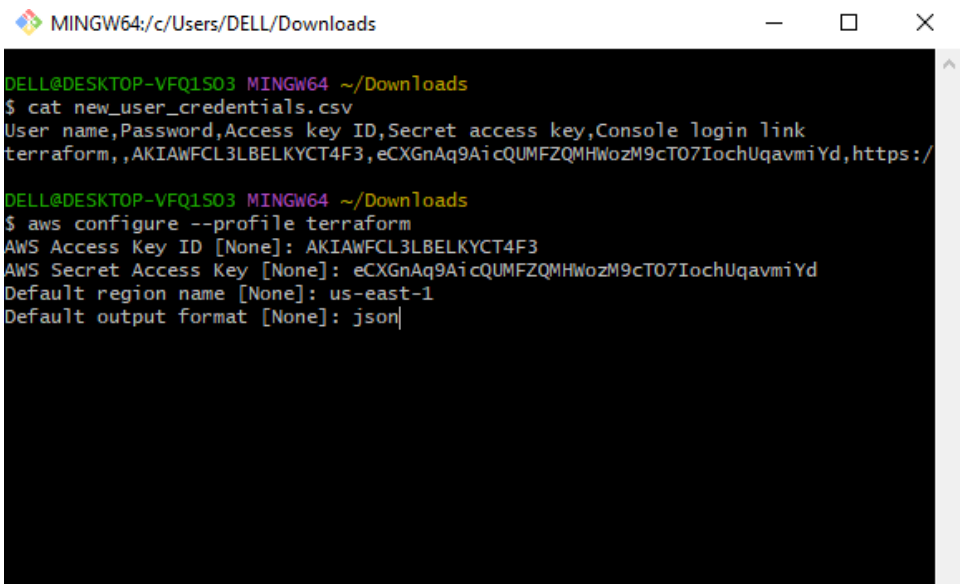
Terraform scripts to Provision AWS EKS

Steps to be followed:

1. Create an IAM (Identity Access Management) user in AWS and add user to the user_group
    - Sign in into AWS console with your crendentials
    - IAM -> Add user -> name -> add to Group -> add tags -> ok and save.
    - After adding user ,Download **new_user_credentials.csv** file .
    - Go to the file location and copy the credentials
    - Open the terminal

      $ cd Downloads/
      $ aws configure --profile <profile name>
      $ AWS Access Key ID : <paste from the csv file>
      $ AWS Secret Access Key: <paste from the csv file>
      $ Default region name: us-east-1
      $ Default output format: json



2. Create the following Terraform Scripts:

    - provider.tf
    - vpc.tf
    - internet-gateway.tf
    - subnets.tf
    - eips.tf
    - nat-gateways,tf

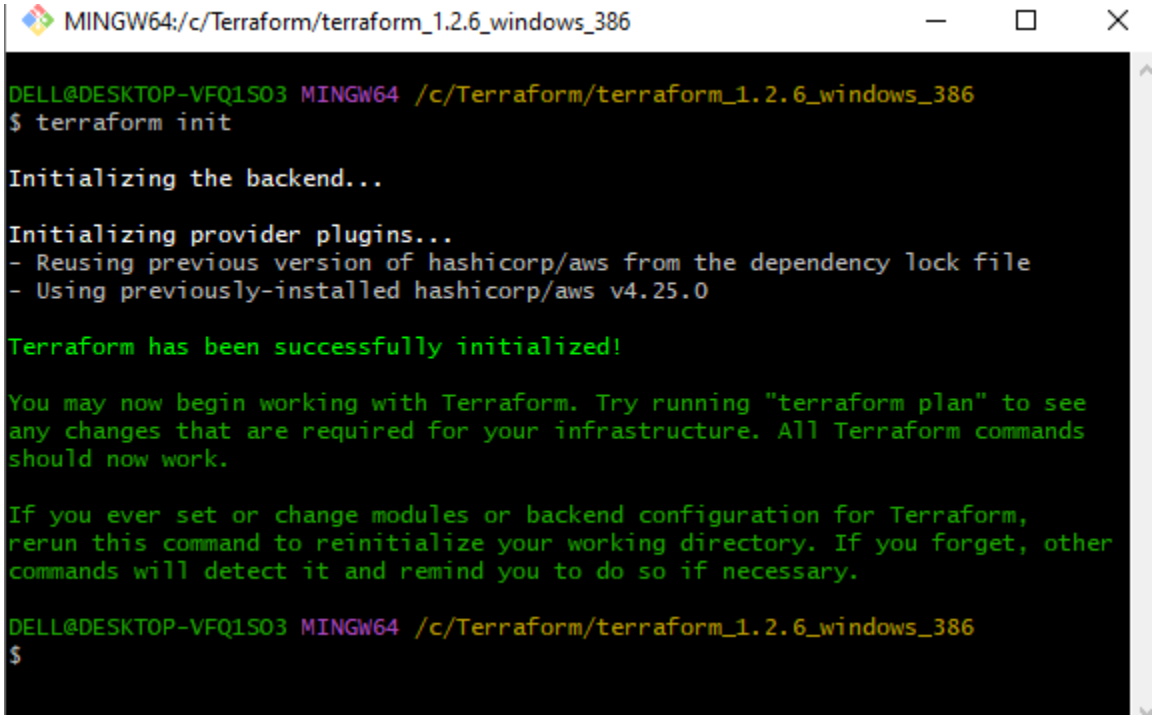
- route-tables.tf
- route-table-association.tf
- eks.tf
- eks-nodegroup.tf

3. Please find below url of my Github Repository for the Source code , where you can find all the Terraform Scripts as mentioned above.

   https://github.com/akshaykumart/terraform-EKS.git

4. Go to the Terminal :

   - **$ cd Terraform** //Location where your Terraform files are located in local
   - **$ terraform version** //validate the terraform version
   - **$ aws –version** // Validate the AWS version
   - **$ terraform init** // Initialize the terraform Environment



   - **$ terraform plan**
   - **$ terraform apply**

MINGW64:/c/Terraform/terraform_1.2.6_windows_386

```
DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$ terraform plan
aws_instance.example: Refreshing state... [id=i-05fd333384fd34f84]

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_vpc.main will be created
  + resource "aws_vpc" "main" {
      + arn                                  = (known after apply)
      + assign_generated_ipv6_cidr_block     = false
      + 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_classiclink                   = false
      + enable_classiclink_dns_support       = false
      + enable_dns_hostnames                 = true
      + enable_dns_support                   = true
      + 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" = "main"
        }
      + tags_all                             = {
          + "Name" = "main"
        }
    }

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

Changes to Outputs:
  + vpc_id = (known after apply)

─────────────────────────────────────────────────────────────────────────────

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.

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

MINGW64:/c/Terraform/terraform_1.2.6_windows_386

```
  + resource "aws_vpc" "main" {
      + arn                                  = (known after apply)
      + assign_generated_ipv6_cidr_block     = false
      + 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_classiclink                   = false
      + enable_classiclink_dns_support       = false
      + enable_dns_hostnames                 = true
      + enable_dns_support                   = true
      + 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" = "main"
        }
      + tags_all                             = {
          + "Name" = "main"
        }
    }

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

Changes to Outputs:
  + vpc_id = (known after apply)

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.main: Creating...
aws_vpc.main: Still creating... [10s elapsed]
aws_vpc.main: Creation complete after 15s [id=vpc-036b565f3f25adbc3]

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

Outputs:

vpc_id = "vpc-036b565f3f25adbc3"

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

MINGW64:/c/Terraform/terraform_1.2.6_windows_386

```
DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$ terraform fmt

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$ terraform plan
aws_vpc.main: Refreshing state... [id=vpc-036b565f3f25adbc3]

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_internet_gateway.main will be created
  + resource "aws_internet_gateway" "main" {
      + arn      = (known after apply)
      + id       = (known after apply)
      + owner_id = (known after apply)
      + tags     = {
          + "Name" = "main"
        }
      + tags_all = {
          + "Name" = "main"
        }
      + vpc_id   = "vpc-036b565f3f25adbc3"
    }

Plan: 1 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.

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

MINGW64:/c/Terraform/terraform_1.2.6_windows_386

```
          + "Name"                    = "public-us-east-1a"
          + "kubernetes.io/cluster/eks" = "shared"
          + "kubernetes.io/role/elb"    = "1"
        }
      + tags_all                                          = {
          + "Name"                    = "public-us-east-1a"
          + "kubernetes.io/cluster/eks" = "shared"
          + "kubernetes.io/role/elb"    = "1"
        }
      + vpc_id                                            = "vpc-036b565f3f25adbc3"
    }

  # aws_subnet.public_2 will be created
  + resource "aws_subnet" "public_2" {
      + arn                                            = (known after apply)
      + assign_ipv6_address_on_creation                = false
      + availability_zone                              = "us-east-1b"
      + availability_zone_id                           = (known after apply)
      + cidr_block                                     = "192.168.64.0/18"
      + 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                        = true
      + owner_id                                       = (known after apply)
      + private_dns_hostname_type_on_launch            = (known after apply)
      + tags                                           = {
          + "Name"                    = "public-us-east-1b"
          + "kubernetes.io/cluster/eks" = "shared"
          + "kubernetes.io/role/elb"    = "1"
        }
      + tags_all                                       = {
          + "Name"                    = "public-us-east-1b"
          + "kubernetes.io/cluster/eks" = "shared"
          + "kubernetes.io/role/elb"    = "1"
        }
      + vpc_id                                         = "vpc-036b565f3f25adbc3"
    }

Plan: 4 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.

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

MINGW64:/c/Terraform/terraform_1.2.6_windows_386

```
      + cidr_block                                       = "10.0.64.0/24"
      + 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                          = true
      + owner_id                                         = (known after apply)
      + private_dns_hostname_type_on_launch              = (known after apply)
      + tags                                             = {
          + "Name"                    = "public-us-east-1b"
          + "kubernetes.io/cluster/eks" = "shared"
          + "kubernetes.io/role/elb"    = "1"
        }
      + tags_all                                         = {
          + "Name"                    = "public-us-east-1b"
          + "kubernetes.io/cluster/eks" = "shared"
          + "kubernetes.io/role/elb"    = "1"
        }
      + vpc_id                                           = "vpc-036b565f3f25adbc3"
    }

Plan: 4 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.public_2: Creating...
aws_subnet.private_1: Creating...
aws_subnet.public_1: Creating...
aws_subnet.private_2: Creating...
aws_subnet.private_2: Creation complete after 2s [id=subnet-05bdca032100a1ca4]
aws_subnet.private_1: Creation complete after 2s [id=subnet-0c9221c4cf96dc3c3]
aws_subnet.public_2: Still creating... [10s elapsed]
aws_subnet.public_1: Still creating... [10s elapsed]
aws_subnet.public_2: Creation complete after 12s [id=subnet-0ca656bc5290f05a0]
aws_subnet.public_1: Creation complete after 13s [id=subnet-06e817fcdce6fde02]

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

Outputs:

vpc_id = "vpc-036b565f3f25adbc3"

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

```
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_eip.nat1 will be created
  + resource "aws_eip" "nat1" {
      + allocation_id        = (known after apply)
      + association_id       = (known after apply)
      + carrier_ip           = (known after apply)
      + customer_owned_ip    = (known after apply)
      + domain               = (known after apply)
      + id                   = (known after apply)
      + instance             = (known after apply)
      + network_border_group = (known after apply)
      + network_interface    = (known after apply)
      + private_dns          = (known after apply)
      + private_ip           = (known after apply)
      + public_dns           = (known after apply)
      + public_ip            = (known after apply)
      + public_ipv4_pool     = (known after apply)
      + tags_all             = (known after apply)
      + vpc                  = (known after apply)
    }

  # aws_eip.nat2 will be created
  + resource "aws_eip" "nat2" {
      + allocation_id        = (known after apply)
      + association_id       = (known after apply)
      + carrier_ip           = (known after apply)
      + customer_owned_ip    = (known after apply)
      + domain               = (known after apply)
      + id                   = (known after apply)
      + instance             = (known after apply)
      + network_border_group = (known after apply)
      + network_interface    = (known after apply)
      + private_dns          = (known after apply)
      + private_ip           = (known after apply)
      + public_dns           = (known after apply)
      + public_ip            = (known after apply)
      + public_ipv4_pool     = (known after apply)
      + tags_all             = (known after apply)
      + vpc                  = (known after apply)
    }

  # aws_nat_gateway.gw1 will be created
  + resource "aws_nat_gateway" "gw1" {
      + allocation_id        = (known after apply)
```

```
      + public_dns            = (known after apply)
      + public_ip             = (known after apply)
      + public_ipv4_pool      = (known after apply)
      + tags_all              = (known after apply)
      + vpc                   = (known after apply)
    }

  # aws_nat_gateway.gw1 will be created
  + resource "aws_nat_gateway" "gw1" {
      + allocation_id        = (known after apply)
      + connectivity_type    = "public"
      + id                   = (known after apply)
      + network_interface_id = (known after apply)
      + private_ip           = (known after apply)
      + public_ip            = (known after apply)
      + subnet_id            = "subnet-06e817fcdce6fde02"
      + tags                 = {
          + "Name" = "NAT 1"
        }
      + tags_all             = {
          + "Name" = "NAT 1"
        }
    }

  # aws_nat_gateway.gw2 will be created
  + resource "aws_nat_gateway" "gw2" {
      + allocation_id        = (known after apply)
      + connectivity_type    = "public"
      + id                   = (known after apply)
      + network_interface_id = (known after apply)
      + private_ip           = (known after apply)
      + public_ip            = (known after apply)
      + subnet_id            = "subnet-0ca656bc5290f05a0"
      + tags                 = {
          + "Name" = "NAT 2"
        }
      + tags_all             = {
          + "Name" = "NAT 2"
        }
    }

Plan: 4 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.

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

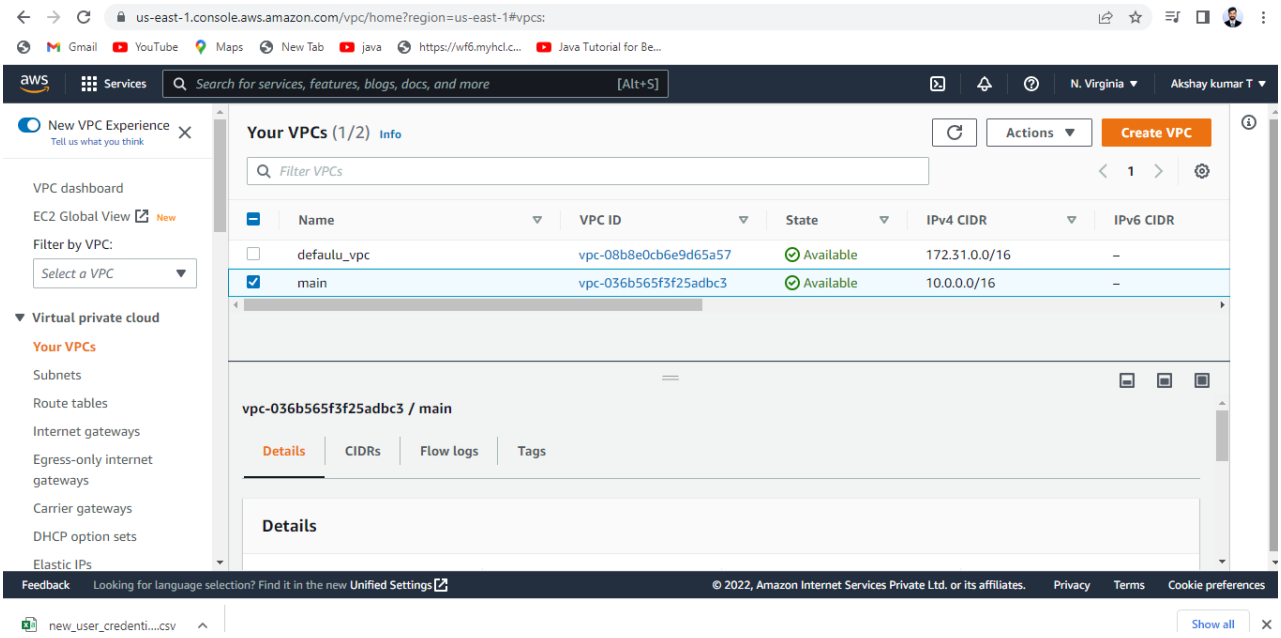
MINGW64:/c/Terraform/terraform_1.2.6_windows_386

```
          + "Name" = "NAT 2"
        }
      + tags_all              = {
          + "Name" = "NAT 2"
        }
    }

Plan: 4 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_eip.nat2: Creating...
aws_eip.nat1: Creating...
aws_eip.nat1: Creation complete after 1s [id=eipalloc-05c93923b158742c0]
aws_eip.nat2: Creation complete after 1s [id=eipalloc-08238c12f96f259e9]
aws_nat_gateway.gw1: Creating...
aws_nat_gateway.gw2: Creating...
aws_nat_gateway.gw1: Still creating... [10s elapsed]
aws_nat_gateway.gw2: Still creating... [10s elapsed]
aws_nat_gateway.gw1: Still creating... [20s elapsed]
aws_nat_gateway.gw2: Still creating... [20s elapsed]
aws_nat_gateway.gw1: Still creating... [30s elapsed]
aws_nat_gateway.gw2: Still creating... [30s elapsed]
aws_nat_gateway.gw1: Still creating... [40s elapsed]
aws_nat_gateway.gw2: Still creating... [40s elapsed]
aws_nat_gateway.gw1: Still creating... [50s elapsed]
aws_nat_gateway.gw2: Still creating... [50s elapsed]
aws_nat_gateway.gw1: Still creating... [1m0s elapsed]
aws_nat_gateway.gw2: Still creating... [1m0s elapsed]
aws_nat_gateway.gw1: Still creating... [1m10s elapsed]
aws_nat_gateway.gw2: Still creating... [1m10s elapsed]
aws_nat_gateway.gw1: Still creating... [1m20s elapsed]
aws_nat_gateway.gw2: Still creating... [1m20s elapsed]
aws_nat_gateway.gw1: Creation complete after 1m28s [id=nat-0f89a25c82c413b05]
aws_nat_gateway.gw2: Still creating... [1m30s elapsed]
aws_nat_gateway.gw2: Still creating... [1m40s elapsed]
aws_nat_gateway.gw2: Creation complete after 1m49s [id=nat-08ec15eec07ca9709]

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

Outputs:

vpc_id = "vpc-036b565f3f25adbc3"

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

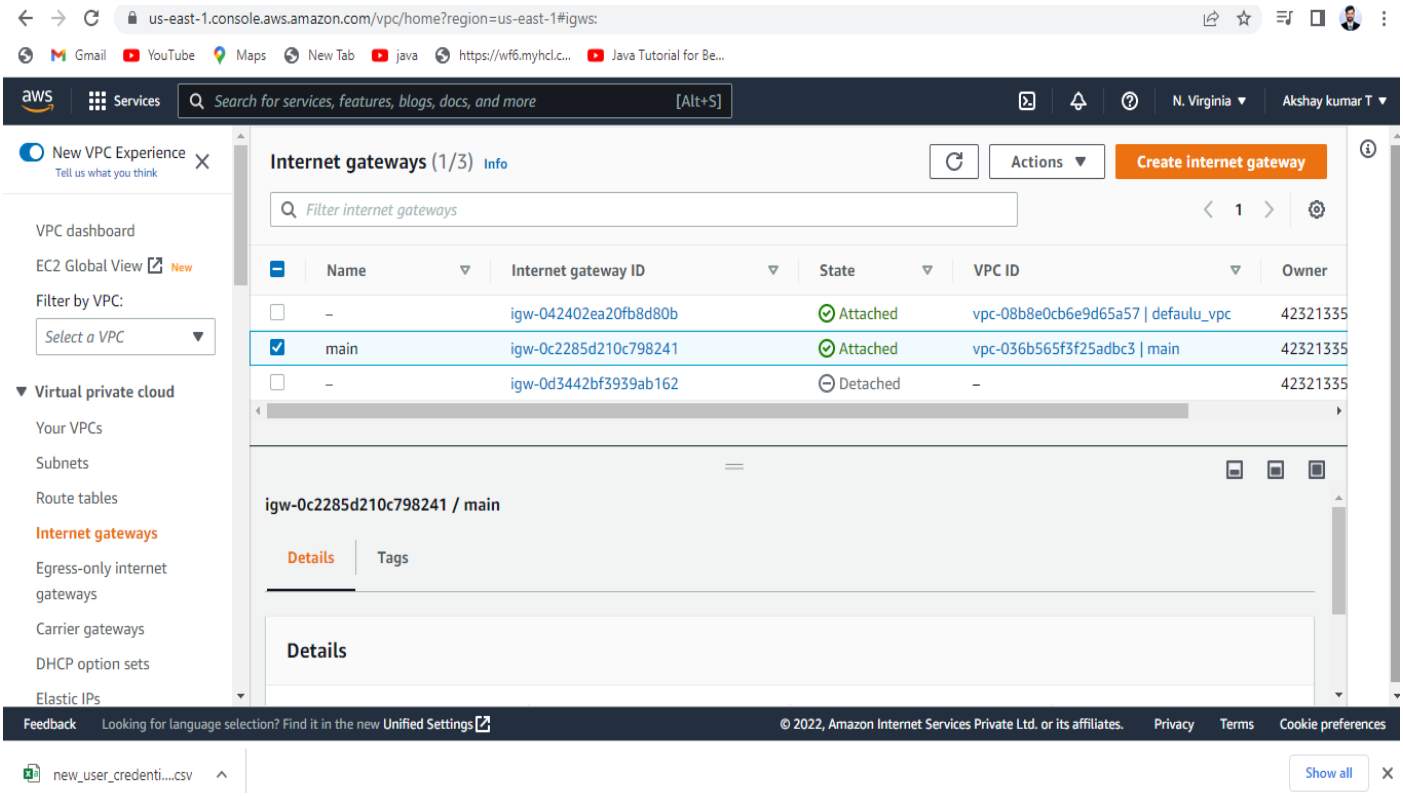
```
MINGW64:/c/Terraform/terraform_1.2.6_windows_386
      + id             = (known after apply)
      + route_table_id = (known after apply)
      + subnet_id      = "subnet-05bdca032100a1ca4"
    }

  # aws_route_table_association.public1 will be created
  + resource "aws_route_table_association" "public1" {
      + id             = (known after apply)
      + route_table_id = (known after apply)
      + subnet_id      = "subnet-06e817fcdce6fde02"
    }

  # aws_route_table_association.public2 will be created
  + resource "aws_route_table_association" "public2" {
      + id             = (known after apply)
      + route_table_id = (known after apply)
      + subnet_id      = "subnet-0ca656bc5290f05a0"
    }

Plan: 7 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_route_table.private1: Creating...
aws_route_table.public: Creating...
aws_route_table.private2: Creating...
aws_route_table.public: Creation complete after 3s [id=rtb-0e96b6fa60a0d8434]
aws_route_table_association.public2: Creating...
aws_route_table_association.public1: Creating...
aws_route_table.private1: Creation complete after 3s [id=rtb-02fe4186172ac28c5]
aws_route_table_association.private1: Creating...
aws_route_table.private2: Creation complete after 4s [id=rtb-05d94f975a6177b6e]
aws_route_table_association.private2: Creating...
aws_route_table_association.public2: Creation complete after 1s [id=rtbassoc-0dbf12dc5afc75ebc]
aws_route_table_association.public1: Creation complete after 1s [id=rtbassoc-0c57a096dc7b34f71]
aws_route_table_association.private1: Creation complete after 1s [id=rtbassoc-0006b48cbc9ed1bfc]
aws_route_table_association.private2: Creation complete after 1s [id=rtbassoc-0ea10c4816fc611e7]

Apply complete! Resources: 7 added, 0 changed, 0 destroyed.

Outputs:

vpc_id = "vpc-036b565f3f25adbc3"

DELL@DESKTOP-VFQ1SO3 MINGW64 /c/Terraform/terraform_1.2.6_windows_386
$
```

5. *Validations:*

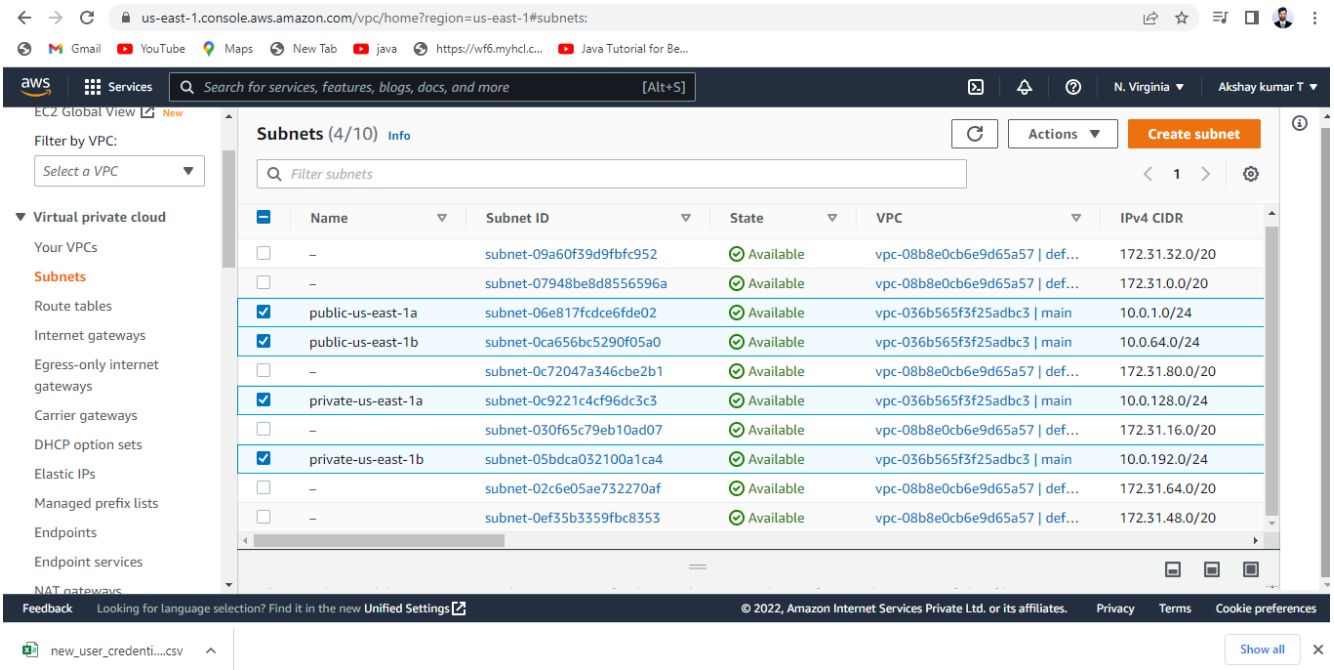
- Login to AWS console and check whether the following things are created or not.



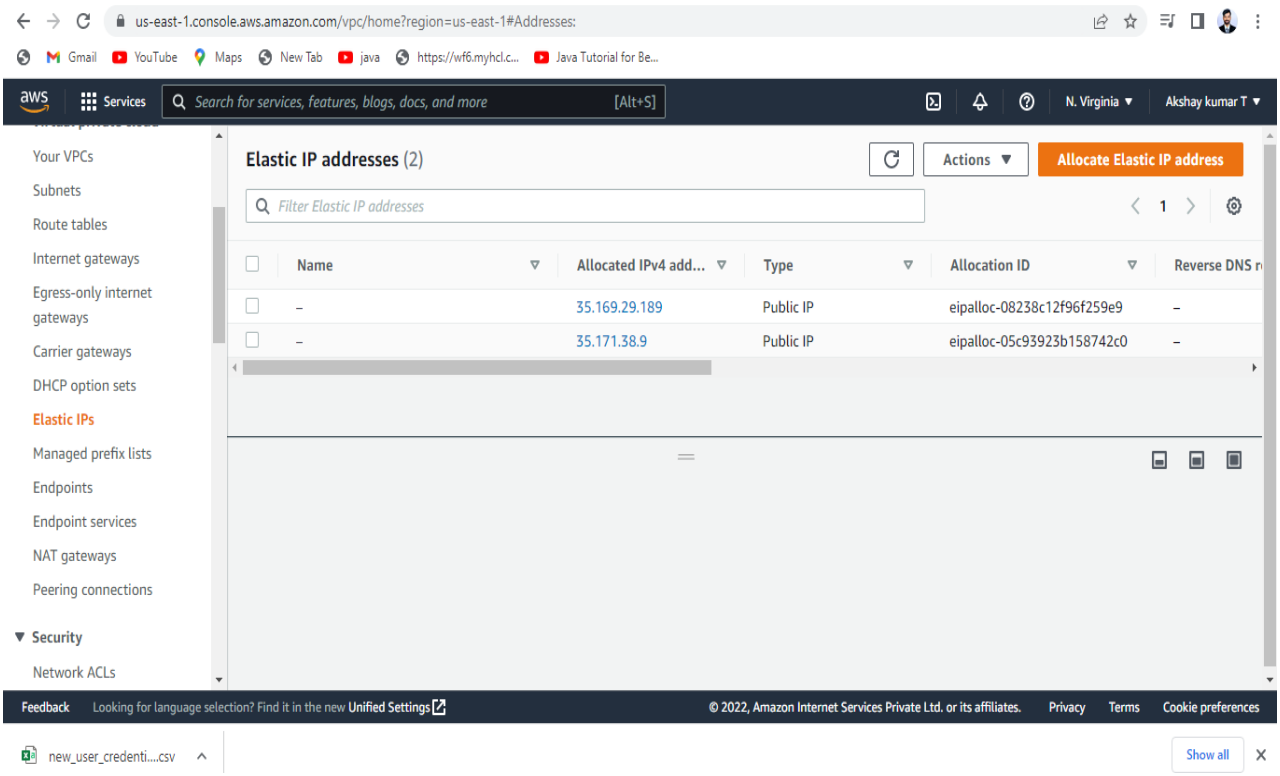
- Validate own VPC created as per the Terraform script as shown above



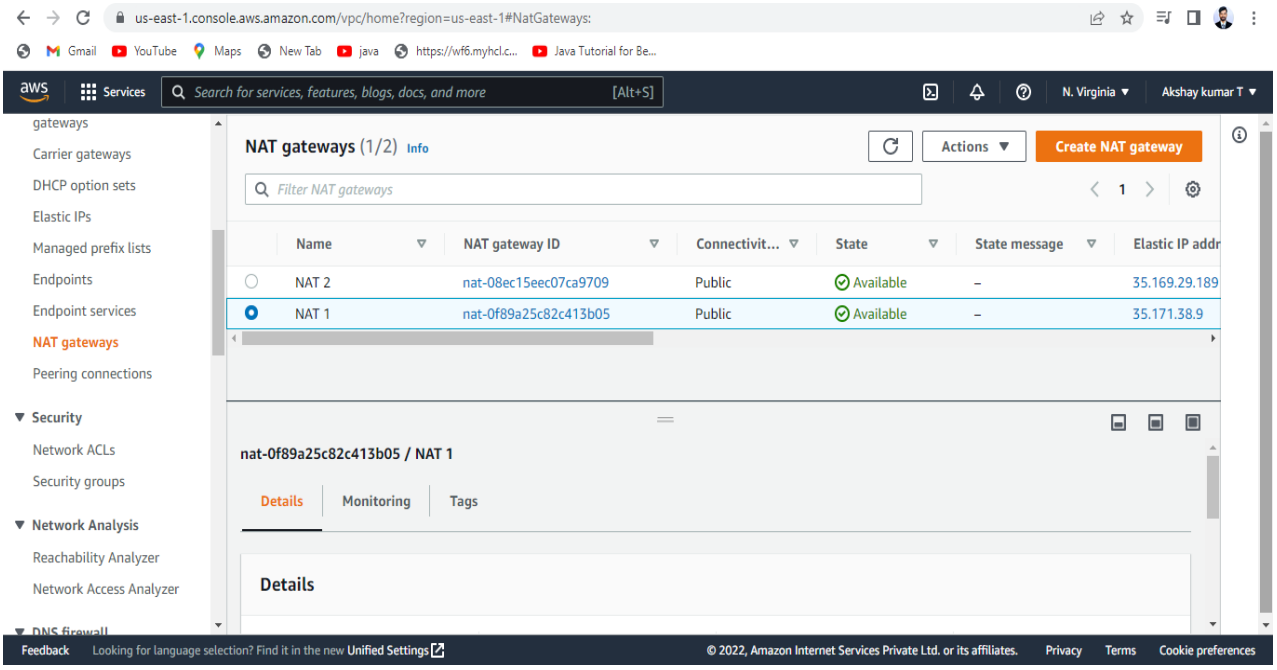
- Validate IGW (Internet Gate Way) created as per the Terraform script as shown above



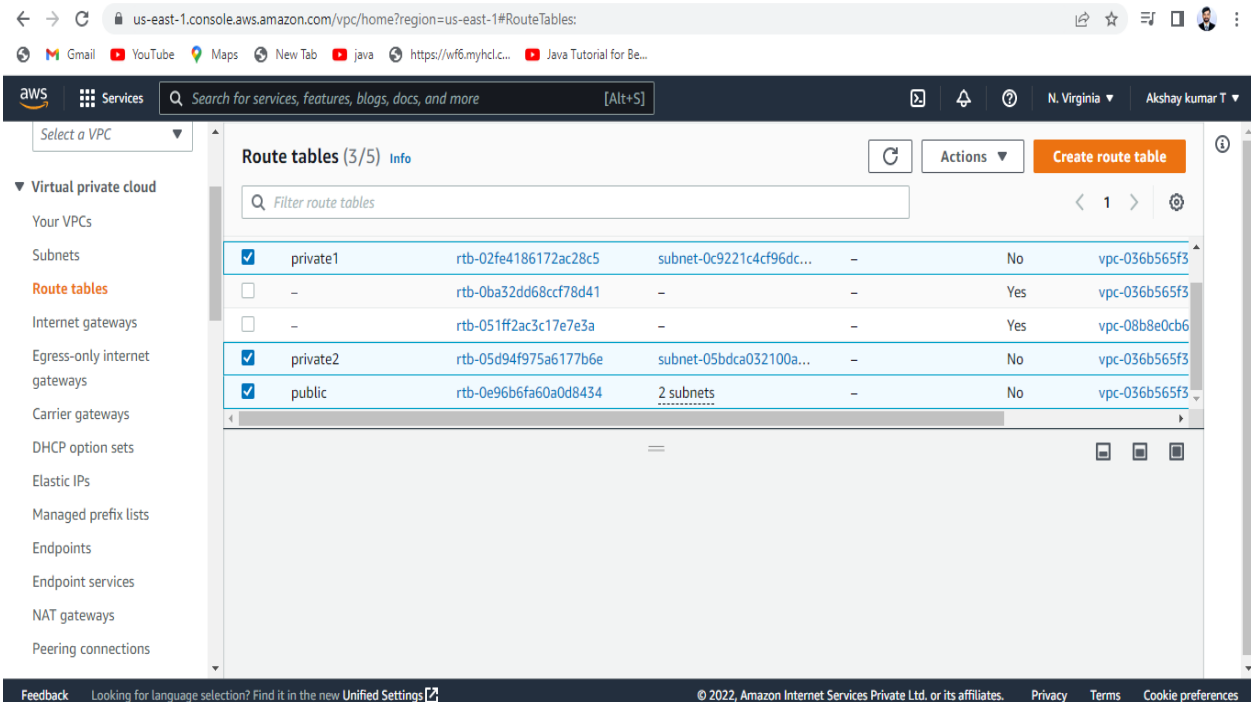
- Validate Subnets created as per the Terraform script as shown above.



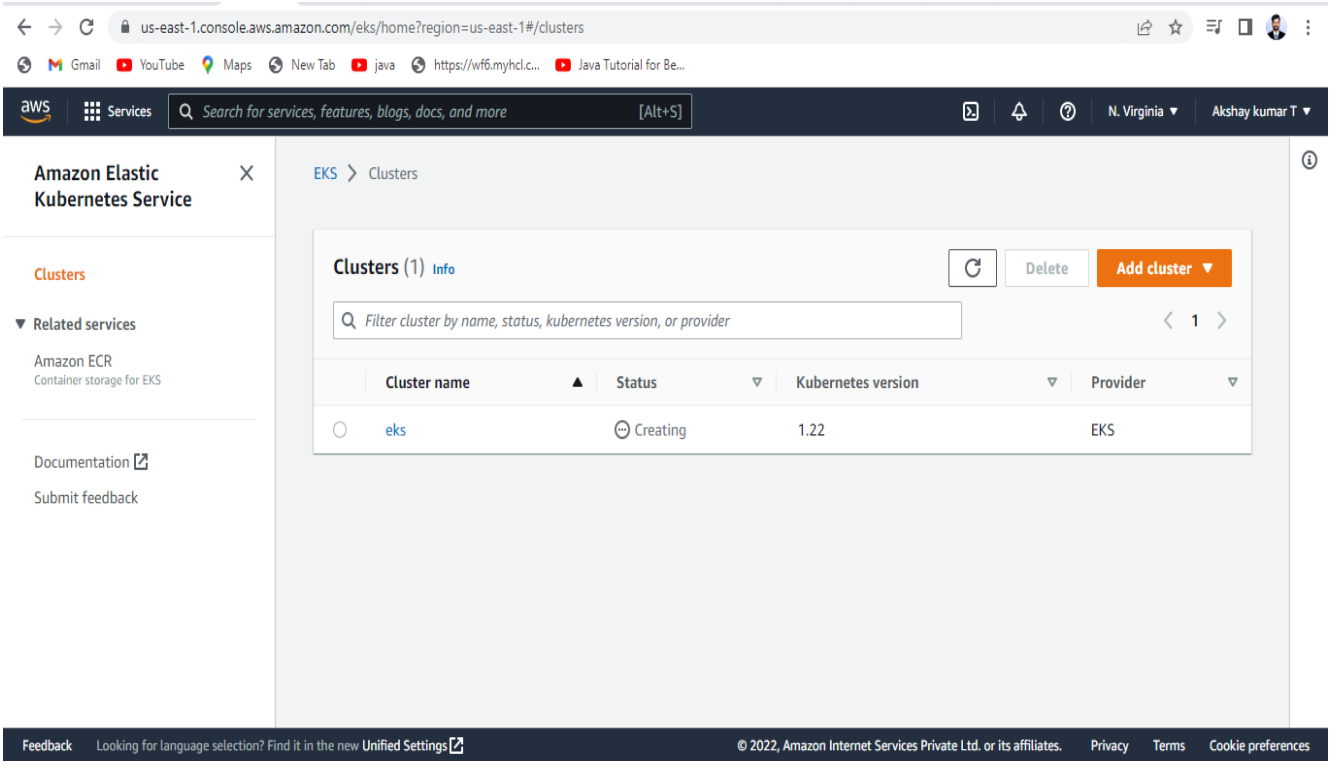
- Validate Elastic IP's created as per the Terraform Script as shown above.



- Validate NAT Gateways created as per the Terraform Script as shown above.



- Validate the Routing Tables as per the Terraform script as shown above.



- Validate the EKS Cluster as per the Terraform Script as shown above.