Deploy a Sample Python Application Using Flask Module

Python:

Python is a popular programming language. It was created by Guido van Rossum, and released in 1991. It is used for:

- web development (server-side),
- software development,
- mathematics,
- system scripting.

Syntax:

Python syntax can be executed by writing directly in the Command Line:

Print('hello world')

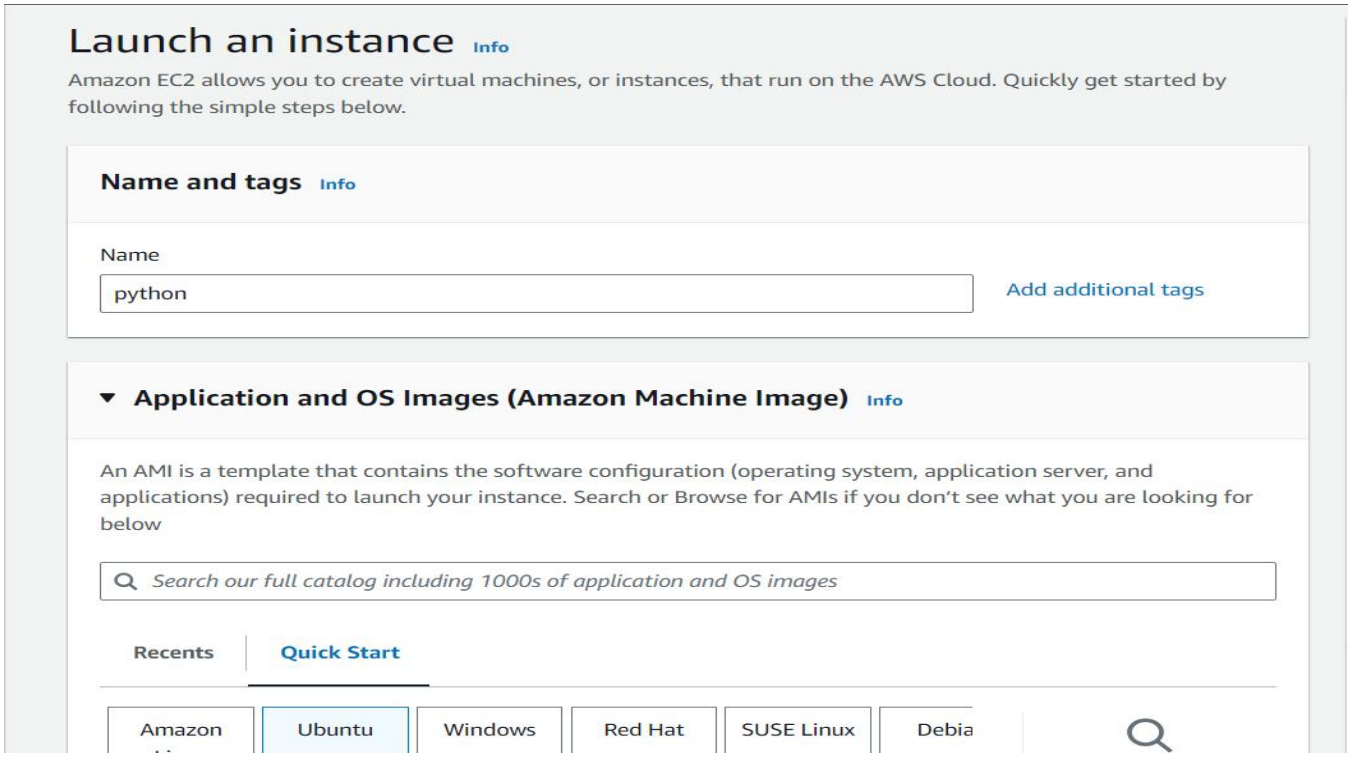
Flask Module:

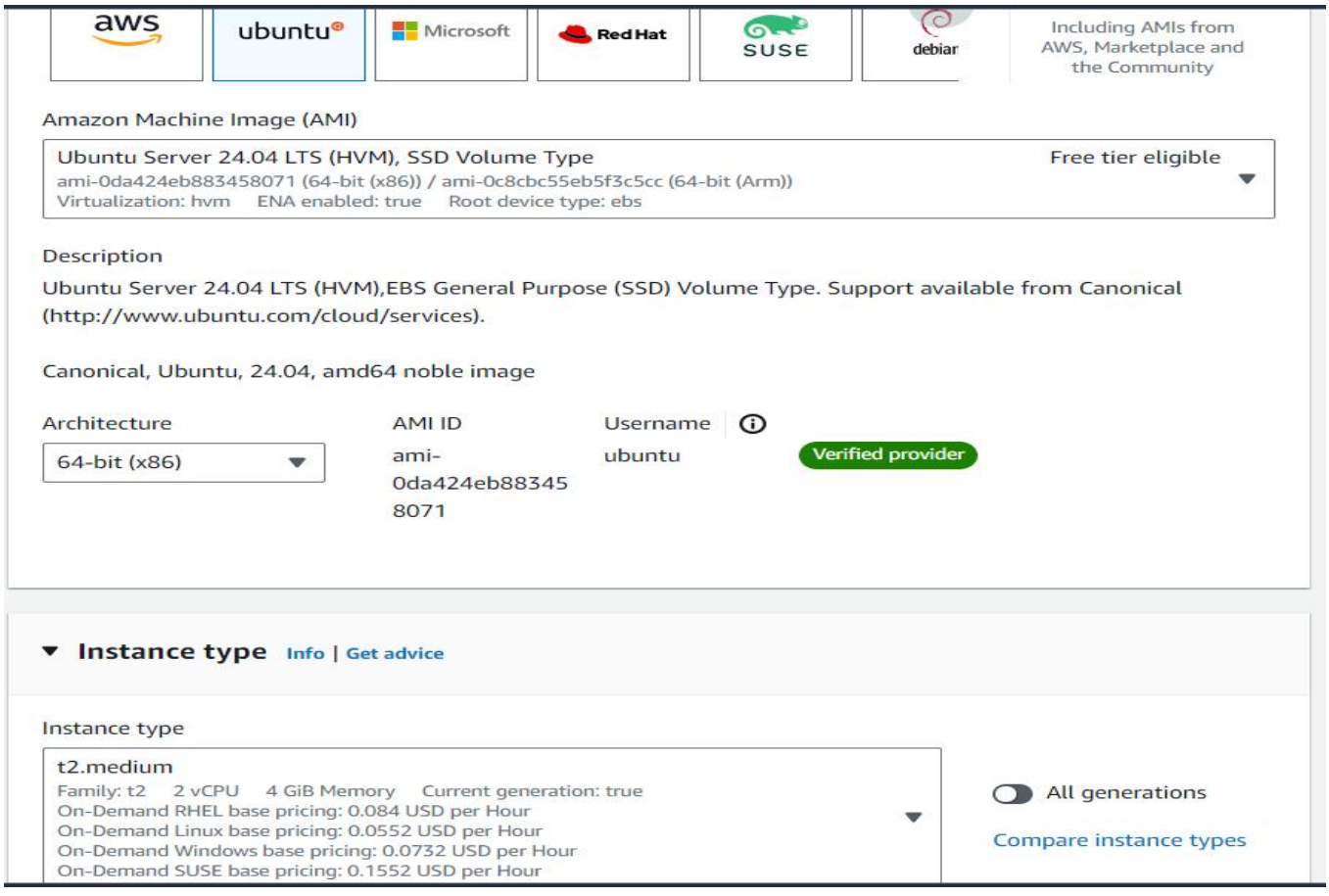
- ✧ It is the latest and comprehensive guide designed for beginners and professionals to learn **Python Web Framework Flaskone**. It is one of the most popular Python-based web frameworks.
- ✧ Flask, a Python web application framework, was created by Armin Ronacher. Known for its lightweight and efficient nature, Flask is designed for quick starts and accommodates complex applications. It is based on the Werkzeug WSGI toolkit and Jinja2 template engine.

In this application we have to use –

- ➢ Launch an **ec2 instance**
- ➢ Install **python3 and pip**
- ➢ Install **flask module**
- ➢ Install **flask and gunicorn module**
- ➢ In **app.py** we have to import the code .
- ➢ Run python flask app by using **python3 app.py**

1. We have to Launch an ec2 instance in Ubuntu or Linux server.





t2.medium
Family: t2 2 vCPU 4 GiB Memory Current generation: true
On-Demand RHEL base pricing: 0.084 USD per Hour
On-Demand Linux base pricing: 0.0552 USD per Hour
On-Demand Windows base pricing: 0.0732 USD per Hour
On-Demand SUSE base pricing: 0.1552 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

deploy

Create new key pair

Network settings Info

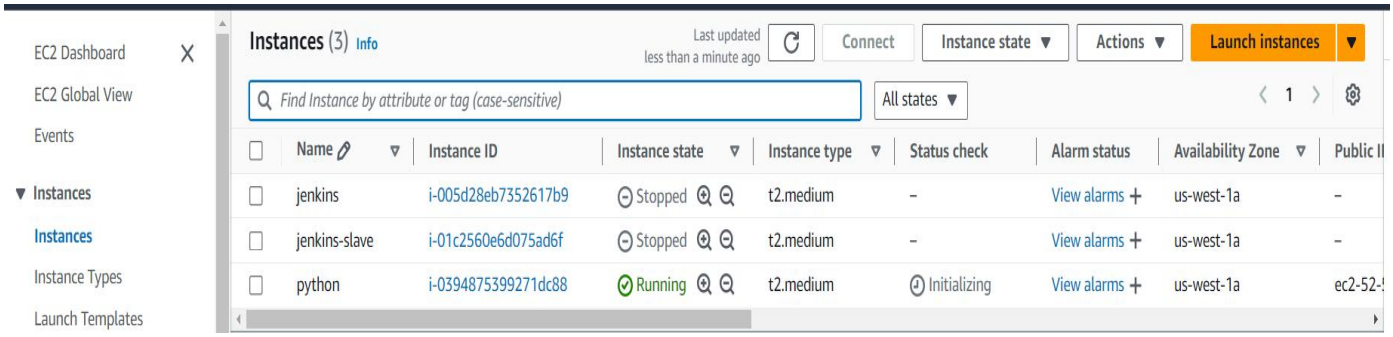
Edit

Network | Info

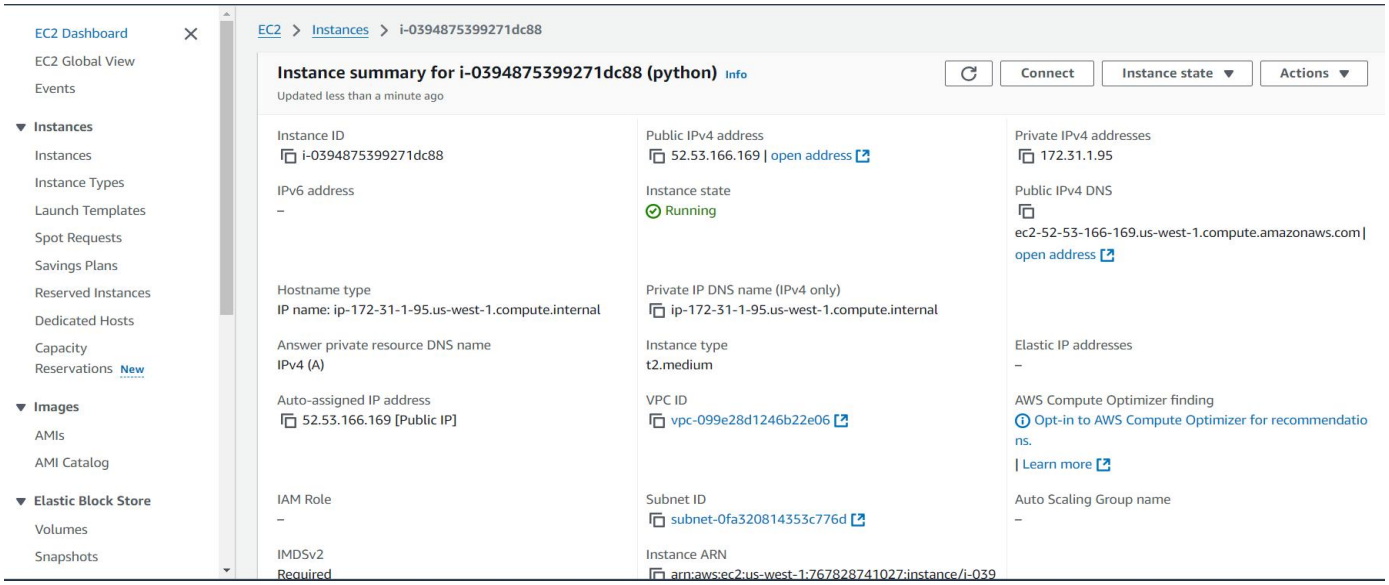
vpc-099e28d1246b22e06

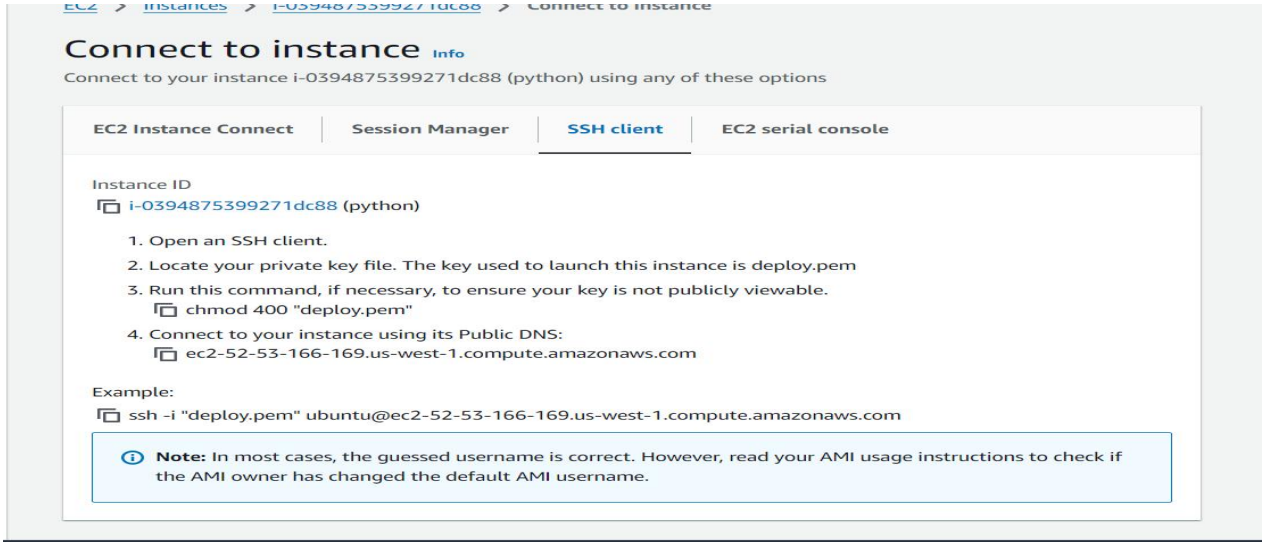
Subnet | Info

No preference (Default subnet in any availability zone)

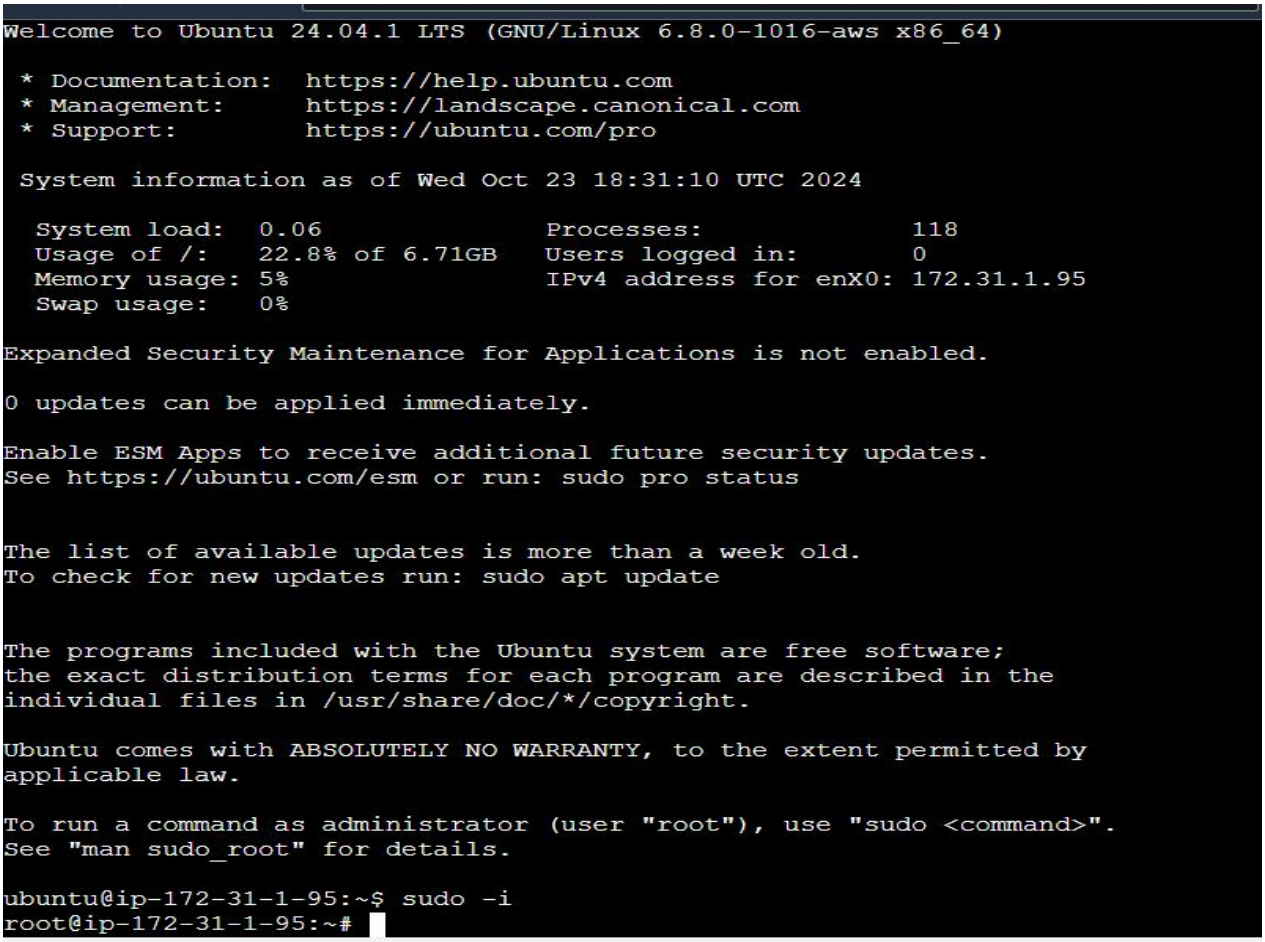


2.The instance is launced we have to connect to server.





3.To switch normal user to root user we use **sudo –i**



4.We have to update the server **(apt update –y)**

5.First we have to install python3 version(**apt install python3**) ,if it already exist we have to check version **(python3 –version)**

```
root@ip-172-31-1-95:~# apt update -y
Hit:1 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:5 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:6 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:7 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:8 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:9 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:10 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:11 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:12 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:13 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [599 kB]
Get:14 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [146 kB]
Get:15 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [114 kB]
Get:16 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [10.3 kB]
Get:17 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [707 kB]
Get:18 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [210 kB]
Get:19 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [306 kB]
Get:20 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.8 kB]
Get:21 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [388 kB]
Get:22 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [74.8 kB]
Get:23 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:24 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [14.7 kB]
Get:25 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3820 B]
Get:26 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:27 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [552 B]
Get:28 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:29 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:30 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.6 kB]
Get:31 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.8 kB]
Get:32 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [21.1 kB]
Get:33 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1104 B]
Get:34 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:35 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:36 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
```

```
Services   Search
root@ip-172-31-1-95:~# python3 --version
Python 3.12.3
root@ip-172-31-1-95:~#
```

6. To install the pip **(apt install python3-pip)**

```
root@ip-172-31-1-95:~# python3 --version
Python 3.12.3
root@ip-172-31-1-95:~# apt install python3-pip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential bzip2 cpp cpp-13 cpp-13-x86-64-linux-gnu cpp-x86-64-linux-gnu dpkg-dev fakeroot
  fontconfig-config fonts-dejavu-core fonts-dejavu-mono g++ g++-13 g++-13-x86-64-linux-gnu g++-x86-64-linux-gnu gcc gcc-13 gcc-13-base gcc-13-x86-64-linux-gnu
  gcc-14-base gcc-x86-64-linux-gnu javascript-common libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libaom3 libasan8 libatomic1 libbinutils
  libc-dev-bin libc-devtools libc6-dev libcc1-0 libcrypt-dev libctf-nobfd0 libctf0 libde265-0 libdeflate0 libdpkg-perl libexpat1-dev libfakeroot
  libfile-fcntllock-perl libfontconfig1 libgcc-13-dev libgcc-s1 libgd3 libgomp1 libgprofng0 libheif-plugin-aomdec libheif-plugin-aomenc libheif-plugin-libde265
  libheif1 libhwasan0 libisl23 libitm1 libjbig0 libjpeg-turbo8 libjpeg8 libjs-jquery libjs-sphinxdoc libjs-underscore liblerc4 liblsan0 libmpc3 libpython3-dev
  libpython3.12-dev libquadmath0 libsframe1 libsharpyuv0 libstdc++-13-dev libstdc++6 libtiff6 libtsan2 libubsan1 libwebp7 libxpm4 linux-libc-dev linux-tools-common
  lto-disabled-list make manpages-dev python3-dev python3-wheel python3.12-dev rpcsvc-proto zlib1g-dev
Suggested packages:
  binutils-doc gprofng-gui bzip2-doc cpp-doc gcc-13-locales cpp-13-doc debian-keyring g++-multilib g++-13-multilib gcc-13-doc gcc-multilib autoconf automake libtool
  flex bison gdb gcc-doc gcc-13-multilib gdb-x86-64-linux-gnu apache2 | lighttpd | httpd glibc-doc bzr libgd-tools libheif-plugin-x265 libheif-plugin-ffmpegdec
  libheif-plugin-jpegdec libheif-plugin-jpegenc libheif-plugin-j2kdec libheif-plugin-j2kenc libheif-plugin-ravle libheif-plugin-svtenc libstdc++-13-doc make-doc
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential bzip2 cpp cpp-13 cpp-13-x86-64-linux-gnu cpp-x86-64-linux-gnu dpkg-dev fakeroot
  fontconfig-config fonts-dejavu-core fonts-dejavu-mono g++ g++-13 g++-13-x86-64-linux-gnu g++-x86-64-linux-gnu gcc gcc-13 gcc-13-base gcc-13-x86-64-linux-gnu
  gcc-x86-64-linux-gnu javascript-common libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libaom3 libasan8 libatomic1 libbinutils
  libc-dev-bin libc-devtools libc6-dev libcc1-0 libcrypt-dev libctf-nobfd0 libctf0 libde265-0 libdeflate0 libdpkg-perl libexpat1-dev libfakeroot
  libfile-fcntllock-perl libfontconfig1 libgcc-13-dev libgd3 libgomp1 libgprofng0 libheif-plugin-aomdec libheif-plugin-aomenc libheif-plugin-libde265 libheif1
  libhwasan0 libisl23 libitm1 libjbig0 libjpeg-turbo8 libjpeg8 libjs-jquery libjs-sphinxdoc libjs-underscore liblerc4 liblsan0 libmpc3 libpython3-dev
  libpython3.12-dev libquadmath0 libsframe1 libsharpyuv0 libstdc++-13-dev libtiff6 libtsan2 libubsan1 libwebp7 libxpm4 linux-libc-dev lto-disabled-list make
  manpages-dev python3-dev python3-pip python3-wheel python3.12-dev rpcsvc-proto zlib1g-dev
The following packages will be upgraded:
  gcc-14-base libgcc-s1 libstdc++6 linux-tools-common
4 upgraded, 86 newly installed, 0 to remove and 23 not upgraded.
Need to get 90.2 MB of archives.
After this operation, 328 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

7.After installing the pip we have to check the version of pip **(pip3 –version)**

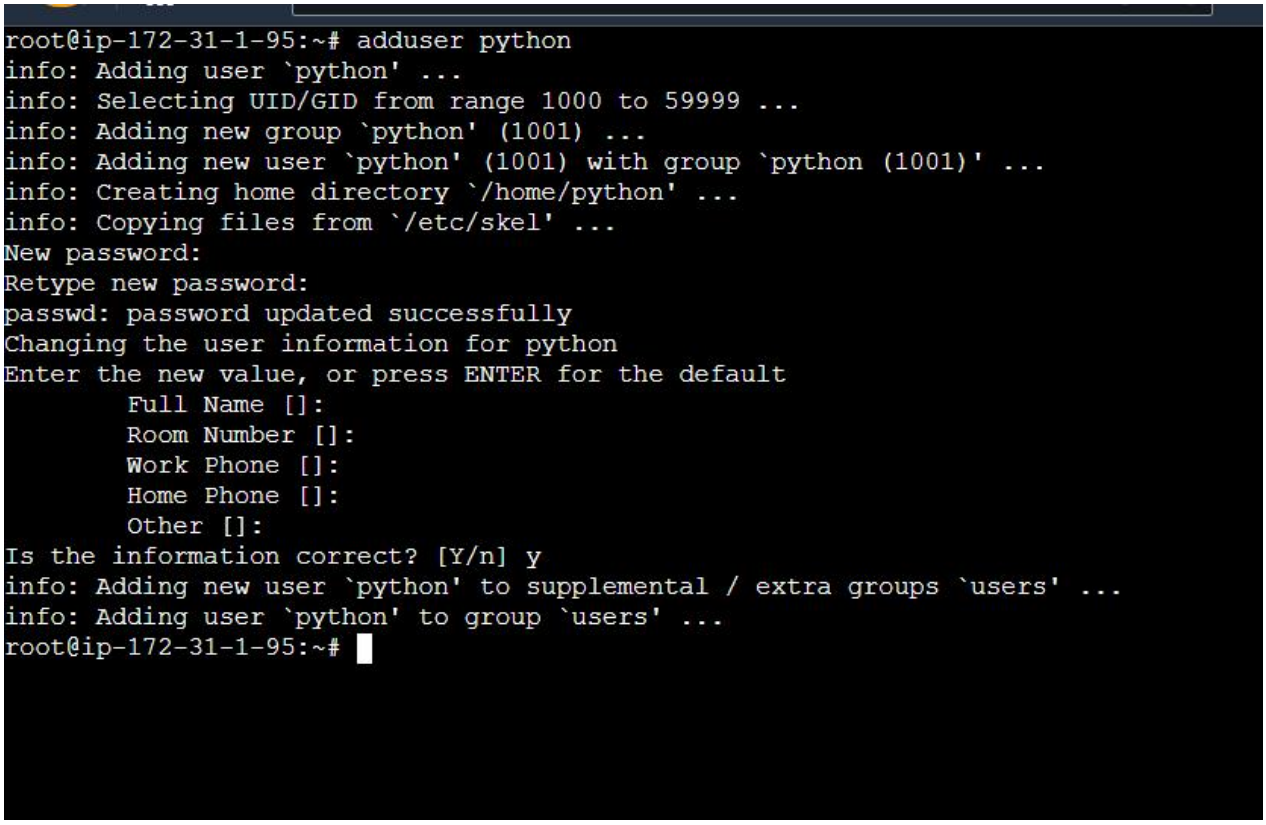
```
root@ip-172-31-1-95:~# pip3 --version
pip 24.0 from /usr/lib/python3/dist-packages/pip (python 3.12)
root@ip-172-31-1-95:~#
```

8.Let us install python3-venv by using the command **(apt install python3-venv python3-pip)**

```
root@ip-172-31-1-95:~# pip3 --version
pip 24.0 from /usr/lib/python3/dist-packages/pip (python 3.12)
root@ip-172-31-1-95:~# apt install python3-venv
python3-pip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  python3-pip-whl python3-setuptools-whl python3.12-venv
The following NEW packages will be installed:
  python3-pip-whl python3-setuptools-whl python3-venv python3.12-venv
0 upgraded, 4 newly installed, 0 to remove and 23 not upgraded.
Need to get 2425 kB of archives.
After this operation, 2777 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 python3-pip-whl all 24.0+dfsg-1ubuntu1 [1702 kB]
Get:2 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 python3-setuptools-whl all 68.1.2-2ubuntu1.1 [716 kB]
Get:3 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 python3.12-venv amd64 3.12.3-1ubuntu0.2 [5678 B]
Get:4 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 python3-venv amd64 3.12.3-0ubuntu2 [1034 B]
Fetched 2425 kB in 0s (55.1 MB/s)
Selecting previously unselected package python3-pip-whl.
(Reading database ... 75277 files and directories currently installed.)
Preparing to unpack .../python3-pip-whl_24.0+dfsg-1ubuntu1_all.deb ...
Unpacking python3-pip-whl (24.0+dfsg-1ubuntu1) ...
Selecting previously unselected package python3-setuptools-whl.
Preparing to unpack .../python3-setuptools-whl_68.1.2-2ubuntu1.1_all.deb ...
Unpacking python3-setuptools-whl (68.1.2-2ubuntu1.1) ...
Selecting previously unselected package python3.12-venv.
Preparing to unpack .../python3.12-venv_3.12.3-1ubuntu0.2_amd64.deb ...
Unpacking python3.12-venv (3.12.3-1ubuntu0.2) ...
Selecting previously unselected package python3-venv.
Preparing to unpack .../python3-venv_3.12.3-0ubuntu2_amd64.deb ...
Unpacking python3-venv (3.12.3-0ubuntu2) ...
Setting up python3-setuptools-whl (68.1.2-2ubuntu1.1) ...
Setting up python3-pip-whl (24.0+dfsg-1ubuntu1) ...
Setting up python3.12-venv (3.12.3-1ubuntu0.2) ...
Setting up python3-venv (3.12.3-0ubuntu2) ...
```

9.You can install Flask globally with the command pip3 install flask, but it’s

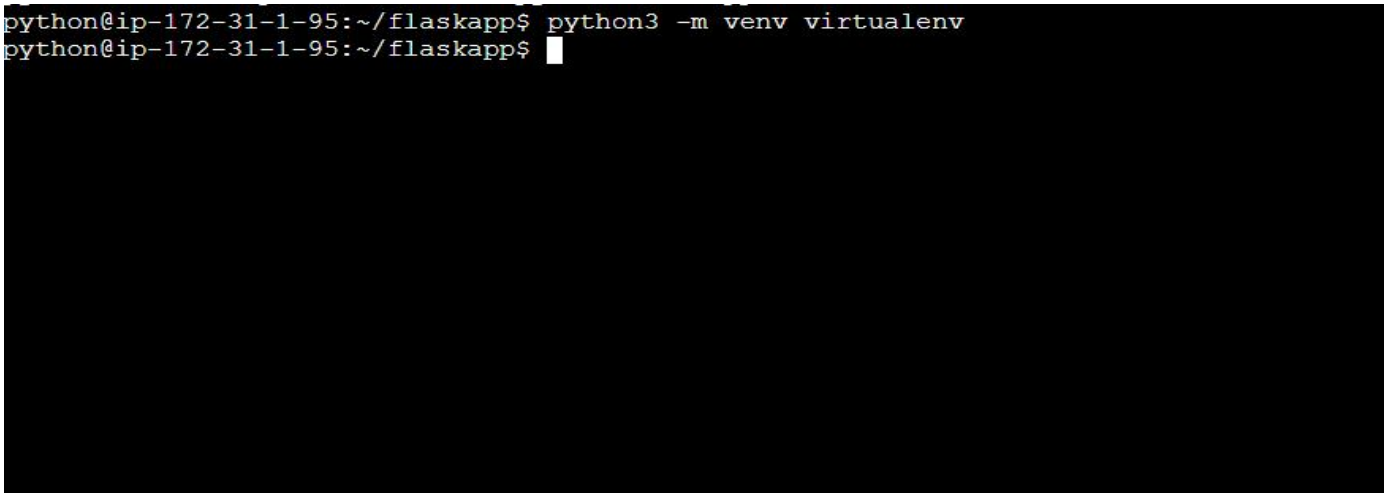
recommended to create a virtual environment and install the Flask application there. Let's create a new user and install the Flask application in a new virtual environment: **(adduser python)**



10.Now, you can log in as the user john with the above command. **(su – Python)**

11.After logging in, create the directories flaskapp/templates **(mkdir –p flaskapp/templates)**

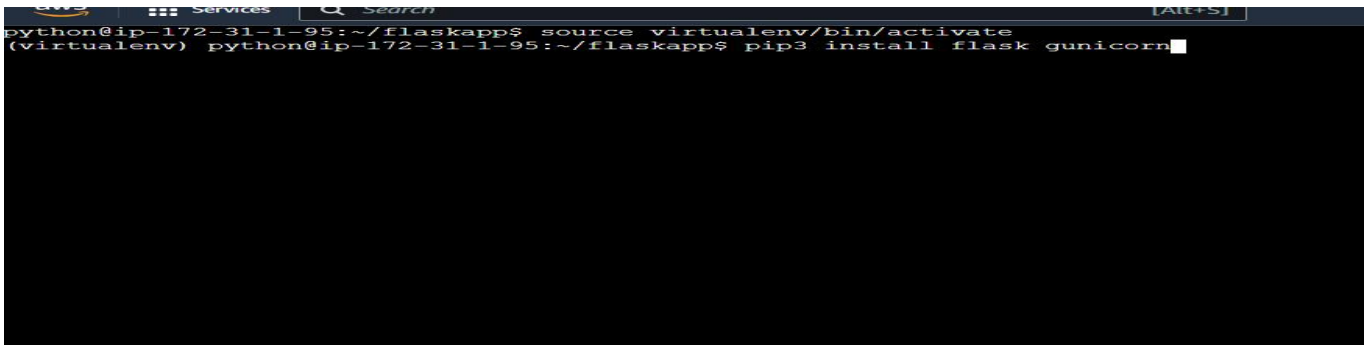
12.Enter the directory called **flaskapp (cd flaskapp)**– you can now go ahead and create the virtual environment. **(python3 –m venv virtualenv)**



13.Now enter the virtual environment with **source virtualenv/bin/activate**

14.You have now activated the virtual environment, where we can start our installation. Let's install Flask and Gunicorn: **pip3 install flask gunicorn** and **pip install flask**

15.Once Flask is installed, you can run a simple application to test if everything is working as expected. Make sure you are logged in as the user "python". Create an **app.py** file using your preferred text editor **vi app.py**



```
python@ip-172-31-1-95:~/flaskapp$ source virtualenv/bin/activate
(virtualenv) python@ip-172-31-1-95:~/flaskapp$ pip3 install flask gunicorn
Collecting flask
  Downloading flask-3.0.3-py3-none-any.whl.metadata (3.2 kB)
Collecting gunicorn
  Downloading gunicorn-23.0.0-py3-none-any.whl.metadata (4.4 kB)
Collecting Werkzeug>=3.0.0 (from flask)
  Downloading werkzeug-3.0.4-py3-none-any.whl.metadata (3.7 kB)
Collecting Jinja2>=3.1.2 (from flask)
  Downloading jinja2-3.1.4-py3-none-any.whl.metadata (2.6 kB)
Collecting itsdangerous>=2.1.2 (from flask)
  Downloading itsdangerous-2.2.0-py3-none-any.whl.metadata (1.9 kB)
Collecting click>=8.1.3 (from flask)
  Downloading click-8.1.7-py3-none-any.whl.metadata (3.0 kB)
Collecting blinker>=1.6.2 (from flask)
  Downloading blinker-1.8.2-py3-none-any.whl.metadata (1.6 kB)
Collecting packaging (from gunicorn)
  Downloading packaging-24.1-py3-none-any.whl.metadata (3.2 kB)
Collecting MarkupSafe>=2.0 (from Jinja2>=3.1.2->flask)
  Downloading MarkupSafe-3.0.2-cp312-cp312-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (4.0 kB)
Downloading flask-3.0.3-py3-none-any.whl (101 kB)
   ---------------------------------------- 101.7/101.7 kB 7.3 MB/s eta 0:00:00
Downloading gunicorn-23.0.0-py3-none-any.whl (85 kB)
   ---------------------------------------- 85.0/85.0 kB 9.8 MB/s eta 0:00:00
Downloading blinker-1.8.2-py3-none-any.whl (9.5 kB)
Downloading click-8.1.7-py3-none-any.whl (97 kB)
   ---------------------------------------- 97.9/97.9 kB 11.6 MB/s eta 0:00:00
Downloading itsdangerous-2.2.0-py3-none-any.whl (16 kB)
Downloading jinja2-3.1.4-py3-none-any.whl (133 kB)
   ---------------------------------------- 133.3/133.3 kB 17.1 MB/s eta 0:00:00
Downloading werkzeug-3.0.4-py3-none-any.whl (227 kB)
   ---------------------------------------- 227.6/227.6 kB 27.1 MB/s eta 0:00:00
Downloading packaging-24.1-py3-none-any.whl (53 kB)
   ---------------------------------------- 54.0/54.0 kB 7.6 MB/s eta 0:00:00
Downloading MarkupSafe-3.0.2-cp312-cp312-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (23 kB)
Installing collected packages: packaging, MarkupSafe, itsdangerous, click, blinker, Werkzeug, Jinja2, gunicorn, flask
Successfully installed Jinja2-3.1.4 MarkupSafe-3.0.2 Werkzeug-3.0.4 blinker-1.8.2 click-8.1.7 flask-3.0.3 gunicorn-23.0.0
```

```
(virtualenv) python@ip-172-31-1-95:~/flaskapp$ pip install flask
Requirement already satisfied: flask in ./virtualenv/lib/python3.12/site-packages (3.0.3)
Requirement already satisfied: Werkzeug>=3.0.0 in ./virtualenv/lib/python3.12/site-packages (from flask) (3.0.4)
Requirement already satisfied: Jinja2>=3.1.2 in ./virtualenv/lib/python3.12/site-packages (from flask) (3.1.4)
Requirement already satisfied: itsdangerous>=2.1.2 in ./virtualenv/lib/python3.12/site-packages (from flask) (2.2.0)
Requirement already satisfied: click>=8.1.3 in ./virtualenv/lib/python3.12/site-packages (from flask) (8.1.7)
Requirement already satisfied: blinker>=1.6.2 in ./virtualenv/lib/python3.12/site-packages (from flask) (1.8.2)
Requirement already satisfied: MarkupSafe>=2.0 in ./virtualenv/lib/python3.12/site-packages (from Jinja2>=3.1.2->flask) (3.0.2)
(virtualenv) python@ip-172-31-1-95:~/flaskapp$
```

16.Add the following code to the file:

```
from flask import Flask
app = Flask(__name__)

@app.route('/')
def hello_world():
    return 'Hello from Koyeb'

if __name__ == "__main__":
    app.run(host='0.0.0.0' ,port=7000)
~
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-- INSERT --
```
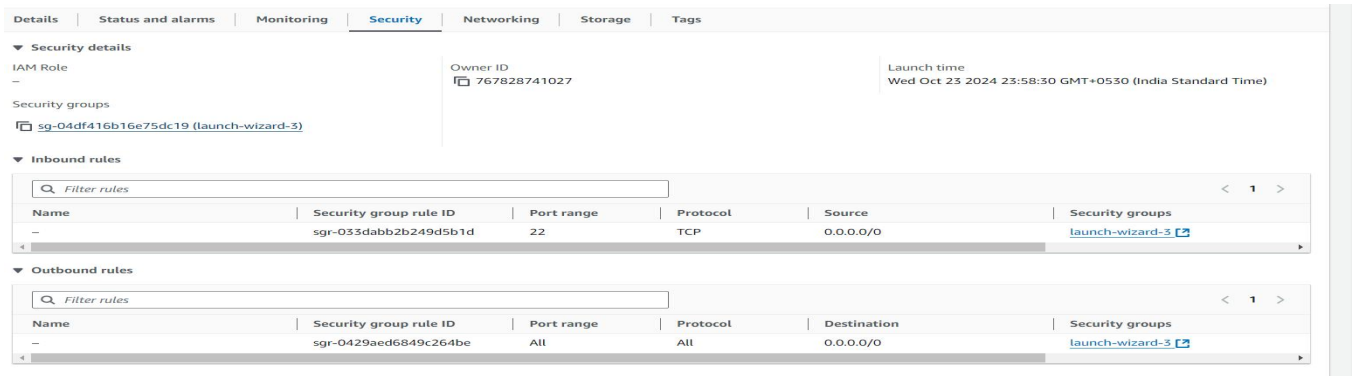
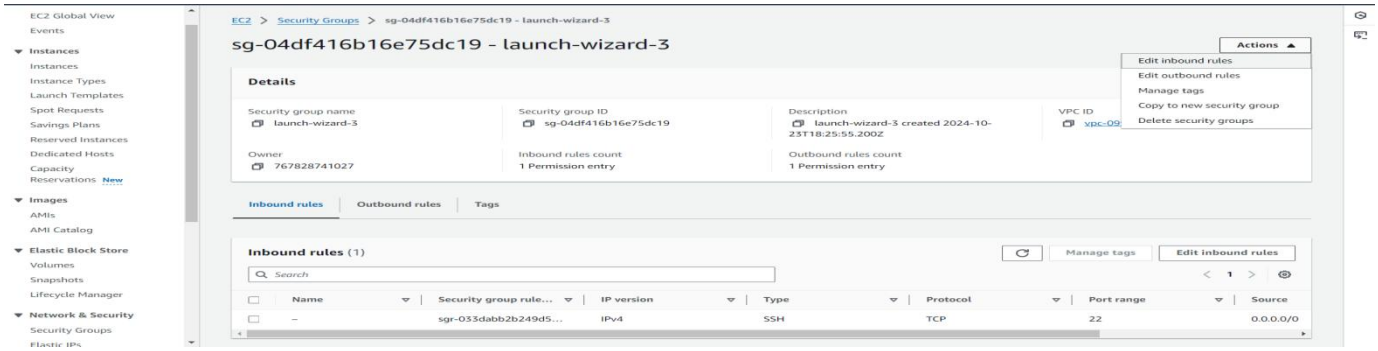
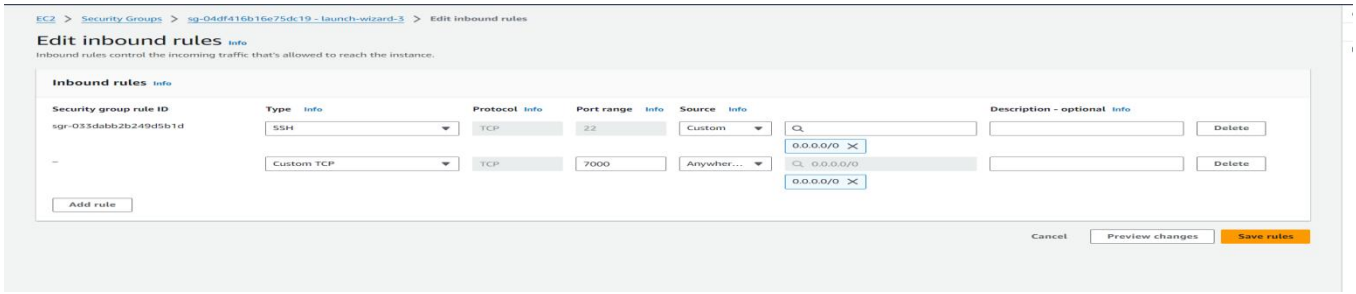

17. Next to allocate port number “7000 “ in security group at the below snapshots.



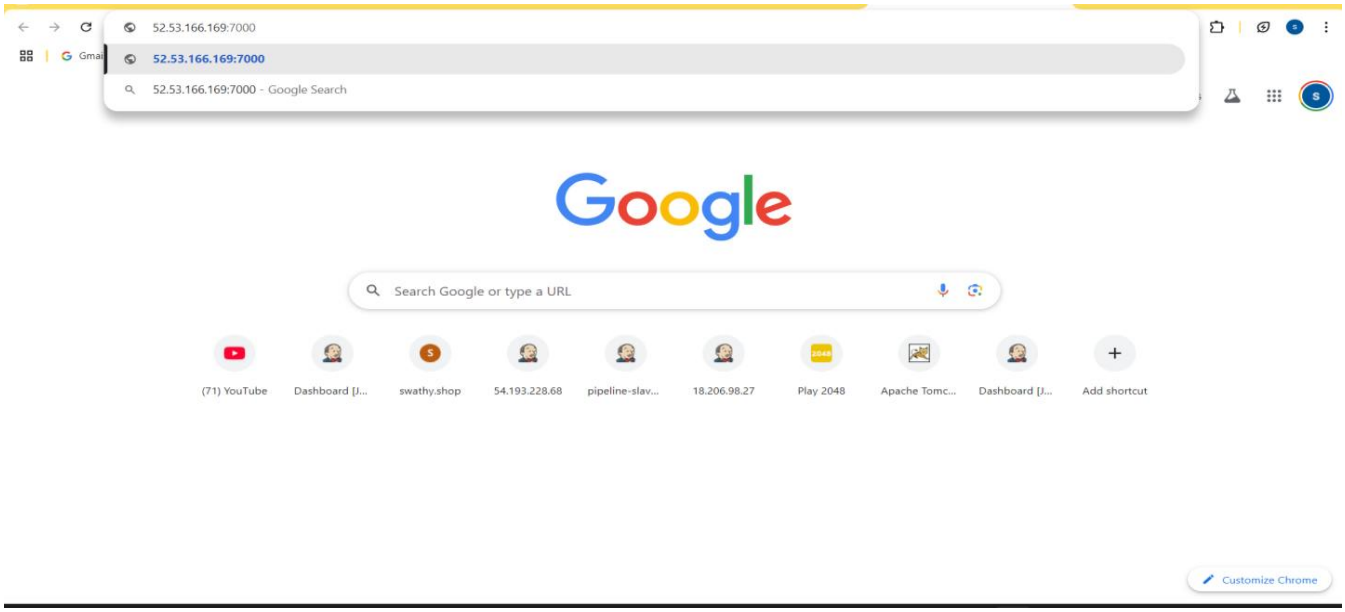




18.To run the python flask app i.e., app.py we use **python3 app.py**

```
(virtualenv) python@ip-172-31-1-95:~/flaskapp$ python3 app.py
 * Serving Flask app 'app'
 * 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://127.0.0.1:7000
 * Running on http://172.31.1.95:7000
Press CTRL+C to quit
219.91.254.118 - - [23/Oct/2024 19:48:22] code 400, message Bad request version ('**\x13\x01\x13\x02\x13\x03À+À/À,ÀÌÈÌ¨À\x13À\x14\x00\x9c\x00\x9d\x00/\x005\x01\x00\x06s\x1a\x1a\x00\x
00\x00')
219.91.254.118 - - [23/Oct/2024 19:48:22] "\x16\x03\x01\x06à\x01\x00\x06Ü\x03\x03§\x14riâN\x7fi$¼aiµx\x86/+)ä¼2i\x88@M"\x07\x84t\x9b4ñ /\x1f\x07\x95Ç/\x012\x12¿1\x98\x92\x17\x0c\x95\
x13\x8fHi\x09\x82\x83f\x9cèà\x9c\x93i\x0d\x00 **\x13\x01\x13\x02\x13\x03àèà/à ÀÌÈÌ¨À\x13À\x14\x00\x9c\x00\x9d\x00/\x005\x01\x00\x06s\x1a\x1a\x00\x00\x00" 400 -
```

19.Once the code is successful we have to copy the public Ip address and paste in any browser.



20.The final output is: