Asgn 7

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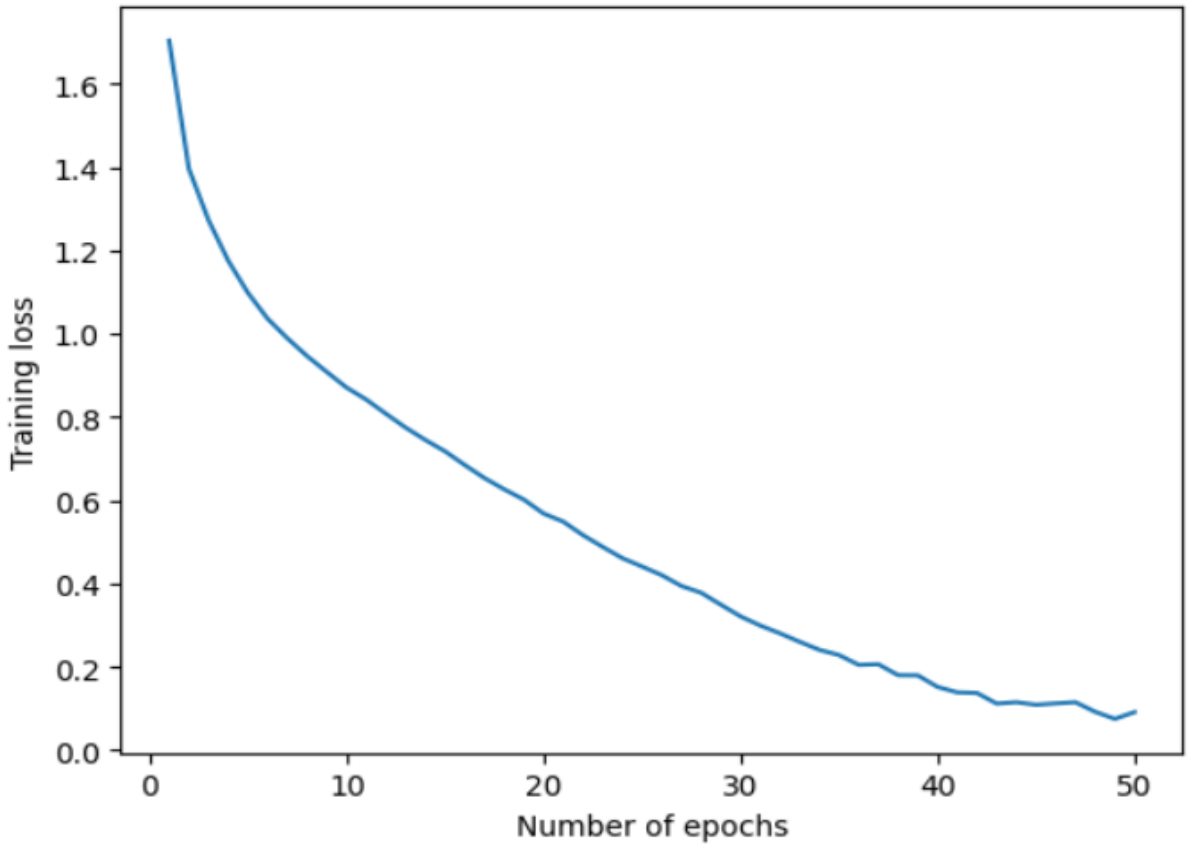
Best choice among CNN vanilla and Resnet is Resnet because of better accuracy on test dataset.

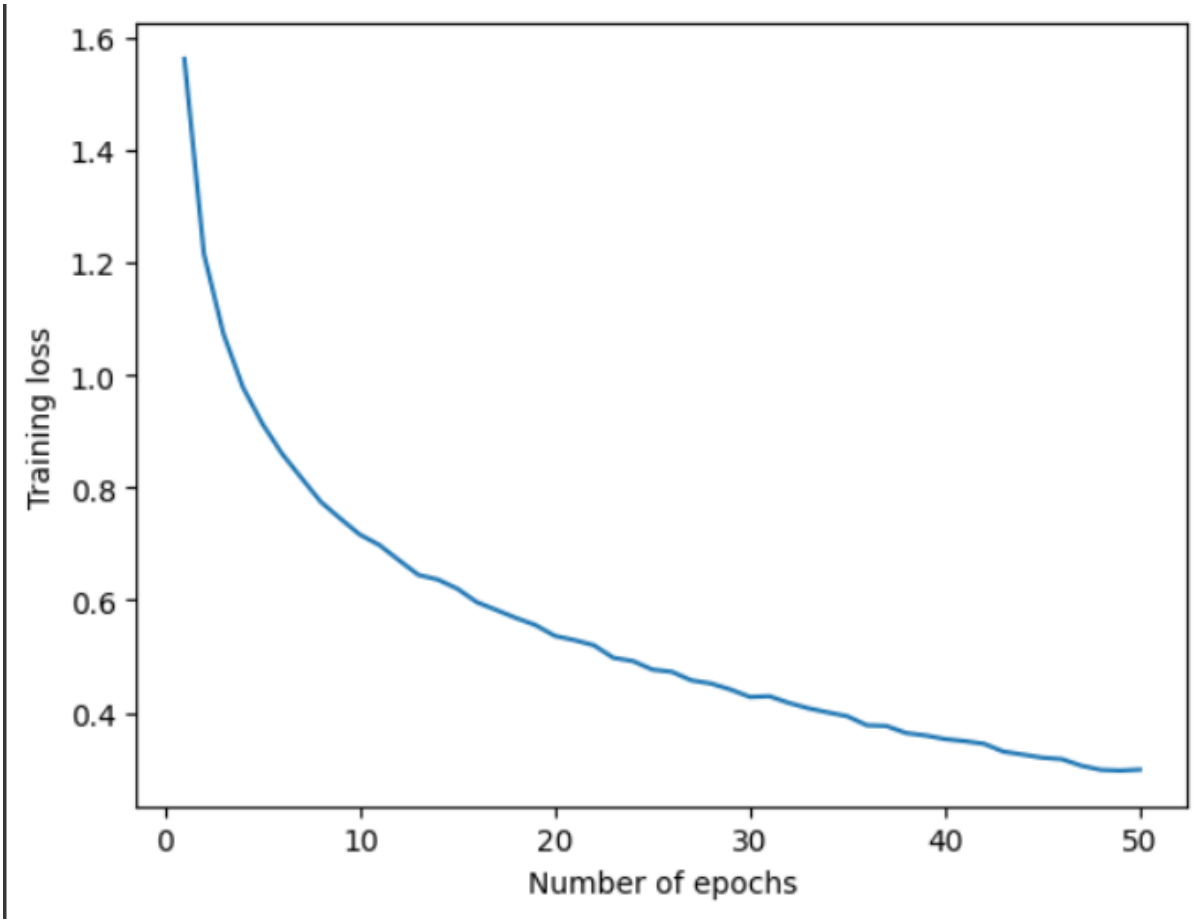
Note-I have reduced dimensions of feature maps significantly, that's why my accuracy is coming 5–7 percent lower. My computation power is limited and its taking forever.

Test set accuracy for a CNN Resnet with three level Resnet block with two fully-connected layers=69.18%
Test set accuracy for CNN Vanilla with similar architecture= 66.97%

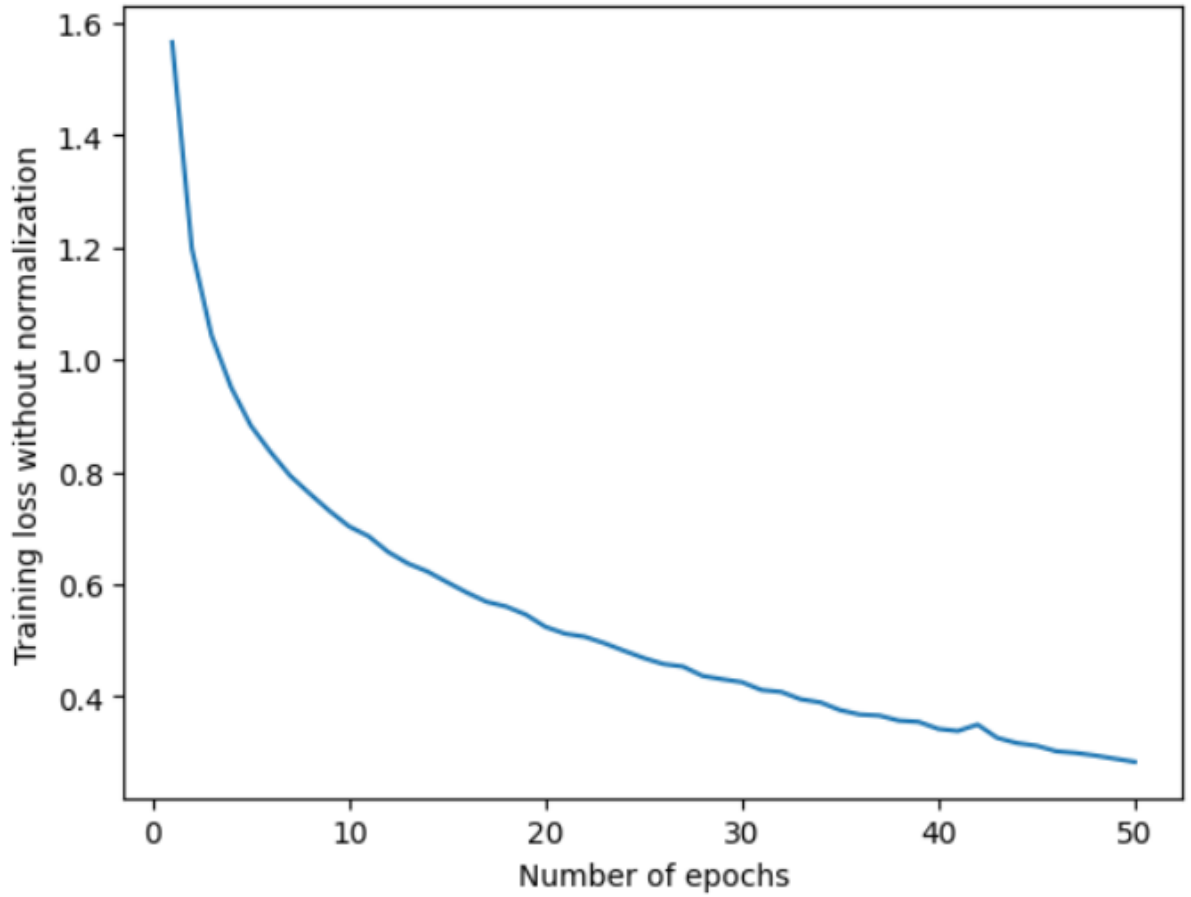
This one for CNN Vanilla



This one for CNN Resnet and by default done with normalisation



This one for CNN Resnet without normalisation



On test data

Accuracy with normalisation=69.18%

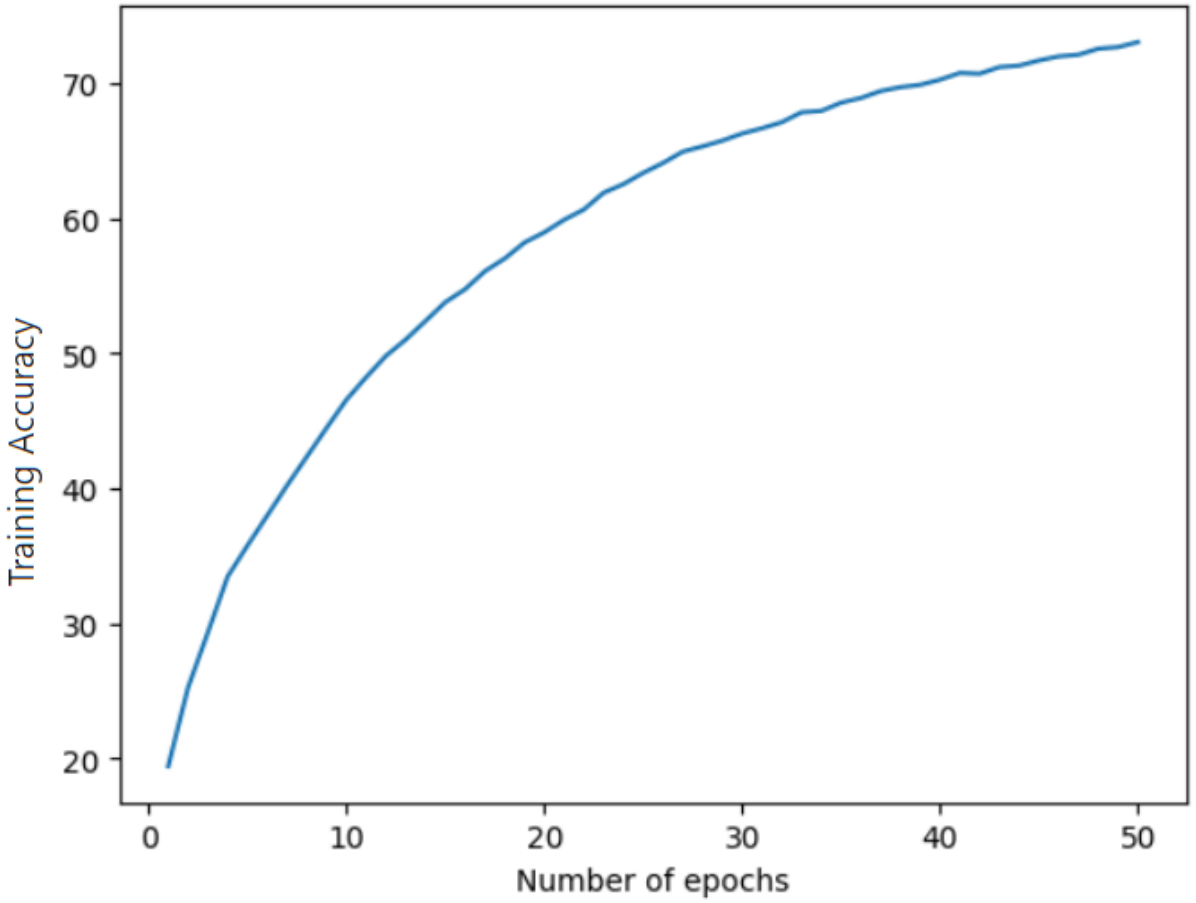
Accuracy without normalisation=71.51%

So, the accuracy on the test data is better without normalisation.
As, its evident from the graph the loss is also lesser.

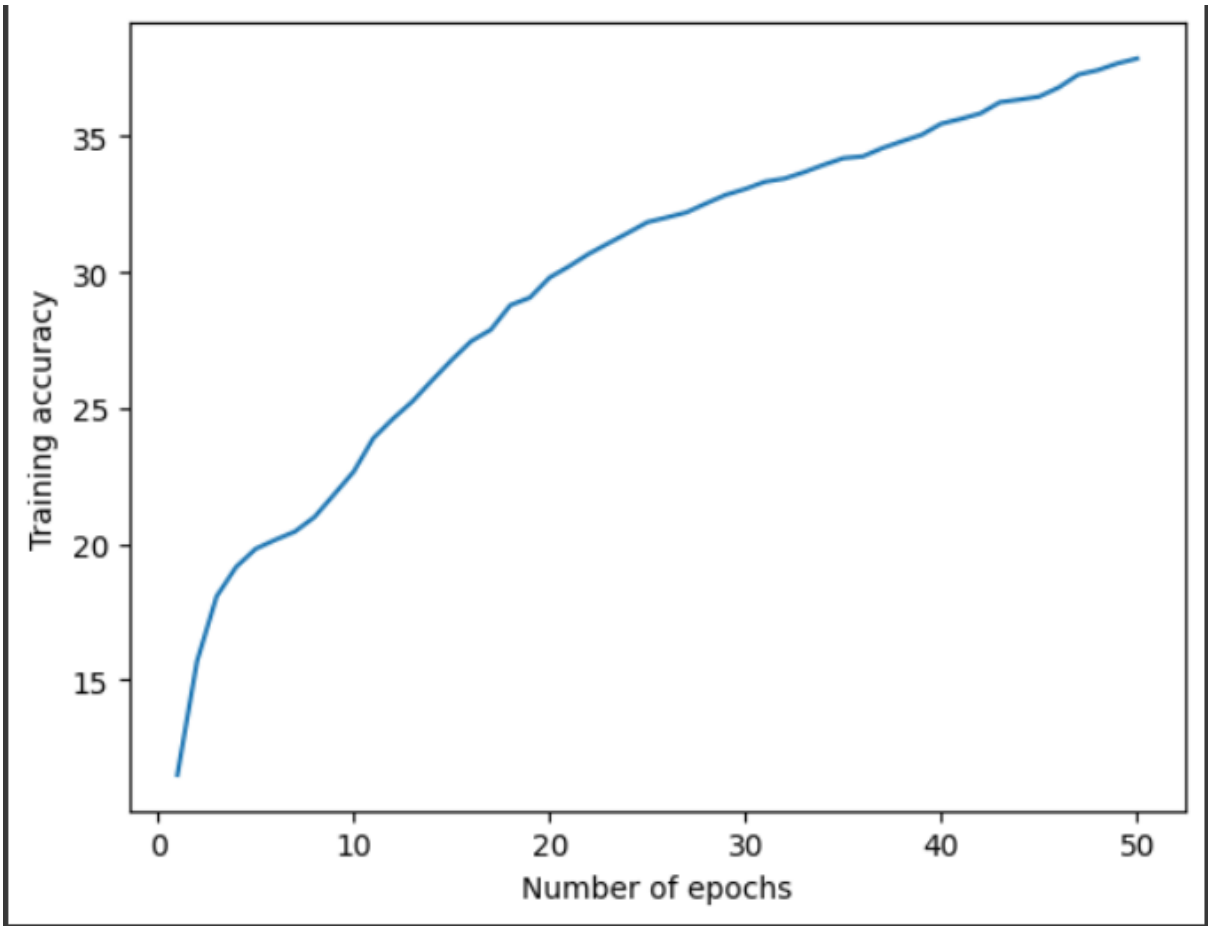
Different Optimisers

a) Stochastic Gradient with and without momentum(momentum=0.9)

<u>This one is with momentum(Max train acc<74%)</u>



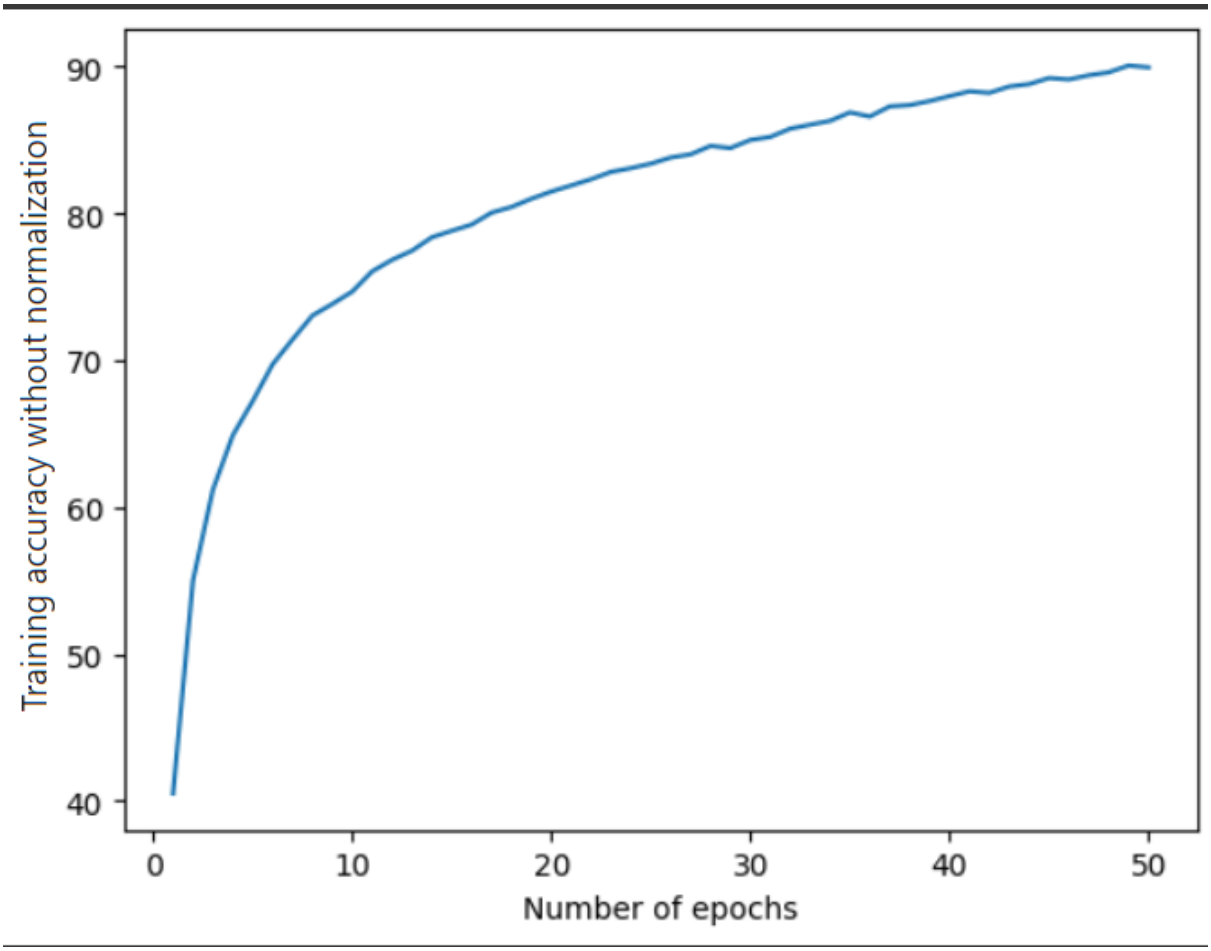
b) **Without momentum(Max acc<40%)**



It can be seen that the best optimiser is Adam optimiser(with which we got 71.51% test accuracy in our Original Resnet model).

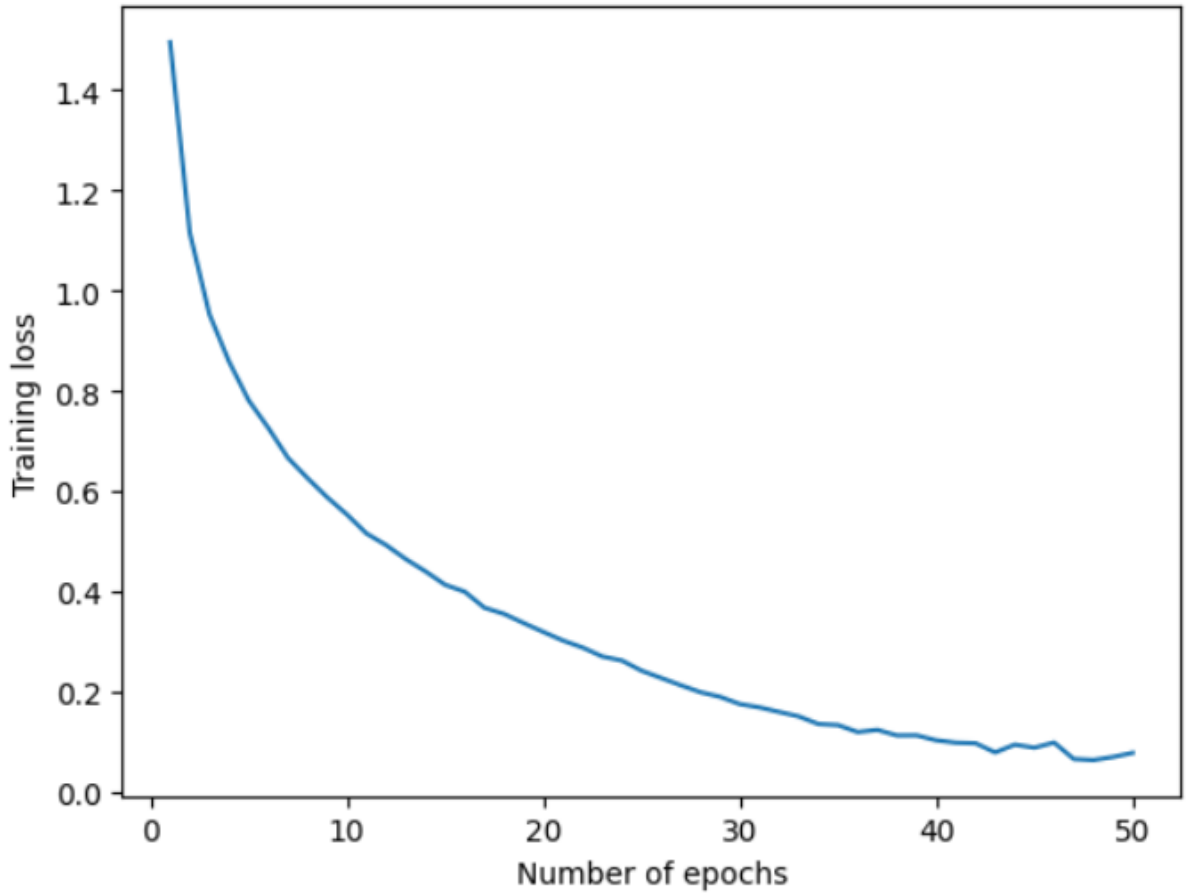
From Stochastic grad descent with minibatch/without it and even with momentum/without momentum, the maximum test accuracy we got is 62.48%.

c) **Adam Optimiser**



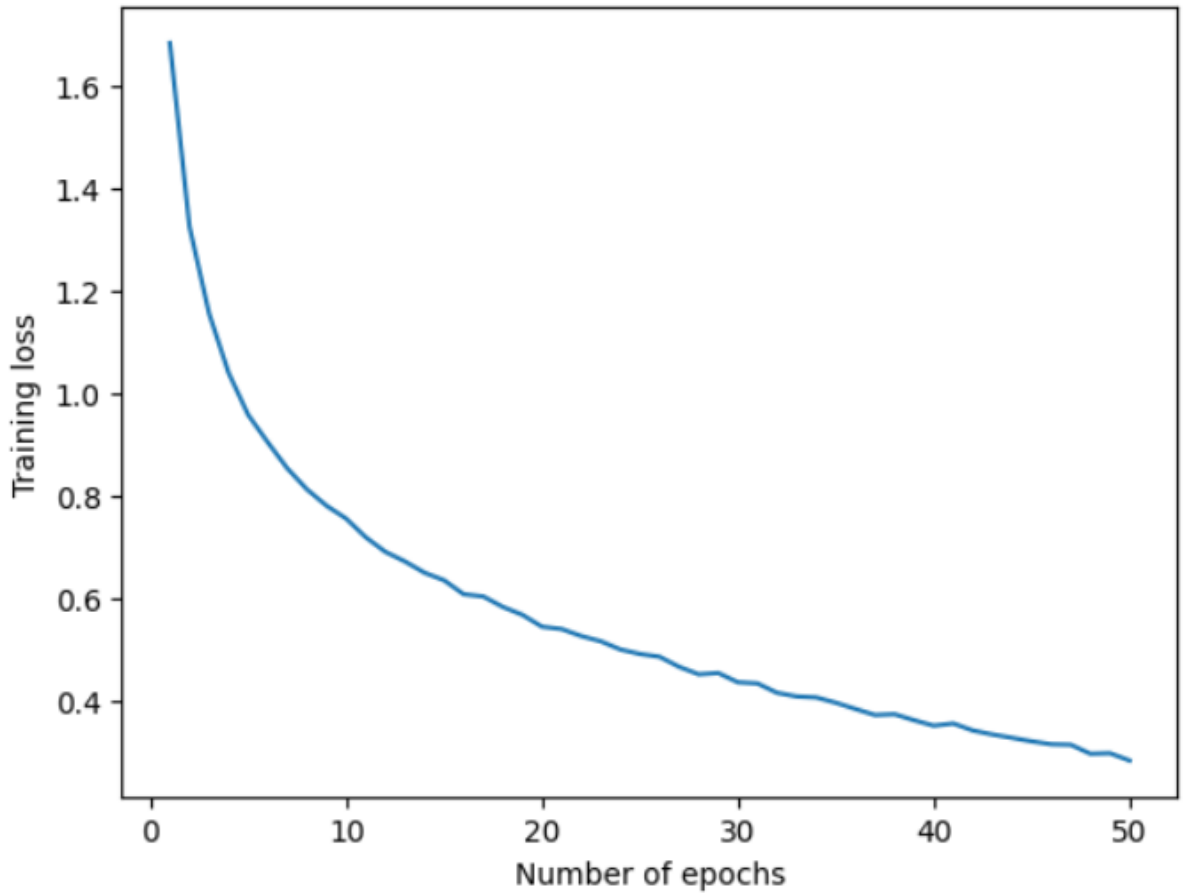
Now testing effect of change of depth

a) Four Level Resnet Block with 2 fully connected layers



Test set Accuracy= 78.66%
Last Epoch Training loss=0.070

b) <u>Three level Resnet with 4 fully connected layers</u>



Test Set Accuracy=76.84%
Last Epoch Training loss=0.2828

Network	Parameters	Test accuracy
Original network (3 residual blocks, 2 fully connected layers)	**23,704**	**69.18%**
Network with four residual blocks (2 fully connected layers)	**26,464**	**78.66%**
Network with three residual blocks (4 fully connected layers)	**23,704**	**76.84%**

So, 4 Level Resnet CNN with two FCL is best among all three types of model.