

K. Srinidhi  
21881A6698 (CSM B)

## **Cloud Computing and Virtualization**

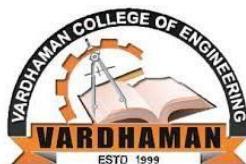
Submitted in partial fulfilment of the requirements for the  
award of Degree of  
**BACHELOR OF TECHNOLOGY**

**In**

**COMPUTER SCIENCE & ENGINEERING (AI&ML)**

**By**

**K. Srinidhi  
(21881A6698)**



Under the Esteemed Guidance of

**Dr. P. Pavankumar  
Associate Professor**

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI&ML)

**VARDHAMAN COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

(Affiliated to JNTUH, Approved by AICTE and Accredited by NBA)  
Shamshabad - 501 218, Hyderabad

#### **ACKNOWLEDGEMENT**

The satisfaction that accompanies the successful completion of the task would be put incomplete without the mention of the people who made it possible, whose constant guidance and encouragement crown all the efforts with success.

We wish to express my deep sense of gratitude to **Dr. P. Pavankumar ,Associate Professor** for their able guidance and useful suggestions, which helped us in completing the design part of potential project in time.

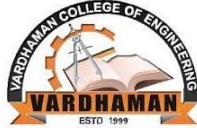
We are particularly thankful to **Dr. M. A. Jabbar**, Professor & Head, Department of Computer Science and Engineering (AI&ML) for his guidance, intense support and encouragement, which helped us to mould our project into a successful one.

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(AI&ML)**

**CERTIFICATE**

Certified that this is the bonafide record of practical work done by Ms. K. Srinidhi, roll number 21881A6698 of B. Tech in the “CLOUD COMPUTING & VIRTUALIZATION” laboratory during the year 2024.

No. of Experiments done:

Total No. of Experiments:

Date:

HOD

Staff Member Incharge

Roll Number -21881A6698

Submitted for the practical exam held on :

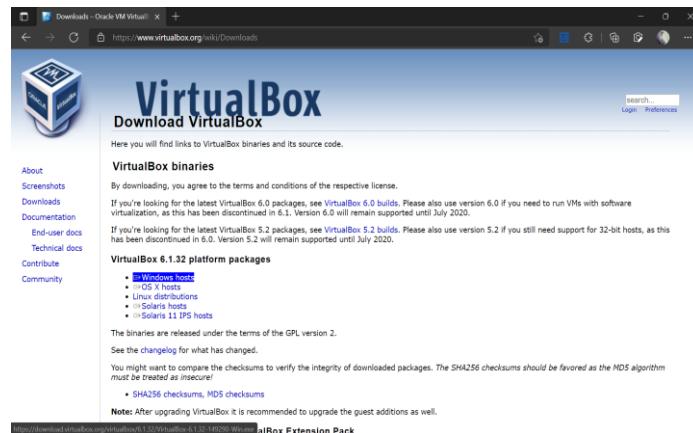
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## Q1. Install Virtual box and making Ubuntu and Window Virtual Machine.

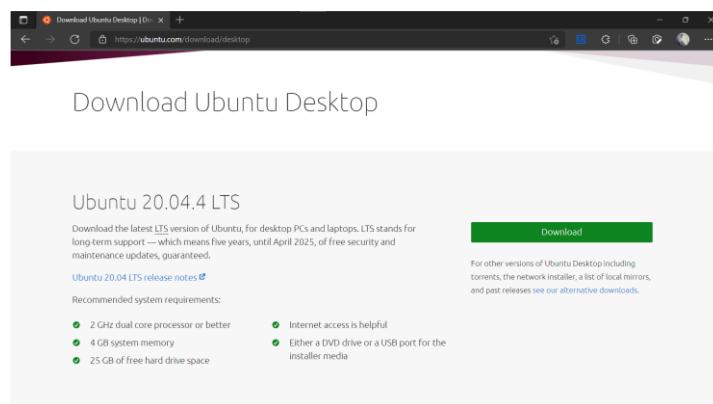
### Ubuntu:

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



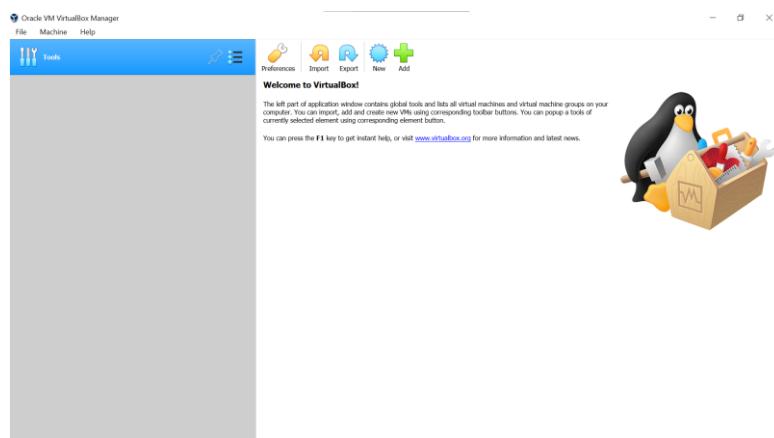
<https://www.virtualbox.org/wiki/Downloads>

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

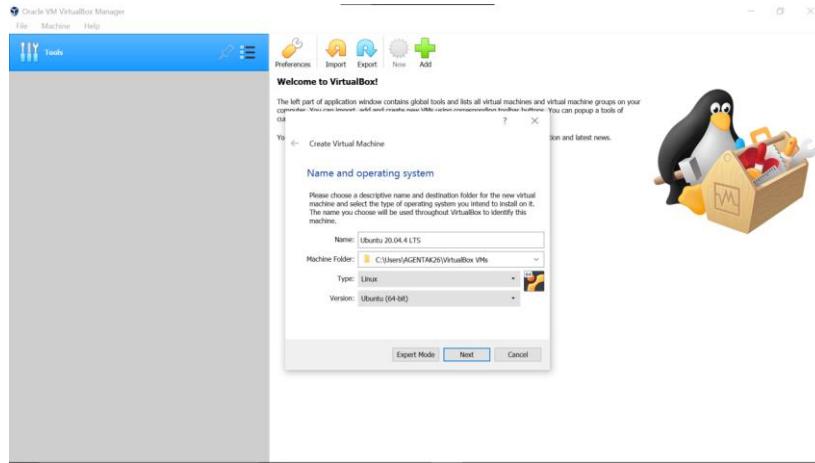


Note: The current version of Ubuntu only works on 64-bit machines.

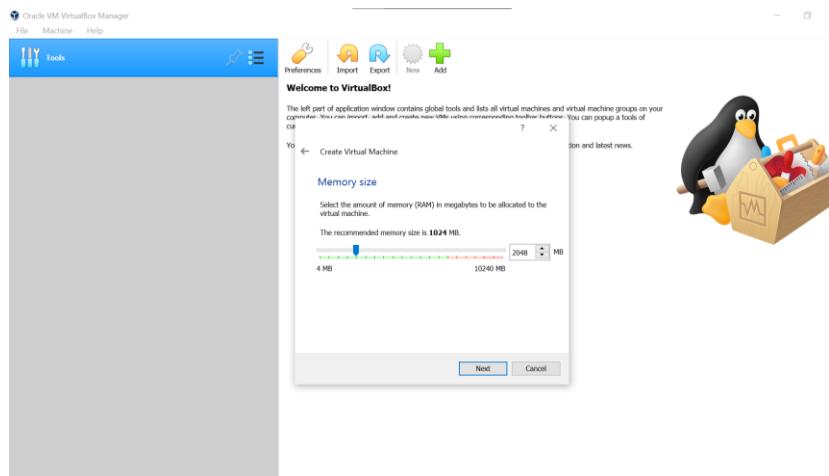
**Step-3:** Open VirtualBox and select New in the top taskbar.



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

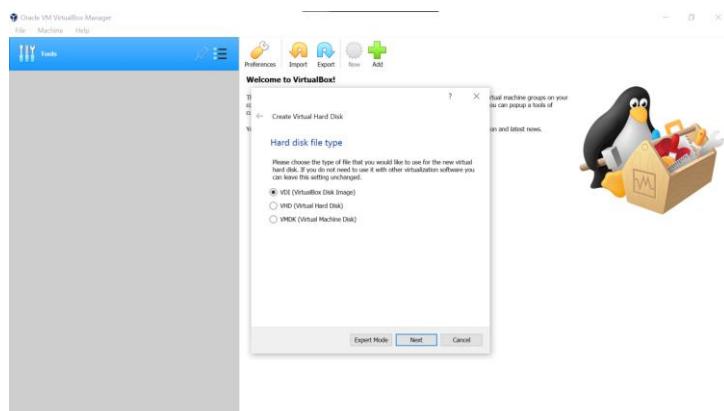


**Step-5:** Choose how much RAM you want to assign to the virtual machine and select Next. The recommended minimum is 1024 MB.



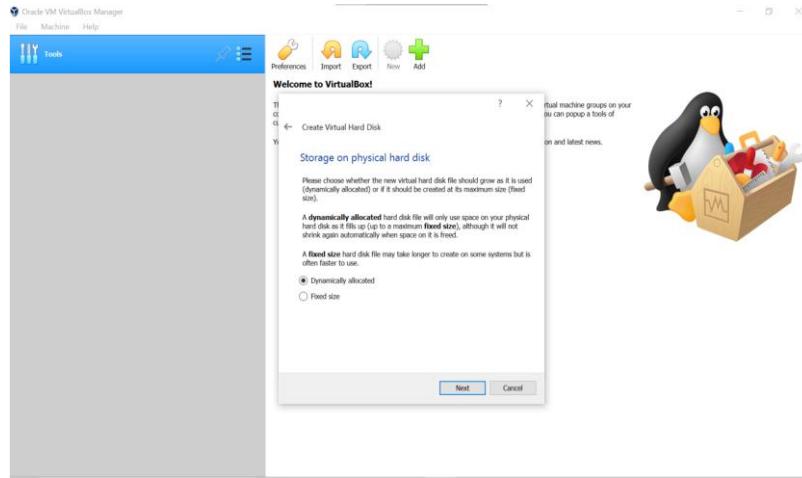
**Step-6:** Choose Create a virtual hard disk now and select Create.

**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.

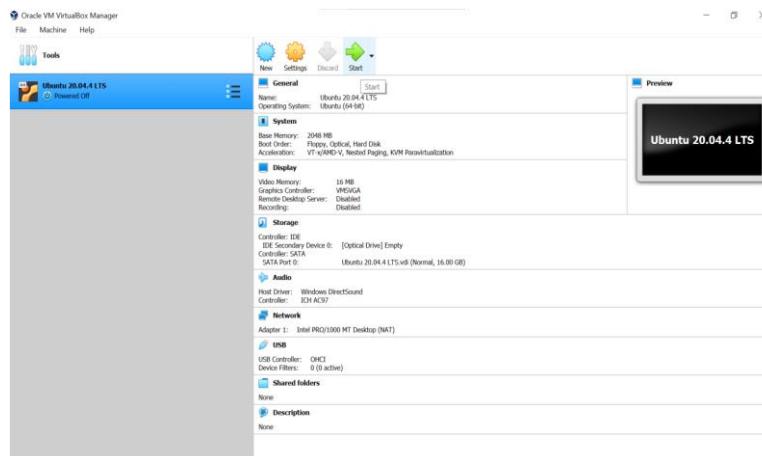


Tip: A fixed size disk performs better because the virtual machine doesn't have to increase the file size as you install software.

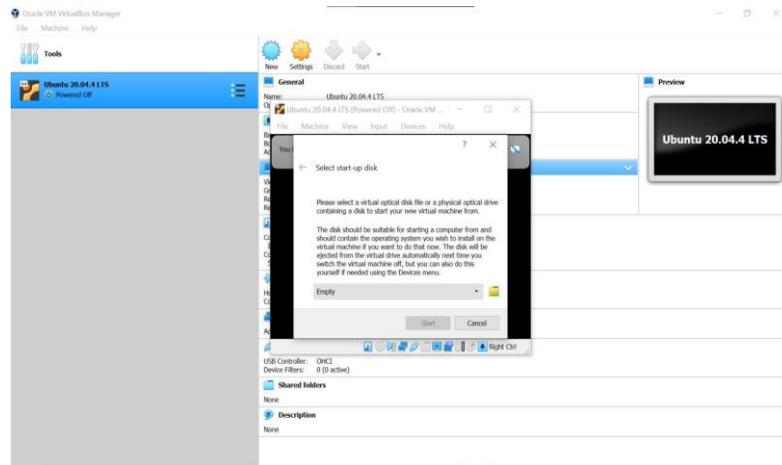
**Step-9:** Choose how much space you wish to set aside for Ubuntu and select Create.

**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.

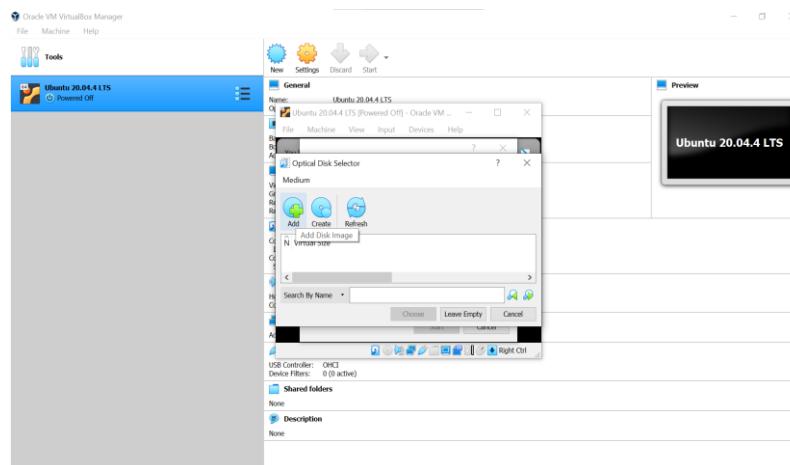
**Step-10:** The name of your virtual machine will now appear on the left side of the VirtualBox manager. Select Start in the toolbar to launch your VM.



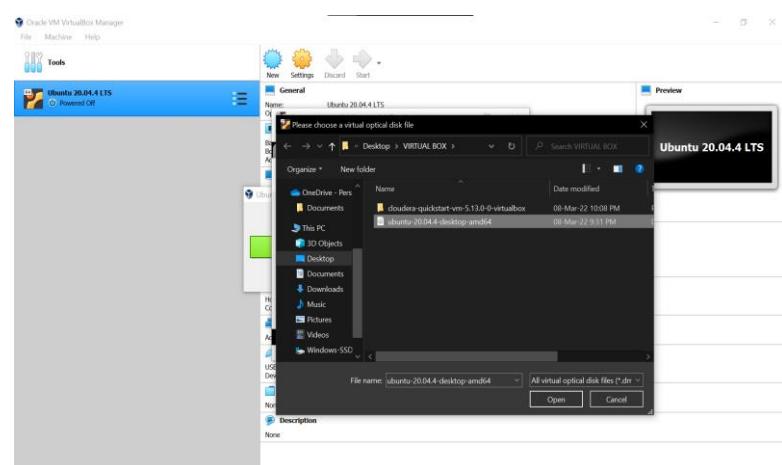
**Step-11:** This is the point where you need to choose the Ubuntu ISO file you downloaded earlier. If the VM doesn't automatically detect it, select the folder next to the Empty field.



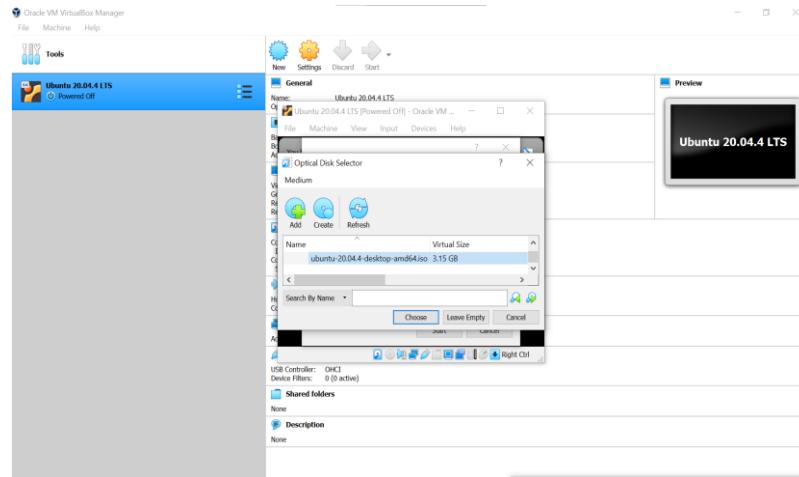
**Step-12:** Select Add in the window that pops up.



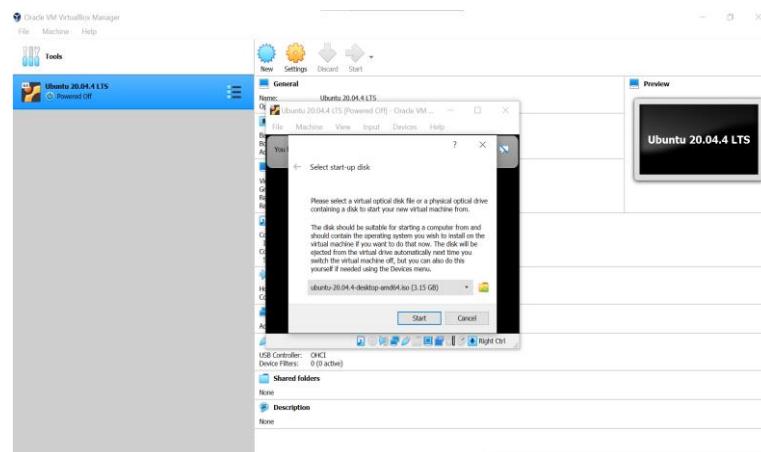
**Step-13:** Choose your Ubuntu disk image and select Open.



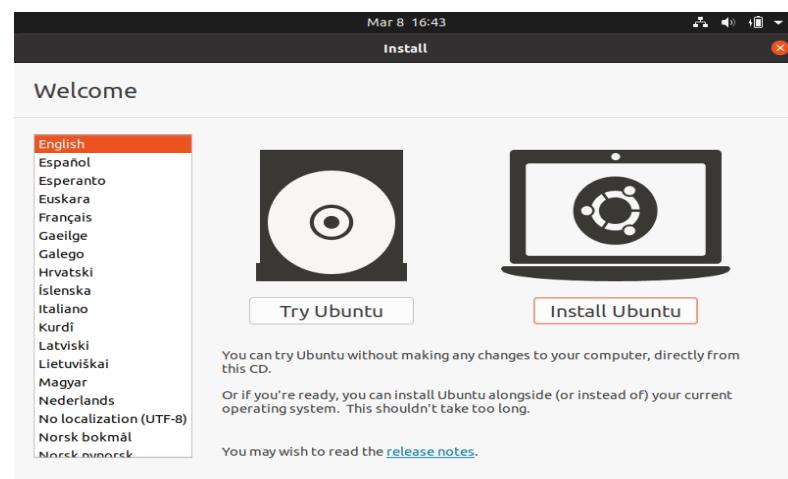
**Step-14:** - Select Choose



**Step-15:** Select Start.

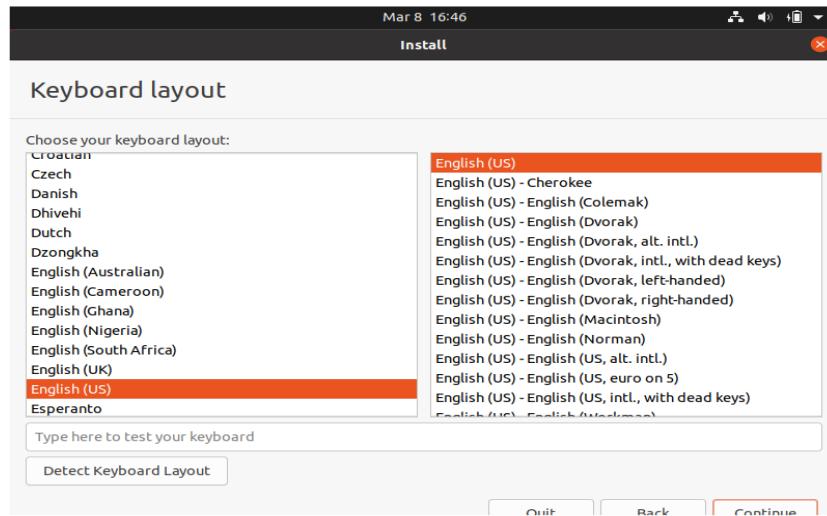


**Step-16:** Your VM will now boot into a live version of Ubuntu. Choose your language and select Install Ubuntu



u.

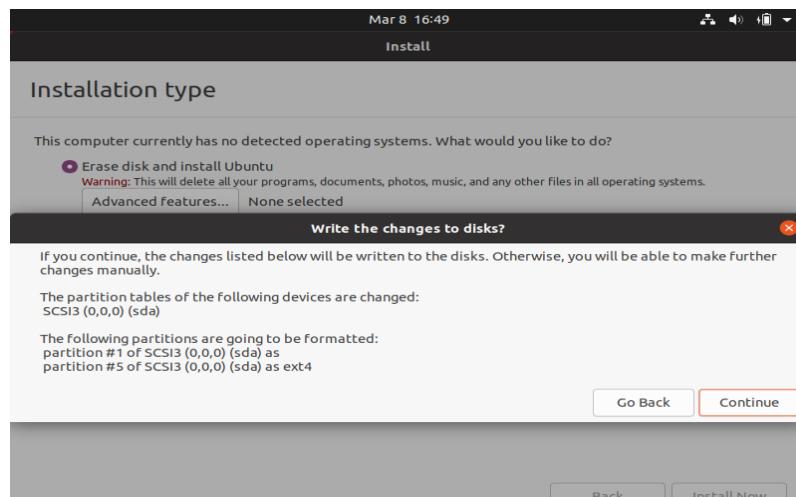
**Step-17:** Choose your keyboard layout and select Continue.



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

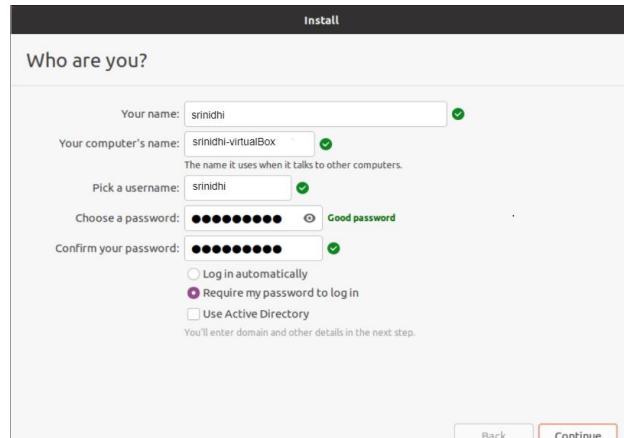
**Step-19:** Choose Erase disk and install Ubuntu and select Install Now, then select Continue to ignore the warning.

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

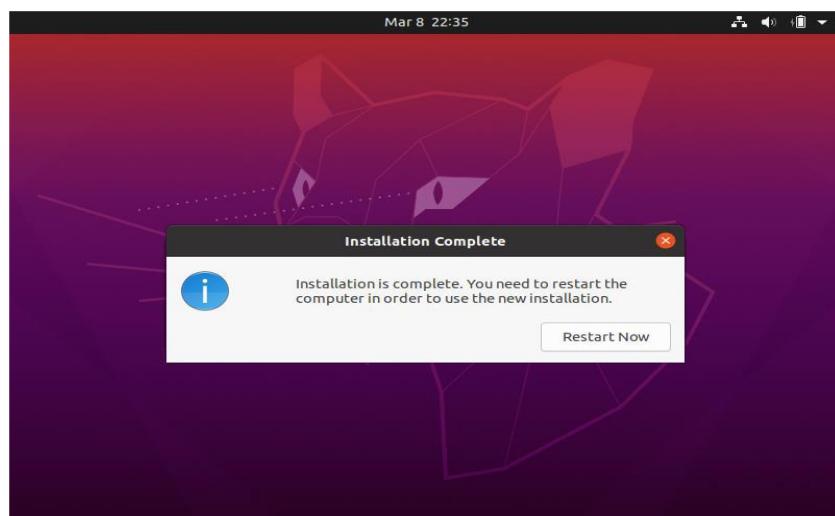


**Step-20:** - Choose your time zone on the map, then select Continue.

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

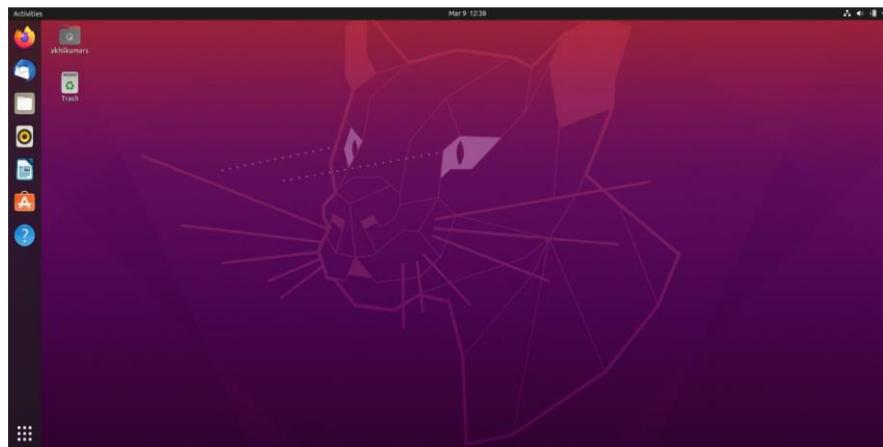


**Step-22:** - Select Restart Now.



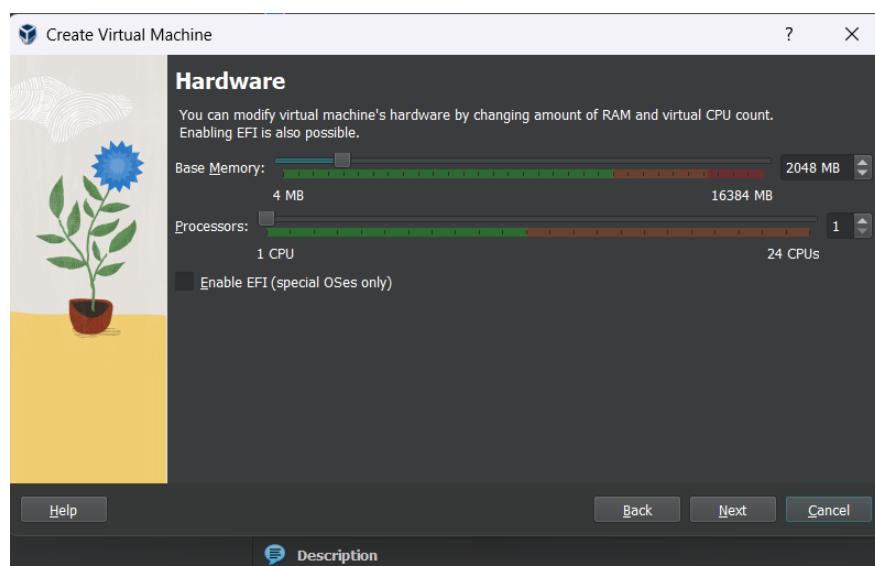
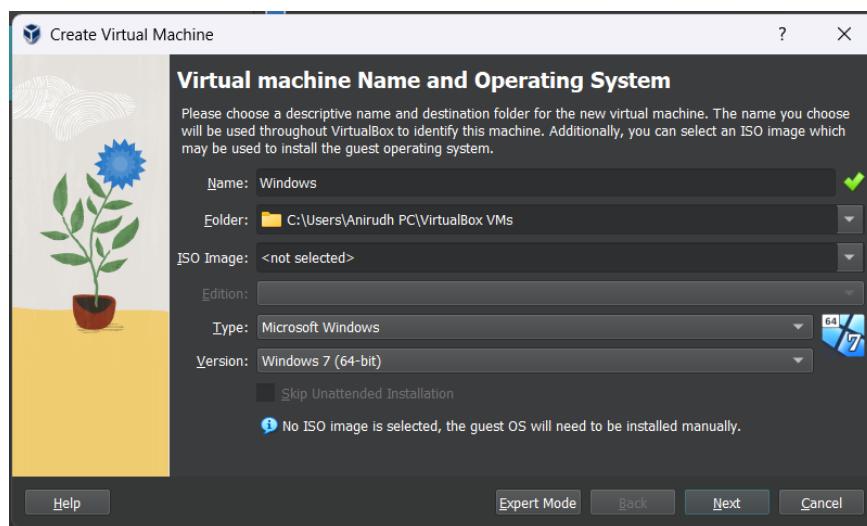
**Step-23:** - After restarting your VM and booting into Ubuntu, you may notice that the desktop doesn't scale correctly if you choose to view it in full-screen mode. You can fix this problem by selecting the VBox\_Gas icon to install VirtualBox Guest Additions.

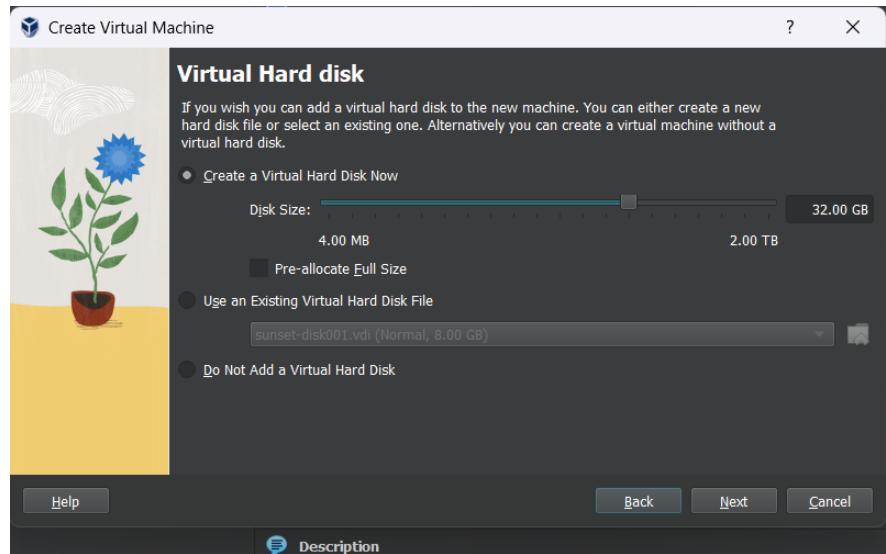
## Output:



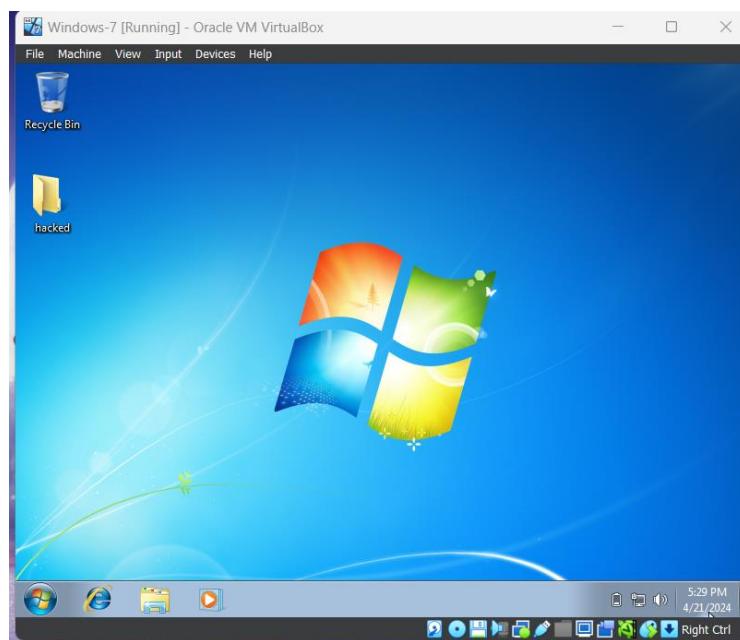
### Windows:

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





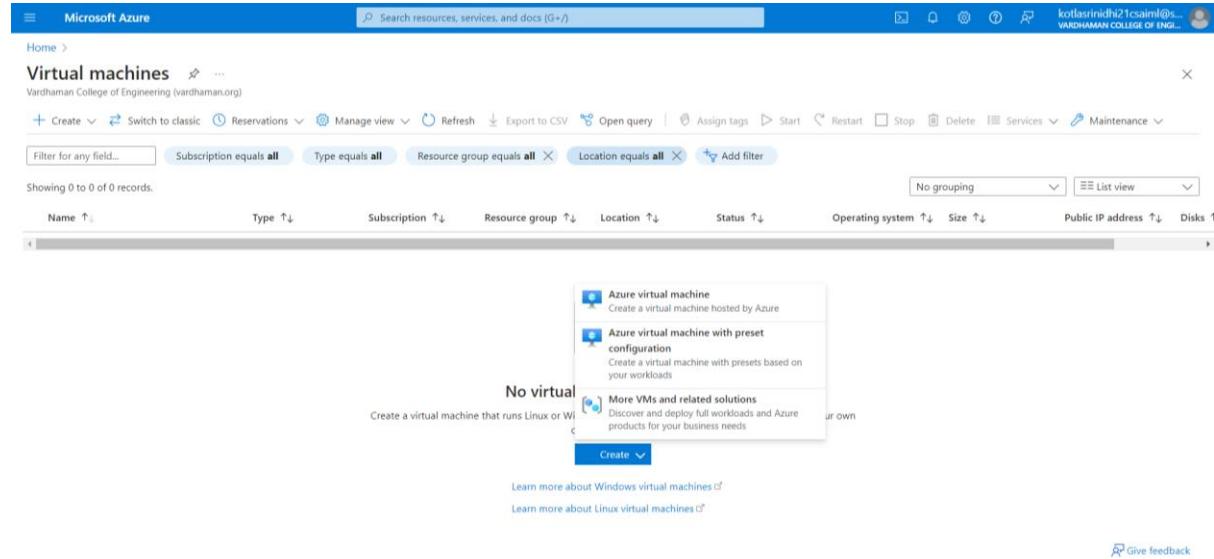
## Output:



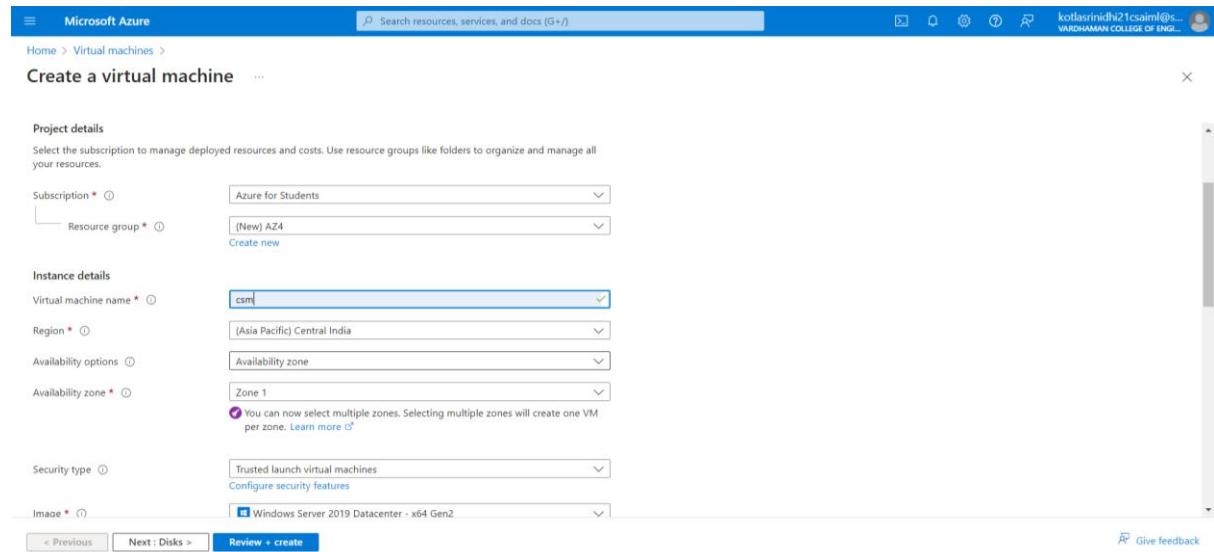
## Q2) Create a Windows Virtual Machine in Microsoft Azure

**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”



**VM architecture**  Arm64  x64  
**Run with Azure Spot discount**   
**Size \***  Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (₹7,895.17/month)   
[See all sizes](#)  
**Enable Hibernation**   
Hibernate is not supported by the size that you have selected. Choose a size that is compatible with Hibernate to enable this feature. [Learn more](#)

**Administrator account**

Username *	Azureuser
Password *	*****
Confirm password *	*****

**Inbound port rules**

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

#### Step-4: After Deployment is over, Go to the remote desktop connection.

**Validation passed**

[Basics](#) [Disks](#) [Networking](#) [Management](#) [Monitoring](#) [Advanced](#) [Tags](#) [Review + create](#)

Cost given below is an estimate and not the final price. For all your pricing needs, please use the pricing calculator.

**Price**  
 1 X Standard DS1 v2 by Microsoft **Subscription credits apply**   
[10.8153 INR/hr](#) [Pricing for other VM sizes](#)

**TERMS**  
 By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the Azure Marketplace Terms for additional details.

< Previous [Next >](#) [Create](#) [Download a template for automation](#) [Give feedback](#)

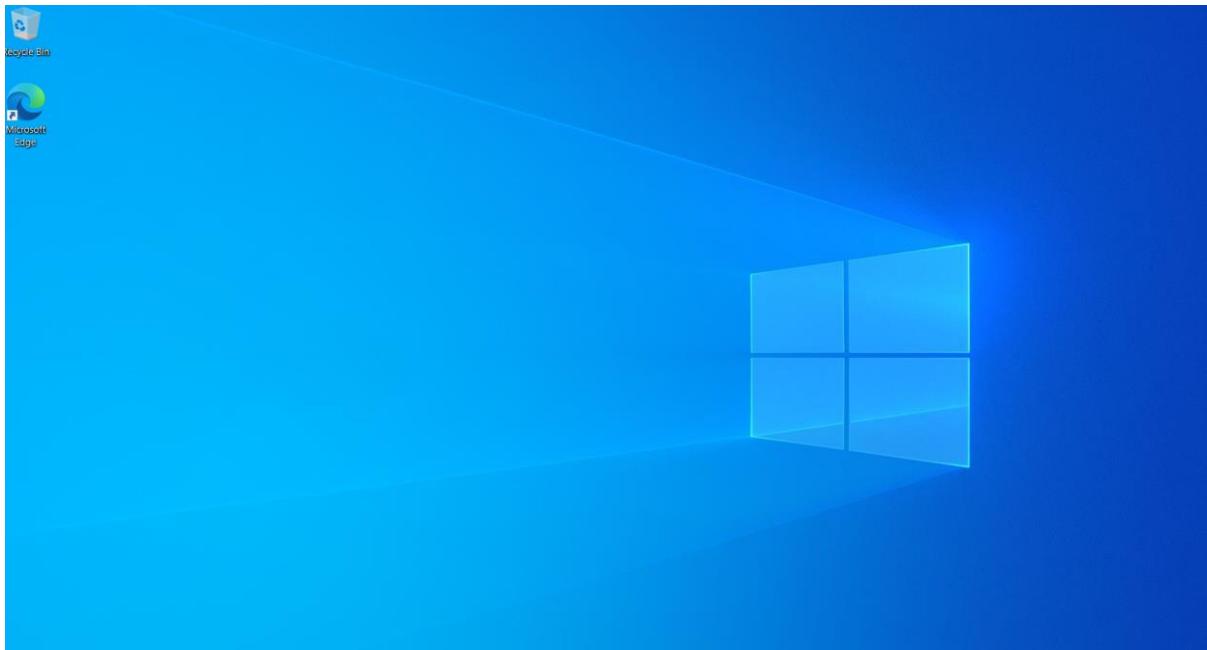
The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information. Below it, the main title is 'CreateVm-MicrosoftWindowsServer.WindowsServer-201-20240615174632 | Overview'. On the left, there's a sidebar with 'Deployment' selected, showing 'Overview', 'Inputs', 'Outputs', and 'Template'. The main content area displays a green checkmark indicating 'Your deployment is complete'. It provides deployment details: name 'CreateVm-MicrosoftWindowsServer.WindowsServer-201-20240615174632', start time '6/15/2024, 5:51:14 PM', subscription 'Azure for Students', correlation ID 'e4f9ae2b-6fd-4c4e-80c3-bdbbf619690d', and resource group 'A24'. It also lists 'Deployment details' (Setup auto-shutdown: Recommended, Monitor VM health, performance and network dependencies: Recommended, Run a script inside the virtual machine: Recommended) and 'Next steps' (links to 'Go to resource' and 'Create another VM'). A feedback section at the bottom encourages users to 'Give feedback' or 'Tell us about your experience with deployment'. To the right, there are promotional cards for 'Cost Management', 'Microsoft Defender for Cloud', 'Free Microsoft tutorials', and 'Work with an expert'.

**Step-5:** Firstly, copy the public IP Address of that created virtual machine.

The screenshot shows two overlapping windows. The top window is 'Remote Desktop Connection' with the title 'Remote Desktop Connection'. It has fields for 'Computer:' (set to '20.244.31.238'), 'User name:' (set to 'MicrosoftAccount\srinidhi'), and a note 'You will be asked for credentials when you connect.' Below these are 'Show Options' and 'Connect' buttons. The bottom window is 'Windows Security' with the title 'Enter your credentials'. It displays the message 'These credentials will be used to connect to 20.40.44.213.' Below this are input fields for 'AzureUser' (containing 'AzureUser') and a password (represented by a redacted series of dots). There is a 'Remember me' checkbox and two large buttons at the bottom: 'OK' (in a brown background) and 'Cancel'.

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

**Output:**



### Q3) Create an Ubuntu Virtual Machine in Microsoft Azure

**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.

The screenshot shows the Microsoft Azure Virtual Machines dashboard. At the top, there's a search bar and various filter options like 'Type equals all', 'Resource group equals all', and 'Location equals all'. Below the filters is a table displaying existing VMs. The columns include Subscription, Resource group, Location, Status, Operating system, Size, Public IP address, and Disks. One VM is listed: 'Azure for Students' in 'AZ4' resource group, located in Central India, running Windows, with a Standard\_DS1\_v2 size, a public IP of 20.244.87.2, and one disk. On the left, there are navigation links for 'Create', 'Switch to classic', 'Reservations', 'Manage view', 'Refresh', 'Export to CSV', 'Open query', 'Assign tags', 'Start', 'Restart', 'Stop', 'Delete', 'Services', 'Maintenance', and a 'More VMs and related solutions' section.

**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 finally click on “Create”.

The screenshot shows the 'Create a virtual machine' wizard, step 1: Set instance details. It includes fields for Subscription (Azure for Students), Resource group ((New) AZ24), and Instance details (Virtual machine name: Ubuntu, Region: (Asia Pacific) Central India, Availability options: Availability zone, Availability zone: Zone 1). Security type is set to Trusted launch virtual machines. The Image field is selected with 'Ubuntu Server 20.04 LTS - x64 Gen2'. VM architecture is set to Arm64. At the bottom, there are buttons for '< Previous' and 'Next : Disks >'.

**Create a virtual machine**

VM architecture:  Arm64  x64

Run with Azure Spot discount:

Size: Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (\$5.101.50/month)

Enable Hibernation:   
Hibernate does not currently support Trusted launch and Confidential virtual machines. [Learn more](#)

Administrator account:

Authentication type:  SSH public key  Password

Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.

Username:

SSH public key source:

< Previous Next : Disks > Review + create Give feedback

**Create a virtual machine**

Username:

SSH public key source:

SSH Key Type:

- RSA SSH Format
- Ed25519 SSH Format

Ed25519 offers better performance and security with a smaller key size, while RSA is still widely used particularly for legacy systems and applications.

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

Select inbound ports:

All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

< Previous Next : Disks > Review + create Give feedback

**Step-4:** After Deployment is over, Go to the remote desktop connection.

**Generate new key pair**

An SSH key pair contains both a public key and a private key. **Azure doesn't store the private key.** After the SSH key resource is created, you won't be able to download the private key again. [Learn more](#)

**Download private key and create resource**

Return to create a virtual machine

**Step-5:** Firstly, copy the public IP Address of that created virtual machine

**Ubuntu** Virtual machine

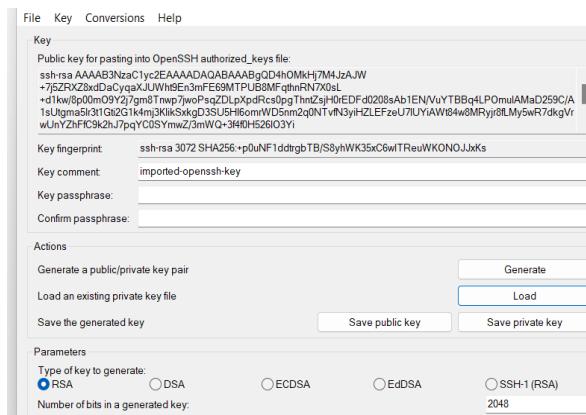
**Essentials**

- Resource group (move) : AZ24
- Status : Running
- Location : Central India (Zone 1)
- Subscription (move) : Azure for Students
- Subscription ID : 37b3b623-b17d-4af9-a30c-ebff8cec50e4
- Availability zone : 1
- Tags (edit) : Add tags

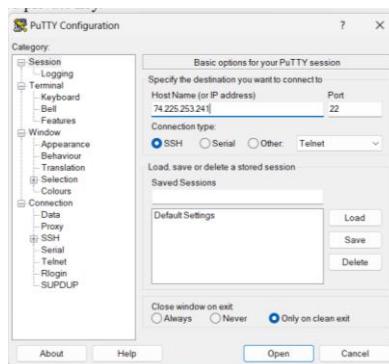
**Properties** Monitoring Capabilities (7) Recommendations Tutorials

Virtual machine	Networking
Computer name : Ubuntu	Public IP address : 74.225.253.241 ( Network interface ubuntu455_z1 )
Operating system : Linux (ubuntu 20.04)	Public IP address (IPv6) : -
VM generation : V2	Private IP address : 10.1.0.4
VM architecture : x64	Private IP address (IPv6) : -
Agent status : Ready	Virtual network/subnet : Ubuntu-vnet/default
Agent version : 2.11.1.4	DNS name : Configure

**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.

**Output:**

```
azureuser@Ubuntu:~  
login as: azureuser  
Authenticating with public key "imported-openssh-key"  
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86_64)  
  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/pro  
  
System information as of Thu Jun 13 16:27:08 UTC 2024  
  
System load: 0.08 Processes: 116  
Usage of /: 5.1% of 28.89GB Users logged in: 0  
Memory usage: 8% IPv4 address for eth0: 10.0.0.4  
Swap usage: 0%  
  
Expanded Security Maintenance for Applications is not enabled.  
0 updates can be applied immediately.  
  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files 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.  
azureuser@Ubuntu:~$
```

#### Q4) Create a Virtual machine and do scale up in Azure.

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

The screenshot shows the Microsoft Azure portal interface. On the left, there's a sidebar with navigation links like Home, Connect, Networking, and Settings. The main area displays the details of a virtual machine named 'Ubuntu'. The 'Overview' tab is selected. Key details shown include:

- Resource group: A2Z4
- Status: Running
- Location: Central India (Zone 1)
- Subscription: Azure for Students
- Subscription ID: 37b3b623-b17d-4af9-a30c-ebff8ce50e4
- Availability zone: 1
- Operating system: Linux (ubuntu 20.04)
- Size: Standard D51 v2 (1 vcpu, 3.5 GiB memory)
- Public IP address: 74.225.253.241
- Virtual network/subnet: Ubuntu-vnet/default
- DNS name: Not configured
- Health state: -
- Time created: 6/15/2024, 12:43 PM UTC

Below the main details, there are tabs for Properties, Monitoring, Capabilities (7), Recommendations, and Tutorials. The Properties tab is active, showing sections for Virtual machine and Networking.

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

The screenshot shows the Microsoft Azure portal interface, similar to the previous one but with a modal dialog box. The dialog is titled 'Stop this virtual machine' and contains the message 'Do you want to stop 'Ubuntu'?'. Below the message is a note: '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.' At the bottom of the dialog are two buttons: 'Yes' (highlighted in blue) and 'No'. The rest of the page shows the same virtual machine details as the first screenshot, including the 'Properties' tab and 'Networking' section.

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

Microsoft Azure

Home > Ubuntu

Ubuntu | Disks

OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MBps)	Encryption	Host caching
Ubuntu_OsDisk_1_db83561addf04557ab	Premium SSD LRS	30	120	25	SSE with PMK	Read/write

Data disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MBps)	Encryption	Host caching
No data disks attached							

Apply Discard changes

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

Microsoft Azure

Home > Ubuntu

Ubuntu | Disks

OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MBps)	Encryption	Host caching
Ubuntu_OsDisk_1_db83561addf04557ab	Premium SSD LRS	30	120	25	SSE with PMK	Read/write

Apply Discard changes

**Step-5:** On the left side there will be select + performance and click on size.

Size	Disk tier	Provisioned IOPS	Provisioned throughput	Max Shares	Max burst IOPS	Max burst throughput
4 GiB	P1	120	25	3	3500	170
8 GiB	P2	120	25	3	3500	170
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	-	-
32768 GiB	P80	20000	1000	10	-	-

**Step-6:** click on disk name and select your preferred ram size, save it.

VM Size ↑	Type ↑	vCPUs ↑	RAM (GiB) ↑	Data disks ↑	Max IOPS ↑	Local storage (GiB) ↑
DS1_v2	General purpose	1	3.5	4	3200	7 (SCSI)
D2s_v3	General purpose	2	8	4	3200	16 (SCSI)
D2as_v4	General purpose	2	8	4	3200	16 (SCSI)
DS2_v2	General purpose	2	7	8	6400	14 (SCSI)
D4s_v3	General purpose	4	16	8	6400	32 (SCSI)

## Q5) 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's a navigation sidebar for the 'Ubuntu' virtual machine, including sections for Overview, Connect, Networking, Settings, and Properties. The main content area displays the 'Essentials' tab with detailed information about the VM, such as Resource group (AZ24), Status (Running), Location (Central India (Zone 1)), Subscription (Azure for Students), and various network and compute details. A 'Tags (edit)' section is also present. Below the essentials, there are tabs for Properties, Monitoring, Capabilities (7), Recommendations, and Tutorials. The 'Virtual machine' properties are shown under the Properties tab, including Computer name (Ubuntu), Operating system (Linux (ubuntu 20.04)), VM generation (V2), VM architecture (x64), Agent status (Ready), and Agent version (2.11.1.4). The 'Networking' section shows the Public IP address (74.225.253.241), Private IP address (10.1.0.4), Virtual network/subnet (Ubuntu-vnet/default), and DNS name (Configure).

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' feature open for the 'Ubuntu' virtual machine. The left sidebar has a 'Settings' section with 'Properties' and 'Locks' selected. A modal dialog box titled 'Add lock' is displayed, prompting for 'Lock name' (vceee) and 'Lock type' (Read-only). There's also a 'Notes' field and 'OK' and 'Cancel' buttons at the bottom of the dialog.

### Step-3: click on ok.

Similarly, you can do for Resource group and subscriptions.

Note: After creating the lock, you need to delete it for deleting VM.

**Ubuntu** Virtual machine

**Essentials**

- Resource group (move) : AZ24
- Status : Running
- Location : Central India (Zone 1)
- Subscription (move) : Azure for Students
- Subscription ID : 37b3b623-b17d-4af9-a30c-ebff8cec50e4
- Availability zone : 1
- Tags (edit) : Add tags

Properties	Monitoring	Capabilities (7)	Recommendations	Tutorials
<b>Virtual machine</b>	<b>Networking</b>			
Computer name : Ubuntu	Public IP address : 74.225.253.241 ( Network interface ubuntu455_x1 )			
Operating system : Linux (ubuntu 20.04)	Public IP address (IPv6) : -			
VM generation : V2	Private IP address : 10.1.0.4			
VM architecture : x64	Private IP address (IPv6) : -			
Agent status : Ready	Virtual network/subnet : Ubuntu-vnet/default			
Agent version : 2.11.14	DNS name : Configure			

**Ubuntu | Locks**

**Locks**

Lock name	Lock type	Scope	Notes
This resource has no locks.			

## Q6) Create Ubuntu VM and run a python program in it.

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

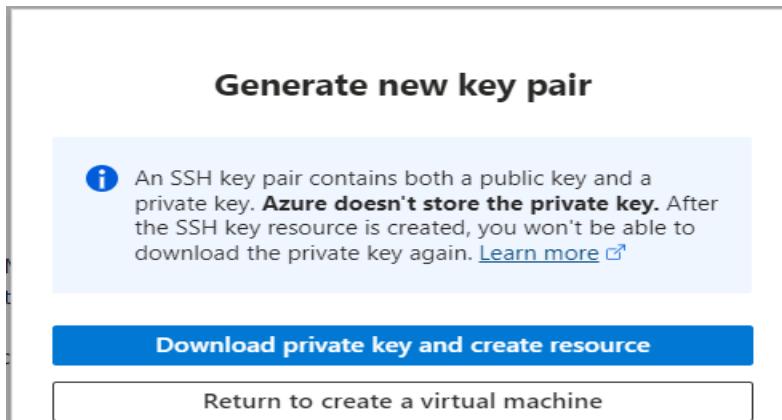
**Step-2:** Go To Virtual machine, and click on “Create” to create a window virtual machine.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information. Below the navigation is a toolbar with various icons. The main content area is titled 'Virtual machines' and shows a message 'Showing 0 to 0 of 0 records.' A large blue 'Create' button is prominently displayed, with a tooltip 'Create a virtual machine hosted by Azure'. Other options shown include 'Azure virtual machine with preset configuration' and 'More VMs and related solutions'.

**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 finally click on “Create”.

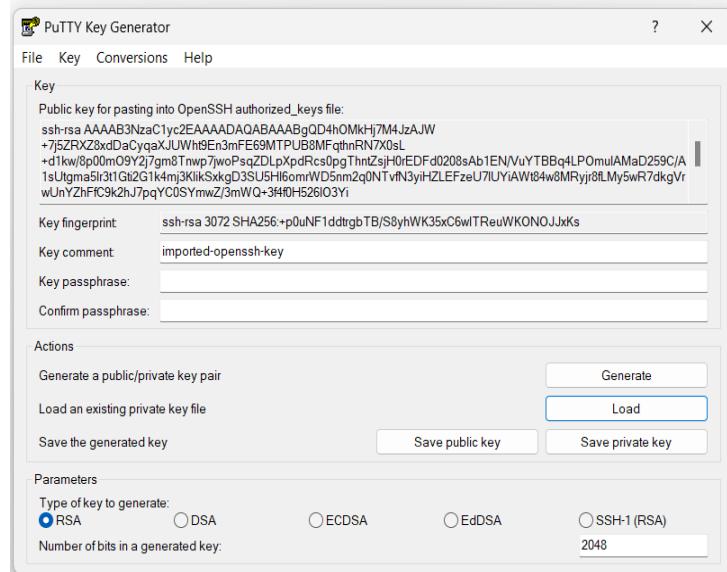
The screenshot shows the 'Create a virtual machine' wizard. Step 1: Configure instance details. It asks for a 'Subscription' (selected: 'Azure for Students') and a 'Resource group' (selected: '(New) AZ24'). Under 'Instance details', the 'Virtual machine name' is set to 'Ubuntu', 'Region' to '(Asia Pacific) Central India', 'Availability options' to 'Availability zone', and 'Availability zone' to 'Zone 1'. A note says 'You can now select multiple zones. Selecting multiple zones will create one VM per zone. Learn more'. The 'Security type' is set to 'Trusted launch virtual machines'. The 'Image' dropdown shows 'Ubuntu Server 20.04 LTS - x64 Gen2' selected. The 'VM architecture' is set to 'Arm64'. At the bottom are buttons for '< Previous', 'Next: Disks >', and 'Review + create'.

**Step-4:** After Deployment is over, Go to the remote desktop connection.

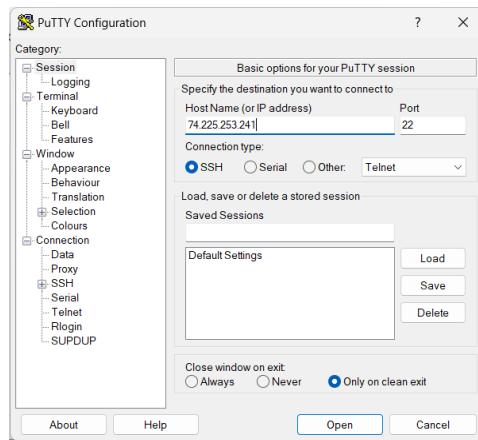


**Step-5:** Firstly, copy the public IP Address of that created virtual machine.

**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:** Login with your username and type python3, write your python program and execute it.

```
azureuser@Ubuntu:~  
└─ login as: azureuser  
└─ Authenticating with public key "imported-openssh-key"  
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86_64)  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/pro  
System information as of Thu Jun 13 16:27:08 UTC 2024  
System load: 0.08 Processes: 116  
Usage of /: 5.1% of 28.89GB Users logged in: 0  
Memory usage: 8% IPv4 address for eth0: 10.0.0.4  
Swap usage: 0%  
Expanded Security Maintenance for Applications is not enabled.  
0 updates can be applied immediately.  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files 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.  
azureuser@Ubuntu:~$ █
```

```
azureuser@ubuntu:~  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files 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.  
  
azureuser@ubuntu:~$ python3  
Python 3.8.10 (default, Nov 22 2023, 10:22:35)  
[GCC 9.4.0] on linux  
Type "help", "copyright", "credits" or "license" for more information.  
=>> a=10  
=>> b=20  
=>> a=a+b  
=>> b=a-b  
=>> a=a-b  
=>> print("after swapping the number ")  
after swapping the number  
=>> print("A and B value is :",a,b)  
A and B value is : 20 10  
=>> █
```

## Q7) Create a Ubuntu VM and transfer files using WinScp.

**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.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information. Below it, the 'Virtual machines' section is visible with various filtering options like 'Subscription equals all', 'Type equals all', 'Resource group equals all', and 'Location equals all'. A message at the top says 'Showing 0 to 0 of records.' In the center, there's a 'Create' button with three options: 'Azure virtual machine', 'Azure virtual machine with preset configuration', and 'More VMs and related solutions'. Below these options, there's a note: 'Create a virtual machine that runs Linux or Windows' and a link to 'Learn more about Windows virtual machines'. Another link 'Learn more about Linux virtual machines' is also present. At the bottom right of the central area, there's a 'Give feedback' link.

**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 finally click on “Create”.

The screenshot shows the 'Create a virtual machine' wizard in the Microsoft Azure portal. It's on the first step, 'Configure virtual machine settings'. The form includes fields for 'Subscription' (set to 'Azure for Students'), 'Resource group' (set to '(New) A224'), 'Virtual machine name' (set to 'Ubuntu'), 'Region' (set to '(Asia Pacific) Central India'), 'Availability options' (set to 'Availability zone'), 'Availability zone' (set to 'Zone 1'), 'Security type' (set to 'Trusted launch virtual machines'), and 'Image' (set to 'Ubuntu Server 20.04 LTS - x64 Gen2'). At the bottom, there are buttons for '< Previous', 'Next : Disks >', and 'Review + create'.

**Create a virtual machine**

VM architecture:  Arm64  x64

Run with Azure Spot discount:

Size \*: Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (₹5,101.50/month)

Enable Hibernation:   
Hibernate does not currently support Trusted launch and Confidential virtual machines for Linux images. [Learn more ↗](#)

Administrator account

Authentication type:  SSH public key  Password

Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.

Username \*: azureuser

SSH public key source: Generate new key pair

< Previous Next: Disks > Review + create Give feedback

**Create a virtual machine**

Username \*: azureuser

SSH public key source: Generate new key pair

SSH Key Type:  RSA SSH Format  Ed25519 SSH Format  
Ed25519 offers better performance and security with a smaller key size, while RSA is still widely used particularly for legacy systems and applications.

Key pair name \*: ubuntu\_key

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.

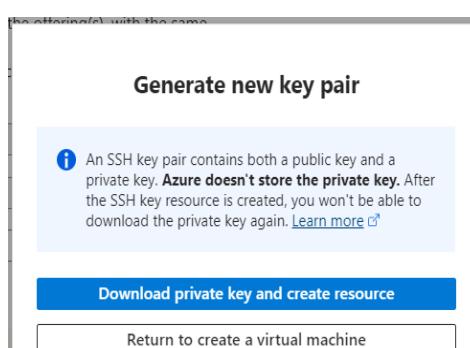
Public inbound ports \*:  None  Allow selected ports

Select inbound ports \*: SSH (22)

All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM - Networking page.

< Previous Next: Disks > Review + create Give feedback

**Step-4:** After Deployment is over, Go to the remote desktop connection.



**Step-5:** Firstly, copy the public IP Address of that created virtual machine.

**Ubuntu** Virtual machine

**Overview**

**Essentials**

Resource group ( <a href="#">move</a> ) :	AZ24	Operating system :	Linux (ubuntu 20.04)
Status :	Running	Size :	Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Location :	Central India (Zone 1)	Public IP address :	<a href="#">74.225.253.241</a>
Subscription ( <a href="#">move</a> ) :	Azure for Students	Virtual network/subnet :	<a href="#">Ubuntu-vnet/default</a>
Subscription ID :	37b3b623-b17d-4af9-a30c-ebff8cec50e4	DNS name :	<a href="#">Not configured</a>
Availability zone :	1	Health state :	-
		Time created :	6/15/2024, 12:43 PM UTC

**Tags (edit) :** [Add tags](#)

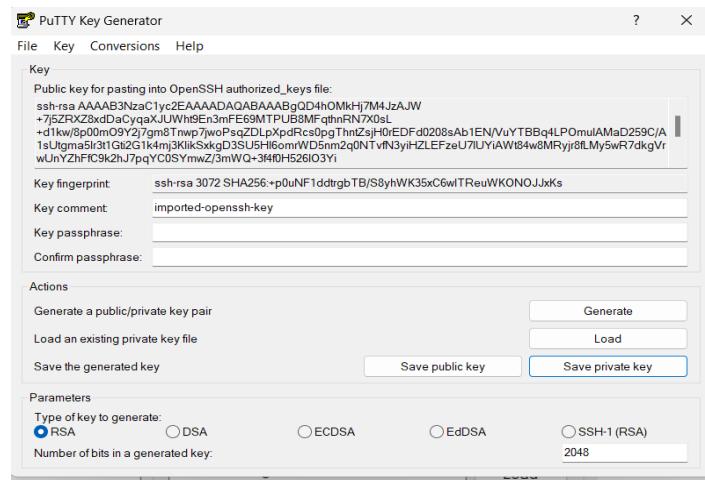
**Properties** Monitoring Capabilities (7) Recommendations Tutorials

**Virtual machine**

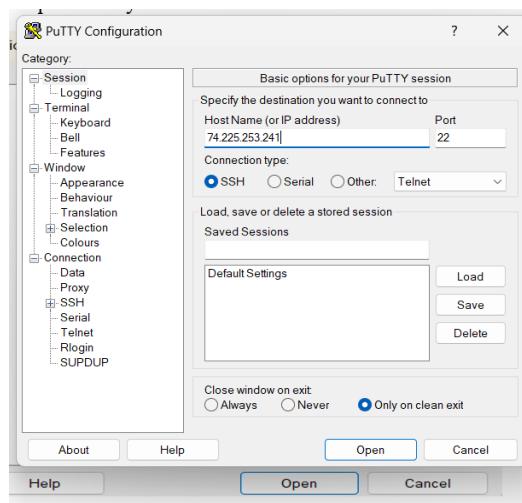
Computer name	Ubuntu	Public IP address	<a href="#">74.225.253.241</a> ( Network interface <a href="#">ubuntu455_z1</a> )
Operating system	Linux (ubuntu 20.04)	Public IP address (IPv6)	-
VM generation	V2	Private IP address	10.1.0.4
VM architecture	x64	Private IP address (IPv6)	-
Agent status	Ready	Virtual network/subnet	<a href="#">Ubuntu-vnet/default</a>
Agent version	2.11.1.4	DNS name	<a href="#">Configure</a>

**Networking**

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

```
azureuser@Ubuntu: ~
[?] login as: azureuser
[?] Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86_64)

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

System information as of Thu Jun 13 16:27:08 UTC 2024

System load: 0.08      Processes:          116
Usage of /: 5.1% of 28.89GB   Users logged in:     0
Memory usage: 8%           IPv4 address for eth0: 10.0.0.4
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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

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

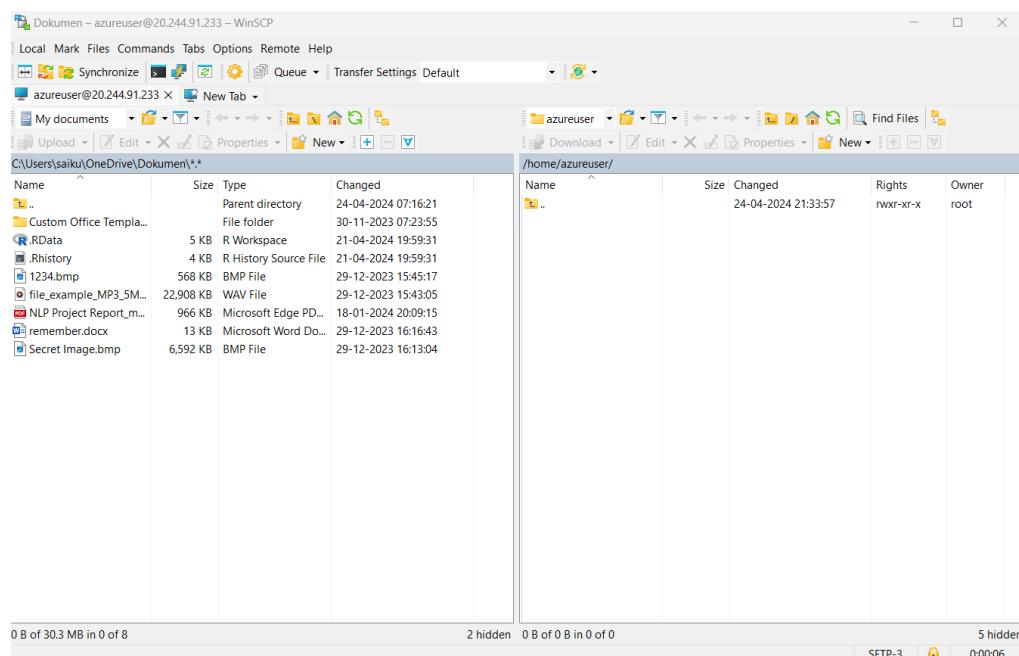
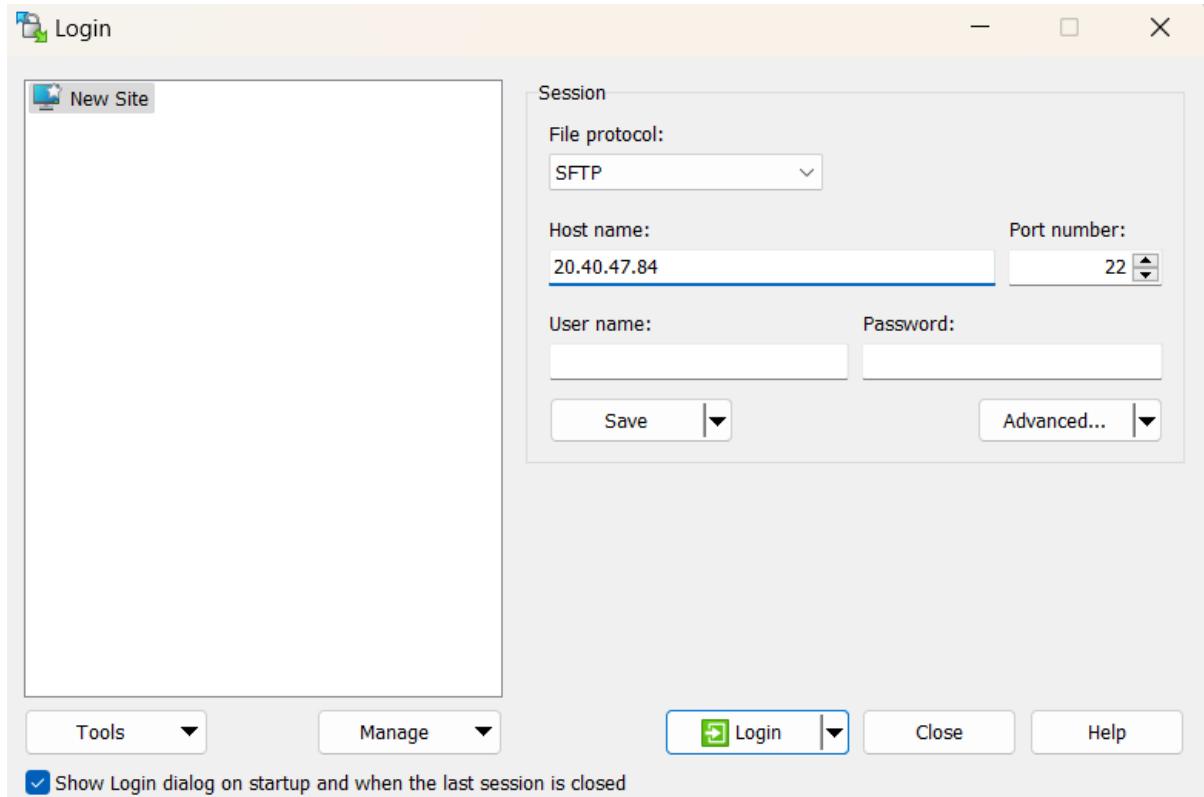
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

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

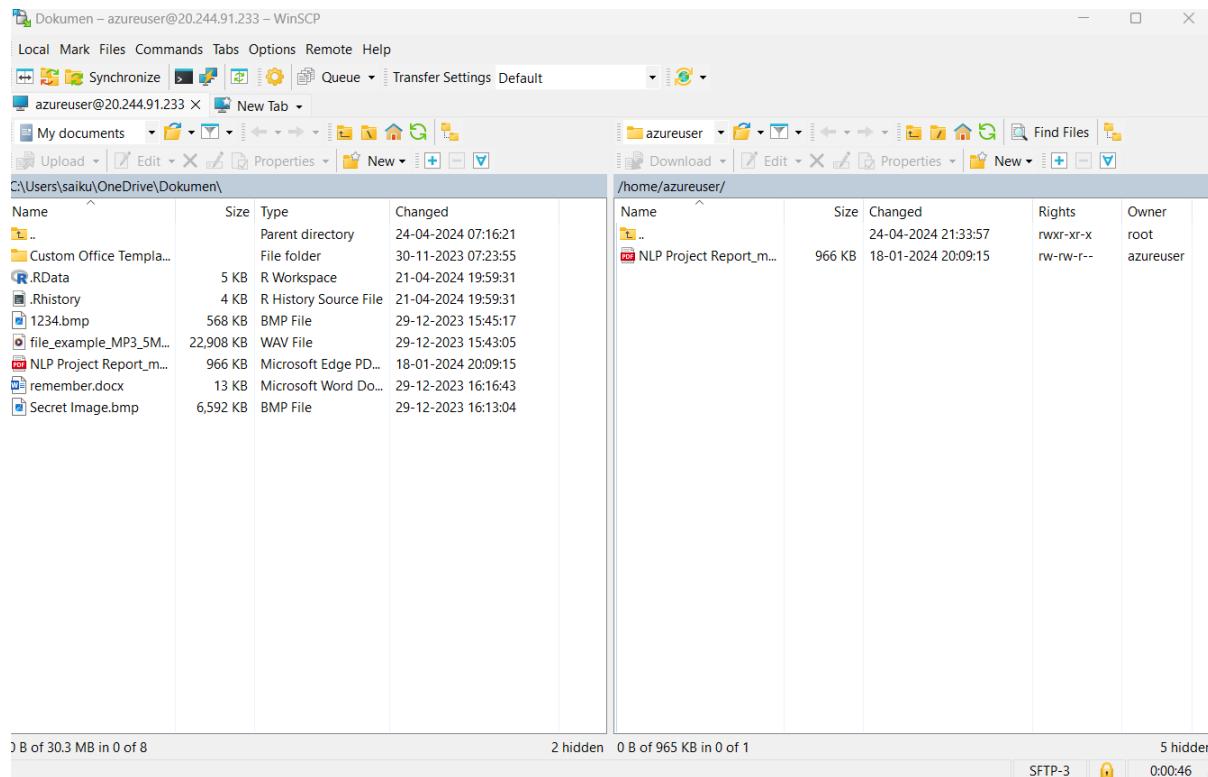
azureuser@Ubuntu:~$
```

**Step-10:** 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-11:** Now again type ls command as you can see file inside ubuntu VM.

```
azureuser@ubuntu: ~
0 updates can be applied immediately.

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

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

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files 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.

azureuser@ubuntu:~$ ls
azureuser@ubuntu:~$ ls
'NLP Project Report main.pdf'
azureuser@ubuntu:~$
```

## Q8) How to make Linux server as web server in AZURE.

**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.

The screenshot shows the Microsoft Azure Virtual machines dashboard. At the top, there are filter options: 'Type equals all', 'Resource group equals all', and 'Location equals all'. Below the filters, a table lists two existing virtual machines:

Name	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disk
VM1	Azure for Students	AZ24	Central India	Running	Linux	Standard_DS1_v2	-	1
VM2	Azure for Students	AZ24	Central India	Running	Linux	Standard_DS1_v2	-	1

**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 finally click on “Create”.

The screenshot shows the 'Create a virtual machine' wizard, Step 1: Instance details. The form includes the following fields:

- Subscription: Azure for Students
- Resource group: AZ24
- Virtual machine name: ubuntu4
- Region: (Asia Pacific) Central India
- Availability options: Availability zone
- Availability zone: Zone 1
- Security type: Trusted launch virtual machines
- Image: Ubuntu Server 20.04 LTS - x64 Gen2
- VM architecture: Arm64

At the bottom, there are navigation buttons: < Previous, Next : Disks >, and Review + create.

**Administrator account**

Authentication type:  SSH public key  Password

Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.

Username \*:

< Previous Next : Disks > Review + create Give feedback

Username \*:

SSH public key source:

SSH Key Type:

- RSA SSH Format
- Ed25519 SSH Format
- Ed25519 offers better performance and security with a smaller key size, while RSA is still widely used particularly for legacy systems and applications.

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.

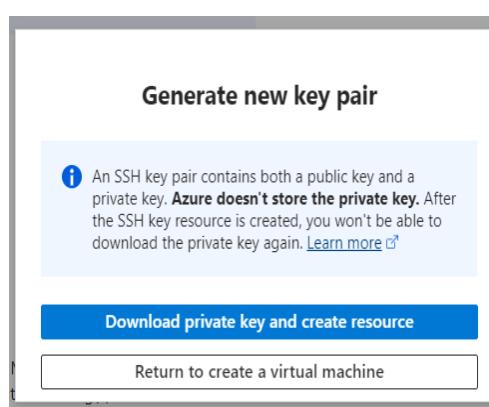
Public inbound ports \*:  Allow selected ports  None

Select inbound ports \*:

All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

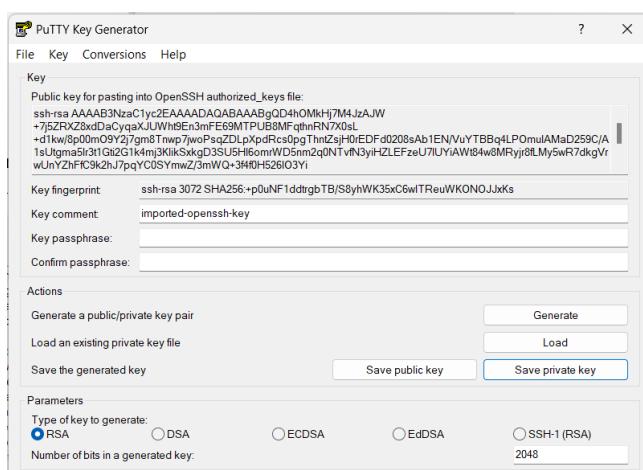
< Previous Next : Disks > Review + create Give feedback

**Step-4:** After Deployment is over, Go to the remote desktop connection.

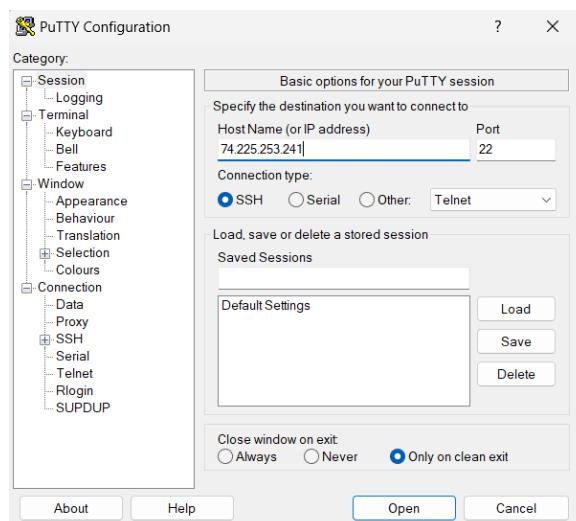


**Step-5:** Firstly, copy the public IP Address of that created virtual machine.

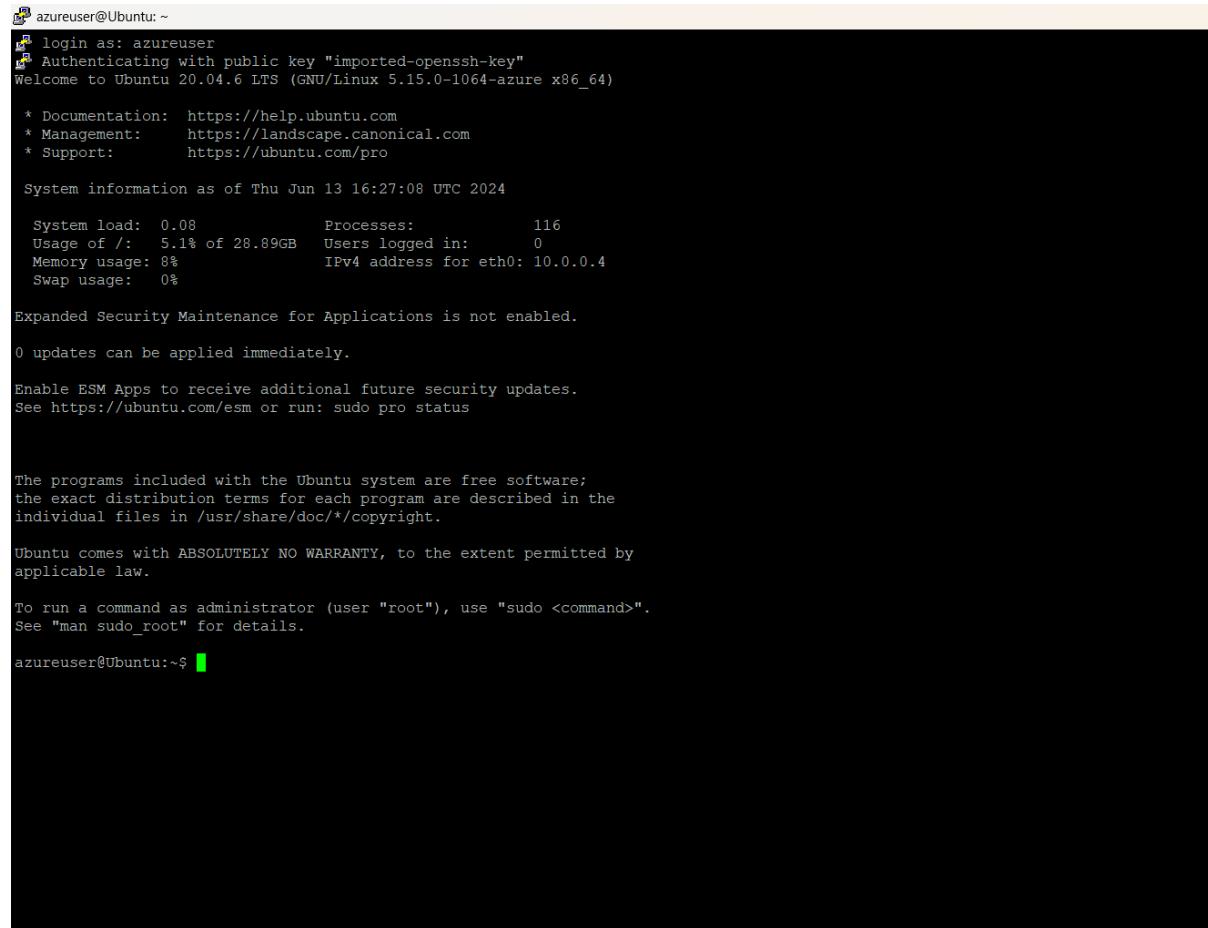
**Step-6:** Go to putty gen and click on load the key generator that you have downloaded.



**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.



The screenshot shows a terminal window with the following text:

```
azureuser@Ubuntu: ~
login as: azureuser
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86_64)

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

System information as of Thu Jun 13 16:27:08 UTC 2024

 System load: 0.08      Processes:          116
 Usage of /: 5.1% of 28.89GB   Users logged in:    0
 Memory usage: 8%           IPv4 address for eth0: 10.0.0.4
 Swap usage:  0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files 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.

azureuser@Ubuntu:~$
```

**Step-9:** Login into your Ubuntu VM using your username and type the following commands.

\$sudo su

\$sudo apt-get update

After typing the two commands, 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.

```
azureuser@Ubuntu: ~
login as: azureuser
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86_64)

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

System information as of Thu Jun 13 16:27:08 UTC 2024

System load: 0.08      Processes:           116
Usage of /: 5.1% of 28.89GB   Users logged in:     0
Memory usage: 8%          IPv4 address for eth0: 10.0.0.4
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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

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

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

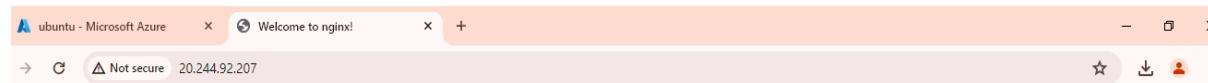
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

azureuser@Ubuntu:~$
```

**Step-10:** 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@ubuntu:/var/www/html
Setting up libnginx-mod-mail (1.18.0-0ubuntu1.4) ...
Setting up fontconfig-config (2.13.1-2ubuntu3) ...
Setting up libnginx-mod-stream (1.18.0-0ubuntu1.4) ...
Setting up libtiff5:amd64 (4.1.0+git191117-2ubuntu0.20.04.12) ...
Setting up libfontconfig1:amd64 (2.13.1-2ubuntu3) ...
Setting up libgd3:amd64 (2.2.5-5.2ubuntu2.1) ...
Setting up libnginx-mod-http-image-filter (1.18.0-0ubuntu1.4) ...
Setting up nginx-core (1.18.0-0ubuntu1.4) ...
Setting up nginx (1.18.0-0ubuntu1.4) ...
Processing triggers for ufw (0.36-6ubuntu1.1) ...
Processing triggers for systemd (245.4-4ubuntu3.23) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.14) ...
root@ubuntu:/home/azureuser# cd /var/www/html
root@ubuntu:/var/www/html# rm index.nginx-debian.html
root@ubuntu:/var/www/html# echo "<h1>Welcome to CSM</h1>"
<h1>Welcome to CSM</h1>
root@ubuntu:/var/www/html# rm index.nginx-debian.html
rm: cannot remove 'index.nginx-debian.html': No such file or directory
root@ubuntu:/var/www/html# echo "<h1>Welcome to CSM</h1>" indx.html
<h1>Welcome to CSM</h1> indx.html
root@ubuntu:/var/www/html# echo "<h1>Welcome to CSM</h1>">indx.html
root@ubuntu:/var/www/html# echo "Welcome to CSM">index.htm
root@ubuntu:/var/www/html#
```

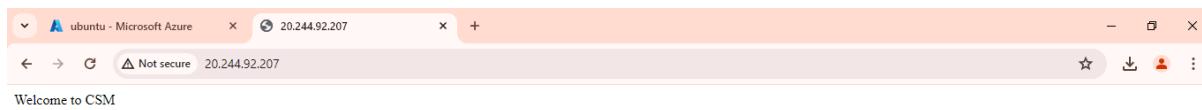


## Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](#). Commercial support is available at [nginx.com](#).

*Thank you for using nginx.*



## Q9) Setup and configure AZURE web server for windows server (IIS).

**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.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information. Below it, the 'Virtual machines' section is visible with various filtering and sorting options. A prominent 'Create' button is located in the center of the page, with a tooltip indicating it creates a virtual machine hosted by Azure. Below the button, there are links for 'More VMs and related solutions' and 'Learn more about Windows virtual machines'.

**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”

The screenshot shows the 'Create a virtual machine' wizard in progress. The current step is 'Project details'. It requires selecting a subscription ('Azure for Students') and a resource group ('(New) A24'). The 'Instance details' section follows, where the virtual machine name is set to 'csm', located in the '(Asia Pacific) Central India' region, and assigned to 'Zone 1'. The 'Security type' is set to 'Trusted launch virtual machines'. The 'Image' section shows 'Windows Server 2019 Datacenter - x64 Gen2' selected. At the bottom, there are navigation buttons: '< Previous', 'Next : Disks >', and 'Review + create'.

**Microsoft Azure** Search resources, services, and docs (G+)

Home > Virtual machines > Create a virtual machine

VM architecture:  x64  Arm64  
Arm64 is not supported with the selected image.

Run with Azure Spot discount:

Size: Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (₹7,895.17/month)  See all sizes

Enable Hibernation:   
Hibernate is not supported by the size that you have selected. Choose a size that is compatible with Hibernate to enable this feature. [Learn more](#)

**Administrator account**

Username: Azureuser

Password:

Confirm password:

Inbound port rules

< Previous Next : Disks > Review + create Give feedback

---

**Microsoft Azure** Search resources, services, and docs (G+)

Home > Virtual machines > Create a virtual machine

Validation passed

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Cost given below is an estimate and not the final price. For all your pricing needs, please use the pricing calculator. [View](#)

**Price**  
1 X Standard DS1 v2 by Microsoft  Subscription credits apply   
[Terms of use](#) | [Privacy policy](#) **10.8153 INR/hr** Pricing for other VM sizes

**TERMS**  
By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

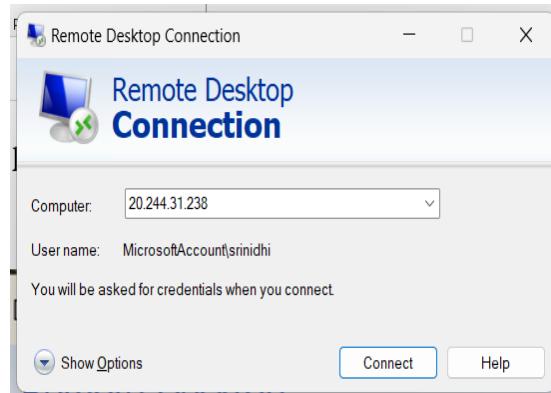
< Previous Next > Create Download a template for automation Give feedback

**Step-4:** After Deployment is over, Go to the remote desktop connection.

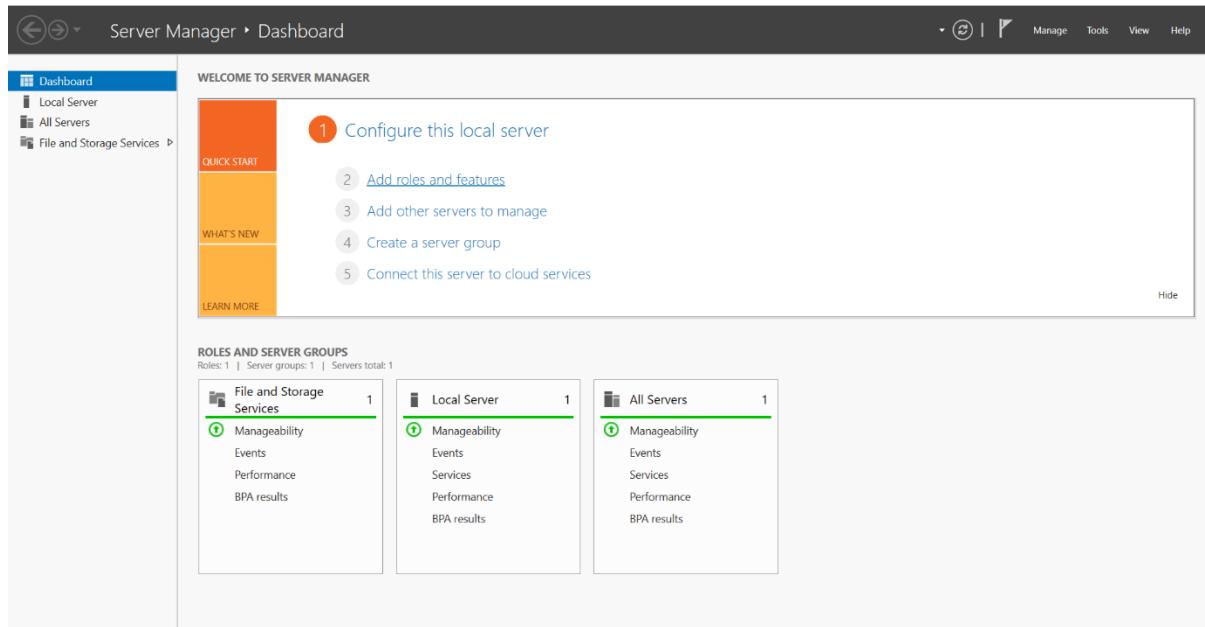
**Step-5:** Firstly, copy the public IP Address of that created virtual machine.

The screenshot shows the Microsoft Azure portal interface. At the top, there's a search bar and a user profile. Below it, the main title is "CreateVm-MicrosoftWindowsServer.WindowsServer-201-20240615174632 | Overview". On the left, there's a navigation sidebar with "Overview", "Inputs", "Outputs", and "Template". The main content area displays a green checkmark icon indicating "Your deployment is complete". It shows deployment details: "Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe...", "Subscription: Azure for Students", "Start time: 6/15/2024, 5:51:14 PM", "Correlation ID: e4f9ae2b-6fdd-4c4e-80c3-bdbbf619690d", and "Resource group: A24". Below this, there are sections for "Deployment details" (Setup auto-shutdown: Recommended), "Monitor VM health, performance and network dependencies: Recommended", and "Run a script inside the virtual machine: Recommended". At the bottom of the main content, there are "Go to resource" and "Create another VM" buttons. To the right, there are three cards: "Cost Management" (Get notified to stay within your budget and prevent unexpected charges on your bill. Set up cost alerts >), "Microsoft Defender for Cloud" (Secure your apps and infrastructure. Go to Microsoft Defender for Cloud >), and "Free Microsoft tutorials" (Start learning today >). There's also a "Work with an expert" section (Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support. Find an Azure expert >).

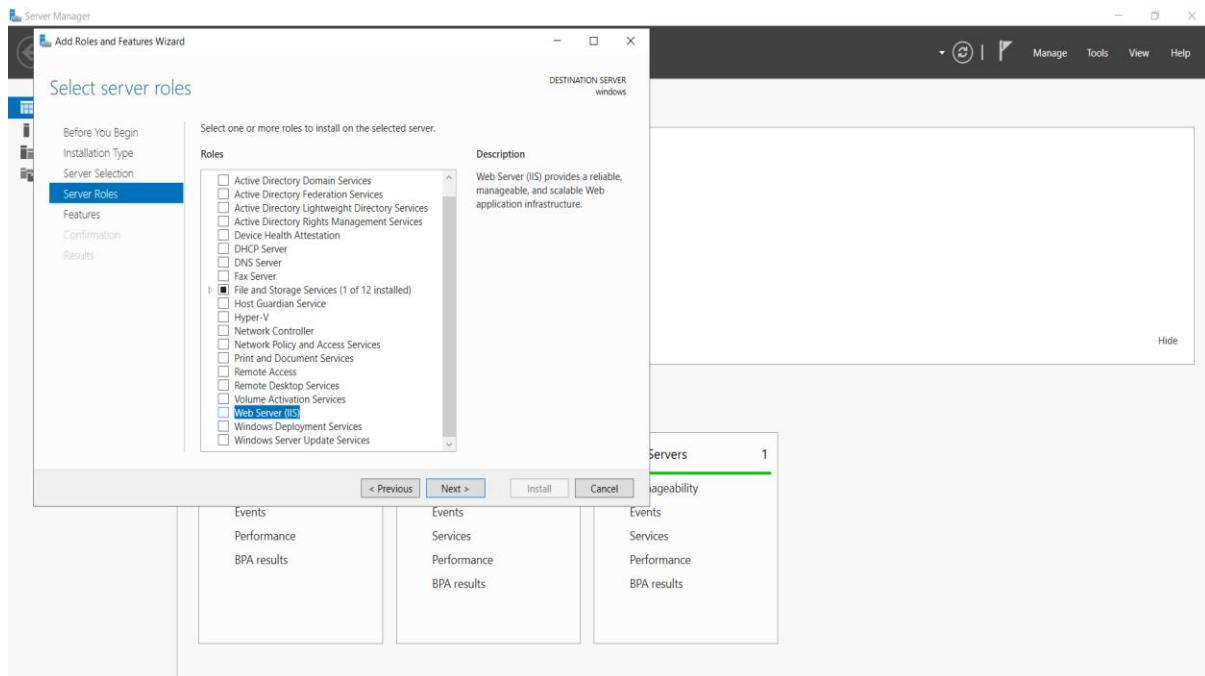
**Step-6:** By using that copied IP Address open the window virtual machine through remote desktop connection.

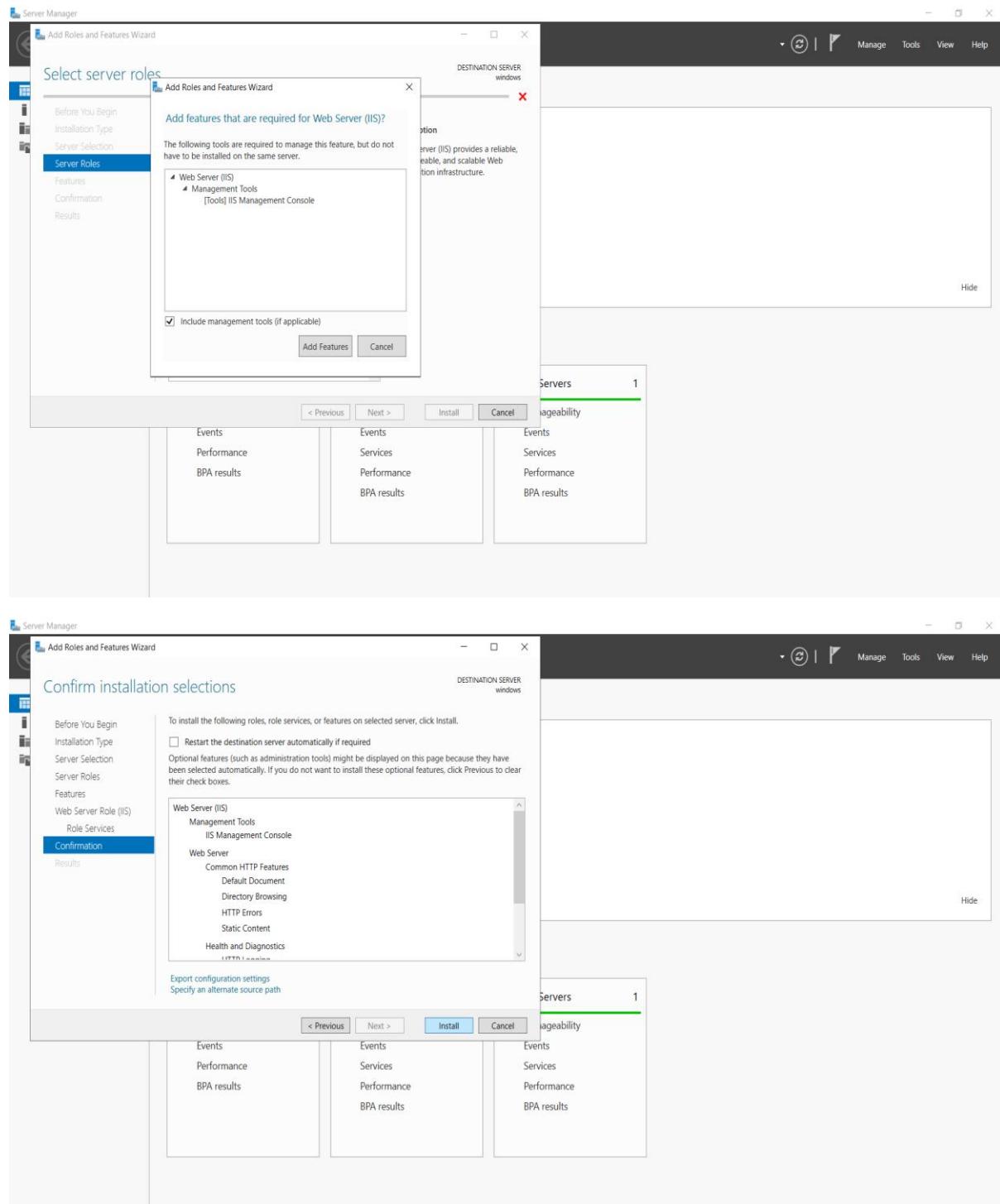


**Step-7:** When remote desktop will start (windows VM) you can see there will be Server Manager will be opened and in that you can see Configure this local server, click on “Add roles and features”.



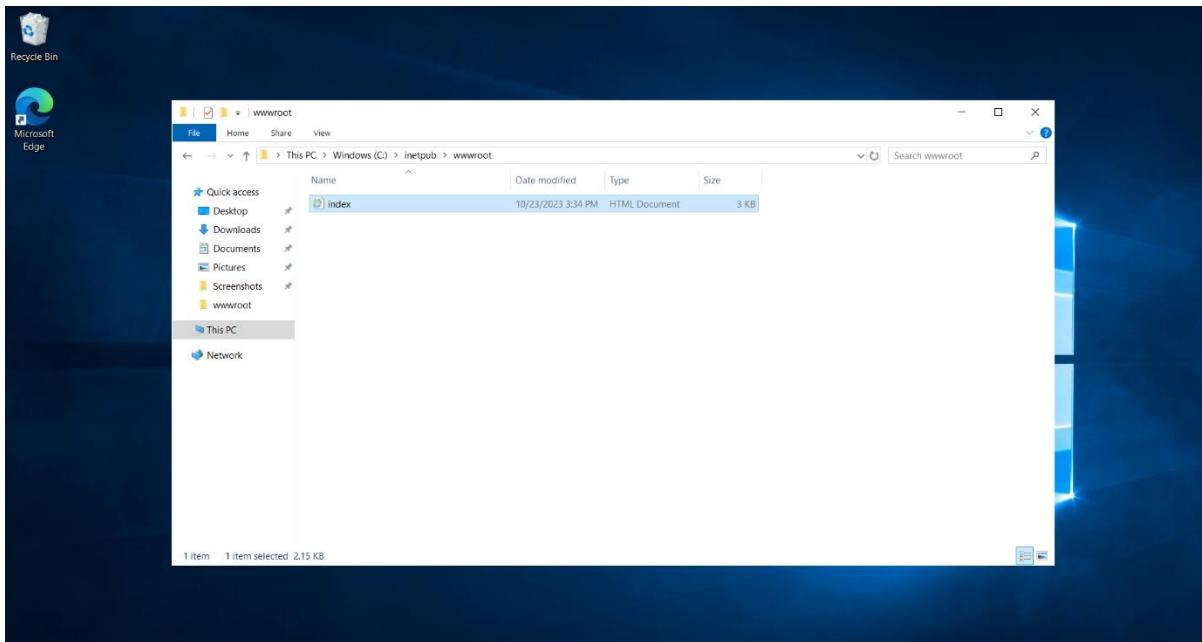
**Step-8:** Click on next, next and in Server Roles select Web Server (IIS) click on add feature, click on next, next till you can get install button and click on install.





**Step- 9:** 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-10:** Refresh the browser page.

## Hello World



## Q10) How we are adding new users, login credentials, changing owner, create authorized key files.

**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.

The screenshot shows the Microsoft Azure portal interface. The user is on the 'Virtual machines' page under the 'Compute' category. At the top, there are various filters and sorting options. In the center, a large 'Create' button is highlighted with a tooltip: 'Create a virtual machine hosted by Azure'. Below this, there are three main options: 'Azure virtual machine', 'Azure virtual machine with preset configuration', and 'More VMs and related solutions'. A callout box points to the 'Create' button with the text 'Create a virtual machine that runs Linux or Windows'. At the bottom of the page, there are links to 'Learn more about Windows virtual machines' and 'Learn more about Linux virtual machines'.

**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 finally click on “Create”.

The screenshot shows the 'Create a virtual machine' wizard. The user is on the first step, 'Set instance details'. The form includes fields for 'Subscription' (set to 'Azure for Students'), 'Resource group' (set to '(New) AZ24'), 'Virtual machine name' (set to 'Ubuntu'), 'Region' (set to '(Asia Pacific) Central India'), 'Availability options' (set to 'Availability zone'), 'Availability zone' (set to 'Zone 1'), 'Security type' (set to 'Trusted launch virtual machines'), and 'Image' (set to 'Ubuntu Server 20.04 LTS - x64 Gen2'). At the bottom, there are navigation buttons: '< Previous', 'Next: Disks >', and 'Review + create'.

**Create a virtual machine**

Size: Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (₹5,101.50/month)

Authentication type: SSH public key

Administrator account:

- Username: srinidhi
- SSH public key source: Generate new key pair

< Previous Next : Disks > Review + create Give feedback

**Create a virtual machine**

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: Allow selected ports

Select inbound ports: SSH (22)

< Previous Next : Disks > Review + create Give feedback

**Step-4:** After Deployment is over, Go to the remote desktop connection.

**Generate new key pair**

An SSH key pair contains both a public key and a private key. **Azure doesn't store the private key.** After the SSH key resource is created, you won't be able to download the private key again. [Learn more](#)

**Download private key and create resource**

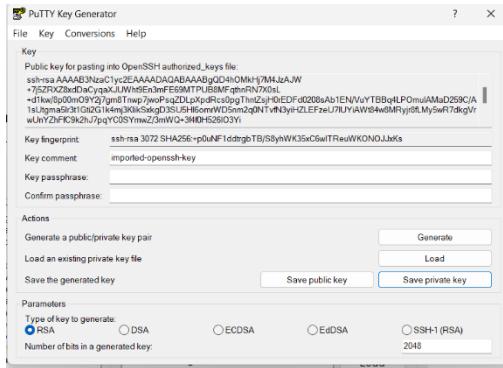
Return to create a virtual machine

**Step-5:** Firstly, copy the public IP Address of that created virtual machine.

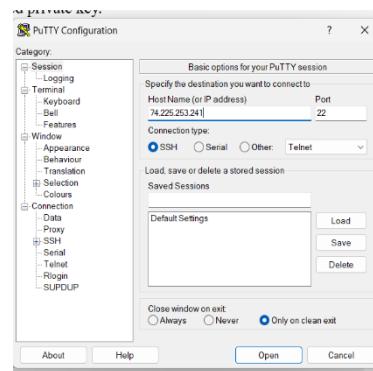
The screenshot shows the Microsoft Azure portal interface. The main title bar says "Microsoft Azure". The top navigation bar includes "Search resources, services, and docs (G+)", "Home > Ubuntu", and user information "kotesrinidhi21csmb1@vrdhamancollegeofengg.onmicrosoft.com". Below the navigation bar is a toolbar with icons for "Connect", "Start", "Restart", "Stop", "Hibernate", "Capture", "Delete", "Refresh", "Open in mobile", "Feedback", and "CLI / PS". On the left, there's a sidebar with sections like "Overview", "Activity log", "Access control (IAM)", "Tags", "Diagnose and solve problems", "Connect", "Bastion", "Networking", "Network settings", "Load balancing", "Application security groups", "Network manager", "Settings", "Disks", "Extensions + applications", and "Overview actions". The main content area is titled "Ubuntu" and "Virtual machine". It displays "Essentials" information such as Resource group (AZ24), Status (Running), Location (Central India (Zone 1)), Subscription (Azure for Students), Subscription ID, Availability zone (1), Tags (Add tags), Operating system (Linux (ubuntu 20.04)), Size (Standard D51 v2 (1 vcpu, 3.5 GiB memory)), Public IP address (74.225.253.241), Virtual network/subnet (Ubuntu-vnet/default), DNS name (Not configured), Health state, and Time created (6/15/2024, 12:43 PM UTC). Below this is a "Properties" section with tabs for "Virtual machine" and "Networking". The "Virtual machine" tab shows Computer name (Ubuntu), Operating system (Linux (ubuntu 20.04)), VM generation (V2), VM architecture (x64), Agent status (Ready), and Agent version (2.11.1.4). The "Networking" tab shows Public IP address (74.225.253.241), Private IP address (IPv6), Private IP address (IPv6), Virtual network/subnet (Ubuntu-vnet/default), and DNS name (Configure).

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

The screenshot shows the PuTTY Key Generator application window. The menu bar includes "File", "Key", "Conversions", and "Help". The main area has a "Key" tab selected, showing the message "No key.". Below this is an "Actions" section with three buttons: "Generate", "Load", and "Save public key". Under "Parameters", it says "Type of key to generate:" with "RSA" selected, and "Number of bits in a generated key:" set to "2048". There are also buttons for "Save private key" and "Load".



**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:** Login into your Ubuntu VM using your username and type the following commands.

To add new user in Linux server:

```
$sudo useradd -m srinidhi
```

To set new password:

```
$sudo passwd srinidhi
```

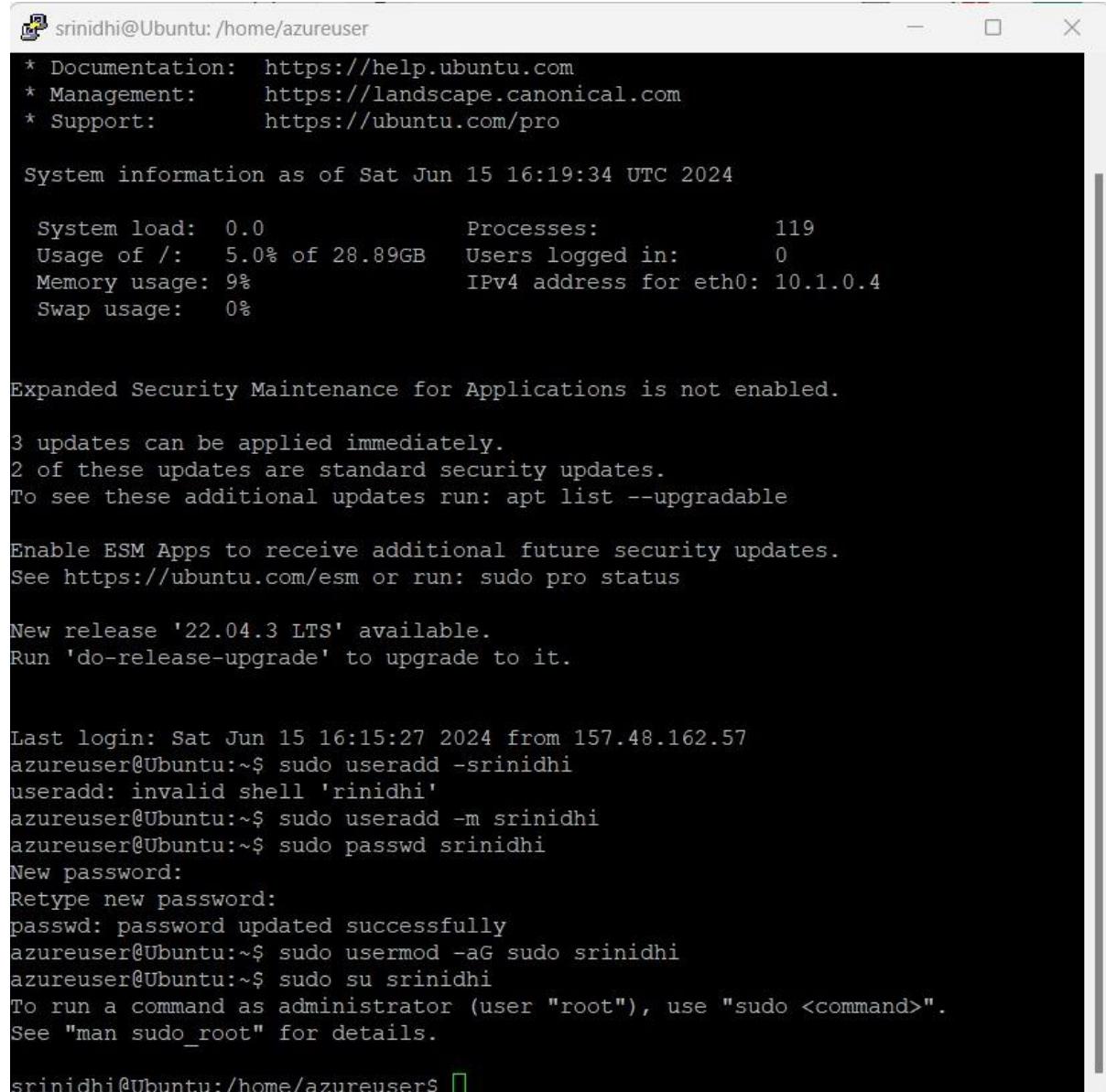
Enter new password and Retype password.

To modify login credentials:

```
$sudo usermod -aG sudo srinidhi
```

To switch the user:

```
$sudo srinidhi
```



```
srinidhi@Ubuntu: /home/azureuser
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/pro

System information as of Sat Jun 15 16:19:34 UTC 2024

System load: 0.0          Processes: 119
Usage of /: 5.0% of 28.89GB Users logged in: 0
Memory usage: 9%          IPv4 address for eth0: 10.1.0.4
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

3 updates can be applied immediately.
2 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

New release '22.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

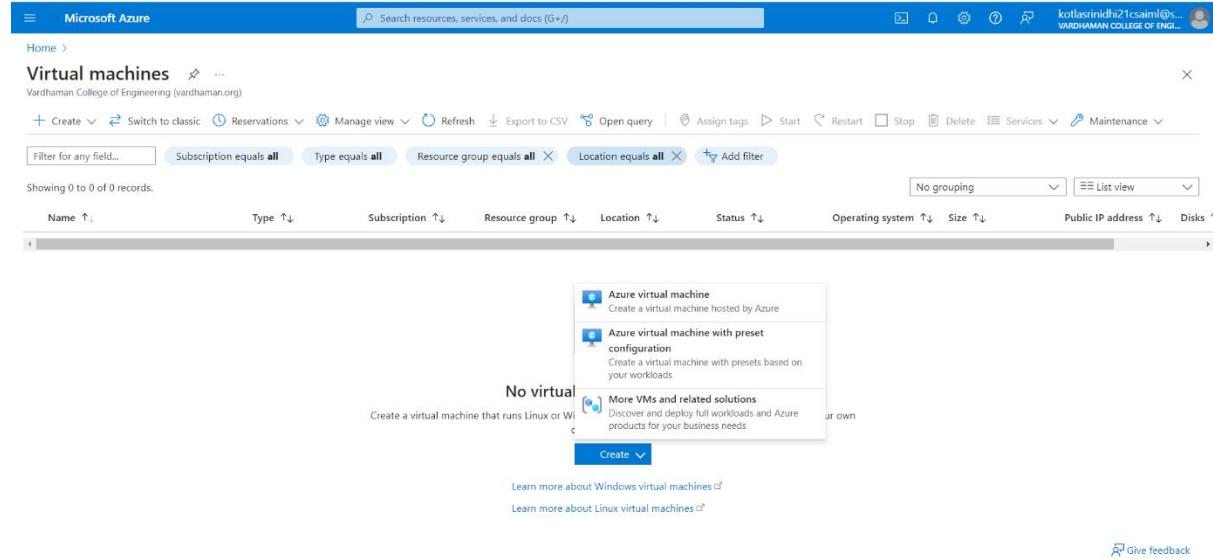
Last login: Sat Jun 15 16:15:27 2024 from 157.48.162.57
azureuser@Ubuntu:~$ sudo useradd -srinidhi
useradd: invalid shell 'rinidhi'
azureuser@Ubuntu:~$ sudo useradd -m srinidhi
azureuser@Ubuntu:~$ sudo passwd srinidhi
New password:
Retype new password:
passwd: password updated successfully
azureuser@Ubuntu:~$ sudo usermod -aG sudo srinidhi
azureuser@Ubuntu:~$ sudo su srinidhi
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

srinidhi@Ubuntu:/home/azureuser$
```

## Q11) Create a Windows VM and transfer files from desktop to remote desktop VM.

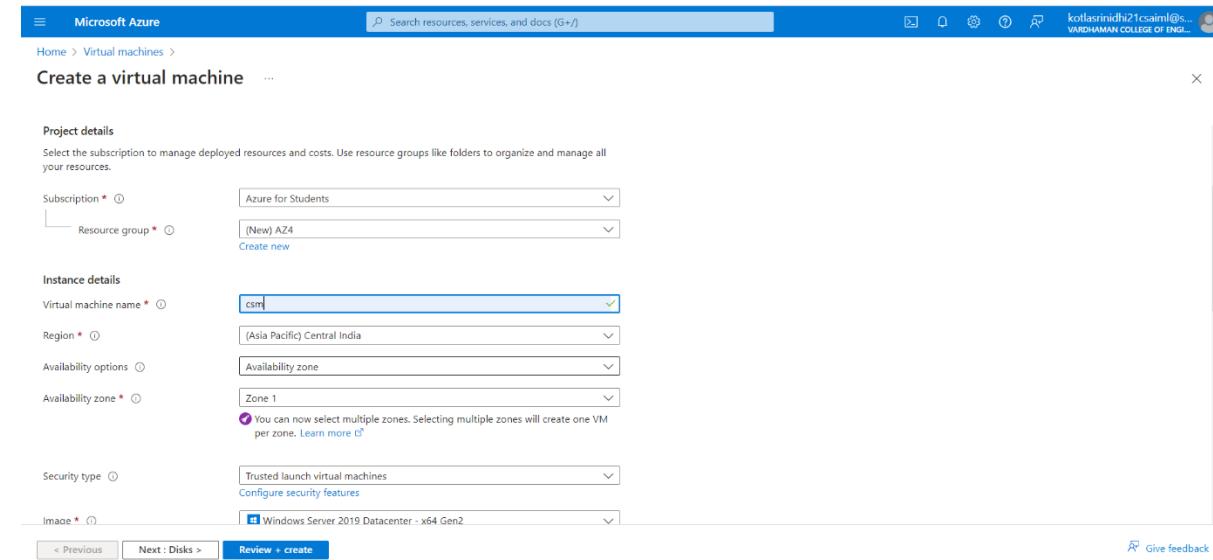
**Step-1:** Sign in to your Microsoft Azure account.

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



The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information. Below it, the 'Virtual machines' section is visible with various filters and sorting options. A prominent 'Create' button is located in the center of the page, with a tooltip describing it as 'Create a virtual machine hosted by Azure'. Other options like 'Azure virtual machine with preset configuration' and 'More VMs and related solutions' are also shown.

**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”



The screenshot shows the 'Create a virtual machine' wizard, step 1: Project details. It includes fields for 'Subscription' (set to 'Azure for Students') and 'Resource group' (set to '(New) AZ4'). The 'Instance details' section contains fields for 'Virtual machine name' (set to 'csm'), 'Region' (set to '(Asia Pacific) Central India'), 'Availability options' (set to 'Availability zone'), and 'Availability zone' (set to 'Zone 1'). A note states, 'You can now select multiple zones. Selecting multiple zones will create one VM per zone.' The 'Security type' field is set to 'Trusted launch virtual machines'. The 'Image' field is set to 'Windows Server 2019 Datacenter - x64 Gen2'. At the bottom, there are buttons for '< Previous', 'Next : Disks >', and 'Review + create'.

**Create a virtual machine**

VM architecture:  x64  Arm64  
Arm64 is not supported with the selected image.

Run with Azure Spot discount:

Size:  Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (₹7,895.17/month)   
[See all sizes](#)

Enable Hibernation:   
Hibernate is not supported by the size that you have selected. Choose a size that is compatible with Hibernate to enable this feature. [Learn more](#)

**Administrator account**

Username: Azureuser

Password:

Confirm password:

Inbound port rules

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

#### Step-4: After Deployment is over, Go to the remote desktop connection.

**CreateVm-MicrosoftWindowsDesktop.Windows-10-win10-20240616222656 | Overview**

Deployment: CreateVm-MicrosoftWindowsDesktop.Windows-10-win10-20240616222656

Overview

Your deployment is complete

Deployment name: CreateVm-MicrosoftWindowsDesktop.Windows-10-win10-20240616222656 Start time: 6/16/2024, 10:29:12 PM  
Subscription: Azure for Students Correlation ID: 0b986fda-afc2-49c6-bc2b-0b8875647a12 [Logs](#)

Deployment details

Next steps

- Setup auto-shutdown Recommended
- Monitor VM health, performance and network dependencies Recommended
- Run a script inside the virtual machine Recommended

[Go to resource](#) [Create another VM](#)

Give feedback [Tell us about your experience with deployment](#)

**Cost Management**  
Get notified to stay within your budget and prevent unexpected charges on your bill.  
[Set up cost alerts >](#)

**Microsoft Defender for Cloud**  
Secure your apps and infrastructure  
[Go to Microsoft Defender for Cloud >](#)

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**Work with an expert**  
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.  
[Find an Azure expert >](#)

#### Step-5: Firstly, copy the public IP Address of that created virtual machine.

Microsoft Azure

Home > vm11 Virtual machine

Search resources, services, and docs (G+)

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

vm11 virtual machine agent status is not ready. Troubleshoot the issue →

**Essentials**

Resource group (move) : ax

Status : Running

Location : Central India (Zone 1)

Subscription (move) : Azure for Students

Subscription ID : 37b3b623-b17d-4af9-a30c-ebff8cec50e4

Availability zone : 1

Operating system : Windows (Windows 10 Pro)

Size : Standard D1 v2 (1 vcpu, 3.5 GiB memory)

Public IP address : 74.225.250.19

Virtual network/subnet : vm11-vnet/default

DNS name : Not configured

Health state : -

Time created : 6/16/2024, 4:59 PM UTC

Tags (edit) : Add tags

**Properties** Monitoring Capabilities (8) Recommendations Tutorials

**Virtual machine**

Computer name	vm11
Operating system	Windows
VM generation	V2
VM architecture	x64
Agent status	Not Ready

**Networking**

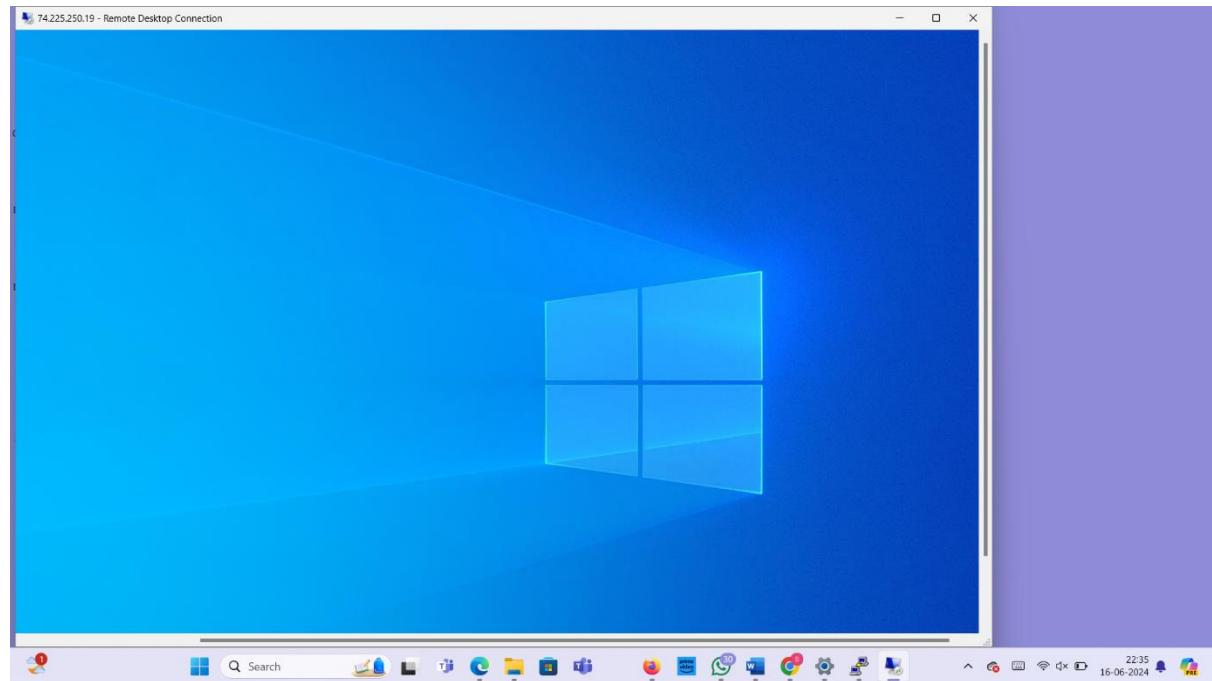
Public IP address	74.225.250.19 ( Network interface vm1100_z1 )
Public IP address (IPv6)	-
Private IP address	10.0.0.4
Private IP address (IPv6)	-
Virtual network/subnet	vm11-vnet/default

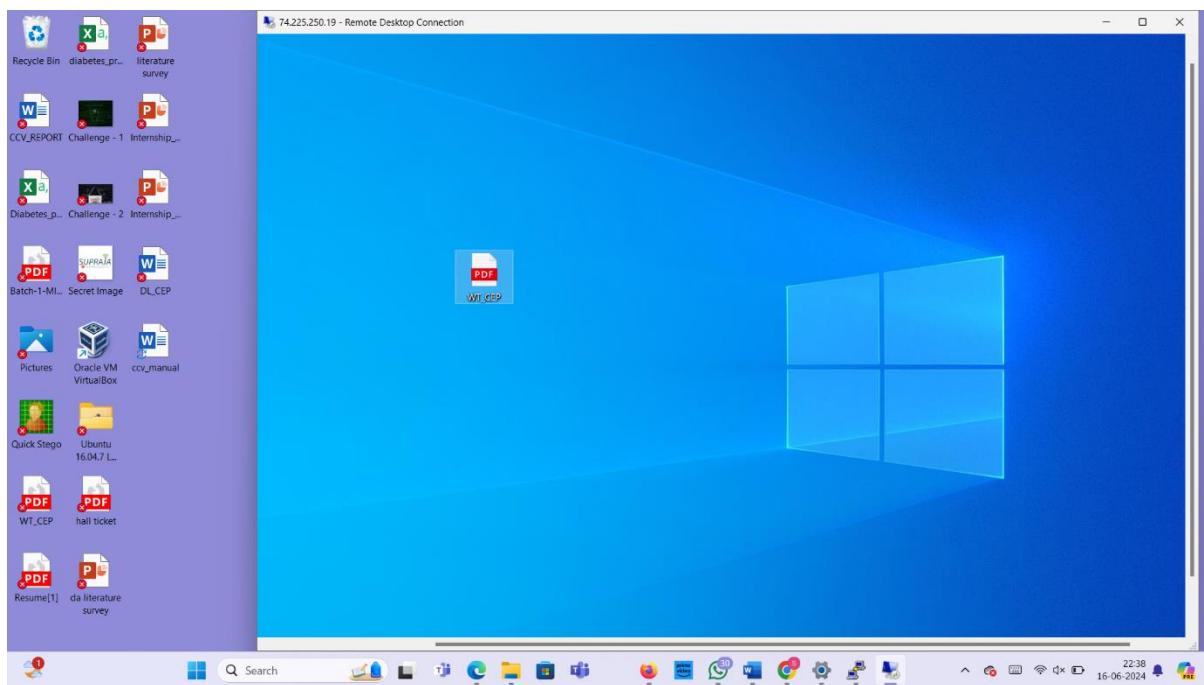
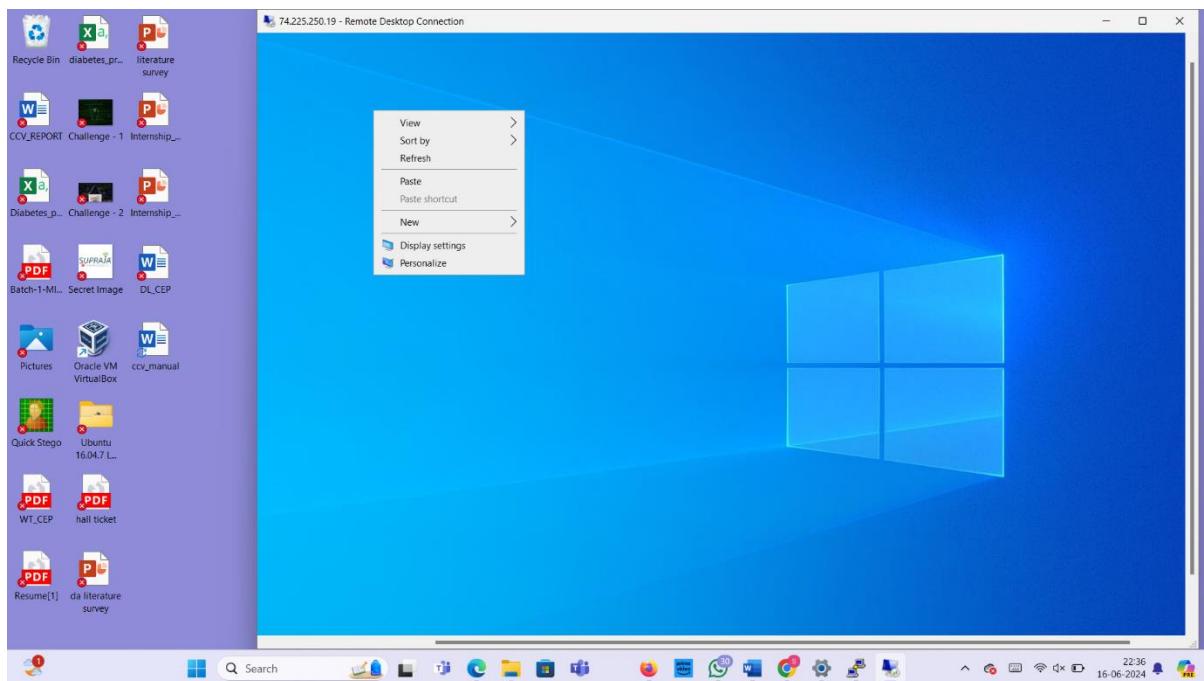
JSON View

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

**Step-7: Minimize the Remote desktop and copy file from desktop.**

**Right click in remote desktop and click on paste.**





## 12Q) How to attach and detach data disks to Windows server in azure data center

Steps:-1) Create a Virtual name with VM name as "UbuntU" with username &password

The screenshot shows the Microsoft Azure Virtual Machines dashboard. A search bar at the top right contains the query 'Search resources, services, and docs (G+)'. Below the search bar, there are several filter options: 'Type equals all', 'Resource group equals all', 'Location equals all', and 'Add filter'. The main table lists one virtual machine:

Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disk count
Azure for Students	ak	Central India	Running	Windows	Standard_DS1_v2	4.240.81.56	1

At the bottom of the page, there are navigation links: '< Previous', 'Page 1 of 1', and 'Next >'. A 'Give feedback' link is also present.

The screenshot shows the 'Create a virtual machine' wizard, Step 1: Project details. The title bar says 'Create a virtual machine ...'. The page includes a note: 'This subscription may not be eligible to deploy VMs of certain sizes in certain regions.' Under 'Project details', there are two dropdown menus: 'Subscription' set to 'Azure for Students' and 'Resource group' set to 'ak'. Below these are sections for 'Instance details': 'Virtual machine name' set to 'vm11', 'Region' set to '(Asia Pacific) Central India', 'Availability options' set to 'Availability zone', and 'Availability zone' set to 'Zone 1'. A note states: 'You can now select multiple zones. Selecting multiple zones will create one VM per zone. Learn more'.

At the bottom, there are navigation buttons: '< Previous', 'Next: Disks >', and 'Review + create'.

Microsoft Azure

Search resources, services, and docs (G+/)

Home > Virtual machines >

Create a virtual machine ...

Image \* ⓘ Ubuntu Server 20.04 LTS - x64 Gen2 ✓  
See all images | Configure VM generation

VM architecture ⓘ Arm64 x64

Run with Azure Spot discount ⓘ

Size \* ⓘ Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (\$5.101.50/month) ✓  
See all sizes

Enable Hibernation ⓘ

Hibernate does not currently support Trusted launch and Confidential virtual machines for Linux images. [Learn more](#)

Administrator account

Authentication type ⓘ SSH public key Password

Username \* ⓘ Azureuser ✓

Password \* ⓘ \*\*\*\*\* ✓

< Previous Next : Disks > Review + create Give feedback

Microsoft Azure

Search resources, services, and docs (G+/)

Home > Virtual machines >

Create a virtual machine ...

default when persisting it to the cloud.

Encryption at host ⓘ

Encryption at host is not registered for the selected subscription.  
[Learn more about enabling this feature](#)

OS disk

OS disk size ⓘ 128 GiB (P10) ✓

Some images are, by default, smaller than the selected OS disk size.  
[Click here to learn how to expand your disk partition size after you create your VM.](#)

OS disk type \* ⓘ Premium SSD (locally-redundant storage) ✓

Delete with VM ⓘ

Key management ⓘ Platform-managed key ✓

Enable Ultra Disk compatibility ⓘ

Ultra disk is not supported for the selected VM size Standard\_DS1\_v2 in Central India.

< Previous Next : Networking > Review + create Give feedback

2) click on "Next:Disks>"

Microsoft Azure

Search resources, services, and docs (G+/)

Home > Virtual machines > Create a virtual machine >

Create a new disk ...

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 \* ⓘ vm11\_DataDisk\_0

Source type \* ⓘ None (empty disk)

Size \* ⓘ 1024 GiB Premium SSD LRS Change size

Key management ⓘ Platform-managed key

Enable shared disk ⓘ Yes No

Delete disk with VM ⓘ

OK Give feedback

- 3) Click on "Create & attach a new disk"
- 4) Click on “change size”

Storage type	Size	Performance tier	Provisioned IOPS	Provisioned throughput	Max Shares	Max burst IOPS	Max burst throughput
Premium SSD (locally-redundant storage)	4 GiB	P1	120	25	3	3500	170
	8 GiB	P2	120	25	3	3500	170
	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	-	-

**OK** [Give feedback](#)

- 5) Customize data size to 10 GiB and click on OK
- 6) Enable delete with VM and click on 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

Delete disk with VM

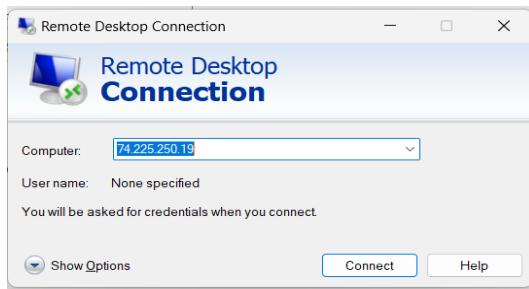
**OK** [Give feedback](#)

- 7) Click on "Review+create" & click on create
- 8) Click on "Go to resource group"
- 9) Copy public IP Address

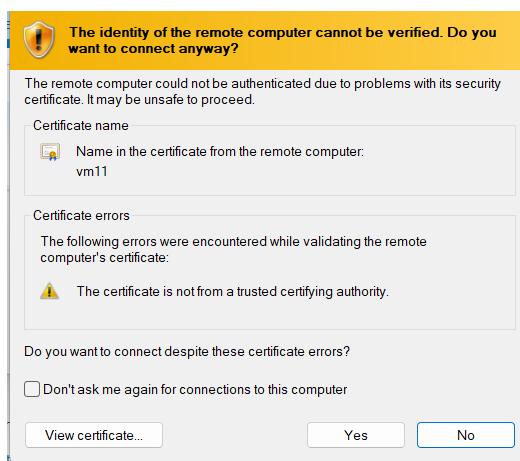
10) Open Remote Desktop Connection in your windows/system and paste the public IP Address

11) Click on “More choices”

12) Click on “Use a different account”, enter the credentials and click on OK



13) Click on yes and now the data disks are attached to the windows server



14) Click on “Disks” in your VM and you can see the attached data disks to the windows server

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MiB/s)	Encryption	Host caching
0	vm11_DataDisk_0	Premium SSD LRS	4	120	25	SSE with PMK	Read-only

15) Detach the data disks from the windows server by clicking on the detach symbol

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MiB/s)	Encryption	Host caching
0	vm11_DataDisk_0	Premium SSD LRS	4	120	25	SSE with PMK	Read-only

16) Click on “Apply”

Microsoft Azure

Home > vm11

vm11 | Disks Virtual machine

disk

Refresh Additional settings Feedback Troubleshoot

OS disk

Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
vm11_disk1_034f6869a3c34e418349459	Premium SSD LRS	30	120	25	SSE with PMK	Read/write

Data disks

Filter by name

Showing 0 of 0 attached data disks

Create and attach a new disk Attach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
No data disks attached							

Apply Discard changes

17) Now the data disks are detached from the windows server

Microsoft Azure

Home > vm11

vm11 | Disks Virtual machine

disk

Refresh Additional settings Feedback Troubleshoot

OS disk

Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
vm11_disk1_034f6869a3c34e418349459	Premium SSD LRS	30	120	25	SSE with PMK	Read/write

Data disks

Filter by name

Showing 0 of 0 attached data disks

Create and attach a new disk Attach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (MB/s)	Encryption	Host caching
No data disks attached							

Apply Discard changes

### 13Q) How to add data disks to linux server in azure data center

Steps:-

Step 1 : Create a Virtual Machine with username &password.

The screenshot shows the Microsoft Azure Virtual Machines dashboard. At the top, there are various filters and sorting options. A modal window titled 'Create' is open, listing three options: 'Azure virtual machine', 'Azure virtual machine with preset configuration', and 'More VMs and related solutions'. Below the modal, there is a section titled 'No virtual machines' with a sub-section for creating a Linux or Windows VM. At the bottom right of the modal, there is a 'Create' button.

Step 2 : click on "Next:Disks>"

The screenshot shows the 'Create a virtual machine' wizard on the 'Instance details' step. It includes fields for Subscription (set to 'Azure for Students'), Resource group (set to 'ak'), Virtual machine name ('vm21'), Region ('(Asia Pacific) Central India'), Availability options ('Availability zone'), Availability zone ('Zone 1'), Security type ('Trusted launch virtual machines'), Image ('Ubuntu Server 20.04 LTS - x64 Gen2'), and VM architecture ('Arm64'). At the bottom, there are navigation buttons: '< Previous', 'Next : Disks >', and 'Review + create'.

The screenshot shows the 'Create a virtual machine' wizard in Microsoft Azure. The current step is 'Set account and inbound port rules'. Under 'Administrator account', 'Authentication type' is set to 'Password' (selected radio button). 'Username' is 'Azureuser', 'Password' is '\*\*\*\*\*', and 'Confirm password' is also '\*\*\*\*\*'. Under 'Inbound port rules', 'Public inbound ports' is set to 'Allow selected ports' (selected radio button), and 'Select inbound ports' is 'SSH (22)'. A note states: 'All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.' Navigation buttons at the bottom include '< Previous', 'Next : Disks >', and 'Review + create'.

### Step 3 : Select

OS disk size -----30GB

OS disk type -----Premium SSD(LRS)

enable "Delete with VM"

The screenshot shows the 'Create a virtual machine' wizard in Microsoft Azure. The current step is 'Set OS disk and data disks'. Under 'OS disk', 'OS disk size' is 'Image default (30 GB)' and 'OS disk type' is 'Premium SSD (locally-redundant storage)' (selected dropdown). 'Delete with VM' is checked. 'Key management' is 'Platform-managed key'. 'Enable Ultra Disk compatibility' is unchecked with a note: 'Ultra disk is not supported for the selected VM size Standard\_DS1\_v2 in Central India.' Under 'Data disks for vm21', there is a table with columns LUN, Name, Size (GiB), Disk type, Host caching, and Delete with VM. Buttons at the bottom include 'Create and attach a new disk' and 'Attach an existing disk'.

### Step 4 : Click on "Create & attach a new disk"

The screenshot shows the 'Create a new disk' dialog box in the Microsoft Azure portal. The 'Name' field is set to 'vm21\_DataDisk\_0'. The 'Source type' dropdown is set to 'None (empty disk)'. The 'Size' dropdown is set to '1024 GiB' under 'Premium SSD LRS'. The 'Key management' dropdown is set to 'Platform-managed key'. The 'Enable shared disk' radio button is selected ('No'). The 'Delete disk with VM' checkbox is checked. At the bottom right, there is an 'OK' button and a 'Give feedback' link.

## Step 5 : Select

Source type -----None (empty disk), Size -----1024GB, Key manager ----- Platform managed key,

Enable shared disk -----NO and finally click on OK

The screenshot shows the 'Create a new disk' dialog box in the Microsoft Azure portal. The 'Name' field is set to 'vm21\_DataDisk\_0'. The 'Source type' dropdown is set to 'None (empty disk)'. The 'Size' dropdown is set to '1024 GiB' under 'Premium SSD LRS'. The 'Key management' dropdown is set to 'Platform-managed key'. The 'Enable shared disk' radio button is selected ('No'). The 'Delete disk with VM' checkbox is checked. At the bottom right, there is an 'OK' button and a 'Give feedback' link.

## Step 6 : Select

Storage type -----Premium SSD(LRS), Custom disk size (GB) -----5

click on OK

**Step 7 :** Click on "Review + create" & click on create

**Disk Configuration:**

- OS disk size: Image default (30 GiB)
- OS disk type: Premium SSD (locally-redundant storage)
- Delete with VM: Selected
- Key management: Platform-managed key
- Note: Ultra disk is not supported for the selected VM size Standard\_DS1\_v2 in Central India.

**Data disks for vm21:**

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
0	vm21_DataDisk_0	1024	Premium SSD LRS	Read-only	Selected

[Create and attach a new disk](#)   [Attach an existing disk](#)

**Advanced:**

< Previous   Next: Networking >   **Review + create**   Give feedback

**Validation passed**

**Price:**  
1 X Standard DS1 v2 by Microsoft   **6.9884 INR/hr**  
[Pricing for other VM sizes](#)

**TERMS:**  
By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the Azure Marketplace Terms for additional details.

Name: KOTLA SRINIDHI

< Previous   Next >   **Create**   Download a template for automation   Give feedback

**Step 8 :** Click on "Go to resource group"

**Deployment succeeded**  
Deployment 'CreateVm-canonical.0001-com-ubuntu-server-focal-2-20240616205237' to resource group 'ak' was successful.

**Cost Management**  
Get notified to stay within your budget and prevent unexpected charges on your bill.  
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Secure your apps and infrastructure  
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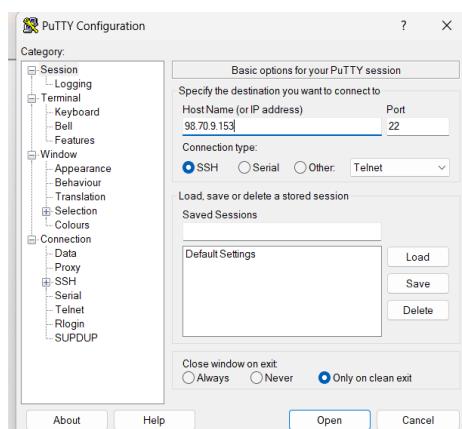
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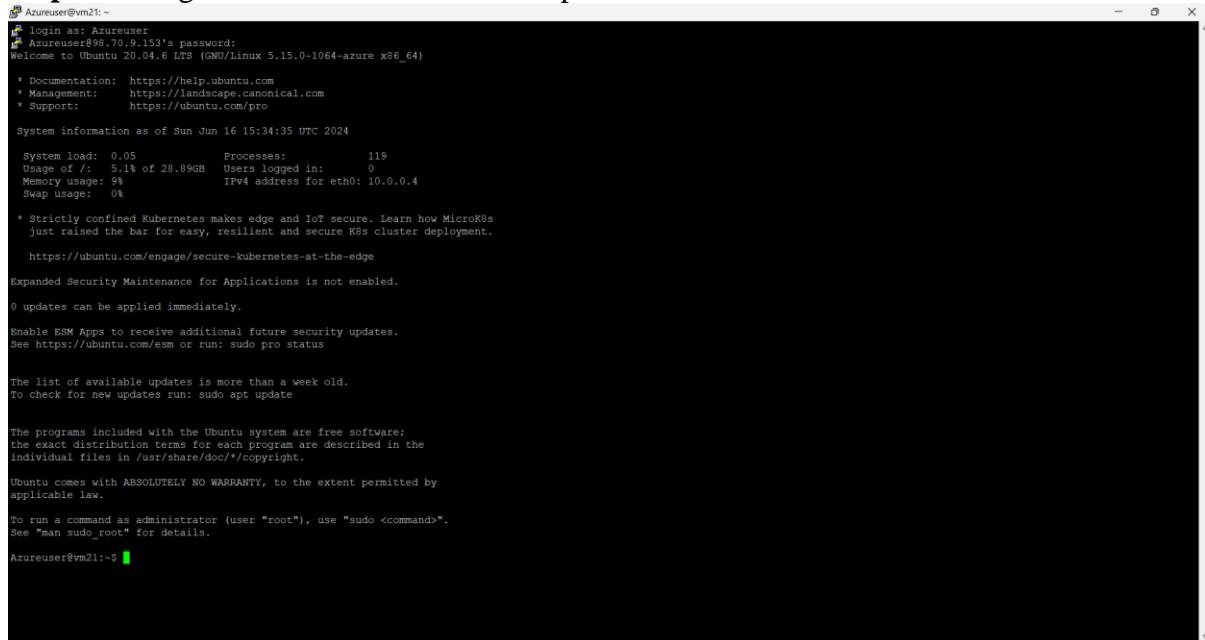
## Step 9 : Copy public IP Address

Essentials	Properties	Networking
Resource group: ak Status: Running Location: Central India (Zone 1) Subscription: Azure for Students Subscription ID: 37b3b623-b17d-4af9-a30c-ebff8cc50e4 Availability zone: 1	Operating system: Linux (ubuntu 20.04) Size: Standard_b3ms_v2 (cpu, 3.5 GB memory) Public IP address: 98.70.9.153 Virtual network/subnet: vm24-vnet/default DNS name: Not configured Health state: - Time created: 6/16/2024, 3:31 PM UTC	Public IP address: 98.70.9.153 (Network interface vm21887_z1) Private IP address (IPv6): - Private IP address (IPv6): 10.0.0.4 Virtual network/subnet: vm24-vnet/default DNS name: Configure

## Step 10 : Open "PUTTY" & paste the IP address and click on "open"



### Step 11 : Login into it with username and password



Azureuser@vm2:~\$  
login as: Azureuser  
Azureuser@98.70.9.153's password:  
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86\_64)  
  
\* Documentation: https://help.ubuntu.com  
\* Management: https://landscape.canonical.com  
\* Support: https://ubuntu.com/pro  
  
System information as of Sun Jun 16 15:34:35 UTC 2024  
  
System load: 0.05 Processes: 119  
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%  
  
\* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s just raised the bar for easy, resilient and secure K8s cluster deployment.  
<https://ubuntu.com/engage/secure-kubernetes-at-the-edge>  
  
Expanded Security Maintenance for Applications is not enabled.  
0 updates can be applied immediately.  
  
Enable ESM Apps to receive additional future security updates.  
See <https://ubuntu.com/esm> or run: sudo pro status  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files 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.  
Azureuser@vm2:~\$

### Step 12 : Type the below commands

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

```
Azureuser@vm21:~ 
0 updates can be applied immediately.

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

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

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files 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.

Azureuser@vm21:~$ df -hT
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/root      ext4   29G  1.6G  28G  6% /
/devtmpfs     devtmpfs 1.7G   0  1.7G  0% /dev
tmpfs          tmpfs  1.7G   0  1.7G  0% /dev/shm
tmpfs          tmpfs  336M 988K 335M  1% /run
tmpfs          tmpfs  5.0M   0  5.0M  0% /run/lock
tmpfs          tmpfs  1.7G   0  1.7G  0% /sys/fs/cgroup
/dev/loop0     squashfs 64M  64M  0 100% /snap/core20/2318
/dev/loop1     squashfs 92M  92M  0 100% /snap/lxd/24061
/dev/loop2     squashfs 39M  39M  0 100% /snap/snappyd/21759
/dev/sda15    vfat   105M  6.1M  99M  6% /boot/efi
/dev/sdb1      ext4   6.8G  28K  6.5G  1% /mnt
tmpfs          tmpfs  336M   0  336M  0% /run/user/1000
Azureuser@vm21:~$ lsblk
NAME  MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0   7:0    0   64M  1 loop /snap/core20/2318
loop1   7:1    0  91.8M  1 loop /snap/lxd/24061
loop2   7:2    0  38.6M  1 loop /snap/snappyd/21759
sda    8:0    0   30G  0 disk 
└─sda1   8:1    0  29.9G 0 part /
  └─sda14  8:14   0   4M  0 part 
  └─sda15  8:15   0  106M 0 part /boot/efi
sdb    8:16   0    7G  0 disk 
└─sdb1   8:17   0    7G  0 part /mnt
sdc    8:32   0    1T  0 disk 
sr0    11:0   1  628K 0 rom
```

Microsoft Azure

Home > vm21

**vm21 | Disks**

Virtual machine

disks

Refresh Additional settings Feedback Troubleshoot

Settings

Disk

Swap OS disk

Backup + disaster recovery

Disaster recovery

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...	Encryption	Host caching
vm21_disk1_60c9c56163284557913066a	Premium SSD LRS	30	120	25	SSE with PMK	Read/write

Data disks

Filter by name

Showing 1 of 1 attached data disks

+ Create and attach a new disk Attach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...	Encryption	Host caching
0	vm21_DataDisk_0	Premium SSD LRS	1024	5000	200	SSE with PMK	Read-only

Apply Discard changes

**Step 13 : Click on Apply**

The screenshot shows the Microsoft Azure portal interface for managing disks of a virtual machine named 'vm21'. The left sidebar has 'Settings' selected under 'Disks'. The main area shows the 'OS disk' section with one entry: 'vm21\_disk1\_60c9c56163284557913066a' (Premium SSD LRS), Size (GiB) 30, Max IOPS 120, Max throughput 25, Encryption SSE with PMK, and Host caching Read/write. Below it is the 'Data disks' section, which is currently empty. At the bottom are 'Apply' and 'Discard changes' buttons.

#### Q14) Move Server Files from one Resource Group to another.

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

The screenshot shows the 'Create a resource group' wizard in Microsoft Azure. The 'Basics' tab is selected. Under 'Project details', 'Subscription' is set to 'Azure for Students' and 'Resource group' is named 'rg-1'. Under 'Resource details', 'Region' is set to '(Asia Pacific) Central India'. At the bottom, there are buttons for 'Review + create', '< Previous', and 'Next : Tags >'.

The screenshot shows the 'Resource groups' page in Microsoft Azure. It lists four resource groups: 'ak' (Subscription: Azure for Students, Location: Central India), 'NetworkWatcherRG' (Subscription: Azure for Students, Location: Central India), 'rg-1' (Subscription: Azure for Students, Location: Central India), and 'rg-2' (Subscription: Azure for Students, Location: Central India). The page includes filters, sorting options, and navigation links at the bottom.

**vm22**

**Essentials**

- Resource group (move) : rg-1
- Status : Running
- Location : Central India (Zone 1)
- Subscription (move) : Azure for Students
- Subscription ID : 37b3b623-b17d-4af9-a30c-ebff8cec50e4
- Availability zone : 1

**Properties**

Virtual machine	Computer name	vm22	Operating system	Linux (ubuntu 20.04)
	Operating system	Linux (ubuntu 20.04)	Public IP address	20.244.25.126 ( Network interface vm22994_z1 )
	VM generation	V2	Private IP address	-
	VM architecture	x64	Private IP address (IPv6)	-
	Agent status	Ready	Virtual network/subnet	vm22-vnet/default
	Agent version	2.11.1.4	DNS name	Configure

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

---

**rg-1**

**Essentials**

Name	Type	Location
srinidhi	SSH key	Central India
vm22	Virtual machine	Central India
vm22-ip	Public IP address	Central India
vm22-rsg	Network security group	Central India
vm22-vnet	Virtual network	Central India
vm22994_z1	Network Interface	Central India
vm22_disk1_3c6322b875dd40ac96d9e940c98a22eb	Disk	Central India

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

The screenshot shows the Microsoft Azure portal interface. The left sidebar is open, showing the 'rg-1' resource group. The main area displays a list of resources under the 'Essentials' tab. A context menu is open at the top right, specifically the 'Move' section, which includes options: 'Move to another resource group', 'Move to another subscription', and 'Move to another region'. The user has selected the first option, 'Move to another resource group'.

The screenshot shows the 'Move resources' wizard in the Microsoft Azure portal. It is on Step 1: Source + target. The 'Source' section shows the current subscription as 'Azure for Students' and the 'Resource group' as 'rg-1'. The 'Target' section shows the subscription as 'Azure for Students' and the 'Resource group' dropdown set to 'rg-2'. At the bottom, there are 'Previous' and 'Next' buttons.

The screenshot shows the Microsoft Azure 'Move resources' interface. The top navigation bar includes 'Microsoft Azure', a search bar, and user information. Below the navigation is a breadcrumb trail: Home > rg-1 > Move resources. The main area is titled 'Move resources' with a sub-section 'rg-1'. A progress bar indicates 'Checking whether these resources can be moved. This might take a few minutes.' Below the progress bar is a table listing resources to move:

Name	Type	Resource type	Validation status
srinidhi	SSH key	microsoft.compute/sshpublickeys	Pending validation
vm22	Virtual machine	microsoft.compute/virtualmachines	Pending validation
vm22-ip	Public IP address	microsoft.network/publicipaddresses	Pending validation
vm22-nsg	Network security group	microsoft.network/networksecuritygroups	Pending validation
vm22-vnet	Virtual network	microsoft.network/virtualnetworks	Pending validation
vm22994_z1	Network interface	microsoft.network/networkinterfaces	Pending validation
vm22_disk1_3c6322b875dd40ac96d9e940c98a2eb	Disk	microsoft.compute/disks	Pending validation

At the bottom of the table are 'Previous' and 'Next' buttons.

The screenshot shows the Microsoft Azure 'rg\_1' resource group overview page. The left sidebar includes 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Resource visualizer', 'Events', 'Deployments', 'Security', 'Deployment stacks', 'Policies', 'Properties', 'Locks', 'Cost analysis', 'Cost alerts (preview)', and 'Budgets'. The main content area is titled 'Essentials' and shows a table for 'Resources'. The table has columns for 'Name', 'Type', and 'Location'. It displays the message 'No resources match your filters' with a 'Create resources' button.

The screenshot shows the Microsoft Azure Resource Groups interface. The left sidebar lists resource groups: 'ak', 'NetworkWatcherRG', 'rg-2' (selected), and 'rg\_1'. The main area displays the 'rg-2' resource group details. The 'Overview' section shows a summary of resources. The 'Essentials' section lists resources with filters applied: 'Type equals all' and 'Location equals all'. The table shows the following resources:

Name	Type	Location
azureuser	Virtual machine	Central India
azureuser-ip	Public IP address	Central India
azureuser-nsg	Network security group	Central India
azureuser-vnet	Virtual network	Central India
azureuser521_z1	Network Interface	Central India
azureuser_disk1_ae23fbfac60e487e80be71b20c725891	Disk	Central India

Page navigation: < Previous | Page 1 of 1 | Next >

### Q15) Create Azure Storage Account, Container – Upload and Delete Objects(blob) in it.

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

Project details

Select the subscription in which to create the new storage account. Choose a new or existing resource group to organize and manage your storage account together with other resources.

Subscription \* Azure for Students

Resource group \* rg\_1

Storage account name \* storagee111

Region \* (Asia Pacific) Central India Deploy to an Azure Extended Zone

Performance \* Standard: Recommended for most scenarios (general-purpose v2 account)  
Premium: Recommended for scenarios that require low latency.

Redundancy \* Geo-redundant storage (GRS)  
Make read access to data available in the event of regional unavailability.

Previous Next Review + create Give feedback

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

Security

Configure security settings that impact your storage account.

Require secure transfer for REST API operations

Allow enabling anonymous access on individual containers

Enable storage account key access

Default to Microsoft Entra authorization in the Azure portal

Minimum TLS version Version 1.2

Permitted scope for copy operations (preview) From any storage account

Hierarchical Namespace

Hierarchical namespace, complemented by Data Lake Storage Gen2 endpoint, enables file and directory semantics, accelerates big data analytics workloads, and enables access control lists (ACLs). [Learn more](#)

Enable hierarchical namespace

Access protocols

Previous Next Review + create Give feedback

**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 \*

Anonymous access level

**Advanced**

**Create** Give feedback

**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

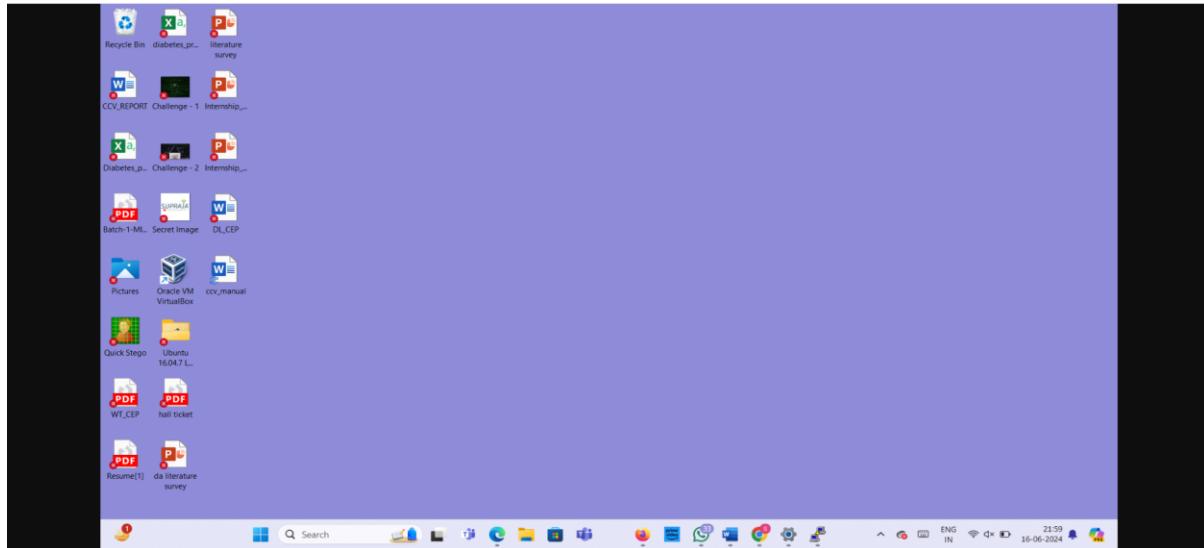
Overwrite if files already exist

**Advanced**

**Upload** Give feedback

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

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state	...
<input type="checkbox"/> Screenshot (138).png	6/16/2024, 10:01:08 ...	Hot (Inferred)		Block blob	169.15 KIB	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.

A screenshot of the Microsoft Azure portal showing the storage container settings for 'con1'. The left sidebar shows 'Overview', 'Access Control (IAM)', 'Settings', 'Shared access tokens', 'Access policy', 'Properties', and 'Metadata'. The main area shows a 'Change access level' dialog box with the message 'Change the access level of container 'con1''. It has a dropdown menu set to 'Private (no anonymous access)'. Below the dialog are tabs for 'Upload', 'Change access level', 'Refresh', 'Delete', 'Change tier', 'Acquire lease', 'Break lease', 'View snapshots', 'Create snapshot', and 'Give feedback'. To the right of the dialog is a table with one row: 'Screenshot (138).png' (blob type: Block blob, size: 169.15 KB, lease state: Available). At the bottom of the page, there is a browser tab showing the URL 'storagee111.blob.core.windows.net/con1/Screenshot%20(138).png' and an XML error message.

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<?xml version="1.0" encoding="utf-8"?>
<Error>
  <Code>ResourceNotFound</Code>
  <Message>The specified resource does not exist. RequestId:cd300b61-2018-0053-0c0a-c0b94b000000 Time:2024-06-16T16:33:55.6799625Z</Message>
</Error>
```

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

The screenshot shows the Microsoft Azure Storage account interface for the 'storagee111' account. The left sidebar navigation includes 'Containers' under 'Data storage'. The main content area displays a table of containers. One container, 'Logs', is listed with the following details:

Name	Last modified	Anonymous access level	Lease state
Logs	6/16/2024, 9:56:32 PM	Private	Available

The screenshot shows the Microsoft Azure Resource Group interface for 'rg\_1'. The left sidebar navigation includes 'Access control (IAM)' and 'Help'. The main content area shows a list of resources under 'Essentials'. A storage account named 'storagee111' is selected for deletion. A modal dialog titled 'Delete Resources' is open on the right side of the screen, prompting the user to confirm the deletion of the selected resources.