Running Jupyter Notebook on a Remote Server and accessing it using your local machine

Installing conda on your remote machine.

1. Login to your Remote Machine the usual way you do using SSH tunnel. Download and install conda from Anaconda.
2. Once you have downloaded conda, you will have to set it up in linux using the below command.

```
conda init
```

3. Create a new conda environment using the below command.

```
# Replace X with the appropriate python version you need.

conda create -n your_env_name python=3.X

# You may omit the python= if you like the latest version.
```

4. Activate this environment using the below command.

```
conda activate your_env_name
```

5. Once the environment is activated, your `python` and `pip` commands would be remapped to the anaconda versions. You may check this using `which python` and `which pip`.

Setting Jupyter Notebook on a Remote Server and accessing it using your system will provide you a GUI interface to interact with your Remote Server and use its resources.

1. Login to your Remote Machine the usual way you do using SSH tunnel. Create and activate virtual environment on your Remote Server.

```
# Replace <REMOTE_USER> with the remote server username.
# Replace <REMOTE_HOST> with your remote server address.
# Replace <ENV NAME> with the environment name of your choice.

ssh <REMOTE_USER>@<REMOTE_HOST>
conda create --name <ENV NAME>
conda activate <ENV NAME>
```

2. Install Jupyter Notebook on your Remote Server (HPC, Phantom etc.)

```
pip install jupyter
```

3. Launch Jupyter Notebook on your remote server, Select a port number for <PORT>

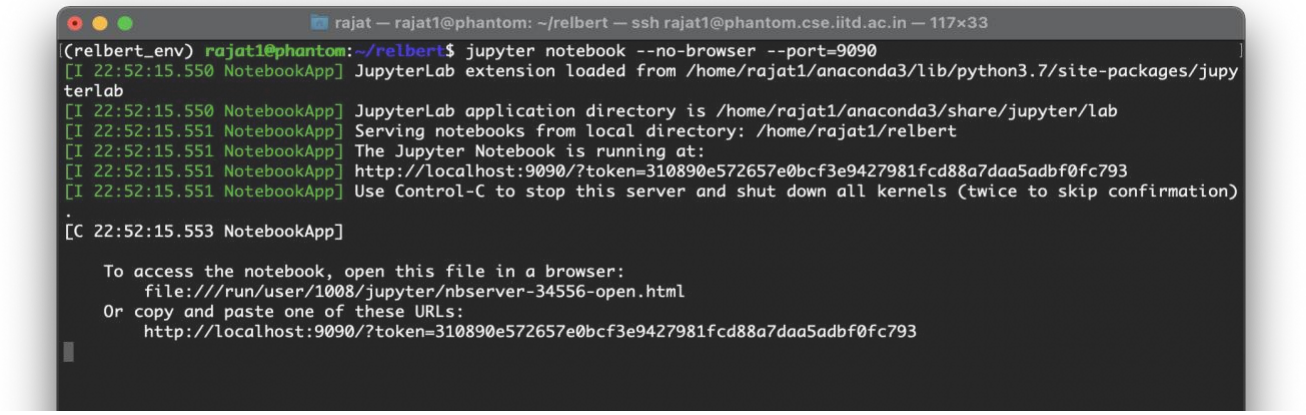
```
# Replace <PORT> with port number of your choice.
# --no-browser will starts the notebook without opening a browser.

jupyter notebook --no-browser --port=<PORT>
```

You can launch the Jupyter Notebook using default port. Note if that default port is not free then it will move to next available port and will print the port it is using.

```
# Default port for your notebook is 8888. If it is occupied then it will find the next
available port.

jupyter notebook --no-browser
```



You will get this output after running the above command

4. Access the remote notebook from your machine over SSH by setting up a SSH tunnel.

```
# Replace <PORT> with the port number you have selected in your above step.
# Replace <REMOTE_USER> with the remote server username.
# Replace <REMOTE_HOST> with your remote server address.

ssh -L 8080:localhost:<PORT> <REMOTE_USER>@<REMOTE_HOST>
```

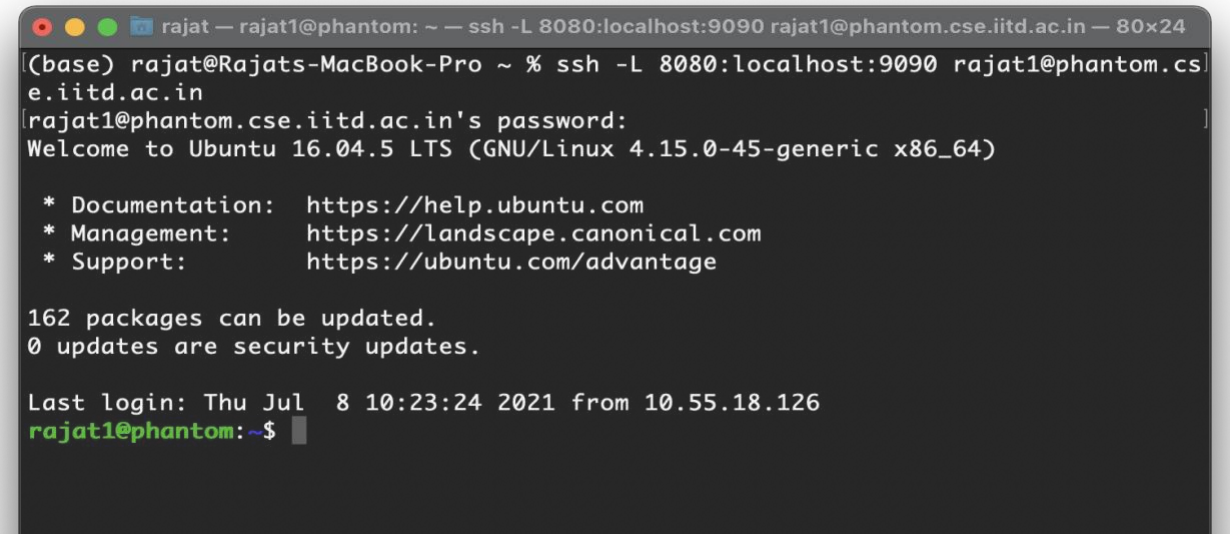
Access the remote notebook from your machine over SSH by setting up a SSH tunnel in background.

```
# Replace <PORT> with the port number you have selected in your above step.
# Replace <REMOTE_USER> with the remote server username.
# Replace <REMOTE_HOST> with your remote server address.

ssh -N -f -L 8080:localhost:<PORT> <REMOTE_USER>@<REMOTE_HOST>
```

```
# -f : this request the ssh command to go to the background before execution.
# In your Remote Server the notebook is running at the port <PORT> but in your machine that
notebook is forwarded to port 8080. Thus you can access the remote notebook at your machine
using 8080 port.
# Instead of 8080 you can use any port that is available in your system.
```

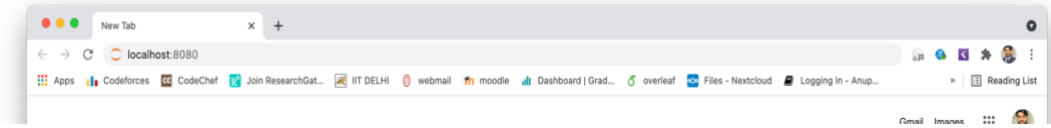
This step will link the Jupyter Notebook port to port 8080 of your local machine thus you can access that remote Jupyter Notebook from local machine using 8080 port.



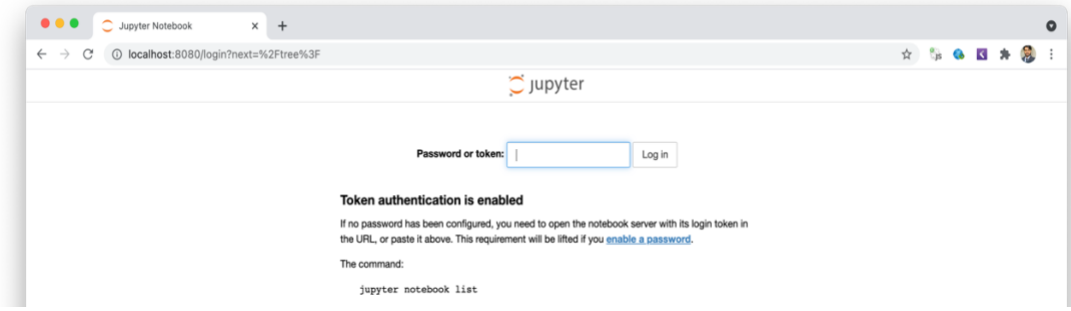
You will get this output after running the above command

5. To access the Remote Notebook you need to fire-up the Notebook from any browser in your machine.

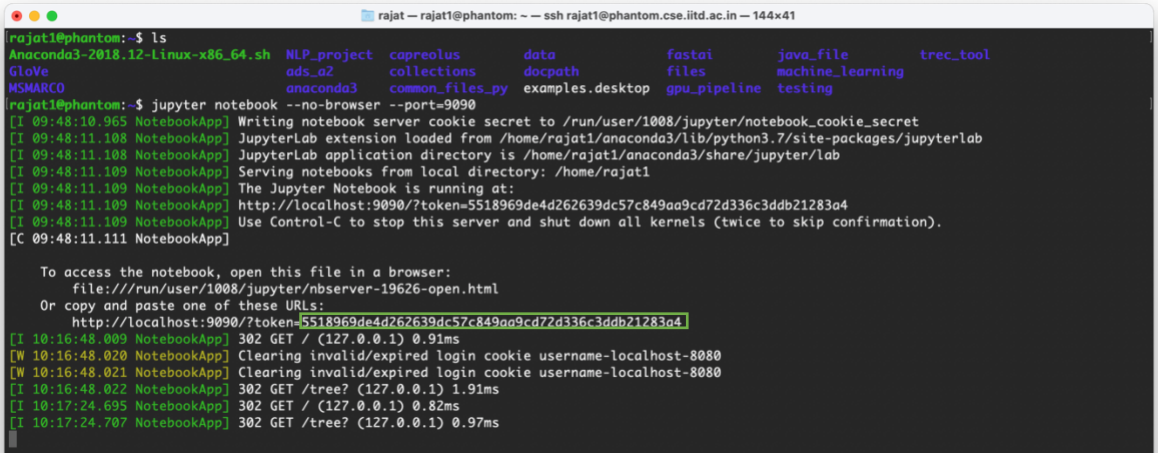
```
localhost:8080
```



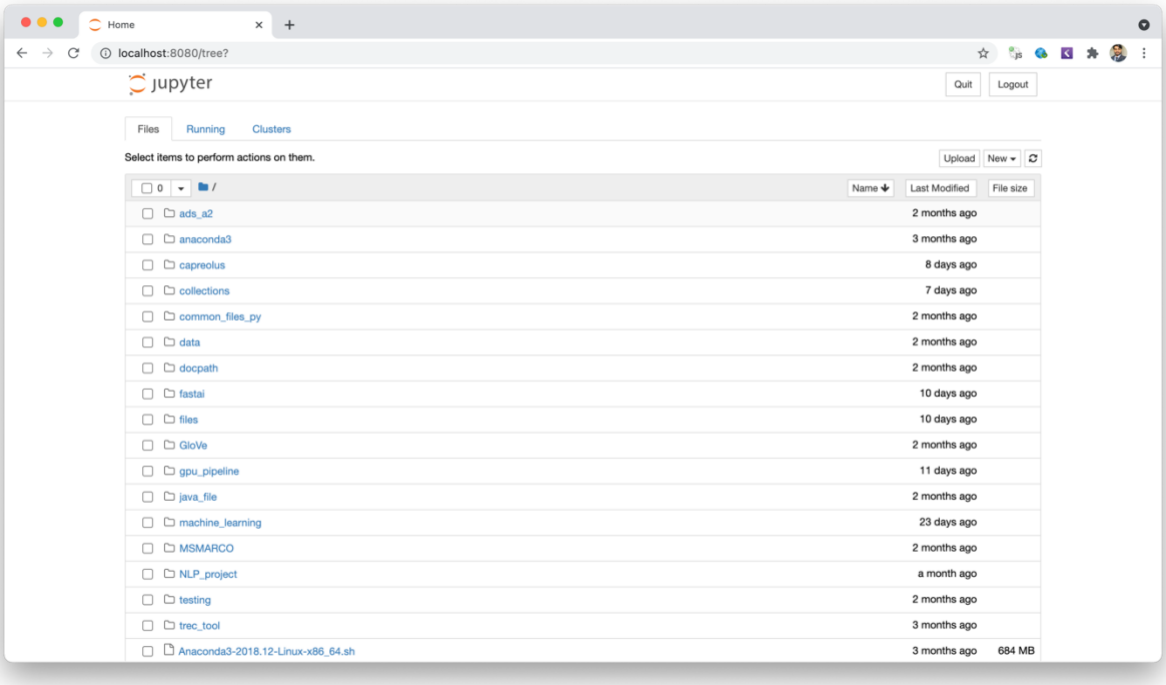
6. After firing up the notebook you will forwarded to token authentication page of the jupyter notebook as shown below.



7. Paste the token that you will get at step 3 (marked with green box) and log in.



8. After login you will directed to the Jupyter Notebook user interface as shown in the snippet. Enjoy the Jupyter Notebook. Note that the homepage of this notebook will be the location where we have launched the notebook in the remote server (Step 3).



References:

1. https://ljvmiranda921.github.io/notebook/2018/01/31/running-a-jupyter-notebook/
2. https://jupyter.org/install
3. https://docs.anaconda.com/anaconda/user-guide/tasks/remote-jupyter-notebook/
4. https://poorvi.cse.iitd.ac.in/~anupam/using-conda/