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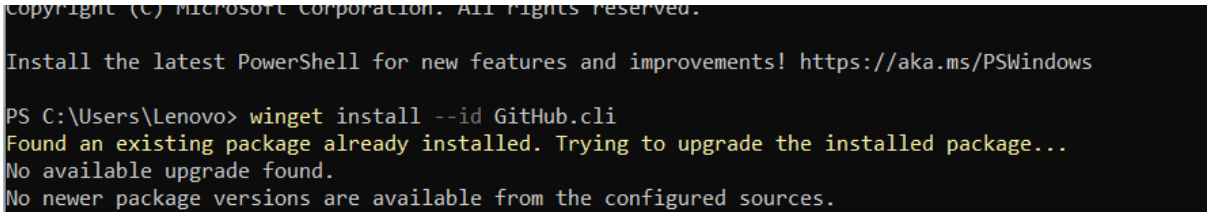
Roll no: 2023-BSE-077

Section: BSE5-B

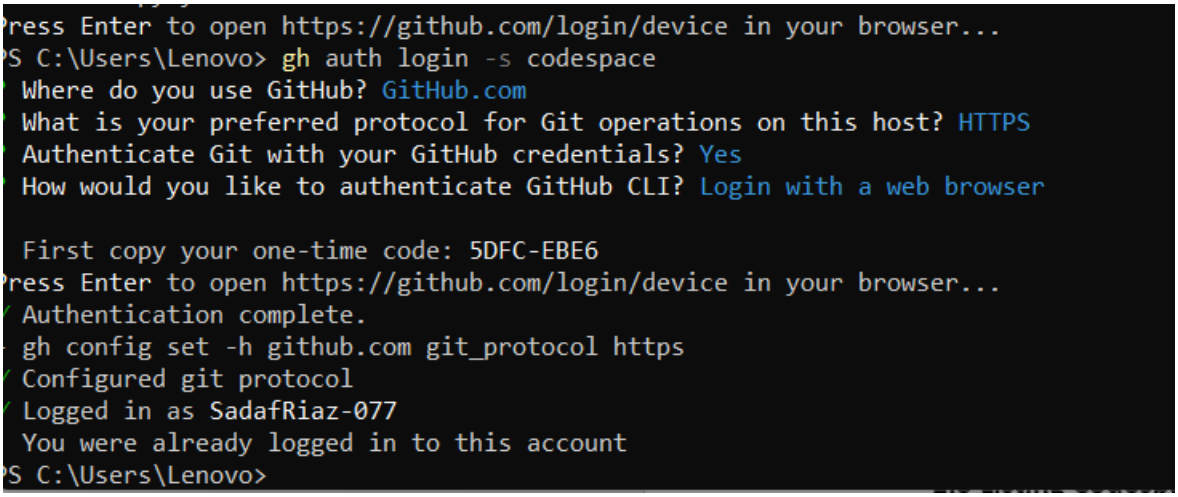
Lab 10

Task 1 — GitHub CLI Codespace Setup & Authentication

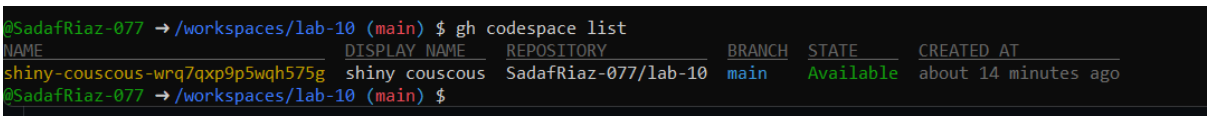
- **1.1 Installing GitHub CLI — Screenshot: task1_gh_install.png**



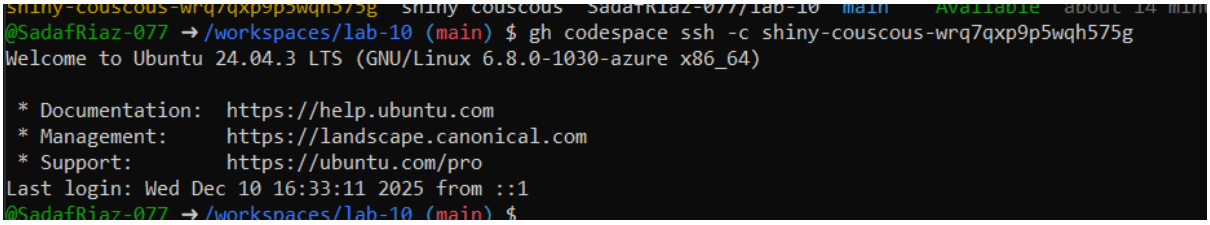
- **1.2 Authenticating GH CLI — Screenshot: task1_gh_auth_login.png**



- **1.3 Listing Codespaces — Screenshot: task1_codespace_list.png**

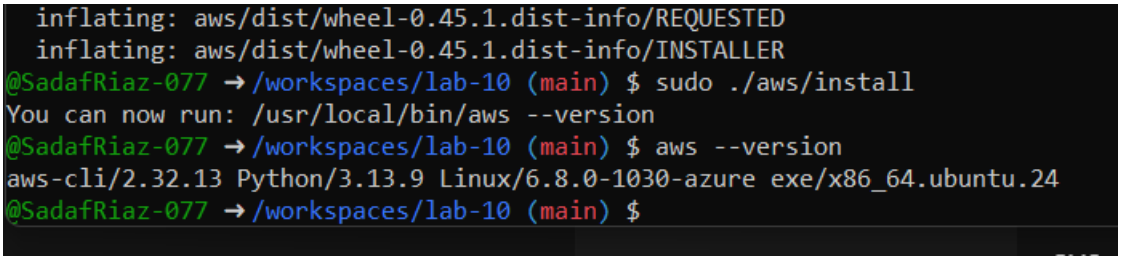


- **1.4 Connecting to Codespace via SSH — Screenshot: task1_codespace_ssh_connected.png**

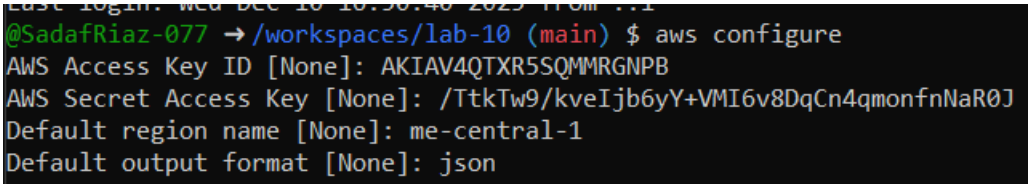


Task 2 — AWS CLI, Terraform CLI & Provider Setup

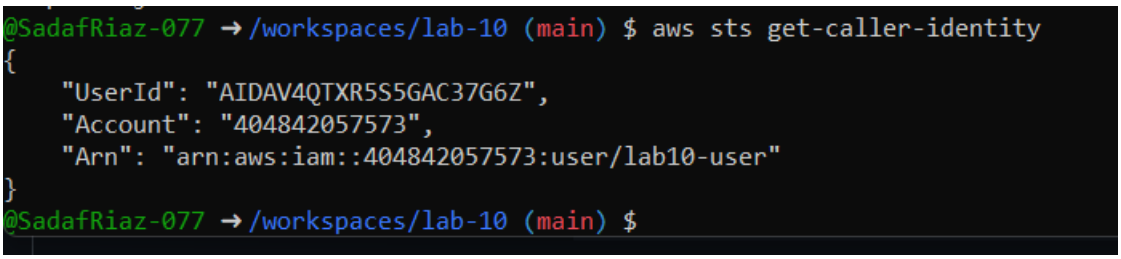
- **2.1 Installing AWS CLI — Screenshot: task2_aws_install_and_version.png**



- **2.2 Configuring AWS CLI — Screenshot: task2_aws_configure_and_files.png**



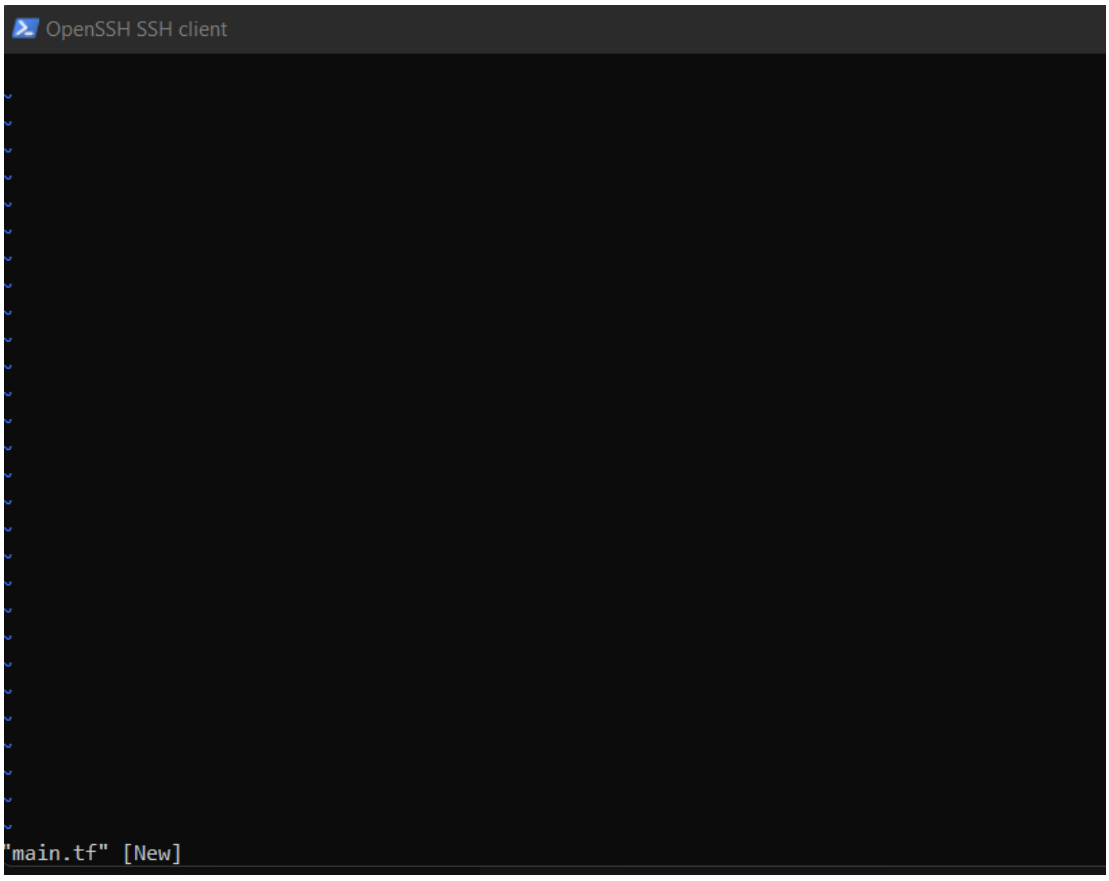
- **2.3 Verifying AWS Caller Identity — Screenshot: task2_aws_get_caller_identity.png**



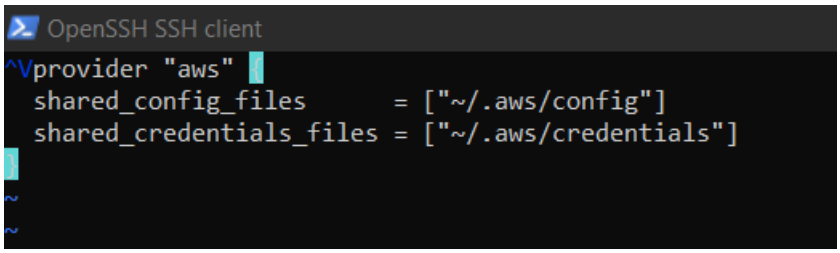
- **2.4 Installing Terraform CLI — Screenshot: task2_terraform_install_and_version.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ wget -O - https://apt.releases.hashicorp.com/gpg | sudo gpg --dearmor -o /usr/share/keyrings/hashicorp-archive-keyring.gpg
architecture) signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com $(grep -oP '(?<=UBUNTU_CODENAME=).*' /etc/os-release || lsb_release -cs) main" | sudo tee /etc/apt/sources.list.d/hashicorp.list
sudo apt update
sudo apt install terraform
which terraform
terraform --version--2025-12-10 17:38:42--  https://apt.releases.hashicorp.com/gpg
Resolving apt.releases.hashicorp.com (apt.releases.hashicorp.com)... 18.172.78.30, 18.172.78.65, 18.172.78.129, ...
Connecting to apt.releases.hashicorp.com (apt.releases.hashicorp.com)|18.172.78.30|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3980 (3.9K) [binary/octet-stream]
Saving to: 'STDOUT'

-                           100%[=============================================>]   3.89K  --.-KB/s    in 0s

2025-12-10 17:38:43 (737 MB/s) - written to stdout [3980/3980]

@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com $(grep -oP '(?<=UBUNTU_CODENAME=).*' /etc/os-release || lsb_release -cs) main" | sudo tee /etc/apt/sources.list.d/hashicorp.list
deb [arch=amd64 signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com noble main
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ sudo apt update
```

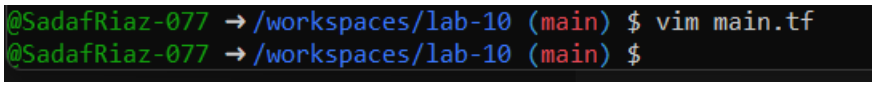
- **2.5 Creating main.tf File — Screenshot: task2_provider_file_creation.png**



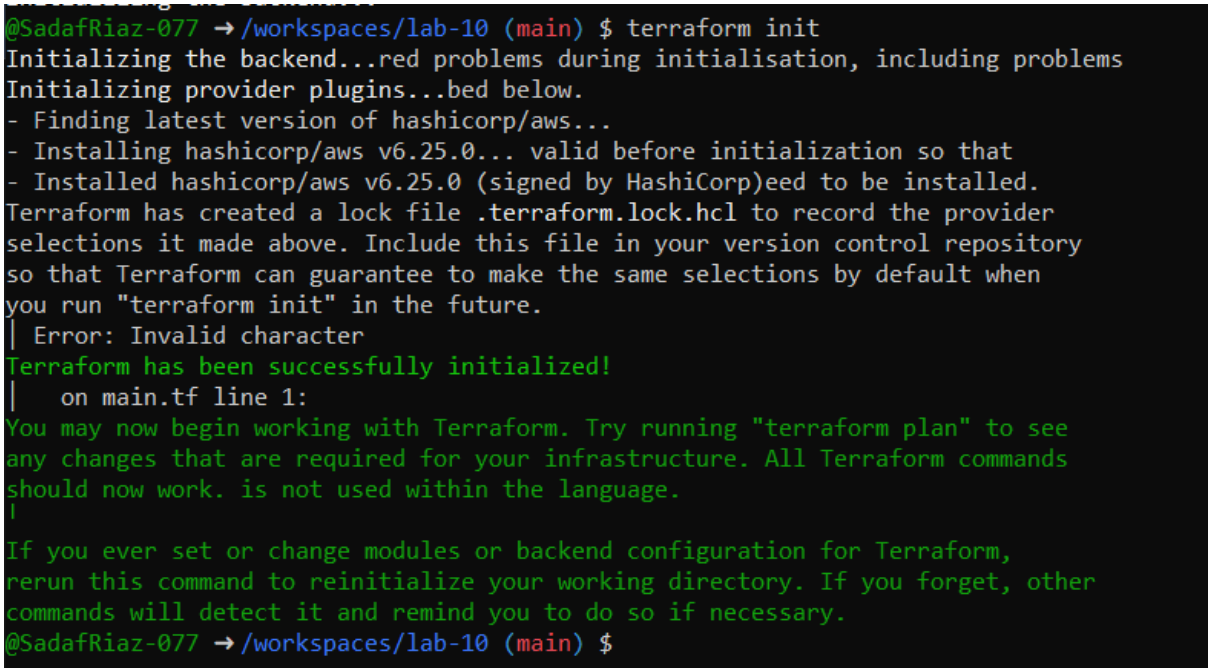
- **2.6 Adding Provider Block — Screenshot: task2_provider_block.png**



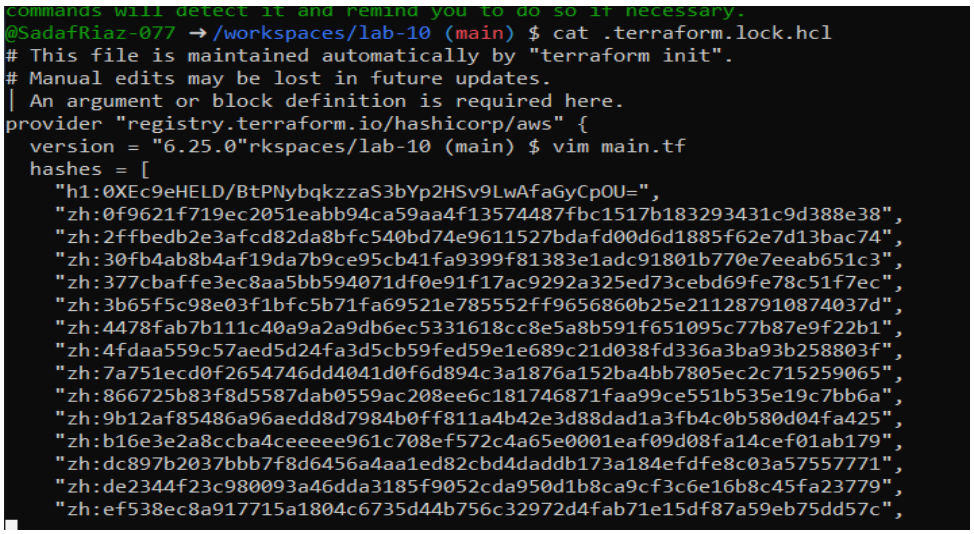
- **2.7 Saving main.tf in Vim — Screenshot: task2_vim_save_main_tf.png**



- **2.8 Running terraform init — Screenshot: task2_terraform_init_output.png**



- **2.9 Viewing .terraform.lock.hcl — Screenshot: task2_terraform_lock_hcl.png**



- **2.10 Listing .terraform Directory — Screenshot: task2_terraform_dir_ls.png**

```
}
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ ls .terraform/
providers
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

Task 3 — VPC & Subnet Creation + Verification

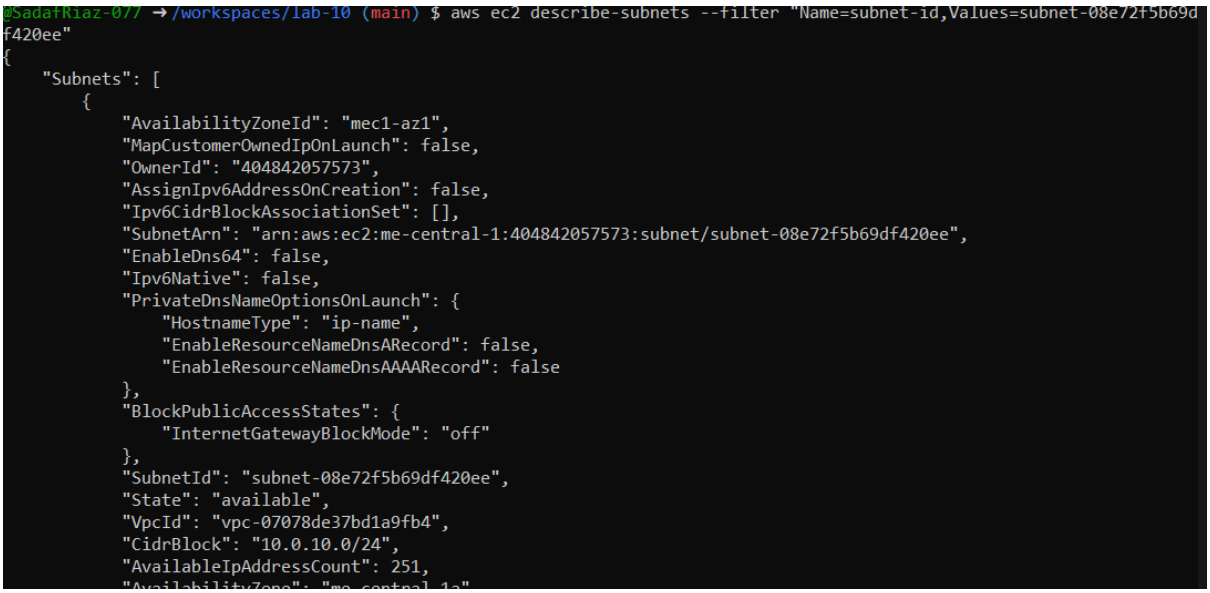
- **3.1 Adding VPC and Subnet Code — Screenshot: task3_main_tf_resource_add.png**

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

    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"
}
~
~
~
```

- **3.2 Running terraform apply — Screenshot: task3_terraform_apply_vpc_subnet.png**

```
      + 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 3s [id=vpc-07078de37bd1a9fb4]
aws_subnet.dev_subnet_1: Creating...
aws_subnet.dev_subnet_1: Creation complete after 1s [id=subnet-08e72f5b69df420ee]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.
```

- **3.3 Verifying Subnet Using AWS CLI — Screenshot: task3_aws_cli_verify_subnet.png**



- **3.4 Verifying VPC Using AWS CLI — Screenshot: task3_aws_cli_verify_vpc.png**

Task 4 — Data Source, Targeted Destroy & Tags

- **4.1 Adding Data Source + New Subnet Screenshot:task4_main_tf_datasource_resource_add.png**

```
  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"
}
~
~
~
~
-- INSERT --
```

- **4.2 Applying Data Source Resource — Screenshot: task4_terraform_apply_datasource_resource.png**

```
      + 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-0ed011693d93d59bc"
    }

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-0a8704aa36ab04cb9]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **4.3 Targeted Destroy Command :Screenshot:task4_terraform_destroy_targeted.png**

```
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.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **4.4 Running terraform refresh — Screenshot: task4_terraform_refresh_state.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform refresh
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-07078de37bd1a9fb4]
data.aws_vpc.existing_vpc: Read complete after 2s [id=vpc-0ed011693d93d59bc]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-08e72f5b69df420ee]
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **4.5 terraform apply After Refresh — Screenshot:task4_terraform_apply_after_refresh.png**

```
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 2s [id=subnet-061cd68a6c3dfc949]

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

- **4.6 Destroying All Resources — Screenshot: task4_terraform_destroy_all.png**

```
      - enable_dns_support                 = true -> null
      - enable_network_address_usage_metrics = false -> null
      - id                                 = "vpc-07078de37bd1a9fb4" -> null
      - instance_tenancy                   = "default" -> null
      - ipv6_netmask_length                = 0 -> null
      - main_route_table_id                = "rtb-0deb8ab3fdaa9cb2b" -> null
      - owner_id                           = "404842057573" -> 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-061cd68a6c3dfc949]
aws_subnet.dev_subnet_1: Destroying... [id=subnet-08e72f5b69df420ee]
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-07078de37bd1a9fb4]
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
```

- **4.7 terraform plan Output — Screenshot: task4_terraform_plan_output.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform plan
data.aws_vpc.existing_vpc: Reading...
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0ed011693d93d59bc]

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 will be created
  + resource "aws_subnet" "dev_subnet_1" {
      + arn                                            = (known after apply)
      + assign_ipv6_address_on_creation                = false
      + availability_zone                              = "me-central-1a"
      + availability_zone_id                           = (known after apply)
      + cidr_block                                     = "10.0.10.0/24"
      + 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                                         = (known after apply)
    }

  # aws_subnet.dev_subnet_1_existing will be created
```

- **4.8 terraform apply After Destroy — Screenshot: task4_terraform_apply_after_destroy.png**

```
      + 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_vpc.development_vpc: Creating...
aws_subnet.dev_subnet_1_existing: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 0s [id=subnet-0fafaab0b8e0461ae]
aws_vpc.development_vpc: Creation complete after 1s [id=vpc-001ca861a575d1b1b]
aws_subnet.dev_subnet_1: Creating...
aws_subnet.dev_subnet_1: Creation complete after 1s [id=subnet-03f3cc3d34a7e7855]

Apply complete! Resources: 3 added, 0 changed, 0 destroyed.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **4.9 Adding Tags to Resources — Screenshot:** task4_main_tf_tagging.png

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

resource "aws_vpc" "development_vpc" {
  cidr_block = "10.0.0.0/16"

  tags = {
    Name    = "development"
    vpc_env = "dev"
  }
}

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"

  tags = {
    Name = "subnet-1-dev"
  }
}

# Existing VPC data source
data "aws_vpc" "existing_vpc" {
  default = true
}

resource "aws_subnet" "dev_subnet_1_existing" {
  vpc_id            = data.aws_vpc.existing_vpc.id
  cidr_block        = "10.0.20.0/24"  # avoid conflicting default VPC range
  availability_zone = "me-central-1a"

  tags = {
    Name = "subnet-1-default"
  }
}
~
~
```

- **4.10 Applying Tags — Screenshot: task4_terraform_apply_tagging.png**

```
Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actio
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform apply -auto-approve
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-001ca861a575d1b1b]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-03f3cc3d34a7e7855]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0ed011693d93d59bc]

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

Terraform will perform the following actions:

  # 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                                           = {
          + "Name" = "subnet-1-default"
        }
      + tags_all                                       = {
          + "Name" = "subnet-1-default"
        }
      + vpc_id                                         = "vpc-0ed011693d93d59bc"
    }

Plan: 1 to add, 0 to change, 0 to destroy.
aws_subnet.dev_subnet_1_existing: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 1s [id=subnet-070168b8ce69b2181]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **4.11 Removing Tag (vpc_env) — Screenshot: task4_terraform_plan_remove_tag.png**

```
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform plan
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-001ca861a575d1b1b]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0ed011693d93d59bc]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-070168b8ce69b2181]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-03f3cc3d34a7e7855]

No changes. Your infrastructure matches the configuration.
```

- **4.12 terraform apply After Tag Removal — Screenshot: task4_terraform_apply_remove_tag.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform apply
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-001ca861a575d1b1b]
data.aws_vpc.existing_vpc: Read complete after 2s [id=vpc-0ed011693d93d59bc]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-070168b8ce69b2181]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-03f3cc3d34a7e7855]

No changes. Your infrastructure matches the configuration.

Terraform has compared your real infrastructure against your configuration and found no differences, so no changes are needed.

Apply complete! Resources: 0 added, 0 changed, 0 destroyed.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

Task 5 — State Inspection & Terraform State Commands

- **5.1 Destroying All Resources — Screenshot: task5_terraform_destroy.png**

```
  # aws_vpc.development_vpc will be destroyed
  - resource "aws_vpc" "development_vpc" {
      - arn                                  = "arn:aws:ec2:me-central-1:404842057573:vpc/vpc
      - assign_generated_ipv6_cidr_block     = false -> null
      - cidr_block                           = "10.0.0.0/16" -> null
      - default_network_acl_id               = "acl-07237fa265fc878d8" -> null
      - default_route_table_id               = "rtb-03b752349475e926c" -> null
      - default_security_group_id            = "sg-023a416ced12cf061" -> null
      - dhcp_options_id                      = "dopt-00025b89642cbf410" -> null
      - enable_dns_hostnames                 = false -> null
      - enable_dns_support                   = true -> null
      - enable_network_address_usage_metrics = false -> null
      - id                                   = "vpc-001ca861a575d1b1b" -> null
      - instance_tenancy                     = "default" -> null
      - ipv6_netmask_length                  = 0 -> null
      - main_route_table_id                  = "rtb-03b752349475e926c" -> null
      - owner_id                             = "404842057573" -> null
      - region                               = "me-central-1" -> null
      - tags                                 = {
          - "Name"    = "development"
          - "vpc_env" = "dev"
        } -> null
      - tags_all                             = {
          - "Name"    = "development"
          - "vpc_env" = "dev"
        } -> 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-070168b8ce69b2181]
aws_subnet.dev_subnet_1: Destroying... [id=subnet-03f3cc3d34a7e7855]
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-001ca861a575d1b1b]
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
```

- **5.2 terraform.tfstate After Destroy — Screenshot: task5_terraform_state_file_empty.png**

```
Destroy complete! Resources: 3 destroyed.
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ cat terraform.tfstate
{
  "version": 4,
  "terraform_version": "1.14.1",
  "serial": 32,
  "lineage": "5f0f5fe9-8b91-d760-48dd-3bfb91f9e713",
  "outputs": {},
  "resources": [],
  "check_results": null
}
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **5.3 terraform.tfstate.backup Contents — Screenshot: task5_terraform_state_backup_prev.png**

```
}
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ cat terraform.tfstate.backup
{
  "version": 4,
  "terraform_version": "1.14.1",
  "serial": 27,
  "lineage": "5f0f5fe9-8b91-d760-48dd-3bfb91f9e713",
  "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-1:404842057573:vpc/vpc-0ed011693d93d59bc",
            "cidr_block": "172.31.0.0/16",
            "cidr_block_associations": [
              {
                "association_id": "vpc-cidr-assoc-0fc13ce2206ae6fe2",
                "cidr_block": "172.31.0.0/16",
                "state": "associated"
              }
            ],
            "default": true,
            "dhcp_options_id": "dopt-00025b89642cbf410",
            "enable_dns_hostnames": true,
            "enable_dns_support": true,
            "enable_network_address_usage_metrics": false,
            "filter": null,
            "id": "vpc-0ed011693d93d59bc",
            "instance_tenancy": "default",
            "ipv6_association_id": "",
            "ipv6_cidr_block": "",
            "main_route_table_id": "rtb-0328c2e3c3d0f1551",
            "owner_id": "404842057573",
            "region": "me-central-1",
```

- **5.4 Recreating Resources — Screenshot: task5_terraform_apply_recreated.png**

```
}
@SadafRiaz-077 → /workspaces/lab-10 (main) $ terraform apply
data.aws_vpc.existing_vpc: Reading...
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0ed011693d93d59bc]

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

Terraform will perform the following actions:

  # aws_subnet.dev_subnet_1 will be created
  + resource "aws_subnet" "dev_subnet_1" {
      + arn                                            = (known after apply)
      + assign_ipv6_address_on_creation                = false
      + availability_zone                              = "me-central-1a"
      + availability_zone_id                           = (known after apply)
      + cidr_block                                     = "10.0.10.0/24"
      + 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                                           = {
          + "Name" = "subnet-1-dev"
        }
      + tags_all                                       = {
          + "Name" = "subnet-1-dev"
        }
      + vpc_id                                         = (known after apply)
    }

  # aws_subnet.dev_subnet_1_existing will be created
```

- **5.5 terraform.tfstate Populated — Screenshot: task5_terraform_state_file_populated.png**

```
}
@SadafRiaz-077 → /workspaces/lab-10 (main) $ cat terraform.tfstate
{
  "version": 4,
  "terraform_version": "1.14.1",
  "serial": 36,
  "lineage": "5f0f5fe9-8b91-d760-48dd-3bfb91f9e713",
  "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-1:404842057573:vpc/vpc-0ed011693d93d59bc",
            "cidr_block": "172.31.0.0/16",
            "cidr_block_associations": [
              {
                "association_id": "vpc-cidr-assoc-0fc13ce2206ae6fe2",
                "cidr_block": "172.31.0.0/16",
                "state": "associated"
              }
            ],
            "default": true,
            "dhcp_options_id": "dopt-00025b89642cbf410",
            "enable_dns_hostnames": true,
            "enable_dns_support": true,
            "enable_network_address_usage_metrics": false,
            "filter": null,
            "id": "vpc-0ed011693d93d59bc",
            "instance_tenancy": "default",
            "ipv6_association_id": "",
            "ipv6_cidr_block": "",
            "main_route_table_id": "rtb-0328c2e3c3d0f1551",
            "owner_id": "404842057573",
            "region": "me-central-1",
```

- **5.6 terraform.tfstate.backup Empty — Screenshot: task5_terraform_state_backup_empty.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ cat terraform.tfstate.backup
{
  "version": 4,
  "terraform_version": "1.14.1",
  "serial": 32,
  "lineage": "5f0f5fe9-8b91-d760-48dd-3bfb91f9e713",
  "outputs": {},
  "resources": [],
  "check_results": null
}
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **5.7 terraform state list — Screenshot: task5_terraform_state_list.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform state list
data.aws_vpc.existing_vpc
aws_subnet.dev_subnet_1
aws_subnet.dev_subnet_1_existing
aws_vpc.development_vpc
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

- **5.8 terraform state show — Screenshot: task5_terraform_state_show_resource.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform state show aws_vpc.development_vpc
# aws_vpc.development_vpc:
resource "aws_vpc" "development_vpc" {
    arn                                  = "arn:aws:ec2:me-central-1:404842057573:vpc/vpc-0ae86db5667fe97df"
    assign_generated_ipv6_cidr_block     = false
    cidr_block                           = "10.0.0.0/16"
    default_network_acl_id               = "acl-03e4e091cf7b6e519"
    default_route_table_id               = "rtb-0270115c1846630f9"
    default_security_group_id            = "sg-0de4380592baff42b"
    dhcp_options_id                      = "dopt-00025b89642cbf410"
    enable_dns_hostnames                 = false
    enable_dns_support                   = true
    enable_network_address_usage_metrics = false
    id                                   = "vpc-0ae86db5667fe97df"
    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-0270115c1846630f9"
    owner_id                             = "404842057573"
    region                               = "me-central-1"
    tags                                 = {
        "Name"    = "development"
        "vpc_env" = "dev"
    }
    tags_all                             = {
        "Name"    = "development"
        "vpc_env" = "dev"
    }
}
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

Task 6 — Terraform Outputs

- **6.1 Basic Outputs (ID + ARN) — Screenshot: task6_terraform_outputs_basic.png**

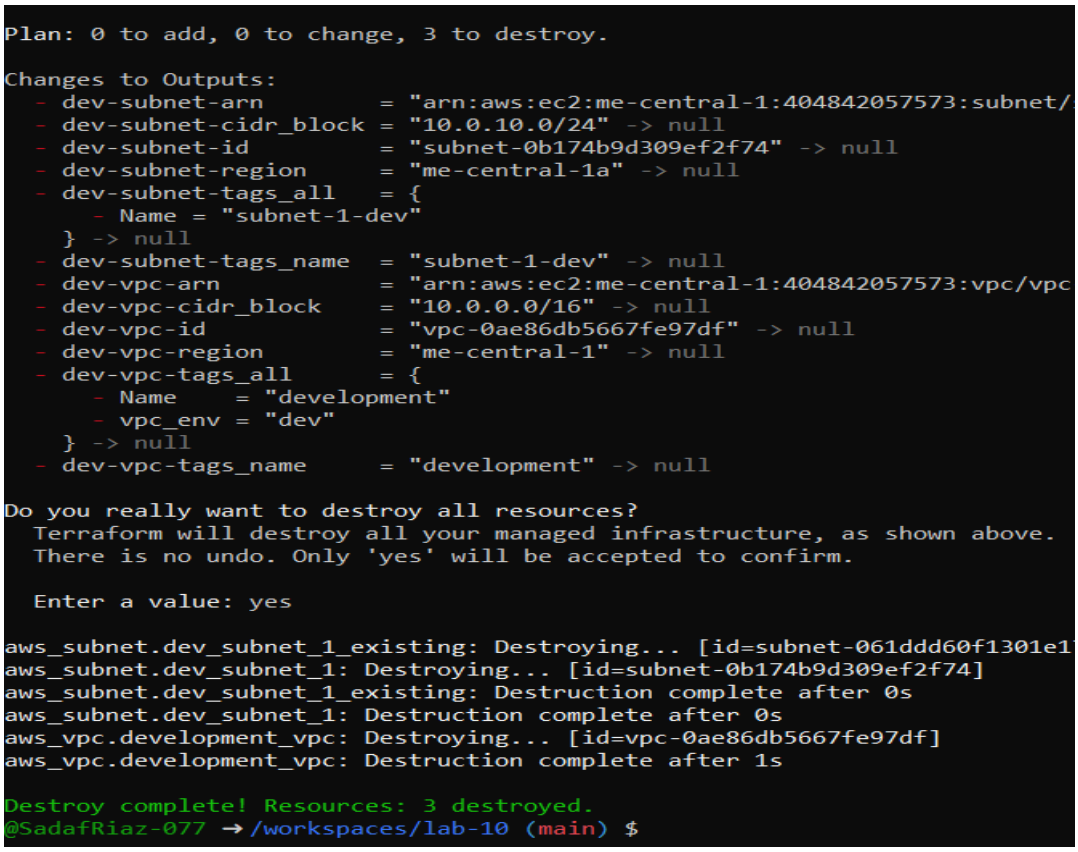
```
Apply complete! Resources: 0 added, 0 changed, 0 destroyed.

Outputs:

dev-subnet-arn = "arn:aws:ec2:me-central-1:404842057573:subnet/subnet-0b174b9d309ef2f74"
dev-subnet-id = "subnet-0b174b9d309ef2f74"
dev-vpc-arn = "arn:aws:ec2:me-central-1:404842057573:vpc/vpc-0ae86db5667fe97df"
dev-vpc-id = "vpc-0ae86db5667fe97df"
```

- **6.2 Expanded Outputs (CIDR, Region, Tags) — Screenshot: task6_expanded_outputs.png**

```
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $ terraform apply -auto-approve
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-0ae86db5667fe97df]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0ed011693d93d59bc]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-061ddd60f1301e17b]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0b174b9d309ef2f74]

Changes to Outputs:
  + dev-subnet-cidr_block = "10.0.10.0/24"
  + dev-subnet-region     = "me-central-1a"
  + dev-subnet-tags_all   = {
      + Name = "subnet-1-dev"
    }
  + dev-subnet-tags_name  = "subnet-1-dev"
  + dev-vpc-cidr_block    = "10.0.0.0/16"
  + dev-vpc-region        = "me-central-1"
  + dev-vpc-tags_all      = {
      + Name     = "development"
      + vpc_env = "dev"
    }
  + dev-vpc-tags_name     = "development"

You can apply this plan to save these new output values to the Terraform state, without changing any r

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

Outputs:

dev-subnet-arn = "arn:aws:ec2:me-central-1:404842057573:subnet/subnet-0b174b9d309ef2f74"
dev-subnet-cidr_block = "10.0.10.0/24"
dev-subnet-id = "subnet-0b174b9d309ef2f74"
dev-subnet-region = "me-central-1a"
dev-subnet-tags_all = tomap({
  "Name" = "subnet-1-dev"
})
dev-subnet-tags_name = "subnet-1-dev"
dev-vpc-arn = "arn:aws:ec2:me-central-1:404842057573:vpc/vpc-0ae86db5667fe97df"
dev-vpc-cidr_block = "10.0.0.0/16"
dev-vpc-id = "vpc-0ae86db5667fe97df"
dev-vpc-region = "me-central-1"
dev-vpc-tags_all = tomap({
  "Name" = "development"
  "vpc_env" = "dev"
})
dev-vpc-tags_name = "development"
@SadafRiaz-077 ➜ /workspaces/lab-10 (main) $
```

Cleanup — Delete Resources & State Verification

- **Destroy All Resources. Save screenshot as: cleanup_destroy_resources.png — destroy output:**



- **Inspect State Files. Save screenshot as: cleanup_state_files.png**