

Installing TensorFlow and Keras

Keras is a High level API used for building, training and evaluating artificial neural networks. It is included in current TensorFlow distributions, or can be installed separately on top of A TensorFlow CNTK or Theano backend. It is recommended that Students install Keras on top of TensorFlow, assignments instructions and demonstrations with Keras will assume Keras has been installed on top of TensorFlow.

Part 1: Installing TensorFlow

There are many ways to install TensorFlow, the recommended approach on Windows (7, 8, 10) is to use anaconda, a python distribution that included many useful packages for scientific research.

1. download and install anaconda from <https://www.anaconda.com/download/>
2. Launch an Anaconda prompt and create an environment for TensorFlow named tensorflow by typing the following into the terminal and pressing enter

```
conda create -n tensorflow python=3.5
```

3. activate environment by typing:

```
activate tensorflow
```

You should now have entered the tensorflow environment. You will need to enter this environment every time you want run Keras / TensorFlow code.

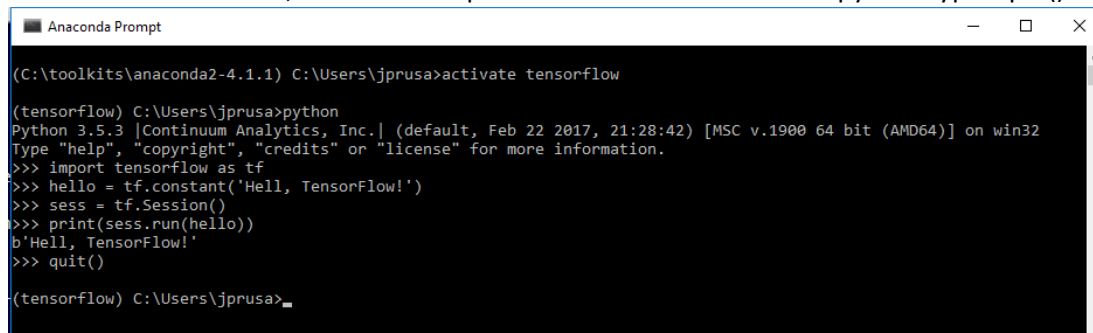
4. install TensorFlow while in this enviornment by typing the following and pressing enter:

```
pip install --ignore-installed --upgrade tensorflow
```

5. check that TensorFlow is installed and works. start an interactive python session by typing "python" and pressing enter. type the follow lines, pressing enter after each line:

```
import tensorflow as tf
hello = tf.constant('Hello, TensorFlow!')
sess = tf.Session()
print(sess.run(hello))
```

You should see "Hello, TensorFlow!" printed in the terminal. To exit python type "quit()".



```
Anaconda Prompt
(C:\toolkits\anaconda2-4.1.1) C:\Users\jprusa>activate tensorflow
(tensorflow) C:\Users\jprusa>python
Python 3.5.3 [Continuum Analytics, Inc.] (default, Feb 22 2017, 21:28:42) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow as tf
>>> hello = tf.constant('Hell, TensorFlow!')
>>> sess = tf.Session()
>>> print(sess.run(hello))
b'Hell, TensorFlow!'
>>> quit()
(tensorflow) C:\Users\jprusa>
```

Additional instructions for other Oses and other installation methods (different python distributions, GPU acceleration etc.) can be found at: <https://www.tensorflow.org/install/>

Part 2. Accessing/Installing Keras

Keras is included in current TensorFlow distributions. To access Keras functions you will need to import from "tensorflow.contrib.keras" and "tensorflow.contrib.keras.python.keras" depending on the resource.

You can test access to Keras inside TensorFlow by starting a python session and typing:

```
import tensorflow as tf
import tensorflow.contrib.keras as keras
```

No error messages should be displayed.

It is **highly recommended** to install Keras on top of TensorFlow inside the tensorflow environment to simplify imports. By doing this you only need to import from Keras, so your imports will look like:

```
import keras
from keras.X import Y
```

instead of

```
import tensorflow.contrib.keras as keras
from tensorflow.contrib.keras.python.keras.X import Y
```

While in the tensorflow environment you created in anaconda install Keras with the following:

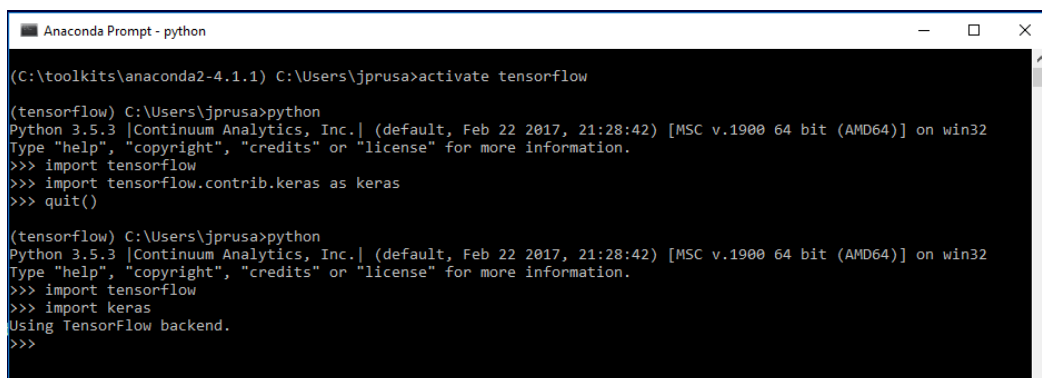
```
pip install keras
```

Your Keras installation by starting a python session and typing:

```
import tensorflow as tf
import keras
```

"Using TensorFlow backend." should be displayed.

The following screen shot shows how to access Keras from within TensorFlow and testing an independent Keras installation. See <https://keras.io/#installation> for additional instructions if needed.



```
Anaconda Prompt - python
(C:\tools\anaconda2-4.1.1) C:\Users\jprusa>activate tensorflow
(tensorflow) C:\Users\jprusa>python
Python 3.5.3 [Continuum Analytics, Inc.] (default, Feb 22 2017, 21:28:42) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow
>>> import tensorflow.contrib.keras as keras
>>> quit()

(tensorflow) C:\Users\jprusa>python
Python 3.5.3 [Continuum Analytics, Inc.] (default, Feb 22 2017, 21:28:42) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow
>>> import keras
Using TensorFlow backend.
>>>
```