1. Tencent Cloud Login
   1)https://intl.cloud.tencent.com/login/subAccount/200018656283?type=subAccount
   2)Root Account ID : 200018656283
   3)Sub-user name : eduxx
   4)Password : P@$$W0rd1234
   5)Improve the information next time 클릭

2. VPC 생성
   1)Products > Networking > Virtual Private Cloud
   2)Region : Seoul 선택
   3)New Click
   4)Name : lab-vpc
   5)IPv4 CIDR Block : 172.16.0.0/16

3. Subnet 생성
   1)Subnet Name : lab-vpc-jupyter-subnet
   2)IPv4 CIDR Block : 172.16.1.0/24
   3)Availability Zone : Seoul Zone 1

4. Security Group 생성하기
   1)Security > Security Group
   2)Region : Seoul
   3)New Click
   4)Template : Custom
   5)Name : jupyter-sg
   6)OK
   7)Add rules now Click
   8)Inbound Rule 추가하기 : ICMP, 22, 8888
   9)Inbound rule > Add Rule Click
      -Type : Ping, Source : all, Protocol Port : ICMP, Policy : Allow, New Line Click
      -Type : Login Linux CVM(22), Source : all, Protocol Port : TCP:22, Policy : Allow, New Line Click
      -Type : Custom, Source : all, Protocol Port : TCP:8888, Policy : Allow
   10)Complete Click
   11)Outbound Rule 추가하기 : ICMP, 443, 80
   12)Outbound rule > Add Rule
      -Type : Ping, Target : all, Protocol Port : ICMP, Policy : Allow, New Line Click
      -Type : HTTPS(443), Target : all, Protocol Port : TCP:443, Policy : Allow
      -Type : HTTPS(80), Target : all, Protocol Port : TCP:80, Policy : Allow
   14)Complete Click

5. CVM 생성하기
   1)Products > Compute > Cloud Virtual Machine
   2)Region : Seoul
   3)Create Click
   4)Billing Mode : Pay as you go
   5)Region : Seoul
   6)Availability Zone : Seoul Zone 1
   7)Network : lab-vpc | 172.16.0.0/16, lab-vpc-jupyter-subnet | 172.16.1.0/24
   8)Instance : Standard | Standard S3 | Standard S3 S3.SMALL1, 1-core, 1GB, 0.02USD/hr
   9)Image : PUblic image | Ubuntu 64-bit | Ubuntu Server 20.04 LTS 64bit
   10)System disk : Premium Cloud Storage 50GB
   11)Public network bandwidth : By Traffic 100Mbps
   12)Amount : 1
   13)Configuration Fee 0.03USD/hr, Network Fee 0.12USD/GB
   14)Next: Complete Configuration Click

15)Security Groups : Existing Security Groups | jupytger-sg
16)Instance Name : jupyter-seoul-xx
17)Login Methods : Set Password
18)Username : ubuntu
19)Password : P@$$W0rd1234
20)Confrim Password : P@$$W0rd1234
21)Advanced Settings Click
22)Hostname : jupyter-seoul-xx
23)Next: Confirm Configuration Click
24)Agree Tencent Cloud Service Terms Check
25)Enable Click

6. Convert CVM's Public IP to EIP
1)CVM Instances 목록에서 해당 CVM 선택 후 EIP Binding 하기
2)OK

7. Windows 10 Terminal에서 CVM 연결하기
1)Windows Terminal에서
ssh -l ubuntu {{EIP}} -p 22

The authenticity of host '119.28.232.233 (119.28.232.233)' can't be established.
ECDSA key fingerprint is SHA256:O09hPuv/7+5Jyd3PspEU9Uquoit089cXcNfA3hnZbYE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes

Warning: Permanently added '119.28.232.233' (ECDSA) to the list of known hosts.
ubuntu@119.28.232.233's password: P@$$W0rd1234

Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-72-generic x86_64)

* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage

System information as of Wed 16 Jun 2021 10:59:34 AM CST

System load: 0.1 Processes: 113
Usage of /: 6.5% of 49.16GB Users logged in: 0
Memory usage: 24% IPv4 address for eth0: 172.16.1.15
Swap usage: 0%

* Pure upstream Kubernetes 1.21, smallest, simplest cluster ops!

https://microk8s.io/

ubuntu@jupytger-seoul-xx:~$

2)$ sudo apt update

8. Jupyter Installation on Tencent Cloud CVM
1)$ python3
Python 3.8.5 (default, Jan 27 2021, 15:41:15)
[GCC 9.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()

2)$ sudo apt install -y python3-pip
3)$ sudo pip3 install notebook
4)$ mkdir jupyter
5)$ mkdir jupyter/cert
6)$ mkdir jupyter/contents
7)cd jupyter/cert
openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout notebook.key -out notebook.pem
계속 엔터키
cd ~
8)Server 비밀번호 생성
-Terminal을 새로 열고
$ ipython

Python 3.8.5 (default, Jan 27 2021, 15:41:15)
Type 'copyright', 'credits' or 'license' for more information
IPython 7.24.1 -- An enhanced Interactive Python. Type '?' for help.

In [1]: from notebook.auth import passwd

In [2]: passwd()
Enter password: P@$$W0rd1234
Verify password: P@$$W0rd1234
Out[2]:
'argon2:$argon2id$v=19$m=10240,t=10,p=8$ESX8W4ouRSlYRCGzdK1o9Q$UJ/wLIqwpEktCZ4e5S0g9Q'

In [3]: exit()

9)위의 Out[2]의 키를 복사해서 메모장에 붙여넣기

9. config 파일 만들기
1)Terminal에서

$ jupyter notebook --generate-config

-위 코드를 실행하면 /home/ubuntu/.jupyter directory에 jupyter_notebook_config.py 파일이 생성된다.

2)Jupyter Server 환경설정하기
-/home/ubuntu/.jupyter directory에 가서 jupyter_notebook_config.py 파일을 연다.

-$ sudo vim /home/ubuntu/.jupyter/jupyter_notebook_config.py
-jupyter_notebook_config.py 파일은 Jupyter Notebook 환경설정이 저장되어 있는 파일인데, 모든 환경설정들이 전부 # c.Notebook.App.ip='' 이런 식으로 앞에 # 이 붙어서 주석처리 되어 있다.
-파일의 제일 마지막에 커서를 위치하고
c = get_config()
c.NotebookApp.password = u'argon2:$argon2id$v=19$m=10240,t=10,p=8$ESX8W4ouRSlYRCGzdK1o9Q$UJ/wLIqwpEktCZ4e5S0g9Q'
c.NotebookApp.ip = '*'
c.NotebookApp.open_browser = False
c.NotebookApp.notebook_dir = u'/home/ubuntu/jupyter/contents'
c.NotebookApp.port = 8888
c.NotebookApp.certfile = u'/home/ubuntu/jupyter/cert/notebook.pem'
c.NotebookApp.keyfile = u'/home/ubuntu/jupyter/cert/notebook.key'

-수정이 완료됐으면 jupyter_notebook_config.py 저장.
-Text Editor를 닫는다.

-Terminal을 닫는다.

10. Jupyter Server 시작하기
1)Terminal에서
$ jupyter-notebook

2)서버가 실행되었다.
3)이제 브라우저에서 주소창에
4)https://{{EIP}}:8888
5)패스워드를 넣고 원격으로 jupyter notebook으로 로그인한다.

11. CVM에 Jupyter Notebook Service 등록하기
1)jupyter-notebook 명령어의 위치알기
$ which jupyter-notebook
/usr/local/bin/jupyter-notebook

2)jupyter.service 파일 생성하기
$ sudo vim /etc/systemd/system/jupyter.service

```
[Unit]
Description=Jupyter Notebook Service

[Service]
type=simple
User=ubuntu
ExecStart=/usr/local/bin/jupyter-notebook
config=/home/ubuntu/.jupyter/jupyter_notebook_config.py

[Install]
WantedBy=multi-user.target
```

3)Save

4) 운영체제에 Service 등록하기
$ sudo systemctl daemon-reload
$ sudo systemctl enable jupyter
$ sudo systemctl start jupyter

5) Service 상태 확인하기
$ sudo systemctl status jupyter