

# COMPARISON OF THE PERFORMANCE OF TWO MULTI-LAYER PERCEPTRONS IN MNIST DATASET

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## SOURCE CODE

The Source code used to train the model can be found [here](#) (Github repository link)

I trained the MNIST dataset in two models. The model summary of the two models is as shown in the images below

### Model 1

Model: "sequential"		
Layer (type)	Output Shape	Param #
=====		
flatten (Flatten)	(None, 784)	0
dense (Dense)	(None, 80)	62800
dense_1 (Dense)	(None, 10)	810
=====		
Total params: 63,610		
Trainable params: 63,610		
Non-trainable params: 0		

### Model 2

Model: "sequential_1"		
Layer (type)	Output Shape	Param #
=====		
flatten_1 (Flatten)	(None, 784)	0
dense_2 (Dense)	(None, 50)	39250
dense_3 (Dense)	(None, 128)	6528
dense_4 (Dense)	(None, 10)	1290
=====		
Total params: 47,068		
Trainable params: 47,068		
Non-trainable params: 0		

A comparison on both the model training is tabulated below:

Criteria	Model 1	Model 2
# of Hidden layers	1	2
# of parameters	63,610	47,068
Total # of neurons	90	188

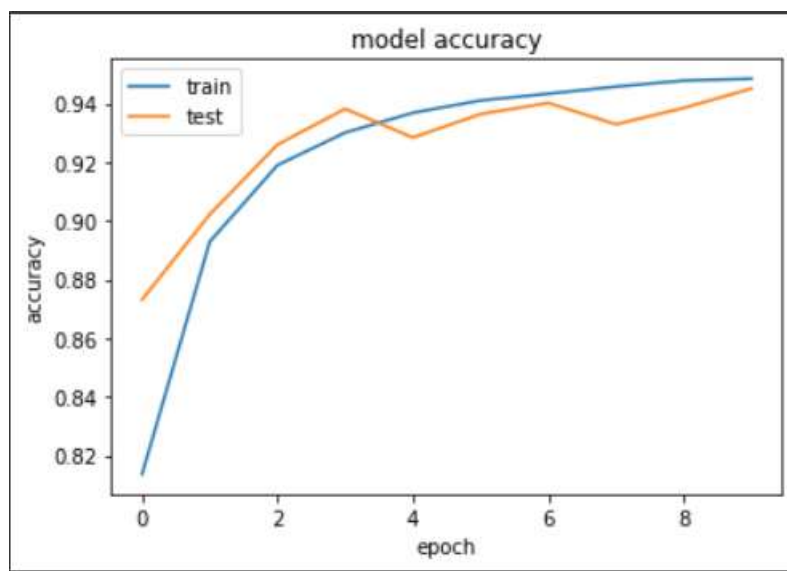
Both the models were trained with same Loss function (cross\_entropy), same optimization function(Adam) and the same number of epochs(ten).

Validation Accuracy of Model 1 = 94.510%

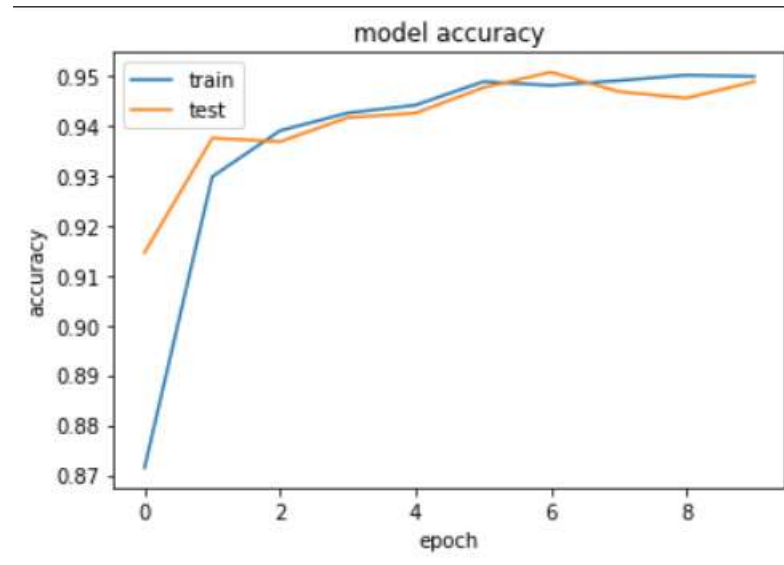
Validation Accuracy of Model 2 =94.870%

Accuracy vs Epoch Plots

Model 1



## Model 2



## Inference

The 2<sup>nd</sup> Model is more accurate than the 1<sup>st</sup> model.

Both models are trained through 10 epochs.

The 1<sup>st</sup> model has more parameters than the 2<sup>nd</sup>.

But the 2<sup>nd</sup> model has more hidden layers and so it is able to give better predictions with better accuracy.