

VARDHAMAN COLLEGE OF ENGINEERING (AUTONOMOUS)

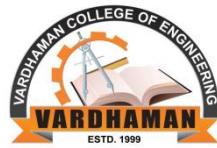
Affiliated to **JNTUH**, Approved by **AICTE**, Accredited by **NAAC** with **A++ Grade**, **ISO 9001:2015** Certified
Kacharam, Shamshabad, Hyderabad - 501218, Telangana, India

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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



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CERTIFICATE

Certified that this is the bonafied 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 prepare for 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.

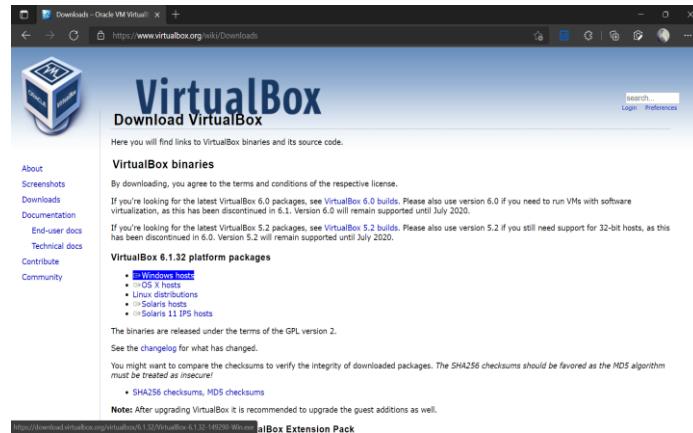
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Q1. Install Virtual box and making Ubuntu And Window Virtual Machine.

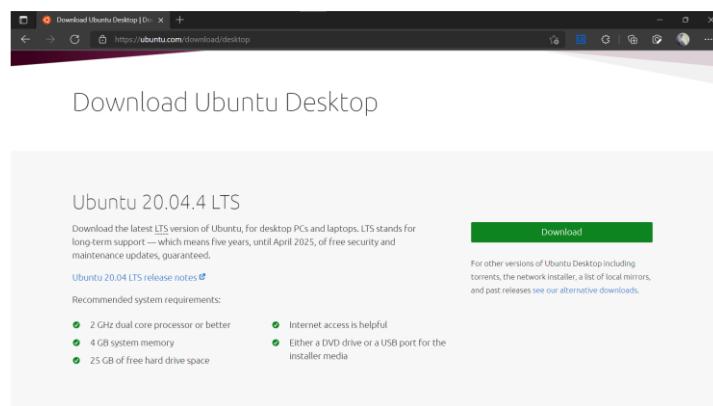
Ubuntu:

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



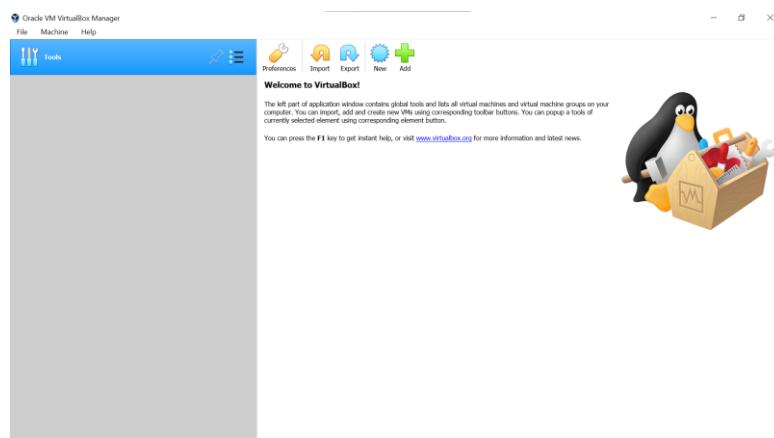
<https://www.virtualbox.org/wiki/Downloads>

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

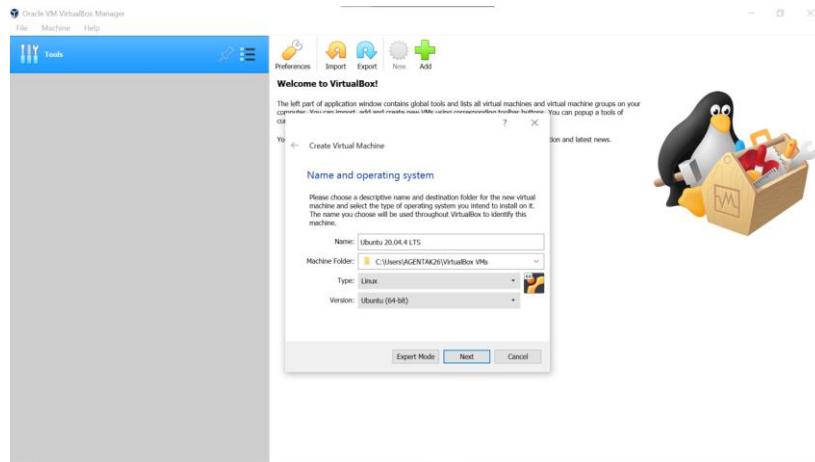


Note: The current version of Ubuntu only works on 64-bit machines.

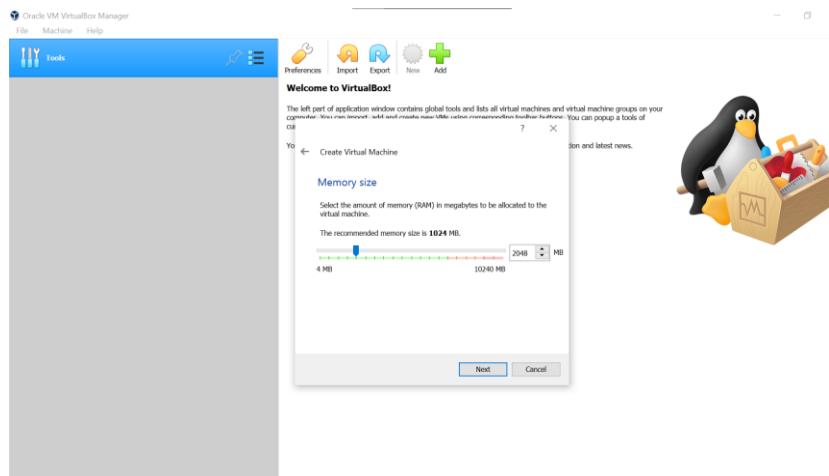
Step-3: Open VirtualBox and select New in the top taskbar.



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

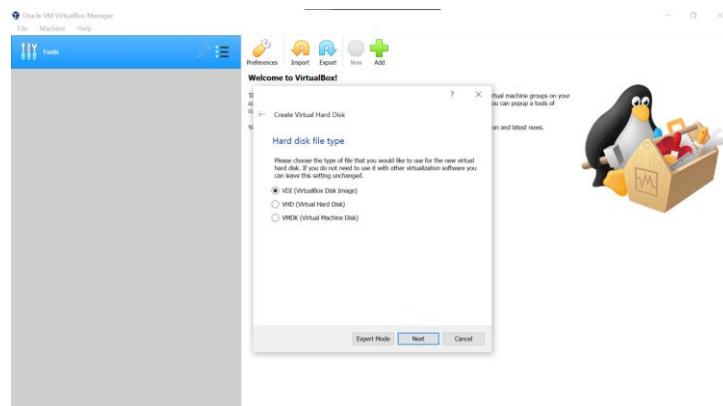


Step-5: Choose how much RAM you want to assign to the virtual machine and select Next. The recommended minimum is 1024 MB.



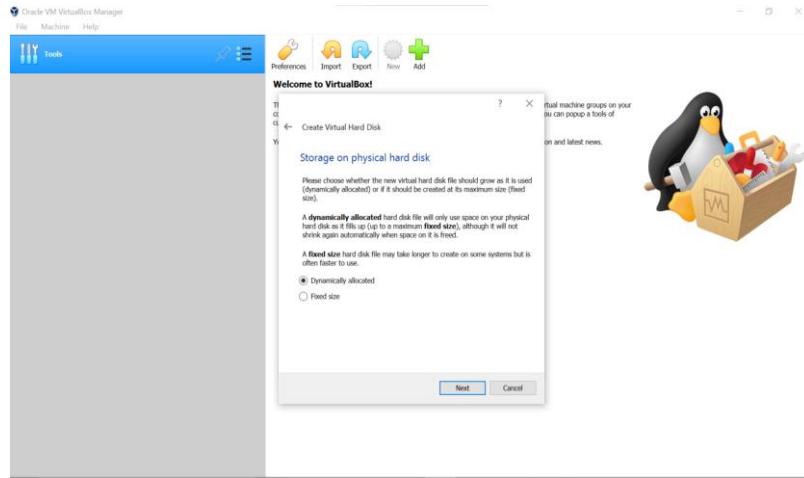
Step-6: Choose Create a virtual hard disk now and select Create.

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.

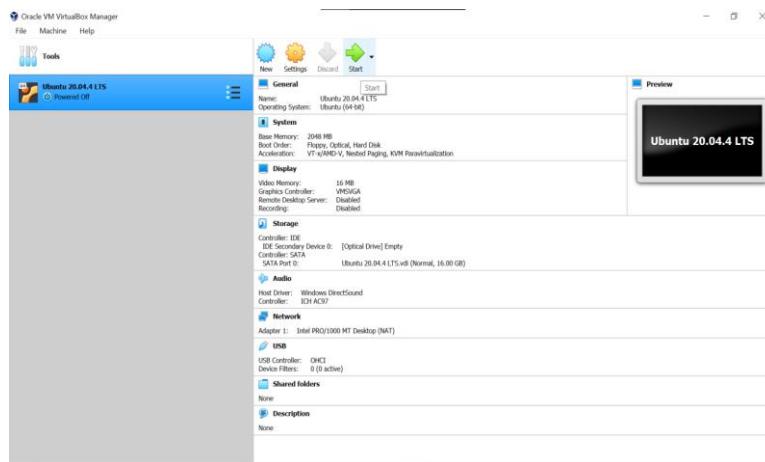


Tip: A fixed size disk performs better because the virtual machine doesn't have to increase the file size as you install software.

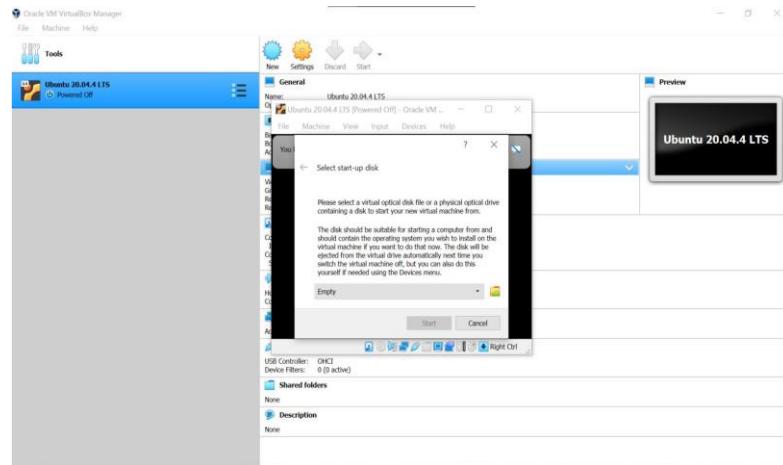
Step-9: Choose how much space you wish to set aside for Ubuntu and select Create.

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.

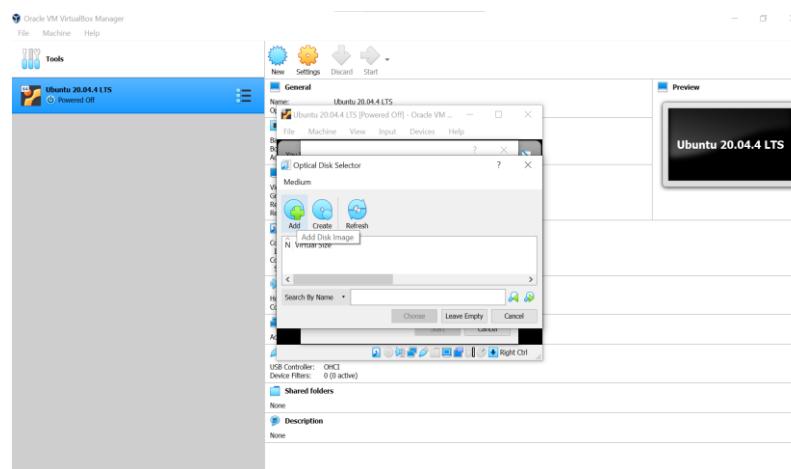
Step-10: The name of your virtual machine will now appear on the left side of the VirtualBox manager. Select Start in the toolbar to launch your VM.



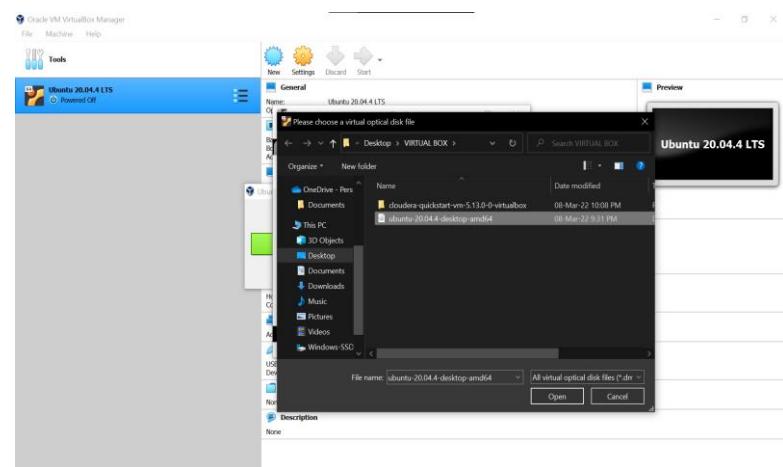
Step-11: This is the point where you need to choose the Ubuntu ISO file you downloaded earlier. If the VM doesn't automatically detect it, select the folder next to the Empty field.



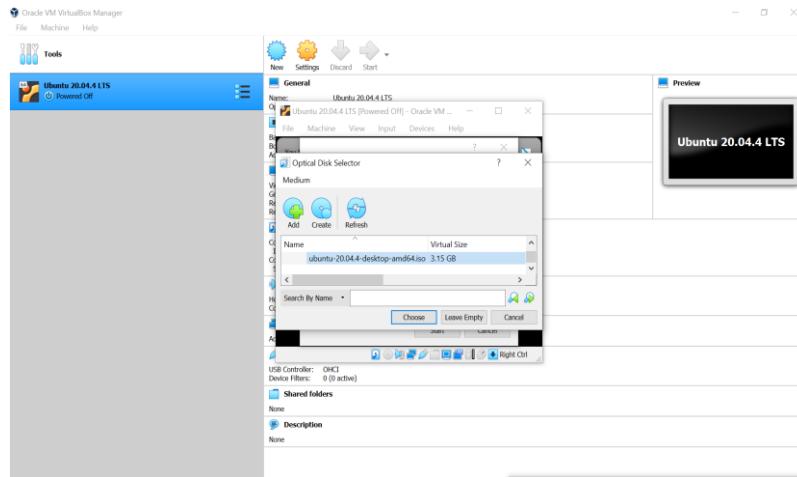
Step-12: Select Add in the window that pops up.



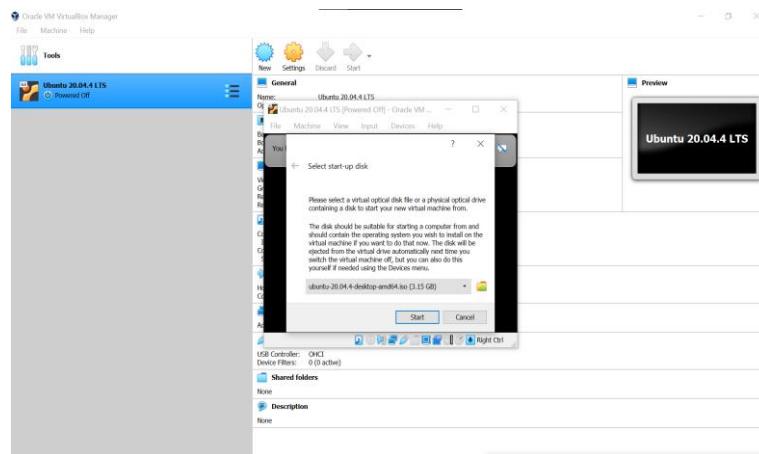
Step-13: Choose your Ubuntu disk image and select Open.



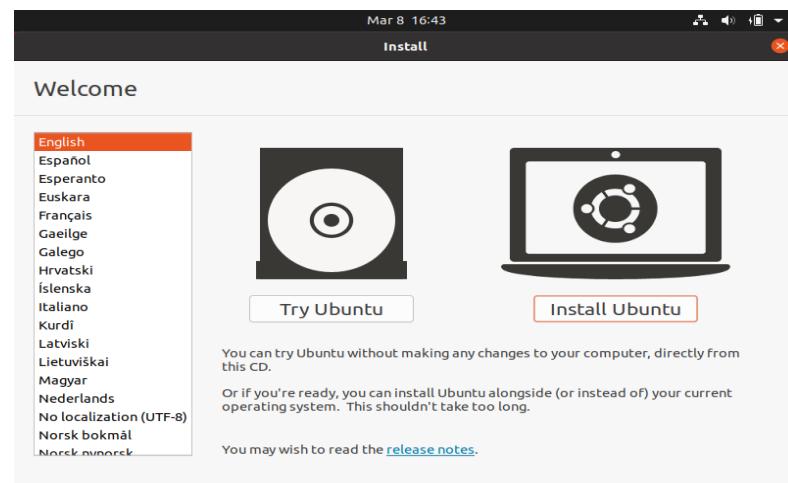
Step-14: - Select Choose



Step-15: Select Start.

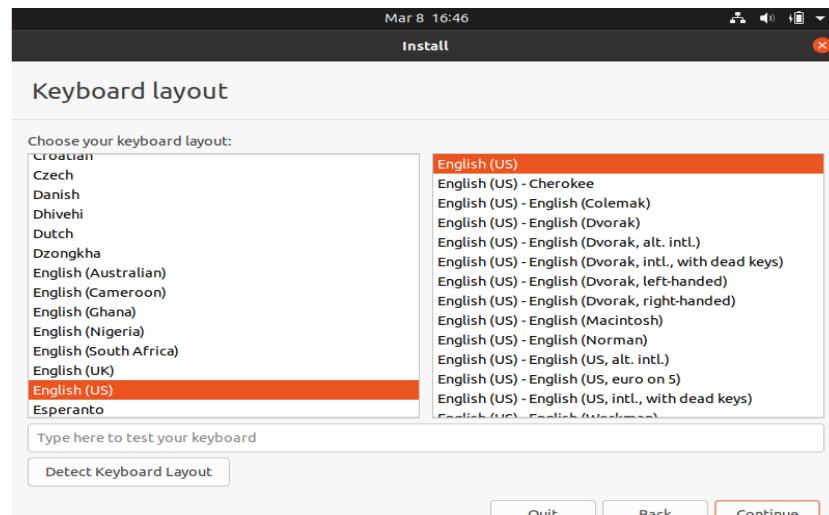


Step-16: Your VM will now boot into a live version of Ubuntu. Choose your language and select Install Ubuntu



u.

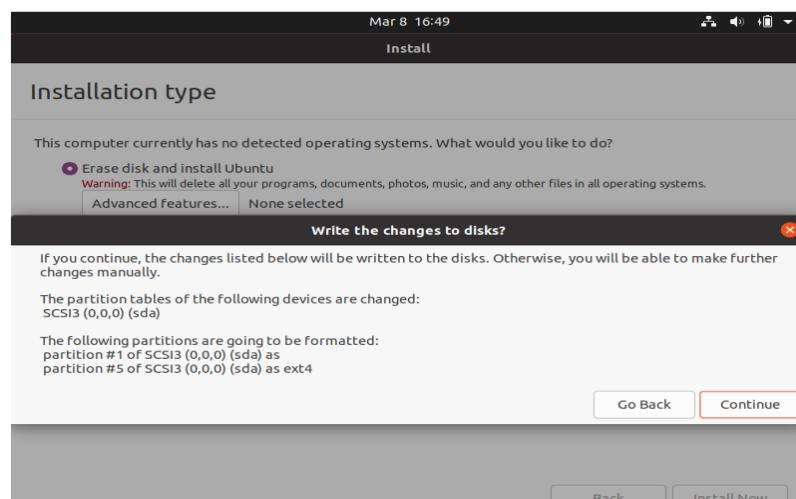
Step-17: Choose your keyboard layout and select Continue.



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

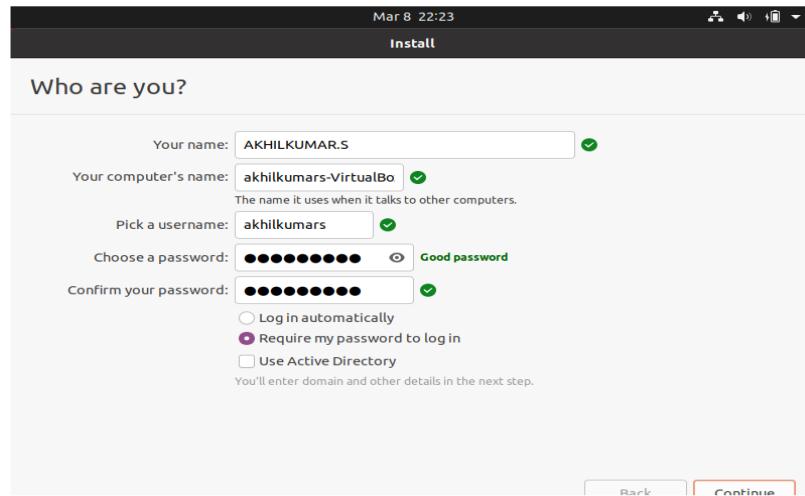
Step-19: Choose Erase disk and install Ubuntu and select Install Now, then select Continue to ignore the warning.

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

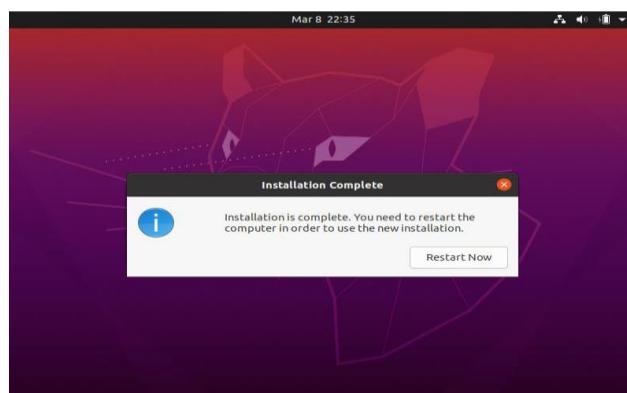


Step-20: - Choose your time zone on the map, then select Continue.

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

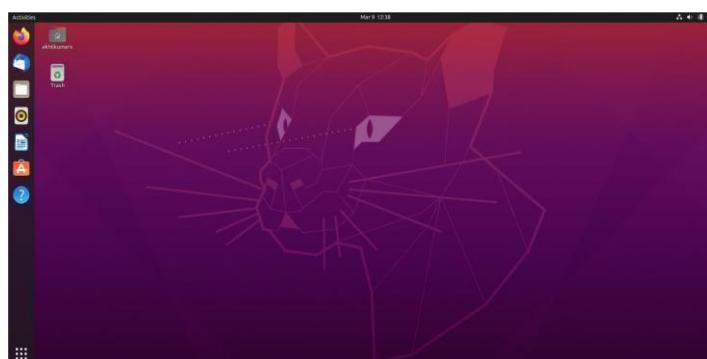


Step-22: - Select Restart Now.



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:

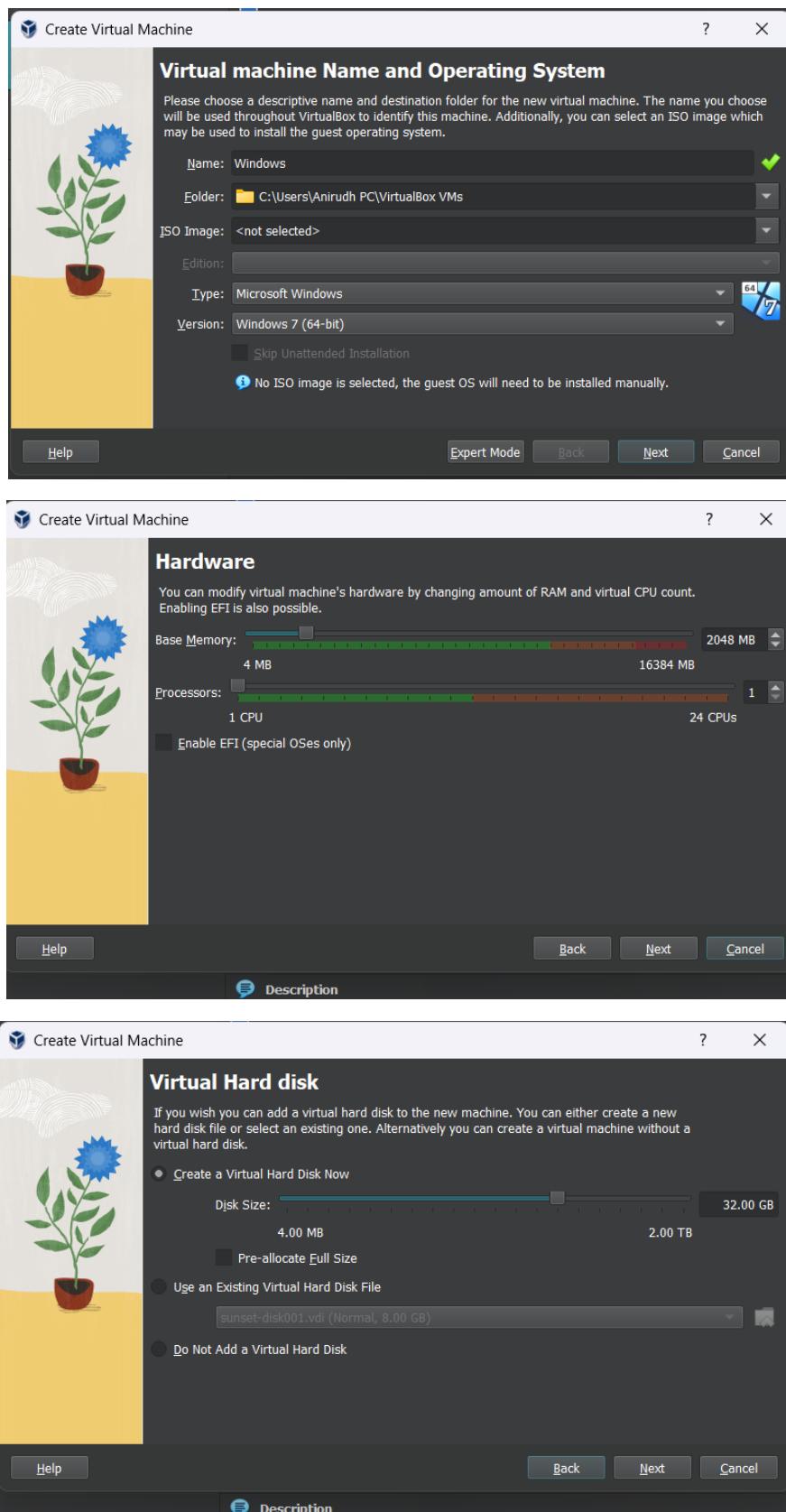


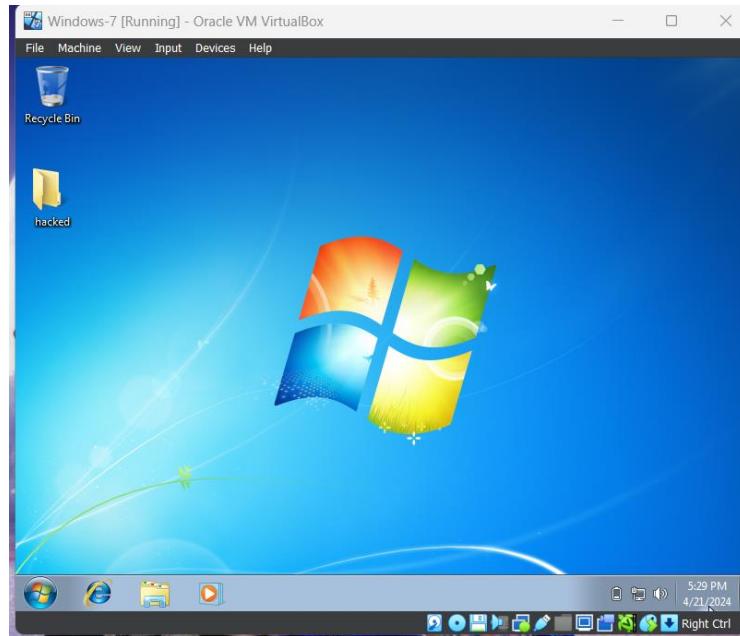
Result:

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.



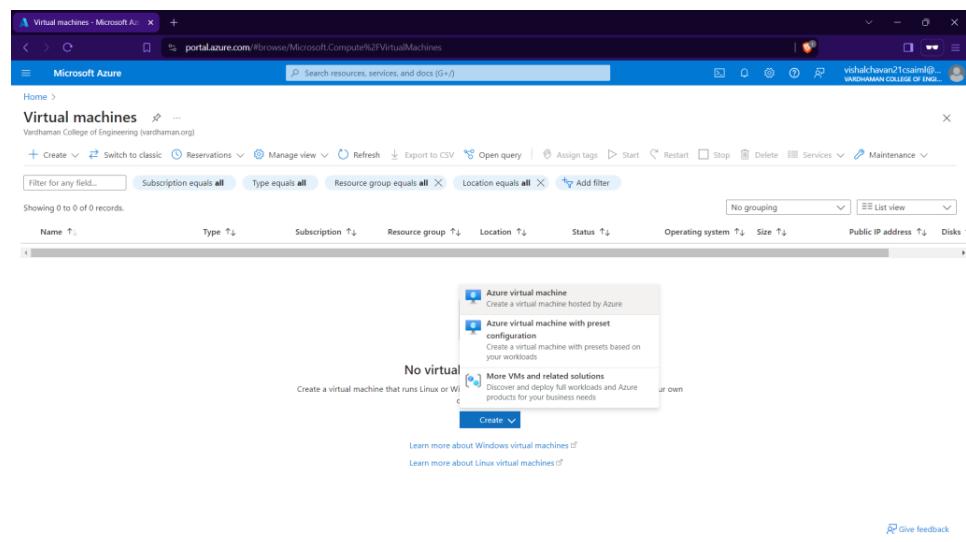
Output:**Result:**

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.

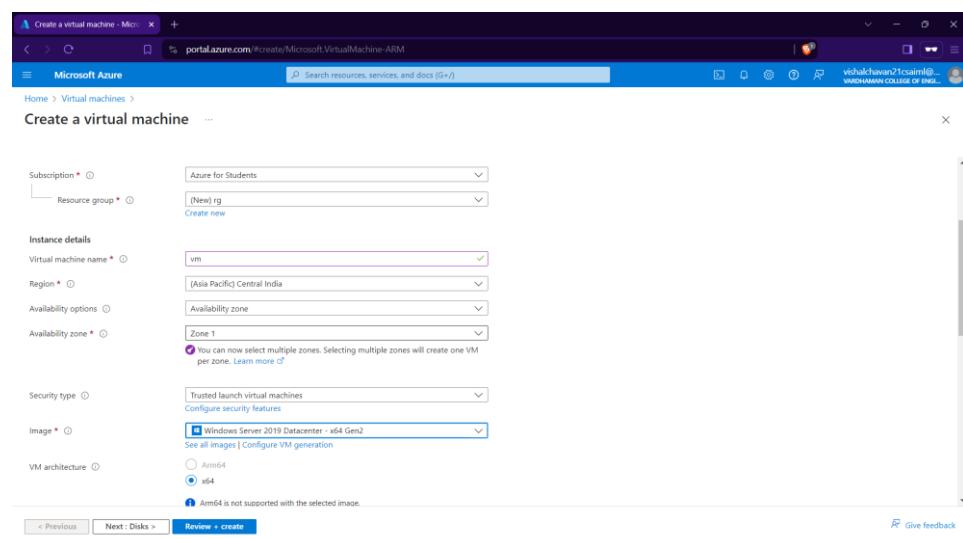
Q3) Create an instance in Virtual Machine & Launch Windows Server through Azure Portal.

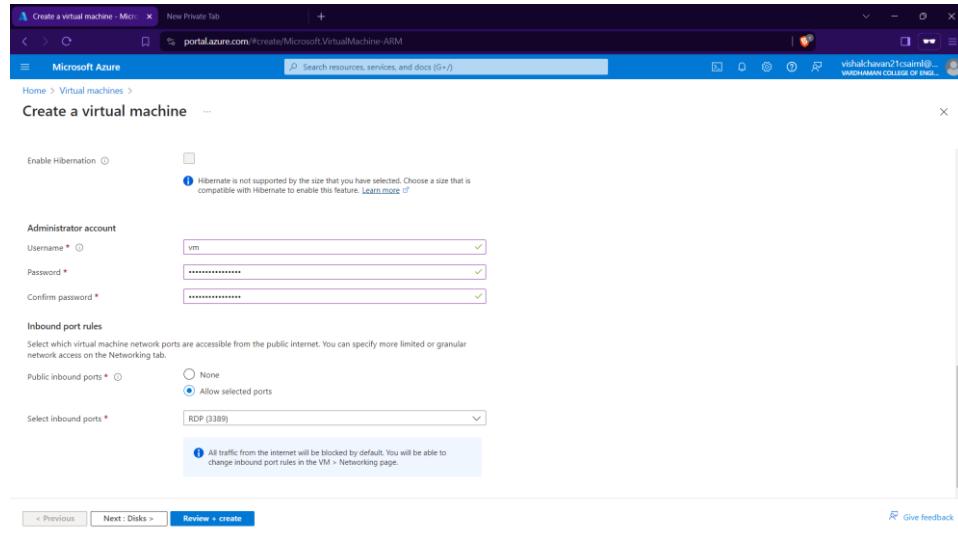
Step-1: Sign in to your Microsoft Azure account.

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

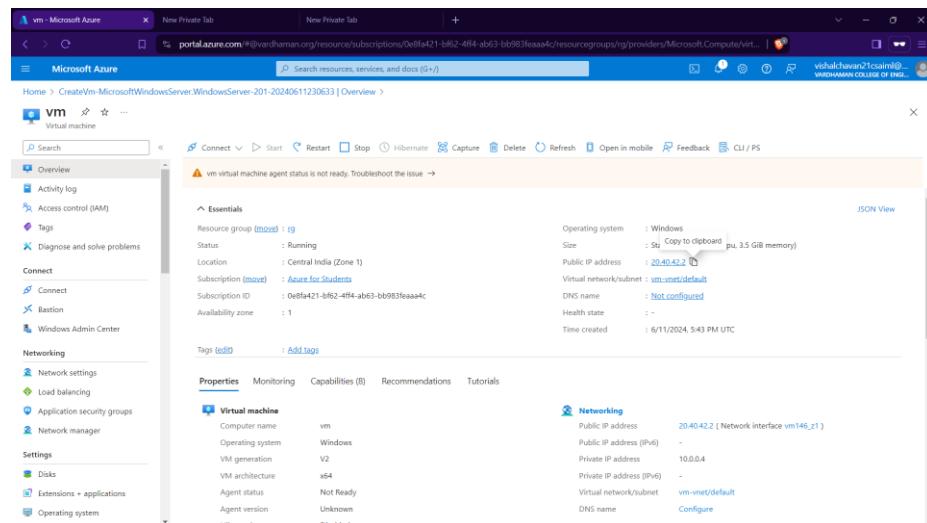


Step-3: Fill the details in that window by creating a “Resource Group”, Zone: Asia, Image: window, Select the disk storage and so on. After that click on “Create + Review”. And Finally click on “Create”

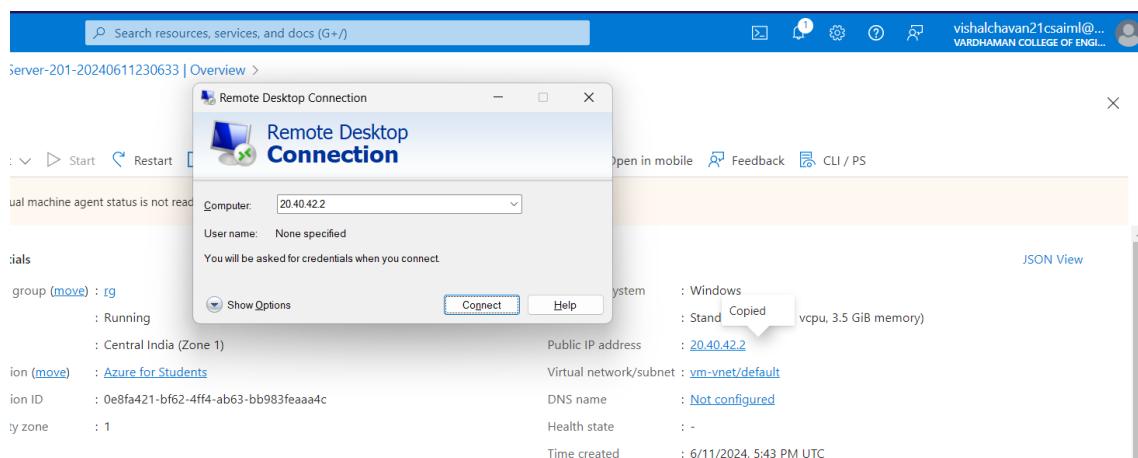




Step-4: Firstly, copy the public IP Address of that created virtual machine.



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



Output:

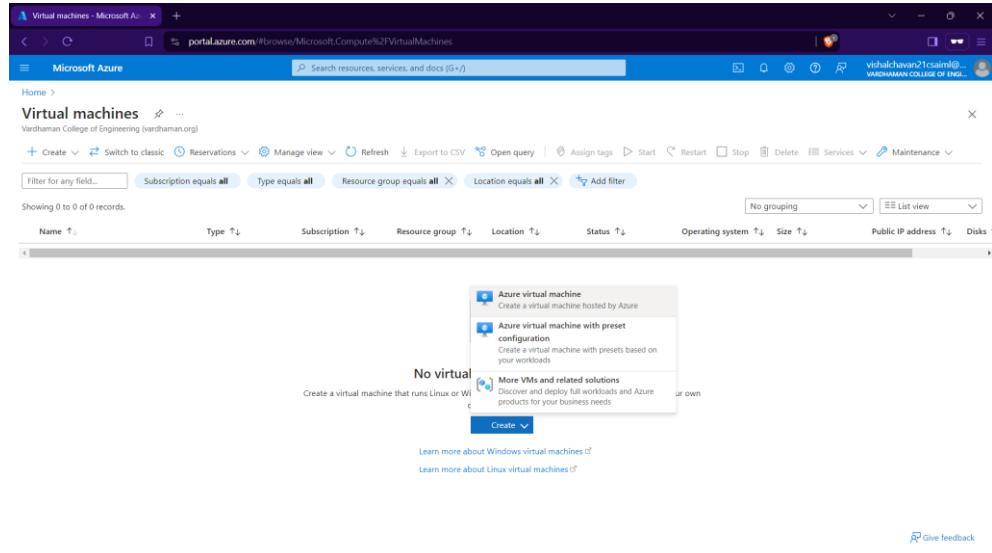
**Result:**

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.

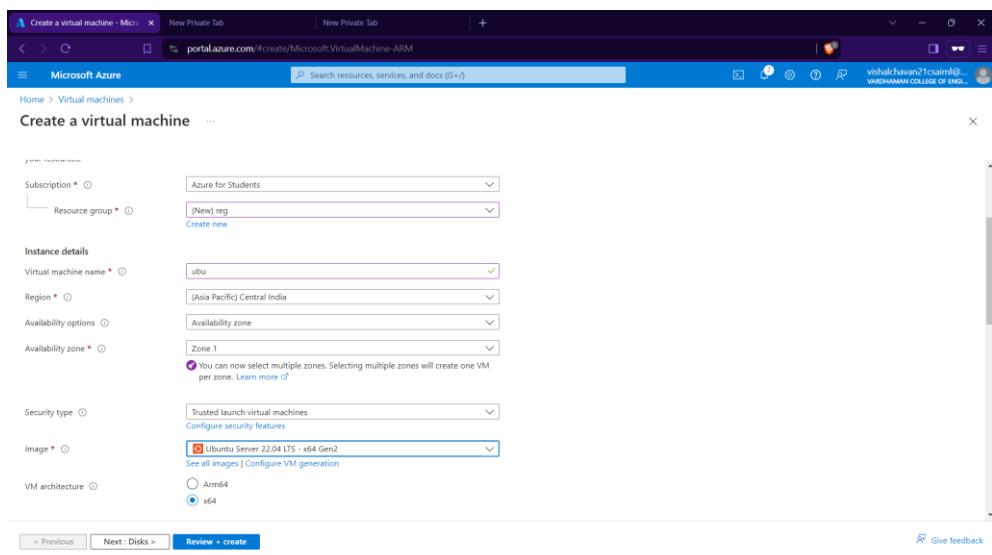
Q4) Launch Linux Server through Azure Portal.

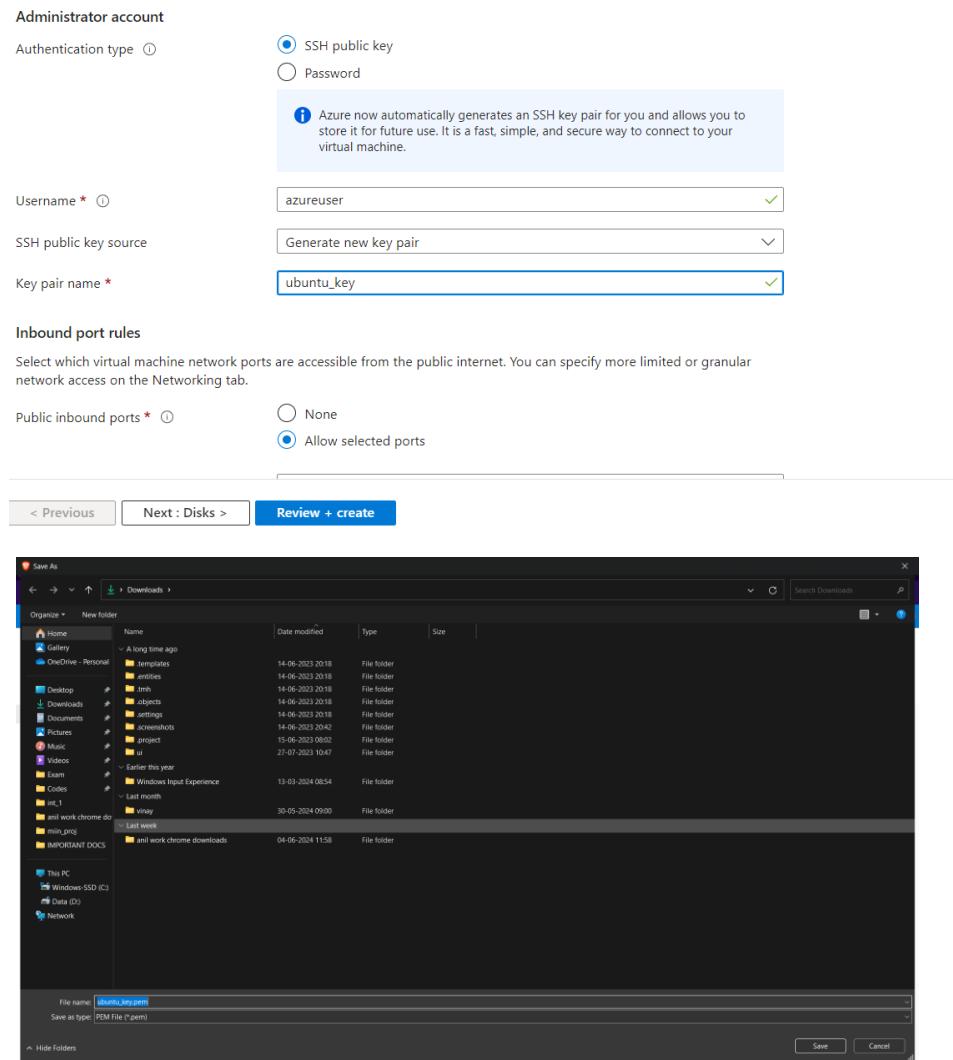
Step-1: Sign in to your Microsoft Azure account.

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.

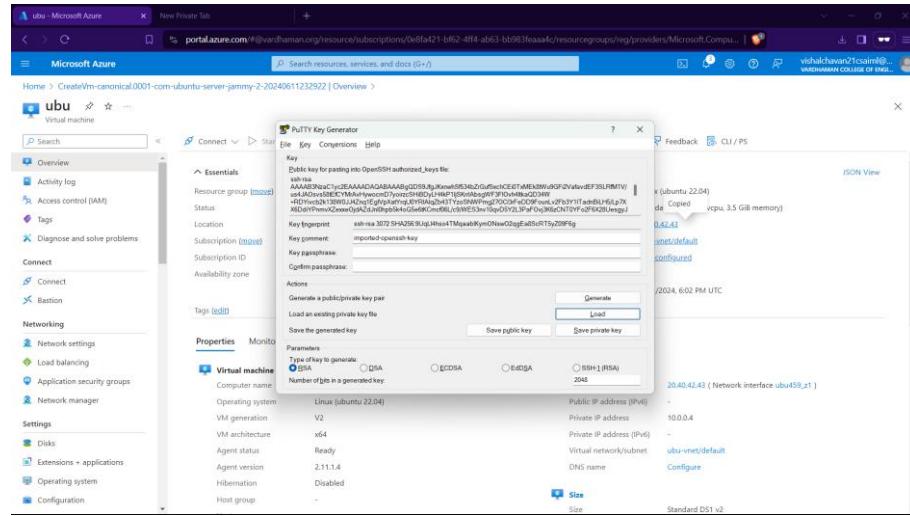




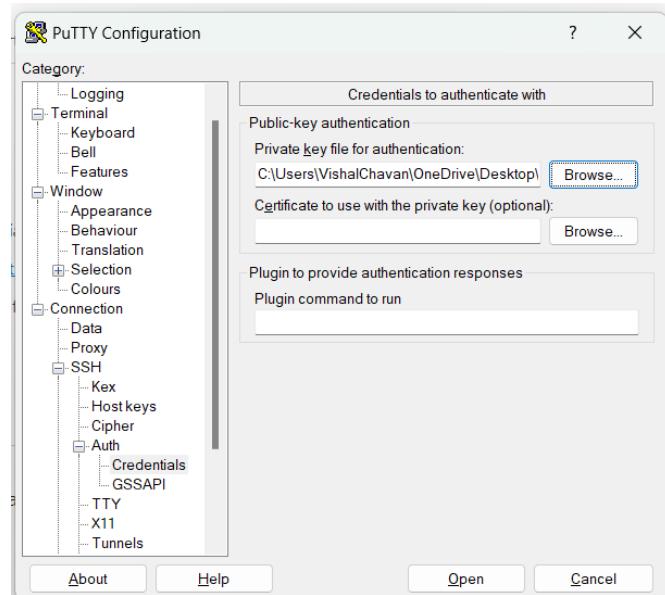
Step-5: Firstly, copy the public IP Address of that created virtual machine and after Deployment is over, Go to the remote desktop connection.

Essentials		JS
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.



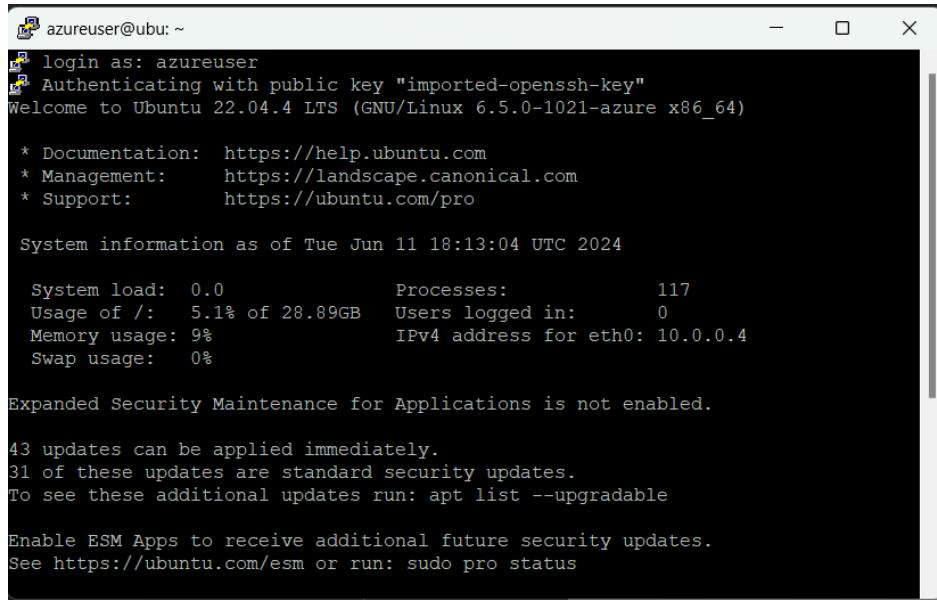
Step-7: In putty, put the Copied IP Adress into it, and then go to ssh->auth->credentials And then put the generated private key.



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
```

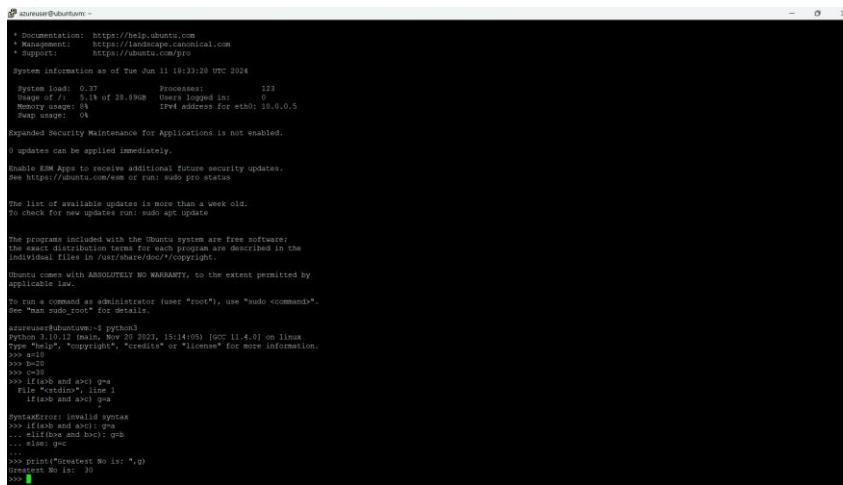
Result:

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.



```

Administrator@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 28.09GB  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 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.

Administrator@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=30
>>> if(a>b) g=a
    File "<stdin>", line 1
      if(a>b) g=a
      ^
SyntaxError: invalid syntax
>>> if(b>a) g=b
... elif(b==a): g=b
...
>>> print("Greatest No is: ",g)
>>> print("Greatest No is: ",g)
>>> 

```

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).

VM Overview

- Essentials**
 - Resource group (mssql) : NetworkWatcherRG
 - Status : Running
 - Location : Central India (Zone 1)
 - Subscription (mssql) : Azure for Students
 - Subscription ID : 0ef8fa421-bf62-4ff4-ab63-bb9983fea4c
 - Availability zone : 1
 - Tags (edit) : Add tags
- Properties** Monitoring Capabilities (8) Recommendations Tutorials
- Virtual machine**

Computer name	vm
Operating system	Windows
VM generation	V2
VM architecture	x64
Agent status	Not Ready
Agent version	Unknown
Subscription	Disabled
- Networking**

Public IP address	20.40.42.43 (Network interface vm266_e1)
Public IP address (IPv6)	-
Private IP address	10.0.0.4
Private IP address (IPv6)	-
Virtual network/subnet	vm-vnet/default
DNS name	Configure

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

Stop this virtual machine

Do you want to stop 'vm'?

Deallocation operations usually complete within 1-2 minutes but may take up to 90 minutes in some cases. You can leave the page and track the progress via notifications.

Yes No

vm

- Computer name : vm
- Operating system : Windows
- VM generation : V1
- VM architecture : x64
- Agent status : Not Ready
- Agent version : Unknown
- Subscription : Disabled

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

vm | Disks

OS disk

Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (Mbps)	Encryption	Host caching
vm_OsDisk_1_3deafca94b485ba0da37	Premium SSD LRS	127	500	100	SSE with PMK	Read/write

Data disks

LUN	Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (Mbps)	Encryption	Host caching
0	No data disks attached						

Apply Discard changes

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 time (6/11/2024, 6:16 PM UTC). The 'Properties' section shows the VM's computer name (vm), operating system (Windows), VM generation (V2), VM architecture (x64), hibernation (Disabled), host group (-), host (-), and proximity placement group (-). The 'Networking' section lists the public and private IP addresses, virtual network/subnet (vm-vnet/default), and DNS name (Not configured). The 'Size' section indicates the VM is running on 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 interface. The left sidebar is identical to the previous screenshot, with the 'Locks' option selected. A modal dialog box titled 'Add lock' is open in the center. 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 instances of the Azure portal interface. The top instance is a modal dialog titled 'Add lock' within the 'NetworkWatcherRG | Locks' blade. It contains fields for 'Lock name' (set to 'rk'), 'Lock type' (set to 'Read-only'), and 'Scope' (set to 'vm'). Below the modal is a table listing existing locks, which includes a row for 'rk' with the same details. The bottom instance is the main 'Resource groups' blade for 'NetworkWatcherRG', showing the 'Locks' section with the same list of locks.

Lock name	Lock type	Scope	Notes
rk	Read-only	vm	
rk	Read-only	NetworkWatcherRG	

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.

Setting	Value
Operating system	Linux (ubuntu 22.04)
Size	Standard_B1ms v3 (3.5 GB memory)
Public IP address	20.40.41.52
Virtual network/subnet	vm-vnet/default
DNS name	Not configured
Health state	-
Time created	6/11/2024, 6:31 PM UTC

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.

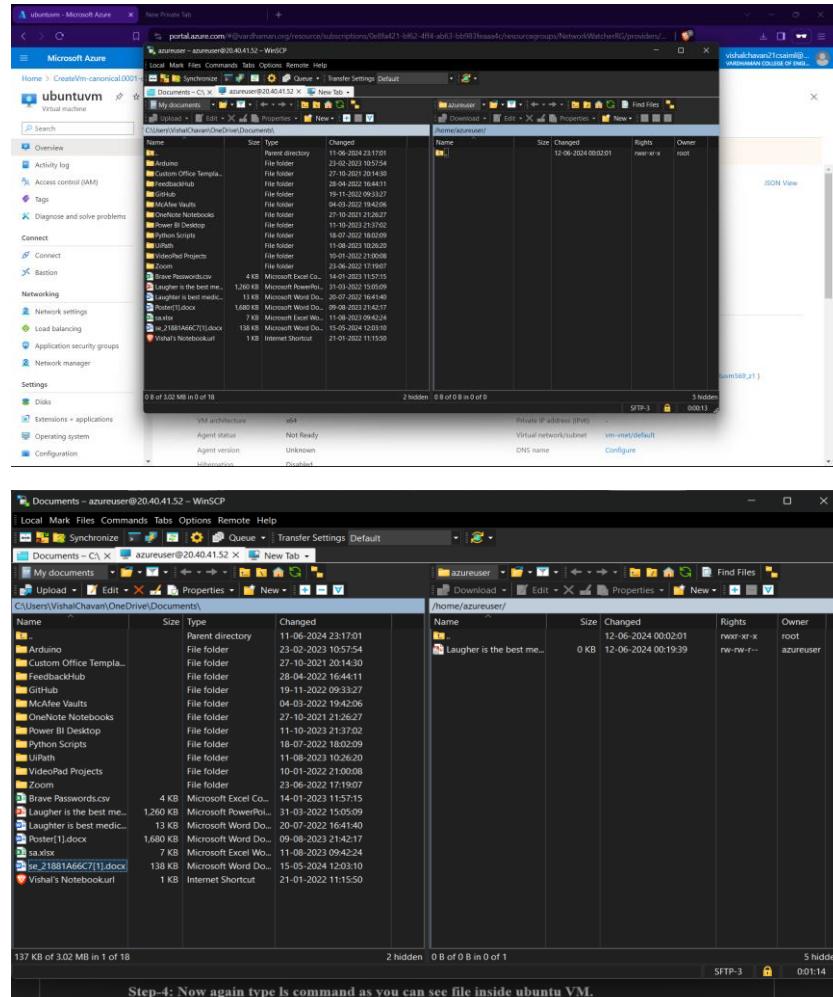
azureuser@ubuntuvm:~$ python3
Python 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> a=10
>>> b=20
>>> c=30
>>> if(a>b and a>c) g=a
      File "<stdin>", line 1
        if(a>b and a>c) g=a
          ^
SyntaxError: 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.



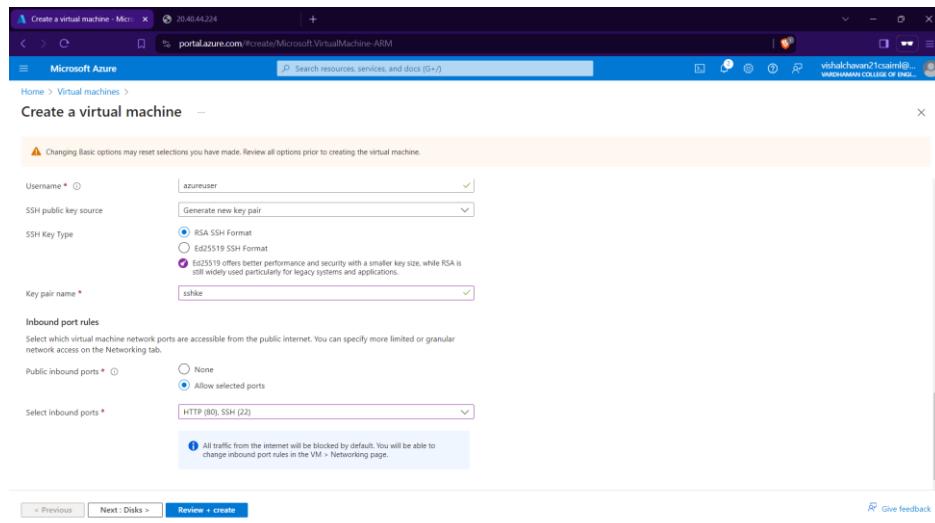
Step-4: Now again type ls command as you can see file inside ubuntu VM.

```
azur...@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
azur...@ubuntuvm:~$ ls
azur...@ubuntuvm:~$ ls
azur...@ubuntuvm:~$ ls
'Laugher is the best medicine.pptx.filepart'
azur...@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.

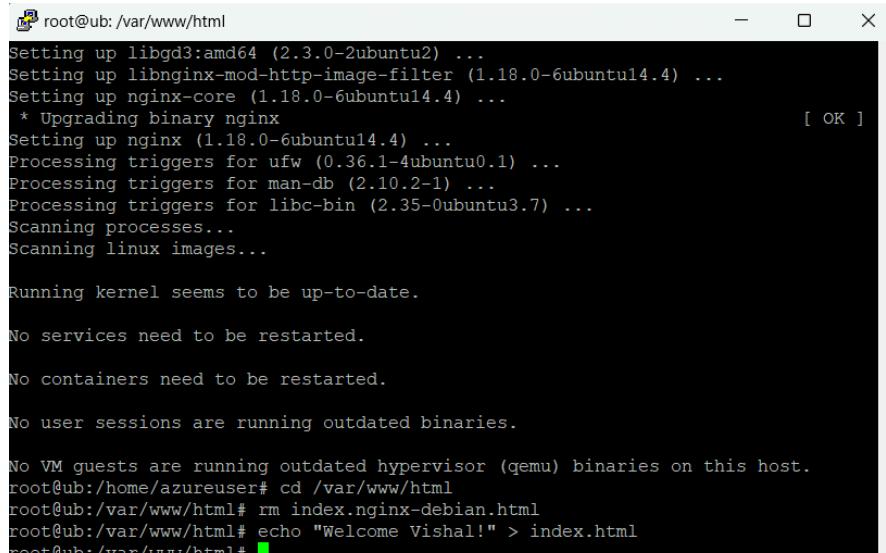


Step-3: To remove following information and keep new information in that page type the following command and refresh the browser page.

\$ 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#
```

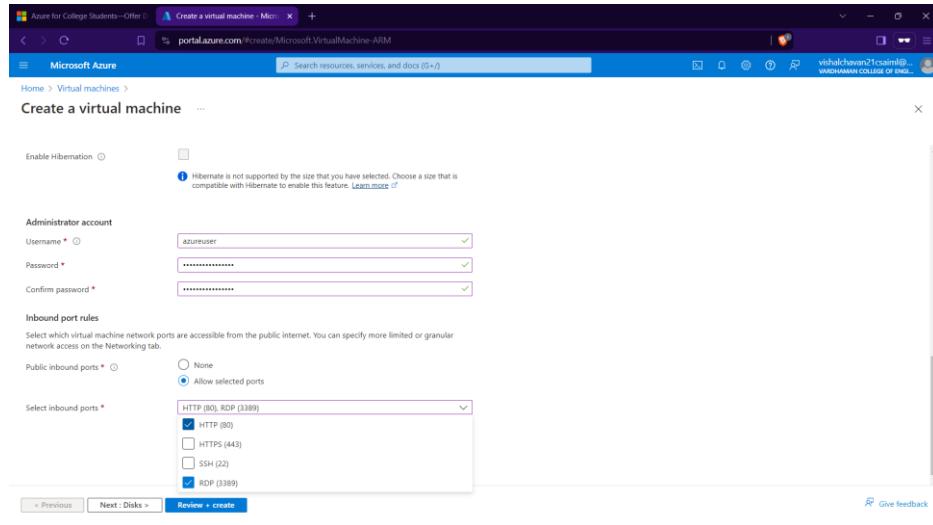


Result:

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.

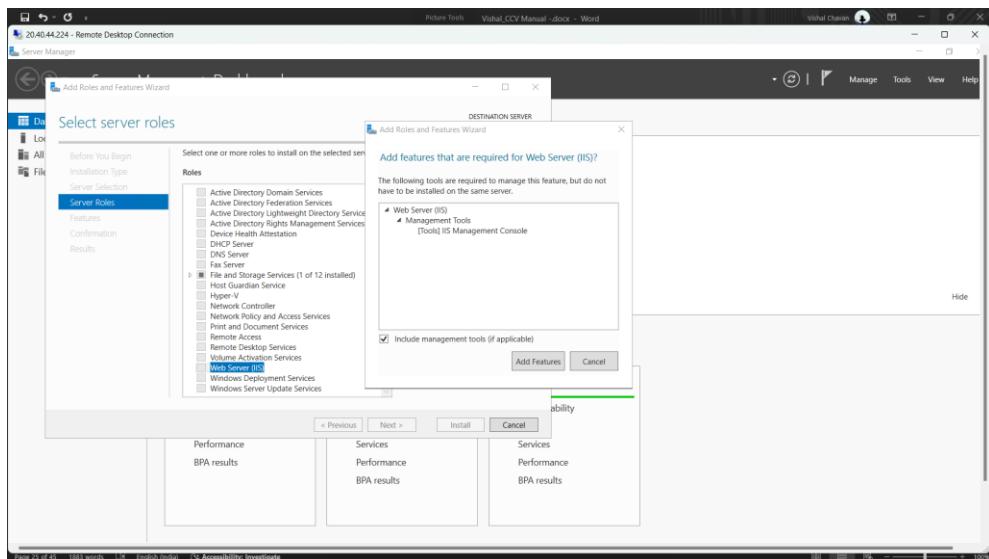
Q10) Setup and configure AZURE web server for windows server(IIS).

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

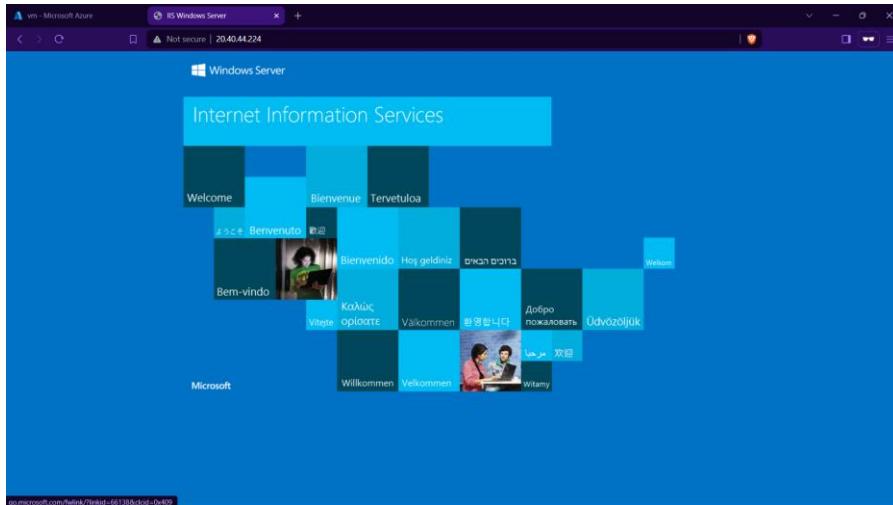


Step-2: When remote desktop will start(windows vm) you can see there will be Server Manager will be opened and in that you can see Configure this local server , Click on “Add roles and features”.

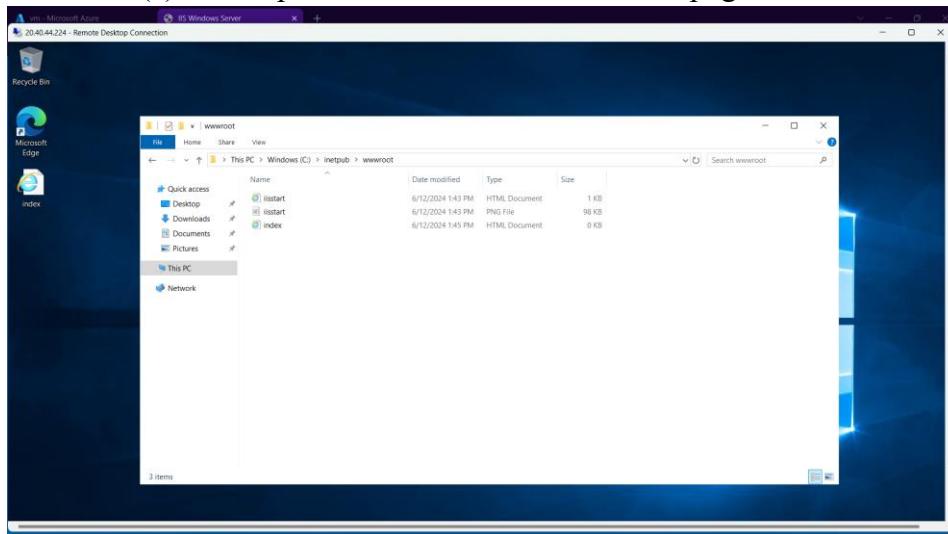
Step-3: Click on next, next and in Server Roles select Web Server(IIS) click on add feature ,click on next, next till you can get install button and click on install .



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.

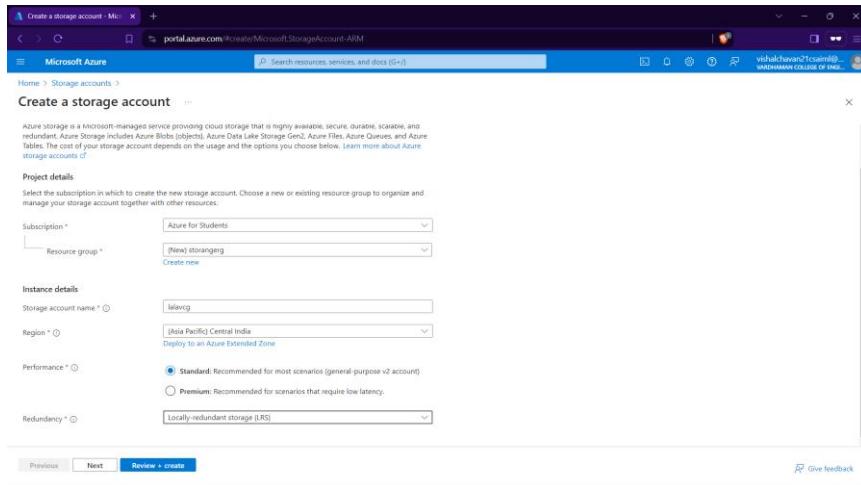


Result:

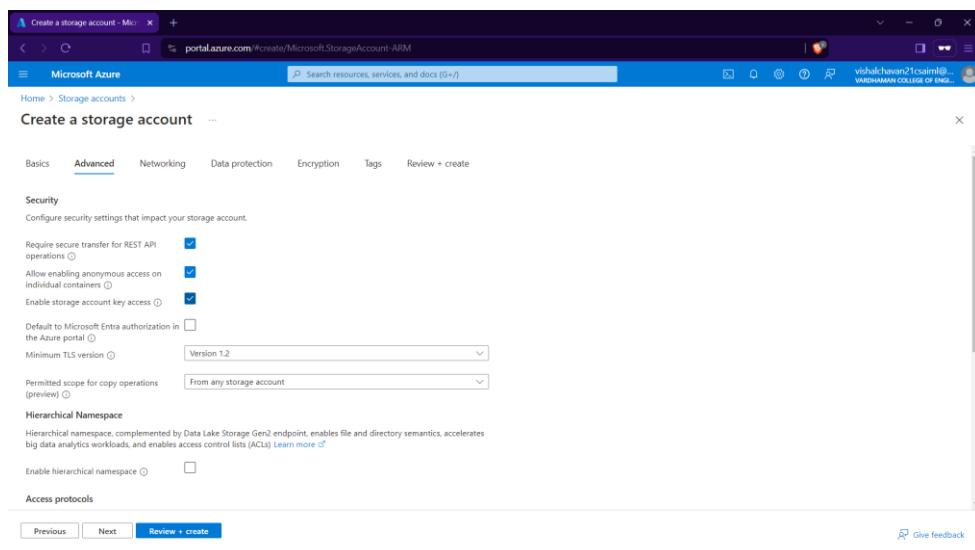
Set up and configured an web server on a Windows server in Azure. The server was operational, and web pages were accessible, indicating a successful configuration.

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

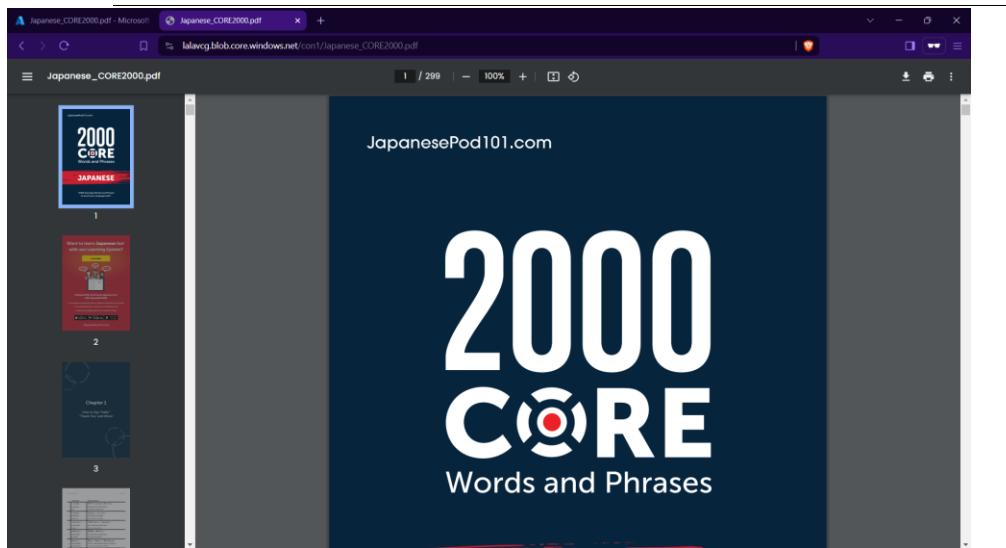
Drag and drop files here or Browse for files

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 for a container named 'con1'. The page includes a search bar, navigation links for Overview, Diagnose and solve problems, Access Control (IAM), Settings, and Shared access tokens. A table lists the blob 'Japanese_CORE2000.pdf' with details: Name, Modified, Access tier, Archive status, Blob type, Size, and Lease state. The blob was modified on 6/12/2024, 6:15:58 PM, is in the Hot (Inferred) tier, is an Archive status, is a Block blob, has a size of 2.44 MB, and is 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.

The screenshot shows the Microsoft Azure Storage Container Overview page for 'con1'. A modal dialog titled 'Change access level' is open, showing the current setting 'Private (no anonymous access)' selected from a dropdown menu. Other options like 'Anonymous access level' and 'Public (anonymous access)' are also visible. Below the dropdown are 'OK' and 'Cancel' buttons. To the right of the modal, a table lists blobs: 'Japanese_CORE2000.pdf' (Block blob, 2.44 MB, Available). At the bottom of the table, there's a link to 'View snapshots'.

The screenshot shows a browser window with the URL 'lalavcgblob.core.windows.net/con1/japanese_CORE2000.pdf'. The page displays an XML error message indicating that the specified resource does not exist. The error code is 404, and the request ID is 'ax5e9efb-901e-001b-3dc6-bca47c000000'. The timestamp is 'Time:2024-06-12T12:47:52.961501Z'.

```
<Error>
<Code>ResourceNotFound</Code>
<Message>The specified resource does not exist. RequestId:ax5e9efb-901e-001b-3dc6-bca47c000000 Time:2024-06-12T12:47:52.961501Z</Message>
</Error>
```

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

The screenshot shows the Microsoft Azure Storage Container Overview page for 'con1'. A modal dialog titled 'Delete blob(s)' is open, asking if the user is sure they want to delete the selected blobs. It includes a list of deletion rules and a checkbox for 'Also delete blob snapshots'. Below the list are 'OK' and 'Cancel' buttons. To the right of the modal, a table lists blobs: 'Japanese_CORE2000.pdf' (Block blob, 2.44 MB, Available).

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

- Screenshot 1: Azure Storage Container Overview**
Shows the 'Containers' blade for the 'con1' container. It lists a single blob named 'Japanese_CORE2000.pdf' with details: Status: Deleted, Retention (days): 6, Modified: 6/12/2024, Access tier: Hot (Inferred), Archive status: Not yet archived, Blob type: Block blob. The container itself is also marked as Deleted.
- Screenshot 2: Delete Container Confirmation**
Shows the 'Delete container(s)' confirmation dialog. It lists the 'con1' container as selected for deletion. A note states: "Containers which are in a leased state are locked for deletion and will be skipped. This action will move the following container(s) and its contents to a soft deleted state. The container(s) will remain recoverable for the retention period of 7 days." Buttons for 'Delete' and 'Cancel' are present.
- Screenshot 3: Delete Storage Account Confirmation**
Shows the 'Delete storage account' confirmation dialog. It lists the 'lalavc' storage account as selected for deletion. A note states: "The following storage account and its contents will be deleted." A table shows the resources to be deleted: Containers, File shares, Tables, and Queues. All values are listed as '-' (empty). A text input field shows 'lalavc' as the confirmation name. Buttons for 'Delete' and 'Cancel' are present.

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) Move Server Files from one Resource Group to another.

Step-1: Create ResourceGroup1 , ResourceGroup2 and a Virtual machine on ResourceGroup1.

The image consists of three vertically stacked screenshots from the Microsoft Azure portal, illustrating the creation of two resource groups, RG1 and RG2.

Screenshot 1: Creating RG1

- The title bar says "Create a resource group - Microsoft Azure".
- The URL is "portal.azure.com/#create/Microsoft.ResourceGroup".
- The main heading is "Create a resource group".
- Under "Project details", "Subscription" is set to "Azure for Students" and "Resource group" is set to "RG1".
- Under "Resource details", "Region" is set to "(Asia Pacific) Central India".
- At the bottom, there are buttons for "Review + create", "< Previous", and "Next : Tags >".

Screenshot 2: Creating RG2

- The title bar says "Create a resource group - Microsoft Azure".
- The URL is "portal.azure.com/#create/Microsoft.ResourceGroup".
- The main heading is "Create a resource group".
- Under "Project details", "Subscription" is set to "Azure for Students" and "Resource group" is set to "RG2".
- Under "Resource details", "Region" is set to "Central India".
- A green banner at the top states "Validation passed.".
- At the bottom, there are buttons for "Basics", "Tags", and "Review + create".

Screenshot 3: Final Step

- The title bar says "Create a resource group - Microsoft Azure".
- The URL is "portal.azure.com/#create/Microsoft.ResourceGroup".
- The main heading is "Create a resource group".
- Under "Project details", "Subscription" is set to "Azure for Students" and "Resource group" is set to "RG2".
- Under "Resource details", "Region" is set to "Central India".
- At the bottom, there are buttons for "Create", "< Previous", "Next >", and "Download a template for automation".

cm - Microsoft Azure

Home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20240612182529 | Overview >

cm Virtual machine

Search

Connect Start Restart Stop Hibernate Capture Delete Refresh Open in mobile Feedback CLI / PS

cm virtual machine agent status is not ready. Troubleshoot the issue →

Essentials

Resource group (move) : RG1
Status : Running
Location : Central India (Zone 1)
Subscription (move) : Azure for Students
Subscription ID : 0effa421-bf62-4ff4-ab63-bb983feaaa4c
Availability zone : 1

Operating system : Windows
Size : Standard DS1 v2 (1 vcpu, 3.5 GB memory)
Public IP address : 20.193.150.151
Virtual network/subnet : cm-vnet/default
DNS name : Not configured
Health state : -
Time created : 6/12/2024, 12:56 PM UTC

Tags (edit) : Add tags

Properties Monitoring Capabilities (8) Recommendations Tutorials

Virtual machine

Computer name	cm
Operating system	Windows
VM generation	V2
VM architecture	x64
Agent status	Not Ready
Agent version	Unknown
Information	Disabled

Networking

Public IP address	20.193.150.151 (Network interface cm608_z1)
Public IP address (IPv6)	-
Private IP address	10.0.0.4
Private IP address (IPv6)	-
Virtual network/subnet	cm-vnet/default
DNS name	Configure

Step-2: Select all the resources from ResourceGroup1 and then click on Move->Move to another resource group.

RG1 - Microsoft Azure

Home > Resource groups >

Resource groups
Vardhaman College of Engineering (vardhaman.org)

+ Create Manage view ...

Filter for any field... Name : RG1

RG1 Resource group

Overview Activity log Access control (IAM) Tag Resource visualizer Events

Subscriptions (move) Azure for Students Subscription ID 0effa421-bf62-4ff4-ab63-bb983feaaa4c Tags (edit) Add tags

Resources Recommendations

Filter for any field... Type equals all X Location equals all X Add filter

Showing 6 of 6 records. Show hidden types □

Name	Type	Location
cm	Virtual machine	Central India
cm-ip	Public IP address	Central India
cm-nsg	Network security group	Central India
cm-vnet	Virtual network	Central India
cm608_z1	Network Interface	Central India

< Previous Page 1 of 1 Next >

Step-3: Select the target Resource Group as ResourceGroup2 and click on move.

Move resources

RG1

Source

Subscription: Azure for Students
Resource group: RG1

Target

Subscription: Azure for Students
Resource group: RG2

Selection summary

Source subscription: Azure for Students
Source resource group: RG1
Target subscription: Azure for Students
Target resource group: RG2
Number of resources to move: 6

I understand that tools and scripts associated with moved resources will not work until I update them to use new resource IDs

Review

Previous Next

RG1 - Microsoft Azure

Resource groups

Vardhaman College of Engineering (vardhaman.org)

RG1

Overview

Subscription ID: 0e0fa421-bf62-4ff4-ab63-bb983feaaa4c
Deployment status: 1 Succeeded
Location: Central India

Resources

No resources match your filters

The screenshot shows the Microsoft Azure portal interface for a resource group named RG2. The left sidebar displays a list of resource groups: NetworkWatcherRG, RG1, and RG2. The main content area is titled 'RG2' and shows the 'Overview' tab. It provides subscription information (Subscription A: Azure for Students, Subscription B: 0e0fa421-bf62-4ff4-ab63-bb903feaaa4c) and deployment details (No deployments, Location: Central India). Below this, the 'Resources' tab is selected, displaying a list of resources with columns for Name, Type, and Location. The resources listed are:

Name	Type	Location
cm	Virtual machine	Central India
cm-ip	Public IP address	Central India
cm-nsg	Network security group	Central India
cm-vnet	Virtual network	Central India
cm608.x1	Network Interface	Central India

Result:

Successfully moved the resources of Virtual Machine allocated to one resource group to another.

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
```

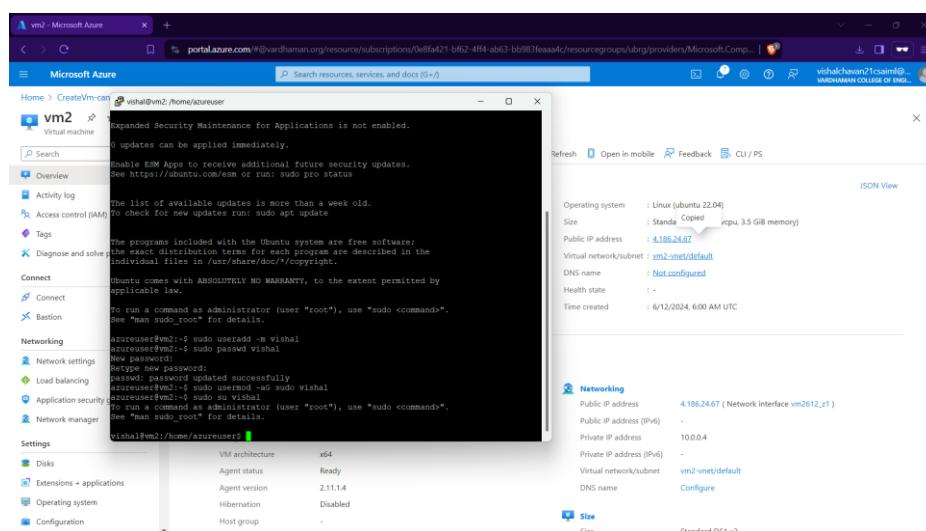
Enter new password and Retype password.

To modify login credentials:

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

To switch the user:

```
$sudo su vishal
```

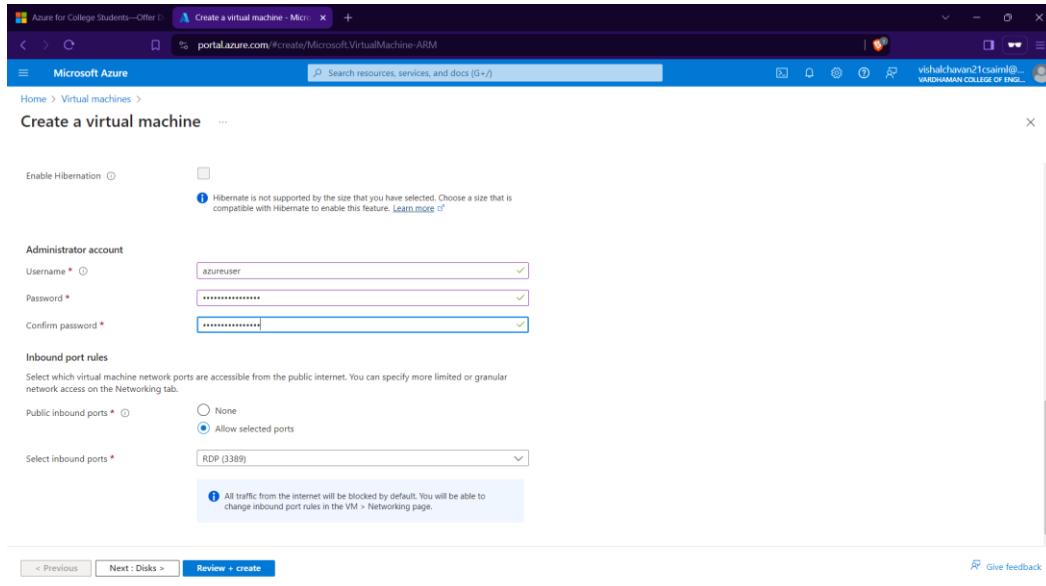


Result:

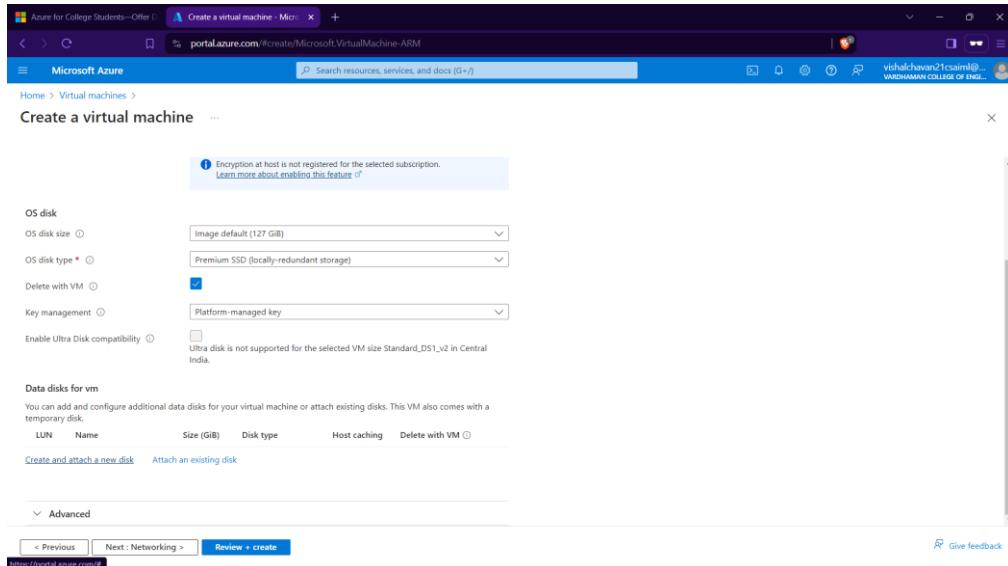
The Linux server has been setup and configured successfully. The new users were added and the credentials were updated successfully.

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.

	P3	P4	P6	P10	P15	P20	P30	P40	P50	P60	P70	P80
16 GiB												
32 GiB												
64 GiB												
128 GiB												
256 GiB												
512 GiB												
1024 GiB												
2048 GiB												
4096 GiB												
8192 GiB												
16384 GiB												
32767 GiB												

Custom disk size (GiB) *

Performance tier

OK [Give feedback](#)

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

Create a new disk to store applications and data on your VM. Disk pricing varies based on factors including disk size, storage type, and number of transactions. [Learn more](#)

Name *

Source type *

Size *
Premium SSD LRS
[Change size](#)

Key management

Enable shared disk Yes No
Shared disk not available for the selected size.

Delete disk with VM

OK [Give feedback](#)

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 left sidebar includes options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Connect, Bastion, Windows Admin Center, Networking, Network settings, Load balancing, Application security groups, Network manager, and Settings (Disks, Extensions + applications, Operating system). The main area shows the 'OS disk' (vm_OsDisk_1) and 'Data disk' (vm_DataDisk_0). A warning message at the top states: '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 125 MBps.' Below this, there are tables for both disk types with columns for Disk name, Storage type, Size (GiB), Max IOPS, Max throughput, Encryption, and Host caching.

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

This screenshot shows the same 'vm | Disks' blade as the previous one, but with a key difference: the 'Data disk' section now displays the message 'No data disks attached'. This indicates that the data disk has been successfully detached from the VM.

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 125 Mbps.

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

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.

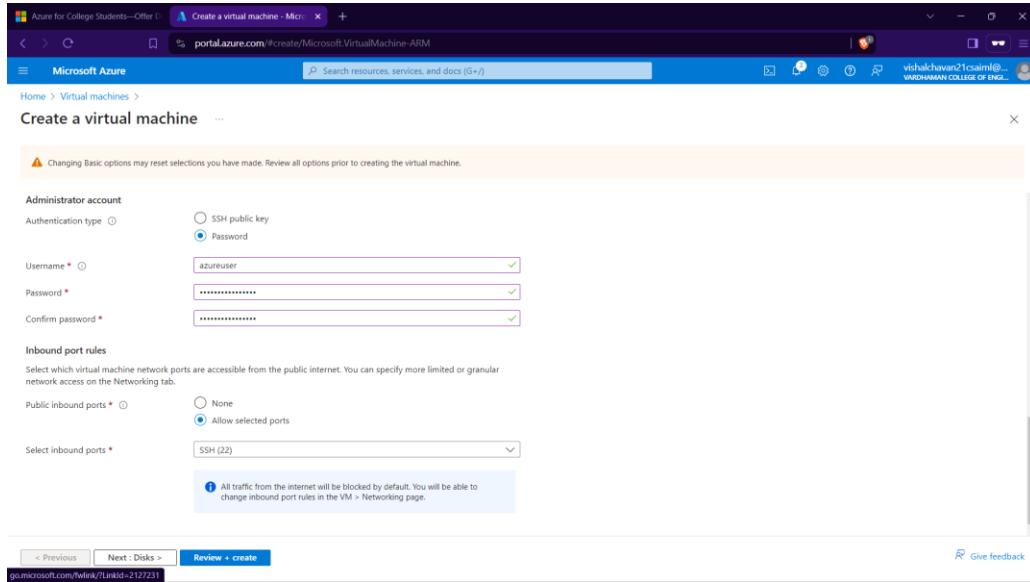
LUN	Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (Mbps)	Encryption	Host caching

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.

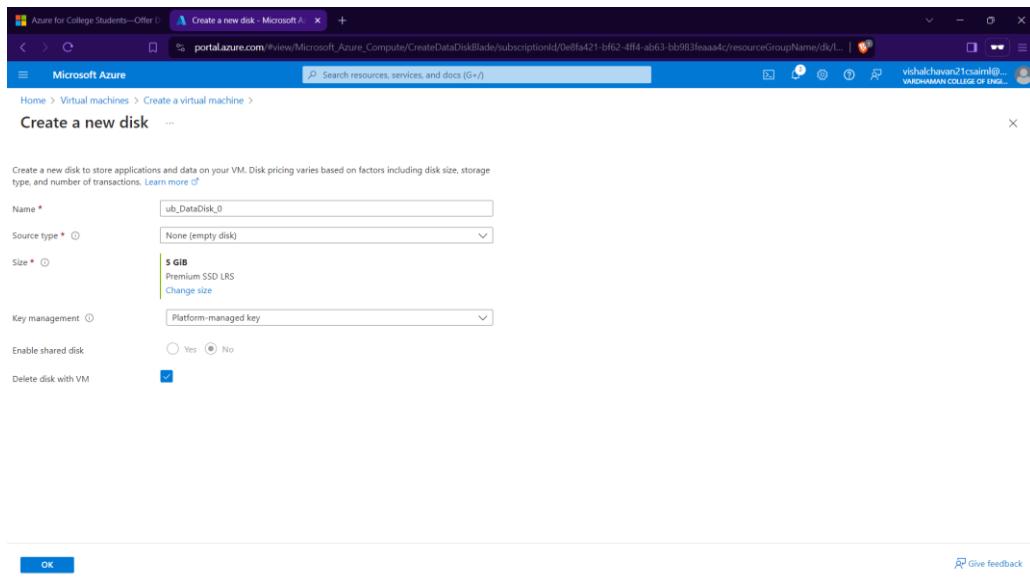
Q15)How to attach and detach data disk to Linux server in azure?

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



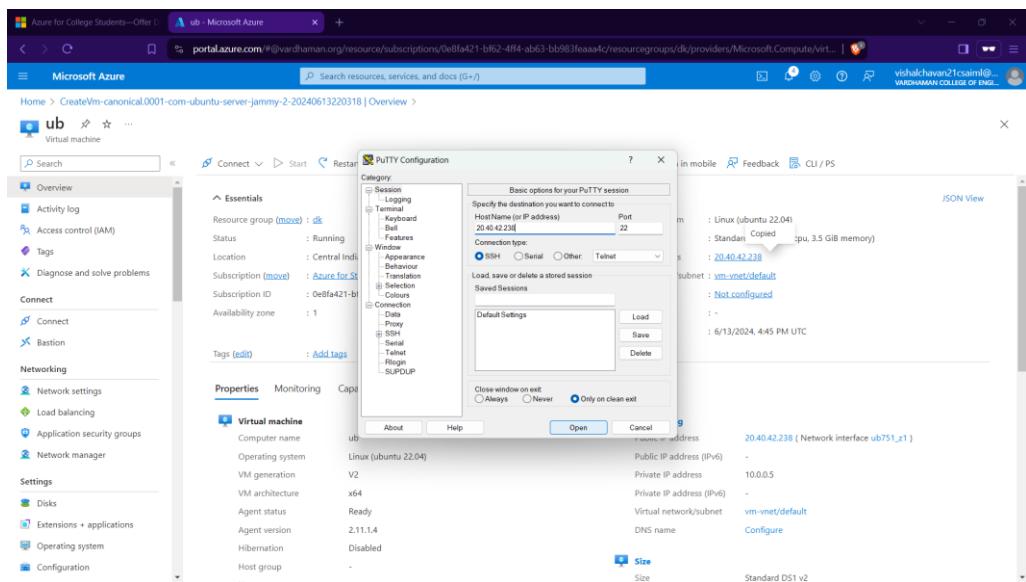
Step-2: Click on Next: Disk and then select OS disk size-30GiB, Os disk type – Premium SSD(LRS) , enable “Delete with VM” and click on “Create and Attach a new data disk”.

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
```

The screenshot shows the Microsoft Azure portal interface. The left sidebar navigation includes 'Disks', which is currently selected. The main content area displays the 'vm' virtual machine details. Under 'OS disk', it lists one disk: 'vm_0Disk_1' (ID: f0f6414f-7ad0-4a4f-9cfa-4eefc). Under 'Data disks', it lists one disk: 'vm_DataDisk_0' (LUN: 0). Both disks are Premium SSD LRS type, 30 GB in size, with 120 Max IOPS and 25 Max throughput. Encryption is set to SSE with PMK. Host caching is set to 'Read/write' for the OS disk and 'Read-only' for the data disk.

Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
vm_0Disk_1 (f0f6414f-7ad0-4a4f-9cfa-4eefc)	Premium SSD LRS	30	120	25	SSE with PMK	Read/write

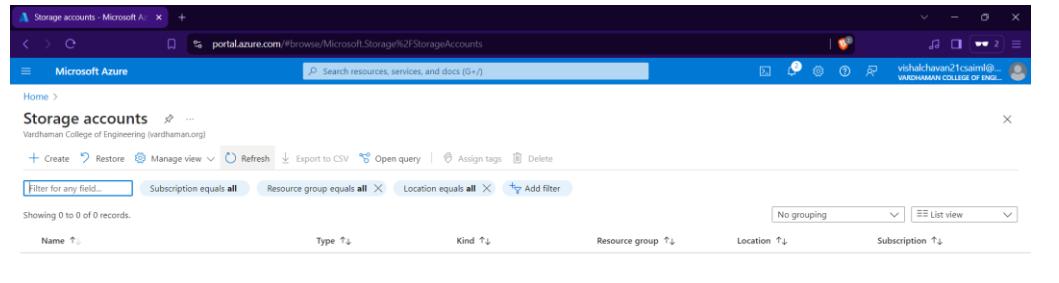
LUN	Disk name	Storage type	Size (GB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
0	vm_DataDisk_0	Premium SSD LRS	30	120	25	SSE with PMK	Read-only

Result:

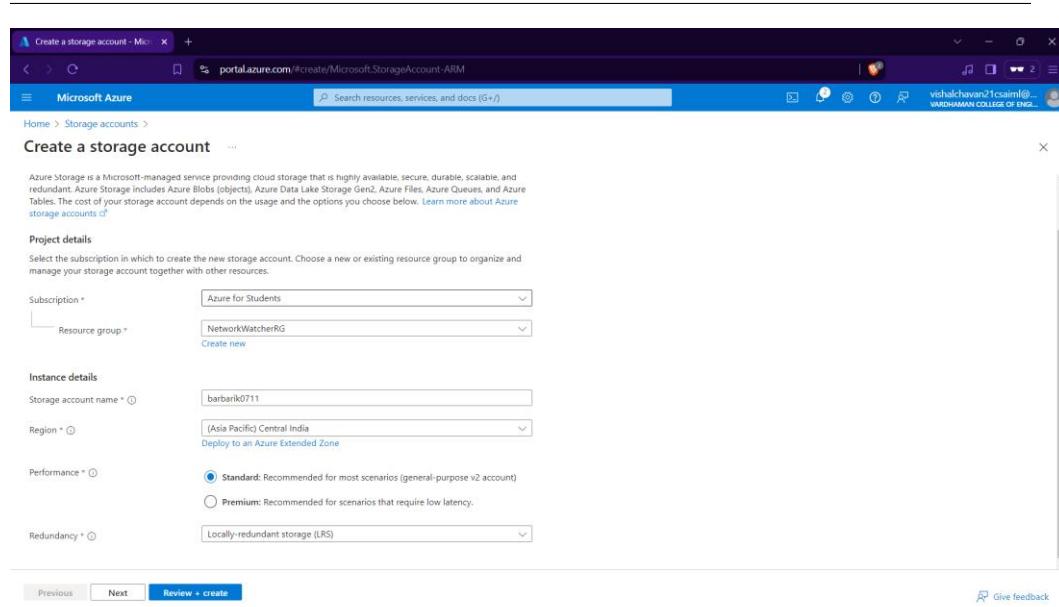
Attached and detached a data disk to a Linux server in Azure. The operations were performed without downtime, and the disk was recognized and accessible after attachment, then safely removed.

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 search bar at the top contains 'Search resources, services, and docs (G+)'. Below the search bar, there are filter options: 'Subscription equals all', 'Resource group equals all', 'Location equals all', and 'Add filter'. A message at the top states 'Showing 0 to 0 of 0 records.' Below this, there is a large 'No storage accounts to display' message with a small icon of a server. A descriptive text follows: '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.' Two buttons are present: 'Create storage account' and 'Learn more'. At the bottom right, there is a 'Give feedback' link.



The screenshot shows the 'Create a storage account' wizard, step 1 of 3. The title is 'Create a storage account'. The page has a 'Project details' section where 'Subscription' is set to 'Azure for Students' and 'Resource group' is set to 'NetworkWatcherRG'. Below this is an 'Instance details' section with fields for 'Storage account name' (set to 'barbarik0711'), 'Region' (set to '(Asia Pacific) Central India'), and 'Performance' (radio button selected for 'Standard: Recommended for most scenarios (general-purpose v2 account)'). Under 'Redundancy', the dropdown is set to 'Locally-redundant storage (LRS)'. At the bottom, there are 'Previous' and 'Next' buttons, and a 'Review + create' button which is highlighted in blue.

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

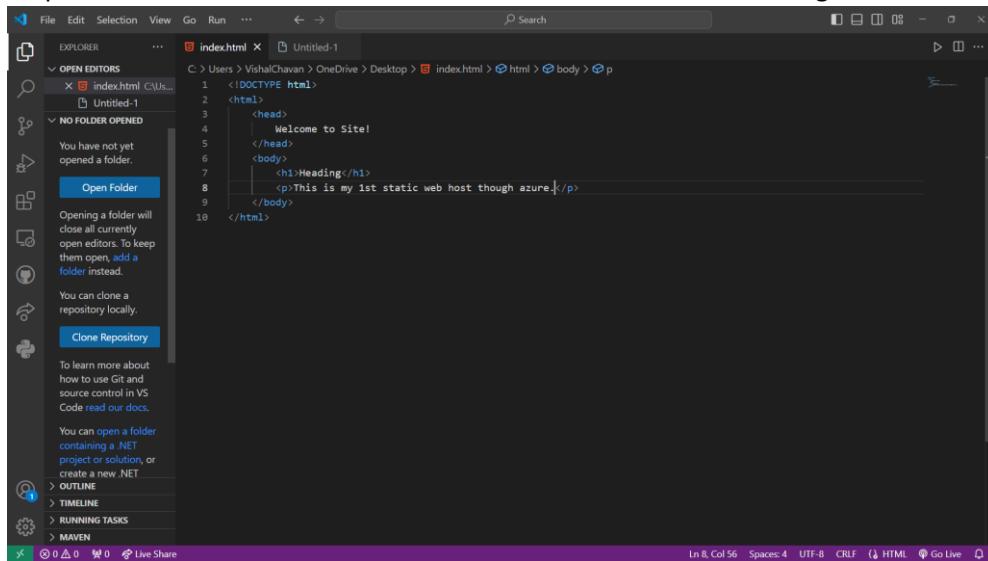
Step-3: Click on Enable under static website then fill index document and error document name and click save and copy the primary endpoint url.

The screenshot shows the Microsoft Azure portal interface. The left sidebar is collapsed, and the main content area displays the 'Static website' settings for a container named '\$web'. The 'Enabled' button is selected under 'Static website'. The 'Primary endpoint' field contains the URL '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'.

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 the 'Containers' section with '\$web' selected. The main content area displays the 'Overview' page for the '\$web' container. It includes sections for 'Authentication method' (Access key), 'Location' (Sweb), and a search bar for blobs. Below these are tabs for 'Overview', 'Diagnose and solve problems', 'Access Control (IAM)', and 'Settings' (with sub-options like Shared access tokens, Access policy, Properties, Metadata, and Editor (preview)). A table at the bottom lists blob results with columns: Name, Modified, Access tier, Archive status, Blob type, Size, and Lease state. The table shows one result: 'No results'.

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

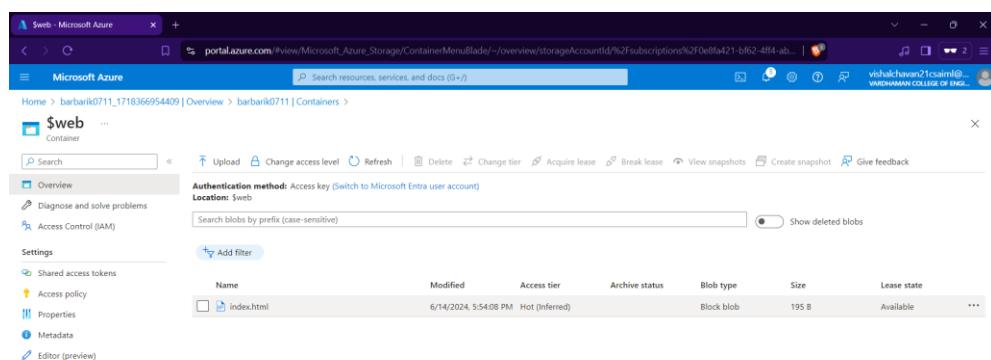


```

<!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.



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

