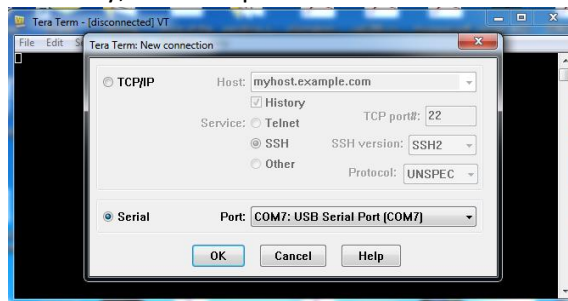


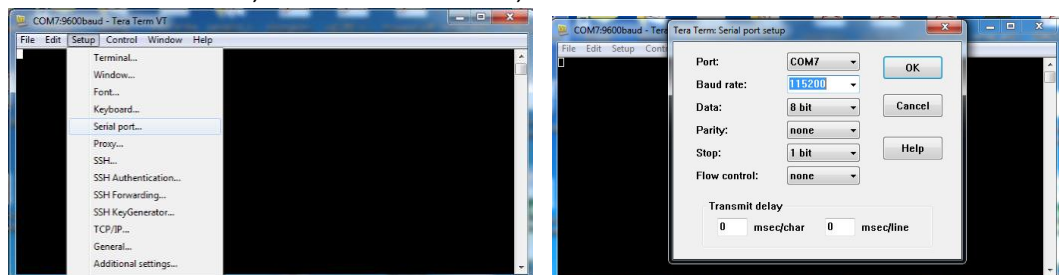
TensorFlow Installation on PYNQ FPGA Board

We are installing Tensorflow on little older version of PYNQ cause there are some basic help on it from hillhao's github. We also tried to install on Latest version of PYNQ: V2_3 but not having/getting the already build .whl file and appropriate Python version has make some messy [error on installation]. So, lets now work on older version of PYNQ and Update Python Manual.

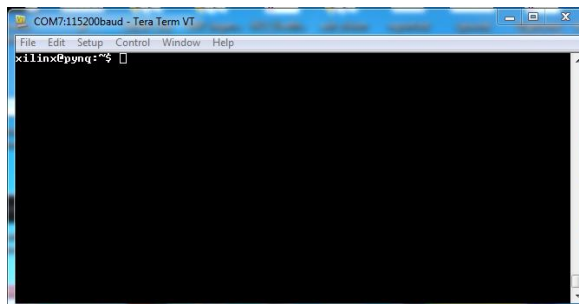
1. **Download the PYNQ OS from Pynq.io:** pynq_z1_image_2016_09_14 , which consists of Python2.7. We need to update the Python into Python3.4 for installation of tensorflow.
 - a. If you were not able to download pynq_z1_image_2016_09_14 then let us know from Message or Q and A Section, we may provide you google drive link of it's.
2. **Connect the PYNQ OS to the Router** and goto browser and enter: <http://pynq:9090>
 - a. Login and Password both are: xilinx
 - b. You do not need to login on Pynq for now, so let's Log Out on it.
3. **Connect your PYNQ with USB cable to PC.**
 - a. **Run the Serial Terminal Program:** Tera Term or Putty [if not have install on your PC]
 - b. **Goto Serial, Select the COM Port** [Tera Term automatically identifies the COM Port but Putty need to insert manually; for COM port look on the Device Manager of your PC].



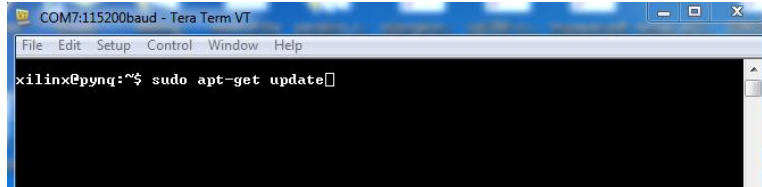
- c. Baud rate is: 115200, Enter on the Console;



- d. Now Console looks like:



4. **Now let's do the update:** `$sudo apt-get update`



```
COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help
xilinx@pynq:~$ sudo apt-get update
```

5. **For installation of Python you can do this [Alternative of Step5 is Step6]:**

- a. # For Python 2.7
- b. `$sudo apt-get install python-pip python-dev`
- c. # For Python 3.3+
- d. `$sudo apt-get install python3-pip python3-dev`
- e. Check the Python installation:
- f. Enter, `$python` on your terminal, it will show the version of python on your Pynq OS. Our's was still 2.7 version. Now do `exit()`; and enter.
- g. **If your python version updated to Python3.4 then you do not need to follow Step 6 of below.**

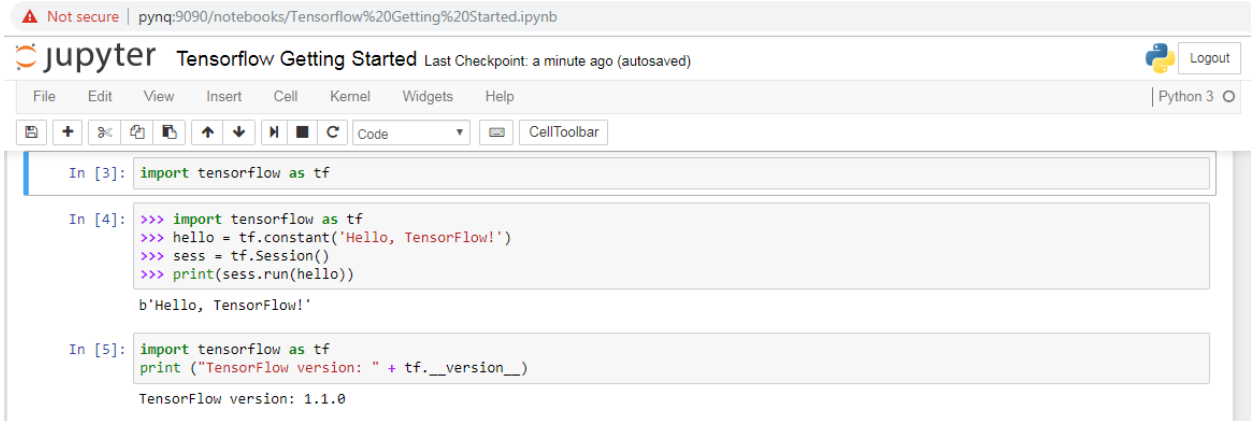
But this install option will not install the required python [we face error on not getting the download location]. So, we are installing Python3.4 manually.

6. **Python 3.4 Installation on PYNQ**

- a. `$wget https://www.python.org/ftp/python/3.4.0/Python-3.4.0.tar.xz`
- b. `$tar -xf Python-3.4.0.tar.xz`
- c. `$cd Python-3.4.0`
- d. `$./configure`
- e. `$sudo make install`

Making the Python3.4.0 will take some 30 min or more.

7. Now, enter: `$wget https://github.com/samjabrahams/tensorflow-on-raspberry-pi/releases/download/v1.1.0/tensorflow-1.1.0-cp34-cp34m-linux_armv7l.whl`
8. Now enter: `$sudo pip3 install tensorflow-1.1.0-cp34-cp34m-linux_armv7l.whl`
9. You may see, installation completes message after some time [maximum 10-20 minutes or early].
10. Now goto browser of your PC, enter <http://pynq:9090>, password is: xilinx
11. Create New python 3 File from New [right hand side].
12. Write this and check the output:



The screenshot shows a Jupyter Notebook titled "Tensorflow Getting Started" with a Python 3 kernel. It contains three code cells:

```
In [3]: import tensorflow as tf
```

```
In [4]: >>> import tensorflow as tf
>>> hello = tf.constant('Hello, TensorFlow!')
>>> sess = tf.Session()
>>> print(sess.run(hello))

b'Hello, TensorFlow!'
```

```
In [5]: import tensorflow as tf
print ("TensorFlow version: " + tf.__version__)

TensorFlow version: 1.1.0
```

Now you can explore more with Tensorflow on your Jupyter Notebook. We will release more tutorial on exploring with tensorflow on Pynq Soon!

Thanks for following this tutorial!

For any queries, please write to us at: info@logictronix.com or visit: www.logictronix.com

Happy Learning!