Lab 3: Deployment of Ubuntu OS in Azure Virtual Machine and install Apache2 for static website deployment

Objectives

a. Deploy an Ubuntu-based Virtual Machine (VM) in Microsoft Azure.
b. Configure secure access to the VM using SSH.
c. Install and configure Apache2 web server on the Ubuntu VM.
d. Deploy a basic static website and verify access via the VM's Public IP.
e. Understand the workflow of cloud VM provisioning and web server hosting.

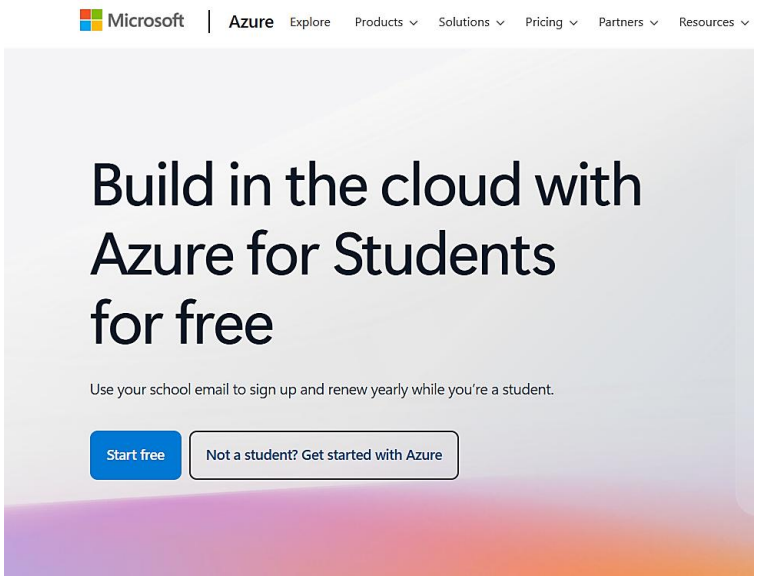
Tools and Technologies Used

a. Microsoft Azure Portal
b. Azure Virtual Machine (Ubuntu)
c. SSH Key Pair (generated during VM creation)
d. Git Bash / Windows Terminal (for SSH access)
e. Apache2 Web Server

Procedure

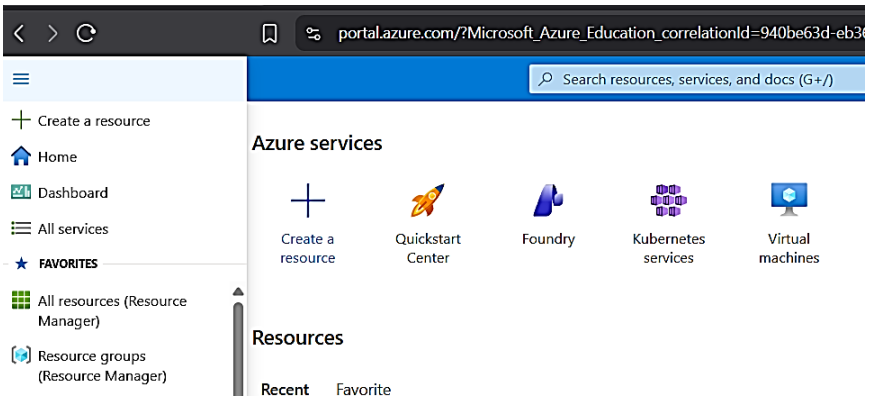
Step 1: Create Azure Free Account

a. Log in to the Azure portal.
b. Activate the Free Trial to access free-tier resources.
c. Navigate to the Azure Home Dashboard.

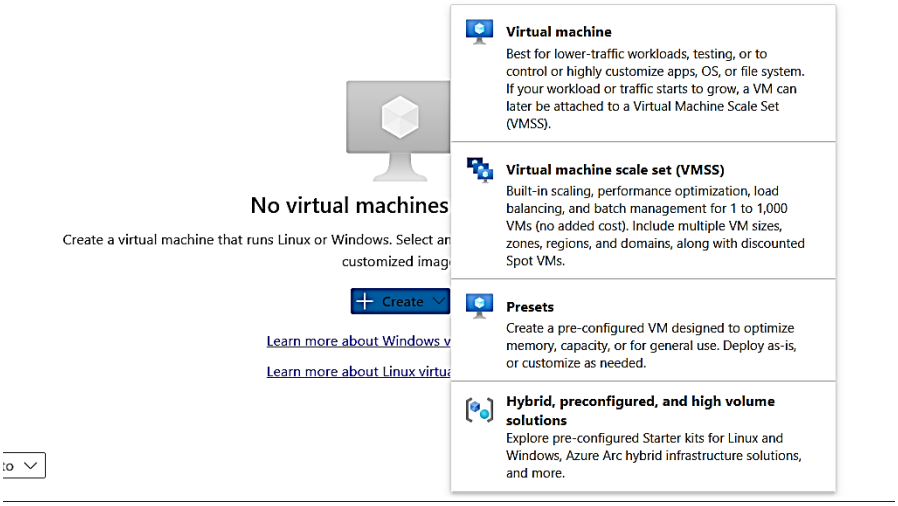


Step 2: Create an Ubuntu Virtual Machine

Go to Home > Azure Services



Create a resource > Virtual Machine.

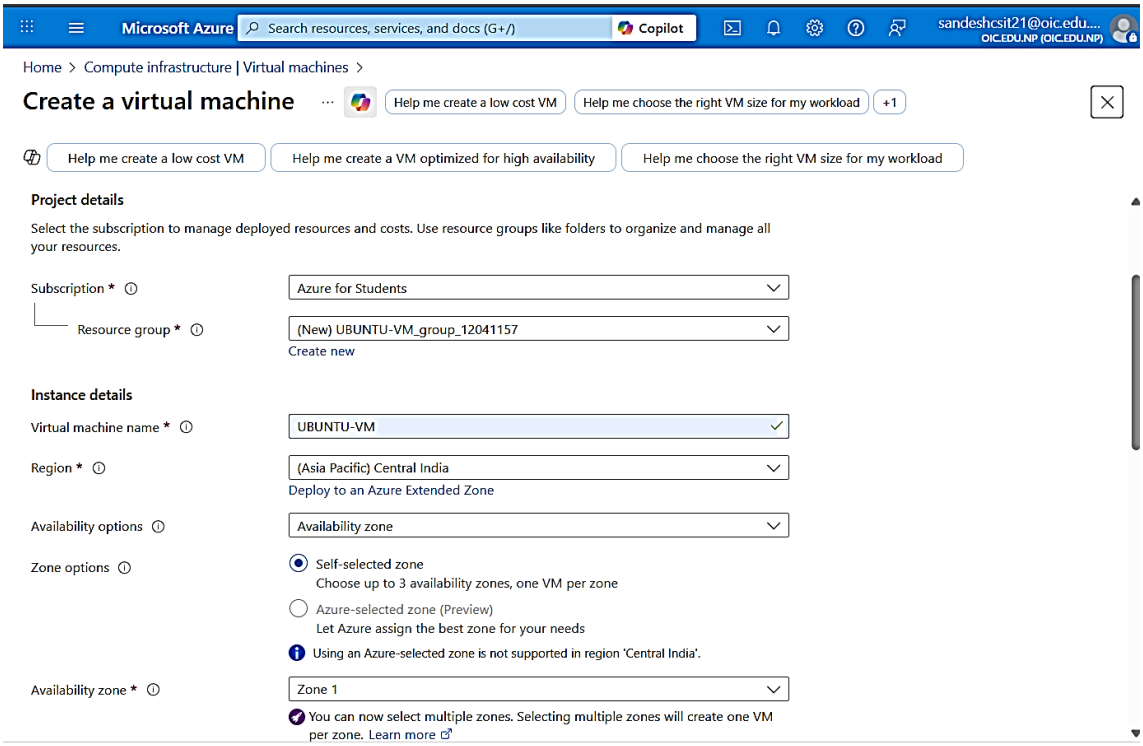


Choose the following basic settings:

a. Virtual Machine Name: UBUNTU-VM

b. Region: (Asia Pacific) Central India

c. Availability Zone: Zone1



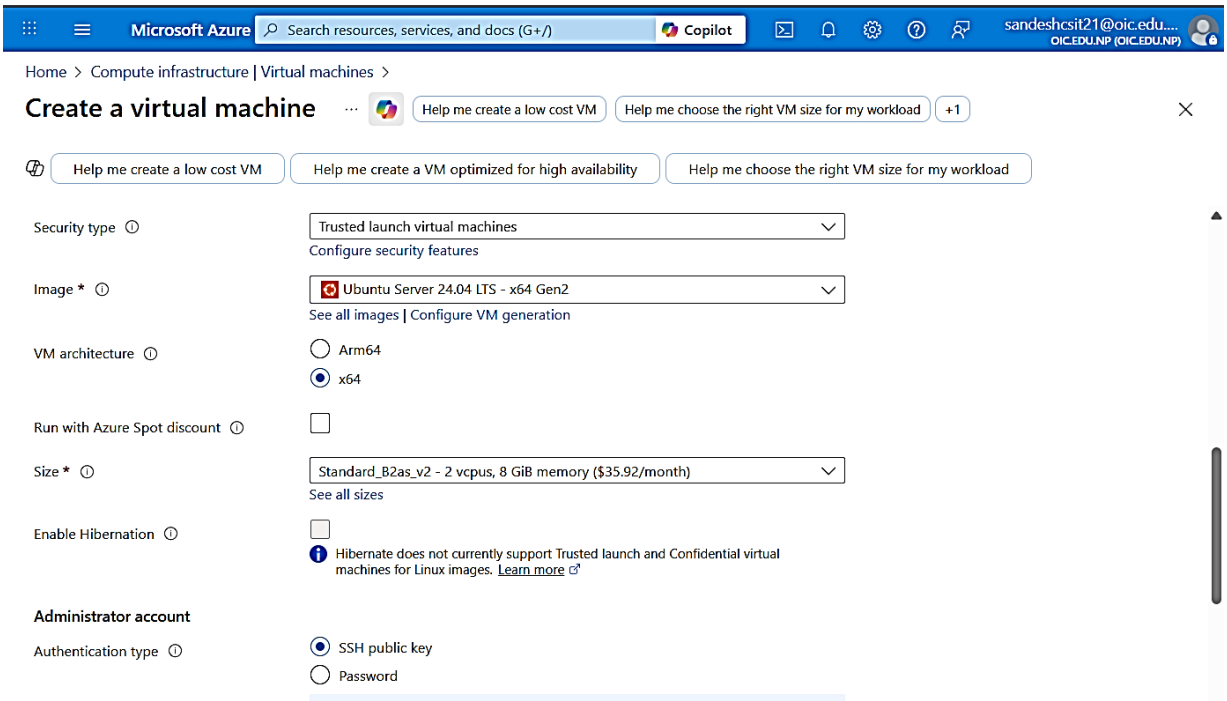
d. Security type: Trusted launch virtual machines

e. Image: Ubuntu Server 24.04 LTS – x64 Gen2

f. VM architecture: x64

g. Size: Standard_B2as_v2 – 2vcpus, 8 Gib Memory ($35.92/month)

h. Authentication type: SSH public key



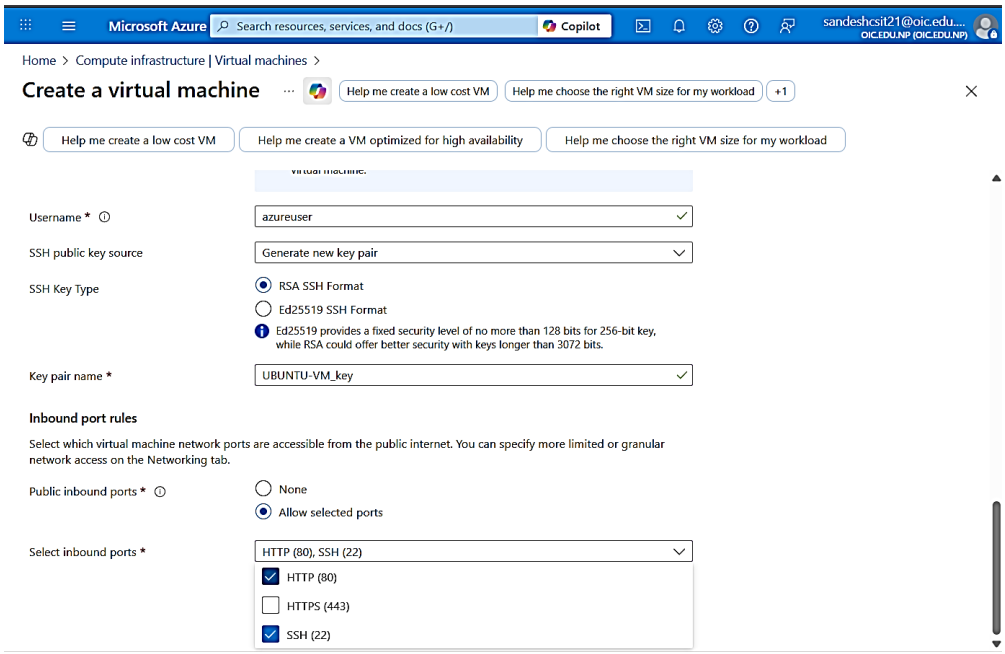
i. Username: azureuser

j. SSH public key source: public key pair

k. SSH Key Type: RSA SSH Format

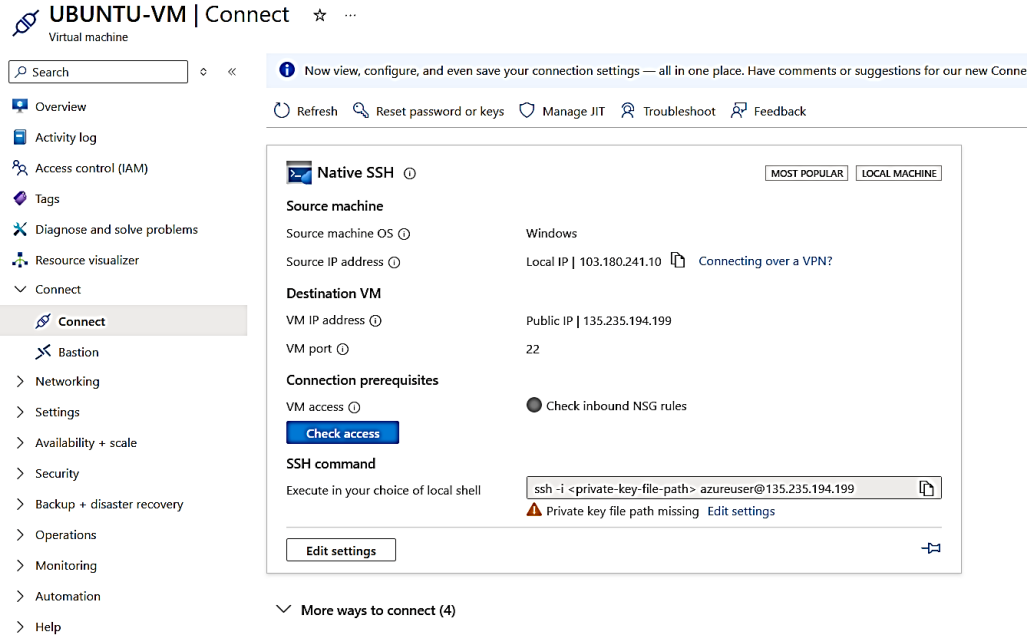
l. Key pair name: UBUNTU-VM_key

m. Select inbound ports: HTTP (80), SSH (22)



Step 3: Connect to the VM through SSH

After deployment, go to Home > Virtual Machines > Connect > SSH.

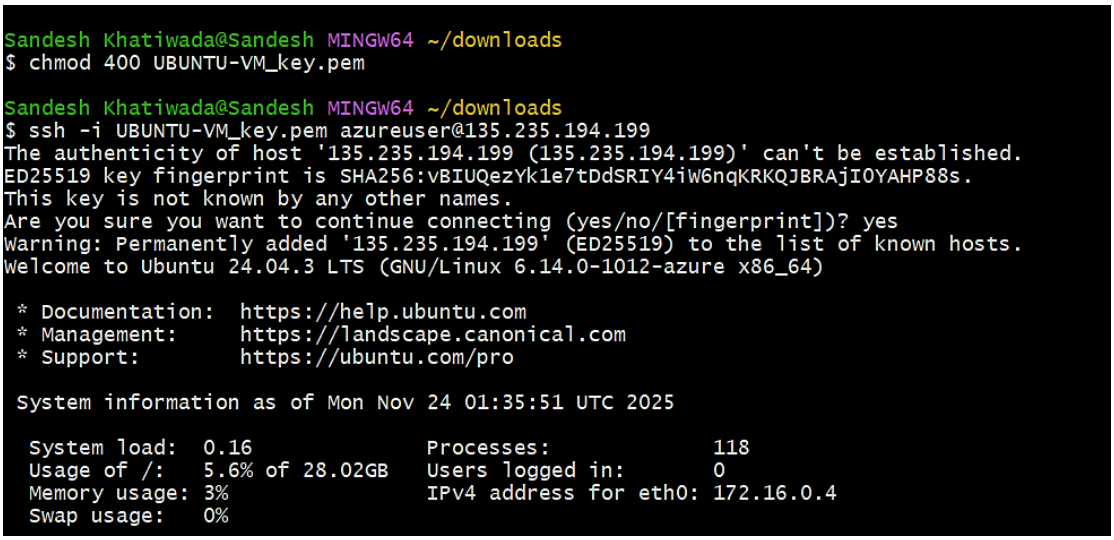


Copy the SSH command given in the portal > Open Git Bash on your PC > Navigate to .pem file.

Run the SSH command:

a. chmod 400 UBUBTU-VM_key.pem

b. ssh -i UBUNTU-VM_key.pem azureuser@135.235.194.199



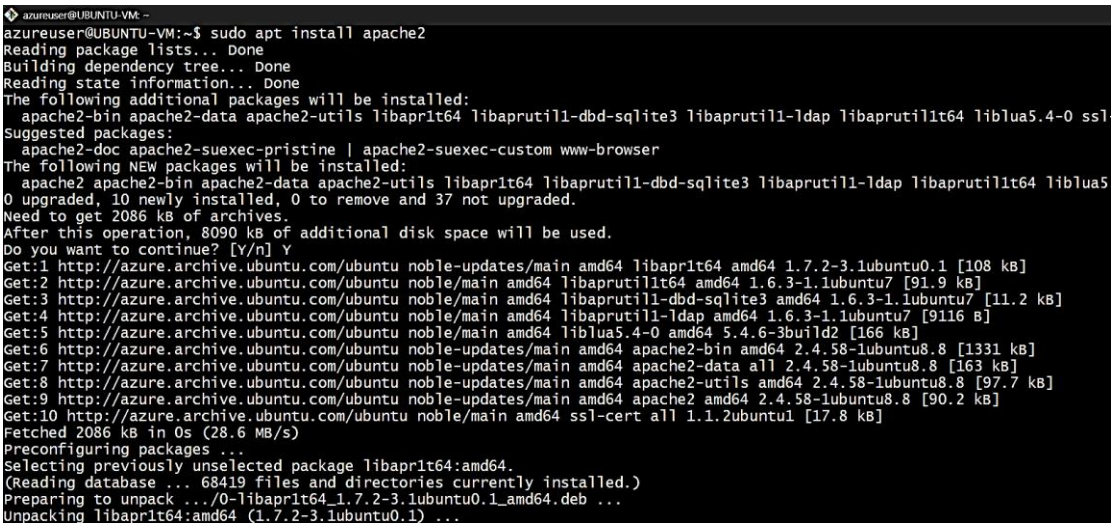
Step 4: Update Packages and Install Apache2

a. Inside the VM terminal:

b. Update package lists:

c. sudo apt update

d. Install Apache2:



e. systemctl status apache2

```
azureuser@UBUNTU-VM:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Mon 2025-11-24 01:44:57 UTC; 3min 17s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2743 (apache2)
      Tasks: 55 (limit: 9444)
     Memory: 5.2M (peak: 5.4M)
        CPU: 43ms
     CGroup: /system.slice/apache2.service
             ├─2743 /usr/sbin/apache2 -k start
             ├─2745 /usr/sbin/apache2 -k start
             └─2747 /usr/sbin/apache2 -k start

Nov 24 01:44:57 UBUNTU-VM systemd[1]: Starting apache2.service - The Apache HTTP Server...
Nov 24 01:44:57 UBUNTU-VM systemd[1]: Started apache2.service - The Apache HTTP Server.
azureuser@UBUNTU-VM:~$
```

f. sudo systemctl stop apache2

```
azureuser@UBUNTU-VM:~$ sudo systemctl stop apache2
azureuser@UBUNTU-VM:~$ sudo systemctl status apache2
○ apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: inactive (dead) since Mon 2025-11-24 01:49:13 UTC; 8s ago
   Duration: 4min 15.902s
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 3119 ExecStop=/usr/sbin/apachectl graceful-stop (code=exited, status=0/SUCCESS)
   Main PID: 2743 (code=exited, status=0/SUCCESS)
        CPU: 66ms

Nov 24 01:44:57 UBUNTU-VM systemd[1]: Starting apache2.service - The Apache HTTP Server...
Nov 24 01:44:57 UBUNTU-VM systemd[1]: Started apache2.service - The Apache HTTP Server.
Nov 24 01:49:13 UBUNTU-VM systemd[1]: Stopping apache2.service - The Apache HTTP Server...
Nov 24 01:49:13 UBUNTU-VM systemd[1]: apache2.service: Deactivated successfully.
Nov 24 01:49:13 UBUNTU-VM systemd[1]: Stopped apache2.service - The Apache HTTP Server.
azureuser@UBUNTU-VM:~$
```

g. sudo systemctl start apache2

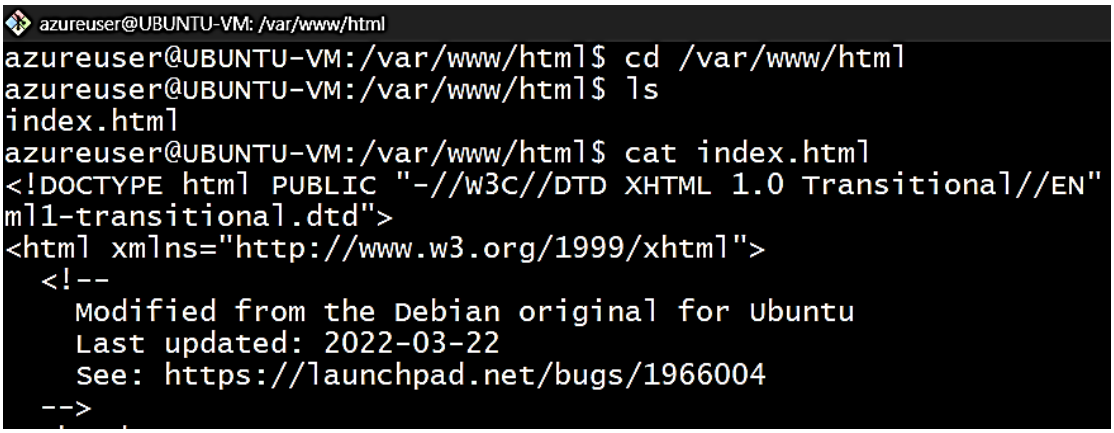
```
azureuser@UBUNTU-VM:~$ sudo systemctl start apache2
azureuser@UBUNTU-VM:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Mon 2025-11-24 01:50:22 UTC; 10s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 3136 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 3139 (apache2)
      Tasks: 55 (limit: 9444)
     Memory: 5.1M (peak: 5.5M)
        CPU: 29ms
     CGroup: /system.slice/apache2.service
             ├─3139 /usr/sbin/apache2 -k start
             ├─3141 /usr/sbin/apache2 -k start
             └─3142 /usr/sbin/apache2 -k start

Nov 24 01:50:22 UBUNTU-VM systemd[1]: Starting apache2.service - The Apache HTTP Server...
Nov 24 01:50:22 UBUNTU-VM systemd[1]: Started apache2.service - The Apache HTTP Server.
azureuser@UBUNTU-VM:~$
```

Step 5: Deploy Static Website

a. Navigate to the Apache web directory:

b. cd /var/www/html



c. Edit or replace the default index.html:

d. sudo nano index.html

e. Write any simple HTML content

f. Save and exit (Ctrl X, Y, Enter).

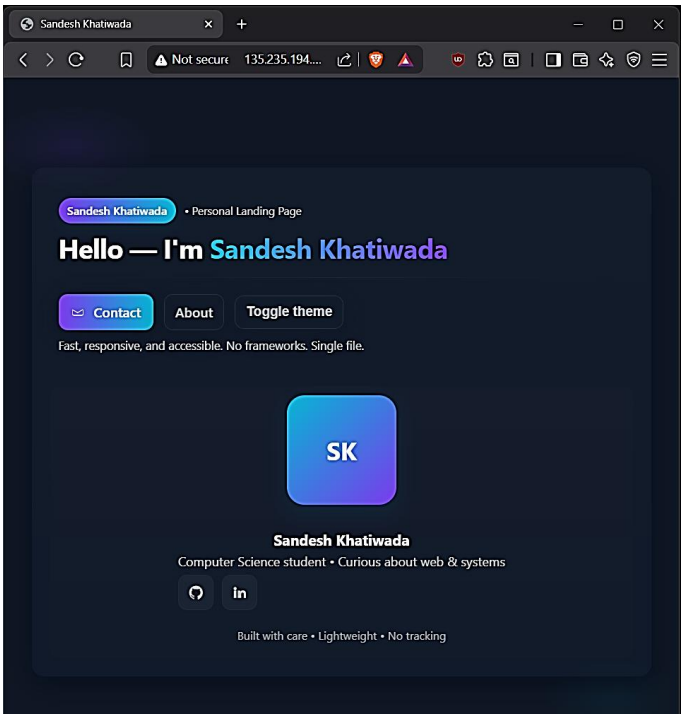
Step 6: Access the Website

a. Go back to the VM page in Azure.

b. Check Networking > Public IP or find the Primary NIC Public IP.

Operating system	: Linux (ubuntu 24.04)
Size	: Standard_B2as_v2
Primary NIC public IP	: 135.235.194.199
	1 associated public IPs

c. Open any browser and enter: http://135.235.194.199



Conclusion

In this lab, an Ubuntu Virtual Machine was successfully deployed in Microsoft Azure using the free-tier setup. The VM was accessed securely via SSH, and Apache2 was installed to host a basic static website. By replacing the default index.html, web content was served publicly through the VM's assigned public IP. This exercise demonstrates foundational cloud skills: VM provisioning, remote access, package installation, and basic web hosting.