PROJECT - 2 REPORT

Architecture:

Conv(64, 2x2) -> Conv(64, 2x2) -> MaxPool(2x2) -> Dropout(0.35)

Conv(128, 2x2) -> Conv(128, 2x2) -> MaxPool(2x2) -> Dropout(0.35)

Flatten -> Dense(256)-> Dropout(0.5) - > Dense(10)

Convolution layer:

I have used 2 pairs of convolution layers with 64 and 128 filters in each pair with a kernel size of 2 in every layer. I tried changing the number of filters but, 64 and 128 produced the best accuracy.

Used Rectified Linear Unit (ReLu) activation function in convolution layer. I have tried other activation functions like tanh and leaky ReLu.

We can also use 3 pairs since our images are 7X7 it is not that useful to use 3 pairs.

MaxPool layer:

Used MaxPooling layer after each pair of convolution layers with a pool size of 2x2

Dropout Layer:

Added a dropout layer because I have observed that the model is overfitting the data resulting in high training accuracy and low testing accuracy.

Tried several combinations after each MaxPool layer and Dense layer but the best possible dropout percentage is 40% after convolution layer and 50% for dense layer.
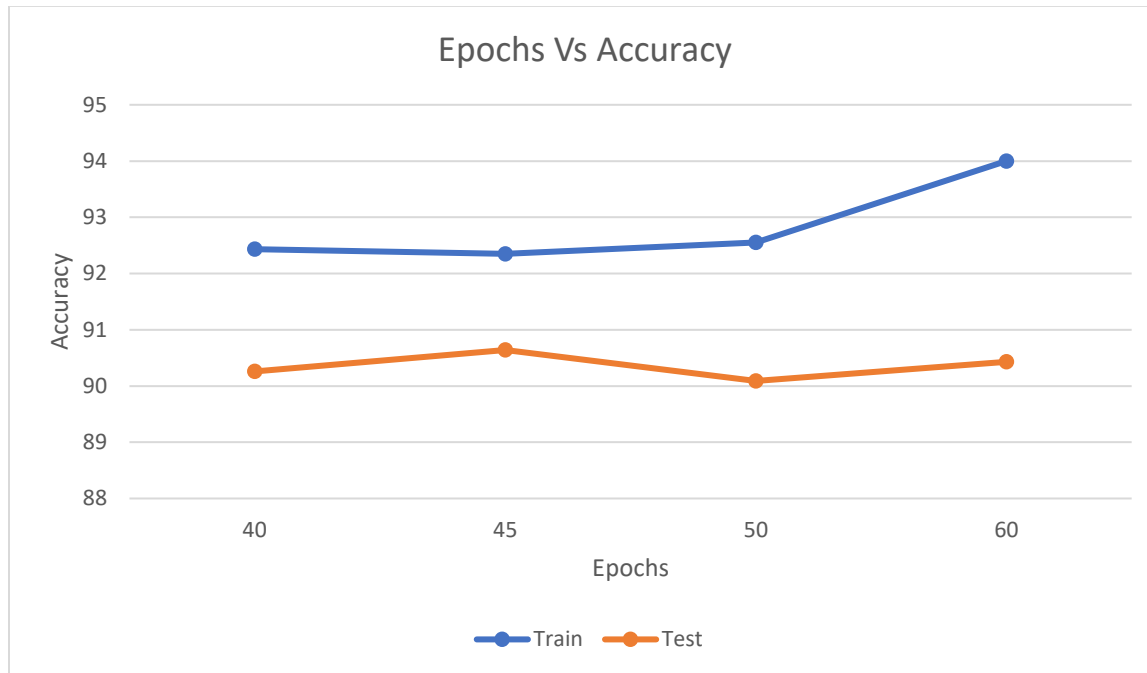
Dense Layer:

I have just used one dense layer because I did not observe any increase in accuracy when I added more layers.

I also tried multiple values of number of units in dense layer including 128, 256 and 512. 256 gave the best test accuracy from my observations.

Epochs:

I tried 40, 45, 50, 60 epochs and observed that 45 is giving best accuracy.

Epochs Vs Accuracy

Batch Normalization:

To increase the independence between each layer and to improve the stability and performance of the network I have added Batch Normalization after each layer except the dropout layer.

Accuracy:

Training Accuracy – 92.35

Testing Accuracy – 90.64