

Tensorflow Practice 2

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Setting

- Download the codes and put on your working directory.
- IPython notebook is optional. You can use terminal only.


 jupyter

Logout

Files Running Clusters

Select items to perform actions on them.

Upload New ↕ ↻

 / Untitled Folder

Text File

Folder

Terminal

Notebooks

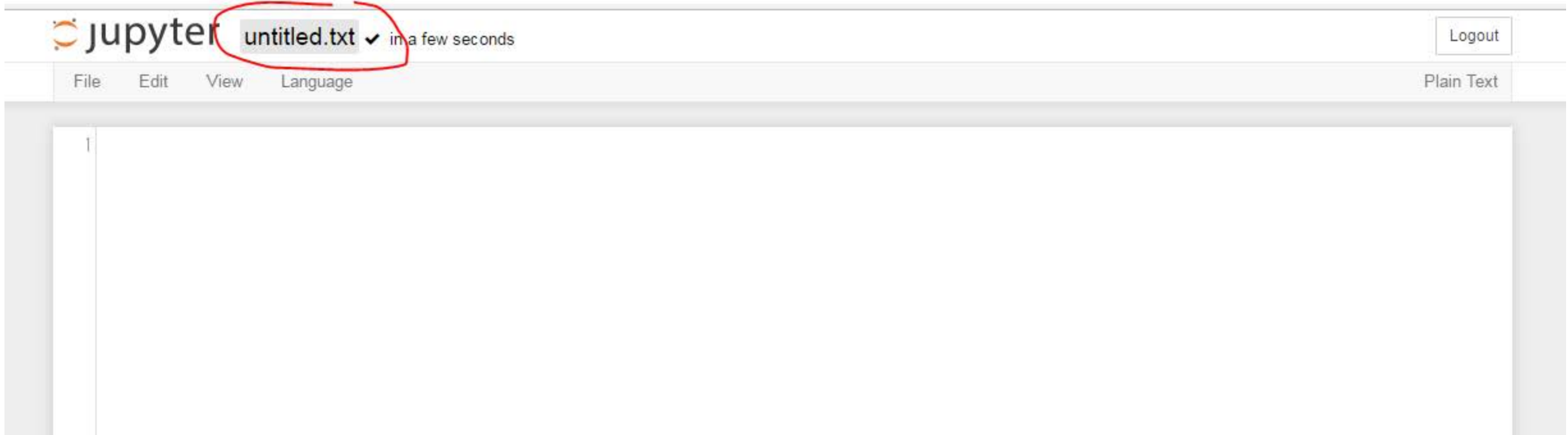
Python 2

iTorch

Notebook list empty.

Creating Python Files

- Change the name.



Editing Python Files

- Edit the file and don't forget to save it (Ctrl+S).



The screenshot shows a JupyterLab interface with a file named 'mnist_fill_hole.py' opened. The code in the editor is as follows:

```
1 import tensorflow as tf
2 import numpy as np
3 import cPickle as pickle
4
5 from ops import *
6 from utils import *
7
8 from tensorflow.examples.tutorials.mnist import input_data
9 mnist = input_data.read_data_sets('MNIST_data', one_hot=True)
10
11 def put_hole(images):
12     # shape of images : num_data * 728
13
14     new_images = np.zeros(images.shape)
15
16     for i in xrange(images.shape[0]):
17         img = np.copy(images[i])
18
19         x = np.random.randint(21)
20         y = np.random.randint(21)
21         img[x:x+7, y:y+7] = 0
22         new_images[i] = img
23
24     return new_images
25
26
27 # constants
28 batch_size = 128
29
30
31 # =====
32 # model
33 # - This model fails to fill the holes.
34 # - Put some fully connected layers between convolutional layer and deconvolutaional layer.
```

Running Code

- After you put the codes run “mnist_fill_hole.py” in terminal.
 - python mnist_fill_hole.py

 jupyter

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Files

Running

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Upload


New ▾




▾  / ml

 ..

 mnist_fill_hole.py

 ops.py

 utils.py

out.png

- "mnist_fill_hole.py" will generate "out.png".

 jupyter

Logout

Files Running Clusters

Select items to perform actions on them.

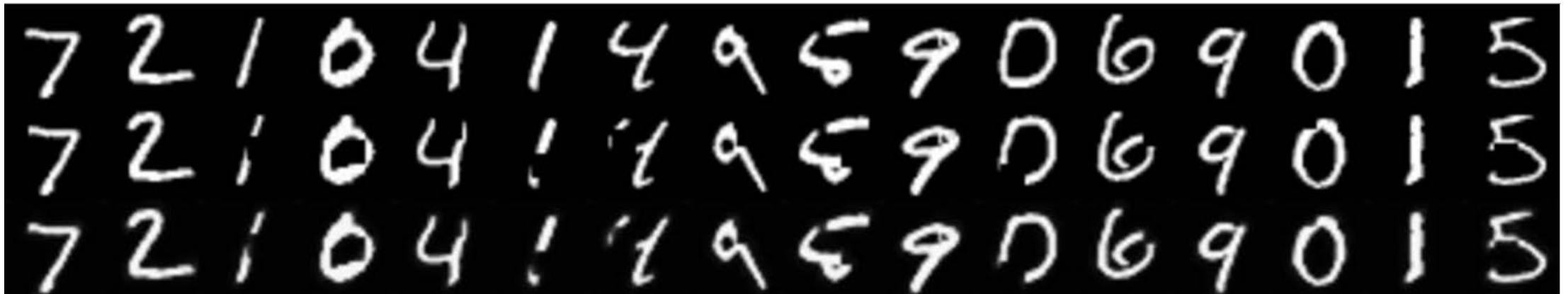
Upload New ↕ ↻

/ ml

<input type="checkbox"/>	..
<input type="checkbox"/>	folder MNIST_data
<input type="checkbox"/>	file mnist_fill_hole.py
<input type="checkbox"/>	file ops.py
<input checked="" type="checkbox"/>	file out.png
<input type="checkbox"/>	file utils.py

out.png

- 1th row: original image
- 2nd row: input image
- 3rd row: output image
- It looks like the model failed to fill the holes ☹️.
 - You need to fix this problem!



Operations (Layers)

- In "ops.py" there are some useful layers
 - **conv2d** : convolutional layer
 - **deconv2d** : transposed convolutional layer
 - **linear** : fully connected layer

ops.py

- `tf.get_variable(...)`, `tf.variable_scope(...)`
 - https://www.tensorflow.org/versions/r0.11/how_tos/variable_scope/index.html#understanding-tf-get-variable
 - Method of creating, naming, and sharing variables in a graph.
- `tf.nn.conv2d(...)`
 - Basic function for convolutional neural network.
 - `Padding="Same"`
 - `stride = 1` -> width and height do not change
 - `stride = 2` -> width and height are halved

ops.py

- `tf.random_normal_initializer(...)`
 - Initialize tensor from normal distribution
- `tf.nn.conv2d_transpose(...)`
 - Transposed convolution
- `tf.nn.bias_add(...)`
 - Add bias vector on 4d-tensor (batch size, height, width, channel)
 - Each channel has one bias.
- `<tensor variable>.get_shape()`
 - Same as `shape()` in numpy except that output is also tensor variable which is different from mere tuple.

Tensorflow for Window

- Use docker (virtual machine framework) for Window!
- <http://solarisailab.com/archives/384>

Questions?

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