In the Name of Allah

Assignment 3

Deadline : 1400 / 12 / 26

Course : Fundamentals of Deep Learning

TA : Moein Heidari

1 MNIST dataset is of 60,000 28x28 grayscale images of the 10 digits, along with a test set of 10,000 images.

a. Load and Visualize all the classes of the dataset.

b. Build a neural network using Keras to classify the digis. Report your accuracy, loss figures and evaluate your models performance on test data.

* Note that the hyper parameters of the model (number of hidden layers, size of neurons in each layer etc…) is optional and you should change them in a way to get the best accuracy.

c. Try using methods to decrease overfiting (drop-out , batch normalization …) and report your results.

2. Develop a neural network to predict sinus function . You can use the following code to generate your dataset.

```
import numpy as np
import sklearn
x=np.arange(0,2*pi,pi/1000)
y=np.sin(x)
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y,test_size=0.2, random_state=0)
```

Good Luck