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Win10系统 安装Anaconda+TensorFlow+Keras

小白一枚，安装过程走了很多坑，前前后后安装了好几天，因此记录一下。

一、安装anaconda

官方下载地址：https://repo.continuum.io/archive/

选项相应的版本安装，我安装的Anaconda3-4.4.0-Windows-x86_64.exe版本，自带的Python版本为3.6.

安装：

安装路径我直接默认的C盘，安装过程一路next。

在Installation Options一步中，我按照官网说明，没有选择Add Anaconda to my PATH environment variable。

官方安装教程：https://docs.anaconda.com/anaconda/install/windows

安装完成后，配置path变量。

右键我的电脑->属性->高级选项->环境变量->系统变量->path->在path中添加路径：需要添加的有三个，分别为：

~\Anaconda3

~\Anaconda3\Scripts

~\Anaconda3\Library\bin

以我配置的环境变量为例：

至此，anaconda安装完成。

cmd，输入Python，显示Python版本，说明安装成功，如图。

另：如果已经配置了path的环境变量，仍报错Python不是内部命令，也不是外部命令。关闭Anaconda Prompt，再重新打开，就好了。

二、安装TensorFlow

打开Anaconda Prompt

1. 将pip升级到最新版：

```
python -m pip install -U pip
```

如图：

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2. 创建名为TensorFlow的环境，同时安装Python3.5.2

```
conda create --name tensorflow python=3.5.2
```

如图：

```
(C:\Users\          \Anaconda3) C:\Users\          >conda create -n tensorflow pyt
Fetching package metadata ...........
Solving package specifications: .

Package plan for installation in environment C:\Users\          \AppData\Local\co

The following NEW packages will be INSTALLED:

    certifi:        2016.2.28-py35_0
    pip:            9.0.1-py35_1
    python:         3.5.2-0
    setuptools:     36.4.0-py35_1
    vc:             14-0
    vs2015_runtime: 14.0.25420-0
    wheel:          0.29.0-py35_0
    wincertstore:   0.2-py35_0

Proceed ([y]/n)? y
```

输入y，回车。安装完成后如图所示：

```
vs2015_runtime 100% |#############################| Time: 0:00:02 933.47 kB/s
vc-14-0.tar.bz 100% |#############################| Time: 0:00:00 140.50 kB/s
python-3.5.2-0 100% |#############################| Time: 0:00:15   2.05 MB/s
certifi-2016.2 100% |#############################| Time: 0:00:00   4.68 MB/s
wheel-0.29.0-p 100% |#############################| Time: 0:00:00   5.23 MB/s
wincertstore-0 100% |#############################| Time: 0:00:00 924.04 kB/s
setuptools-36. 100% |#############################| Time: 0:00:00   6.41 MB/s
pip-9.0.1-py35 100% |#############################| Time: 0:00:00   5.73 MB/s
#
# To activate this environment, use:
# > activate tensorflow
#
# To deactivate this environment, use:
# > deactivate tensorflow
#
# * for power-users using bash, you must source
#
```

3. 激活这个环境：activate tensorflow

4. 安装TensorFlow

```
pip install tensorflow
```

如图：

```
(tensorflow) C:\Users\        >pip install tensorflow
Collecting tensorflow
  Downloading tensorflow-1.5.0-cp35-cp35m-win_amd64.whl (31.1MB)
    100% |################################| 31.1MB 40kB/s
Collecting six>=1.10.0 (from tensorflow)
  Using cached six-1.11.0-py2.py3-none-any.whl
Collecting numpy>=1.12.1 (from tensorflow)
  Using cached numpy-1.14.0-cp35-none-win_amd64.whl
Collecting protobuf>=3.4.0 (from tensorflow)
  Using cached protobuf-3.5.1-py2.py3-none-any.whl
Collecting tensorflow-tensorboard<1.6.0,>=1.5.0 (from tensorflow)
  Using cached tensorflow_tensorboard-1.5.0-py3-none-any.whl
Collecting absl-py>=0.1.6 (from tensorflow)
  Using cached absl-py-0.1.10.tar.gz
Requirement already satisfied: wheel>=0.26 in c:\users\        \appdata\local\conda\conda\envs\tensorflow\lib\site-packages (from ter
Requirement already satisfied: setuptools in c:\users\        \appdata\local\conda\conda\envs\tensorflow\lib\site-packages (from prot
Collecting html5lib==0.9999999 (from tensorflow-tensorboard<1.6.0,>=1.5.0->tensorflow)
Collecting bleach==1.5.0 (from tensorflow-tensorboard<1.6.0,>=1.5.0->tensorflow)
  Using cached bleach-1.5.0-py2.py3-none-any.whl
Collecting futures>=3.1.1 (from tensorflow-tensorboard<1.6.0,>=1.5.0->tensorflow)
Collecting markdown>=2.6.8 (from tensorflow-tensorboard<1.6.0,>=1.5.0->tensorflow)
  Using cached Markdown-2.6.11-py2.py3-none-any.whl
Collecting werkzeug>=0.11.10 (from tensorflow-tensorboard<1.6.0,>=1.5.0->tensorflow)
  Using cached Werkzeug-0.14.1-py2.py3-none-any.whl
Building wheels for collected packages: absl-py
  Running setup.py bdist_wheel for absl-py ... done
  Stored in directory: C:\Users\        5\AppData\Local\pip\Cache\wheels\45\07\0e\6880381ca521796cf6cc18ba4ab502c2232e5777099b4df4ae
Successfully built absl-py
Installing collected packages: six, numpy, protobuf, html5lib, bleach, futures, markdown, werkzeug, tensorflow-tensorboard, absl-py,
Successfully installed absl-py-0.1.10 bleach-1.5.0 futures-3.1.1 html5lib-0.9999999 markdown-2.6.11 numpy-1.14.0 protobuf-3.5.1 six-1.
```

注：要在刚刚创建的名为tensorflow的环境中，安装TensorFlow. 即命令行前面有（Tensorflow）

验证安装是否成功：

```
(tensorflow) C:\Users\        >python
Python 3.5.2 |Continuum Analytics, Inc.| (default, Jul  5 2016, 11:41:13) [MSC v.
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow as tf
>>> exit()
```

三、安装keras

 重新进入Anaconda Prompt

1.安装keras

```
pip install keras
```

如图：

```
(tensorflow) C:\Users\        >pip install keras
Collecting keras
  Using cached Keras-2.1.3-py2.py3-none-any.whl
Collecting scipy>=0.14 (from keras)
  Using cached scipy-1.0.0-cp35-none-win_amd64.whl
Collecting pyyaml (from keras)
  Using cached PyYAML-3.12-cp35-cp35m-win_amd64.whl
Requirement already satisfied: numpy>=1.9.1 in c:\users\        \appdata\local\conda\conda\envs\ten
Requirement already satisfied: six>=1.9.0 in c:\users\        \appdata\local\conda\conda\envs\tenso
Installing collected packages: scipy, pyyaml, keras
Successfully installed keras-2.1.3 pyyaml-3.12 scipy-1.0.0
```

2. 安装MinGW

```
conda install mingw libpython
```

如图：

```
(tensorflow) C:\Users\        >conda install mingw libpython
Fetching package metadata ...........
Solving package specifications: .

Package plan for installation in environment C:\Users\        \AppData\Local\conda\

The following NEW packages will be INSTALLED:

    libpython: 2.0-py35_0
    mingw:     4.7-1

Proceed ([y]/n)? y

mingw-4.7-1.ta 100% |############################| Time: 0:00:31   1.87 MB/s
libpython-2.0- 100% |############################| Time: 0:00:00 897.31 kB/s
```
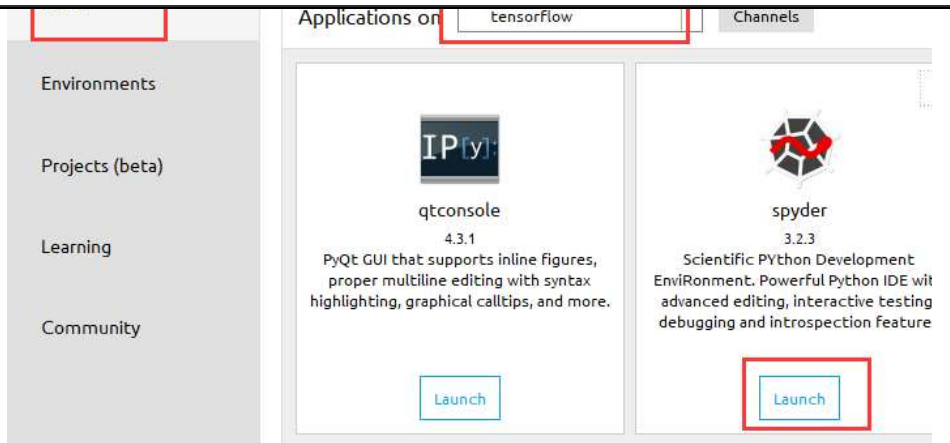
注：keras和MinGW都是在tensorflow的环境下安装。

此时keras安装成功。

验证：输入Python，再输入import keras，显示Using TensorFlow backed，则说明安装成功，如图。

```
(tensorflow) C:\Users\        >python
Python 3.5.2 |Continuum Analytics, Inc.| (default, Jul  5 2016, 11:41:13) [MSC v.
Type "help", "copyright", "credits" or "license" for more information.
>>> import keras
Using TensorFlow backend.
>>> import tensorflow as tf
>>>
```

四、实例

在Anaconda Navigator中打开Spyder，如图：

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复制keras官网下的实例，http://keras-cn.readthedocs.io/en/latest/getting_started/sequential_model/

```python
import numpy as np
from keras.models import Sequential
from keras.layers import Dense, Dropout

# Generate dummy data
x_train = np.random.random((1000, 20))
y_train = np.random.randint(2, size=(1000, 1))
x_test = np.random.random((100, 20))
y_test = np.random.randint(2, size=(100, 1))

model = Sequential()
model.add(Dense(64, input_dim=20, activation='relu'))
model.add(Dropout(0.5))
model.add(Dense(64, activation='relu'))
model.add(Dropout(0.5))
model.add(Dense(1, activation='sigmoid'))

model.compile(loss='binary_crossentropy',
              optimizer='rmsprop',
              metrics=['accuracy'])
model.fit(x_train, y_train,
          epochs=20,
          batch_size=128)
score = model.evaluate(x_test, y_test, batch_size=128)
```

运行结果如下所示

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```
1000/1000 [==============================] - 2s 2ms/step - loss: 0.7202 - acc: 0.4980
Epoch 2/20
1000/1000 [==============================] - 0s 25us/step - loss: 0.7011 - acc: 0.5110
Epoch 3/20
1000/1000 [==============================] - 0s 19us/step - loss: 0.7021 - acc: 0.4950
Epoch 4/20
1000/1000 [==============================] - 0s 17us/step - loss: 0.7067 - acc: 0.4890
Epoch 5/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6967 - acc: 0.4970
Epoch 6/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6950 - acc: 0.5190
Epoch 7/20
1000/1000 [==============================] - 0s 15us/step - loss: 0.6922 - acc: 0.5370
Epoch 8/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6950 - acc: 0.5230
Epoch 9/20
1000/1000 [==============================] - 0s 18us/step - loss: 0.6911 - acc: 0.5400
Epoch 10/20
1000/1000 [==============================] - 0s 15us/step - loss: 0.6980 - acc: 0.5240
Epoch 11/20
1000/1000 [==============================] - 0s 17us/step - loss: 0.6968 - acc: 0.5120
Epoch 12/20
1000/1000 [==============================] - 0s 18us/step - loss: 0.6954 - acc: 0.5200
Epoch 13/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6953 - acc: 0.5230
Epoch 14/20
1000/1000 [==============================] - 0s 17us/step - loss: 0.6936 - acc: 0.5220
Epoch 15/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6893 - acc: 0.5400
Epoch 16/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6911 - acc: 0.5360
Epoch 17/20
1000/1000 [==============================] - 0s 16us/step - loss: 0.6922 - acc: 0.5290
Epoch 18/20
1000/1000 [==============================] - 0s 17us/step - loss: 0.6920 - acc: 0.5290
Epoch 19/20
1000/1000 [==============================] - 0s 15us/step - loss: 0.6856 - acc: 0.5430
Epoch 20/20
1000/1000 [==============================] - 0s 15us/step - loss: 0.6925 - acc: 0.5300
100/100 [==============================] - 0s 210us/step
```

参考资料：

http://blog.csdn.net/u013829973/article/details/70555037

https://www.jianshu.com/p/f50bbfcb3674

--分割线--

安装过程中遇到的一部分错误：

1. 安装完keras后，在导入keras时，报错ImportError: No module named 'Keras'，如图：

解决：要在刚刚安装的tensorflow环境下，安装keras。而不是打开Anaconda Prompt就直接安装，如图：

错误安装：

正确安装：

```
Using cached Keras-2.1.3-py2.py3-none-any.whl
Collecting scipy>=0.14 (from keras)
  Using cached scipy-1.0.0-cp35-none-win_amd64.whl
Collecting pyyaml (from keras)
  Using cached PyYAML-3.12-cp35-cp35m-win_amd64.whl
Requirement already satisfied: numpy>=1.9.1 in c:\users\          \appdata\local\conda\conda\envs\ten
Requirement already satisfied: six>=1.9.0 in c:\users\        \appdata\local\conda\conda\envs\tenso
Installing collected packages: scipy, pyyaml, keras
Successfully installed keras-2.1.3 pyyaml-3.12 scipy-1.0.0
```

2. 成功安装tensorflow后，在import tensorflow时，报错Importing the multiarray numpy extension module failed，如图：

```
>>> import tensorflow as tf
Traceback (most recent call last):
  File "C:\Users\       \Anaconda3\Lib\site-packages\numpy\core\__init__.py",
    from . import multiarray
ImportError: cannot import name 'multiarray'

During handling of the above exception, another exception occurred:

Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "C:\Users\        \Anaconda3\Lib\site-packages\tensorflow\__init__.py",
    from tensorflow.python import *
  File "C:\Users\       \Anaconda3\Lib\site-packages\tensorflow\python\__init_
    import numpy as np
  File "C:\Users\        \Anaconda3\Lib\site-packages\numpy\__init__.py", line
    from . import add_newdocs
  File "C:\Users\        \Anaconda3\Lib\site-packages\numpy\add_newdocs.py", li
    from numpy.lib import add_newdoc
  File "C:\Users\       \Anaconda3\Lib\site-packages\numpy\lib\__init__.py", li
    from .type_check import *
  File "C:\Users\       \Anaconda3\Lib\site-packages\numpy\lib\type_check.py",
    import numpy.core.numeric as _nx
  File "C:\Users\        \Anaconda3\Lib\site-packages\numpy\core\__init__.py",
    raise ImportError(msg)
ImportError:
Importing the multiarray numpy extension module failed.  Most
likely you are trying to import a failed build of numpy.
If you're working with a numpy git repo, try `git clean -xdf` (removes all
files not under version control).  Otherwise reinstall numpy.
```

开始以为是numpy包的安装问题，因此卸了numpy，由重新安装，但仍报这个错。之后找到一篇博客得以改正。

解决方法：在Anaconda3\Lib\site-packages目录下，找到numpy相关的包，直接删除；然后再在tensorflow环境下安装numpy：pip install numpy

删除的文件为：

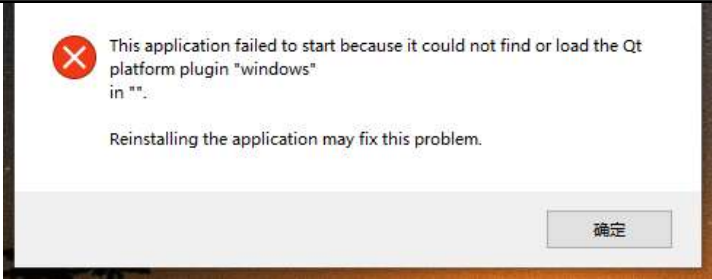|	
numpy	C:\Users\ \Anaconda3\Lib\site-packages\numpy\core\include
numpy	C:\Users\ \Anaconda3\Lib\site-packages
numpy-1.12.1-py3.6.egg-info	C:\Users\ \Anaconda3\Lib\site-packages

删除numpy文件后的Anaconda3\Lib\site-packages目录下的numpy文件为：

numpy 修改日期: 2018/2/2 16:10		C:\用户\ \Anaconda3\Lib\site-packages\pandas\co
numpy 修改日期: 2018/2/2 16:07		C:\用户\ \Anaconda3\Lib\site-packages\Cython\Incl
numpy 修改日期: 2018/2/2 16:06		C:\用户\ \Anaconda3\Lib\site-packages\astropy\util
numpy.png	类型: 照片 分辨率: 600 x 300	大小: 6
numpy_compat.cpython-36.pyc C:\用户\ \Anaconda3\Lib\site-packages\dask...	类型: PYC 文件	修改日 大小: 1
test_numpy.cpython-36.pyc C:\用户\ \Anaconda3\Lib\site-packages\distri...	类型: PYC 文件	修改日 大小: 5

但只知其然不知其所以然，不知道为什么这样就可以了。

参考：http://blog.csdn.net/bianjun1075/article/details/77803395

3. 打不开Anaconda Navigator：could not find or load the QT platform plugin "window in"，如图：

　解决方法：　将\Anaconda3\Library\plugins目录下的platforms文件夹拷贝到\Anaconda3后重新打开 Anaconda Navigator

　参考：http://blog.csdn.net/isomebody/article/details/72910207

4. 卸载anaconda

因为安装tensorflow一直不成功，反反复复卸载重装了几次anaconda，卸载anaconda过程：
运行~/Anaconda3目录下的Uninstall-Anaconda.exe程序，卸载完成后，因为担心有残留文件，又检查了c盘 （因为anaconda安装在了c盘）中跟anaconda相关的文件，再手动删除跟anaconda相关的文件。

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