

# Introduction of Amazon EC2

Amazon Elastic Compute Cloud (EC2) is a web service provided by Amazon Web Services (AWS) that allows users to rent virtual machines, known as "instances", in the cloud. EC2 provides a scalable and flexible computing environment in which users can deploy and manage their applications, data, and services.

EC2 instances can be launched from pre-configured Amazon Machine Images (AMIs), which are essentially pre-built virtual machine images that contain an operating system, applications, and other necessary software. Alternatively, users can create their own custom AMIs or use the AWS Marketplace to find and deploy pre-built applications and software.

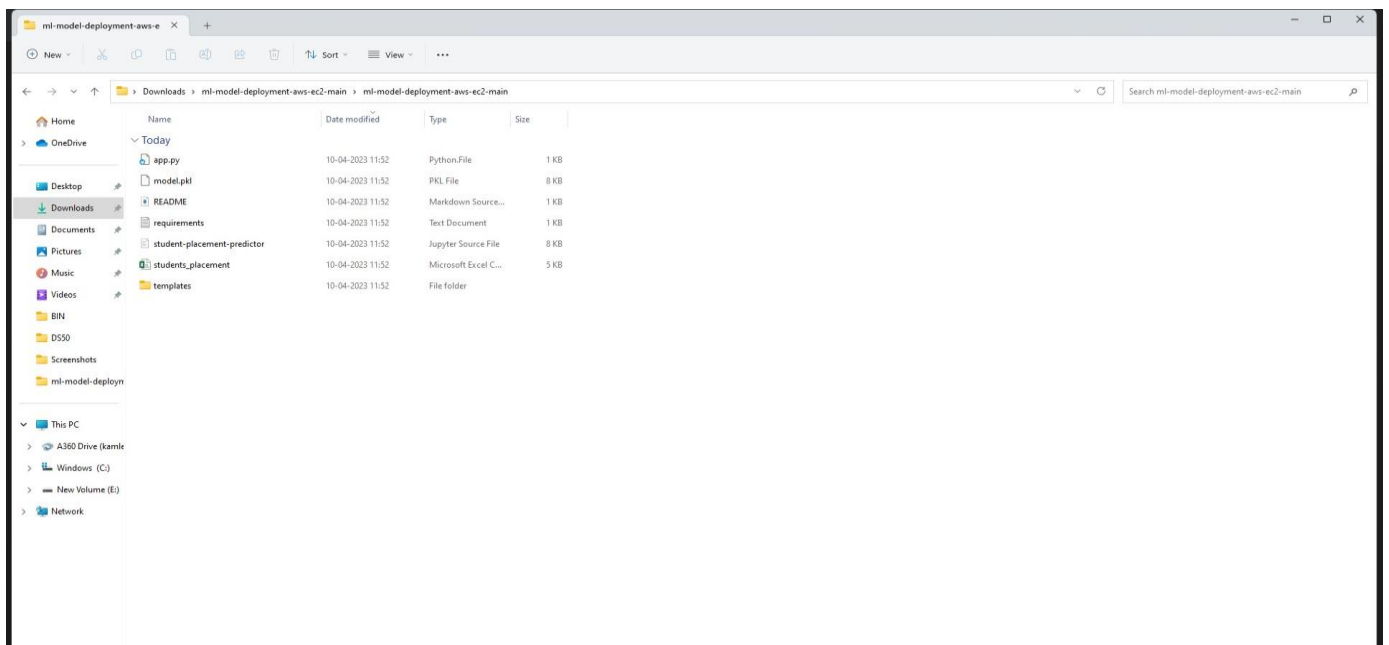
Users can choose from a wide variety of instance types, each optimized for different workloads and use cases. Instances can be configured with different amounts of CPU, memory, and storage to meet specific application requirements. Additionally, users can scale up or down the number of instances in their environment as needed, making it easy to handle changes in demand and traffic.

EC2 instances are designed to be highly available and fault-tolerant, with automatic instance recovery and replacement. Users can also leverage additional AWS services, such as Elastic Load Balancing and Auto Scaling, to further enhance their application's availability and scalability.

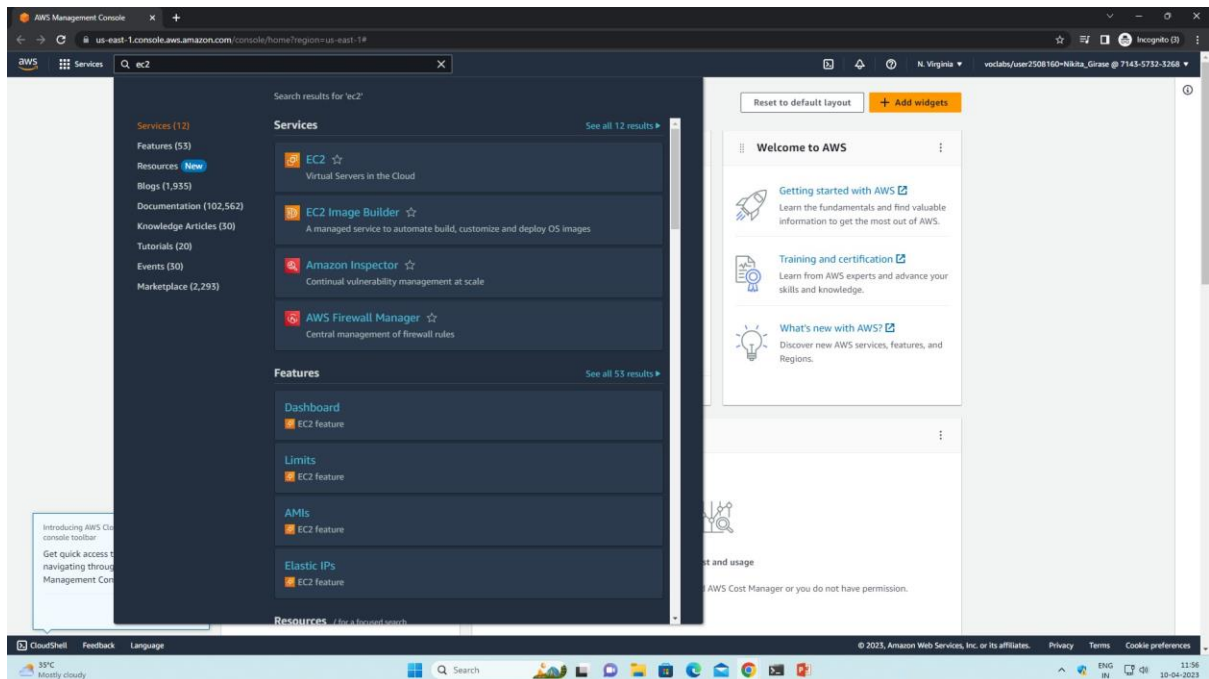
Overall, Amazon EC2 provides a highly flexible and scalable computing environment in the cloud, making it an attractive option for a wide range of use cases, from small startups to large enterprises.

## Steps to Deploy Machine Learning Model On AWS EC2

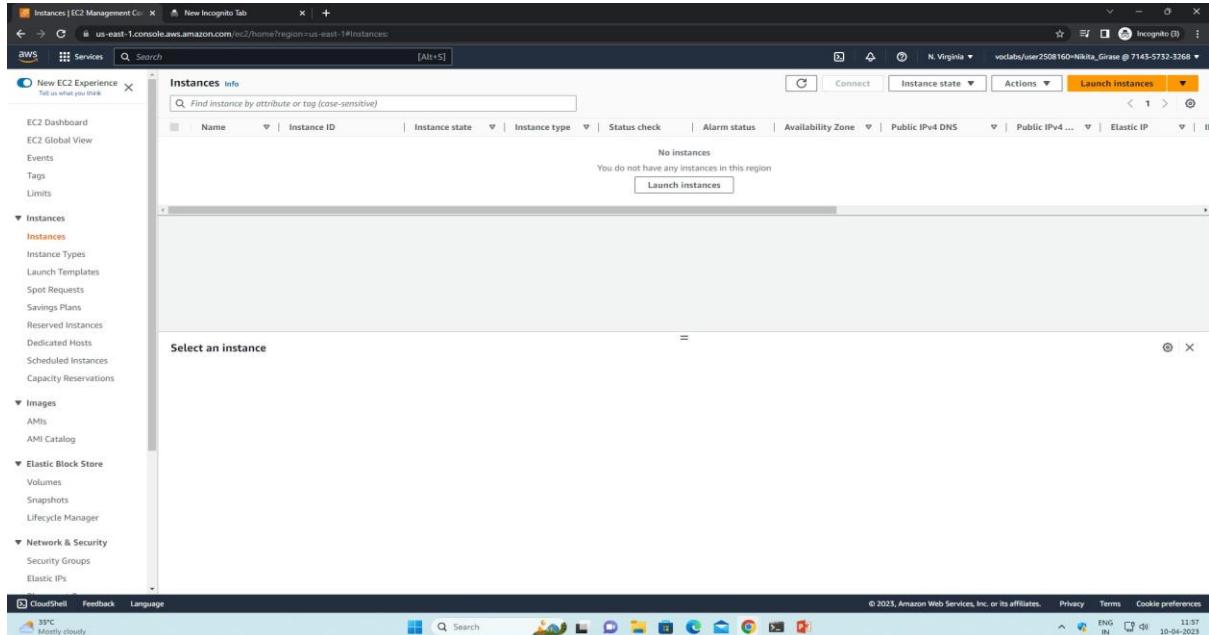
### Step 1 : Create Machine Learning model using python.



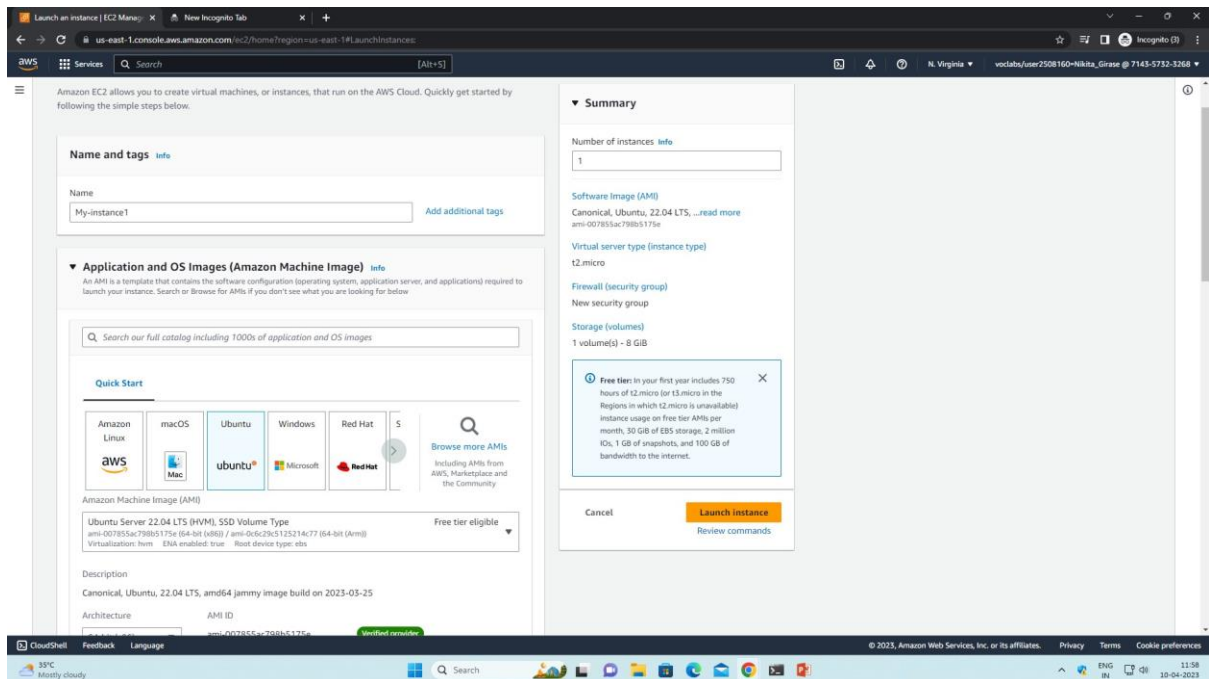
## Step 2 : Log in to AWS account and open EC2.



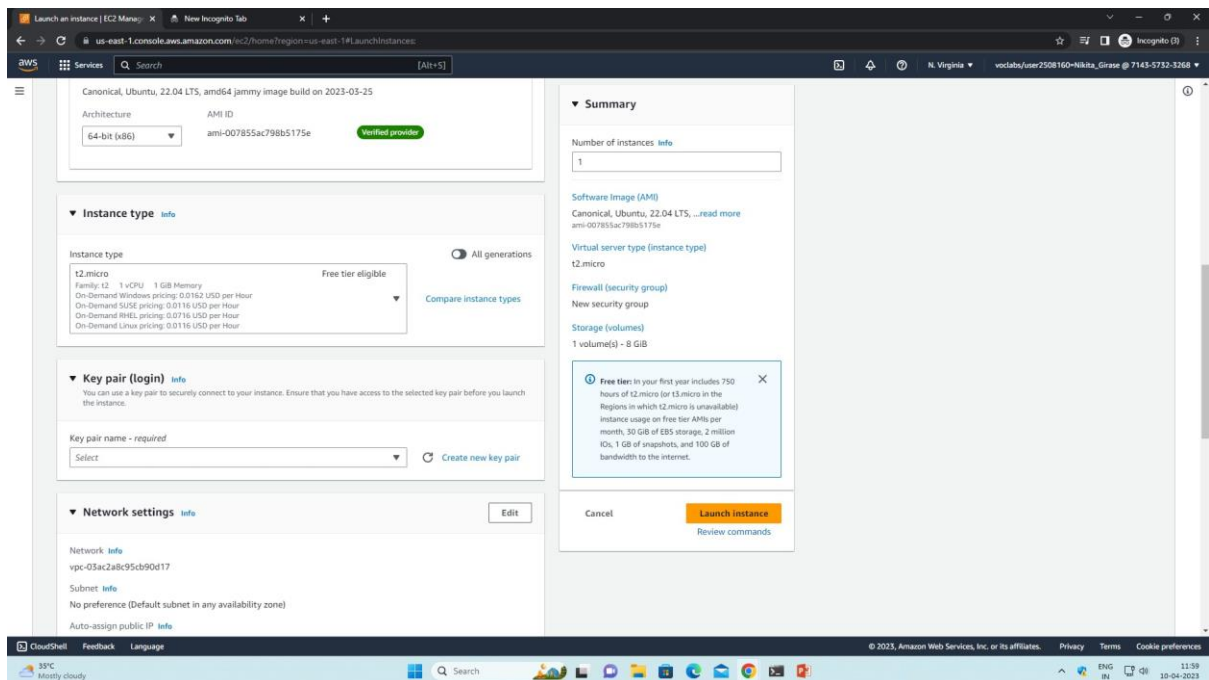
## Step 3 : Create EC2 Instance.



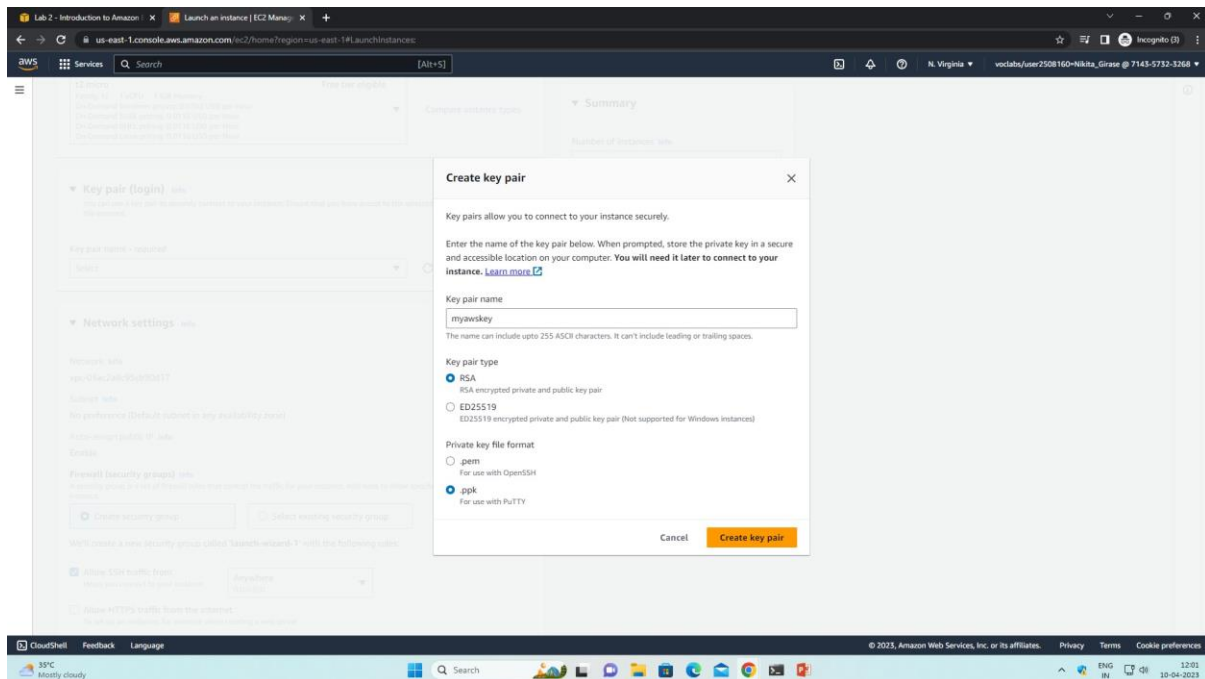
## Step 4 : Select Operating system as per your requirement.



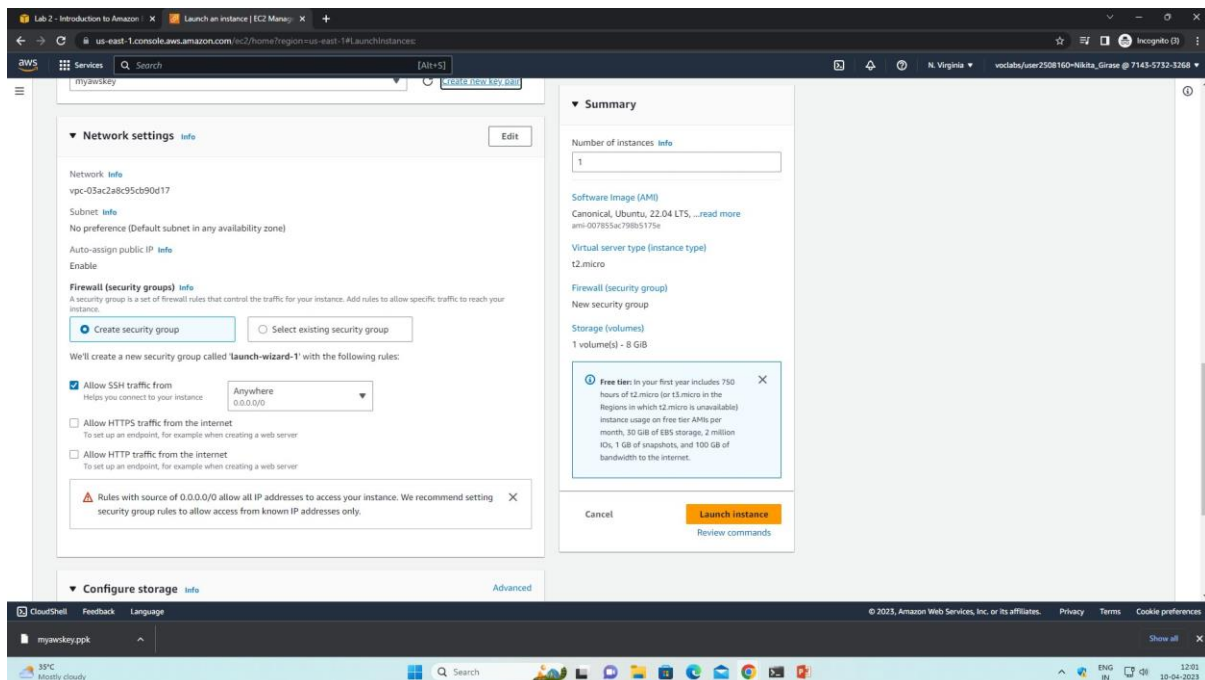
## Step 5 : Choose Instance Type



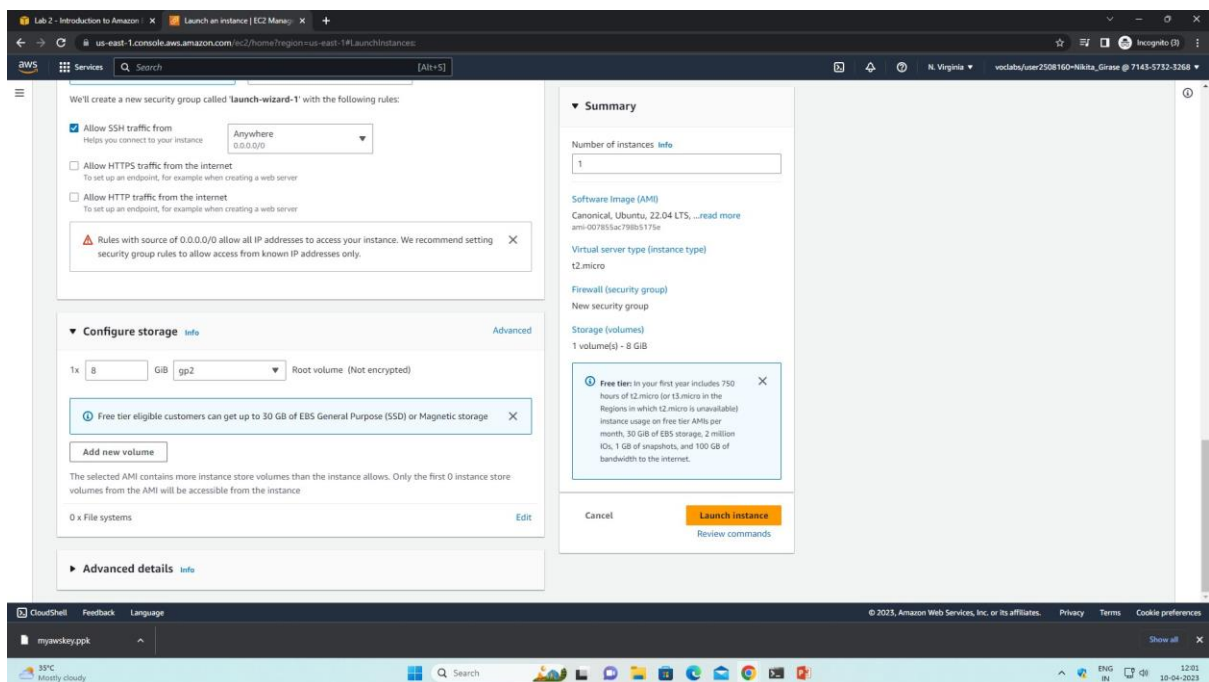
## Step 6 : Create Key Pair with .ppk extension and download it.



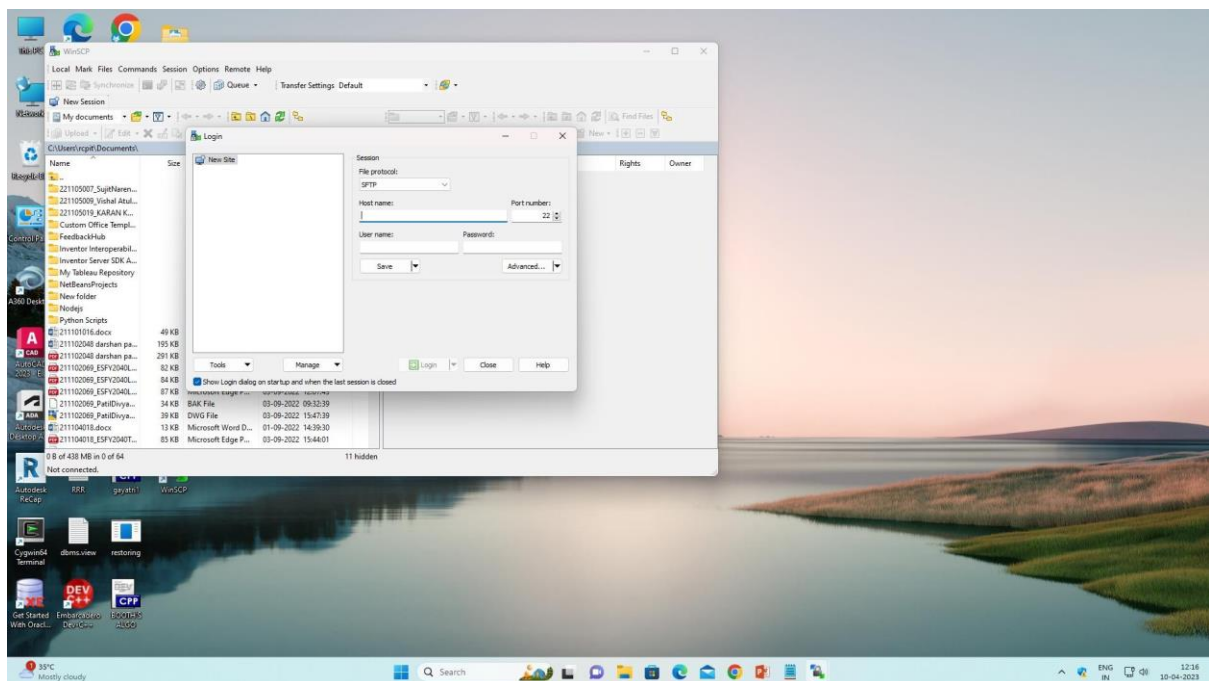
## Step 7 : Create Security group.



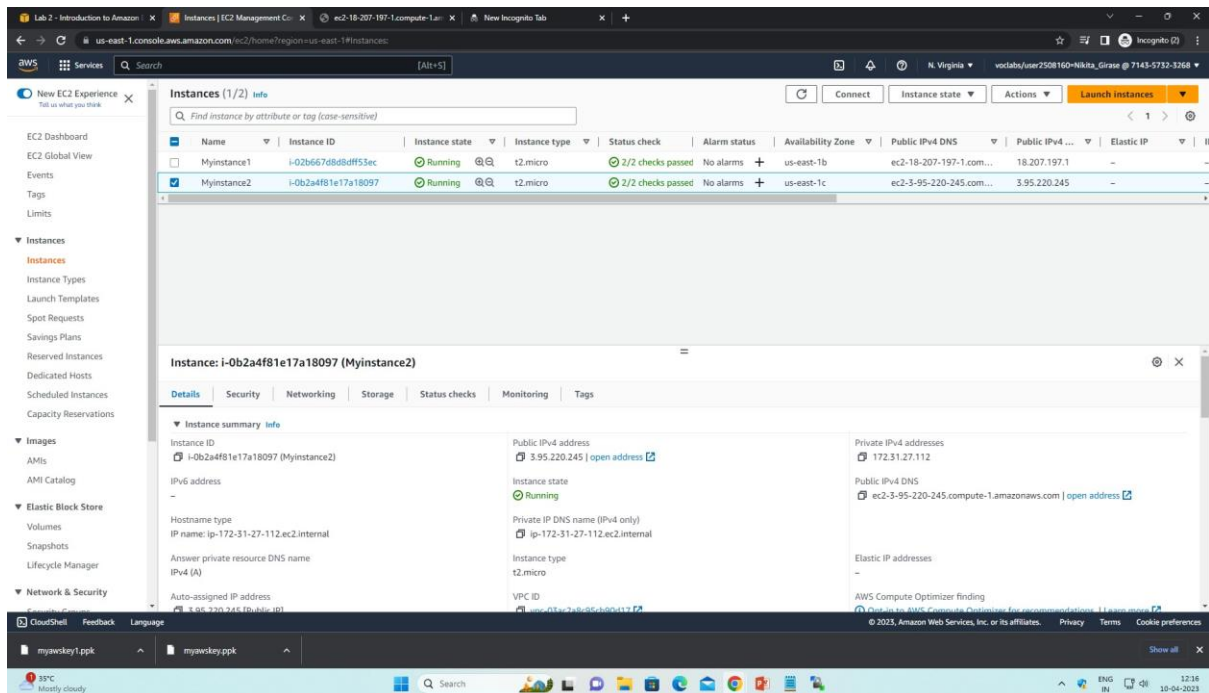
## Step 8 : Configure Storage as per your requirement



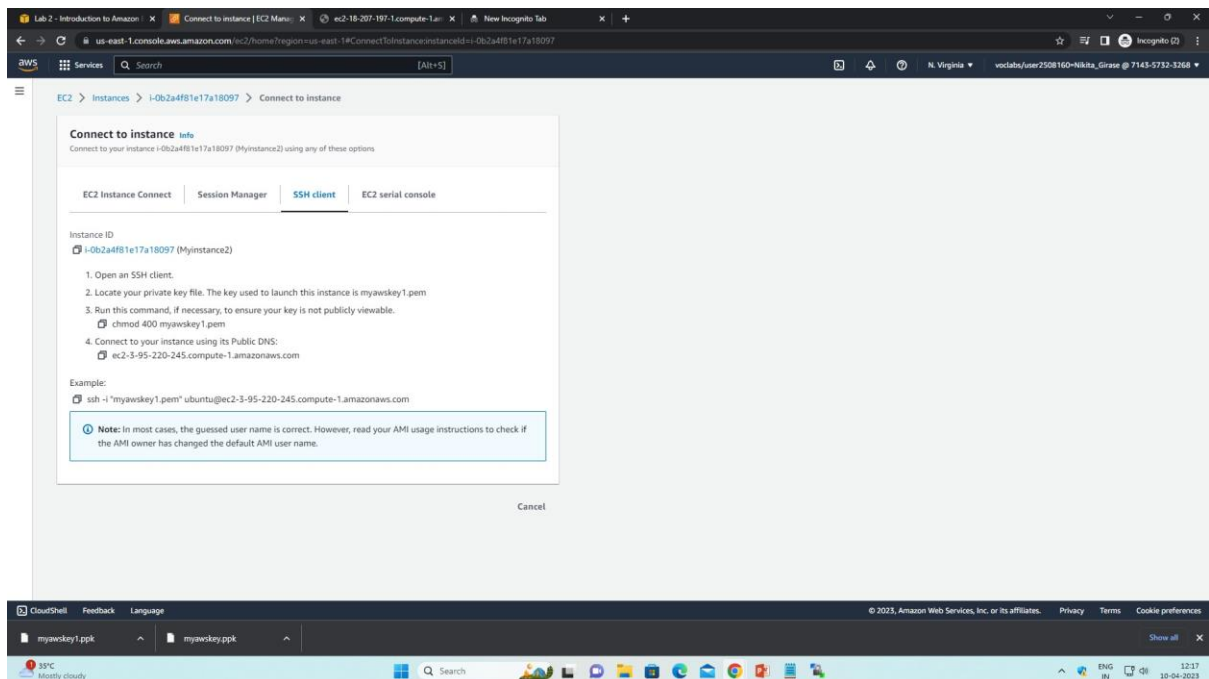
## Step 9 : Open WinSCP and connect with SSH terminal of our instance



## Step 10 : Our instance in running state

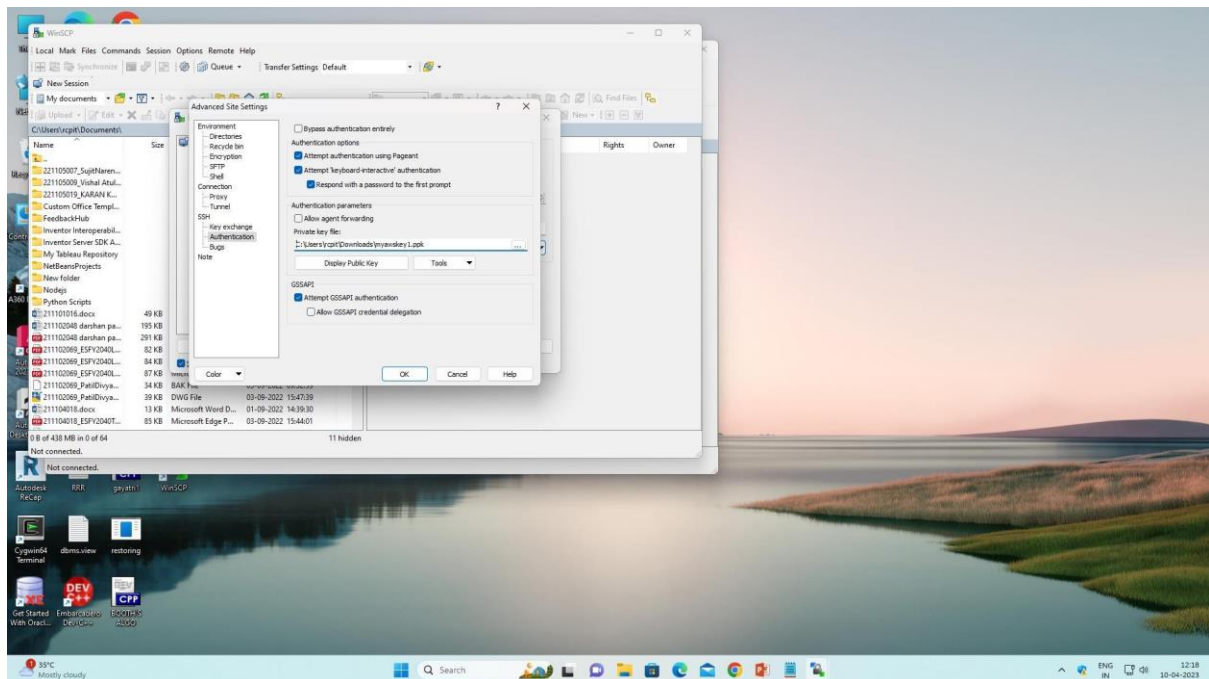


## Step 11 : Copy public DNS to check working of our instance

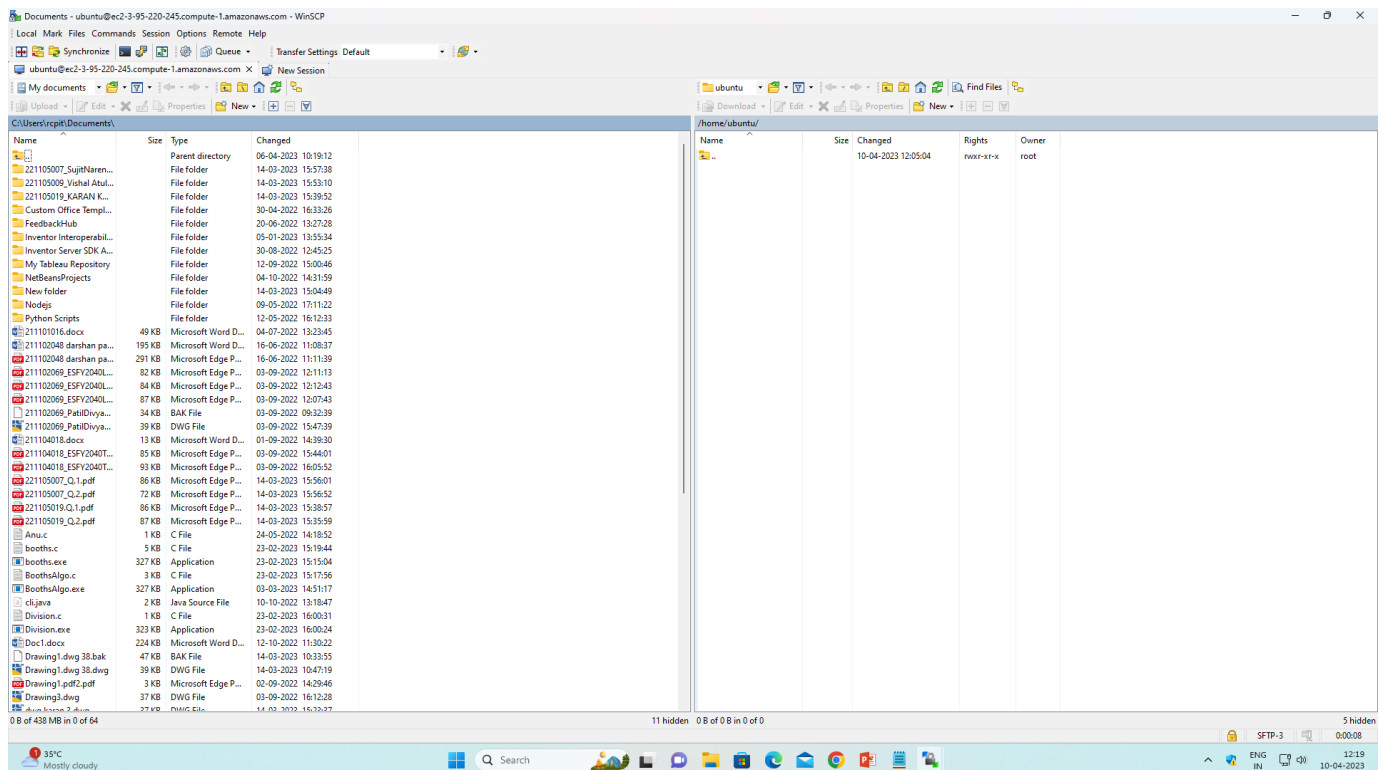




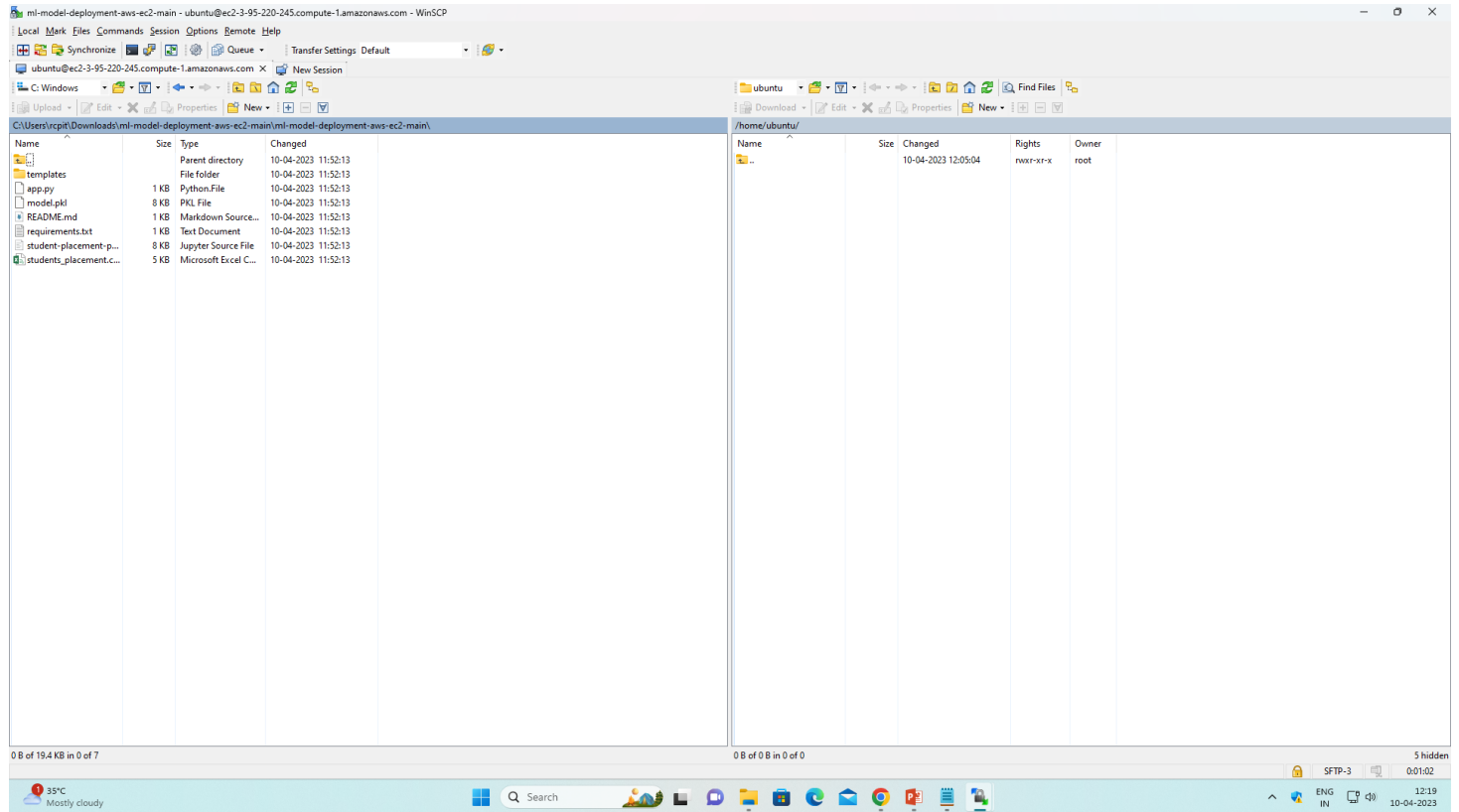
## Step 12 : Authenticate using key pair (.ppk) file



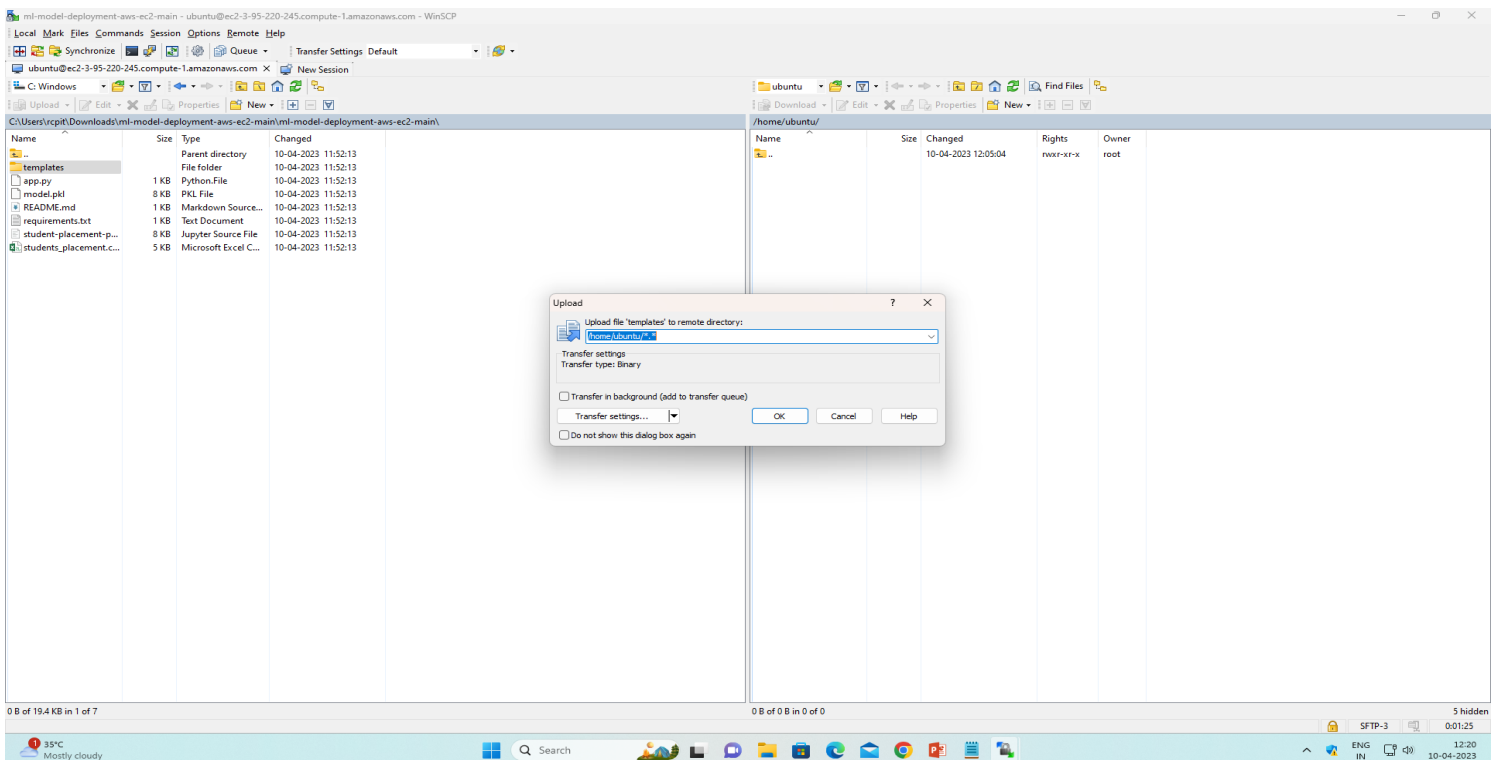
## Step 13: Upload all files using WinSCP to server



## Step 14: Select all files and click on upload

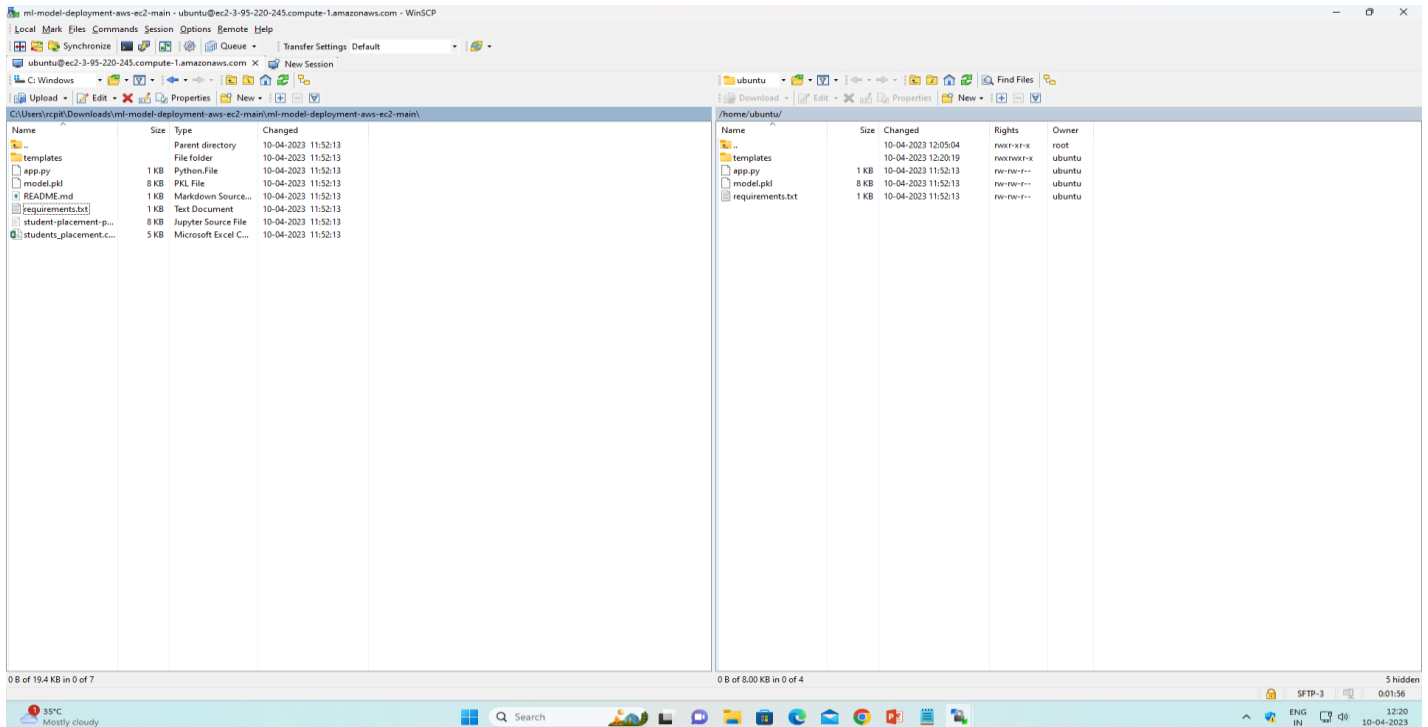


## Step 15: Uploading all files

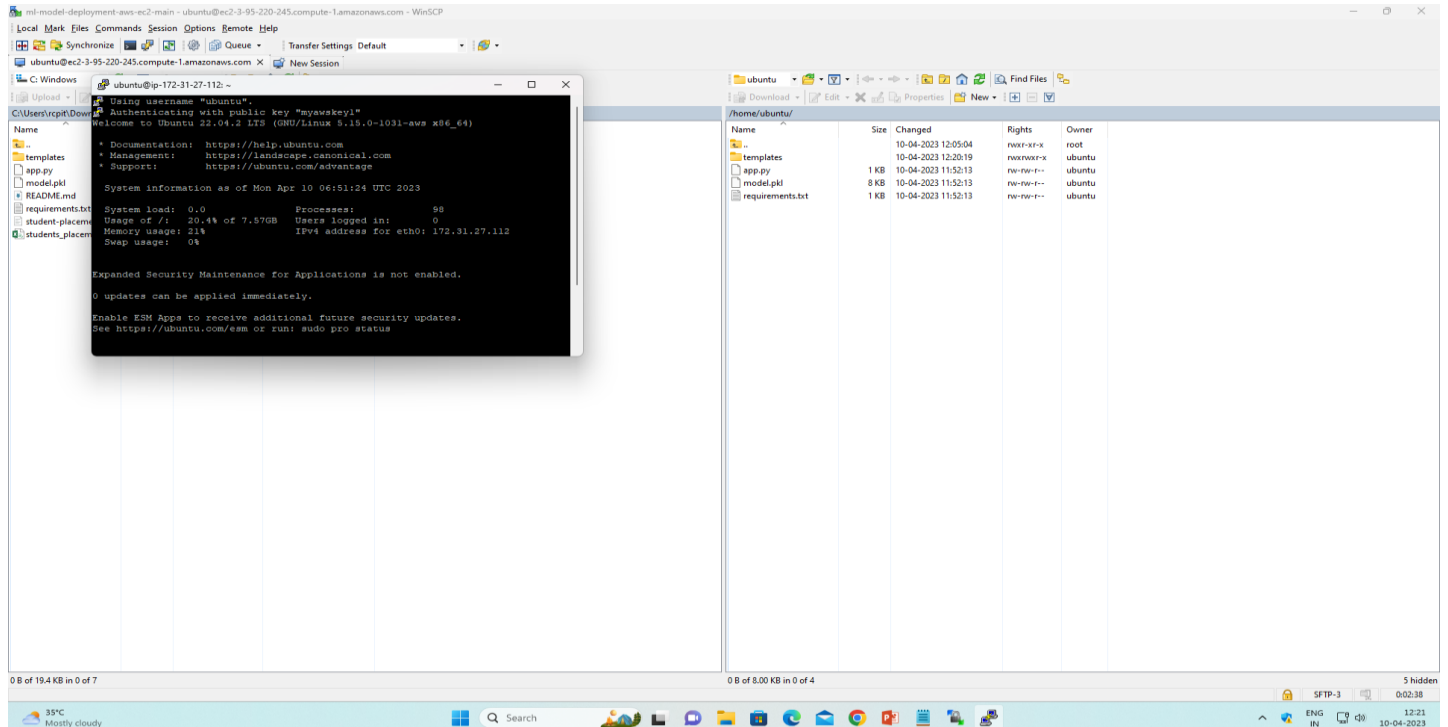




## Step 16 : All files are uploaded to local machine to server



## Step 17: Authorize to SSH terminal



## Step 18 : Connected to SSH terminal

```
ubuntu@ip-172-31-27-112:~$  
* Using username "ubuntu".  
* Authenticating with public key "myawskey1"  
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.15.0-1031-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/advantage  
  
System information as of Mon Apr 10 06:51:24 UTC 2023  
  
System load: 0.0          Processes:           98  
Usage of /:  20.4% of 7.57GB      Users logged in:   0  
Memory usage: 21%             IPv4 address for eth0: 172.31.27.112  
Swap usage:  0%  
  
Expanded Security Maintenance for Applications is not enabled.  
0 updates can be applied immediately.  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update  
  
Last login: Mon Apr 10 06:42:27 2023 from 117.217.104.210  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ubuntu@ip-172-31-27-112:~$ python  
Command 'python' not found, did you mean:  
  command 'python3' from deb python3  
  command 'python' from deb python-is-python3  
ubuntu@ip-172-31-27-112:~$ sudo apt install python3  
sudo: apt: command not found  
ubuntu@ip-172-31-27-112:~$ sudo apt install python3  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
python3 is already the newest version (3.10.6-1~22.04).  
python3 set to manually installed.  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
ubuntu@ip-172-31-27-112:~$
```

## Step 19: Python 3 is installed on server

```
ubuntu@ip-172-31-27-112:~$  
ubuntu@ip-172-31-27-112:~$ python3  
Python 3.10.6 (main, Mar 10 2023, 10:55:28) [GCC 11.3.0] on linux  
Type "help", "copyright", "credits" or "license()" for more information.  
>>>
```

### Step 20 : Copy this commands and run on terminal

## Step 21 : Commands are running

[illegible]

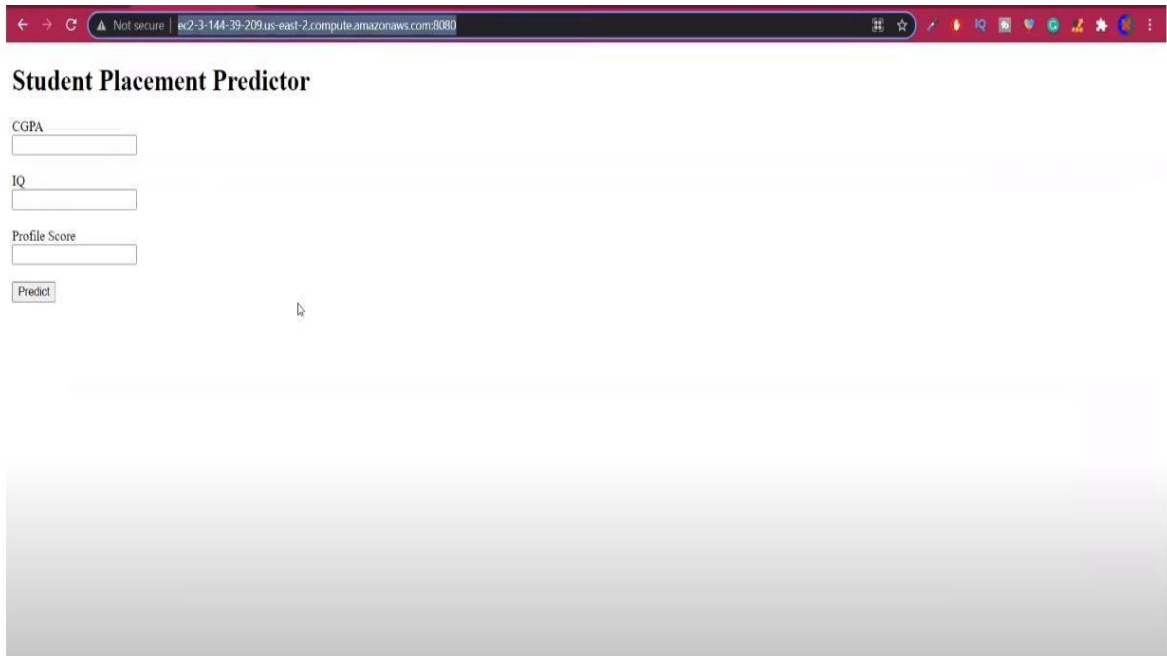
## Step 22 : Installing all required libraries

```
ubuntu@ip-172-31-27-112: ~$ pip install -r requirements.txt
Defaulting to user installation because normal site-packages is not writeable
Collecting flask
  Downloading Flask-2.2.3-py3-none-any.whl (101 kB)
-----
101.5/101.5 KB 2.1 MB/s eta 0:00:00
Collecting numpy
  Downloading numpy-1.24.2-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (17.3 MB)
-----
17.3/17.3 MB 10.9 MB/s eta 0:00:00
Collecting sklearn
  Downloading sklearn-0.0.post1.tar.gz (3.6 kB)
  Preparing metadata (setup.py) ... done
Collecting Werkzeug>=2.2.2
  Downloading Werkzeug-2.2.3-py3-none-any.whl (233 kB)
-----
233.6/233.6 KB 29.6 MB/s eta 0:00:00
Requirement already satisfied: click==8.0 in /usr/lib/python3/dist-packages (from flask->-r requirements.txt (line 1)) (8.0.3)
Collecting itsdangerous==2.0
  Downloading itsdangerous-2.1.2-py3-none-any.whl (15 kB)
Requirement already satisfied: Jinja2>=3.0 in /usr/lib/python3/dist-packages (from flask->-r requirements.txt (line 1)) (3.0.3)
Collecting MarkupSafe>=2.1.1
```

## Step 23: Again copy the public DNS and run on browser

The screenshot displays the AWS Management Console interface. At the top, there are several browser tabs, including 'Lab 2 - Introduction to Amazon', 'Connect to instance | EC2 Mana...', 'ec2-18-207-197-1.compute-1.a...', and 'New Incognito Tab'. The main content area shows the 'Connect to instance' dialog for EC2 instance i-0b2a4f81e17a18097. The 'SSH client' tab is selected, displaying instructions for connecting to the instance via SSH. The instructions include opening an SSH client, locating the private key file (myawskey1.pem), and connecting to the instance using its Public DNS (ec2-3-95-220-245.compute-1.amazonaws.com). Below the instructions, there is an 'Example' section showing the command: `ssh -i "myawskey1.pem" ubuntu@ec2-3-95-220-245.compute-1.amazonaws.com`. A note indicates that in most cases, the guessed user name is correct, but users should read their AMI usage instructions to check if the AMI owner has changed the default AMI user name. At the bottom of the console, a CloudShell terminal window is open, showing the command: `ssh -i "myawskey1.pem" ubuntu@ec2-3-95-220-245.compute-1.amazonaws.com`. The terminal window also shows the file 'myawskey1.ppk' in the current directory.

## Step 24 : Now our model is deployed on Amazon EC2



The screenshot shows a web browser window with the address bar displaying 'Not secure | ec2-3-144-39-209.us-east-2.compute.amazonaws.com:8080'. The page title is 'Student Placement Predictor'. The form contains three input fields labeled 'CGPA', 'IQ', and 'Profile Score'. Below these fields is a 'Predict' button. The background of the page is a light blue gradient.

## Conclusion:

In conclusion, deploying a machine learning model on AWS EC2 offers numerous advantages, including scalability, flexibility, and cost-effectiveness. With EC2, you can easily spin up instances of virtual machines with different configurations to suit the specific needs of your model. Additionally, EC2 provides a range of machine learning services, such as Amazon Sage Maker, that enable you to build, train, and deploy models with ease.