Zaheena Anwar

2023-Bse-070

BSE-5B

Question 1

```
@Zaheena1 ➜ /workspaces/Lab_exam (main) $ aws iam create-group --group-name Soft
wareEngineering
~
(END)...skipping...
{
    "Group": {
        "Path": "/",
        "GroupName": "SoftwareEngineering",
        "GroupId": "AGPA35PWBHQSORESCEUKC",
        "Arn": "arn:aws:iam::819244121124:group/SoftwareEngineering",
        "CreateDate": "2026-01-19T07:50:52+00:00"
    }
}
~
~
~
~
```

```
@Zaheena1 ➜ /workspaces/Lab_exam (main) $ aws iam get-group --group-name SoftwareEngineering
{
    "Users": [],
    "Group": {
        "Path": "/",
        "GroupName": "SoftwareEngineering",
        "GroupId": "AGPA35PWBHQSORESCEUKC",
        "Arn": "arn:aws:iam::819244121124:group/SoftwareEngineering",
        "CreateDate": "2026-01-19T07:50:52+00:00"
    }
}
@Zaheena1 ➜ /workspaces/Lab_exam (main) $
```

```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam create-user --user-name Zahina
{
    "User": {
        "Path": "/",
        "UserName": "Zahina",
        "UserId": "AIDA35PWBHQSDT6RM3BRM",
        "Arn": "arn:aws:iam::819244121124:user/Zahina",
        "CreateDate": "2026-01-19T08:02:52+00:00"
    }
}
@Zaheena1 /workspaces/Lab_exam (main) $
```

```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam get-user --user-name Zahina
{
    "User": {
        "Path": "/",
        "UserName": "Zahina",
        "UserId": "AIDA35PWBHQSDT6RM3BRM",
        "Arn": "arn:aws:iam::819244121124:user/Zahina",
        "CreateDate": "2026-01-19T08:02:52+00:00"
    }
}
@Zaheena1 /workspaces/Lab_exam (main) $
```

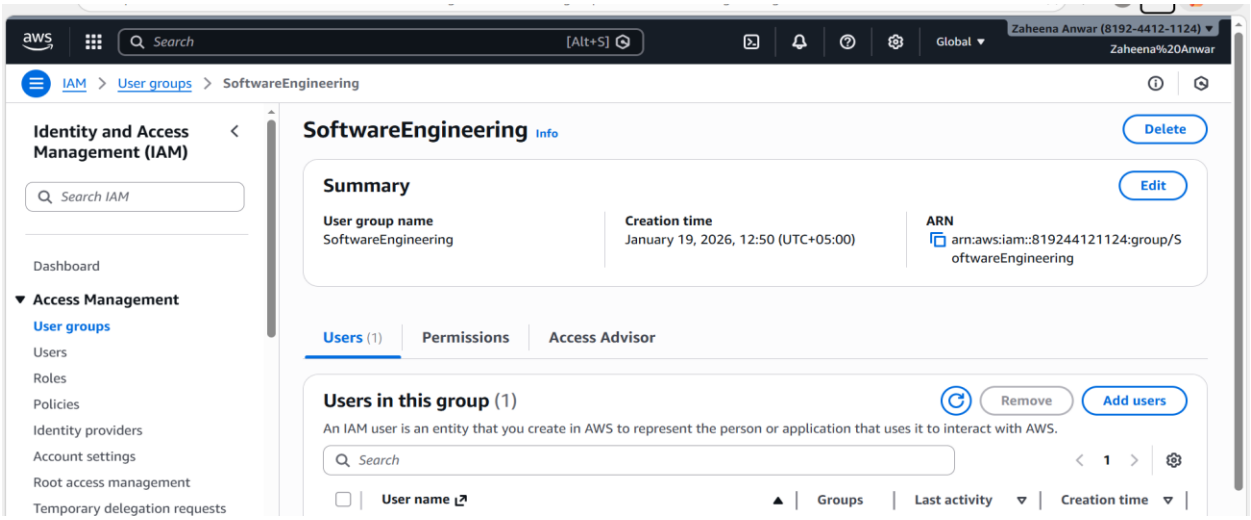
```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam add-user-to-group --user-name Zahina --group-name SoftwareEngineering
@Zaheena1 /workspaces/Lab_exam (main) $
```

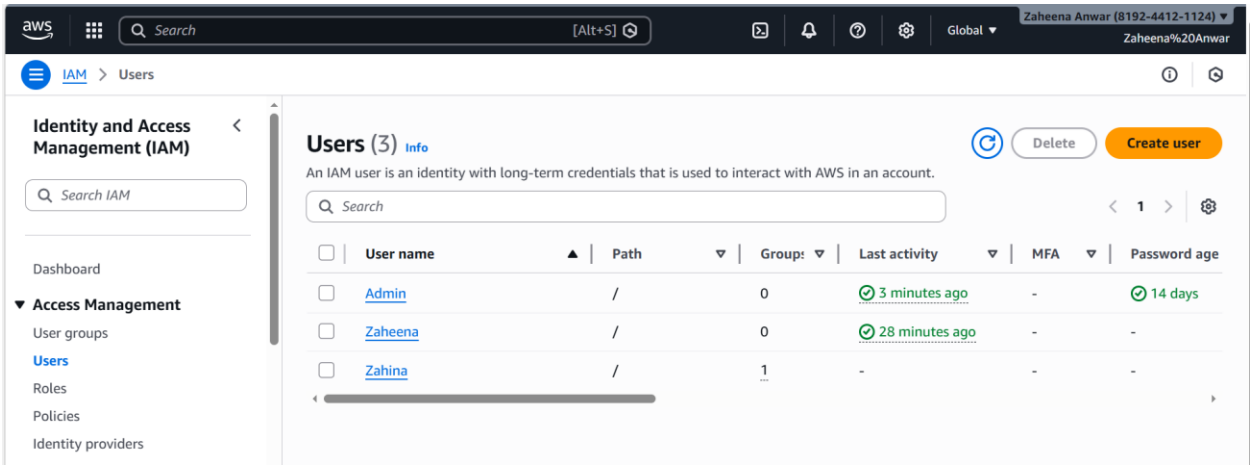
```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam get-group --group-name SoftwareEngineering
{
    "Users": [
        {
            "Path": "/",
            "UserName": "Zahina",
            "UserId": "AIDA35PWBHQSDT6RM3BRM",
            "Arn": "arn:aws:iam::819244121124:user/Zahina",
            "CreateDate": "2026-01-19T08:02:52+00:00"
        }
    ],
    "Group": {
        "Path": "/",
        "GroupName": "SoftwareEngineering",
        "GroupId": "AGPA35PWBHQSORESCEUKC",
        "Arn": "arn:aws:iam::819244121124:group/SoftwareEngineering",
        "CreateDate": "2026-01-19T07:50:52+00:00"
    }
}
@Zaheena1 /workspaces/Lab_exam (main) $
```

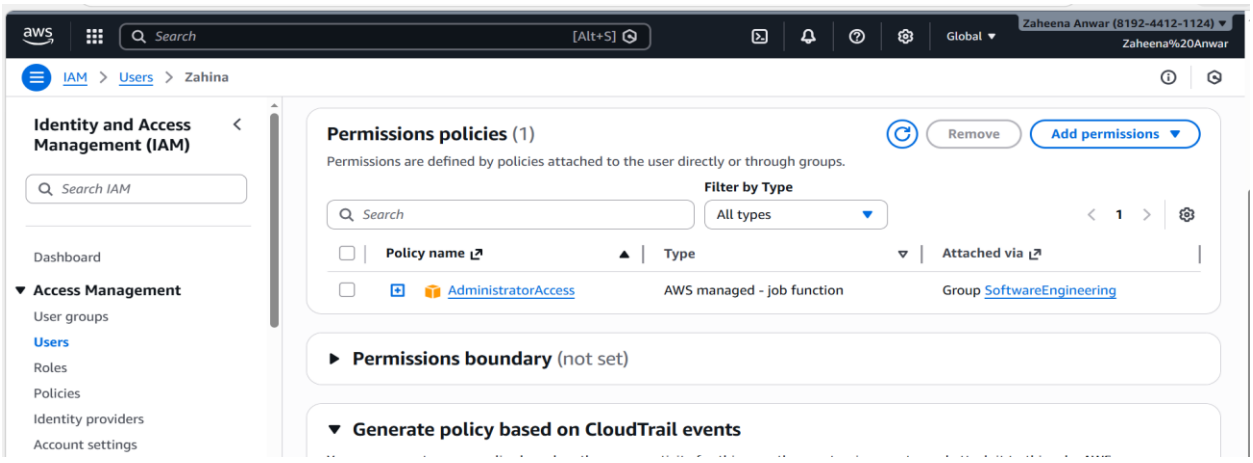
```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam list-policies --query "Policies[?PolicyName=='AdministratorAccess'].{PolicyName:PolicyName, Arn:Arn}" --output table
-------------------------------------------------------------------
|                          ListPolicies                           |
+-----------------------------------------+----------------------+
|                   Arn                   |      PolicyName      |
+-----------------------------------------+----------------------+
|  arn:aws:iam::aws:policy/AdministratorAccess  |  AdministratorAccess  |
+-----------------------------------------+----------------------+
@Zaheena1 /workspaces/Lab_exam (main) $
```

```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam attach-group-policy --group-name SoftwareEngineering --policy-arn arn:aws:iam::aws:policy/AdministratorAccess
@Zaheena1 /workspaces/Lab_exam (main) $ S
```

```
@Zaheena1 /workspaces/Lab_exam (main) $ aws iam list-attached-group-policies --group-name SoftwareEngineering
{
    "AttachedPolicies": [
        {
            "PolicyName": "AdministratorAccess",
            "PolicyArn": "arn:aws:iam::aws:policy/AdministratorAccess"
        }
    ]
}
@Zaheena1 /workspaces/Lab_exam (main) $
```







Question 2

```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ cat main.tf
terraform {
  required_providers {
    aws = {
      source  = "hashicorp/aws"
      version = "~> 5.0"
    }
  }
}

provider "aws" {
  region                   = "us-east-1"
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
  profile                  = "default"
}
```

```
resource "aws_vpc" "myapp_vpc" {
  cidr_block = var.vpc_cidr_block
  tags = { Name = "${var.env_prefix}-vpc" }
}

resource "aws_subnet" "myapp_subnet_1" {
  vpc_id            = aws_vpc.myapp_vpc.id
  cidr_block        = var.subnet_cidr_block
  availability_zone = var.availability_zone
  tags = { Name = "${var.env_prefix}-subnet-1" }
}
```

```
resource "aws_internet_gateway" "myapp_igw" {
  vpc_id = aws_vpc.myapp_vpc.id
  tags = { Name = "${var.env_prefix}-igw" }
}

resource "aws_default_route_table" "main_rt" {
  default_route_table_id = aws_vpc.myapp_vpc.default_route_table_id
  route {
    cidr_block = "0.0.0.0/0"
    gateway_id = aws_internet_gateway.myapp_igw.id
  }
  tags = { Name = "${var.env_prefix}-rt" }
}
```

```
data "http" "myip" {
  url = "https://icanhazip.com"
}

locals {
  my_ip = "${chomp(data.http.myip.response_body)}/32"
}
```

```
resource "aws_default_security_group" "default_sg" {
  vpc_id = aws_vpc.myapp_vpc.id

  ingress {
    from_port = 22
    to_port = 22
    protocol = "tcp"
    cidr_blocks = [local.my_ip]
  }
  ingress {
    from_port = 80
    to_port = 80
    protocol = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port = 443
    to_port = 443
    protocol = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
  egress {
    from_port = 0
    to_port = 0
    protocol = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }
  tags = { Name = "${var.env_prefix}-default-sg" }
}

resource "aws_key_pair" "ssh_key" {
  key_name   = "serverkey"
  public_key = file("~/.ssh/id_ed25519.pub")
}
```

```
resource "aws_key_pair" "ssh_key" {
  key_name   = "serverkey"
  public_key = file("~/.ssh/id_ed25519.pub")
}
```

```
resource "aws_instance" "myapp_server" {
  ami                         = "ami-04b70fa74e45c3917"
  instance_type               = var.instance_type
  subnet_id                   = aws_subnet.myapp_subnet_1.id
  vpc_security_group_ids      = [aws_default_security_group.default_sg.id]
  availability_zone           = var.availability_zone
  associate_public_ip_address = true
  key_name                    = aws_key_pair.ssh_key.key_name
  user_data                   = file("entry-script.sh")

  tags = { Name = "${var.env_prefix}-ec2-instance" }
}
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $
```

```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ cat variables.tf
variable "vpc_cidr_block" {}
variable "subnet_cidr_block" {}
variable "availability_zone" {}
variable "env_prefix" {}
variable "instance_type" {}
EOFcat <<EOF > variables.tf
variable "vpc_cidr_block" {}
variable "subnet_cidr_block" {}
variable "availability_zone" {}
variable "env_prefix" {}
variable "instance_type" {}
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $
```

```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ cat entry-script.sh
#!/bin/bash
sudo yum update -y
sudo yum install -y nginx mod_ssl

# Create a custom index page with your name
echo "<h1>Hello, this is Urooj's Terraform Environment</h1>" | sudo tee /usr/share/nginx/html/index.html

# Generate Self-Signed Certificate
sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 \
  -keyout /etc/pki/tls/private/localhost.key \
  -out /etc/pki/tls/certs/localhost.crt \
  -subj "/C=US/ST=State/L=City/O=Organization/CN=localhost"

# Configure Nginx for HTTPS
sudo cat <<EOC > /etc/nginx/conf.d/ssl.conf
server {
    listen 443 ssl;
    server_name localhost;

    ssl_certificate /etc/pki/tls/certs/localhost.crt;
    ssl_certificate_key /etc/pki/tls/private/localhost.key;

    location / {
        root /usr/share/nginx/html;
        index index.html index.htm;
    }
}
server {
    listen 80;
    server_name localhost;
    return 301 https://\$host\$request_uri;
}
EOC

# Start Nginx
sudo systemctl enable nginx
sudo systemctl start nginx
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $
```

```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ cat outputs.tf
output "ec2_public_ip" {
  value = aws_instance.myapp_server.public_ip
}
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $
```

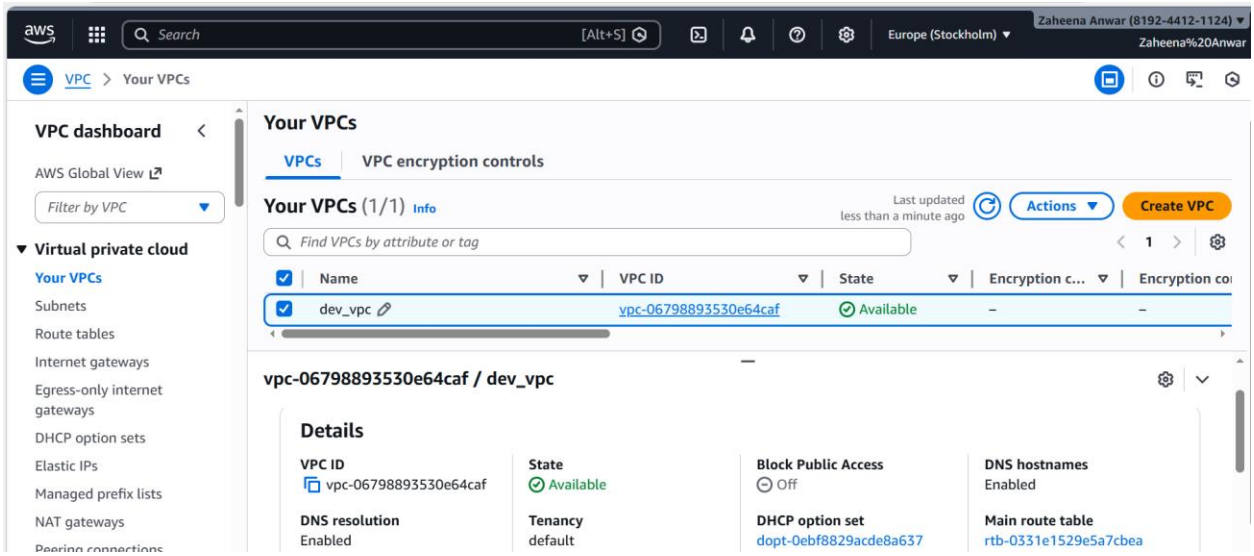
```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ cat terraform.tfvars
vpc_cidr_block    = "10.0.0.0/16"
subnet_cidr_block = "10.0.10.0/24"
availability_zone = "us-east-1a"
env_prefix        = "dev"
instance_type     = "t3.micro"
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $
```

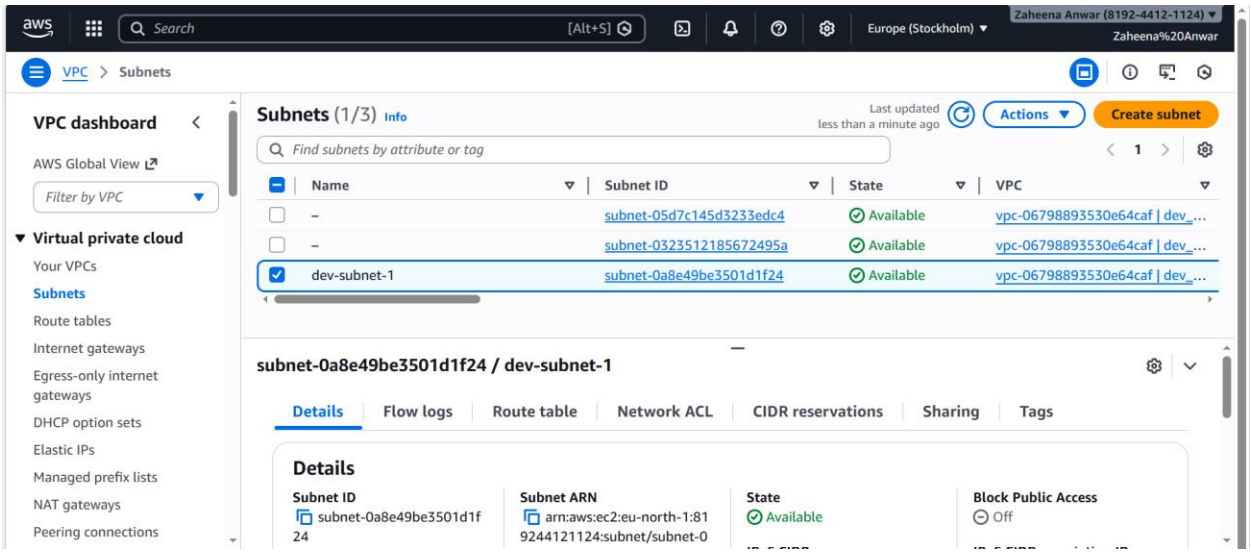
```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform init
Initializing the backend...
Initializing provider plugins...
- Finding hashicorp/aws versions matching "~> 5.0"...
- Finding latest version of hashicorp/http...
- Installing hashicorp/aws v5.100.0...
- Installed hashicorp/aws v5.100.0 (signed by HashiCorp)
- Installing hashicorp/http v3.5.0...
- Installed hashicorp/http v3.5.0 (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.
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $
```

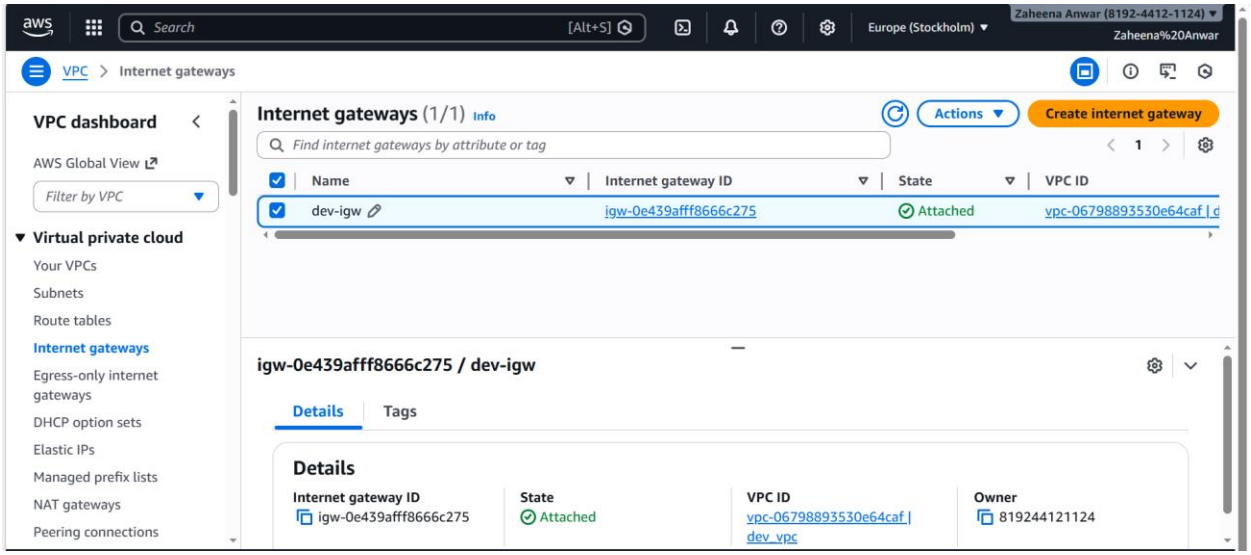
```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform plan
data.http.myip: Reading...
data.http.myip: Read complete after 0s [id=https://icanhazip.com]

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_default_route_table.main_rt will be created
  + resource "aws_default_route_table" "main_rt" {
      + arn                    = (known after apply)
      + default_route_table_id = (known after apply)
      + id                     = (known after apply)
      + owner_id               = (known after apply)
      + route                  = [
          + {
              + cidr_block                = "0.0.0.0/0"
              + gateway_id                = (known after apply)
                # (10 unchanged attributes hidden)
            },
        ]
      + tags                   = {
          + "Name" = "dev-rt"
        }
      + tags_all               = {
          + "Name" = "dev-rt"
        }
      + vpc_id                 = (known after apply)
    }

  # aws_default_security_group.default_sg will be created
  + resource "aws_default_security_group" "default_sg" {
      + arn                    = (known after apply)
      + description            = (known after apply)
      + egress                 = [
          + {
              + cidr_blocks      = [
                  + "0.0.0.0/0",
                ]
              + from_port        = 0
```

```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform apply --auto-approve
data.http.myip: Reading...
data.http.myip: Read complete after 0s [id=https://icanhazip.com]

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_default_route_table.main_rt will be created
  + resource "aws_default_route_table" "main_rt" {
      + arn                    = (known after apply)
      + default_route_table_id = (known after apply)
      + id                     = (known after apply)
      + owner_id               = (known after apply)
      + route                  = [
          + {
              + cidr_block                = "0.0.0.0/0"
              + gateway_id                = (known after apply)
                # (10 unchanged attributes hidden)
            },
        ]
      + tags                   = {
          + "Name" = "dev-rt"
        }
      + tags_all               = {
          + "Name" = "dev-rt"
        }
      + vpc_id                 = (known after apply)
    }

  # aws_default_security_group.default_sg will be created
  + resource "aws_default_security_group" "default_sg" {
      + arn                    = (known after apply)
      + description            = (known after apply)
      + egress                 = [
```

```
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform output
ec2_public_ip = "100.31.242.176"
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform output
ec2_public_ip = "100.31.242.176"
@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform
```




Search
[Alt+S]
Europe (Stockholm)
Zaheena Anwar (8192-4412-1124)
Zaheena%20Anwar
VPC > Subnets
VPC dashboard
AWS Global View
Filter by VPC
Virtual private cloud
Your VPCs
Subnets
Route tables
Internet gateways
Egress-only internet gateways
DHCP option sets
Elastic IPs
Managed prefix lists
NAT gateways
Peering connections
Subnets (1/3) Info
Last updated less than a minute ago
Actions
Create subnet
Find subnets by attribute or tag
Name
Subnet ID
State
VPC
subnet-05d7c145d3233edc4
Available
subnet-0323512185672495a
Available
dev-subnet-1
subnet-0a8e49be3501d1f24
Available
subnet-0a8e49be3501d1f24 / dev-subnet-1
Details
Flow logs
Route table
Network ACL
CIDR reservations
Sharing
Tags
Subnet ID
Subnet ARN
State
Block Public Access
Off


Search
[Alt+S]
Europe (Stockholm)
Zaheena Anwar (8192-4412-1124)
Zaheena%20Anwar
VPC > Internet gateways
VPC dashboard
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Filter by VPC
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DHCP option sets
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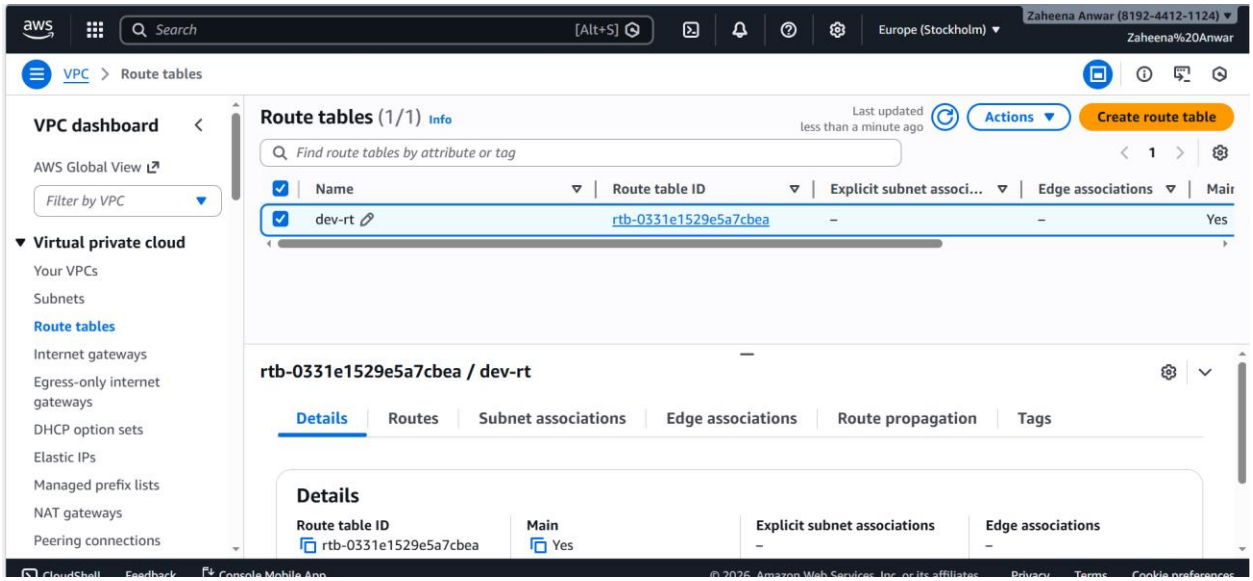
Managed prefix lists
NAT gateways
Peering connections
Internet gateways (1/1) Info
Actions
Create internet gateway
Find internet gateways by attribute or tag
Name
Internet gateway ID
State
VPC ID
dev-igw
igw-0e439afff8666c275
Attached
igw-0e439afff8666c275 / dev-igw
Details
Tags
Internet gateway ID
State
VPC ID
Owner
igw-0e439afff8666c275
Attached
819244121124


Search
[Alt+S]
Europe (Stockholm)
Zaheena Anwar (8192-4412-1124)
Zaheena%20Anwar
VPC > Route tables
VPC dashboard
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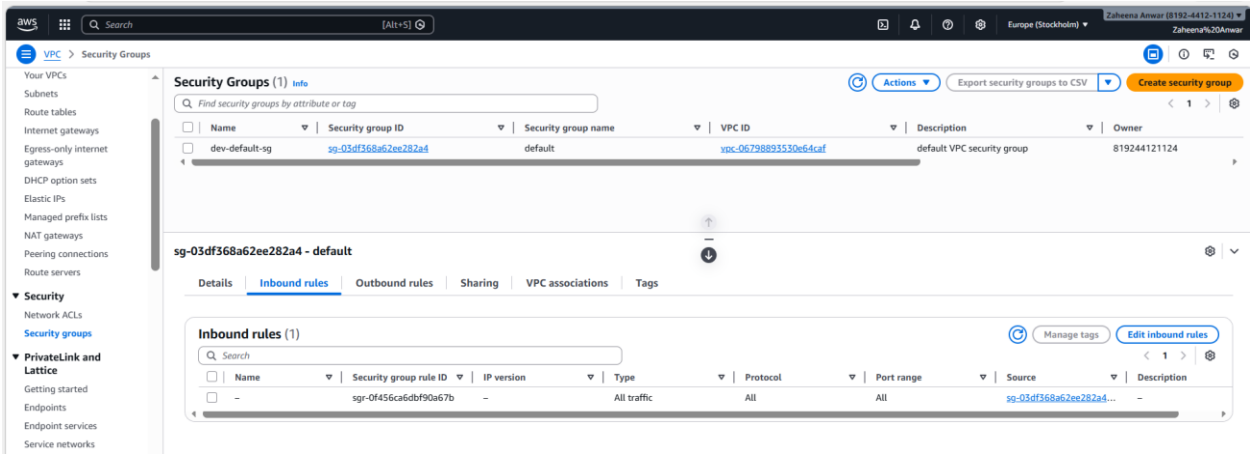
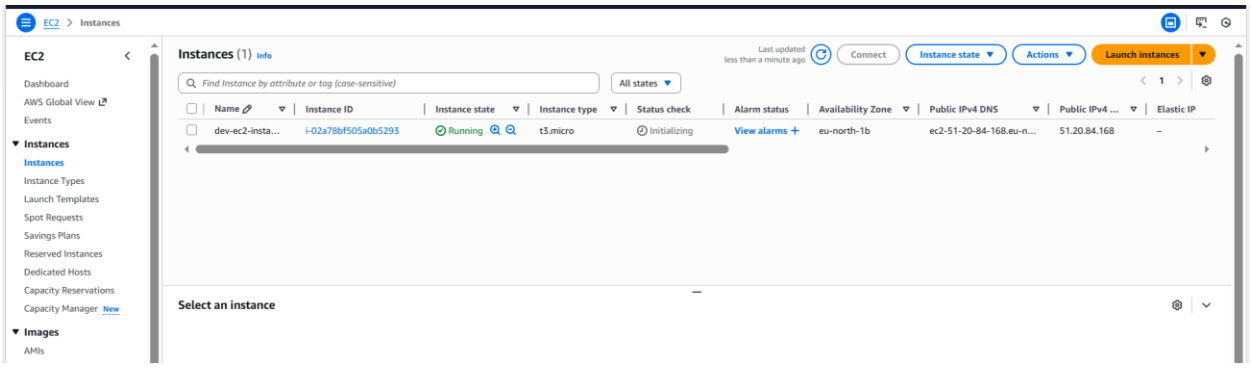
Elastic IPs
Managed prefix lists
NAT gateways
Peering connections
Route tables (1/1) Info
Last updated less than a minute ago
Actions
Create route table
Find route tables by attribute or tag
Name
Route table ID
Explicit subnet associ...
Edge associations
dev-rt
rtb-0331e1529e5a7cbea
Yes
rtb-0331e1529e5a7cbea / dev-rt
Details
Routes
Subnet associations
Edge associations
Route propagation
Tags
Route table ID
Main
Explicit subnet associations
Edge associations
rtb-0331e1529e5a7cbea
Yes
CloudShell
Feedback
Console Mobile App
Privacy
Terms
Cookie preferences





Terraform .

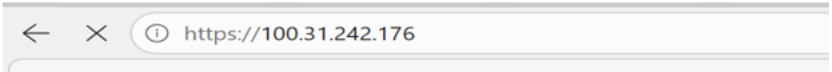
Question 3

```
@Zaheena1 ➜ /workspaces/Lab_exam/ansible (main) $ cat <<EOF > hosts
> [ec2]
> 100.31.242.176
>
> [ec2:vars]
> ansible_user=ec2-user
> ansible_ssh_private_key_file=~/.ssh/id_ed25519
> ansible_ssh_common_args='-o StrictHostKeyChecking=no'
> EOF
@Zaheena1 ➜ /workspaces/Lab_exam/ansible (main) $
```

```
@Zaheena1 /workspaces/Lab_exam/ansible (main) $ cat <<EOF > ansible.cfg
> [defaults]
> host_key_checking = False
> inventory = ./hosts
> interpreter_python = /usr/bin/python3
> EOF
@Zaheena1 /workspaces/Lab_exam/ansible (main) $
```

```
@Zaheena1 /workspaces/Lab_exam/ansible (main) $ cat <<EOF > my-playbook.yml
> ---
> - name: Configure Web Server on Q2 Instance
>   hosts: ec2
>   become: true
>   tasks:
>     - name: Update all packages
>       dnf:
>         name: "*"
>         state: latest
>
>     - name: Stop and disable Nginx (from Q2)
>       service:
>         name: nginx
>         state: stopped
>         enabled: false
>       ignore_errors: true  # Proceed even if nginx isn't there
>
>     - name: Install Apache HTTPD
>       dnf:
>         name: httpd
>         state: present
>
>
>       uri:
```

```
> ^C
@Zaheena1 /workspaces/Lab_exam/ansible (main) $ cat <<EOF > my-playbook.yml
> ---
> - name: Configure Web Server on Q2 Instance
>   hosts: ec2
>   become: true
>   tasks:
>     - name: Update all packages
>       dnf:
>         name: "*"
>         state: latest
>
>     - name: Stop and disable Nginx (from Q2)
>       service:
>         name: nginx
>         state: stopped
>         enabled: false
>       ignore_errors: true  # Prevents failure if Nginx isn't installed
>
```



It works!

Cleanup:

```
roy --auto-approve@Zaheena1 /workspaces/Lab_exam/lab_q2 (main) $ terraform destroy --auto-approve
data.http.myip: Reading...
data.http.myip: Read complete after 0s [id=https://icanhazip.com]
aws_key_pair.ssh_key: Refreshing state... [id=serverkey]
aws_vpc.myapp_vpc: Refreshing state... [id=vpc-008116b4d00179796]
aws_subnet.myapp_subnet_1: Refreshing state... [id=subnet-0d140b7671c7aac8b]
aws_internet_gateway.myapp_igw: Refreshing state... [id=igw-0a7ca1fd1a9db5a6a]
aws_default_security_group.default_sg: Refreshing state... [id=sg-00a11a7d95856b56f]
aws_default_route_table.main_rt: Refreshing state... [id=rtb-09b7e1fa12c7b506a]
aws_instance.myapp_server: Refreshing state... [id=i-0c0fb8c02c802e47f]

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

Terraform will perform the following actions:

  # aws_default_route_table.main_rt will be destroyed
  - resource "aws_default_route_table" "main_rt" {
      - arn                    = "arn:aws:ec2:us-east-1:819244121124:route-table/rtb-09b7e1fa12c7b506a" -> null
      - default_route_table_id = "rtb-09b7e1fa12c7b506a" -> null
      - id                     = "rtb-09b7e1fa12c7b506a" -> null
      - owner_id               = "819244121124" -> null
      - propagating_vgws       = [] -> null
      - route                  = [
          - {
```