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Practical 1

Setting up of Azure account

1. Search for “Microsoft Azure for Students” on Google and click on the link.

The screenshot shows the Microsoft Azure for Students landing page. At the top left is the Microsoft logo. Next to it, the text "Microsoft Azure" and the URL "https://azure.microsoft.com › en-in › free › students" are displayed. To the right of the URL is a three-dot menu icon. Below this, the title "Azure for Students – Free Account Credit" is centered. A subtext below the title reads: "With Microsoft **Azure for Students**, get a USD 100 credit when you create your free account. There is no credit card needed and 12 months of free Azure ...".

2. Click on “Start Free”

The screenshot shows the "Build in the cloud free with Azure for Students" page. At the top left is the Microsoft logo. The main heading is "Build in the cloud free with Azure for Students". Below it, a subtext says "Use your university or school email to sign up and renew each year you're a student". Two buttons are present: a green "Start free" button and a white "Learn about eligibility" button. Below these buttons are two boxes: one containing "Start with USD 100 Azure credit" and another containing "No credit card required". A large plus sign (+) is centered at the bottom of the page.

3. Sign in to Microsoft using the email address and password.

The screenshot shows the Microsoft sign-in page. At the top left is the Microsoft logo. The heading "Sign in" is centered. Below it is an input field containing the email address "carol.d@somaiya.edu". Underneath the input field is the text "No account? [Create one!](#)". Below that is the text "Can't access your account?". At the bottom are two buttons: "Back" (gray) and "Next" (blue). Below the "Next" button is a dark progress bar. At the very bottom, there are social media and sign-in links: "Sign in with GitHub" (with a GitHub icon) and "Sign-in options" (with a key icon).

4. Fill in the details mentioned and verify the academic status.

Student Verification

Start by entering your name as per the school records. Select your school's country and enter your school's name. Enter your date of birth as per the school records. The email address may be used to reach you if we have trouble verifying your application, so please enter your school provided email address.

First name
Carol

Last name
Dsouza

Country
India

If your country is not listed, the offer is not available in your region. [Learn More](#)

School name
S k सोमैया कॉलेज (Mumbai, Maharashtra)

School name will help provide Microsoft with additional information for verification. If available, please enter it here.

Date of birth
09/28/2003

5. The student version of Azure has \$100 credits free for students

Microsoft Azure Search resources, services, and docs (G+) Home > Education | Overview

Get started **Overview**

Student offer details

- Available credits **US\$100 out of US\$100**
- Days until credit expires **355**
Expires on 08/12/2024

Popular solutions

- Deploy a Docker container
- Create your first Node.js app
- Create and train a Machine Learning model
- Build and deploy your first website

Free Services

- Azure Virtual Machines – Windows
- Azure Blob Storage
- Computer Vision
- Azure App Service

Free software

- SQL Server 2019 Developer
- Machine Learning Server 9.4.7 for Windows
- Microsoft R Client 9.4.7

Free learning paths

- Data Scientist
- AI Engineer

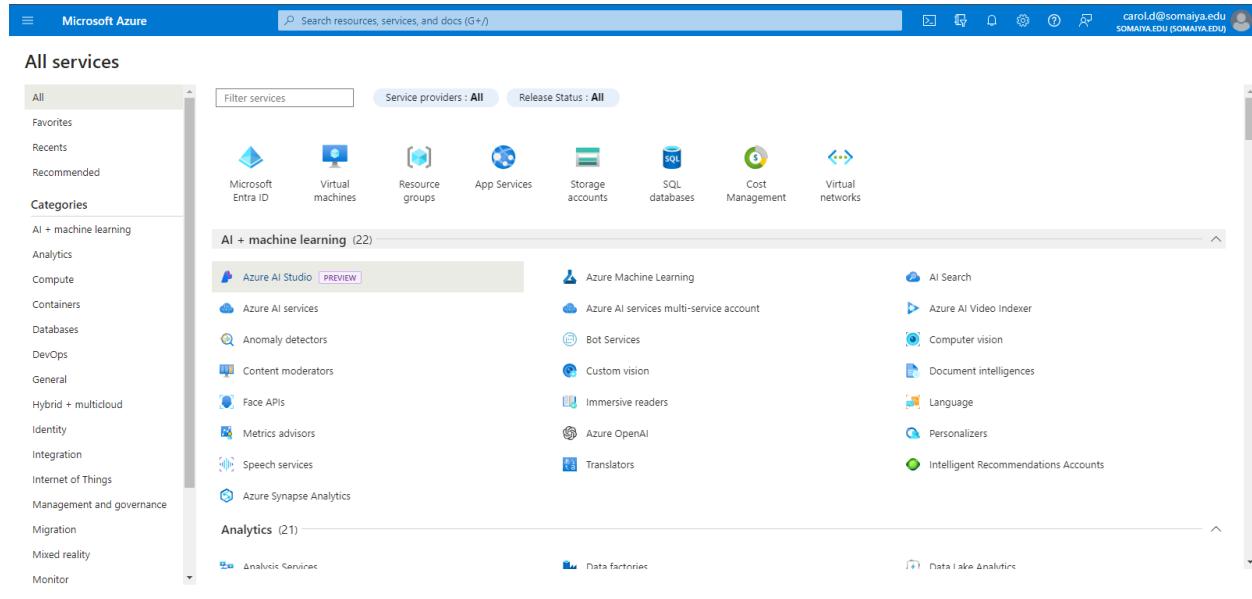
Resources

- Get started guide for Azure developers
- Pricing calculator

Practical 2

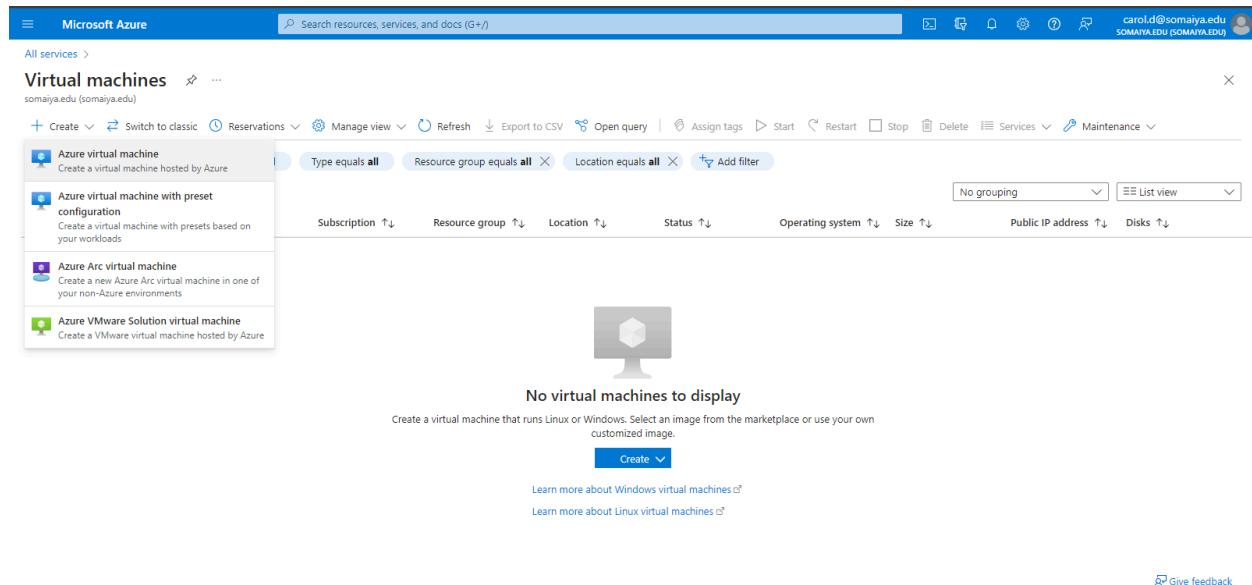
Creation of Virtual Machine

1. Go to Home on Azure and click on “Virtual machines”



The screenshot shows the Microsoft Azure portal's 'All services' page. At the top, there's a search bar and a navigation bar with icons for account, notifications, and settings. Below the search bar, there are filters for 'Service providers: All' and 'Release Status: All'. A sidebar on the left lists various service categories like AI + machine learning, Compute, and General. The main area displays a grid of service icons. The 'Virtual machines' icon, which looks like a computer monitor with a hexagon, is located in the 'Compute' section. Other visible icons include Microsoft Entra ID, App Services, Storage accounts, SQL databases, Cost Management, and Virtual networks.

2. Click on “Create” and select “Azure virtual machine - Create a virtual machine hosted by Azure”



The screenshot shows the 'Virtual machines' blade in the Azure portal. At the top, there's a header with a back arrow, a search bar, and a user profile. Below the header, there are filter buttons for 'Type equals all', 'Resource group equals all', and 'Location equals all'. There are also buttons for 'Assign tags', 'Start', 'Restart', 'Stop', 'Delete', 'Services', and 'Maintenance'. The main content area shows four items under the heading 'Virtual machines': 'Azure virtual machine' (Create a virtual machine hosted by Azure), 'Azure virtual machine with preset configuration' (Create a virtual machine with presets based on your workloads), 'Azure Arc virtual machine' (Create a new Azure Arc virtual machine in one of your non-Azure environments), and 'Azure VMware Solution virtual machine' (Create a VMware virtual machine hosted by Azure). Below this, there's a large 'Create' button. A message at the bottom says 'No virtual machines to display' and provides instructions to 'Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.' There are also links to 'Learn more about Windows virtual machines' and 'Learn more about Linux virtual machines'.

3. Enter the name of the virtual machine as well as change the region to India.

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

All services > Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

ⓘ This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * (Azure for Students) Resource group * (New) VirtualMachine1_group [Create new](#)

Instance details

Virtual machine name * (VirtualMachine1) Region * (Asia Pacific) Central India Availability options Availability zone Availability zone * Zones 1

Review + create < Previous Next : Disks >

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

All services > Create a virtual machine ...

Security type Trusted launch virtual machines [Configure security features](#)

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_D2s_v3 - 2 vcpus, 8 GiB memory (₹6,019.67/month) [See all sizes](#)

Enable Hibernation (preview) To enable Hibernation, you must register your subscription. [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.

Review + create < Previous Next : Disks >

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

All services > Create a virtual machine

Password

Info 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

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 *

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

Review + create < Previous Next : Disks >

4. Then click on “Review + create”. Once the validation is complete, click on “Create”

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

All services > Create a virtual machine

Validation passed

Basics Disks Networking Management Monitoring Advanced Tags **Review + create**

Info Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.

Price

1 X Standard B1s by Microsoft [Terms of use](#) [Privacy policy](#) Subscription credits apply **0.8796 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

Preferred e-mail address

Create < Previous Next > Download a template for automation

5. The machine will be created along with the SSH keys. Download the private key pair present as a “PEM file” and save it. Click on “Go to resource”

The screenshot shows the Microsoft Azure Deployment Overview page for a deployment named "CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231220071742". The status is "Your deployment is complete". Deployment details include a deployment name, subscription ("Azure for Students"), and resource group ("VirtualMachine1_group"). Next steps include "Setup auto-shutdown" (Recommended), "Monitor VM health, performance and network dependencies" (Recommended), and "Run a script inside the virtual machine" (Recommended). Buttons at the bottom include "Go to resource" (highlighted in blue) and "Create another VM".

6. Under “Connect” in Settings, select the “Native SSH”.

The screenshot shows the Microsoft Azure Virtual Machine Connect settings for "VirtualMachine1". The "Connect" section is selected in the sidebar. It displays connection details: "Connecting using Public IP address | 4.240.67.227". Below this, under "Settings", the "Networking" section is selected. The "Connect" section shows two options: "SSH using Azure CLI" and "Native SSH". "Native SSH" is highlighted with a green border and has a "Select" button. Other options like "Local machine" and "Azure portal" are also visible.

7. Follow the instructions given to connect the local machine i.e. copy the path of the private key (PEM File) and paste it. Then, open the local shell (Command Prompt) on the PC and execute the command.

Native SSH

Connect from your local machine (Windows)

Switch local machine OS ▾

1 Configure prerequisites for Native SSH

Azure needs to configure some features in order to connect to the VM.

✓ **Prerequisites configured**

✓ **Port 22 access**
Port 22 on this virtual machine is accessible from the local machine IP (14.142.143.98). [Learn more ↗](#)
i Change the port for connecting to this virtual machine on the Connect page of the virtual machine.

✓ **Public IP address: 4.240.67.227**
A public IP address is required to connect via this connection method.

Configured

2 Open a local shell (on Windows)

Open Terminal (Windows 11), PowerShell (Windows 10 or less), or a shell of your choice. Or switch the local machine OS above to view more instructions.

3 Copy and execute SSH command

Provide a path to your SSH private key file on your local machine.

```
~/ssh/id_rsa.pem
```

Can't find your private key? [Reset your SSH private key](#)

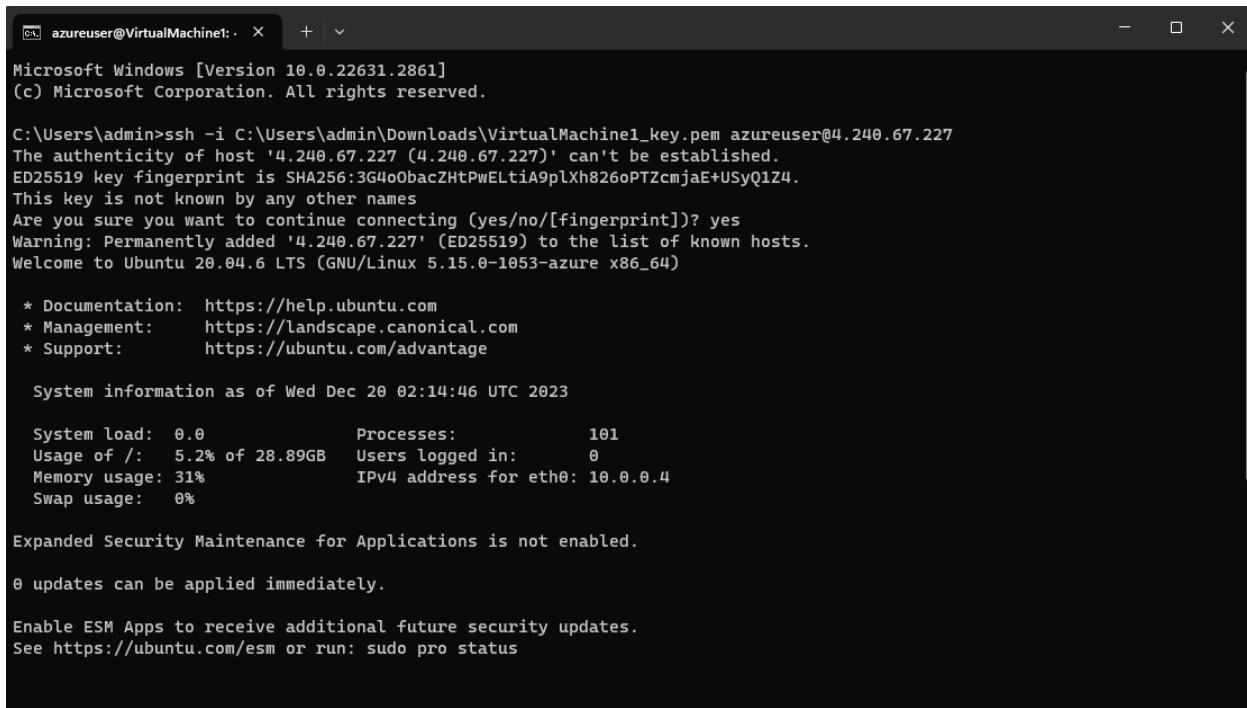
SSH to VM with specified private key.

```
ssh -i ~/ssh/id_rsa.pem azureuser@4.240.67.227
```

Copy

[Close](#) [Troubleshooting](#) [Give feedback](#)

8. The command is executed as shown below in the Command Prompt and the local machine is now connected to the virtual machine.



```
azureuser@VirtualMachine1:~ + - × Microsoft Windows [Version 10.0.22631.2861]
(c) Microsoft Corporation. All rights reserved.

C:\Users\admin>ssh -i C:\Users\admin\Downloads\VirtualMachine1_key.pem azureuser@4.240.67.227
The authenticity of host '4.240.67.227 (4.240.67.227)' can't be established.
ED25519 key fingerprint is SHA256:3G4o0bacZHtPwELtiA9plXh826oPTZcmjaE+USyQ1Z4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '4.240.67.227' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1053-azure x86_64)

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

 System information as of Wed Dec 20 02:14:46 UTC 2023

 System load:  0.0          Processes:      101
 Usage of /:   5.2% of 28.89GB  Users logged in:    0
 Memory usage: 31%           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
```

Practical 3

Creating Excel Blob using Storage Account in Azure

1. Go to Home on Azure and click on “Virtual machines”

The screenshot shows the Microsoft Azure portal homepage. On the left, there is a sidebar titled 'All services' with various categories like AI + machine learning, Compute, and Monitoring. In the center, there is a search bar and a grid of service icons. Below the grid, under the 'AI + machine learning' section, the 'Virtual machines' icon is highlighted. The main content area shows a list of AI services.

2. Click on “Create” and select “Azure virtual machine - Create a virtual machine hosted by Azure”

The screenshot shows the 'Virtual machines' blade in the Azure portal. At the top, there is a 'Create' button. Below it, there are four options listed: 'Azure virtual machine', 'Azure virtual machine with preset configuration', 'Azure Arc virtual machine', and 'Azure VMware Solution virtual machine'. The 'Azure virtual machine' option is selected. In the center, there is a large 'No virtual machines to display' message with a 'Create' button below it. At the bottom, there are links to learn more about Windows and Linux virtual machines, and a 'Give feedback' link.

3. Enter the name of the virtual machine as well as change the region to India.

Microsoft Azure

All services > Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * [Azure for Students](#)
Resource group * [\(New\) VirtualMachine1_group](#) [Create new](#)

Instance details

Virtual machine name * [VirtualMachine1](#)
Region * [\(Asia Pacific\) Central India](#)
Availability options [Availability zone](#)
Availability zone * [Zones 1](#)

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

4. Then click on “Review + create”. Once the validation is complete, click on “Create”

Microsoft Azure

All services > 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. Please use [Pricing calculator](#) for all your pricing needs.

Price

1 X Standard B1s by Microsoft [Subscription credits apply](#) [0.8796 INR/hr](#)
[Terms of use](#) | [Privacy policy](#) [Pricing for other VM sizes](#)

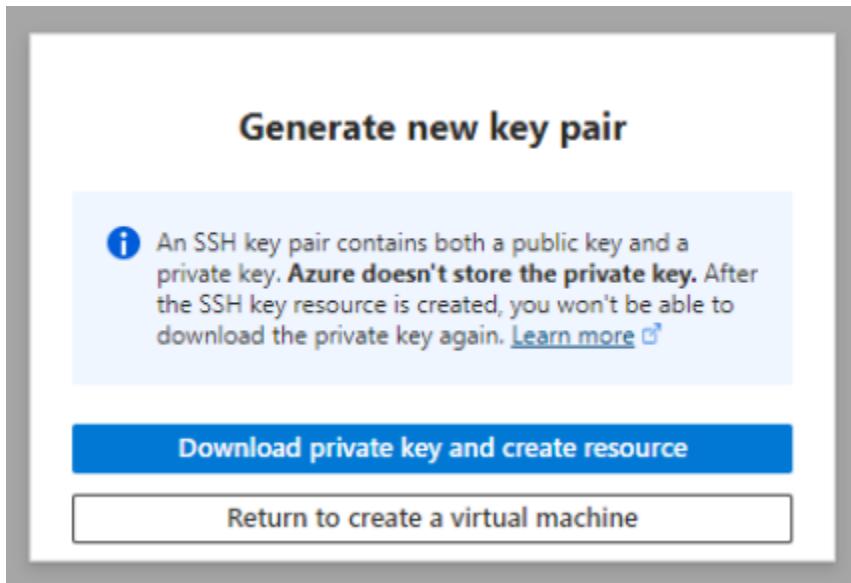
TERMS

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
Preferred e-mail address

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

5. The machine will be created along with the SSH keys. Download the private key pair present as a “PEM file” and save it.



6. Click on “Go to resource”

A screenshot of the Microsoft Azure portal showing the deployment details for a VM named "CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231220071742". The "Overview" tab is selected, displaying the message "Your deployment is complete". Deployment details include: Deployment name: CreateVm-canonical.0001-com-ubuntu-server-f...; Subscription: Azure for Students; Start time: 12/20/2023, 7:27:23 AM; Resource group: VirtualMachine1_group; Correlation ID: 85542b42-40fa-43a5-9ae3-d616495a5449. Below this, there are sections for "Deployment details" (Setup auto-shutdown, Monitor VM health, Run a script inside the virtual machine) and "Next steps" (Create another VM). At the bottom, there are links for "Give feedback" and "Tell us about your experience with deployment".

7. Under “Connect” in Settings, select the “Native SSH”.

VirtualMachine1 | Connect

Virtual machine

Search

Refresh Troubleshoot More Options Feedback

Connecting using Public IP address | 4.240.67.227

Admin username : azureuser
Port (change) : 22 Check access
Just-in-time policy : Unsupported by plan

Recommended

SSH using Azure CLI Local machine Azure portal

Quickly connect in browser. Supports Azure AD authentication. Private key not required.

Public IP address (4.240.67.227)

Select

Most common

Native SSH Local machine

No additional software needed. Private key required for connection. Best for those with existing SSH tools.

Public IP address (4.240.67.227)

Select

More ways to connect (3)

8. Follow the instructions given to connect the local machine i.e copy the path of the private key (PEM File) and paste it. Then, open the Command Prompt and execute the command.

Native SSH

Connect from your local machine (Windows)

Switch local machine OS

1 Configure prerequisites for Native SSH

Azure needs to configure some features in order to connect to the VM.

✓ Prerequisites configured

✓ Port 22 access

Port 22 on this virtual machine is accessible from the local machine IP (14.142.143.98). Learn more

Change the port for connecting to this virtual machine on the Connect page of the virtual machine.

✓ Public IP address: 4.240.67.227

A public IP address is required to connect via this connection method.

Configured

2 Open a local shell (on Windows)

Open Terminal (Windows 11), PowerShell (Windows 10 or less), or a shell of your choice. Or switch the local machine OS above to view more instructions.

3 Copy and execute SSH command

Provide a path to your SSH private key file on your local machine.

~/ssh/id_rsa.pem

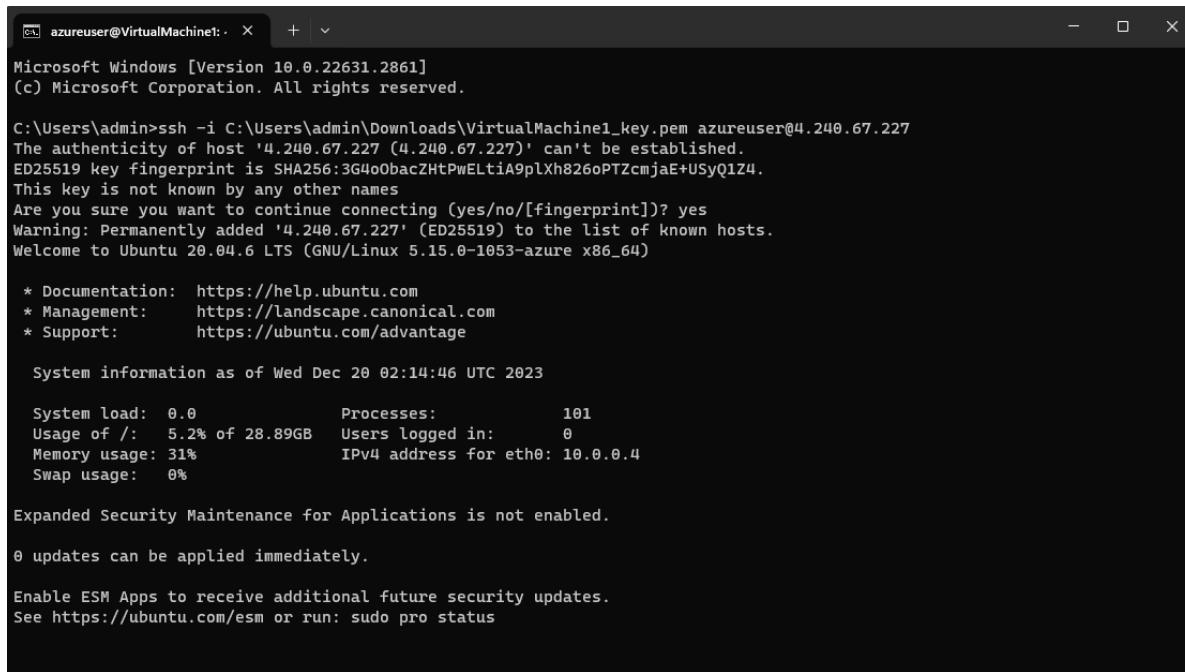
Can't find your private key? Reset your SSH private key

SSH to VM with specified private key.

ssh -i ~/ssh/id_rsa.pem azureuser@4.240.67.227

Close Troubleshooting Give feedback

8. The command is executed as shown below in the Command Prompt and the local machine is now connected to the virtual machine.



```
azureuser@VirtualMachine1: ~ + \ 
Microsoft Windows [Version 10.0.22631.2861]
(c) Microsoft Corporation. All rights reserved.

C:\Users\admin>ssh -i C:\Users\admin\Downloads\VirtualMachine1_key.pem azureuser@4.240.67.227
The authenticity of host '4.240.67.227 (4.240.67.227)' can't be established.
ED25519 key fingerprint is SHA256:3G4oObacZHtPwEltiA9plXh826oPTZcmjaE+USyQ1Z4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '4.240.67.227' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1053-azure x86_64)

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

 System information as of Wed Dec 20 02:14:46 UTC 2023

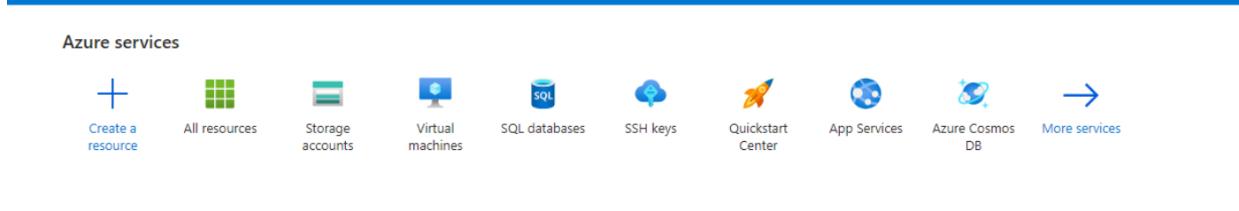
 System load: 0.0          Processes:           101
 Usage of /: 5.2% of 28.89GB   Users logged in:    0
 Memory usage: 31%          IPv4 address for eth0: 10.0.0.4
 Swap usage:  0%

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
```

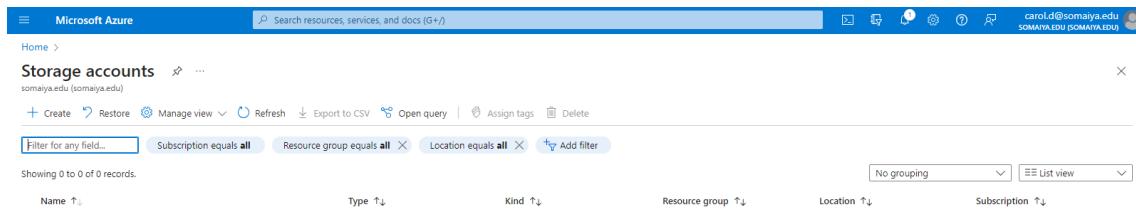
9. Go to Home and click on “Storage Accounts”.



Azure services

- Create a resource
- All resources
- Storage accounts
- Virtual machines
- SQL databases
- SSH keys
- Quickstart Center
- App Services
- Azure Cosmos DB
- More services

10. Click on “Create”

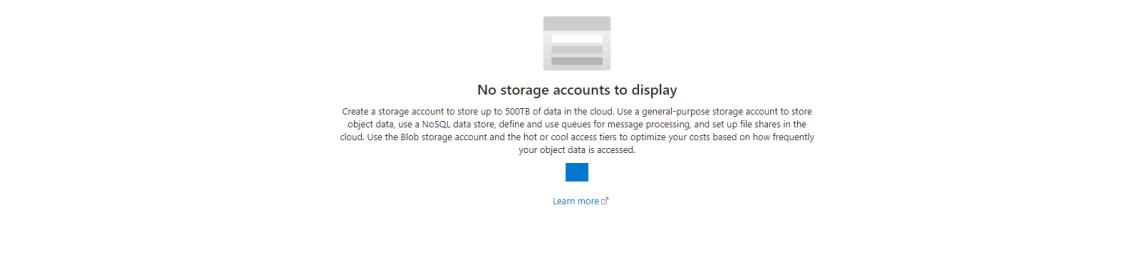


Storage accounts

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

No grouping List view

Name	Type	Kind	Resource group	Location	Subscription
Showing 0 to 0 of 0 records.					



No storage accounts to display

Create a storage account to store up to 500TB of data in the cloud. Use a general-purpose storage account to store object data, use a NoSQL data store, define and use queues for message processing, and set up file shares in the cloud. Use the Blob storage account and the hot or cool access tiers to optimize your costs based on how frequently your object data is accessed.

Learn more ↗

Give feedback

11. Enter the name of the storage account and fill in the required information. Click on “Review”

The screenshot shows the 'Create a storage account' review step in the Azure portal. At the top, there's a navigation bar with 'Microsoft Azure' and a search bar. Below it, the breadcrumb path 'Home > Storage accounts >' and the title 'Create a storage account' are visible. A horizontal navigation bar at the top of the form includes 'Basics', 'Advanced', 'Networking', 'Data protection', 'Encryption', 'Tags', and 'Review'. The 'Review' tab is currently selected.

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: NetworkWatcherRG

Instance details

Storage account name: vm1storageaccount

Region: (Asia Pacific) Central India

At the bottom, there are navigation buttons: 'Review' (highlighted in blue), '< Previous', and 'Next : Advanced >'. There's also a 'Create new' link under the resource group dropdown.

12. Then, click on “Create”.

The screenshot shows the 'Create a storage account' creation step in the Azure portal. The interface is similar to the previous review step, with a navigation bar, breadcrumb path, and title. The 'Review' tab is still selected.

Basics

Subscription	Azure for Students
Resource Group	NetworkWatcherRG
Location	centralindia
Storage account name	vm1storageaccount
Deployment model	Resource manager
Performance	Standard
Replication	Read-access geo-redundant storage (RA-GRS)

Advanced

Enable hierarchical namespace	Disabled
Enable network file system v3	Disabled
Allow cross-tenant replication	Disabled
Access tier	Hot
Enable SFTP	Disabled
Large file shares	Disabled

At the bottom, there are buttons: 'Create' (highlighted in blue), '< Previous', 'Next >', and 'Download a template for automation'.

13. Here, the storage account has been created and deployment is completed. Click on “Go to resource”

The screenshot shows the Microsoft Azure Storage Account Overview page for 'vm1storageaccount_1703039827783'. The main content area displays a green checkmark icon and the message 'Your deployment is complete'. Below this, it shows deployment details: Deployment name: vm1storageaccount_1703039827783, Subscription: Azure for Students, Resource group: NetworkWatcherRG. It also shows the start time as 12/20/2023, 8:07:08 AM and a Correlation ID: c6080e4c-bb94-4401-b6a1-336c3d887aed. On the right side, there are several promotional 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 >), 'Free Microsoft tutorials' (Start learning today >), and '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 >).

14. Click on “Upload”.

The screenshot shows the Microsoft Azure Storage Account Overview page for 'vm1storageaccount_1703039827783'. The top navigation bar includes 'Upload' as one of the options. The main content area displays the storage account details: Resource group (move) : NetworkWatcherRG, Location : Central India, Primary/Secondary Location : Primary: Central India, Secondary: South India, Subscription (move) : Azure for Students, Subscription ID : 9ae460b0-ea40-4d04-a8b1-fd15fd239164, Disk state : Primary: Available, Secondary: Available. The 'Properties' tab is selected, showing sections for 'Blob service', 'Security', and 'Networking'. Under 'Blob service', settings like Hierarchical namespace (Disabled), Default access tier (Hot), Blob anonymous access (Disabled), Blob soft delete (Enabled (7 days)), Container soft delete (Enabled (7 days)), Versioning (Disabled), Change feed (Disabled), NFS v3 (Disabled), and Allow cross-tenant replication (Disabled) are listed. Under 'Security', settings like Require secure transfer for REST API operations (Enabled), Storage account key access (Enabled), Minimum TLS version (Version 1.2), and Infrastructure encryption (Disabled) are listed. Under 'Networking', settings like Allow access from (All networks), Number of private endpoint connections (0), and Microsoft network routing (Network routing) are listed.

15. Create an Excel file as below and save it.

	A	B
1	Name	seat no.
2	Sandeep	12
3	Guransh	54
4	Tanish	34
5	Venkatraj	106
C		

16. Upload the file by clicking on “Browse for files”. Create a new container and name it.

Upload blob ×



 1 file(s) selected: VM1Excel.xlsx

 Drag and drop files here or [Browse for files](#)

Select an existing container

[Create new](#)

Overwrite if files already exist

Advanced

Blob type ①

Block blob

Upload .vhdx files as page blobs (recommended)

Block size ①

4 MiB

Access tier ①

Hot (Inferred)

Upload to folder

17. Navigate to “Storage Browser” and enter the blob container to see if the Excel file has been uploaded.

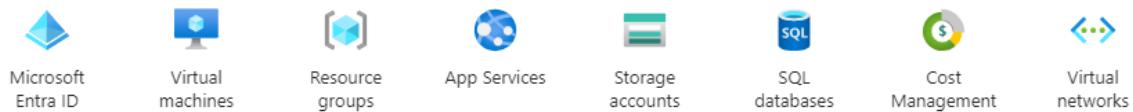
The screenshot shows the Microsoft Azure Storage browser interface. The left sidebar menu is visible, with 'Storage browser' selected. The main area displays the 'vm1storageaccount' storage account. Under 'Blob containers', the 'vm1container' is selected. A single blob named 'VM1Excel.xlsx' is listed in the table below. The table columns are: Name, Last modified, Access tier, Blob type, Size, and Lease state. The blob details are: Name: VM1Excel.xlsx, Last modified: 12/20/2023, 8:12:46 AM, Access tier: Hot (Inferred), Blob type: Block blob, Size: 15.08 KB, Lease state: Available.

Name	Last modified	Access tier	Blob type	Size	Lease state
VM1Excel.xlsx	12/20/2023, 8:12:46 AM	Hot (Inferred)	Block blob	15.08 KB	Available

Practical 4

Creating Image Blob using Storage Account in Azure

1. Go to Home on Azure and click on “Virtual machines”



2. Click on “Create” and select “Azure virtual machine - Create a virtual machine hosted by Azure”

A screenshot of the Azure Virtual Machines blade. At the top, there's a search bar and several filter options like 'Type equals all', 'Resource group equals all', and 'Location equals all'. Below the filters is a table header with columns: Subscription, Resource group, Location, Status, Operating system, Size, Public IP address, and Disks. Underneath the table, there's a large message: 'No virtual machines to display' followed by a sub-instruction: 'Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.' A prominent blue 'Create' button is located at the bottom left of this section. At the very bottom right, there's a link 'Give feedback'.

3. Enter the name of the virtual machine as well as change the region to India.

A screenshot of the 'Create a virtual machine' wizard, Step 1: Basics. The 'Basics' tab is selected. The 'Virtual machine name' field contains 'VirtualMachine1'. The 'Region' dropdown is set to '(Asia Pacific) Central India'. Other tabs visible include Disks, Networking, Management, Monitoring, Advanced, Tags, and Review + create. A note at the top states: 'Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization.' A warning message in a box says: 'This subscription may not be eligible to deploy VMs of certain sizes in certain regions.' At the bottom, there are 'Review + create', '< Previous', and 'Next : Disks >' buttons.

4. Then click on “Review + create”. Once the validation is complete, click on “Create”

The screenshot shows the 'Create a virtual machine' review + create step. At the top, there's a green bar indicating 'Validation passed'. Below it, the 'Review + create' tab is selected from a navigation bar. A note says 'Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.' The 'Price' section shows '1 X Standard B1s by Microsoft' with a price of '0.8796 INR/hr'. It also mentions 'Subscription credits apply' and 'Pricing for other VM sizes'. The 'TERMS' section contains legal text about agreeing to terms and privacy statements. Below that, there are fields for 'Name' (Carol Dsouza) and 'Preferred e-mail address' (carol.d@somaiya.edu). At the bottom are buttons for 'Create' (highlighted in blue), '< Previous' and 'Next >', and a link to 'Download a template for automation'.

5. The machine will be created along with the SSH keys. Download the private key pair present as a “PEM file” and save it.

The screenshot shows a modal dialog titled 'Generate new key pair'. It contains an informational message: '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](#)'.

At the bottom of the dialog are two buttons: a blue 'Download private key and create resource' button and a white 'Return to create a virtual machine' button.

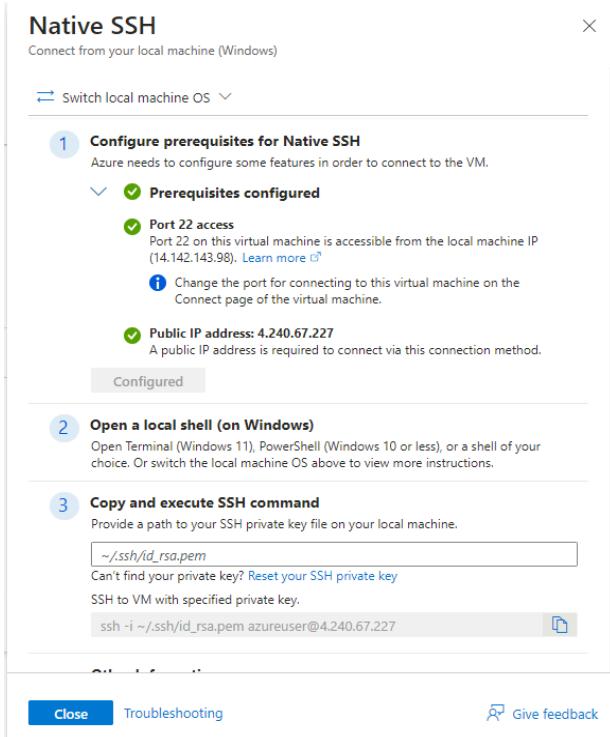
6. Click on “Go to resource”

The screenshot shows the Microsoft Azure Deployment Overview page for a deployment named "CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231220071742". The status is "Your deployment is complete". Deployment details include a start time of 12/20/2023, 7:27:23 AM, and a correlation ID of 85542b42-40fa-43a5-9ae3-d616495a5449. Next steps include setup auto-shutdown, monitor VM health, and run a script inside the virtual machine.

7. Under “Connect” in Settings, select the “Native SSH”.

The screenshot shows the "VirtualMachine1 | Connect" settings page. Under the "Connect" section, the "Native SSH" option is selected. It is described as requiring no additional software and being best for those with existing SSH tools. A "Select" button is visible next to the Native SSH option.

8. Follow the instructions given to connect the local machine i.e copy the path of the private key (PEM File) and paste it. Then, open the Command Prompt and execute the command.



8. The command is executed as shown below in the Command Prompt and the local machine is now connected to the virtual machine.

```
azureuser@VirtualMachine1: ~ + \v
Microsoft Windows [Version 10.0.22631.2861]
(c) Microsoft Corporation. All rights reserved.

C:\Users\admin>ssh -i C:\Users\admin\Downloads\VirtualMachine1_key.pem azureuser@4.240.67.227
The authenticity of host '4.240.67.227 (4.240.67.227)' can't be established.
ED25519 key fingerprint is SHA256:3G4oObacZHtPwELtiA9plXh826oPTZcmjaE+USyQ1Z4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '4.240.67.227' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1053-azure x86_64)

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

 System information as of Wed Dec 20 02:14:46 UTC 2023

 System load:  0.0          Processes:      101
 Usage of /:   5.2% of 28.89GB  Users logged in:     0
 Memory usage: 31%           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
```

9. Go to Home and click on “Storage Accounts”.



10. Click on “Create”

Screenshot of the Microsoft Azure Storage accounts page. The top navigation bar shows "Microsoft Azure" and the user "carol.d@somaiya.edu". The main heading is "Storage accounts". Below it, there are filter options: "Subscription equals all", "Resource group equals all", and "Location equals all". The search bar shows "Filter for any field...". The results table has columns: Name, Type, Kind, Resource group, Location, and Subscription. A message at the bottom says "No storage accounts to display".

11. Enter the name of the storage account and fill in the required information. Click on “Review”

Screenshot of the "Create a storage account" wizard. The title is "Create a storage account". The tabs at the top are Basics (selected), Advanced, Networking, Data protection, Encryption, Tags, and Review.

Basics

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

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 *: NetworkWatcherRG

Instance details

Storage account name *: lvm1storageaccount

Region *: (Asia Pacific) Central India

Buttons at the bottom: "Review" (highlighted in blue), "< Previous", and "Next : Advanced >"

12. Then, click on “Create”.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Storage accounts >

Create a storage account ...

Basics Advanced Networking Data protection Encryption Tags Review

Basics

Subscription	Azure for Students
Resource Group	NetworkWatcherRG
Location	centralindia
Storage account name	vm1storageaccount
Deployment model	Resource manager
Performance	Standard
Replication	Read-access geo-redundant storage (RA-GRS)

Advanced

Enable hierarchical namespace	Disabled
Enable network file system v3	Disabled
Allow cross-tenant replication	Disabled
Access tier	Hot
Enable SFTP	Disabled
Large file shares	Disabled

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

13. Here, the storage account has been created and deployment is completed. Click on “Go to resource”

Microsoft Azure

Search resources, services, and docs (G+)

Home >

vm1storageaccount_1703039827783 | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview

Your deployment is complete

Deployment name: vm1storageaccount_1703039827783
Subscription: Azure for Students
Resource group: NetworkWatcherRG

Start time: 12/20/2023, 8:07:08 AM
Correlation ID: c6080e4c-bb94-4401-b6a1-336c3d887aed

Deployment details
Next steps

[Go to resource](#)

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 >](#)

Free Microsoft tutorials
[Start learning today >](#)

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 >](#)

14. Click on “Upload”.

Microsoft Azure

Home > vm1storageaccount_1703039827783 | Overview >

vm1storageaccount Storage account

Search

Upload Open in Explorer Delete Move Refresh Open in mobile CLI / PS Feedback

Overview

Activity log Tags Diagnose and solve problems Access Control (IAM) Data migration Events Storage browser Storage Mover

Data storage

Containers File shares Queues Tables

Security + networking

Networking Front Door and CDN Access keys

Resource group (move) : NetworkWatcherRG Location : centralindia Primary/Secondary Location : Primary: Central India, Secondary: South India Subscription (move) : Azure for Students Subscription ID : 9ae460b0-ea40-4d04-a8b1-fd15fd239164 Disk state : Primary: Available, Secondary: Available

Tags (edit) : Add tags

Properties Monitoring Capabilities (7) Recommendations (0) Tutorials Tools + SDKs

Blob service

Hierarchical namespace	Disabled
Default access tier	Hot
Blob anonymous access	Disabled
Blob soft delete	Enabled (7 days)
Container soft delete	Enabled (7 days)
Versioning	Disabled
Change feed	Disabled
NFS v3	Disabled
Allow cross-tenant replication	Disabled

Security

Require secure transfer for REST API operations	Enabled
Storage account key access	Enabled
Minimum TLS version	Version 1.2
Infrastructure encryption	Disabled

Networking

Allow access from	All networks
Number of private endpoint connections	0

Network routing Microsoft network routing

15. Download an image and save it. Upload the file by clicking on “Browse for files”. Create a new container and name it.

Upload blob

1 file(s) selected: dogblob.jpg

Drag and drop files here or [Browse for files](#)

Select an existing container

vm1container

Create new

Overwrite if files already exist

Advanced

Upload Give feedback

16. Navigate to “Storage Browser” and enter the blob container to see if the image file has been uploaded.

Microsoft Azure

Home > vm1storageaccount

vm1storageaccount | Storage browser

Storage account

Search

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data migration

Events

Storage browser

Storage Mover

Data storage

Containers

File shares

Queues

Tables

Security + networking

Networking

Front Door and CDN

Access keys

vm1storageaccount

Favorites

Recently viewed

Blob containers

slogs

vm1container

Add filter

Search blobs by prefix (case-sensitive)

Only show active blobs

Authentication method: Access key (Switch to Microsoft Entra user account)

Add Directory

Upload

Change access level

Refresh

Delete

Copy

Paste

Rename

Acquire lease

Break lease

...

Blob containers > vm1container

Showing all 2 items

Name	Last modified	Access tier	Blob type	Size	Lease state
VM1Excel.xlsx	12/20/2023, 8:12:46 AM	Hot (Inferred)	Block blob	15.08 KiB	Available
dogblob.jpg	12/20/2023, 8:22:28 AM	Hot (Inferred)	Block blob	119.13 KiB	Available

Practical 5

SQL Database

1. Go to Home and click on “SQL databases”



2. Click on “Create SQL database” to create a new database.

A screenshot of the Microsoft Azure 'SQL databases' blade. The top navigation bar shows 'Home > SQL databases'. The main area displays a large 'SQL' icon and the text 'No SQL databases to display'. It includes a 'Create SQL database' button and a 'Learn more' link. The bottom right corner has a 'Give feedback' button.

3. Enter the details for the SQL Database Server such as name and location.

A screenshot of the Microsoft Azure 'Create SQL Database Server' blade. The top navigation bar shows 'Home > SQL databases > Create SQL Database'. The main area has sections for 'Server details' and 'Authentication'. In 'Server details', there's a 'Server name' field containing 'sqlservervm1' and a 'Location' dropdown set to '(US) East US'. A tooltip provides validation rules: 'Server name should not contain reserved words.', 'The specified server name is available.', and 'Your server name can't start or end with hyphens '-' nor can it have two hyphens '--' in third and fourth places of the name.' In 'Authentication', there's a note about Microsoft Entra ID and a section for selecting authentication methods: 'Use Microsoft Entra-only authentication' (selected), 'Use both SQL and Microsoft Entra authentication', and 'Use SQL authentication'. At the bottom, there's an 'OK' button.

4. Select the “Authentication method” as “Use SQL authentication”. Enter the admin login and password (Remember the login and password). Then click “Ok”

Azure Active Directory (Azure AD) is now Microsoft Entra ID. [Learn more](#)

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication; select only Microsoft Entra authentication [Learn more](#) or using an existing Microsoft Entra user, group, or application as Microsoft Entra admin [Learn more](#), or select both SQL and Microsoft Entra authentication.

Authentication method

Server admin login *

Password *

Confirm password *

OK

5. Under the “Review + create” tab, click on “Create”.

Estimated cost

Storage cost 428.31 INR / month + Compute cost 0.012520 INR / vCore second

Cost summary

General Purpose (GP_S_Gen5_1)

Cost per GB (in INR) 10.30

Max storage selected (in GB) x 41.6

ESTIMATED STORAGE COST / MONTH 428.31 INR

COST / VCORE SECOND 0.012520 INR

NOTES

1 Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. [Learn more](#) about serverless billing

Create < Previous Download a template for automation

6. After deployment has been completed, click on “Go to resource”

The screenshot shows the Microsoft Azure Deployment Overview page for a resource named "Microsoft.SQLDatabase.newDatabaseNewServer_6d8984ee865d4eba8e033". The main message is "Your deployment is complete". Deployment details include a name, subscription ("Azure for Students"), and resource group ("NetworkWatcherRG"). A start time of 12/20/2023, 8:29:18 AM, and a correlation ID of bfcd7211-1ecc-423b-aa5c-4e584b010d92 are also listed. On the right side, there are several promotional cards: "Cost management" (Get notified to stay within budget), "Microsoft Defender for Cloud" (Secure your apps and infrastructure), "Free Microsoft tutorials" (Start learning today), and "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).

7. Click on “Properties”.

The screenshot shows the Microsoft Azure VM Properties page for a VM named "VM1 (sqlservervm1/VM1)". The main section displays essential information such as the resource group ("NetworkWatcherRG"), status ("Online"), location ("Central India"), and subscription ("Azure for Students"). It also shows the server name ("sqlservervm1.database.windows.net"), connection strings ("Show database connection strings"), pricing tier ("General Purpose - Serverless: Gen5, 1 vCore"), auto-pause delay ("1 hour"), and earliest restore point ("No restore point available"). Below this, there are sections for "Getting started" (Configure access, Connect to application, Start developing), "See connection strings", "Open Azure Data Studio", and "Open in Visual Studio".

8. Click on “Networking” and then select “Selected Networks” under Public access.

sqlservervm1 | Networking

Public access

Selected networks

Virtual networks

Firewall rules

Rule

Virtual network

Subnet

Address range

Endpoint status

Resource group

Subscription

State

Save

Discard

9. Click on “Add your client IPv4 address” and select the “Allow Azure services and resources to access this server” checkbox”. Then click “Save”

sqlservervm1 | Networking

Virtual networks

Firewall rules

Add your client IPv4 address (14.142.143.98)

Rule name

Start IPv4 address

End IPv4 address

ClientIPAddress_2023-12-20_8-38-53

14.142.143.98

14.142.143.98

Exceptions

Allow Azure services and resources to access this server

Save

Discard

10. Navigate to the “Query editor” tab. Create a table using SQL queries and insert values into the table.

The screenshot shows the Azure Data Studio interface. On the left, there's a sidebar for 'VM1 (system)' showing 'Tables', 'Views', and 'Stored Procedures'. The main area is titled 'Query 1' with the following SQL code:

```
1 CREATE TABLE student
2   (id int,
3    name varchar(20),
4    course varchar(20)
5 );
```

Below the code, it says 'Query succeeded: Affected rows: 0'. At the bottom, there are tabs for 'Results' and 'Messages', with 'Messages' being the active tab.

Insert values into the database as follows

'prac1/sqlprac' | Query editor (preview) ⋮

The screenshot shows the Azure Data Studio interface. On the left, there's a sidebar for 'sqlprac (system)' showing 'Tables', 'Views', and 'Stored Procedures'. The main area is titled 'Query 1' with the following SQL code:

```
5 );
6
7 insert into student values(012,'Sandeep','CS');
8 insert into student values(054,'guransh','CS');
9 insert into student values(034,'tanish','CS');
10 insert into student values(106,'venkat','CS');
```

Below the code, it says 'Query succeeded: Affected rows: 4'. At the bottom, there are tabs for 'Results' and 'Messages', with 'Messages' being the active tab.

11. Display the columns present in the table using the “SELECT” statement.

Query 1

Run Cancel query Save query Export data as Show only E

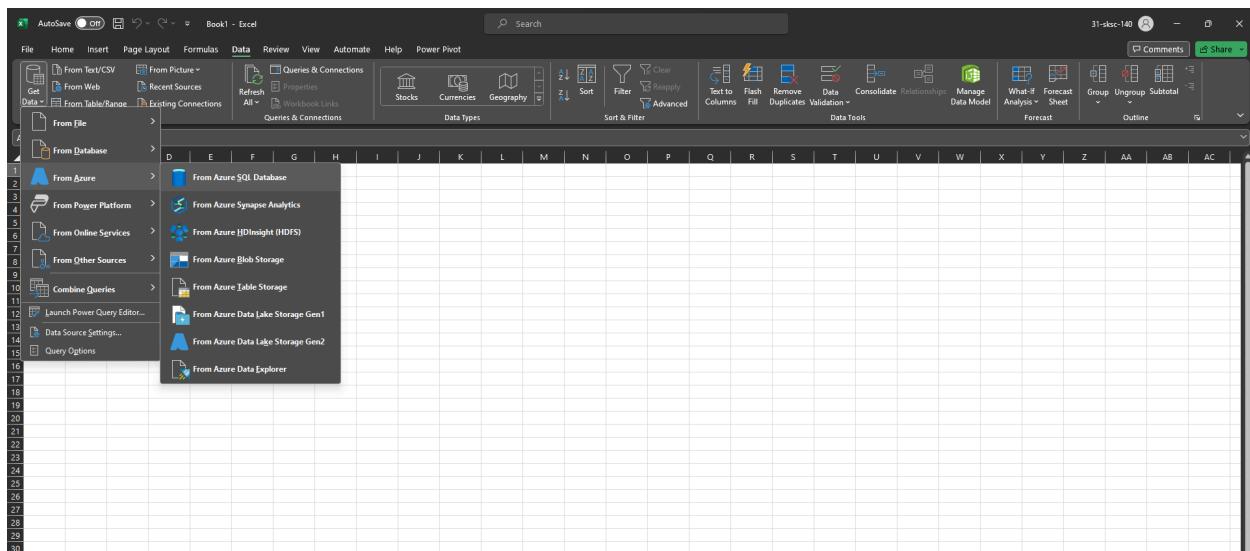
```
6
7   insert into student values(012,'Sandeep','CS');
8   insert into student values(054,'guransh','CS');
9   insert into student values(034,'tanish','CS');
10  insert into student values(106,'venkat','CS');
11
12  select * from student
```

Results

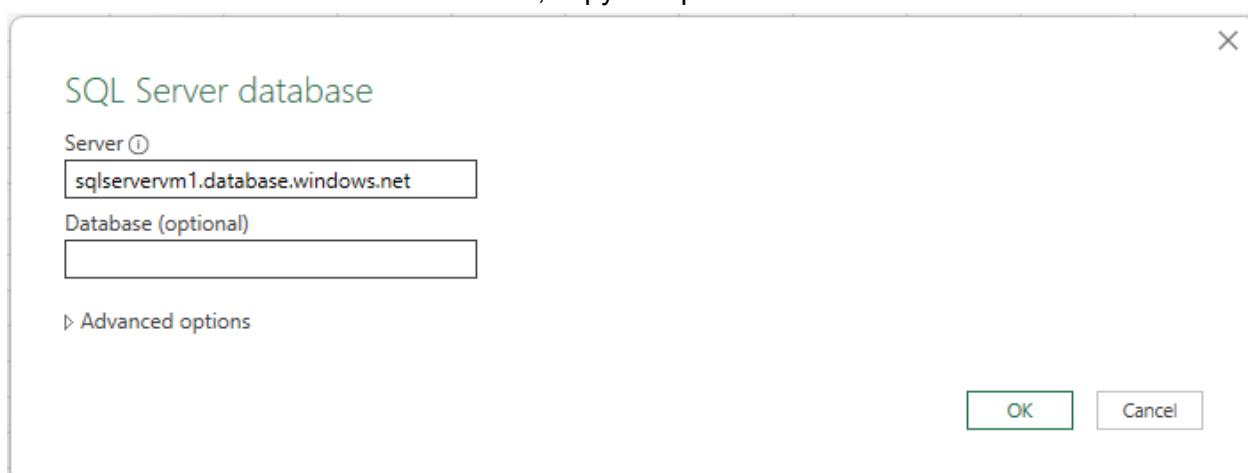
Messages

54	guransh	CS
34	tanish	CS
106	venkat	CS

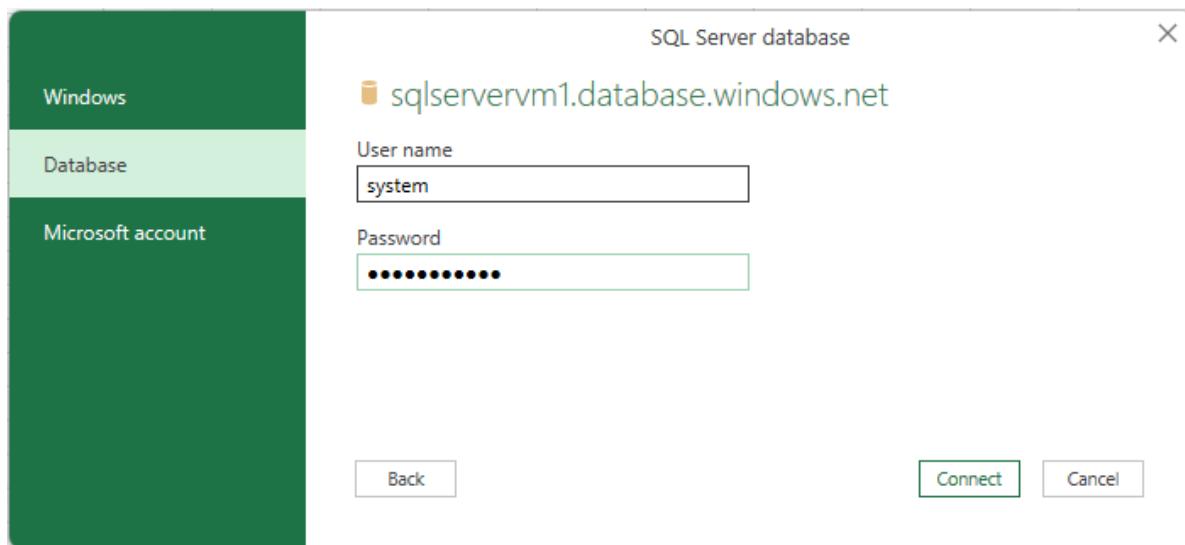
12. Open Excel on the PC. Navigate to the Data tab. Click on “Get Data”, select “From Azure” then select “From Azure SQL Database”



13. From overview in the Azure database, copy and paste the Server name and then click “OK”



14. Enter the details asked i.e. username and password and then click on “Connect”.



The following tab opens up and you have to select the database

Navigator

The screenshot shows the Navigator interface with a search bar at the top. Below it is a checkbox labeled "Select multiple items". Under "Display Options", there is a dropdown menu and a refresh icon. A tree view shows two databases: "sqlserverprac1.database.windows.net [1]" and "sqlprac [2]". Under "sqlprac [2]", there is a folder icon followed by "sys.database_firewall_rules" and a table icon followed by "student". The "student" entry is highlighted with a green background.

student

id	name	course
12	Sandeep	CS
54	guransh	CS
34	tanish	CS
106	venkat	CS

The data stored is displayed on the Excel sheet

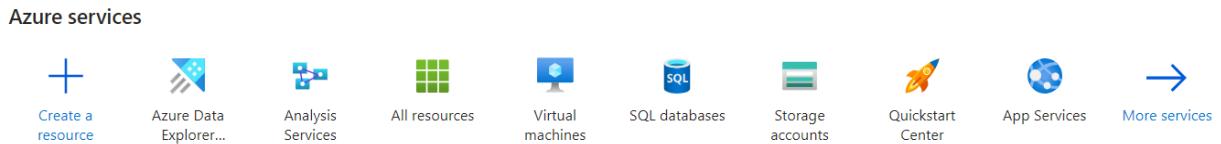
The screenshot shows an Excel spreadsheet with data in rows 1 through 6. Row 1 contains column headers: "id", "name", and "course". Rows 2 through 5 contain data: row 2 has "12 Sandeep CS", row 3 has "54 guransh CS", row 4 has "34 tanish CS", and row 5 has "106 venkat CS". Row 6 is empty. The "id" column is bolded. The entire table is bordered.

	A	B	C	D
1	id	name	course	
2	12	Sandeep	CS	
3	54	guransh	CS	
4	34	tanish	CS	
5	106	venkat	CS	
6				

Practical 6

Power BI (Data Analytics)

1. Login to Azure and click on “More Services”



2. Under “All services”, click “Analytics”

All services

All

Favorites

Recents

Recommended

Categories

AI + machine learning

Analytics

Compute

3. Click on “Analysis Services”

Big data processing

Analysis Services

Data Lake Storage Gen1

Azure HDInsight on AKS clusters (preview) PREVIEW

4. Click on “Create” in Analysis Services

The screenshot shows the Microsoft Azure Analysis Services blade. At the top, there's a search bar and a navigation bar with 'All services > Analysis Services'. Below the search bar are filter options: 'Subscription equals all', 'Resource group equals all', and 'Location equals all'. The main area displays a message: 'No analysis services to display' with a small icon of three squares connected by lines. Below this, it says 'Try changing or clearing your filters.' and 'Learn more'.

5. Enter the details and create a new resource group. Select “B2 (80 Query Processing Units)” as the Pricing tier

The screenshot shows the 'Create' blade for Analysis Services. It has several input fields with validation icons:

- Server name ***: analysis13 (green checkmark)
- Subscription ***: Azure for Students (dropdown menu)
- Resource group ***: (New) analysisresource (dropdown menu)
- Location ***: West India (dropdown menu)
- Pricing tier (View full pricing details) ***: B2 (80 Query Processing Units) (dropdown menu)
- Administrator (Select) ***: carol.d@somaiya.edu (green checkmark)

Below these, there are sections for **Backup Storage Settings** (Backup Storage: Not configured) and **Storage key expiration** (Never). At the bottom, there are two buttons: a blue **Create** button and a grey **Automation options** button.

6. After deployment is complete, click on “Go to resource”

All services >

Microsoft.AnalysisServices | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

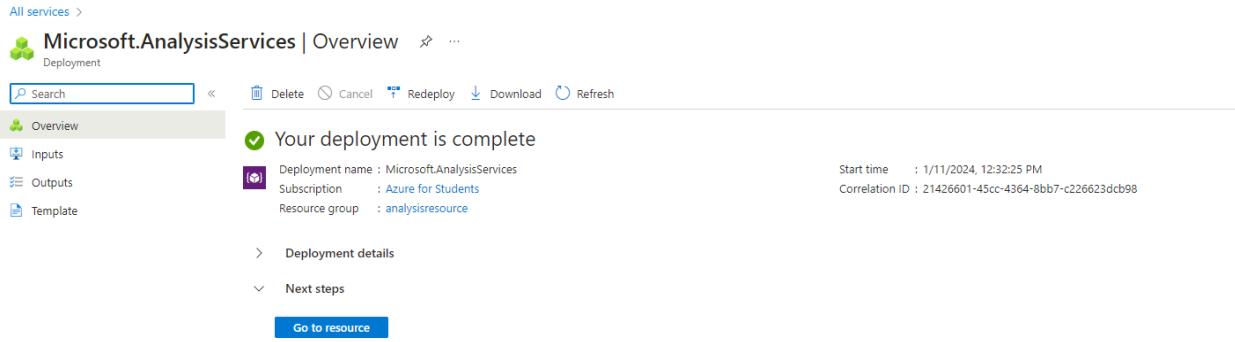
Your deployment is complete

Deployment name : Microsoft.AnalysisServices
Subscription : Azure for Students
Resource group : analysisresource

Start time : 1/11/2024, 12:32:25 PM
Correlation ID : 21426601-45cc-4364-8bb7-c226623dc98

Deployment details Next steps

Go to resource



7. Select “New model”

All services > Microsoft.AnalysisServices | Overview >

analysis13

Analysis Services

Search New model Pause Move Delete

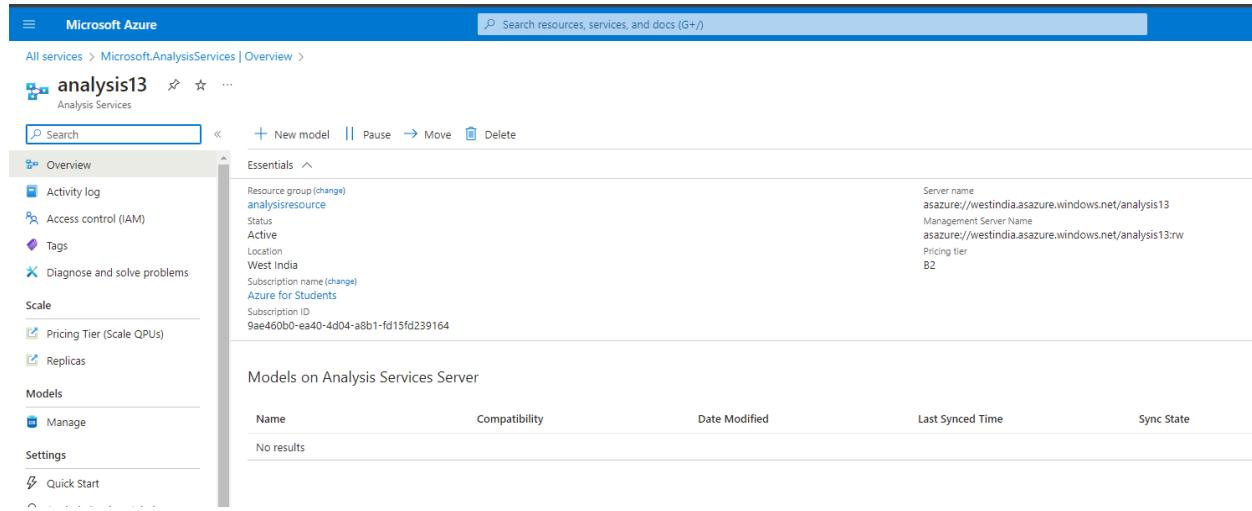
Overview Activity log Access control (IAM) Tags Diagnose and solve problems Scale Pricing Tier (Scale QPUs) Replicas Models Manage Settings Quick Start

Resource group (change)
analysisresource
Status Active
Location West India
Subscription name (change)
Azure for Students
Subscription ID 9ae460b0-ea40-4d04-a8b1-fd15fd239164

Server name
asazure://westindia.asazure.windows.net/analysis13
Management Server Name
asazure://westindia.asazure.windows.net/analysis13rw
Pricing tier
B2

Models on Analysis Services Server

Name	Compatibility	Date Modified	Last Synced Time	Sync State
No results				



8. Choose the data source as “Sample data” and then click on “Add”

All services > Microsoft.AnalysisServices | Overview > analysis13 >

New model

Where is your data? Choose a data source Sample data

Add



Navigate to the “Manage” tab and the sample data will be visible there.

The screenshot shows the Microsoft Azure Analysis Services Manage page for a service named 'analysis13'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Scale, Pricing Tier (Scale QPUs), Replicas, Models (selected), Settings, Quick Start, Analysis Services Admins, On-Premises Data Gateway, Backups, Connection Strings, Firewall, Properties, Locks, Monitoring, Alerts, Metrics, and Diagnostic settings. The main content area displays a table titled 'Models on Analysis Services Server' with columns: Name, Compatibility, Date Modified, Last Synced Time, and Sync State. One row is listed: 'adventureworks' with Compatibility 1200, Date Modified 1/11/2024, 12:35 PM, and Sync State Synced.

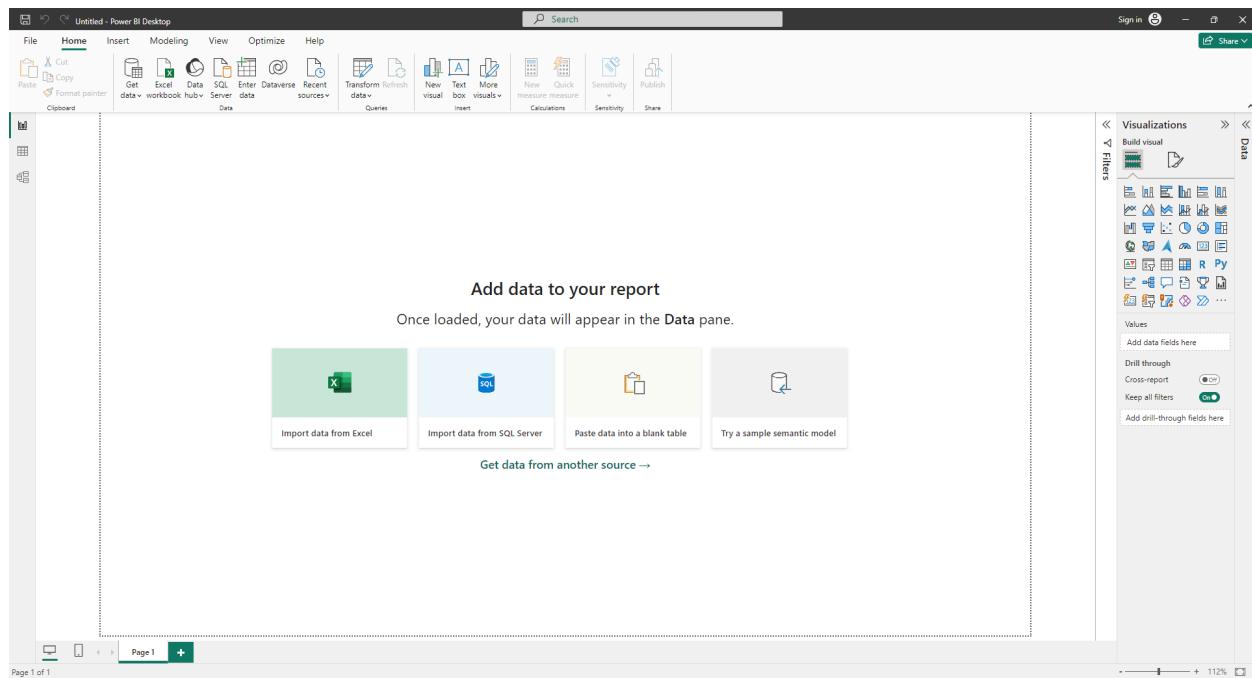
9. Right click on the sample data and select “Open in Power BI Desktop”

A context menu is open over the 'adventureworks' row in the 'Models on Analysis Services Server' table. The menu options are 'Open in Excel', 'Open in Power BI Desktop' (which is highlighted with a blue border), and 'Open in Visual Studio'.

Save the file

The screenshot shows the 'Save As' dialog box. The 'File name:' field contains 'adventureworks.pbix' and the 'Save as type:' field is set to 'PBIX File (*.pbix)'. The 'Downloads' folder is selected in the 'Save in:' dropdown. The left sidebar lists 'OneDrive', 'Desktop', 'Downloads', 'Documents', 'Pictures', 'Music', 'Videos', and 'Local Disk (D:)'. The right pane shows a list of files and folders in the 'Downloads' folder, including 'adventureworks.pbix', 'sqlcl-latest', 'edsim51di', 'DiskView', 'mysql-shell-8.1.1-windows-x86-64bit', and 'GFG-master'. At the bottom are 'Save' and 'Cancel' buttons.

10. Once Power BI is opened, click on “Import data from Excel”



11. Add an excel sheet into Power BI and click on “Load”

The screenshot shows the Power BI Data view. On the left, the Navigator pane lists "Book1.xlsx [2]" with "Table1" checked and "Sheet1" unselected. The main area displays "Sheet1" with the header "Region", "Agent", and "Revenue". The data table contains the following rows:

Region	Agent	Revenue
East	Cardan	1468
west	Hedice	345
north	Kenzi	987
south	Castin	781
East	Hook	435
west	Jude	678
north	Hockey	458
south	Rum	1111
East	Juliet	257
west	Rayun	980
north	Rahui	567
south	Aayush	200

At the bottom, there are three buttons: "Load" (green), "Transform Data" (white), and "Cancel" (white).

12. We use Power BI in order to visualize the data stored.

On the right hand side of the screen, select the visualizations you want (In this case, it is table) and select the various columns you want to visualize.

The screenshot shows the 'Visualizations' pane in Power BI. At the top, there are three icons: 'Build visual', 'Table' (which is highlighted with a red box), and a magnifying glass. Below these are several categories of visualizations represented by icons: Cards, Maps, Timeline, Bar charts, Line charts, Gantt charts, Tables, R, Py, and others. The 'Table' icon is specifically highlighted. In the 'Columns' section, three fields are selected: 'Agent', 'Region', and 'Sum of Revenue'. Under 'Drill through', the 'Cross-report' option is set to 'Off' and 'Keep all filters' is set to 'On'. A dashed box highlights the 'Add drill-through fields here' section.

Visualizations

Build visual

Table

Columns

Agent

Region

Sum of Revenue

Drill through

Cross-report Off

Keep all filters On

Add drill-through fields here

Data

Search

Table1

Agent

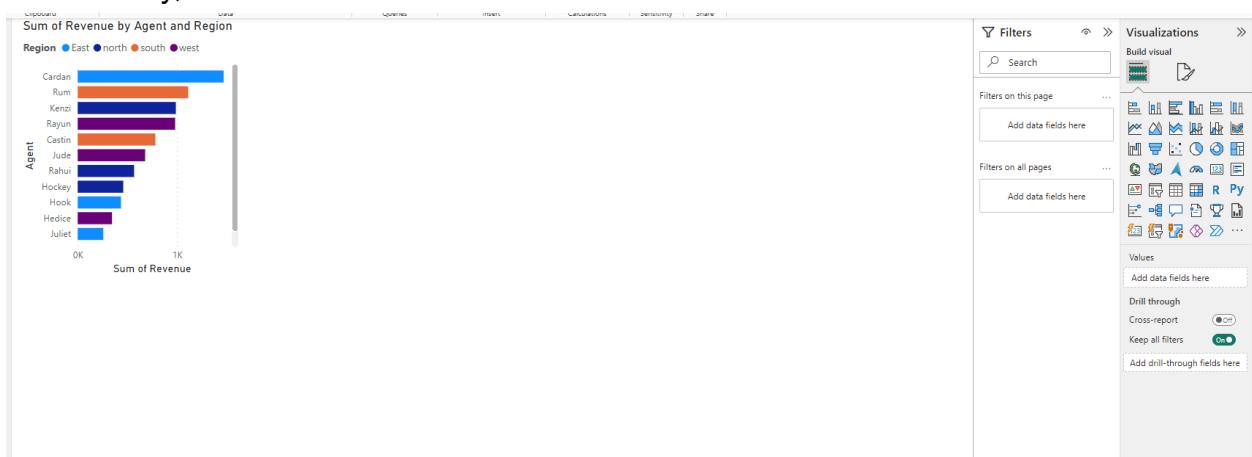
Region

Σ Revenue

The output of the visualization is as shown below

Agent	Region	Sum of Revenue
Aayush	south	200
Cardan	East	1468
Castin	south	781
Hedice	west	345
Hockey	north	458
Hook	East	435
Jude	west	678
Juliet	East	257
Kenzi	north	987
Rahui	north	567
Rayun	west	980
Rum	south	1111
Total		8267

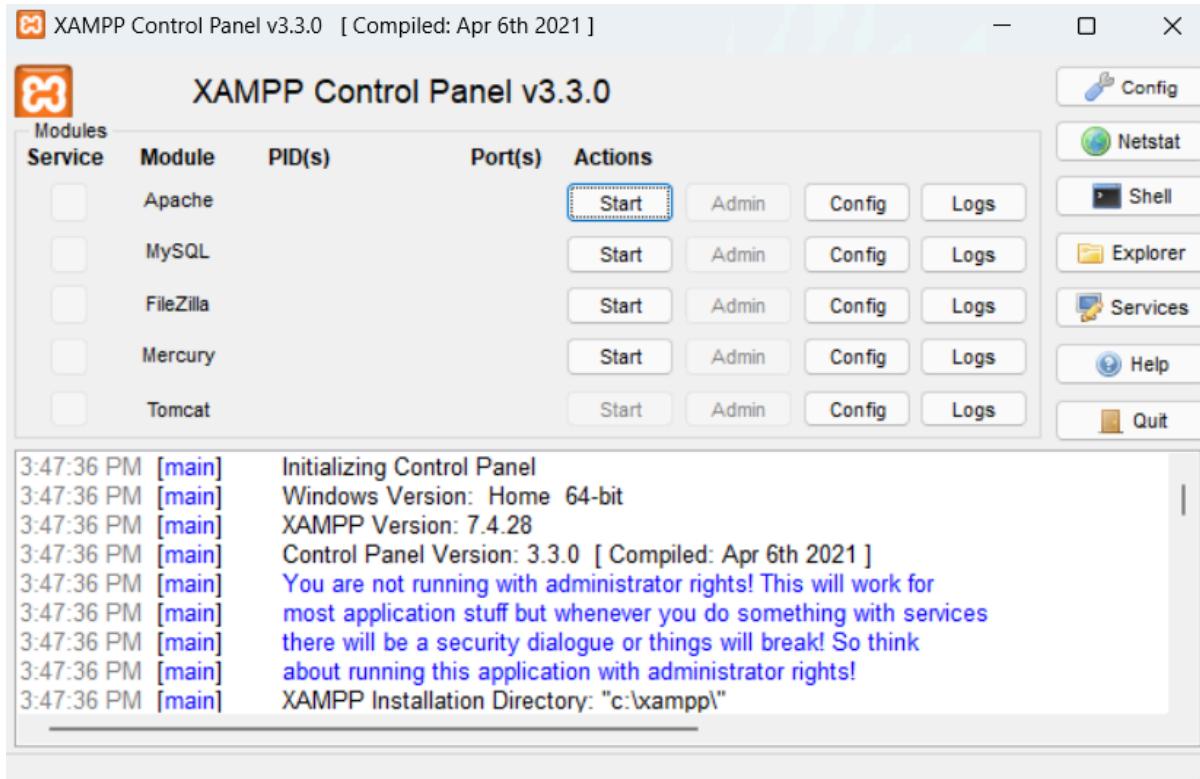
13. Similarly, we can use other visualizations in order to visualize the the data



Practical 7

Web Feeds

1. Download the XAMPP application.



2. Write the following HTML code and PHP code and save both the files in a new folder in the xampp/htdocs folder

HTML Code :

```
Unset
<html>
<head>
<script> function showRSS(str) {
if (str.length == 0) {
document.getElementById("output").innerHTML = "";
return;
}
if (window.XMLHttpRequest) {
xmlhttp = new XMLHttpRequest();
```

```

}else {
xmlhttp = new ActiveXObject("Microsoft.XMLHTTP");
}
xmlhttp.onreadystatechange = function() {
if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
document.getElementById("output").innerHTML = xmlhttp.responseText;
}

}
xmlhttp.open("GET", "ccpracphp.php?q="+str,true);
xmlhttp.send();
}
</script>
</head>
<body>
<p>Please Select an option to get RSS:</p>
<form>
<select onchange = "showRSS(this.value)">
<option value = "">Select an RSS-feed:</option>
<option value = "cnn">CNN</option>
<option value = "bbc">BBC News</option>
<option value = "pcw">PC World</option>
</select>
</form>
<br>
<div id = "output">RSS-feeds</div>
</body>
</html>

```

PHP Code :

```

<?php
$q = isset($_GET["q"]) ? $_GET["q"] : "";
$xml = "";
if ($q == "cnn") {
    $xml = "http://rss.cnn.com/rss/cnn_topstories.rss";
} elseif ($q == "bbc") {
    $xml = "http://newsrss.bbc.co.uk/rss/newsinline_world_edition/americas/rss.xml";
} elseif ($q == "pcw") {

```

```

$xml = "http://www.pcworld.com/index.rss";
}

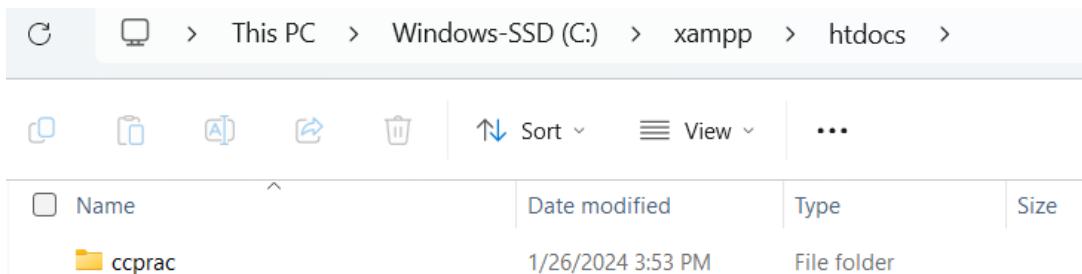
if ($xml !== "") {
    $xmlDoc = new DOMDocument();
    if ($xmlDoc->load($xml)) {
        $channel = $xmlDoc->getElementsByTagName('channel')->item(0);
        $channel_title = $channel->getElementsByTagName('title')
            ->item(0)->childNodes->item(0)->nodeValue;
        $channel_link = $channel->getElementsByTagName('link')
            ->item(0)->childNodes->item(0)->nodeValue;
        $channel_desc = $channel->getElementsByTagName('description')
            ->item(0)->childNodes->item(0)->nodeValue;

        echo("<p><a href=\"" . $channel_link . "\">" . $channel_title . "</a></p>");
        echo("<p>" . $channel_desc . "</p>");

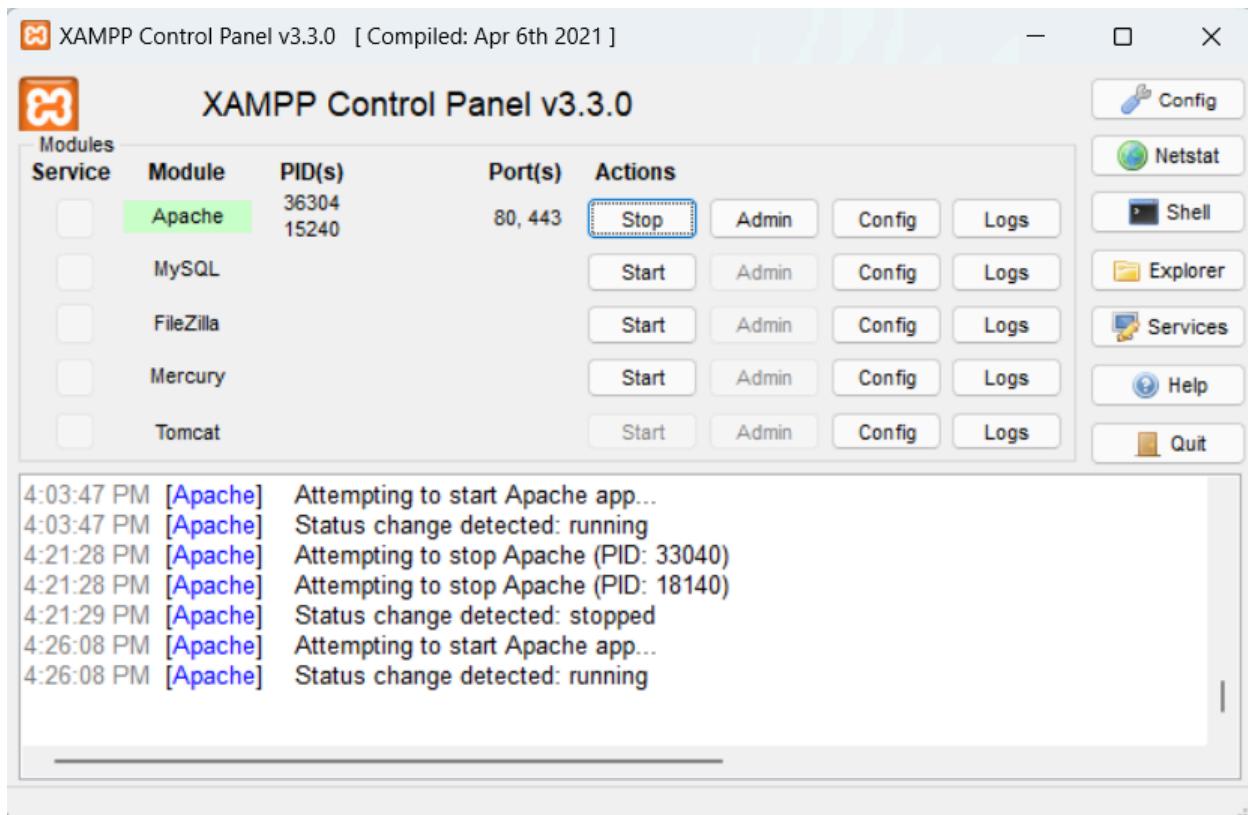
        $x = $xmlDoc->getElementsByTagName('item');
        for ($i = 0; $i <= 2; $i++) {
            $item_title = $x->item($i)->getElementsByTagName('title')
                ->item(0)->childNodes->item(0)->nodeValue;
            $item_link = $x->item($i)->getElementsByTagName('link')
                ->item(0)->childNodes->item(0)->nodeValue;

            echo ("<p><a href=\"" . $item_link . "\">" . $item_title . "</a></p>");
        }
    } else {
        echo "Failed to load XML";
    }
} else {
    echo "No RSS feed selected";
}
?>

```



3. Start the “Apache” service



4. In the browser, navigate to localhost/foldername (here it is localhost/ccprac). Then select the html file (ccprac5.html)

The browser address bar shows the URL `localhost/ccprac/`. The page content is as follows:

Index of /ccprac

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
Parent Directory		-	
ccprac5.html	2024-01-26 16:16	882	
ccpracphp.php	2024-01-26 16:16	1.8K	

Apache/2.4.52 (Win64) OpenSSL/1.1.1m PHP/7.4.28 Server at localhost Port 80

5. Select any of the options and the RSS feed will be displayed

← → ⌂ ⌄ localhost/ccprac/ccprac5.html

Please Select an option to get RSS:

CNN ▾

[CNN.com - RSS Channel - HP Hero](#)

CNN.com delivers up-to-the-minute news and information on the latest top stories, weather, entertainment, politics and more.

[Some on-air claims about Dominion Voting Systems were false. Fox News acknowledges in statement after deal is announced](#)

[Dominion still has pending lawsuits against election deniers such as Rudy Giuliani and Sidney Powell](#)

[Here are the 20 specific Fox broadcasts and tweets Dominion says were defamatory](#)

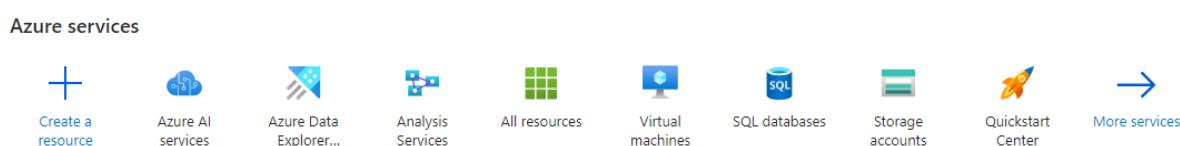
Practical 8

AI Services in Azure

Part 1 :

i. Text to Speech

1. Login to Azure and click on “More Services”



2. Under “AI + machine learning”, click on “Azure AI Services”

A screenshot of the 'AI + machine learning' section in the Azure portal. It lists 22 services under the heading 'AI + machine learning (22)'. The services include: Azure AI Studio (PREVIEW), Azure Machine Learning, Azure AI services, Azure AI services multi-service account, Anomaly detectors, Bot Services, Content moderators, Custom vision, Face APIs, Immersive readers, Metrics advisors, Azure OpenAI, Speech services, Translators, and Azure Synapse Analytics.

3. Click on “Speech Service”

A screenshot of the 'Azure AI services' page in the Azure portal. The left sidebar shows a navigation tree with 'Overview' selected under 'Azure AI services'. Other options in the tree include 'All Azure AI services', 'Azure AI services', 'Azure OpenAI', 'AI Search', 'Computer vision', 'Face API', and 'Custom vision'. The main content area displays four service cards: 'Azure OpenAI account', 'AI Search', 'Custom vision', and 'Speech service'. Each card has a 'Create' and 'View' button.

4. Create a new Resource group and fill in the rest of the details as well.
Under “Pricing tier”, click on “Free F0”

The screenshot shows the 'Create Speech Services' wizard in the Microsoft Azure portal. The top navigation bar includes 'Microsoft Azure', a search bar, and links for 'Home', 'Azure AI services', 'Create Speech Services', and more.

Basics tab selected. Project Details section shows:

- Subscription: Azure for Students
- Resource group: (New) SpeechRecognitionResource

A tooltip message appears: "Azure AI services resource creation requires subscription registration, we detected that your selected subscription did not register Cognitive services resource type before, we will help you to register Cognitive services resource type when you select a subscription in subscription dropdown. Click to learn more how to check registration state for your selected subscription."

Instance Details section shows:

- Region: Central India
- Name: speechrecognitionservice13
- Pricing tier: Free F0

At the bottom, there are 'Previous' and 'Next' buttons, and a prominent blue 'Review + create' button.

5. Check whether all the details entered are correct and click “Create”

Create Speech Services

...

[Basics](#) [Network](#) [Identity](#) [Tags](#) [Review + create](#)[View automation template](#)

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.

Basics

Subscription	Azure for Students
Resource group	SpeechRecognitionResource
Region	Central India
Name	speechrecognitionservice13
Pricing tier	Free F0

Network

Type All networks, including the internet, can access this resource.

Identity

Identity type None

[Previous](#)[Next](#)[Create](#)

6. Once the deployment is complete, click on “Go to resource”

The screenshot shows the Azure Deployment Overview page for a deployment named "Microsoft.CognitiveServicesSpeechServices-20240125111930". The deployment status is "Complete". The deployment details are as follows:

- Deployment name: Microsoft.CognitiveServicesSpeechServices-20240125111930
- Subscription: Azure for Students
- Resource group: SpeechRecognitionResource

The deployment started at 1/25/2024, 11:24:01 AM with a Correlation ID of 3bdd2d0f-5cccd-466e-8436-82602438a49c.

Below the deployment details, there are two expandable sections: "Deployment details" and "Next steps". A prominent blue button labeled "Go to resource" is located at the bottom of the main content area.

At the very bottom of the page, there are two links: "Give feedback" and "Tell us about your experience with deployment".

7. Under “Get Started”, click on “Go to Speech Studio”

The screenshot shows the Azure portal interface for a speech service named 'speechrecognitionservice13'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource Management, Monitoring, Automation, and Export template. The main content area displays resource details such as Resource group (SpeechRecognitionResource), Status (Active), Location (Central India), Subscription (Azure for Students), Subscription ID (9ae460bb-ea40-4d04-a8b1-fd15fd239164), and Tags (Add tags). The 'Get Started' section is active, featuring a 'Get started with your resource in Speech Studio' heading, a note about trying use cases, and a prominent blue 'Go to Speech Studio' button. Below this, there's a 'Keys and endpoint' section with a warning about key security and a 'Show Keys' button.

8. Speech studio is displayed below. Then click on “Captioning with speech to text”

The screenshot shows the 'Speech Studio' interface. The top navigation bar includes icons for Home, AI, Speech, Vision, and a question mark. The main content area has a 'Speech Studio' title and a 'Get started with Speech' heading. It features a 'Recent custom projects I've worked on' section with a message about starting new projects. Below this is a 'Speech capabilities by scenario' section with three cards: 'Captioning with speech to text' (showing a person at a soccer game), 'Post call transcription and analytics' (showing people in a call center), and 'Live chat avatar' (showing a person interacting with an AI). The 'Captioning with speech to text' card is highlighted. At the bottom, there's a 'Speech to text' section with a brief description and a 'Learn more about speech to text' link.

8. Under “Try it out”, click on “Try with your own video”

Captioning with speech to text

Use our sample application to learn how to use Azure Speech to automatically caption your content in real-time and offline by transcribing the audio of films, videos, live events, and more. Display the resulting text on a screen to provide an accessible experience. In this example, we leverage features like speech to text and phrase list.

Common use cases:

- Captioning for video content such as films, live television, sports matches
- Transcribing audio-only content like podcasts or phone conversations

[View documentation](#) [Get samples on GitHub](#)

[Try it out](#) [Developer resources](#) [Next steps](#)

Technologies used
(Speech SDK)

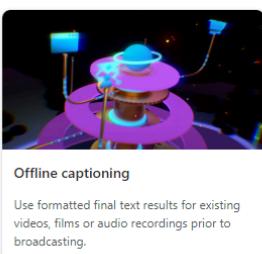
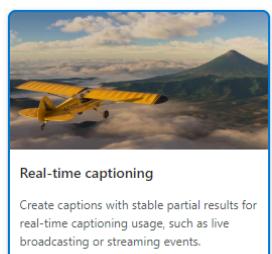
Speech to text
Phrase list

Try it out

Choose a video clip to see captioning result.

[Sample videos](#) [Try with your own video](#)

Choose a sample video clip to see real-time or offline processed captioning result.



Captioning with speech to text

Use our sample application to learn how to use Azure Speech to automatically caption your content in real-time and offline by transcribing the audio of films, videos, live events, and more. Display the resulting text on a screen to provide an accessible experience. In this example, we leverage features like speech to text and phrase list.

Common use cases:

- Captioning for video content such as films, live television, sports matches
- Transcribing audio-only content like podcasts or phone conversations

[View documentation](#) [Get samples on GitHub](#)

[Try it out](#) [Developer resources](#) [Next steps](#)

Technologies used
(Speech SDK)

Speech to text
Phrase list

Try it out

Choose a video clip to see captioning result.

[Sample videos](#) [Try with your own video](#)

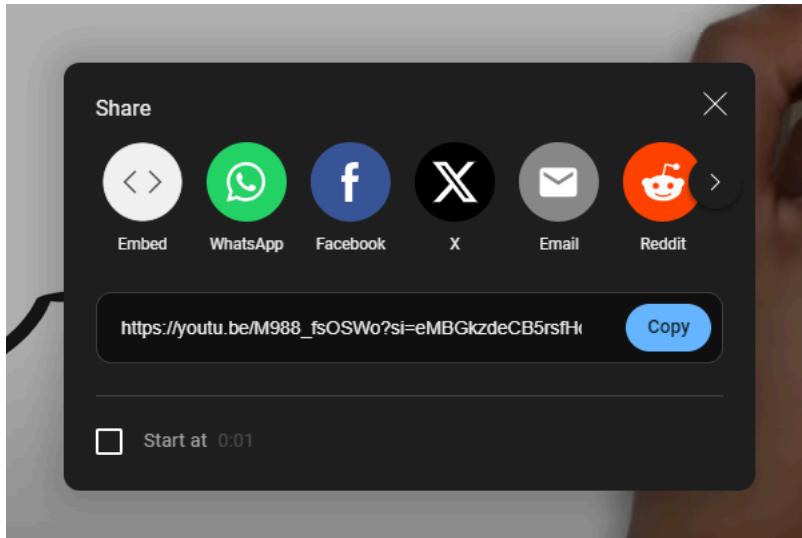
I acknowledge that this application uses the resource `speechrecognitionservice13` and will incur usage to my account. [Choose a different resource](#)

Upload your own video files

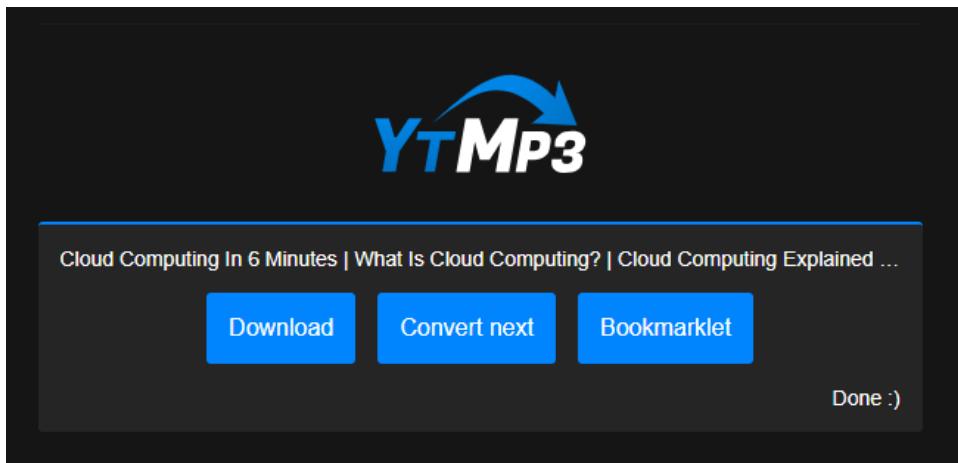
Video files I've uploaded

Drag and drop video file (MP4) or audio file (WAV or MP3) here
or
[Browse for a file](#)

9. Go to “Youtube” and copy the link of any video



Then go to “Youtube to MP3” and convert the video to MP4. Then download it.



10. Navigate back to Speech Studio -> Captioning with speech to text
Then, upload the file downloaded

11. The audio is converted from speech to text.

You can change the mode, language and the number of lines that you want to be displayed.

Captioning result

00:13 06:23 Lines 5 Length 60

Captioning settings

Caption mode Real-time Stable partial threshold 3 (Recommended)

Choose a language English (United States)

Language identification At start Continuous

Phrase list Off

Enter words or phrases to improve accuracy (separated with a comma or semicolon)

Show advanced options

Apply Reset to default

Part 2 : Text to Speech

1. Navigate back to the Speech Studio.

Under “Text to Speech”, click on “Voice Gallery”

The screenshot shows the 'Text to speech' section of the Speech Studio. It includes a brief introduction about building apps with over 400 voices across 140 languages. Below this are four cards:

- Voice Gallery**: Browse expressive voices with humanlike speech to find the perfect speaker for your project. [Try out Voice Gallery](#)
- Custom Voice**: Use your own audio recordings to create a distinct, one-of-a-kind voice for your text-to-speech apps. [Start a Custom Voice project](#)
- Personal Voice Preview**: Create an AI voice easily from a human voice sample, providing your users with a personalized voice experience across 100 languages. [Try out Personal Voice](#)
- Audio Content Creation**: Craft nuanced speech by adjusting the speaking style, pacing, and pronunciation of your spoken content. [Start an Audio Content Creation project](#)

The voice gallery is shown as below

The screenshot shows the 'Voice Gallery' page. At the top, there are links to documentation, sample code, SDK reference, and REST API. The main area is divided into 'Voice catalog' and 'Examples by use case' tabs. The catalog filters are set to English (United States), All genders, and Default speaking styles. A note says voices are in public preview in three regions. The examples show four voices: Ava (Female, English), Andrew (Male, English), Emma (Female, English), and Brian (Male, English). The right side shows a detailed view for the 'Ava' voice, including its description ('Bright, engaging voice with a beautiful tone.'), speaking styles (1 style: Default), and a sample code section with a play button and a timeline.

2. Under “Voice details”, click on “Go to Audio Content Creation”

Voice details Try it out Sample code

 **Ava**
Female
English (United States)

 Speaking styles: 1 style
Default 

 Description: Bright, engaging voice with a beautiful tone.

Showcase

Advertisement
  00:00  00:19s

Conversation
  00:00  00:00s

 [Go to Audio Content Creation](#)

3. Here, You can enter any text that will be converted into speech

Speech Studio > Audio Content Creation > My files > Untitled *

File Save Export Template Auto predict SSML 00:13 24kHz

00:00  

1. [Ava] Hello Everyone. This is a text to speech service in Azure AI Services used for cloud computing practicals.

2.

You are using a free (F0) speech resource. The upper limit of your free quota is 500K characters every month for neural voices, with each file limited to 3000 characters. Switch to a paid S0 resource to enjoy the full capability. [Check pricing](#), [View your current usage metrics](#).

Speech Studio > Audio Content Creation > My files > Untitled *

File Save Export Template Auto predict SSML 00:07 24kHz

00:01  

1. [Ava] Hello Everyone. This is a text to speech service in Azure AI Services used for cloud computing practicals.

4. Under “Tuning”, Select the three dots

The screenshot shows the 'Tuning' tab selected in the top navigation bar. Below it, there's a 'Recent' section with a pencil icon. Under 'Voice', there's a dropdown menu with 'English (United States)' selected. A list of voices is shown: Tony (selected), Ava, Andrew, Emma, and an ellipsis (...). Below this, a preview for 'Ava' is shown with a play button. The preview details are: English (United States) and Public voice.

Change the “Voice profile” to Tony and click Confirm.

The screenshot shows the 'Voice' settings dialog box. On the left, there are filters for Language (English (United States)), Gender (All), Type (Custom voice/Public voice), and Sort by (Recommendation). The main area displays a grid of voices: Sara (Female), Tony (Male), Nancy (Female), and Amber (Female). The 'Tony' profile is selected and highlighted in blue. To the right, a detailed view of the 'Tony' profile shows: Male, English (United States), Sample rate: 48kHz, Voice type: Public voice, Speaking styles: 11 styles (Default, Angry, Cheerful, Friendly, Sad, Shouting, Terrified, Whispering, Angry, Excited, Hopeful, Shouting, Unfriendly). At the bottom are 'Confirm' and 'Cancel' buttons.

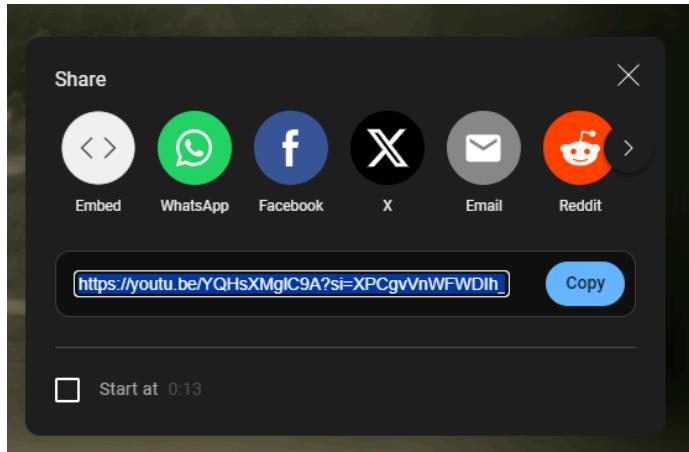
Once you click on the “Play” button, the text will be converted to speech

The screenshot shows a user interface for a text-to-speech service. At the top, there are navigation links: File, Save, Export, Template, Auto predict, and a toggle for SSML. Below the navigation is a toolbar with icons for play, stop, volume, and other controls. A progress bar indicates the audio is at 00:00 and is set to 24kHz. The main area displays a transcript of a conversation:

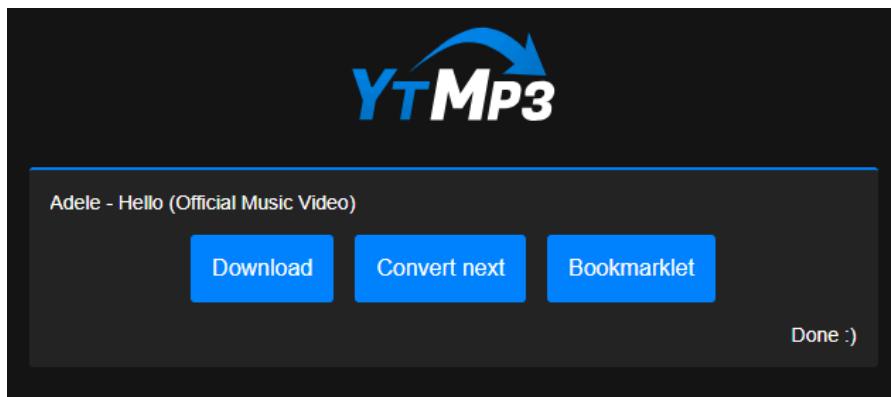
1. [Ava] Hello Everyone. This is a text to speech service in Azure AI Services used for cloud computing practicals.
2. [Tony] The text to speech can also have feelings such as angry, dejected, hopeful etc
- 3.

Part 3 : Converting an MP3 song into lyrics (text)

1. Go to “Youtube” and copy the link of any video



2. Then go to “Youtube to MP3” and convert the video to MP3. Then download it.



3. Navigate to the “Speech Studio”. Under “Speech to Text”, select “Real-time speech to text”

Speech to text

Quickly and accurately transcribe in more than 100 languages and dialects. Enhance the accuracy of your transcriptions by creating a custom speech model that can handle domain-specific terminology, background noise, and accents. [Learn more about speech to text](#)

Real-time speech to text
Quickly test live transcription capabilities on your own audio without writing any code.
[Try out Real-time speech to text](#)

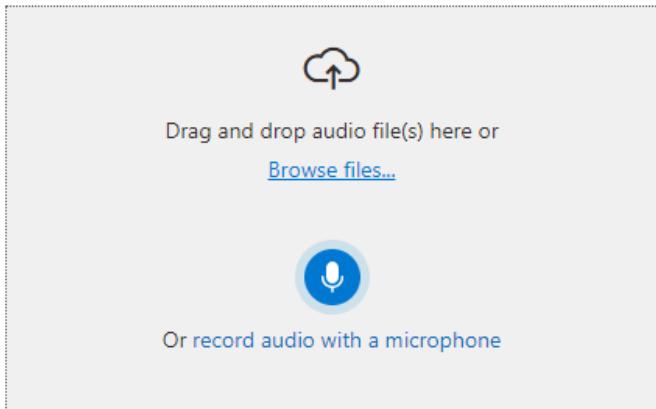
Whisper Model in Azure OpenAI Service
Quickly test live transcription capabilities on your own audio utilizing your Azure OpenAI resource and use prompts to improve the quality of the transcripts.
[Try out Whisper Model in Azure OpenAI Service](#)

Batch speech to text
Quickly test batch transcription capabilities to transcribe a large amount of audio in storage and receive results asynchronously using Azure Speech models or OpenAI Whisper model.
[Try out Batch speech to text](#)

Custom Speech
Add your own data and adapt to specific speaking styles, vocabulary, and more with a customized speech to text model.
[Start a Custom Speech project](#)

4. Upload the audio file downloaded.

Choose audio files



The audio is now converted into text

The screenshot displays the application's interface after processing an audio file. On the left, the "Choose audio files" panel is identical to the one above. On the right, the "Test results" panel shows the following details:

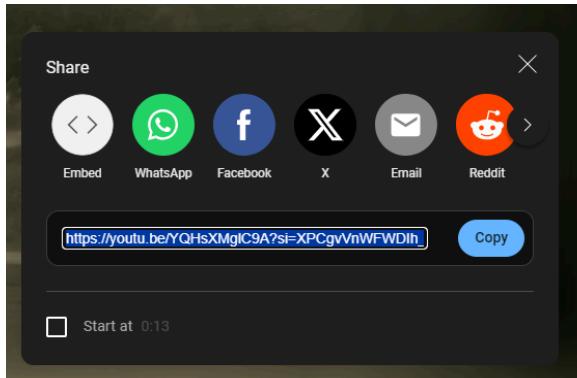
- File name: Adele - Hello (Official Music Video).mp3
- Language: English (United States)
- Output format: Detailed
- Custom endpoint: [None]
- Phrase list: Off

A progress bar indicates the file is 00:00 to 06:06s. Below the progress bar, there are tabs for "Text" and "JSON", with "Text" selected. The text output is a single line: "I just got here and I think I'm losing signal already. Hello. Can you hear me now?"

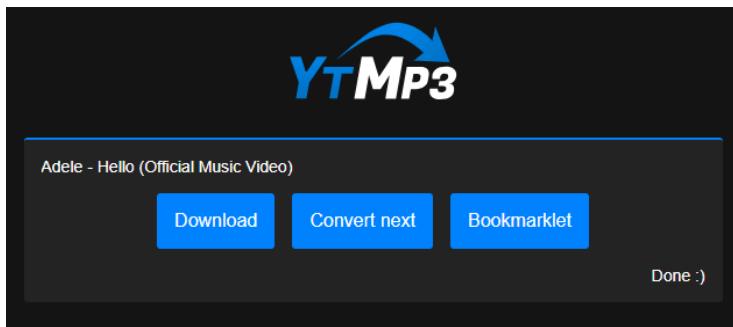
At the bottom left, a smaller panel titled "Audio files" lists the uploaded file "Adele - Hello (Official Music Video).mp3". A "Clear all" button is at the bottom of this panel.

Part 4 : Translating Youtube subtitles into another language

1. Go to “Youtube” and copy the link of any video



2. Then go to “Youtube to MP3” and convert the video to MP3. Then download it.



3. Navigate to the “Speech Studio”. Under “Speech to Text”, select “Speech Translation”

A screenshot of the Azure Speech Studio interface. It features a grid of cards for different speech processing services:

- Real-time speech to text:** Quickly test live transcription capabilities on your own audio without writing any code. (Icon: microphone and A)
- Whisper Model in Azure OpenAI Service:** Quickly test live transcription capabilities on your own audio utilizing your Azure OpenAI resource and use prompts to improve the quality of the transcripts. (Icon: microphone and A)
- Batch speech to text:** Quickly test batch transcription capabilities to transcribe a large amount of audio in storage and receive results asynchronously using Azure Speech models or OpenAI Whisper model. (Icon: microphone, A, and a stack of documents)
- Custom Speech:** Add your own data and adapt to specific speaking styles, vocabulary, and more with a customized speech to text model. (Icon: microphone, A, and a gear)
- Pronunciation Assessment with speech to text:** Get instant feedback on pronunciation accuracy and fluency by reading a script aloud. (Icon: microphone, pink speech marks, and a thumbs-up)
- Speech Translation:** Translate speech into other languages of your choice with low latency. (Icon: microphone and three speech bubbles with different symbols)

Each card has a "Try out" button below it.

4. Upload the audio file downloaded and change the target language to whichever language you want the text to be translated into.

Choose a spoken language Choose a target language

Speak out translation Voice name: स्वरा (hi-IN-SwaraNeural)

Choose audio files


Drag and drop audio file(s) here or
[Browse files...](#)


Or record audio with a microphone

Test results

File name: --
Target language: --

 00:00

The audio is translated into the language you have chosen.

Choose a spoken language Choose a target language

Speak out translation Voice name: स्वरा (hi-IN-SwaraNeural)

Choose audio files


Drag and drop audio file(s) here or
[Browse files...](#)


Or record audio with a microphone

Test results

File name: Adele - Hello (Official Music Video).mp3
Target language: Hindi

 00:01 06:06s 

Translated text **Original text** **JSON**

मैं अभी यहाँ आया हूँ और मुझे लगता है कि मैं पहले से ही सिग्रल खो रहा हूँ। नमस्कार। क्या आप मुझे अभी सुन सकते हैं? क्षमा करें। नमस्कार। यह मैं हूँ। मैं सोच रहा था कि क्या इन सभी वर्षों के बाद आप मुझे जाना चाहते हैं। सब। वे कहते हैं कि मैं आपको ठीक करने वाला हूँ। लॉरिन मैंने बहुत उपचार नहीं किया है। नमस्कार। क्या आप मुझे सुन रखते हैं? मैं कैलिफोर्निया में सपना देख रहा हूँ कि हम कोन हुआ करते थे। जब हम छोटे थे। और मुझता मैं भूल गया कि दुनिया के सामने कैसा महसूस होता है। ऐसा अंतर है। के बीच। हम और एक लाख। काफी दूर। दूसरे से नरक। पक्ष मैंने इसे बुलाया होगा।

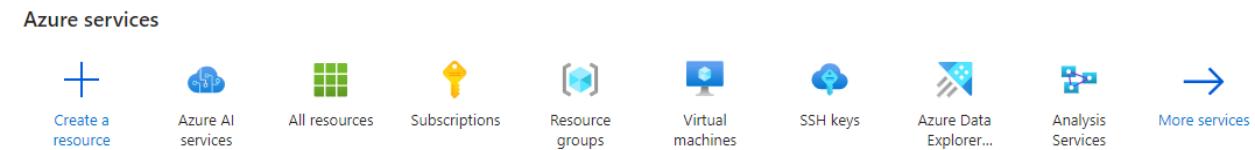
Audio files

 Adele - Hello (Official Music Video).mp3 

[Clear all](#)

Part 5 : Computer Vision

1. Log into Azure ad click on “Azure AI Services”



2. Under Azure AI Services, click on “Create Computer Vision”

The image shows the 'Azure AI services' page. On the left, there's a sidebar with links for 'Overview', 'All Azure AI services', 'Azure AI services', 'Azure OpenAI', 'AI Search', 'Computer vision', 'Face API', and 'Custom vision'. The main area has a heading 'Build smarter apps and services' with three cards: 'Azure OpenAI account', 'AI Search', and 'Computer vision'. Each card has a '+ Create' button and a 'View' link. The 'Computer vision' card is highlighted.

3. Add a new resource group and enter the details of the resource. Choose the pricing tier as “Free F0(20 Calls per minute, 5K Calls per month)

The image shows the 'Create Computer Vision' wizard. It has several tabs at the top: 'Basics' (which is selected), 'Network', 'Identity', 'Tags', and 'Review + create'.

Project Details:
Subscription: Azure for Students
Resource group: analysisresource (with a 'Create new' link)

Instance Details:
Region: East US
Name: ComputerVisionPract
Pricing tier: Free F0 (20 Calls per minute, 5K Calls per month)

Responsible AI Notice:
A detailed notice about Microsoft's Responsible AI practices and data handling.

Online Services DPA:
A link to the Responsible Use of AI documentation for Online Services.

At the bottom, there are 'Previous' and 'Next' buttons, and a prominent blue 'Review + create' button.

Review the information entered and then click on “Create”

Home > Azure AI services >

Create Computer Vision ...

Basics Network Identity Tags Review + create

⌚ View automation template

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.

Basics

Subscription	Azure for Students
Resource group	analysisresource
Region	East US
Name	ComputerVisionPract
Pricing tier	Free F0 (20 Calls per minute, 5K Calls per month)

Network

Type All networks, including the internet, can access this resource.

Identity

Identity type None

[Previous](#) [Next](#) [Create](#)

4. Once the deployment is complete, click on “Go to Resource”

Home >



Microsoft.CognitiveServicesComputerVision-20240208122401 | Overview ⚡ ...

[Delete](#) [Cancel](#) [Redeploy](#) [Download](#) [Refresh](#)

Overview

[Inputs](#)

[Outputs](#)

[Template](#)

✓ Your deployment is complete

Deployment name : Microsoft.CognitiveServicesComputerVision-20240208122401
Subscription : Azure for Students
Resource group : analysisresource

Start time : 2/8/2024, 12:24:46 PM
Correlation ID : 5626d365-3a41-4d8f-b3a0-237a5de4c57d

> Deployment details

▽ Next steps

[Go to resource](#)

Give feedback

⌚ Tell us about your experience with deployment

5. Under “Get Started”, click on “Go to Vision Studio”

Home > Microsoft.CognitiveServicesComputerVision-20240208122401 | Overview >

 ComputerVisionPract Computer vision

Search Delete

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource Management

Keys and Endpoint

Encryption

Pricing tier

Networking

Identity

Cost analysis

Resource group (move) : [analysisresource](#)

Status : Active

Location : East US

Subscription (move) : [Azure for Students](#)

Subscription ID : 9ae460b0-ea40-4d04-a8b1-fd15fd239164

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

Get Started

Get started with your resource in Vision Studio

Try out all Computer Vision features and build your own custom models



6. The Vision Studio opens up on a new page. Here, click on “Add captions to images”

A

Get started with Azure AI Vision

Give your apps the ability to read text, analyze images, and detect faces with technology like optical character recognition (OCR) and machine learning.

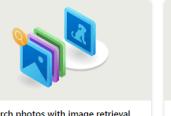


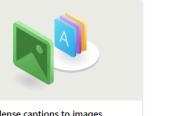
Featured Optical character recognition Spatial analysis Face Image analysis


Video Retrieval and Summary
Preview
Get a brief summary of the main points shown in video. Locate specific keywords and jump to the relevant section.
[Try it out](#)


Recognize products on shelves
Preview
Identify products on shelves, gaps in product availability, and compliance for planograms.
[Try it out](#)


Customize models with images
Preview
Create custom image classification and object detection models with images using Vision Studio and Azure ML.
[Start a project](#)


Search photos with image retrieval
Preview
Search specific moments within your photo album. For example, you can search for a wedding you attended last summer, your pet, or your favorite city.
[Try it out](#)


Add dense captions to images
Preview
Generate human-readable captions for all important objects detected in your image.
[Try it out](#)

7. Here, select the image that you want to add captions to or upload your own image

Add captions to images

Generate a human-readable sentence that describes the content of an image.



To try out this feature, choose from a sample below, or upload your own image. To try out the model without limitations, sign in with Azure.


Drag and drop a file here
or
Browse my file
or
Take a photo



Sample image 1



Detected attributes

A group of cows grazing in a field

8. Go back to the Vision Studio and now select “Extract common tags from images”. Here, you can drop your own file or use the pre-defined files and see the attributes that have been detected.

Azure AI | Vision Studio

Vision Studio > Extract common tags from images

Sample image 1

Drag and drop a file here
or
Browse for a file
or
Take a photo

Detected attributes JSON

clothing (95.31%)
train station (95.22%)
metro station (95.07%)
train (94.18%)
transport (92.86%)
metro (92.66%)
person (92.33%)
platform (91.76%)
footwear (91.28%)
public transport (90.98%)
transport hub (88.05%)
railway (87.70%)
passenger (86.15%)
people (76.47%)
subway (72.38%)
track (71.05%)
indoor (65.18%)
waiting (58.40%)

9. Go back to the Vision Studio and now select “Video Retrieval and Summary”. Click on “Industrial”.

Azure AI | Vision Studio

Vision Studio > Video summary and frame locator

Video Retrieval and Summary PREVIEW

Video search and summarization uses a combination of natural language processing and computer vision techniques to analyze the content of a video. It can quickly and concisely summarize the main points of a video, and it also allows you to search for specific moments within the video, making it easy to find relevant content.

Platforms
Cloud

View documentation Use the REST API

Try it out

Choose a video clip to see the video retrieval and summary capabilities.
Note: videos that have been uploaded to Vision Studio will be stored in your account for 48 hours for this try out experience, after which they will be deleted automatically.

Drag and drop one or more files
or
Browse for files
or
Browse container for your videos

Sign in to upload your own video

Media
Highlighted from Microsoft Build 2023.

Video set

Industrial
Get a close-up view of daily industrial work.

Retail
A grocery store where people go to buy food and day-to-day items.

The video is then analyzed and summarized.

< Factory

Locate a frame in the video
Find a specific moment in the video based on a natural language search:

Person with a hardhat

Run summary again
Modify settings and run summary type and search terms and rerun:

Results

"Person with a hardhat" appeared at:

- ▼ 04:57 (Datacenter)
- ▼ 05:10 (Datacenter)
- ▼ 00:33 (Factory)
- ▼ 04:36 (Datacenter)
- ▼ 00:26 (Warehouse)

Show more

(Factory) Summary for "Generic":
The recently released video showcases the daily operations of a factory or machine shop, focusing on worker safety and efficient use of equipment. Here

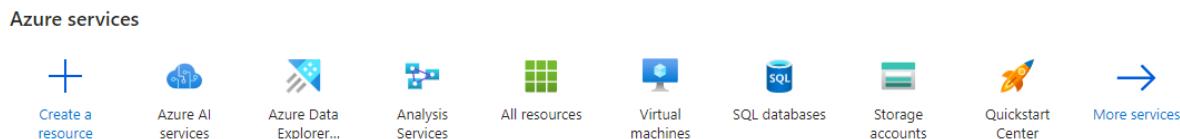


0:33 3:28

Practical 9

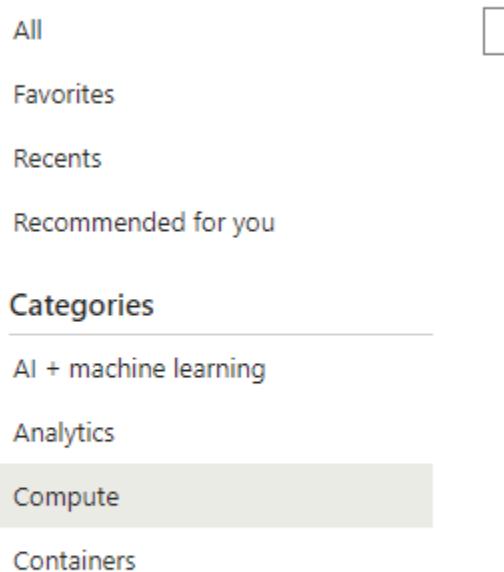
SSH Key Generation

1. Login to Azure and click on “More Services”

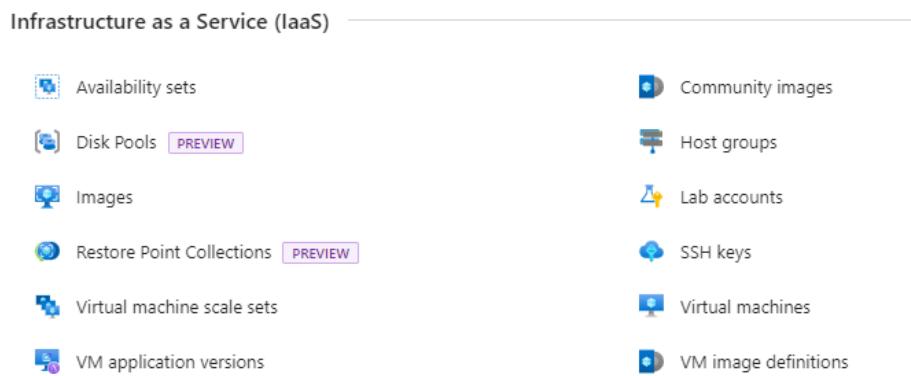


2. Click on “Compute”

All services | Compute



3. Under “Infrastructure as a Service”, click on “SSH Keys”



4. Click on “Create SSH key”

The screenshot shows the 'SSH keys' blade in the Azure portal. At the top, there are filter options: 'Subscription equals all', 'Resource group equals all', 'Location equals all', and 'Add filter'. Below the filters, it says 'Showing 0 to 0 of 0 records.' On the left, there are sorting columns: 'Name ↑', 'Type ↑↓', 'Resource group ↑↓', 'Location ↑↓', and 'Subscription ↑↓'. On the right, there are grouping and view mode buttons: 'No grouping' and 'List view'. In the center, there's a large cloud icon with a key symbol. Below it, the text 'No SSH keys to display' is displayed, followed by a detailed explanation: 'SSH is an encrypted connection protocol that allows secure sign-ins over unsecured connections. SSH keys allow secure connection to virtual machines, without having to use passwords.' A prominent blue 'Create SSH key' button is centered below the explanation, and a 'Learn more' link is at the bottom.

5. Create a new resource group and enter the rest of the details such as key pair name. Select “Generate new key pair” then “Review + create”

The screenshot shows the 'Create an SSH key' blade. At the top, there are three tabs: 'Basics' (which is selected), 'Tags', and 'Review + create'. Below the tabs, a note says 'Creating an SSH key resource allows you to manage and use public keys stored in Azure with Linux virtual machines.' with a 'Learn more' link. The 'Project details' section shows 'Subscription' set to 'Azure for Students' and 'Resource group' set to '(New) SSHkeys'. The 'Instance details' section shows 'Region' set to '(Asia Pacific) West India', 'Key pair name' set to 'sshkey13' (highlighted with a purple border), and 'SSH public key source' set to 'Generate new key pair'. At the bottom, there are navigation buttons: 'Review + create' (in a blue box), '< Previous', and 'Next : Tags >'.

6. Verify if all the details entered is correct and then click on “Create”

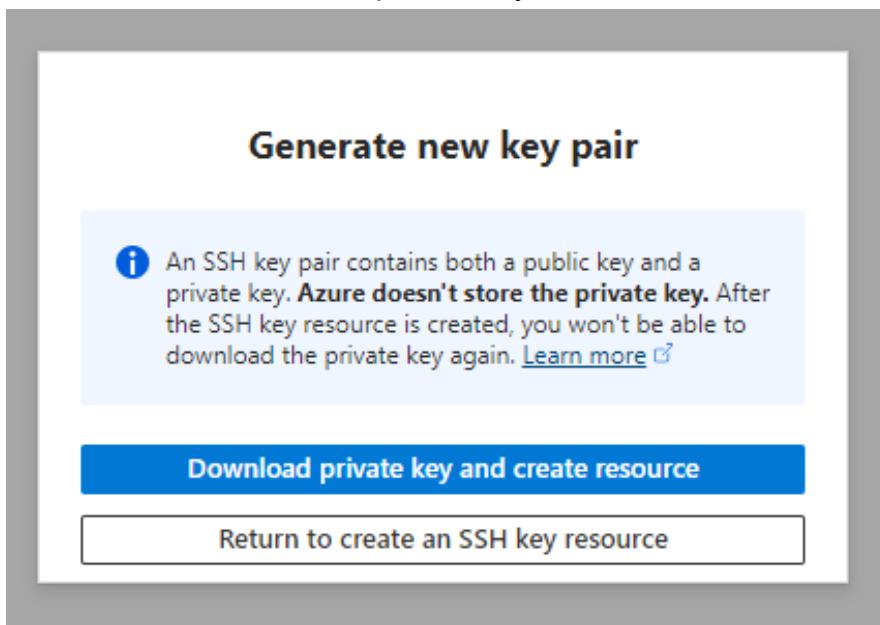
Create an SSH key

The screenshot shows the 'Review + create' step of the Azure portal for creating an SSH key. At the top, a green bar indicates 'Validation passed'. Below it, tabs for 'Basics', 'Tags', and 'Review + create' are visible, with 'Review + create' being the active tab. The 'Basics' section displays the following configuration:

Setting	Value
Subscription	Azure for Students
Resource group	(new) SSHkeys
Region	West India
Key pair name	sshkey13

At the bottom, there are buttons for 'Create' (in blue), '< Previous' and 'Next >' (disabled), and 'Download a template for automation'.

7. Click on “Download the private key and create the resource.” and save the PEM file.



The SSH public key has been generated

Microsoft Azure

All services > **sshkey13** SSH key

Search

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Settings Properties Locks Tasks (preview) Export template Help Support + Troubleshooting

Delete Refresh JSON View

Essentials

Resource group (move) : SSHkeys

Location : West India

Subscription (move) : Azure for Students

Subscription ID : 9aa460b0-ea40-4bd4-a8b1-fd15fd239164

Tags (edit) : Add tags

Name : sshkey13

Public key : ssh-rsa AAAA83NzaC1y2EAA4ADAQABAA8gQDzE8B9MKix3tunv7p7CvCMSCqbuWjncrvLn5Txi0ieeR0dTQw+6fX8Impg67Fq024Lu5n2Ei024fP0mgfQdAhj0DCDT+S/gtarQjMq68TikSfqrYqaIuYp95nDIBCc080j67jwDZ5rV/NR9ia5wb5j1Q2kEE2vaBRy/H3ueb3cbljHmbblVm0cbw0GPjPrV+RC82k8Af6/yd0tby1B20k4LERg3nOvhxSt68JhLarDjT9V1GJMrOoczyfReNjWzxf0QQA+2zdwr/G9jD8htVXccXjXj2G40eUoyvuCeYku8Cscce09eNPcPGC9gdj+W3++5v9kCEBVVT0Hj98CYbvj/d39inurSsxMv8sj/0MXZ0WFs2+KhoR7cycqOVELkvBa65x9Sp9MIOflw08Hf3ds2eUd2SWPym9lguZGB8mcmmtE8L679y3qkDk4EiPSAHgOxnzwXqjXOW175nqU= generated-by-az

Public key

Getting started with SSH keys

Create a Linux virtual machine

How to connect

SSH troubleshooting

Practical 10

Virtualization

1. Login to Azure and click on “Virtual Machine”



2. Create a virtual machine, namely VirtualMachine1

The screenshot shows the "Create a virtual machine" wizard in the Azure portal. The "Basics" tab is selected. In the "Project details" section, the subscription is set to "Azure for Students" and the resource group is "(New) VM". In the "Instance details" section, the virtual machine name is "VirtualMachine1", the region is "(US) East US", the availability options are "Availability zone", and the availability zone is "Zones 1". A note says "You can now select multiple zones. Selecting multiple zones will create one VM per zone." In the "Security type" section, the option is "Trusted launch virtual machines". At the bottom, there are buttons for "Review + create", "< Previous", and "Next : Disks >".

Microsoft Azure

All services > Virtual machines >

Create a virtual machine

Basics Disks Networking Management Monitoring Advanced Tags Review + create

⚠️ Changing Basic options may reset selections you have made. Review all options prior to creating the virtual machine.

This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ Azure for Students

Resource group * ⓘ (New) VM

Create new

Instance details

Virtual machine name * ⓘ VirtualMachine1

Region * ⓘ (US) East US

Availability options ⓘ Availability zone

Availability zone * ⓘ Zones 1

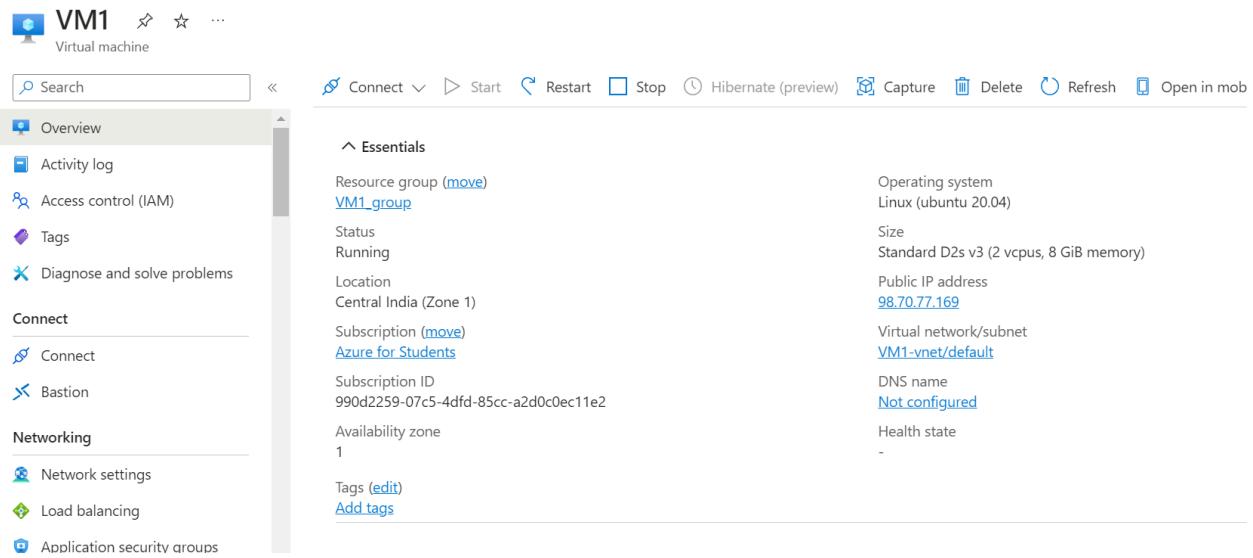
You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more ↗](#)

Security type ⓘ Trusted launch virtual machines

Configure security features

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

Choose “Windows” from the list and then enter the details for the username and password (Remember the password used). Then select the checkbox and click “Review and Create”



The screenshot shows the Azure portal interface for a virtual machine named "VM1". The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Connect (with options for Connect and Bastion), Networking (with Network settings, Load balancing, and Application security groups), and a search bar. The main content area is titled "Essentials" and displays the following configuration details:

Setting	Value
Resource group (move)	VM1_group
Status	Running
Location	Central India (Zone 1)
Subscription (move)	Azure for Students
Subscription ID	990d2259-07c5-4dfd-85cc-a2d0c0ec11e2
Availability zone	1
Tags (edit)	Add tags
Operating system	Linux (ubuntu 20.04)
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Public IP address	98.70.77.169
Virtual network/subnet	VM1-vnet/default
DNS name	Not configured
Health state	-

Then click on “Create” and the virtual machine is deployed.

Basics Disks Networking Management Monitoring Advanced Tags **Review + create**

i Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.

Price

1 X Standard B1s
by Microsoft
[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ

0.8836 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.

⚠ You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.

Basics

Subscription	Azure for Students
Resource group	(new) VM
Virtual machine name	VirtualMachine1
Region	East US

Create

< Previous

Next >

[Download a template for automation](#)

3. Once the deployment is complete, click on “Go to Resource”



Deployment succeeded



Deployment 'CreateVm-MicrosoftWindowsDesktop.Windows-10-win10-20240208114041' to resource group 'VM' was successful.

Go to resource

Pin to dashboard

a minute ago

4. Click on “Connect” in VirtualMachine1

Home >

VirtualMachine1

Virtual machine

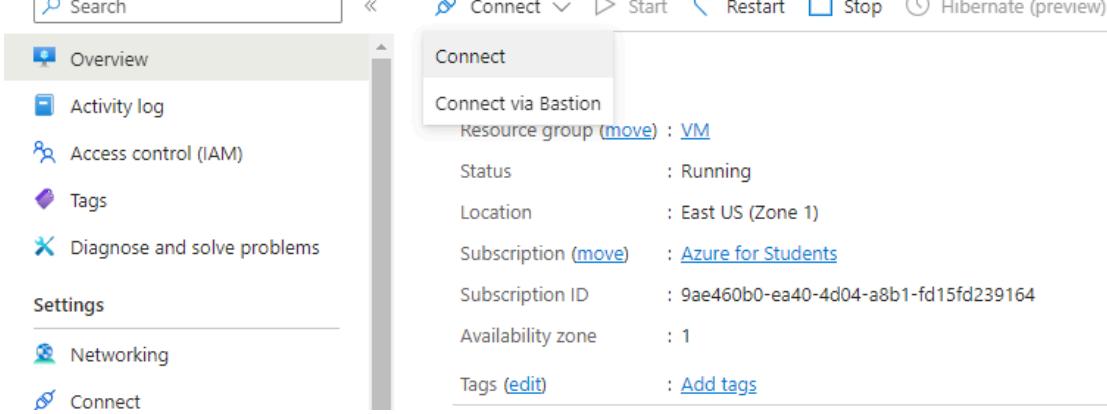
Search Connect Start Restart Stop Hibernate (preview)

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Networking Connect

Connect via Bastion

Resource group (move) : VM

Status	: Running
Location	: East US (Zone 1)
Subscription (move)	: Azure for Students
Subscription ID	: 9ae460b0-ea40-4d04-a8b1-fd15fd239164
Availability zone	: 1
Tags (edit)	: Add tags



5. In “Native RDP”, click on “Select”

Home > VirtualMachine1

VirtualMachine1 | Connect

Virtual machine

Search Refresh Troubleshoot More Options Feedback

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Networking Connect Disks Size Microsoft Defender for Cloud Advisor recommendations Extensions + applications Availability + scaling Configuration Identity Properties

Connecting using Public IP address | 20.84.116.221

Admin username	: Carol
Port (change)	: 3389 Check access ⓘ
Just-in-time policy	: Unsupported by plan ⓘ

Most common

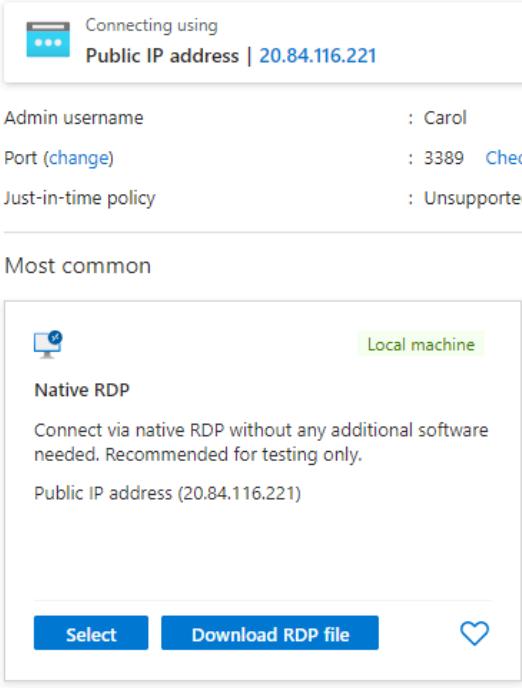
Native RDP Local machine

Connect via native RDP without any additional software needed. Recommended for testing only.

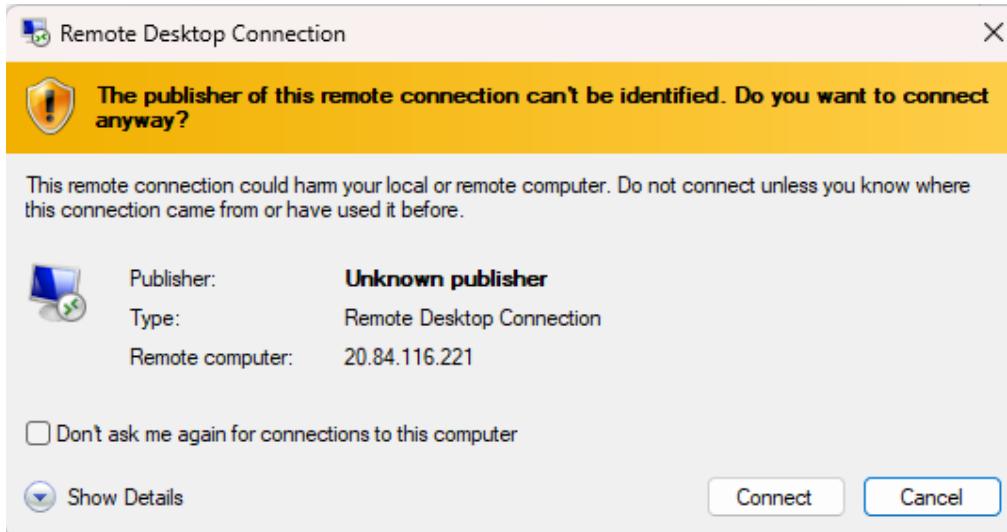
Public IP address (20.84.116.221)

Select Download RDP file

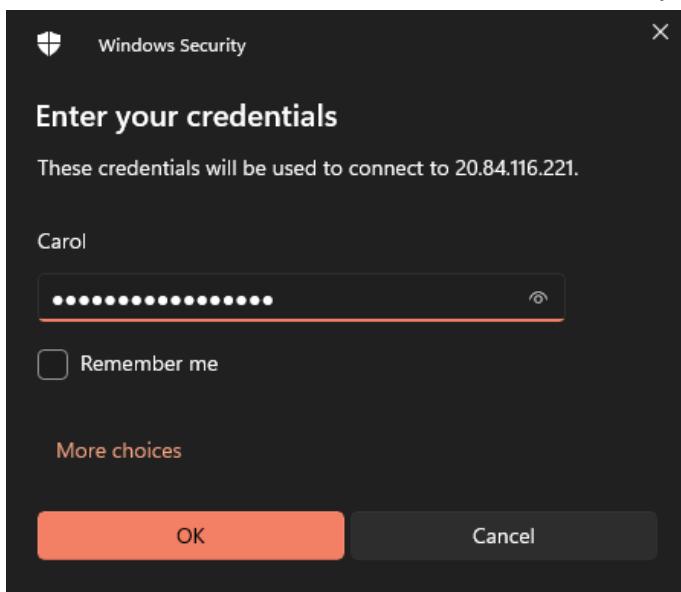
More ways to connect (3)



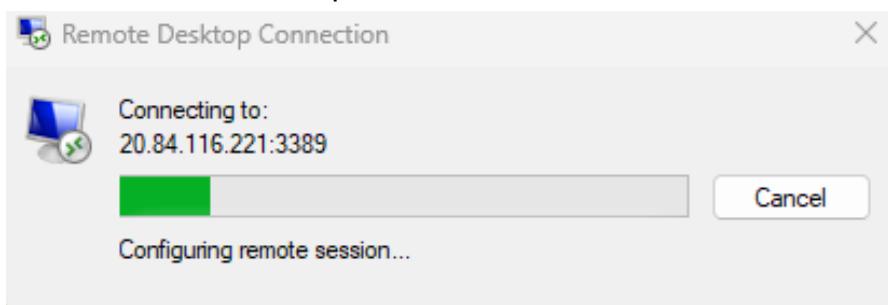
6. A pop up window will appear and click on “Connect”



7. Enter the credentials i.e. the username and password and then click “OK”



8. Then click on Yes to proceed for the connection.



9. Follow the same steps and create a second virtual machine.

Here, while creating the second virtual machine, go to the Networking tab and then make sure that the virtual network of the VM2 is the same as that of VM1.

Home > Virtual machines >

Create a virtual machine

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

i This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * i

Azure for Students

Resource group * i

VM

[Create new](#)

Instance details

Virtual machine name * i

VirtualMachine2

Region * i

(US) East US

Availability options i

Availability zone

Availability zone * i

Zones 1

i You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more](#)

Security type i

Trusted launch virtual machines

[Configure security features](#)

Image * i

Windows 10 Pro, version 22H2 - x64 Gen2

[See all images](#) | [Configure VM generation](#)

[Review + create](#)

[< Previous](#)

[Next : Disks >](#)

Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.

[Learn more](#)

Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network *	<input type="text" value="VirtualMachine1-vnet"/> <input type="button" value="Create new"/>
Subnet *	<input type="text" value="default (10.0.0.0/24)"/> <input type="button" value="Manage subnet configuration"/>
Public IP *	<input type="text" value="(new) VirtualMachine2-ip"/> <input type="button" value="Create new"/>
NIC network security group	<input type="radio"/> None <input checked="" type="radio"/> Basic <input type="radio"/> Advanced
Public inbound ports *	<input type="radio"/> None <input checked="" type="radio"/> Allow selected ports
Select inbound ports *	<input type="text" value="RDP (3389)"/>

⚠️ This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Delete public IP and NIC when VM is deleted

[Review + create](#)

[< Previous](#)

[Next : Management >](#)

Microsoft Azure

Home > Virtual machines >

Create a virtual machine ...

Validation passed

Resource group	VM
Virtual machine name	VirtualMachine2
Region	East US
Availability options	Availability zone
Availability zone	1
Security type	Trusted launch virtual machines
Enable secure boot	Yes
Enable VTPM	Yes
Integrity monitoring	No
Image	Windows 10 Pro, version 22H2 - Gen2
VM architecture	x64
Size	Standard B1s (1 vcpu, 1 GiB memory)
Username	Carol
Public inbound ports	RDP
Already have a Windows license?	Yes
License type	Windows Client
Azure Spot	No

Disks

OS disk size	Image default
OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	VirtualMachine1-vnet
-----------------	----------------------

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

Home >

CreateVm-MicrosoftWindowsDesktop.Windows-10-win10-20240208115023 | Overview

Deployment

Search | Delete | Cancel | Redeploy | Download | Refresh

Overview

Your deployment is complete

Deployment name: CreateVm-MicrosoftWindowsDesktop.Windows... Start time: 2/8/2024, 11:55:04 AM

Subscription: Azure for Students Correlation ID: 6dab6854-9632-4a07-881e-64b850118458

Resource group: VM

Inputs Outputs Template

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

Microsoft Azure

Home > CreateVm-MicrosoftWindowsDesktop.Windows-10-win10-202

VirtualMachine2

Virtual machine

Search | Connect | Start

Overview Activity log Access control (IAM) Tags

VirtualMachine2 | Connect Virtual machine

Search | Refresh | Troubleshoot | More Options | Feedback

Connecting using Public IP address | 20.84.54.159

Admin username : Carol
Port (change) : 3389 Check access ⓘ
Just-in-time policy : Unsupported by plan ⓘ

Most common

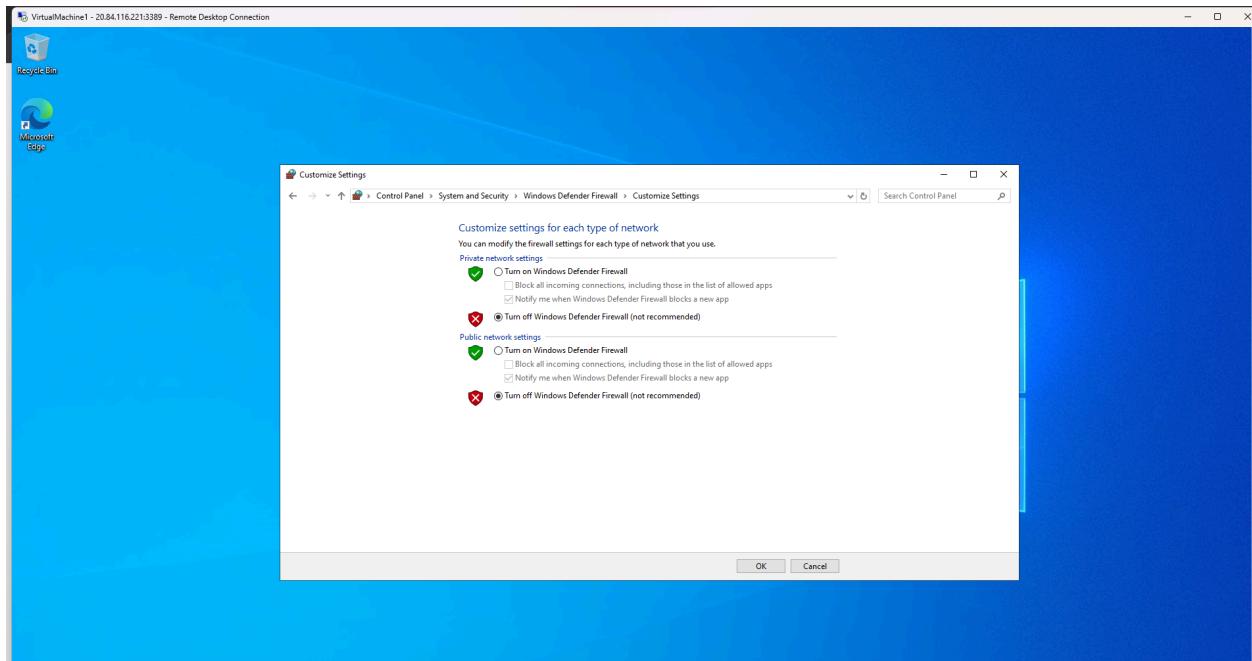
Native RDP Local machine

Connect via native RDP without any additional software needed. Recommended for testing only.

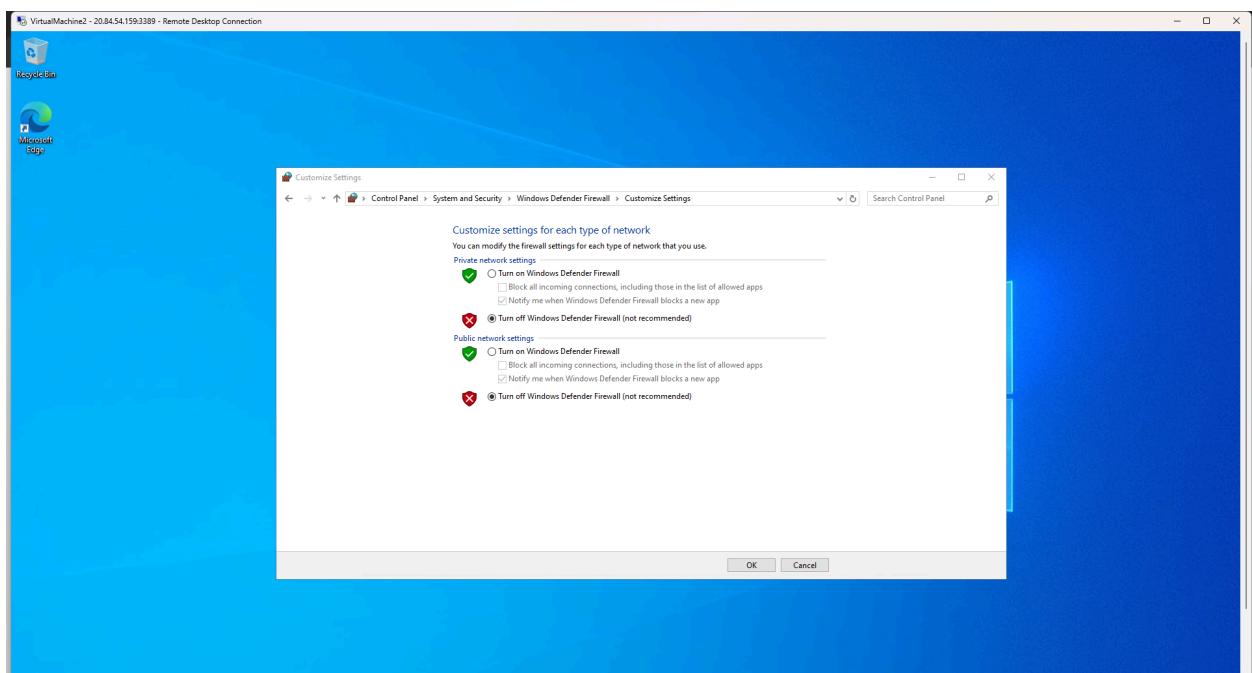
Public IP address (20.84.54.159)

Select Download RDP file

10. Now, VirtualMachine1 will be open. Go to the Firewall Customize Settings and turn it off.



Do the same for VirtualMachine2 as well



11. In VirtualMachine2, go to the command prompt and type “ipconfig” in order get the IPv4 address

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.3930]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Carol>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix . : oha2qaohdp4e1jm2eoemqjkf2g.bx.internal.cloudapp.net
    Link-local IPv6 Address . . . . . : fe80::ac62:af30:c91c:90c1%6
    IPv4 Address . . . . . : 10.0.0.5
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.0.0.1

C:\Users\Carol>
```

12. Go to VirtualMachine1 and ping the VirtualMachine2 using the ping command and the ip address of VirtualMachine2

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.3930]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Carol>ping 10.0.0.5

Pinging 10.0.0.5 with 32 bytes of data:
Reply from 10.0.0.5: bytes=32 time=3ms TTL=128
Reply from 10.0.0.5: bytes=32 time=1ms TTL=128
Reply from 10.0.0.5: bytes=32 time=1ms TTL=128
Reply from 10.0.0.5: bytes=32 time=1ms TTL=128

Ping statistics for 10.0.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 1ms

C:\Users\Carol>
```

Practical 11

Web Hosting

In Visual Studio :

1. Create a new HTML page with the following code :

```
<html>
<head>
<title> table </title></head>
<body>
<form>
<h1>HTML form</h1>
<table>
<tr>
<td>First name :</td>
<td><input type="text"></td>
</tr>
<tr>
<td>last name :</td>
<td><input type="text"></td>
</tr>
<tr>
<td>Date of birth :</td>
<td><input type="date"></td>
</tr>
<tr>
<td>Email id :</td>
<td><input type="email"></td>
</tr>
<tr>
<td>Mobile number :</td>
<td><input type="integer"></td>
</tr>
<tr>
<th><input type="submit" value=Submit>&nbsp &nbsp<input type="reset" value=Reset></th>
</tr>
</table>
</form>
</body>
```

```
↳ HTML_Login.html ×
↳ HTML_Login.html > ⚒ html > ⚒ body
1   <html>
2   <head>
3   <title> table </title></head>
4   <body>
5   <form>
6   <h1>HTML form</h1>
7   <table>
8   <tr>
9   <td>First name :</td>
10  <td><input type="text"></td>
11  </tr>
12  <tr>
13  <td>last name :</td>
14  <td><input type="text"></td>
15  </tr>
16  <tr>
17  <td>Date of birth :</td>
18  <td><input type="date"></td>
19  </tr>
20  <tr>
21  <td>Email id :</td>
22  <td><input type="email"></td>
```

The screenshot shows a web browser window with the following details:

- Title Bar:** The title bar displays the word "table" and a file path: "file:///C:/Users/Admin/Desktop/HTML_Login.html".
- Content Area:** The main content area shows an

HTML form

. Below it is a table with five rows, each containing a label and an input field.
 - First name :** An input field.
 - last name :** An input field.
 - Date of birth :** An input field with a date placeholder "dd / mm / yyyy" and a calendar icon.
 - Email id :** An input field.
 - Mobile number :** An input field.
- Buttons:** At the bottom left of the form area, there are two buttons: "Submit" and "Reset".

1. Login to Azure and then click on “More Services”



2. Search for Storage Account and click on it

A screenshot of the Microsoft Azure All services search results. The search bar at the top contains the word "storage". Below the search bar, there is a list of services: Storage accounts (marked with a star), Storage Sync Services, Azure Managed Lustre (Resource type: Microsoft.StorageCache/amlFilesystems), and Free services (Keywords: free storage). On the left, there are sections for Favorites, Recents, and Recommended for you, as well as a Categories section with AI + machine learning.

3. Click on “Create Storage Account”

A screenshot of the Azure Storage accounts blade. The title is "Storage accounts". It shows a message: "No storage accounts to display". Below this, there is a brief description: "Create a storage account to store up to 500TB of data in the cloud. Use a general-purpose storage account to store object data, use a NoSQL data store, define and use queues for message processing, and set up file shares in the cloud. Use the Blob storage account and the hot or cool access tiers to optimize your costs based on how frequently your object data is accessed." At the bottom, there is a "Create storage account" button and a "Learn more" link.

4. Enter the details of the storage account like the name, region. Then click on “Review”

Create a storage account ...

Basics Advanced Networking Data protection Encryption Tags Review

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

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 *

Resource group * [Create new](#)

Instance details

Storage account name ⓘ *

Region ⓘ * [Deploy to an edge zone](#)

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

Redundancy ⓘ * Read and write to data available in the event of regional unavailability

[Review](#)

[< Previous](#)

[Next : Advanced >](#)

5. Then click on “Create” after verifying the details

Create a storage account ...

Basics Advanced Networking Data protection Encryption Tags [Review](#)

Basics

Subscription	Azure for Students
Resource Group	analysisresource
Location	eastus
Storage account name	htmlpage123
Deployment model	Resource manager
Performance	Standard
Replication	Read-access geo-redundant storage (RA-GRS)

Advanced

Enable hierarchical namespace	Disabled
Enable network file system v3	Disabled
Allow cross-tenant replication	Disabled
Access tier	Hot
Enable SFTP	Disabled
Large file shares	Disabled

Networking

Network connectivity	Public endpoint (all networks)
Default routing tier	Microsoft network routing
Endpoint type	Standard

Security

[Create](#)

[< Previous](#)

[Next >](#)

[Download a template for automation](#)

6. Once the deployment has been completed, click on “Go to resource”

htmlpage123_1709187783617 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Your deployment is complete

Deployment name: htmlpage123_1709187783617
Subscription: Azure for Students
Resource group: analysisresource

Start time: 2/29/2024, 11:53:06 AM
Correlation ID: 39ff0ccd-ab13-4a91-924a-48c30a4baae6

Deployment details
Next steps

Go to resource

7. Click on “Capabilities” and then click on “Static website”

htmlpage123 Storage account

Search

Upload Open in Explorer Delete Move Refresh Open in mobile

Overview

Activity log Tags Diagnose and solve problems Access Control (IAM) Data migration Events Storage browser Storage Mover

Data storage

Containers File shares Queues Tables

Security + networking

Networking Front Door and CDN Access keys

Properties Monitoring Capabilities (7) Recommendations (0) Tutorials Tools + 5

Capabilities (7)

- Static website**: Host static content on the blob service. Status: Loading...
- Data protection**: Save and recover data when it is erroneously modified or deleted. Status: Partially configured
- Security**: Enable Azure Defender for your storage account. Status: Not configured
- Private endpoints**: Secure data access over a private link. Status: Not configured

8. Then switch the “Disabled” toggle to “Enabled”

Enabling static websites on the blob service allows you to host static content. Webpages may include static content and client-side scripts. Server-side scripting is not supported. As data is replicated asynchronously from primary to secondary regions, files at the secondary endpoint may not be immediately available or in sync with files at the primary endpoint. [Learn more](#)

Static website

Enabled

Improve the page load time of your static website by using the caching features of Azure Front Door (Additional costs apply). [Azure Front Door](#)

Index document name

Error document path

9. Enter the name of the HTML document and the error document. The click on “Save”

Enabling static websites on the blob service allows you to host static content. Webpages may include static content and client-side scripts. Server-side scripting is not supported. As data is replicated asynchronously from primary to secondary regions, files at the secondary endpoint may not be immediately available or in sync with files at the primary endpoint. [Learn more](#)

Static website

Disabled Enabled

i Improve the page load time of your static website by using Azure Front Door.

Index document name i

HTML_Login.html

Error document path i

404.html

The following screen shows the information

Save Discard Give feedback

Enabling static websites on the blob service allows you to host static content. Webpages may include static content and client-side scripts. Server-side scripting is not supported. As data is replicated asynchronously from primary to secondary regions, files at the secondary endpoint may not be immediately available or in sync with files at the primary endpoint. [Learn more](#)

Static website

Disabled Enabled

An Azure Storage container has been created to host your static website.

i Improve the page load time of your static website by using the caching features of Azure Front Door (Additional costs apply). [Azure Front Door](#)

Primary endpoint i

Secondary endpoint i

Index document name i

Error document path i

10. Go back to the storage account created and navigate to the “Configuration” tab. Then click “Enabled” in “Allow Blob anonymous access”

htmlpage123 | Configuration

Storage account

Search Save Discard Refresh Give feedback

The cost of your storage account depends on the usage and the options you choose below. [Learn more](#)

Account kind
StorageV2 (general purpose v2)

Performance i
 Standard Premium

i This setting cannot be changed after the storage account is created.

Secure transfer required i
 Disabled Enabled

Allow Blob anonymous access i
 Disabled Enabled

i Some blobs may become anonymously readable.

Allow storage account key access i
 Disabled Enabled

Allow recommended upper limit for shared access signature (SAS) expiry interval i
 Disabled Enabled

Default to Microsoft Entra authorization in the Azure portal i
 Disabled Enabled

Minimum TLS version i

Shared access signature
Encryption
Microsoft Defender for Cloud

Data management

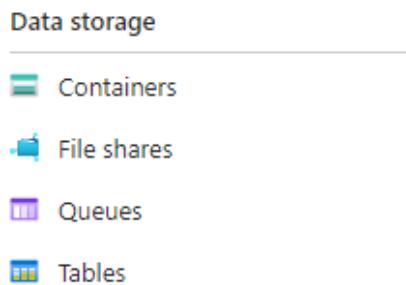
Storage tasks (preview)
Redundancy
Data protection
Object replication
Blob inventory
Static website

Lifecycle management
Azure AI Search

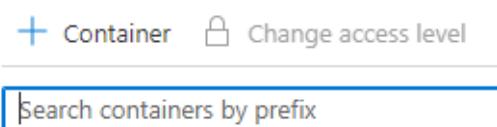
Settings

Configuration
Data Lake Gen2 upgrade
Resource sharing (CORS)

11. Then in the storage account, under Data Storage, click on “Containers”



Add a new container by clicking on the + (plus) sign



Enter the name of the container then click on Create

A screenshot of the "New container" creation dialog. It includes fields for "Name" (containing "loginpage") and "Anonymous access level" (set to "Private (no anonymous access)"). A note below states: "The access level is set to private because anonymous access is disabled on this storage account." At the bottom are "Create" and "Give feedback" buttons.

New container

Name *****
loginpage

Anonymous access level ⓘ
Private (no anonymous access)

The access level is set to private because anonymous access is disabled on this storage account.

Advanced

Create Give feedback

Now, change the access level to “Container(anonymous read access for containers and blobs)” and click on OK

The screenshot shows the Azure Storage Container 'loginpage' settings page. On the left, there's a sidebar with options like Overview, Diagnose and solve problems, Access Control (IAM), Settings, Shared access tokens, Access policy, Properties, and Metadata. The 'Overview' option is selected. In the main area, there's a 'Change access level' dialog. It says 'Change the access level of container 'loginpage''. Under 'Anonymous access level', a dropdown menu is open, showing 'Container (anonymous read access for containers and blobs)' as the selected option. Below the dropdown, a warning message states: '⚠ All container and blob data can be read by anonymous request. Clients can enumerate blobs within the container by anonymous request, but cannot enumerate containers within the storage account.' At the bottom of the dialog are 'OK' and 'Cancel' buttons.

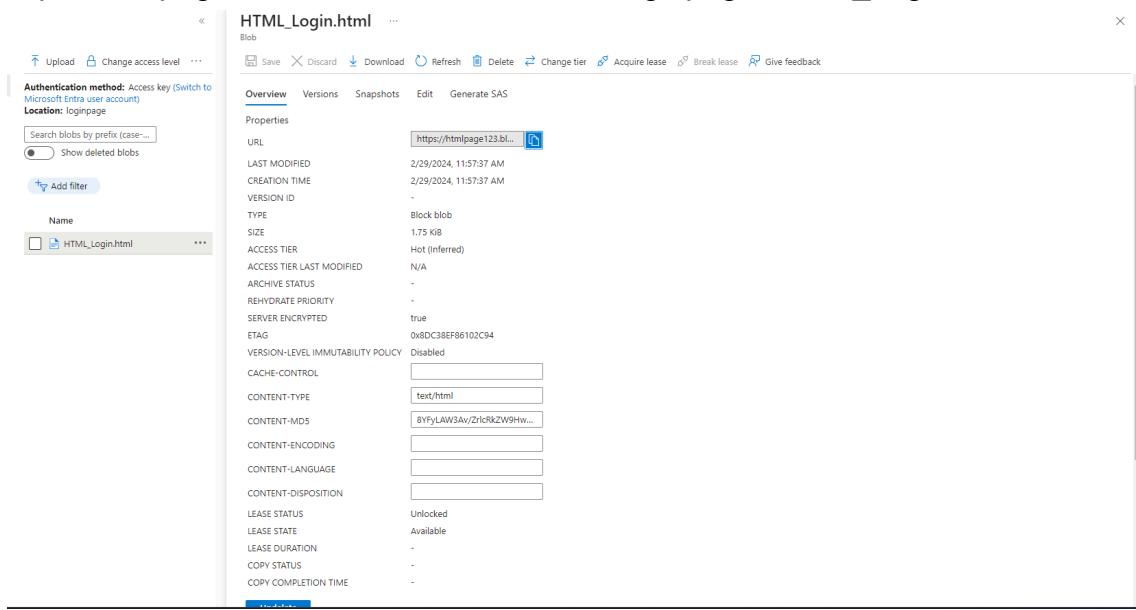
12. Click on “Upload”

The screenshot shows the Azure Storage Container 'loginpage' overview page. The 'Overview' tab is selected in the sidebar. At the top, there are buttons for 'Search', 'Upload', 'Change access level', and other actions. Below the sidebar, there are sections for 'Authentication method: Access key' and 'Location: loginpage'. A search bar at the bottom right says 'Search blobs by prefix (case-sensitive)'. The main content area is currently empty.

Select the HTML file and click on “Upload”

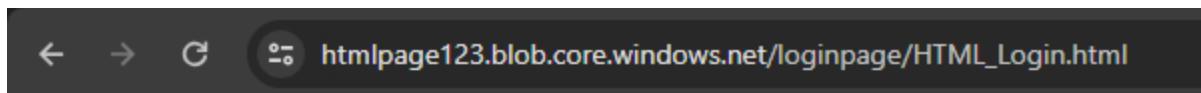
The screenshot shows the 'Upload blob' dialog. At the top, it says 'Upload blob' and has a close button 'X'. In the center, there's a dashed box for dragging files. Inside the box, there's a cloud icon with an upward arrow. Below the box, it says '1 file(s) selected: HTML_Login.html' and 'Drag and drop files here or [Browse for files](#)'. At the bottom of the dialog, there are two checkboxes: 'Overwrite if files already exist' and 'Advanced'. There's also a large blue 'Upload' button and a 'Give feedback' link.

13. Click on the blob created and then copy the URL available :
https://htmlpage123.blob.core.windows.net/loginpage/HTML_Login.html



The screenshot shows the 'Overview' tab of a blob named 'HTML_Login.html'. The URL listed is https://htmlpage123.blob.core.windows.net/loginpage/HTML_Login.html. Other properties shown include Last Modified (2/29/2024, 11:57:37 AM), Creation Time (2/29/2024, 11:57:37 AM), Type (Block blob), Size (1.75 KiB), and Access Tier (Hot (inferred)).

Paste the URL in the browser and the web page is now hosted.



HTML form

First name :

last name :

Date of birth : dd - mm - yyyy

Email id :

Mobile number :