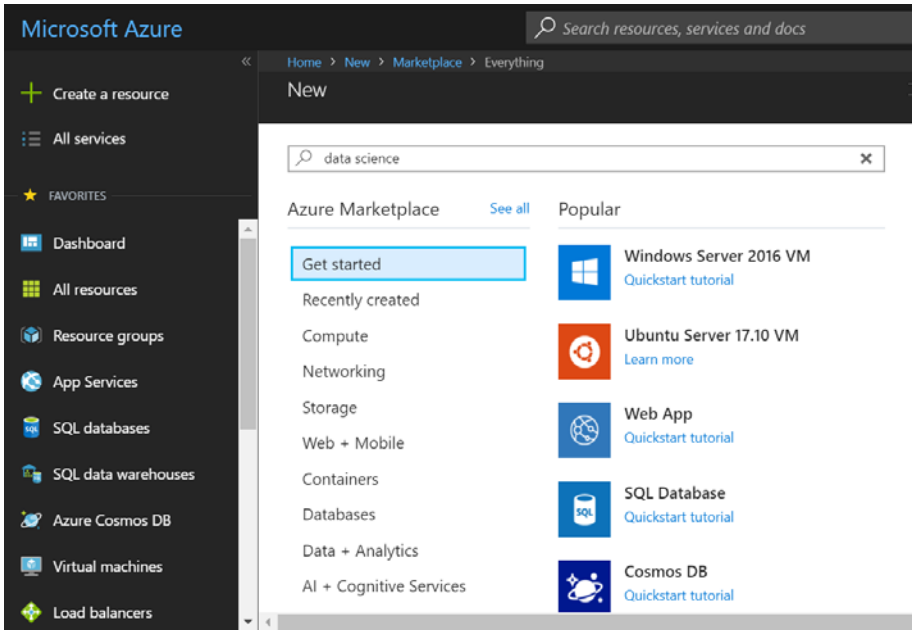
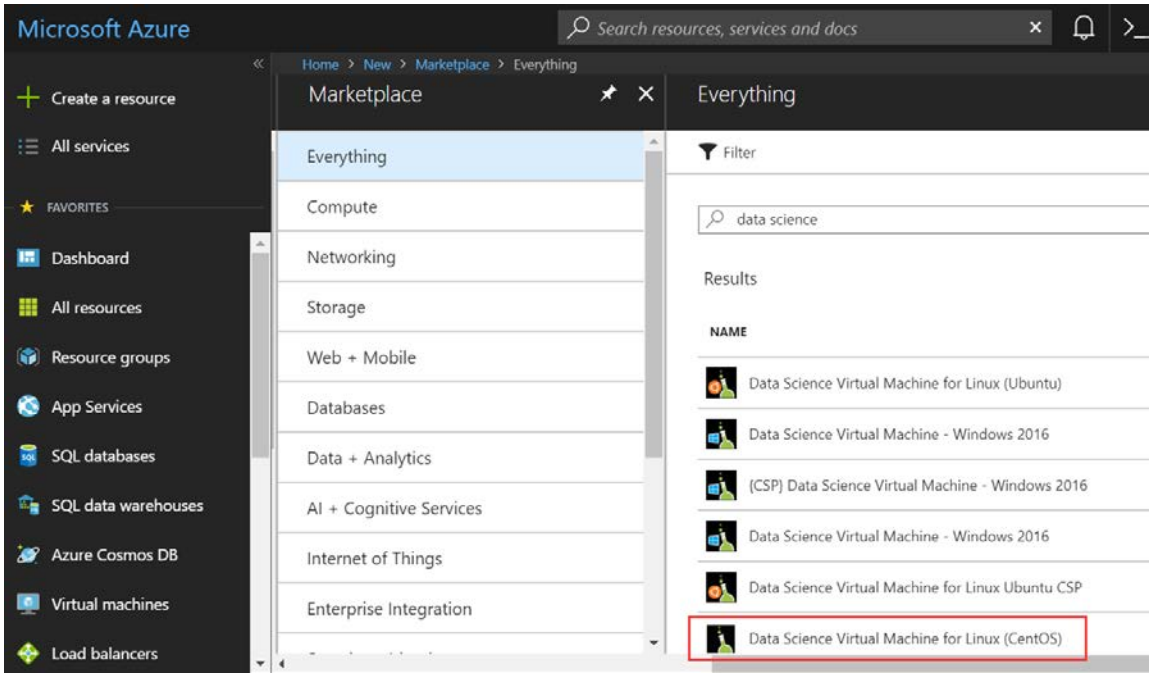
Using Jupyter Notebook Remotely in Azure VM

If you are on Windows, please first install an SSH client. The tutorial below works on the Linux Subsystem of Windows 10. Other SSH clients, like Cygwin, Git Bash, PuTTY and SecureCRT, should work well similarly.

1. Create a resource at https://portal.azure.com/ . Type “data science” in search box and choose **Data Science Virtual Machine for Linux (CentOS)**.

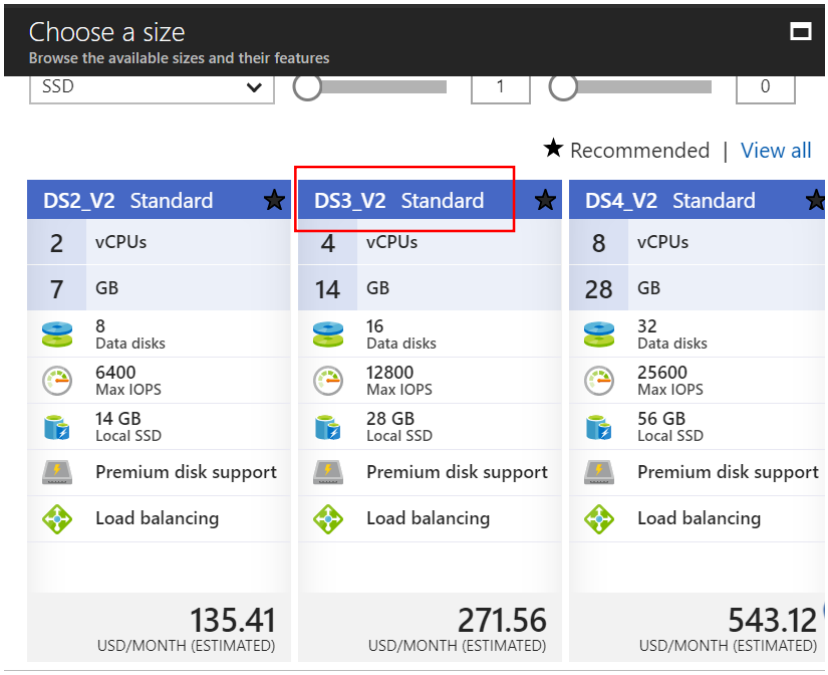




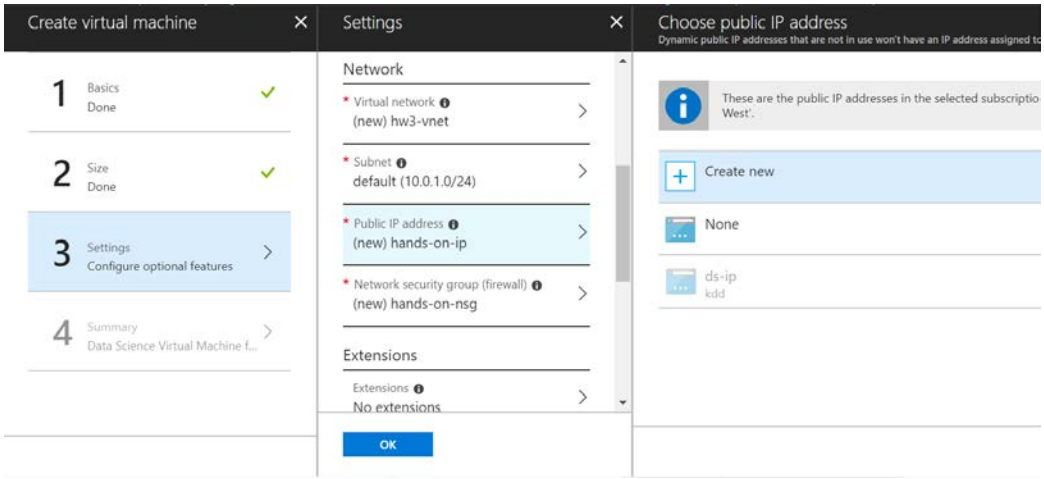
2. In basic settings, if you choose SSH public key as authentication type, you need to provide an

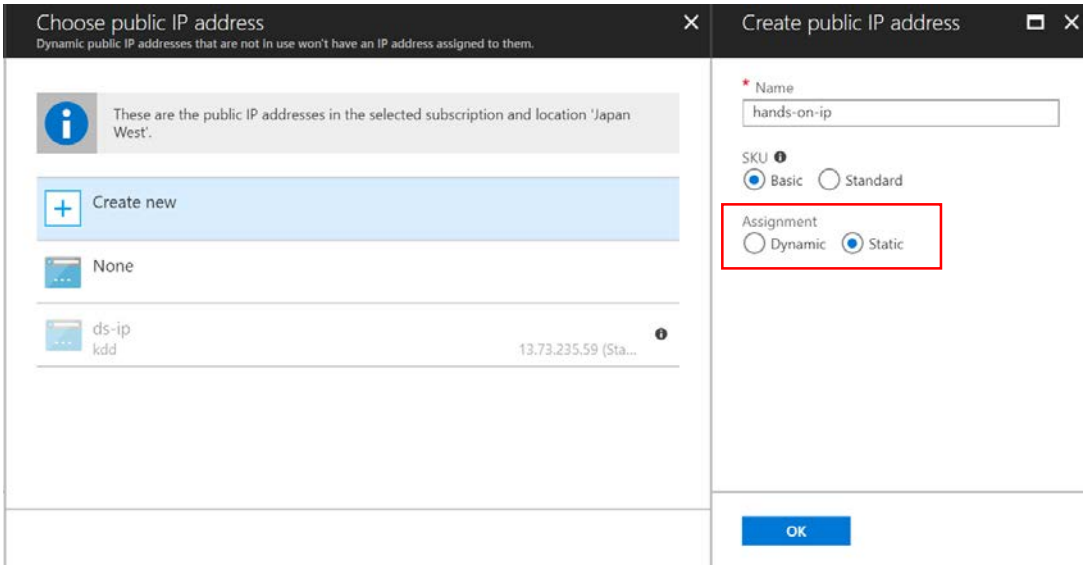
RSA public key.

3. As for VM size, basic configuration is enough to accomplish task 1. For example, you can choose DS3_V2.

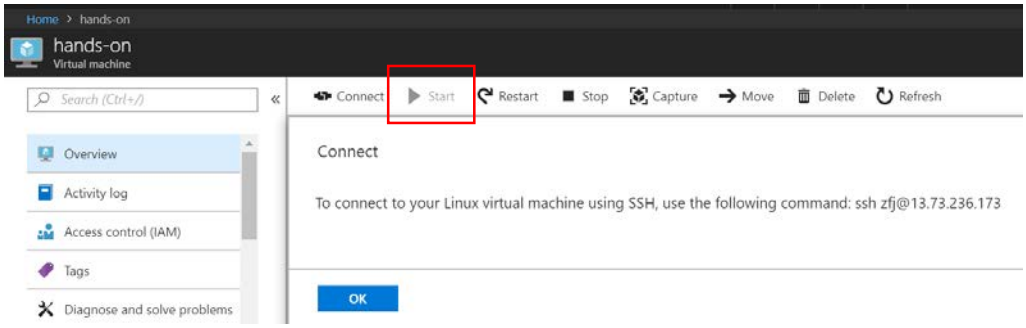


4. When configuring optional features, it is recommended to assign a public static IP address to your VM so that you can connect to it via SSH. Alternatively, you can configure networking after creating the VM.





5. After creating the VM, you will see the Public IP address in the **Overview** tab. Before executing SSH command, you should start the machine first. Then execute *ssh <user_name>@<public_ip>* to connect to the remote VM. (If you are using other SSH clients, you should use the corresponding method to configure SSH session.)



6. Setup for assignment2. You could download the source code via:

```
wget http://cs231n.stanford.edu/assignments/2017/spring1617_assignment2.zip
unzip spring1617_assignment2.zip
```

Then you could configure the environment described in assignment2.pdf.

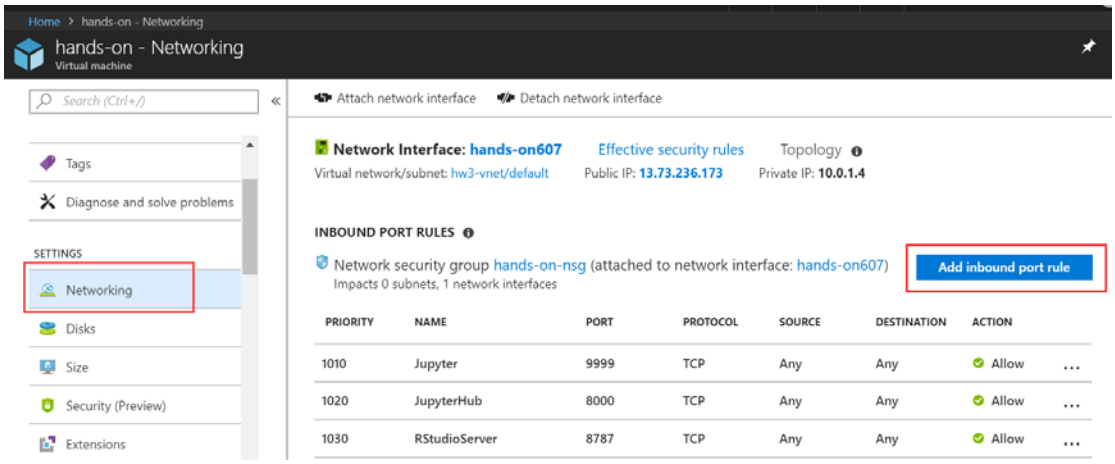
Please note that you are recommended to **install python package locally** without root. You can replace all *pip install <package>* with *pip install --user <package>*.
When installing virtualenv (pip install --user virtualenv), you may encounter this problem:

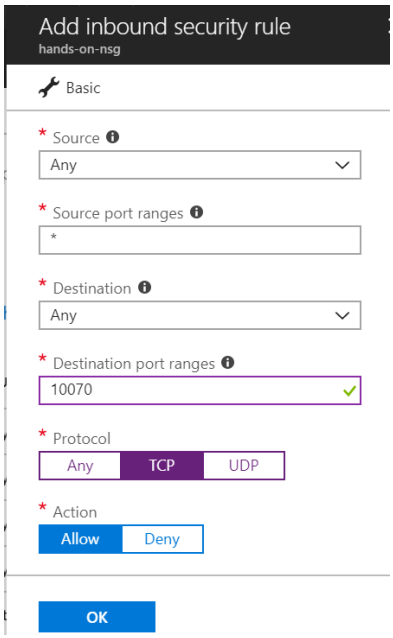
```
[zfj@hands-on assignment2]$ python3 -m venv .env
Error: Command '['/home/zfj/assignment2/.env/bin/python3', '-Im', 'ensurepip', '--upgrade', '--default-p
ip']' returned non-zero exit status 1
```

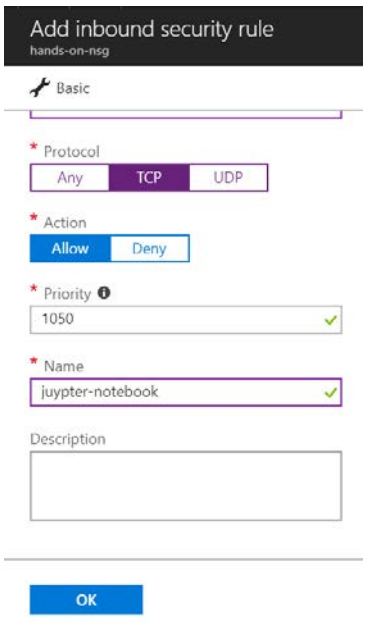
You can solve this problem by the solution provided here.

Please finish all configuration except executing *jupyter notebook* command in assignment2.pdf.

7. In order to connect to jupyter notebook running on remote VM, you should open an **available** port for VM (The port number CAN'T be the same as other PORTS in inbound port rules). In the Azure portal, we can see the resource group for the virtual machine. You could select networking tab and add inbound port rule to allow *destination port* for the TCP protocol.







8. After that, you should connect to VM via:

```
ssh -L 8080:localhost:10070 <user_name>@<public_ip>
```

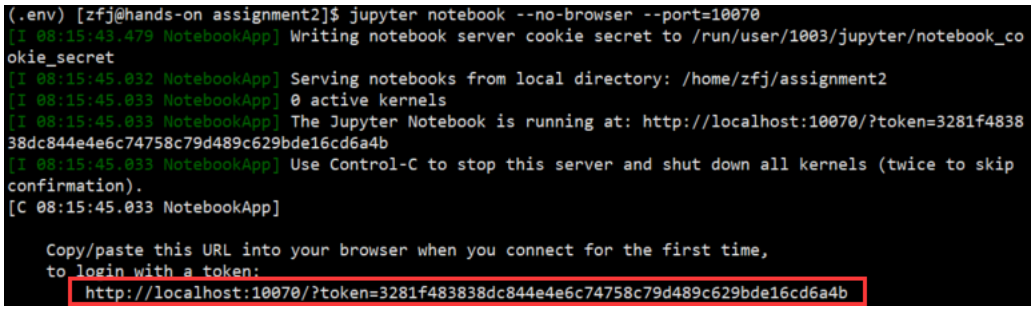
where 8080 can be replaced with other available port in local machine.

This means you need enable SSH tunnel (local port forwarding in this case) in your SSH session. You need figure out an appropriate way to setup local port forwarding if you use a GUI SSH client (like putty(link), xshell)

Then in assignment2 directory on the VM, you could start jupyter notebook via:

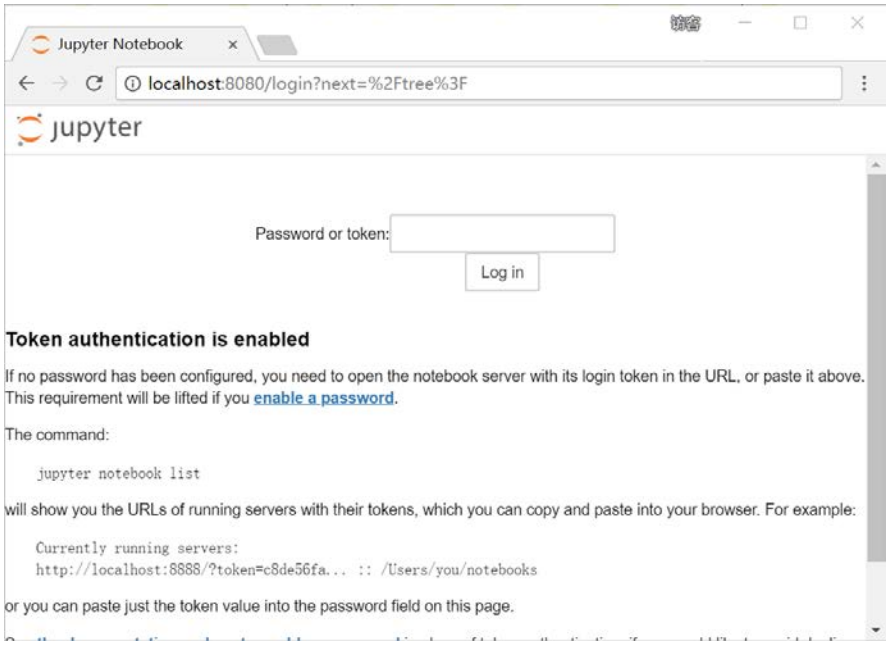
```
jupyter notebook --no-browser --port=10070
```

where 10070 is the open port of VM.

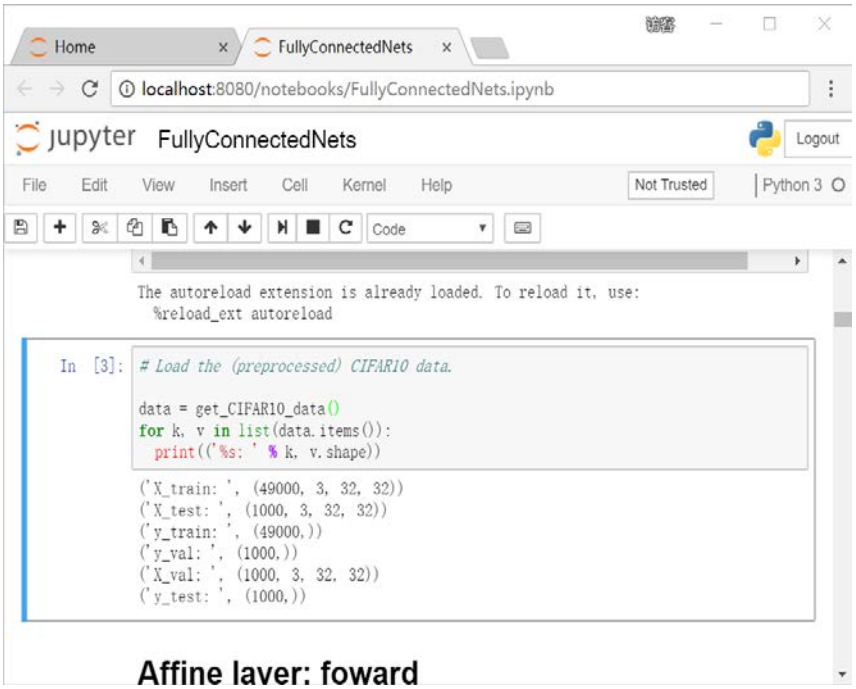


Next, you could use the token in the debugging message to access jupyter notebook running on the VM.

Please note that you should enter *localhost:8080* in the browser locally instead of *localhost:10070*, where 8080 is the open port of your local machine.



Finally you can run the notebooks successfully. Please check this by running the first two cells in FullyConnectedNets.ipynb.



Important reminder: you should stop Azure VM in portal.azure.com when you finish your lab every time. Closing SSH session doesn't mean the VM is stopped.

References:

[1] http://www.vickyfu.com/2017/04/using-jupyter-notebook-remotely-in-azure-vm/