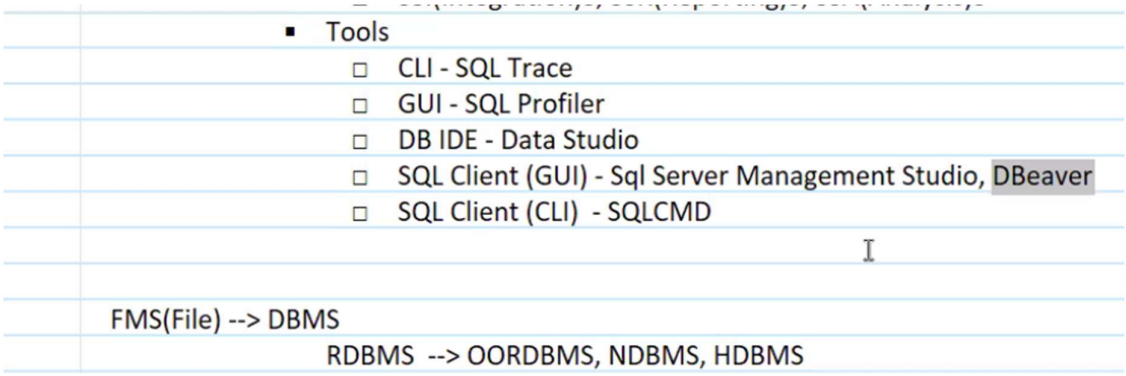
```
Intelligence = Cloud + Data + Automation

9i, 10g, 11g 12cc(10DBA) --> Auto Heal---> 18c(3/4 DBA)
```

```
Cloud:
    > Set of Services
    > Services:
        > Storage
        > Computer
            a. ServerBase
                1. Dedicated
                2. Virtualize(Shared)
                3. Containers
            b. Serverless
                1. Microservices
        > Network
            Security
```

Web Framework	Django
Database Server	SQL Server
Runtime	VM --> Serverless
VCS	Github
Editor	Online/Offline VSCode
Package Availability	1. VM(Terminal) 2. SSH Tunnel

SQL

- Query Language
- Standard (ANSI SQL)
  - Close Source :
    - MS SQL Server(Paid)
  - Open Source :
    - MySQL Server(Community)
- MS SQL Server
  - Implementation of
    - Standard SQL
    - RDBMS
    - Package for OORDBMS(BI)---> DWH(ETL) --> BigData
      - SSI(Integration)S, SSR(Reporting)S, SSA(Analysis)S
    - Tools
      - CLI - SQL Trace
      - GUI - SQL Profiler
      - DB IDE - Data Studio
      - SQL Client (GUI) - Sql Server Management Studio



Data

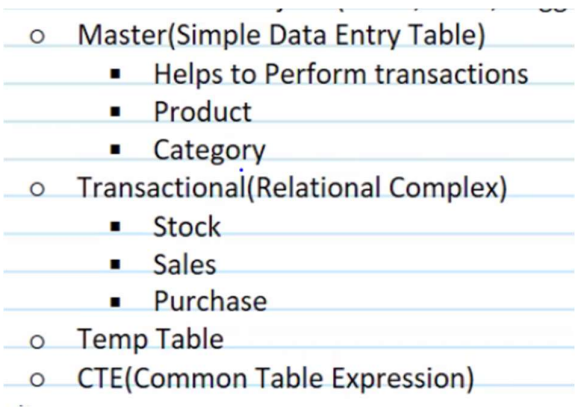
1. Traditional Data
2. Big Data
   a. Hadoop --> PySpark --> Streaming ---> Data Lake
3. New Data

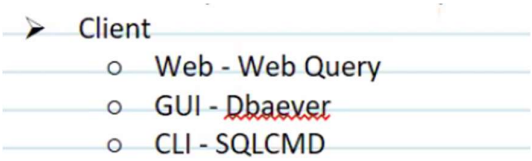
Driver

- Driver is basically software which helps to understand system(hw/sw)
  - Infinite program (program/service/daemon)

Azure sql

- Server → infinite program to bring data files
- Database → set of objects (table, view, stored procedure, functions, packages etc)





Virtualization(ms azure) Containerization(Docker)
Image-File(local/Remote)
Container-Process/Running image
(Archive registry/container registry
Market place(Remote img)
-Hub.Docker.com
-Microsoft-→ACR-Azure Container Registry
-GCR,ECR etc

Shops(repository)

Docker pull mujahed/welcome1:tagname

ShopName/ProductName:version

1. Check Subscription
2. Create Resource Group
3. Order VM
   a. Configuration: 4CPU, 16GB
   b. UserName: azureuser
   c. Password: Localhost@1234567

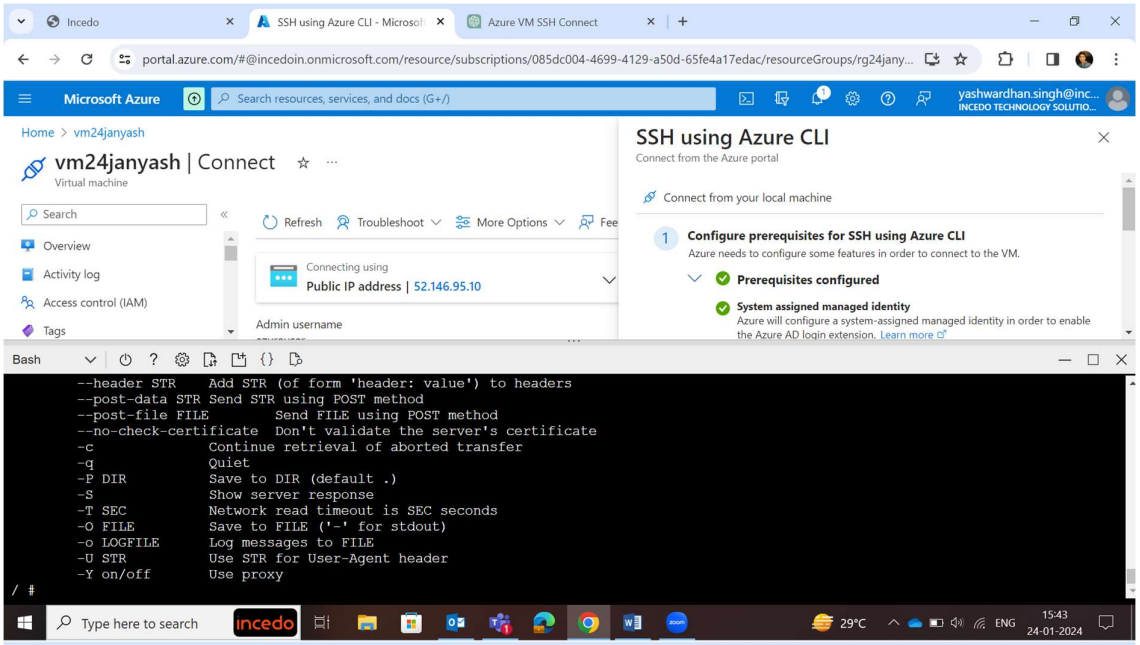
4. Connect VM
    a. Azure CLI
        i. $ az ssh vm --resource-group rg-24jan-pentaho --vm-name vm-24jan-pentaho --subscription 675613e4-01ce-4876-99a1-37bb6cffdd3d
        ii. $ az ssh vm --resource-group r1 --vm-name v1 --subscription s1
    b. SSH CLI
    c. GUI Tools
        i. MobaXterm
        ii. Putty
5. Install Docker

ii. Putty

5. Install Docker
    a. $ sudo su
    b. # apt update
    c. # apt install docker.io -y

6. Create Application Deployment
    a. Create Docker Network
        i. # docker network create incedo-nw
        ii. # docker network ls
    b. Pull Remote Image From CR(hub.docker.com)
        i. # docker images
        ii. # docker pull nginx:latest
    c. Local Image(nginx:latest) --> Container [detachable mode]
        i. # docker run --rm --net nw --name ws -d nginx:latest
        ii. # export CID=1ed32814ee6c
        iii. # docker inspect $CID | grep IPAddress
        iv. # export WSIP=172.18.0.2
    d. Pull Remote Image--> Local Image --> Container
        i. # docker run --net nw --it busybox sh
    e. Test Web Server From 2nd Container

e. Test Web Server From 2nd Container
    i. # wget -q -O - http://ContainerName:80
    ii. # wget -q -O - http://IPAddress:80
    iii. wget -q -O - http://IPAddress
    iv. wget -q -O - IPAddress
    v. wget -q -O - ContainerName
f. Delete All Containers & Images
    i. # docker rm $(docker ps -aq) --force && docker rmi $(docker images -q) --force


Incedo
SSH using Azure CLI - Microsof
Azure VM SSH Connect
portal.azure.com/#@incedoin.onmicrosoft.com/resource/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/rg24jany...
Microsoft Azure
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yashwardhan.singh@inc...
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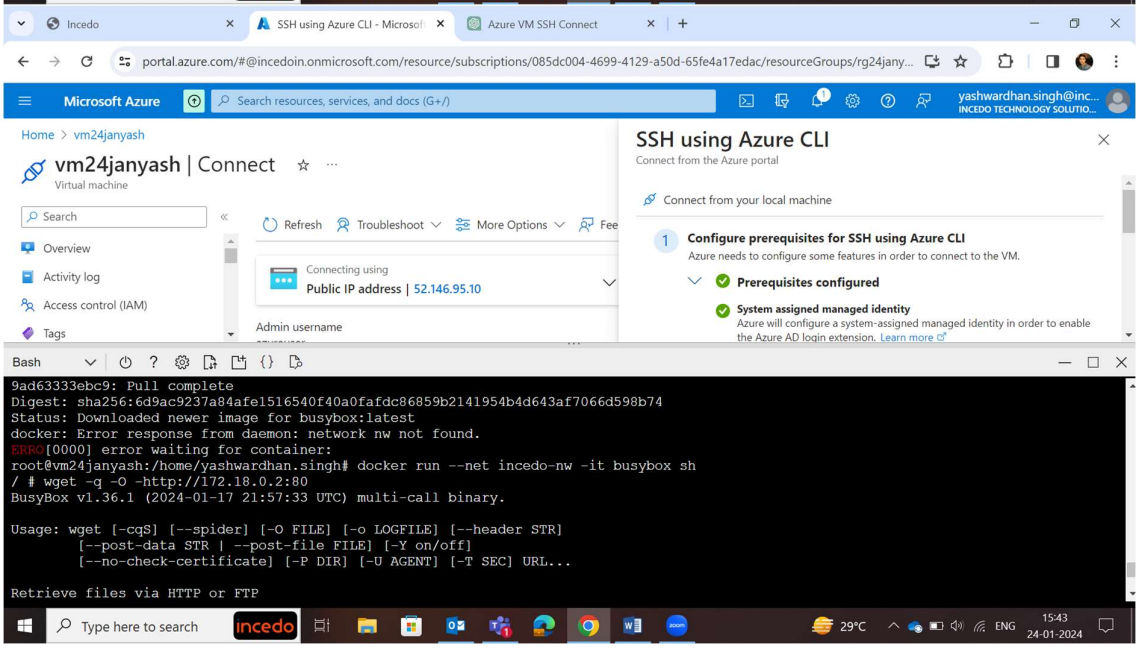
Virtual machine
Search
Overview
Activity log
Access control (IAM)
Tags
Refresh
Troubleshoot
More Options
Connecting using
Public IP address | 52.146.95.10
Admin username
SSH using Azure CLI
Connect from the Azure portal
Connect from your local machine
1
Configure prerequisites for SSH using Azure CLI
Azure needs to configure some features in order to connect to the VM.
Prerequisites configured
System assigned managed identity
Azure will configure a system-assigned managed identity in order to enable the Azure AD login extension. Learn more
Bash
--header STR Add STR (of form 'header: value') to headers
--post-data STR Send STR using POST method
--post-file FILE Send FILE using POST method
--no-check-certificate Don't validate the server's certificate
-c Continue retrieval of aborted transfer
-q Quiet
-P DIR Save to DIR (default .)
-S Show server response
-T SEC Network read timeout is SEC seconds
-O FILE Save to FILE ('-' for stdout)
-o LOGFILE Log messages to FILE
-U STR Use STR for User-Agent header
-Y on/off Use proxy
/ #
Type here to search
incedo
29°C
ENG
15:43
24-01-2024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portal.azure.com/#@incedoin.onmicrosoft.com/resource/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/rg24jany...
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Bash
9ad63333ebc9: Pull complete
Digest: sha256:6d9ac9237a84afe1516540f40a0fafdc86859b2141954b4d643af7066d598b74
Status: Downloaded newer image for busybox:latest
docker: Error response from daemon: network nw not found.
ERRO[0000] error waiting for container:
root@vm24janyash:/home/yashwardhan.singh# docker run --net incedo-nw -it busybox sh
/ # wget -q -O -http://172.18.0.2:80
BusyBox v1.36.1 (2024-01-17 21:57:33 UTC) multi-call binary.
Usage: wget [-cqS] [--spider] [-O FILE] [-o LOGFILE] [--header STR]
[--post-data STR | --post-file FILE] [-Y on/off]
[--no-check-certificate] [-P DIR] [-U AGENT] [-T SEC] URL...
Retrieve files via HTTP or FTP
Type here to search
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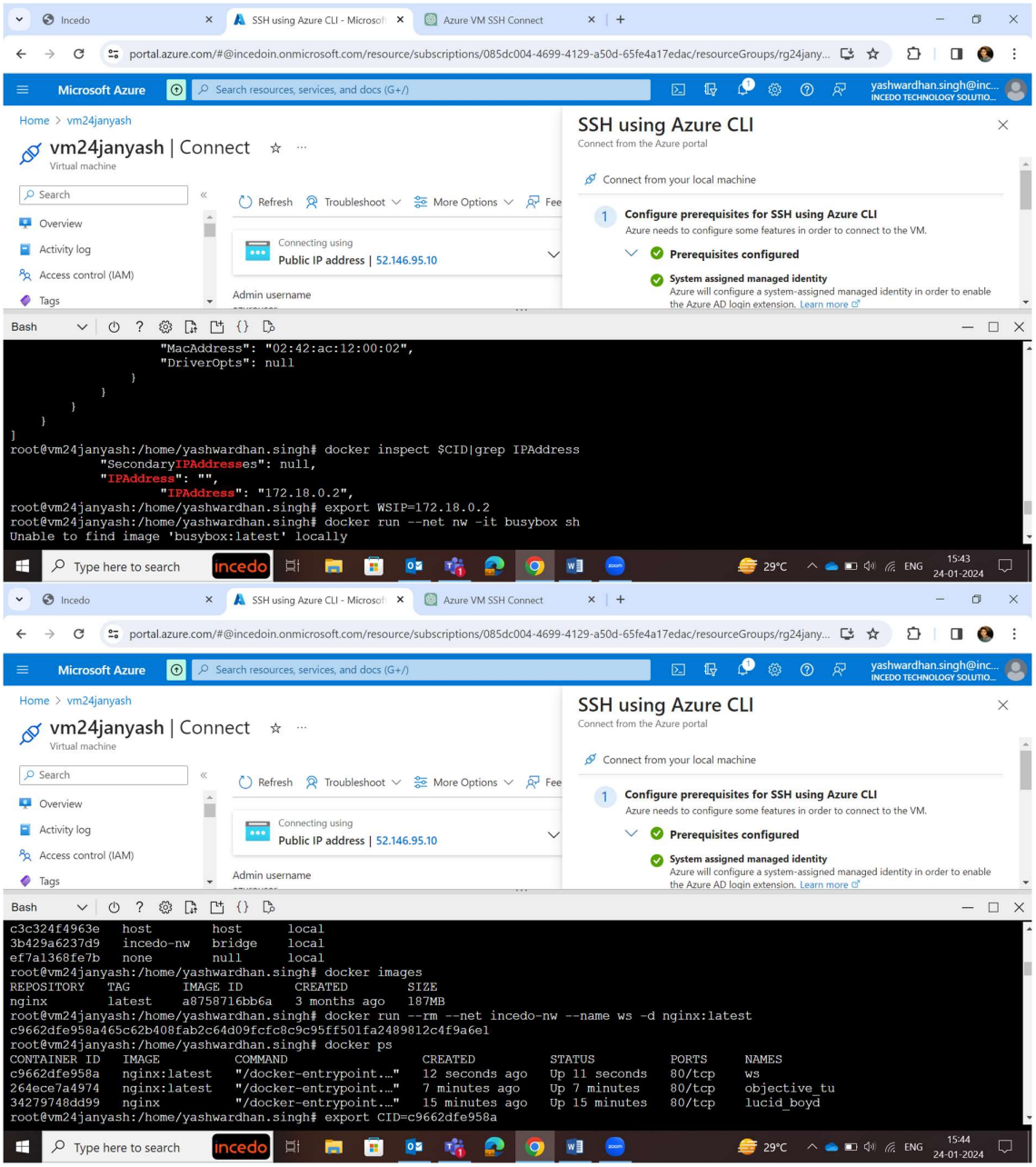
29°C
ENG
15:43
24-01-2024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Azure VM SSH Connect
portal.azure.com/#@incedoin.onmicrosoft.com/resource/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/rg24jany...
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Bash
"MacAddress": "02:42:ac:12:00:02",
"DriverOpts": null
root@vm24janyash:/home/yashwardhan.singh# docker inspect $CID|grep IPAddress
"SecondaryIPAddresses": null,
"IPAddress": "",
"IPAddress": "172.18.0.2",
root@vm24janyash:/home/yashwardhan.singh# export WSIP=172.18.0.2
root@vm24janyash:/home/yashwardhan.singh# docker run --net nw -it busybox sh
Unable to find image 'busybox:latest' locally
Type here to search
29°C
ENG
15:43
24-01-2024

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Azure VM SSH Connect
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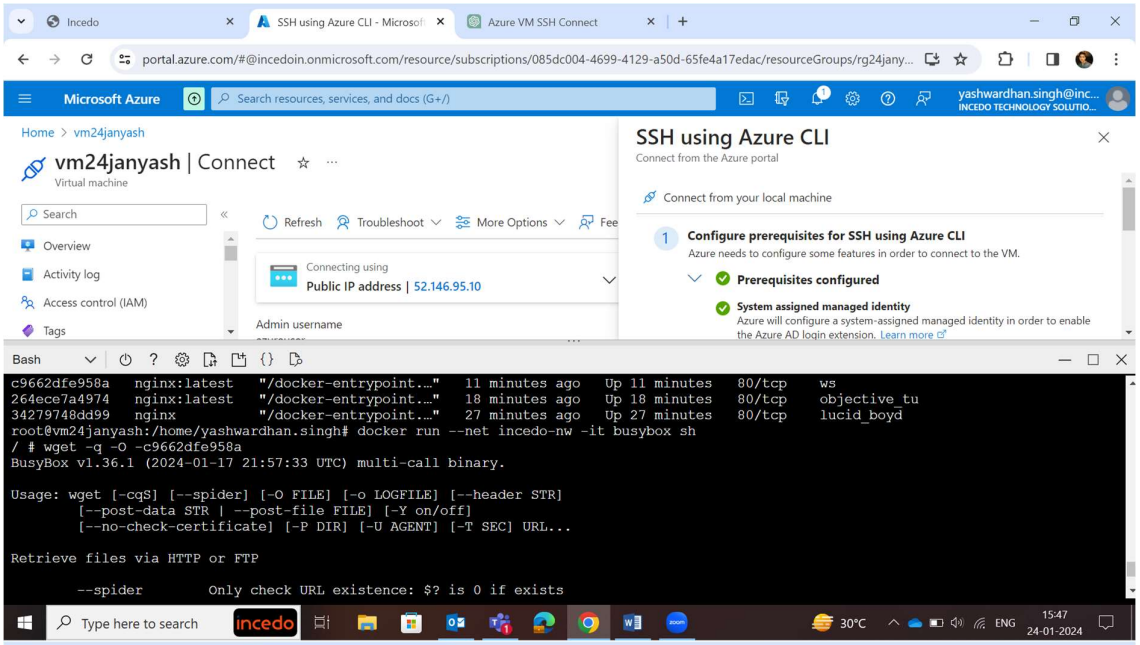
Bash
c3c324f4963e host host local
3b429a6237d9 incedo-nw bridge local
ef7a1368fe7b none null local
root@vm24janyash:/home/yashwardhan.singh# docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
nginx latest a8758716bb6a 3 months ago 187MB
root@vm24janyash:/home/yashwardhan.singh# docker run --rm --net incedo-nw --name ws -d nginx:latest
c9662dfe958a465c62b408fab2c64d09fcfc8c9c95ff501fa2489812c4f9a6e1
root@vm24janyash:/home/yashwardhan.singh# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
c9662dfe958a nginx:latest "/docker-entrypoint.…" 12 seconds ago Up 11 seconds 80/tcp ws
264ece7a4974 nginx:latest "/docker-entrypoint.…" 7 minutes ago Up 7 minutes 80/tcp objective_tu
34279748dd99 nginx "/docker-entrypoint.…" 15 minutes ago Up 15 minutes 80/tcp lucid_boyd
root@vm24janyash:/home/yashwardhan.singh# export CID=c9662dfe958a
Type here to search
29°C
ENG
15:44
24-01-2024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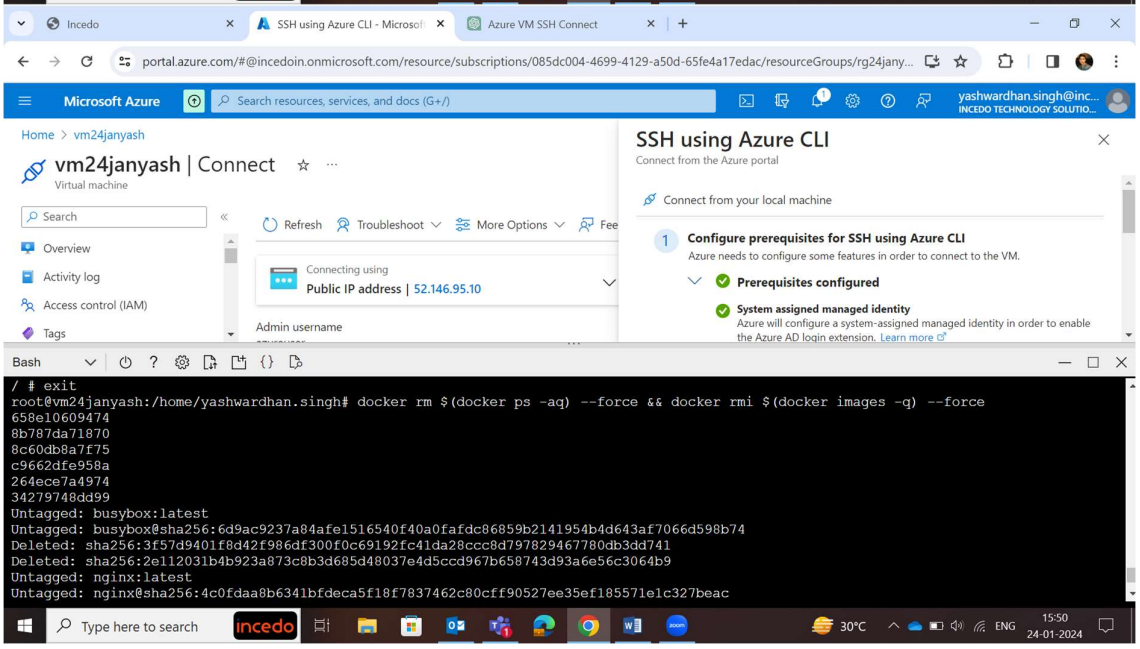
c9662dfe958a nginx:latest "/docker-entrypoint.…" 11 minutes ago Up 11 minutes 80/tcp ws
264ece7a4974 nginx:latest "/docker-entrypoint.…" 18 minutes ago Up 18 minutes 80/tcp objective_tu
34279748dd99 nginx "/docker-entrypoint.…" 27 minutes ago Up 27 minutes 80/tcp lucid_boyd
root@vm24janyash:/home/yashwardhan.singh# docker run --net incedo-nw -it busybox sh
/ # wget -q -O -c9662dfe958a
BusyBox v1.36.1 (2024-01-17 21:57:33 UTC) multi-call binary.
Usage: wget [-cqS] [--spider] [-O FILE] [-o LOGFILE] [--header STR]
[--post-data STR | --post-file FILE] [-Y on/off]
[--no-check-certificate] [-P DIR] [-U AGENT] [-T SEC] URL...
Retrieve files via HTTP or FTP
--spider Only check URL existence: $? is 0 if exists
Type here to search
incedo
30°C
ENG
15:47
24-01-2024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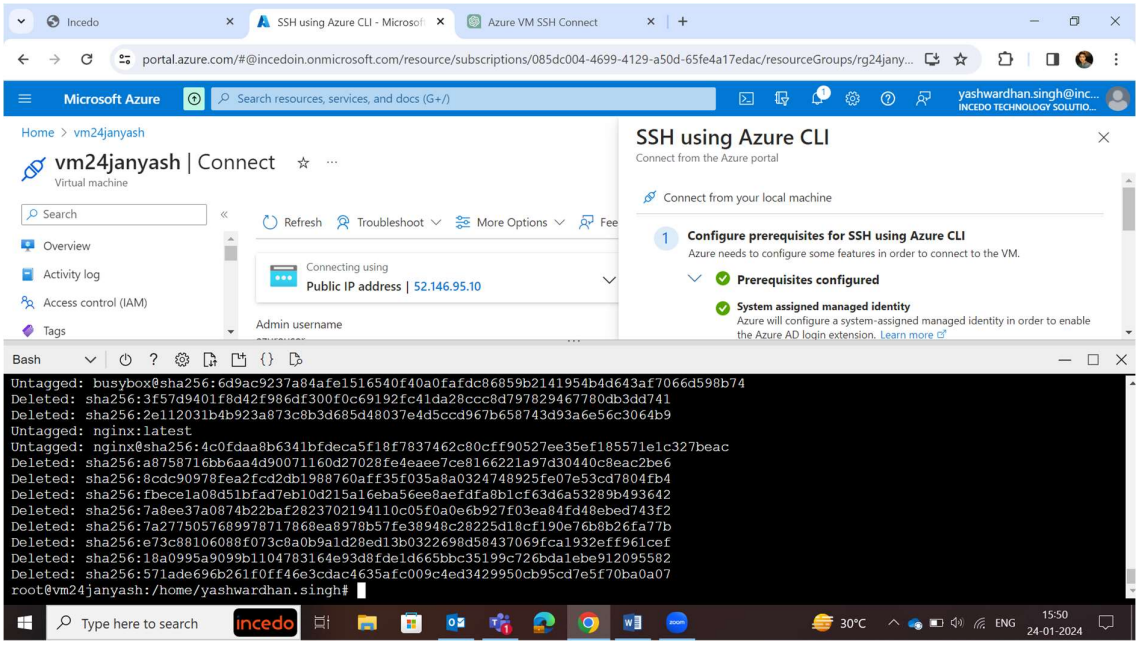
Bash
/ # exit
root@vm24janyash:/home/yashwardhan.singh# docker rm $(docker ps -aq) --force && docker rmi $(docker images -q) --force
658e10609474
8b787da71870
8c60db8a7f75
c9662dfe958a
264ece7a4974
34279748dd99
Untagged: busybox:latest
Untagged: busybox@sha256:6d9ac9237a84afe1516540f40a0fafdc86859b2141954b4d643af7066d598b74
Deleted: sha256:3f57d9401f8d42f986df300f0c69192fc41da28ccc8d797829467780db3dd741
Deleted: sha256:2e112031b4b923a873c8b3d685d48037e4d5ccd967b658743d93a6e56c3064b9
Untagged: nginx:latest
Untagged: nginx@sha256:4c0fdaa8b6341bfdeca5f18f7837462c80cff90527ee35ef185571e1c327beac
Type here to search
incedo
30°C
ENG
15:50
24-01-2024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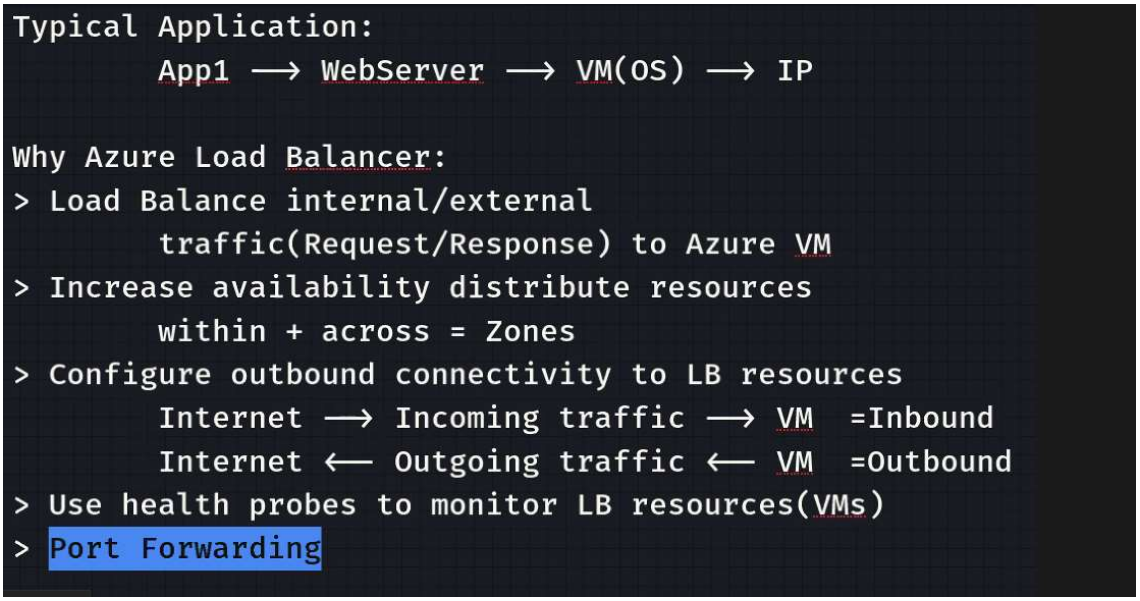
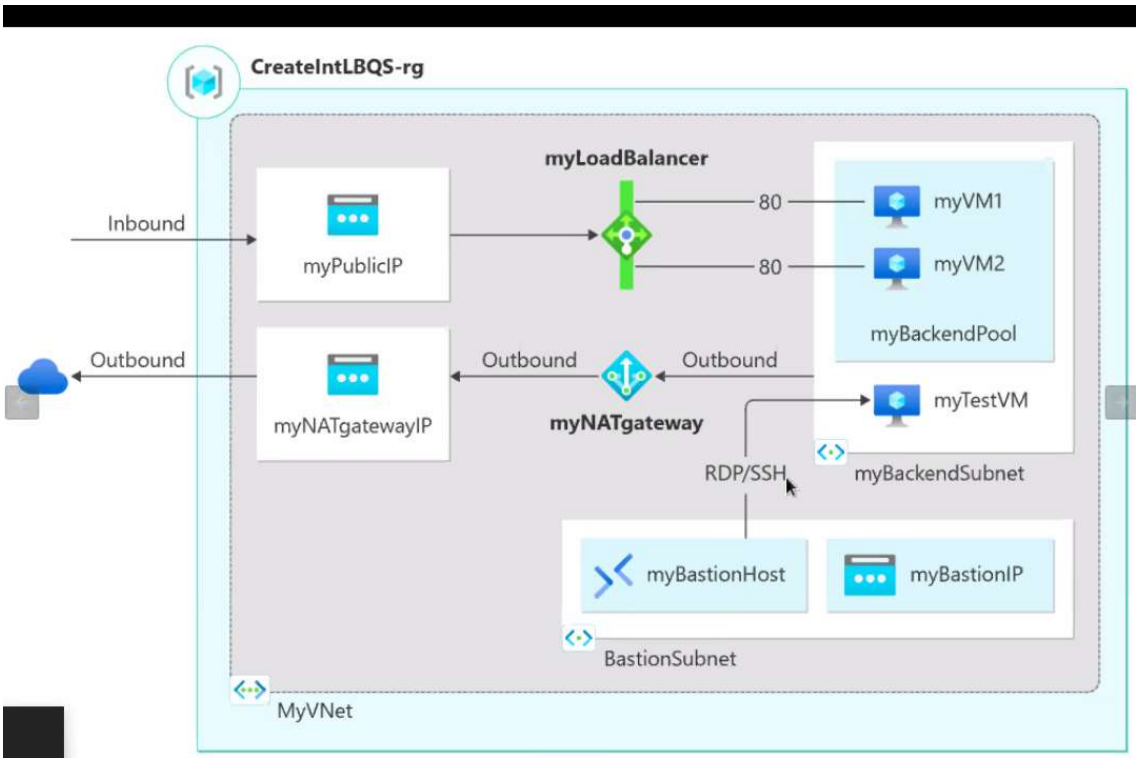
Bash
Untagged: busybox@sha256:6d9ac9237a84afe1516540f40a0fafdc86859b2141954b4d643af7066d598b74
Deleted: sha256:3f57d9401f8d42f986df300f0c69192fc41da28ccc8d797829467780db3dd741
Deleted: sha256:2e112031b4b923a873c8b3d685d48037e4d5ccd967b658743d93a6e56c3064b9
Untagged: nginx:latest
Untagged: nginx@sha256:4c0fdaa8b6341bfdeca5f18f7837462c80cff90527ee35ef185571e1c327beac
Deleted: sha256:a8758716bb6aa4d90071160d27028fe4eaee7ce8166221a97d30440c8eac2be6
Deleted: sha256:8cdc90978fea2fcd2db1988760aff35f035a8a0324748925fe07e53cd7804fb4
Deleted: sha256:fbece1a08d51bfad7eb10d215a16eba56ee8aefdfa8b1cf63d6a53289b493642
Deleted: sha256:7a8ee37a0874b22baf2823702194110c05f0a0e6b927f03ea84fd48ebed743f2
Deleted: sha256:7a2775057689978717868ea8978b57fe38948c28225d18cf190e76b8b26fa77b
Deleted: sha256:e73c88106088f073c8a0b9a1d28ed13b0322698d58437069fca1932eff961cef
Deleted: sha256:18a0995a9099b1104783164e93d8fde1d665bbc35199c726bda1ebe912095582
Deleted: sha256:571ade696b261f0ff46e3cdac4635afc009c4ed3429950cb95cd7e5f70ba0a07
root@vm24janyash:/home/yashwardhan.singh#
Type here to search
incedo
30°C
ENG
15:50
24-01-2024

29 jan 2024


Typical Application:
App1 ⟶ WebServer ⟶ VM(OS) ⟶ IP
Why Azure Load Balancer:
> Load Balance internal/external
traffic(Request/Response) to Azure VM
> Increase availability distribute resources
within + across = Zones
> Configure outbound connectivity to LB resources
Internet ⟶ Incoming traffic ⟶ VM =Inbound
Internet ⟵ Outgoing traffic ⟵ VM =Outbound
> Use health probes to monitor LB resources(VMs)
> Port Forwarding



NSG:Network security group

HP: health probe

NIC: network interface card

1) Subscription ⟶ Resource Group
2) VNet ⟶ myPubIP
3) LB ⟶ HP ⟶ LB Route
4) NSG ⟶ NSG Rule
5) Bastion Host
   PubIP - MyBastionIP
   Subnet -

```
        Subnet - AzBastionSubnet
6) Backend Subnet:
        Create NIC  with name as MyNicVM1, MyNicVM2
```

```
6) Backend Subnet:
        Create NIC  with name as MyNicVM1, MyNicVM2
        VM1, VM2
        LB ⟵ VM1,VM2 ⟵ MyNicVM1,MyNicVM2
7) NAT Gateway
        MyNATGWIp
        MyNATGW ⟶ BackendSubnet
8) WebServer(IIS) ⟵ HelloWorld ⟵ VM1,VM2
9) Test
10) Delete
```

```
Full CIDR Block: 10.1.0.0/26
Network Type:  10.1.0.
IPV4 : X.X.X.X = 8.8.8.8 =   32 - 26 =2^6 = 64
Start IP Address:       10.1.0.0
End IP Address  :       10.1.0.63

Full CIDR Block: 10.1.0.0/28
Network Type:  10.1.0.
IPV4 : X.X.X.X = 8.8.8.8 =   32 - 28 =2^4 = 16
Start IP Address:       10.1.0.0
End IP Address  :       10.1.0.15
```

az group create --name CreatePubLBQS-rg \

> --location eastus

```
yashwardhan [ ~ ]$ az group create --name CreatePubLBQS-rg \
> --location eastus
{
  "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/CreatePubLBQS-rg",
  "location": "eastus",
  "managedBy": null,
  "name": "CreatePubLBQS-rg",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
```

az network vnet create \
--resource-group CreatePubLBQS-rg \
--location eastus \
--name myVNet \
--address-prefixes 10.1.0.0/16 \
--subnet-name myBackendSubnet \
--subnet-prefixes 10.1.0.0/24

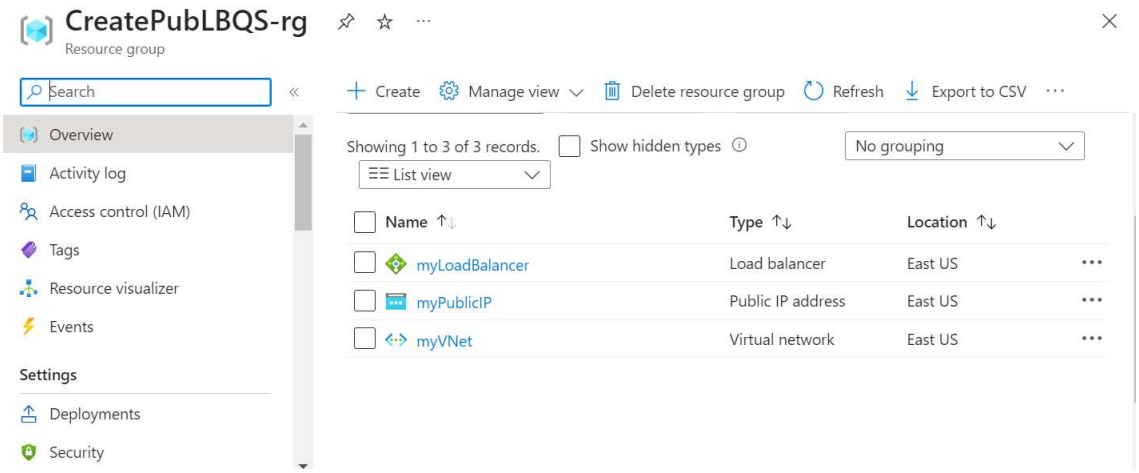
```
yashwardhan [ ~ ]$ az network vnet create \
        --resource-group CreatePubLBQS-rg \
        --location eastus \
        --name myVNet \
        --address-prefixes 10.1.0.0/16 \
        --subnet-name myBackendSubnet \
        --subnet-prefixes 10.1.0.0/24
{
  "newVNet": {
    "addressSpace": {
      "addressPrefixes": [
        "10.1.0.0/16"
      ]
    },
    "enableDdosProtection": false,
    "etag": "W/\"bf51b86e-6551-44bd-9bea-5d2fd78ce73a\"",
    "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/CreatePubLBQS-rg/providers/Microsoft.Network/virtualNetwo
rks/myVNet",
    "location": "eastus",
    "name": "myVNet",
    "provisioningState": "Succeeded",
    "resourceGroup": "CreatePubLBQS-rg",
    "resourceGuid": "5f24cdc9-8ffe-404d-bd02-970e0b28164e",
    "subnets": [
      {
        "addressPrefix": "10.1.0.0/24",
        "delegations": [],
```

az network public-ip create --resource-group CreatePubLBQS-rg --name myPublicIP --sku Standard --zone 1

```
yashwardhan [ ~ ]$ az network public-ip create --resource-group CreatePubLBQS-rg --name myPublicIP --sku Standard --zone 1
{
  "publicIp": {
    "ddosSettings": {
      "protectionMode": "VirtualNetworkInherited"
    },
    "etag": "W/\"c3f2d86f-d83a-442f-8e3e-f92c439cbfc4\"",
    "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/CreatePubLBQS-rg/providers/Microsoft.Network/publicIPAddr
esses/myPublicIP",
    "idleTimeoutInMinutes": 4,
    "ipAddress": "172.178.88.59",
    "ipTags": [],
    "location": "eastus",
    "name": "myPublicIP",
    "provisioningState": "Succeeded",
    "publicIPAddressVersion": "IPv4",
    "publicIPAllocationMethod": "Static",
    "resourceGroup": "CreatePubLBQS-rg",
    "resourceGuid": "afae6be7-9c4c-42ad-95ce-54dbf4b4c456",
    "sku": {
      "name": "Standard",
      "tier": "Regional"
    },
    "type": "Microsoft.Network/publicIPAddresses",
    "zones": [
      "1"
    ]
  }
```

az network lb create \
--resource-group CreatePubLBQS-rg \
--name myLoadBalancer \
--sku Standard \
--public-ip-address myPublicIP \
--frontend-ip-name myFrontEnd \
--backend-pool-name myBackEndPool

```
yashwardhan [ ~ ]$ az network lb create \
                     --resource-group CreatePubLBQS-rg \
                     --name myLoadBalancer \
                     --sku Standard \
                     --public-ip-address myPublicIP \
                     --frontend-ip-name myFrontEnd \
                     --backend-pool-name myBackEndPool
{
  "loadBalancer": {
    "backendAddressPools": [
      {
        "etag": "W/\"f1cc477e-0412-44a1-b5f1-34b0a124f57b\"",
        "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/CreatePubLBQS-rg/providers/Microsoft.Network/loadBalancers/myLoadBalancer/backendAddress
ools/myBackEndPool",
        "name": "myBackEndPool",
        "properties": {
          "loadBalancerBackendAddresses": [],
          "provisioningState": "Succeeded"
        },
        "resourceGroup": "CreatePubLBQS-rg",
        "type": "Microsoft.Network/loadBalancers/backendAddressPools"
      }
    ],
    "frontendIPConfigurations": [
      {
        "etag": "W/\"f1cc477e-0412-44a1-b5f1-34b0a124f57b\"",
        "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/CreatePubLBQS-rg/providers/Microsoft.Network/loadBalancers/myLoadBalancer/frontendIPCon
gurations/myFrontEnd",
        "name": "myFrontEnd",
        "properties": {
          "privateIPAllocationMethod": "Dynamic",
          "provisioningState": "Succeeded",
```




```
az network lb probe create \
--resource-group CreatePubLBQS-rg \
--lb-name myLoadBalancer \
--name myHealthProbe \
--protocol tcp \
--port 80
```

```
az network lb rule create \
--resource-group CreatePubLBQS-rg \
--lb-name myLoadBalancer \
--name myHTTPRule \
--protocol tcp --frontend-port 80 \
--backend-port 80 \
--frontend-ip-name myFrontEnd \
--backend-pool-name myBackEndPool \
--probe-name myHealthProbe \
--disable-outbound-snat true \
--idle-timeout 15 --enable-tcp-reset true
```

```
az network nsg create \
--resource-group CreatePubLBQS-rg \
--name myNSG
```

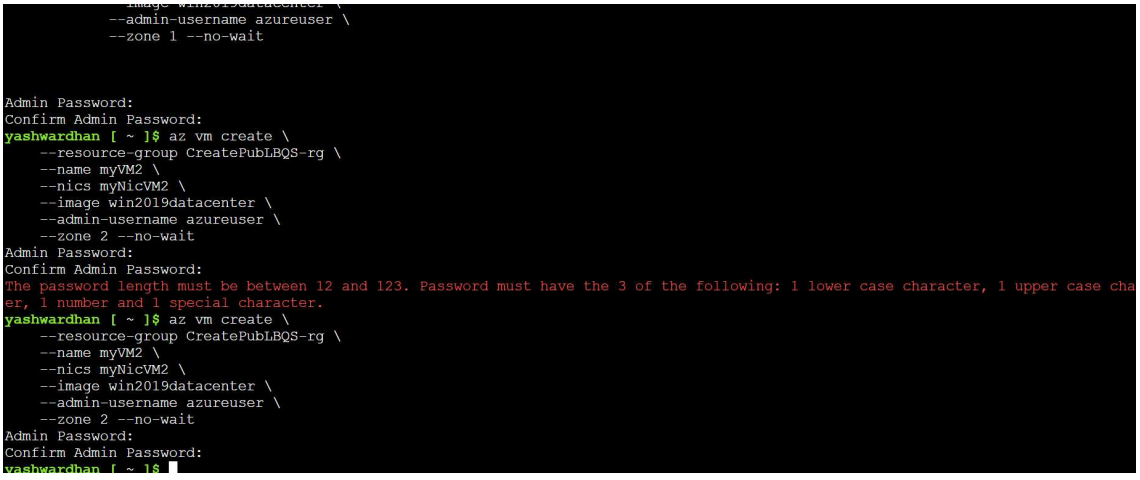
```
az network nsg rule create \
--resource-group CreatePubLBQS-rg \
```

```
--nsg-name myNSG \
--name myNSGRuleHTTP \
--protocol '*' --direction inbound \
--source-address-prefix '*' \
--source-port-range '*' \
--destination-address-prefix '*' \
--destination-port-range 80 \
--access allow --priority 200


az network public-ip create \
--resource-group CreatePubLBQS-rg \
--name myBastionIP \
--sku Standard --zone 1 2 3


az network vnet subnet create \
    --resource-group CreatePubLBQS-rg \
    --name AzureBastionSubnet \
    --vnet-name myVNet \
    --address-prefixes 10.1.1.0/27


az network bastion create \
    --resource-group CreatePubLBQS-rg \
    --name myBastionHost \
    --public-ip-address myBastionIP \
    --vnet-name myVNet \
    --location eastus


array=(myNicVM1 myNicVM2)
    for vmnic in "${array[@]}"
    do
        az network nic create \
            --resource-group CreatePubLBQS-rg \
            --name $vmnic \
            --vnet-name myVNet \
            --subnet myBackEndSubnet \
            --network-security-group myNSG
    done
```

```
az vm create \
    --resource-group CreatePubLBQS-rg \
    --name myVM1 \
    --nics myNicVM1 \
    --image win2019datacenter \
    --admin-username azureuser \
    --zone 1 --no-wait
```

Localhost@1234567

```
az vm create \
    --resource-group CreatePubLBQS-rg \
    --name myVM2 \
    --nics myNicVM2 \
    --image win2019datacenter \
    --admin-username azureuser \
    --zone 2 --no-wait
```



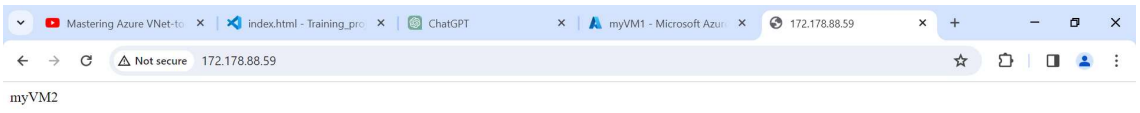

```
array=(myNicVM1 myNicVM2)
    for vmnic in "${array[@]}"
    do
        az network nic ip-config address-pool add \
            --address-pool myBackendPool \
            --ip-config-name ipconfig1 \
            --nic-name $vmnic \
```

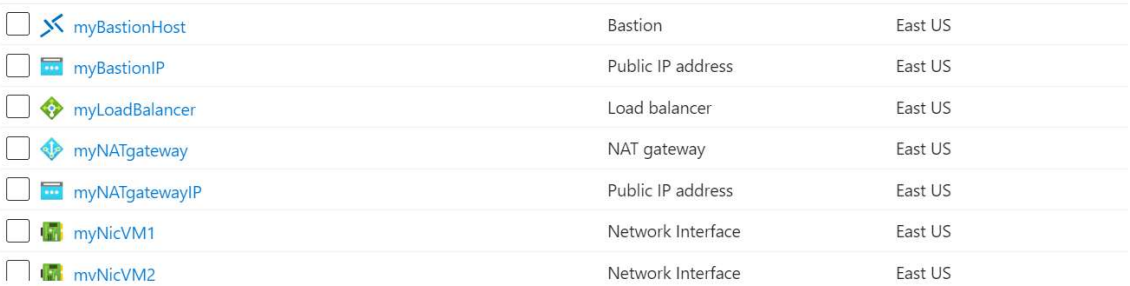
```
        --resource-group CreatePubLBQS-rg \
        --lb-name myLoadBalancer
    done


az network public-ip create \
    --resource-group CreatePubLBQS-rg \
    --name myNATgatewayIP \
    --sku Standard \
    --zone 1 2 3


az network nat gateway create \
    --resource-group CreatePubLBQS-rg \
    --name myNATgateway \
    --public-ip-addresses myNATgatewayIP \
    --idle-timeout 10


az network vnet subnet update \
      --resource-group CreatePubLBQS-rg \
      --vnet-name myVNet \
      --name myBackendSubnet \
      --nat-gateway myNATgateway


array=(myVM1 myVM2)
    for vm in "${array[@]}"
    do
       az vm extension set \
          --publisher Microsoft.Compute \
          --version 1.8 --name CustomScriptExtension \
          --vm-name $vm --resource-group CreatePubLBQS-rg \
          --settings '{"commandToExecute":"powershell Add-WindowsFeature Web-
Server; powershell Add-Content -Path \"C:\\inetpub\\wwwroot\\Default.htm\" -
Value $($env:computername)"}'
    done
```

```
yashwardhan [ ~ ]$ array=(myVM1 myVM2)
    for vm in "${array[@]}"
    do
        az vm extension set \
            --publisher Microsoft.Compute \
            --version 1.8 --name CustomScriptExtension \
            --vm-name $vm --resource-group CreatePubLBQS-rg \
            --settings '{"commandToExecute":"powershell Add-WindowsFeature Web-Server; powershell Add-Content -Path \"C:\\inetpub\\www
oot\\Default.htm\" -Value $($env:computername)"}'
    done
{
  "autoUpgradeMinorVersion": true,
  "enableAutomaticUpgrade": null,
  "forceUpdateTag": null,
  "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/CreatePubLBQS-rg/providers/Microsoft.Compute/virtualMachin
s/myVM1/extensions/CustomScriptExtension",
  "instanceView": null,
  "location": "eastus",
  "name": "CustomScriptExtension",
  "protectedSettings": null,
  "protectedSettingsFromKeyVault": null,
  "provisionAfterExtensions": null,
  "provisioningState": "Succeeded",
  "publisher": "Microsoft.Compute",
  "resourceGroup": "CreatePubLBQS-rg",
  "settings": {
    "commandToExecute": "powershell Add-WindowsFeature Web-Server; powershell Add-Content -Path \"C:\\inetpub\\wwwroot\\Default.htm\"
```

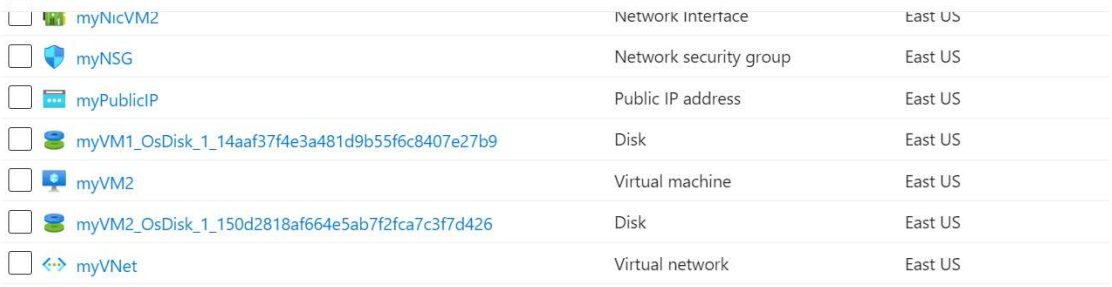
```
az network public-ip show \
        --resource-group CreatePubLBQS-rg \
        --name myPublicIP \
        --query ipAddress \
        --output tsv
```

```
  "typePropertiesType": "CustomScriptExtension"
}
yashwardhan [ ~ ]$ az network public-ip show \
        --resource-group CreatePubLBQS-rg \
        --name myPublicIP \
        --query ipAddress \
        --output tsv
Command group 'az network' is in preview and under development. Reference and support levels: https://aka.ms/CLI_refstatus
172.178.88.59
```





myBastionHost	Bastion	East US
myBastionIP	Public IP address	East US
myLoadBalancer	Load balancer	East US
myNATgateway	NAT gateway	East US
myNATgatewayIP	Public IP address	East US
myNicVM1	Network Interface	East US
mvNicVM2	Network Interface	East US



myNicVM2	Network Interface	East US
myNSG	Network security group	East US
myPublicIP	Public IP address	East US
myVM1_OsDisk_1_14aaf37f4e3a481d9b55f6c8407e27b9	Disk	East US
myVM2	Virtual machine	East US
myVM2_OsDisk_1_150d2818af664e5ab7f2fca7c3f7d426	Disk	East US
myVNet	Virtual network	East US

***Sast and Dast**

For agile paid tool jira

Trello tool which maintain ticket last date efforts etc→ category of ticketing tools

https://drive.google.com/file/d/1mODaphOZ18BEUqaM4MqKjth5s49OijJP/view?usp=sharing
https://drive.google.com/file/d/133JEnborTj8mX--MUaN4K2EwhZUAk9Vi/view?usp=sharing
https://drive.google.com/file/d/1Kifc2gBbAfJnmcQwHl5pZPAxx_fdj5BF/view?usp=sharing
https://drive.google.com/file/d/1qWnwLNAV7CUPCsEEMJ9QYrzTZlyAetgA/view?usp=sharing
https://drive.google.com/file/d/1Y2ZGkXO-VlhiO0ILbnYkUIEMLUEqOxgG/view?usp=sharing
https://drive.google.com/file/d/1sixq4TD6dJrefom6ci4RuePaNXDlM6ZI/view?usp=sharing
https://drive.google.com/file/d/1yIVOR86mZSu0n6w-wKnFmrJksvb4HV2M/view?usp=sharing
https://drive.google.com/file/d/1voVZY8N1tnQLnoGZEJxtUYjas6k_v2QY/view?usp=sharing
https://drive.google.com/file/d/1aoFq3HgOdXhunj9QBdSH3a3a7rRzCwv2/view?usp=sharing

```
Agile
        Documentation: Confluence, Github pages
        Ticketing Tool:  Trello, Jira, Github Issue
        Chat:   Slack, Microsoft Team
Designing
        Graphic:                Corel, Photoshop, AI
        Web/Mobile App:         AdobeXD, Figma
        Database:               ER Diagram, Draw.io
        Software:               UML
Development
        Distributed VCS:        Github, GitLab Repo, Bitbucket
        Testing:
                Automated Testing: Selenium, JUnit, TestNG,
                Continues Testing: Jenkins, Github
        Continues Integration:  Jenkins, Github Action(Infra Automation), GitLab
        Continues Deployment/Configuration/Delivery/Release:
                Infra. Provisioning:    Terraform
                Continues Deployment:   Ansible/Jenkins/Docker
                Configuration Mgt:      Ansible
```

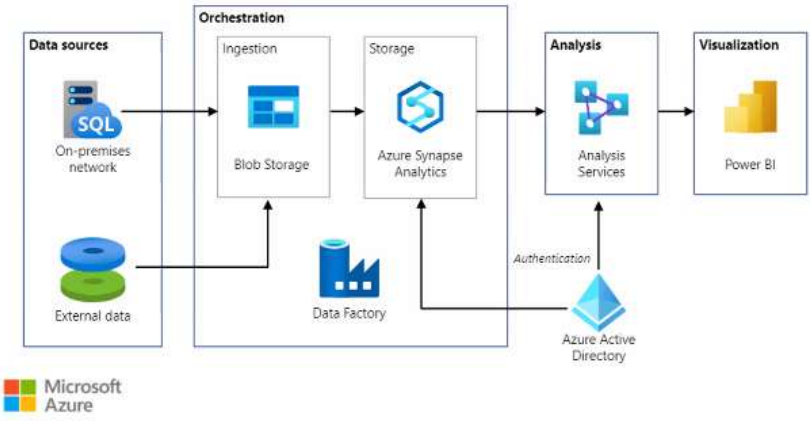
```
git clone https://github.com/NubeEra-Projects/LnT.git

1) Push all Changes(LnT) in LXP project
        1.1 - Push LnT in Github
                Gaurav
                Yuvraj
                Deepak
        1.2 - LXP.zip ⟶ Push in LnT
                Remaining Leaners
        1.3 - Testing
                |
2) Web Desigining(UI Changes) - CSS, Bootstrap
3) Sqlite ⟶ MS SQL Server
4) Django Web Server ⟶ NGINX(Web/ProxyServer) & Gunicorn(WSGI)
5) Documentations
        Architecture
        Modules
        Database Design
```

02/02/2023

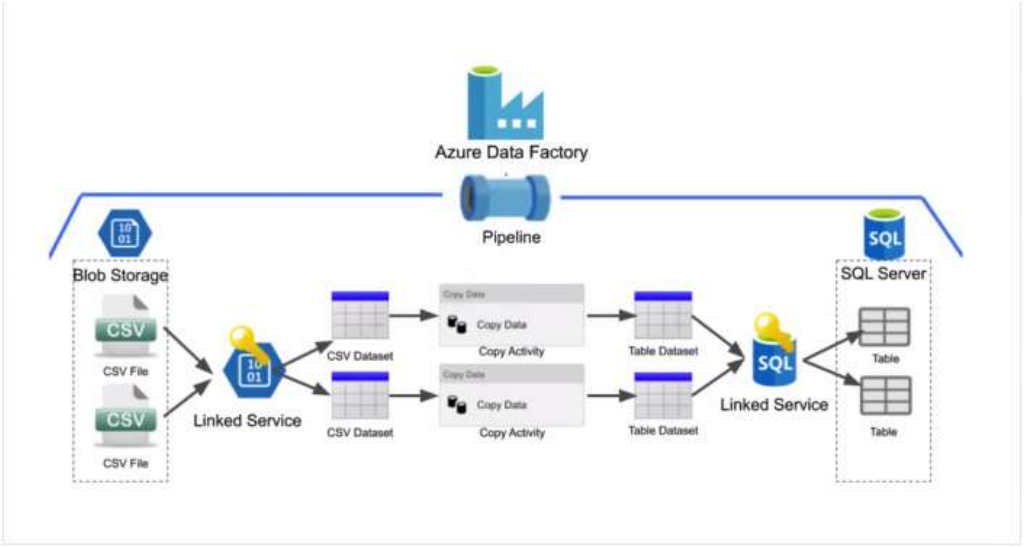
Data factory

Code free ETL as a service

1. Extract the data (Ingestion)
2. Control and data **flow**
3. Scheduling
4. Controlling



(Ctrl)



Data Factory Pipeline (Blob-Extract ---> Trans(Copy) ---> Az SQL[Load])

- Linked Service <-- Blob
- DataSet <-- CSV
- Activity <-- Process(CSV 1st Row--> Insert into SQL)
- Linked Service --> SQL Server

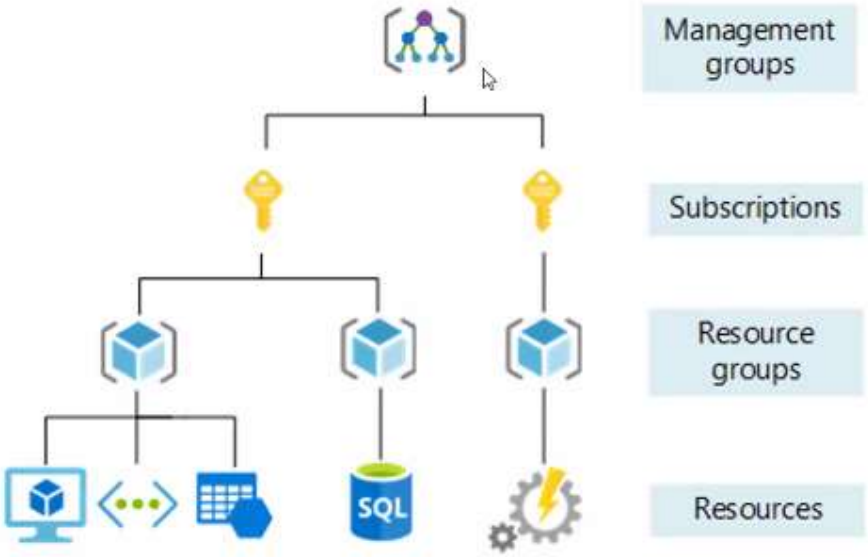
Storage Account	Service	This PC
Blob Container	Feature	Drive
Blob - Binary Large Object	Resource	File/Folder

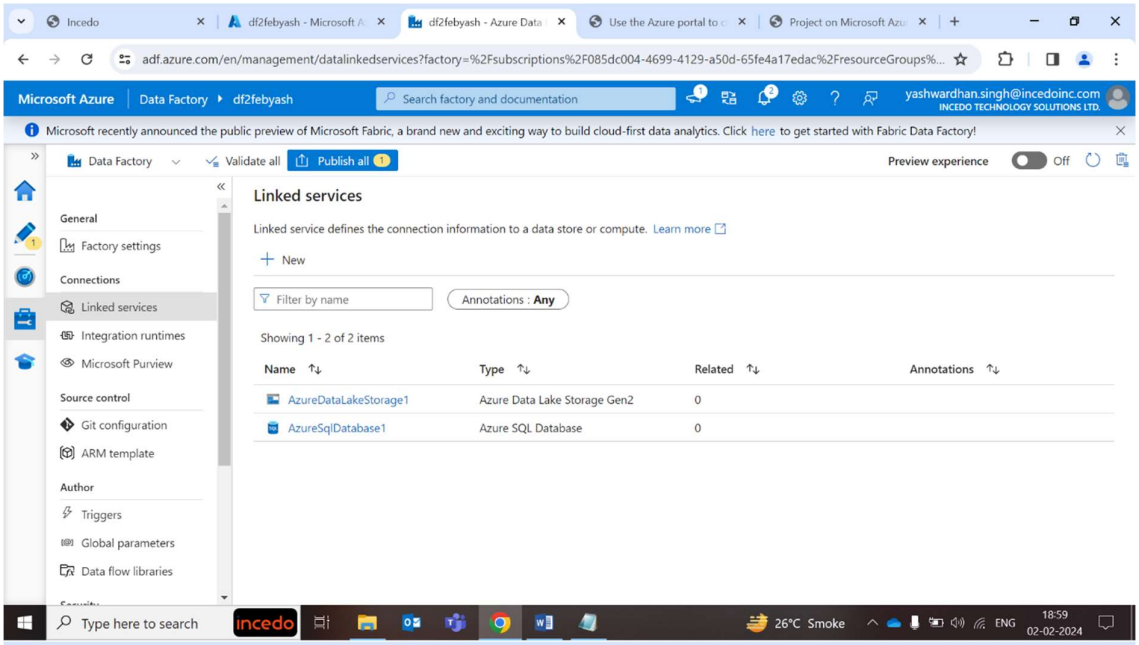
Storage Account

- Blob Container
- Table
- Queue
- File System

Azure data factory
Storage account
Source
Destination

1. Source(Storage Account --> Container= Input) = Test.csv
2. Sink(Storage Account --> Container = Output
3. Create ADF Studio & Pipeline
    a. Launch Studio
    b. PIPE LINE
        i. Manage --> Linked Service
        ii. Author ---> Data Sets(Input & Output)
        iii. Pipeline --> Activity(Copy) ---> Select Source & Sink
        iv. Publish
        v. Debug


Management groups
Subscriptions
Resource groups
Resources
SQL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df2febyash - Azure Data
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Project on Microsoft Azu
adf.azure.com/en/management/datalinkedservices?factory=%2Fsubscriptions%2F085dc004-4699-4129-a50d-65fe4a17edac%2FresourceGroups%...
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Data Factory
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Publish all 1
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Off
General
Factory settings
Connections
Linked services
Integration runtimes
Microsoft Purview
Source control
Git configuration
ARM template
Author
Triggers
Global parameters
Data flow libraries
Linked services
Linked service defines the connection information to a data store or compute. Learn more
New
Filter by name
Annotations : Any
Showing 1 - 2 of 2 items
Name
Type
Related
Annotations
AzureDataLakeStorage1
Azure Data Lake Storage Gen2
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AzureSqlDatabase1
Azure SQL Database
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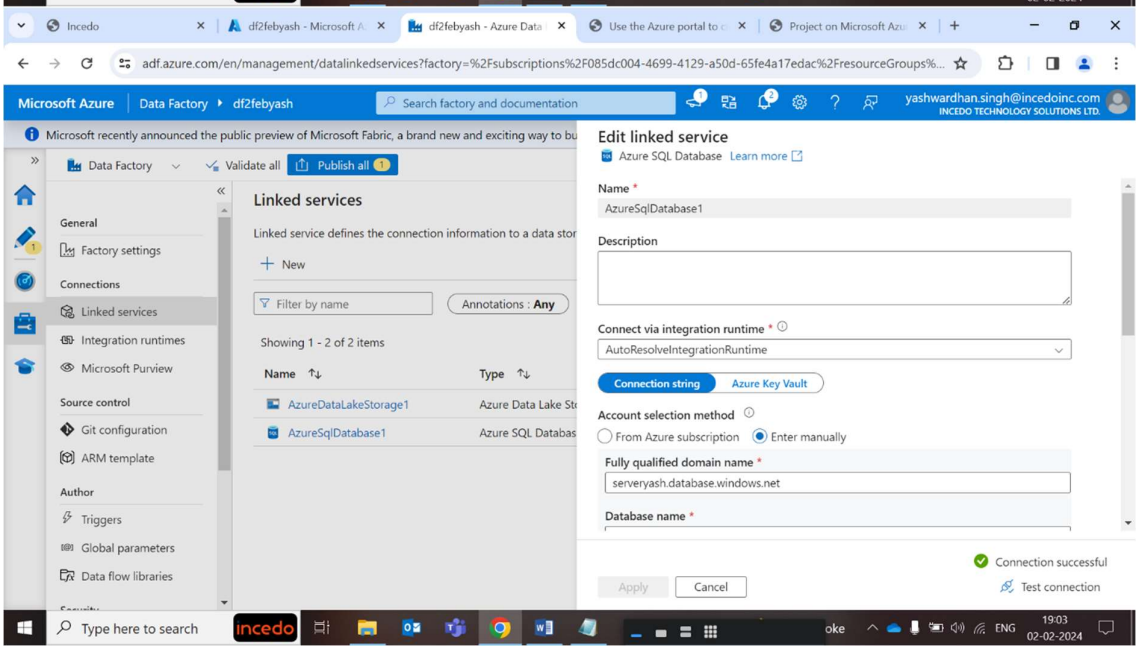
02-02-2024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Project on Microsoft Azu
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Author
Triggers
Global parameters
Data flow libraries
Linked services
Linked service defines the connection information to a data stor
New
Filter by name
Annotations : Any
Showing 1 - 2 of 2 items
Name
Type
AzureDataLakeStorage1
Azure Data Lake St
AzureSqlDatabase1
Azure SQL Databas
Edit linked service
Azure SQL Database Learn more
Name *
AzureSqlDatabase1
Description
Connect via integration runtime *
AutoResolveIntegrationRuntime
Connection string
Azure Key Vault
Account selection method
From Azure subscription
Enter manually
Fully qualified domain name *
serveryash.database.windows.net
Database name *
Connection successful
Apply
Cancel
Test connection
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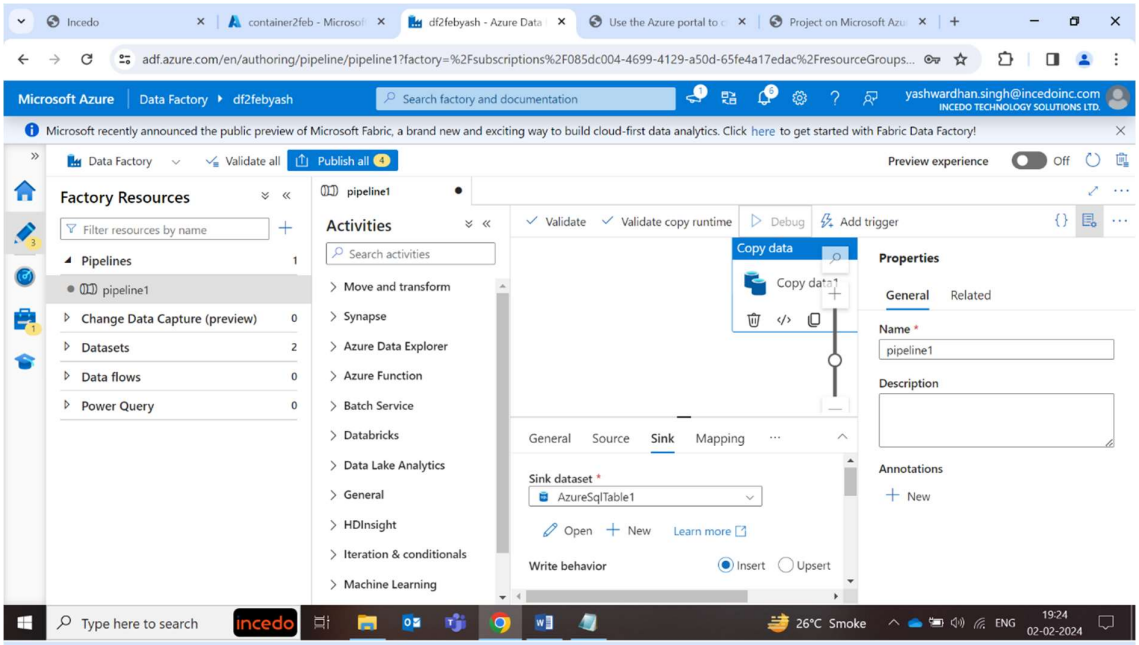
02-02-2024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Publish all 4
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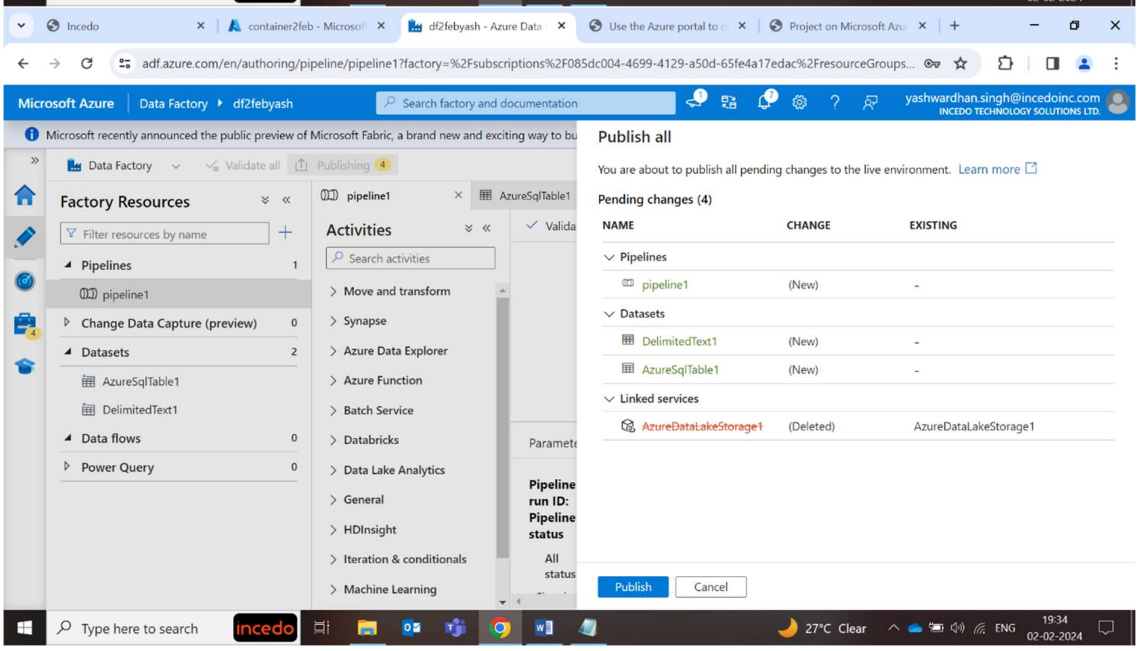
Off
Factory Resources
Filter resources by name
Pipelines 1
pipeline1
Change Data Capture (preview) 0
Datasets 2
Data flows 0
Power Query 0
pipeline1
Activities
Search activities
Move and transform
Synapse
Azure Data Explorer
Azure Function
Batch Service
Databricks
Data Lake Analytics
General
HDInsight
Iteration & conditionals
Machine Learning
Validate
Validate copy runtime
Debug
Add trigger
Copy data
Properties
General
Related
Name *
pipeline1
Description
Annotations
New
General
Source
Sink
Mapping
Sink dataset *
AzureSqlTable1
Open
New
Learn more
Write behavior
Insert
Upsert
Type here to search
26°C Smoke
ENG
19:24
02-02-2024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Pending changes (4)
NAME
CHANGE
EXISTING
Pipelines
pipeline1
(New)
-
Datasets
DelimitedText1
(New)
-
AzureSqlTable1
(New)
-
Linked services
AzureDataLakeStorage1
(Deleted)
AzureDataLakeStorage1
Publish
Cancel
Factory Resources
Pipelines 1
pipeline1
Change Data Capture (preview) 0
Datasets 2
AzureSqlTable1
DelimitedText1
Data flows 0
Power Query 0
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Azure Function
Batch Service
Databricks
Data Lake Analytics
General
HDInsight
Iteration & conditionals
Machine Learning
Type here to search
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ENG
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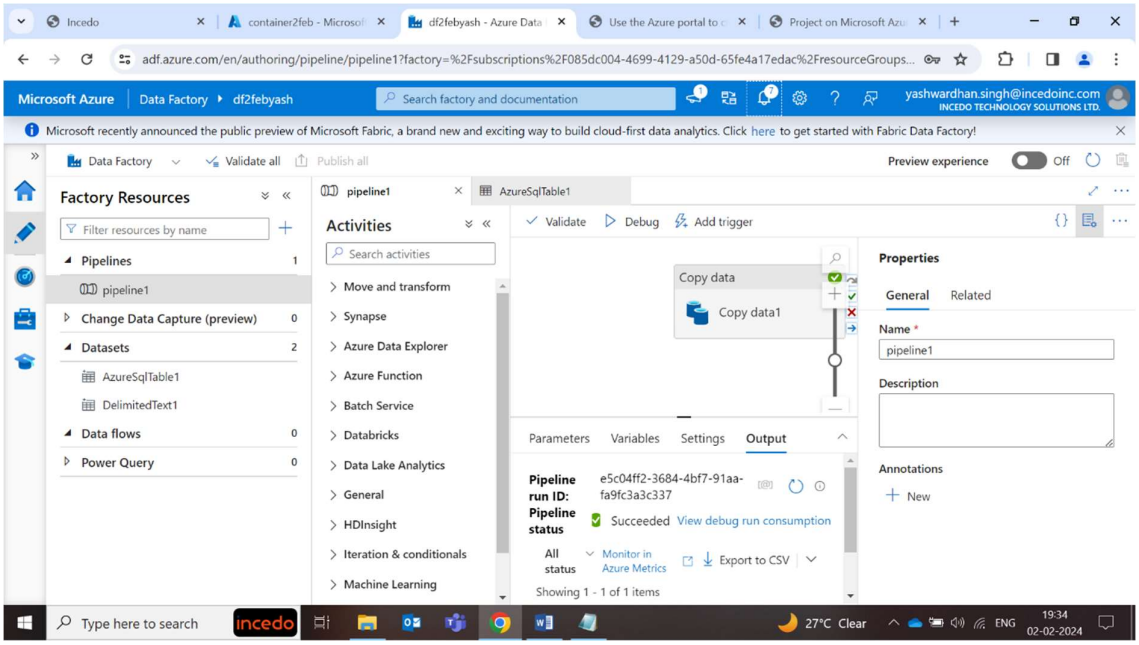
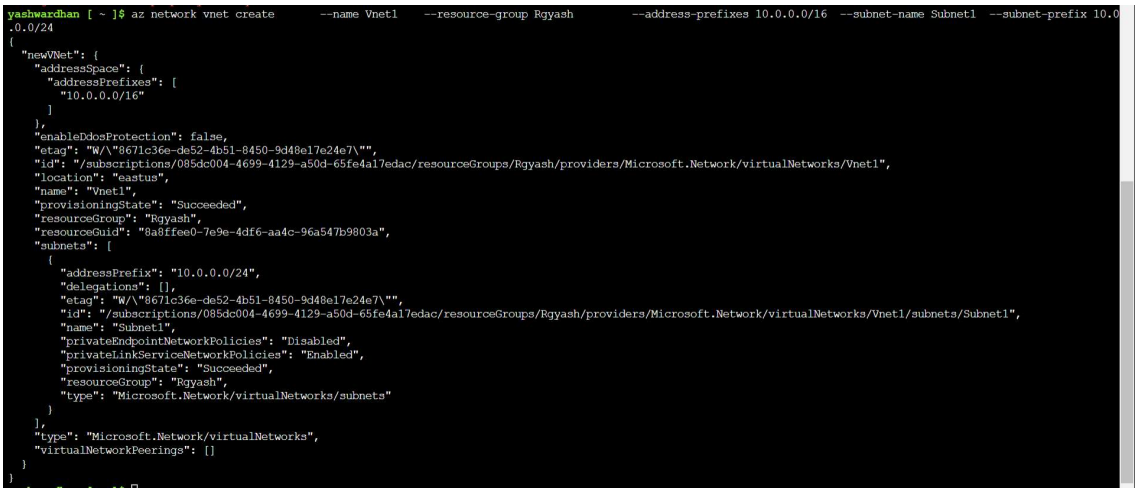


3-2-24

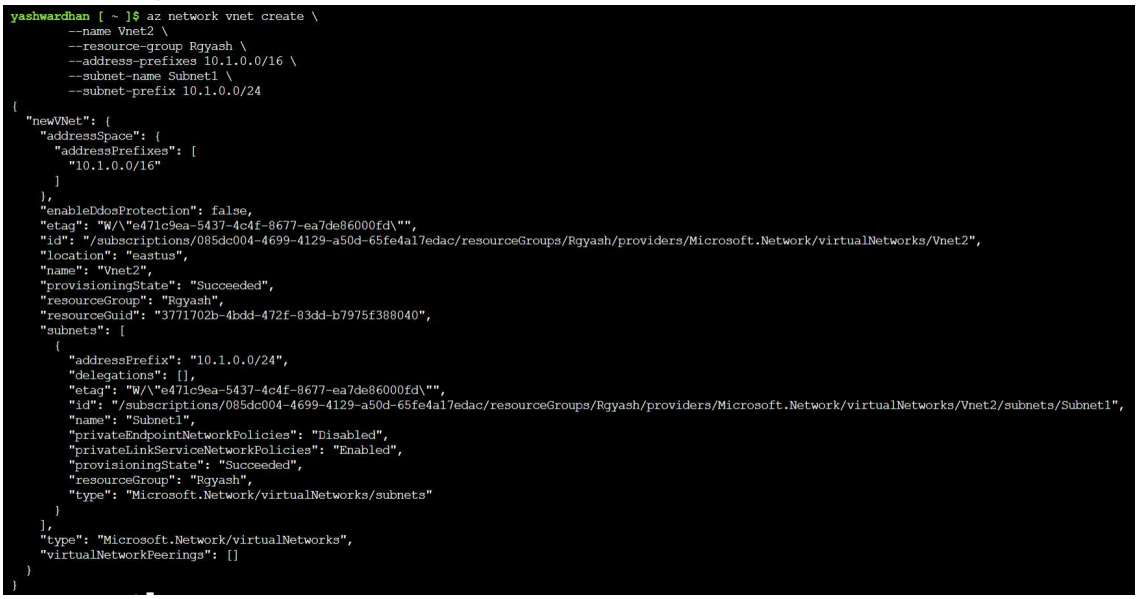
az group create --name Rgyash --location eastus

```
yashwardhan [ ~ ]$ az group create --name Rgyash --location eastus
{
  "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/Rgyash",
  "location": "eastus",
  "managedBy": null,
  "name": "Rgyash",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
```

az network vnet create
--name Vnet1
--resource-group Rgyash
--address-prefixes 10.0.0.0/16
--subnet-name Subnet1
--subnet-prefix 10.0.0.0/24




```
az network vnet create \
    --name Vnet2 \
    --resource-group Rgyash \
    --address-prefixes 10.1.0.0/16 \
    --subnet-name Subnet1 \
    --subnet-prefix 10.1.0.0/24
```




```
# Get the id for $Vnet1.
vNet1Id=(az network vnet show \
  --resource-group Rgyash \
  --name Vnet1 \
  --query id --out tsv)
```

```
yashwardhan [ ~ ]$ vNet1Id=(az network vnet show \
   --resource-group Rgyash \
   --name Vnet1 \
   --query id --out tsv)
```

# Get the id for myVirtualNetwork2.
vNet2Id=(az network vnet show \
 --resource-group Rgyash \
 --name Vnet2 \
 --query id \
 --out tsv)

```
yashwardhan [ ~ ]$ vNet2Id=(az network vnet show \
   --resource-group Rgyash \
   --name Vnet2 \
   --query id \
   --out tsv)
```

#VNet1 to Vent2
az network vnet peering create \

 --name Vnet1-Vnet2 \

 --resource-group Rgyash \

 --vnet-name Vnet1 \

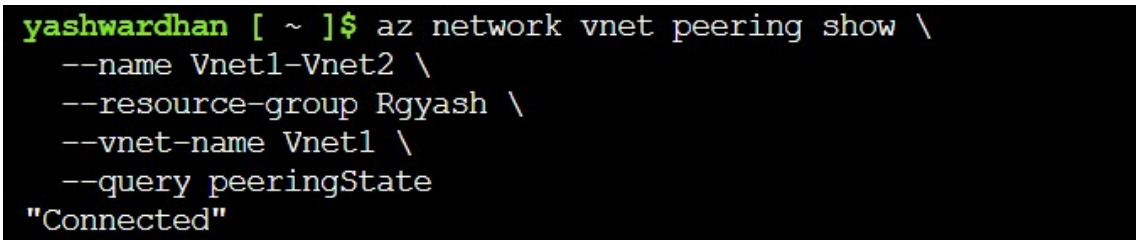
 --remote-vnet $vNet2Id \

 --allow-vnet-access


```
yashwardhan [ ~ ]$ az network vnet peering create \
  --name Vnet1-Vnet2 \
  --resource-group Rgyash \
  --vnet-name Vnet1 \
  --remote-vnet $vNet2Id \
  --allow-vnet-access
{
  "allowForwardedTraffic": false,
  "allowGatewayTransit": false,
  "allowVirtualNetworkAccess": true,
  "doNotVerifyRemoteGateways": false,
  "etag": "W/\"c19fce1b-d33f-4d25-b512-e2f0ff33e9a9\"",
  "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/Rgyash/providers/Microsoft.Network/virtualNetworks/Vnet1/virtualNetworkPeerings/Vnet1-Vnet2",
  "name": "Vnet1-Vnet2",
  "peeringState": "Initiated",
  "peeringSyncLevel": "RemoteNotInSync",
  "provisioningState": "Succeeded",
  "remoteAddressSpace": {
    "addressPrefixes": [
      "10.1.0.0/16"
    ]
  },
  "remoteVirtualNetwork": {
    "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/Rgyash/providers/Microsoft.Network/virtualNetworks/Vnet2",
    "resourceGroup": "Rgyash"
  },
  "remoteVirtualNetworkAddressSpace": {
    "addressPrefixes": [
      "10.1.0.0/16"
    ]
  },
  "resourceGroup": "Rgyash",
  "resourceGuid": "bdfe8ecb-3543-0ad9-2991-21321881007a",
  "type": "Microsoft.Network/virtualNetworks/virtualNetworkPeerings",
  "useRemoteGateways": false
```

```
az network vnet peering create \
  --name Vnet2-Vnet1 \
  --resource-group Rgyash \
  --vnet-name Vnet2 \
  --remote-vnet $vNet1Id \
  --allow-vnet-access
```


```
az network vnet peering show \
  --name Vnet1-Vnet2 \
  --resource-group Rgyash \
  --vnet-name Vnet1 \
  --query peeringState
```




```
az vm create \
  --resource-group Rgyash \
  --name myVm1 \
  --image Ubuntu2204 \
  --public-ip-sku Standard \
  --vnet-name Vnet1 \
  --subnet Subnet1 \
```

--ssh-key-value ~/.ssh/mujahed_lock.pub \
--no-wait

```
yashwardhan [ ~ ]$ ssh-keygen -t rsa -b 2048 -f ~/.ssh/yash_lock
Generating public/private rsa key pair.
Created directory '/home/yashwardhan/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/yashwardhan/.ssh/yash_lock
Your public key has been saved in /home/yashwardhan/.ssh/yash_lock.pub
The key fingerprint is:
SHA256:Qxu+u80+aIhEkEanIsSOCEdZ7lGsV3t+a/oiwrh5uQ4 yashwardhan@SandboxHost-638425588755369208
The key's randomart image is:
+---[RSA 2048]----+
|.+o+o..          |
|o.*+ .. .        |
|Bo..o. .o.       |
|+o .o..o.o.      |
|   ...  So       |
|    .    o. .    |
|   .E+ o.. . .   |
|    oo* ++o o    |
|    o+o+o+=*.    |
+----[SHA256]-----+
```

az vm create \

--resource-group Rgyash \

--name myVm2 \

--image Ubuntu2204 \

--public-ip-sku Standard \

--vnet-name Vnet2 \

--subnet Subnet1 \

--ssh-key-value ~/.ssh/yash_lock.pub

```
yashwardhan [ ~ ]$ az vm create \
  --resource-group Rgyash \
  --name myVm2 \
  --image Ubuntu2204 \
  --public-ip-sku Standard \
  --vnet-name Vnet2 \
  --subnet Subnet1 \
  --ssh-key-value ~/.ssh/yash_lock.pub #--generate-ssh-keys

{
  "fqdns": "",
  "id": "/subscriptions/085dc004-4699-4129-a50d-65fe4a17edac/resourceGroups/Rgyash/providers/Microsoft.Compute/virtualMachines/myVm2",
  "location": "eastus",
  "macAddress": "60-45-BD-EB-E0-3C",
  "powerState": "VM running",
  "privateIpAddress": "10.1.0.4",
  "publicIpAddress": "20.127.0.229",
  "resourceGroup": "Rgyash",
  "zones": ""
```

ssh -i ~/.ssh/yash_lock yash@20.127.0.229 (ip of vm2)

```
yashwardhan [ ~ ]$ ssh -i ~/.ssh/yash_lock yash@20.127.0.229
The authenticity of host '20.127.0.229 (20.127.0.229)' can't be established.
ED25519 key fingerprint is SHA256:PIX6U78iMvk3tIl3QcVsAwKdnNuOGRKZfyOAZBoyKp4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])?
Host key verification failed.
```

#Ping to VM1 ip
ping 10.0.0.4 -c 4

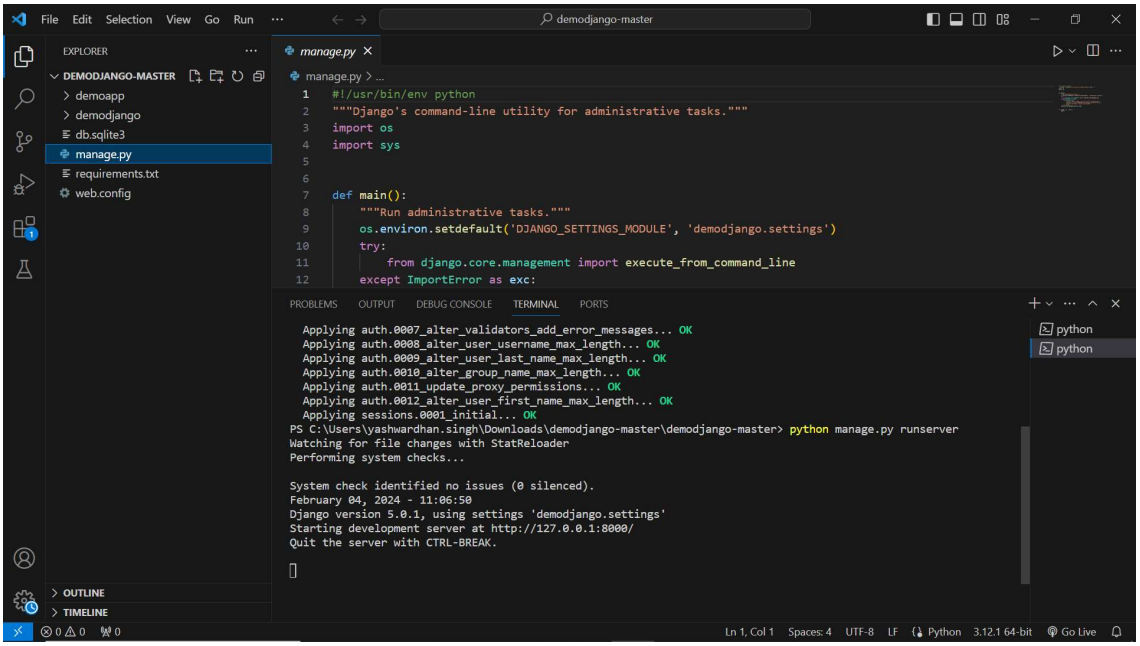
```
yashwardhan [ ~ ]$ ping 20.121.38.14
PING 20.121.38.14 (20.121.38.14) 56(84) bytes of data.
```

az group delete --name $Rg –yes

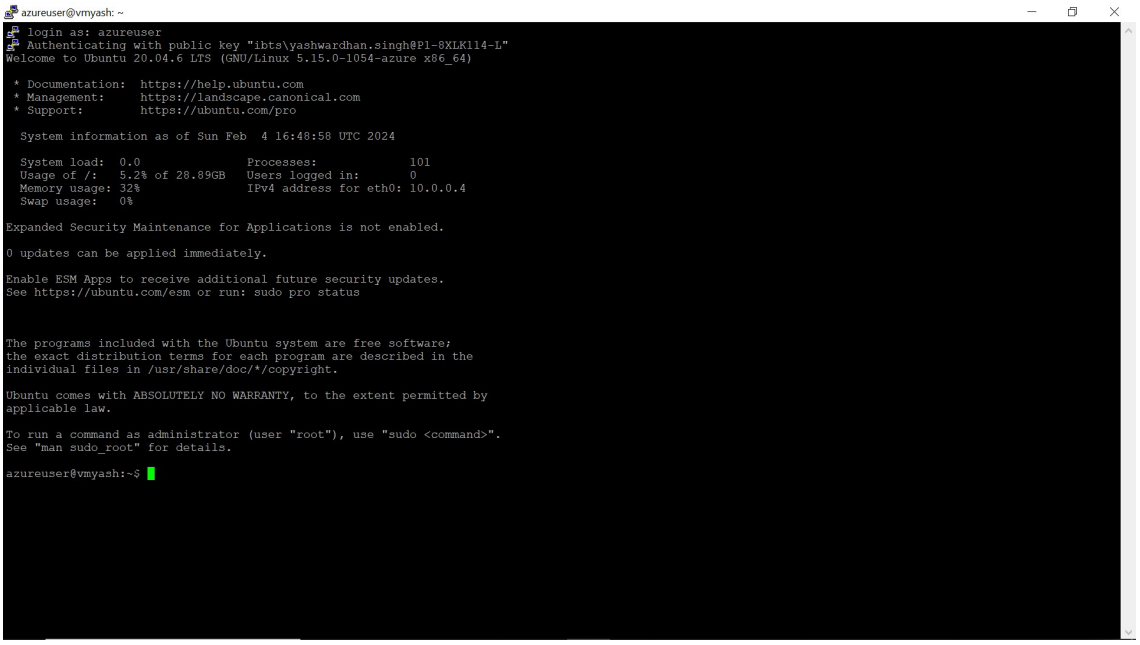
04/02/2024

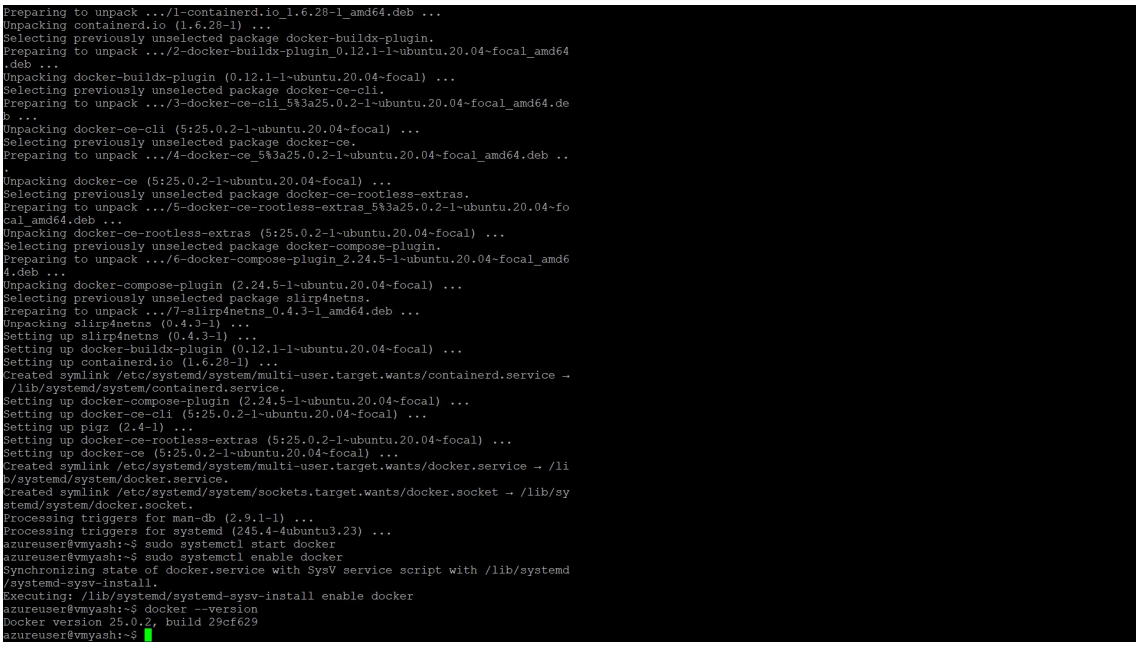
Project Title:

"Efficient Django Deployment: Dockerized Application on Azure VM"




```
yashwardhan [ ~ ]$ ssh-keygen -t rsa -b 2048 -f ~/.ssh/my-ssh-key
Generating public/private rsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/yashwardhan/.ssh/my-ssh-key
Your public key has been saved in /home/yashwardhan/.ssh/my-ssh-key.pub
The key fingerprint is:
SHA256:jIMGHSkrYl9ml/AhXoojVX70fRmS+HUF4t7a1XefWeM yashwardhan@SandboxHost-638426230841341143
The key's randomart image is:
+---[RSA 2048]----+
|     oo .  ..o...o|
|  .oo+.o...o.oo. |
|  oo+.*.o...oo.  |
|oo.+ B.*   o..  .|
|o.o B + S   . ..*|
|   o   .     o..O|
|            . .E.|
|                 |
|                 |
+----[SHA256]-----+
```

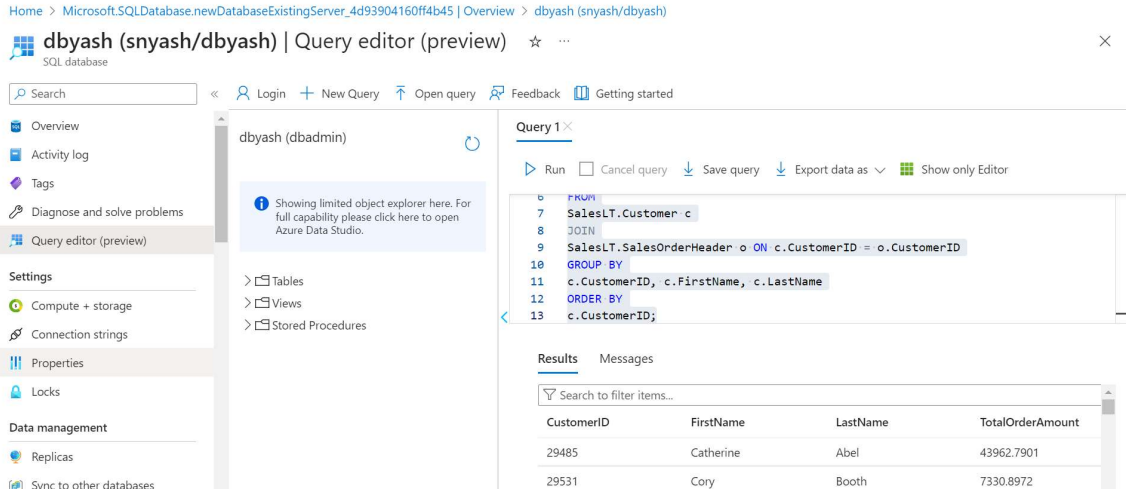




Module 2: Perform T-SQL Operations on Restored Database (50 Marks)

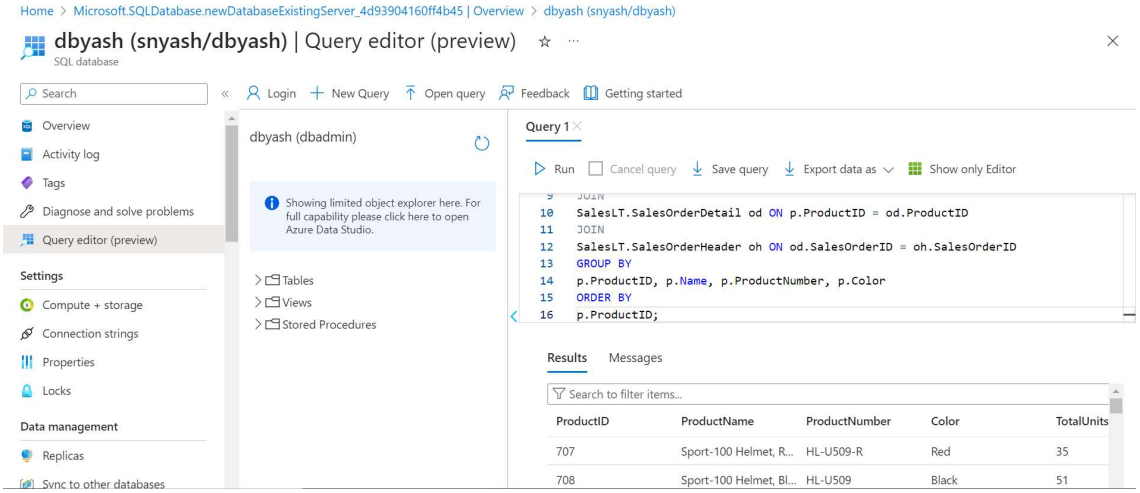
1. **Retrieve a list of customers along with their total order amounts.**

```
SELECT
c.CustomerID,
c.FirstName,
c.LastName,
SUM(o.TotalDue) AS TotalOrderAmount
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader o ON c.CustomerID = o.CustomerID
GROUP BY
c.CustomerID, c.FirstName, c.LastName
ORDER BY
c.CustomerID;
```



2. Display product information along with the number of units sold for each product.

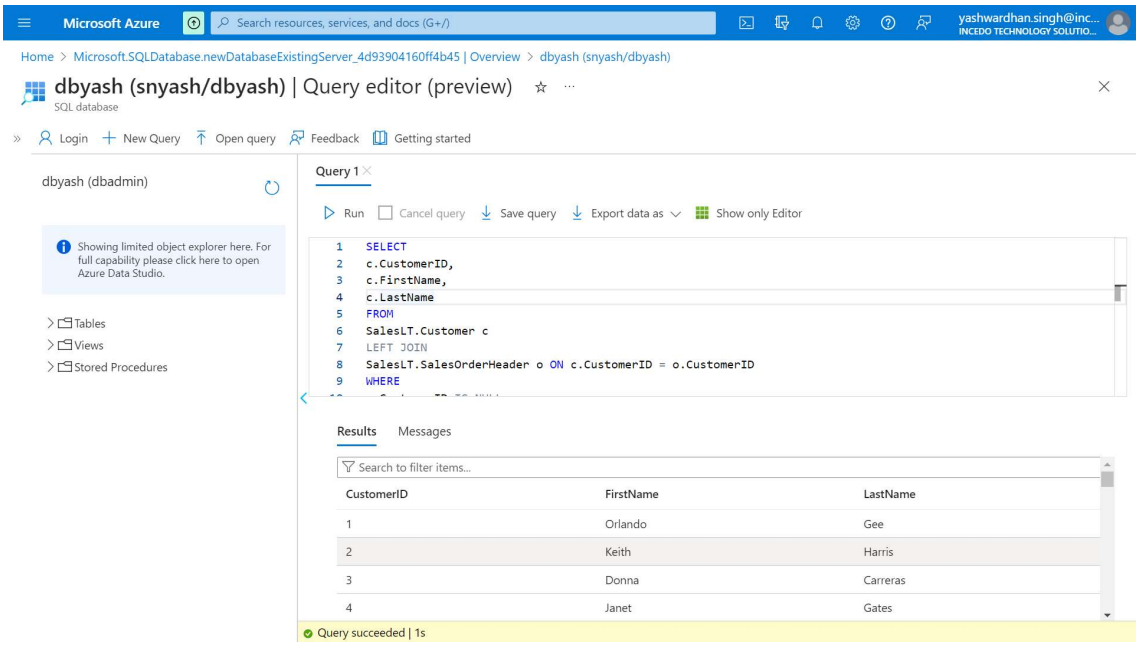
```
SELECT
p.ProductID,
p.Name AS ProductName,
p.ProductNumber,
p.Color,
SUM(od.OrderQty) AS TotalUnitsSold
FROM
SalesLT.Product p
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
JOIN
SalesLT.SalesOrderHeader oh ON od.SalesOrderID = oh.SalesOrderID
GROUP BY
p.ProductID, p.Name, p.ProductNumber, p.Color
ORDER BY
p.ProductID;
```



3. **Find employees who have the same manager.**
   Data not available.

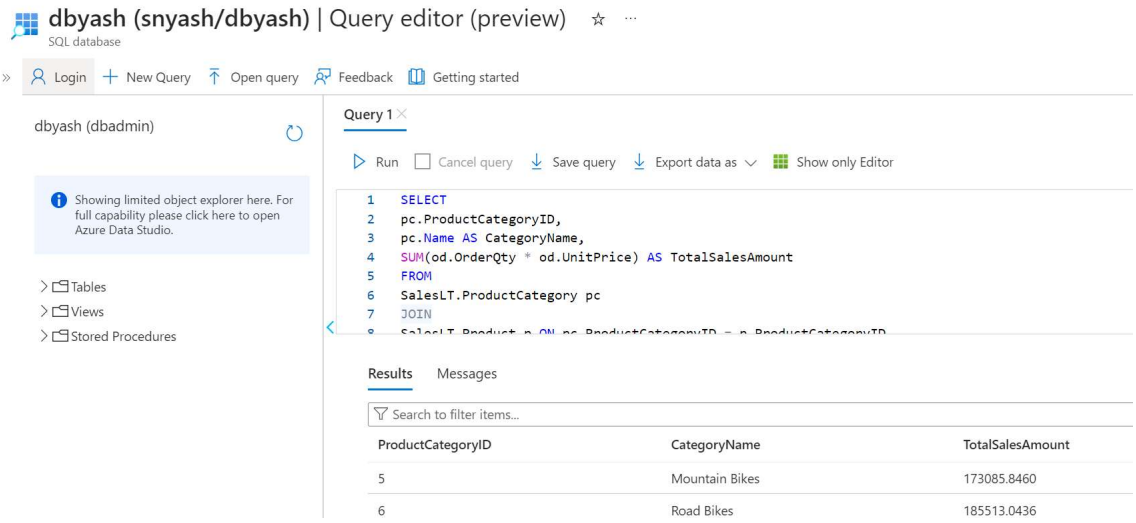
4. **List all customers who have never placed an order.**

```
SELECT
c.CustomerID,
c.FirstName,
c.LastName
FROM
SalesLT.Customer c
LEFT JOIN
SalesLT.SalesOrderHeader o ON c.CustomerID = o.CustomerID
WHERE
o.CustomerID IS NULL;
```



5. **Retrieve the total sales amount for each product category.**

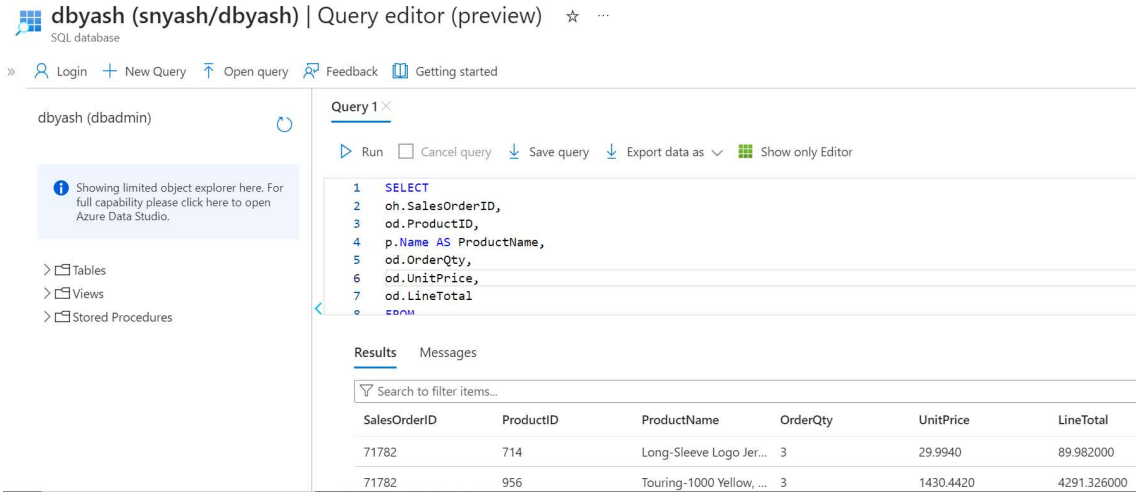
```
SELECT
pc.ProductCategoryID,
pc.Name AS CategoryName,
SUM(od.OrderQty * od.UnitPrice) AS TotalSalesAmount
FROM
SalesLT.ProductCategory pc
JOIN
SalesLT.Product p ON pc.ProductCategoryID = p.ProductCategoryID
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
JOIN
SalesLT.SalesOrderHeader oh ON od.SalesOrderID = oh.SalesOrderID
GROUP BY
pc.ProductCategoryID, pc.Name
ORDER BY
pc.ProductCategoryID;
```



6. Display the names of employees and their direct managers. Data not available

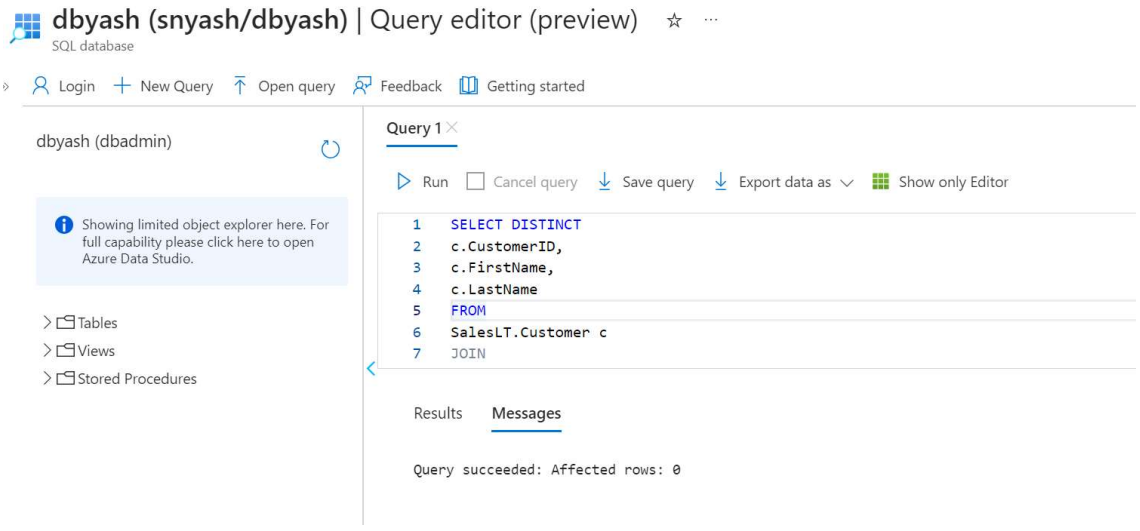
7. Show the order details with product names for a specific customer.

```
SELECT
oh.SalesOrderID,
od.ProductID,
p.Name AS ProductName,
od.OrderQty,
od.UnitPrice,
od.LineTotal
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
WHERE
c.CustomerID = 29485;
```



8. List customers who have made purchases in the last 30 days

```
SELECT DISTINCT
c.CustomerID,
c.FirstName,
c.LastName
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
WHERE
oh.OrderDate >= DATEADD(day, -30, GETDATE());
```

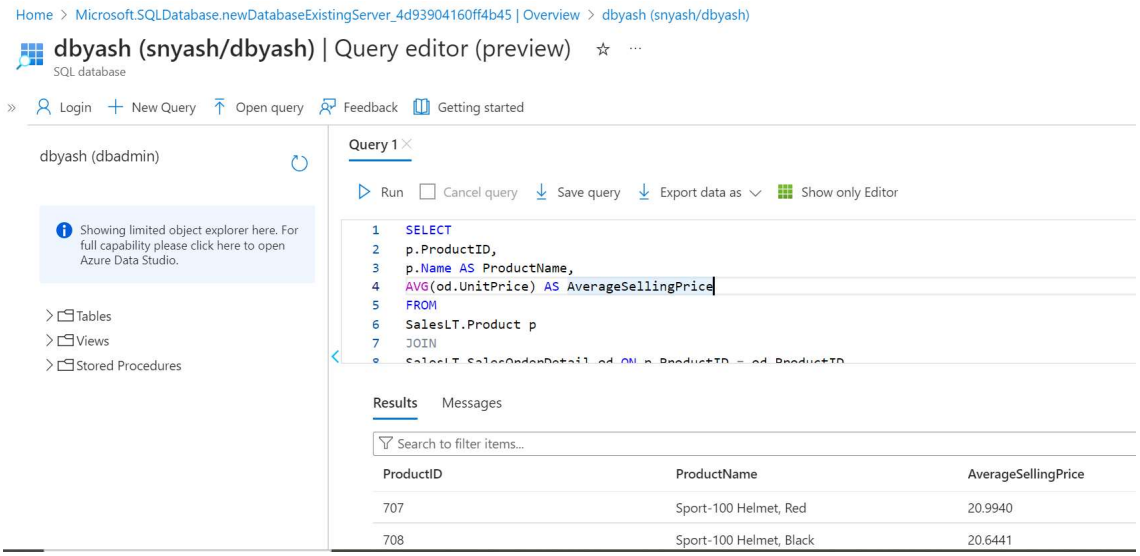


9. Find employees who do not have any direct reports.

Data Not available

10. Retrieve all products along with their average selling prices

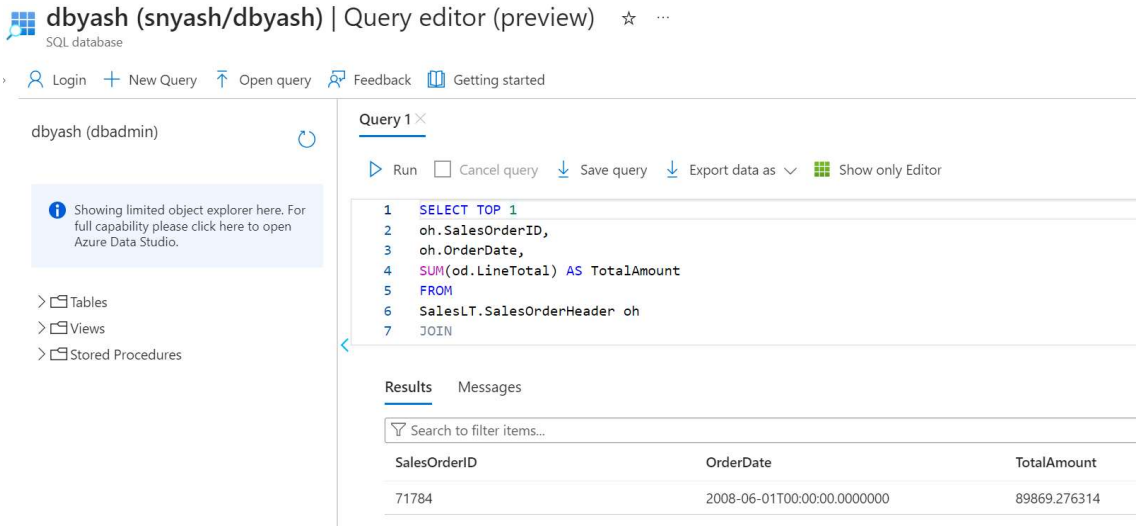
```
SELECT
p.ProductID,
p.Name AS ProductName,
AVG(od.UnitPrice) AS AverageSellingPrice
FROM
SalesLT.Product p
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
GROUP BY
p.ProductID, p.Name
ORDER BY
p.ProductID;
```



11. Find the order with the highest total amount.

```
SELECT TOP 1
oh.SalesOrderID,
oh.OrderDate,
SUM(od.LineTotal) AS TotalAmount
FROM
SalesLT.SalesOrderHeader oh
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
```

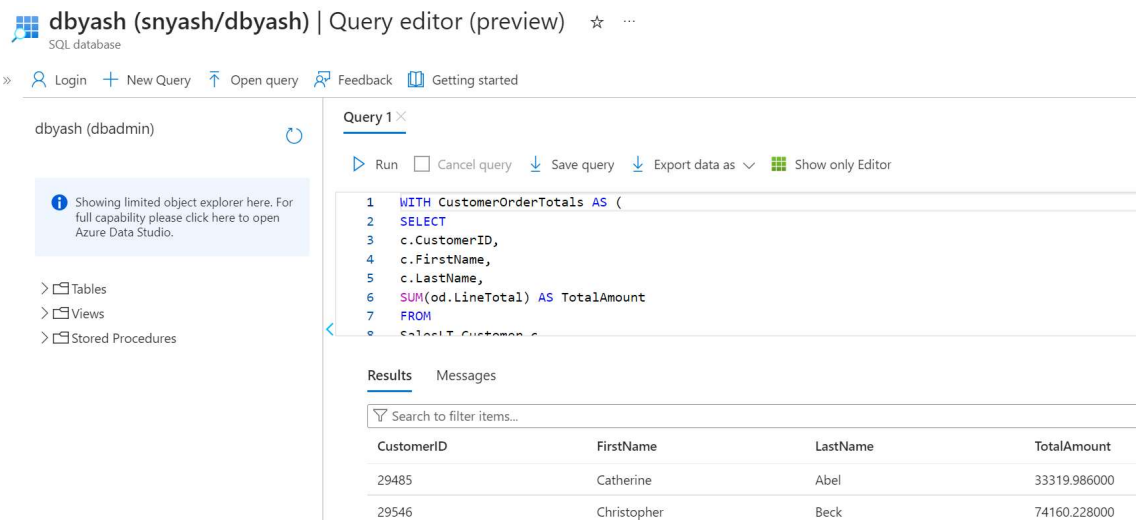
```
GROUP BY
oh.SalesOrderID, oh.OrderDate
ORDER BY
TotalAmount DESC;
```



12. Display customers who have placed orders with a total amount greater than the average.

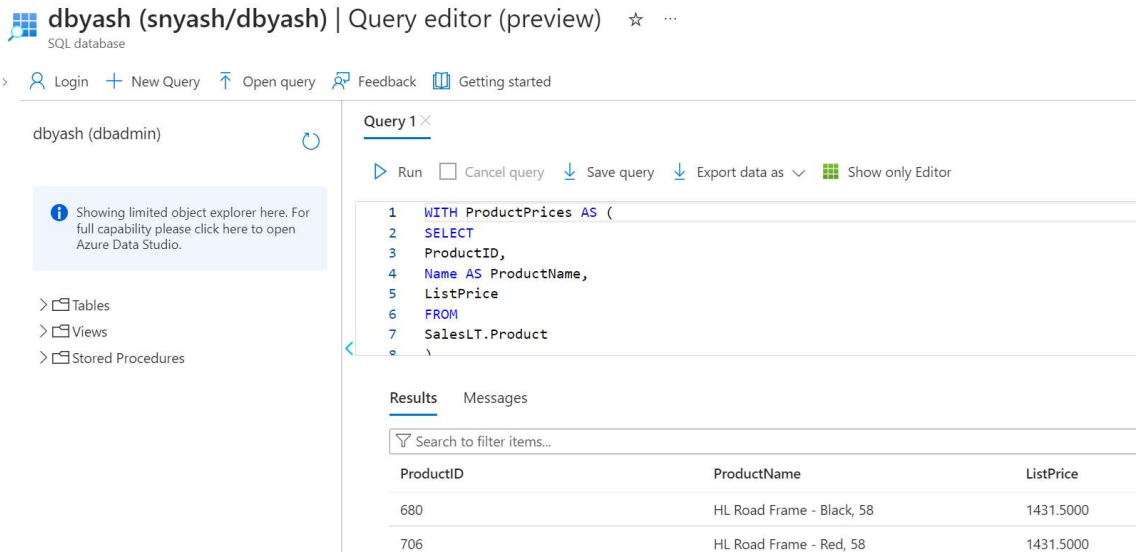
```
WITH CustomerOrderTotals AS (
SELECT
c.CustomerID,
c.FirstName,
c.LastName,
SUM(od.LineTotal) AS TotalAmount
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
GROUP BY
c.CustomerID, c.FirstName, c.LastName
)
SELECT
CustomerID,
FirstName,
LastName,
TotalAmount
FROM
CustomerOrderTotals
WHERE
```

```
TotalAmount > (SELECT AVG(TotalAmount) FROM CustomerOrderTotals);
```



13.List products with prices higher than the average product price.

```
WITH ProductPrices AS (
SELECT
ProductID,
Name AS ProductName,
ListPrice
FROM
SalesLT.Product
)
SELECT
ProductID,
ProductName,
ListPrice
FROM
ProductPrices
WHERE
ListPrice > (SELECT AVG(ListPrice) FROM ProductPrices);
```

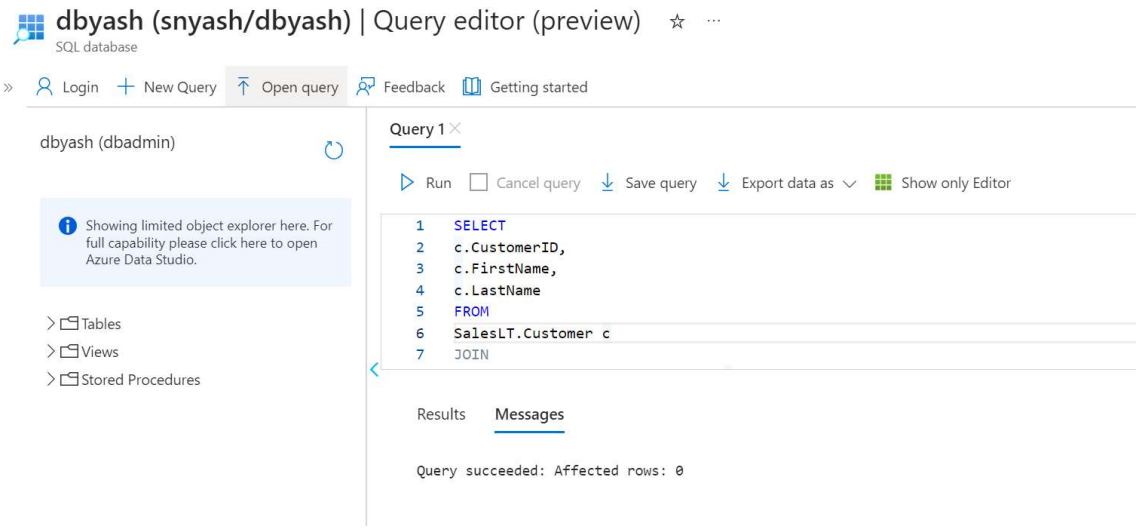


14.Retrieve orders placed by employees who have a specific job title.

Data not available

15.Display customers who have placed orders for a specific product category

```
SELECT
c.CustomerID,
c.FirstName,
c.LastName
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
JOIN
SalesLT.ProductCategory pc ON p.ProductCategoryID =
pc.ProductCategoryID
WHERE
pc.ProductCategoryID = 22;
```

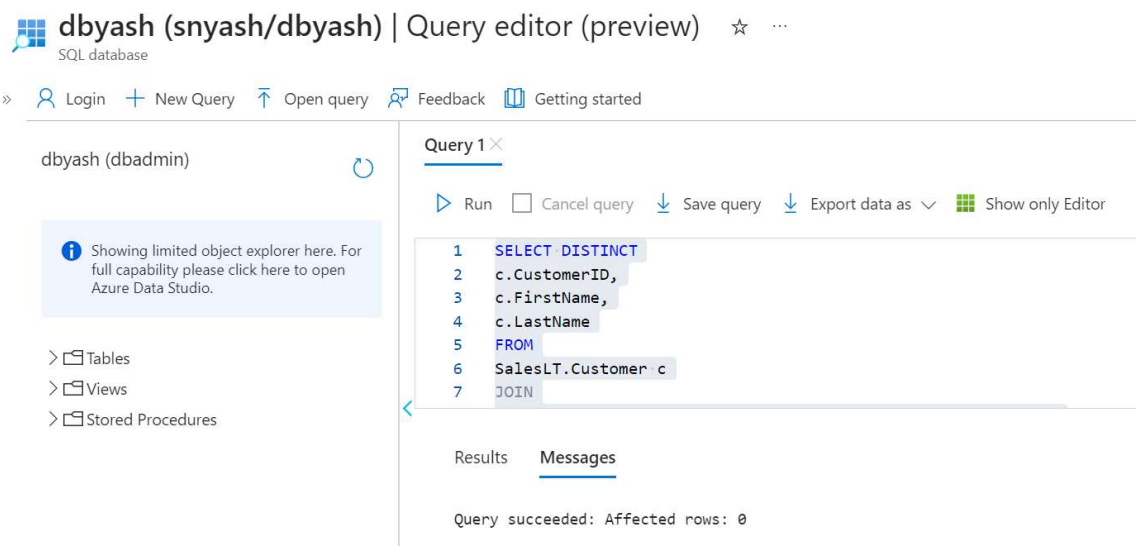


16.Find employees with salaries greater than the average salary in their department.

Data Not available

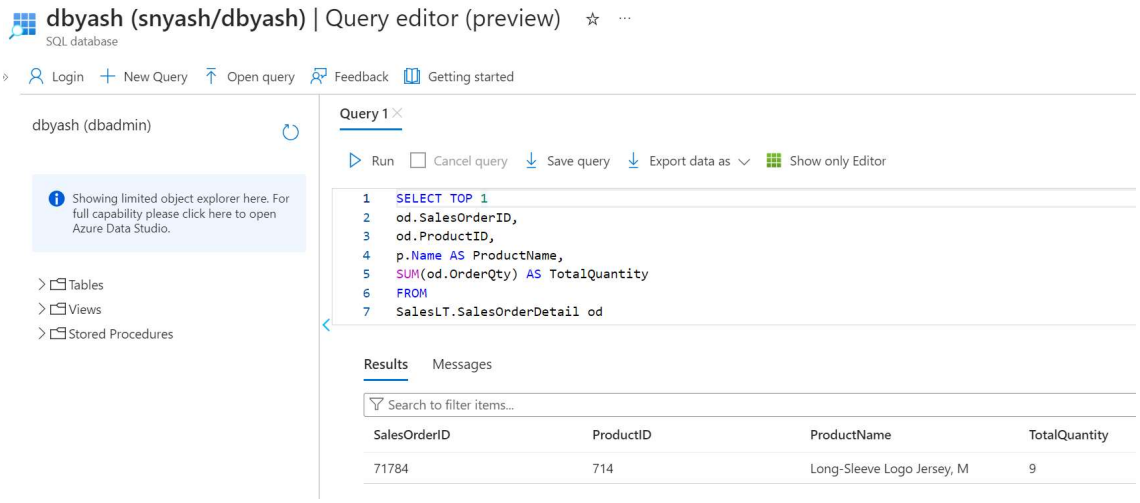
17.List customers who have placed orders before a specific date. Enough data not available for query

```
SELECT DISTINCT
c.CustomerID,
c.FirstName,
c.LastName
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
WHERE
oh.OrderDate < 2008-07-02;
```



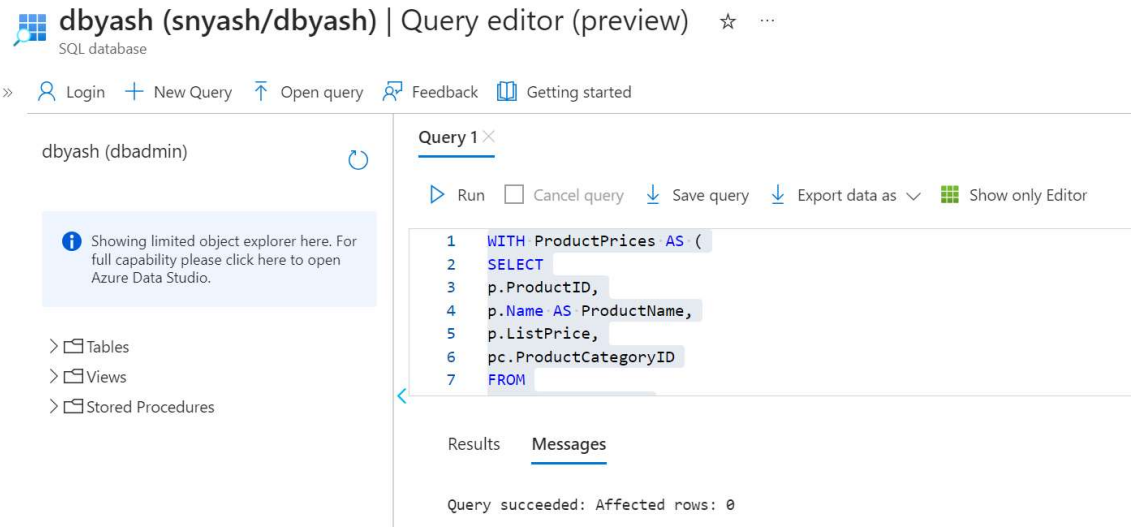
18.Retrieve the order with the highest quantity of a specific product

```
SELECT TOP 1
od.SalesOrderID,
od.ProductID,
p.Name AS ProductName,
SUM(od.OrderQty) AS TotalQuantity
FROM
SalesLT.SalesOrderDetail od
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
WHERE
od.ProductID = 714
GROUP BY
od.SalesOrderID, od.ProductID, p.Name
ORDER BY
TotalQuantity DESC;
```



19.Display products with prices lower than the lowest product price in a specific category.

```
WITH ProductPrices AS (
SELECT
p.ProductID,
p.Name AS ProductName,
p.ListPrice,
pc.ProductCategoryID
FROM
SalesLT.Product p
JOIN
SalesLT.ProductCategory pc ON p.ProductCategoryID =
pc.ProductCategoryID
WHERE
pc.ProductCategoryID = 11
)
SELECT
ProductID,
ProductName,
ListPrice
FROM
ProductPrices
WHERE
ListPrice < (SELECT MIN(ListPrice) FROM ProductPrices);
```



20.Find employees who have the same job title as their manager.

Data not available

21.Combine results from two queries to get a list of unique customer and employee names.

Data Not Available

22.Retrieve product names that are common in two different product categories.

Not enough data available

```
SELECT
p.Name AS ProductName
FROM
SalesLT.Product p
JOIN
SalesLT.ProductCategory pc1 ON p.ProductCategoryID =
pc1.ProductCategoryID
JOIN
SalesLT.ProductCategory pc2 ON p.ProductCategoryID =
pc2.ProductCategoryID
WHERE
pc1.ProductCategoryID <> pc2.ProductCategoryID;
```

23.Display the names of employees and customers in a single result set.

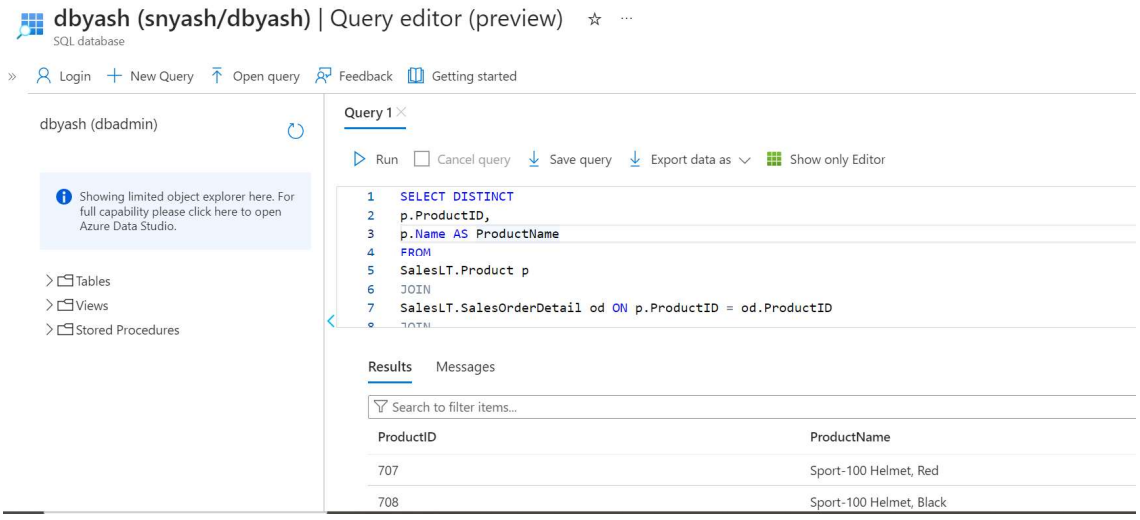
Data Not Available

24.List products that are in stock or have been discontinued.

Data Not Available

25.Combine the results of two queries to find unique products ordered by a specific customer.

```
SELECT DISTINCT
p.ProductID,
p.Name AS ProductName
FROM
SalesLT.Product p
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
JOIN
SalesLT.SalesOrderHeader oh ON od.SalesOrderID = oh.SalesOrderID
WHERE
oh.CustomerID = 29485
UNION
SELECT DISTINCT
p.ProductID,
p.Name AS ProductName
FROM
SalesLT.Product p
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
ORDER BY
ProductID;
```



26.Retrieve orders placed by customers and employees in a single result set.

Data not available

27.Display products that are either in a specific category or have a specific safety stock level.

Data not Available

28.List customers who have placed orders and employees who have direct reports in a single result set.

Data Not Available

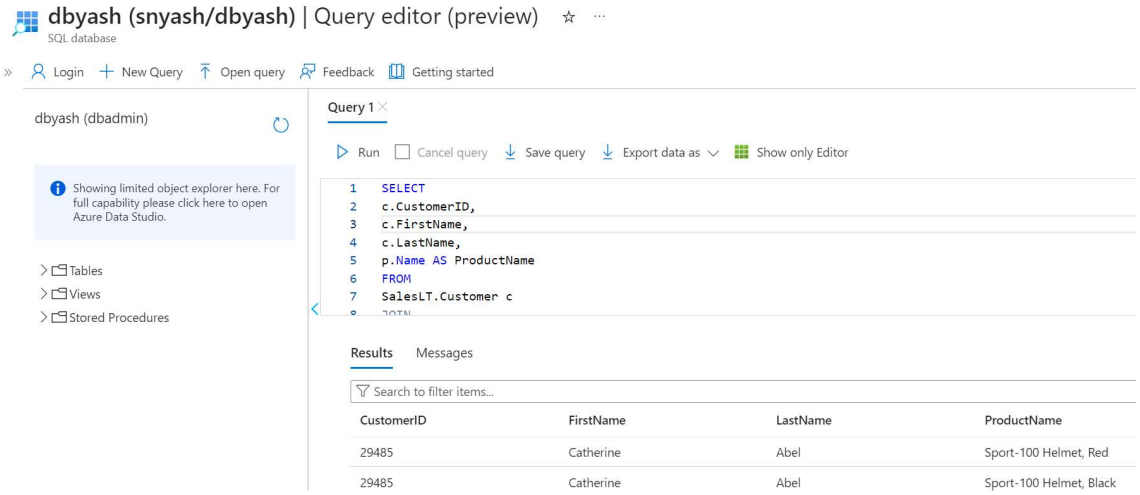
29.Retrieve products that are in stock in one location and out of stock in another.

Data Not Available

30.Combine information about employees who are managers and employees who have managers
Data Not Available INTERMEDIATE

31.Retrieve a list of customers along with the names of the products they have purchased.

```
SELECT
c.CustomerID,
c.FirstName,
c.LastName,
p.Name AS ProductName
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
ORDER BY
c.CustomerID, p.ProductID;
```

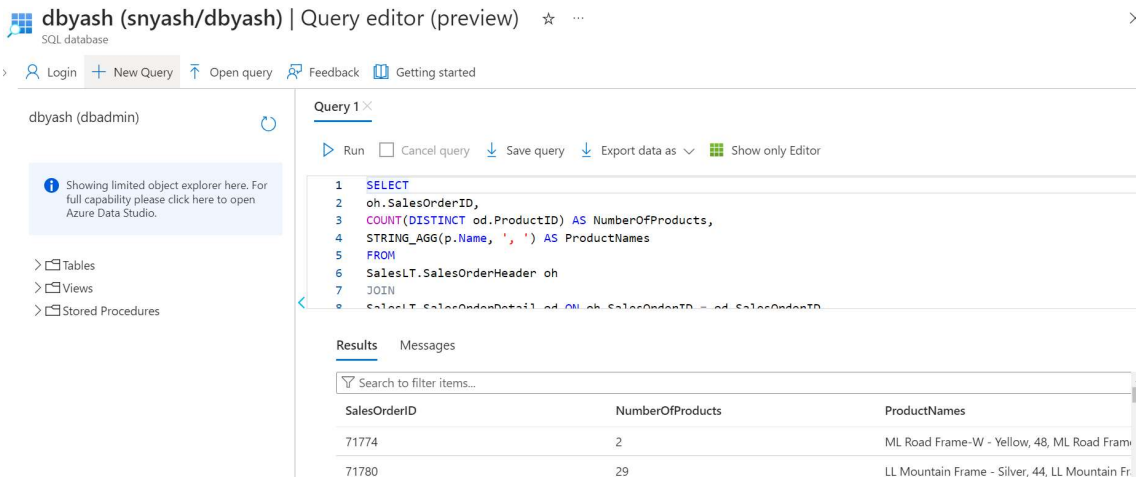


32.Display employees who have the same manager, including indirect reports.

Data Not Available

33.Find orders with multiple products and display the product names.

```
SELECT
oh.SalesOrderID,
COUNT(DISTINCT od.ProductID) AS NumberOfProducts,
STRING_AGG(p.Name, ', ') AS ProductNames
FROM
SalesLT.SalesOrderHeader oh
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
GROUP BY
oh.SalesOrderID
HAVING
COUNT(DISTINCT od.ProductID) > 1;
```



34.List customers along with the names of the salespeople who handled their orders.

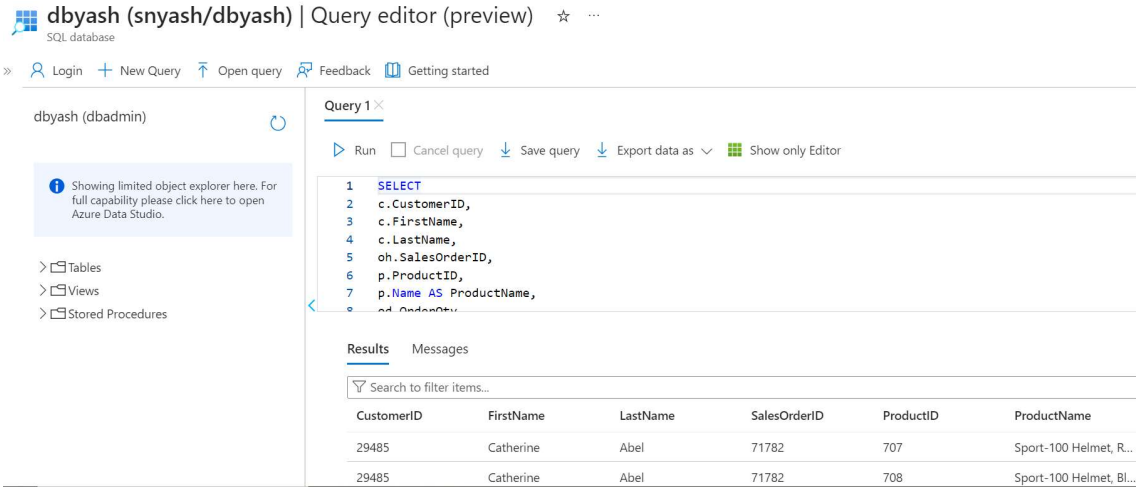
Data Not Available

35.Retrieve a list of products along with the names of suppliers.

Data Not Available

36.Display customers who have placed orders and the products they have purchased, including product details.

```
SELECT
c.CustomerID,
c.FirstName,
c.LastName,
oh.SalesOrderID,
p.ProductID,
p.Name AS ProductName,
od.OrderQty,
od.UnitPrice
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
ORDER BY
c.CustomerID, oh.SalesOrderID, p.ProductID;
```



37.Find orders where multiple employees were involved, showing the employee names.

Data Not Available

38.List products that have similar names but belong to different categories.

Data Not Enough

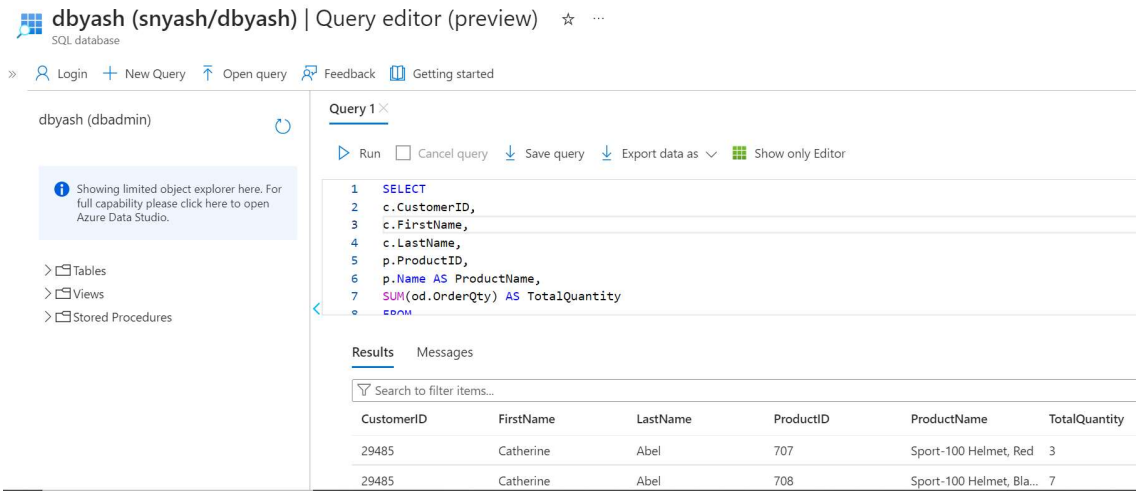
39.Retrieve a list of employees along with their training courses and training dates.

Data Not Available

40.Display customers who have placed orders and the total quantity of each product ordered.

```
SELECT
c.CustomerID,
c.FirstName,
c.LastName,
p.ProductID,
p.Name AS ProductName,
SUM(od.OrderQty) AS TotalQuantity
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
JOIN
SalesLT.Product p ON od.ProductID = p.ProductID
```

```
GROUP BY
c.CustomerID, c.FirstName, c.LastName, p.ProductID, p.Name
ORDER BY
c.CustomerID, p.ProductID;
```



41.Find customers who have made more purchases than the average number of purchases.

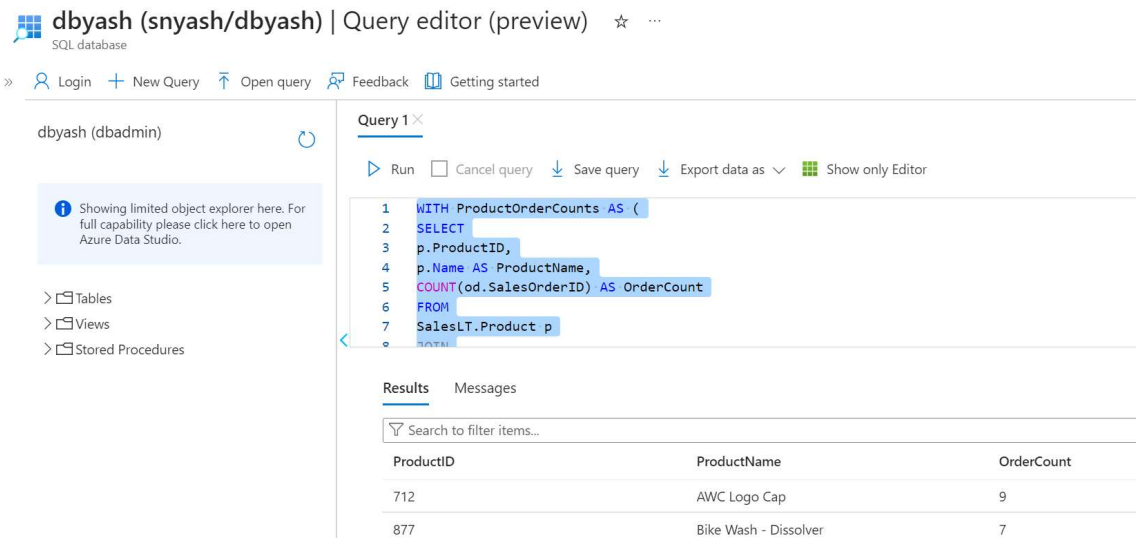
Not Enough Data

```
WITH CustomerPurchaseCounts AS (
SELECT
c.CustomerID,
COUNT(DISTINCT oh.SalesOrderID) AS PurchaseCount
FROM
SalesLT.Customer c
JOIN
SalesLT.SalesOrderHeader oh ON c.CustomerID = oh.CustomerID
JOIN
SalesLT.SalesOrderDetail od ON oh.SalesOrderID = od.SalesOrderID
GROUP BY
c.CustomerID
)
SELECT
c.CustomerID,
c.FirstName,
c.LastName,
c.EmailAddress,
c.Phone,
c.CompanyName
FROM
SalesLT.Customer c
```

```
JOIN
CustomerPurchaseCounts pc ON c.CustomerID = pc.CustomerID
WHERE
pc.PurchaseCount > (SELECT AVG(PurchaseCount) FROM
CustomerPurchaseCounts);
```

42.Display products that have been ordered more than the average number of times.

```
WITH ProductOrderCounts AS (
SELECT
p.ProductID,
p.Name AS ProductName,
COUNT(od.SalesOrderID) AS OrderCount
FROM
SalesLT.Product p
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
GROUP BY
p.ProductID, p.Name
)
SELECT
ProductID,
ProductName,
OrderCount
FROM
ProductOrderCounts
WHERE
OrderCount > (SELECT AVG(OrderCount) FROM ProductOrderCounts);
```



43.Retrieve orders placed by employees who have completed a specific training course.

Data Not Available

44.List employees who have a higher salary than at least one employee in another department.
Data Not Available

45.Display products that have not been ordered in the last 60 days.

Data Not Available

46.Find employees who have the same job title as the employee with the highest salary.

Data Not Available

47.List customers who have placed orders with a total amount greater than the total amount of a specific order.

48.Retrieve products that have been ordered by customers with the same shipping address.

Not Enough Data

```
WITH CustomerShippingAddresses AS (
SELECT
ca.CustomerID,
ca.AddressID,
a.AddressLine1,
a.AddressLine2,
a.City,
a.StateProvince,
a.CountryRegion,
a.PostalCode
FROM
SalesLT.CustomerAddress ca
JOIN
SalesLT.Address a ON ca.AddressID = a.AddressID
)
SELECT
p.ProductID,
p.Name AS ProductName,
od.SalesOrderID,
csa.CustomerID,
csa.AddressID,
```

```
csa.AddressLine1,
csa.AddressLine2,
csa.City,
csa.StateProvince,
csa.CountryRegion,
csa.PostalCode
FROM
SalesLT.Product p
JOIN
SalesLT.SalesOrderDetail od ON p.ProductID = od.ProductID
JOIN
SalesLT.SalesOrderHeader oh ON od.SalesOrderID = oh.SalesOrderID
JOIN
CustomerShippingAddresses csa ON oh.CustomerID = csa.CustomerID
WHERE
oh.ShipToAddressID IN (
SELECT
ShipToAddressID
FROM
SalesLT.SalesOrderHeader
GROUP BY
ShipToAddressID
HAVING
COUNT(DISTINCT CustomerID) > 1
```