Objectives: Practice dealing with Dataset. (학습 목표 : Dataset 을 다루는 연습을 합니다)

```
import warnings
warnings.filterwarnings('ignore')
```

```
import numpy as np
import matplotlib.pyplot as plt
#import tensorflow as tf
from tensorflow.examples.tutorials.mnist import input_data
```

- Download dataset

```
mnist = input_data.read_data_sets("MNIST_data/", one_hot=True)

#for furture version mnist = tf.keras.datasets.mnist
```

```
Extracting MNIST_data/train-images-idx3-ubyte.gz
Extracting MNIST_data/train-labels-idx1-ubyte.gz
Extracting MNIST_data/t10k-images-idx3-ubyte.gz
Extracting MNIST_data/t10k-labels-idx1-ubyte.gz
```

```
print(mnist.train.images.shape)
print(mnist.test.images.shape)
```

```
(55000, 784)
(10000, 784)
```

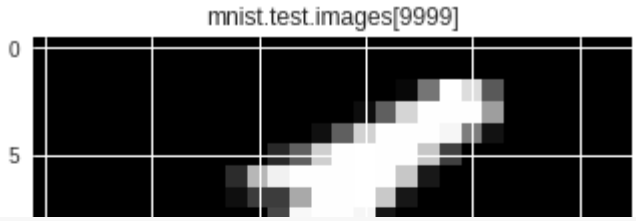
```
idx = 9999
```

```
'mnist.test.images[{}]'.format(idx)
```

```
'mnist.test.images[9999]'
```

```
img1 = mnist.test.images[idx]
img1 = np.array(img1, dtype='float')

pixels = img1.reshape((28, 28))
plt.imshow(pixels, cmap='gray')
plt.title('mnist.test.images[{}]'.format(idx))
plt.show()
```




```
mnist.test.labels[idx]
```

```
array([0., 0., 0., 0., 0., 0., 1., 0., 0., 0.])
```

```
label1 = mnist.test.labels[idx]
print(label1)
```

```
[0. 0. 0. 0. 0. 0. 1. 0. 0. 0.]
```

Students

- what is *one-hot encoding* ?
- What does the code below mean? (아래 코드의 의미는?)

```
label2 = np.argmax(label1)
print(label2)
```

```
6
```

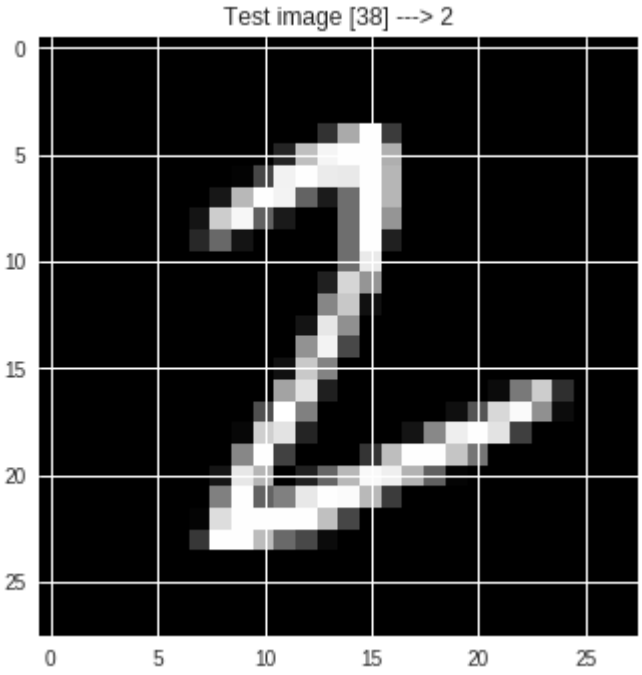
To practice one more thing

```
np.argmax([0, 1, 6, 3, 2, -2, 5, 7, 10])
```

```
8
```

```
idx = 38
img1 = mnist.test.images[idx]
img1 = np.array(img1, dtype='float')
lbl1 = np.argmax(mnist.test.labels[idx])

pixels = img1.reshape((28, 28))
plt.imshow(pixels, cmap='gray')
#plt.title('mnist.test.images[{}] ---> {}'.format(idx, lbl1))
plt.title('Test image [{}] ---> {}'.format(idx, lbl1))
plt.show()
```


Test image [38] ---> 2
0
5
10
15
20
25
0
5
10
15
20
25