ASSIGNMENT 1

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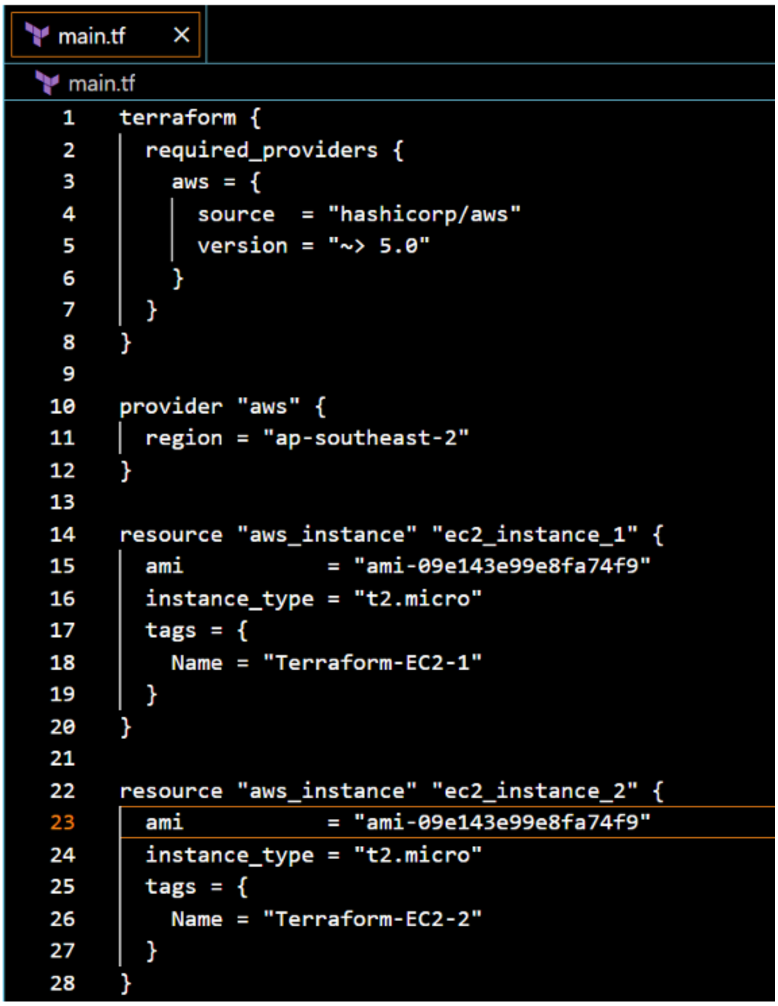
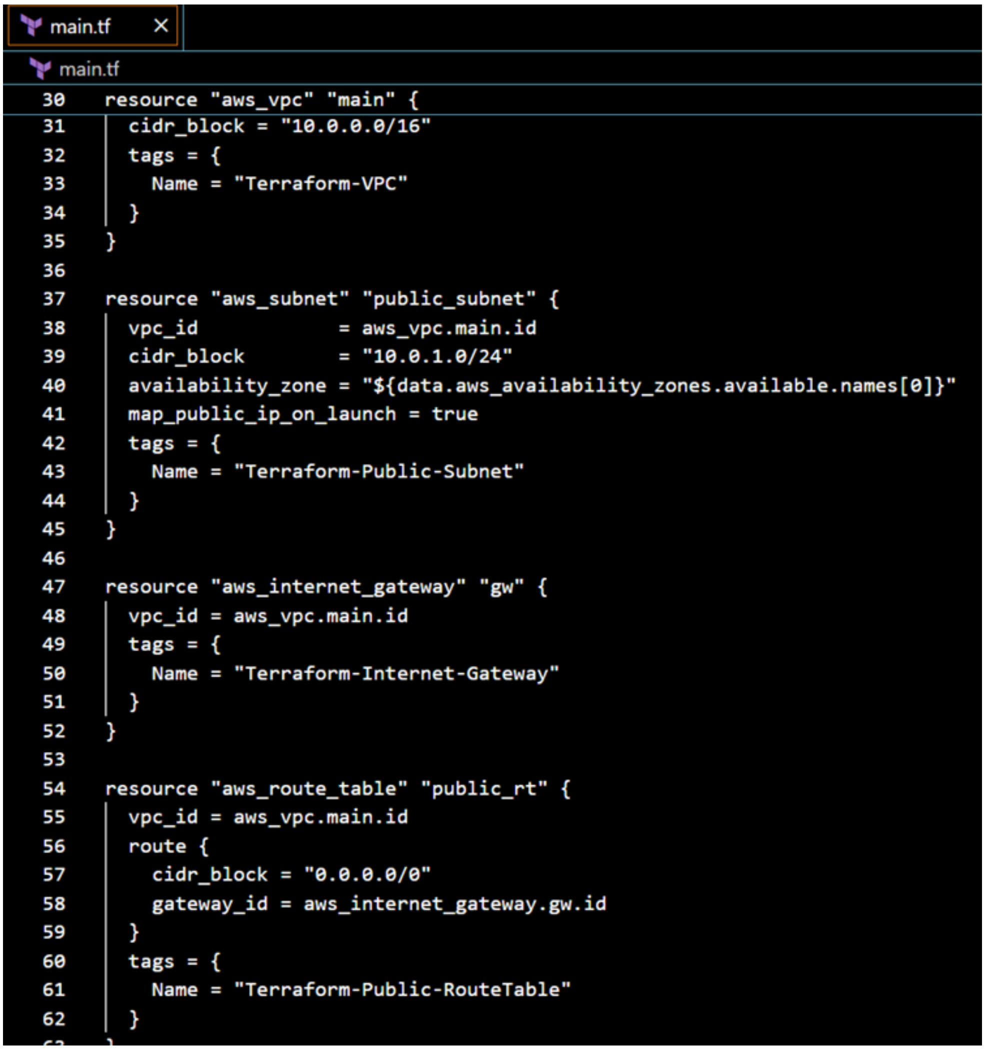
Write Terraform script to do perform following tasks on AWS cloud Platform

Step 1: Create two T2 Micro EC2 Instances.



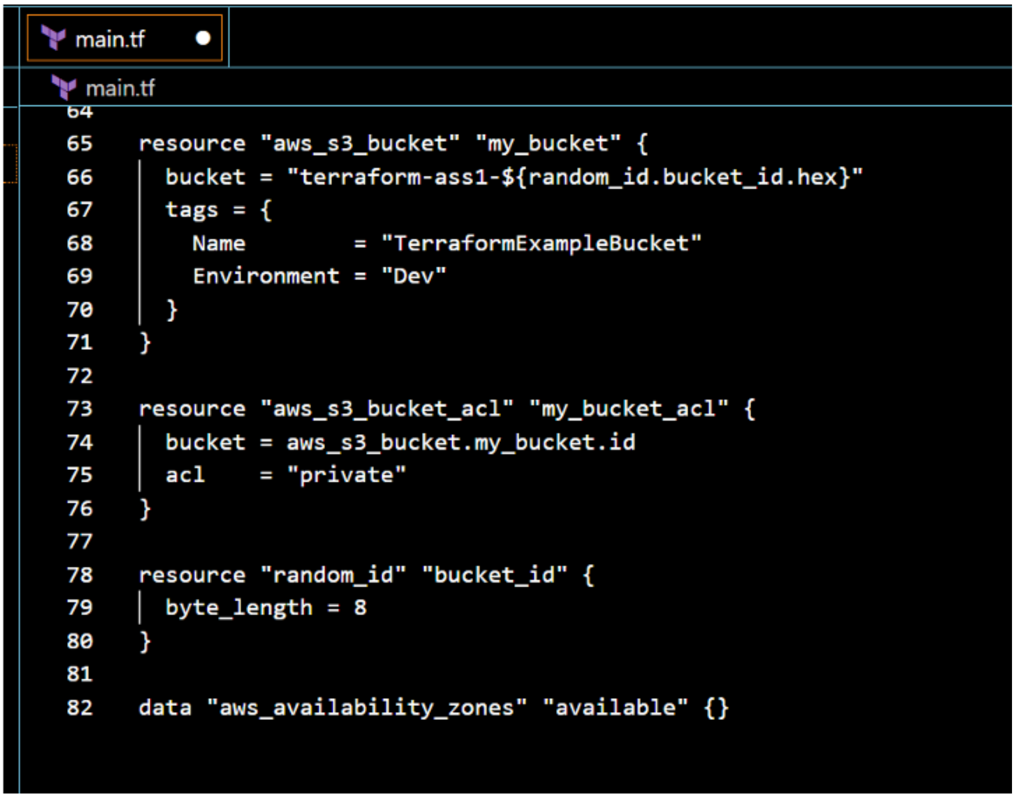
```
terraform {
  required_providers {
    aws = {
      source  = "hashicorp/aws"
      version = "~> 5.0"
    }
  }
}

provider "aws" {
  region = "ap-southeast-2"
}

resource "aws_instance" "ec2_instance_1" {
  ami           = "ami-09e143e99e8fa74f9"
  instance_type = "t2.micro"
  tags = {
    Name = "Terraform-EC2-1"
  }
}

resource "aws_instance" "ec2_instance_2" {
  ami           = "ami-09e143e99e8fa74f9"
  instance_type = "t2.micro"
  tags = {
    Name = "Terraform-EC2-2"
  }
}
```

Step2: Create a VPN on AWS



```
resource "aws_vpc" "main" {
  cidr_block = "10.0.0.0/16"
  tags = {
    Name = "Terraform-VPC"
  }
}

resource "aws_subnet" "public_subnet" {
  vpc_id            = aws_vpc.main.id
  cidr_block        = "10.0.1.0/24"
  availability_zone = "${data.aws_availability_zones.available.names[0]}"
  map_public_ip_on_launch = true
  tags = {
    Name = "Terraform-Public-Subnet"
  }
}

resource "aws_internet_gateway" "gw" {
  vpc_id = aws_vpc.main.id
  tags = {
    Name = "Terraform-Internet-Gateway"
  }
}

resource "aws_route_table" "public_rt" {
  vpc_id = aws_vpc.main.id
  route {
    cidr_block = "0.0.0.0/0"
    gateway_id = aws_internet_gateway.gw.id
  }
  tags = {
    Name = "Terraform-Public-RouteTable"
  }
}
```

Step 3: Create a S3 Bucket

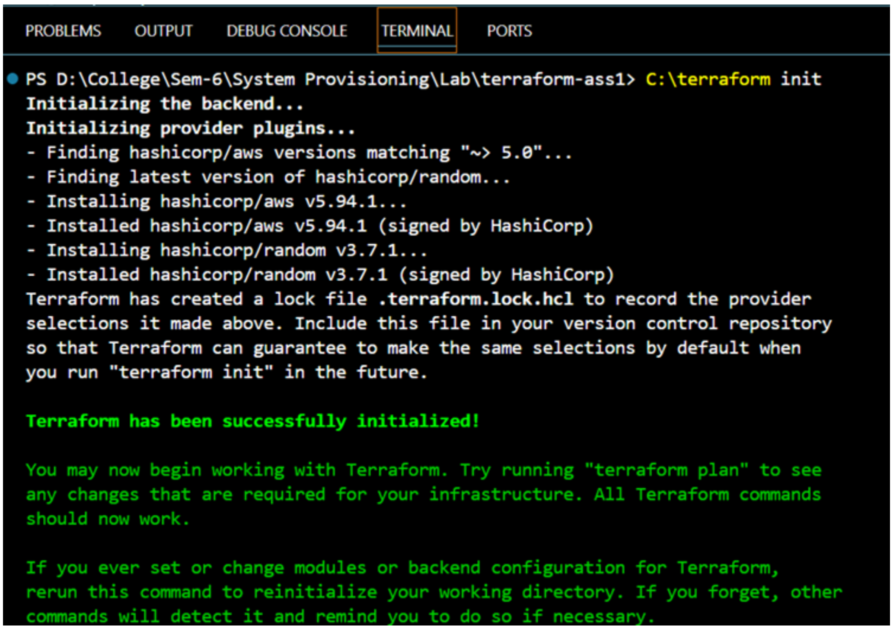


```
resource "aws_s3_bucket" "my_bucket" {
  bucket = "terraform-ass1-${random_id.bucket_id.hex}"
  tags = {
    Name        = "TerraformExampleBucket"
    Environment = "Dev"
  }
}

resource "aws_s3_bucket_acl" "my_bucket_acl" {
  bucket = aws_s3_bucket.my_bucket.id
  acl    = "private"
}

resource "random_id" "bucket_id" {
  byte_length = 8
}

data "aws_availability_zones" "available" {}
```

Step 4: Write the code for step 1,2 and 3 in a IaC terraform file and run terraform commands to execute these steps.

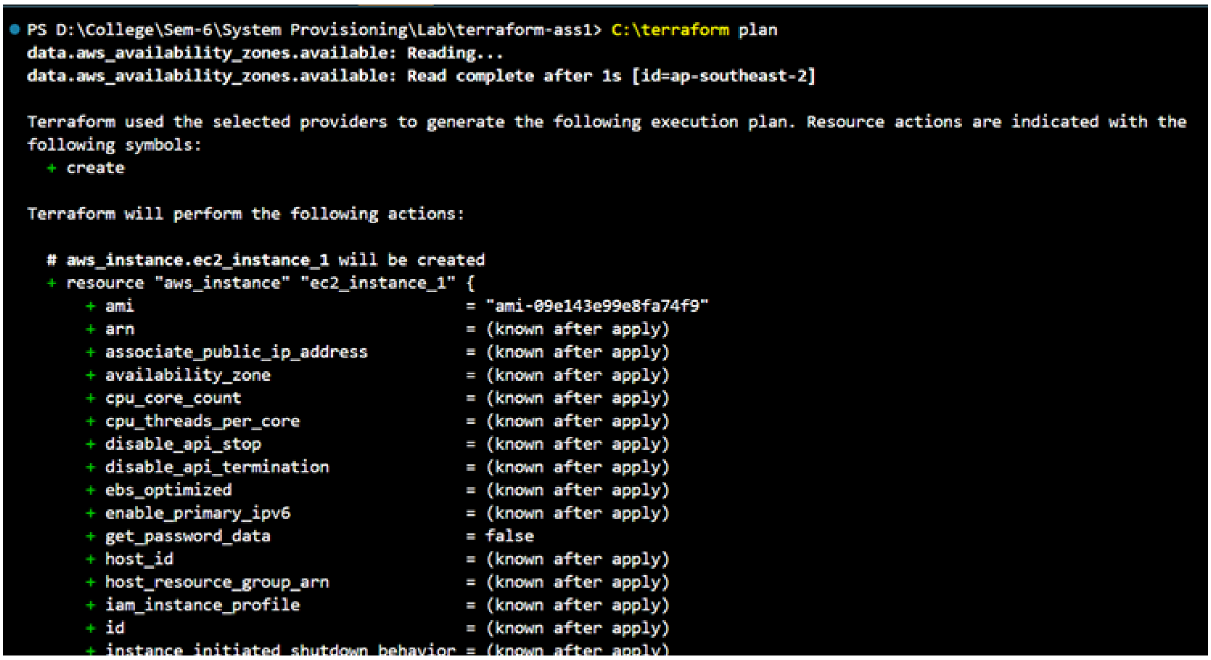
```
terraform {
  required_providers {
    aws = {
      source  = "hashicorp/aws"
      version = "~> 5.0"
    }
  }
}

provider "aws" {
  region = "ap-southeast-2"
}

data "aws_availability_zones" "available" {}

resource "random_id" "bucket_id" {
  byte_length = 8
}

# VPC
resource "aws_vpc" "main" {
  cidr_block = "10.0.0.0/16"

  tags = {
    Name = "Terraform-VPC"
  }
}

# Subnet
resource "aws_subnet" "public_subnet" {
  vpc_id                  = aws_vpc.main.id
  cidr_block              = "10.0.1.0/24"
  availability_zone       = data.aws_availability_zones.available.names[0]
  map_public_ip_on_launch = true

  tags = {
    Name = "Terraform-Public-Subnet"
  }
}

# Internet Gateway
resource "aws_internet_gateway" "gw" {
  vpc_id = aws_vpc.main.id

  tags = {
    Name = "Terraform-Internet-Gateway"
  }
}

# Route Table
resource "aws_route_table" "public_rt" {
  vpc_id = aws_vpc.main.id

  route {
    cidr_block = "0.0.0.0/0"
    gateway_id = aws_internet_gateway.gw.id
  }

  tags = {
    Name = "Terraform-Public-RouteTable"
  }
}

# EC2 Instances
resource "aws_instance" "ec2_instance_1" {
  ami           = "ami-09e143e99e8fa74f9"
  instance_type = "t2.micro"

  tags = {
    Name = "Terraform-EC2-1"
  }
}

resource "aws_instance" "ec2_instance_2" {
  ami           = "ami-09e143e99e8fa74f9"
  instance_type = "t2.micro"

  tags = {
    Name = "Terraform-EC2-2"
  }
}

# S3 Bucket
resource "aws_s3_bucket" "my_bucket" {
  bucket = "terraform-ass1-${random_id.bucket_id.hex}"

  tags = {
    Name        = "TerraformExampleBucket"
    Environment = "Dev"
  }
}

# S3 Bucket ACL
resource "aws_s3_bucket_acl" "my_bucket_acl" {
  bucket = aws_s3_bucket.my_bucket.id
  acl    = "private"
}
```

Terraform init:



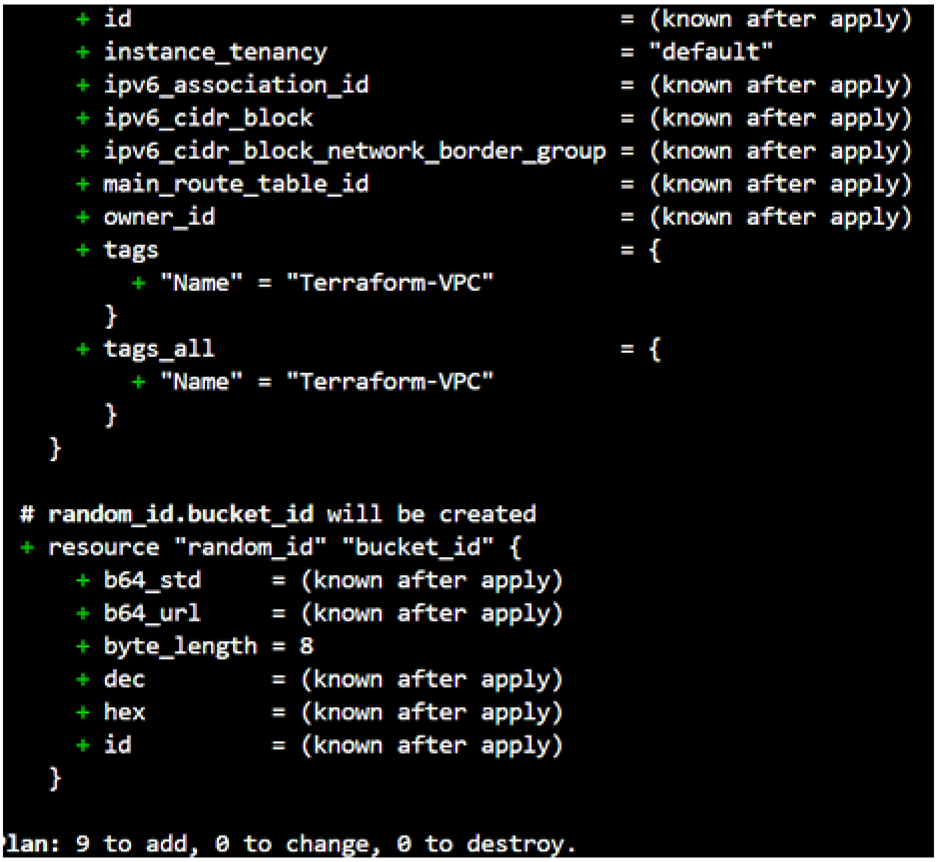
```
PS D:\College\Sem-6\System Provisioning\Lab\terraform-ass1> C:\terraform init
Initializing the backend...
Initializing provider plugins...
- Finding hashicorp/aws versions matching "~> 5.0"...
- Finding latest version of hashicorp/random...
- Installing hashicorp/aws v5.94.1...
- Installed hashicorp/aws v5.94.1 (signed by HashiCorp)
- Installing hashicorp/random v3.7.1...
- Installed hashicorp/random v3.7.1 (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.
```

Terraform plan:



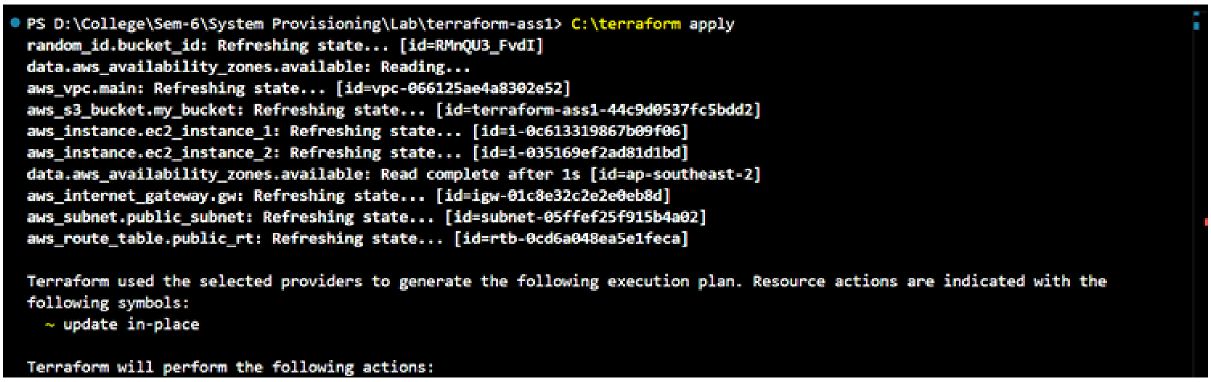
```
PS D:\College\Sem-6\System Provisioning\Lab\terraform-ass1> C:\terraform plan
data.aws_availability_zones.available: Reading...
data.aws_availability_zones.available: Read complete after 1s [id=ap-southeast-2]

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_instance.ec2_instance_1 will be created
  + resource "aws_instance" "ec2_instance_1" {
      + ami                                  = "ami-09e143e99e8fa74f9"
      + arn                                  = (known after apply)
      + associate_public_ip_address          = (known after apply)
      + availability_zone                    = (known after apply)
      + cpu_core_count                       = (known after apply)
      + cpu_threads_per_core                 = (known after apply)
      + disable_api_stop                     = (known after apply)
      + disable_api_termination              = (known after apply)
      + ebs_optimized                        = (known after apply)
      + enable_primary_ipv6                  = (known after apply)
      + get_password_data                    = false
      + host_id                              = (known after apply)
      + host_resource_group_arn              = (known after apply)
      + iam_instance_profile                 = (known after apply)
      + id                                   = (known after apply)
      + instance_initiated_shutdown_behavior = (known after apply)
```

Terraform plan:

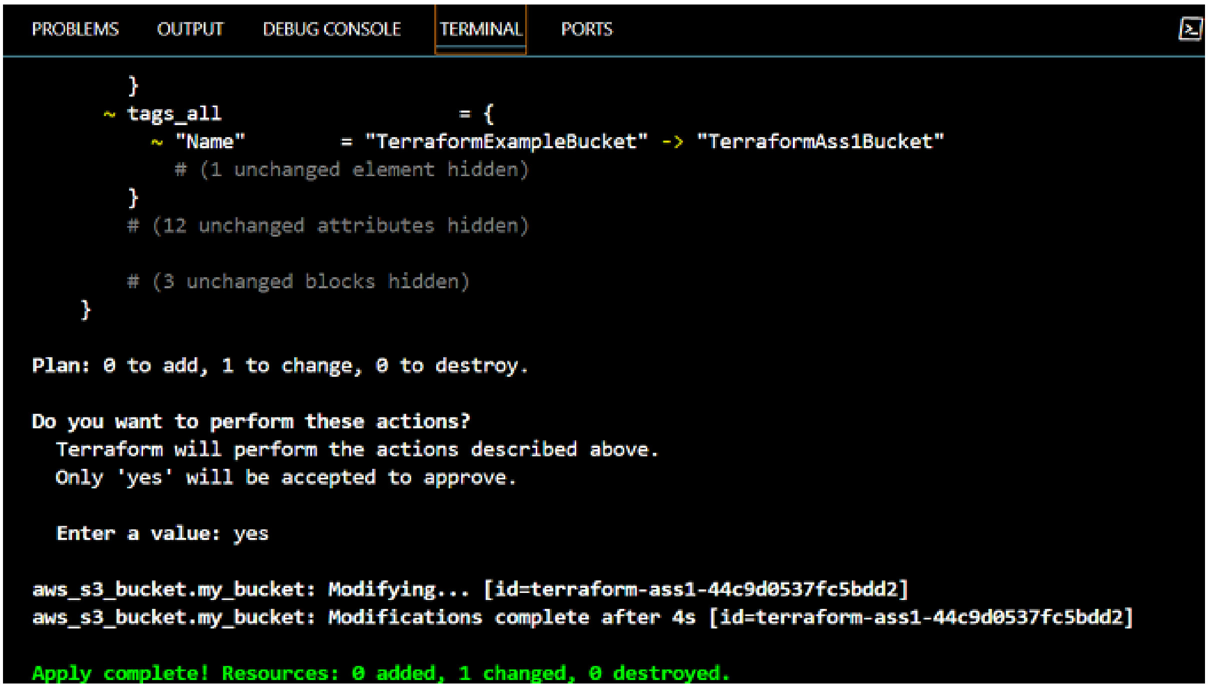


```
      + id                                   = (known after apply)
      + instance_tenancy                     = "default"
      + ipv6_association_id                  = (known after apply)
      + ipv6_cidr_block                      = (known after apply)
      + ipv6_cidr_block_network_border_group = (known after apply)
      + main_route_table_id                  = (known after apply)
      + owner_id                             = (known after apply)
      + tags                                 = {
          + "Name" = "Terraform-VPC"
        }
      + tags_all                             = {
          + "Name" = "Terraform-VPC"
        }
    }

  # random_id.bucket_id will be created
  + resource "random_id" "bucket_id" {
      + b64_std     = (known after apply)
      + b64_url     = (known after apply)
      + byte_length = 8
      + dec         = (known after apply)
      + hex         = (known after apply)
      + id          = (known after apply)
    }

lan: 9 to add, 0 to change, 0 to destroy.
```

Terraform apply:

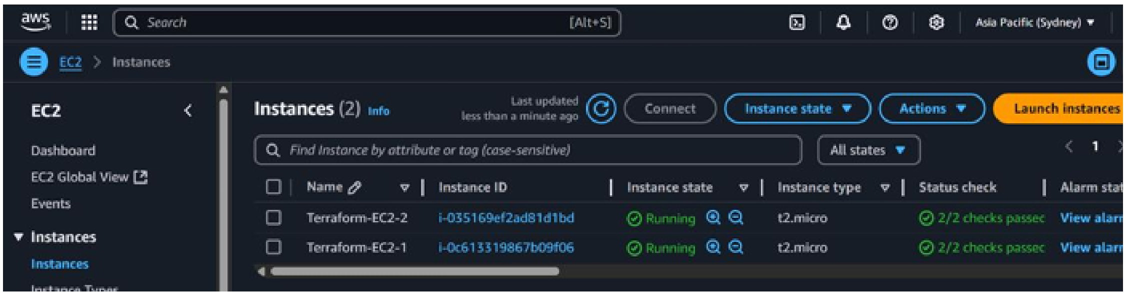


```
PS D:\College\Sem-6\System Provisioning\Lab\terraform-ass1> C:\terraform apply
random_id.bucket_id: Refreshing state... [id=RMnQU3_FvdI]
data.aws_availability_zones.available: Reading...
aws_vpc.main: Refreshing state... [id=vpc-066125ae4a8302e52]
aws_s3_bucket.my_bucket: Refreshing state... [id=terraform-ass1-44c9d0537fc5bdd2]
aws_instance.ec2_instance_1: Refreshing state... [id=i-0c613319867b09f06]
aws_instance.ec2_instance_2: Refreshing state... [id=i-035169ef2ad81d1bd]
data.aws_availability_zones.available: Read complete after 1s [id=ap-southeast-2]
aws_internet_gateway.gw: Refreshing state... [id=igw-01c8e32c2e2e0eb8d]
aws_subnet.public_subnet: Refreshing state... [id=subnet-05ffef25f915b4a02]
aws_route_table.public_rt: Refreshing state... [id=rtb-0cd6a048ea5e1feca]

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:
```



```
        }
      ~ tags_all                    = {
          ~ "Name"         = "TerraformExampleBucket" -> "TerraformAss1Bucket"
            # (1 unchanged element hidden)
        }
        # (12 unchanged attributes hidden)

        # (3 unchanged blocks 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_s3_bucket.my_bucket: Modifying... [id=terraform-ass1-44c9d0537fc5bdd2]
aws_s3_bucket.my_bucket: Modifications complete after 4s [id=terraform-ass1-44c9d0537fc5bdd2]

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

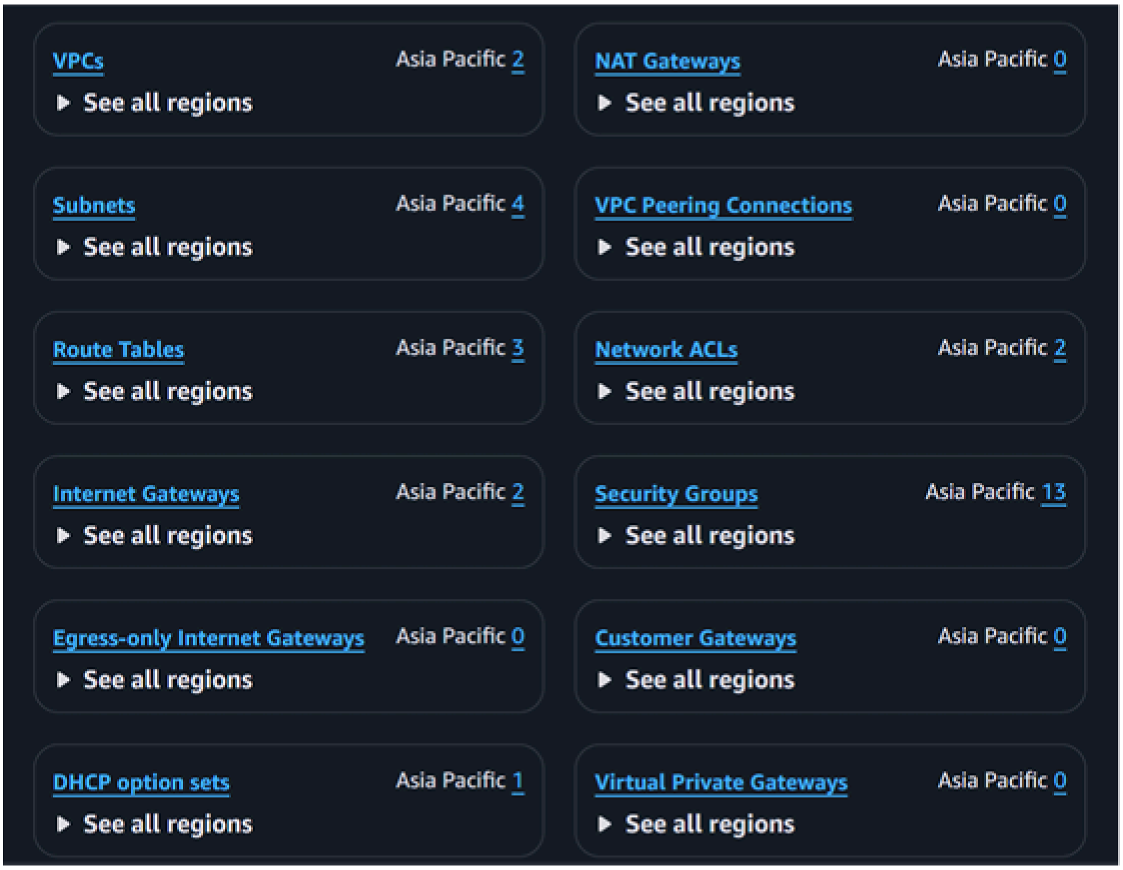
AWS Console Output: Instance-



Instances (2)

□	Name	Instance ID	Instance state	Instance type	Status check	Alarm stat
□	Terraform-EC2-2	i-035169ef2ad81d1bd	Running	t2.micro	2/2 checks passec	View alarn
□	Terraform-EC2-1	i-0c613319867b09f06	Running	t2.micro	2/2 checks passec	View alarn

VPN-



VPCs Asia Pacific 2
▶ See all regions

NAT Gateways Asia Pacific 0
▶ See all regions

Subnets Asia Pacific 4
▶ See all regions

VPC Peering Connections Asia Pacific 0
▶ See all regions

Route Tables Asia Pacific 3
▶ See all regions

Network ACLs Asia Pacific 2
▶ See all regions

Internet Gateways Asia Pacific 2
▶ See all regions

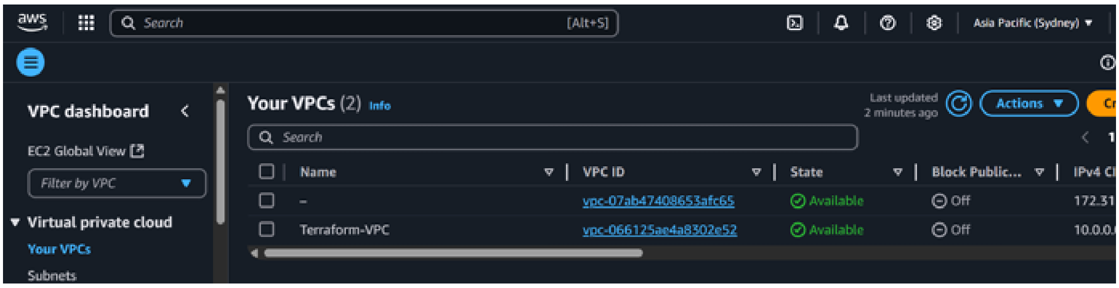
Security Groups Asia Pacific 13
▶ See all regions

Egress-only Internet Gateways Asia Pacific 0
▶ See all regions

Customer Gateways Asia Pacific 0
▶ See all regions

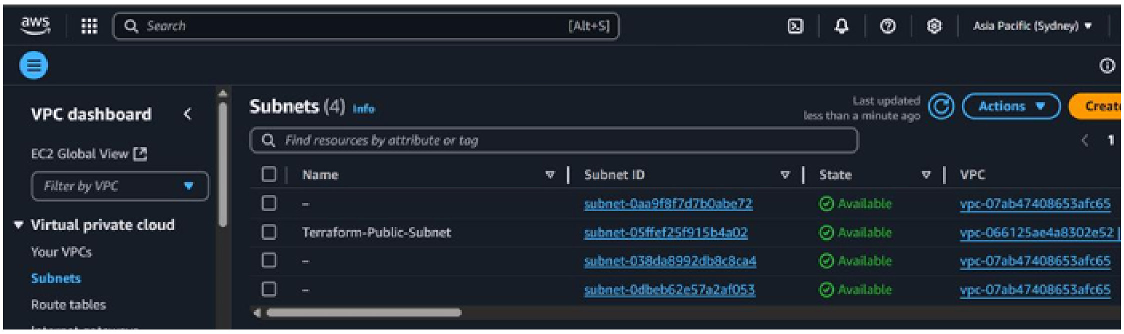
DHCP option sets Asia Pacific 1
▶ See all regions

Virtual Private Gateways Asia Pacific 0
▶ See all regions



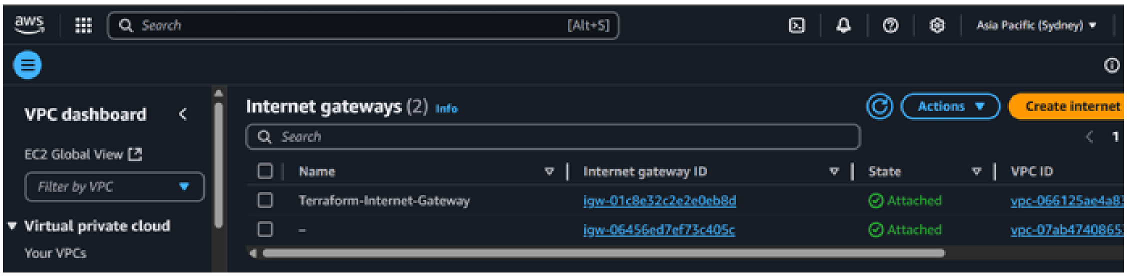
Your VPCs (2) Info

□	Name	VPC ID	State	Block Public...	IPv4 CI
□	–	vpc-07ab47408653afc65	✓ Available	⊖ Off	172.31
□	Terraform-VPC	vpc-066125ae4a8302e52	✓ Available	⊖ Off	10.0.0.



Subnets (4) Info

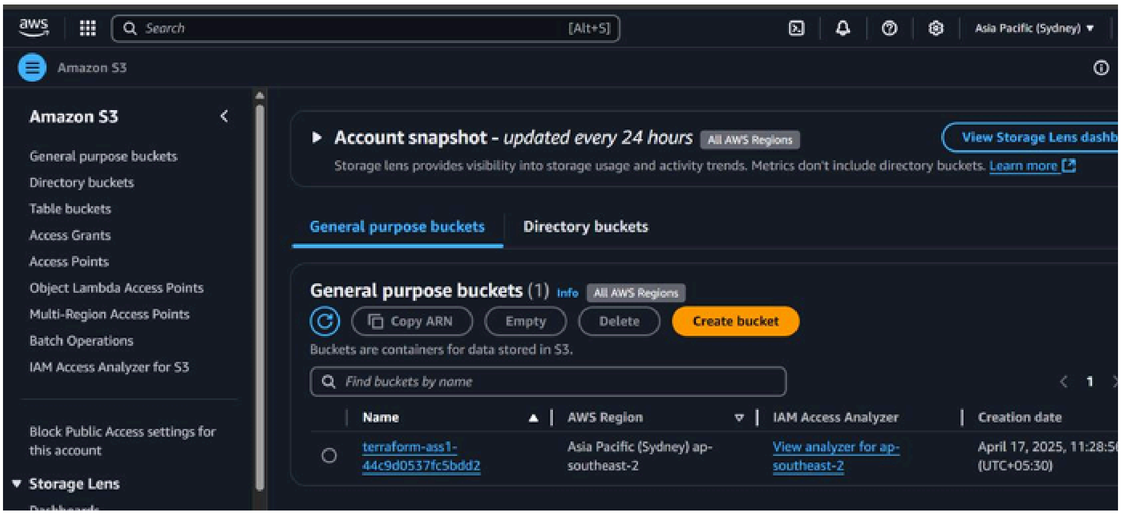
□	Name	Subnet ID	State	VPC
□	–	subnet-0aa9f8f7d7b0abe72	✓ Available	vpc-07ab47408653afc65
□	Terraform-Public-Subnet	subnet-05ffef25f915b4a02	✓ Available	vpc-066125ae4a8302e52
□	–	subnet-038da8992db8c8ca4	✓ Available	vpc-07ab47408653afc65
□	–	subnet-0dbeb62e57a2af053	✓ Available	vpc-07ab47408653afc65



Internet gateways (2) Info

□	Name	Internet gateway ID	State	VPC ID
□	Terraform-Internet-Gateway	igw-01c8e32c2e2e0eb8d	✓ Attached	vpc-066125ae4a8
□	-	igw-06456ed7ef73c405c	✓ Attached	vpc-07ab4740865

S3 Bucket-



▸ Account snapshot - *updated every 24 hours* All AWS Regions

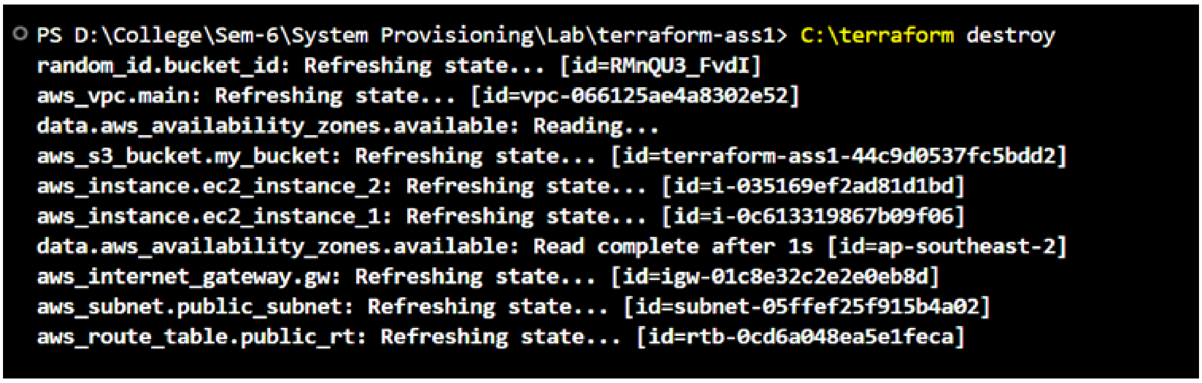
Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets. Learn more

General purpose buckets (1) Info All AWS Regions

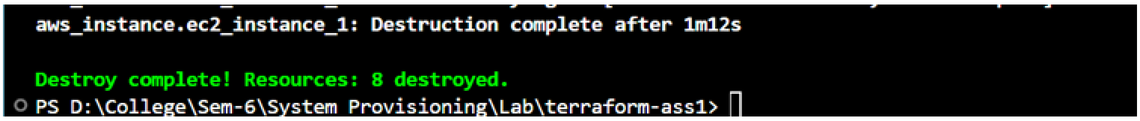
Buckets are containers for data stored in S3.

	Name	AWS Region	IAM Access Analyzer	Creation date
○	terraform-ass1-44c9d0537fc5bdd2	Asia Pacific (Sydney) ap-southeast-2	View analyzer for ap-southeast-2	April 17, 2025, 11:28:5 (UTC+05:30)

Terraform destroy:



```
○ PS D:\College\Sem-6\System Provisioning\Lab\terraform-ass1> C:\terraform destroy
  random_id.bucket_id: Refreshing state... [id=RMnQU3_FvdI]
  aws_vpc.main: Refreshing state... [id=vpc-066125ae4a8302e52]
  data.aws_availability_zones.available: Reading...
  aws_s3_bucket.my_bucket: Refreshing state... [id=terraform-ass1-44c9d0537fc5bdd2]
  aws_instance.ec2_instance_2: Refreshing state... [id=i-035169ef2ad81d1bd]
  aws_instance.ec2_instance_1: Refreshing state... [id=i-0c613319867b09f06]
  data.aws_availability_zones.available: Read complete after 1s [id=ap-southeast-2]
  aws_internet_gateway.gw: Refreshing state... [id=igw-01c8e32c2e2e0eb8d]
  aws_subnet.public_subnet: Refreshing state... [id=subnet-05ffef25f915b4a02]
  aws_route_table.public_rt: Refreshing state... [id=rtb-0cd6a048ea5e1feca]
```



```
  aws_instance.ec2_instance_1: Destruction complete after 1m12s

  Destroy complete! Resources: 8 destroyed.
○ PS D:\College\Sem-6\System Provisioning\Lab\terraform-ass1> 
```

Step 5: Create a PDF file using all screenshots. A small description need to be added with each screenshot.

Step 6: PDF filename name should be your complete roll no.

Step 7: Push your pdf file in this GitHub Repo in your respective folder.

https://github.com/hkshitesh/SPCM-2025-ASSIGNMENTS-SUBMISSION.git

********** All The Best*********************