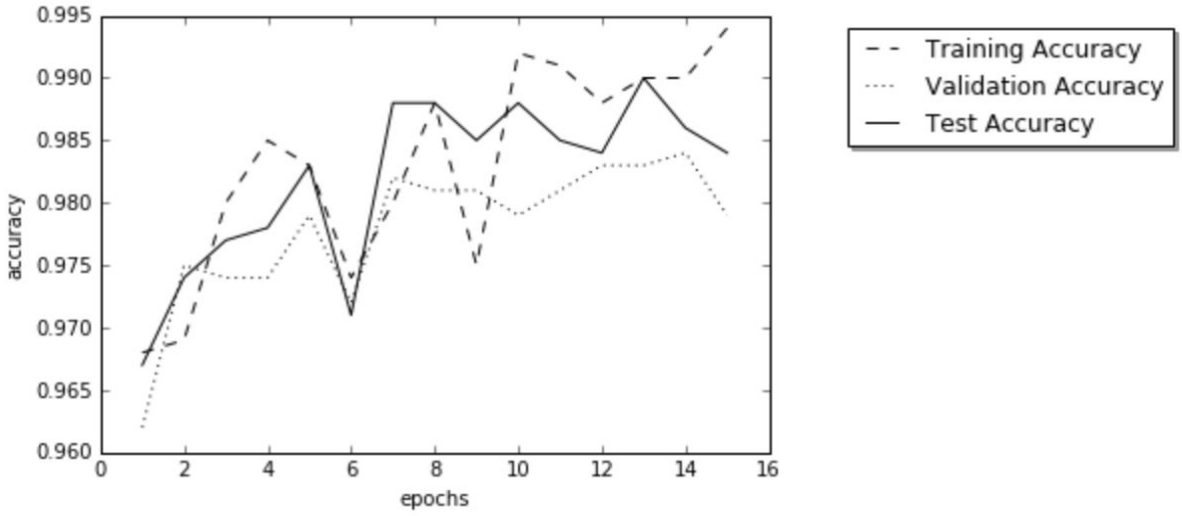
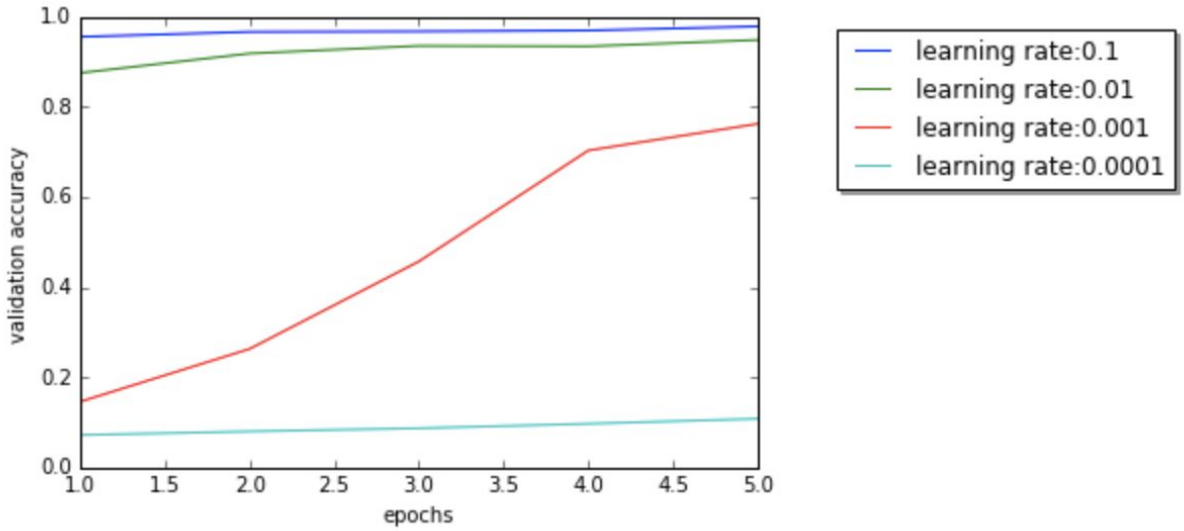
Implementation of Neural Network in Tensor Flow

Constructed Convolutional Neural Network according to specifications given in the assignment. I trained my ConvNet using SGD and 15 training epochs. As evident from graph, with increasing epochs, the accuracy gets better and better.



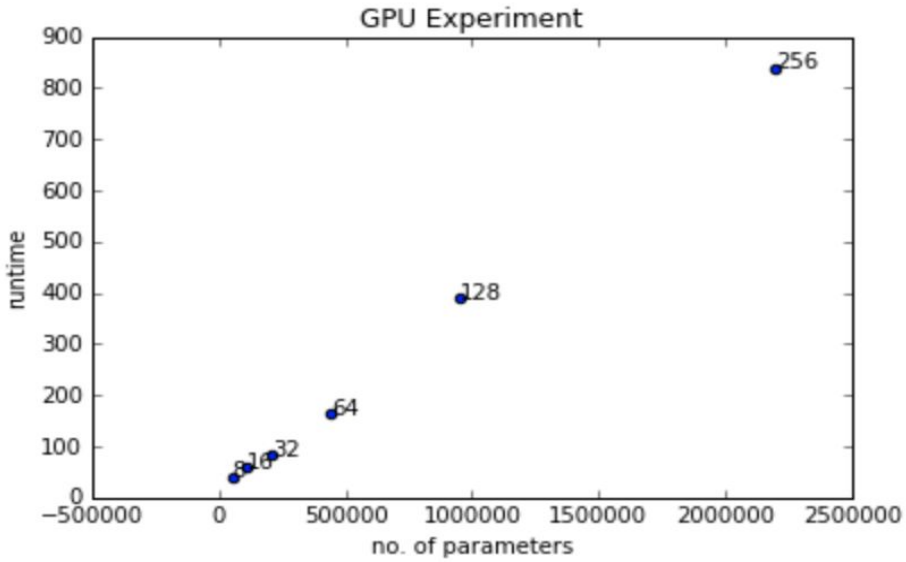
Changing the Learning Rate

After making sure that everything works correctly, I tried SGD with varying learning rates. As evident from graph, the learning rate of 0.1 works best. Learning is slow for 0.001. For learning rate of 0.0001, network learns really really slow. It is highly unlikely that the network will learn good parameters in reasonable amount of time for learning rate of 0.0001.



Runtime GPU Experiment:

In this experiment, I tried varying number of filters for our Convolutional layers. I ran this experiment using GPUs in computer pool. As evident from below given scatter plot, there is linear relationship between number of parameters and runtime. With increasing number of filters, number of parameters increases, and in turn runtime also drastically increases.



Runtime CPU Experiment

Did same experiment but this time using CPU. Below is the plot I produced after completion of my experiment. The plot isn't very different from GPU plot.