9 Sept 2019

**Attendance: 10%, Continuous evaluation: 70%, Viva-20%**

***Assignment No. 3***

1. Download and install tensorflow from <https://www.tensorflow.org/install/install_sources> or using command sudo pip install tensorflow alternatively the Keras library can be used.
2. Download MNIST dataset (contains class labels for digits 0-9). using the command:

*import tensorflow as tf*

*data = tf.contrib.learn.datasets.mnist.load\_mnist()*

*or*

*from keras.datasets import mnist*

*(x\_train, y\_train), (x\_test, y\_test) = mnist.load\_data()*

1. Use Multi Layer Fully Connected Neural Network to develop the model and predict the accuracy for test set. (Reduce the training size by 1/10 if computation resources are limited).
2. Now run the network by changing the hyper-parameters:

|  |  |  |  |
| --- | --- | --- | --- |
| Hidden Layers | Activation Function | Hidden Neurons | Dropout |
| 1 | Sigmoid | [ 64] | 0.8` |
| 2 | Tanh | [256] | 0.5 |
| 3 | Relu | [128] | 0.2 |

Try all the possible combinations.

1. Plot the graph for loss vs epoch and accuracy(train, test set) vs epoch for all the above cases.
2. Create five image(size 28\*28) containing a digit of your won handwriting and test whether your trained classifier is able to predict it or not.

Submit a report with results.