2.Environment setup

1. Introduction to JupyterLab

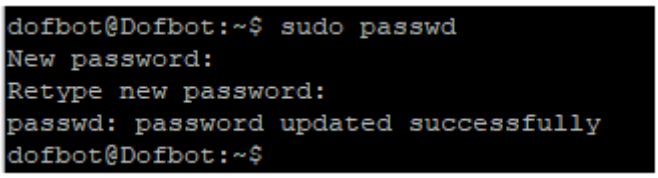
JupyterLab is an interactive development environment and the next generation product of Jupyter notebook. It integrates more functions, supports plug-in extensions, and can be run through the web page. It is simple, convenient and powerful. It is a code editor worth using. Artifact.

2. Switch to root user

You need to use the root user to install jupyterlab. The root user of the ubuntu mate 20.04 system has no password by default and cannot be switched. Therefore, you need to set a password for root before you can use the root account.

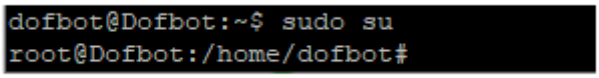
1. Enter the following command to set a password for root, and then enter the same password twice to confirm.

```
sudo passwd
```



2. Switch to root user

```
sudo su
```

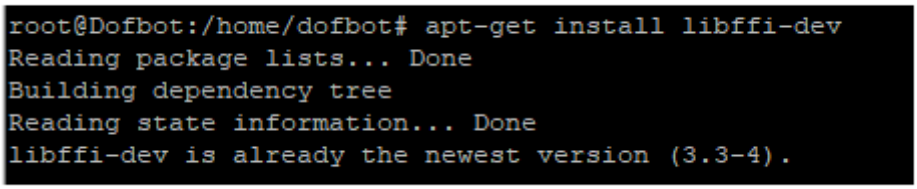


As you can see from the picture above, you have switched to the root user. And the $ symbol before the editing command has changed to the # symbol.

3. Install JupyterLab

1. Install the ffi library

```
apt-get install libffi-dev
```



2.Install jupyter

```
pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simple jupyter
```

```
root@Dofbot:/home/dofbot# pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simp
le jupyter
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Collecting jupyter
  Using cached https://pypi.tuna.tsinghua.edu.cn/packages/83/df/0f5dd132200728a8
6190397e1ea87cd76244e42d39ec5e88efd25b2abd7e/jupyter-1.0.0-py2.py3-none-any.whl
(2.7 kB)
Collecting ipywidgets
  Using cached https://pypi.tuna.tsinghua.edu.cn/packages/56/a0/dbcf5881bb2f51e8
db678211907f16ea0a182b232c591a6d6f276985ca95/ipywidgets-7.5.1-py2.py3-none-any.w
hl (121 kB)
Collecting jupyter-console
```

3.Install jupyter lab

```
pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simple jupyterlab
```

```
root@Dofbot:/home/dofbot# pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simp
le jupyterlab
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Collecting jupyterlab
  Downloading https://pypi.tuna.tsinghua.edu.cn/packages/31/7b/cd66f306c31a84a53
c6a3a86e296586e8664f407a6ac5b7cfe6a433aa8c4/jupyterlab-2.2.9-py3-none-any.whl (7
.9 MB)
     |                                | 256 kB 499 kB/s eta 0:00:16
```

4. After the installation is completed, switch back to the normal user

```
su dofbot
```

```
root@Dofbot:/home/dofbot# su dofbot
dofbot@Dofbot:~$
```

4. Configure JupyterLab

1.Generate configuration file

```
jupyter notebook --generate-config
```

```
dofbot@Dofbot:~$ jupyter notebook --generate-config
Writing default config to: /home/dofbot/.jupyter/jupyter_notebook_config.py
dofbot@Dofbot:~$ ls ~/.jupyter/
jupyter_notebook_config.py
dofbot@Dofbot:~$
```

2.Use ipython to generate the login password for jupyterlab.

```
ipython
```

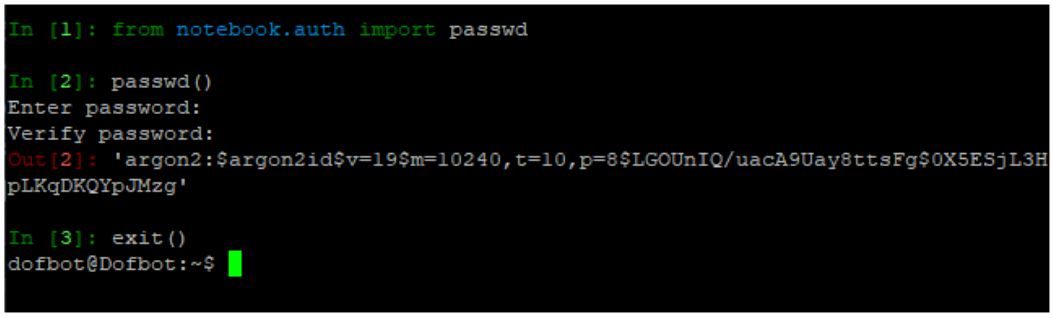
In In [1] enter: **from notebook.auth import passwd**

In In [2] enter: **passwd()**

Then enter the same password twice and press Enter to confirm. Note that the password here is used to log in to the jupyterlab interface. For ease of remembering, it can be consistent with the user password.

Then the system will output the ciphertext of the password. Copy the entire ciphertext. The ciphertext generated for each password may be different. Please copy the actual output ciphertext.

In In [3] enter: **exit()**

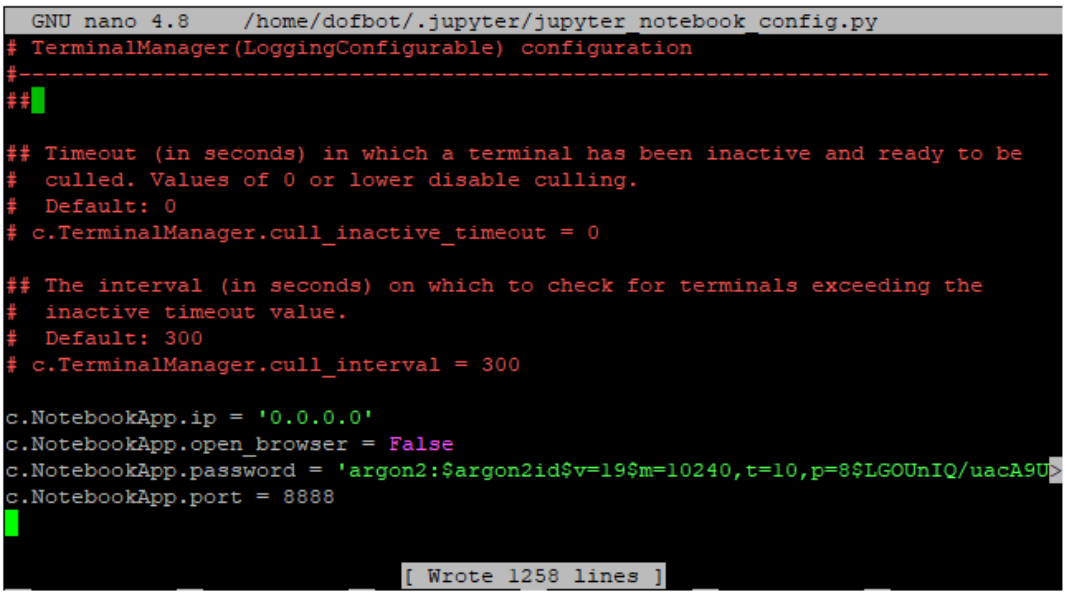


3. Compile jupyter configuration file

```
nano ~/.jupyter/jupyter_notebook_config.py
```

Skip directly to the end and add the following.

```
c.NotebookApp.ip = '0.0.0.0'
c.NotebookApp.open_browser = False
c.NotebookApp.password =***** The entire password ciphertext
c.NotebookApp.port = 8888
```



Save and exit.

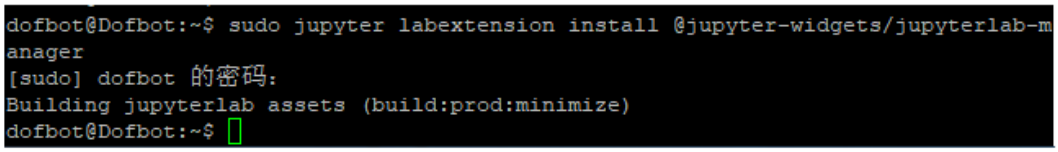
5. Install jupyterlab plug-in

1. Install nodejs and npm

```
sudo apt install nodejs npm
```

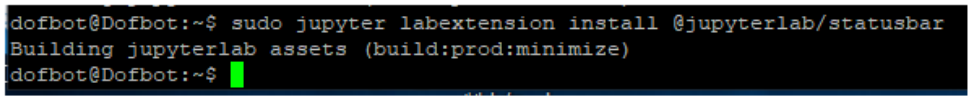
2. Install the jupyter widget extension plug-in. Since it needs to be downloaded and compiled, it will take a long time to run, and errors may occur. If an error occurs, re-run the installation.

```
sudo jupyter labextension install @jupyter-widgets/jupyterlab-manager
```



3. Install statusbar plug-in

```
sudo jupyter labextension install @jupyterlab/statusbar
```



4. At this point, jupyterlab has been installed.

6.Start up jupyterlab

1. Enter the directory where you want to run the code. Here we take creating a new test folder as an example.

```
mkdir test
cd test
```

2.Open jupyterlab

```
jupyter lab
```

```
dofbot@Dofbot:~/test$ jupyter lab
[I 16:19:05.401 LabApp] Writing notebook server cookie secret to /home/dofbot/.l
ocal/share/jupyter/runtime/notebook_cookie_secret
[I 16:19:06.045 LabApp] JupyterLab extension loaded from /usr/local/lib/python3.
8/dist-packages/jupyterlab
[I 16:19:06.045 LabApp] JupyterLab application directory is /usr/local/share/jup
yter/lab
[I 16:19:06.052 LabApp] Serving notebooks from local directory: /home/dofbot/tes
t
[I 16:19:06.052 LabApp] Jupyter Notebook 6.1.4 is running at:
[I 16:19:06.052 LabApp] http://Dofbot:8888/
[I 16:19:06.052 LabApp] Use Control-C to stop this server and shut down all kern
els (twice to skip confirmation).
```

This port number is the port number we need to access. The default is the port number pointed to by c.NotebookApp.port in the jupyter configuration file in the previous step.

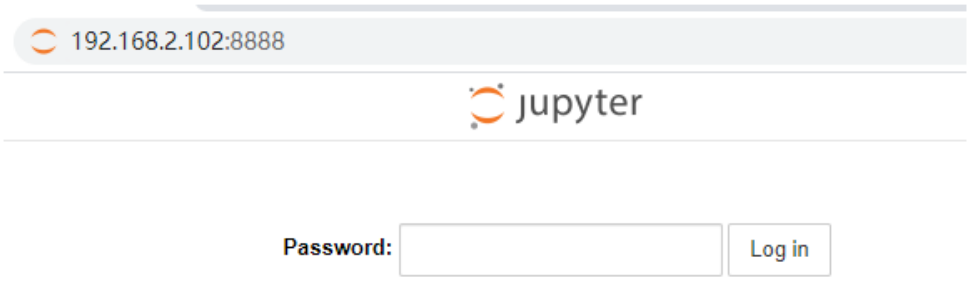
If you open an additional jupyterlab service, the port number will automatically +1, so that different jupyterlabs can be distinguished.

7. Remote access jupyterlab

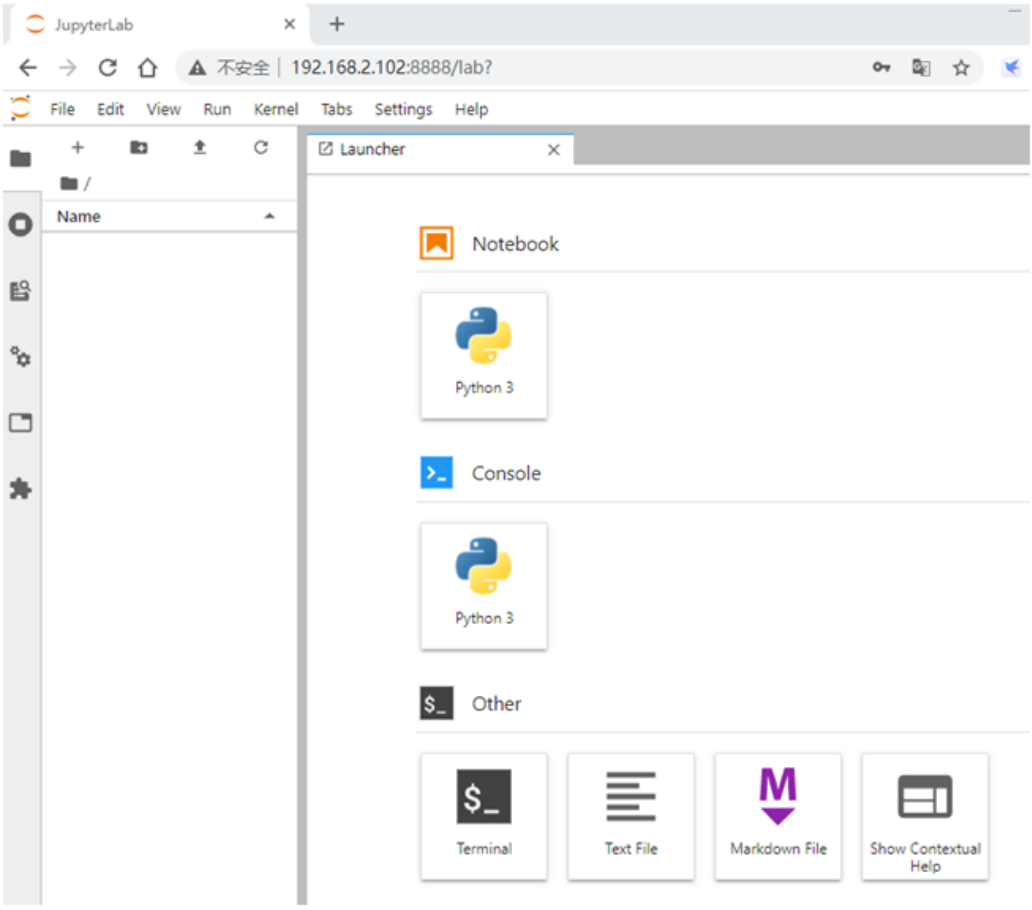
1. Open a browser on your computer (Chrome or Firefox is recommended), and then enter the Raspberry Pi's IP:port number. Here, the IP is 192.168.2.102 and the port is 8888 as an example.

http://192.168.2.102:8888/

The jupyterlab interface will pop up and ask for a password. Just fill in the jupyterlab login password set above.



2. When you see the following interface, you have successfully logged in to jupyterlab remotely and can create a new Python3 program to run.



8. Exit jupyterlab

Press Ctrl+C twice on the terminal where jupyterlab was just opened to exit jupyterlab.