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Week1 Assignment
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Q1 & 2: Observe assigned Subscriptions Observe Azure Entra ID or create own Azure Entra ID in personal Azure account Create test users and groups Assign a RBAC role to user and test Create a custom role and assigned to users and test

Objective:

- View assigned Azure subscriptions
- Check Azure Entra ID (formerly Azure Active Directory)
- Create your own Azure Entra ID (if needed)
- Create test users and groups
- Assign RBAC role to a user and test
- Create a custom role and assign to a user and test

🔹 **Step-by-Step Procedure:**

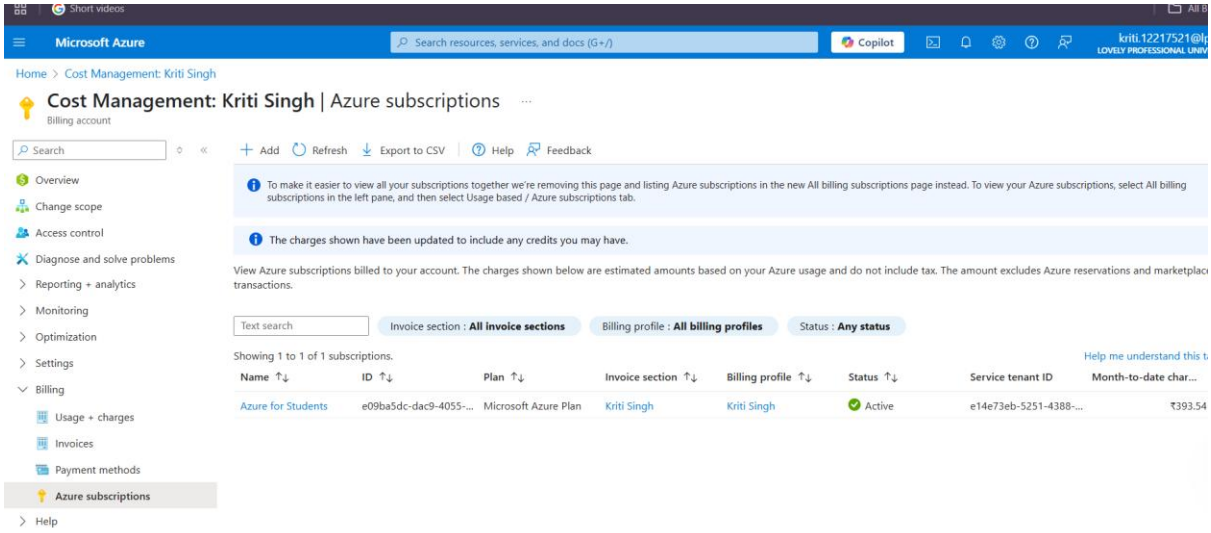
Step 1: Log into Azure Portal

- Go to: https://portal.azure.com
- Sign in with your Microsoft account.

Step 2: Observe Assigned Subscriptions

- On the left menu, click on **Subscriptions**.
- Here, you'll see the subscriptions associated with your account.
- You can check the **Subscription ID**, **Directory**, and **Billing Information**.

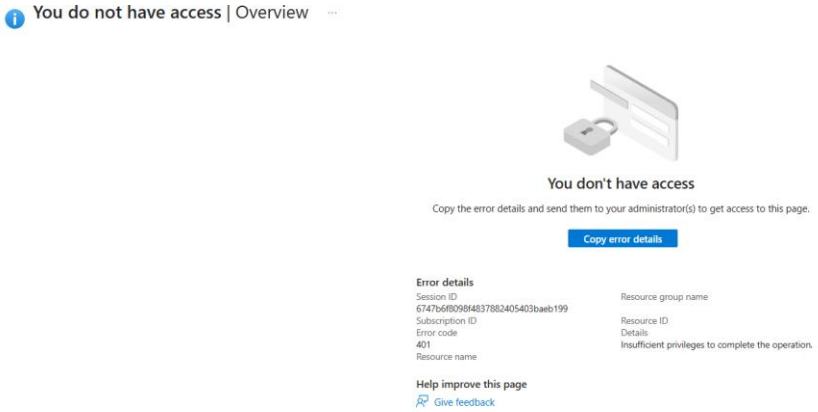
List of subscriptions visible.

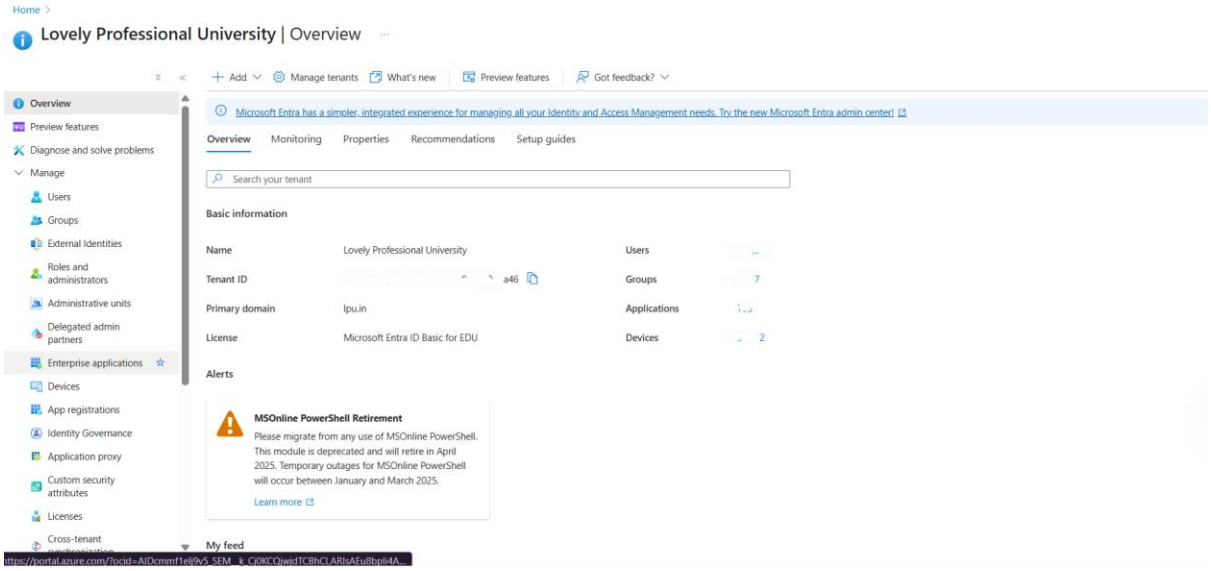


Step 3: View Azure Entra ID (AAD)

- Search for **"Azure Entra ID"** in the search bar.
- Open it and you'll see your **default directory**.
- Note the **Directory name** and **Tenant ID**.
- Note: only user administrator and global administrator can access the azure Entra id. In my case I am a student, so I am unable to access it.

Azure Entra ID Overview with error as role is student





Step 4: Create Your Own Entra ID (if needed)

- Go to **Azure Entra ID > Manage tenants > Create**.
- Choose:
    - **Type**: Azure Active Directory
    - **Name**: Your custom name (e.g., "MyTestDirectory")
    - Click **Review + Create**

Step 5: Switch to New Directory

- Click on your **user profile icon** in the top-right.
- Choose **"Switch directory"**
- Select the new directory you just created.

Step 6: Create Test Users and Groups

- Go to **Azure Entra ID > Users > + New User**
- Fill in:
    - **Username**: testuser1
    - **Name**: Test User One
    - **Password**: Auto-generate or custom
- Create a second user similarly (testuser2)
- Now create a group:
    - Go to **Groups > + New Group**
    - Group Type: Security
    - Name: "TestGroup"
    - Add members: Add the users you just created

Step 7: Assign a Built-in RBAC Role to User

- Go to **Subscriptions > Your Subscription**
- Click on **Access Control (IAM)**
- Click **+ Add > Add role assignment**
- Select:
    - **Role**: Reader

    - **Assign access to**: User
    - **Select members**: Choose "testuser1"
- Click **Review + Assign**

Step 8: Create a Custom Role

- Go to **Subscriptions > Access Control (IAM) > Roles > + Add Custom Role**
- Define:
    - **Name**: MyCustomReader
    - **Permissions**: Select only Microsoft.Resources/subscriptions/read
- Assign to **testuser2** using the same IAM > Add role assignment.

Q3: Create Virtual maching and Vnet from Azure CLI

Answer:

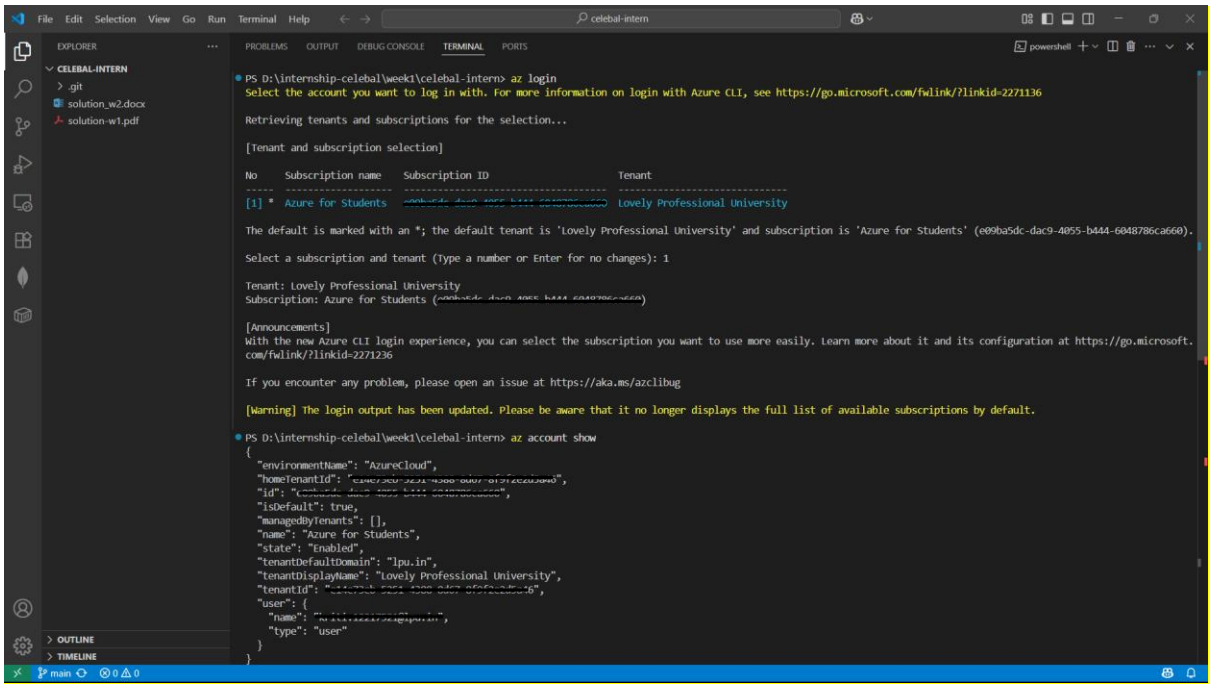
Goal:

We will use Azure CLI to:

- **Create a resource group**
- **Create a Virtual Network (VNet) and subnet**
- **Create a Linux Virtual Machine**
- **Verify the setup**

Prerequisites:

- **Logged into Azure Portal with your student account**
- **Azure CLI installed and signed in (az login)**

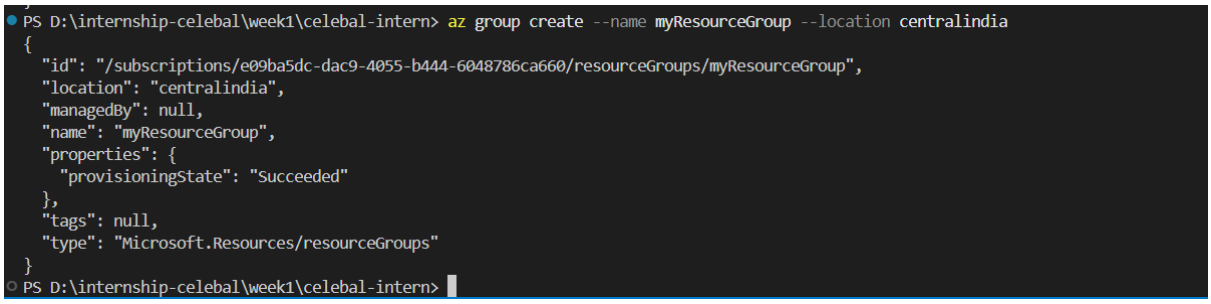


Step 1: Create a Resource Group

"Now, I will create a resource group in the Central India region where all my resources will be organized."

az group create --name myResourceGroup --location centralindia

Terminal after running this command (show the success JSON output with "provisioningState": "Succeeded")

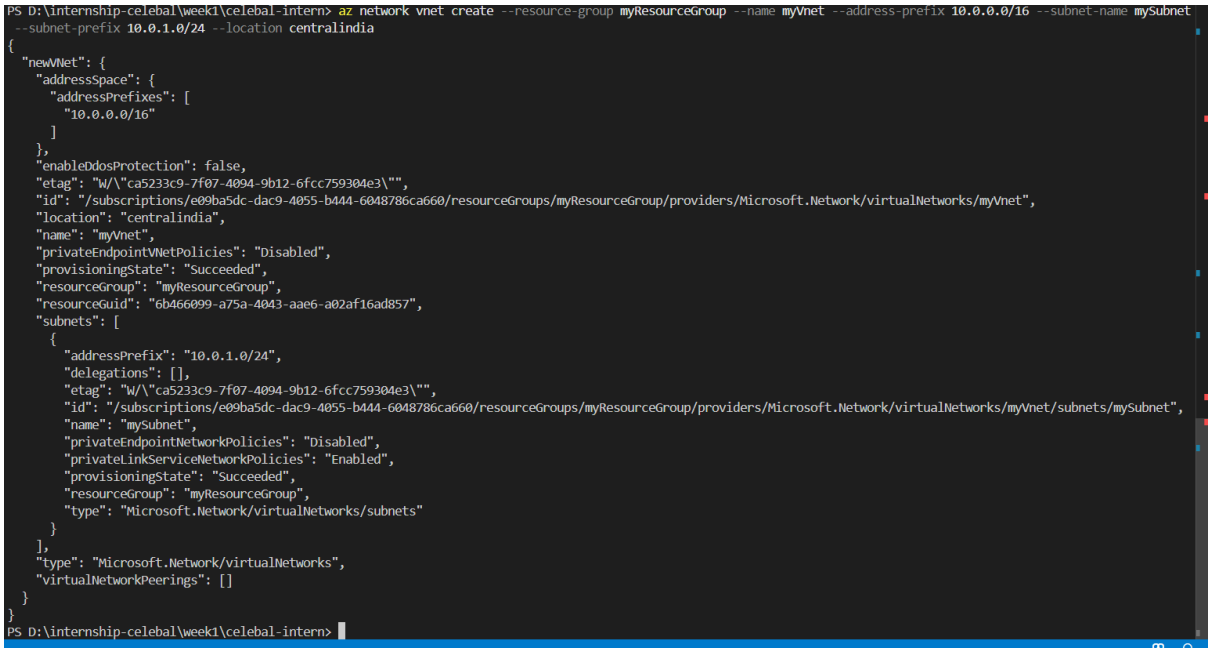


Step 2: Create a Virtual Network and Subnet

"Next, I will create a Virtual Network (VNet) with an address range and a default subnet inside it."

az network vnet create --resource-group myResourceGroup --name myVnet --address-prefix 10.0.0.0/16 --subnet-name mySubnet --subnet-prefix 10.0.1.0/24

Terminal output showing VNet and subnet creation (look for "provisioningState": "Succeeded" and names)



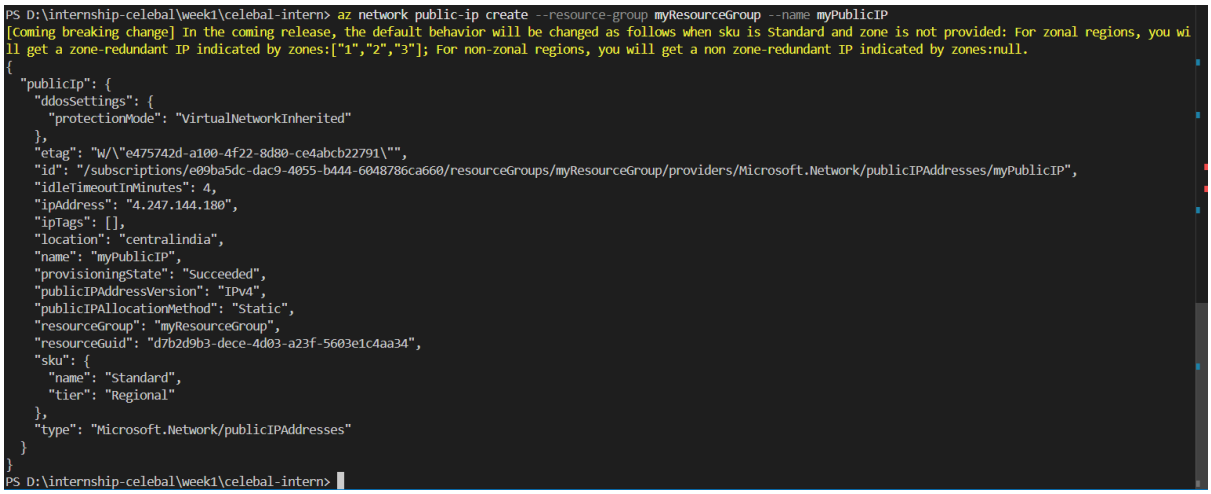
Step 3: Create a Public IP Address

"Now, I will create a public IP for the VM to connect externally."

az network public-ip create --resource-group myResourceGroup --name myPublicIP

Note: we can add location to avoid non zone-redundant IP

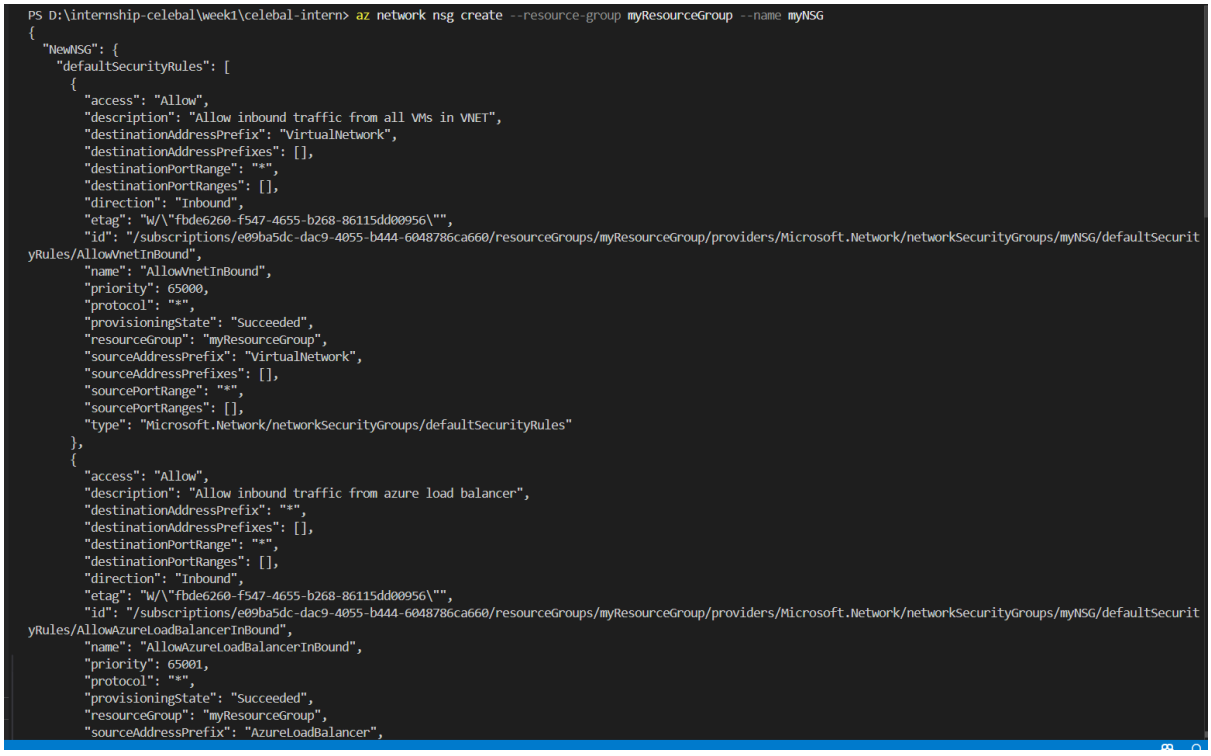
Output JSON showing the ipAddress and "provisioningState": "Succeeded"



Step 4: Create a Network Security Group (NSG) and Rule

"Next, I'll secure the VM with a Network Security Group and allow SSH access (port 22)."

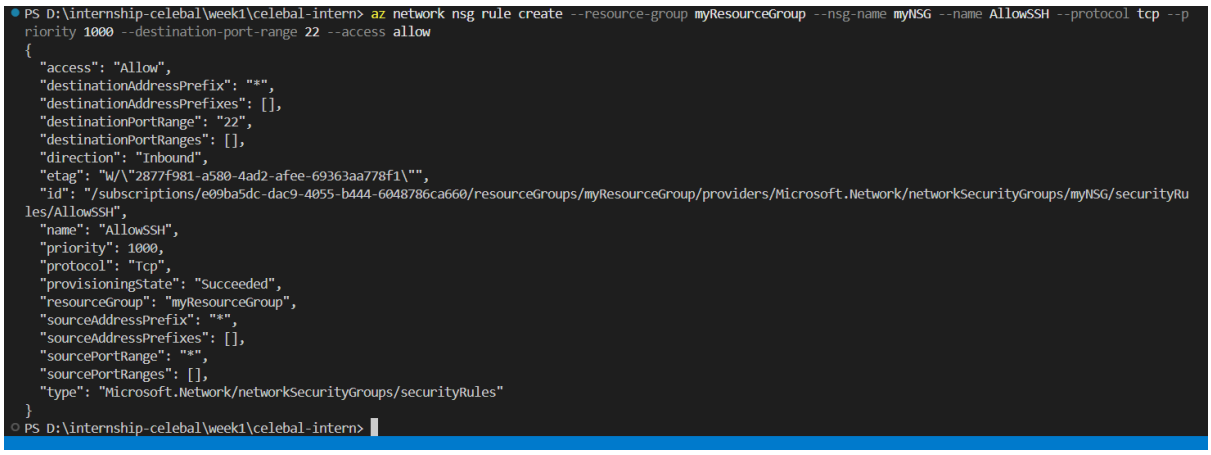
```
az network nsg create \
  --resource-group myResourceGroup \
  --name myNSG
```




```
az network nsg rule create \
  --resource-group myResourceGroup \
  --nsg-name myNSG \
```

```
  --name AllowSSH \
  --protocol tcp \
  --priority 1000 \
  --destination-port-range 22 \
  --access allow
```

NSG and rule creation outputs (especially AllowSSH rule shown in JSON)

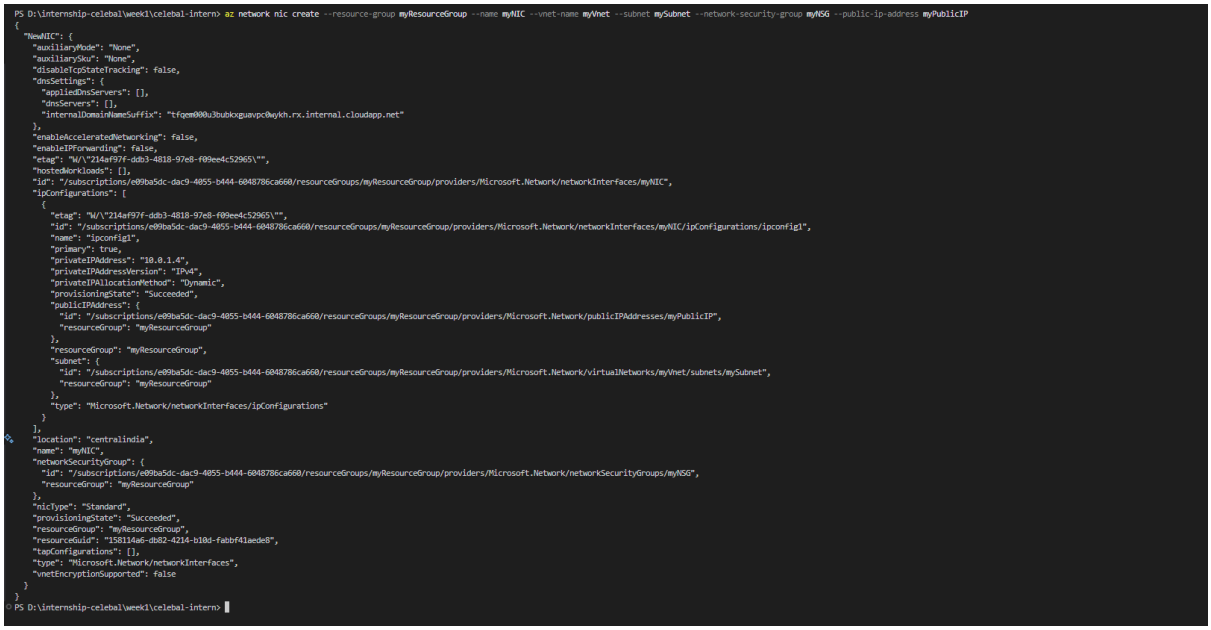


Step 5: Create a NIC (Network Interface)

"Now, I will create a network interface and attach the subnet, NSG, and public IP to it."

```
az network nic create \
  --resource-group myResourceGroup \
  --name myNIC \
  --vnet-name myVnet \
  --subnet mySubnet \
  --network-security-group myNSG \
  --public-ip-address myPublicIP
```

Terminal output showing "provisioningState": "Succeeded" and NIC name



Step 6: Create the Virtual Machine

"Finally, I'll create a Linux virtual machine and attach the NIC to it. I'll also define a username and generate SSH keys."

az vm create --resource-group myResourceGroup --name myVM --nics myNIC --image UbuntuLTS --admin-username azureuser --generate-ssh-keys

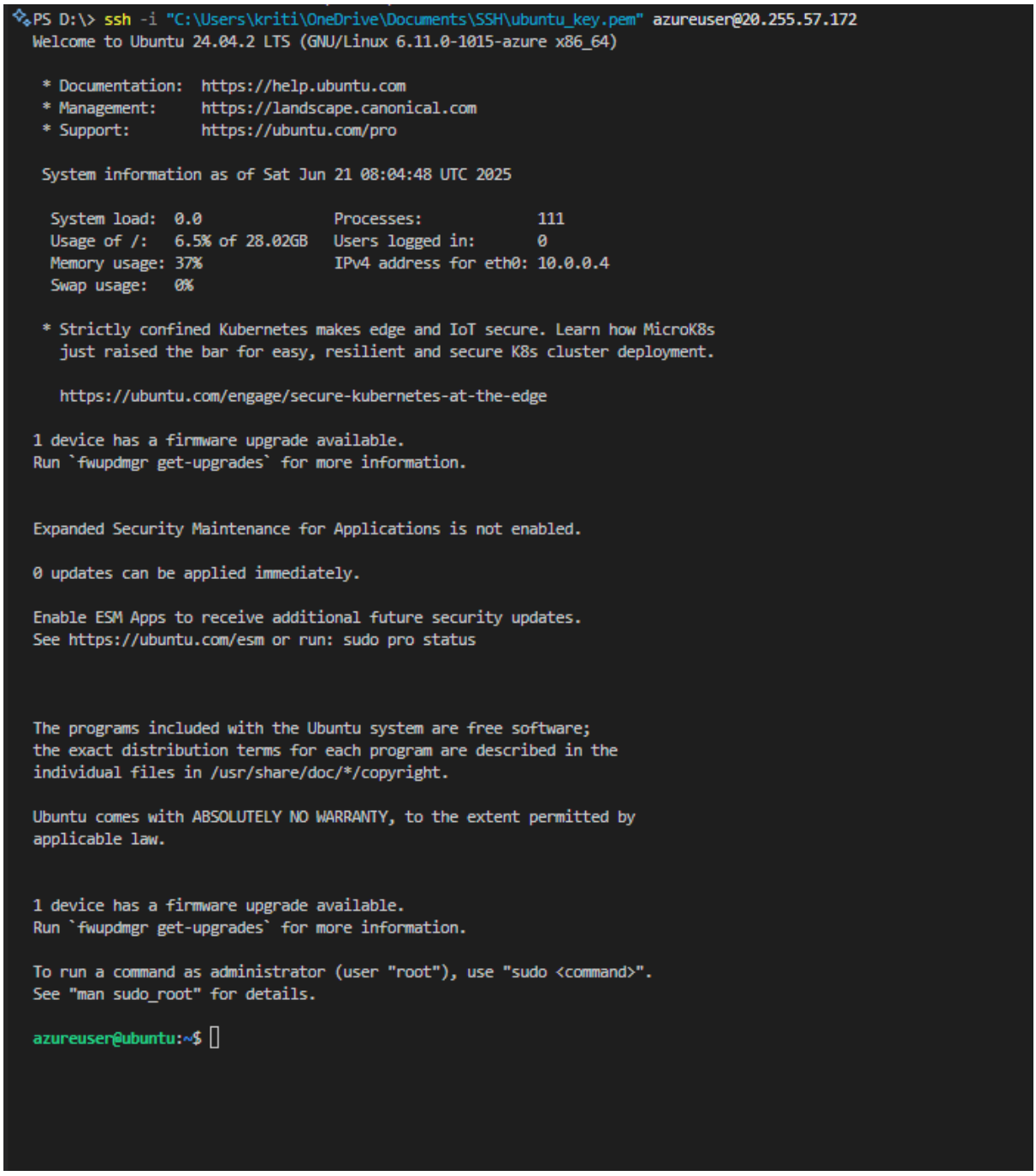
I can create new vm using above command but I am using previously built vm here

- az vm list –output table (to see the list of vm)
- az vm show --name ubuntu --resource-group AZURELINUX_GROUP --show-details --query publicIps --output tsv (to see the ip address you can see it on portal also)

Step 7: Connect to the VM

- ssh -i "C:\Users\kriti\OneDrive\Documents\SSH\ubuntu_key.pem" azureuser@20.255.57.172 (for this you should have ssh file)

Terminal after successful SSH connection into Ubuntu VM (Welcome to Ubuntu message)



4: Create and Assign a Policy at Subscription Level

Goal:

- **Create a built-in policy (e.g., "Allowed Locations")**

- **Assign it at the subscription level to restrict resource creation to Central India**

🔹 Step 1: List All Built-in Policies

az policy definition list --query "[?contains(displayName, 'Allowed locations')].{Name:displayName, ID:id}" --output table

Show the list with the "Allowed locations" policy ID

```
PS D:\internship-celebal\week1\celebal-intern> az policy definition list --query "[?contains(displayName, 'Allowed locations')].{Name:displayName, ID:id}" --output table
Name                                ID
----------------------------------  ------------------------------------------------------------------------------------
Allowed locations                   /providers/Microsoft.Authorization/policyDefinitions/e56962a6-4747-49cd-b67b-bf8b01975c4c
Allowed locations for resource groups  /providers/Microsoft.Authorization/policyDefinitions/e765b5de-1225-4ba3-bd56-1ac6695af988
```

🔹 Step 2: Assign the Policy

**az policy assignment create **
**--name "AllowOnlyCentralIndia" **
**--display-name "Only Central India Allowed" **
**--scope /subscriptions/<subscription-id> **
**--policy <policy-definition-id> **
--params '{"listOfAllowedLocations": {"value": ["centralindia"]}}'

Replace:

- **<subscription-id> with your actual subscription ID**
- **<policy-definition-id> with the built-in policy ID you copied above**

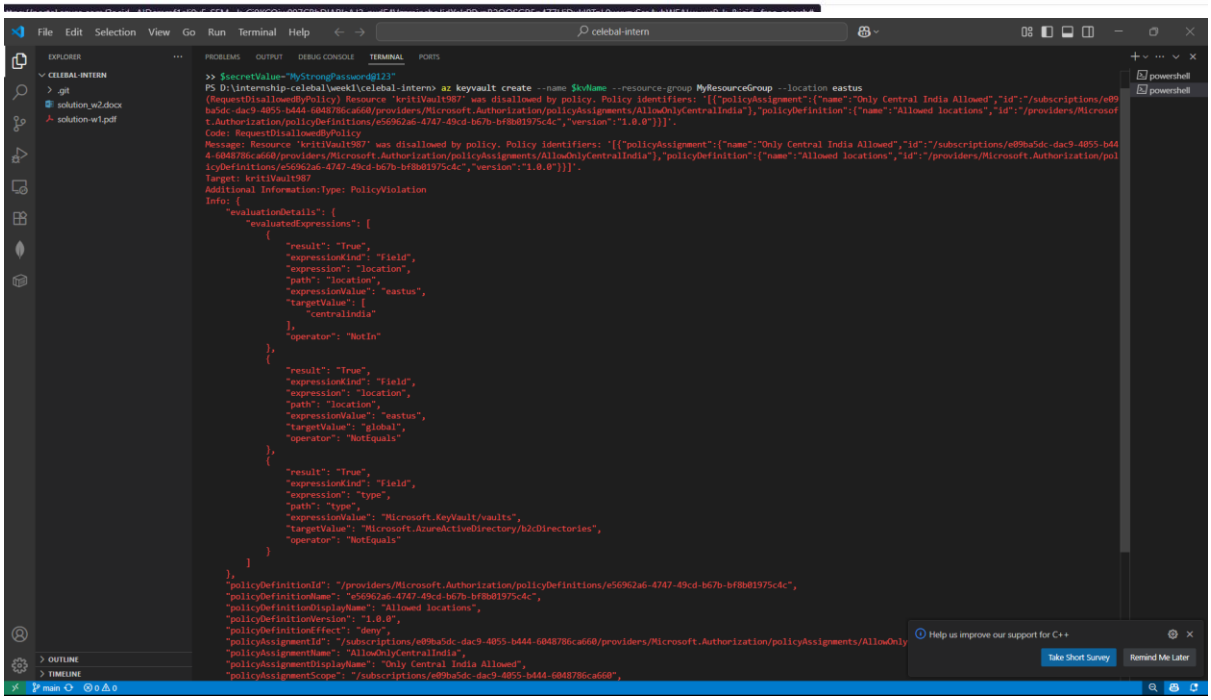
Policy assignment success JSON output

```
The provided JSON string may have been parsed by the shell. See https://learn.microsoft.com/cli/azure/use-azure-cli-successfully-quoting#json-strings
PowerShell requires additional quoting rules. See https://github.com/Azure/azure-cli/blob/dev/doc/quoting-issues-with-powershell.md
PS D:\internship-celebal\week1\celebal-intern> az policy assignment create `
>>   --name "AllowOnlyCentralIndia" `
>>   --display-name "Only Central India Allowed" `
>>   --scope "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660" `
>>   --policy "e56962a6-4747-49cd-b67b-bf8b01975c4c" `
>>   --params '{\"listOfAllowedLocations\": {\"value\": [\"centralindia\"]}}'
Readonly attribute scope will be ignored in class <class 'azure.mgmt.resource.policy.v2021_06_01.models._models_py3.PolicyAssignment'>
{
  "description": null,
  "displayName": "Only Central India Allowed",
  "enforcementMode": "Default",
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/providers/Microsoft.Authorization/policyAssignments/AllowOnlyCentralIndia",
  "identity": null,
  "location": null,
  "metadata": {
    "createdBy": "956cc40c-bd7b-4697-9e44-f7aca2d3c523",
    "createdOn": "2025-06-21T08:32:28.8301246Z",
    "updatedBy": null,
    "updatedOn": null
  },
  "name": "AllowOnlyCentralIndia",
  "nonComplianceMessages": null,
  "notScopes": null,
  "parameters": {
    "listOfAllowedLocations": {
      "value": [
        "centralindia"
      ]
    }
  },
  "policyDefinitionId": "/providers/Microsoft.Authorization/policyDefinitions/e56962a6-4747-49cd-b67b-bf8b01975c4c",
  "scope": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660",
  "systemData": {
    "createdAt": "2025-06-21T08:32:28.795190+00:00",
    "createdBy": "kriti.12217521@lpu.in",
    "createdByType": "User",
    "lastModifiedAt": "2025-06-21T08:32:28.795190+00:00",
    "lastModifiedBy": "kriti.12217521@lpu.in",
    "lastModifiedByType": "User"
  },
  "type": "Microsoft.Authorization/policyAssignments"
}
PS D:\internship-celebal\week1\celebal-intern>
```

- **Step 3: Test It**

Try to create a resource in East US from the portal or CLI — it should fail due to the policy.

Error message in portal or CLI (e.g., "disallowed by policy")



5. Azure Key Vault: Create, Store Secret, Configure Access, Retrieve via CLI

Variables

kvName="MyKeyVault"

secretName="MySecret"

secretValue="MySecretValue"

```
PS D:\internship-celebal\week1\celebal-intern> $kvName="kritiVault987"
>> $secretName="DbPassword"
>> $secretValue="MyStrongPassword@123"
```

Create Key Vault

az keyvault create --name $kvName --resource-group $resourceGroup --location $location

Add Secret

az keyvault secret set --vault-name $kvName --name $secretName --value $secretValue

Set Policy to allow current user to get secrets

az keyvault set-policy --name $kvName --secret-permissions get list --object-id $(az ad signed-in-user show --query objectId -o tsv)

Retrieve the secret

az keyvault secret show --vault-name $kvName --name $secretName --query value -o tsv

6. Create VM using PowerShell

Login

Connect-AzAccount

Variables

$rg = "MyResourceGroup"
$location = "EastUS"
$vmName = "MyVM"

Create resource group

New-AzResourceGroup -Name $rg -Location $location

Create credentials

$cred = Get-Credential

Create VM

New-AzVm -ResourceGroupName $rg -Name $vmName -Location $location -Credential $cred -Image "Win2019Datacenter"

7A. Schedule Daily VM Backup at 3 AM + CPU Alert

1. Create Recovery Services Vault

```
az backup vault create \
 --resource-group $resourceGroup \
 --name "MyBackupVault" \
 --location $location
```

2. Register VM and Enable Backup

Register the VM

```
az backup protection enable-for-vm \
 --resource-group $resourceGroup \
 --vault-name "MyBackupVault" \
 --vm "$vmName" \
 --policy-name "DefaultPolicy"
```

3. Create Alert Rule for CPU > 80%

```
az monitor metrics alert create \
 --name "HighCPUAlert" \
 --resource-group $resourceGroup \
 --scopes $(az vm show -g $resourceGroup -n $vmName --query id -o tsv) \
 --condition "avg Percentage CPU > 80" \
 --description "CPU usage above 80%" \
 --action email --email-addresses your-email@example.com
```

7B. Provision Backups via Backup Center + Configure Retention

1. Backup Center Registration (CLI)

```
az backup protection enable-for-vm \
 --resource-group $resourceGroup \
 --vault-name "MyBackupVault" \
 --vm $vmName \
 --policy-name "DefaultPolicy"
```

2. Create Custom Backup Policy

```
az backup policy create \
 --resource-group $resourceGroup \
 --vault-name "MyBackupVault" \
 --name "DailyPolicy" \
 --policy
"{\"schedulePolicy\":{\"schedulePolicyType\":\"SimpleSchedulePolicy\",\"schedul
```

eRunFrequency\":\"Daily\",\"scheduleRunTimes\":[\"03:00\"]},\"retentionPolicy\":{\"retentionPolicyType\":\"SimpleRetentionPolicy\",\"dailySchedule\":{\"retentionTimes\":[\"03:00\"],\"retentionDuration\":{\"count\":30,\"durationType\":\"Days\"}}}}
"