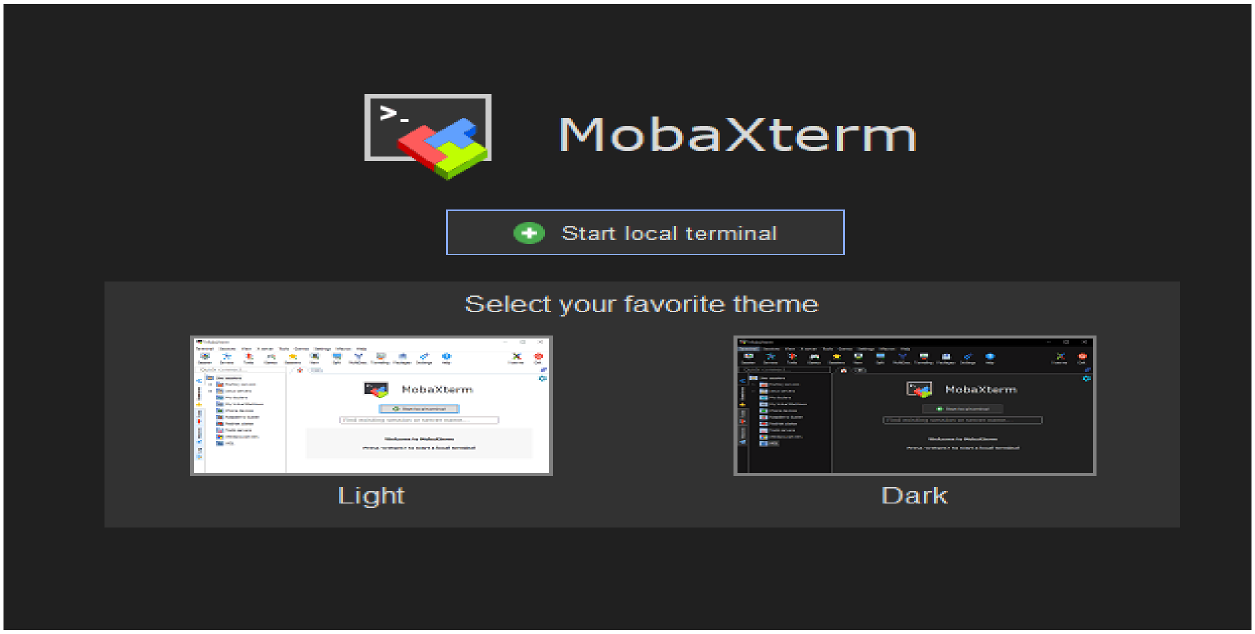
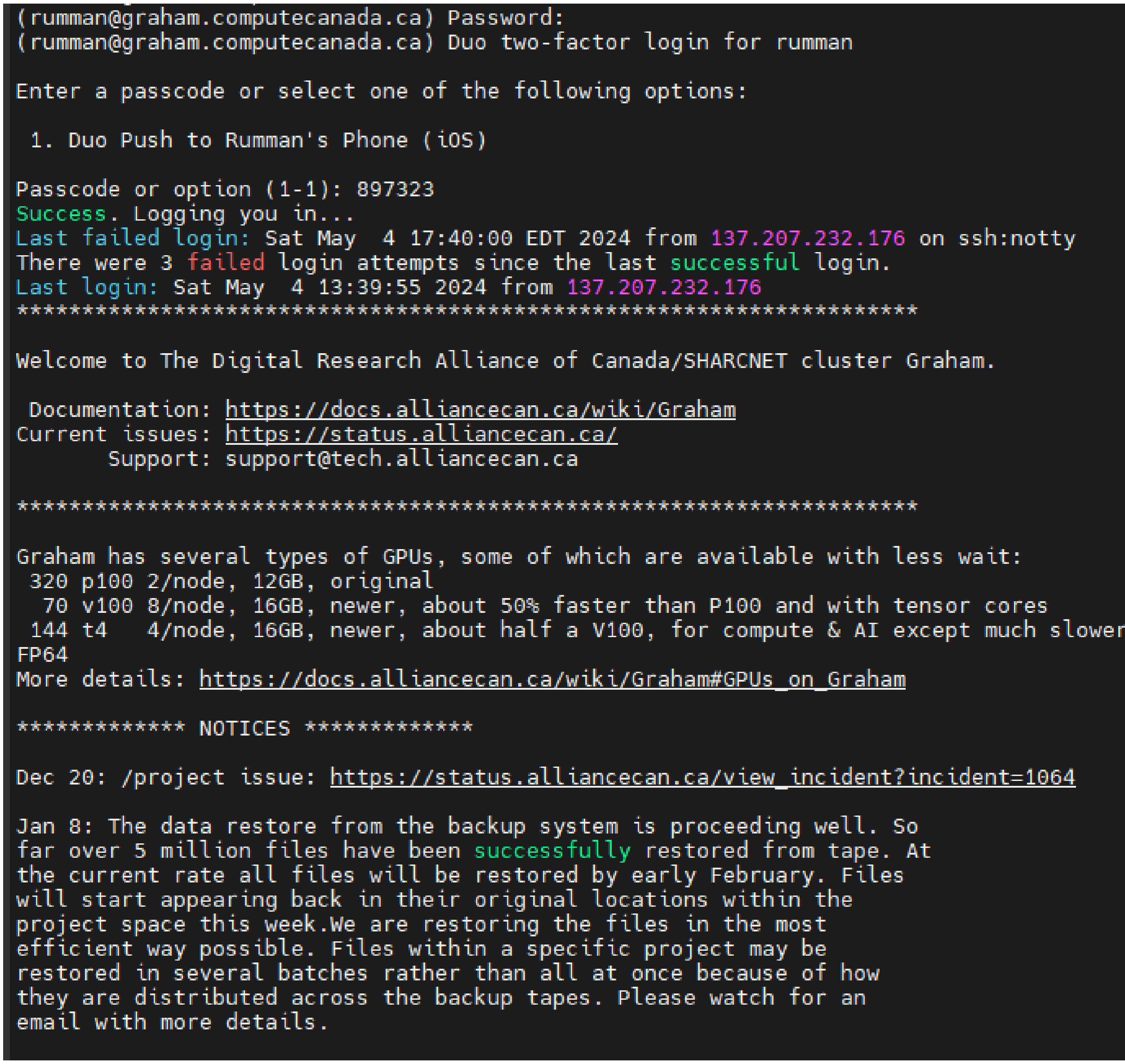
Compute Canada With Jupyter Lab

1. Download MobaXtrem at first.

2. After installing it, click on the Start the local terminal

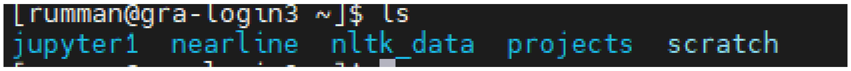


3. Now in the terminal, login to the Compute Canada following the below steps:
   a. Login: **ssh -Y <your-username>@graham.computecanada.ca**
      Example: ssh -Y rumman@graham.computecanada.ca
   b. Enter your password at the prompt.
   c. After entering the correct credentials you will be able to see the following page.



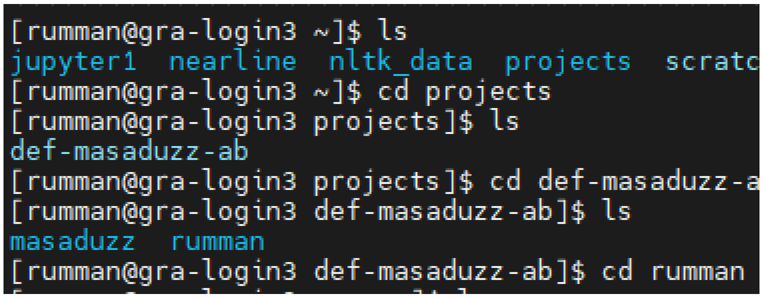
```
(rumman@graham.computecanada.ca) Password:
(rumman@graham.computecanada.ca) Duo two-factor login for rumman

Enter a passcode or select one of the following options:

 1. Duo Push to Rumman's Phone (iOS)

Passcode or option (1-1): 897323
Success. Logging you in...
Last failed login: Sat May  4 17:40:00 EDT 2024 from 137.207.232.176 on ssh:notty
There were 3 failed login attempts since the last successful login.
Last login: Sat May  4 13:39:55 2024 from 137.207.232.176
*********************************************************************

Welcome to The Digital Research Alliance of Canada/SHARCNET cluster Graham.

 Documentation: https://docs.alliancecan.ca/wiki/Graham
Current issues: https://status.alliancecan.ca/
       Support: support@tech.alliancecan.ca

*********************************************************************

Graham has several types of GPUs, some of which are available with less wait:
 320 p100 2/node, 12GB, original
  70 v100 8/node, 16GB, newer, about 50% faster than P100 and with tensor cores
 144 t4   4/node, 16GB, newer, about half a V100, for compute & AI except much slower
FP64
More details: https://docs.alliancecan.ca/wiki/Graham#GPUs_on_Graham

************* NOTICES *************

Dec 20: /project issue: https://status.alliancecan.ca/view_incident?incident=1064

Jan 8: The data restore from the backup system is proceeding well. So
far over 5 million files have been successfully restored from tape. At
the current rate all files will be restored by early February. Files
will start appearing back in their original locations within the
project space this week.We are restoring the files in the most
efficient way possible. Files within a specific project may be
restored in several batches rather than all at once because of how
they are distributed across the backup tapes. Please watch for an
email with more details.
```

d. If “ls” is a common being type then it will show all the folders in that directory.



```
[rumman@gra-login3 ~]$ ls
jupyter1  nearline  nltk_data  projects  scratch
```

4. Now write the below commands one by one which will lead you to your folder. As my name is rumman that is why I went inside to that folder



```
[rumman@gra-login3 ~]$ ls
jupyter1  nearline  nltk_data  projects  scratc
[rumman@gra-login3 ~]$ cd projects
[rumman@gra-login3 projects]$ ls
def-masaduzz-ab
[rumman@gra-login3 projects]$ cd def-masaduzz-a
[rumman@gra-login3 def-masaduzz-ab]$ ls
masaduzz  rumman
[rumman@gra-login3 def-masaduzz-ab]$ cd rumman
```

5. Now here, **git clone https://github.com/tvhahn/compute-canada-hpc.git** write this command which will help cloning the repository whatever you want.

6. Now for creating the virtual environment you need to follow the below steps:
   a. Go to your home directory. The cd command takes you to your home directory.
   b. Load Python/3.10.13 .: module load python/3.10.13 (whichever is latest for you).
   c. Create the virtual environment in your home directory: virtualenv ~/jupyter1
   d. Activate the virtual environment you just created: source ~/jupyter1/bin/activate

7. One can install python packages here following the below steps:
   a. Install the packages you need to open up a Jupyter notebook and do data analysis.
   b. While the jupyter1 environment is active, upgrade the package manager, pip: pip install --no-index --upgrade pip You should always do this when setting up a new environment.
   c. Install basic data-science packages, scikit-learn, Pandas, Matplotlib: pip install --no-index pandas scikit_learn matplotlib seaborn

8. To launch jupyter lab you need to follow the below steps:
   a. Use nano (text editor in linux) to create a bash script that we'll call upon to open up a Jupyter Lab session.
   b. Create a script in your virtual environment (make sure jupyter1 is active), in the bin folder: nano $VIRTUAL_ENV/bin/notebook.sh
   c. This opens up the nano text editor, so that we can create the bash script
   d. Copy the following code in that file

```
#!/bin/bash
unset XDG_RUNTIME_DIR
jupyter-lab --ip $(hostname -f) --no-browser
```

e. Press ctrl-O to save, and after that press enter and ctrl-X to exit.

f. Back in your home directory, change the user privileges of the notebook.sh that you just created (we'll allow the user, *u*, to execute, *x*, the file). This is needed so that we can run the script in the bin folder: chmod u+x $VIRTUAL_ENV/bin/notebook.sh

9. To run jupyter lab create an allocation by following the below steps:

a. While in your virtual environment, run the following:

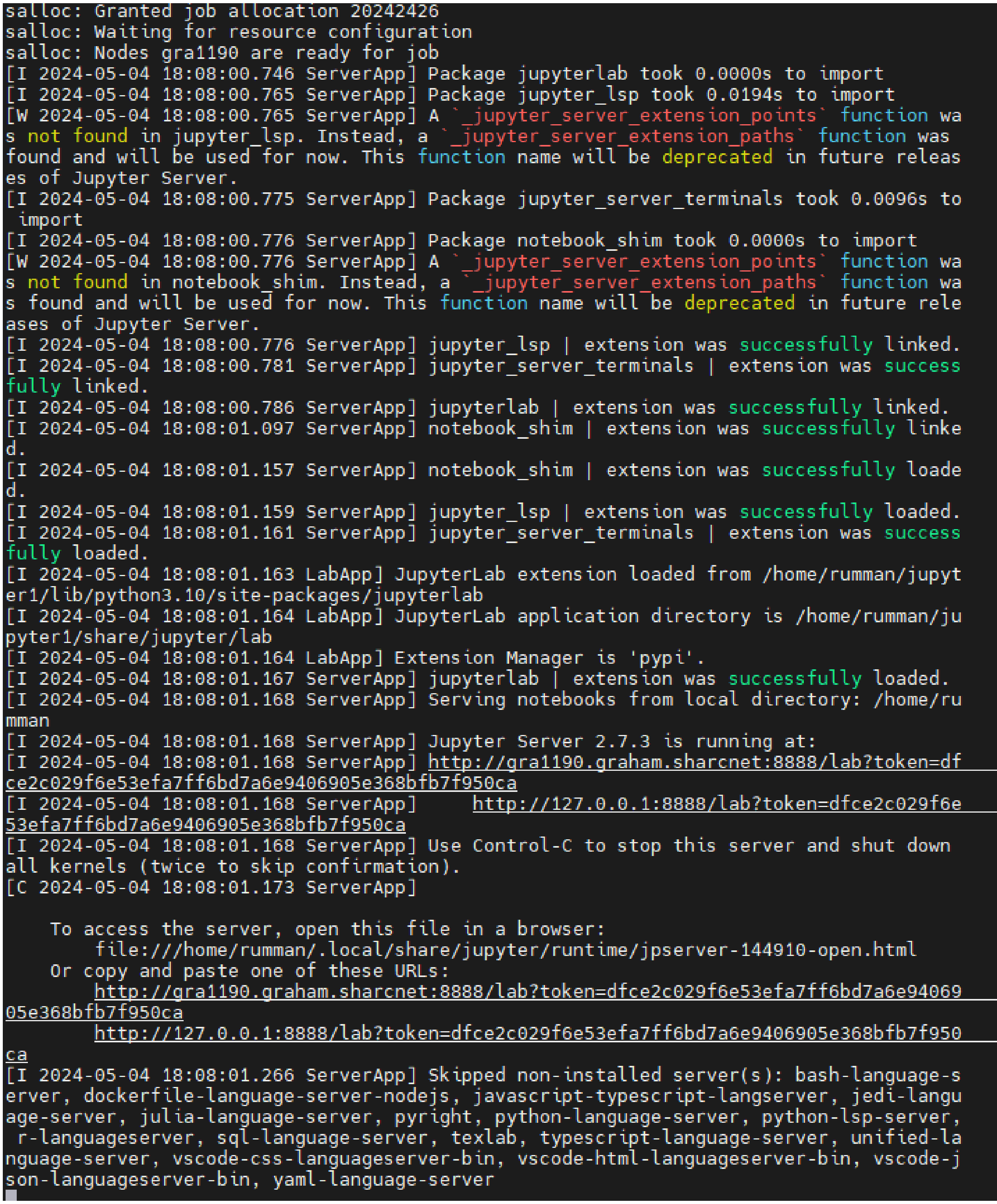
```
salloc --time=1:0:0 --ntasks=1 --cpus-per-task=4 --mem-per-cpu=2048M --account=<your-account> srun $VIRTUAL_ENV/bin/notebook.sh
```

b. Rename account name with your Compute Canada account name

c. In the above command, 1 hour allocated for 1 task, using 4 cpus and 2048 MB of RAM/CPU. Allocated on the

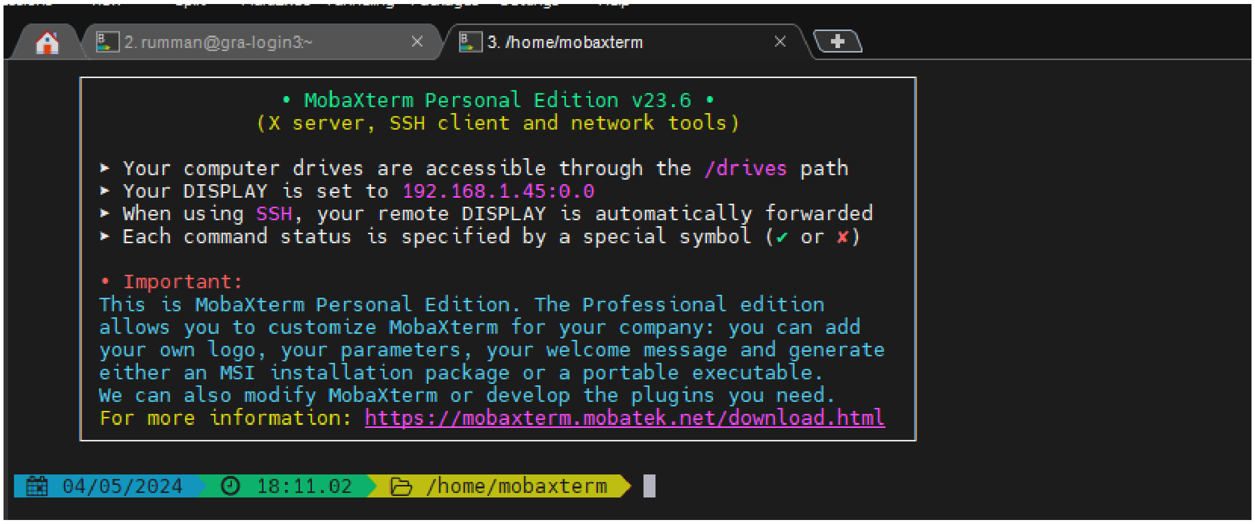
Warning: Try not to allocate more than you need so that the resources can be efficiently used between users.

d. After running that command you will be able to see the following thing

e. 

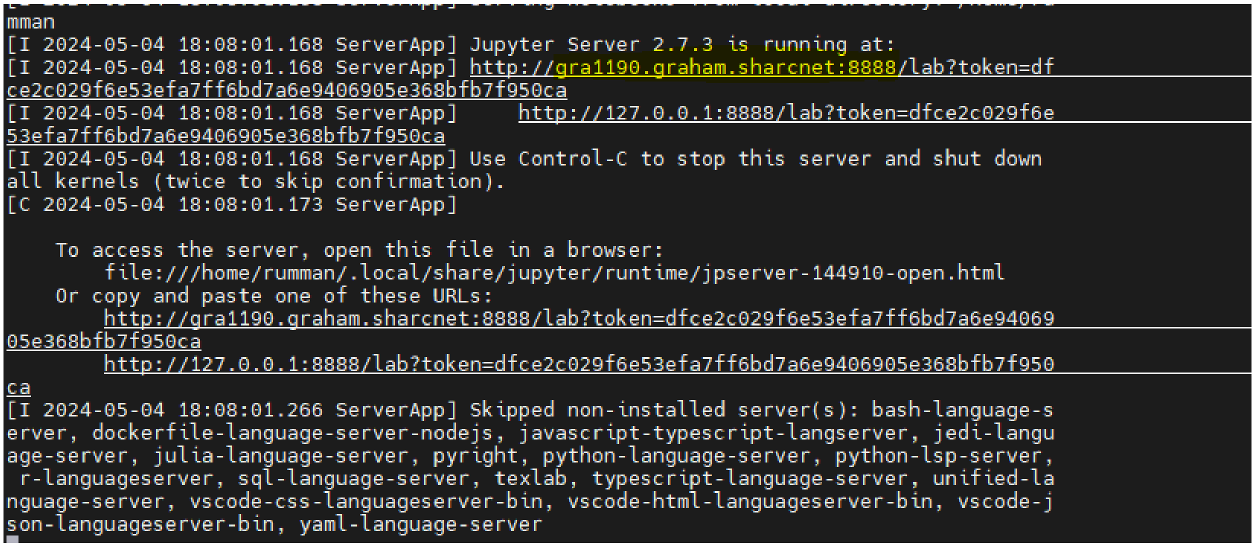
```
salloc: Granted job allocation 20242426
salloc: Waiting for resource configuration
salloc: Nodes gra1190 are ready for job
[I 2024-05-04 18:08:00.746 ServerApp] Package jupyterlab took 0.0000s to import
[I 2024-05-04 18:08:00.765 ServerApp] Package jupyter_lsp took 0.0194s to import
[W 2024-05-04 18:08:00.765 ServerApp] A `_jupyter_server_extension_points` function wa
s not found in jupyter_lsp. Instead, a `_jupyter_server_extension_paths` function was
found and will be used for now. This function name will be deprecated in future releas
es of Jupyter Server.
[I 2024-05-04 18:08:00.775 ServerApp] Package jupyter_server_terminals took 0.0096s to
 import
[I 2024-05-04 18:08:00.776 ServerApp] Package notebook_shim took 0.0000s to import
[W 2024-05-04 18:08:00.776 ServerApp] A `_jupyter_server_extension_points` function wa
s not found in notebook_shim. Instead, a `_jupyter_server_extension_paths` function wa
s found and will be used for now. This function name will be deprecated in future rele
ases of Jupyter Server.
[I 2024-05-04 18:08:00.776 ServerApp] jupyter_lsp | extension was successfully linked.
[I 2024-05-04 18:08:00.781 ServerApp] jupyter_server_terminals | extension was success
fully linked.
[I 2024-05-04 18:08:00.786 ServerApp] jupyterlab | extension was successfully linked.
[I 2024-05-04 18:08:01.097 ServerApp] notebook_shim | extension was successfully linke
d.
[I 2024-05-04 18:08:01.157 ServerApp] notebook_shim | extension was successfully loade
d.
[I 2024-05-04 18:08:01.159 ServerApp] jupyter_lsp | extension was successfully loaded.
[I 2024-05-04 18:08:01.161 ServerApp] jupyter_server_terminals | extension was success
fully loaded.
[I 2024-05-04 18:08:01.163 LabApp] JupyterLab extension loaded from /home/rumman/jupyt
er1/lib/python3.10/site-packages/jupyterlab
[I 2024-05-04 18:08:01.164 LabApp] JupyterLab application directory is /home/rumman/ju
pyter1/share/jupyter/lab
[I 2024-05-04 18:08:01.164 LabApp] Extension Manager is 'pypi'.
[I 2024-05-04 18:08:01.167 ServerApp] jupyterlab | extension was successfully loaded.
[I 2024-05-04 18:08:01.168 ServerApp] Serving notebooks from local directory: /home/ru
mman
[I 2024-05-04 18:08:01.168 ServerApp] Jupyter Server 2.7.3 is running at:
[I 2024-05-04 18:08:01.168 ServerApp] http://gra1190.graham.sharcnet:8888/lab?token=df
ce2c029f6e53efa7ff6bd7a6e9406905e368bfb7f950ca
[I 2024-05-04 18:08:01.168 ServerApp]     http://127.0.0.1:8888/lab?token=dfce2c029f6e
53efa7ff6bd7a6e9406905e368bfb7f950ca
[I 2024-05-04 18:08:01.168 ServerApp] Use Control-C to stop this server and shut down
all kernels (twice to skip confirmation).
[C 2024-05-04 18:08:01.173 ServerApp]

    To access the server, open this file in a browser:
        file:///home/rumman/.local/share/jupyter/runtime/jpserver-144910-open.html
    Or copy and paste one of these URLs:
        http://gra1190.graham.sharcnet:8888/lab?token=dfce2c029f6e53efa7ff6bd7a6e94069
05e368bfb7f950ca
        http://127.0.0.1:8888/lab?token=dfce2c029f6e53efa7ff6bd7a6e9406905e368bfb7f950
ca
[I 2024-05-04 18:08:01.266 ServerApp] Skipped non-installed server(s): bash-language-s
erver, dockerfile-language-server-nodejs, javascript-typescript-langserver, jedi-langu
age-server, julia-language-server, pyright, python-language-server, python-lsp-server,
 r-languageserver, sql-language-server, texlab, typescript-language-server, unified-la
nguage-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-j
son-languageserver-bin, yaml-language-server
```

10. Now open another new terminal side by side



```
                 • MobaXterm Personal Edition v23.6 •
               (X server, SSH client and network tools)

 ➤ Your computer drives are accessible through the /drives path
 ➤ Your DISPLAY is set to 192.168.1.45:0.0
 ➤ When using SSH, your remote DISPLAY is automatically forwarded
 ➤ Each command status is specified by a special symbol (✓ or ✗)

 • Important:
 This is MobaXterm Personal Edition. The Professional edition
 allows you to customize MobaXterm for your company: you can add
 your own logo, your parameters, your welcome message and generate
 either an MSI installation package or a portable executable.
 We can also modify MobaXterm or develop the plugins you need.
 For more information: https://mobaxterm.mobatek.net/download.html

04/05/2024  18:11.02  /home/mobaxterm
```

11. In the new terminal, ssh into the graham server. Type something like this, based on what is shown the other terminal you have open showing the notebook access token: ssh -L 8888:[gra800.graham.sharcnet:8888(change this with new value)] rumman@graham.computecanada.ca
12. Replace the red one with the value marked as yellow which you got from the previous terminal



```
mman
[I 2024-05-04 18:08:01.168 ServerApp] Jupyter Server 2.7.3 is running at:
[I 2024-05-04 18:08:01.168 ServerApp] http://gra1190.graham.sharcnet:8888/lab?token=df
ce2c029f6e53efa7ff6bd7a6e9406905e368bfb7f950ca
[I 2024-05-04 18:08:01.168 ServerApp]     http://127.0.0.1:8888/lab?token=dfce2c029f6e
53efa7ff6bd7a6e9406905e368bfb7f950ca
[I 2024-05-04 18:08:01.168 ServerApp] Use Control-C to stop this server and shut down
all kernels (twice to skip confirmation).
[C 2024-05-04 18:08:01.173 ServerApp]

    To access the server, open this file in a browser:
        file:///home/rumman/.local/share/jupyter/runtime/jpserver-144910-open.html
    Or copy and paste one of these URLs:
        http://gra1190.graham.sharcnet:8888/lab?token=dfce2c029f6e53efa7ff6bd7a6e94069
05e368bfb7f950ca
        http://127.0.0.1:8888/lab?token=dfce2c029f6e53efa7ff6bd7a6e9406905e368bfb7f950
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erver, dockerfile-language-server-nodejs, javascript-typescript-langserver, jedi-langu
age-server, julia-language-server, pyright, python-language-server, python-lsp-server,
 r-languageserver, sql-language-server, texlab, typescript-language-server, unified-la
nguage-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-j
son-languageserver-bin, yaml-language-server
```
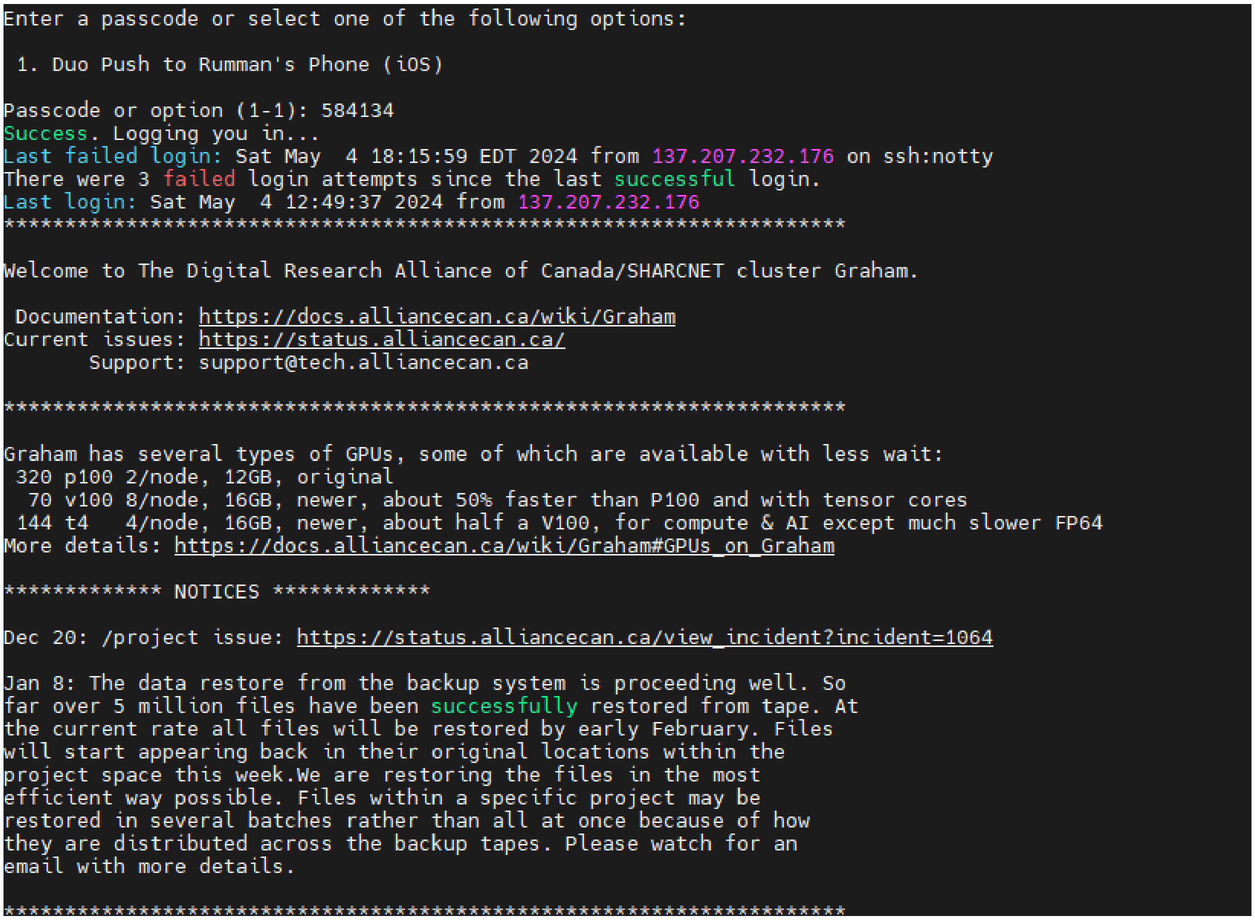

13. Now if you see the following picture in your new terminal, then your task is almost done:



```
Enter a passcode or select one of the following options:

 1. Duo Push to Rumman's Phone (iOS)

Passcode or option (1-1): 584134
Success. Logging you in...
Last failed login: Sat May  4 18:15:59 EDT 2024 from 137.207.232.176 on ssh:notty
There were 3 failed login attempts since the last successful login.
Last login: Sat May  4 12:49:37 2024 from 137.207.232.176
**********************************************************************

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 Documentation: https://docs.alliancecan.ca/wiki/Graham
Current issues: https://status.alliancecan.ca/
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************* NOTICES *************

Dec 20: /project issue: https://status.alliancecan.ca/view_incident?incident=1064

Jan 8: The data restore from the backup system is proceeding well. So
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project space this week.We are restoring the files in the most
efficient way possible. Files within a specific project may be
restored in several batches rather than all at once because of how
they are distributed across the backup tapes. Please watch for an
email with more details.

**********************************************************************
```
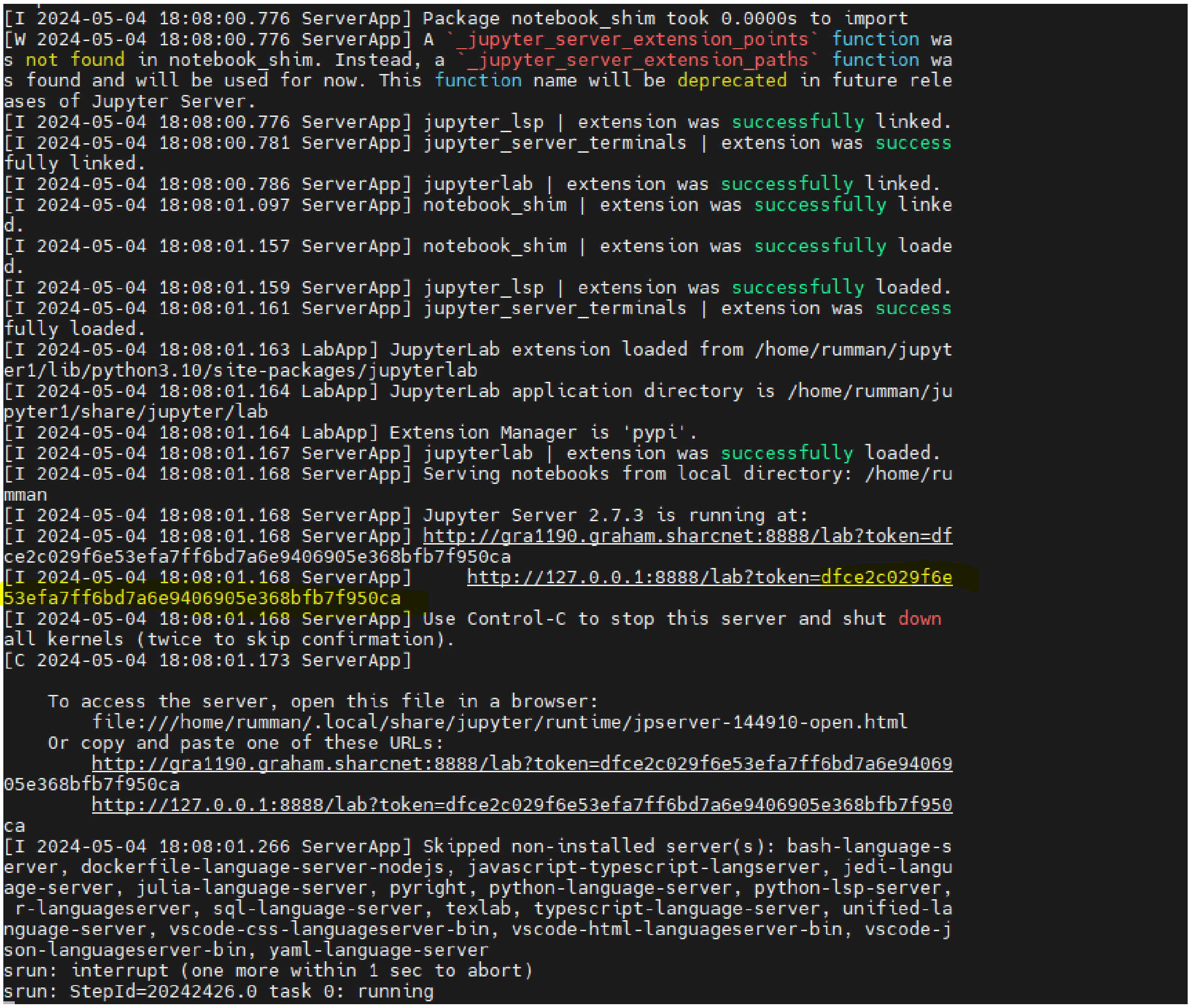

14. Then on local browser, copy the link to Jupyter lab with the access token, like: http://localhost:8888/?token=<token>
15. Now, Replace the token value with previous terminal's token value which has been marked yellow in the below picture:
16. Now you will be able to have the access to your server



```
[I 2024-05-04 18:08:00.776 ServerApp] Package notebook_shim took 0.0000s to import
[W 2024-05-04 18:08:00.776 ServerApp] A `_jupyter_server_extension_points` function wa
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fully linked.
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[I 2024-05-04 18:08:01.097 ServerApp] notebook_shim | extension was successfully linke
d.
[I 2024-05-04 18:08:01.157 ServerApp] notebook_shim | extension was successfully loade
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er1/lib/python3.10/site-packages/jupyterlab
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[I 2024-05-04 18:08:01.164 LabApp] Extension Manager is 'pypi'.
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[I 2024-05-04 18:08:01.168 ServerApp] http://gra1190.graham.sharcnet:8888/lab?token=df
ce2c029f6e53efa7ff6bd7a6e9406905e368bfb7f950ca
[I 2024-05-04 18:08:01.168 ServerApp]     http://127.0.0.1:8888/lab?token=dfce2c029f6e
53efa7ff6bd7a6e9406905e368bfb7f950ca
[I 2024-05-04 18:08:01.168 ServerApp] Use Control-C to stop this server and shut down
all kernels (twice to skip confirmation).
[C 2024-05-04 18:08:01.173 ServerApp]

    To access the server, open this file in a browser:
        file:///home/rumman/.local/share/jupyter/runtime/jpserver-144910-open.html
    Or copy and paste one of these URLs:
        http://gra1190.graham.sharcnet:8888/lab?token=dfce2c029f6e53efa7ff6bd7a6e94069
05e368bfb7f950ca
        http://127.0.0.1:8888/lab?token=dfce2c029f6e53efa7ff6bd7a6e9406905e368bfb7f950
ca
[I 2024-05-04 18:08:01.266 ServerApp] Skipped non-installed server(s): bash-language-s
erver, dockerfile-language-server-nodejs, javascript-typescript-langserver, jedi-langu
age-server, julia-language-server, pyright, python-language-server, python-lsp-server,
 r-languageserver, sql-language-server, texlab, typescript-language-server, unified-la
nguage-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-j
son-languageserver-bin, yaml-language-server
srun: interrupt (one more within 1 sec to abort)
srun: StepId=20242426.0 task 0: running
```
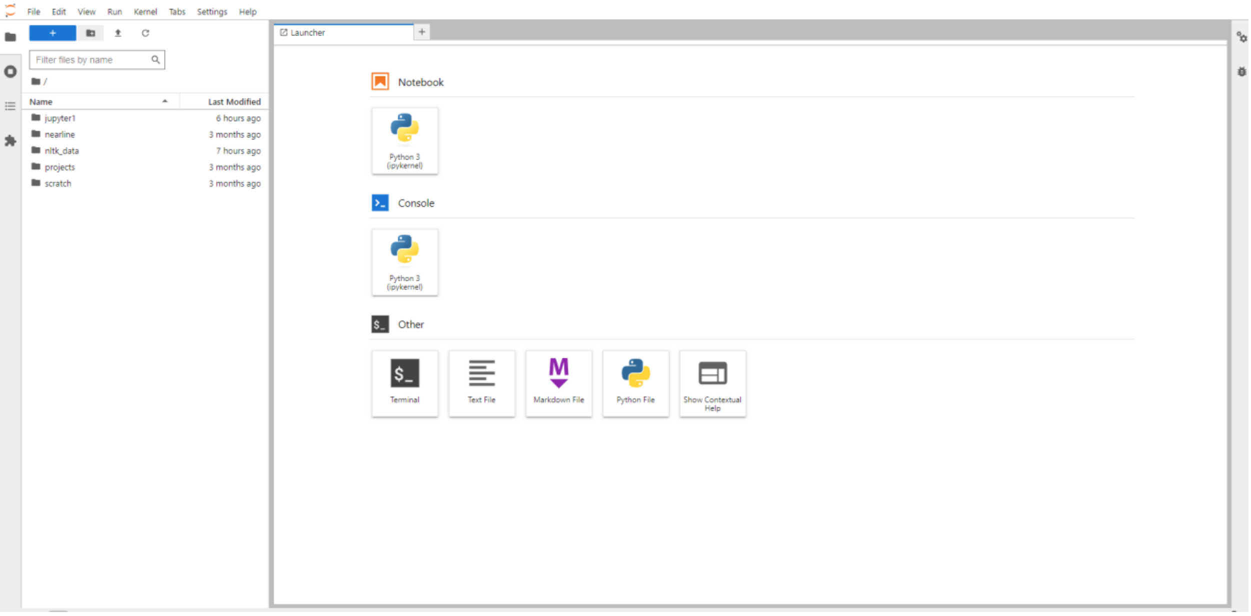

17. Now you will have the access to your server



Name	Last Modified
jupyter1	6 hours ago
nearline	3 months ago
nltk_data	7 hours ago
projects	3 months ago
scratch	3 months ago

18. Now for the scheduling jobs follow the following steps:

    a. Now create a file (ex: random_search_cpu.sh)

    b. Inside this file add the following bash script

    ```
    #!/bin/bash
    #SBATCH --account=<your-account>
    #SBATCH --cpus-per-task=4   # number of cores
    #SBATCH --mem=4G          # memory for the entire job across all cores (4GB)
    #SBATCH --time=0-00:10     # time (DD-HH:MM)
    #SBATCH --output=%N-%j.out  # %N for node name, %j for jobID
    #SBATCH --mail-type=ALL            # Type of email notification-
    BEGIN,END,F$
    #SBATCH --mail-user=<your-email> # Email to which notifications will be $


    module load python/3.10.13
    source ~/jupyter1/bin/activate

    python train_model_tcn.py
    ```

    c. The email id is provided so that when this will start and finish it will be sent to the provided mail id.

    d. Account name will be replaced by your own account name, time can be updated with requirement and email id.

    e. For submitting the bash job do the following command:

    ```
    sbatch random_search_cpu.sh
    ```

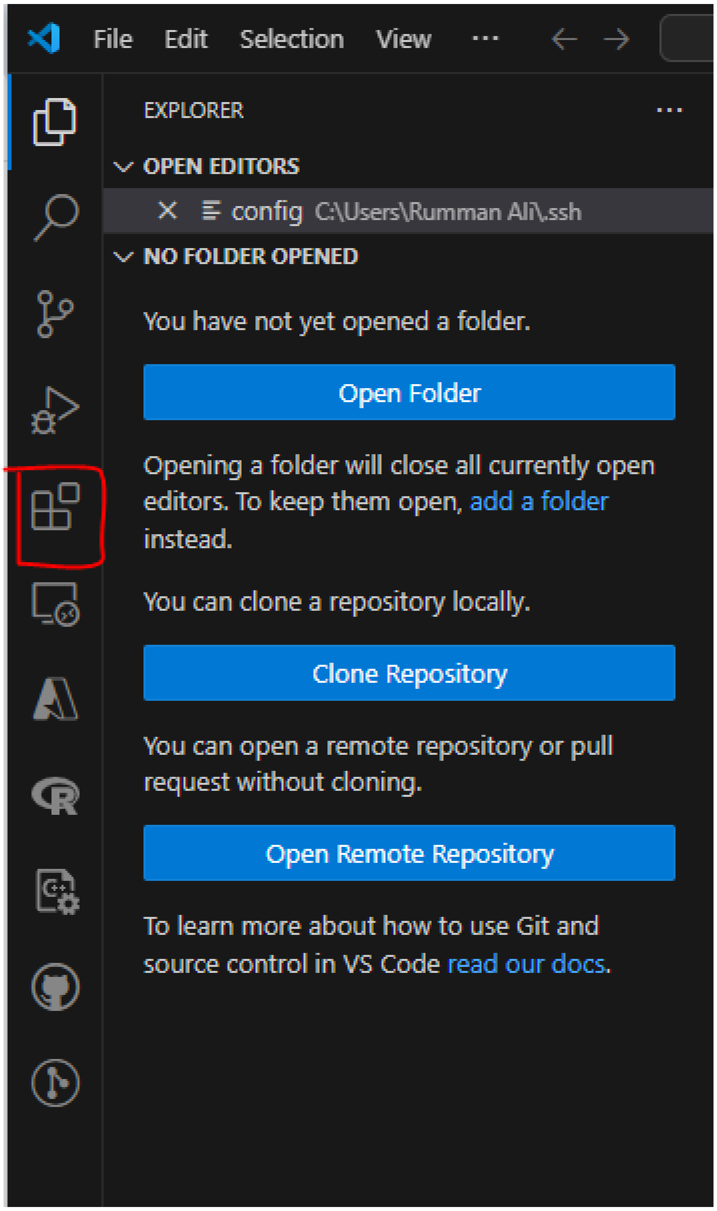
    f. To see the progress of the bash job type the following command:

    ```
    squeue -u rumman
    ```

Referenced Video: https://www.youtube.com/watch?v=K8wuaIKW6aU

Compute Canada With Visual Studio

1. Download Visual Studio Code Community edition
2. Now go to visual studio code. Need to add the following extensions:
    a. Click on this extension tab



You have not yet opened a folder.

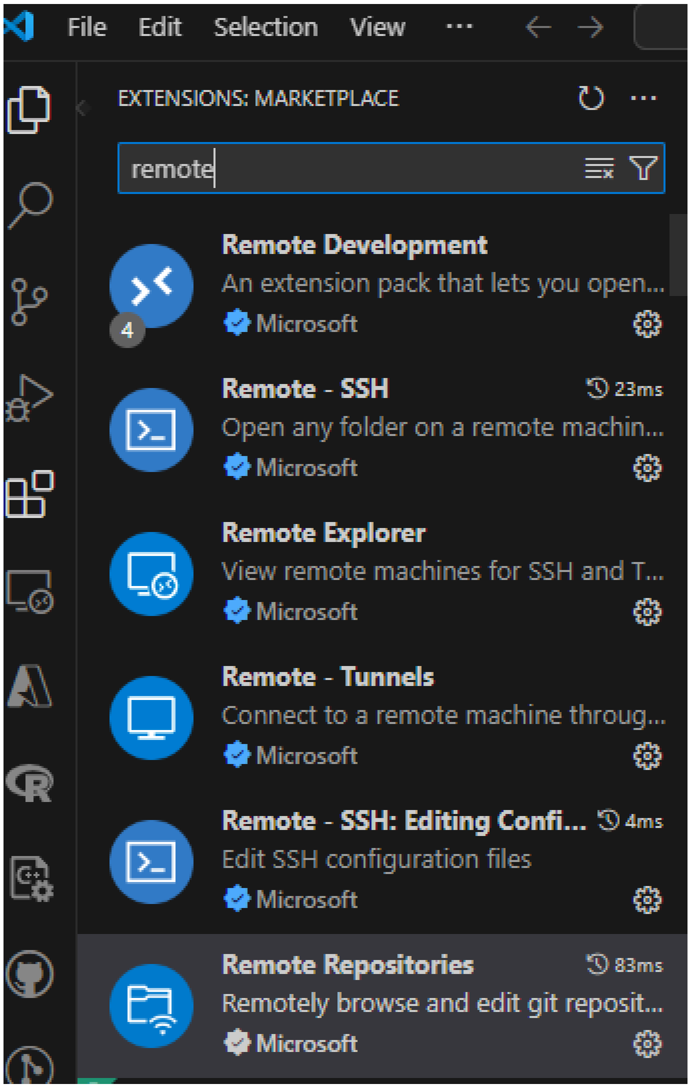
Opening a folder will close all currently open editors. To keep them open, add a folder instead.

You can clone a repository locally.

You can open a remote repository or pull request without cloning.

To learn more about how to use Git and source control in VS Code read our docs.

    b. Now search remote and download the following extensions



remote

Remote Development
An extension pack that lets you open...
Microsoft

Remote - SSH 23ms
Open any folder on a remote machin...
Microsoft

Remote Explorer
View remote machines for SSH and T...
Microsoft

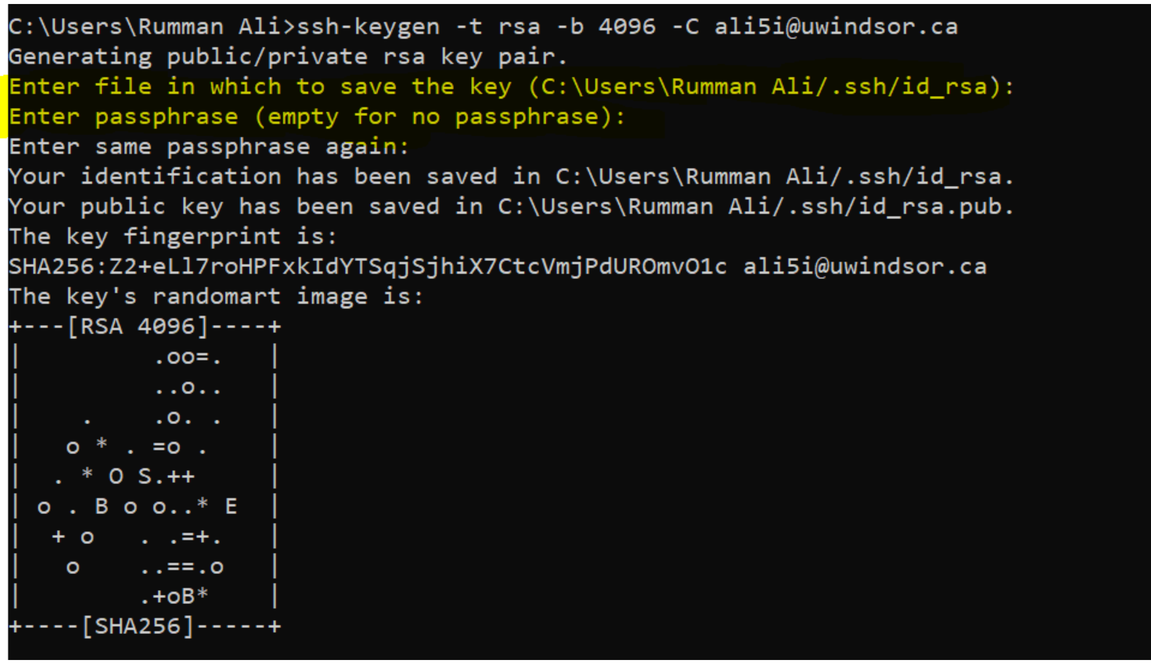
Remote - Tunnels
Connect to a remote machine throug...
Microsoft

Remote - SSH: Editing Confi... 4ms
Edit SSH configuration files
Microsoft

Remote Repositories 83ms
Remotely browse and edit git reposit...
Microsoft

3. Next step is to generate a public key and add that key in Compute Canada as well.
    a. Enter the following command which will result in creating the public key. At the end, add your own email address

```
ssh-keygen -t rsa -b 4096 -C <your-email>
```

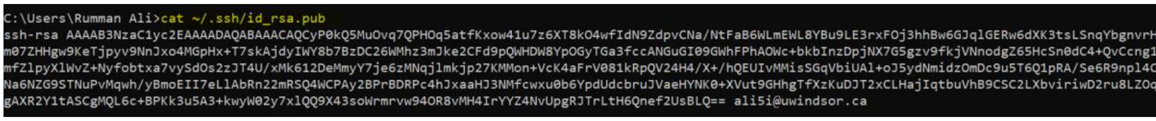


```
C:\Users\Rumman Ali>ssh-keygen -t rsa -b 4096 -C ali5i@uwindsor.ca
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\Rumman Ali/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\Rumman Ali/.ssh/id_rsa.
Your public key has been saved in C:\Users\Rumman Ali/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:Z2+eLl7roHPFxkIdYTSqjSjhiX7CtcVmjPdUROmvO1c ali5i@uwindsor.ca
The key's randomart image is:
+---[RSA 4096]----+
|         .oo=.   |
|         ..o..   |
|    .    .o. .   |
|   o * . =o .    |
|  . * O S.++     |
| o . B o o..* E  |
|  + o   . .=+.   |
|   o    ..==.o   |
|        .+oB*    |
+----[SHA256]-----+
```

b. It will ask for the location where you want to save the key pair. If you press enter then C:\Users\Rumman Ali/.ssh/id_rsa this will be its default location.

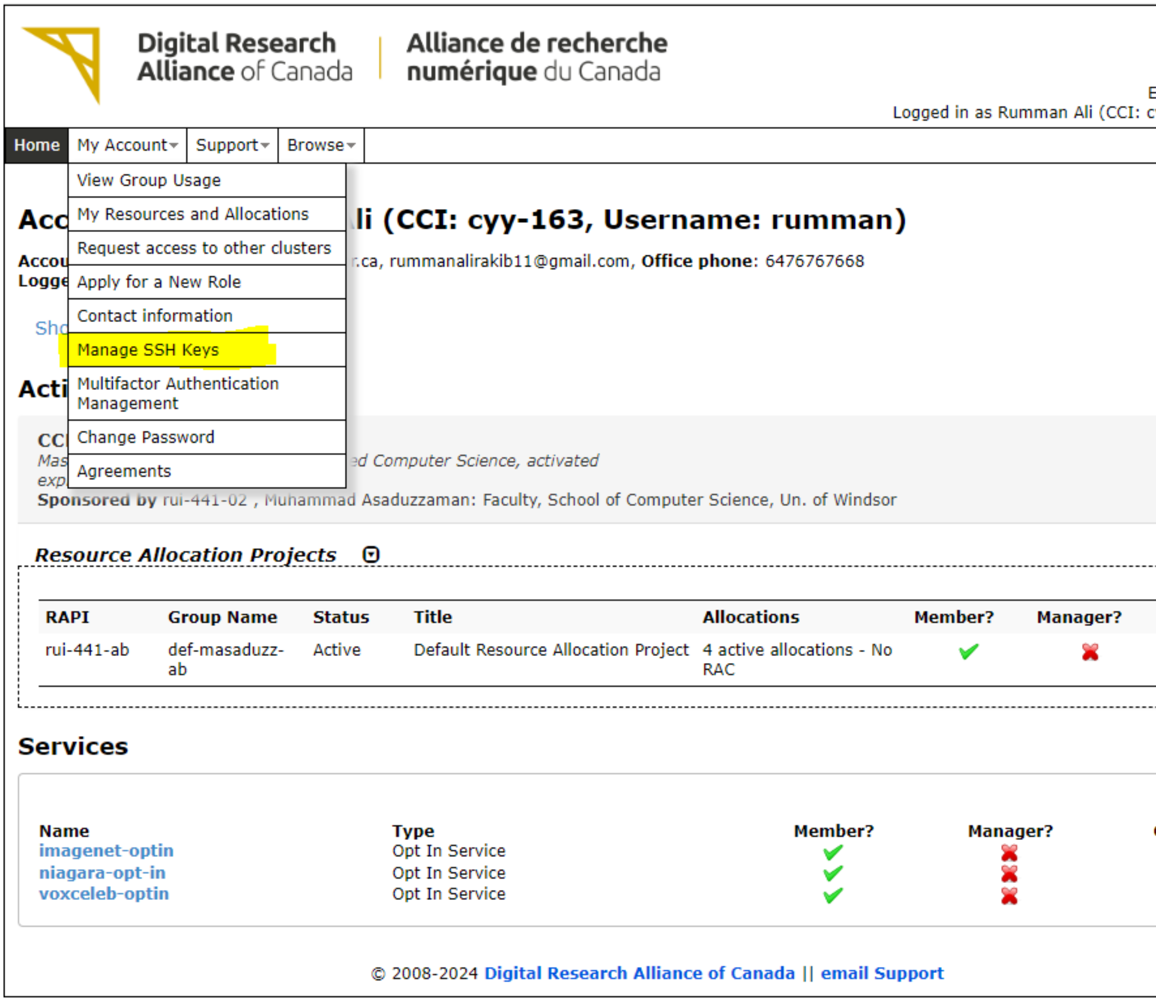
c. And be careful about the passphrase, if you are providing one then do remember it.

d. With the following command, you can see your public key in the command line or you open it from the folder as well.
Command is: cat ~/.ssh/id_rsa.pub



```
C:\Users\Rumman Ali>cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQCyP0kQ5MuOvq7QPHOq5atfKxow41u7z6XT8kO4wfIdN9ZdpvCNa/NtFaB6WLmEWL8YBu9LE3rxFOj3hhBw6GJqlGERw6dXK3tsLSnqYbgnvrH
m07ZHHgw9KeTjpyv9NnJxo4MGpHx+T7skAjdyIWY8b7BzDC26WMhz3mJke2CFd9pQWHDW8YpOGyTGa3fccANGuGI09GWhFPhAOWc+bkbInzDpjNX7G5gzv9fkjVNnodgZ65HcSn0dC4+QvCcng1
mfZlpyXlWvZ+Nyfobtxa7vySdOs2zJT4U/xMk612DeMmyY7je6zMNqjlmkjp27KMMon+VcK4aFrV081kRpQV24H4/X+/hQEUIvMMisSGqVbiUAl+oJ5ydNmidzOmDc9u5T6Q1pRA/Se6R9npl4C
Na6NZG9STNuPvMqwh/yBmoEII7eLlAbRn22mRSQ4WCPAy2BPrBDRPc4hJxaaHJ3NMfcwxu0b6YpdUdcbruJVaeHYNK0+XVut9GHhgTfXzKuDJT2xCLHajIqtbuVhB9CSC2LXbviriwD2ru8LZOq
gAXR2Y1tASCgMQL6c+BPKk3u5A3+kwyW02y7xlQQ9X43soWrmrvw94OR8vMH4IrYYZ4NvUpgRJTrLtH6Qnef2UsBLQ== ali5i@uwindsor.ca
```

e. Log into Compute Canada. After logging in go to the Manage SSH Keys


Digital Research Alliance of Canada
Alliance de recherche numérique du Canada
Home
My Account
Support
Browse
View Group Usage
My Resources and Allocations
Request access to other clusters
Apply for a New Role
Contact information
Manage SSH Keys
Multifactor Authentication Management
Change Password
Agreements

Logged in as Rumman Ali (CCI: c

Acc li (CCI: cyy-163, Username: rumman)

Accou r.ca, rummanalirakib11@gmail.com, **Office phone**: 6476767668
Logge

Sho

Acti

CC
Mas ed Computer Science, activated
exp
Sponsored by rui-441-02 , Muhammad Asaduzzaman: Faculty, School of Computer Science, Un. of Windsor

Resource Allocation Projects

RAPI	Group Name	Status	Title	Allocations	Member?	Manager?
rui-441-ab	def-masaduzz-ab	Active	Default Resource Allocation Project	4 active allocations - No RAC	✓	✗

Services

Name	Type	Member?	Manager?
imagenet-optin	Opt In Service	✓	✗
niagara-opt-in	Opt In Service	✓	✗
voxceleb-optin	Opt In Service	✓	✗

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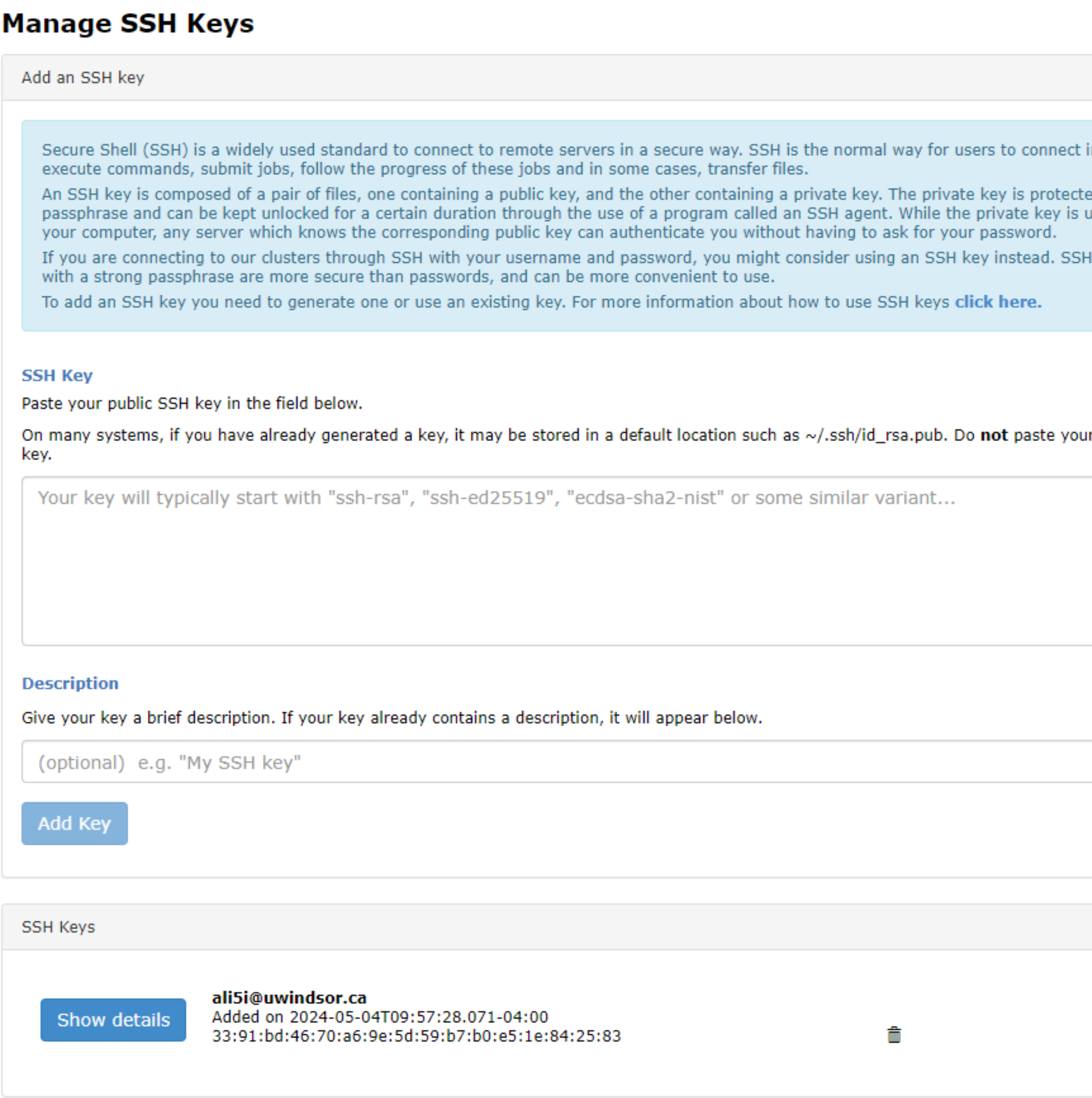
f. Paste the public key in the SSH Key section. After pasting the public key in that box. Now, click on the button Add Key which will result in adding the key.



Manage SSH Keys

Add an SSH key

Secure Shell (SSH) is a widely used standard to connect to remote servers in a secure way. SSH is the normal way for users to connect i
execute commands, submit jobs, follow the progress of these jobs and in some cases, transfer files.

An SSH key is composed of a pair of files, one containing a public key, and the other containing a private key. The private key is protecte
passphrase and can be kept unlocked for a certain duration through the use of a program called an SSH agent. While the private key is u
your computer, any server which knows the corresponding public key can authenticate you without having to ask for your password.

If you are connecting to our clusters through SSH with your username and password, you might consider using an SSH key instead. SSH
with a strong passphrase are more secure than passwords, and can be more convenient to use.

To add an SSH key you need to generate one or use an existing key. For more information about how to use SSH keys **click here.**

SSH Key

Paste your public SSH key in the field below.

On many systems, if you have already generated a key, it may be stored in a default location such as ~/.ssh/id_rsa.pub. Do **not** paste your
key.

Your key will typically start with "ssh-rsa", "ssh-ed25519", "ecdsa-sha2-nist" or some similar variant...

Description

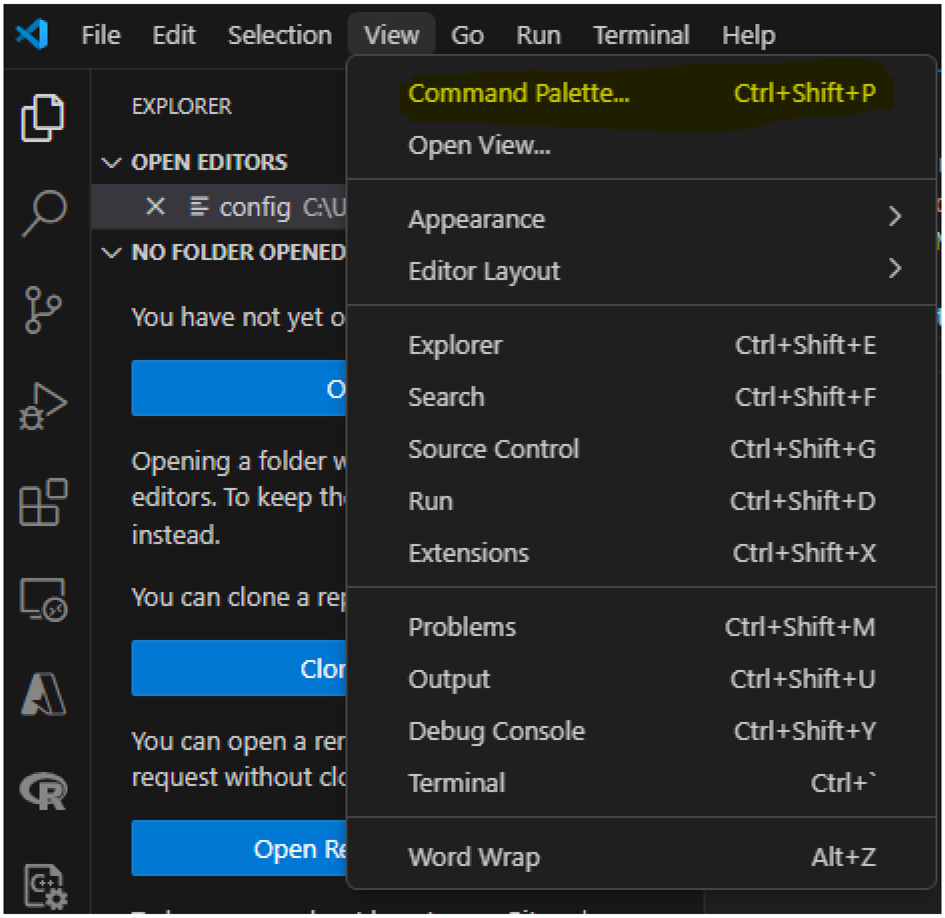
Give your key a brief description. If your key already contains a description, it will appear below.

(optional) e.g. "My SSH key"

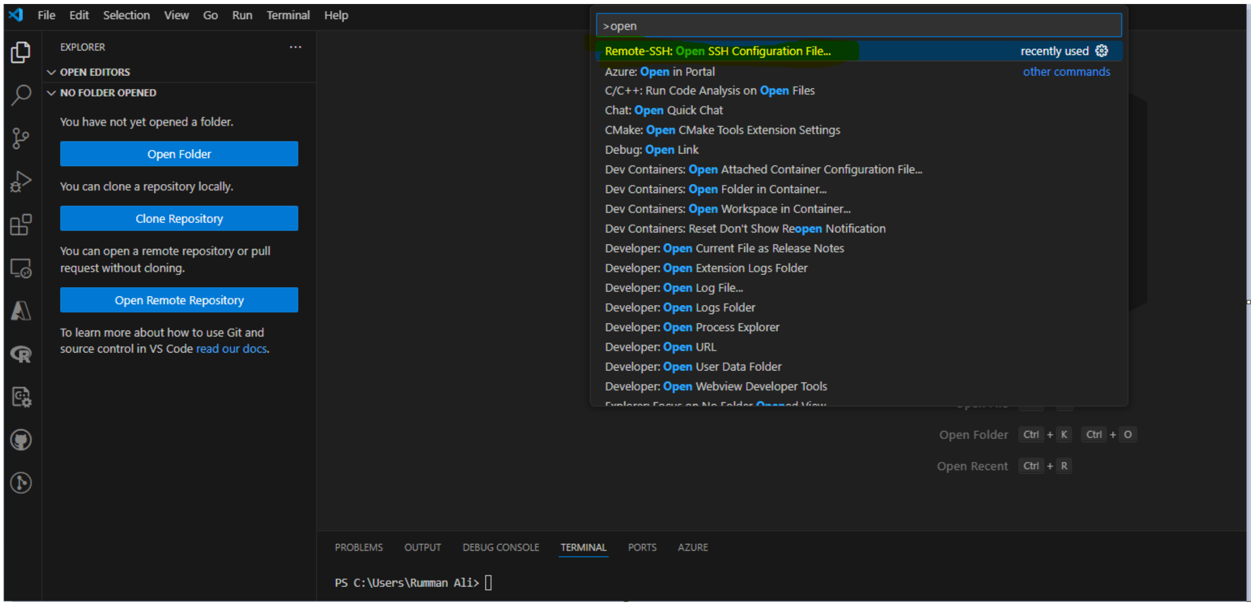
SSH Keys

ali5i@uwindsor.ca
Added on 2024-05-04T09:57:28.071-04:00
33:91:bd:46:70:a6:9e:5d:59:b7:b0:e5:1e:84:25:83

4. Now go to Visual Studio Code and open Command Palette from view or by using shower key Ctrl+Shift+P

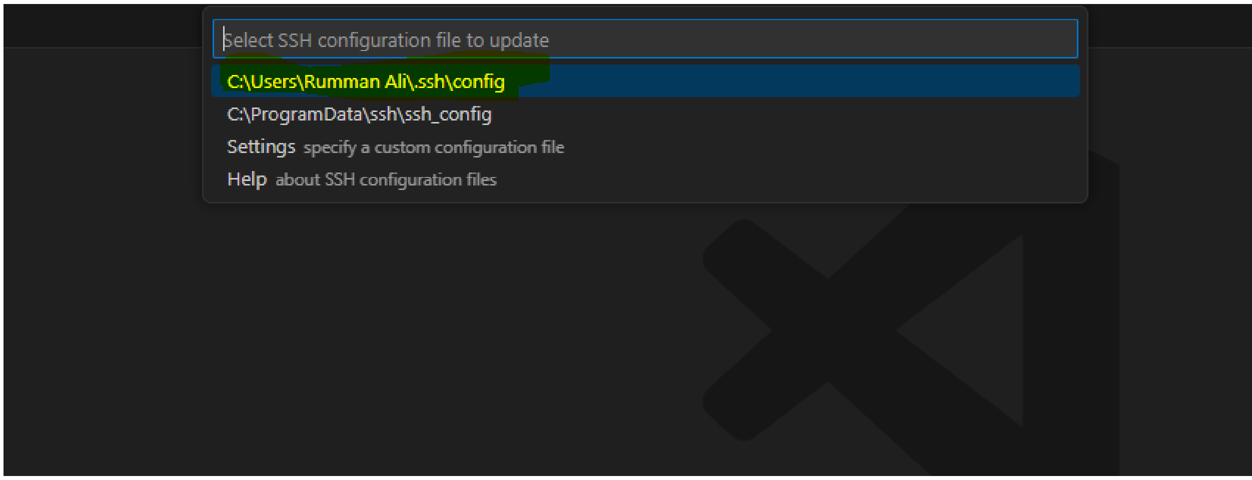


5. Now after that go to Remote SSH: Open SSH Configuration file


File
Edit
Selection
View
Go
Run
Terminal
Help
EXPLORER
OPEN EDITORS
NO FOLDER OPENED
You have not yet opened a folder.
Open Folder
You can clone a repository locally.
Clone Repository
You can open a remote repository or pull request without cloning.
Open Remote Repository
To learn more about how to use Git and source control in VS Code read our docs.
>open
Remote-SSH: Open SSH Configuration File...
recently used
Azure: Open in Portal
other commands
C/C++: Run Code Analysis on Open Files
Chat: Open Quick Chat
CMake: Open CMake Tools Extension Settings
Debug: Open Link
Dev Containers: Open Attached Container Configuration File...
Dev Containers: Open Folder in Container...
Dev Containers: Open Workspace in Container...
Dev Containers: Reset Don't Show Reopen Notification
Developer: Open Current File as Release Notes
Developer: Open Extension Logs Folder
Developer: Open Log File...
Developer: Open Logs Folder
Developer: Open Process Explorer
Developer: Open URL
Developer: Open User Data Folder
Developer: Open Webview Developer Tools
Open Folder Ctrl + K Ctrl + O
Open Recent Ctrl + R
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
AZURE

```
PS C:\Users\Rumman Ali>
```

6. Now just go with the default one:



Select SSH configuration file to update

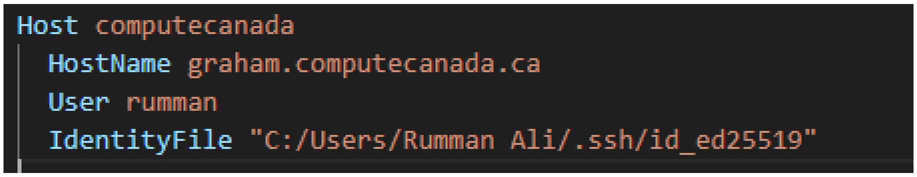
C:\Users\Rumman Ali\.ssh\config

C:\ProgramData\ssh\ssh_config

Settings specify a custom configuration file

Help about SSH configuration files

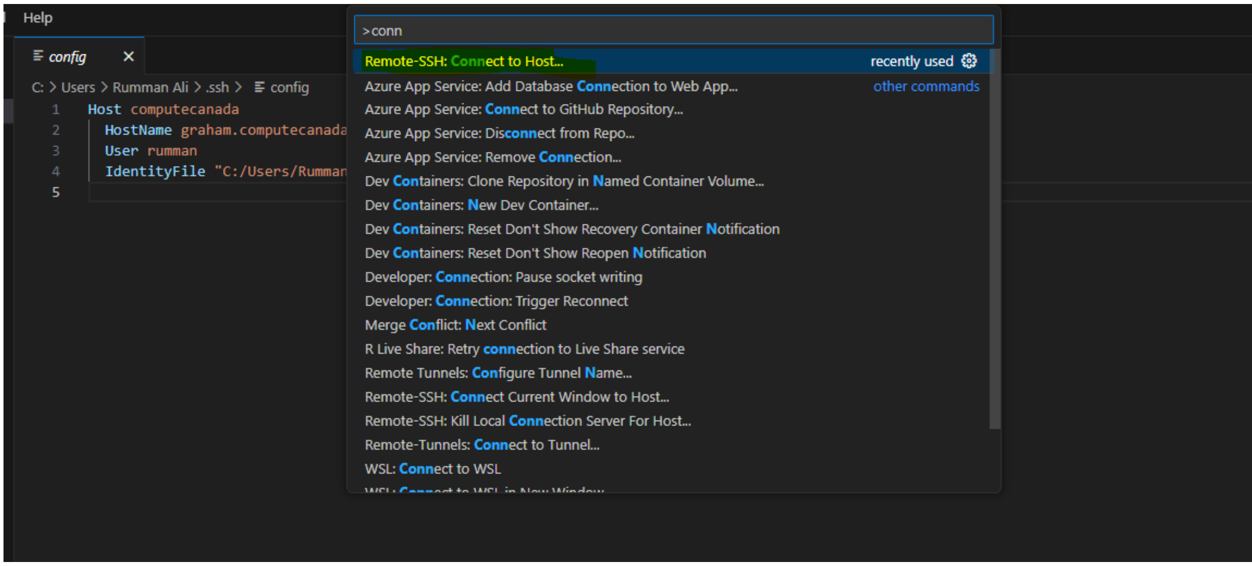
7. Now in that file add the following things:



```
Host computecanada
  HostName graham.computecanada.ca
  User rumman
  IdentityFile "C:/Users/Rumman Ali/.ssh/id_ed25519"
```

Add the value with your own values. After that in the IdentifyFile just add the location of your public key in the quotation mark.

8. Now, again open Command Palette select the Remote-SSH: Connect to Host



```
Host computecanada
  HostName graham.computecanada
  User rumman
  IdentityFile "C:/Users/Rumman
```

>conn

Remote-SSH: Connect to Host... recently used

Azure App Service: Add Database Connection to Web App... other commands

Azure App Service: Connect to GitHub Repository...

Azure App Service: Disconnect from Repo...

Azure App Service: Remove Connection...

Dev Containers: Clone Repository in Named Container Volume...

Dev Containers: New Dev Container...

Dev Containers: Reset Don't Show Recovery Container Notification

Dev Containers: Reset Don't Show Reopen Notification

Developer: Connection: Pause socket writing

Developer: Connection: Trigger Reconnect

Merge Conflict: Next Conflict

R Live Share: Retry connection to Live Share service

Remote Tunnels: Configure Tunnel Name...

Remote-SSH: Connect Current Window to Host...

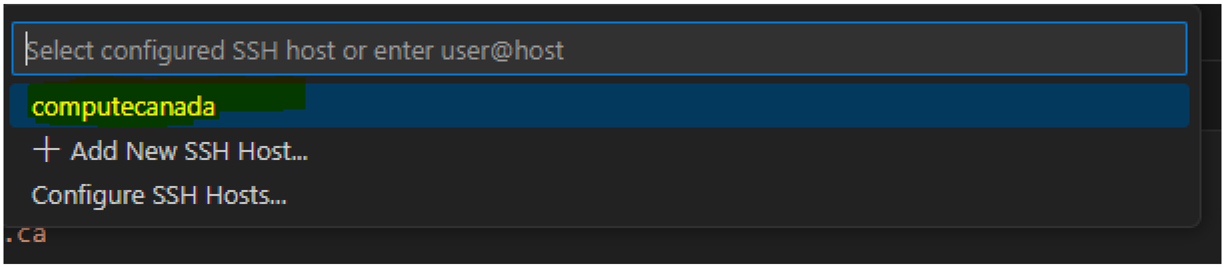
Remote-SSH: Kill Local Connection Server For Host...

Remote-Tunnels: Connect to Tunnel...

WSL: Connect to WSL

WSL: Connect to WSL in New Window

9. Now, Select the Host you provided



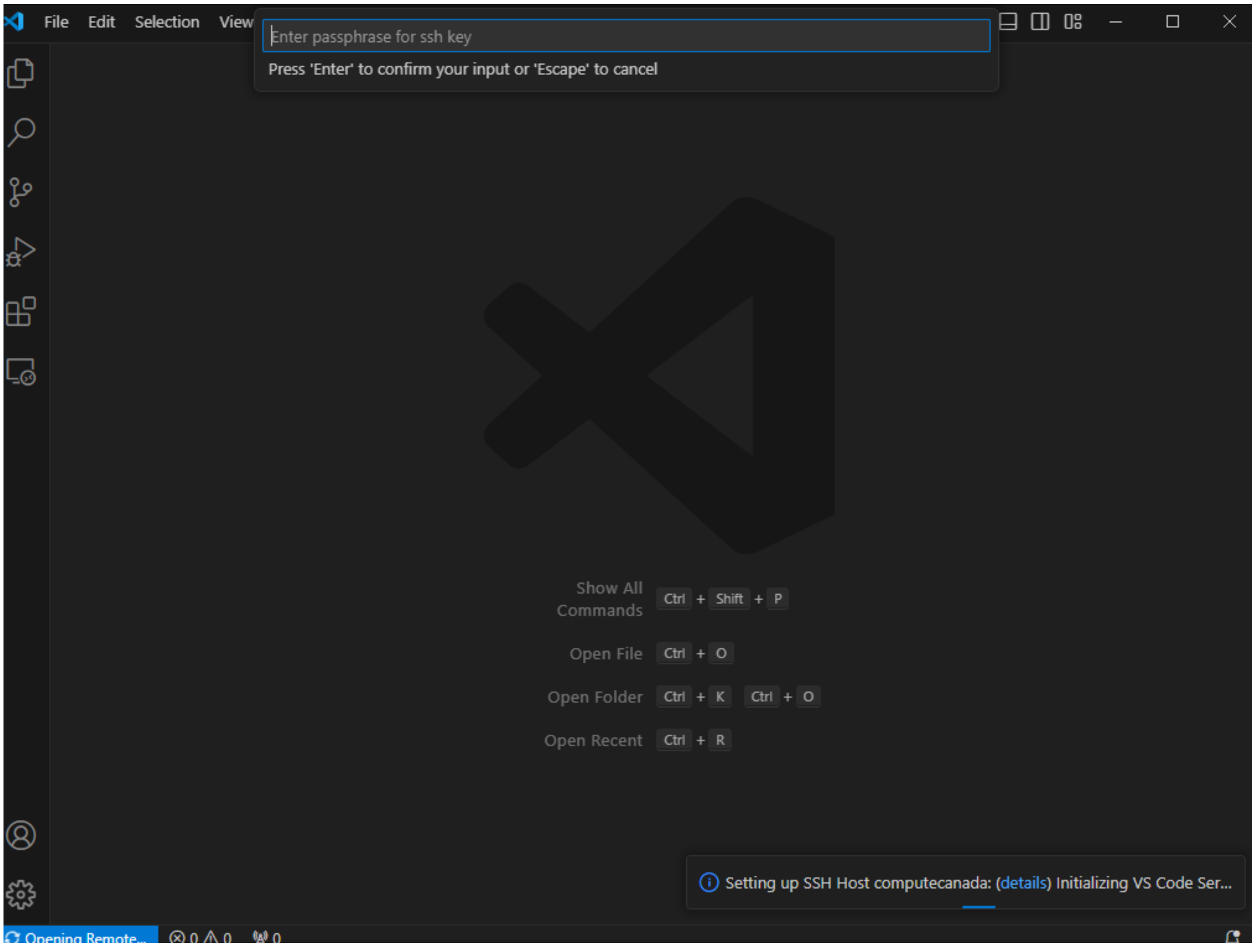
Select configured SSH host or enter user@host

computecanada

+ Add New SSH Host...

Configure SSH Hosts...

10. Now it will redirect you to the new visual studio code. And you will have to provide your passphrase

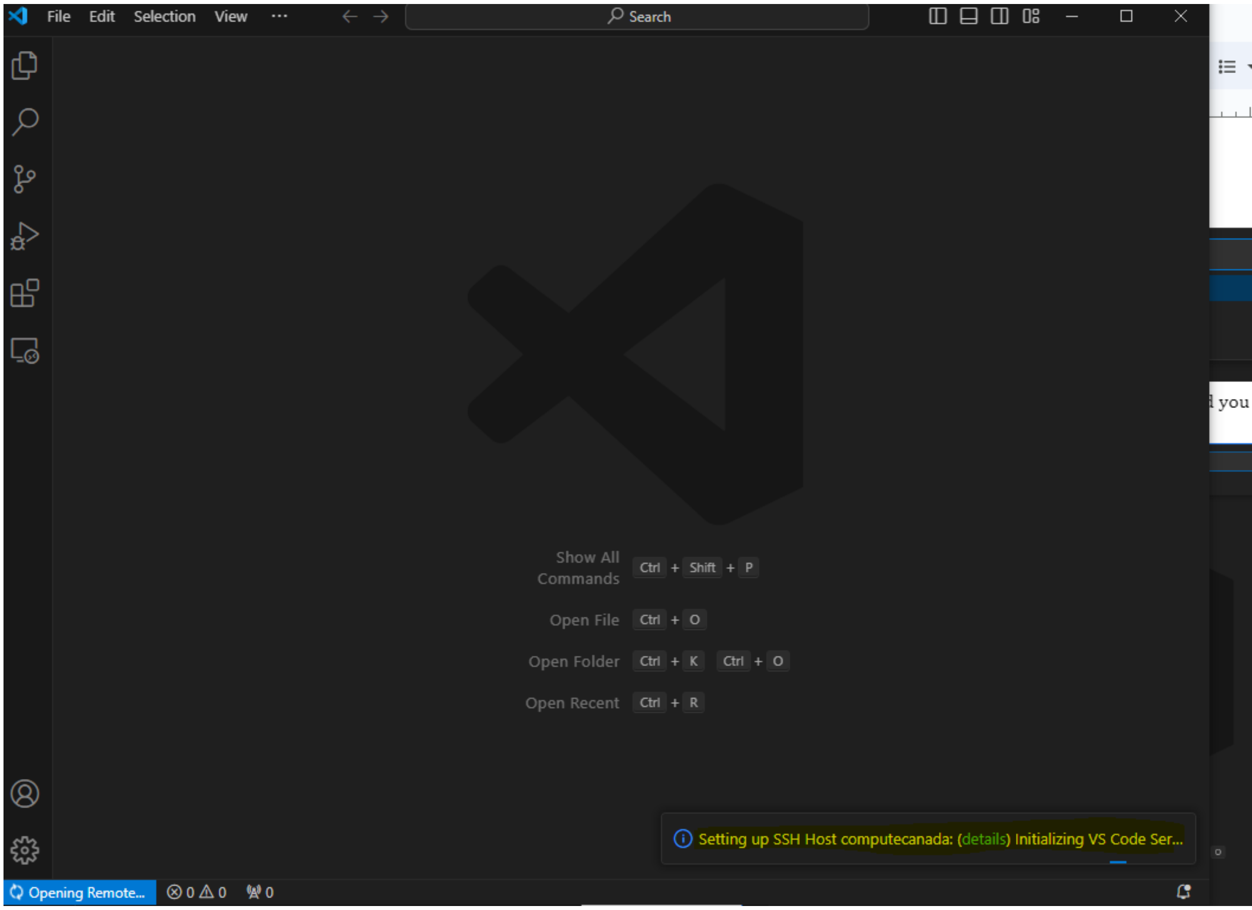


Enter passphrase for ssh key

Press 'Enter' to confirm your input or 'Escape' to cancel

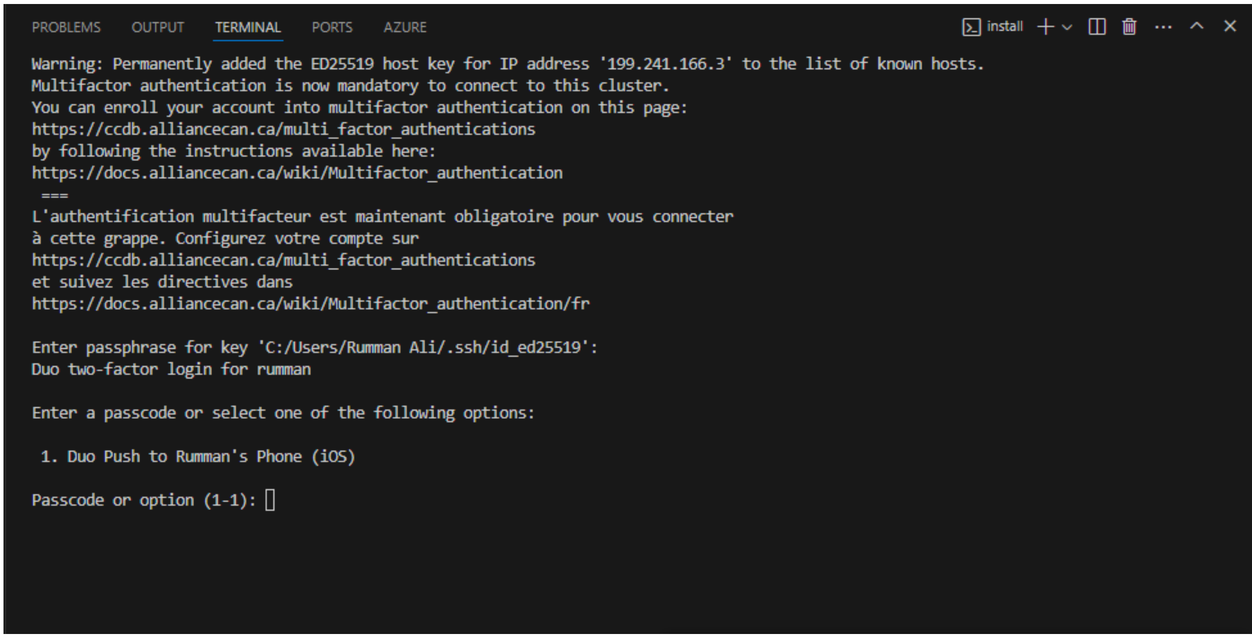
Setting up SSH Host computecanada: (details) Initializing VS Code Ser...

11. Now click on the details. Otherwise it will keep on running.



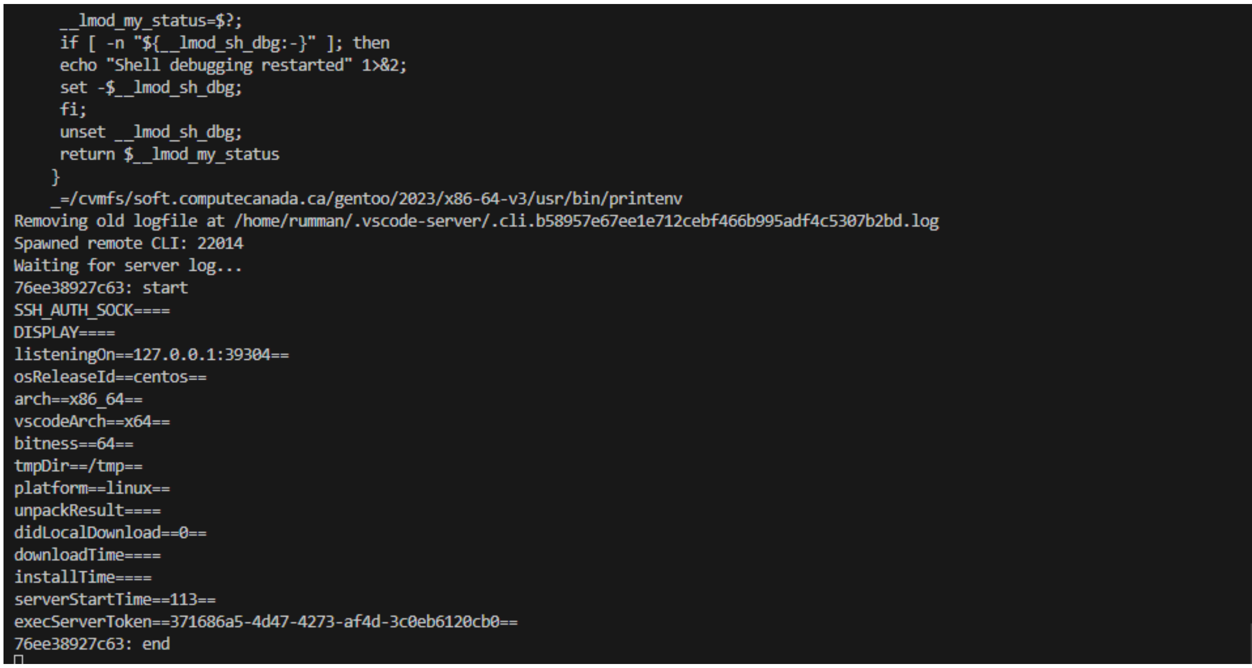
Setting up SSH Host computecanada: (details) Initializing VS Code Ser...

12. Now provide the passcode for your two step verification



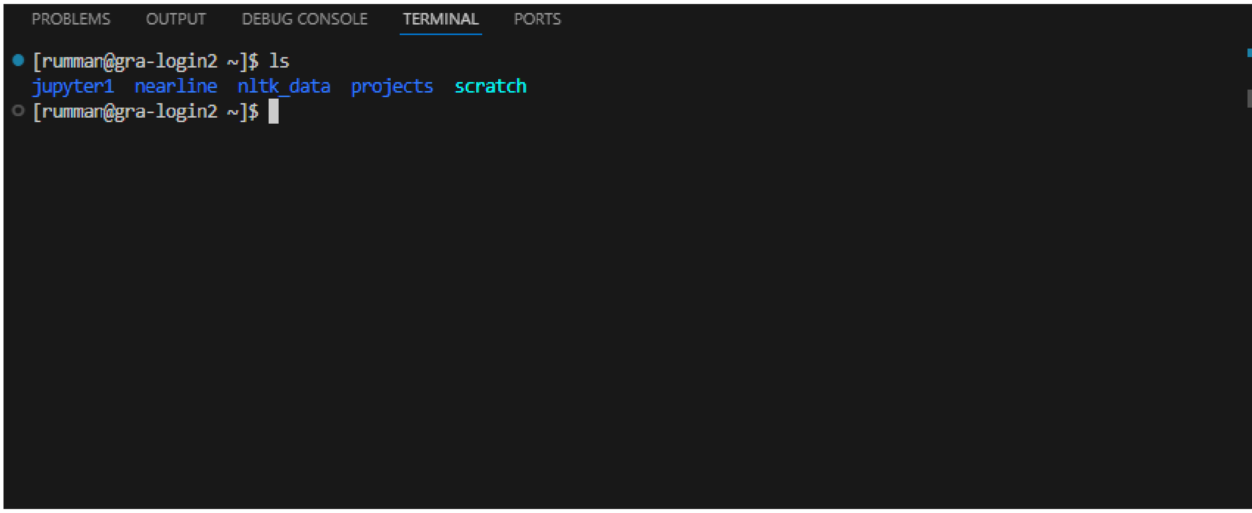
```
Warning: Permanently added the ED25519 host key for IP address '199.241.166.3' to the list of known hosts.
Multifactor authentication is now mandatory to connect to this cluster.
You can enroll your account into multifactor authentication on this page:
https://ccdb.alliancecan.ca/multi_factor_authentications
by following the instructions available here:
https://docs.alliancecan.ca/wiki/Multifactor_authentication
 ===
L'authentification multifacteur est maintenant obligatoire pour vous connecter
à cette grappe. Configurez votre compte sur
https://ccdb.alliancecan.ca/multi_factor_authentications
et suivez les directives dans
https://docs.alliancecan.ca/wiki/Multifactor_authentication/fr

Enter passphrase for key 'C:/Users/Rumman Ali/.ssh/id_ed25519':
Duo two-factor login for rumman

Enter a passcode or select one of the following options:

 1. Duo Push to Rumman's Phone (iOS)

Passcode or option (1-1): 
```

13. Now, after the successful connection, you will be able to see the following things



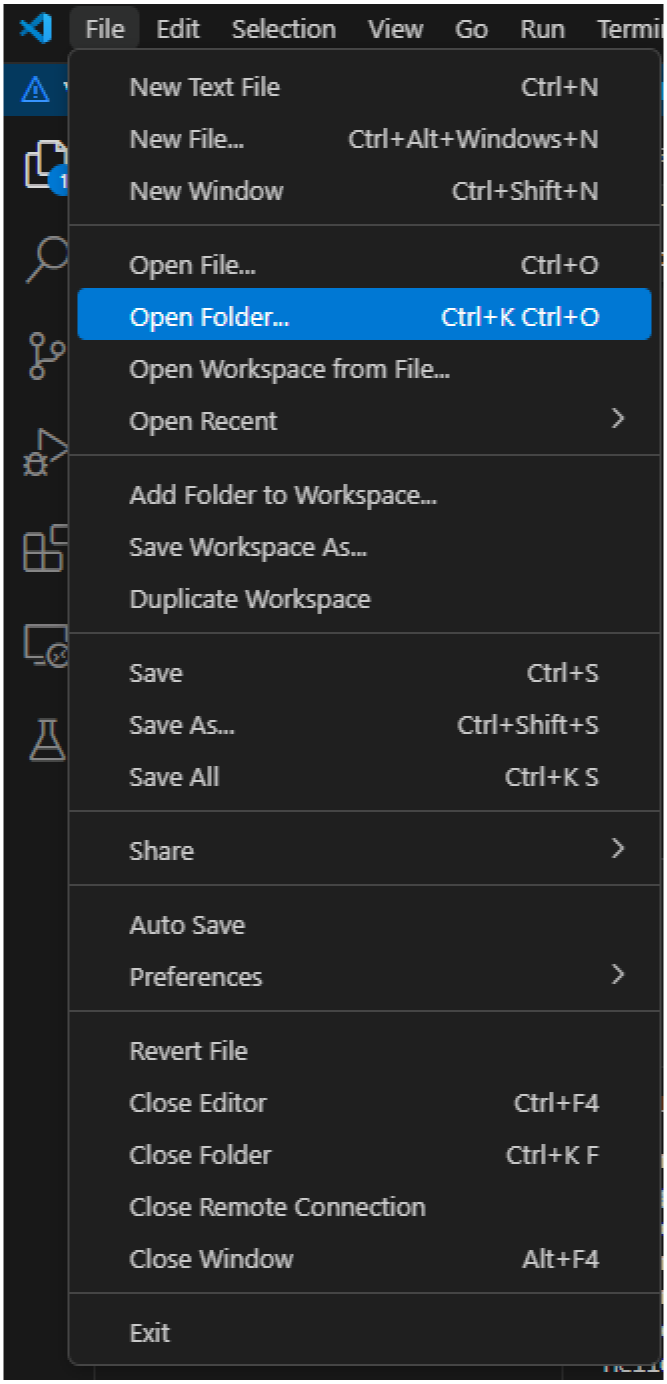
```
      __lmod_my_status=$?;
      if [ -n "${__lmod_sh_dbg:-}" ]; then
      echo "Shell debugging restarted" 1>&2;
      set -$__lmod_sh_dbg;
      fi;
      unset __lmod_sh_dbg;
      return $__lmod_my_status
     }
     _=/cvmfs/soft.computecanada.ca/gentoo/2023/x86-64-v3/usr/bin/printenv
Removing old logfile at /home/rumman/.vscode-server/.cli.b58957e67ee1e712cebf466b995adf4c5307b2bd.log
Spawned remote CLI: 22014
Waiting for server log...
76ee38927c63: start
SSH_AUTH_SOCK====
DISPLAY====
listeningOn==127.0.0.1:39304==
osReleaseId==centos==
arch==x86_64==
vscodeArch==x64==
bitness==64==
tmpDir==/tmp==
platform==linux==
unpackResult====
didLocalDownload==0==
downloadTime====
installTime====
serverStartTime==113==
execServerToken==371686a5-4d47-4273-af4d-3c0eb6120cb0==
76ee38927c63: end
```

14. Now, if you open your new terminal in the VS code then you will be able to see that, you are now connected with your Compute Canada server

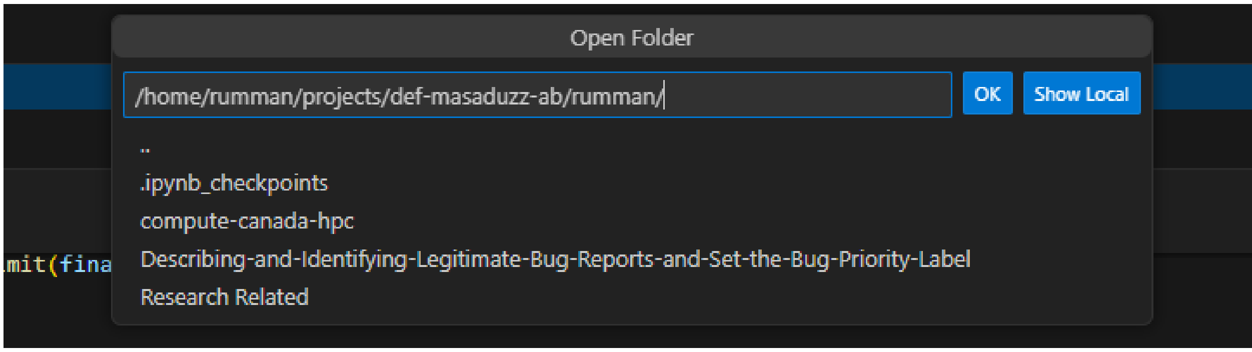


```
[rumman@gra-login2 ~]$ ls
jupyter1  nearline  nltk_data  projects  scratch
[rumman@gra-login2 ~]$
```

15. Now go to file and open folder

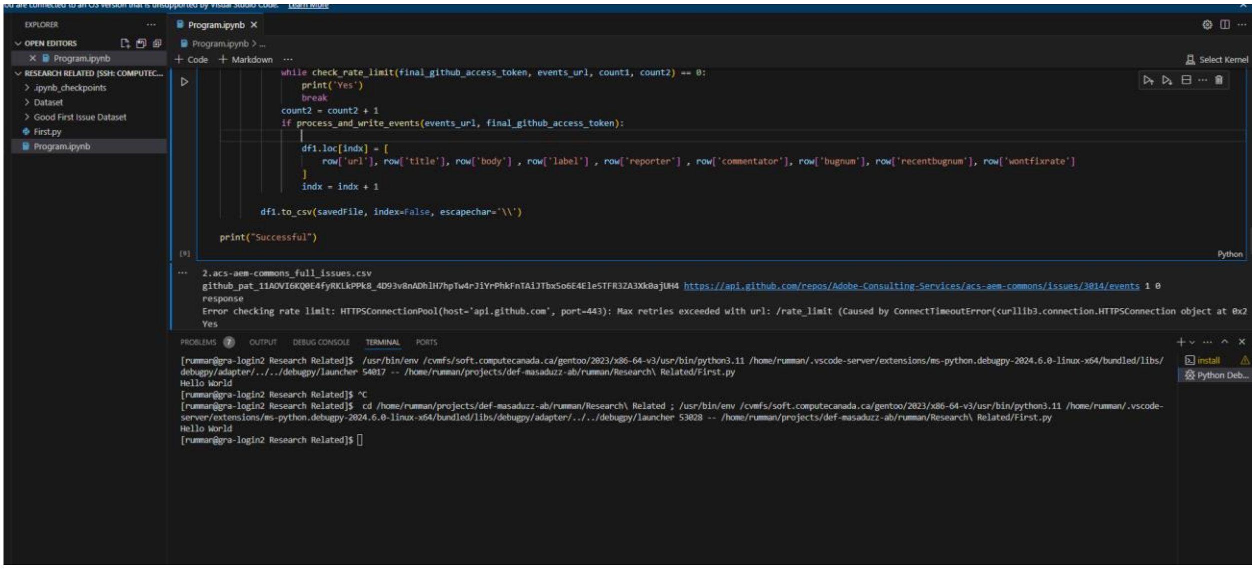


16. After that, it will ask you to redirect to the folder you want to work on.



/home/rumman/projects/def-masaduzz-ab/rumman/

17. And after selecting the folder, now you can write your code and run your file.



```
            while check_rate_limit(final_github_access_token, events_url, count1, count2) == 0:
                print('Yes')
                break
            count2 = count2 + 1
            if process_and_write_events(events_url, final_github_access_token):

                df1.loc[indx] = [
                    row['url'], row['title'], row['body'] , row['label'] , row['reporter'] , row['commentator'], row['bugnum'], row['recentbugnum'], row['wontfixrate']
                ]
                indx = indx + 1

        df1.to_csv(savedFile, index=False, escapechar='\\')

    print("Successful")
```

```
2.acs-aem-commons_full_issues.csv
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 https://api.github.com/repos/Adobe-Consulting-Services/acs-aem-commons/issues/3014/events 1 0
response
Error checking rate limit: HTTPSConnectionPool(host='api.github.com', port=443): Max retries exceeded with url: /rate_limit (Caused by ConnectTimeoutError(<urllib3.connection.HTTPSConnection object at 0x2
Yes
```

```
[rumman@gra-login2 Research Related]$  /usr/bin/env /cvmfs/soft.computecanada.ca/gentoo/2023/x86-64-v3/usr/bin/python3.11 /home/rumman/.vscode-server/extensions/ms-python.debugpy-2024.6.0-linux-x64/bundled/libs/
debugpy/adapter/../../debugpy/launcher 54017 -- /home/rumman/projects/def-masaduzz-ab/rumman/Research\ Related/First.py
Hello World
[rumman@gra-login2 Research Related]$ ^C
[rumman@gra-login2 Research Related]$  cd /home/rumman/projects/def-masaduzz-ab/rumman/Research\ Related ; /usr/bin/env /cvmfs/soft.computecanada.ca/gentoo/2023/x86-64-v3/usr/bin/python3.11 /home/rumman/.vscode-
server/extensions/ms-python.debugpy-2024.6.0-linux-x64/bundled/libs/debugpy/adapter/../../debugpy/launcher 53028 -- /home/rumman/projects/def-masaduzz-ab/rumman/Research\ Related/First.py
Hello World
[rumman@gra-login2 Research Related]$ 
```

Referenced Video: https://www.youtube.com/watch?v=lKXMyln_5q4