Challenge 1: A 3-tier environment is a common setup. Use a tool of your choosing/familiarity create these resources on a cloud environment (Azure/AWS/GCP).

Ans:3 tier environment set up using virtual machine

1. Presentation tier(web server)

2.Application tier(app server)

3.data tier(DB server)

**1.Presentaion tier**

.Create a virtual network to host the servers(virtual machines)

Login to azure portal->virtual network->create

Create a subnet based on the requirement

Create a bastion subnet to secure rdp/ssh to the vm

2.Create a virtual machines

Deploy a virtual machine in the created virtual network.

Go to virtual machine->create(choose the size,OS,etc .based on the requirement.).Configure availability set for high availability of applications

3.Configure web server

Install web server configure like iis for windows and apache for linux

3.create load balancer and add the VMs in backend pool

2**.Application tier**

For hosting the applications either we can use app services or virtual machines for client specific applications I prefer to use virtual machine

1. Create the VM in the same subnet

2. Take RDP or SSH to the VM, Install and configure application software in the VM

**3.Data tier**

1.Create VMs for hosting database servers

2.Place the VMs in the specific subnet .

3.install DBMS

4.Configure databases,tables,etc.

Challenge 2 : **We need to write code that will query the meta data of an instance within Azure and provide a json formatted output**.

Ans:code.ps1

$metadataEndpoint = "http://169.254.169.254/metadata/instance?api-version=2021-02-01"

function Get-AzureMetadata {

param (

[string]$key

}

try {

$metadata = Invoke-RestMethod -Uri $metadataEndpoint -Headers @{Metadata="true"} -TimeoutSec 2

if ($metadata.PSObject.Properties[$key]) {

$output = @{

$key = $metadata.$key

}

Write-Output ($output | ConvertTo-Json -Depth 4)

} else {

Write-Output ("{""error"": ""Key '$key' not found in Azure metadata.""}")

}

} catch {

# Handle any errors that occur during the request

Write-Output ("{""error"": ""Failed to retrieve Azure metadata: $\_""}")

}

}

$keyToRetrieve = "network/interface/0/ipv4/ipAddress/0/privateIpAddress"

Get-AzureMetadata -key $keyToRetrieve

**Challenge 3: We have a nested object. We would like a function where you pass in the object and a key and get back the value.**

Ans:code.java

import java.util.Map;

public class NestedObject

{

public static Object getValue(Map<String, Object> object, String key)

{

String[] keys = key.split("/");

Map<String, Object> currentObject = object;

for (String k : keys)

{

if (currentObject.containsKey(k) && currentObject.get(k) instanceof Map)

{

currentObject = (Map<String, Object>) currentObject.get(k);

}

else

{

return null;

}

}

return currentObject;

}

public static void main(String[] args) {

// Eg: 1

Map<String, Object> object1 = Map.of("a", Map.of("b", Map.of("c", "d")));

String key1 = "a/b/c";

Object value1 = getValue(object1, key1);

System.out.println("Example 1: Value for key '" + key1 + "' is '" + value1 + "'");

// Eg: 2

Map<String, Object> object2 = Map.of("x", Map.of("y", Map.of("z", "a")));

String key2 = "x/y/z";

Object value2 = getValue(object2, key2);

System.out.println("Example 2: Value for key '" + key2 + "' is '" + value2 + "'");

}

}