

# Terraform lab 3

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DEVOPS

SZABIST KARACHI

## SECTION 1

### PART 1

```
C:\Users\Saad\Desktop>cd lab03s1

C:\Users\Saad\Desktop\lab03s1>echo. > vars03s1.tf

C:\Users\Saad\Desktop\lab03s1>echo. > providers.tf

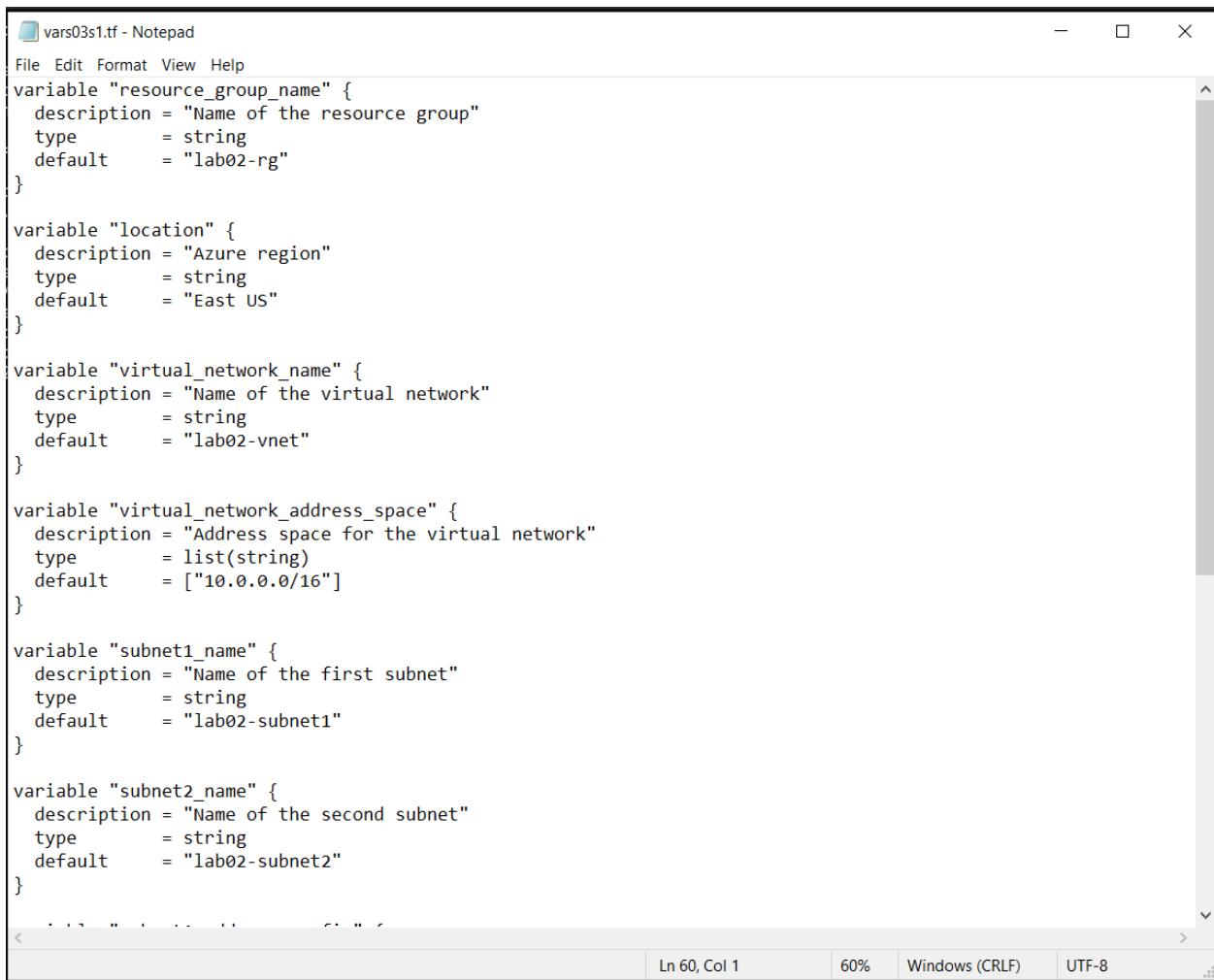
C:\Users\Saad\Desktop\lab03s1>dir
Volume in drive C has no label.
Volume Serial Number is 6C1E-A20E

Directory of C:\Users\Saad\Desktop\lab03s1

13/04/2025  10:04 pm    <DIR>          .
13/04/2025  10:04 pm    <DIR>          ..
13/04/2025  08:52 pm            3,341 lab03s1.tf
13/04/2025  10:04 pm            3 providers.tf
13/04/2025  10:03 pm            3 vars03s1.tf
                           3 File(s)        3,347 bytes
                           2 Dir(s)   100,729,729,024 bytes free

C:\Users\Saad\Desktop\lab03s1>
```

## PART 2



The screenshot shows a Windows Notepad window titled "vars03s1.tf - Notepad". The window contains a Terraform configuration file with several variable declarations. The variables define resource group, location, virtual network, address space, and two subnets. The code is as follows:

```
vars03s1.tf - Notepad
File Edit Format View Help
variable "resource_group_name" {
  description = "Name of the resource group"
  type        = string
  default     = "lab02-rg"
}

variable "location" {
  description = "Azure region"
  type        = string
  default     = "East US"
}

variable "virtual_network_name" {
  description = "Name of the virtual network"
  type        = string
  default     = "lab02-vnet"
}

variable "virtual_network_address_space" {
  description = "Address space for the virtual network"
  type        = list(string)
  default     = ["10.0.0.0/16"]
}

variable "subnet1_name" {
  description = "Name of the first subnet"
  type        = string
  default     = "lab02-subnet1"
}

variable "subnet2_name" {
  description = "Name of the second subnet"
  type        = string
  default     = "lab02-subnet2"
}

Ln 60, Col 1       60%    Windows (CRLF)   UTF-8
```

vars03s1.tf - Notepad

```
File Edit Format View Help
description = "Name of the first subnet"
type        = string
default     = "lab02-subnet1"
}

variable "subnet2_name" {
description = "Name of the second subnet"
type        = string
default     = "lab02-subnet2"
}

variable "subnet1_address_prefix" {
description = "Address prefix for the first subnet"
type        = list(string)
default     = ["10.0.1.0/24"]
}

variable "subnet2_address_prefix" {
description = "Address prefix for the second subnet"
type        = list(string)
default     = ["10.0.2.0/24"]
}

variable "nsg1_name" {
description = "Name of the first Network Security Group"
type        = string
default     = "lab02-nsg1"
}

variable "nsg2_name" {
description = "Name of the second Network Security Group"
type        = string
default     = "lab02-nsg2"
}
```

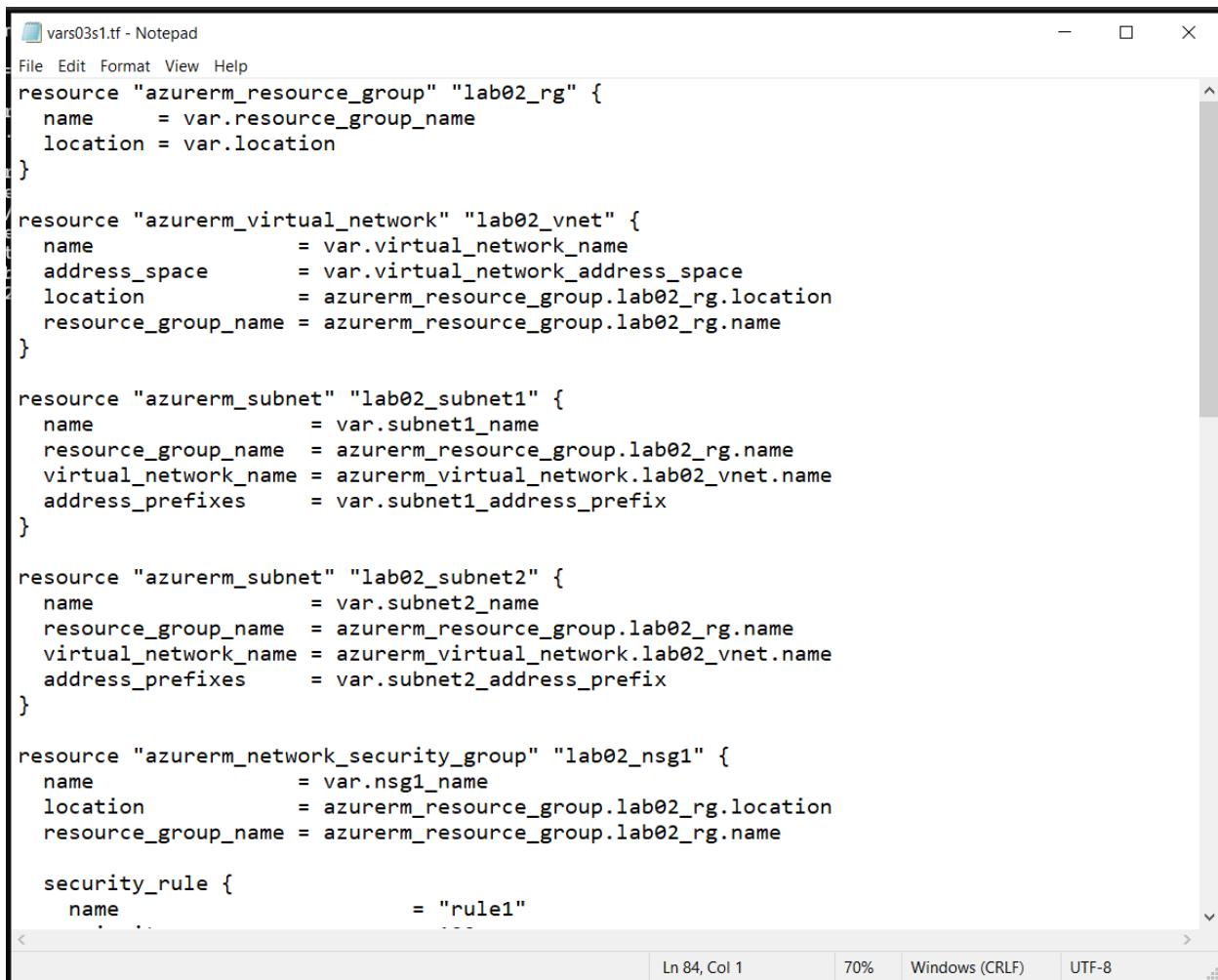
providers.tf - Notepad

```
File Edit Format View Help
terraform {
  required_providers {
    azurerm = {
      source  = "hashicorp/azurerm"
      version = ">= 3.0.0"
    }
  }

  required_version = ">= 1.0.0"
}

provider "azurerm" {
  features {}
  subscription_id = "bfbe3041-7fa8-4038-8890-37ee17f2c645"
}
```

### PART 3



The screenshot shows a Notepad window titled "vars03s1.tf - Notepad". The content is a Terraform configuration file (tf) for Azure resources. The code defines several resources: a resource group, a virtual network, two subnets, and a network security group with a security rule.

```
vars03s1.tf - Notepad
File Edit Format View Help
resource "azurerm_resource_group" "lab02_rg" {
    name      = var.resource_group_name
    location  = var.location
}

resource "azurerm_virtual_network" "lab02_vnet" {
    name          = var.virtual_network_name
    address_space = var.virtual_network_address_space
    location      = azurerm_resource_group.lab02_rg.location
    resource_group_name = azurerm_resource_group.lab02_rg.name
}

resource "azurerm_subnet" "lab02_subnet1" {
    name          = var.subnet1_name
    resource_group_name = azurerm_resource_group.lab02_rg.name
    virtual_network_name = azurerm_virtual_network.lab02_vnet.name
    address_prefixes   = var.subnet1_address_prefix
}

resource "azurerm_subnet" "lab02_subnet2" {
    name          = var.subnet2_name
    resource_group_name = azurerm_resource_group.lab02_rg.name
    virtual_network_name = azurerm_virtual_network.lab02_vnet.name
    address_prefixes   = var.subnet2_address_prefix
}

resource "azurerm_network_security_group" "lab02_nsg1" {
    name          = var.nsg1_name
    location      = azurerm_resource_group.lab02_rg.location
    resource_group_name = azurerm_resource_group.lab02_rg.name

    security_rule {
        name          = "rule1"
        ...
    }
}

Ln 84, Col 1    70%    Windows (CRLF)    UTF-8
```

The screenshot shows a Notepad window titled "vars03s1.tf - Notepad". The content is a Terraform configuration file. It defines two security rules (rule1 and rule2) with specific parameters like name, priority, direction, access, protocol, and port ranges. It also creates two network security group associations (lab02\_assoc1 and lab02\_assoc2) linking subnets to network security groups. The code uses the azurerm provider.

```
vars03s1.tf
File Edit Format View Help

security_rule {
    name          = "rule1"
    priority      = 100
    direction     = "Inbound"
    access        = "Allow"
    protocol      = "Tcp"
    source_port_range = "*"
    destination_port_range = "3389"
    source_address_prefix = "*"
    destination_address_prefix = "*"
}

security_rule {
    name          = "rule2"
    priority      = 200
    direction     = "Inbound"
    access        = "Allow"
    protocol      = "Tcp"
    source_port_range = "*"
    destination_port_range = "5985"
    source_address_prefix = "*"
    destination_address_prefix = "*"
}

resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
    subnet_id      = azurerm_subnet.lab02_subnet1.id
    network_security_group_id = azurerm_network_security_group.lab02_nsg1.id
}

resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
    subnet_id      = azurerm_subnet.lab02_subnet2.id
    network_security_group_id = azurerm_network_security_group.lab02_nsg2.id
}

Ln 84, Col 1       60%   Windows (CRLF)   UTF-8
```

#### PART 4

```
C:\Users\Saad\Desktop\lab03s1>terraform init
Initializing the backend...
Initializing provider plugins...
- Finding hashicorp/azurerm versions matching "~> 3.0"...
- Installing hashicorp/azurerm v3.117.1...
- Installed hashicorp/azurerm v3.117.1 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.
```

```
Terraform has been successfully initialized!
```

```
You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.
```

```
If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
```

```
C:\Users\Saad\Desktop\lab03s1>
```

## PART 5

```
C:\Users\Saad\Desktop\lab03s1>terraform validate  
Success! The configuration is valid.
```

```
C:\Users\Saad\Desktop\lab03s1>
```

## PART 6

```
C:\Users\Saad\Desktop\lab03s1>terraform plan  
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:  
+ create  
Terraform will perform the following actions:  
  
# azurerm_network_security_group.lab02_nsg1 will be created  
+ resource "azurerm_network_security_group" "lab02_nsg1" {  
    + id          = (known after apply)  
    + location    = "eastus"  
    + name        = "lab02-nsg1"  
    + resource_group_name = "lab02-resources"  
    + security_rule = (known after apply)  
}  
  
# azurerm_network_security_group.lab02_nsg2 will be created  
+ resource "azurerm_network_security_group" "lab02_nsg2" {  
    + id          = (known after apply)  
    + location    = "eastus"  
    + name        = "lab02-nsg2"  
    + resource_group_name = "lab02-resources"  
    + security_rule = (known after apply)  
}  
  
# azurerm_resource_group.lab02_rg will be created  
+ resource "azurerm_resource_group" "lab02_rg" {  
    + id          = (known after apply)  
    + location    = "eastus"  
    + name        = "lab02-resources"  
}  
  
# azurerm_subnet.lab02_subnet1 will be created  
+ resource "azurerm_subnet" "lab02_subnet1" {  
    + address_prefixes      = [  
        + "10.0.1.0/24",  
    ]  
    + default_outbound_access_enabled = true  
    + enforce_private_link_endpoint_network_policies = (known after apply)  
    + enforce_private_link_service_network_policies = (known after apply)  
    + id          = (known after apply)  
    + name        = "lab02-subnet1"  
    + private_endpoint_network_policies = (known after apply)  
    + private_endpoint_network_policies_enabled = (known after apply)  
    + private_link_service_network_policies_enabled = (known after apply)  
    + resource_group_name = "lab02-resources"  
    + virtual_network_name = "lab02-vnet"  
}
```

```

+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name                         = "lab02-resources"
+ virtual_network_name                        = "lab02-vnet"
}

# azurerm_subnet_lab02_subnet2 will be created
resource "azurerm_subnet" "lab02_subnet2" {
+ address_prefixes                           = [
+   "10.0.2.0/24",
]
+ default_outbound_access_enabled           = true
+ enforce_private_link_endpoint_network_policies = (known after apply)
+ enforce_private_link_service_network_policies = (known after apply)
+ id                                       = (known after apply)
+ name                                      = "lab02-subnet2"
+ private_endpoint_network_policies          = (known after apply)
+ private_endpoint_network_policies_enabled    = (known after apply)
+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name                        = "lab02-resources"
+ virtual_network_name                      = "lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
+ id                                     = (known after apply)
+ network_security_group_id             = (known after apply)
+ subnet_id                             = (known after apply)
}

# azurerm_subnet_network_security_group_association.lab02_assoc2 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
+ id                                     = (known after apply)
+ network_security_group_id             = (known after apply)
+ subnet_id                             = (known after apply)
}

# azurerm_virtual_network.lab02_vnet will be created
resource "azurerm_virtual_network" "lab02_vnet" {
+ address_space                           = [
+   "10.0.0.0/16",
]
+ dns_servers                            = (known after apply)
+ guid                                    = (known after apply)
+ id                                      = (known after apply)
+ location                                = "eastus"
+ name                                     = "lab02-vnet"
+ resource_group_name                     = "lab02-resources"
+ subnet                                  = (known after apply)
}

```

Plan: 8 to add, 0 to change, 0 to destroy.

---

Note: You didn't use the `-out` option to save this plan, so Terraform can't guarantee to take exactly these actions if you run `"terraform apply"` now.

## PART 8

```

C:\Users\Saad\Desktop\lab03s1>terraform apply
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_network_security_group.lab02_nsg1 will be created
resource "azurerm_network_security_group" "lab02_nsg1" {
+ id                                     = (known after apply)
+ location                                = "eastus"
+ name                                     = "lab02-nsg1"
+ resource_group_name                     = "lab02-resources"
+ security_rule                            = (known after apply)
}

# azurerm_network_security_group.lab02_nsg2 will be created
resource "azurerm_network_security_group" "lab02_nsg2" {
+ id                                     = (known after apply)
+ location                                = "eastus"
+ name                                     = "lab02-nsg2"
+ resource_group_name                     = "lab02-resources"
+ security_rule                            = (known after apply)
}

# azurerm_resource_group.lab02_rg will be created
resource "azurerm_resource_group" "lab02_rg" {
+ id                                     = (known after apply)
+ location                                = "eastus"
+ name                                     = "lab02-resources"
}

# azurerm_subnet_lab02_subnet1 will be created
resource "azurerm_subnet" "lab02_subnet1" {
+ address_prefixes                           = [
+   "10.0.1.0/24",
]
+ default_outbound_access_enabled           = true
+ enforce_private_link_endpoint_network_policies = (known after apply)
+ enforce_private_link_service_network_policies = (known after apply)
+ id                                       = (known after apply)
+ name                                      = "lab02-subnet1"
+ private_endpoint_network_policies          = (known after apply)
+ private_endpoint_network_policies_enabled    = (known after apply)
+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name                        = "lab02-resources"
+ virtual_network_name                      = "lab02-vnet"
}

# azurerm_subnet_lab02_subnet2 will be created
resource "azurerm_subnet" "lab02_subnet2" {
+ address_prefixes                           = [
+   "10.0.2.0/24",
]
+ default_outbound_access_enabled           = true

```

```

    + "10.0.2.0/24",
  ]
  + default_outbound_access_enabled = true
  + enforce_private_link_endpoint_network_policies = "(known after apply)"
  + enforce_private_link_service_network_policies = "(known after apply)"
  + id = "lab02-subnet2"
  + name = "lab02-vnet"
  + private_endpoint_network_policies
  + private_endpoint_network_policies_enabled = "(known after apply)"
  + private_link_service_network_policies_enabled = "(known after apply)"
  + resource_group_name = "Lab02-resources"
  + virtual_network_name = "Lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
  + id = "(known after apply)"
  + network_security_group_id = "(known after apply)"
  + subnet_id = "(known after apply)"
}

# azurerm_subnet_network_security_group_association.lab02_assoc2 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
  + id = "(known after apply)"
  + network_security_group_id = "(known after apply)"
  + subnet_id = "(known after apply)"
}

# azurerm_virtual_network.lab02_vnet will be created
resource "azurerm_virtual_network" "lab02_vnet" {
  + address_space = [
    + "10.0.0.0/16",
  ]
  + dns_servers = "(known after apply)"
  + guid = "(known after apply)"
  + id = "(known after apply)"
  + location = "eastus"
  + name = "Lab02-vnet"
  + resource_group_name = "Lab02-resources"
  + subnet = "(known after apply)"
}

Plan: 8 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

azurerm_resource_group.lab02_rg: Creating...
azurerm_resource_group.lab02_rg: Still creating... [10s elapsed]
azurerm_resource_group.lab02_rg: Creation complete after 12s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources]
azurerm_network_security_group.lab02_nsg1: Creating...
azurerm_network_security_group.lab02_nsg2: Creating...
azurerm_virtual_network.lab02_vnet: Creating...
azurerm_network_security_group.lab02_nsg1: Creation complete after 6s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg1]

[+]
  + network_security_group_id = "(known after apply)"
  + subnet_id = "(known after apply)"

# azurerm_virtual_network.lab02_vnet will be created
resource "azurerm_virtual_network" "lab02_vnet" {
  + address_space = [
    + "10.0.0.0/16",
  ]
  + dns_servers = "(known after apply)"
  + guid = "(known after apply)"
  + id = "(known after apply)"
  + location = "eastus"
  + name = "Lab02-vnet"
  + resource_group_name = "Lab02-resources"
  + subnet = "(known after apply)"
}

Plan: 8 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

azurerm_resource_group.lab02_rg: Creating...
azurerm_resource_group.lab02_rg: Still creating... [10s elapsed]
azurerm_resource_group.lab02_rg: Creation complete after 12s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources]
azurerm_network_security_group.lab02_nsg1: Creating...
azurerm_network_security_group.lab02_nsg2: Creating...
azurerm_virtual_network.lab02_vnet: Creating...
azurerm_network_security_group.lab02_nsg1: Creation complete after 6s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg1]
azurerm_network_security_group.lab02_nsg2: Creation complete after 7s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg2]
azurerm_virtual_network.lab02_vnet: Still creating... [10s elapsed]
azurerm_virtual_network.lab02_vnet: Creation complete after 11s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet]
azurerm_subnet.lab02_subnet1: Creating...
azurerm_subnet.lab02_subnet1: Creation complete after 10s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1]
azurerm_subnet_network_security_group_association.lab02_assoc1: Creating...
azurerm_subnet_network_security_group_association.lab02_assoc1: Still creating... [10s elapsed]
azurerm_subnet_network_security_group_association.lab02_assoc1: Creation complete after 18s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1]
azurerm_subnet_network_security_group_association.lab02_assoc2: Creating...
azurerm_subnet_network_security_group_association.lab02_assoc2: Still creating... [10s elapsed]
azurerm_subnet_network_security_group_association.lab02_assoc2: Creation complete after 18s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2]
azurerm_subnet_network_security_group_association.lab02_assoc2: Creation complete after 19s [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2]

Apply complete! Resources: 8 added, 0 changed, 0 destroyed.

C:\Users\Saad\Desktop\lab03\saad>

```

## PART 9

```
C:\Users\Saad\Desktop\lab03s1>terraform state list
azurerm_network_security_group.lab02_nsg1
azurerm_network_security_group.lab02_nsg2
azurerm_resource_group.lab02_rg
azurerm_subnet.lab02_subnet1
azurerm_subnet.lab02_subnet2
azurerm_subnet_network_security_group_association.lab02_assoc1
azurerm_subnet_network_security_group_association.lab02_assoc2
azurerm_virtual_network.lab02_vnet

C:\Users\Saad\Desktop\lab03s1>terraform show
# azurerm_network_security_group.lab02_nsg1:
resource "azurerm_network_security_group" "lab02_nsg1" {
  location          = "eastus"
  name              = "lab02-nsg1"
  resource_group_name = "lab02-resources"
  security_rule      = []
}

# azurerm_network_security_group.lab02_nsg2:
resource "azurerm_network_security_group" "lab02_nsg2" {
  location          = "eastus"
  name              = "lab02-nsg2"
  resource_group_name = "lab02-resources"
  security_rule      = []
}

# azurerm_resource_group.lab02_rg:
resource "azurerm_resource_group" "lab02_rg" {
  id                = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources"
  location          = "eastus"
  managed_by        = null
  name              = "lab02-resources"
}

# azurerm_subnet.lab02_subnet1:
resource "azurerm_subnet" "lab02_subnet1" {
  address_prefixes     = [
    "10.0.1.0/24",
  ]
  default_outbound_access_enabled = true
  enforce_private_link_endpoint_network_policies = false
  enforce_private_link_service_network_policies = false
  id                = "/subscriptions/bfbbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1"
  bnet2:
    name              = "Lab02-subnet1"
    private_endpoint_network_policies = "Enabled"
    private_endpoint_network_policies_enabled = true
    private_link_service_network_policies_enabled = true
    resource_group_name = "lab02-resources"
    virtual_network_name = "Lab02-vnet"
}

private endpoint network policies      = "Enabled"
private_endpoint_network_policies_enabled = true
private_link_service_network_policies_enabled = true
resource_group_name                  = "Lab02-resources"
virtual_network_name                = "Lab02-vnet"

# azurerm_subnet.lab02_subnet2:
resource "azurerm_subnet" "lab02_subnet2" {
  address_prefixes     = [
    "10.0.2.0/24",
  ]
  default_outbound_access_enabled = true
  enforce_private_link_endpoint_network_policies = false
  enforce_private_link_service_network_policies = false
  id                = "/subscriptions/bfbbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2"
  bnet2:
    name              = "Lab02-subnet2"
    private_endpoint_network_policies = "Enabled"
    private_endpoint_network_policies_enabled = true
    private_link_service_network_policies_enabled = true
    resource_group_name = "Lab02-resources"
    virtual_network_name = "Lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1:
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
  id                = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1"
  network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg1"
  subnet_id         = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1"
}

# azurerm_subnet_network_security_group_association.lab02_assoc2:
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
  id                = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2"
  network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg2"
  subnet_id         = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2"
}

# azurerm_virtual_network.lab02_vnet:
resource "azurerm_virtual_network" "lab02_vnet" {
  address_space       = [
    "10.0.0.0/16",
  ]
  bgp_community       = null
  dns_servers         = []
  edge_zone           = null
  flow_timeout_in_minutes = 30
  guid               = "0216fa8e-c5a0-4ffa-ac42-cellc0cc97b3"
  id                 = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet"
  location            = "eastus"
  name               = "Lab02-vnet"
  resource_group_name = "lab02-resources"
  subnet              = []
}

C:\Users\Saad\Desktop\lab03s1>
```

## PART 10

**Microsoft Azure**

Search resources, services, and docs (G+/)

Copilot

bscs2112118@szabist.pk  
DEFAULT DIRECTORY

All services >

**Resource groups** ...

Default Directory

+ Create ...

You are viewing a new version of Browse experience. Some features may be missing. Click here to access the old experience.

Filter for any field... Subscription equals all Location equals all + Add filter

Name	Subscription	Location
lab02-resources	Azure for Students	East US
NetworkWatcherRG	Azure for Students	East US

**Microsoft Azure**

Search resources, services, and docs (G+/)

Copilot

bscs2112118@szabist.pk  
DEFAULT DIRECTORY

All services > Resource groups >

**Resource groups** ...

Default Directory

+ Create ...

You are viewing a new version of Browse experience. Some features may be missing. Click here to access the old experience.

Filter for any field... Type equals all Location equals all + Add filter

Name	Type	Location
lab02-resources	Network security group	East US
lab02-nsg1	Network security group	East US
lab02-nsg2	Network security group	East US
lab02-vnet	Virtual network	East US

**Microsoft Azure**

Search resources, services, and docs (G+/)

Copilot

bscs2112118@szabist.pk  
DEFAULT DIRECTORY

All services > Resource groups > lab02-resources > lab02-vnet

**lab02-vnet | Subnets** ...

Virtual network

+ Subnet Refresh Manage users Delete

Create subnets to segment the virtual network address space into smaller ranges for use by your applications. When you deploy resources into a subnet, Azure assigns the resource an IP address from the subnet.

Search subnets

Name	IPv4	IPv6	Available IPs	Delegated to	Security group	Route table
lab02-subnet1	10.0.1.0/24	-	251	-	lab02-nsg1	-
lab02-subnet2	10.0.2.0/24	-	251	-	lab02-nsg2	-

## PART 11

```
C:\Users\Saad\Desktop\lab03si>terraform destroy
azurerm_resource_group.lab02_rg: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources]
azurerm_network_security_group.lab02_ns1: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-ns1]
azurerm_network_security_group.lab02_ns2: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-ns2]
azurerm_virtual_network.lab02_vnet: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet]
azurerm_subnet.lab02_subnet1: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet1]
azurerm_subnet.lab02_subnet2: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet2]
azurerm_subnet_network_security_group_association.lab02_assoc1: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet1]
azurerm_subnet_network_security_group_association.lab02_assoc2: Refreshing state... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet2]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
  destroy

Terraform will perform the following actions:

# azurerm_network_security_group.lab02_ns1 will be destroyed
resource "azurerm_network_security_group" "lab02_ns1" {
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-ns1" -> null
  - location    = "eastus" -> null
  - name        = "Lab02-NS1" -> null
  - resource_group_name = "lab02-resources" -> null
  - security_rule = [] -> null
  - tags         = {} -> null
}

# azurerm_network_security_group.lab02_ns2 will be destroyed
resource "azurerm_network_security_group" "lab02_ns2" {
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-ns2" -> null
  - location    = "eastus" -> null
  - name        = "Lab02-NS2" -> null
  - resource_group_name = "lab02-resources" -> null
  - security_rule = [] -> null
  - tags         = {} -> null
}

# azurerm_resource_group.lab02_rg will be destroyed
resource "azurerm_resource_group" "lab02_rg" {
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources" -> null
  - location    = "eastus" -> null
  - name        = "Lab02-resources" -> null
  - tags         = {} -> null
  # (1 unchanged attribute hidden)
}

# azurerm_subnet.lab02_subnet1 will be destroyed
resource "azurerm_subnet" "lab02_subnet1" {
  - address_prefixes = [
    - "10.0.1.0/24",
    ] -> null
  - default_outbound_access_enabled = true -> null
  - enforce_private_link_endpoint_network_policies = false -> null
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet1" -> null
  - name        = "Lab02-subnet1" -> null
  - private_endpoint_network_policies = false -> null
  - private_endpoint_network_policies_enabled = true -> null
  - private_link_service_network_policies_enabled = true -> null
  - resource_group_name = "lab02-resources" -> null
  - service_endpoint_ids = [] -> null
  - service_endpoints = [] -> null
  - virtual_network_name = "Lab02-vnet" -> null
}

# azurerm_subnet.lab02_subnet2 will be destroyed
resource "azurerm_subnet" "lab02_subnet2" {
  - address_prefixes = [
    - "10.0.2.0/24",
    ] -> null
  - default_outbound_access_enabled = true -> null
  - enforce_private_link_endpoint_network_policies = false -> null
  - enforce_private_link_service_network_policies = false -> null
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet2" -> null
  - name        = "Lab02-subnet2" -> null
  - private_endpoint_network_policies = "Enabled" -> null
  - private_endpoint_network_policies_enabled = true -> null
  - private_link_service_network_policies_enabled = true -> null
  - resource_group_name = "lab02-resources" -> null
  - service_endpoint_ids = [] -> null
  - service_endpoints = [] -> null
  - virtual_network_name = "Lab02-vnet" -> null
}

# azurerm_subnet_network_security_group_association.lab02_assoc1 will be destroyed
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet1" -> null
  - network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-ns1" -> null
  - subnet_id   = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet1" -> null
}

# azurerm_subnet_network_security_group_association.lab02_assoc2 will be destroyed
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
  - id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet2" -> null
  - network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-ns2" -> null
  - subnet_id   = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/Lab02-vnet/subnets/Lab02-subnet2" -> null
}

# azurerm_virtual_network.lab02_vnet will be destroyed
resource "azurerm_virtual_network" "lab02_vnet" {
  - address_space     = [
    - "10.0.0.0/16",
    ] -> null
  - dns_servers       = [] -> null
  - flow_timeout_in_minutes = 0 -> null
  - guid              = "0216fa8e-c5a0-4ffa-ac42-cellc0cc97b3" -> null
}
```



## SECTION 2

### PART 1

```
C:\Users\Saad\Desktop>mkdir lab03s2

C:\Users\Saad\Desktop>cd lab03s2

C:\Users\Saad\Desktop\lab03s2>echo vars03s2.tf
vars03s2.tf

C:\Users\Saad\Desktop\lab03s2>echo dir
dir

C:\Users\Saad\Desktop\lab03s2>dir
Volume in drive C has no label.
Volume Serial Number is 6C1E-A20E

Directory of C:\Users\Saad\Desktop\lab03s2

13/04/2025  11:09 pm    <DIR>          .
13/04/2025  11:09 pm    <DIR>          ..
13/04/2025  10:18 pm            1,871 lab03s1.tf
13/04/2025  10:16 pm            235 providers.tf
13/04/2025  10:18 pm            1,453 vars03s1.tf
               3 File(s)        3,559 bytes
               2 Dir(s)   99,783,090,176 bytes free

C:\Users\Saad\Desktop\lab03s2>echo. > vars03s2.tf

C:\Users\Saad\Desktop\lab03s2>dir
Volume in drive C has no label.
Volume Serial Number is 6C1E-A20E

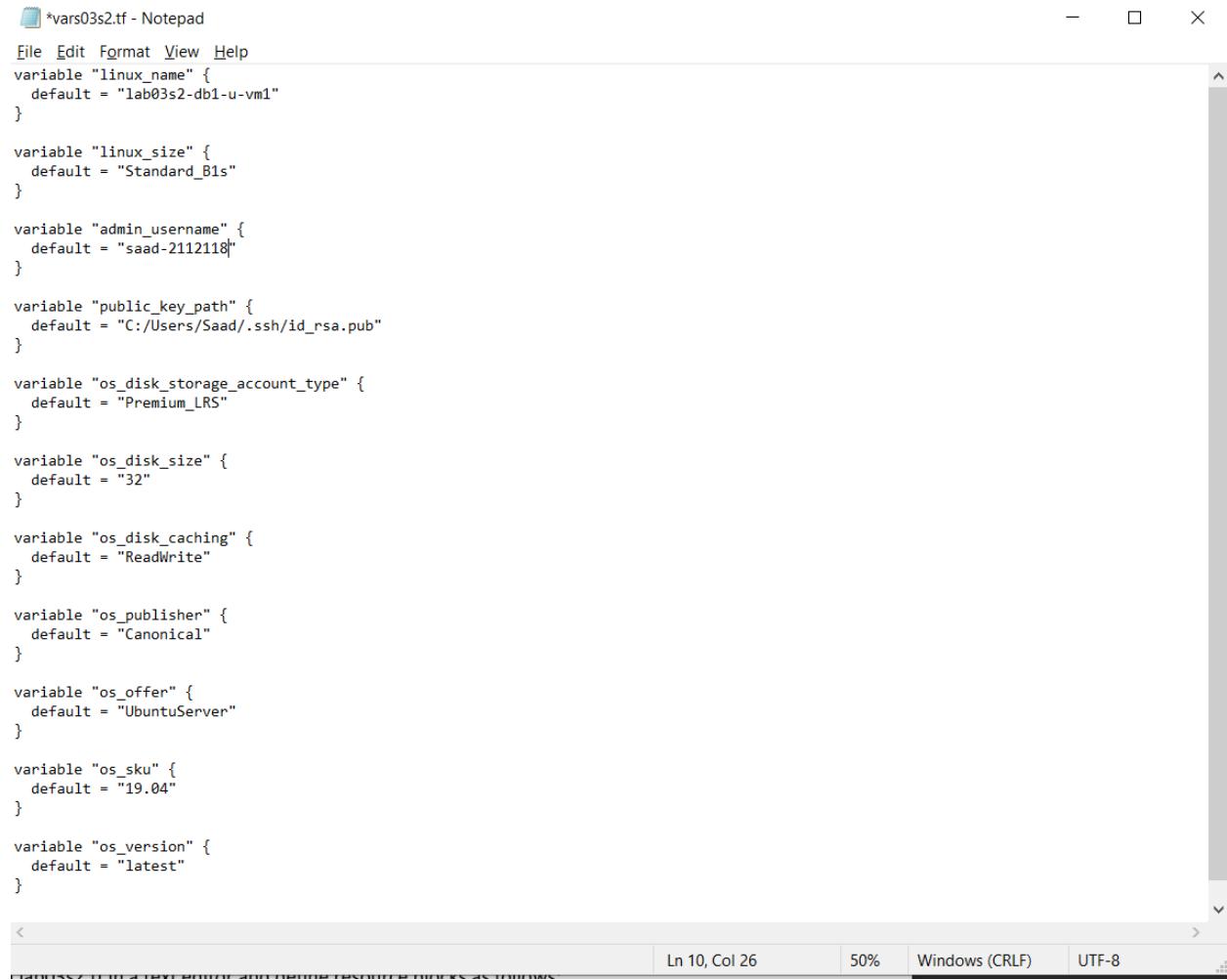
Directory of C:\Users\Saad\Desktop\lab03s2

13/04/2025  11:13 pm    <DIR>          .
13/04/2025  11:13 pm    <DIR>          ..
13/04/2025  10:18 pm            1,871 lab03s1.tf
13/04/2025  10:16 pm            235 providers.tf
13/04/2025  10:18 pm            1,453 vars03s1.tf
13/04/2025  11:13 pm            3 vars03s2.tf
               4 File(s)        3,562 bytes
               2 Dir(s)   99,782,828,032 bytes free

C:\Users\Saad\Desktop\lab03s2>echo. > lab03s2.tf

C:\Users\Saad\Desktop\lab03s2>
```

## PART 2



The screenshot shows a Windows Notepad window titled "vars03s2.tf - Notepad". The window contains a block of Terraform configuration code defining various variables with their default values. The code includes variables for Linux name, size, admin username, public key path, storage account type, disk size, caching, publisher, offer, SKU, and version. The Notepad interface includes standard menu options like File, Edit, Format, View, and Help, along with status bar elements indicating the current line (Ln 10), column (Col 26), zoom level (50%), encoding (Windows (CRLF)), and character set (UTF-8).

```
variable "linux_name" {
    default = "lab03s2-db1-u-vm1"
}

variable "linux_size" {
    default = "Standard_B1s"
}

variable "admin_username" {
    default = "saad-2112118"
}

variable "public_key_path" {
    default = "C:/Users/Saad/.ssh/id_rsa.pub"
}

variable "os_disk_storage_account_type" {
    default = "Premium_LRS"
}

variable "os_disk_size" {
    default = "32"
}

variable "os_disk_caching" {
    default = "ReadWrite"
}

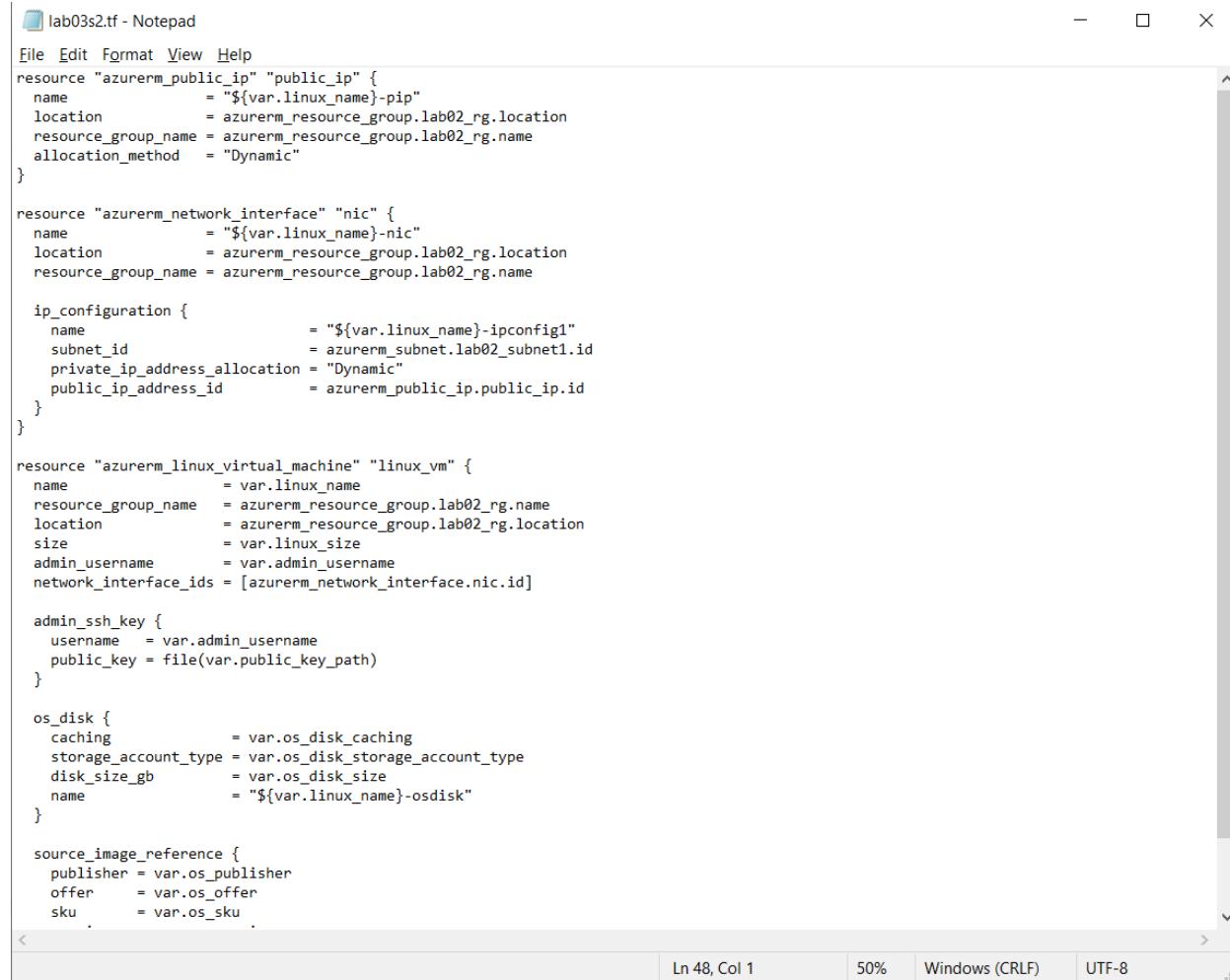
variable "os_publisher" {
    default = "Canonical"
}

variable "os_offer" {
    default = "UbuntuServer"
}

variable "os_sku" {
    default = "19.04"
}

variable "os_version" {
    default = "latest"
}
```

## PART 3



The screenshot shows a Microsoft Notepad window titled "lab03s2.tf - Notepad". The content is a Terraform configuration file (tf) for creating an Azure Linux virtual machine. The code defines resources for a public IP, a network interface, and a VM itself, setting various parameters like name, location, and disk size.

```
File Edit Format View Help
resource "azurerm_public_ip" "public_ip" {
  name          = "${var.linux_name}-pip"
  location      = azurerm_resource_group.lab02_rg.location
  resource_group_name = azurerm_resource_group.lab02_rg.name
  allocation_method = "Dynamic"
}

resource "azurerm_network_interface" "nic" {
  name          = "${var.linux_name}-nic"
  location      = azurerm_resource_group.lab02_rg.location
  resource_group_name = azurerm_resource_group.lab02_rg.name

  ip_configuration {
    name          = "${var.linux_name}-ipconfig1"
    subnet_id     = azurerm_subnet.lab02_subnet1.id
    private_ip_address_allocation = "Dynamic"
    public_ip_address_id       = azurerm_public_ip.public_ip.id
  }
}

resource "azurerm_linux_virtual_machine" "linux_vm" {
  name          = var.linux_name
  resource_group_name = azurerm_resource_group.lab02_rg.name
  location      = azurerm_resource_group.lab02_rg.location
  size          = var.linux_size
  admin_username = var.admin_username
  network_interface_ids = [azurerm_network_interface.nic.id]

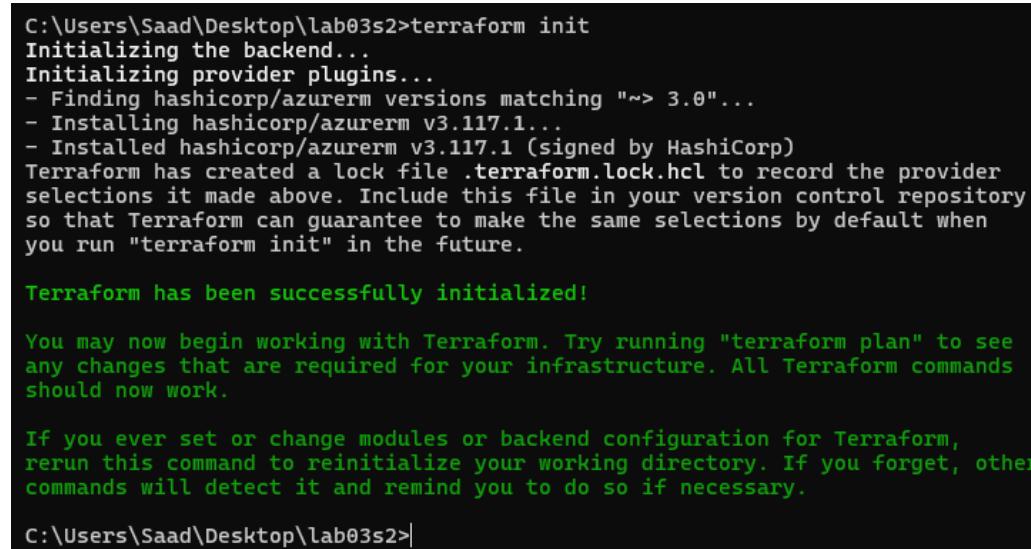
  admin_ssh_key {
    username = var.admin_username
    public_key = file(var.public_key_path)
  }

  os_disk {
    caching           = var.os_disk_caching
    storage_account_type = var.os_disk_storage_account_type
    disk_size_gb     = var.os_disk_size
    name              = "${var.linux_name}-osdisk"
  }

  source_image_reference {
    publisher = var.os_publisher
    offer     = var.os_offer
    sku       = var.os_sku
  }
}

< > Ln 48, Col 1 50% Windows (CRLF) UTF-8
```

## PART 4



The screenshot shows a terminal window with the command "terraform init" run from the directory "C:\Users\Saad\Desktop\lab03s2". The output indicates that the backend is being initialized, provider plugins are being found and installed (specifically hashicorp/azurerm v3.117.1), and a lock file ".terraform.lock.hcl" is created to record the provider selections. It also states that Terraform has been successfully initialized and provides instructions for working with the infrastructure.

```
C:\Users\Saad\Desktop\lab03s2>terraform init
Initializing the backend...
Initializing provider plugins...
- Finding hashicorp/azurerm versions matching "~> 3.0"...
- Installing hashicorp/azurerm v3.117.1...
- Installed hashicorp/azurerm v3.117.1 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.

C:\Users\Saad\Desktop\lab03s2>
```

## PART 5

```
C:\Users\Saad\Desktop\lab03s2>notepad lab03s1.tf  
C:\Users\Saad\Desktop\lab03s2>terraform validate  
Success! The configuration is valid.
```

C:\Users\Saad\Desktop\lab03s2>

## PART 6

```

C:\Users\Saad\Desktop\lab03s>terraform validate
Success! The configuration is valid.

C:\Users\Saad\Desktop\lab03s>terraform plan

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_linux_virtual_machine linux_vm will be created
+ resource "azurerm_linux_virtual_machine" "linux_vm" {
    + admin_username          = "saad-21121118"
    + allow_sticky_operations = true
    + bypass_platform_safety_checks_on_user_schedule_enabled = false
    + computer_name           = "(known after apply)"
    + disable_password_authentication = true
    + disk_controller_type     = "(known after apply)"
    + extensions_time_budget  = "101180M"
    + id                       = "(known after apply)"
    + location                 = "eastus"
    + max_bid_price            = "-1"
    + name                     = "lab03s2-db1-u-vml"
    + network_interface_ids   = "(known after apply)"
    + patch_assessment_mode    = "ImageDefault"
    + patch_mode                = "ImageDefault"
    + platform_fault_domain    = "-1"
    + priority                 = "Regular"
    + public_ip_address         = "(known after apply)"
    + provision_ip_addresses   = "(known after apply)"
    + provision_vm_agent        = true
    + public_ip_address         = "(known after apply)"
    + public_ip_addresses       = "Lab02-Subsources"
    + resource_group_name       = "Standard_B1s"
    + size                      = "(known after apply)"
    + virtual_machine_id        = "(known after apply)"
    + vm_agent_platform_updates_enabled = false

    + admin_ssh_key {
        + public_key = "saad-21121118"
    }

    + os_disk {
        + caching                  = "ReadWrite"
        + disk_size_gb              = 32
        + name                      = "lab03s2-db1-u-vml-osdisk"
        + storage_account_type       = "Premium_LRS"
        + write_accelerator_enabled = false
    }
}

880</#>H#ZD0ETfnnHnLJxKeh61sp0uB8G0mnhBZjyvNal0OpqB88G0mnhahJGFB9qyWd09KX1lFpgu2k3qW01585+Y1RfTA+VYCl1qvSV5gPYZm09KX1l1c8B8EzD0Pnzs20R1Tt8uAayNbm76nzz801TOSh4pB88B8Ew05N1T6fef1wNxZx73k/#MP8G1t/3FCfJ
MsKjRzV0vCnCsirpKjmcycVt31VShNt0cJw0/ewuKjGhahadFfB3dG12awpns0f0ThsKw1s0e3t0hXk4d0ppbJyV1lw#E809Hm15zE20dPm1FxFz2dPm1wD0BwHvNtHvNOMGfC0cqzWAp0edfBp0mtE2eu71UkyfLwZangG7/C0B3j1WHxRus3CA
KcjaQfSONGKs3D0sRq,jhEwKkGhNy1hvaRxoxtv7hyHl0373h12Sp4RzE3t0paAs0cE8jhBwAfWfD2zIh3Nh0etw07h7W4BvusxghQcQv6s-dn#= saad@DESKTOP-RSDV585
      EOT
}

```

```

+ storage_account_type      = "Premium_LRS"
}
+ write_accelerator_enabled = false
}

+ source_image_reference {
+ offer      = "UbuntuServer"
+ publisher  = "Canonical"
+ sku        = "19.04"
+ version    = "latest"
}

+ termination_notification (known after apply)
}

# azurerm_network_interface.nic will be created
resource "azurerm_network_interface" "nic" {
+ id          = (known after apply)
+ applied_dns_servers = (known after apply)
+ dns_servers = (known after apply)
+ enable_accelerated_networking = (known after apply)
+ enable_ip_forwarding = (known after apply)
+ internal_ip_address = (known after apply)
+ internal_domain_name_suffix = (known after apply)
+ ip_forwarding_enabled = (known after apply)
+ location   = "eastus"
+ mac_address = "lab03s2-db1-u-vml-nic"
+ private_ip_address = (known after apply)
+ private_ip_addresses = (known after apply)
+ resource_group_name = "lab02-resources"
+ virtual_machine_id = (known after apply)

+ ip_configuration {
+ gateway_load_balancer_frontend_ip_configuration_id = (known after apply)
+ name        = "lab03s2-db1-u-vml-ipconfig1"
+ priority    = (known after apply)
+ private_ip_address = (known after apply)
+ private_ip_address_allocation = "Dynamic"
+ private_ip_address_version = "IPv4"
+ public_ip_address_id = (known after apply)
+ subnet_id   = (known after apply)
}

# azurerm_network_security_group.lab02_nsg1 will be created
resource "azurerm_network_security_group" "lab02_nsg1" {
+ id          = (known after apply)
+ location   = "eastus"
+ name        = "Lab02-nsg1"
+ resource_group_name = "Lab02-resources"
+ security_rule = (known after apply)
}

# azurerm_network_security_group.lab02_nsg2 will be created
resource "azurerm_network_security_group" "lab02_nsg2" {
+ id          = (known after apply)
+ location   = "eastus"
}

+ name           = "lab03s2-db1-u-vml-pip"
+ resource_group_name = "lab02-resources"
+ sku            = "Basic"
+ sku_tier       = "Regional"
}

# azurerm_resource_group.lab02_rg will be created
resource "azurerm_resource_group" "lab02_rg" {
+ id          = (known after apply)
+ location   = "eastus"
+ name        = "lab02-resources"
}

# azurerm_subnet.lab02_subnet1 will be created
resource "azurerm_subnet" "lab02_subnet1" {
+ address_prefixes           = [
+   "10.0.1.0/24",
]
+ default_outbound_access_enabled = true
+ enforce_private_link_endpoint_network_policies = (known after apply)
+ enforce_private_link_service_network_policies = (known after apply)
+ id          = (known after apply)
+ name        = "lab02-subnet1"
+ private_endpoint_network_policies = (known after apply)
+ private_endpoint_network_policies_enabled = (known after apply)
+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name = "lab02-resources"
+ virtual_network_name = "lab02-vnet"
}

# azurerm_subnet.lab02_subnet2 will be created
resource "azurerm_subnet" "lab02_subnet2" {
+ address_prefixes           = [
+   "10.0.2.0/24",
]
+ default_outbound_access_enabled = true
+ enforce_private_link_endpoint_network_policies = (known after apply)
+ enforce_private_link_service_network_policies = (known after apply)
+ id          = (known after apply)
+ name        = "lab02-subnet2"
+ private_endpoint_network_policies = (known after apply)
+ private_endpoint_network_policies_enabled = (known after apply)
+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name = "lab02-resources"
+ virtual_network_name = "lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
+ id          = (known after apply)
+ network_security_group_id = (known after apply)
+ subnet_id   = (known after apply)
}

# azurerm_subnet_network_security_group_association.lab02_assoc2 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
+ id          = (known after apply)
}

```

```

+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name                         = "lab02-resources"
+ virtual_network_name                        = "lab02-vnet"
}

# azurerm_subnet.lab02_subnet2 will be created
resource "azurerm_subnet" "lab02_subnet2" {
+ address_prefixes                           = [
+   "10.0.2.0/24",
]
+ default_outbound_access_enabled           = true
+ enforce_private_link_endpoint_network_policies = (known after apply)
+ enforce_private_link_service_network_policies = (known after apply)
+ id                                         = (known after apply)
+ name                                       = "lab02-subnet2"
+ private_endpoint_network_policies          = (known after apply)
+ private_endpoint_network_policies_enabled    = (known after apply)
+ private_link_service_network_policies_enabled = (known after apply)
+ resource_group_name                        = "lab02-resources"
+ virtual_network_name                      = "lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
+ id                                         = (known after apply)
+ network_security_group_id                 = (known after apply)
+ subnet_id                                 = (known after apply)
}

# azurerm_subnet_network_security_group_association.lab02_assoc2 will be created
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
+ id                                         = (known after apply)
+ network_security_group_id                 = (known after apply)
+ subnet_id                                 = (known after apply)
}

# azurerm_virtual_network.lab02_vnet will be created
resource "azurerm_virtual_network" "lab02_vnet" {
+ address_space                            = [
+   "10.0.0.0/16",
]
+ dns_servers                               = (known after apply)
+ guid                                     = (known after apply)
+ id                                         = (known after apply)
+ location                                  = "eastus"
+ name                                       = "lab02-vnet"
+ resource_group_name                      = "lab02-resources"
+ subnet                                    = (known after apply)
}

```

Plan: 11 to add, 0 to change, 0 to destroy.

---

Note: You didn't use the `-out` option to save this plan, so Terraform can't guarantee to take exactly these actions if you run `"terraform apply"` now.  
C:\Users\Gord\Desktop\lab02>

## PART 7

```

C:\Users\Saad\Desktop\lab03s2>terraform apply

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_linux_virtual_machine.linux_vm will be created
+ resource "azurerm_linux_virtual_machine" "linux_vm" {
    + admin_username          = "saad-2112118"
    + allow_extension_operations = true
    + bypass_platform_safety_checks_on_user_schedule_enabled = false
    + computer_name           = (known after apply)
    + disable_password_authentication = true
    + disk_controller_type     = (known after apply)
    + extensions_time_budget   = "PT1H30M"
    + id                       = (known after apply)
    + location                 = "eastus"
    + max_bid_price            = -1
    + name                     = "lab03s2-db1-u-vm1"
    + network_interface_ids    = (known after apply)
    + patch_assessment_mode    = "ImageDefault"
    + patch_mode                = "ImageDefault"
    + platform_fault_domain    = -1
    + priority                  = "Regular"
    + private_ip_address        = (known after apply)
    + private_ip_addresses      = (known after apply)
    + provision_vm_agent        = true
    + public_ip_address         = (known after apply)
    + public_ip_addresses        = (known after apply)
    + resource_group_name       = "lab02-resources"
    + size                      = "Standard_B1s"
    + virtual_machine_id        = (known after apply)
    + vm_agent_platform_updates_enabled = false

    + admin_ssh_key {
        + public_key = <<<EOT
          ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQDKZT4fI80i21iynz6R0TT6HcH2yt6KEP1e9+lVTift5X1SKBcu9Rm3rTw6WISaD6lWUoQH7pdTDURe0qGEDi1PX
80v/aWPMZDOETqfnshKLjXek616pguqWB2XJgvnSaE6pgu88Gorw6hFahJG8f8KxyW6LgkUeiFg42kU3+qQw150S+0YiRTFA+VY5CiYqsVS9gyPYZm09kXITLic83mMEzd00Pnzs2DR
MskjRzfVo4Gmsirphkj4ucymt23LVjkShtDcjw0+/erw3HjG4RwadyFm3Ggit2wYnmQFthsks0VJbdCce3e6thdXskGD0ppbJgYjow+EK89HM+1sze28001+FXVz6pPtGjwdt0Dzu
8kciaQFLSDNG5R3D8ssMqjbhE9WkXBHtyHzR1voxtvTMyNU8J7Sk12Bp4RxE3eDApAzbAEbhj0kAWfd2uFHJNh0etwoh7Mw48Vsuxgk0CQv6s+dnw== saad@DESKTOP-RSOV5BS
        EOT
        + username    = "saad-2112118"
    }

    + os_disk {
        + caching          = "ReadWrite"
        + disk_size_gb     = 32
        + name              = "lab03s2-db1-u-vm1-osdisk"
        + storage_account_type = "Premium_LRS"
        + write_accelerator_enabled = false
    }
}

```

```

+ caching           = "ReadWrite"
+ disk_size_gb    = 32
+ name              = "lab03s2-dbl-u-vm1-osdisk"
+ storage_account_type = "Premium_LRS"
+ write_accelerator_enabled = false
}

+ source_image_reference {
+   offer      = "UbuntuServer"
+   publisher  = "Canonical"
+   sku        = "19.04"
+   version    = "latest"
}

+ termination_notification (known after apply)
}

# azurerm_network_interface.nic will be created
resource "azurerm_network_interface" "nic" {
+ accelerated_networking_enabled = (known after apply)
+ applied_dns_servers          = (known after apply)
+ dns_servers                   = (known after apply)
+ enable_accelerated_networking = (known after apply)
+ enable_ip_forwarding          = (known after apply)
+ id                           = (known after apply)
+ internal_domain_name_suffix = (known after apply)
+ ip_forwarding_enabled         = (known after apply)
+ location                      = "eastus"
+ mac_address                  = (known after apply)
+ name                          = "lab03s2-dbl-u-vm1-nic"
+ private_ip_address            = (known after apply)
+ private_ip_addresses          = (known after apply)
+ resource_group_name           = "lab02-resources"
+ virtual_machine_id            = (known after apply)

+ ip_configuration {
+   gateway_load_balancer_frontend_ip_configuration_id = (known after apply)
+   name          = "lab03s2-dbl-u-vm1-ipconfig1"
+   primary       = (known after apply)
+   private_ip_address          = (known after apply)
+   private_ip_address_allocation = "Dynamic"
+   private_ip_address_version   = "IPv4"
+   public_ip_address_id         = (known after apply)
+   subnet_id                = (known after apply)
}
}

# azurerm_network_security_group.lab02_nsg1 will be created
resource "azurerm_network_security_group" "lab02_nsg1" {
+ id               = (known after apply)
+ location        = "eastus"
+ name            = "lab02-nsg1"
+ resource_group_name = "lab02-resources"
+ security_rule    = (known after apply)
}

# azurerm_network_security_group.lab02_nsg2 will be created

```

```

# azurerm_network_security_group.lab02_nsg1 will be created
+ resource "azurerm_network_security_group" "lab02_nsg1" {
  + id          = (known after apply)
  + location    = "eastus"
  + name        = "lab02-nsg1"
  + resource_group_name = "lab02-resources"
  + security_rule    = (known after apply)
}

# azurerm_network_security_group.lab02_nsg2 will be created
+ resource "azurerm_network_security_group" "lab02_nsg2" {
  + id          = (known after apply)
  + location    = "eastus"
  + name        = "lab02-nsg2"
  + resource_group_name = "lab02-resources"
  + security_rule    = (known after apply)
}

# azurerm_public_ip.public_ip will be created
+ resource "azurerm_public_ip" "public_ip" {
  + allocation_method      = "Dynamic"
  + ddos_protection_mode   = "VirtualNetworkInherited"
  + fqdn                  = (known after apply)
  + id                     = (known after apply)
  + idle_timeout_in_minutes = 4
  + ip_address             = (known after apply)
  + ip_version              = "IPv4"
  + location                = "eastus"
  + name                   = "lab03s2-db1-u-vml-pip"
  + resource_group_name     = "lab02-resources"
  + sku                     = "Basic"
  + sku_tier                = "Regional"
}

# azurerm_resource_group.lab02_rg will be created
+ resource "azurerm_resource_group" "lab02_rg" {
  + id          = (known after apply)
  + location    = "eastus"
  + name        = "lab02-resources"
}

# azurerm_subnet.lab02_subnet1 will be created
+ resource "azurerm_subnet" "lab02_subnet1" {
  + address_prefixes           = [
    + "10.0.1.0/24",
  ]
  + default_outbound_access_enabled = true
  + enforce_private_link_endpoint_network_policies = (known after apply)
  + enforce_private_link_service_network_policies = (known after apply)
  + id          = (known after apply)
  + name        = "lab02-subnet1"
  + private_endpoint_network_policies      = (known after apply)
  + private_endpoint_network_policies_enabled = (known after apply)
  + private_link_service_network_policies_enabled = (known after apply)
  + resource_group_name     = "lab02-resources"
  + virtual_network_name       = "lab02-vnet"
}

```

```

+ admin_ssh_key {
    + public_key = <<-EOT
      ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQADKZT4fI80i21+ivnz6R0TT6HcH2yt6KEP1e9+lVTift5X1SKBcu9Rm3rTv
80v/aWPMZDOETqfnshKLjXek616pguqwBB2XJgvnSaE6pgu88GorkW6hFahJG8f8KxyW6lgkUeiFg42kU3+q0w150s+0YirTFA+VY5CiYqsVS90
MsKjRzfVo4GmsirphkYj4ucymt23lVjkShtDcjW0+/erw3HjG4RwadYFFm3GGit2wYnmJQFthskOVJbSdMCe3e0thDXskGD0ppbJgYIjow+EK89k
8kCiaQFlsDNG5R3D8ssMqjbhE9WkXBHIyHvzR1voxtvTNyNU8J7SkL2Bp4RrE3eDApAzDAEBhj0kAWFD2uFHJNhOetwOh7Mw48Vusxgk0cQv6s+t
    EOT
    + username    = "saad-2112118"
  }

+ os_disk {
    + caching          = "ReadWrite"
    + disk_size_gb    = 32
    + name             = "Lab03s2-db1-u-vm1-osdisk"
    + storage_account_type = "Premium_LRS"
    + write_accelerator_enabled = false
  }

+ source_image_reference {
    + offer      = "UbuntuServer"
    + publisher  = "Canonical"
    + sku        = "16.04-LTS"
    + version    = "latest"
  }

+ termination_notification (known after apply)
}

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

Enter a value: yes

azurerm_linux_virtual_machine.linux_vm: Creating...
azurerm_linux_virtual_machine.linux_vm: Still creating... [10s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [20s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [30s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [40s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [50s elapsed]
azurerm_linux_virtual_machine.linux_vm: Creation complete after 56s [id=/subscriptions/bfbe3041-7fa8-4038-8890-3
b1-u-vm1]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

C:\Users\Saad\Desktop\lab03s2>

```

## PART 8

```
C:\Users\Saad\Desktop\lab03s2>terraform state list
azurerm_linux_virtual_machine.linux_vm
azurerm_network_interface.nic
azurerm_network_security_group.lab02_nsg1
azurerm_network_security_group.lab02_nsg2
azurerm_public_ip.public_ip
azurerm_resource_group.lab02_rg
azurerm_subnet.lab02_subnet1
azurerm_subnet.lab02_subnet2
azurerm_subnet_network_security_group_association.lab02_assoc1
azurerm_subnet_network_security_group_association.lab02_assoc2
azurerm_virtual_network.lab02_vnet

C:\Users\Saad\Desktop\lab03s2>terraform show
# azurerm_linux_virtual_machine.linux_vm:
resource "azurerm_linux_virtual_machine" "linux_vm" {
    admin_username          = "saad-2112118"
    allow_extension_operations = true
    availability_set_id      = null
    bypass_platform_safety_checks_on_user_schedule_enabled = false
    capacity_reservation_group_id = null
    computer_name            = "lab03s2-dbl-u-vm1"
    dedicated_host_group_id   = null
    dedicated_host_id         = null
    disable_password_authentication = true
    disk_controller_type      = null
    edge_zone                 = null
    encryption_at_host_enabled = false
    eviction_policy           = null
    extensions_time_budget    = "PT1H30M"
    id                       = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkInterfaces/lab03s2"
    license_type              = null
    location                  = "eastus"
    max_bid_price             = -1
    name                      = "lab03s2-dbl-u-vm1"
    network_interface_ids     = [
        "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkInterfaces/lab03s2"
    ]
    patch_assessment_mode     = "ImageDefault"
    patch_mode                = "ImageDefault"
    platform_fault_domain     = -1
    priority                  = "Regular"
    private_ip_address         = "10.0.1.4"
    private_ip_addresses       = [
        "10.0.1.4",
    ]
    provision_vm_agent        = true
    proximity_placement_group_id = null
    public_ip_address          = "52.168.77.125"
    public_ip_addresses         = [
        "52.168.77.125",
    ]
    reboot_setting             = null
}
```

```

virtual_machine_id          = "9902a554-e93d-423f-892e-eae63f0e4567"
virtual_machine_scale_set_id = null
vm_agent_platform_updates_enabled = false
vtpm_enabled                = false
zone                         = null

admin_ssh_key {
  public_key = <<-EOT
    ssh-rsa AAAAB3NzaC1yc2EAAAQABAAACADKZT4fI80i21+ivnz6R0TT6hC2yt6KEP1e9+lVi ft5X1SKBcu9Rm3rTw6WISaD6lWUoQH7pdTDUR
aWPMZDOETqfnshKLjXek616pguqWB2XJJgvnsaE6pgu88Gor kW6hFahJG8f8KxyW6LgkUeiFg42kU3+qQw150S+0YiRTFA+VY5CiYqsVS9gyPYZm09kXITL ic83mMEz
RzFvo4GmsirphkYj4ucymt23lvjkShtDcjW0+/erw3Hj64RwadyFm3GGit2wvnmJQFthskOVbSdMCe3e0thDXskgD0ppbJgYijow+EK89HM+1sz9E2800i+FVxZ6pP
aQFlSDNG5R3D8ssMqjbhE9WkXBHIyHzvR1voxtvTNyNU8J7SkL2Bp4RrE3eDApAzDAEBhj@kAWfD2uFHJNh0etw0h7Mw48Vusxgk0cQv6s+dnw== saad@DESKTOP-RS
  EOT
  username     = "saad-2112118"
}

os_disk {
  caching           = "ReadWrite"
  disk_encryption_set_id = null
  disk_size_gb     = 32
  name              = "lab03s2-db1-u-vm1-osdisk"
  secure_vm_disk_encryption_set_id = null
  security_encryption_type = null
  storage_account_type   = "Premium_LRS"
  write_accelerator_enabled = false
}

source_image_reference {
  offer      = "UbuntuServer"
  publisher  = "Canonical"
  sku        = "16.04-LTS"
  version    = "latest"
}

# azurerm_network_interface.nic:
resource "azurerm_network_interface" "nic" {
  accelerated_networking_enabled = false
  applied_dns_servers           = []
  auxiliary_mode                 = null
  auxiliary_sku                  = null
  dns_servers                    = []
  edge_zone                      = null
  enable_accelerated_networking = false
  enable_ip_forwarding           = false
  id                            = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/
internal_dns_name_label        = null
internal_domain_name_suffix    = "pggpl5tsolsuja3iwahgzs0fdg.bx.internal.cloudapp.net"
ip_forwarding_enabled          = false
location                       = "eastus"
mac_address                     = null
name                           = "lab03s2-db1-u-vm1-nic"
private_ip_address              = "10.0.1.4"
private_ip_addresses            = [
}

```

```

    name          = "lab03s2-db1-u-vm1-ipconfig"
    primary       = true
    private_ip_address
    private_ip_address_allocation
    private_ip_address_version
    public_ip_address_id
    -pip"        subnet_id
    lab02-subnet1"
}
}

# azurerm_network_security_group.lab02_nsg1:
resource "azurerm_network_security_group" "lab02_nsg1" {
  id           = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg1"
  location     = "eastus"
  name         = "lab02-nsg1"
  resource_group_name = "lab02-resources"
  security_rule   = []
  tags          = {}
}

# azurerm_network_security_group.lab02_nsg2:
resource "azurerm_network_security_group" "lab02_nsg2" {
  id           = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-nsg2"
  location     = "eastus"
  name         = "lab02-nsg2"
  resource_group_name = "lab02-resources"
  security_rule   = []
  tags          = {}
}

# azurerm_public_ip.public_ip:
resource "azurerm_public_ip" "public_ip" {
  allocation_method      = "Dynamic"
  ddos_protection_mode  = "VirtualNetworkInherited"
  edge_zone               = null
  id                     = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/publicIPs/public_ip"
  idle_timeout_in_minutes = 4
  ip_address             = null
  ip_tags                = {}
  ip_version              = "IPv4"
  location                = "eastus"
  name                   = "lab03s2-db1-u-vm1-pip"
  resource_group_name     = "lab02-resources"
  sku                    = "Basic"
  sku_tier               = "Regional"
  tags                  = {}
  zones                 = []
}

# azurerm_resource_group.lab02_rg:
resource "azurerm_resource_group" "lab02_rg" {
  id           = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources"
  location     = "eastus"
  managed_by   = null
  name         = "lab02-resources"
}

```

```

address_prefixes = [
    "10.0.1.0/24",
]
default_outbound_access_enabled = true
enforce_private_link_endpoint_network_policies = false
enforce_private_link_service_network_policies = false
id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet"
bnet1 =
name = "lab02-subnet1"
private_endpoint_network_policies = "Enabled"
private_endpoint_network_policies_enabled = true
private_link_service_network_policies_enabled = true
resource_group_name = "lab02-resources"
service_endpoint_policy_ids = []
service_endpoints = []
virtual_network_name = "lab02-vnet"
}

# azurerm_subnet.lab02_subnet2:
resource "azurerm_subnet" "lab02_subnet2" {
address_prefixes = [
    "10.0.2.0/24",
]
default_outbound_access_enabled = true
enforce_private_link_endpoint_network_policies = false
enforce_private_link_service_network_policies = false
id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet"
bnet2 =
name = "lab02-subnet2"
private_endpoint_network_policies = "Enabled"
private_endpoint_network_policies_enabled = true
private_link_service_network_policies_enabled = true
resource_group_name = "lab02-resources"
service_endpoint_policy_ids = []
service_endpoints = []
virtual_network_name = "lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1:
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/networkSecurityGroups/lab02-assoc1"
network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-assoc1"
subnet_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1"
}

# azurerm_subnet_network_security_group_association.lab02_assoc2:
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/networkSecurityGroups/lab02-assoc2"
network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/networkSecurityGroups/lab02-assoc2"
subnet_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2"
}

# azurerm_virtual_network.lab02_vnet:
resource "azurerm_virtual_network" "lab02_vnet" {
address_space = [
    "10.0.0.0/16",
]
}

```

```

bnet2"
  name                  = "lab02-subnet2"
  private_endpoint_network_policies      = "Enabled"
  private_endpoint_network_policies_enabled = true
  private_link_service_network_policies_enabled = true
  resource_group_name                = "lab02-resources"
  service_endpoint_policy_ids        = []
  service_endpoints                 = []
  virtual_network_name              = "lab02-vnet"
}

# azurerm_subnet_network_security_group_association.lab02_assoc1:
resource "azurerm_subnet_network_security_group_association" "lab02_assoc1" {
  id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/pr
  network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/pr
  subnet_id       = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/pr
}

# azurerm_subnet_network_security_group_association.lab02_assoc2:
resource "azurerm_subnet_network_security_group_association" "lab02_assoc2" {
  id          = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/pr
  network_security_group_id = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/pr
  subnet_id       = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/pr
}

# azurerm_virtual_network.lab02_vnet:
resource "azurerm_virtual_network" "lab02_vnet" {
  address_space           = [
    "10.0.0.0/16",
  ]
  bgp_community           = null
  dns_servers             = []
  edge_zone                = null
  flow_timeout_in_minutes = 0
  guid                    = "fef58c79-7272-44e5-83a8-b00e6ccb4519"
  id                      = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/prov
  location                = "eastus"
  name                    = "lab02-vnet"
  resource_group_name     = "lab02-resources"
  subnet {
    {
      address_prefix = "10.0.1.0/24"
      id            = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/provi
      name          = "lab02-subnet1"
      security_group = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/provi
    },
    {
      address_prefix = "10.0.2.0/24"
      id            = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/provi
      name          = "lab02-subnet2"
      security_group = "/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resources/provi
    },
  ],
  tags                   = {}
}

```

C:\Users\Saad\Desktop\lab03s2>|

## PART 9

The screenshot shows the Microsoft Azure 'All resources' page. At the top, there are navigation links for 'All services >', 'Copilot', and a user account. Below the header, there are buttons for '+ Create', 'Manage view', 'Refresh', 'Export to CSV', 'Open query', 'Assign tags', and 'Delete'. A search bar at the top right contains the placeholder 'Search resources, services, and docs (G+ /)'. The main area displays a table of resources with the following columns: Name, Type, Resource group, Location, and Subscription. There are three tabs at the top of the table: 'Unsecure resources' (0), 'Recommendations' (0), and 'Changed resources' (8). The table lists the following resources:

Name	Type	Resource group	Location	Subscription
lab02-nsg1	Network security group	lab02-resources	East US	Azure for Students
lab02-nsg2	Network security group	lab02-resources	East US	Azure for Students
lab02-vnet	Virtual network	lab02-resources	East US	Azure for Students
lab03s2-db1-u-vm1	Virtual machine	lab02-resources	East US	Azure for Students
lab03s2-db1-u-vm1-nic	Network Interface	lab02-resources	East US	Azure for Students
lab03s2-db1-u-vm1-osdisk	Disk	LAB02-RESOURCES	East US	Azure for Students
lab03s2-db1-u-vm1-pip	Public IP address	lab02-resources	East US	Azure for Students
NetworkWatcher_eastus	Network Watcher	NetworkWatcherRG	East US	Azure for Students

## PART 10

The screenshot shows a terminal window with the following text:

```
Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.

Enter a value: yes

azurerm_subnet_network_security_group_association.lab02_assoc1: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17-/lab02-vnet/subnets/lab02-subnet1]
azurerm_subnet_network_security_group_association.lab02_assoc2: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17-/lab02-vnet/subnets/lab02-subnet2]
azurerm_linux_virtual_machine.linux_vm: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/la
azurerm_subnet_network_security_group_association.lab02_assoc2: Destruction complete after 7s
azurerm_subnet_network_security_group.lab02_nsg2: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/azurerm_subnet.lab02_subnet2: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resour
azurerm_subnet_network_security_group_association.lab02_assoc1: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-
azurerm_linux_virtual_machine.linux_vm: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...pute/virtualMachines/azurerm_subnet_network_security_group_association.lab02_assoc1: Destruction complete after 13s
azurerm_subnet_network_security_group.lab02_nsg1: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/azurerm_subnet_network_security_group.lab02_nsg2: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...twork/networkSecur
azurerm_subnet.lab02_subnet2: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...works/lab02-vnet/subnets/lab02-
azurerm_linux_virtual_machine.linux_vm: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...pute/virtualMachines/azurerm_subnet_network_security_group.lab02_nsg2: Destruction complete after 13s
azurerm_subnet_network_security_group.lab02_nsg1: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/azurerm_subnet.lab02_subnet2: Destruction complete after 18s
azurerm_subnet_network_security_group.lab02_nsg1: Destruction complete after 13s
azurerm_linux_virtual_machine.linux_vm: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...pute/virtualMachines/azurerm_subnet_network_interface.nic: Destruction complete after 38s
azurerm_subnet_network_interface.nic: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resou
azurerm_subnet_network_interface.nic: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...etworkInterfaces/lab03s2-db1-u-azurerm_subnet_network_interface.nic: Destruction complete after 13s
azurerm_public_ip.public_ip: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resour
azurerm_subnet.lab02_subnet1: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-resour
azurerm_subnet_network_ip.public_ip: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...ublicIPAddresses/lab03s2-db1-u-azurerm_subnet.lab02_subnet1: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...works/lab02-vnet/subnets/lab02-
azurerm_subnet.lab02_subnet1: Destruction complete after 12s
azurerm_virtual_network.lab02_vnet: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-
azurerm_public_ip.public_ip: Destruction complete after 12s
azurerm_virtual_network.lab02_vnet: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...oft.Network/virtualNetwor
azurerm_virtual_network.lab02_vnet: Destruction complete after 17s
azurerm_resource_group.lab02_rg: Destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-37ee17f2c645/resourceGroups/lab02-res
azurerm_resource_group.lab02_rg: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...7f2c645/resourceGroups/lab02-
azurerm_resource_group.lab02_rg: Still destroying... [id=/subscriptions/bfbe3041-7fa8-4038-8890-...7f2c645/resourceGroups/lab02-
azurerm_resource_group.lab02_rg: Destruction complete after 21s

Destroy complete! Resources: 11 destroyed.

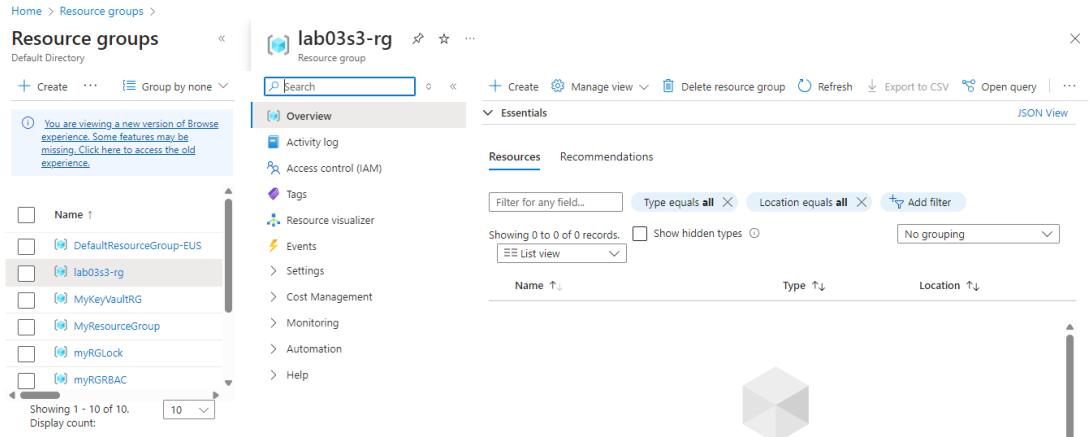
C:\Users\Saad\Desktop\lab03s2>terraform state list

C:\Users\Saad\Desktop\lab03s2>terraform show
The state file is empty. No resources are represented.

C:\Users\Saad\Desktop\lab03s2>
```

## SECTION 3

```
C:\Users\Sanaullah\OneDrive\Desktop\java_SpringBoot_Work\Devops-Assignment\terraform-assignment\lab02\lab03s1\lab03s2\lab03s3>terraform state list  
azurerm_resource_group.lab02_rg  
  
C:\Users\Sanaullah\OneDrive\Desktop\java_SpringBoot_Work\Devops-Assignment\terraform-assignment\lab02\lab03s1\lab03s2\lab03s3>terraform show  
# azurerm_resource_group.lab02_rg:  
resource "azurerm_resource_group" "lab02_rg" {  
    id      = "/subscriptions/c4c52df1-62df-48e5-b057-de2e03b45e52/resourceGroups/lab03s3-rg"  
    location  = "eastus"  
    managed_by = null  
    name      = "lab03s3-rg"  
}  
  
C:\Users\Sanaullah\OneDrive\Desktop\java_SpringBoot_Work\Devops-Assignment\terraform-assignment\lab02\lab03s1\lab03s2\lab03s3>
```



```
azurerm_resource_group.lab02_rg: Refreshing state... [id=/subscriptions/c4c52df1-62df-48e5-b057-de2e03b45e52/resourceGroups/lab03s3-rg]  
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:  
- destroy  
  
Terraform will perform the following actions:  
  
# azurerm_resource_group.lab02_rg will be destroyed  
- resource "azurerm_resource_group" "lab02_rg" {  
    - id      = "/subscriptions/c4c52df1-62df-48e5-b057-de2e03b45e52/resourceGroups/lab03s3-rg" -> null  
    - location  = "eastus" -> null  
    - name      = "lab03s3-rg" -> null  
    - tags      = {} -> null  
    # (1 unchanged attribute hidden)  
}  
  
Plan: 0 to add, 0 to change, 1 to destroy.  
  
Do you really want to destroy all resources?  
Terraform will destroy all your managed infrastructure, as shown above.  
There is no undo. Only 'yes' will be accepted to confirm.  
  
Enter a value: yes  
  
azurerm_resource_group.lab02_rg: Destroying... [id=/subscriptions/c4c52df1-62df-48e5-b057-de2e03b45e52/resourceGroups/lab03s3-rg]  
azurerm_resource_group.lab02_rg: Still destroying... [id=/subscriptions/c4c52df1-62df-48e5-b057-de2e03b45e52/resourceGroups/lab03s3-rg, 10s elapsed]  
azurerm_resource_group.lab02_rg: Still destroying... [id=/subscriptions/c4c52df1-62df-48e5-b057-de2e03b45e52/resourceGroups/lab03s3-rg, 20s elapsed]  
azurerm_resource_group.lab02_rg: Destruction complete after 21s  
  
Destroy complete! Resources: 1 destroyed.
```

```
C:\Users\Sanaullah\OneDrive\Desktop\java_SpringBoot_Work\Devops-Assignment\terraform-assignment\lab02\lab03s1\lab03s2\lab03s3>terraform show  
The state file is empty. No resources are represented.
```

## SECTION 3

### PART 2

```
File Edit View

# Public IP Address
resource "azurerm_public_ip" "linux_pip" {
    name          = "${var.linux_name}-pip"
    location      = var.location
    resource_group_name = var.resource_group_name
    allocation_method  = "Dynamic"

    tags = {
        Name      = local.Name
        Project   = local.Project
        ContactEmail = local.ContactEmail
        Environment = local.Environment
    }
}

# Network Interface
resource "azurerm_network_interface" "linux_nic" {
    name          = "${var.linux_name}-nic"
    location      = var.location
    resource_group_name = var.resource_group_name

    ip_configuration {
        name          = "${var.linux_name}-ipconfig1"
        subnet_id     = azurerm_subnet.lab02_subnet1.id
        private_ip_address_allocation = "Dynamic"
        public_ip_address_id       = azurerm_public_ip.linux_pip.id
    }

    tags = {
        Name      = local.Name
        Project   = local.Project
        ContactEmail = local.ContactEmail
        Environment = local.Environment
    }
}

# Linux Virtual Machine
resource "azurerm_linux_virtual_machine" "linux_vm" {
    name          = var.linux_name
    location      = var.location
```

```
variable "os_disk_size" {
  description = "Size of the OS disk in GB"
  type        = number
  default     = 32
}

variable "os_disk_caching" {
  description = "Caching mode for the OS disk"
  type        = string
  default     = "ReadWrite"
}

variable "ubuntu_publisher" {
  description = "Publisher for the Ubuntu image"
  type        = string
  default     = "Canonical"
}

variable "ubuntu_offer" {
  description = "Offer for the Ubuntu image"
  type        = string
  default     = "UbuntuServer"
}

variable "ubuntu_sku" {
  description = "SKU for the Ubuntu image"
  type        = string
  default     = "19.04"
}

variable "ubuntu_version" {
  description = "Version for the Ubuntu image"
  type        = string
  default     = "latest"
}
```

### PART 3

```
File Edit View

# Public IP Address
resource "azurerm_public_ip" "linux_pip" {
    name          = "${var.linux_name}-pip"
    location      = var.location
    resource_group_name = var.resource_group_name
    allocation_method  = "Dynamic"

    tags = {
        Name      = local.Name
        Project   = local.Project
        ContactEmail = local.ContactEmail
        Environment = local.Environment
    }
}

# Network Interface
resource "azurerm_network_interface" "linux_nic" {
    name          = "${var.linux_name}-nic"
    location      = var.location
    resource_group_name = var.resource_group_name

    ip_configuration {
        name          = "${var.linux_name}-ipconfig1"
        subnet_id     = azurerm_subnet.lab02_subnet1.id
        private_ip_address_allocation = "Dynamic"
        public_ip_address_id       = azurerm_public_ip.linux_pip.id
    }

    tags = {
        Name      = local.Name
        Project   = local.Project
        ContactEmail = local.ContactEmail
        Environment = local.Environment
    }
}

# Linux Virtual Machine
resource "azurerm_linux_virtual_machine" "linux_vm" {
    name          = var.linux_name
```

```

# Linux Virtual Machine
resource "azurerm_linux_virtual_machine" "linux_vm" {
  name          = var.linux_name
  location      = var.location
  resource_group_name = var.resource_group_name
  size          = var.vm_size
  admin_username = var.admin_username

  network_interface_ids = [
    azurerm_network_interface.linux_nic.id
  ]

  admin_ssh_key {
    username    = var.admin_username
    public_key = file(var.public_key)
  }

  os_disk {
    name          = "${var.linux_name}-osdisk"
    caching       = var.os_disk_caching
    storage_account_type = var.os_disk_storage_account_type
    disk_size_gb   = var.os_disk_size
  }

  #  Updated image configuration for eastus
  source_image_reference {
    publisher = "Canonical"
    offer     = "UbuntuServer"
    sku       = "18_04-lts-gen2"
    version   = "latest"
  }

  tags = {
    Name        = local.Name
    Project     = local.Project
    ContactEmail = local.ContactEmail
    Environment  = local.Environment
  }
}

```

```
Initializing the backend...
Initializing provider plugins...
- Finding hashicorp/random versions matching "~> 3.0"...
- Finding hashicorp/azurerm versions matching "~> 3.0"...
- Installing hashicorp/random v3.7.1...
- Installed hashicorp/random v3.7.1 (signed by HashiCorp)
- Installing hashicorp/azurerm v3.117.1...
- Installed hashicorp/azurerm v3.117.1 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.
```

```
Terraform has been successfully initialized!
```

```
You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.
```

```
If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
```

```
C:\Users\SCS\lab03s3>terraform validate
Success! The configuration is valid.
```

```
azurerm_container_group.lab02_container
azurerm_linux_virtual_machine.linux_vm
azurerm_network_interface.linux_nic
azurerm_network_security_group.lab02_nsg1
azurerm_network_security_group.lab02_nsg2
azurerm_public_ip.linux_pip
azurerm_resource_group.lab02_rg
azurerm_subnet.lab02_subnet1
azurerm_subnet.lab02_subnet2
azurerm_subnet_network_security_group_association.lab02_nsg_assoc1
azurerm_subnet_network_security_group_association.lab02_nsg_assoc2
azurerm_virtual_network.lab02_vnet
random_integer.rand
```

```
C:\Users\SCS\Lab03>terraform show
# azurerm_container_group.lab02_container:
resource "azurerm_container_group" "lab02_container" {
  dns_name_label          = "lab02-container"
  dns_name_label_reuse_policy = "Unsecure"
  exposed_port             = [
    {
      port      = 80
      protocol = "TCP"
    },
  ]
  fqdn                   = "lab02-container-75602.eastus.azurecontainer.io"
  id                     = "/subscriptions/ea6fc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/Lab02-rg/providers/Microsoft.ContainerInstance/contain
erGroups/lab02-container-75602"
  ip_address              = "29.242.229.80"
  ip_address_type         = "Public"
  location                = "eastus"
  name                    = "lab02-container-75602"
  os_type                 = "Linux"
  priority                = null
  resource_group_name     = "lab02-rg"
  restart_policy           = "Always"
  sku                     = "Standard"
  subnet_ids              = []
  tags                    = [
    "environment" = "lab"
  ]
  zones                  = []

  container {
    commands            = []
    cpus                = 1
    cpus_limit          = 0
    environment_variables = {}
    image               = "mcr.microsoft.com/azuredocs/aci-helloworld"
    memory              = 1.5
    memory_limit        = 0
    name                = "helloworld"
  }
}

# azurerm_linux_virtual_machine.lab03:
resource "azurerm_linux_virtual_machine" "linux_vm" {
  admin_username          = "scs-yourNumberID"
  allow_extension_operations = true
  availability_set_id     = null
  bypass_platform_safety_checks_on_user_schedule_enabled = false
  capacity_reservation_group_id = null
  computer_name            = "Lab03s2-dbl-u-val"
  dedicated_host_group_id = null
  dedicated_host_id        = null
  disable_password_authentication = true
  disk_controller_type     = "SCSI"
  edge_zone                = null
  encryption_at_host_enabled = false
  eviction_policy           = null
  extensions_time_budget   = "PT1H30M"
  id                      = "/subscriptions/ea6fc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/Lab02-rg/providers/Microsoft
Compute/virtualMachines/lab03s2-dbl-u-val"
  license_type              = null
  location                 = "eastus"
  max_bid_price             = 1
  name                     = "Lab03s2-dbl-u-val"
  network_interface_ids     = [
    "/subscriptions/ea6fc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/Lab02-rg/providers/Microsoft.Network/networkInterfaces/lab03s2-dbl-u-val-nic",
  ]
  patch_assessment_mode     = "EspressoDefault"
  patch_mode                = "ImageDefault"
}
```

```
environment_variables      = {}
image                     = "mcr.microsoft.com/azuredocs/aci-helloworld"
memory                   = 1.5
memory_limit              = 0
name                     = "helloworld"
secure_environment_variables = (sensitive value)

ports {
  port      = 80
  protocol = "TCP"
}
}

# azurerm_linux_virtual_machine.lab03:
resource "azurerm_linux_virtual_machine" "linux_vm" {
  admin_username          = "scs-yourNumberID"
  allow_extension_operations = true
  availability_set_id     = null
  bypass_platform_safety_checks_on_user_schedule_enabled = false
  capacity_reservation_group_id = null
  computer_name            = "Lab03s2-dbl-u-val"
  dedicated_host_group_id = null
  dedicated_host_id        = null
  disable_password_authentication = true
  disk_controller_type     = "SCSI"
  edge_zone                = null
  encryption_at_host_enabled = false
  eviction_policy           = null
  extensions_time_budget   = "PT1H30M"
  id                      = "/subscriptions/ea6fc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/Lab02-rg/providers/Microsoft
Compute/virtualMachines/lab03s2-dbl-u-val"
  license_type              = null
  location                 = "eastus"
  max_bid_price             = 1
  name                     = "Lab03s2-dbl-u-val"
  network_interface_ids     = [
    "/subscriptions/ea6fc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/Lab02-rg/providers/Microsoft.Network/networkInterfaces/lab03s2-dbl-u-val-nic",
  ]
  patch_assessment_mode     = "EspressoDefault"
  patch_mode                = "ImageDefault"
}
```

```

security_rule      = [
  {
    access          = "Allow"
    description     = null
    destination_address_prefix = "*"
    destination_address_prefixes = []
    destination_application_security_group_ids = []
    destination_port_range = "3389"
    destination_port_ranges = []
    direction       = "Inbound"
    name            = "rule1"
    priority        = 100
    protocol        = "Tcp"
    source_address_prefix = "*"
    source_address_prefixes = []
    source_application_security_group_ids = []
    source_port_range = "*"
    source_port_ranges = []
  },
  {
    access          = "Allow"
  }
]

```

```

# azurerm_subnet_lab02_subnet1:
resource "azurerm_subnet" "lab02_subnet1" {
  address_prefixes           = [
    "10.0.1.0/24",
  ]
  default_outbound_access_enabled = true
  enforce_private_link_endpoint_network_policies = false
  enforce_private_link_service_network_policies = false
  id                         = "/subscriptions/eaf6fc9c7-fe32-4565-b42a-e336c92040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet1"
  name                        = "lab02-subnet1"
  private_endpoint_network_policies = "Enabled"
  private_endpoint_network_policies_enabled = true
  private_link_service_network_policies_enabled = true
  resource_group_name          = "Lab02-rg"
  service_endpoint_policy_ids = []
  service_endpoints            = []
  virtual_network_name         = "lab02-vnet"
}

# azurerm_subnet_lab02_subnet2:
resource "azurerm_subnet" "lab02_subnet2" {
  address_prefixes           = [
    "10.0.2.0/24",
  ]
  default_outbound_access_enabled = true
  enforce_private_link_endpoint_network_policies = false
  enforce_private_link_service_network_policies = false
  id                         = "/subscriptions/eaf6fc9c7-fe32-4565-b42a-e336c92040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/virtualNetworks/lab02-vnet/subnets/lab02-subnet2"
  name                        = "lab02-subnet2"
  private_endpoint_network_policies = "Enabled"
  private_endpoint_network_policies_enabled = true
  private_link_service_network_policies_enabled = true
  resource_group_name          = "Lab02-rg"
  service_endpoint_policy_ids = []
  service_endpoints            = []
  virtual_network_name         = "lab02-vnet"
}

```

```

    ],
    bps_community = null
    dns_servers = []
    edge_zone = null
    flow_timeout_in_minutes = 0
    guid = "/dd24bd9-4167-43bb-a07b-f9a68bdc6378"
    id = "/subscriptions/eabfc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/virtualNetworks/lab02
--vnet"
    location = "eastus"
    name = "Lab02-vnet"
    resource_group_name = "Lab02-rg"
    subnet = [
        {
            address_prefix = "10.0.1.0/24"
            id = "/subscriptions/eabfc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/virtualNetworks/lab02-
vnet/subnets/lab02-subnet1"
            name = "Lab02-subnet1"
            security_group = "/subscriptions/eabfc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/networkSecurityGroups/
Lab02-nsg1"
        },
        {
            address_prefix = "10.0.2.0/24"
            id = "/subscriptions/eabfc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/virtualNetworks/lab02-
vnet/subnets/lab02-subnet2"
            name = "Lab02-subnet2"
            security_group = "/subscriptions/eabfc9c7-fe32-4565-b42a-e336c72040d9/resourceGroups/lab02-rg/providers/Microsoft.Network/networkSecurityGroups/
Lab02-nsg2"
        }
    ]
    tags = {}
}

# random_integer.rand:
resource "random_integer" "rand" {
    id = "75002"
    max = 99999
    min = 10000
    result = 75002
}

```

C:\Users\SCS\lab02s3s3>

The screenshot shows the Microsoft Azure portal interface for managing Resource Groups. At the top, there's a navigation bar with 'Microsoft Azure' and a search bar. Below it, a message says 'You are viewing a new version of Azure experience. Some features may be missing. Click here to access the old experience.' The main area is titled 'Resource groups' and shows two entries:

Name	Subscription	Location
lab02-rg	Azure for Students	East US
NetworkWatchRG	Azure for Students	East US

At the bottom, there are buttons for 'Give feedback' and a display count selector set to 10.

## SECTION 4

### PART 2

```
File    Edit    View

output "vm_hostname" {
  value = azurerm_linux_virtual_machine.linux_vm.name
}

output "private_ip_address" {
  value = azurerm_network_interface.linux_nic.private_ip_address
}

output "public_ip_address" {
  value = azurerm_public_ip.linux_pip.ip_address
}

output "vnet_name" {
  value = azurerm_virtual_network.myvnet.name
}

output "vnet_address_space" {
  value = azurerm_virtual_network.myvnet.address_space
}

output "subnet1_name" {
  value = azurerm_subnet.lab02_subnet1.name
}

output "subnet1_address_prefix" {
  value = azurerm_subnet.lab02_subnet1.address_prefixes
}

output "subnet2_name" {
  value = azurerm_subnet.lab02_subnet2.name
}

output "subnet2_address_prefix" {
  value = azurerm_subnet.lab02_subnet2.address_prefixes
}
```

PART 3-8

```
Apply complete! Resources: 4 added, 0 changed, 0 destroyed.

Outputs:

private_ip_address = "10.0.1.4"
public_ip_address = ""
subnet1_address_prefix = tolist([
    "10.0.1.0/24",
])
subnet1_name = "lab02-subnet1"
subnet2_address_prefix = tolist([
    "10.0.2.0/24",
])
subnet2_name = "lab02-subnet2"
vm_hostname = "lab03s2-db1-u-vm1"
vnet_address_space = tolist([
    "10.0.0.0/16",
])
vnet_name = "lab03s2-db1-u-vm1-vnet"

C:\Users\SCS\lab03s4>terraform state list
azurerm_container_group.lab02_container
azurerm_linux_virtual_machine.linux_vm
azurerm_network_interface.linux_nic
azurerm_network_security_group.lab02_nsg1
azurerm_network_security_group.lab02_nsg2
azurerm_public_ip.linux_pip
azurerm_resource_group.lab02_rg
azurerm_subnet.lab02_subnet1
azurerm_subnet.lab02_subnet2
azurerm_subnet_network_security_group_association.lab02_nsg_assoc1
azurerm_subnet_network_security_group_association.lab02_nsg_assoc2
azurerm_virtual_network.lab02_vnet
azurerm_virtual_network.myvnet
random_integer.rand
```

```
C:\Users\SCS\Lab03\#terraform show
# azurerm_container_group.lab02_container:
resource "azurerm_container_group" "lab02_container" {
  dns_name_label          = "Lab02-container-90197"
  dns_name_label_reuse_policy = "Reuse"
  exposed_port             = [
    {
      port      = 80
      protocol = "TCP"
    },
  ]
  fqdn                   = "Lab02-container-90197.eastus.azurecontainer.io"
  id                     = "/subscriptions/eaf6fc9c7-fe32-4565-b42a-e136c720ff9/resourceGroups/lab02-rg/providers/Microsoft.ContainerInstance/contain
erGroups/lab02-container-90197"
  ip_address              = "20.241.238.233"
  ip_address_type         = "Public"
  location                = "eastus"
  name                   = "Lab02-container-90197"
  os_type                 = "Linux"
  priority                = null
  resource_group_name     = "Lab02-rg"
  restart_policy           = "Always"
  sku                     = "Standard"
  subnet_ids              = []
  tags                    = [
    "environment" = "lab"
  ]
  zones                  = []

  container {
    commands            = []
    cpu                 = 1
    cpu_limit           = 0
    environment_variables = []
    image               = "mcr.microsoft.com/azuredocs/aci-helloworld"
    memory               = 1.5
    memory_limit         = 0
    name                = "helloworld"
    secure_environment_variables = (sensitive value)
  }

  ports {
```

```

s2-db1-u-vm1-vnet"
  location          = "eastus"
  name             = "lab03s2-db1-u-vm1-vnet"
  resource_group_name = "lab02-rg"
  subnet           = []
  tags             = {
    "ContactEmail" = "youremailaddress"
    "Environment"  = "Lab"
    "Name"         = "Terraform-Class"
    "Project"      = "Learning"
  }
}

# random_integer.rand:
resource "random_integer" "rand" {
  id      = "90197"
  max    = 99999
  min    = 10000
  result = 90197
}

```

**Outputs:**

```

private_ip_address = "10.0.1.4"
public_ip_address = null
subnet1_address_prefix = [
  "10.0.1.0/24",
]
subnet1_name = "lab02-subnet1"
subnet2_address_prefix = [
  "10.0.2.0/24",
]
subnet2_name = "lab02-subnet2"
vm_hostname = "lab03s2-db1-u-vm1"
vnet_address_space = [
  "10.0.0.0/16",
]
vnet_name = "lab03s2-db1-u-vm1-vnet"

```

C:\Users\SCS\lab03s4>

```
private_ip_address = "10.0.1.4"
public_ip_address = ""
subnet1_address_prefix = tolist([
    "10.0.1.0/24",
])
subnet1_name = "lab02-subnet1"
subnet2_address_prefix = tolist([
    "10.0.2.0/24",
])
subnet2_name = "lab02-subnet2"
vm_hostname = "lab03s2-db1-u-vm1"
vnet_address_space = tolist([
    "10.0.0.0/16",
])
vnet_name = "lab03s2-db1-u-vm1-vnet"
```

```
Destroy complete! Resources: 11 destroyed.

C:\Users\Saad\Desktop\lab03s2>terraform state list

C:\Users\Saad\Desktop\lab03s2>terraform show
The state file is empty. No resources are represented.

C:\Users\Saad\Desktop\lab03s2>
```

## SECTION 5

### PART 2

```
File    Edit    View

# Virtual Network
resource "azurerm_virtual_network" "myvnet" {
  name          = "${var.linux_name}-vnet"
  location      = var.location
  resource_group_name = var.resource_group_name
  address_space   = ["10.0.0.0/16"]

  tags = {
    Name      = local.Name
    Project   = local.Project
    ContactEmail = local.ContactEmail
    Environment = local.Environment
  }
}

# Public IP Address
resource "azurerm_public_ip" "linux_pip" {
  name          = "${var.linux_name}-pip"
  location      = var.location
  resource_group_name = var.resource_group_name
  allocation_method = "Dynamic"

  tags = {
    Name      = local.Name
    Project   = local.Project
    ContactEmail = local.ContactEmail
    Environment = local.Environment
  }
}

# Network Interface
resource "azurerm_network_interface" "linux_nic" {
  name          = "${var.linux_name}-nic"
  location      = var.location
  resource_group_name = var.resource_group_name

  ip_configuration {
    name          = "${var.linux_name}-ipconfig1"
    subnet_id     = azurerm_subnet.lab02_subnet1.id
    private_ip_address_allocation = "Dynamic"
```

```

ip_configuration {
  name          = "${var.linux_name}-ipconfig1"
  subnet_id     = azurerm_subnet.lab02_subnet1.id
  private_ip_address_allocation = "Dynamic"
  public_ip_address_id      = azurerm_public_ip.linux_pip.id
}

tags = {
  Name      = local.Name
  Project   = local.Project
  ContactEmail = local.ContactEmail
  Environment = local.Environment
}
}

# Linux Virtual Machine
resource "azurerm_linux_virtual_machine" "linux_vm" {
  name          = var.linux_name
  location      = var.location
  resource_group_name = var.resource_group_name
  size          = var.vm_size
  admin_username = var.admin_username

  network_interface_ids = [
    azurerm_network_interface.linux_nic.id
  ]

  admin_ssh_key {
    username      = var.admin_username
    public_key = file(var.public_key)
  }

  os_disk {
    name          = "${var.linux_name}-osdisk"
    caching       = var.os_disk_caching
    storage_account_type = var.os_disk_storage_account_type
    disk_size_gb   = var.os_disk_size
  }
}

```

PART 3-9

```
C:\Users\Saad\Desktop\lab03s2>terraform validate
Success! The configuration is valid.
```

```
C:\Users\Saad\Desktop\lab03s2>
```

```

  * public_key = <<-EOT
    ssh-rsa AAAAB3NzaC1EzAAQABAAAACAO0KZTHfI8B121ivnz6R0TT6Hch2ytkEP1+9+LVtIFTX1SH8c09Rn3tT6v/ISaD61WUoQj7ndTURD9GEdIIIXPx1ReuAVx51WiacPxS2II/A1HEFOXFNq+CEETgIVixiYLHhMhk2Dxpds
  80v/nPMID0EYtfqmfJzG1G1w8b2323byvngsEGpnw08cxNvGhTahJGBfDkoyGlpUxLfpnDn24Qp0185j9V4STFAjVVEciYeo159pPV2ap9hXTL1c53mWEad0pPrcs2DR1T8L4Aa1Nb7fhz201TS05h4Ap0B88E0m0SN1T6fef1wzX/5k/mP
  MskjRzFv04ms1rpHyV4ucynt23lVjKshtCjwH/+ery3hjg4madYFr3GGit2wYnmJQFthsk0V3b5dKce3e8thDXskGDabJgvIjow+EK89HH+1Sz9E2800i+FVz2jPtGjwdt0Dzul@hvChN0mGF5CogmzwApbedWFp08mt2E71UkyfLwzAHG07/C8D
  8kCiaQfLSDNG5R3D8ssMqjbhE9WkxBH1yHvzRivotvTnyNu8J7Sk128p4RrE3eDApzDAE8hj0kAwFD2uFHJNh0etwoH7m4BVusxgkOcQv6s+dnw== saad@DESKTOP-R50V5BS
    EOT
  + username   = "saad-211218"
}

* os_disk {
  + caching      = "ReadWrite"
  + disk_size_gb = 32
  + name         = "lab03s2-db1-u-vm1-osdisk"
  + storage_account_type = "premium_LRS"
  + write_accelerator_enabled = false
}

* source_image_reference {
  + offer        = "UbuntuServer"
  + publisher    = "Canonical"
  + sku          = "16.04-LTS"
  + version      = "latest"
}

* termination_notification (known after apply)
}

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

Enter a value: yes

azurerm_linux_virtual_machine.linux_vm: Creating...
azurerm_linux_virtual_machine.linux_vm: Still creating... [10s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [20s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [30s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [40s elapsed]
azurerm_linux_virtual_machine.linux_vm: Still creating... [50s elapsed]
azurerm_linux_virtual_machine.linux_vm: Creation complete after 56s [id=/subscriptions/bfbe3041-7fa8-4038-8898-37ee17f2c645/resourceGroups/lab02-resources/providers/Microsoft.Compute/virtualMachine
bl-u-vm1]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

C:\Users\Saad\Desktop\lab03s2>terraform show
# azurerm_linux_virtual_machine.linux_vm:
resource "azurerm_linux_virtual_machine" "linux_vm" {
  admin_username           = "saad-211218"
  allow_extension_operations = true
  availability_set_id       = null
  bypass_platform_safety_checks_on_user_schedule_enabled = false
  capacity_reservation_group_id = null
  computer_name              = "lab03s2-db1-u-vm1"
}

```



The state file is empty. No resources are represented.

```
C:\Users\Saad\Desktop\lab03s2>terraform validate
Success! The configuration is valid.
```