Programming Assignment 02: Convolutional Neural Network (CNN) for Classification

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In this programming assignment we constructed a convolutional neural network in order to perform number digit classification using the MNIST dataset.

In the first step, we created a Fully Connected Network with 100 Neurons and a Sigmoid Activation Function. After training and testing, we got an accuracy of 97.91%

In the second step, we added 2 convolutional layers to the network. Each CNN layer had a pooling layer, 40 5x5 kernels, a stride of 1, and a pool over 2x2 regions. We got an accuracy of 99.07%.

In the third step, we used the same network as the previous step, but changed the activation function from Sigmoid to Relu and changed the learning rate. We got an accuracy of 99.32%. The change in accuracy changed less then a percent.

In the fourth step, we added a third fully connected layer to the network created in the previous step. We got an accuracy of 99.28%.

Finally in the fifth step, we changed the Neurons in Fully Connected layers from 100 to 1000. We also implemented Dropout at a rate of 0.5. We got an accuracy increase of 99.47%

In conclusion, the increase in layers and complexity of the Neural Network did improve accuracy. By 2-3%.