

Fatima Jinnah Women University

Subject: Cloud Computing



Lab 10

Name:

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Registration number:

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Submitted To:

Sir Shoaib

Task 1:

```
PS C:\Users\tehre> winget install --id GitHub.cli
Found an existing package already installed. Trying to upgrade the installed package...
No available upgrade found.
No newer package versions are available from the configured sources.
PS C:\Users\tehre>

PS C:\Users\tehre> gh auth login -s codespace
? Where do you use GitHub? GitHub.com
? What is your preferred protocol for Git operations on this host? HTTPS
? Authenticate Git with your GitHub credentials? Yes
? How would you like to authenticate GitHub CLI? Login with a web browser

! First copy your one-time code: 011A-001F
Press Enter to open https://github.com/login/device in your browser...
? Authentication complete.
- gh config set -h github.com git_protocol https
? Configured git protocol
? Logged in as tehreem-0514
! You were already logged in to this account
PS C:\Users\tehre>

PS C:\Users\tehre> gh codespace list
NAME          DISPLAY NAME      REPOSITORY      BRANCH   STATE    CREATED AT
symmetrical-cod-9664p55vpjph95gv symmetrical cod  tehreem-0514/CC_TehreemKhan_064 main* Available about 12 hours ago
PS C:\Users\tehre>

PS C:\Users\tehre> gh codespace ssh -c symmetrical-cod-9664p55vpjph95gv
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-1030-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro
Last login: Fri Jan  2 09:42:42 2026 from ::1
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-1030-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro
Last login: Fri Jan  2 09:42:42 2026 from ::1
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

Task 2:

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ aws --version
aws-cli/2.32.26 Python/3.13.11 Linux/6.8.0-1030-azure exe/x86_64.ubuntu.24
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ aws configure
AWS Access Key ID [*****5XX3]: AKIA27EVSW27I5KR7HVE
AWS Secret Access Key [*****niFm]: 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
Default region name [me-central-1]: me-central-1
Default output format [json]: json
Default output format [json]: json
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat ~/.aws/credentials
[default]
aws_access_key_id = AKIA27EVSW27I5KR7HVE
aws_secret_access_key = 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
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat ~/.aws/config
[default]
region = me-central-1
output = json
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ aws sts get-caller-identity
{
    "UserId": "AIDA27EVSW27LJBMAWGMB",
    "Account": "754080462526",
    "Arn": "arn:aws:iam::754080462526:user/tehreem0514"
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

Get:9 https://repo.anaconda.com/pkgs/misc/debrepo/conda stable InRelease [3961 B]
Get:10 https://repo.anaconda.com/pkgs/misc/debrepo/conda stable/main amd64 Packages [4557 B]
Get:11 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:12 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [1183 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [331 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [19.3 MB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [33.1 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1752 kB]
Get:20 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [2898 kB]
Get:21 http://archive.ubuntu.com/ubuntu noble/restricted amd64 Packages [117 kB]
Get:22 http://archive.ubuntu.com/ubuntu noble/main amd64 Packages [1808 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [2130 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1950 kB]
Get:25 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [3059 kB]
Get:26 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [35.9 kB]
Get:27 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Packages [49.5 kB]
Get:28 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [34.6 kB]
Fetched 35.7 MB in 6s (6049 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
51 packages can be upgraded. Run 'apt list --upgradable' to see them.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform --version
-bash: terraform: command not found
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ sudo apt install terraform
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  terraform
0 upgraded, 1 newly installed, 0 to remove and 51 not upgraded.
Need to get 30.6 MB of archives.
After this operation, 101 MB of additional disk space will be used.
Get:1 https://apt.releases.hashicorp.com/noble/main amd64 terraform amd64 1.14.3-1 [30.6 MB]
Fetched 30.6 MB in 0s (133 MB/s)
Selecting previously unselected package terraform.
(Reading database ... 58629 files and directories currently installed.)
Preparing to unpack .../terraform_1.14.3-1_amd64.deb ...
Unpacking terraform (1.14.3-1) ...
Setting up terraform (1.14.3-1) ...
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ which terraform
/usr/bin/terraform
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform --version
Terraform v1.14.3
on linux_amd64
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ vim main.tf
```

```
provider "aws" {
  shared_config_files      = "~/.aws/config"
  shared_credentials_files = "~/.aws/credentials"
}
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat main.tf
provider "aws" {
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform init
Initializing the backend...
Initializing provider plugins...
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v6.27.0...
- Installed hashicorp/aws v6.27.0 (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.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat .terraform.lock.hcl
# This file is maintained automatically by "terraform init".
# Manual edits may be lost in future updates.

provider "registry.terraform.io/hashicorp/aws" {
  version = "6.27.0"
  hashes = [
    "h1:bixp2PSsP5ZGBczGCxcbSDn6lF5QFlUX1Nroq9cdab4=",
    "zh:177a24b806c72e8484b5cabcb93b2b38e3d770ae6f745a998b54d6619fd0e8129",
    "zh:4ac4a85c14fb868a3306b542e6a56c10bd6c6d5a67bc0c9b8f6a9060cf5f3be7",
    "zh:552652185bc85c8ba1dalde65dea47c454728a5c6839c458b6dc3ce71c19ccfc",
    "zh:60284b8172d09aee91eae0856f09855eaf040ce3a58d6933602ae17c53f8ed04",
    "zh:6be38d156756ca61fb8e7c752cc5d769cd709686700ac4b230f40a6e95b5dbc9",
    "zh:7a409138fae4ef42e3a637e37cb9efedf96459e28a3c764fc4e855e8db9a7485",
    "zh:8070cf5224ed1ed3a3e9a59f7c30ff88bf071c7567165275d477c1738a56c064",
    "zh:894439ef340a9a79f69cd759e27ad11c7826adeca27be1b1ca82b3c9702fa300",
    "zh:89d035eebf08a97c89374ff06040955ddc09f275ecca609d0c9d58d149bef5cf",
    "zh:985b1145d724fc1f38369099e4a5087141885740fd6c0b1dbc492171e73c2e49",
    "zh:9b12af85486a96aedd8d7984b0ff811a4b42e3d88dad1a3fb4c0b580d04fa425",
    "zh:a80b47ae8d1475201c86bd94a5dc9dd4da5e8b73102a90820b68b66b76d50fd",
    "zh:d3395be1556210f82199b9166a6b2e677cee9c4b67e96e63f6c3a98325ad7ab0",
    "zh:db0b869d09657f6f1e4110b56093c5fcdf9dbdd97c020db1e577b239c0adcbce",
    "zh:ffc72e680370ae7c21f9bd3082c6317730df805c6797427839a6b6b7e9a26a01",
  ]
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ ls .terraform/
providers
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

Task 3:

```
GNU nano 7.2                                     main.tf *
```

```
provider "aws" {
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
}
resource "aws_vpc" "development_vpc" {
  cidr_block = "10.0.0.0/16"
}

resource "aws_subnet" "dev_subnet_1" {
  vpc_id      = aws_vpc.development_vpc.id
  cidr_block = "10.0.10.0/24"
  availability_zone = "me-central-1a"
}
```

```
+ ipv6_cidr_block = (known after apply)
+ ipv6_cidr_block_network_border_group = (known after apply)
+ main_route_table_id = (known after apply)
+ owner_id = (known after apply)
+ region = "me-central-1"
+ tags_all = (known after apply)
}

Plan: 2 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

aws_vpc.development_vpc: Creating...
aws_vpc.development_vpc: Creation complete after 2s [id=vpc-00833e2ee14419553]
aws_subnet.dev_subnet_1: Creating...
aws_subnet.dev_subnet_1: Creation complete after 1s [id=subnet-0170b6ef7a7e81cc5]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ aws ec2 describe-subnets --filter "Name=subnet-id,Values=subnet-0170b6ef7a7e81cc5"
{
    "Subnets": [
        {
            "AvailabilityZoneId": "mec1-az1",
            "MapCustomerOwnedIpOnLaunch": false,
            "OwnerId": "754080462526",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "SubnetArn": "arn:aws:ec2:me-central-1:754080462526:subnet/subnet-0170b6ef7a7e81cc5",
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            },
            "BlockPublicAccessStates": {
                "InternetGatewayBlockMode": "off"
            },
            "SubnetId": "subnet-0170b6ef7a7e81cc5",
            "State": "available",
            "VpcId": "vpc-00833e2ee14419553",
            "CidrBlock": "10.0.10.0/24",
            "AvailableIpAddressCount": 251,
            "AvailabilityZone": "me-central-1a",
            "DefaultForAz": false,
            "MapPublicIpOnLaunch": false
        }
    ]
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ aws ec2 describe-vpcs --filter "Name=vpc-id,Values=vpc-00833e2ee14419553"
{
    "Vpcs": [
        {
            "OwnerId": "754080462526",
            "InstanceTenancy": "default",
            "CidrBlockAssociationSet": [
                {
                    "AssociationId": "vpc-cidr-assoc-01167cd154aa8b857",
                    "CidrBlock": "10.0.0.0/16",
                    "CidrBlockState": {
                        "State": "associated"
                    }
                }
            ],
            "IsDefault": false,
            "BlockPublicAccessStates": {
                "InternetGatewayBlockMode": "off"
            },
            "VpcId": "vpc-00833e2ee14419553",
            "State": "available",
            "CidrBlock": "10.0.0.0/16",
            "DhcpOptionsId": "dopt-0c226be11fcb44d5b"
        }
    ]
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

```

Task 4:

```

provider "aws" {
    shared_config_files      = ["~/.aws/config"]
    shared_credentials_files = ["~/.aws/credentials"]
}
resource "aws_vpc" "development_vpc" {
    cidr_block = "10.0.0.0/16"
}

resource "aws_subnet" "dev_subnet_1" {
    vpc_id      = aws_vpc.development_vpc.id
    cidr_block = "10.0.10.0/24"
    availability_zone = "me-central-1a"
}
data "aws_vpc" "existing_vpc" {
    default = true
}

resource "aws_subnet" "dev_subnet_1_existing" {
    vpc_id      = data.aws_vpc.existing_vpc.id
    cidr_block = "172.31.48.0/24"
    availability_zone = "me-central-1a"
}

```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform apply
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-00833e2ee14419553]
data.aws_vpc.existing_vpc: Read complete after 0s [id=vpc-0d668582150defbf9]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0170b6ef7a7e81cc5]

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:

# aws_subnet.dev_subnet_1_existing will be created
+ resource "aws_subnet" "dev_subnet_1_existing" {
    + arn
    + assign_ipv6_address_on_creation
    + availability_zone
    + availability_zone_id
    + cidr_block
    + enable_dns64
    + enable_resource_name_dns_a_record_on_launch
    + enable_resource_name_dns_aaaa_record_on_launch
    + id
    + ipv6_cidr_block_association_id
    + ipv6_native
    + map_public_ip_on_launch
    + owner_id
    + private_dns_hostname_type_on_launch
    + region
    + tags_all
    + vpc_id
}

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

aws_subnet.dev_subnet_1_existing: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 1s [id=subnet-04af28b127bd46cad]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

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

Warning: Resource targeting is in effect

You are creating a plan with the -target option, which means that the result of this plan
may not represent all of the changes requested by the current configuration.

The -target option is not for routine use, and is provided only for exceptional situations
such as recovering from errors or mistakes, or when Terraform specifically suggests to use
it as part of an error message.

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

aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-04af28b127bd46cad]
aws_subnet.dev_subnet_1_existing: Destruction complete after 1s

Warning: Applied changes may be incomplete

The plan was created with the -target option in effect, so some changes requested in the
configuration may have been ignored and the output values may not be fully updated. Run the
following command to verify that no other changes are pending:
    terraform plan

Note that the -target option is not suitable for routine use, and is provided only for
exceptional situations such as recovering from errors or mistakes, or when Terraform
specifically suggests to use it as part of an error message.

Destroy complete! Resources: 1 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform refresh
aws_vpc.development_vpc: Refreshing state... [id=vpc-00833e2ee14419553]
data.aws_vpc.existing_vpc: Reading...
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0d668582150defbf9]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0170b6ef7a7e81cc5]
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```

# aws_subnet.dev_subnet_1_existing will be created
+ resource "aws_subnet" "dev_subnet_1_existing" {
    + arn                               = (known after apply)
    + assign_ipv6_address_on_creation   = false
    + availability_zone                = "me-central-1a"
    + availability_zone_id             = (known after apply)
    + cidr_block                      = "172.31.48.0/24"
    + enable_dns64                    = false
    + enable_resource_name_dns_a_record_on_launch = false
    + enable_resource_name_dns_aaaa_record_on_launch = false
    + id                               = (known after apply)
    + ipv6_cidr_block_association_id   = (known after apply)
    + ipv6_native                     = false
    + map_public_ip_on_launch          = false
    + owner_id                         = (known after apply)
    + private_dns_hostname_type_on_launch = (known after apply)
    + region                           = "me-central-1"
    + tags_all                         = (known after apply)
    + vpc_id                           = "vpc-0d668582150defbf9"
}

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

aws_subnet.dev_subnet_1_existing: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 0s [id=subnet-08dd94eedb623bfba]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

    - instance_tenancy                  = "deradit" -> null
    - ipv6_netmask_length               = 0 -> null
    - main_route_table_id              = "rtb-065e5c52404fb1b7d" -> null
    - owner_id                          = "754080462526" -> null
    - region                           = "me-central-1" -> null
    - tags                             = {} -> null
    - tags_all                         = {} -> null
    # (4 unchanged attributes hidden)
}

Plan: 0 to add, 0 to change, 3 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

aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-08dd94eedb623bfba]
aws_subnet.dev_subnet_1: Destroying... [id=subnet-0170b6ef7a7e81cc5]
aws_subnet.dev_subnet_1: Destruction complete after 0s
aws_vpc.development_vpc: Destroying... [id=vpc-00833e2ee14419553]
aws_subnet.dev_subnet_1_existing: Destruction complete after 0s
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

```

```
+ resource "aws_subnet" "dev_subnet_1_existing" {
+   arn                               = (known after apply)
+   assign_ipv6_address_on_creation    = false
+   availability_zone                 = "me-central-1a"
+   availability_zone_id              = (known after apply)
+   cidr_block                        = "172.31.48.0/24"
+   enable_dns64                      = false
+   enable_resource_name_dns_a_record_on_launch = false
+   enable_resource_name_dns_aaaa_record_on_launch = false
+   id                                = (known after apply)
+   ipv6_cidr_block_association_id    = (known after apply)
+   ipv6_native                        = false
+   map_public_ip_on_launch           = false
+   owner_id                           = (known after apply)
+   private_dns_hostname_type_on_launch = (known after apply)
+   region                            = "me-central-1"
+   tags_all                           = (known after apply)
+   vpc_id                             = "vpc-0d668582150defbf9"
}

# aws_vpc.development_vpc will be created
+ resource "aws_vpc" "development_vpc" {
+   arn                               = (known after apply)
+   cidr_block                        = "10.0.0.0/16"
+   default_network_acl_id            = (known after apply)
+   default_route_table_id            = (known after apply)
+   default_security_group_id         = (known after apply)
+   dhcp_options_id                  = (known after apply)
+   enable_dns_hostnames              = (known after apply)
+   enable_dns_support                = true
+   enable_network_address_usage_metrics = (known after apply)
+   id                                = (known after apply)
+   instance_tenancy                  = "default"
+   ipv6_association_id               = (known after apply)
+   ipv6_cidr_block                   = (known after apply)
+   ipv6_cidr_block_network_border_group = (known after apply)
+   main_route_table_id               = (known after apply)
+   owner_id                           = (known after apply)
+   region                            = "me-central-1"
+   tags_all                           = (known after apply)
}
```

Plan: 3 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.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) \$

```
# aws_vpc.development_vpc will be created
+ resource "aws_vpc" "development_vpc" {
    + arn                               = (known after apply)
    + cidr_block                         = "10.0.0.0/16"
    + default_network_acl_id            = (known after apply)
    + default_route_table_id           = (known after apply)
    + default_security_group_id        = (known after apply)
    + dhcp_options_id                  = (known after apply)
    + enable_dns_hostnames             = (known after apply)
    + enable_dns_support                = true
    + enable_network_address_usage_metrics = (known after apply)
    + id                                = (known after apply)
    + instance_tenancy                 = "default"
    + ipv6_association_id              = (known after apply)
    + ipv6_cidr_block                  = (known after apply)
    + ipv6_cidr_block_network_border_group = (known after apply)
    + main_route_table_id              = (known after apply)
    + owner_id                          = (known after apply)
    + region                            = "me-central-1"
    + tags_all                          = (known after apply)
}

Plan: 3 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

aws_subnet.dev_subnet_1_existing: Creating...
aws_vpc.development_vpc: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 1s [id=subnet-045167effcae1859e]
aws_vpc.development_vpc: Creation complete after 1s [id=vpc-022291170325821e6]
aws_subnet.dev_subnet_1: Creating...
aws_subnet.dev_subnet_1: Creation complete after 1s [id=subnet-0cd488e68b01b6c5d]

Apply complete! Resources: 3 added, 0 changed, 0 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```

provider "aws" {
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
}

resource "aws_subnet" "dev_subnet_1" {
  vpc_id      = aws_vpc.development_vpc.id
  cidr_block = "10.0.10.0/24"
  availability_zone = "me-central-1a"
}
data "aws_vpc" "existing_vpc" {
  default = true
}

resource "aws_subnet" "dev_subnet_1_existing" {
  vpc_id      = data.aws_vpc.existing_vpc.id
  cidr_block = "172.31.48.0/24"
  availability_zone = "me-central-1a"
}

resource "aws_vpc" "development_vpc" {
  cidr_block = "10.0.0.0/16"
  tags = {
    Name: "development"
    vpc_env = "dev"
  }
}

```

```

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ @tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform refresh
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-022291170325821e6]
data.aws_vpc.existing_vpc: Read complete after 0s [id=vpc-0d668582150defbf9]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-045167effcae1859e]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0cd488e68b01b6c5d]
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform apply -auto-approve
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-022291170325821e6]
data.aws_vpc.existing_vpc: Read complete after 0s [id=vpc-0d668582150defbf9]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-045167effcae1859e]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0cd488e68b01b6c5d]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
  ~ update in-place

Terraform will perform the following actions:

  # aws_vpc.development_vpc will be updated in-place
  ~ resource "aws_vpc" "development_vpc" {
      id                      = "vpc-022291170325821e6"
      ~ tags                  = {
          + "Name"     = "development"
          + "vpc_env"  = "dev"
      }
      ~ tags_all              = {
          + "Name"     = "development"
          + "vpc_env"  = "dev"
      }
      # (19 unchanged attributes hidden)
    }

Plan: 0 to add, 1 to change, 0 to destroy.
aws_vpc.development_vpc: Modifying... [id=vpc-022291170325821e6]
aws_vpc.development_vpc: Modifications complete after 1s [id=vpc-022291170325821e6]

Apply complete! Resources: 0 added, 1 changed, 0 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $

```

```
resource "aws_vpc" "development_vpc" {
  cidr_block = "10.0.0.0/16"
  tags = {
    Name: "development"
  }
}
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform plan
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-022291170325821e6]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0d668582150defbf9]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-045167effcae1859e]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0cd488e68b01b6c5d]

Terraform used the selected providers to generate the following execution plan. Resource
actions are indicated with the following symbols:
  ~ update in-place

Terraform will perform the following actions:

# aws_vpc.development_vpc will be updated in-place
~ resource "aws_vpc" "development_vpc" {
    id                      = "vpc-022291170325821e6"
    ~ tags                  = {
        "Name"      = "development"
        - "vpc_env" = "dev" -> null
    }
    ~ tags_all              = {
        - "vpc_env" = "dev" -> null
        # (1 unchanged element hidden)
    }
    # (19 unchanged attributes hidden)
}

Plan: 0 to add, 1 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.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) \$

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform apply
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-022291170325821e6]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0d668582150defbf9]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-045167effcae1859e]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0cd488e68b01b6c5d]

Terraform used the selected providers to generate the following execution plan. Resource
actions are indicated with the following symbols:
  ~ update in-place

Terraform will perform the following actions:

# aws_vpc.development_vpc will be updated in-place
~ resource "aws_vpc" "development_vpc" {
    id                      = "vpc-022291170325821e6"
    ~ tags                  = {
        "Name"      = "development"
        - "vpc_env" = "dev" -> null
    }
    ~ tags_all              = {
        - "vpc_env" = "dev" -> null
        # (1 unchanged element hidden)
    }
    # (19 unchanged attributes hidden)
}

Plan: 0 to add, 1 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

aws_vpc.development_vpc: Modifying... [id=vpc-022291170325821e6]
aws_vpc.development_vpc: Modifications complete after 1s [id=vpc-022291170325821e6]
```

Task 5:

```
# aws_vpc.development_vpc will be destroyed
- resource "aws_vpc" "development_vpc" {
    - arn = "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-022291170325821e6" -> null
    - assign_generated_ipv6_cidr_block = false -> null
    - cidr_block = "10.0.0.0/16" -> null
    - default_network_acl_id = "acl-0074b7bb7aad1e8bb" -> null
    - default_route_table_id = "rtb-00098617c5fa59f9e" -> null
    - default_security_group_id = "sg-021dd2f23b772c6a8" -> null
    - dhcp_options_id = "dopt-0c226be11fcbb44d5b" -> null
    - enable_dns_hostnames = false -> null
    - enable_dns_support = true -> null
    - enable_network_address_usage_metrics = false -> null
    - id = "vpc-022291170325821e6" -> null
    - instance_tenancy = "default" -> null
    - ipv6_netmask_length = 0 -> null
    - main_route_table_id = "rtb-00098617c5fa59f9e" -> null
    - owner_id = "754080462526" -> null
    - region = "me-central-1" -> null
    - tags = {
        - "Name" = "development"
    } -> null
    - tags_all = {
        - "Name" = "development"
    } -> null
    # (4 unchanged attributes hidden)
}

Plan: 0 to add, 0 to change, 3 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

aws_subnet.dev_subnet_1: Destroying... [id=subnet-0cd488e68b01b6c5d]
aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-045167effcae1859e]
aws_subnet.dev_subnet_1: Destruction complete after 0s
aws_vpc.development_vpc: Destroying... [id=vpc-022291170325821e6]
aws_subnet.dev_subnet_1_existing: Destruction complete after 0s
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat terraform.tfstate
{
  "version": 4,
  "terraform_version": "1.14.3",
  "serial": 28,
  "lineage": "f4a5ea44-7bf9-4934-bb7b-f5f1983de08a",
  "outputs": {},
  "resources": [],
  "check_results": null
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat terraform.tfstate.backup
{
  "version": 4,
  "terraform_version": "1.14.3",
  "serial": 23,
  "lineage": "f4a5ea44-7bf9-4934-bb7b-f5f1983de08a",
  "outputs": {},
  "resources": [
    {
      "mode": "data",
      "type": "aws_vpc",
      "name": "existing_vpc",
      "provider": "provider[\"registry.terraform.io/hashicorp/aws\"]",
      "instances": [
        {
          "schema_version": 0,
          "attributes": {
            "arn": "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-0d668582150defbf9",
            "cidr_block": "172.31.0.0/16",
            "cidr_block_associations": [
              {
                "association_id": "vpc-cidr-assoc-014213f2f7599a6d7",
                "cidr_block": "172.31.0.0/16",
                "state": "associated"
              }
            ],
            "default": true,
            "dhcp_options_id": "dopt-0c226be11fcb44d5b",
            "enable_dns_hostnames": true,
            "enable_dns_support": true,
            "enable_network_address_usage_metrics": false,
            "filter": null,
            "id": "vpc-0d668582150defbf9",
            "instance_tenancy": "default",
            "ipv6_association_id": "",
            "ipv6_cidr_block": "",
            "main_route_table_id": "rtb-0f031114f8daee32b",
            "owner_id": "754080462526",
            "region": "me-central-1",
            "state": null,
            "tags": {},
            "timeouts": null
          },
          "sensitive_attributes": [],
          "identity_schema_version": 0
        }
      ]
    }
  ]
}
```

```
# aws_vpc.development_vpc will be created
+ resource "aws_vpc" "development_vpc" {
    + arn                               = (known after apply)
    + cidr_block                         = "10.0.0.0/16"
    + default_network_acl_id             = (known after apply)
    + default_route_table_id             = (known after apply)
    + default_security_group_id          = (known after apply)
    + dhcp_options_id                   = (known after apply)
    + enable_dns_hostnames              = (known after apply)
    + enable_dns_support                = true
    + enable_network_address_usage_metrics = (known after apply)
    + id                                = (known after apply)
    + instance_tenancy                  = "default"
    + ipv6_association_id               = (known after apply)
    + ipv6_cidr_block                   = (known after apply)
    + ipv6_cidr_block_network_border_group = (known after apply)
    + main_route_table_id               = (known after apply)
    + owner_id                           = (known after apply)
    + region                            = "me-central-1"
    + tags
        + "Name" = "development"
    }
    + tags_all                          = {
        + "Name" = "development"
    }
}

Plan: 3 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

aws_vpc.development_vpc: Creating...
aws_subnet.dev_subnet_1_existing: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 1s [id=subnet-083ae24b8a08005c5]
aws_vpc.development_vpc: Creation complete after 1s [id=vpc-0e2f0da22cb0cbc91]
aws_subnet.dev_subnet_1: Creating...
aws_subnet.dev_subnet_1: Creation complete after 1s [id=subnet-0f484b23609216ae4]

Apply complete! Resources: 3 added, 0 changed, 0 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
"provider": "provider[\"registry.terraform.io/hashicorp/aws\"]",
"instances": [
{
  "schema_version": 1,
  "attributes": {
    "arn": "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-0e2f0da22cb0cbc91",
    "assign_generated_ipv6_cidr_block": false,
    "cidr_block": "10.0.0.0/16",
    "default_network_acl_id": "acl-09547b56e368735c0",
    "default_route_table_id": "rtb-0de0198b7eff6b8a0",
    "default_security_group_id": "sg-04ec0fe2e72b63c96",
    "dhcp_options_id": "dopt-0c226be11fcba44d5b",
    "enable_dns_hostnames": false,
    "enable_dns_support": true,
    "enable_network_address_usage_metrics": false,
    "id": "vpc-0e2f0da22cb0cbc91",
    "instance_tenancy": "default",
    "ipv4_ipam_pool_id": null,
    "ipv4_netmask_length": null,
    "ipv6_association_id": "",
    "ipv6_cidr_block": "",
    "ipv6_cidr_block_network_border_group": "",
    "ipv6_ipam_pool_id": "",
    "ipv6_netmask_length": 0,
    "main_route_table_id": "rtb-0de0198b7eff6b8a0",
    "owner_id": "754080462526",
    "region": "me-central-1",
    "tags": {
      "Name": "development"
    },
    "tags_all": {
      "Name": "development"
    }
  },
  "sensitive_attributes": [],
  "identity_schema_version": 0,
  "identity": {
    "account_id": "754080462526",
    "id": "vpc-0e2f0da22cb0cbc91",
    "region": "me-central-1"
  },
  "private": "eyJzY2hlbWFfdmVyc2lvbiI6IjEifQ=="
}
]
},
"check_results": null
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat terraform.tfstate.backup
{
  "version": 4,
  "terraform_version": "1.14.3",
  "serial": 28,
  "lineage": "f4a5ea44-7bf9-4934-bb7b-f5f1983de08a",
  "outputs": {},
  "resources": [],
  "check_results": null
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ @tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform state list
data.aws_vpc.existing_vpc
aws_subnet.dev_subnet_1
aws_subnet.dev_subnet_1_existing
aws_vpc.development_vpc

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ terraform state show aws_vpc.development_vpc
# aws_vpc.development_vpc:
resource "aws_vpc" "development_vpc" {
    arn                                = "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-0e2f0da22cb0cbc91"
    assign_generated_ipv6_cidr_block     = false
    cidr_block                          = "10.0.0.0/16"
    default_network_acl_id              = "acl-09547b56e368735c0"
    default_route_table_id              = "rtb-0de0198b7eff6b8a0"
    default_security_group_id           = "sg-04ec0fe2e72b63c96"
    dhcp_options_id                    = "dopt-0c226be11fcba44d5b"
    enable_dns_hostnames                = false
    enable_dns_support                  = true
    enable_network_address_usage_metrics = false
    id                                 = "vpc-0e2f0da22cb0cbc91"
    instance_tenancy                   = "default"
    ipv6_association_id                = null
    ipv6_cidr_block                    = null
    ipv6_cidr_block_network_border_group = null
    ipv6_ipam_pool_id                 = null
    ipv6_netmask_length                = 0
    main_route_table_id                = "rtb-0de0198b7eff6b8a0"
    owner_id                           = "754080462526"
    region                            = "me-central-1"
    tags                               = {
        "Name" = "development"
    }
    tags_all                           = {
        "Name" = "development"
    }
}

@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

Task 6:

```

provider "aws" {
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
}

resource "aws_subnet" "dev_subnet_1" {
  vpc_id      = aws_vpc.development_vpc.id
  cidr_block = "10.0.10.0/24"
  availability_zone = "me-central-1a"
}
data "aws_vpc" "existing_vpc" {
  default = true
}

resource "aws_subnet" "dev_subnet_1_existing" {
  vpc_id      = data.aws_vpc.existing_vpc.id
  cidr_block = "172.31.48.0/24"
  availability_zone = "me-central-1a"
}

resource "aws_vpc" "development_vpc" {
  cidr_block = "10.0.0.0/16"
  tags = {
    Name: "development"
  }
}

output "dev-vpc-id" {
  value = aws_vpc.development_vpc.id
}
output "dev-subnet-id" {
  value = aws_subnet.dev_subnet_1.id
}
output "dev-vpc-arn" {
  value = aws_vpc.development_vpc.arn
}
output "dev-subnet-arn" {
  value = aws_subnet.dev_subnet_1.arn
}

```

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

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

Outputs:

```

dev-subnet-arn = "arn:aws:ec2:me-central-1:754080462526:subnet/subnet-0f484b23609216ae4"
dev-subnet-id = "subnet-0f484b23609216ae4"
dev-vpc-arn = "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-0e2f0da22cb0cbc91"
dev-vpc-id = "vpc-0e2f0da22cb0cbc91"
@tehreem-0514 ~ /workspaces/CC_TehreemKhan_064 (main) $
```

```
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

aws_subnet.dev_subnet_1: Modifying... [id=subnet-0f484b23609216ae4]
aws_subnet.dev_subnet_1: Modifications complete after 1s [id=subnet-0f484b23609216ae4]

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

Outputs:

dev-subnet-arn = "arn:aws:ec2:me-central-1:754080462526:subnet/subnet-0f484b23609216ae4"
dev-subnet-cidr_block = "10.0.10.0/24"
dev-subnet-id = "subnet-0f484b23609216ae4"
dev-subnet-region = "me-central-1a"
dev-subnet-tags_all = tomap({
    "Name" = "development"
})
dev-subnet-tags_name = "development"
dev-vpc-arn = "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-0e2f0da22cb0cbc91"
dev-vpc-cidr_block = "10.0.0.0/16"
dev-vpc-id = "vpc-0e2f0da22cb0cbc91"
dev-vpc-region = "me-central-1"
dev-vpc-tags_all = tomap({
    "Name" = "development"
})
dev-vpc-tags_name = "development"
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

Cleanup:

```
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

aws_subnet.dev_subnet_1: Destroying... [id=subnet-0f484b23609216ae4]
aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-083ae24b8a08005c5]
aws_subnet.dev_subnet_1_existing: Destruction complete after 1s
aws_subnet.dev_subnet_1: Destruction complete after 1s
aws_vpc.development_vpc: Destroying... [id=vpc-0e2f0da22cb0cbc91]
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
```

```
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat terraform.tfstate
{
  "version": 4,
  "terraform_version": "1.14.3",
  "serial": 49,
  "lineage": "f4a5ea44-7bf9-4934-bb7b-f5f1983de08a",
  "outputs": {},
  "resources": [],
  "check_results": null
}
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $
@tehreem-0514 ② /workspaces/CC_TehreemKhan_064 (main) $ cat terraform.tfstate.backup
{
  "version": 4,
  "terraform_version": "1.14.3",
  "serial": 44,
  "lineage": "f4a5ea44-7bf9-4934-bb7b-f5f1983de08a",
  "outputs": {
    "dev-subnet-arn": {
      "value": "arn:aws:ec2:me-central-1:754080462526:subnet/subnet-08f6acd3e41f0b8b2",
      "type": "string"
    },
    "dev-subnet-cidr_block": {
      "value": "10.0.10.0/24",
      "type": "string"
    },
    "dev-subnet-id": {
      "value": "subnet-08f6acd3e41f0b8b2",
      "type": "string"
    },
    "dev-subnet-region": {
      "value": "me-central-1a",
      "type": "string"
    },
    "dev-subnet-tags_all": {
      "value": {
        "Name": "development"
      },
      "type": [
        "map",
        "string"
      ]
    },
    "dev-subnet-tags_name": {
      "value": "development",
      "type": "string"
    },
    "dev-vpc-arn": {
      "value": "arn:aws:ec2:me-central-1:754080462526:vpc/vpc-0501519468b49f85c",
      "type": "string"
    },
    "dev-vpc-cidr_block": {
      "value": "10.0.0.0/16",
      "type": "string"
    },
    "dev-vpc-id": {
      "value": "vpc-0501519468b49f85c",
      "type": "string"
    }
  }
}
```