Name: Sadaf Riaz

Roll no: 2023-BSE-077

Class: BSE5-B

Lab Exam

```
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $ aws iam create-group --group-name SoftwareEngineering
{
    "Group": {
        "Path": "/",
        "GroupName": "SoftwareEngineering",
        "GroupId": "AGPAV4QTXR5S2GC7SEZYO",
        "Arn": "arn:aws:iam::404842057573:group/SoftwareEngineering",
        "CreateDate": "2026-01-19T07:35:36+00:00"
    }
}
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $
```

```
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $ aws iam get-group --group-name SoftwareEngineering
{
    "Users": [],
    "Group": {
        "Path": "/",
        "GroupName": "SoftwareEngineering",
        "GroupId": "AGPAV4QTXR5S2GC7SEZYO",
        "Arn": "arn:aws:iam::404842057573:group/SoftwareEngineering",
        "CreateDate": "2026-01-19T07:35:36+00:00"
    }
}
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $
```

```
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $ aws iam create-user --user-name Sadaf
{
    "User": {
        "Path": "/",
        "UserName": "Sadaf",
        "UserId": "AIDAV4QTXR5SRNQRWQZFO",
        "Arn": "arn:aws:iam::404842057573:user/Sadaf",
        "CreateDate": "2026-01-19T07:36:51+00:00"
    }
}
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $
```

```
@SadafRiaz077 →/workspaces/Lab_exam (main) $ aws iam get-user --user-name Sadaf
{
    "User": {
        "Path": "/",
        "UserName": "Sadaf",
        "UserId": "AIDAV4QTXR5SRNQRWQZFO",
        "Arn": "arn:aws:iam::404842057573:user/Sadaf",
        "CreateDate": "2026-01-19T07:36:51+00:00"
    }
}
@SadafRiaz077 →/workspaces/Lab_exam (main) $
```

```
@SadafRiaz077 →/workspaces/Lab_exam (main) $ aws iam add-user-to-group \
--user-name Sadaf \
--group-name SoftwareEngineering
@SadafRiaz077 →/workspaces/Lab_exam (main) $
```

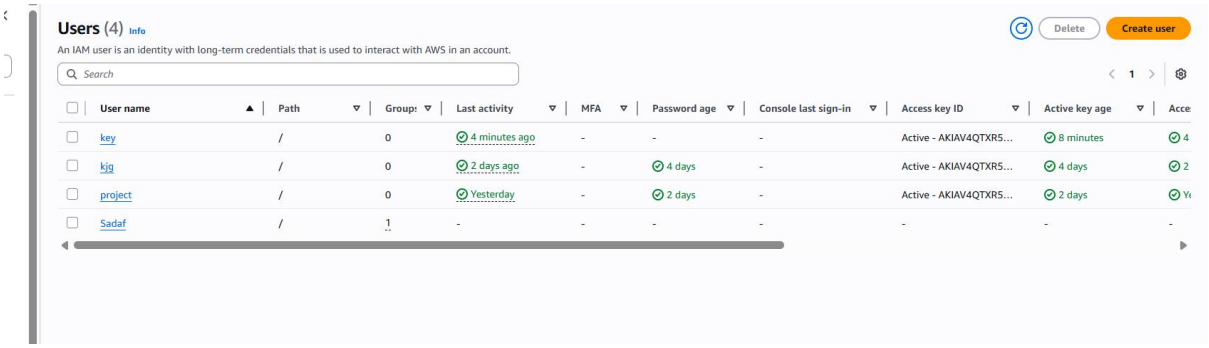
```
@SadafRiaz077 →/workspaces/Lab_exam (main) $ aws iam get-group --group-name SoftwareEngineering
{
    "Users": [
        {
            "Path": "/",
            "UserName": "Sadaf",
            "UserId": "AIDAV4QTXR5SRNQRWQZFO",
            "Arn": "arn:aws:iam::404842057573:user/Sadaf",
            "CreateDate": "2026-01-19T07:36:51+00:00"
        }
    ],
    "Group": {
        "Path": "/",
        "GroupName": "SoftwareEngineering",
        "GroupId": "AGPAV4QTXR5S2GC7SEZYO",
        "Arn": "arn:aws:iam::404842057573:group/SoftwareEngineering",
        "CreateDate": "2026-01-19T07:35:36+00:00"
    }
}
@SadafRiaz077 →/workspaces/Lab_exam (main) $
```

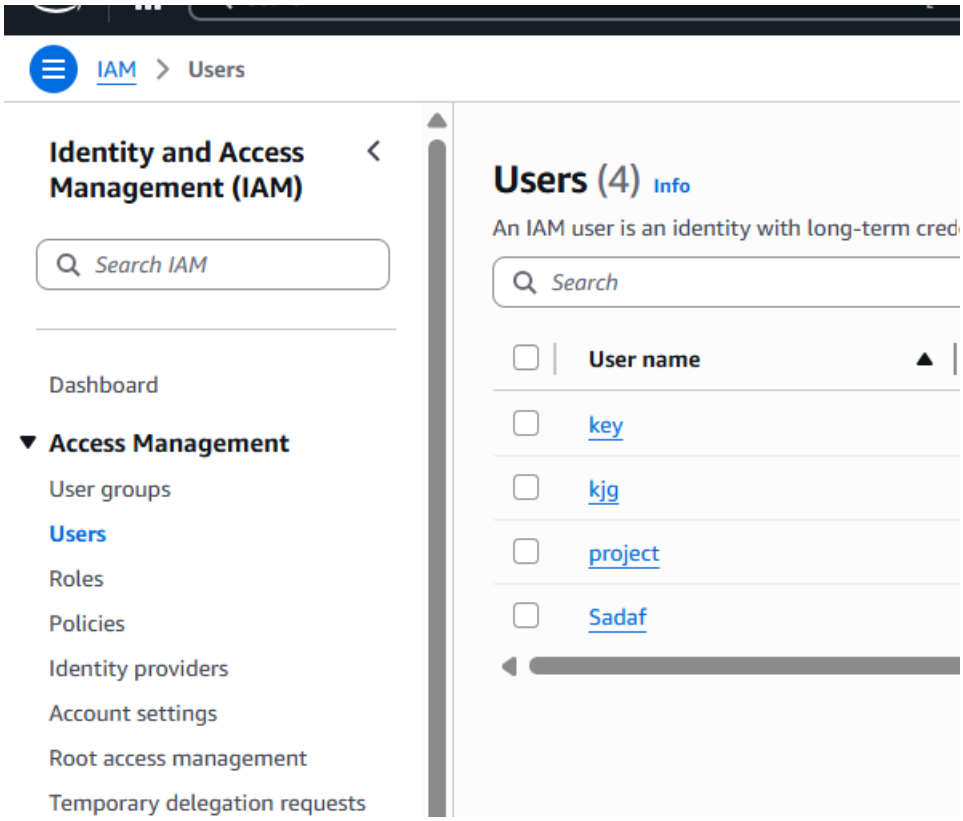
```
@SadafRiaz077 →/workspaces/Lab_exam (main) $ aws iam list-policies --scope AWS --query "Policies[?PolicyName=='Administ
ratorAccess']"
[
    {
        "PolicyName": "AdministratorAccess",
        "PolicyId": "ANPAIWMBCKSKIEE64ZLYK",
        "Arn": "arn:aws:iam::aws:policy/AdministratorAccess",
        "Path": "/",
        "DefaultVersionId": "v1",
        "AttachmentCount": 3,
        "PermissionsBoundaryUsageCount": 0,
        "IsAttachable": true,
        "CreateDate": "2015-02-06T18:39:46+00:00",
        "UpdateDate": "2015-02-06T18:39:46+00:00"
    }
]
@SadafRiaz077 →/workspaces/Lab_exam (main) $
```

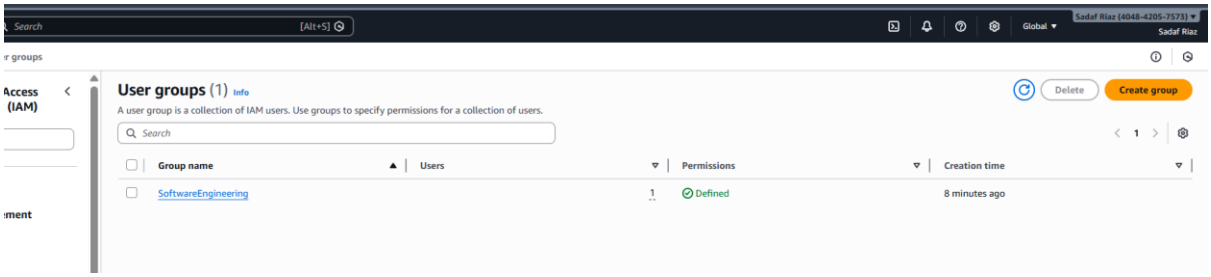
```
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $ aws iam attach-group-policy \
 --group-name SoftwareEngineering \
 --policy-arn arn:aws:iam::aws:policy/AdministratorAccess
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $
```

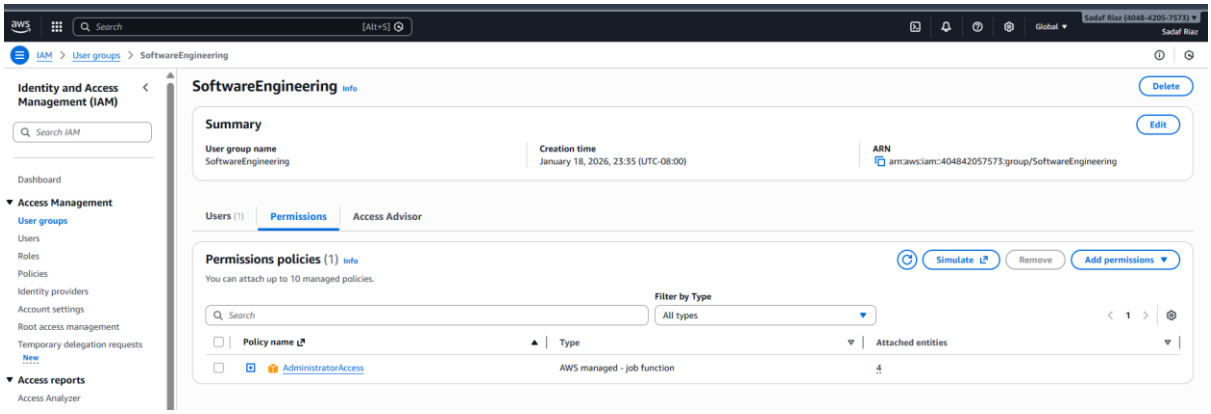
```
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $ aws iam list-attached-group-policies \
 --group-name SoftwareEngineering
{
    "AttachedPolicies": [
        {
            "PolicyName": "AdministratorAccess",
            "PolicyArn": "arn:aws:iam::aws:policy/AdministratorAccess"
        }
    ]
}
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $
```

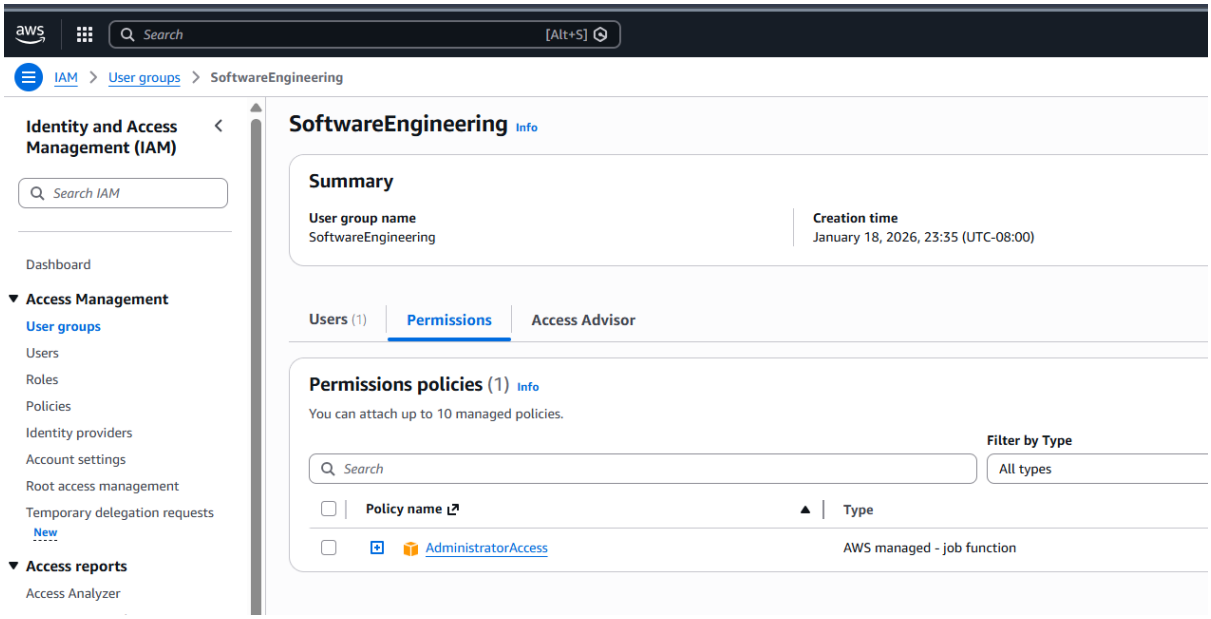
Aws






User groups (1) Info
A user group is a collection of IAM users. Use groups to specify permissions for a collection of users.
Delete
Create group
Group name
Users
Permissions
Creation time
SoftwareEngineering
1
Defined
8 minutes ago


IAM > User groups > SoftwareEngineering
Identity and Access Management (IAM)
SoftwareEngineering Info
Delete
Summary
Edit
User group name
SoftwareEngineering
Creation time
January 18, 2026, 23:35 (UTC-08:00)
ARN
arn:aws:iam::404842057573:group/SoftwareEngineering
Users (1)
Permissions
Access Advisor
Permissions policies (1) Info
You can attach up to 10 managed policies.
Simulate
Remove
Add permissions
Filter by Type
All types
Policy name
Type
Attached entities
AdministratorAccess
AWS managed - job function
4


IAM > User groups > SoftwareEngineering
Identity and Access Management (IAM)
Search IAM
Dashboard
Access Management
User groups
Users
Roles
Policies
Identity providers
Account settings
Root access management
Temporary delegation requests
New
Access reports
Access Analyzer
SoftwareEngineering Info
Summary
User group name
SoftwareEngineering
Creation time
January 18, 2026, 23:35 (UTC-08:00)
Users (1)
Permissions
Access Advisor
Permissions policies (1) Info
You can attach up to 10 managed policies.
Filter by Type
All types
Policy name
Type
AdministratorAccess
AWS managed - job function

Q 2

```
@SadafRiaz077 ➜/workspaces/Lab_exam (main) $ mkdir q2-terraform
cd q2-terraform

touch main.tf
touch variables.tf
touch terraform.tfvars
touch outputs.tf
touch entry-script.sh
@SadafRiaz077 ➜/workspaces/Lab_exam/q2-terraform (main) $
```

Variables.tf

```
@SadafRiaz077 ➜/workspaces/Lab_exam/q2-terraform (main) $ nano variables.tf
@SadafRiaz077 ➜/workspaces/Lab_exam/q2-terraform (main) $ cat variables.tf
variable "vpc_cidr_block" {
  type = string
}

variable "subnet_cidr_block" {
  type = string
}

variable "availability_zone" {
  type = string
}

variable "env_prefix" {
  type = string
}

variable "instance_type" {
  type = string
}


@SadafRiaz077 ➜/workspaces/Lab_exam/q2-terraform (main) $
```

Main.tf

Ec2, route table,subnet

```
@SadafRiaz077 →/workspaces/Lab_exam/q2-terraform (main) $ cat main.tf

provider "aws" {
  region  = "me-central-1"
  profile = "default"
}


resource "aws_vpc" "myapp_vpc" {
  cidr_block = var.vpc_cidr_block

  tags = {
    Name = "${var.env_prefix}-vpc"
  }
}

resource "aws_subnet" "myapp_subnet" {
  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" "myapp_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"
  }
```

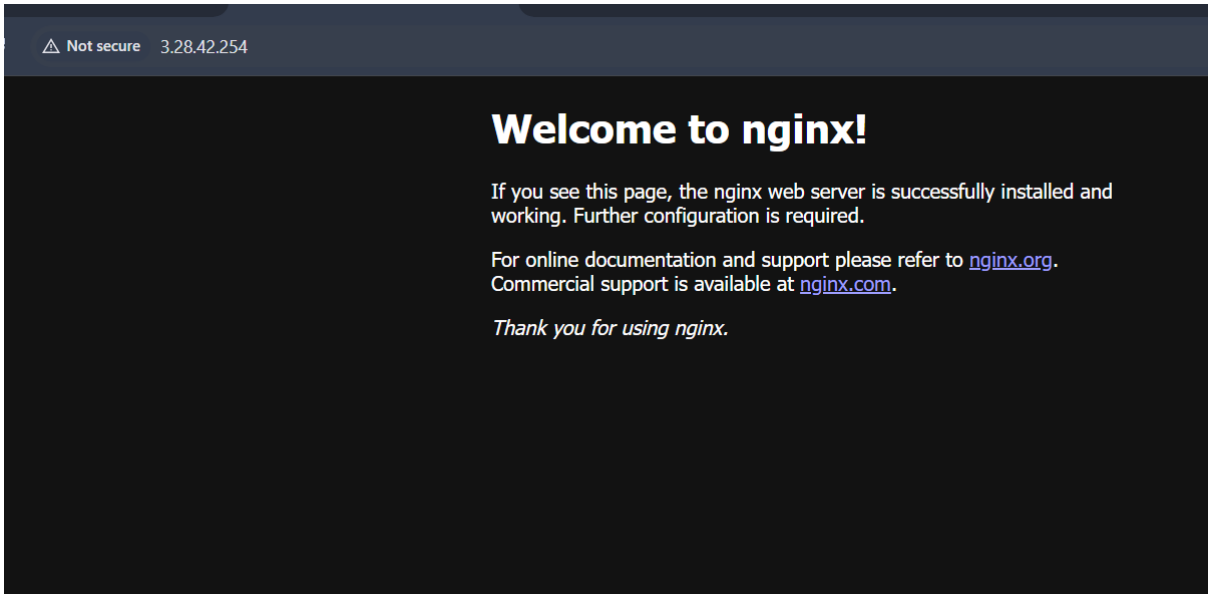
```
resource "aws_default_security_group" "default_sg" {
  vpc_id = aws_vpc.myapp_vpc.id

  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" "serverkey" {
```

```
resource "aws_instance" "myapp_ec2" {
  ami                         = data.aws_ami.amazon_linux2.id
  instance_type               = var.instance_type
  subnet_id                   = aws_subnet.myapp_subnet.id
  availability_zone           = var.availability_zone
  vpc_security_group_ids      = [aws_default_security_group.default_sg.id]
  associate_public_ip_address = true
  key_name                    = aws_key_pair.serverkey.key_name
  user_data                   = file("entry-script.sh")

  tags = {
    Name = "${var.env_prefix}-ec2-instance"
  }
}
```

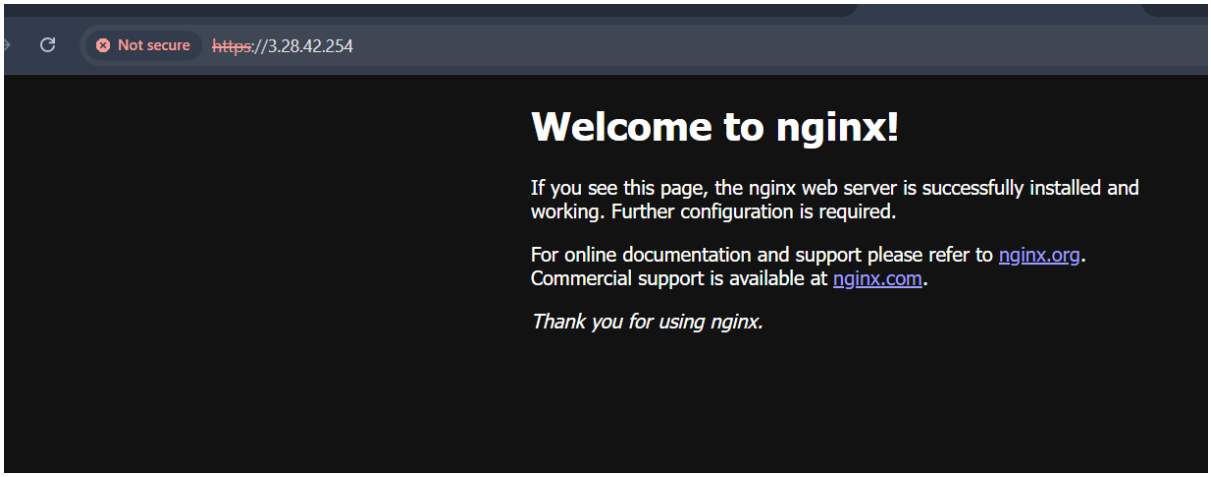
```
@SadafRiaz077 →/workspaces/Lab_exam/q2-terraform (main) $ terraform init
Initializing the backend...
Initializing provider plugins...
- Reusing previous version of hashicorp/http from the dependency lock file
- Reusing previous version of hashicorp/aws from the dependency lock file
- Using previously-installed hashicorp/http v3.5.0
- Using previously-installed hashicorp/aws v6.28.0

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.
```

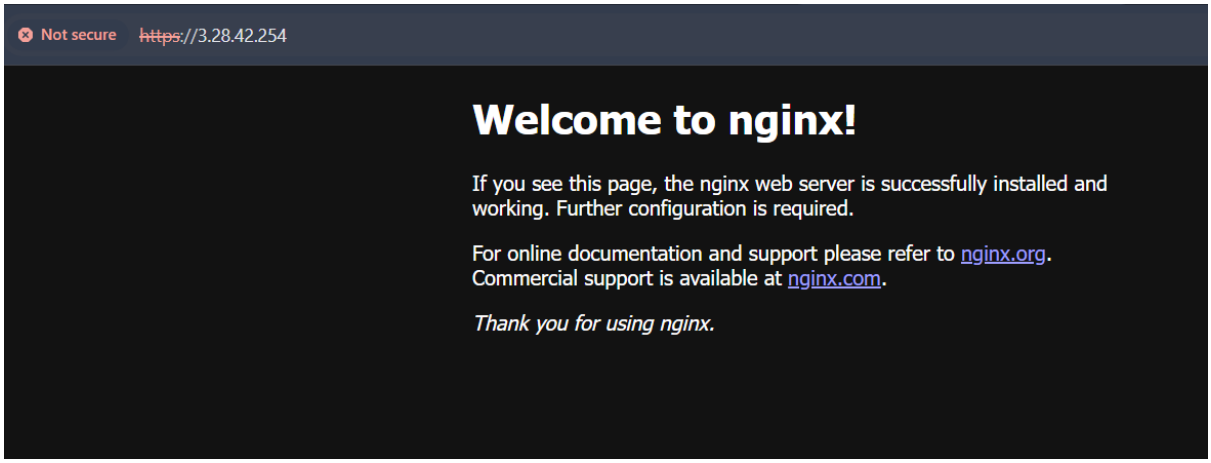
```
@SadafRiaz077 →/workspaces/Lab_exam/q2-terraform (main) $ terraform apply -auto-approve
data.http.my_ip: Reading...
data.http.my_ip: Read complete after 1s [id=https://icanhazip.com]
aws_key_pair.serverkey: Refreshing state... [id=serverkey]
data.aws_ami.amazon_linux2: Reading...
aws_vpc.myapp_vpc: Refreshing state... [id=vpc-0b99b091aee313055]
data.aws_ami.amazon_linux2: Read complete after 1s [id=ami-057e2bc910cc38f26]
aws_subnet.myapp_subnet: Refreshing state... [id=subnet-0f5490d28c070f027]
aws_internet_gateway.myapp_igw: Refreshing state... [id=igw-0bd54eae6a10dc2bb]
aws_default_security_group.default_sg: Refreshing state... [id=sg-082c25e7aec0723fb]
aws_default_route_table.myapp_rt: Refreshing state... [id=rtb-04a70a64e7063bcff]
aws_instance.myapp_ec2: Refreshing state... [id=i-0a4315feba50cfa21]

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.

Outputs:

ec2_public_ip = "3.28.42.254"
@SadafRiaz077 →/workspaces/Lab_exam/q2-terraform (main) $ ssh -i ~/.ssh/id_ed25519 ec2-user@3.28.42.254
```

```
@SadafRiaz077 →/workspaces/Lab_exam/q2-terraform (main) $ ssh -i ~/.ssh/id_ed25519 ec2-user@3.28.42.254
Last login: Mon Jan 19 08:24:54 2026 from 20.192.21.54
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2026-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-10-0-10-171 ~]$
```

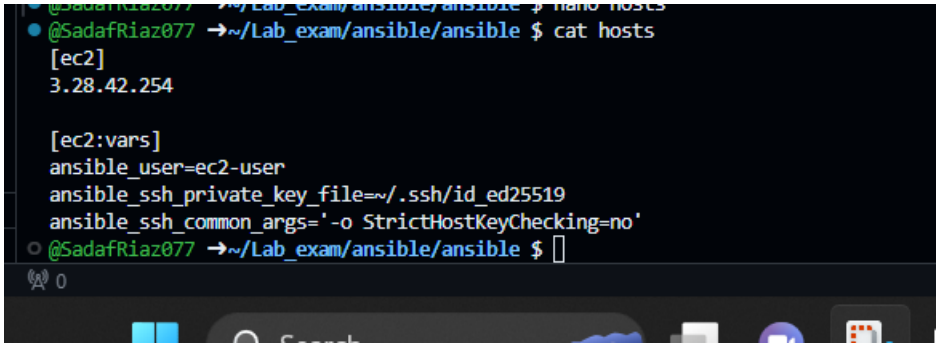


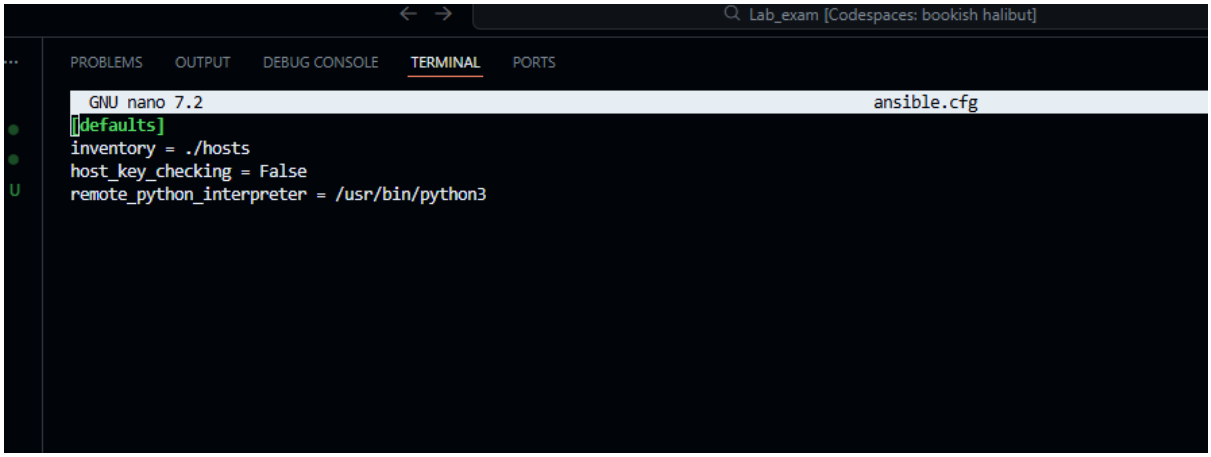
Convert to https

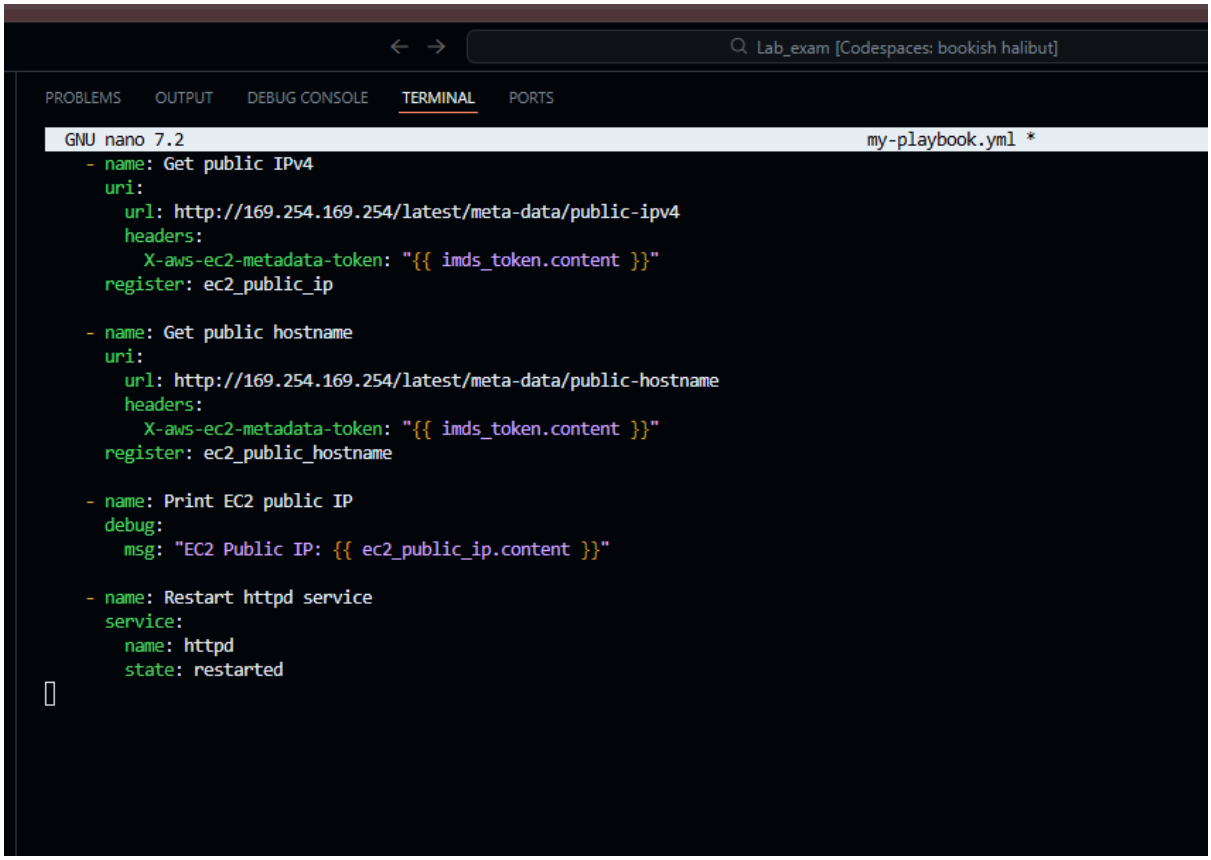

Not secure
https://3.28.42.254
Welcome to nginx!
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.
Thank you for using nginx.


Not secure
https://3.28.42.254
Welcome to nginx!
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.
Thank you for using nginx.

Question3


@SadafRiaz077 →~/Lab_exam/ansible/ansible $ cat hosts
[ec2]
3.28.42.254
[ec2:vars]
ansible_user=ec2-user
ansible_ssh_private_key_file=~/.ssh/id_ed25519
ansible_ssh_common_args='-o StrictHostKeyChecking=no'
@SadafRiaz077 →~/Lab_exam/ansible/ansible $


Lab_exam [Codespaces: bookish halibut]
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
GNU nano 7.2
ansible.cfg
[defaults]
inventory = ./hosts
host_key_checking = False
remote_python_interpreter = /usr/bin/python3


Lab_exam [Codespaces: bookish halibut]
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
GNU nano 7.2
my-playbook.yml *
- name: Get public IPv4
uri:
url: http://169.254.169.254/latest/meta-data/public-ipv4
headers:
X-aws-ec2-metadata-token: "{{ imds_token.content }}"
register: ec2_public_ip
- name: Get public hostname
uri:
url: http://169.254.169.254/latest/meta-data/public-hostname
headers:
X-aws-ec2-metadata-token: "{{ imds_token.content }}"
register: ec2_public_hostname
- name: Print EC2 public IP
debug:
msg: "EC2 Public IP: {{ ec2_public_ip.content }}"
- name: Restart httpd service
service:
name: httpd
state: restarted


@SadafRiaz077 ➜~/Lab_exam/ansible/ansible $ ansible-playbook -i hosts my-playbook.yml
PLAY [Configure EC2 Web Server] **
TASK [Gathering Facts] ***
[WARNING]: Platform linux on host 3.28.42.254 is using the discovered Python interpreter at /usr/bin/python3.7, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.16/reference_appendices/interpreter_discovery.html for more information.
ok: [3.28.42.254]
TASK [Update system packages] **
ok: [3.28.42.254]
TASK [Stop and disable Nginx if installed] ***
fatal: [3.28.42.254]: FAILED! => {"changed": false, "msg": "Could not find the requested service nginx: host"}
...ignoring
TASK [Remove Nginx package if installed] ***
ok: [3.28.42.254]
TASK [Install httpd (Apache)] **
ok: [3.28.42.254]
TASK [Start and enable httpd service] **
ok: [3.28.42.254]
TASK [Get IMDSv2 token] **
ok: [3.28.42.254]
TASK [Get public IPv4] ***
fatal: [3.28.42.254]: FAILED! => {"msg": "The task includes an option with an undefined variable. The error was: 'dict object' has no attribute 'content'. 'dict object' has no attribute 'content'\n\nThe error appears to be in '/home/codespace/Lab_exam/ansible/ansible/my-playbook.yml': line 52, column 7, but may\nbe elsewhere in the file depending on the exact syntax problem.\n\nThe offending line appears to be:\n\n\n   - name: Get public IPv4\n   ^ here\n"}
PLAY RECAP ***
3.28.42.254 : ok=7 changed=0 unreachable=0 failed=1 skipped=0 rescued=0 ignored=1