

Atria Institute of Technology



Department of Information Science and Engineering

Big Data Analytics (18CS72)

Assignment-1

SUBMITTED BY

Name: Ananya A

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Section: B

Submission Date: 27/11/2023

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Table of contents

Sl. No	Description
1	Create an EC2 Linux instance in AWS Cloud /Any cloud INSTANCE NAME - YOUR NAME INSTANCE TYPE - t2.micro/any other also. key pair name- your name storage - 10 GB Take the screenshot of instance running status Mention the private IP address and Public IP address. (Execute this program/concept and take a screenshot of the output)
2	Execute the basic Linux commands/ simple program on the instance (Execute this program and take a screenshot of the output)
3	Create the GitHub Account with your credentials, Same things stored in public repository in Github. Share the assignment in github link.

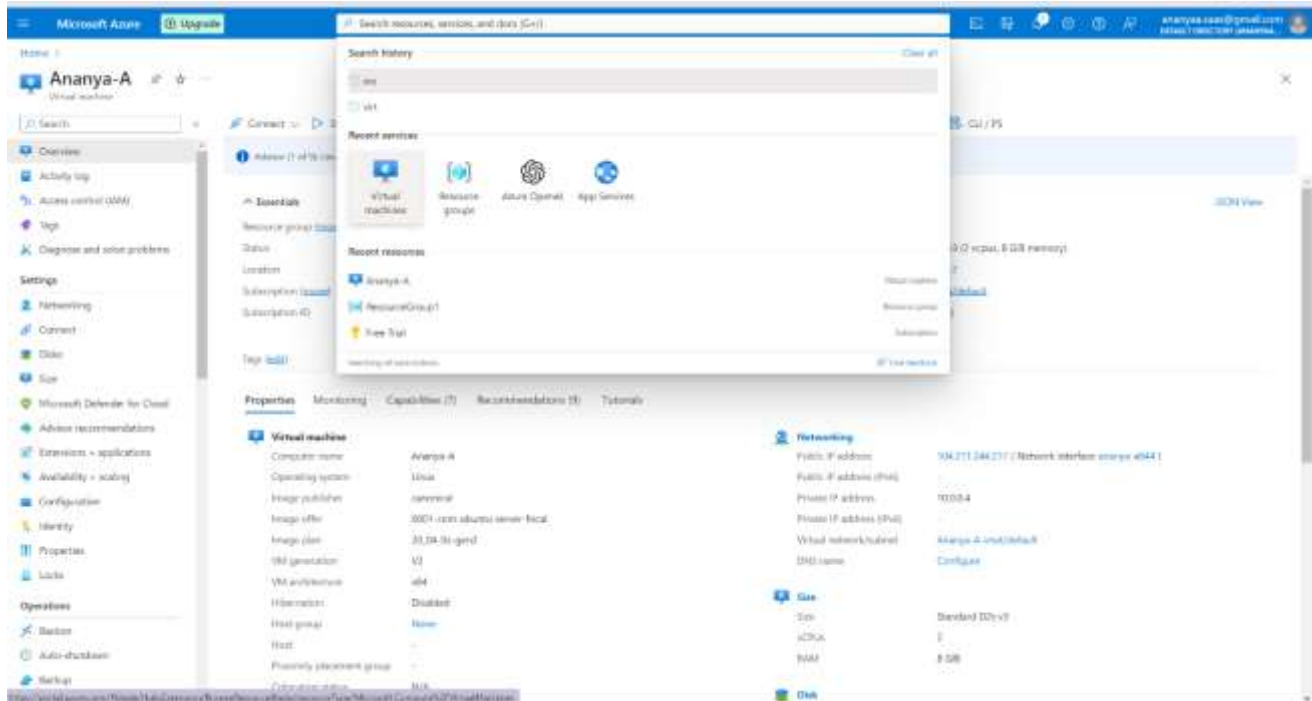
Note:

1. Minimum 10 Screenshots with proper explanation
2. Minimum no of pages – 10
3. Submit your Assignment soft copy (Word & PDF) to anandakumar.ks@atria.edu.
Subject Line in mail: Student_Name_USN_BDA_Assignment1
4. Share your assignment Github link in Assignment Document.
5. Submit Assignment on or before **27th Nov 2023**.

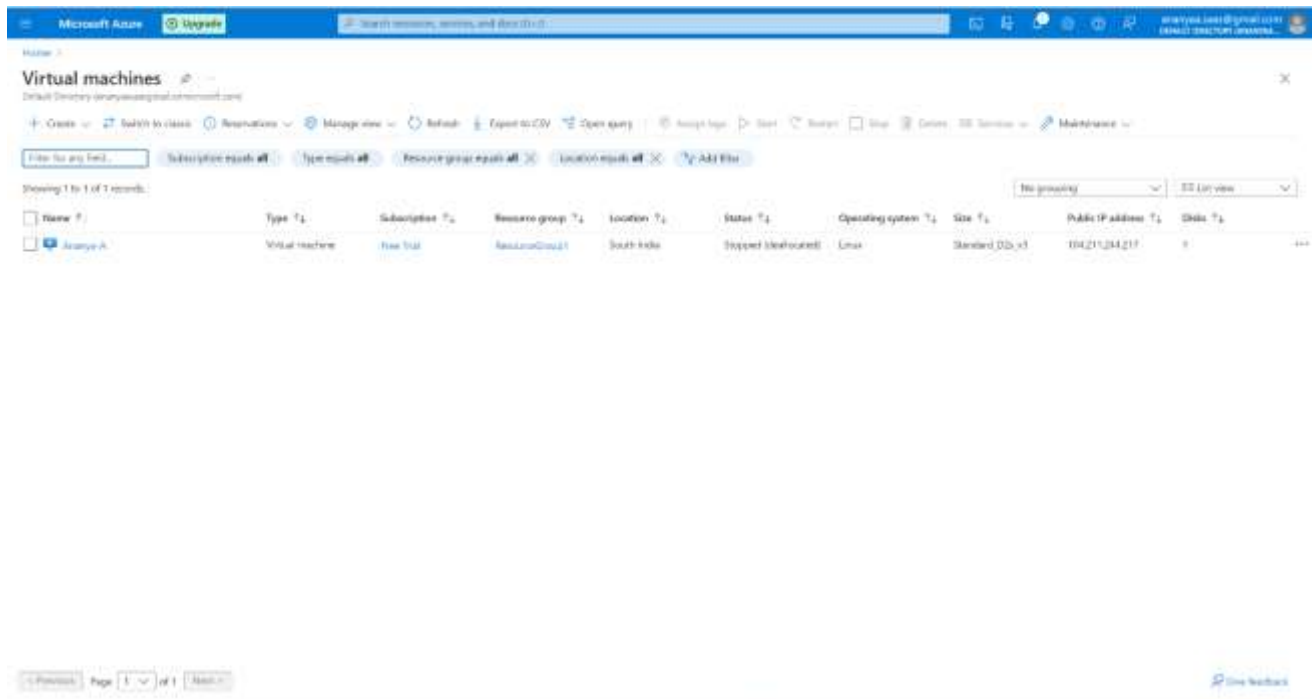
01 - Instance Creation

Virtual Machine instance created in Microsoft Azure

1. Search for Virtual Machine and create



2. Click on the create option.



3. Create or choose the existing resource group, choose a region, security type, image/ OS, virtual machine architecture.

Provide a name for virtual machine.

The screenshot shows the 'Create a virtual machine' page in the Microsoft Azure portal. The 'Basics' tab is selected. The page includes a navigation bar with 'Home', 'Virtual machines', and 'Upgrade'. A search bar is at the top right. The main content area has a 'Create a virtual machine' title and a 'Review + create' button. Below the title, there are tabs for 'Basics', 'Disks', 'Networking', 'Management', 'Monitoring', 'Advanced', 'Tags', and 'Review + create'. A note states: 'This subscription may not be eligible to deploy VMs in certain regions.' The 'Project details' section asks to select a subscription and resource group. The 'Instance details' section includes fields for 'Virtual machine name', 'Region', 'Availability options', 'Security type', 'Image', and 'VM architecture'. The 'Review + create' button is highlighted in blue.

4. Choose your preferred size of the VM, authentication type. In case of SSH public key authentication generate a key-pair or choose from the existing values.

The screenshot shows the 'Create a virtual machine' page in the Microsoft Azure portal, specifically the 'Authentication' section. The 'Basics' tab is selected. The page includes a navigation bar with 'Home', 'Virtual machines', and 'Upgrade'. A search bar is at the top right. The main content area has a 'Create a virtual machine' title and a 'Review + create' button. Below the title, there are tabs for 'Basics', 'Disks', 'Networking', 'Management', 'Monitoring', 'Advanced', 'Tags', and 'Review + create'. A note states: 'You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. Learn more.' The 'Size' dropdown is set to 'Standard_DS2_v2'. The 'Enable Hyper-V' checkbox is checked. The 'Authentication type' is set to 'SSH public key'. A note states: '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.' The 'Username' is set to 'azureuser'. The 'SSH public key source' is set to 'Generate new key pair'. The 'Key pair name' is set to 'AzureKey'. The 'Review + create' button is highlighted in blue.

5. Fill the requirements related to Disks.

- i) OS disk size.
- ii) OS disk type.
- iii) Key management.
- iv) Advanced settings.

Microsoft Azure | Upgrade | Search resources, services, and docs (Ctrl+Q)

Home > Virtual machines > Create a virtual machine

Basics | **Disks** | Networking | Management | Monitoring | Advanced | Tags | Review > create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#) >

VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ☒

Encryption at host is not supported for the selected subscription. [Learn more about available OS features](#) >

OS disk

OS disk size

OS disk type *

Delete with VM ☒

Key management

Enable Ultra Disk compatibility ☐

Ultra disk is not supported with selected security type.

Data disks for Ananya-A

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

LUN	Name	Size (GB)	Disk type	Host caching	Delete with VM
-----	------	-----------	-----------	--------------	----------------

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

[Review > create](#) [< Previous](#) [Next > Networking](#) [Give feedback](#)

Microsoft Azure | Upgrade | Search resources, services, and docs (Ctrl+Q)

Home > Virtual machines > Create a virtual machine

Basics | **Disks** | Networking | Management | Monitoring | Advanced | Tags | Review > create

OS disk

OS disk size

OS disk type *

The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM ☒

Key management

Enable Ultra Disk compatibility ☐

Ultra disk is not supported with selected security type.

Data disks for Ananya-A

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

LUN	Name	Size (GB)	Disk type	Host caching	Delete with VM
-----	------	-----------	-----------	--------------	----------------

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

Advanced

Use managed disks ☒

Ephemeral OS disk ☒ ☐ None ☐ OS cache placement ☐ Temp disk placement

The selected image is too large for the temp disk of the selected instance.

[Review > create](#) [< Previous](#) [Next > Networking](#) [Give feedback](#)

6. Fill out the networking requirements of your virtual machine. It is important to choose right port numbers for accessing.

The screenshot shows the 'Networking' tab of the 'Create a virtual machine' wizard in the Microsoft Azure portal. The page is titled 'Create a virtual machine' and has tabs for 'Basics', 'Disks', 'Networking', 'Management', 'Monitoring', 'Advanced', 'Tags', and 'Review + create'. The 'Networking' tab is active, showing options for configuring the network interface. The 'Virtual network' is set to 'Azure-6-vnet', the 'Subnet' is 'default (10.0.0.0/24)', and the 'Public IP' is 'Create new'. The 'NIC network security group' is set to 'None', and the 'Public inbound ports' are set to 'Allow selected ports'. The 'Select inbound ports' dropdown is set to 'SSH (22)'. A warning message states: 'This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced options in the Networking tab to create rules to limit inbound traffic to known IP addresses.' The 'Delete public IP and NIC when VM is' checkbox is unchecked. The 'Review + create' button is highlighted in blue.

7. Check the requirements of Management options like backup, auto shutdown.

The screenshot shows the 'Management' tab of the 'Create a virtual machine' wizard in the Microsoft Azure portal. The page is titled 'Create a virtual machine' and has tabs for 'Basics', 'Disks', 'Networking', 'Management', 'Monitoring', 'Advanced', 'Tags', and 'Review + create'. The 'Management' tab is active, showing options for configuring management options for the VM. The 'Microsoft Defender for Cloud' section indicates that the subscription is protected by Microsoft Defender for Cloud basic plan. The 'Identity' section has 'Disable system assigned managed identity' unchecked. The 'Azure AD' section has 'Login with Azure AD' unchecked, with a note that 'RBAC role assignment of Virtual Machine Administrator Login or Virtual Machine User Login is required when using Azure AD login'. The 'Auto-shutdown' section has 'Enable auto shutdown' unchecked. The 'Backup' section has 'Enable backup' unchecked. The 'Guest OS updates' section is visible at the bottom. The 'Review + create' button is highlighted in blue.

8. Check for advanced requirements for your virtual machine.

The screenshot shows the 'Create a virtual machine' wizard in the Microsoft Azure portal, specifically the 'Advanced' tab. The breadcrumb navigation at the top reads 'Home > Virtual machines > Create a virtual machine'. The 'Advanced' tab is selected, and the sub-header is 'Add additional configuration, agents, scripts or applications as virtual machine extensions or cloud-init'. The 'Extensions' section explains that extensions provide pre-deployed configurations and automation, with a link to 'Select an extension to install'. The 'VM applications' section states that VM applications contain application files that are securely and reliably downloaded to your VM after deployment, with a link to 'Select a VM application to install'. The 'Custom data and cloud-init' section explains that users can pass a cloud-init script, configuration files, or other data into the virtual machine while it is being provisioned, with a link to 'Learn more about custom data for VMs'. Below this is a 'Custom data' text area. The 'User data' section explains that users can pass a script, configuration file, or other data that will be available to their applications throughout the lifetime of the virtual machine, with a link to 'Learn more about user data for VMs'. At the bottom, there are buttons for 'Review + create', '< Previous', and 'Next > Tags', along with a 'Give feedback' link.

9. Check for the tags and modify them based on your needs.

The screenshot shows the 'Create a virtual machine' wizard in the Microsoft Azure portal, specifically the 'Tags' tab. The breadcrumb navigation at the top reads 'Home > Virtual machines > Create a virtual machine'. The 'Tags' tab is selected, and the sub-header is 'Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. Learn more about tags'. A note states: 'Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.' Below this is a table with three columns: 'Name', 'Value', and 'Resource'. The 'Name' column has a text input field. The 'Value' column has a text input field. The 'Resource' column has a dropdown menu with '11 selected' and a '+' icon. At the bottom, there are buttons for 'Review + create', '< Previous', and 'Next > Review + create', along with a 'Give feedback' link.

10. Finally, review all the functionalities and configuration of your VM before creating.

The screenshot shows the 'Review + create' step of the 'Create a virtual machine' wizard in the Microsoft Azure portal. The top navigation bar includes the Microsoft Azure logo, an 'Upgrade' button, a search bar, and a user profile icon. The breadcrumb trail is 'Home > Virtual machines > Create a virtual machine'. A green banner at the top indicates 'Validation passed!'. Below this, a tabbed interface shows 'Basics', 'Disks', 'Networking', 'Management', 'Monitoring', 'Advanced', 'Tags', and 'Review + create'. A blue information box states: 'Cost given below is an estimate and not the final price. Please see Pricing calculator if the all your pricing needs.' The 'Price' section shows '1 X Standard D2s v5' by Microsoft, with a price of '16,000.21 INR/hr' and a note 'Subscription credits apply'. Below this, the 'TERMS' section contains a paragraph of legal text and a 'Name' field with the value 'Ananya A.'. The 'Preferred e-mail address' field contains 'ananyaa.sasid@gmail.com' and the 'Preferred phone number' field is empty. A yellow warning box states: 'You have set SSH port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.' At the bottom, there are 'Create', '< Previous', 'Next >', and 'Download a template for automation' buttons, along with a 'Give feedback' link.

Microsoft Azure Upgrade Search resources, services, and docs (Ctrl) ananyaa.sasid@gmail.com CONTACT SUPPORT

Home > Virtual machines > Create a virtual machine

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 see Pricing calculator if the all your pricing needs.

Price

1 X Standard D2s v5 by Microsoft
Subscription credits apply
16,000.21 INR/hr
Pricing for other VM sizes

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statements 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 agents for third-party offerings. See the Azure Marketplace terms for additional details.

Name: Ananya A.

Preferred e-mail address: ananyaa.sasid@gmail.com

Preferred phone number:

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

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

The screenshot shows the 'Basics' step of the 'Create a virtual machine' wizard in the Microsoft Azure portal. The top navigation bar is identical to the previous screenshot. The breadcrumb trail is 'Home > Virtual machines > Create a virtual machine'. A green banner at the top indicates 'Validation passed!'. Below this, the 'Basics' tab is selected. The configuration details are as follows: Subscription: Free Trial; Resource group: ResourceGroup1; Virtual machine name: Ananya A.; Region: South India; Availability options: No infrastructure redundancy required; Security type: Trusted launch virtual machines; Enable secure boot: Yes; Enable VMFS: No; Integrity monitoring: No; Image: Ubuntu Server 20.04 LTS - Gen2; VM architecture: x64; Size: Standard D2s v5 (2 vcpus, 8 GB memory); Authentication type: SSH public key; Username: ananya@VM; Key pair name: Ananya_A_key; Public inbound ports: SSH; Admin Ssh: No. Under the 'Disks' section, the configuration is: OS disk size: Image default; OS disk type: Standard SSD (LRS); Use managed disks: Yes; Delete OS disk with VM: Tracked; Supplemental OS disk: No. At the bottom, there are 'Create', '< Previous', 'Next >', and 'Download a template for automation' buttons, along with a 'Give feedback' link.

Microsoft Azure Upgrade Search resources, services, and docs (Ctrl) ananyaa.sasid@gmail.com CONTACT SUPPORT

Home > Virtual machines > Create a virtual machine

Create a virtual machine

Validation passed!

Basics

Subscription: Free Trial

Resource group: ResourceGroup1

Virtual machine name: Ananya A.

Region: South India

Availability options: No infrastructure redundancy required

Security type: Trusted launch virtual machines

Enable secure boot: Yes

Enable VMFS: No

Integrity monitoring: No

Image: Ubuntu Server 20.04 LTS - Gen2

VM architecture: x64

Size: Standard D2s v5 (2 vcpus, 8 GB memory)

Authentication type: SSH public key

Username: ananya@VM

Key pair name: Ananya_A_key

Public inbound ports: SSH

Admin Ssh: No

Disks

OS disk size: Image default

OS disk type: Standard SSD (LRS)

Use managed disks: Yes

Delete OS disk with VM: Tracked

Supplemental OS disk: No

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

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

Home > CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231204153442 | Overview

Deployment

Search

Overview | Inputs | Outputs | Template

Deployment is in progress

Deployment name: CreateVm-canonical.0001-com-ubuntu-server-f... Start time: 04/12/2023, 15:39:08
Subscription: Free Trial Correlation ID: 687056d1-9409-4246-a629-267684655342

Resource group: ResourceGroup1

Deployment details

Resource	Type	Status	Operation details
No results.			

One feedback
Tell us about your experience with deployment

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 work on Azure and be your first line of support.
Find an Azure expert >

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

Home > CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231204153442 | Overview

Deployment

Search

Overview | Inputs | Outputs | Template

Deployment succeeded

Deployment: CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231204153442 to resource group 'ResourceGroup1' was successful

Go to resource | Pin to Dashboard

Your deployment is complete

Deployment name: CreateVm-canonical.0001-com-ubuntu-server-f... Start time: 04/12/2023, 15:39:08
Subscription: Free Trial Correlation ID: 687056d1-9409-4246-a629-267684655342

Resource group: ResourceGroup1

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

One 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 >

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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 work on Azure and be your first line of support.
Find an Azure expert >

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Home > Virtual machines

Default settings

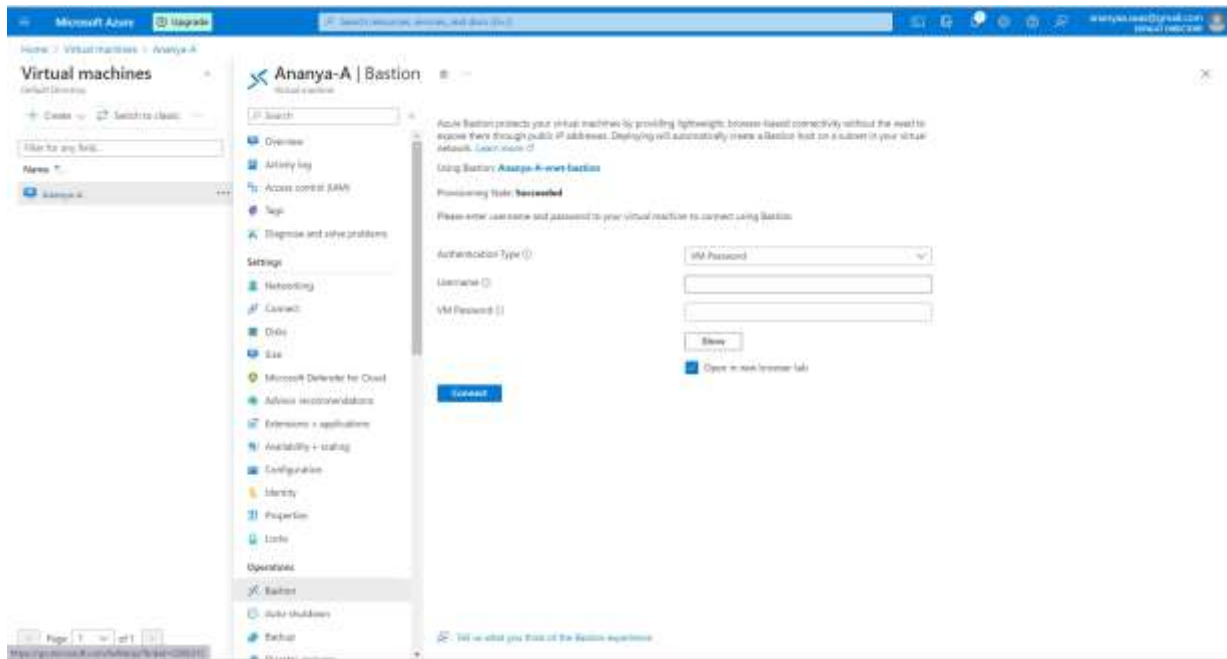
+ Create | Switch to classic | Reservations | Manage view | Refresh | Export to CSV | Open query | Assign tags | Stop | Restart | Delete | Services | Maintenance

Filter for any field: Subscription equals all | Type equals all | Resource group equals all | Location equals all | Add filter

Showing 1 out of 1 records.

Name	Type	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disks
Example-1	Virtual machine	Free trial	ResourceGroup1	South India	Running	Linux	Standard_DS5_v2	192.11.244.213	1

11. Run your VM on Bastion.



```
welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1052-azure x86_64)

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

System information as of Mon Dec  4 10:11:39 UTC 2023

System load:  0.43          Processes:    123
Usage of /:   5.2% of 28.89GB Users logged in:  0
Memory usage: 3%           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 apt update

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

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

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

ananya-a@ananya-a:~$
```

02 - Running sample Program on Linux Instance

```
ananya-aVM@Ananya-A:~$ mkdir test
ananya-aVM@Ananya-A:~$ ls
demo test
ananya-aVM@Ananya-A:~$ pwd
/home/ananya-aVM
ananya-aVM@Ananya-A:~$ ls -l
total 8
drwxrwxr-x 3 ananya-aVM ananya-aVM 4096 Dec  4 17:32 demo
drwxrwxr-x 2 ananya-aVM ananya-aVM 4096 Dec  4 17:33 test
ananya-aVM@Ananya-A:~$ cd test
ananya-aVM@Ananya-A:~/test$ pwd
/home/ananya-aVM/test
ananya-aVM@Ananya-A:~/test$ echo "Hello! this is my test directory"
Hello! this is my test directory
ananya-aVM@Ananya-A:~/test$ cd ../
ananya-aVM@Ananya-A:~$ mkdir class
ananya-aVM@Ananya-A:~$ ls -l
total 12
drwxrwxr-x 2 ananya-aVM ananya-aVM 4096 Dec  4 17:35 class
drwxrwxr-x 3 ananya-aVM ananya-aVM 4096 Dec  4 17:32 demo
drwxrwxr-x 2 ananya-aVM ananya-aVM 4096 Dec  4 17:33 test
ananya-aVM@Ananya-A:~$ rmdir demo
rmdir: failed to remove 'demo': Directory not empty
ananya-aVM@Ananya-A:~$ cd demo
ananya-aVM@Ananya-A:~/demo$ ls -l
total 4
drwxrwxr-x 2 ananya-aVM ananya-aVM 4096 Dec  4 17:32 test
ananya-aVM@Ananya-A:~/demo$ rmdir test
ananya-aVM@Ananya-A:~/demo$ ls -l
total 0
ananya-aVM@Ananya-A:~/demo$ cd ../
ananya-aVM@Ananya-A:~$ rmdir demo
ananya-aVM@Ananya-A:~$ ls -l
total 8
drwxrwxr-x 2 ananya-aVM ananya-aVM 4096 Dec  4 17:35 class
drwxrwxr-x 2 ananya-aVM ananya-aVM 4096 Dec  4 17:33 test
ananya-aVM@Ananya-A:~$
```

Commands executed:

1. ls.
2. ls -l.
3. mkdir.
4. pwd.
5. cd.
6. rmdir.

1. **ls:** The `ls` command lists the contents of the current directory. It is one of the most basic and frequently used commands in Linux. The output of the `ls` command is a list of filenames, one per line.

Here are some options that can be used with the `ls` command:

- `-a`: List all files, including hidden files.
- `-l`: List files in long format, which includes information such as the file permissions, owner, group, size, and modification time.
- `-d`: List directories as if they were files.
- `-R`: Recursively list the contents of subdirectories.

2. **ls -l:** The `ls -l` command is the same as the `ls` command, but it lists files in long format. This format includes more information about each file, such as the file permissions, owner, group, size, and modification time.

3. **mkdir:** The `mkdir` command creates a new directory. The syntax for the `mkdir` command is: `mkdir directory_name`. Where `directory_name` is the name of the directory that you want to create. For example, to create a directory called `newdir`, you would type: `mkdir newdir`

4. **pwd:** The `pwd` command prints the name of the current working directory. The current working directory is the directory that you are currently in.
For example, if you are in the directory `/home/user`, then the output of the `pwd` command would be:
`/home/user`

5. **cd:** The `cd` command changes the current working directory. The syntax for the `cd` command is: `cd directory_name`. Where `directory_name` is the name of the directory that you want to change to.
For example, to change to the directory `/home/user/Documents`, you would type: `cd Documents`.
You can also use the `cd` command to change to the parent directory by typing `cd ..`. For example, if you are in the directory `/home/user/Documents`, then typing `cd ..` will change to the directory `/home/user`.

6. rmdir: The rmdir command removes an empty directory.

The syntax for the rmdir command is: rmdir directory_name.

Where directory_name is the name of the directory that you want to remove. For example, to remove the directory newdir, you would type: rmdir newdir.

The rmdir command will only remove an empty directory. If the directory contains any files or subdirectories, then the command will fail.

Assignment Link: <https://github.com/ananya-a03/BDA-Assignment>