**Course End Project** - **Automating Infrastructure using Terraform**

**Problem Statement:**

**Use Terraform to build a virtual machine and install other required automation tools in it.**

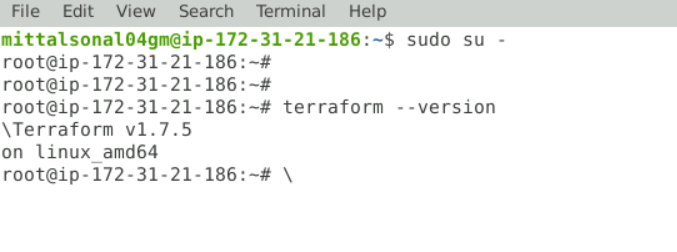
* Launch an EC2 instance using Terraform
* Connect to the instance
* Install Jenkins, Java and Python in the instance

**Tools required:** Terraform, AWS account with security credentials, Keypair

**Solution:**

**Step 1: Terraform Core is installed on the Lab VM:**

**# terraform --version**

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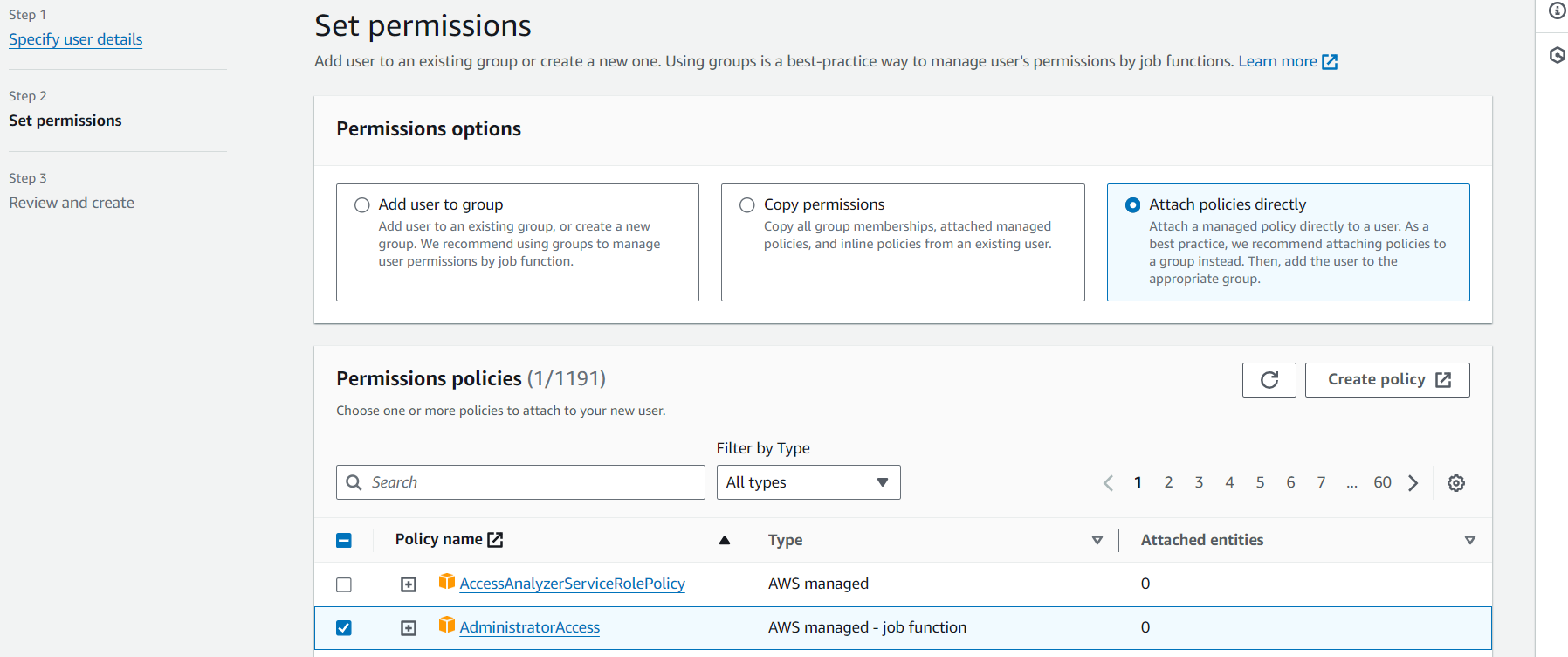
**Step 2: Create AWS user and security credentials:**

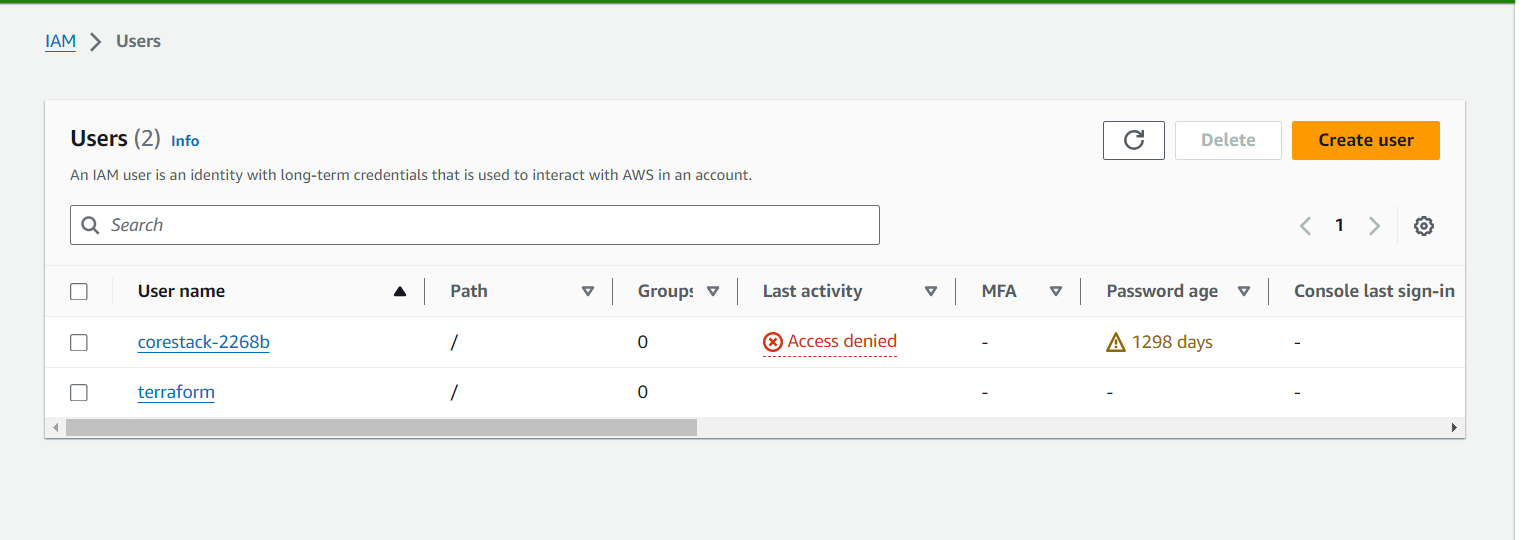
**In the search box, give IAM and select it.**

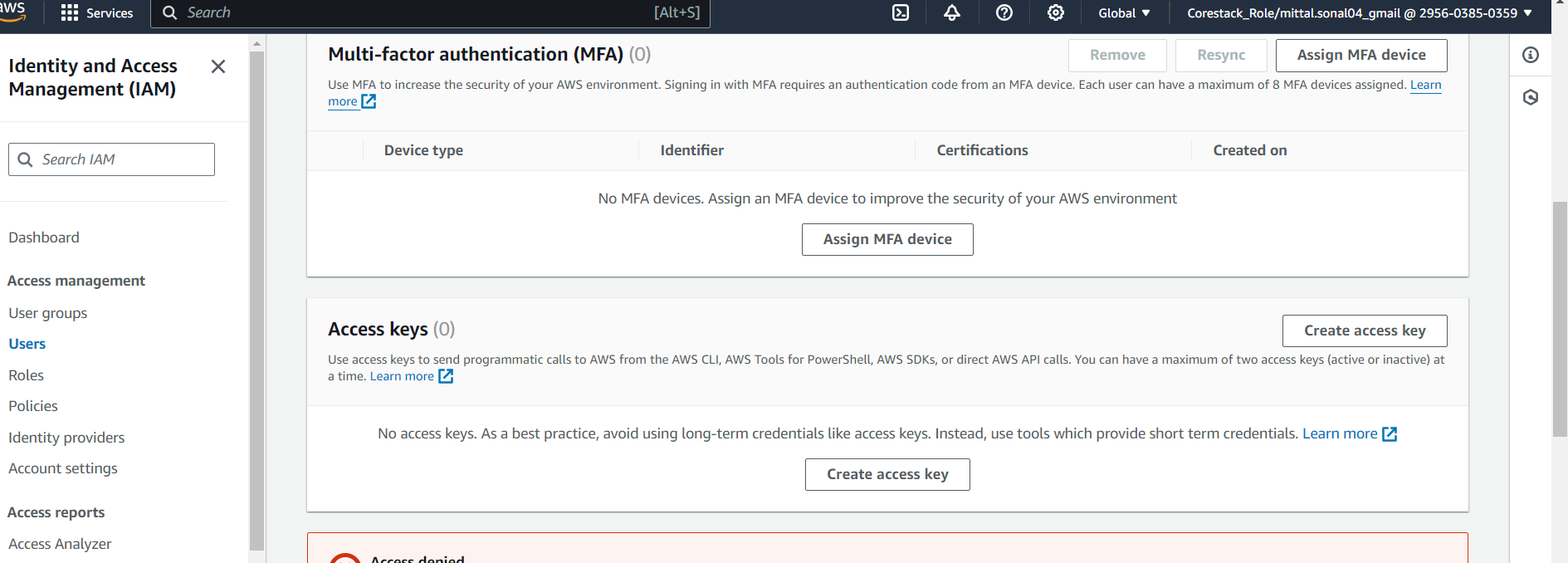
**You will be on IAM dashboard**

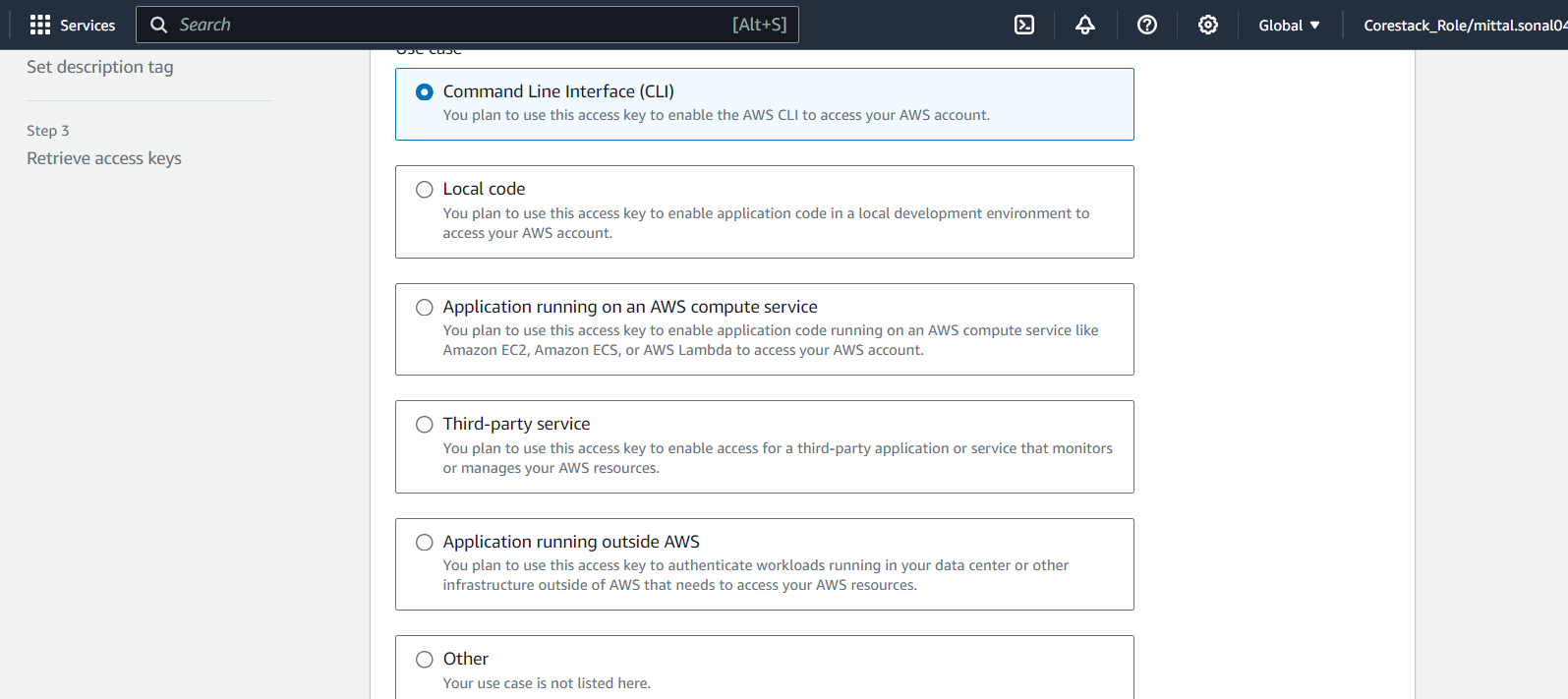
**On the left side→ click on Users→ Click on ADD user button →under user details give User name as Terraform → click on next →select 3rd option Attach policies directly →scroll down and from list click on AdministratorAccess →Scroll down → click next → scroll down and click on Create User.**

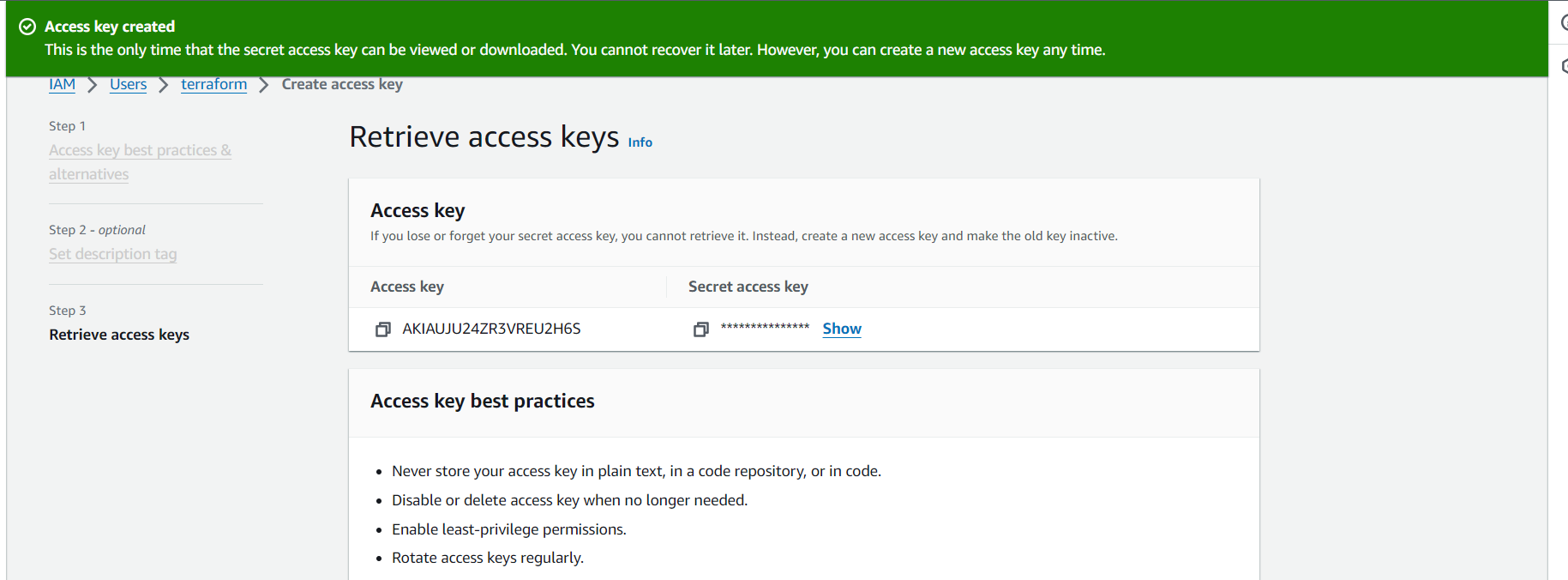
**Click on the user name Terraform →Click on security credentials tab→ scroll down to access key→ click on create access key→Click on Command Line Interface (CLI) → Scroll down→Select the box of→ I understand the above recommendation and want to proceed to create an access key. → click on next → click on create access key**

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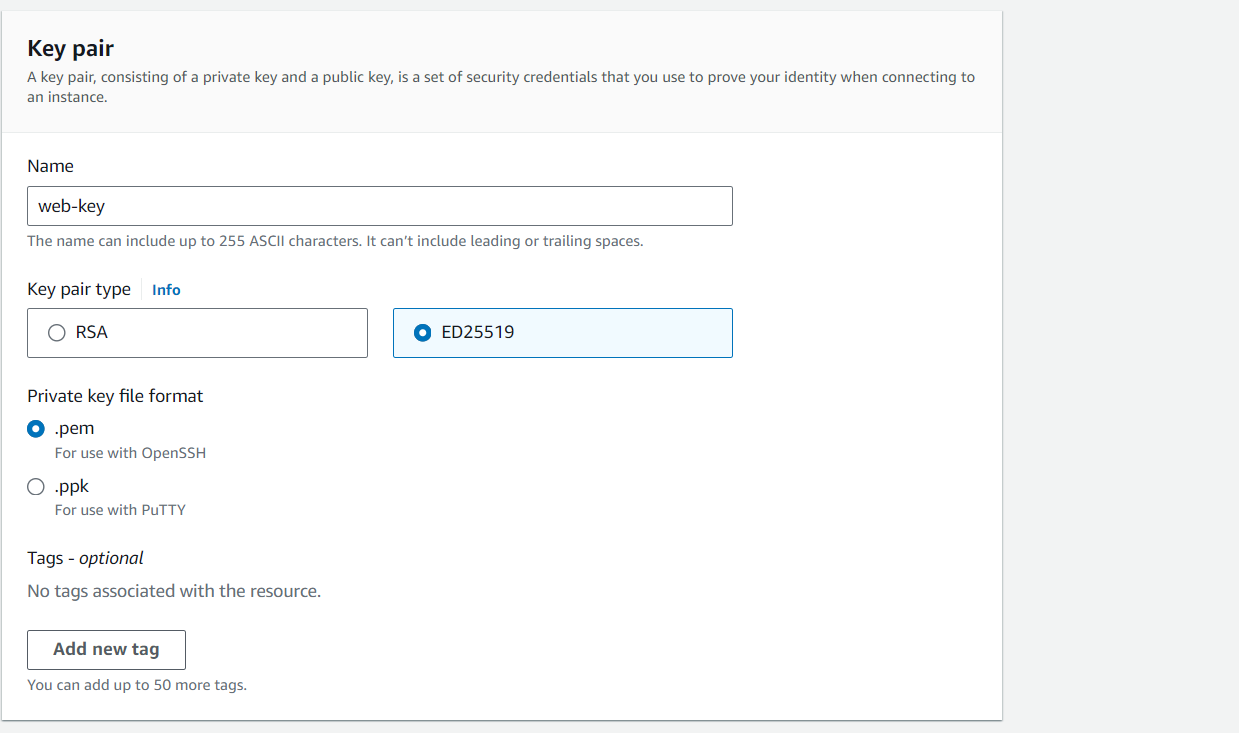
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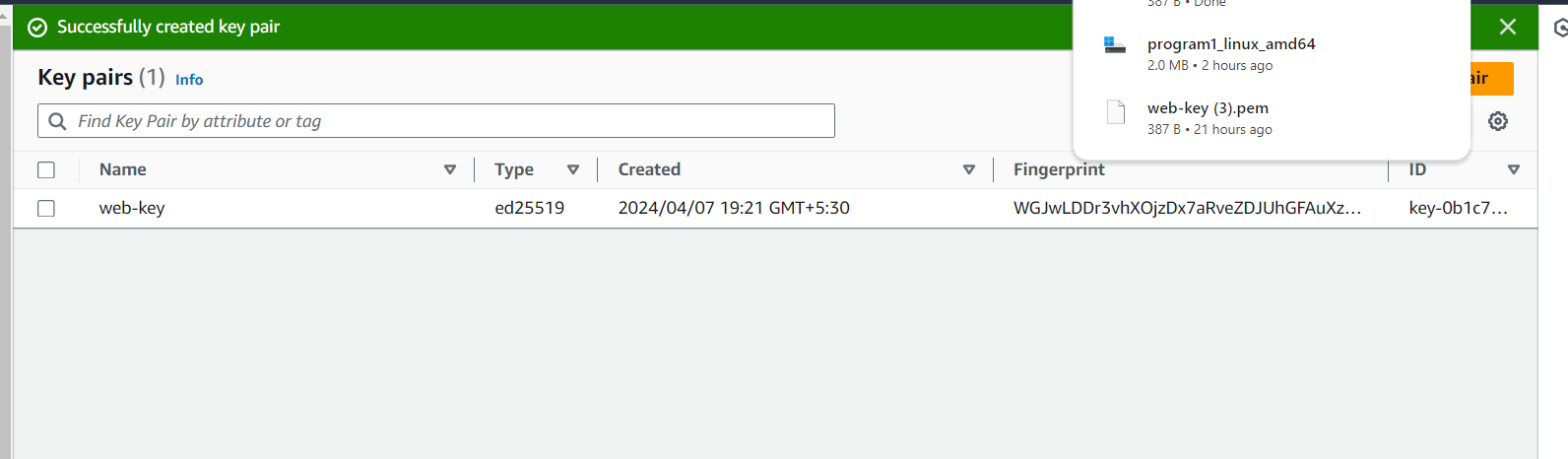
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**Step 4: Create a key pair in AWS, we will use this keypair to connect to the ec2 instance**

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**Step 5: Prepare the terraform configuration file with provider and resource blocks**

**In the configuration file , we will use:**

* **Provider : aws**
* **Resource: security\_group**
* **Resource: aws\_instance**
* **Resource: aws\_network\_interface\_sg\_attachment**

**Final code:**

**provider "aws" {**

**region = "us-east-1"**

**access\_key = "AKIAUJU24ZR3VREU2H6S"**

**secret\_key = "EpHfOKGkvRd1WcmPD/SLA+OgUgvknWDPQU1vL7M"**

**}**

**resource "aws\_security\_group" "mysg" {**

**name        = "mysg"**

**description = "Allow inbound SSH"**

**ingress {**

**from\_port        = 22**

**to\_port          = 22**

**protocol         = "tcp"**

**cidr\_blocks      = ["0.0.0.0/0"]**

**ipv6\_cidr\_blocks = ["::/0"]**

**}**

**ingress {**

**description = "HTTP"**

**from\_port   = 8080**

**to\_port     = 8080**

**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"]**

**}**

**}**

**resource "aws\_instance" "myec2" {**

**ami = "ami-0a699202e5027c10d"**

**instance\_type = "t2.micro"**

**key\_name = "web-key"**

**tags = {**

**Name = "instance-1"**

**}**

**user\_data = <<-EOF**

**#!/bin/bash**

**sudo yum install git -y**

**sudo amazon-linux-extras install java-openjdk11 -y**

**sudo wget -O /etc/yum.repos.d/jenkins.repo** [**https://pkg.jenkins.io/redhat-stable/jenkins.repo**](https://pkg.jenkins.io/redhat-stable/jenkins.repo)

**sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key**

**sudo yum install jenkins -y**

**sudo systemctl start jenkins**

**sudo yum install python3 -y**

**EOF**

**}**

**resource "aws\_network\_interface\_sg\_attachment" "sg\_attachment1" {**

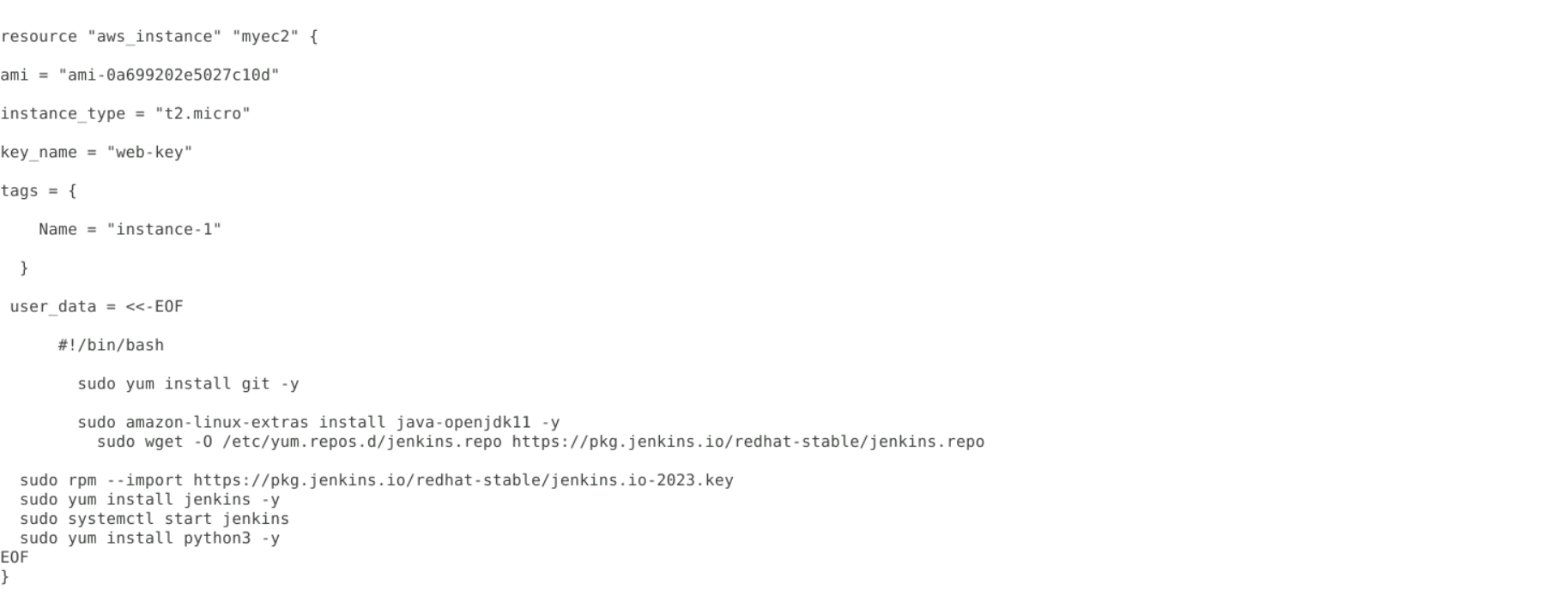
**security\_group\_id = aws\_security\_group.mysg.id**

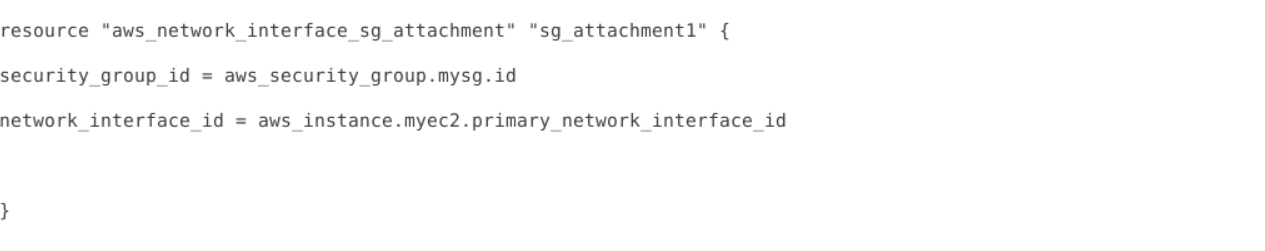
**network\_interface\_id = aws\_instance.myec2.primary\_network\_interface\_id**

**}**

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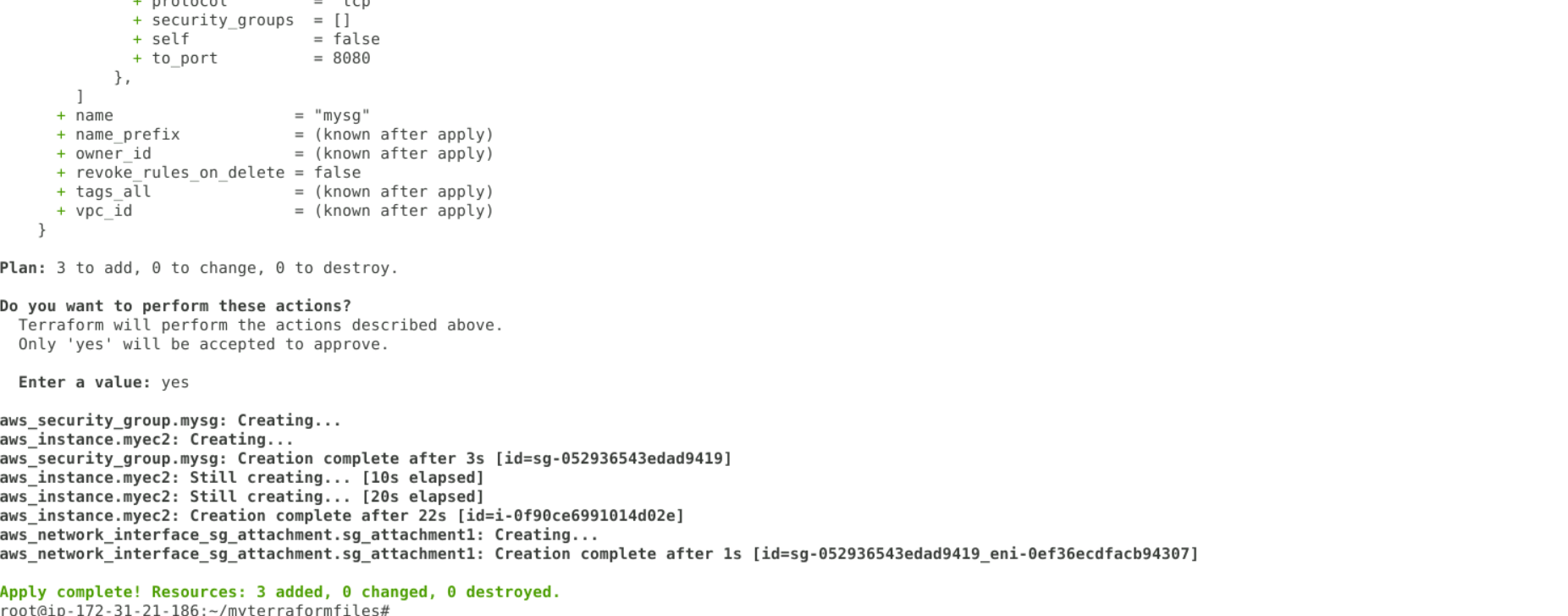
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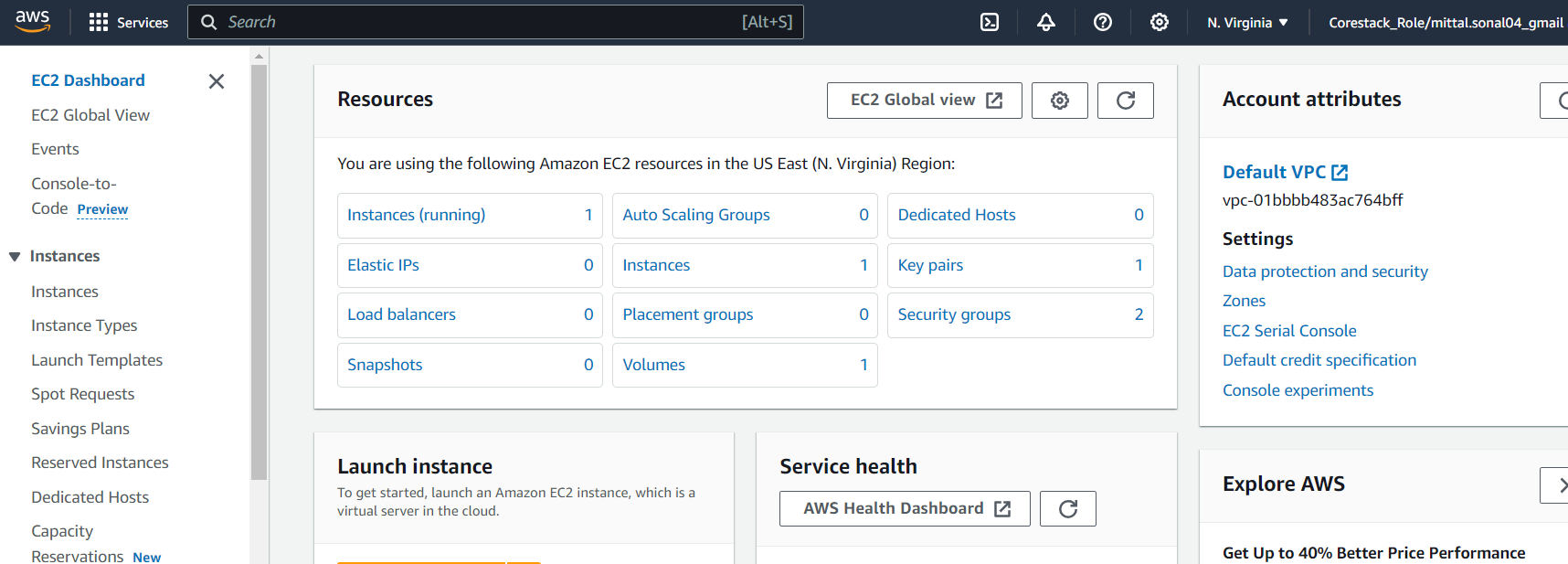
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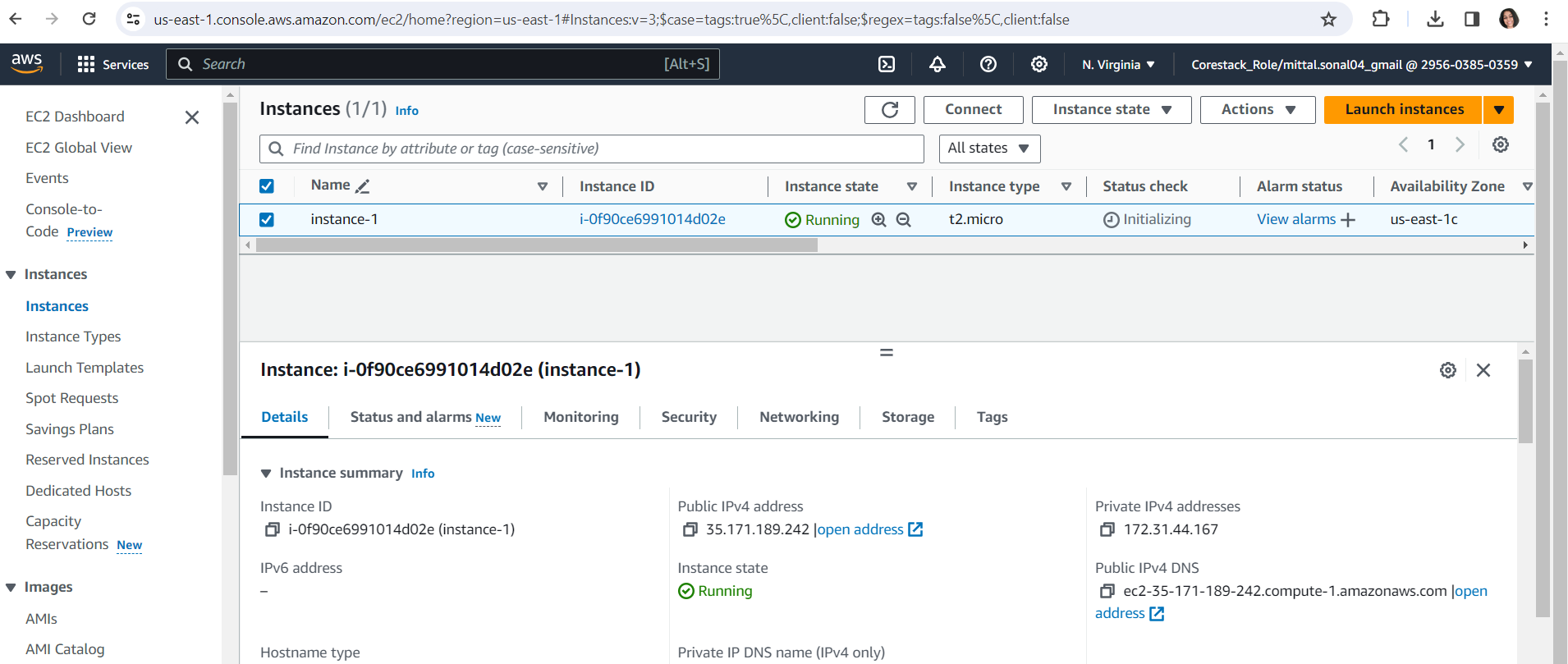
**Step 7: Execute the terraform configuration**

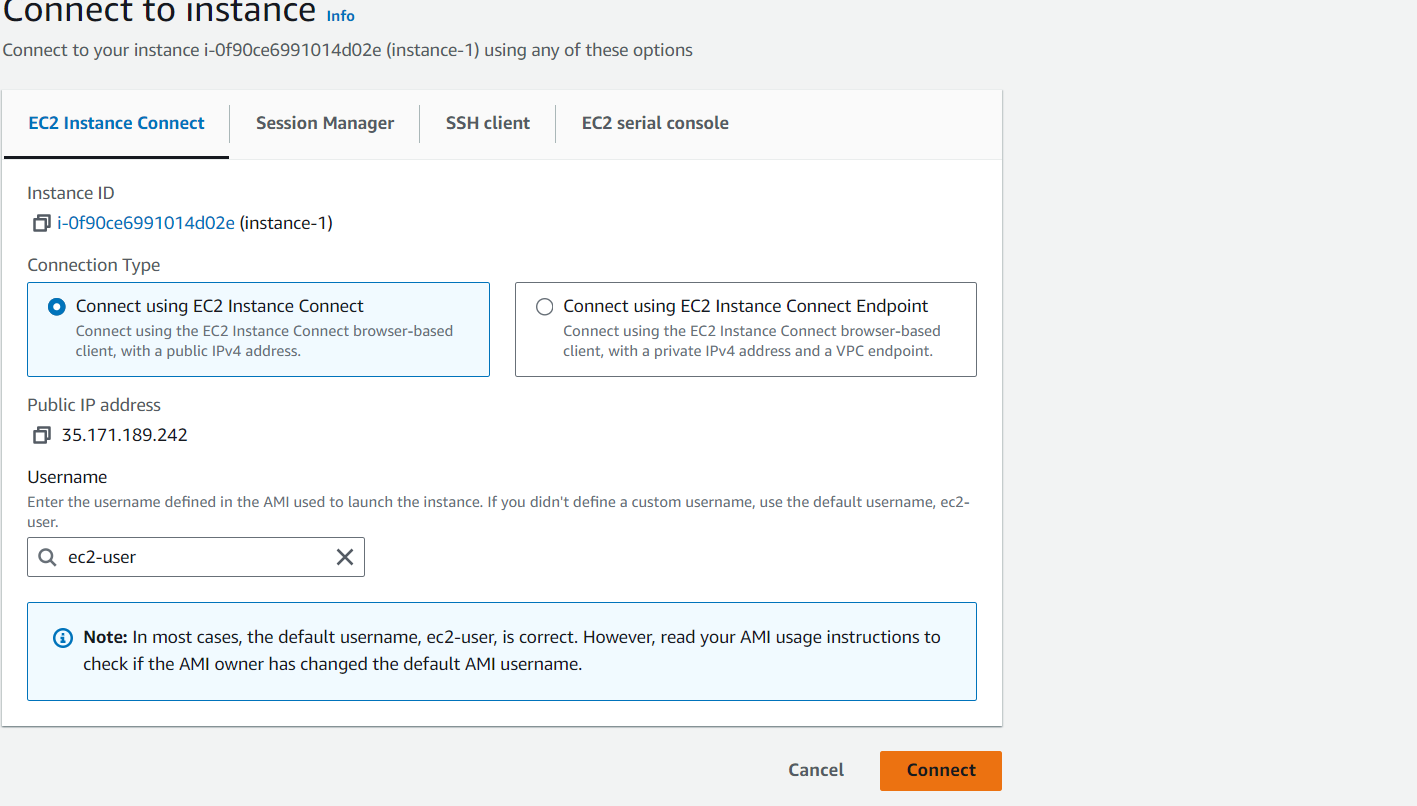
**# terraform apply**

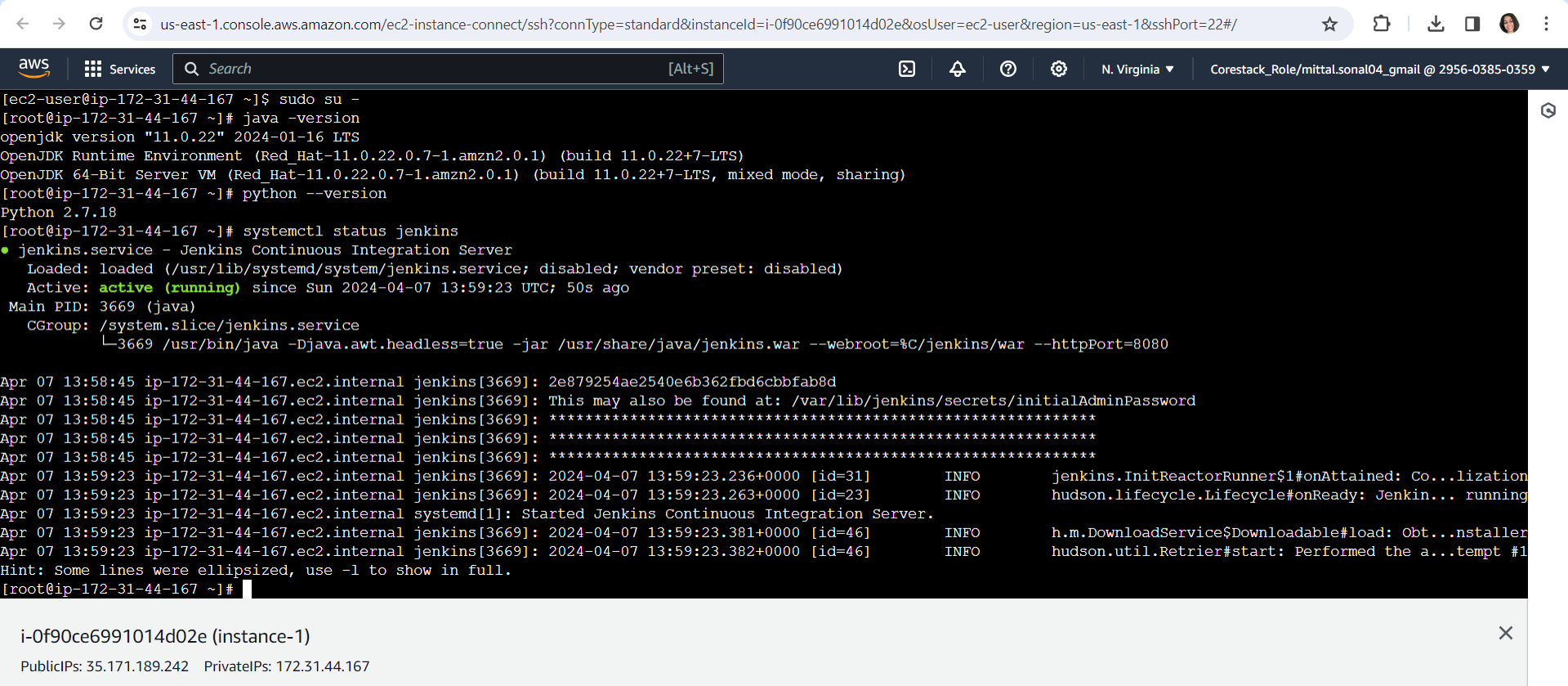
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**Step 8: Validate and check if the tools have been installed on the VM or not.**

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**Completed the project**