Cloud Computing

Journal

Submitted By

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TY BSc CS (Hons)

Department Of Computer Science Somaiya Vidyavihar University SK Somaiya college

INDEX

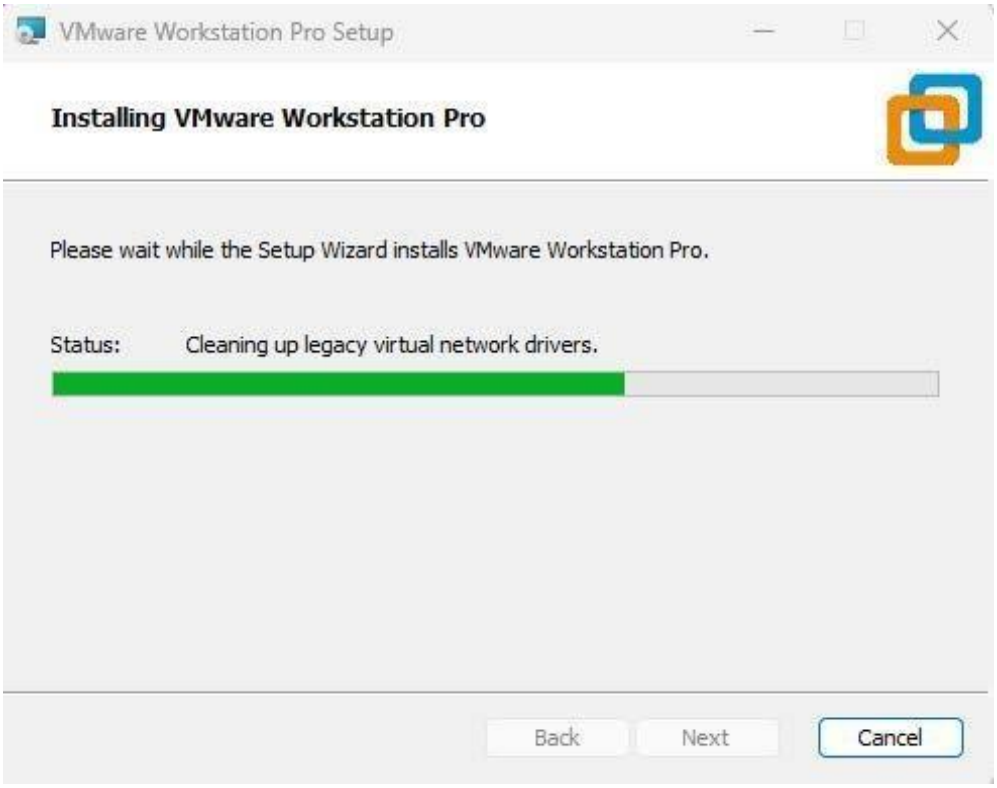
Practical No: 1

To install VMware on Windows 11

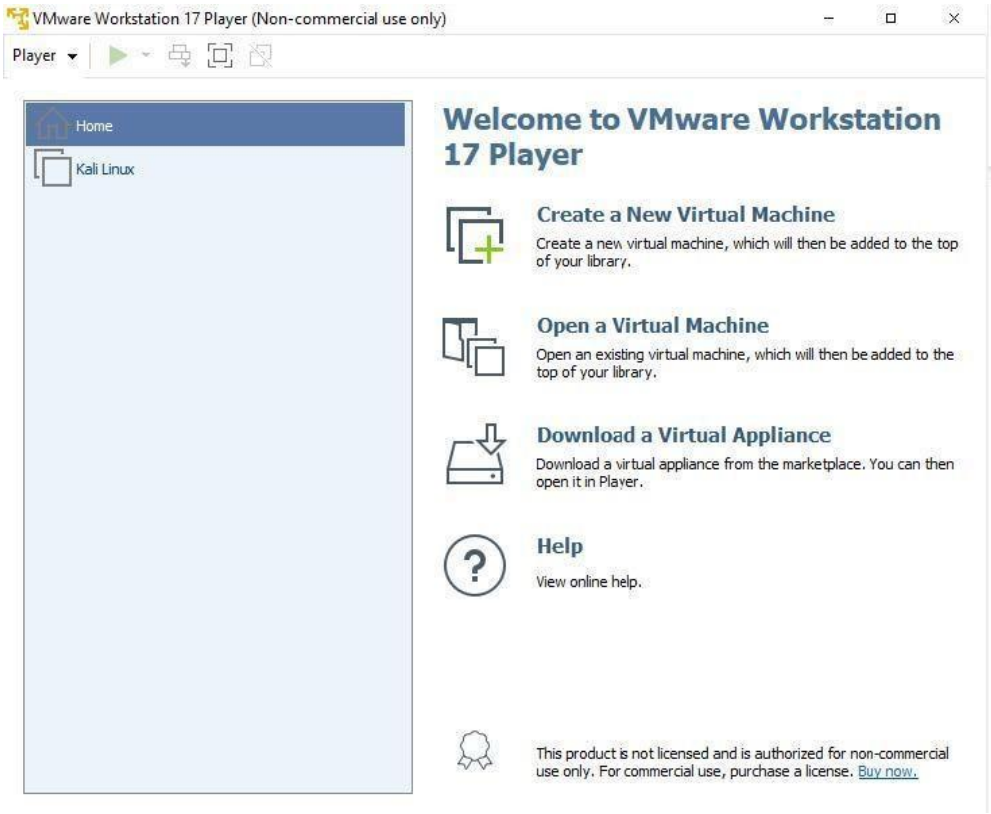
Step1: Visit VMware Workstation to download VMware software.

Step2: Now Install VMware on your System. (*Note it will ask you to restart your system).

Step3: The installation screen should look like this.

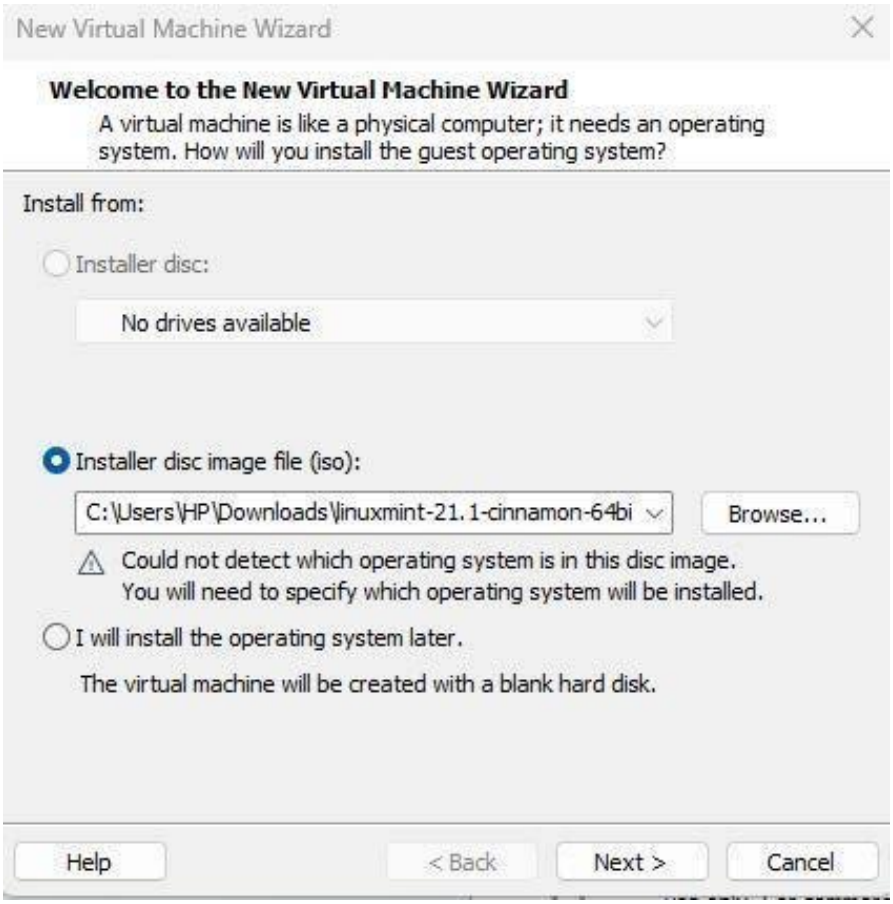


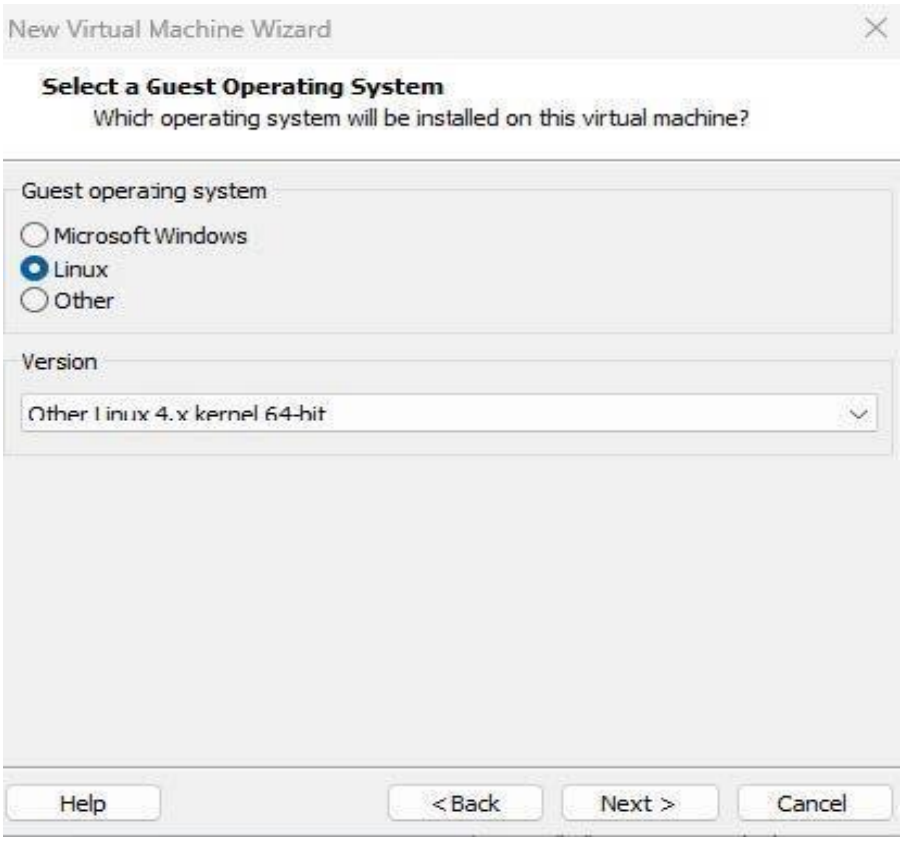
Step4: After successful installation you should get this screen.

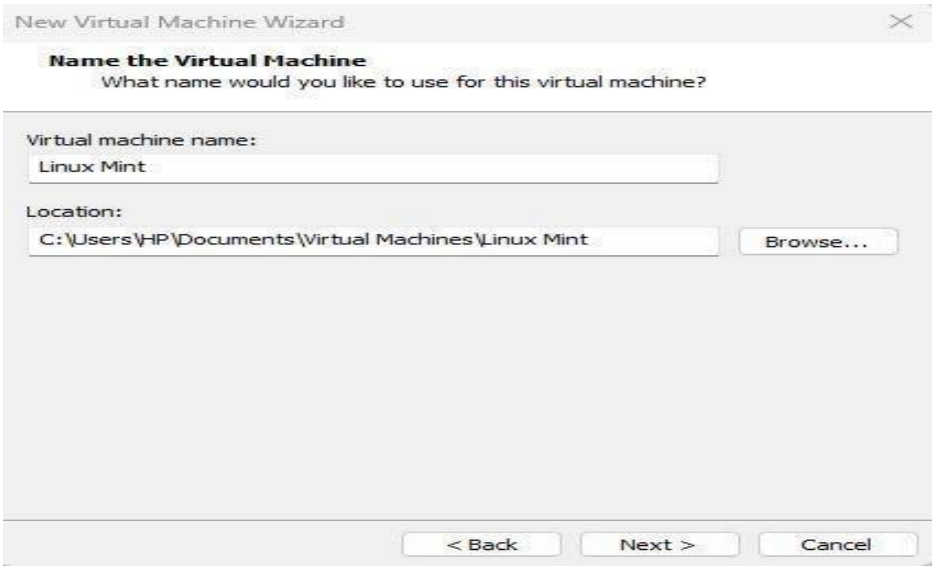


Step5: Now download the OS you wish to install on your VMware in this case I am going with Linux mint.

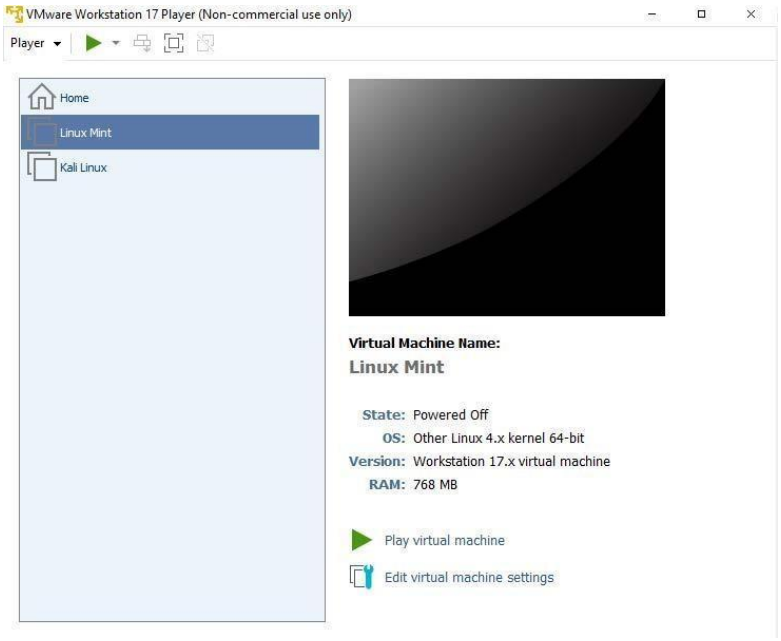
Step6: After downloading the iso file open VMware , click on Create new virtual machine.
Step7: Now add the iso file in the installer disk.

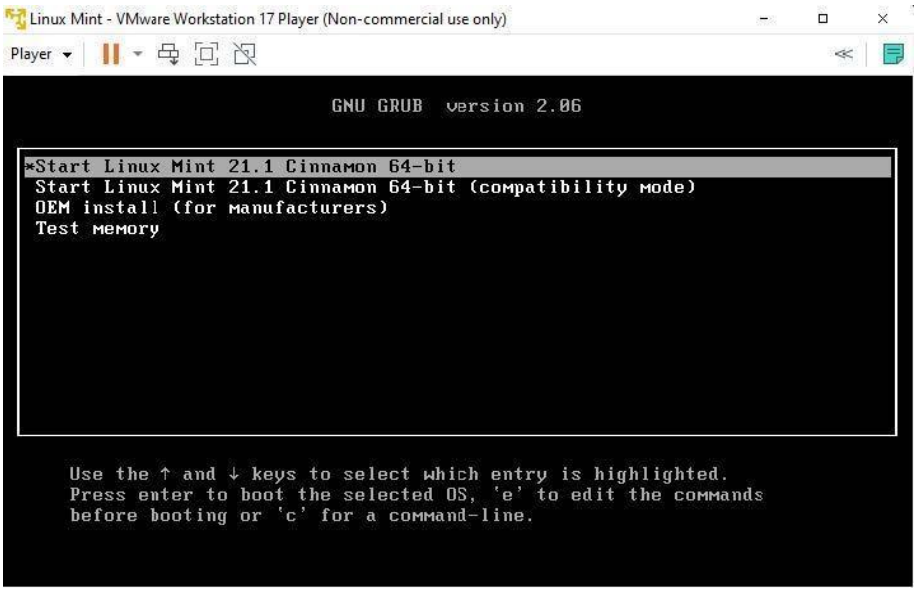

New Virtual Machine Wizard
Welcome to the New Virtual Machine Wizard
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?
Install from:
Installer disc:
No drives available
Installer disc image file (iso):
C:\Users\HP\Downloads\linuxmint-21.1-cinnamon-64bi
Browse...
Could not detect which operating system is in this disc image.
You will need to specify which operating system will be installed.
I will install the operating system later.
The virtual machine will be created with a blank hard disk.
Help
< Back
Next >
Cancel

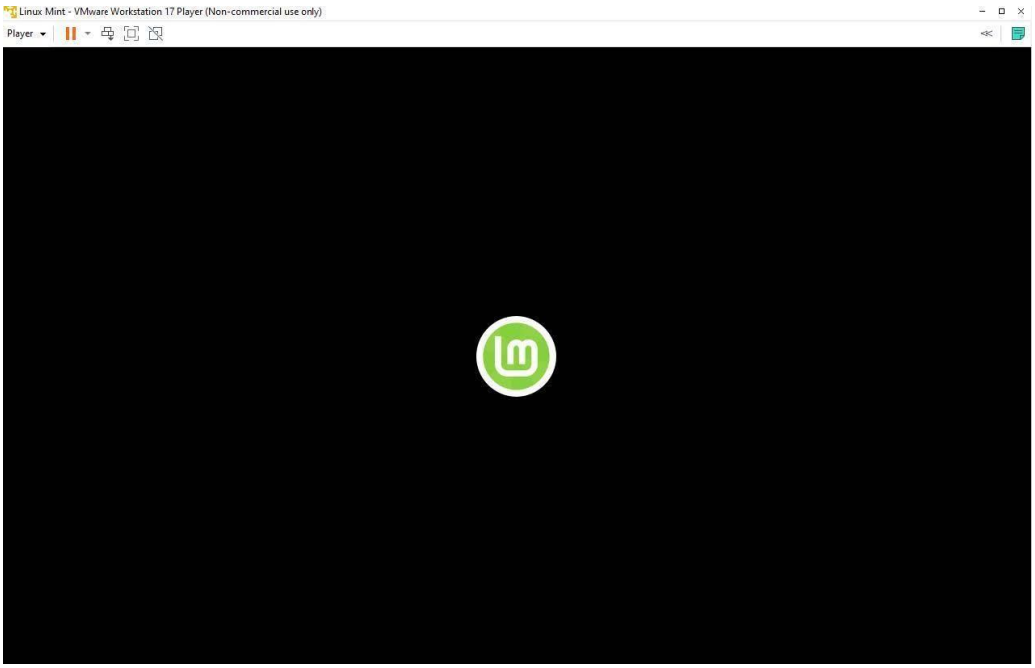

New Virtual Machine Wizard
Select a Guest Operating System
Which operating system will be installed on this virtual machine?
Guest operating system
Microsoft Windows
Linux
Other
Version
Other Linux 4.x kernel 64-bit
Help
< Back
Next >
Cancel



Step8: Now click on finish and click on play virtual machine.





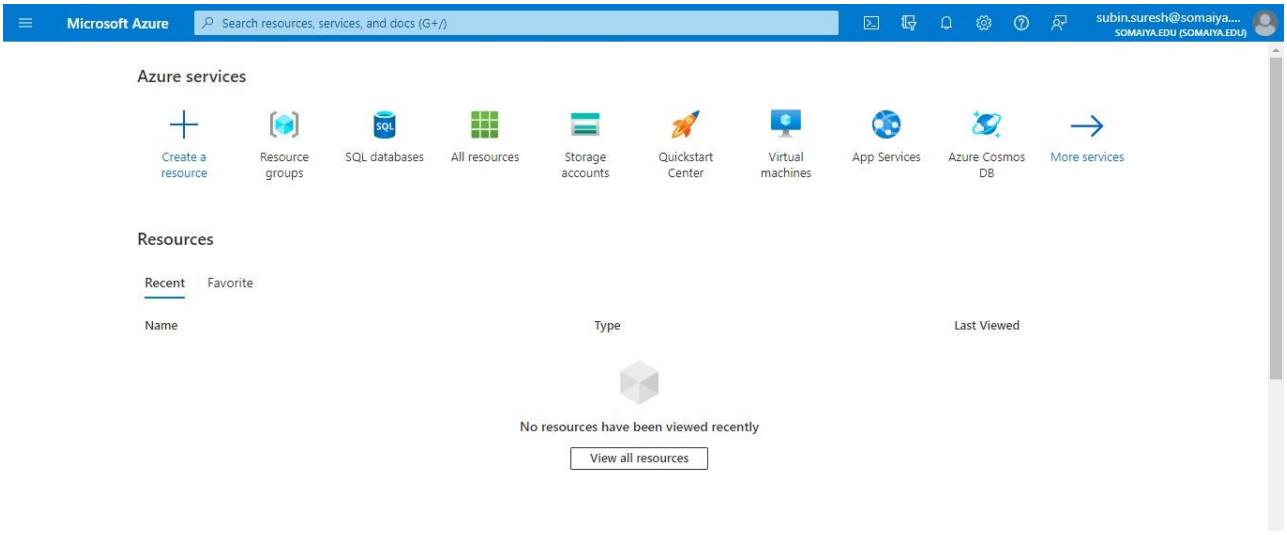


Step9: With this your setup is done!!!

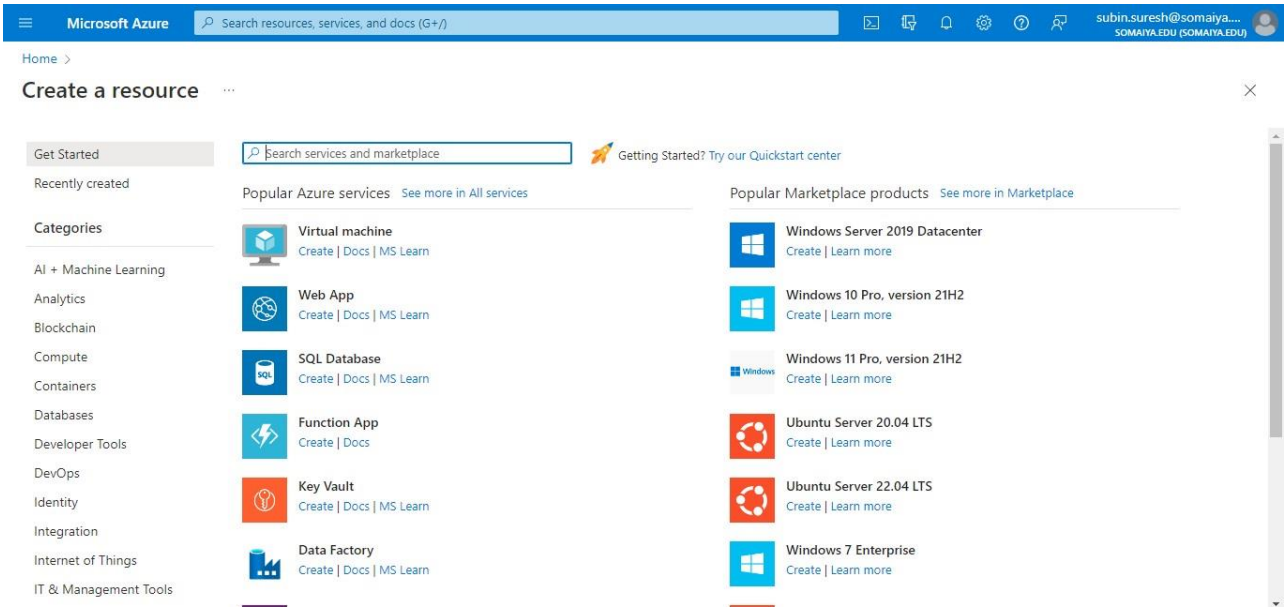
Practical No: 2

VM account on Microsoft Azure

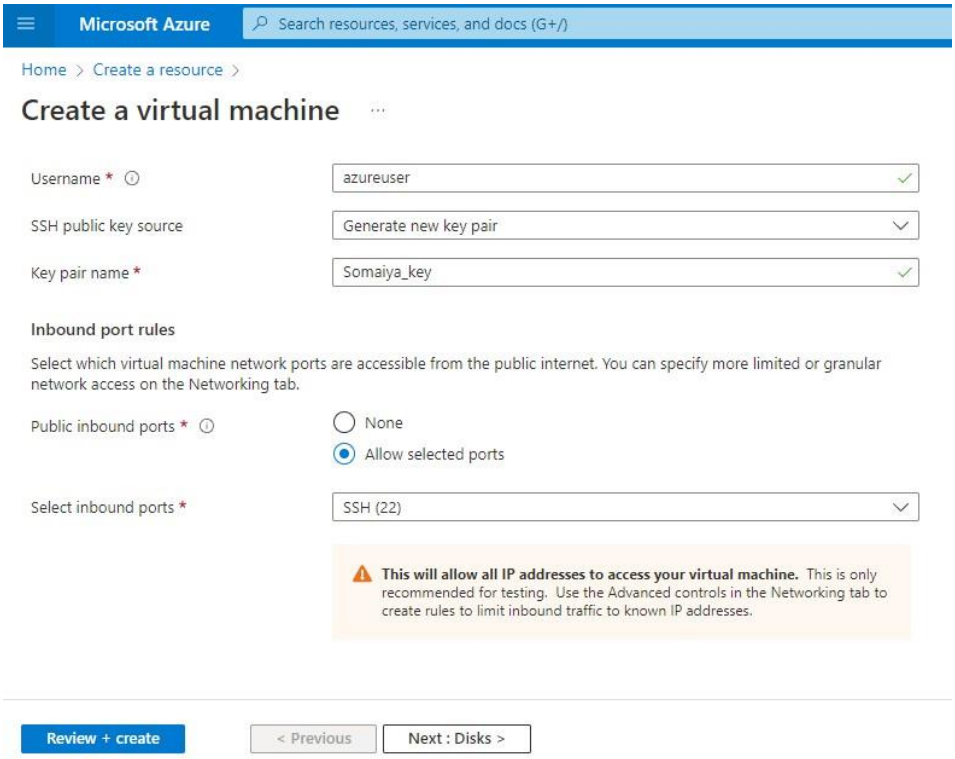
Step 1: Open Microsoft Azure Website and login with Somaiya.edu



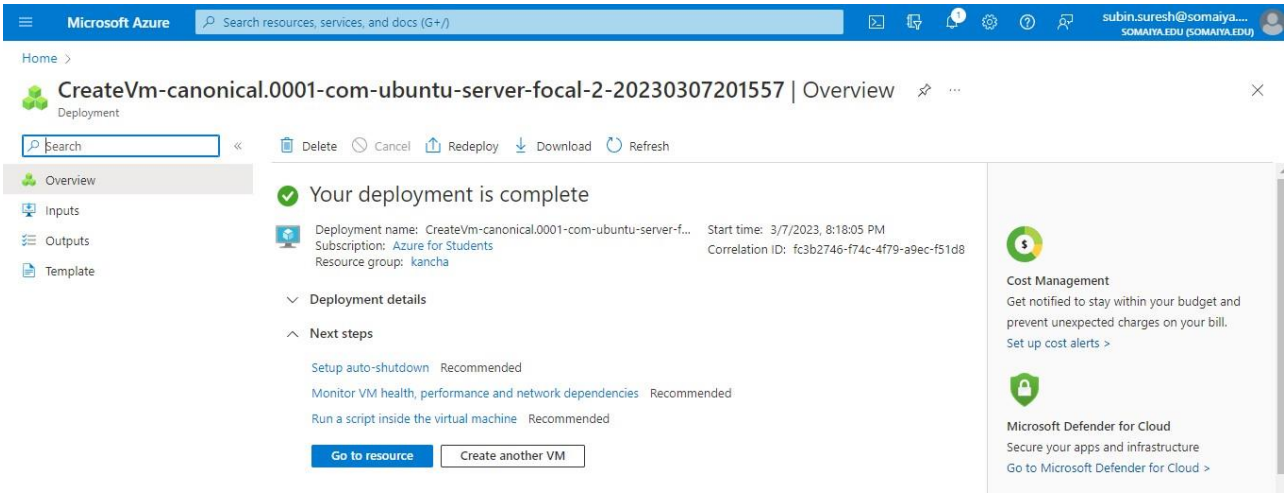
Step 2: Click on Create resource



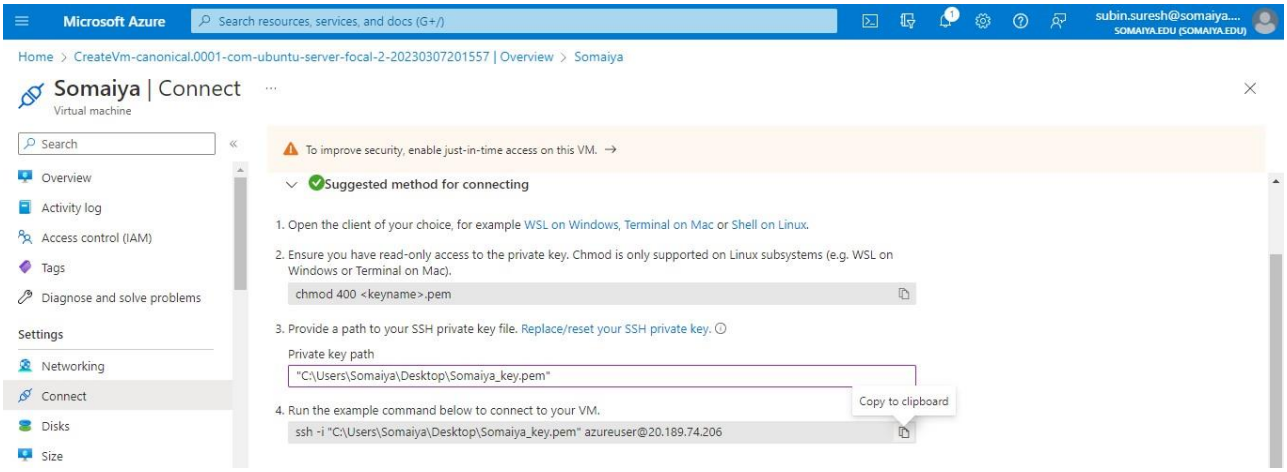
Step 3: Enter the necessary details



Step 4: Overview of Virtual Machine



Step 5: Paste the .pem file location which was downloaded on your system (Under the SSH tab , but first you need to search for SSH to get to this tab)



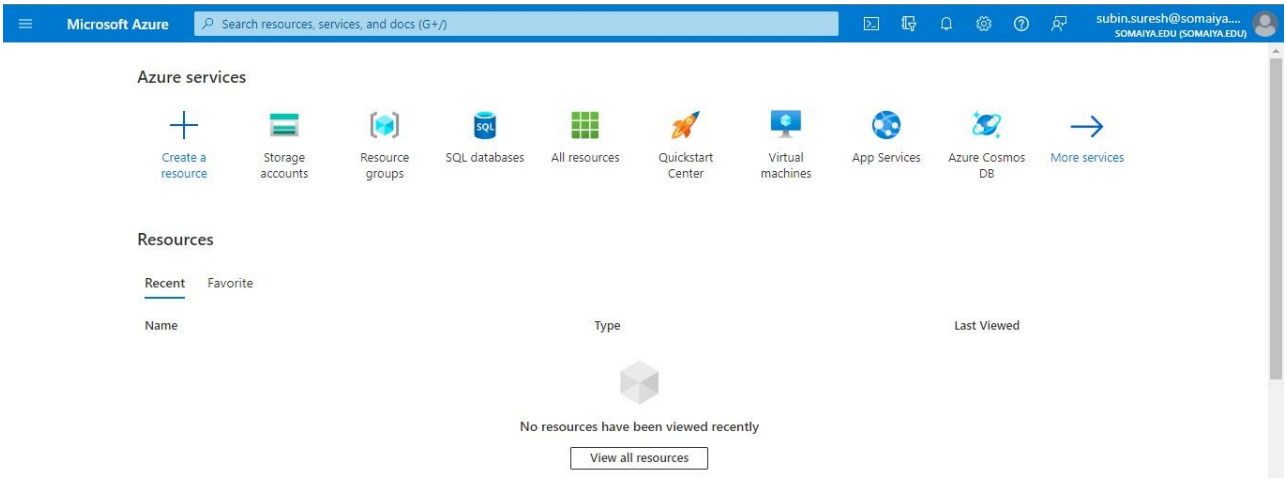
Step 6: Open CMD paste the ssh command in the terminal and follow the following

```
azureuser@Somaiya: ~

C:\Users\Subin>ssh -i "C:\Users\Subin\Desktop\Somaiya_key.pem" azureuser@20.193.145.123
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1034-azure x86_64)

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

  System information as of Tue Mar  7 18:54:40 UTC 2023

  System load:  0.0               Processes:             124
  Usage of /:   5.3% of 28.89GB   Users logged in:       0
  Memory usage: 4%                IPv4 address for eth0: 10.0.0.4
  Swap usage:   0%

 * Introducing Expanded Security Maintenance for Applications.
   Receive updates to over 25,000 software packages with your
   Ubuntu Pro subscription. Free for personal use.

     https://ubuntu.com/azure/pro

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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



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

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

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

azureuser@Somaiya:~$ whoami
azureuser
azureuser@Somaiya:~$
```

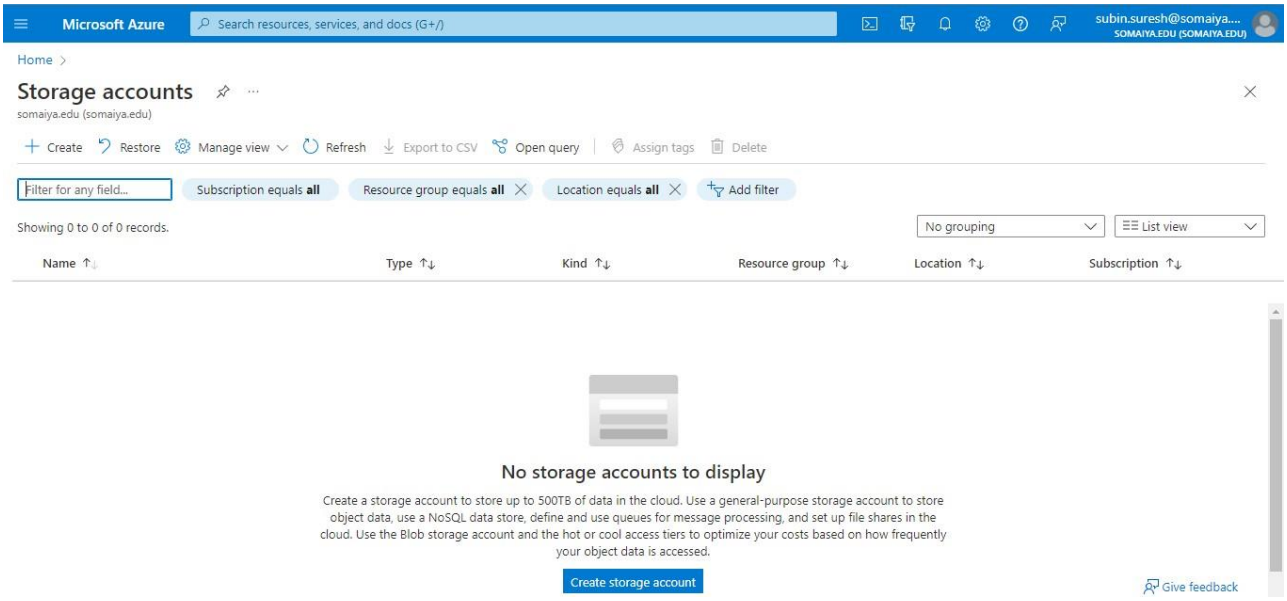
Practical No: 3

To create a storage account in Microsoft Azure and upload data in it.

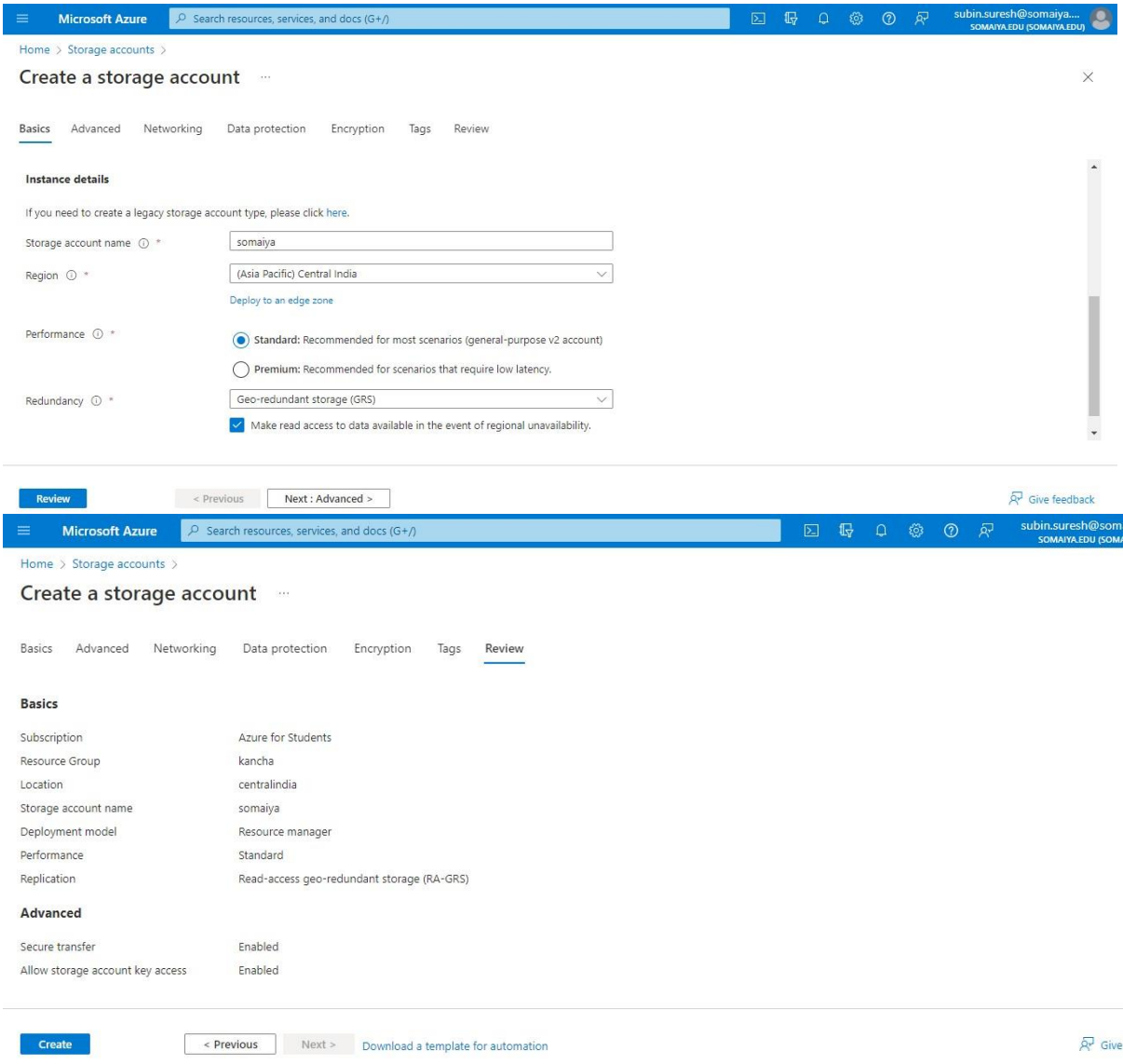
Step 1: Open the dashboard of the Microsoft azure portal.



Step 2: Click on the storage accounts option on the dashboard.

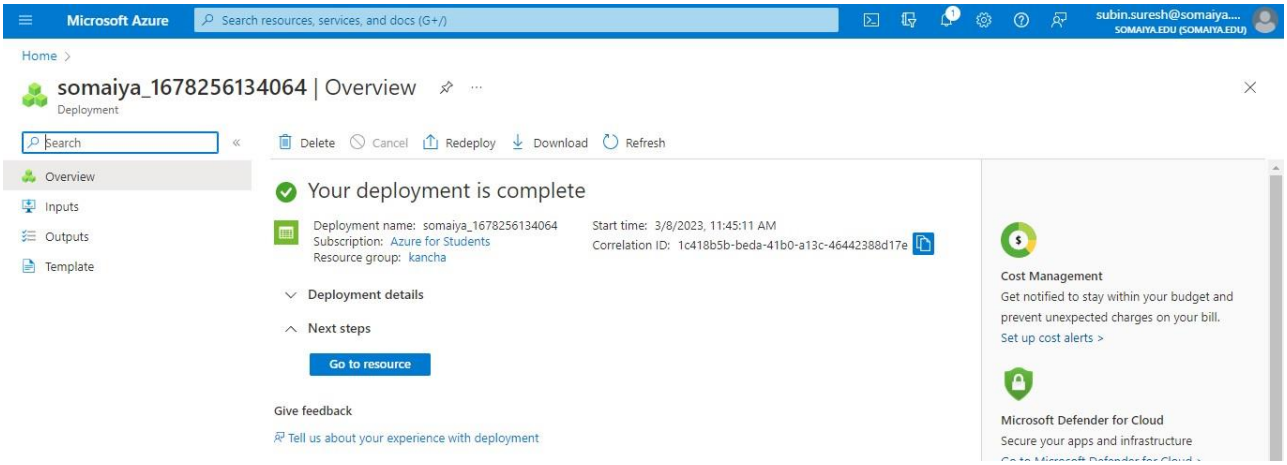


Step 3: Click on Create storage account and create your storage account.

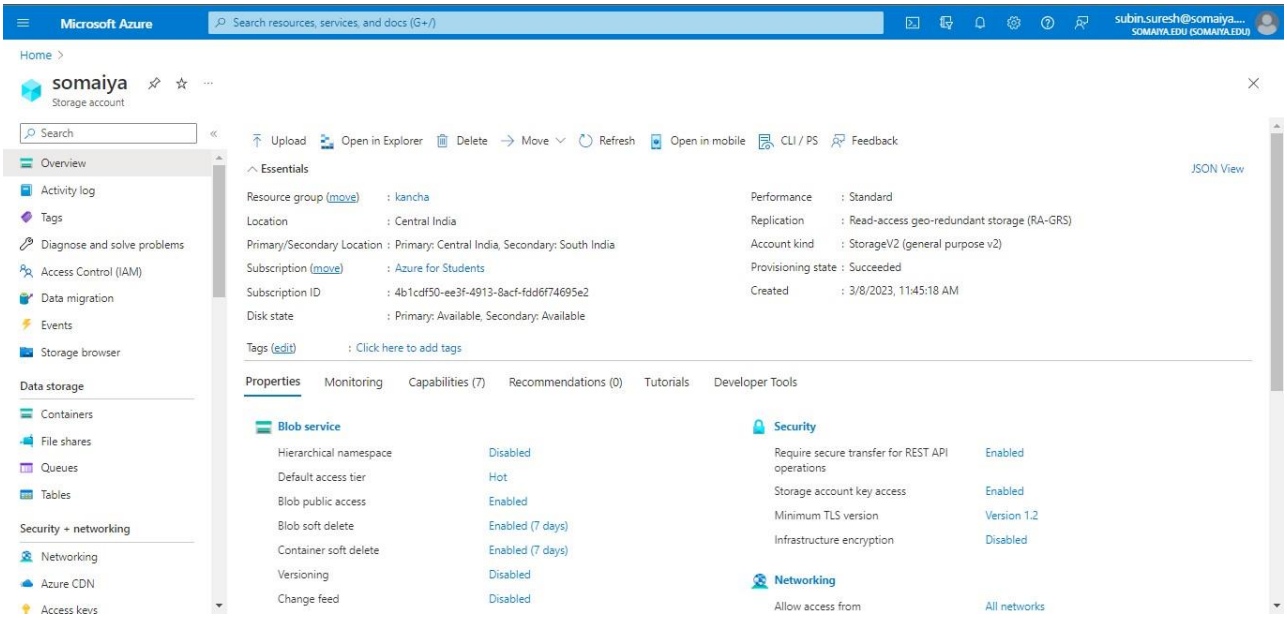


Step 4: After finally providing all the required information click on the review tab.

Step 5: After reviewing the tab a create option will be visible on the bottom of the dashboard.

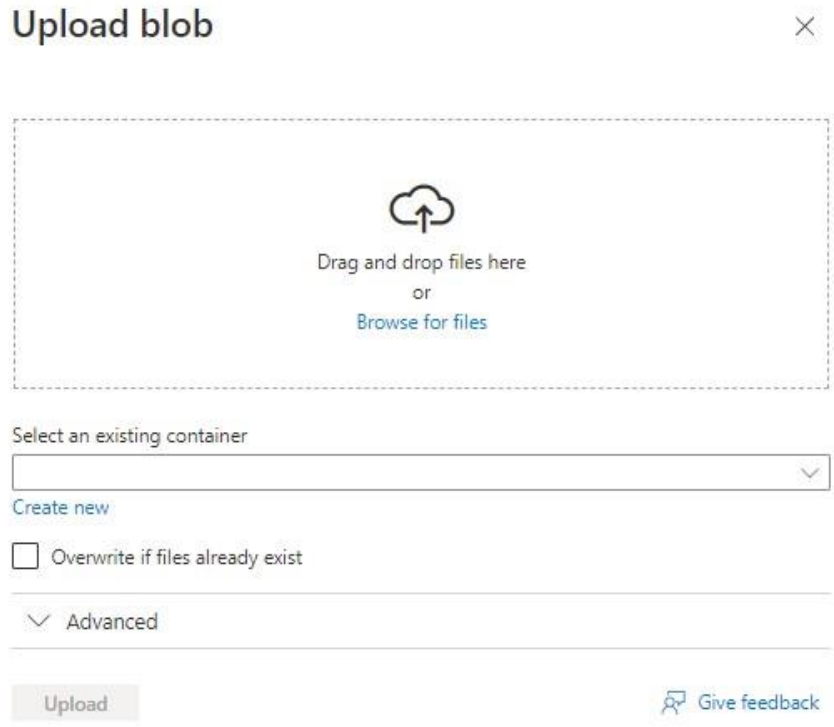


Step 6: Once you create the storage account, a notification will appear on the top-right corner regarding the resource or storage account you have just created.

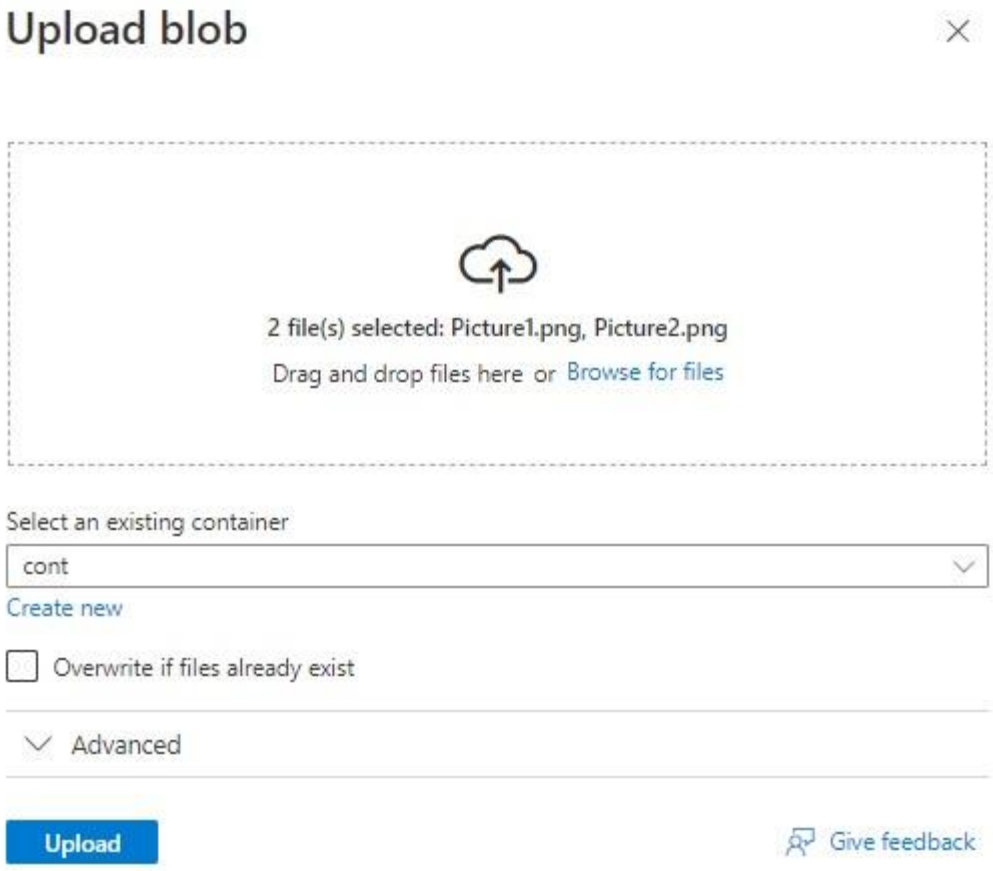


Step 7: Go to the dashboard and then click on upload.

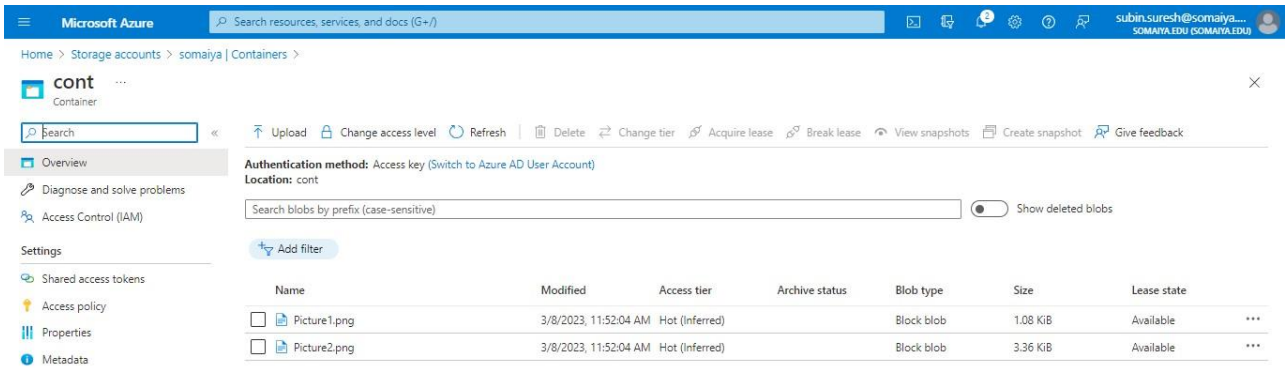
Step 8: Click on the upload button and The following options will be shown to you.



Step 9: Enter the file which has to be uploaded and then create a container inside which you want to store that file.



Step 10: Click on upload button and your file will be uploaded which can be seen on the storage account option from the left dashboard services.

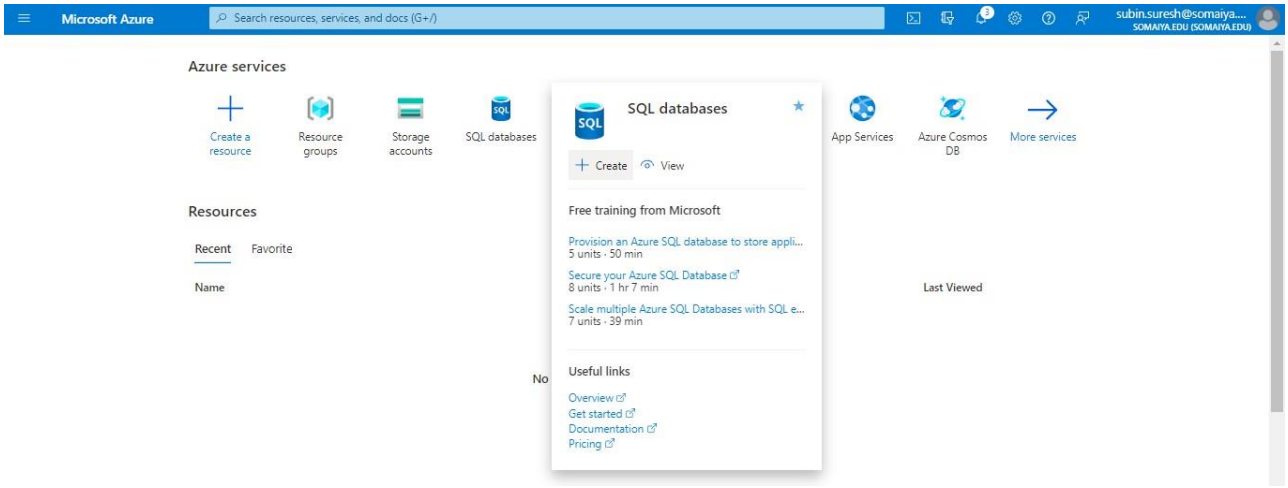


Step 11: Click on Storage accounts > Containers > cont > You can see all your uploaded files here.

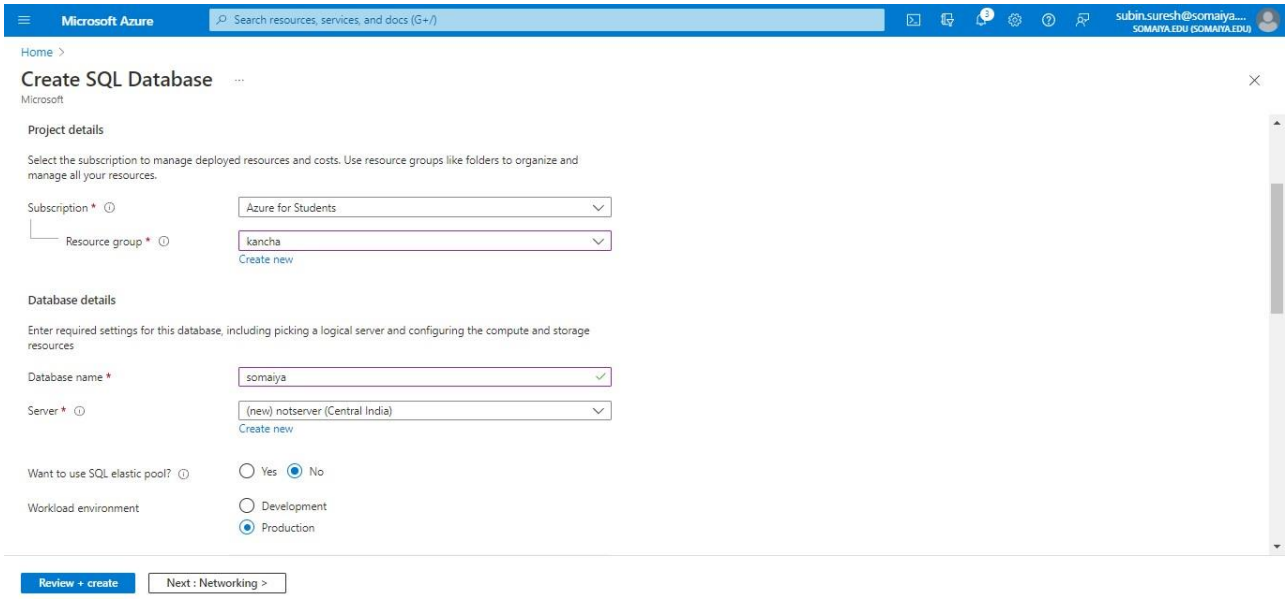
Practical No:4

SQL Database using Azure

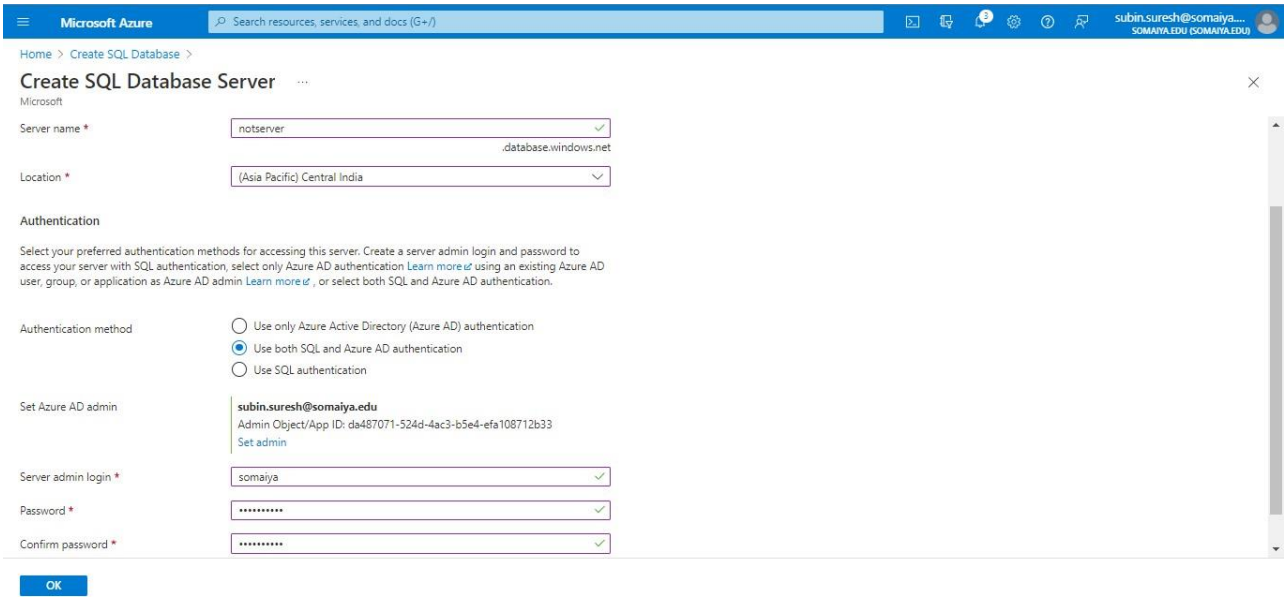
Step 1: Click on create SQL Database



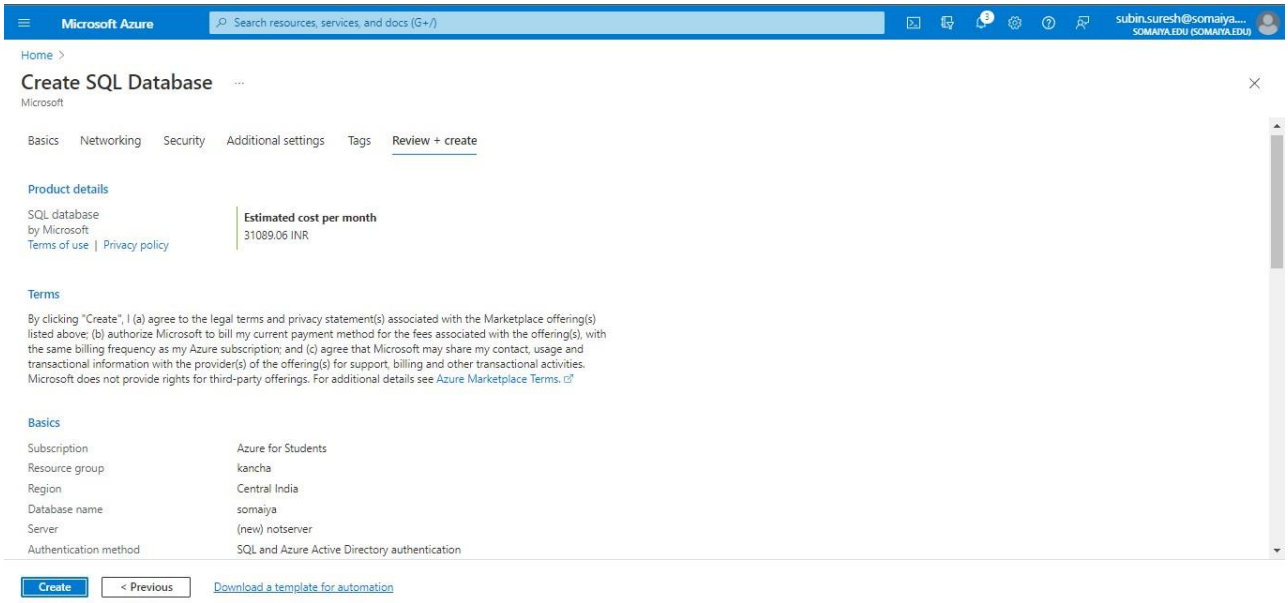
Step 2: Give Name to resource group, database and server



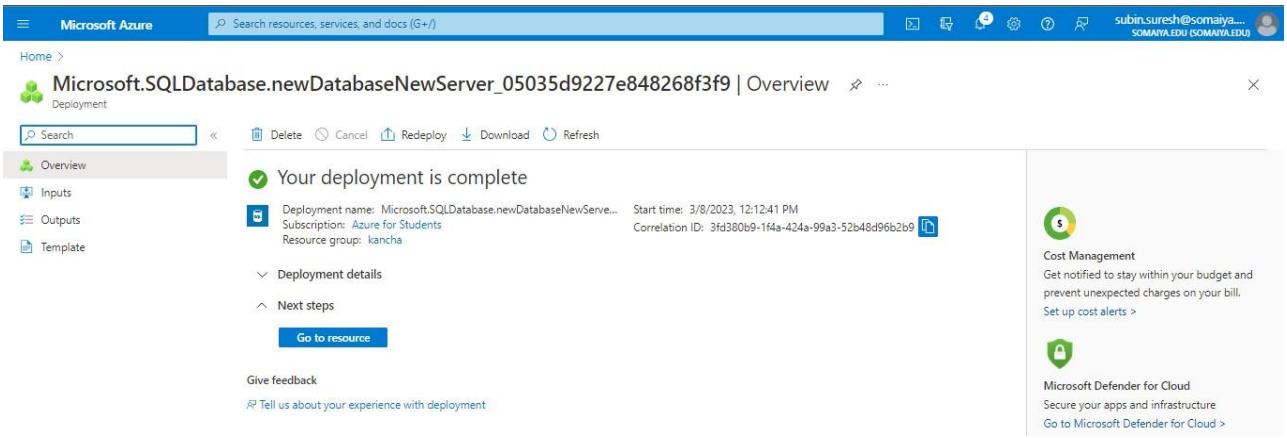
Step 3: Enter server name and select a location, in authentication method select 2nd option, enter server admin login and password.



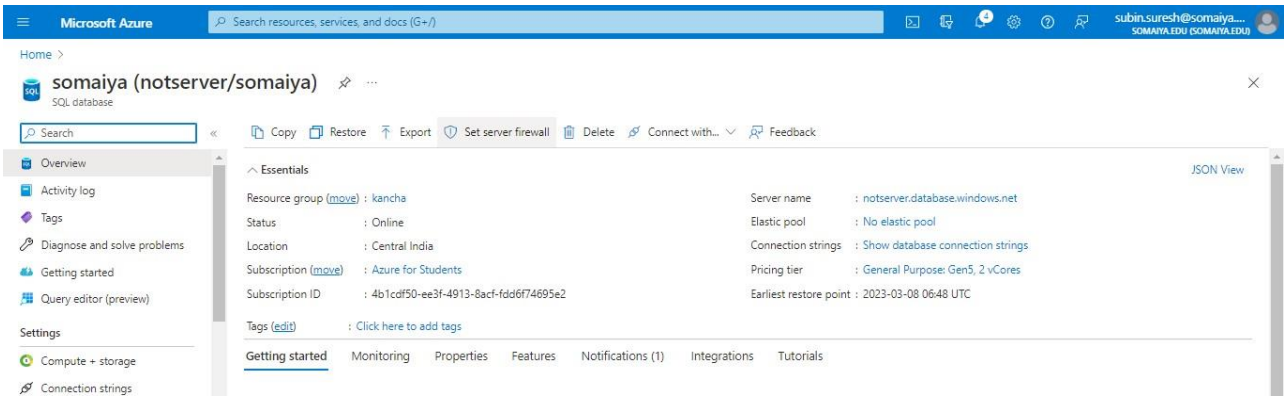
Step 4: Click on set admin and enter Somaiya mail-id and click on select, and then click on ok and just keep on clicking next-next and finally click on create.

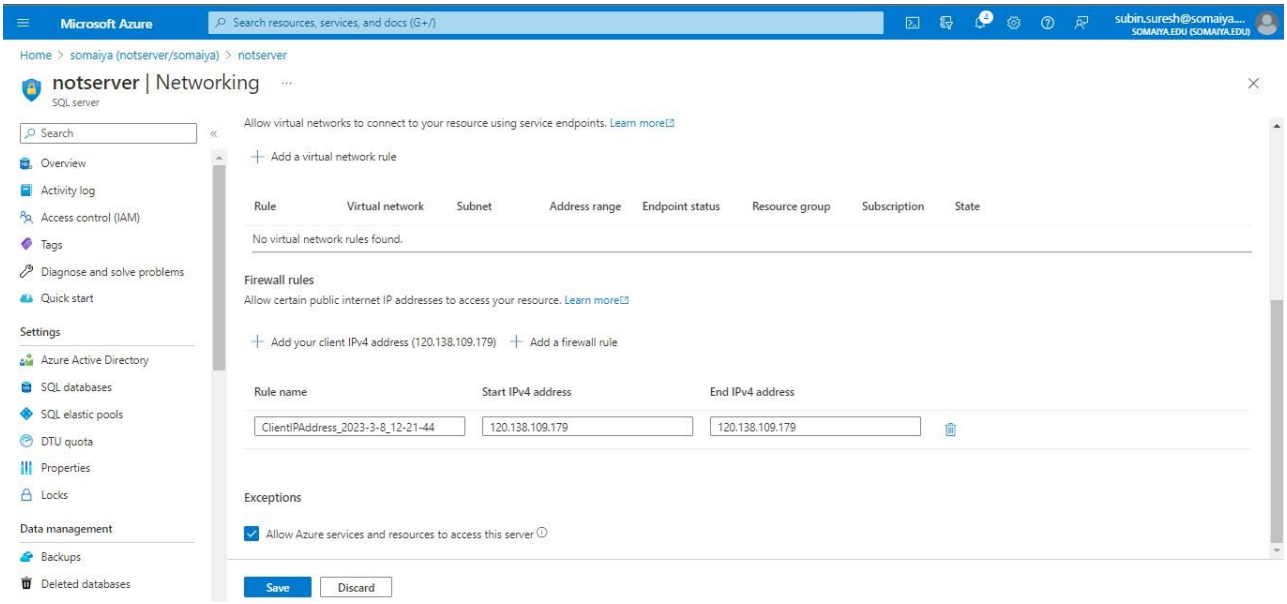


Step 5: Now you have successfully deployed SQL database, click on go to resource.



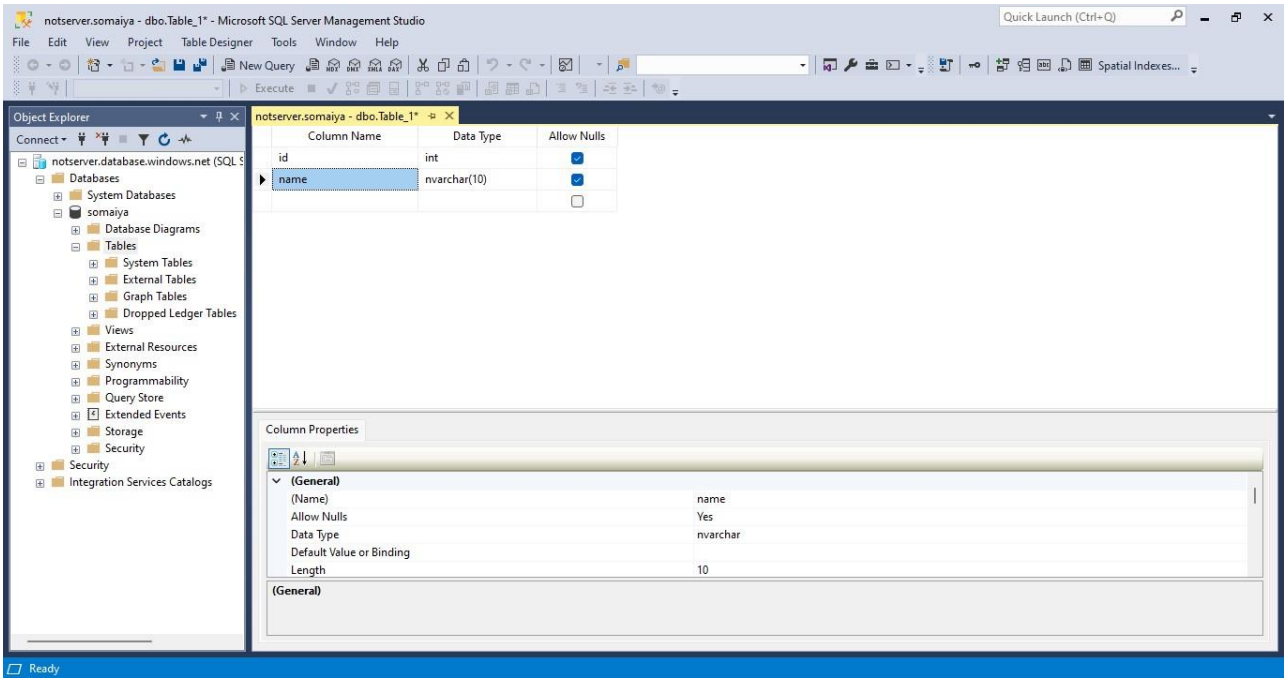
Step 6: Here, click on set server firewall (to get successful connection with SSMS), in public network access click on selected networks, under firewall rules click on add button you can see 2 ip address, now save it and get back to your sql database.



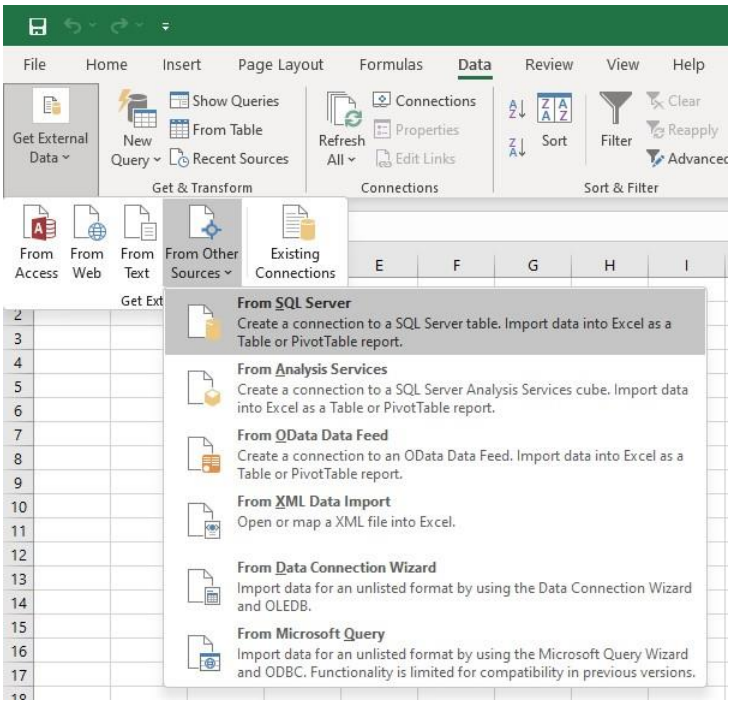


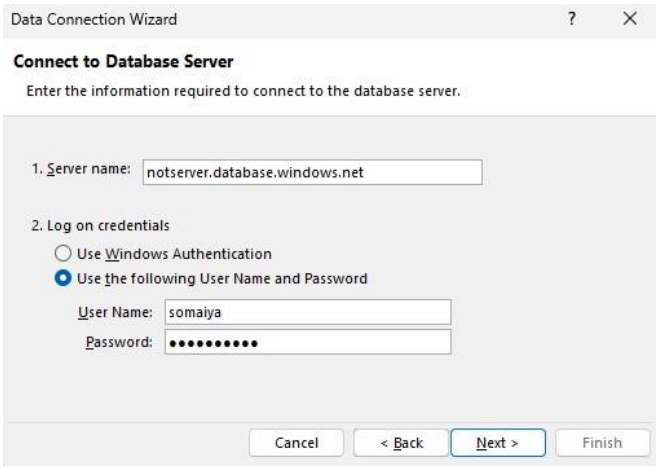
Step 7: Open SSMS (SQL Server Management Studio) and Open it, now you can see a pop-up will appear regarding connect to the server. Here, enter the server name which you got in azure while creating SQL database and then in the login password enter the details which you gave while creating a server in azure and click on connect.

Step 8: Now after successful connection, you can see the database is already created under that create a table containing two columns and insert the values in it.

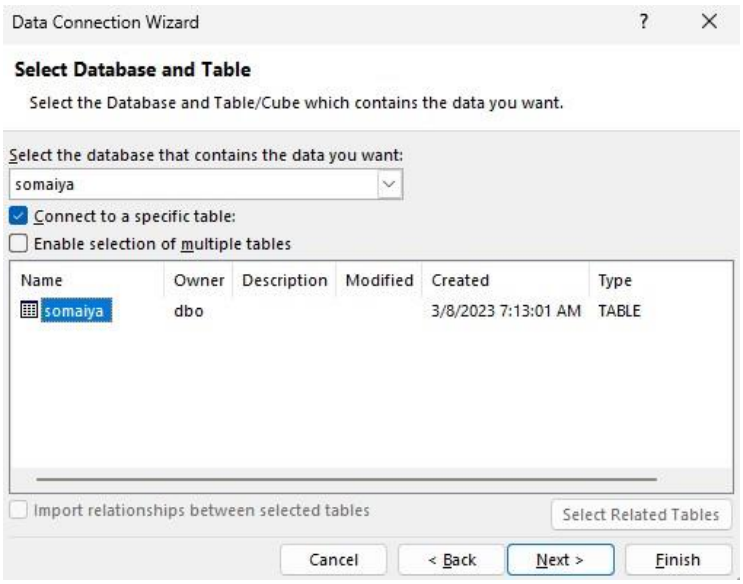


Step 9: Now go to Excel, click on Data and then get external data, and then hover on from other sources and click on from sql database.

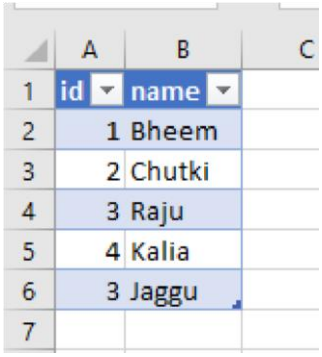




Step 10: Now Click on Database and then click on table name and click Finish.



Step 11: Now you can see the table with values you created has been fetched in excel using your server name, username and password.



	A	B	C
1	id	name	
2	1	Bheem	
3	2	Chutki	
4	3	Raju	
5	4	Kalia	
6	3	Jaggu	
7			

Practical No: 5

Web Feeds

CODE:

Index.html

```
<head>
 <script>
 function showRSS(str) {
 if (str.length == 0) {
 document.getElementById("output").innerHTML = "";
 return;
```

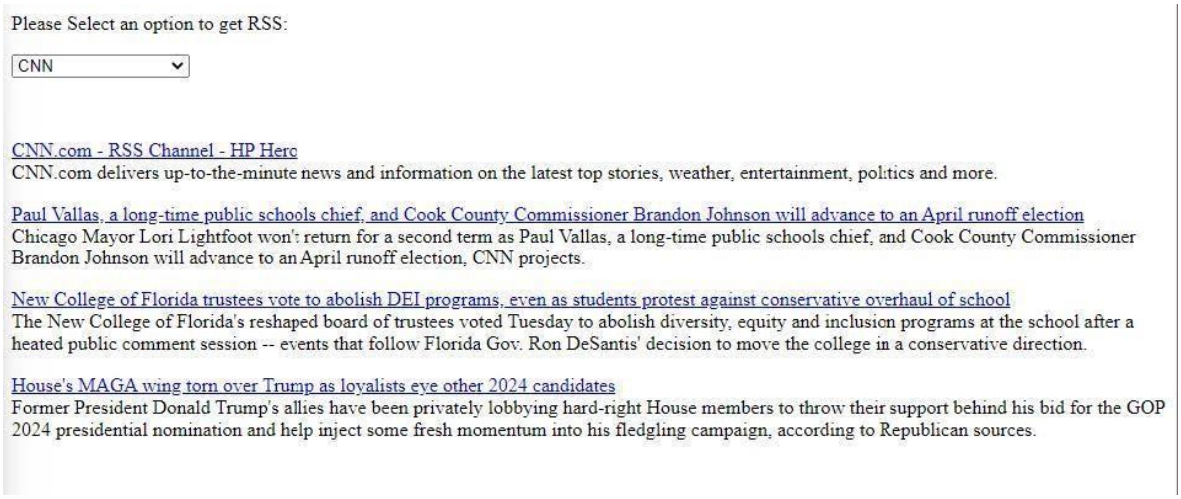
```
  }
  if (window.XMLHttpRequest) {
  xmlhttp = new XMLHttpRequest();
   }else {
  xmlhttp = new ActiveXObject("Microsoft.XMLHTTP");
   }
  xmlhttp.onreadystatechange = function() {
  if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
  document.getElementById("output").innerHTML = xmlhttp.responseText;
   }
   }
  xmlhttp.open("GET","rss.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 = "pc">PC World</option>
  </select>
  </form>
  <br>
  <div id = "output">RSS-feeds</div>
  </body>
  </html>
```

RSS.php

```
<?php
$q = $_GET["q"];
if($q == "cnn") {
$xml = ("http://rss.cnn.com/rss/cnn_topstories.rss");
}elseif($q == "bbc") {
$xml =
("http://newsrss.bbc.co.uk/rss/newsonline_world_edition/americas/rss.xml")
;
}elseif($q = "pcw"){
$xml = ("http://www.pcworld.com/index.rss");
}
$xmlDoc = new DOMDocument();
$xmlDoc->load($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 . "'>" .
$channel_title . "</a>");
echo("<br>");
echo($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;
$item_desc = $x->item($i)->getElementsByTagName('description')
->item(0)->childNodes->item(0)->nodeValue;
echo ("<p><a href = '" . $item_link . "'>" .
$item_title . "</a>");
echo ("<br>");
echo ($item_desc . "</p>");
}
?>
```

OUTPUT:



Please Select an option to get RSS:

BBC News

BBC News - US & Canada
BBC News - US & Canada

Covid: FBI chief Christopher Wray says China lab leak 'most likely'
Christopher Wray says the FBI has "for quite some time" settled on a potential lab incident in Wuhan.

LA agrees to pay Kobe Bryant widow almost $29m
Vanessa Bryant said first responders took photos of her late husband's remains for "morbid gossip".

Donald Trump assails Rupert Murdoch over defamation testimony
The media mogul's emails reveal he told a Fox executive: "We want to make Trump a non person."

Please Select an option to get RSS:

PC World

Notice: Trying to get property 'nodeValue' of non-object in **C:\xampp\htdocs\RSS.php** on line **16**

PCWorld
PCWorld helps you navigate the PC ecosystem to find the products you want and the advice you need to get the job done.

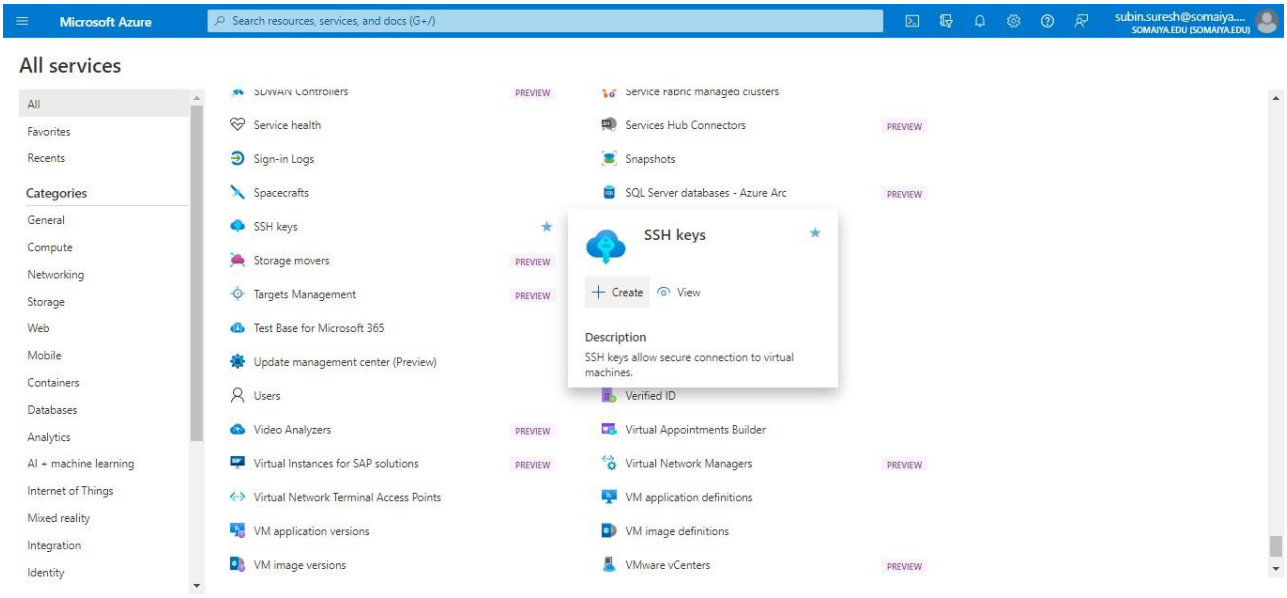
Insane water-cooling rig uses 69 heads and 100 feet of tubing

Most water-cooled desktops have a system that cools the CPU, and maybe the GPU if it's extra-fancy. But that wasn't good enough for one intrepid user on the /r/watercooling subreddit. They spent months on possibly the most elaborate water-cooled desktop ever, cooling what appears to be every single internal component and then some. It's all topped off with fluorescent cooling fluid and enough LEDs to make it shine like a Terminator in an EDM rave.

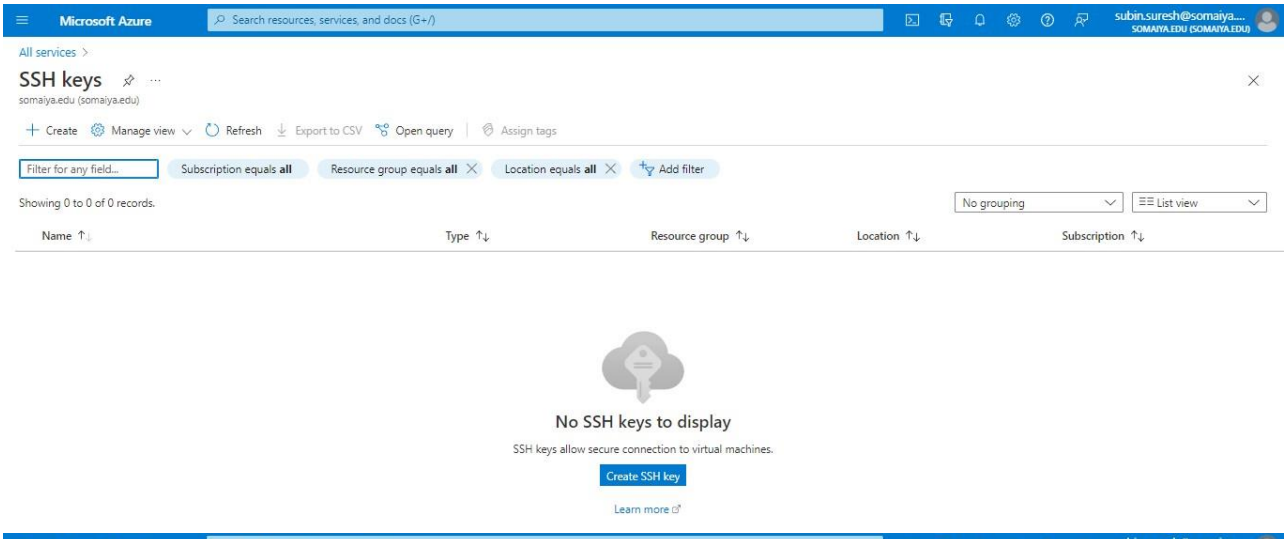
Practical No. 6

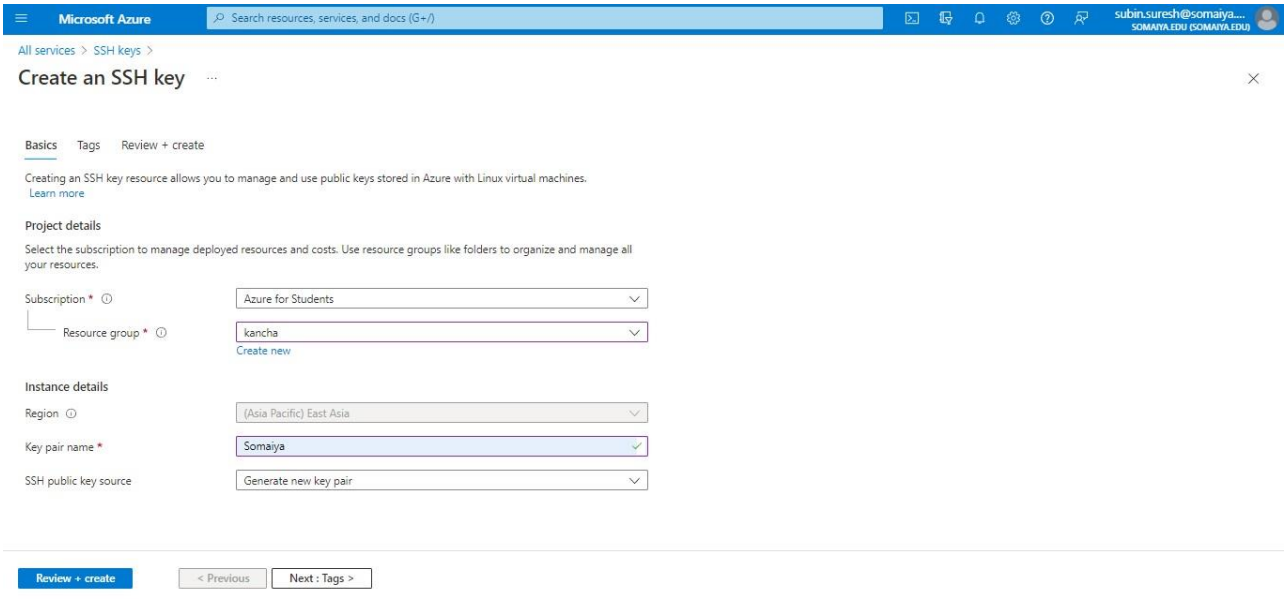
Generating SSH Keys using Azure

Step 1: Open Microsoft Azure, click on create resources and select SSH Keys.

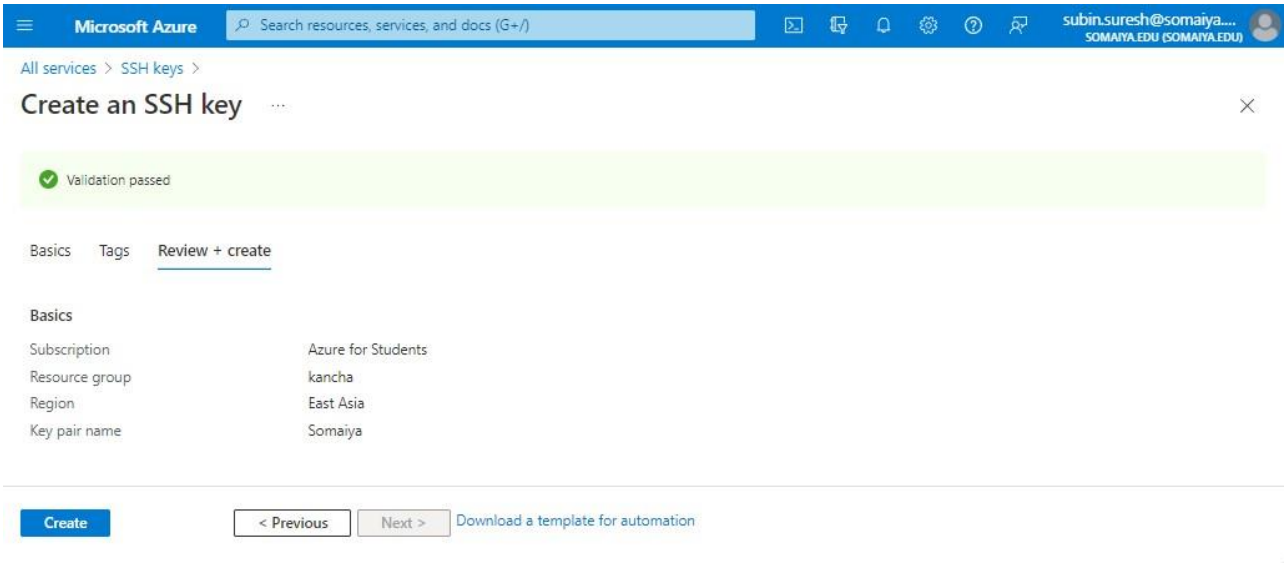


Step 2: Now after you open SSH Keys, click on create SSH key.





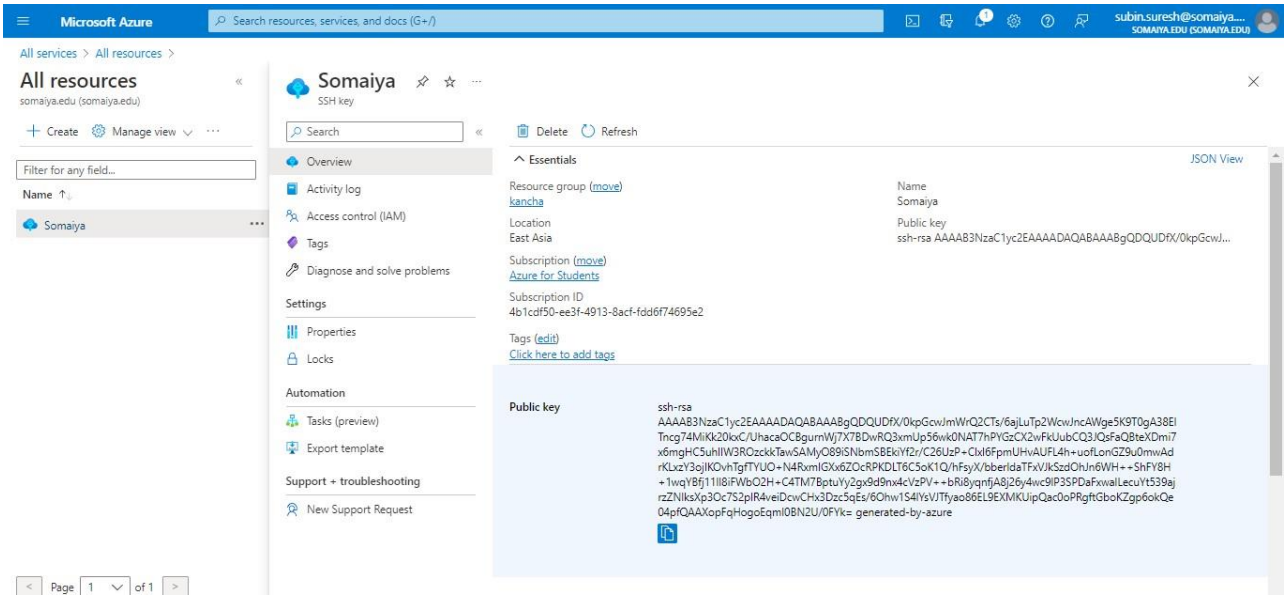
Step 5: Now you have successfully created an SSH Keys.



Step 6: Now you will get a prompt which will allow you to download a private key and create a resource, just click on it.

Step 7: You can see a .pem file has been downloaded.

Step 8: Now click on Go to resource and you can see the below window.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Somaiya
SSH key
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Properties
Locks
Automation
Tasks (preview)
Export template
Support + troubleshooting
New Support Request
Delete
Refresh
Essentials
JSON View
Resource group (move)
kancha
Location
East Asia
Subscription (move)
Azure for Students
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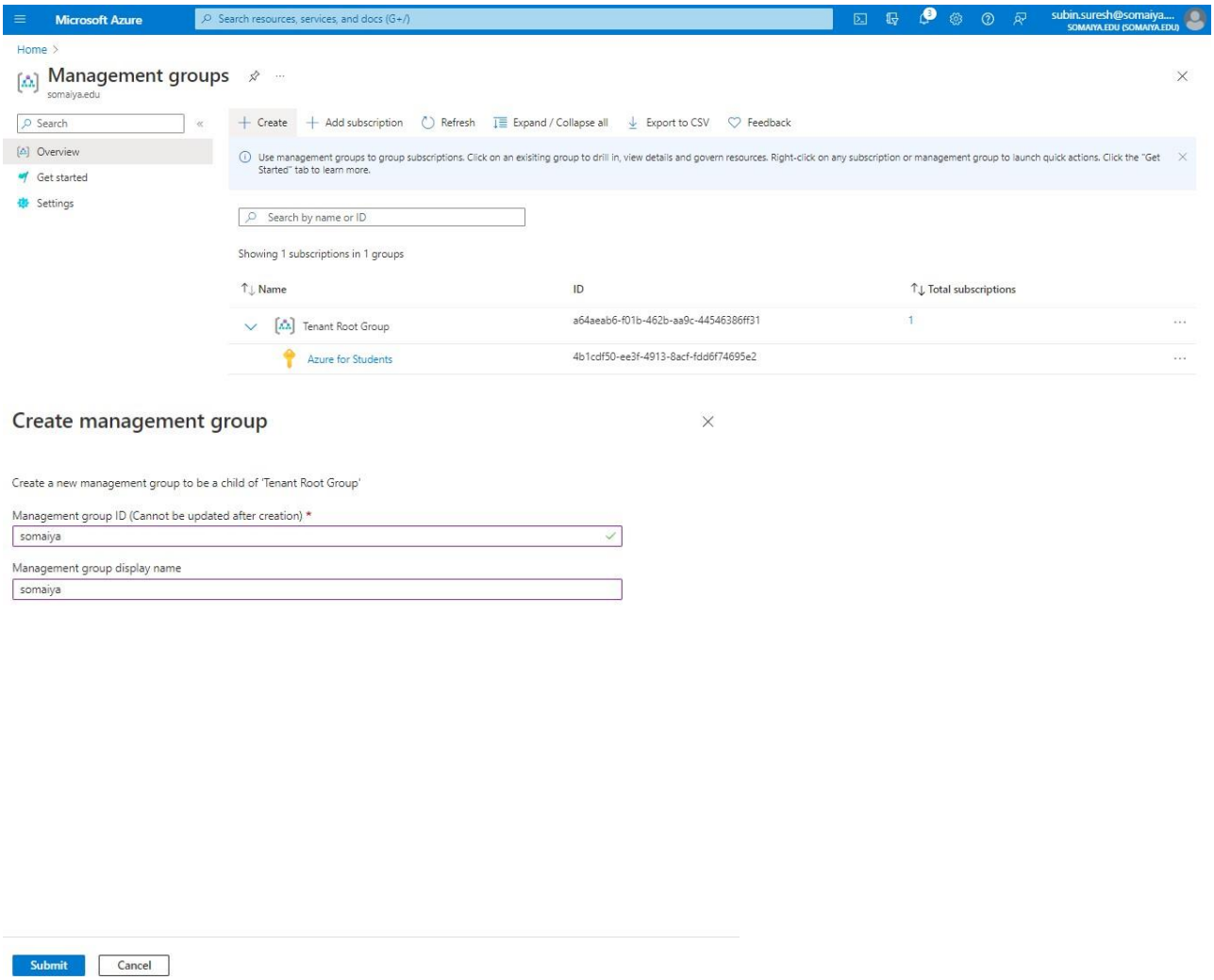
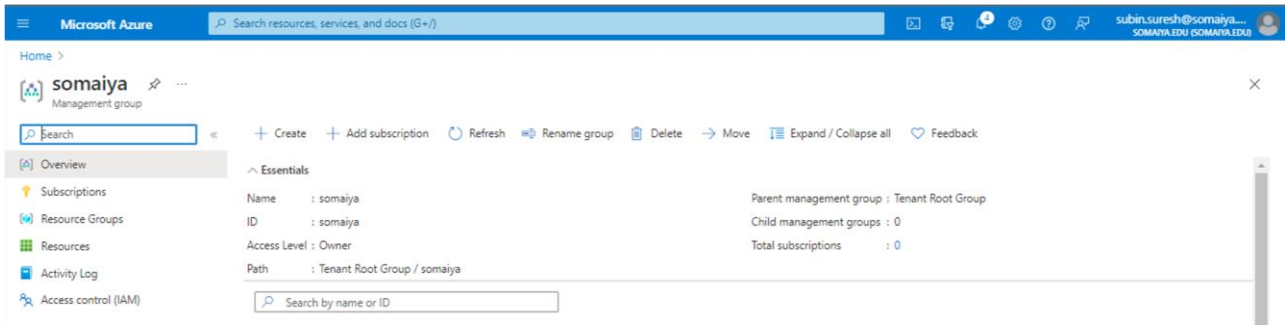
Practical No: 7

User management in cloud

Step 1: From home page search for management groups and click on create

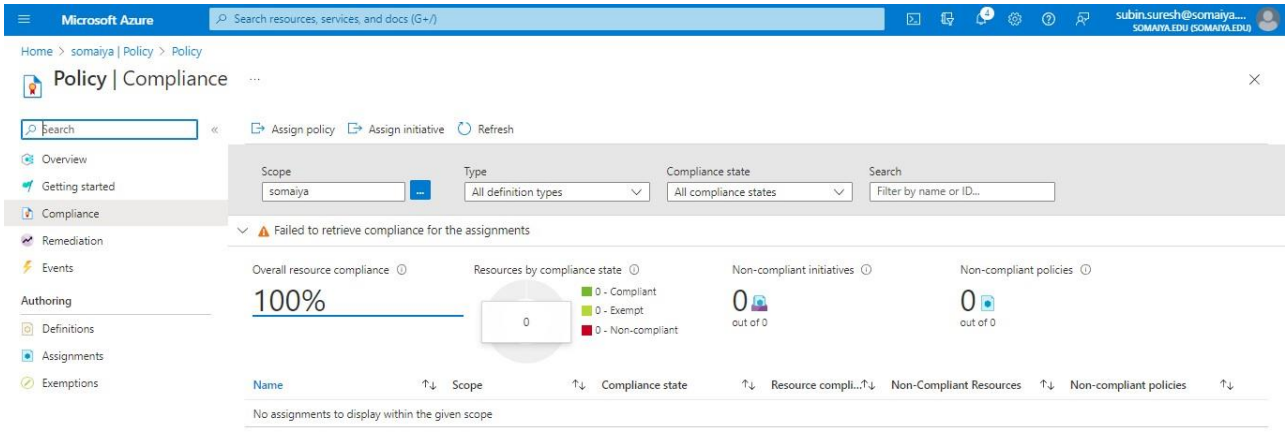


Step 2: After creating, click on that. On the left side click on policy.

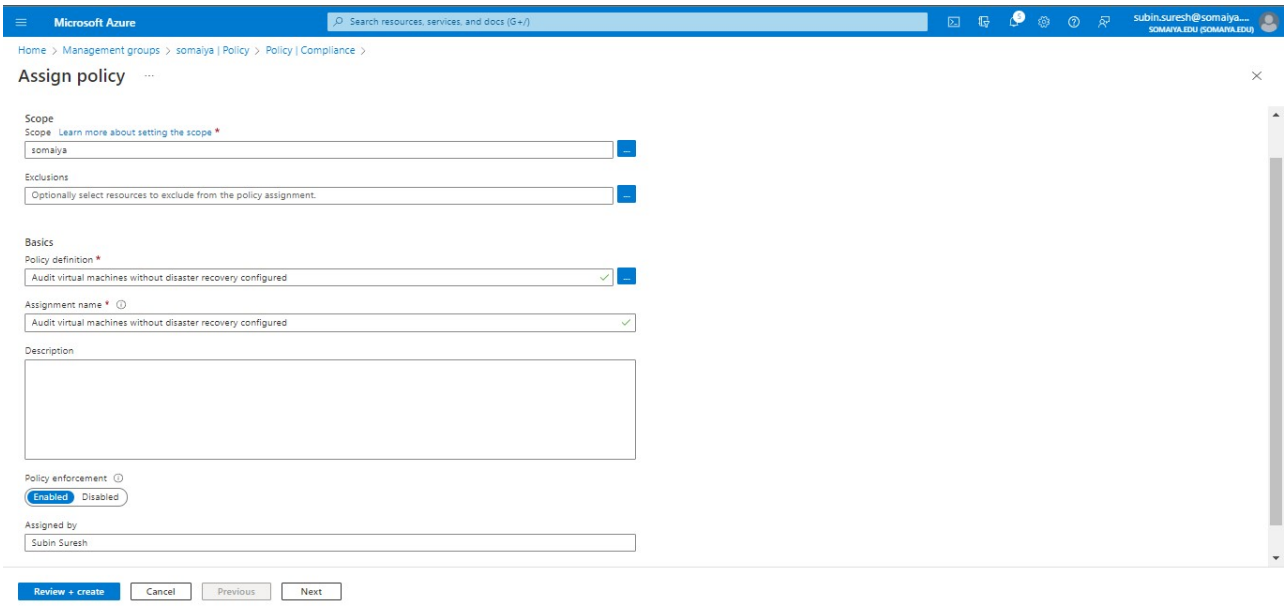


Step 3: choose policy

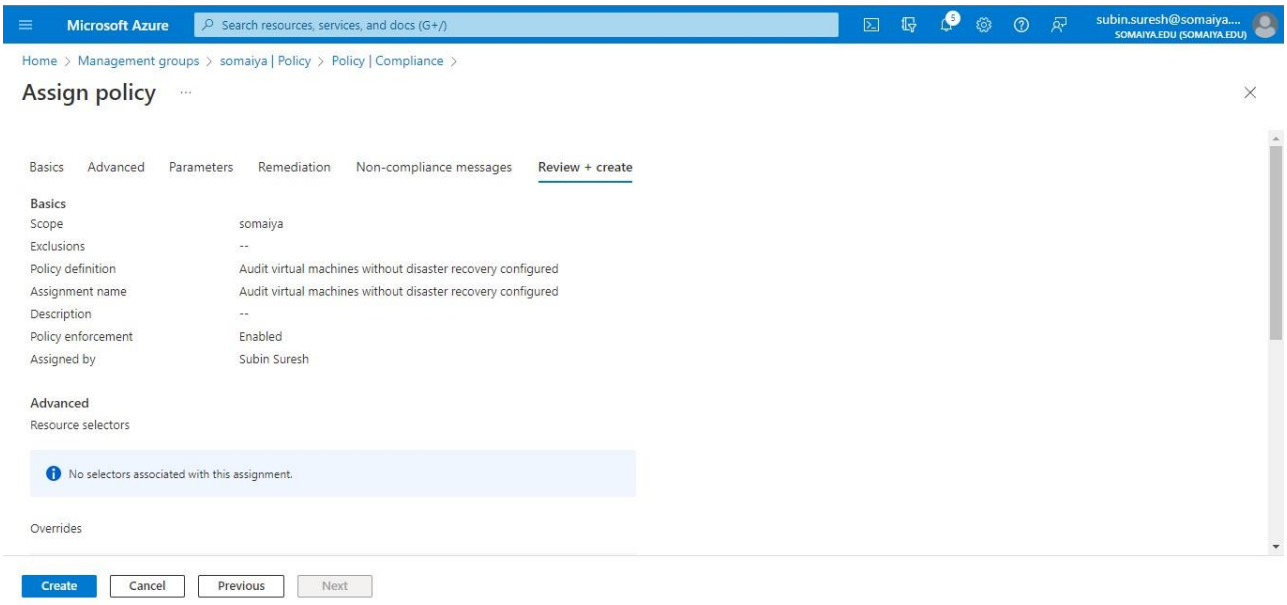
Step 4: After choosing policy, click on assign policy



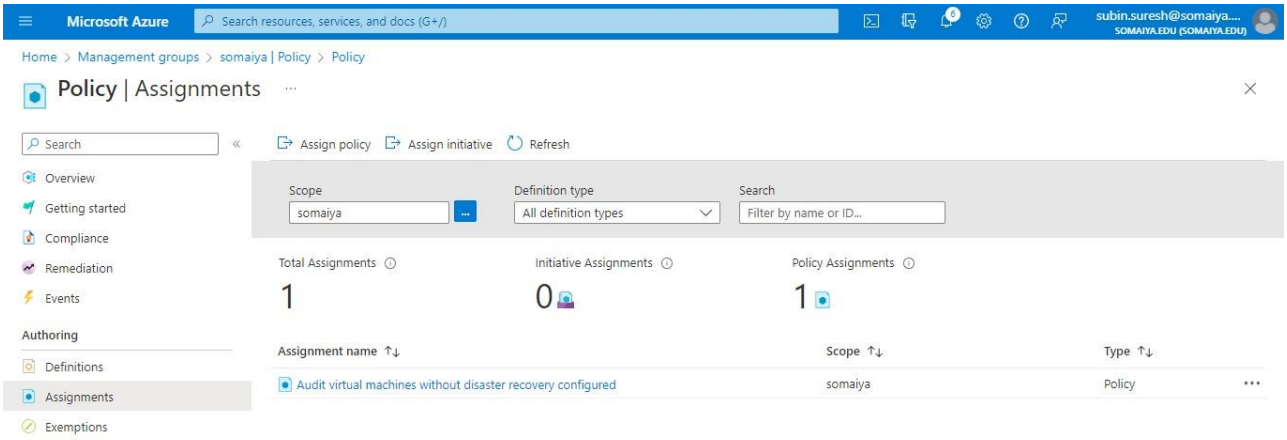
Step 5: Click on basis and add first option and then click on review + create



Step 6: Click on create.



Step 7: Click on Assignments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Policy | Assignments
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Compliance
Remediation
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Exemptions
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Definition type
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Total Assignments
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Initiative Assignments
0
Policy Assignments
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Assignment name
Scope
Type
Audit virtual machines without disaster recovery configured
somaiya
Policy

Practical No: 8

Case study on Amazon EC2

Abstract

A tremendous growth in user data has led to design and development of a number of analytic tools. To support such tools, efficient cloud computing services have become the need of the hour. This paper studies Amazon Web Services, a popular cloud computing platform. The paper provides an overview of features of the platform such as AWS security and identify, computation, storage, content delivery, etc.

Introduction

A rapid growth of network usage has led to an increasing transmission of user data over it. User data not only exposes what users want but also provides an insight into how users think and behave. Amazon Web Services (AWS) is a collection of cloud computing services, also called services that make up a cloud-computing platform offered by Amazon.com. These services operate from 12 geographical regions across the world. The most central and well-known of these services arguably include Amazon Elastic Compute Cloud, also known as“EC2”, and Amazon Simple Storage Service, also known as “S3”. Amazonmarkets AWS as a service to provide large computing capacity more quickly and more cheaply than a client company building an actual physical server farm.

AWS Security and Identity

AWS Identity and Access Management:

AWS Identity and Access Management (IAM) is a web service that helps you securely control access to AWS resources for your users. You use IAM to control who can use your AWS resources (authentication) and what resources they can use and in what ways (authorization).

Features:

- Shared access to your AWS account
- Granular permissions
- Multi-factor authentication (MFA)
- Secure access to AWS resources for applications that run on Amazon EC2
- Identity federation
- Identity information for assurance
- PCI DSS Compliance
- Integrated with many AWS services
- Eventually Consistent
- Free to use
- AWS SDKs

AWS Certificate Manager:

AWS Certificate Manager (ACM) handles the complexity of provisioning, deploying, and managing certificates provided by ACM (ACM Certificates) for your AWS-based websites and applications. You use ACM to request and manage the certificate and then use other AWS services

to provision the ACM Certificate for your website or application. As shown by the following illustration, ACM Certificates are currently available for use with only Elastic Load Balancing and Amazon CloudFront. You cannot use ACM Certificates outside of AWS.

Features of Amazon EC2

- Virtual computing environments, known as instances.
- Preconfigured templates for your instances, known as Amazon Machine Images (AMIs), that package the bits you need for your server (including the operating system and additional software).
- Various configurations of CPU, memory, storage, and networking capacity for your instances, known as instance types.
- Secure login information for your instances using key pairs (AWS stores the public key, and you store the private key in a secure place).
- Storage volumes for temporary data that's deleted when you stop or terminate your instance, known as instance store volumes.
- Persistent storage volumes for your data using Amazon Elastic Block Store (Amazon EBS), known as Amazon EBS volumes.
- Multiple physical locations for your resources, such as instances and Amazon EBS volumes, known as regions and Availability Zones.

Practical No: 9

Case study on Amazon EC2

Abstract

Cloud computing is an emerging paradigm that provides a promise to revolutionize the way the software development industry operates. In this paper, we perform a thorough case study of Microsoft Azure, a popular cloud computing platform. We thoroughly study various key concepts and features provided by this platform. This study will provide research and in-depth understanding of various aspects of Microsoft Azure.

Introduction

Microsoft Azure is a cloud computing platform that offers a wide range of services and tools to help organizations manage and deploy applications and infrastructure in the cloud. One case study that demonstrates the benefits of Microsoft Azure is the use of the platform by the NFL. It provides both PaaS and IaaS services and supports many different programming languages, tools and frameworks, including both Microsoft-specific and third-party software and systems. Azure Storage is massively scalable, so a user can store and process hundreds of terabytes of data to support the big data scenarios required by scientific, financial analysis and media applications. Further, the user can store the small amounts of data required for a small business website. Such capabilities are also required for the development of new analytic features

Benefits of Azure Storage

Azure Storage supports clients using a diverse set of operating systems (including Windows and Linux) and a variety of programming languages (including .NET, Java, and C++) for convenient development. Azure Storage also exposes data resources via simple REST APIs, which are available to any client capable of sending and receiving data via HTTP/HTTPS.

Services Provided By Microsoft Azure: Microsoft lists over 50 Azure services including: Azure Active Directory B2C, Azure Active Directory, Azure Active Directory Domain Services, API Management, Application Gateway, Visual Studio Application Insights, App Service, Automation, Backup, Batch, BizTalk Services, CDN, Cloud Services, Azure Container Service, Data Catalog, Data Factory, Data Lake Analytics, Data Lake Store, Azure DevTest Labs, AzureDNS, DocumentDB, Event Hubs, ExpressRoute, HDInsight, Azure IoT Hub, Key Vault, Load Balancer, Machine Learning, Managed Cache Service, Media Services, Mobile Engagement, Mobile Services ,Multi-Factor Authentication, Notification Hubs, Operational Insights, Redis Cache, RemoteApp, Scheduler, Search, Security Center, Service Bus, Service Fabric, SiteRecovery, SQL Database, SQL Data Warehouse, SQL Server Stretch Database, Storage, StorSimple, Stream Analytics, Traffic Manager, Virtual Machines, Virtual Network, Visual Studio Team Services, VPN Gateway.

Key Features provided by Microsoft Azure

1.Computer:

These services provide virtual machines, containers, batch processing and remote application access.

a) App services, platform as a service (PaaS) environment letting developers easily publish and manage websites.

b) Websites, high-density hosting of websites allows developers to build sites using ASP.NET, PHP, Node.js, or Python and can be deployed using FTP, Git, Mercurial or Team Foundation Server. This feature was announced in preview form in June 2012 at the Meet Microsoft Azure event. Customers can create websites in PHP, ASP.NET, Node.js, or Python, or select from several open-source applications from a gallery to deploy. This comprises one aspect of the platform as a service (PaaS) offerings for the Microsoft Azure Platform. It was renamed to Web Apps in April 2015.

2.Networking:

This group includes virtual networks, dedicated connections and gateways, as well as services for traffic management, load balancing and domain name system (DNS) hosting.

a) Virtual Network, a hosted Virtual private network.

b) Azure DNS, a DNS domain hosting service. It provides domain name resolution services using the cloud infrastructure of Microsoft Azure. The Azure DNS services are integrated with other Azure services in terms of APIs, billing, and credentials. The Azure DNS service is built up on the highly scalable cloud infrastructure provided by Microsoft Azure. The deployment is Anycast based and the service has a high global footprint to provide faster network resolution. Azure DNS is currently open for public preview.

3. Data + Storage:

a) This category includes Database offerings for SQL and NoSQL, as well as unstructured and cached cloud storage. Azure Storage provides the flexibility and hyper-scale needed to store and retrieve large amounts of data.

b) Use Azure Blob Storage (Object Storage) to store unstructured data, such as documents and media files. Use Azure Table Storage for structured NoSQL data. Use Azure Queue Storage to reliably store messages. And use SMB-based Azure File Storage for existing or new applications—no code changes are required.

c) SQL Database, formerly known as SQL Azure Database, works to create, scale and extend applications into the cloud using Microsoft SQL Server technology. It also integrates with Active Directory and Microsoft System Center and Hadoop.

d) DocumentDB is a NoSQL database service that implements a subset of the [SQL] SELECT statement on [JSON] documents.

e) Redis Cache is a managed implementation of Redis.

f) StorSimple manages storage tasks between on-premises devices and cloud storage.

Conclusion

In this case study, we studied about a cloud computing platform: Microsoft Azure. First, we studied what is Microsoft Azure. Following this, we went through its benefits and various services provided by Microsoft Azure. Finally, we explored different features provided by Microsoft Azure like compute, data+storage,and Networking in detail.

Practical No: 10

Case study on Google Cloud

Abstract

One successful example of a company that has leveraged Google Cloud is Home Depot, the largest home improvement retailer in the United States. Home Depot has been using Google Cloud since 2018 to improve its customer experience and streamline its operations.

Introduction

Google Cloud Platform enables developers to build, test and deploy applications on Google's highly -scalable and reliable infrastructure. Choose from computing, storage and application services for your web, mobile and backend solutions.

Today Google Compute Engine is Generally Available (GA), offering virtual machines that are performant, scalable, reliable, and offer industry-leading security features like encryption of data at rest. Compute Engine is available with 24/7 support and 99.95%monthly SLA for your mission-critical workloads. We are also introducing several new features and lower prices for persistent disks and popular compute instances.

Google Cloud Platform (GCP) has emerged as a key suite of tools to power university infrastructure, research, and teaching. It provides a powerful infrastructure, data analytics, and machine learning to free institutions from the overhead of managing infrastructure, provisioning servers, and configuring networks. But, higher education institutions needed key customizations and enhancements to the service to implement and fully leverage GCP. Through the Internet2 NET+ Program Service Validation process, universities formed a collective voice to work with GCP to customize and enhance the service to meet the data demands of researchers; and the security, scalability, and integration needs of higher education institutions and the extended community.

Cloud solutions have become critical to improve operations, reduce costs, and increase the speed of service delivery at academic institutions. Google Cloud Platform (GCP) has emerged as a key suite of tools to power university infrastructure, research, and teaching. However, without key customizations for the unique needs of the academic enterprise, there were many impediments to institutions adopting, and researchers utilizing this important solution.

"The NET+ GCP service validation process has given Indiana University access to a unique offering. This includes a community of technical resources and a collaborative environment to think strategically on how to design this service offering—something we could not have done on our own. Cloud adoption is essential for our community to stay competitive in the global marketplace. We are excited to provide the GCP toolset to our teaching, learning, and research communities to see where their imaginations can take it."– Bob Flynn, Manager, Cloud Services, Indiana University.

Key features and Services:

- **Compute:** GCP provides various computing services, including virtual machines, Kubernetes, App Engine, and serverless computing options.

- **Storage:** GCP offers multiple storage options, including object storage, block storage, and file storage. It also provides backup and disaster recovery solutions.
- **Networking:** GCP provides global network infrastructure with options for virtual private cloud, load balancing, and content delivery.
- **Big Data:** GCP provides a suite of big data tools, including BigQuery, Dataflow, and Dataproc, for managing large data sets.
- **Machine Learning:** GCP offers a range of machine learning tools, including TensorFlow, AI Platform, and AutoML, to help businesses build and deploy machine learning models.
- **Security:** GCP provides multiple layers of security, including encryption, identity access management, and network security.
- **Management Tools:** GCP offers various management tools, including Cloud Console, Cloud Shell, and Cloud APIs, to help businesses manage their applications and services.

Conclusion

Google Cloud Platform offers a robust and scalable cloud computing environment for businesses and organizations to build, deploy, and manage their applications and services.