📓 codebasics / **deep-learning-keras-tf-tutorial**   ⬡ Public

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deep-learning-keras-tf-tutorial / **9_tensorboard** /

digits_recognition_neural_network_tensorboard_demo.ipynb

🐙   **Karandeep Grover** ENH: moved all the active tutorial content from py/deeplearning   ↺

👥 **0** contributors

```
749 lines (749 sloc)  │  39.8 KB
```

Tensorboard demo using handwritten digits classification using neural network

In this notebook we will classify handwritten digits using a simple neural network which has only input and output layers. We will than add a hidden layer and see how the performance of the model improves

```python
In [1]:  import tensorflow as tf
         from tensorflow import keras
         import matplotlib.pyplot as plt
         %matplotlib inline
         import numpy as np
```

```python
In [2]:  (X_train, y_train) , (X_test, y_test) = keras.datasets.mnist.load_data()
```

```python
In [3]:  len(X_train)
```
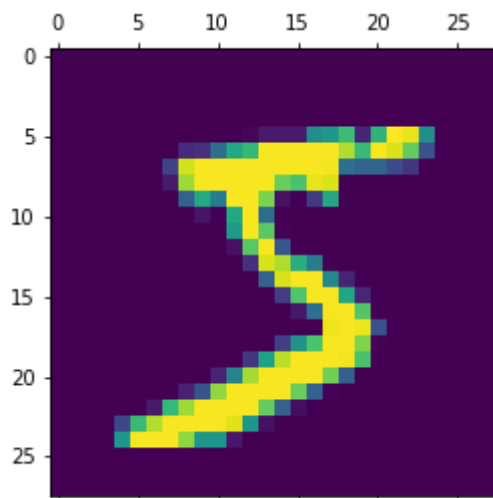
Out[3]: 60000

```python
In [4]:  len(X_test)
```

Out[4]: 10000

```python
In [5]:  X_train[0].shape
```

Out[5]: (28, 28)

```python
In [6]:  plt.matshow(X_train[0])
```

Out[6]:


```python
In [7]:  y_train[0]
```

Out[7]: 5

In [8]:
```python
X_train = X_train / 255
X_test = X_test / 255
```

In [9]:
```python
X_train_flattened = X_train.reshape(len(X_train), 28*28)
X_test_flattened = X_test.reshape(len(X_test), 28*28)
```

In [10]:
```python
X_train_flattened.shape
```

Out[10]: (60000, 784)

Using Flatten layer so that we don't have to call .reshape on input dataset

In [12]:
```python
model = keras.Sequential([
    keras.layers.Flatten(input_shape=(28, 28)),
    keras.layers.Dense(100, activation='relu'),
    keras.layers.Dense(10, activation='sigmoid')
])

model.compile(optimizer='adam',
              loss='sparse_categorical_crossentropy',
              metrics=['accuracy'])

tb_callback = tf.keras.callbacks.TensorBoard(log_dir="logs/", histogram_

model.fit(X_train, y_train, epochs=5, callbacks=[tb_callback])
```

```
Epoch 1/5
   1/1875 [..............................] - ETA: 0s - loss: 2.2880 - acc
uracy: 0.0625WARNING:tensorflow:From C:\Users\dhava\AppData\Roaming\Pytho
n\Python38\site-packages\tensorflow\python\ops\summary_ops_v2.py:1277: st
op (from tensorflow.python.eager.profiler) is deprecated and will be remo
ved after 2020-07-01.
Instructions for updating:
use `tf.profiler.experimental.stop` instead.
WARNING:tensorflow:Callbacks method `on_train_batch_end` is slow compared
to the batch time (batch time: 0.0000s vs `on_train_batch_end` time: 0.02
75s). Check your callbacks.
1875/1875 [==============================] - 1s 579us/step - loss: 0.2877
- accuracy: 0.9203
Epoch 2/5
1875/1875 [==============================] - 1s 555us/step - loss: 0.1335
- accuracy: 0.9610
Epoch 3/5
1875/1875 [==============================] - 1s 558us/step - loss: 0.0937
- accuracy: 0.9717
Epoch 4/5
1875/1875 [==============================] - 1s 561us/step - loss: 0.0726
- accuracy: 0.9781
Epoch 5/5
1875/1875 [==============================] - 1s 562us/step - loss: 0.0602
- accuracy: 0.9816
```

Out[12]:

In [ ]:
```python
# %load_ext tensorboard
# %tensorboard --logdir logs/fit
```

```
# %tensorboard --logdir logs/fit
```

Either run above inline magic or go to git bash or your command prompt and type below to run it, `tensorboard --logdir logs/` This will launch tensorboard at this url which you can open in your browser `http://localhost:6006/`

In [17]:
```
model.get_weights()
```

Out[17]:
```
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        ...,
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```

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