

VARDHAMAN COLLEGE OF ENGINEERING (AUTONOMOUS)

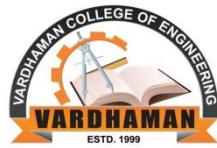
Affiliated to **JNTUH**, Approved by **AICTE**, Accredited by **NAAC** with **A++** Grade, **ISO 9001:2015** Certified
Kacharam, Shamshabad, Hyderabad - 501218, Telangana, India

www.vardhaman.org

DEPARTMENT OF **COMPUTER SCIENCE & ENGINEERING** **(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

LABORATORY RECORD

Registration Number	:	21881A66C7
Student Name	:	Vishal Chavan
Class / Semester	:	III B. TECH II
Course Name	:	Cloud Computing & Virtualization
Course Code	:	A7514
Academic Year	:	2023-24
Regulation	:	VCE-R21



VARDHAMAN COLLEGE OF ENGINEERING (AUTONOMOUS)

Affiliated to **JNTUH**, Approved by **AICTE**, Accredited by **NAAC** with **A++ Grade**, **ISO 9001:2015** Certified
Kacharam, Shamshabad - 501218, Telangana, India

www.vardhaman.org

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

CERTIFICATE

Certified that this is the bonafide record of practical work done by Mr. Vishal Chavan Roll Number 21881A66C7 of B.Tech III Year CSE(AI&ML) in the Cloud Computing & Virtualization laboratory during the year 2023-24.

Date:

HOD

Staff Incharge

Internal Examiner

External Examiner

1. Course Description:

Course Overview

This course provides a hands-on comprehensive study of Cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). In IaaS mainstream Cloud infrastructure services and related vendor solutions are covered in detail. The course also covers the Cloud migration and security model. Students will gain hands-on experience on virtual box and advanced open-source tools like Azure, Open stack and Eucalyptus. The major motto of this course is to not just stick with the academic portion but also to encourage students to pursue cloud certifications to brighten their future endeavours in IT sectors.

2. Course Outcomes (COs)

After the completion of the course, the student will be able to:

A7514.1 Demonstrate cloud services, architecture and layers in cloud environment.

A7514.2 Identify the cloud migration model and challenges of integration in cloud sectors.

A7514.3 Make use of virtualization concepts in cloud.

A7514.4 Select cloud storage, privacy approaches for efficient implementation of cloud.

A7514.5 Implement IaaS / PaaS service on a public cloud using any open-source tool.

INDEX

S.No	Date	Title of the Experiment	Page	Signature
1		Install the Virtual Box (or) a Malware work station and launch Linux Server	5	
2		Install a Virtual box (or) a Malware work station and launch Windows Server	12	
3		Create an instance in Virtual Machine & Launch Windows Server through Azure Portal.	14	
4		Launch Linux Server through Azure Portal.	17	
5		Create Ubuntu VM and run a python program in it.	21	
6		Perform scaling in Azure Portal.	22	
7		Implementing locks in Azure Portal.	24	
8		Create SSH tunnel between the host system and guest system and transfer files from local machine to Linux server (WinSCP).	26	
9		Setup and Configure Linux Server as Web Server in Azure Portal. (nginx web server).	28	
10		Setup and Configure Windows Server as Web Server in Azure Portal. (windows server IIS)	30	
11		Create Azure Storage Account, Container and upload and delete objects in it.	33	
12		Implement Object Replication in Azure.	38	
13		How we are adding new users, login credentials, changing owner, create authorized key files.	41	
14		Perform attach and detach of data disk to Windows Server in Azure data center.	42	
15		Perform attach and detach of data Linux Server in Azure data center.	46	
16		Implement static web hosting in Azure.	49	

Q1. Install Virtual box and making Ubuntu And Window Virtual Machine.

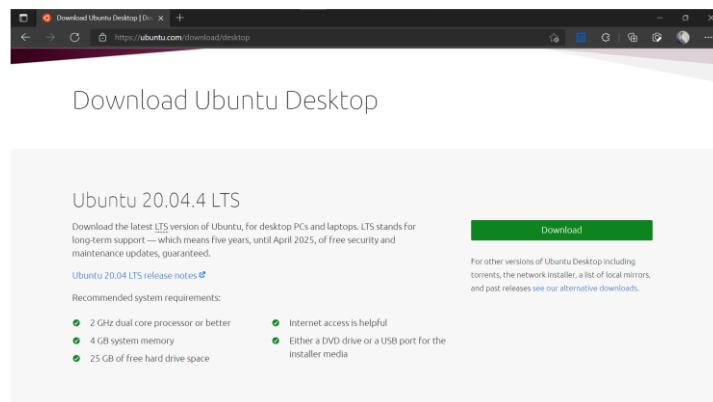
Ubuntu:

Step-1: Download VirtualBox for Windows and install it on your computer



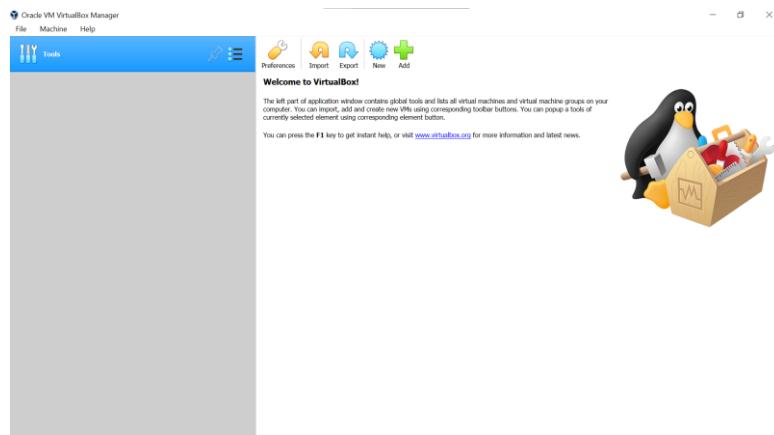
<https://www.virtualbox.org/wiki/Downloads>

Step-2: Download the Ubuntu ISO file you want to install from the Ubuntu download page.

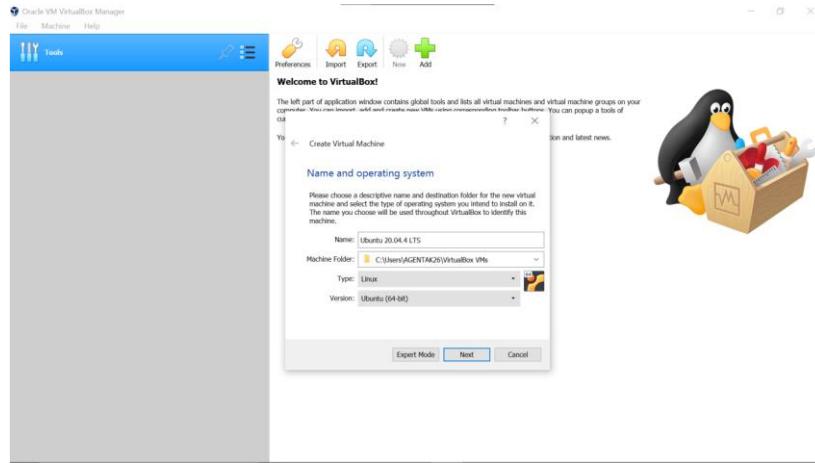


Note: The current version of Ubuntu only works on 64-bit machines.

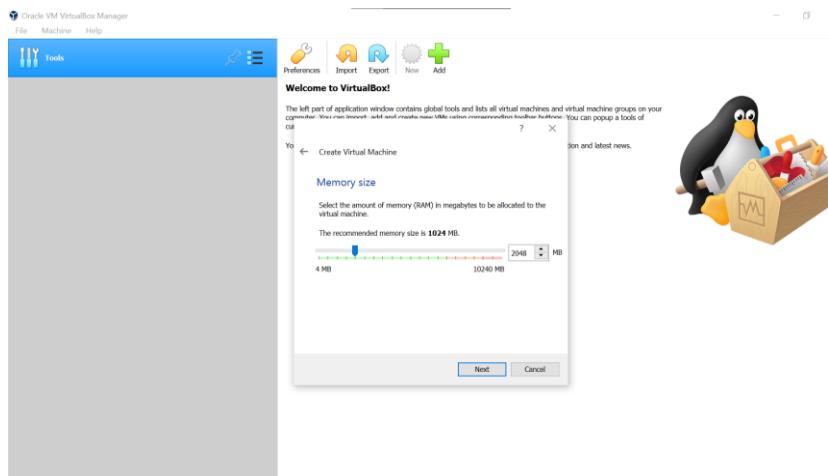
Step-3: Open VirtualBox and select New in the top taskbar.



Step-4: Give your VM a name, choose Linux as the Type, then choose Ubuntu as the Version and select Next.

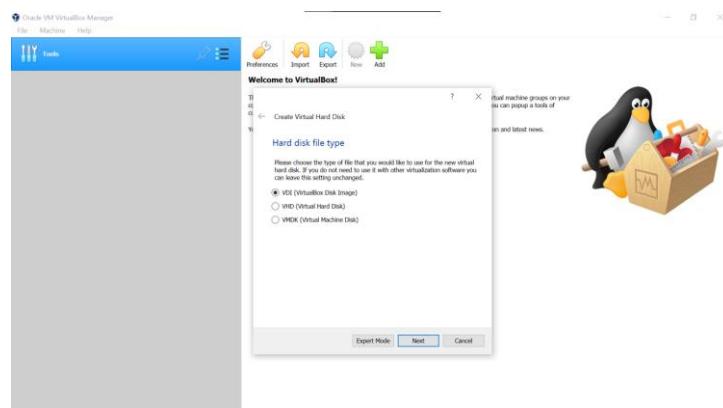


Step-5: Choose how much RAM you want to assign to the virtual machine and select Next. The recommended minimum is 1024 MB.



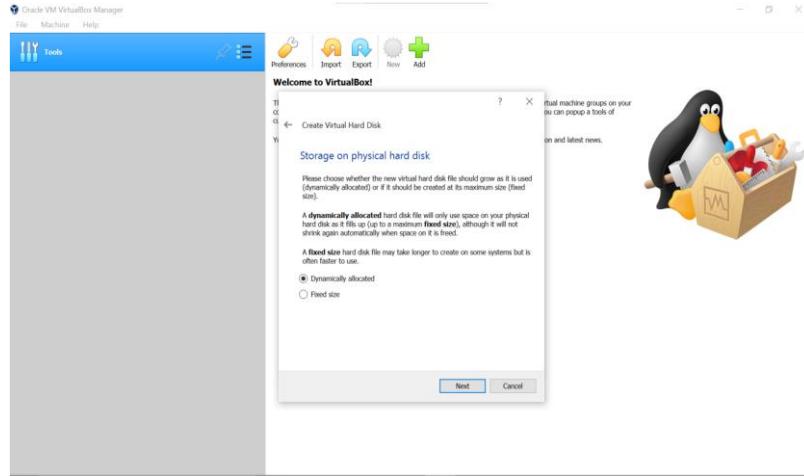
Step-6: Choose Create a virtual hard disk now and select Create.

Step-7: Choose VDI (VirtualBox Disk Image) and select Next.



Note on (VDI): Normally, Oracle VM VirtualBox uses its own container format for guest hard disks. This is called a Virtual Disk Image (VDI) file. This format is used when you create a new virtual machine with a new disk.

Step-8: Choose Dynamically allocated or Fixed size for the storage type and select Next.

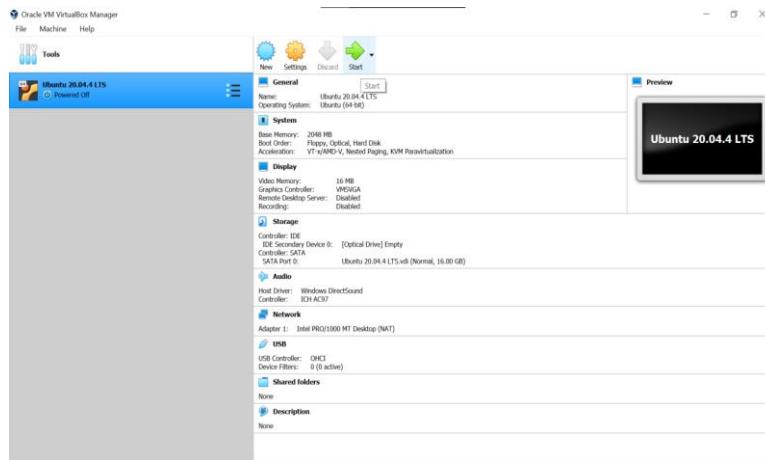


Tip: A fixed size disk performs better because the virtual machine doesn't have to increase the file size as you install software.

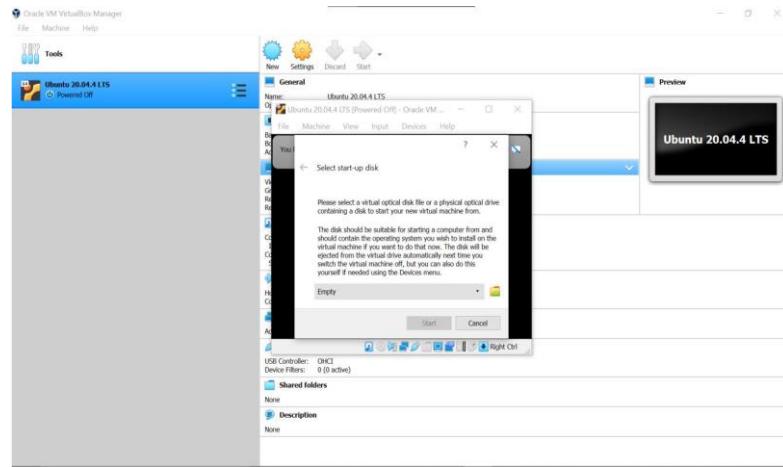
Step-9: Choose how much space you wish to set aside for Ubuntu and select Create.

Note: The amount of space you allocate for your virtual machine determines how much room you must install applications, so set aside a sample amount.

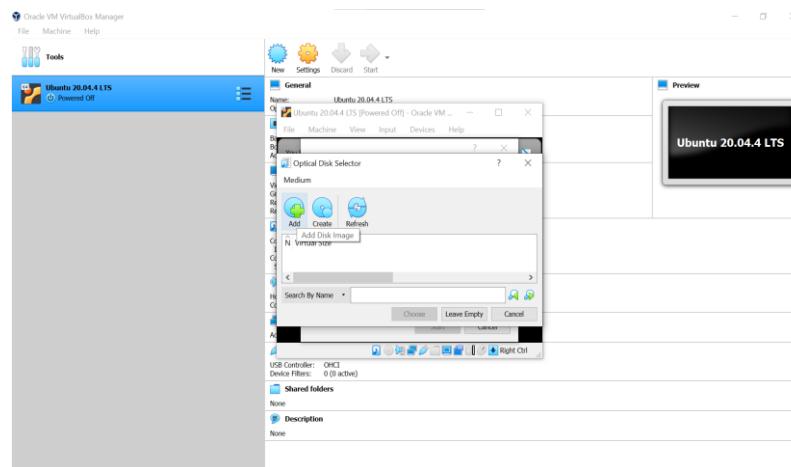
Step-10: The name of your virtual machine will now appear on the left side of the VirtualBox manager. Select Start in the toolbar to launch your VM.



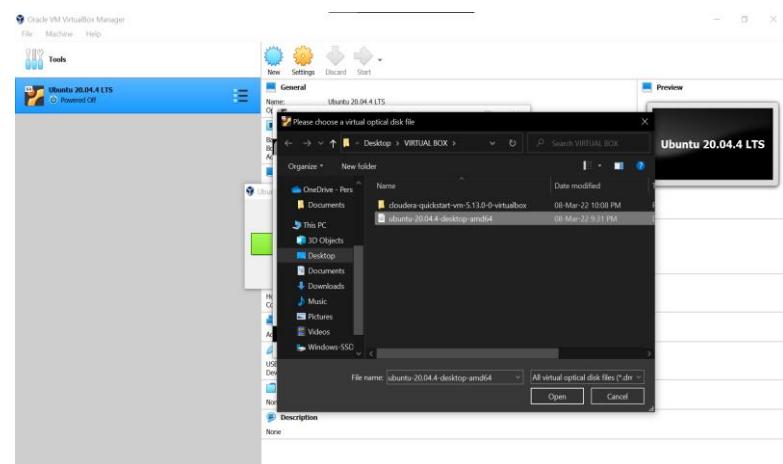
Step-11: This is the point where you need to choose the Ubuntu ISO file you downloaded earlier. If the VM doesn't automatically detect it, select the folder next to the Empty field.



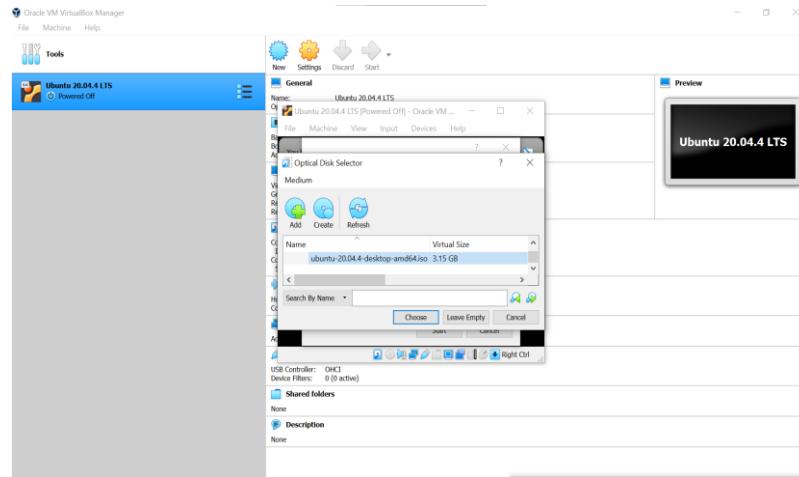
Step-12: Select Add in the window that pops up.



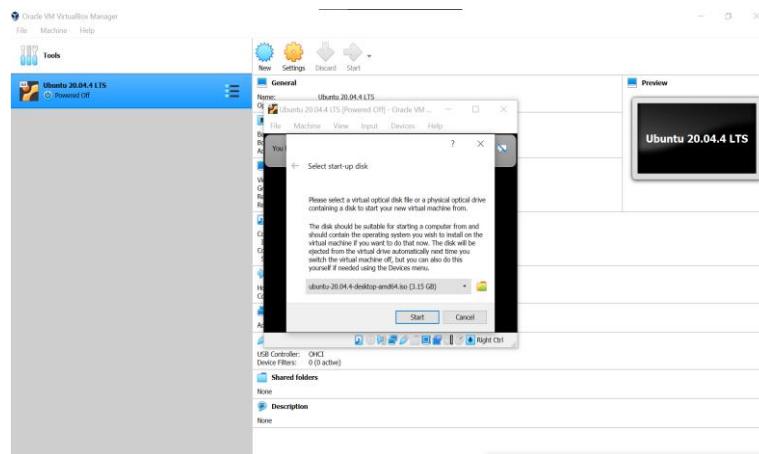
Step-13: Choose your Ubuntu disk image and select Open.



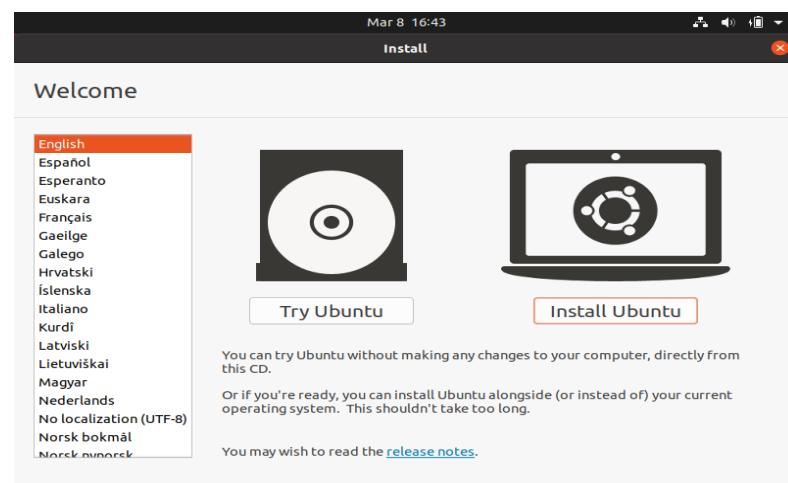
Step-14: - Select Choose



Step-15: Select Start.

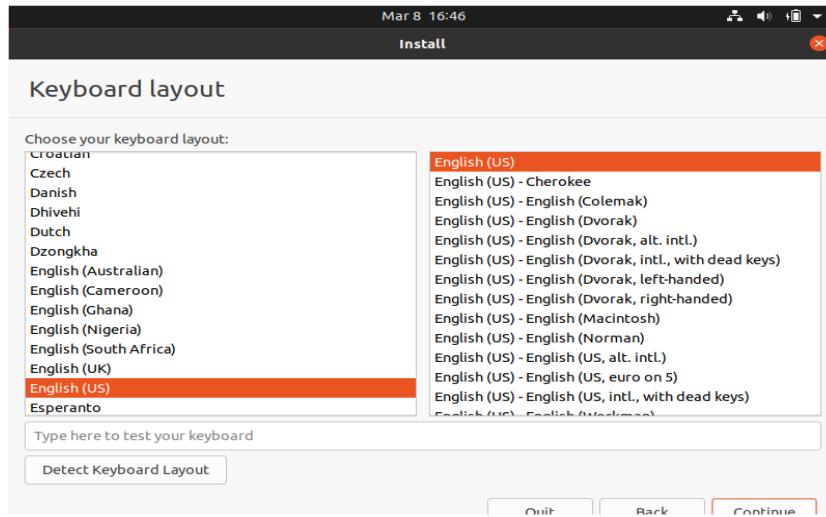


Step-16: Your VM will now boot into a live version of Ubuntu. Choose your language and select Install Ubuntu



u.

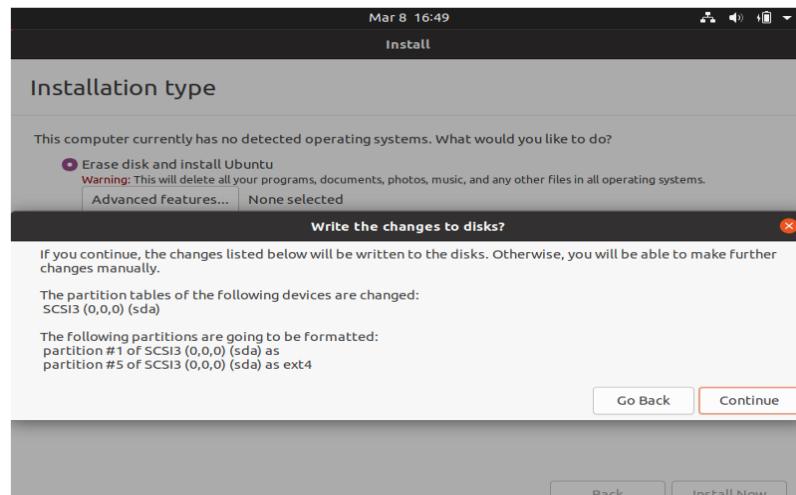
Step-17: Choose your keyboard layout and select Continue.



Step-18: Choose Normal installation or Minimal installation, then select Continue.

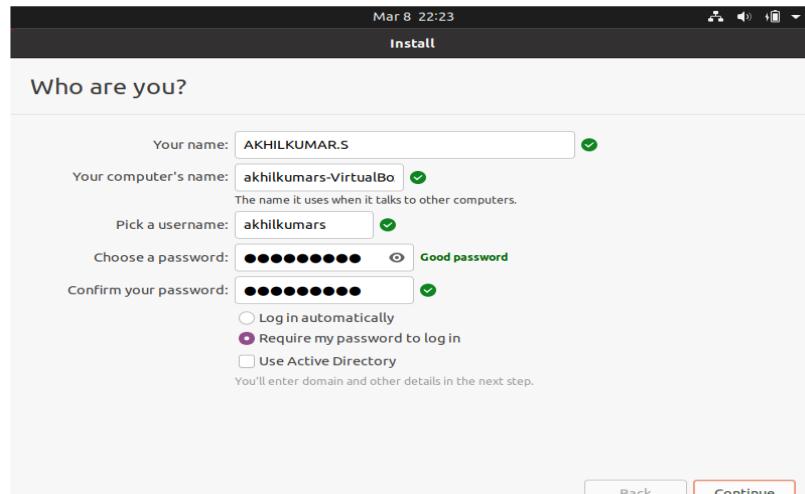
Step-19: Choose Erase disk and install Ubuntu and select Install Now, then select Continue to ignore the warning.

Note: This step will not erase your computer's physical hard drive; it only applies to the virtual machine.

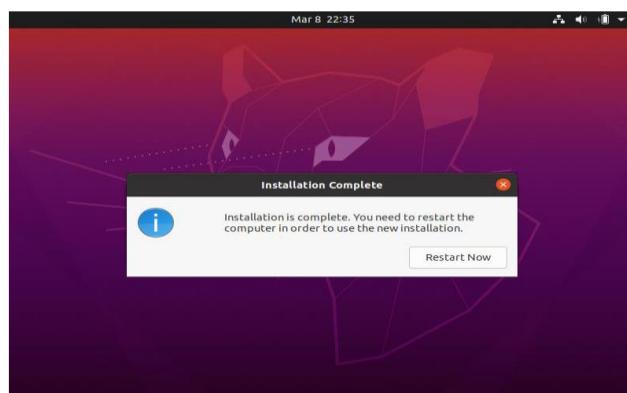


Step-20: - Choose your time zone on the map, then select Continue.

Step-21: - Set up your user account and select Continue.

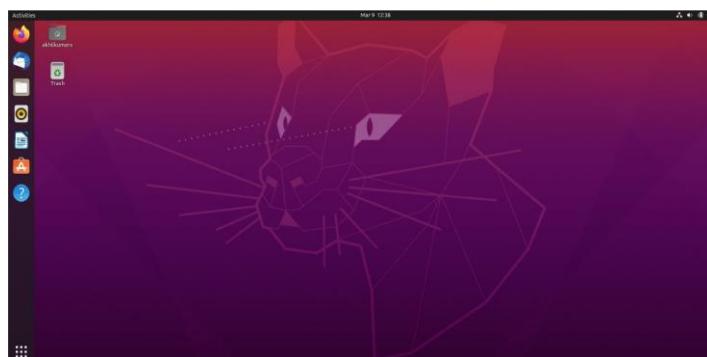


Step-22: - Select Restart Now.



Step-23: - After restarting your VM and booting into Ubuntu, you may notice that the desktop doesn't scale correctly if you choose to view it in full-screen mode. You can fix this problem by selecting the VBox_Gas icon to install VirtualBox Guest Additions.

Output:

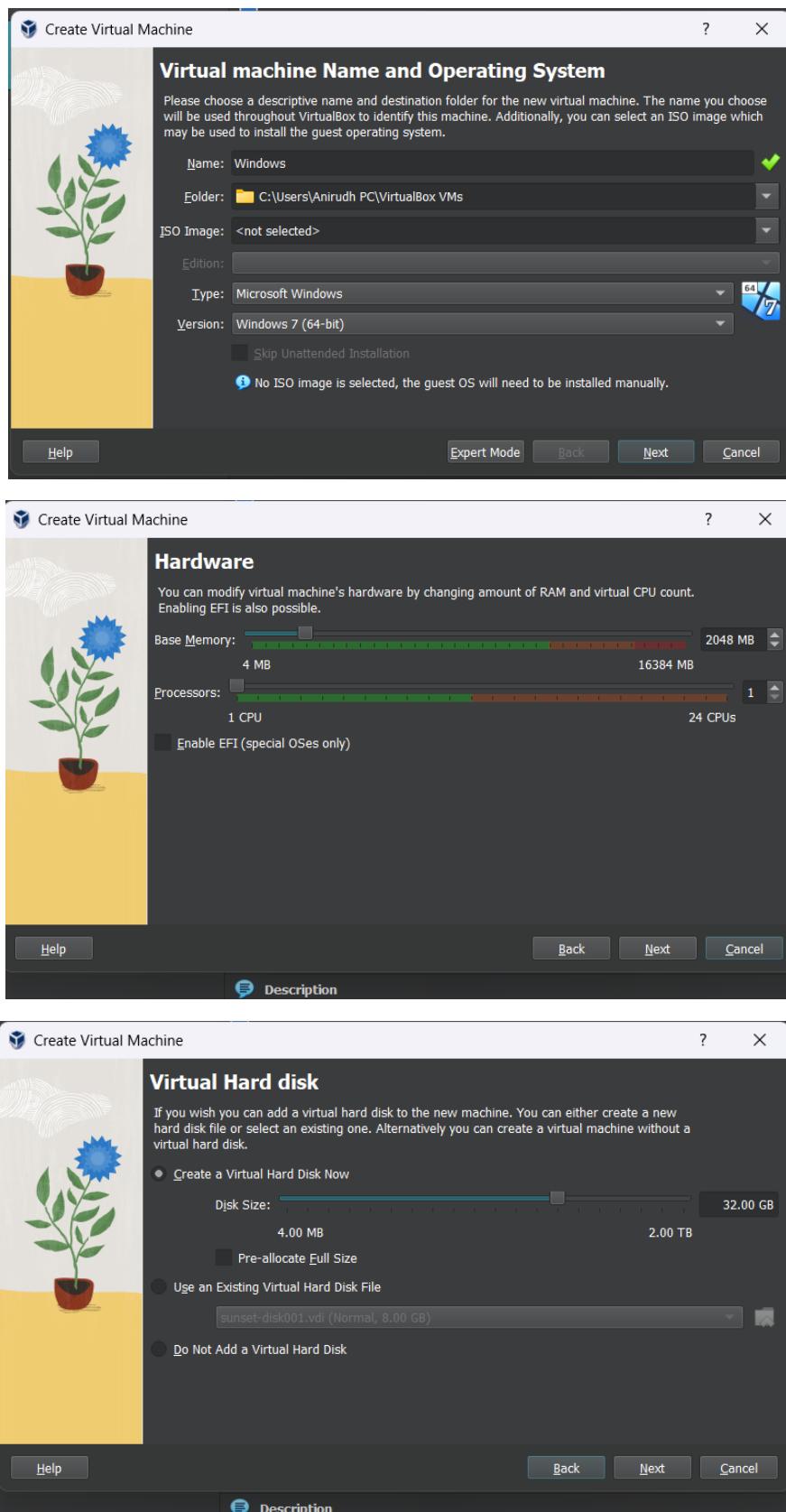


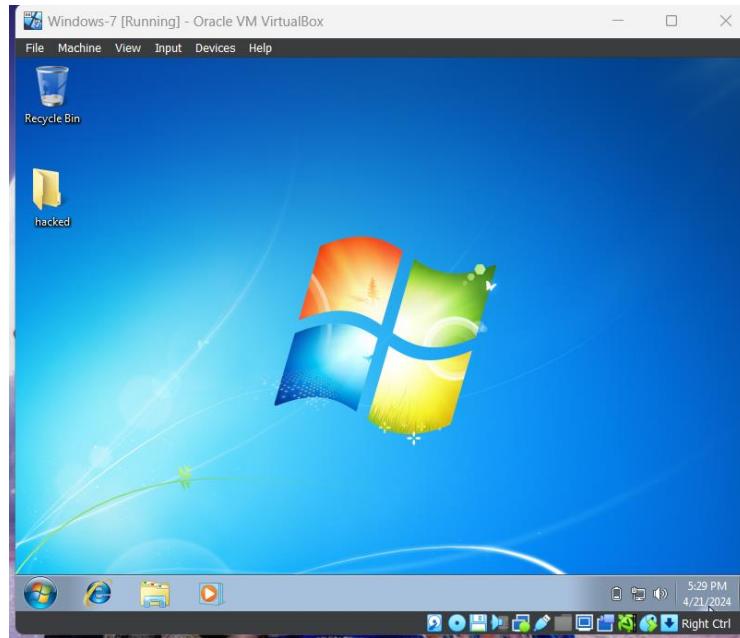
Result:

Successfully installed VirtualBox and launched a Linux server. The server was responsive, and basic operations were verified to ensure proper installation and functionality.

Q2) Install the Virtual Box (or) a Malware work station and launch Windows Server.

Similarly, Follow the same steps above to Build Windows Virtual Machine.



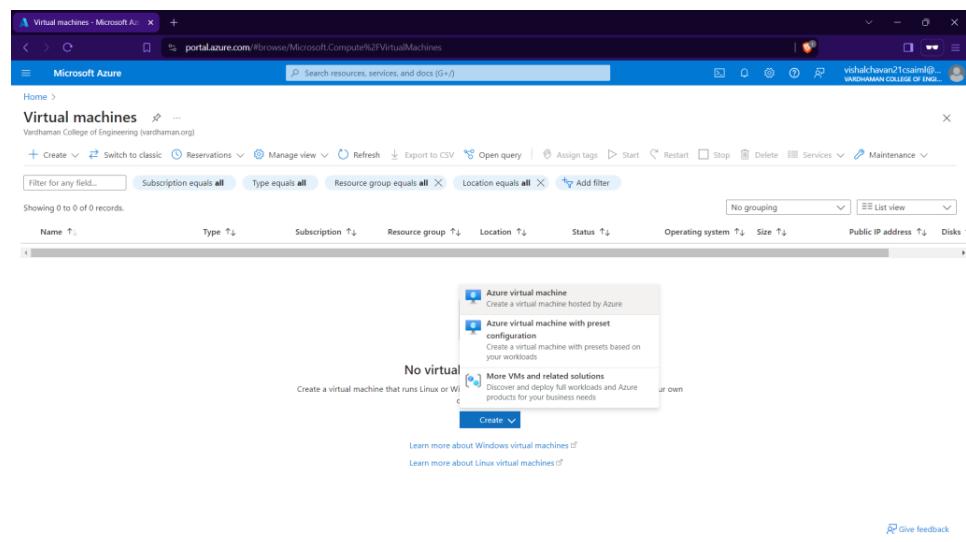
Output:**Result:**

VirtualBox installation was followed by launching a Windows server. The server ran smoothly, with all core services operational, confirming the successful setup of the Windows environment.

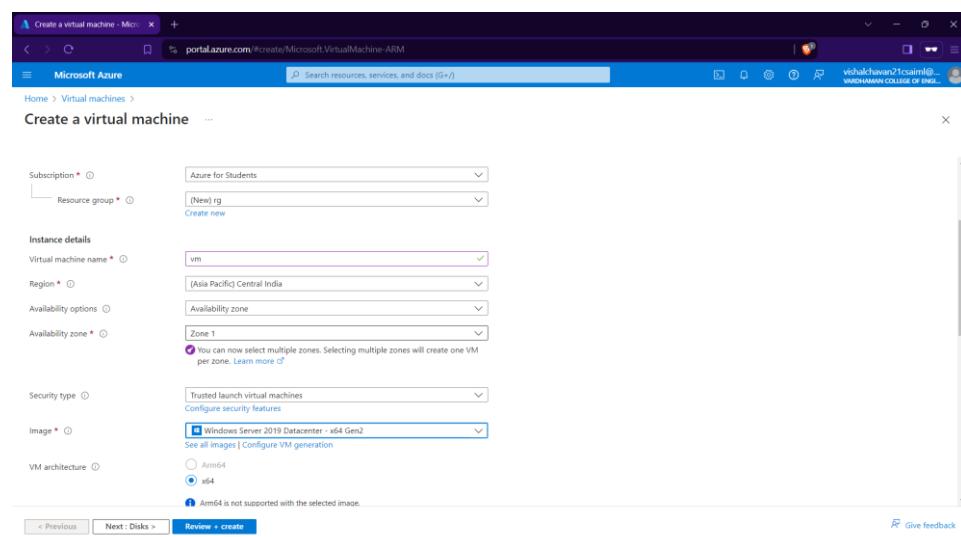
Q3) Create an instance in Virtual Machine & Launch Windows Server through Azure Portal.

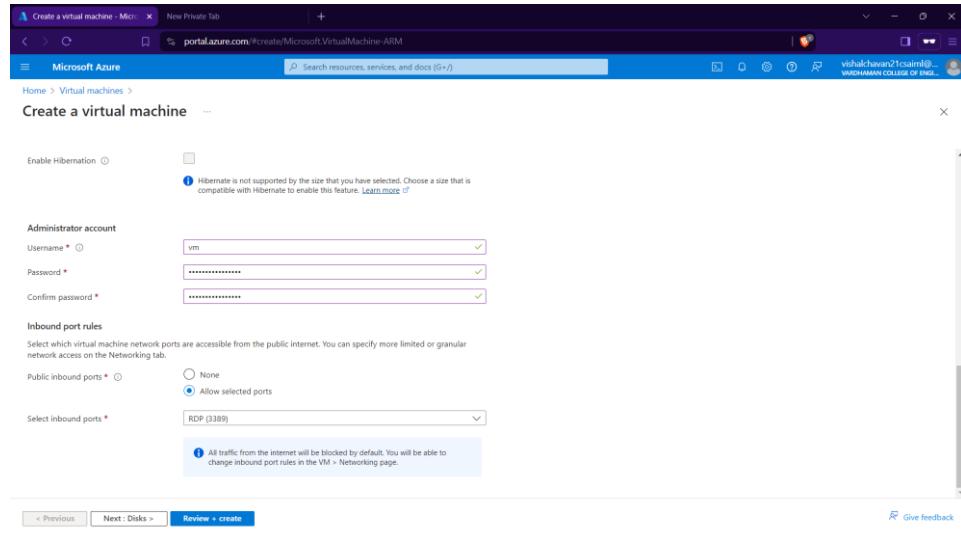
Step-1: Sign in to your Microsoft Azure account.

Step-2: Go To Virtual machine, and click on “Create” to create a window virtual machine.



Step-3: Fill the details in that window by creating a “Resource Group”, Zone: Asia, Image: window, Select the disk storage and so on. After that click on “Create + Review”. And Finally click on “Create”





Step-4: Firstly, copy the public IP Address of that created virtual machine.

Property	Value
Public IP address	20.40.42.2
Private IP address (IPv6)	-
Private IP address (IPv4)	10.0.0.4
Virtual network/subnet	vm-vnet/default
DNS name	Configure

Step-6: By using that copied IP Address open the window virtual machine through remote desktop connection.

Property	Value
Computer name	vm
Operating system	Windows
VM generation	V2
VM architecture	x64
Agent status	Not Ready
Agent version	Unknown
Subscription	Not assigned

Output:

**Result:**

Created a new virtual machine instance on the Azure portal and launched a Windows server. The server instance was up and running with no issues, and connectivity was confirmed through remote desktop access.

Q4) Launch Linux Server through Azure Portal.

Step-1: Sign in to your Microsoft Azure account.

Step-2: Go To Virtual machine, and click on “Create” to create a window virtual machine.

Step-3: Fill the details in that ubuntu by creating a “Resource Group”, Zone: Asia, Image: ubuntu, select “SSH”, Select the disk storage and so on. After that click on “Create + Review” and click on “Create” then download key and open resource group.

Administrator account

Authentication type SSH public key Password

Username *

SSH public key source

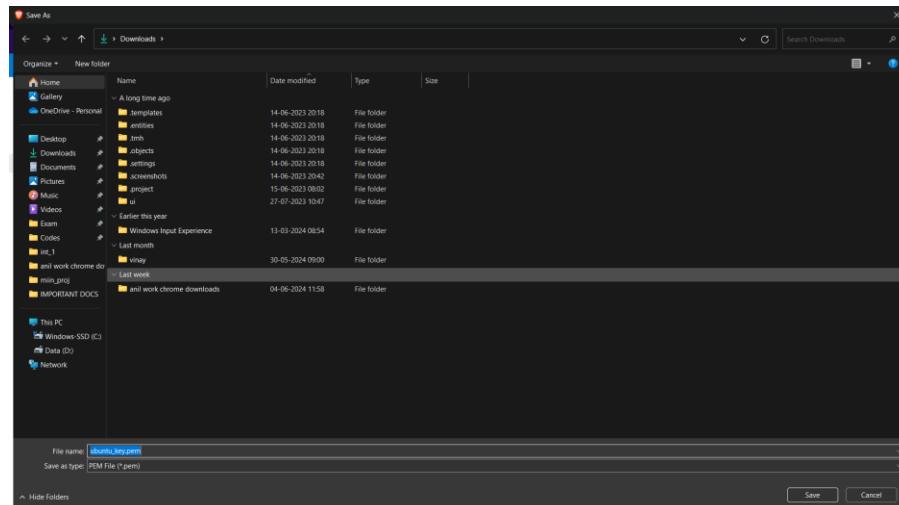
Key pair name *

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * None Allow selected ports

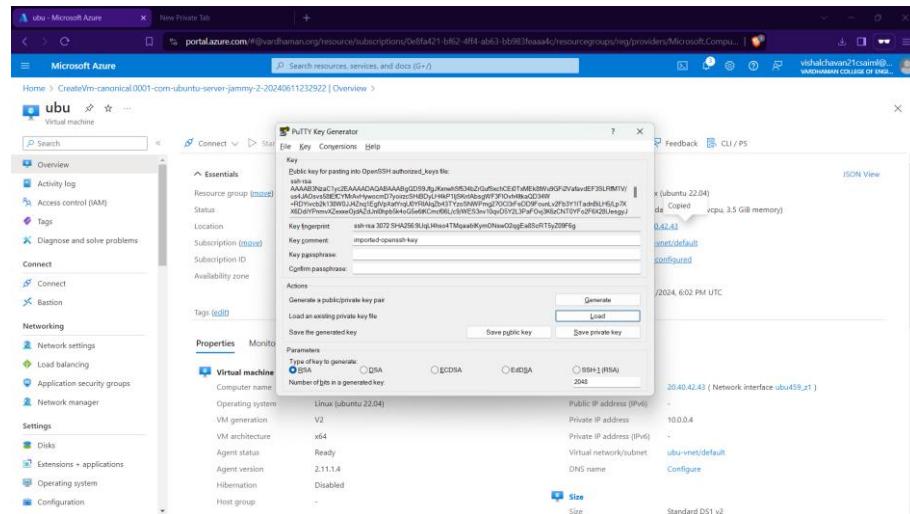
[< Previous](#) [Next : Disks >](#) [Review + create](#)



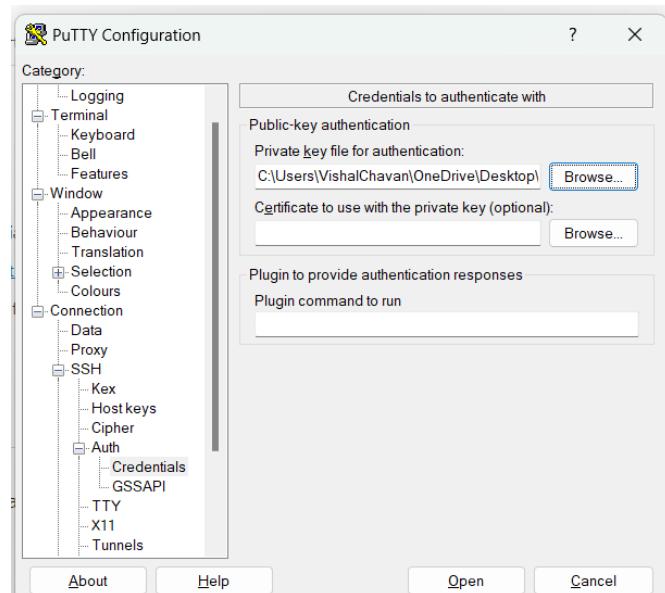
Step-5: Firstly, copy the public IP Address of that created virtual machine and after Deployment is over, Go to the remote desktop connection.

^ Essentials		JSI	
Resource group (move)	: reg	Operating system	: Linux (ubuntu 22.04)
Status	: Running	Size	: Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Location	: Central India (Zone 1)	Public IP address	: 20.40.42.43
Subscription (move)	: Azure for Students	Virtual network/subnet	: ubu-vnet/default
Subscription ID	: 0e8fa421-bf62-4ff4-ab63-bb983feaaa4c	DNS name	: Not configured
Availability zone	: 1	Health state	: -
		Time created	: 6/11/2024, 6:02 PM UTC

Step-6: Go to putty gen and click on load the key generator that you have downloaded.



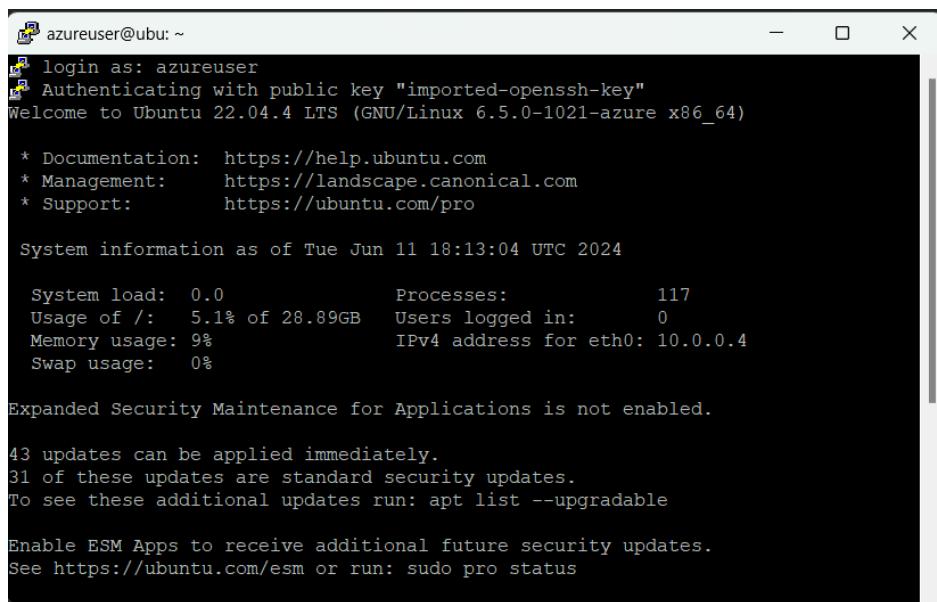
Step-7: In putty, put the Copied IP Adress into it, and then go to ssh->auth->credentials And the put the generated private key.



Step-8: A login page will be opened in that type your username and you will be into the ubuntu.

Step-9: After this delete its resource group and virtual machine.

Output:



```
azureuser@ubu: ~
login as: azureuser
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 6.5.0-1021-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

System information as of Tue Jun 11 18:13:04 UTC 2024

System load: 0.0          Processes:           117
Usage of /:   5.1% of 28.89GB  Users logged in:    0
Memory usage: 9%          IPv4 address for eth0: 10.0.0.4
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

43 updates can be applied immediately.
31 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
```

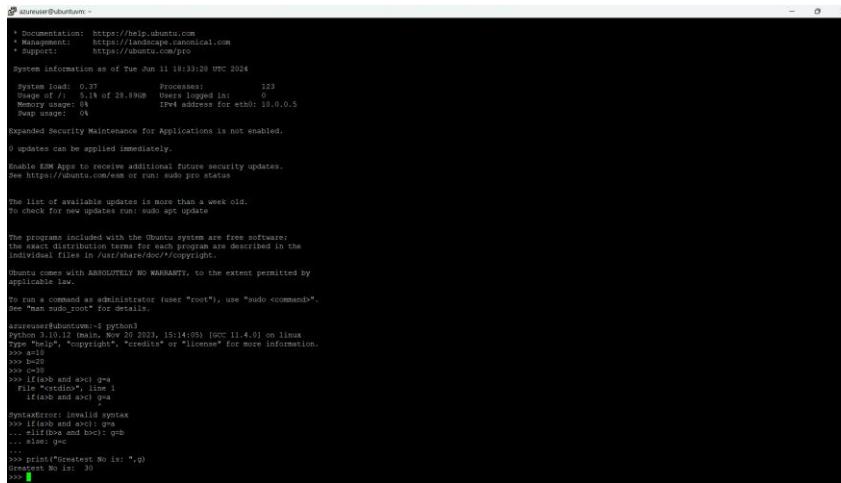
Result:

Launched a Linux server instance via the Azure portal. The server started without any hitches, and SSH access was established to perform basic system checks and updates.

Q5) Create Ubuntu VM and run a python program in it.

Step-1: Create a ubuntu virtual machine using SSH key same as previous experiment.

Step-2: Login with your username and type python3, write your python program and execute it.



```

alireza@UbuntuVM: ~
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/p/o

System information as of Tue Jun 11 10:33:20 UTC 2024
System load: 0.37      Processes:           123
Usage of /: 5.1% of 28.96GB   Users logged in: 0
Memory usage: 184MB          IPv4 address for eth0: 19.6.0.5
Swap usage: 0B

Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.

Ubuntu 24.04 LTS is ready to receive additional future security updates.
See https://ubuntu.com/mem or run: sudo apt update

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual copyright headers in /usr/share/doc/*copyright*.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

alireza@UbuntuVM:~$ python3
Python 3.10.12 (main, Nov 20 2023, 15:14:05) (GCC 11.4.0) on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> b=20
>>> a=10
>>> if(a>b) g=a
    File "<stdin>", line 1
      if(a>b) g=a
      ^
SyntaxError: invalid syntax
>>> elif(b>a): g=b
...     else: g=c
...
>>> print("Greatest No is: ",g)
>>> ^Z
>>> ^C

```

Result:

With this we are able to run a python program in the Virtual Machine.

Q6) Create a Virtual machine and do scale up in Azure.

Step-1: Create a virtual machine (ubuntu or windows).

Step-2: After deployment of VM stop VM for scaling.

Step-3: On the left side there will be settings and click on disks.

Step-4: click on disk name and select your preferred size, save it.

Size	Disk tier	Provisioned IOPS	Provisioned throughput	Max Shares	Max burst IOPS	Max burst throughput
4 GB	P1	120	25	3	3500	170
8 GB	P2	120	25	3	3500	170
16 GB	P3	120	25	3	3500	170
32 GB	P4	120	25	3	3500	170
64 GB	P6	240	50	3	3500	170
128 GB	P10	500	100	3	3500	170
256 GB	P15	1100	125	3	3500	170
512 GB	P20	2300	150	3	3500	170
1024 GB	P30	5000	200	5	-	-
2048 GB	P40	7500	250	5	-	-
4096 GB	P50	7500	250	5	-	-
8192 GB	P60	16000	500	10	-	-
16384 GB	P70	18000	750	10	-	-
32767 GB	P80	20000	900	10	-	-

Step-5: On the left side there will be select + performance and click on size then click on disk name and select your preferred ram size, save it.

VM Size	Type	VCPUs	RAM (GB)	Data disks	Max IOPS	Local storage (GB)
D1s v2	General purpose	1	3.5	4	3200	7 (SCSI)
D2s v3	General purpose	2	8	4	3200	16 (SCSI)
D2s v4	General purpose	2	8	4	3200	16 (SCSI)
D3s v2	General purpose	2	7	8	6400	14 (SCSI)
D4s v3	General purpose	4	16	8	6400	32 (SCSI)
D5s v2	General purpose	4	14	16	12800	28 (SCSI)

Result:

Conducted scaling operations in Azure Portal, successfully increasing and decreasing the number of virtual machine instances. The scaling process was seamless, with new instances provisioning correctly and load distribution verified.

Q7) Create a Virtual machine and do lock for VM in AZURE.

Step-1: Create a virtual machine (ubuntu or windows).

The screenshot shows the Microsoft Azure portal interface. On the left, there is a sidebar with various settings like Disks, Extensions + applications, Operating system, Configuration, Advisor recommendations, Properties, and Locks. The Locks option is currently selected. The main content area shows the 'vm' virtual machine's overview. It includes sections for Essentials, Properties, Networking, and Size. The 'Essentials' section provides detailed information about the VM, such as its resource group (NetworkWatcherRG), status (Stopped (deallocated)), location (Central India (Zone 1)), subscription (Azure for Students), and creation date (6/11/2024, 6:16 PM UTC). The 'Networking' section shows its public and private IP addresses and the virtual network it is connected to. The 'Size' section indicates it is using Standard D2s v3.

Step-2: On the left side there will be settings and click on locks, give lock name and select lock type.

The screenshot shows the Microsoft Azure portal with the 'Locks' section selected in the sidebar. A modal dialog box titled 'Add lock' is open. It has fields for 'Lock name' (containing 'lk') and 'Lock type' (set to 'Read-only'). There is also a 'Notes' field and 'OK' and 'Cancel' buttons at the bottom. The background shows the same 'vm' virtual machine overview as the previous screenshot.

Step-3: click on ok.

Similarly, you can do for Resource group and subscriptions.

The screenshot shows two consecutive screenshots of the Microsoft Azure portal interface, specifically within the NetworkWatcherRG resource group.

Screenshot 1: Adding a Lock

- The top part shows the "Add lock" dialog box. It has fields for "Lock name" (containing "rk") and "Lock type" (set to "Read-only"). Below these are "Scope" and "Notes" fields, both currently empty.
- At the bottom right of the dialog are "OK" and "Cancel" buttons.

Screenshot 2: List of Locks

- The bottom part shows the list of locks in the "NetworkWatcherRG | Locks" blade.
- The table has columns: Lock name, Lock type, Scope, and Notes.
- There are two entries in the list:

 - The first entry has "lk" in the Lock name column, "Read-only" in the Lock type column, and "vm" in the Scope column.
 - The second entry has "rk" in the Lock name column, "Read-only" in the Lock type column, and "NetworkWatcherRG" in the Scope column.

- Each row has an "Edit" and a "Delete" button at the end.

Result:

Implemented resource locks in the Azure portal to prevent accidental deletion or modification of critical resources. The locks were tested and effectively restricted changes, ensuring resource protection.

Q8) Create SSH tunnel between the host system and guest system and transfer files from local machine to Linux server (WinSCP).

Step-1: Create a ubuntu virtual machine using SSH as previous experiment and copy public IP address.

ubuntuvm - Microsoft Azure

ubuntuvm Virtual machine

Essentials

- Resource group: NetworkWatcherRG
- Status: Running
- Location: Central India (Zone 1)
- Subscription: Azure for Students
- Subscription ID: 0e8fa421-bf62-4ff4-ab63-bb983fea4c
- Availability zone: 1
- Operating system: Linux (Ubuntu 22.04)
- Size: Standard_B1ms_v2 (3.5 GB memory)
- Public IP address: 20.40.41.52
- Virtual network/subnet: vm-net/default
- DNS name: Not configured
- Health state: Good
- Time created: 6/11/2024, 6:31 PM UTC

Networking

Public IP address	20.40.41.52 (Network interface ubuntuvm549_r1)
Public IP address (IPv6)	-
Private IP address	10.0.0.5
Private IP address (IPv6)	-
Virtual network/subnet	vm-net/default
DNS name	Configure

Step-2: Login into your ubuntu VM using PUTTY and type ls command as you can see nothing.

```

azureuser@ubuntuvm: ~
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

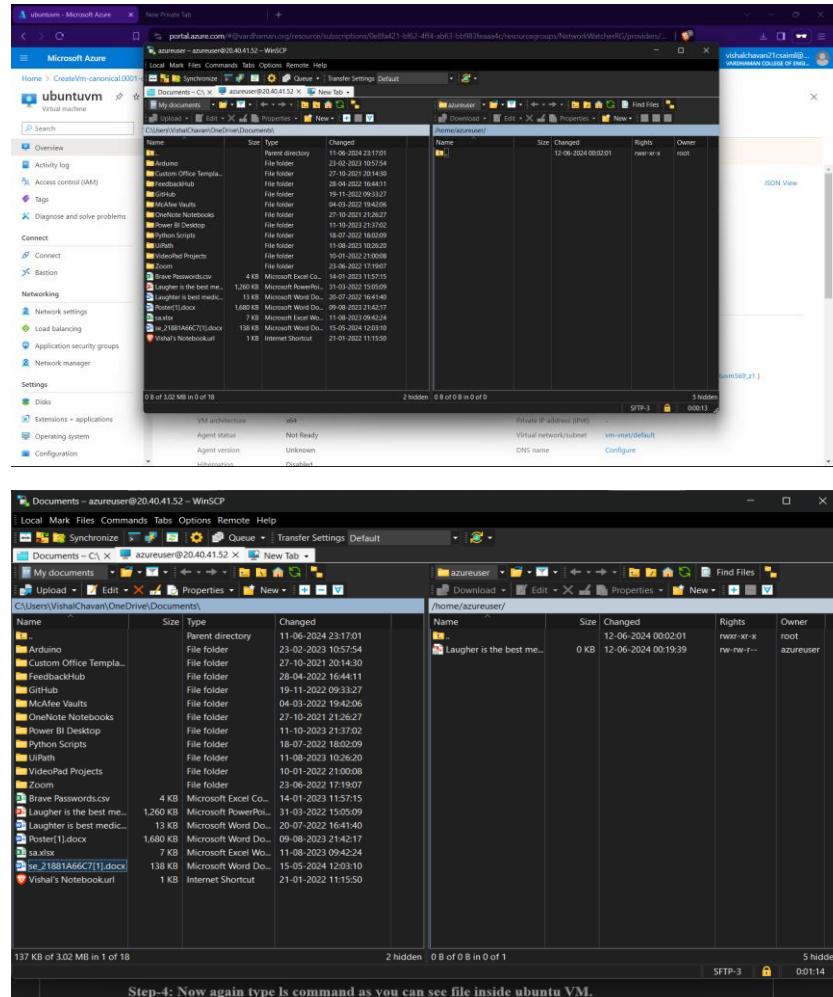
azureuser@ubuntuvm:~$ python3
Python 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> a=10
>>> b=20
>>> c=30
>>> if(a>b and a>c) g=a
  File "<stdin>", line 1
    if(a>b and a>c) g=a
      ^
SyntaxError: invalid syntax
>>> if(a>b and a>c): g=a
... elif(b>a and b>c): g=b
... else: g=c
...
>>> print("Greatest No is: ",g)
Greatest No is:  30
>>>
[1]+  Stopped                  python3
azureuser@ubuntuvm:~$ ls
azureuser@ubuntuvm:~$ 

```

Step-3: Open WinScp at right bottom you can see Advanced option->SSH->Authentication->In that drag private key file and click on ok.

At last Login into your account using public IP address and username in WinScp.

Now, you can drag your files from your desktop to ubuntu VM in WinScp.



Step-4: Now again type ls command as you can see file inside ubuntu VM.

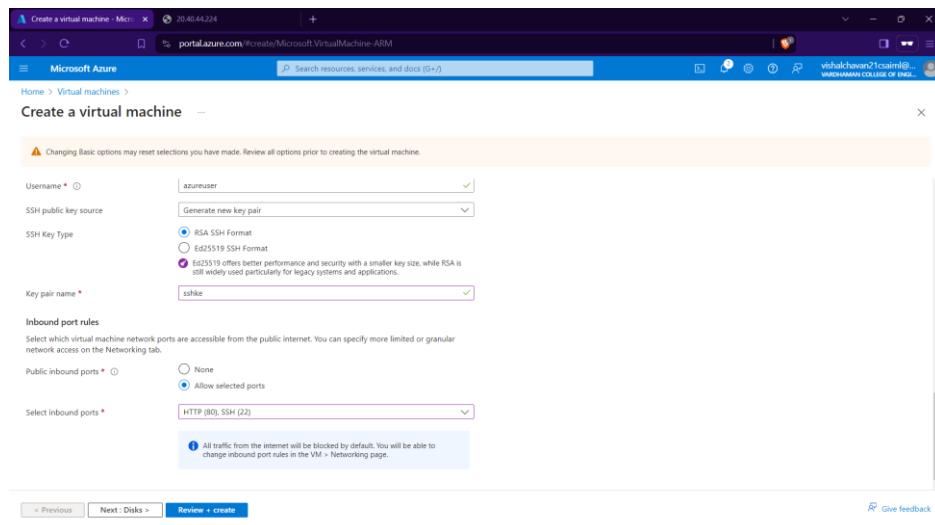
```

azuser@ubuntuvm:~$ python3
Python 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> a=10
>>> b=20
>>> c=30
>>> if(a>b and a>c) g=a
      File "<stdin>", line 1
        if(a>b and a>c) g=a
          ^
SyntaxError: invalid syntax
>>> if(a>b and a>c): g=a
... elif(b>a and b>c): g=b
... else: g=c
...
>>> print("Greatest No is: ",g)
Greatest No is:  30
>>>
[1]+  Stopped                  python3
azuser@ubuntuvm:~$ ls
azuser@ubuntuvm:~$ ls
azuser@ubuntuvm:~$ ls
'Laugher is the best medicine.pptx.filepart'
azuser@ubuntuvm:~$ 
```

Result: Established an SSH tunnel between the host and guest systems and successfully transferred files using WinSCP. The file transfer was smooth and error-free, confirming a secure and functional connection.

Q9) Setup and Configure Linux Server as Web Server in Azure Portal. (nginx web server)

Step-1: Create a ubuntu virtual machine using SSH and enable HTTP port as well, as previous experiment and copy public IP address.



Step-2: Login into your Ubuntu VM using your username and type the following commands.
\$sudo su

\$sudo apt-get update

After typing the two command, now install web server using the below command

\$sudo apt-get install nginx

After installing in VM, paste the public ip address in desktop browser and you can see.



Step-3: To remove following information and keep new information in that page type the following command and refresh the browser page.

\$cd /var/www/html

```
$rm index.nginx-debian.html
$echo "Welcome to CSM ">index.html
```

```
root@ub:/var/www/html
Setting up libgd3:amd64 (2.3.0-2ubuntu2) ...
Setting up libnginx-mod-http-image-filter (1.18.0-6ubuntu14.4) ...
Setting up nginx-core (1.18.0-6ubuntu14.4) ...
  * Upgrading binary nginx [ OK ]
Setting up nginx (1.18.0-6ubuntu14.4) ...
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.7) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ub:/home/azureuser# cd /var/www/html
root@ub:/var/www/html# rm index.nginx-debian.html
root@ub:/var/www/html# echo "Welcome Vishal!" > index.html
root@ub:/var/www/html#
```

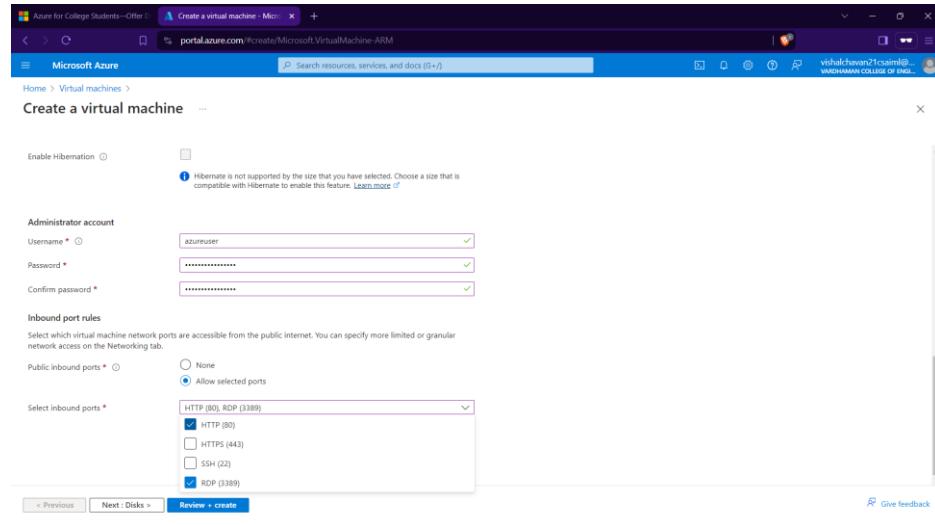


Result:

Configured a nginx web server on a Linux server in Azure. The web server was tested and found to be serving web pages correctly, confirming successful setup and configuration.

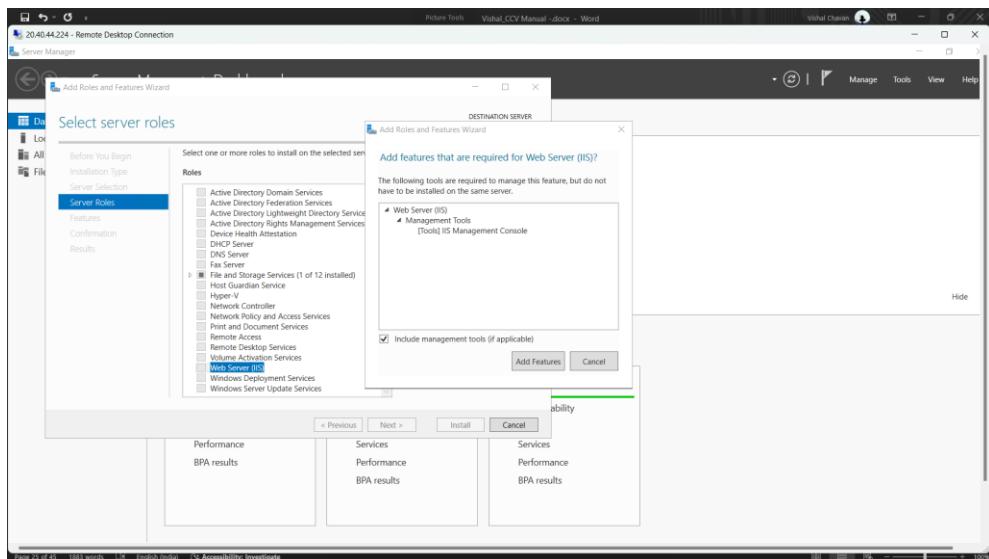
Q10) Setup and configure AZURE web server for windows server(IIS).

Step-1: Create VM with Rdp and Http port enable and login windows VM same as previous experiment and copy public IP address.

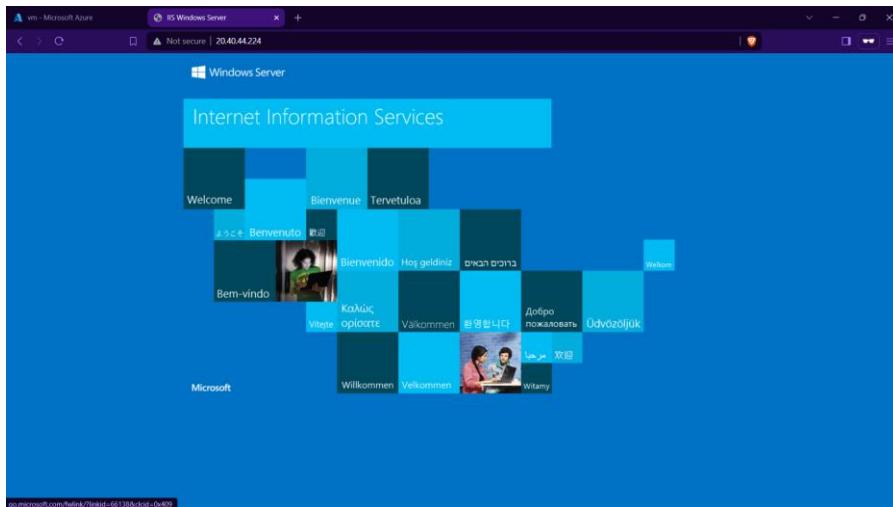


Step-2: When remote desktop will start(windows vm) you can see there will be Sever Manager will be opened and in that you can see Configure this local server , Click on “Add roles and features”.

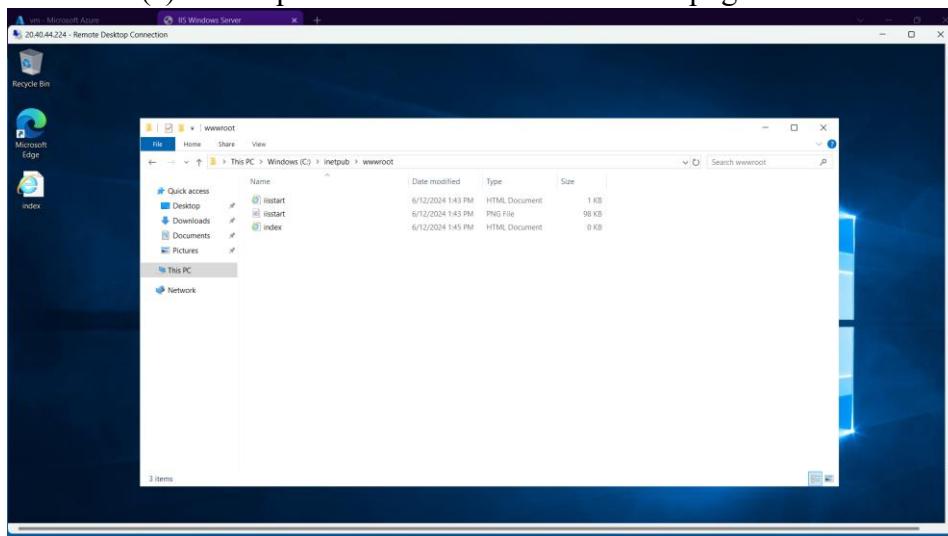
Step-3: Click on next, next and in Server Roles select Web Server(IIS) click on add feature ,click on next, next till you can get install button and click on install .



Step-4: paste the public ip address in desktop browser and you can see.



Now to remove this all information first of all create index.html in desktop and that should paste in the specified location of remote desktop VM that is ThisPC->windows(c)->inetup->wwwroot and remove iistart.png.



Step-5: Refresh the browser page.

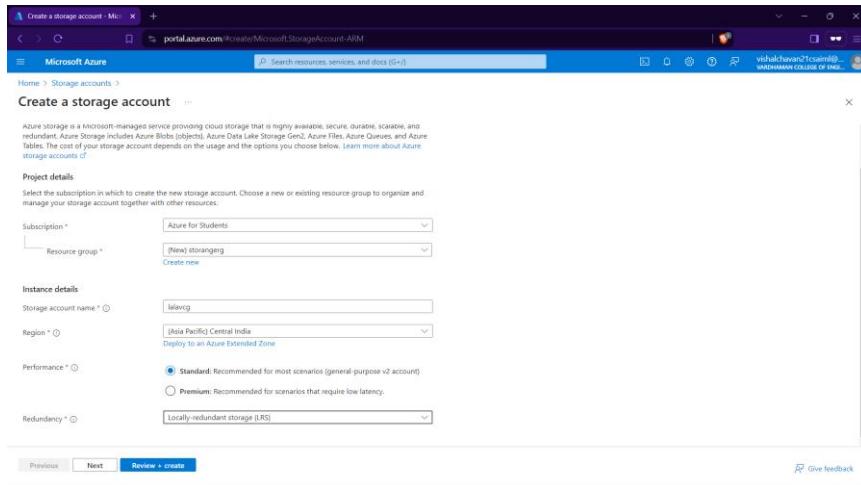


Result:

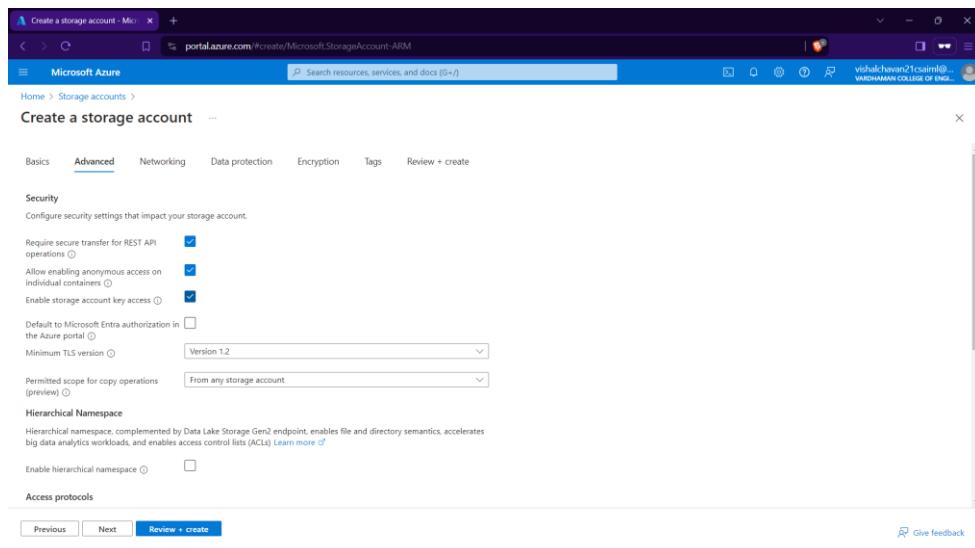
Set up and configured an web server on a Windows server in Azure. The server was operational, and web pages were accessible, indicating a successful configuration.

Q11) Create Azure Storage Account, Container and upload and delete objects in it.

Step-1: Click On Storage Account and Create one and select redundancy as GRS/LRS.



Step-2: Go to advance and Allow enabling anonymous access on individual containers.



Step-3: After deployment Click on go to resource group and on Left Click on Containers and Create it with anonymous access level as blob(anonymous read access to blob only)

New container

Name * con1

Anonymous access level Blob (anonymous read access for blobs only)

Advanced

Encryption scope Select from existing account scopes

Use this encryption scope for all blobs in the container

Enable version-level immutability support In order to enable version-level immutability support, your storage account must have versioning turned on.

Step-4: Then open new container , click on upload and upload a file from desktop.

Upload blob

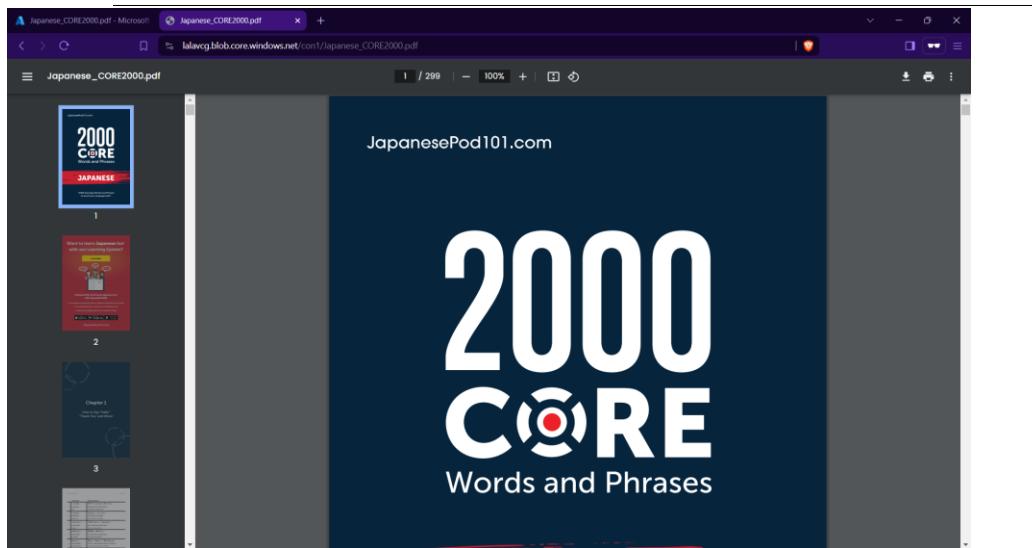
Drag and drop files here or Browse for files

Advanced

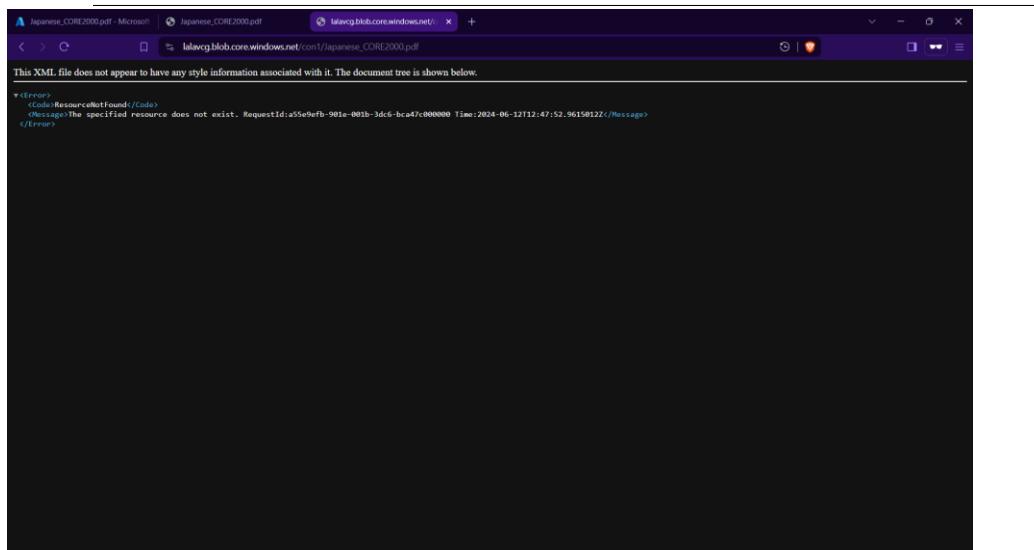
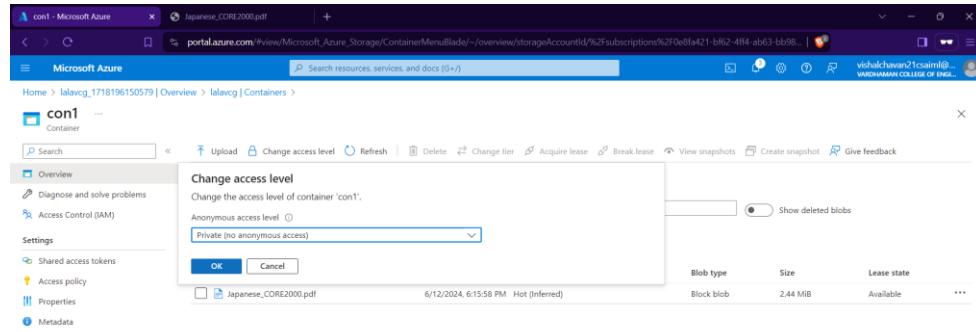
Overwrite if files already exist

Step-5: Select the file and click on provided URL to open the file.

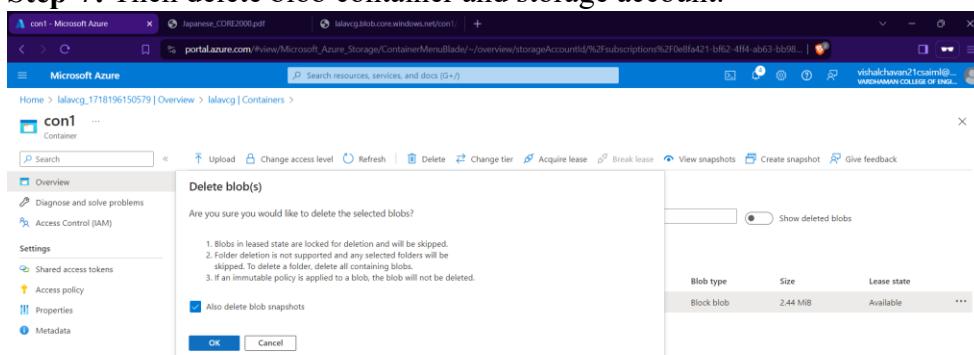
The screenshot shows the Microsoft Azure Storage Container Overview page. The container name is 'con1'. A single blob named 'Japanese_CORE2000.pdf' is listed. The blob's properties include Name: Japanese_CORE2000.pdf, Modified: 6/12/2024, 6:15:58 PM, Access tier: Hot (Inferred), Archive status: Not yet archived, Blob type: Block blob, Size: 2.44 MB, and Lease state: Available.



Step-6: On container click Change access level to Private(no anonymous access) and try to open the file in new tab it will show error.



Step-7: Then delete blob container and storage account.



The image contains three screenshots of the Microsoft Azure portal, showing the creation and management of a storage account and its container.

- Screenshot 1:** Shows the 'Containers' blade for a storage account named 'con1'. It displays a single blob named 'Japanese_CORE2000.pdf' which is marked as 'Deleted'. Other settings like 'Access policy' and 'Properties' are visible.
- Screenshot 2:** Shows the 'Delete container(s)' dialog. It lists the container 'con1' and provides information about soft deletion. A red 'Delete' button is at the bottom.
- Screenshot 3:** Shows the 'Delete storage account' dialog. It lists the storage account 'lalavc' and its properties. A red 'Delete' button is at the bottom.

Result:

Created an Azure Storage Account and container, then uploaded and deleted objects within it. All operations were successfully performed, confirming the storage functionalities.

Q12) Implement Object Replication through Azure.

Step-1: As demonstrated in the previous program. Please create a Container each in two different Storage Accounts.

Step-2: Go to the resource page of the source storage account.

Step-3: Under the 'Data management' section, click on 'Object replication'. Click on 'Add replication policy'.

Step-4: Enter the destination storage account name or select it from the list. You might need to provide the destination storage account key. Obtain the key from destination storage account under 'Access key'.

Step-5: Define the source and destination containers. Specify the replication rules, such as prefixes for which object to replicate.

Step-6: Review the replication settings. Click Save or Enable to activate the replication policy.

The screenshot shows the Azure portal interface for managing storage accounts. A table lists replication configurations:

Destination account	Source container	Destination container	Filters
desntion	consorce	condest	0

Step-7: Navigate to the source container and upload objects using Upload button .Choose the files you want to upload from your local device and click Upload.

The screenshot shows the Azure portal interface for the 'consorce' container. A single blob named 'Japanese_CORE2000.pdf' is listed in the table:

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
Japanese_CORE2000.pdf	6/19/2024, 2:41:02 PM	Hot (inferred)		Block blob	2.44 MB	Available

Step-8: After a short period,navigate to destination container. Verify that the uploaded objects from the source container are replicated to the destination container.

The screenshot shows the Azure portal interface for the 'condest' container. The same blob 'Japanese_CORE2000.pdf' is listed in the table:

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
Japanese_CORE2000.pdf	6/19/2024, 2:43:14 PM	Hot (Inferred)		Block blob	2.44 MB	Available

Result:

Configured object replication between two storage accounts in Azure. The replication was tested, and objects were successfully replicated across the accounts, ensuring data redundancy.

Q13) How we are adding new users, login credentials, changing owner, create authorized key files.

Step-1: Create a ubuntu virtual machine using SSH as previous experiment.

Step-2: Login into your Ubuntu VM using your username and type the following commands.

To add new user in Linux server:

```
$sudo useradd -m vishal
```

To set new password:

```
$sudo password vishal
```

Enter new password and Retype password.

To modify login credentials:

```
$sudo usermod -aG sudo vishal
```

To switch the user:

```
$sudo su vishal
```

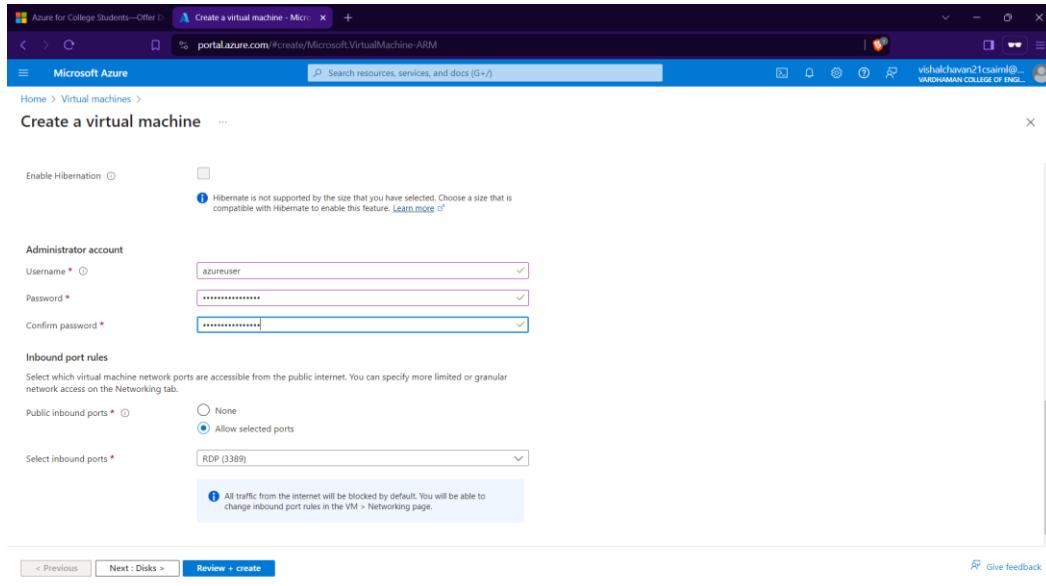
The screenshot shows the Microsoft Azure portal interface. On the left, there's a sidebar with 'vm2' selected under 'Virtual machines'. The main area has two panes. The left pane is a terminal window titled 'vishal@vm2: /home/azuruser' showing the process of creating a new user 'vishal' and adding them to the 'sudo' group. The right pane displays detailed information about the VM 'vm2', including its operating system (Ubuntu 22.04), size (Standard_B2I_v2), public IP address (4.186.24.67), and networking details.

Result:

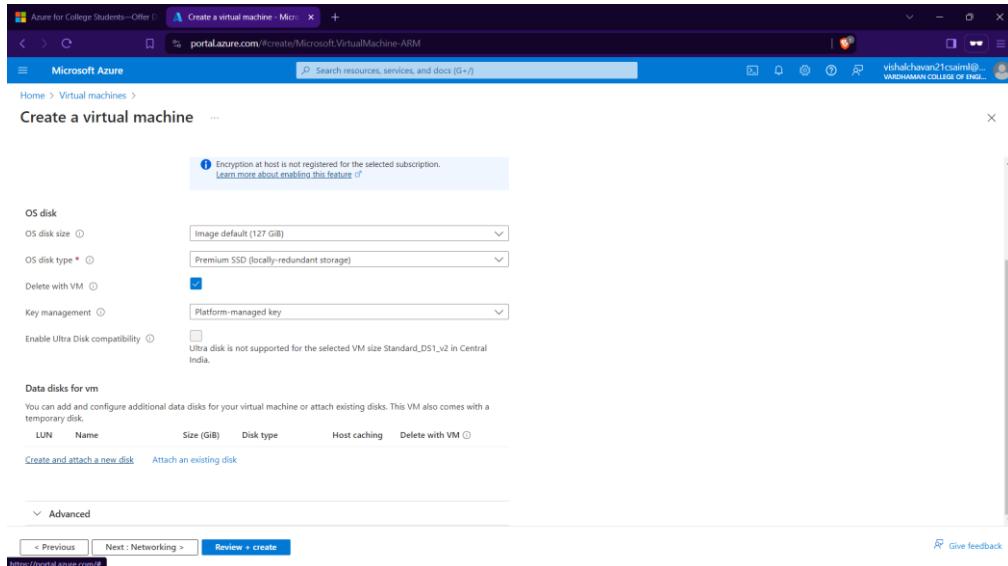
The Linux server has been setup and configured successfully. The new users were added and the credentials were updated successfully.

Q14) Perform attach and detach data disk to Windows Server in Azure data center

Step-1: Create Virtual Machine with username and password and click on Next: Disks



Step-2: Click on create and attach new disk



Step-3: Click on change size and select 10GiB and click on ok.

Disk Size (GiB)	Performance Tier	Read IOPS (Max)	Write IOPS (Max)	Throughput (Mbps)	Latency (ms)	Price (\$)
16 GiB	P3	120	25	3	3500	170
32 GiB	P4	120	25	3	3500	170
64 GiB	P6	240	50	3	3500	170
128 GiB	P10	500	100	3	3500	170
256 GiB	P15	1100	125	3	3500	170
512 GiB	P20	2300	150	3	3500	170
1024 GiB	P30	5000	200	5	-	-
2048 GiB	P40	7500	250	5	-	-
4096 GiB	P50	7500	250	5	-	-
8192 GiB	P60	16000	500	10	-	-
16384 GiB	P70	18000	750	10	-	-
32767 GiB	P80	20000	900	10	-	-

Step-4: Select delete disk with VM and click OK

Step-5: Click on review+create and then create, go to resource group and copy Ip address and login to remote desktop connection with username and password.

Step-6: Click on Disks in left hand side to check the attached data disk to windows server.

The screenshot shows the 'vm | Disks' blade in the Microsoft Azure portal. The 'Data disks' table lists:

LUN	Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (MBps)	Encryption	Host caching
0	vm_DataDisk_0	Premium SSD LRS	10	120	25	SSE with PMK	Read-only

Step-7: Click on detach symbol at right end of data disk and click apply to detach data disk from windows server.

The screenshot shows the 'vm | Disks' blade in the Microsoft Azure portal after the data disk has been detached. The 'Data disks' table now displays:

LUN	Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (MBps)	Encryption	Host caching

A message at the top indicates: 'The desired performance might not be reached due to the maximum virtual machine disk performance cap. The current virtual machine size supports up to 48 MBps. The total for disks attached to 'vm' is 100 MBps.'

The screenshot displays two side-by-side views of the Microsoft Azure portal's 'Disks' section for a virtual machine named 'vm'. Both views are identical in terms of the interface and the list of disks attached to the VM.

OS disk:

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (..)	Encryption	Host caching
vm_OsDisk_1_dee5a1bc34e5497eaeeefdf	Premium SSD LRS	127	500	100	SSE with PMK	Read/write

Data disks:

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (..)	Encryption	Host caching
0	vm_DataDisk_0	Premium SSD LRS	10	120	25	SSE with PMK	Read-only

Buttons at the bottom:

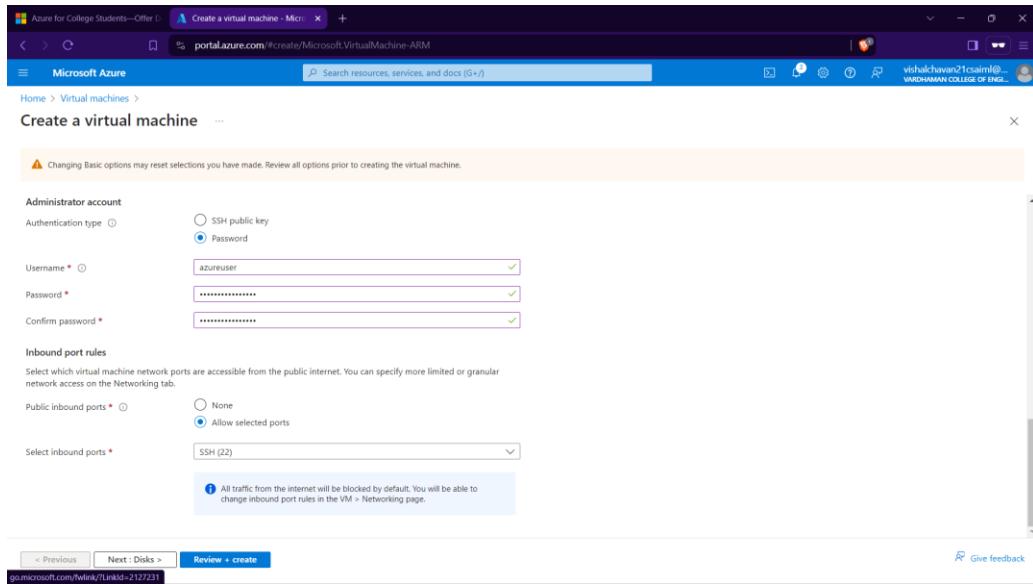
- Apply
- Discard changes

Result:

Successfully attached and detached a data disk to a Windows Server .The data disk was available for use upon attachment and removed cleanly without data loss.

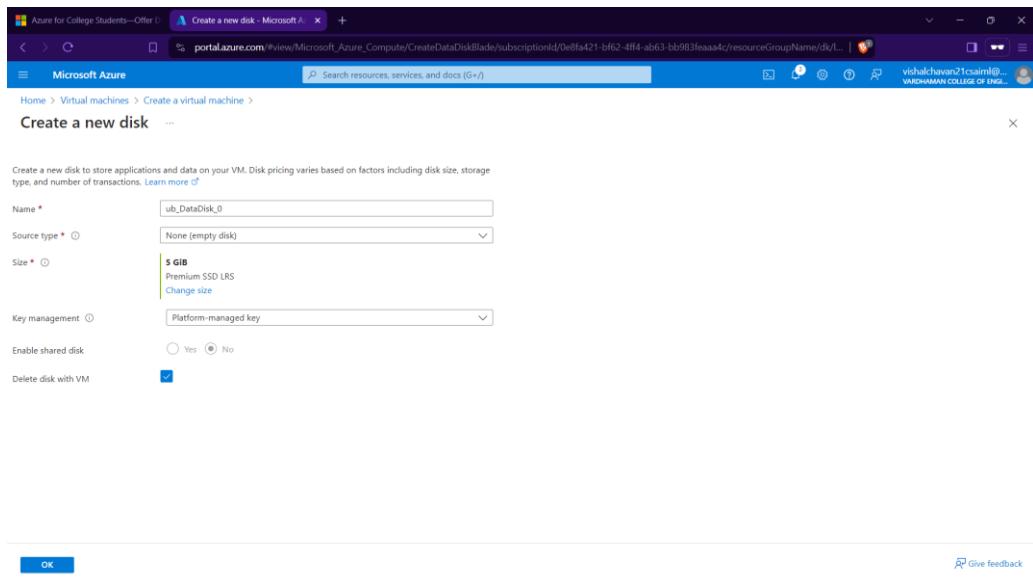
Q15)How to attach and detach data disk to Linux server in azure?

Step-1: Create a Virtual Machine with ubuntu sever and username and password.



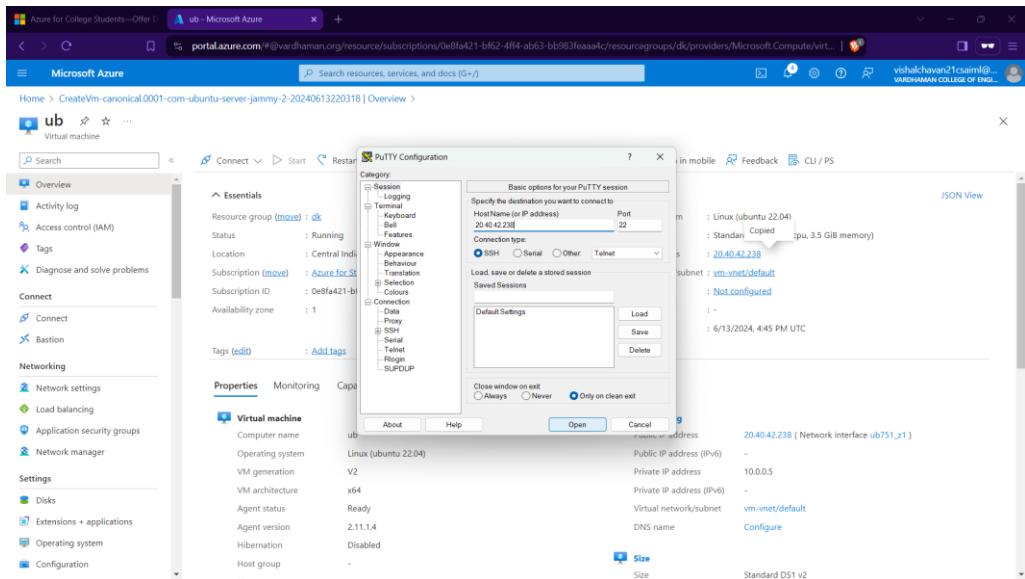
Step-2: Click on Next: Disk and then select OS disk size-30GiB, Os disk type – Premium SSD(LRS) , enable “Delete with VM” and click on “Create and Attach a new data disk”.

Step-3: Change size to 5GiB and Select Delete disk with VM



Step-4: . Click OK and Review+Create then Create.

Step-5: Go to resource group and copy Ip address and then open “Putty” paste the Ip address and click Open.



Step-6: Login with username and password and type the commands:

```
$ df -hT
$ lsblk
$ sudo filoe -s/dev/sdc
$ sudo mkfs -t ext4 /dev/sdc
$ mkdir test
$ sudo mount /dev/sdc/ test
$ cd test
$ df -hT
```

Result:

Attached and detached a data disk to a Linux server in Azure. The operations were performed without downtime, and the disk was recognized and accessible after attachment, then safely removed.

Q16)Implement static web hosting in Azure

Step-1: Create a Storage Account make sure to change redundancy as Locally Redundant storage and click review and click create.

The screenshot shows the 'Storage accounts' page in the Microsoft Azure portal. The URL is <https://portal.azure.com/#browse/Microsoft.Storage%2FStorageAccounts>. The page title is 'Storage accounts'. It displays a message: 'No storage accounts to display'. Below this, there is a brief description: 'Create a storage account to store up to 500TB of data in the cloud. Use a general-purpose storage account to store object data, use a NoSQL data store, define and use queues for message processing, and set up file shares in the cloud. Use the Blob storage account and the hot or cool access tiers to optimize your costs based on how frequently your object data is accessed.' A 'Create storage account' button is visible. At the bottom right, there is a 'Give feedback' link.

The screenshot shows the 'Create a storage account' wizard, step 1: Project details. The URL is <https://portal.azure.com/#create/Microsoft.StorageAccount-ARM>. The page title is 'Create a storage account'. It includes a brief description of Azure Storage and its features. The 'Project details' section requires selecting a subscription ('Azure for Students') and a resource group ('NetworkWatcherRG'). Other sections include 'Instance details' (storage account name 'barbarik0711', region '(Asia Pacific) Central India'), 'Performance' (radio button selected for 'Standard: Recommended for most scenarios (general-purpose v2 account)'), and 'Redundancy' (radio button selected for 'Locally-redundant storage (LRS)'). Navigation buttons at the bottom are 'Previous', 'Next', and 'Review + create'.

Step-2: After deployment od Storage Account click on go to resource then go to Static Website in left hand side.

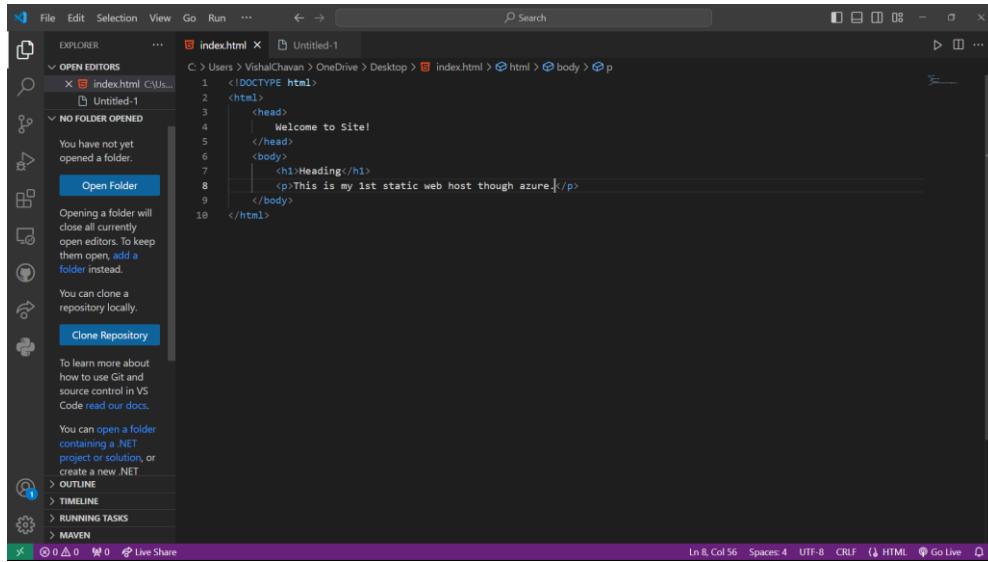
Step-3: Click on Enable under static website then fill index document and error document name and click save and copy the primary endpoint url.

The screenshot shows the Microsoft Azure portal interface. The left sidebar is expanded, showing categories like Storage accounts, Encryption, Microsoft Defender for Cloud, Data management, Settings, and more. Under the Data management section, 'Static website' is selected. The main content area displays the configuration for the '\$web' container. It shows the primary endpoint as <https://barbarik0711.z29.web.core.windows.net/>. Below it, the 'Index document name' is set to 'index.html' and the 'Error document path' is set to '404.html'. A success message at the top right states: 'Successfully updated static website settings' and 'Successfully updated static website settings for "barbarik0711". Settings may take up to 30 seconds to take effect.' There are buttons for 'Save', 'Discard', and 'Give feedback'.

Step-4: Navigate to Containers on left hand side and open \$web.

The screenshot shows the Microsoft Azure portal interface. The left sidebar is expanded, showing categories like Overview, Diagnose and solve problems, Access Control (IAM), Settings, Properties, Metadata, and Editor (preview). Under the Settings section, 'Shared access tokens' is selected. The main content area displays the overview of the '\$web' container. It includes a search bar, a toolbar with actions like Upload, Change access level, Refresh, Delete, Change tier, Acquire lease, Break lease, View snapshots, Create snapshot, and Give feedback. It also shows the authentication method as 'Access key (Switch to Microsoft Entra user account)' and the location as '\$web'. A search bar for blobs by prefix is present. Below is a table with columns: Name, Modified, Access tier, Archive status, Blob type, Size, and Lease state. The table shows 'No results'.

Step-5: Make a index.html file make sure to have the same name as given in static website.

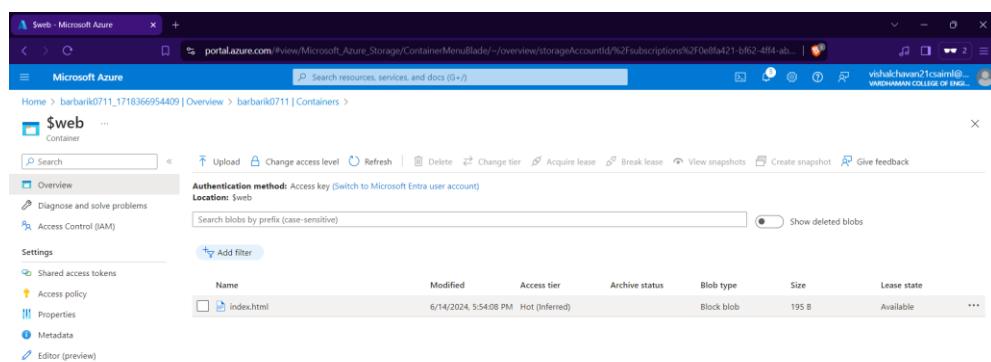


```

<!DOCTYPE html>
<html>
<head>
    <title>Welcome to Site!</title>
</head>
<body>
    <h1>Heading</h1>
    <p>This is my 1st static web host though azure</p>
</body>
</html>

```

Step-6: Upload the file in web container by clicking on upload.



Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
index.html	6/14/2024, 5:54:08 PM	Hot (Inferred)		Block blob	195 B	Available

Step-7: Now paste the endpoint URL in new tab.



Heading

This is my 1st static web host though azure.

Result:

As you can observe both webpages accessed from primary and secondary endpoints are same. This setup ensures high data availability and data redundancy , providing access to your content even if your region in down.

GitHub Link of Manual : https://github.com/Barbarik0711/Azure_CCV_Lab