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Assignment01: Setting Up Python Environment

Date: 6/22/2022

In [1]:

```
# change directory to dsc650 root dir
import os

# check current dir
# os.getcwd()

os.chdir('C:/Users/taylo/OneDrive/Documents/dsc650/')
```

In [2]:

```
# 1.1.a. Run Keras MNIST MLP Examples
%run examples/mnist_mlp.py
```

```
60000 train samples
10000 test samples
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
dense (Dense)                (None, 512)               401920
_________________________________________________________________
dropout (Dropout)            (None, 512)               0
_________________________________________________________________
dense_1 (Dense)              (None, 512)               262656
_________________________________________________________________
dropout_1 (Dropout)          (None, 512)               0
_________________________________________________________________
dense_2 (Dense)              (None, 10)                5130
=================================================================
Total params: 669,706
Trainable params: 669,706
Non-trainable params: 0
_________________________________________________________________
Train on 60000 samples, validate on 10000 samples
Epoch 1/20
60000/60000 [==============================] - 9s 150us/sample - loss: 0.2467 - accuracy: 0.9243 - val_
loss: 0.1014 - val_accuracy: 0.9693
Epoch 2/20
60000/60000 [==============================] - 8s 128us/sample - loss: 0.1029 - accuracy: 0.9686 - val_
loss: 0.0763 - val_accuracy: 0.9769
Epoch 3/20
60000/60000 [==============================] - 8s 137us/sample - loss: 0.0752 - accuracy: 0.9770 - val_
loss: 0.0749 - val_accuracy: 0.9798
Epoch 4/20
60000/60000 [==============================] - 7s 117us/sample - loss: 0.0609 - accuracy: 0.9816 - val_
loss: 0.0754 - val_accuracy: 0.9802
Epoch 5/20
60000/60000 [==============================] - 6s 106us/sample - loss: 0.0515 - accuracy: 0.9845 - val_
loss: 0.0717 - val_accuracy: 0.9823
Epoch 6/20
60000/60000 [==============================] - 6s 103us/sample - loss: 0.0423 - accuracy: 0.9869 - val_
loss: 0.0759 - val_accuracy: 0.9801
Epoch 7/20
60000/60000 [==============================] - 9s 148us/sample - loss: 0.0380 - accuracy: 0.9880 - val_
loss: 0.0708 - val_accuracy: 0.9823
Epoch 8/20
60000/60000 [==============================] - 10s 169us/sample - loss: 0.0336 - accuracy: 0.9901 - val
```

```
_loss: 0.0875 - val_accuracy: 0.9804
Epoch 9/20
60000/60000 [==============================] - 9s 152us/sample - loss: 0.0297 - accuracy: 0.9914 - val_
loss: 0.0774 - val_accuracy: 0.9825
Epoch 10/20
60000/60000 [==============================] - 9s 148us/sample - loss: 0.0277 - accuracy: 0.9922 - val_
loss: 0.0814 - val_accuracy: 0.9843
Epoch 11/20
60000/60000 [==============================] - 7s 122us/sample - loss: 0.0269 - accuracy: 0.9921 - val_
loss: 0.0853 - val_accuracy: 0.9839
Epoch 12/20
60000/60000 [==============================] - 8s 137us/sample - loss: 0.0244 - accuracy: 0.9931 - val_
loss: 0.0913 - val_accuracy: 0.9832
Epoch 13/20
60000/60000 [==============================] - 8s 139us/sample - loss: 0.0221 - accuracy: 0.9937 - val_
loss: 0.0848 - val_accuracy: 0.9849
Epoch 14/20
60000/60000 [==============================] - 9s 146us/sample - loss: 0.0212 - accuracy: 0.9938 - val_
loss: 0.0915 - val_accuracy: 0.9852
Epoch 15/20
60000/60000 [==============================] - 10s 161us/sample - loss: 0.0199 - accuracy: 0.9943 - val
_loss: 0.1053 - val_accuracy: 0.9842
Epoch 16/20
60000/60000 [==============================] - 8s 141us/sample - loss: 0.0208 - accuracy: 0.9946 - val_
loss: 0.1107 - val_accuracy: 0.9836
Epoch 17/20
60000/60000 [==============================] - 8s 136us/sample - loss: 0.0172 - accuracy: 0.9951 - val_
loss: 0.1133 - val_accuracy: 0.9855
Epoch 18/20
60000/60000 [==============================] - 8s 141us/sample - loss: 0.0154 - accuracy: 0.9954 - val_
loss: 0.1176 - val_accuracy: 0.9839
Epoch 19/20
60000/60000 [==============================] - 8s 135us/sample - loss: 0.0177 - accuracy: 0.9953 - val_
loss: 0.1061 - val_accuracy: 0.9862
Epoch 20/20
60000/60000 [==============================] - 7s 121us/sample - loss: 0.0169 - accuracy: 0.9957 - val_
loss: 0.1321 - val_accuracy: 0.9846
Test loss: 0.1321271433721706
Test accuracy: 0.9846
```

In [3]:

```
# 1.1.b Run PySpark Example
%run examples/pi.py
```

```
Pi is roughly 3.141240
```