```
Assignment No.1
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Batch : P-11
```

Tensorflow Test Program

In [1]:
```
import tensorflow as tf
```

In [2]:
```
tf.__version__
```

Out[2]:
```
'2.7.0'
```

In [3]:
```
print(tf.reduce_sum(tf.random.normal([50, 100])))
```

```
tf.Tensor(-2.8645325, shape=(), dtype=float32)
```

Keras Test Program

In [4]:
```
from tensorflow import keras
```

In [5]:
```
from keras.datasets import mnist
```

In [6]:
```
data = mnist.load_data()
```

In [7]:
```
data
```

Out[7]:
```
((array([[[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         ...,

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]]], dtype=uint8),
  array([5, 0, 4, ..., 5, 6, 8], dtype=uint8)),
 (array([[[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
```

```
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         ...,

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]],

         [[0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          ...,
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0],
          [0, 0, 0, ..., 0, 0, 0]]], dtype=uint8),
 array([7, 2, 1, ..., 4, 5, 6], dtype=uint8)))
```

In [8]:
```
(train_images, train_labels), (test_images, test_labels) = mnist.load_data()
```

In [10]:
```
train_images.shape, test_images.shape
```

Out[10]:
```
((60000, 28, 28), (10000, 28, 28))
```

Theano Test Program

In [12]:
```
import numpy
```

In [5]:
```
pip install theano
```

```
Collecting theano
  Downloading Theano-1.0.5.tar.gz (2.8 MB)
Requirement already satisfied: numpy>=1.9.1 in f:\anacondasetup\lib\site-packag
es (from theano) (1.20.1)
Requirement already satisfied: scipy>=0.14 in f:\anacondasetup\lib\site-package
s (from theano) (1.6.2)
Requirement already satisfied: six>=1.9.0 in f:\anacondasetup\lib\site-packages
(from theano) (1.15.0)
Building wheels for collected packages: theano
  Building wheel for theano (setup.py): started
  Building wheel for theano (setup.py): still running...
  Building wheel for theano (setup.py): finished with status 'done'
  Created wheel for theano: filename=Theano-1.0.5-py3-none-any.whl size=2668107
sha256=23ca7652f0f0f34c653c76f34441cf790ca812b5e74b3b803ab36f315b248bd5
  Stored in directory: c:\users\hp\appdata\local\pip\cache\wheels\84\cb\19\235b
5b10d89b4621f685112f8762681570a9fa14dc1ce904d9
Successfully built theano
Installing collected packages: theano
Successfully installed theano-1.0.5
Note: you may need to restart the kernel to use updated packages.
```

In [6]:
```
import theano.tensor as T
from theano import function
```

```
WARNING (theano.tensor.blas): Using NumPy C-API based implementation for BLAS f
unctions.
```

In [7]:
```
# Declare two variables
x = T.dscalar('x')
y = T.dscalar('y')

# Summing up the two numbers
z = x + y

# converting it to a callable object
# so that it takes matrix as parameter
f = function([x, y], z)
f(5, 7)
```

Out[7]:
```
array(12.)
```

PyTorch Test Program

In [8]:
```
conda install torch
```

```
^C

Note: you may need to restart the kernel to use updated packages.
```

In [1]:
```
import torch
```

In [2]:
```
x = torch.rand(5, 3)
print(x)
```

```
tensor([[0.8167, 0.8302, 0.5331],
        [0.2227, 0.0976, 0.0612],
        [0.4158, 0.5402, 0.2268],
        [0.0267, 0.5081, 0.3983],
        [0.3840, 0.0267, 0.0800]])
```

In [3]:
```
print(torch.__version__)
```

```
1.13.0+cpu
```

In [ ]:
```

```