Q3: Create 2 Identical AWS EC2 Instances (Instance Name: Regno_EC2_VM1, Regno_EC2_VM2) and install the necessary packages to execute a program of your choice in 'Regno_EC2_VM1'.

Solution:

Step 1: Created 2 instances with the name 2348554_EC2_VM1 and 2348554_EC2_VM2

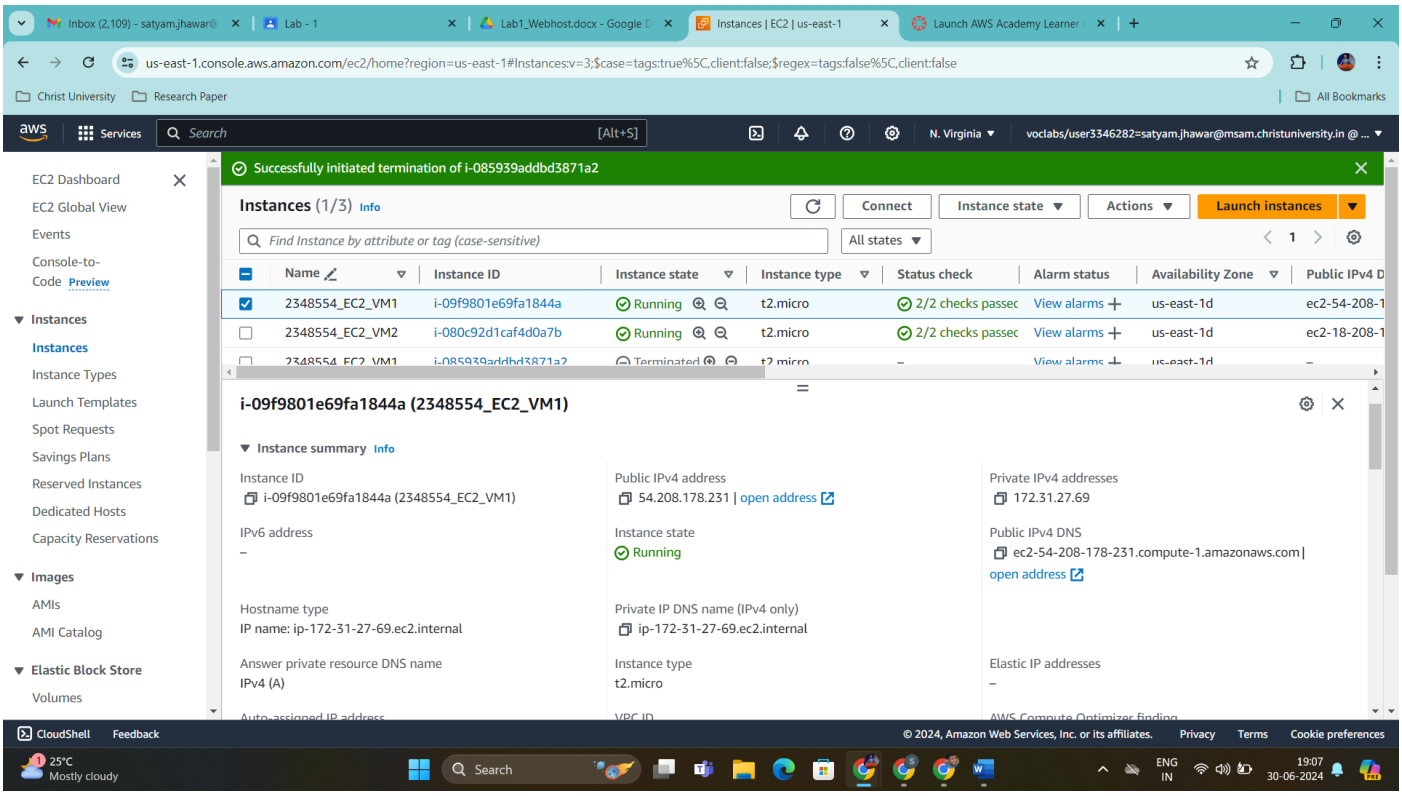


Figure 1 : 2348554_EC2_VM1 Details

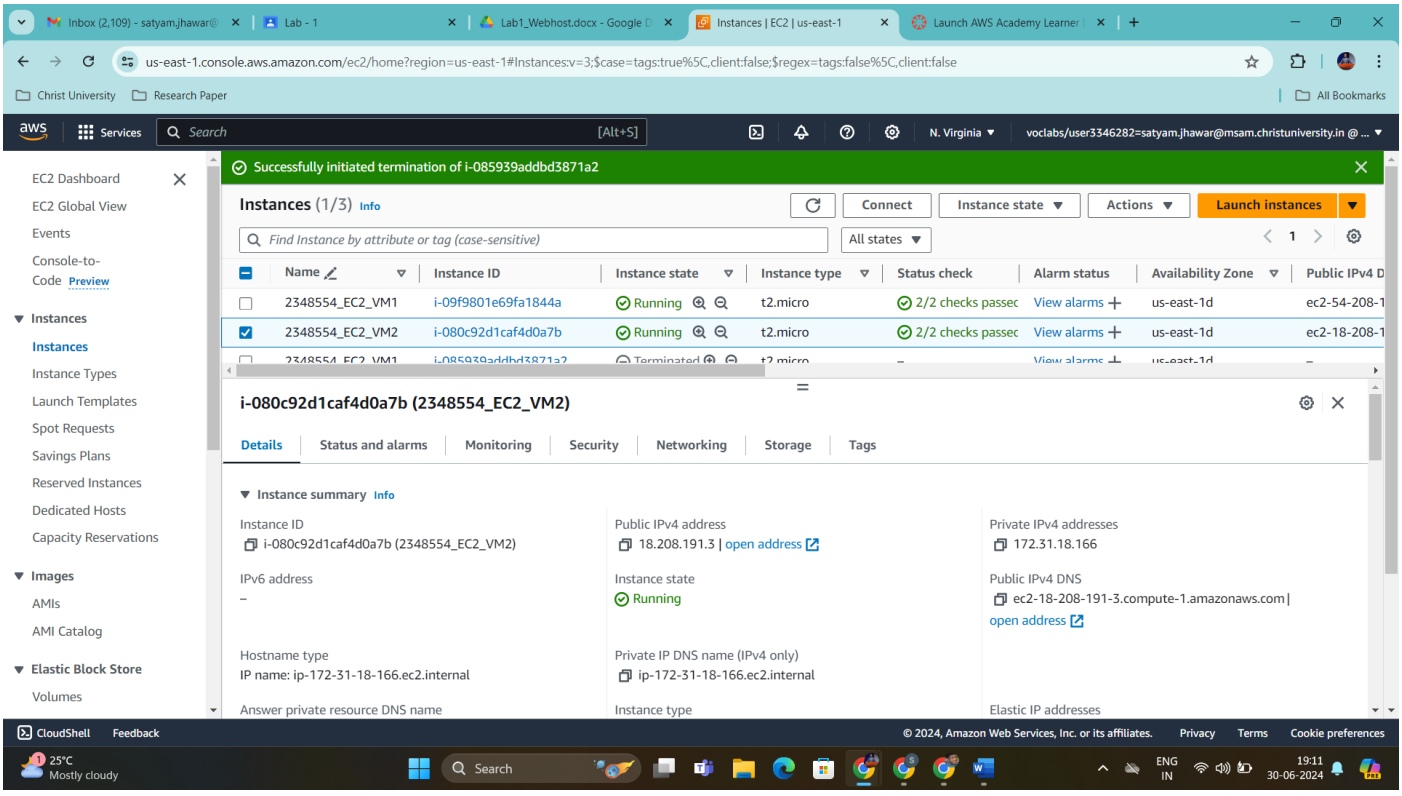


Figure 2: 2348554_EC2_VM2 Details

Both the instances have been allocated the same security group i.e. named as SG1

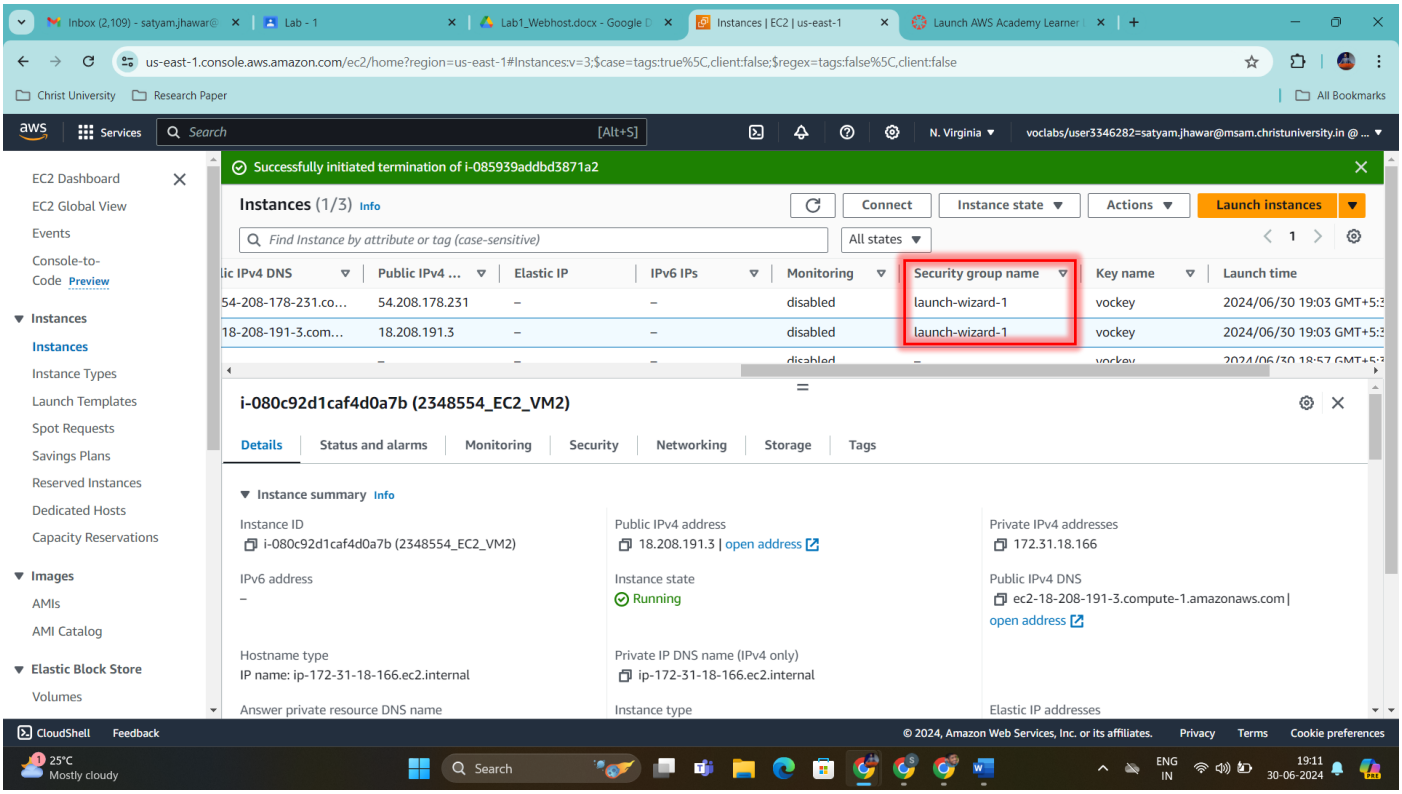


Figure 3: Both the instances allocated same security group

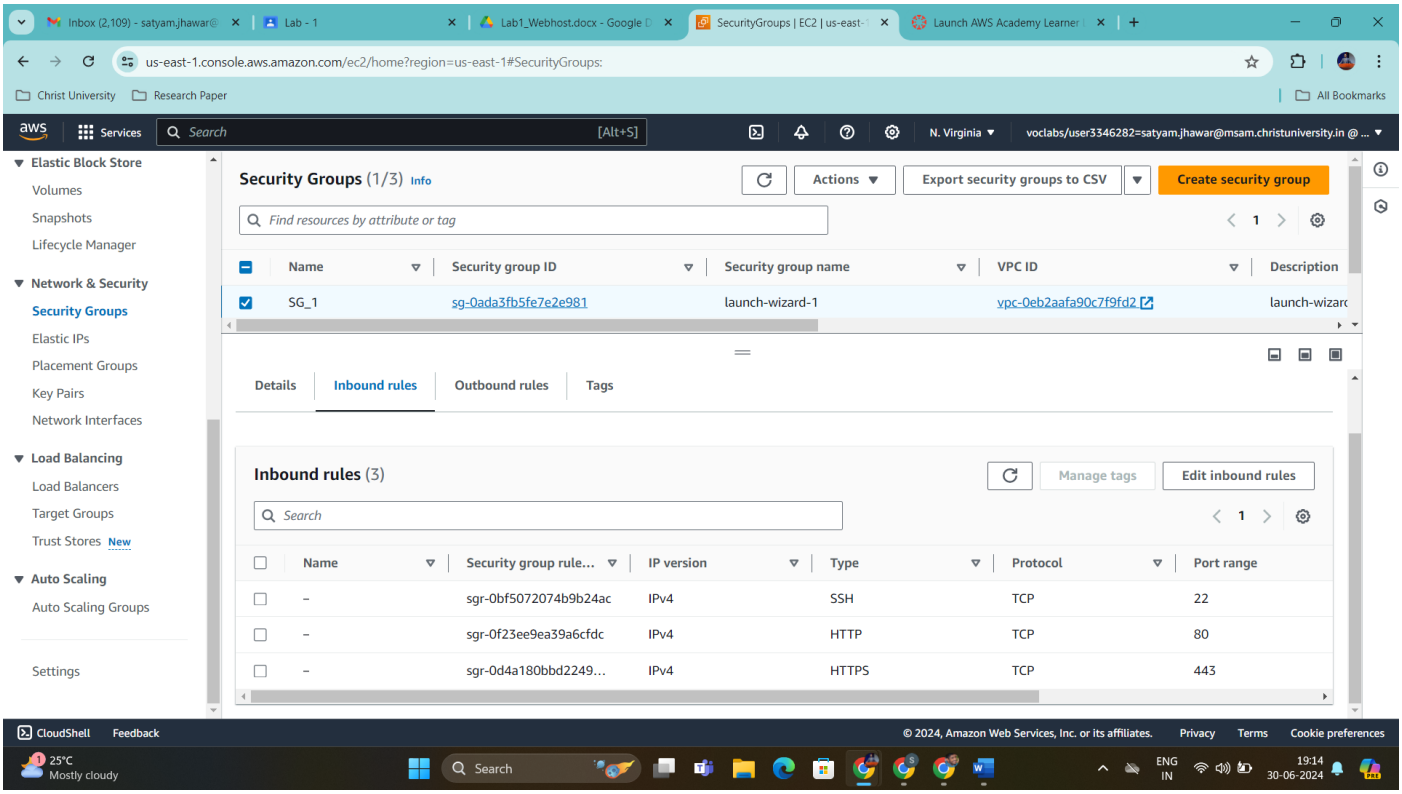


Figure 4: Details of Security Group 1

Step 2: Connect to the instance using EC2 connect

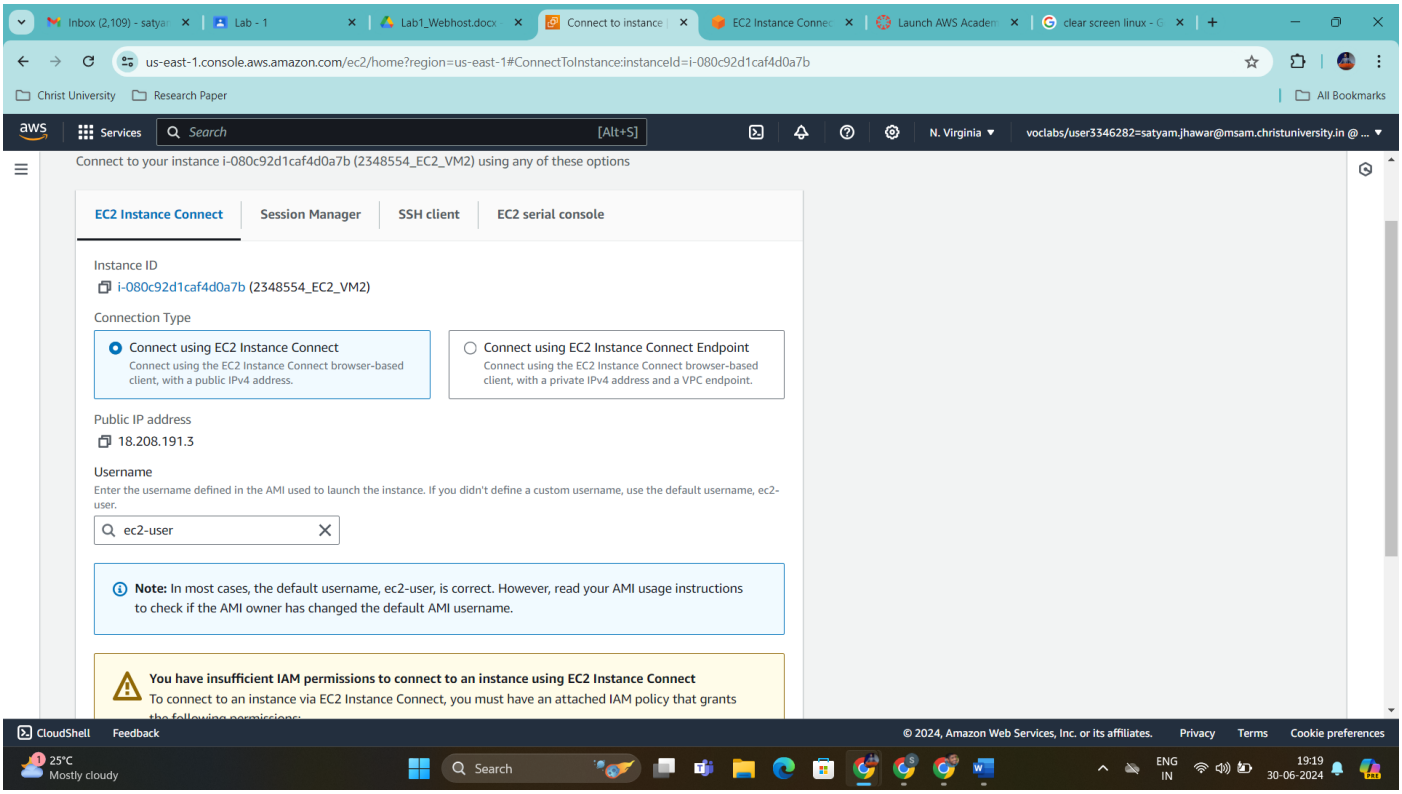
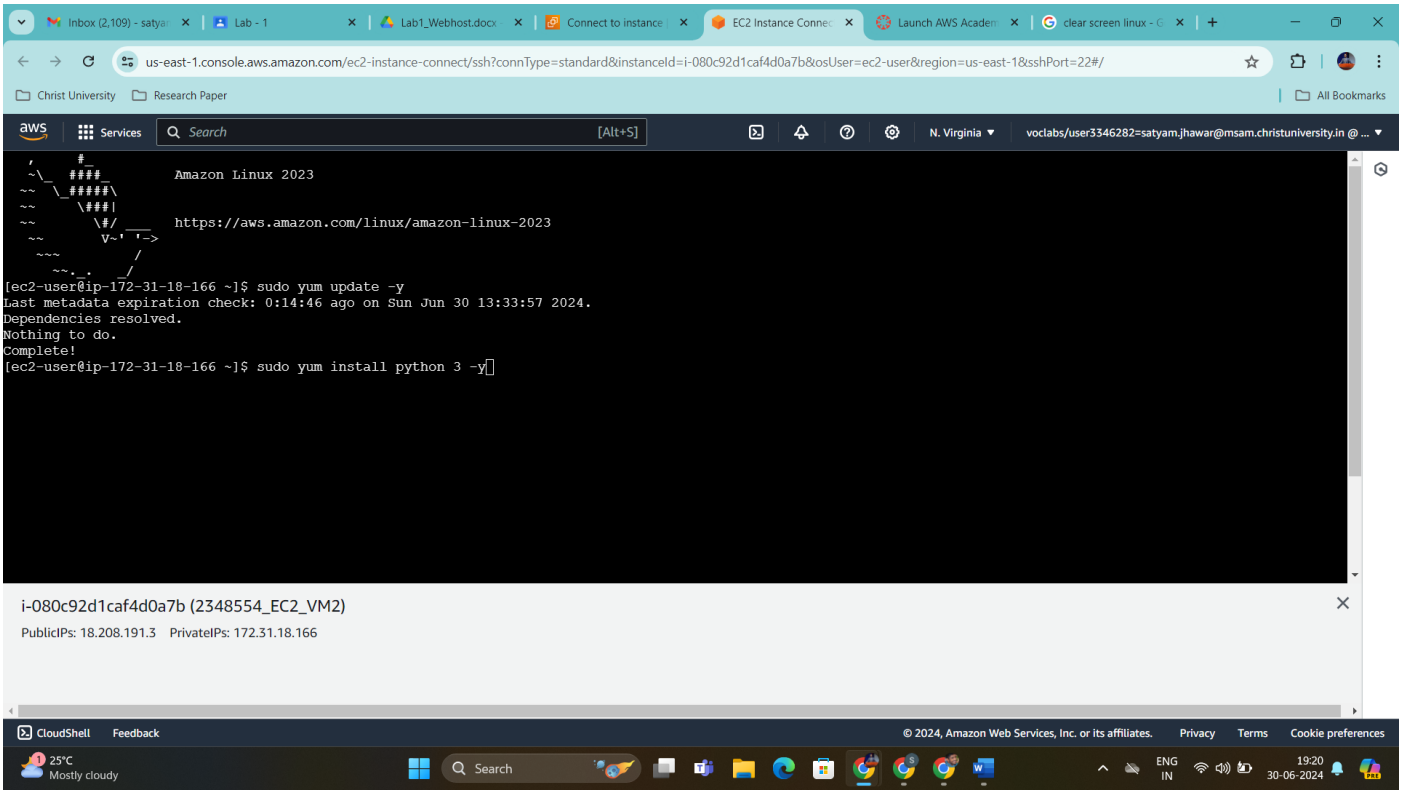


Figure 5: EC2 connect dashboard

The dashboard appears



Step 3: Update the terminal using the below command

Sudo yum update -y

```
[ec2-user@ip-172-31-18-166 ~]$ sudo yum update -y
Last metadata expiration check: 0:14:46 ago on Sun Jun 30 13:33:57 2024.
Dependencies resolved.
Nothing to do.
Complete!
```

Figure 6: Update command output

Step 4: Install Python package using the below command

Sudo yum install python3 -y

```
[ec2-user@ip-172-31-18-166 ~]$ sudo yum install python3 -y
Last metadata expiration check: 0:19:16 ago on Sun Jun 30 13:33:57 2024.
Package python3-3.9.16-1.amzn2023.0.8.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

Figure 7: Output of installing python3

Step 5: Install pip using the below command

sudo yum install python3-pip -y

```
================================================================================================================
 Package                  Architecture          Version                          Repository                  Si
================================================================================================================
Installing:
 python3-pip              noarch                21.3.1-2.amzn2023.0.7            amazonlinux                1.8
Installing weak dependencies:
 libxcrypt-compat         x86_64                4.4.33-7.amzn2023                amazonlinux                 92

Transaction Summary
================================================================================================================
Install  2 Packages

Total download size: 1.9 M
Installed size: 11 M
Downloading Packages:
(1/2): libxcrypt-compat-4.4.33-7.amzn2023.x86_64.rpm                          1.5 MB/s |  92 kB     00:00
(2/2): python3-pip-21.3.1-2.amzn2023.0.7.noarch.rpm                            18 MB/s | 1.8 MB     00:00
----------------------------------------------------------------------------------------------------------------
Total                                                                          11 MB/s | 1.9 MB     00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                          1
  Installing       : libxcrypt-compat-4.4.33-7.amzn2023.x86_64                                                1
  Installing       : python3-pip-21.3.1-2.amzn2023.0.7.noarch                                                 2
  Running scriptlet: python3-pip-21.3.1-2.amzn2023.0.7.noarch                                                 2
  Verifying        : libxcrypt-compat-4.4.33-7.amzn2023.x86_64                                                1
  Verifying        : python3-pip-21.3.1-2.amzn2023.0.7.noarch                                                 2

Installed:
  libxcrypt-compat-4.4.33-7.amzn2023.x86_64                     python3-pip-21.3.1-2.amzn2023.0.7.noarch

Complete!
```

Figure 8: Output of installing pip

Step 6: Install flask using the below command

Pip3 install flask

```
[ec2-user@ip-172-31-18-166 ~]$ pip3 install flask
Defaulting to user installation because normal site-packages is not writeable
Collecting flask
  Downloading flask-3.0.3-py3-none-any.whl (101 kB)
     |████████████████████████████████| 101 kB 4.1 MB/s
Collecting click>=8.1.3
  Downloading click-8.1.7-py3-none-any.whl (97 kB)
     |████████████████████████████████| 97 kB 10.7 MB/s
Collecting Jinja2>=3.1.2
  Downloading jinja2-3.1.4-py3-none-any.whl (133 kB)
     |████████████████████████████████| 133 kB 46.1 MB/s
Collecting Werkzeug>=3.0.0
  Downloading werkzeug-3.0.3-py3-none-any.whl (227 kB)
     |████████████████████████████████| 227 kB 49.3 MB/s
Collecting blinker>=1.6.2
  Downloading blinker-1.8.2-py3-none-any.whl (9.5 kB)
Collecting itsdangerous>=2.1.2
  Downloading itsdangerous-2.2.0-py3-none-any.whl (16 kB)
Collecting importlib-metadata>=3.6.0
  Downloading importlib_metadata-8.0.0-py3-none-any.whl (24 kB)
Collecting zipp>=0.5
  Downloading zipp-3.19.2-py3-none-any.whl (9.0 kB)
Collecting MarkupSafe>=2.0
  Downloading MarkupSafe-2.1.5-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (25 kB)
Installing collected packages: zipp, MarkupSafe, Werkzeug, Jinja2, itsdangerous, importlib-metadata, click, blinker, flask
Successfully installed Jinja2-3.1.4 MarkupSafe-2.1.5 Werkzeug-3.0.3 blinker-1.8.2 click-8.1.7 flask-3.0.3 importlib-metadata-8.0.0 itsdangerous-2.2.0 zipp-3.19.2
[ec2-user@ip-172-31-18-166 ~]$
```

Figure 9: Output of installing flask command

Step 7: Install git using the below command

Sudo yum install git -y

```
[ec2-user@ip-172-31-18-166 ~]$ sudo yum install git -y
Last metadata expiration check: 0:25:04 ago on Sun Jun 30 13:33:57 2024.
Dependencies resolved.
==================================================================================================================================
 Package                   Architecture          Version                                 Repository                        Si
==================================================================================================================================
Installing:
 git                       x86_64                2.40.1-1.amzn2023.0.3                   amazonlinux                       54
Installing dependencies:
 git-core                  x86_64                2.40.1-1.amzn2023.0.3                   amazonlinux                      4.3
 git-core-doc              noarch                2.40.1-1.amzn2023.0.3                   amazonlinux                      2.6
 perl-Error                noarch                1:0.17029-5.amzn2023.0.2                amazonlinux                       41
 perl-File-Find            noarch                1.37-477.amzn2023.0.6                   amazonlinux                       26
 perl-Git                  noarch                2.40.1-1.amzn2023.0.3                   amazonlinux                       42
 perl-TermReadKey          x86_64                2.38-9.amzn2023.0.2                     amazonlinux                       36
 perl-lib                  x86_64                0.65-477.amzn2023.0.6                   amazonlinux                       15

Transaction Summary
==================================================================================================================================
Install  8 Packages

Total download size: 7.1 M
Installed size: 34 M
Downloading Packages:
(1/8): git-2.40.1-1.amzn2023.0.3.x86_64.rpm                                                   789 kB/s |  54 kB     00:00
(2/8): perl-Error-0.17029-5.amzn2023.0.2.noarch.rpm                                           2.0 MB/s |  41 kB     00:00
(3/8): perl-File-Find-1.37-477.amzn2023.0.6.noarch.rpm                                        1.3 MB/s |  26 kB     00:00
(4/8): git-core-doc-2.40.1-1.amzn2023.0.3.noarch.rpm                                           17 MB/s | 2.6 MB     00:00
(5/8): perl-Git-2.40.1-1.amzn2023.0.3.noarch.rpm                                              927 kB/s |  42 kB     00:00
(6/8): perl-TermReadKey-2.38-9.amzn2023.0.2.x86_64.rpm                                        1.4 MB/s |  36 kB     00:00
(7/8): git-core-2.40.1-1.amzn2023.0.3.x86_64.rpm                                               19 MB/s | 4.3 MB     00:00
(8/8): perl-lib-0.65-477.amzn2023.0.6.x86_64.rpm                                              231 kB/s |  15 kB     00:00
----------------------------------------------------------------------------------------------------------------------------------
Total                                                                                          25 MB/s | 7.1 MB     00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                                       1/
  Installing       : git-core-2.40.1-1.amzn2023.0.3.x86_64                                                                 1/
  Installing       : git-core-doc-2.40.1-1.amzn2023.0.3.noarch                                                             2/
  Installing       : perl-lib-0.65-477.amzn2023.0.6.x86_64                                                                 3/
  Installing       : perl-TermReadKey-2.38-9.amzn2023.0.2.x86_64                                                           4/
  Installing       : perl-File-Find-1.37-477.amzn2023.0.6.noarch                                                           5/
  Installing       : perl-Error-1:0.17029-5.amzn2023.0.2.noarch                                                            6/
  Installing       : perl-Git-2.40.1-1.amzn2023.0.3.noarch                                                                 7
  Installing       : git-2.40.1-1.amzn2023.0.3.x86_64                                                                      8
  Running scriptlet: git-2.40.1-1.amzn2023.0.3.x86_64                                                                      8
  Verifying        : git-2.40.1-1.amzn2023.0.3.x86_64                                                                      1
  Verifying        : git-core-2.40.1-1.amzn2023.0.3.x86_64                                                                 2
  Verifying        : git-core-doc-2.40.1-1.amzn2023.0.3.noarch                                                             3
  Verifying        : perl-Error-1:0.17029-5.amzn2023.0.2.noarch                                                            4
  Verifying        : perl-File-Find-1.37-477.amzn2023.0.6.noarch                                                           5
  Verifying        : perl-Git-2.40.1-1.amzn2023.0.3.noarch                                                                 6
  Verifying        : perl-TermReadKey-2.38-9.amzn2023.0.2.x86_64                                                           7
  Verifying        : perl-lib-0.65-477.amzn2023.0.6.x86_64                                                                 8

Installed:
  git-2.40.1-1.amzn2023.0.3.x86_64                   git-core-2.40.1-1.amzn2023.0.3.x86_64              git-core-doc-2.40.1-1.amzn2023.0.3.noarch
  perl-Error-1:0.17029-5.amzn2023.0.2.noarch         perl-File-Find-1.37-477.amzn2023.0.6.noarch        perl-Git-2.40.1-1.amzn2023.0.3.noarch
  perl-TermReadKey-2.38-9.amzn2023.0.2.x86_64        perl-lib-0.65-477.amzn2023.0.6.x86_64

Complete!
[ec2-user@ip-172-31-18-166 ~]$
```

Figure 10: Output of installing git

Step 8: Create a flask app directory and change to the flask_app directory

Mkdir flask_app

Cd flask_app

```
[ec2-user@ip-172-31-18-166 ~]$ mkdir flask_app
[ec2-user@ip-172-31-18-166 ~]$ cd flask_app
[ec2-user@ip-172-31-18-166 flask_app]$
```

Figure 11: FLask_app directory

Step 9: Clonig a sample flask app repository from https://github.com/pallets/flask.git suing the below command

git clone https://github.com/pallets/flask.git

```
[ec2-user@ip-172-31-18-166 flask_app]$ git clone https://github.com/pallets/flask.git
Cloning into 'flask'...
remote: Enumerating objects: 24878, done.
remote: Counting objects: 100% (226/226), done.
remote: Compressing objects: 100% (151/151), done.
remote: Total 24878 (delta 107), reused 167 (delta 66), pack-reused 24652
Receiving objects: 100% (24878/24878), 10.24 MiB | 24.85 MiB/s, done.
Resolving deltas: 100% (16666/16666), done.
[ec2-user@ip-172-31-18-166 flask_app]$
```

Figure 12: Output of Cloning Repository

Step 10: Change the directory using the below command

cd flask/examples/tutorial

```
[ec2-user@ip-172-31-18-166 flask_app]$ cd flask/examples/tutorial
[ec2-user@ip-172-31-18-166 tutorial]$
```

Figure 13: Changing directory to tutorials

Step 11: Install Flask app dependencies using the below command

```
pip3 install -e .
```

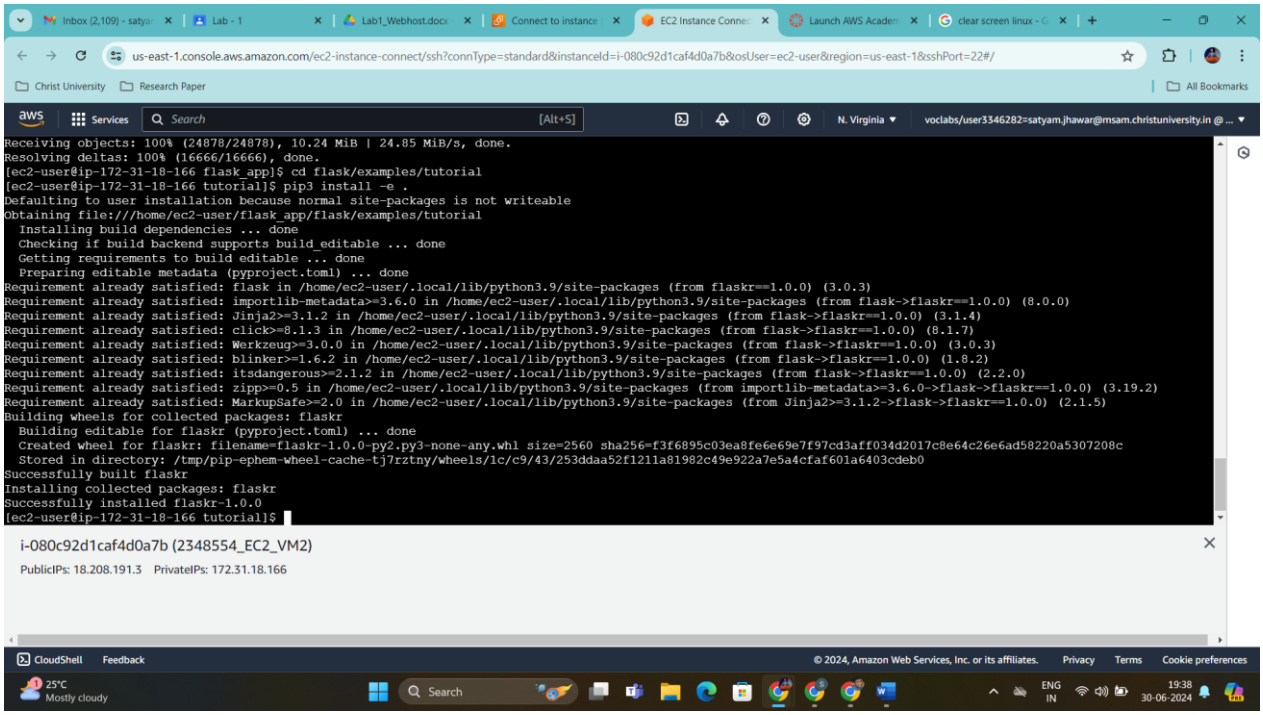


Figure 14: Output of Installing the dependencies

Step 12: Set the Flask app environment variable using the below command

export FLASK_APP=flaskr

Step 13: Initialize the database using the below command

flask init-db

```
[ec2-user@ip-172-31-18-166 tutorial]$ export FLASK_APP=flaskr
[ec2-user@ip-172-31-18-166 tutorial]$ flask init-db
Initialized the database.
```

Figure 15: Output of initialing the database

Step 14: Run the Flask application using the below command

flask run --host=0.0.0.0

```
[ec2-user@ip-172-31-18-166 tutorial]$ flask run --host=0.0.0.0
 * Serving Flask app 'flaskr'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.31.18.166:5000
Press CTRL+C to quit
```

Figure 16: Running on all hosts Output

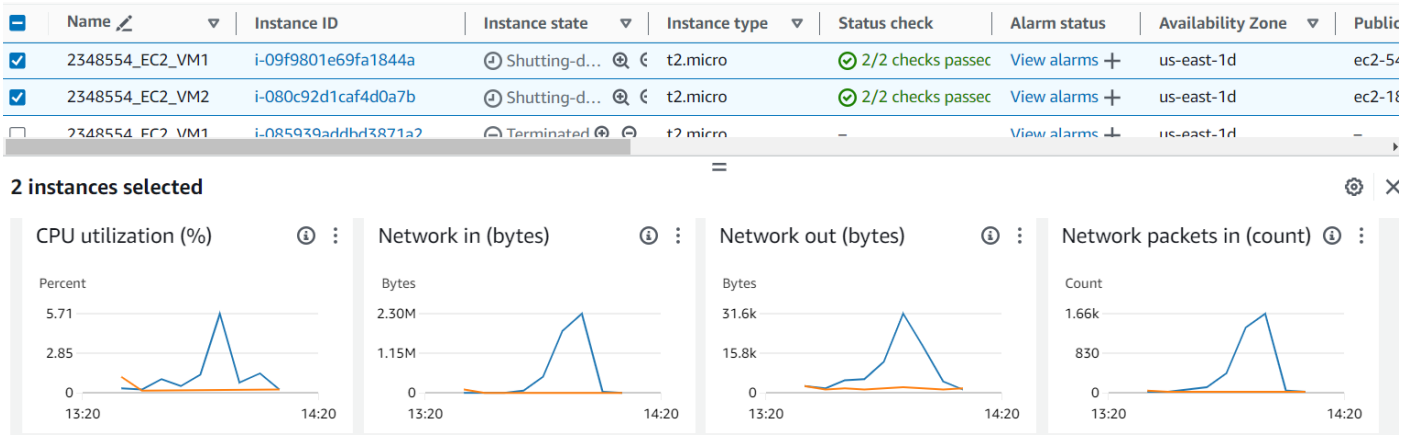


Figure 17: Graph Monitoring of both instances