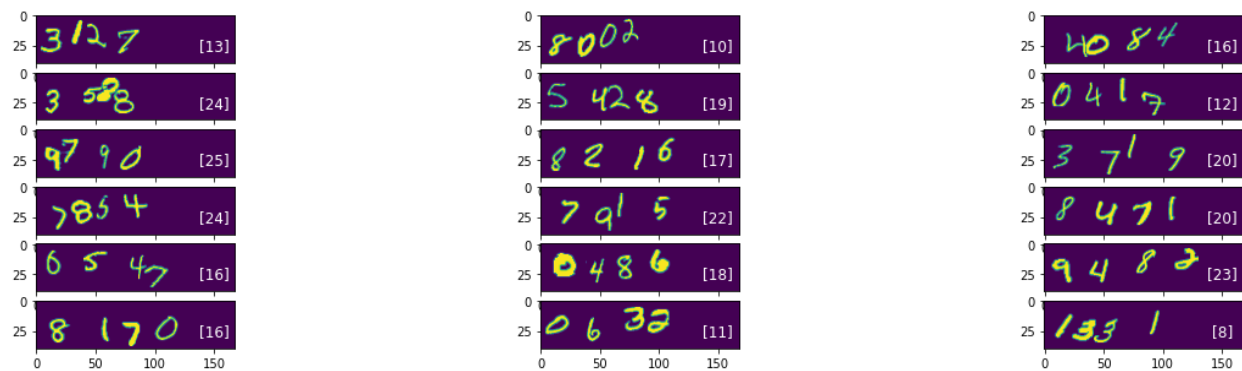
Approch: Given dataset is very small to train deep network, So generate new dataset which is similar to given dataset and train on Regression CNN whose architecture is similar to LeNet-5

- There are 30k images of size 40 x 168 pixel given as dataset.
- Each image contains 4 integer numbers.
- Task is to predict the summation of those four numbers.
- Its difficult to train deep network with such small dataset.
- So there is a need of more dataset which can be used along with given dataset.

Synthesized images from mnist dataset



Given dataset images



Synthesized image shape X = (30000, 40, 168, 1), Y = (30000, 1)

Given dataset image shape: X = (30000, 40, 168, 1), Y = (30000, 1)

Train and Test split

trainX: (58000, 40, 168, 1)

trainY: (58000, 1)

testX: (2000, 40, 168, 1)

testY: (2000, 1)

Model

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Model: "sequential"
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Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 40, 168, 32)	832
max_pooling2d (MaxPooling2D)	(None, 20, 84, 32)	0
conv2d_1 (Conv2D)	(None, 16, 80, 48)	38448
max_pooling2d_1 (MaxPooling2D)	(None, 8, 40, 48)	0
conv2d_2 (Conv2D)	(None, 4, 36, 64)	76864
max_pooling2d_2 (MaxPooling2D)	(None, 2, 18, 64)	0
flatten (Flatten)	(None, 2304)	0
dense (Dense)	(None, 256)	590080
dense_1 (Dense)	(None, 84)	21588
dense_2 (Dense)	(None, 1)	85

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Total params: 727,897
Trainable params: 727,897
Non-trainable params: 0
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Optimizer = 'adam'

Loss= 'mse'

Accuracy on Testing data: 54%

