D Y PATIL INTERNATIONAL UNIVERSITY
AKURDI PUNE

School of Computer Science, Engineering and Applications(SCSEA)
B.C.A. TY (CCSA)
Subject : Infrastructure Orchestration (P)

Name of the Student: **ABCDEF GHIJKL MNOPQR** **PRN: 20220801024**

Title of Practical : **YAML CloudFormation Template for AWS: Creating a VPC with Public and Private Subnets and Deploying EC2 Instances with SNS Integration**

NOTE:

1. DO THE NECESSARY CHANGES IN TEMPLATE (eg:AMI)
2. CREATE ROLE WITH SPECIFIC PERMISSIONS
3. CREATE KEYPAIR

Step 1: CREATE TEMPLATE(CAN USE NOTEPAD OR VSCODE)

components of template used are:

Description: [comments about your template.] For this practical , we are creating vpc
with both public and private subnet along with two ec2 instances for both public and private subnet using dynamic parameter.

Parameters: [used to provide custom or dynamic values to the stack during runtime.]
dynamic parameter used are: KeyPair, vpcCIDR, PublicSubnetCIDR, PrivateSubnetCIDR.

Resources: [specify the properties of AWS resources you want in your stack.] here
we mention all our resources such as vpc, ec2 instance.

Output: [defines the value which is generated as an output when you view your cloud formationstack properties.] public and private instances

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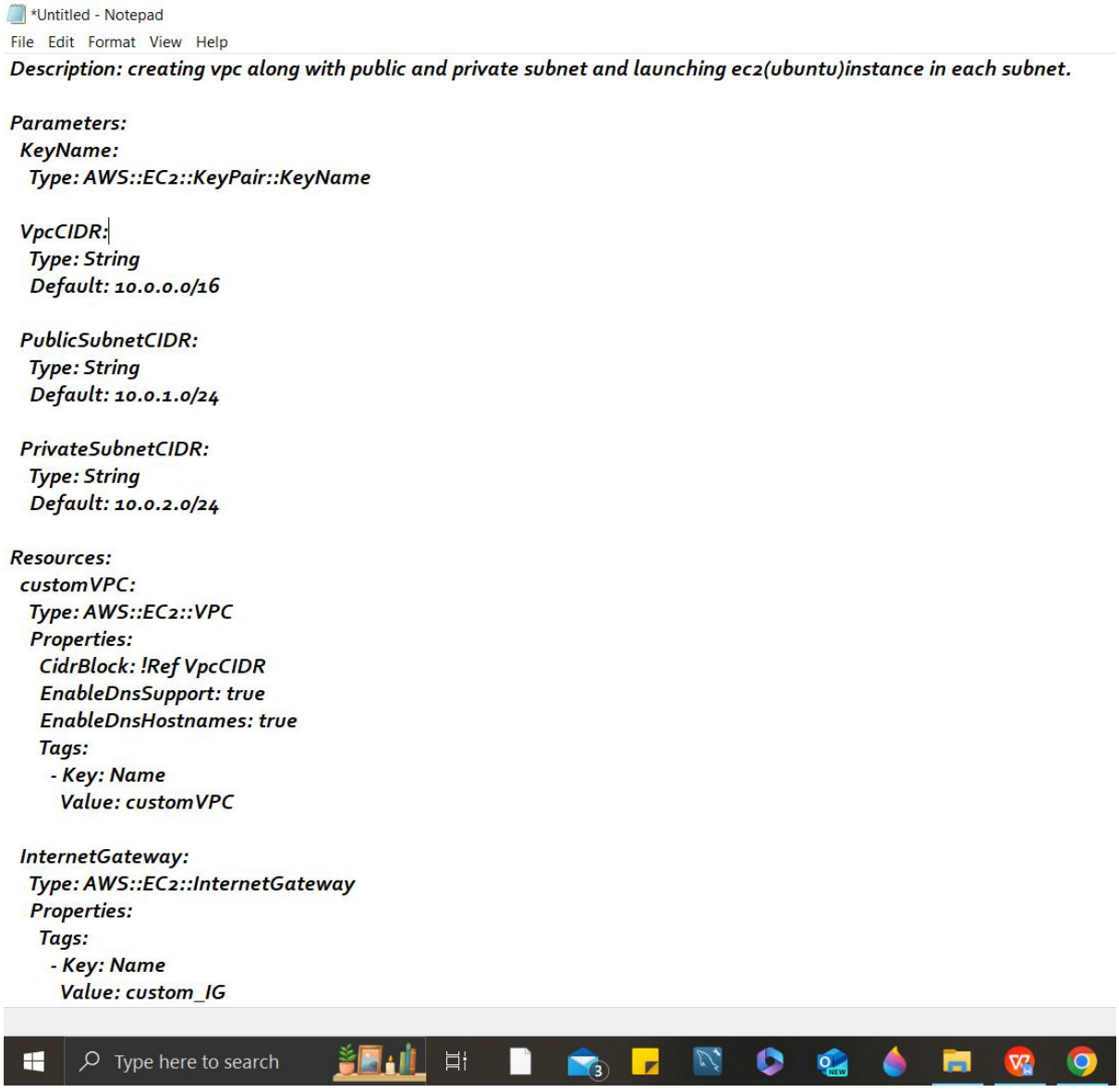

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```
Description: creating vpc along with public and private subnet and launching ec2(ubuntu)instance in each subnet.

Parameters:
  KeyName:
    Type: AWS::EC2::KeyPair::KeyName

  VpcCIDR:
    Type: String
    Default: 10.0.0.0/16

  PublicSubnetCIDR:
    Type: String
    Default: 10.0.1.0/24

  PrivateSubnetCIDR:
    Type: String
    Default: 10.0.2.0/24

Resources:
  customVPC:
    Type: AWS::EC2::VPC
    Properties:
      CidrBlock: !Ref VpcCIDR
      EnableDnsSupport: true
      EnableDnsHostnames: true
      Tags:
        - Key: Name
          Value: customVPC

  InternetGateway:
    Type: AWS::EC2::InternetGateway
    Properties:
      Tags:
        - Key: Name
          Value: custom_IG
```

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```
InternetGateway:
  Type: AWS::EC2::InternetGateway
  Properties:
    Tags:
      - Key: Name
        Value: custom_IG

InternetGatewayAttachment:
  Type: AWS::EC2::VPCGatewayAttachment
  Properties:
    InternetGatewayId:  !Ref InternetGateway
    VpcId: !Ref customVPC

PublicSubnet:
  Type: AWS::EC2::Subnet
  Properties:
    VpcId: !Ref customVPC
    CidrBlock: !Ref PublicSubnetCIDR
    MapPublicIpOnLaunch: true
    Tags:
      - Key: Name
        Value: custom_public-subnet

PrivateSubnet:
  Type: AWS::EC2::Subnet
  Properties:
    VpcId: !Ref customVPC
    CidrBlock: !Ref PrivateSubnetCIDR
    MapPublicIpOnLaunch: false
    Tags:
      - Key: Name
        Value: custom_private-subnet

PublicRouteTable:
  Type: AWS::EC2::RouteTable
```

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```
PublicRouteTable:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref customVPC
    Tags:
      - Key: Name
        Value: custom_Public-Route-table

DefaultPublicRoute:
  Type: AWS::EC2::Route
  DependsOn: InternetGatewayAttachment
  Properties:
    RouteTableId: !Ref PublicRouteTable
    DestinationCidrBlock: 0.0.0.0/0
    GatewayId: !Ref InternetGateway


PublicSubnet1RouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
    RouteTableId: !Ref PublicRouteTable
    SubnetId: !Ref PublicSubnet

PrivateRouteTable:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref customVPC
    Tags:
      - Key: Name
        Value: custom_Private-Route-table

PrivateSubnetRouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
    SubnetId: !Ref PrivateSubnet
```

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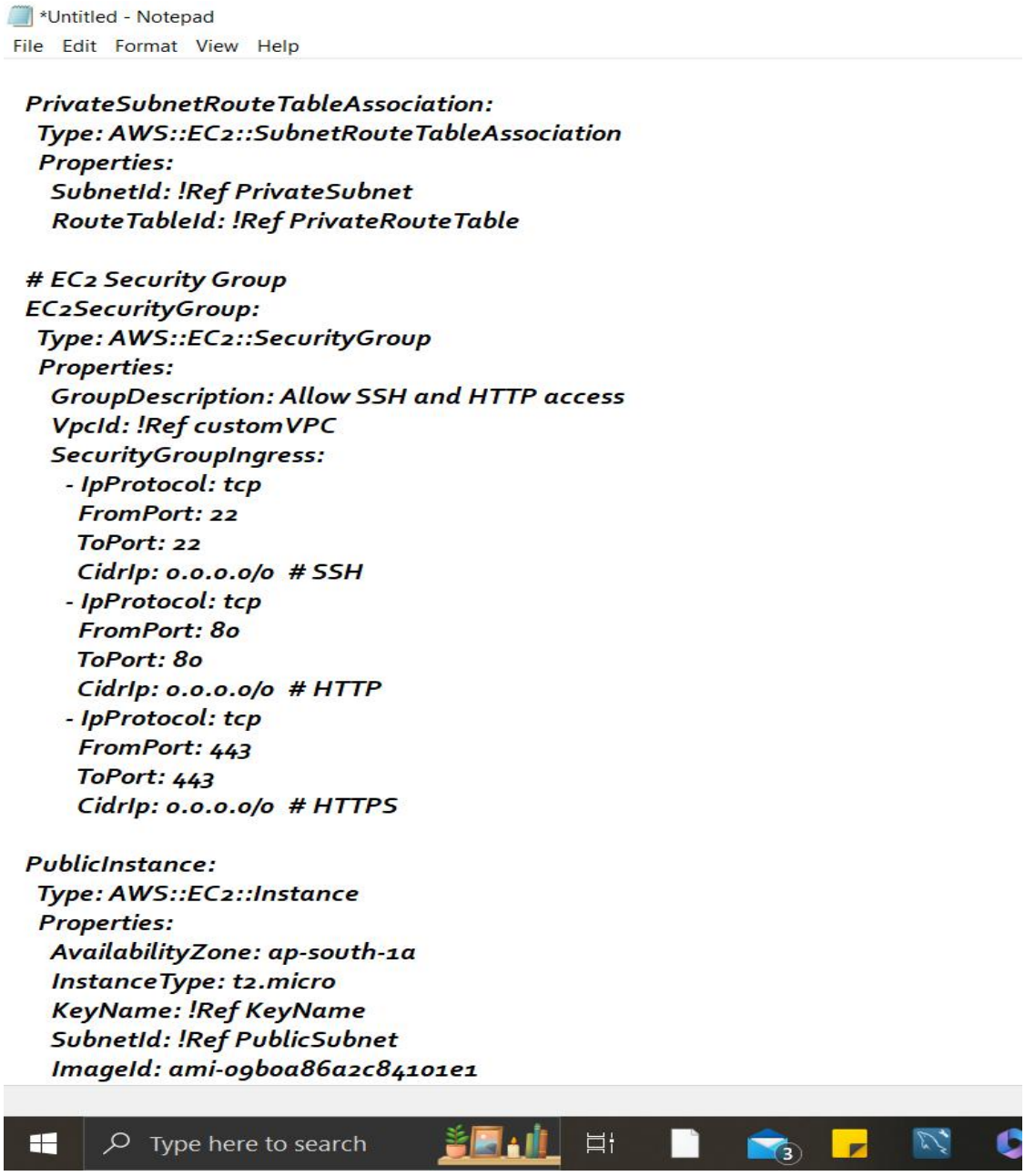

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```
    SubnetId: !Ref PrivateSubnet
    ImageId: ami-09b0a86a2c84101e1
    SecurityGroupIds:
      - !Ref EC2SecurityGroup
    Tags:
      - Key: Name
        Value: PrivateInstance

  # SNS Topic for Notifications
  SNSTopic:
    Type: AWS::SNS::Topic
    Properties:
      Subscription:
        - Endpoint: "shrushtishree04@gmail.com"
          Protocol: email
      DisplayName: "launch Notification"

Outputs:
  VPCId:
    Description: VPC ID
    Value: !Ref customVPC
  PublicSubnetId:
    Description: Public Subnet ID
    Value: !Ref PublicSubnet
  PrivateSubnetId:
    Description: Private Subnet ID
    Value: !Ref PrivateSubnet
  PublicInstanceId:
    Description: Public EC2 Instance ID
    Value: !Ref PublicInstance
  PrivateInstanceId:
    Description: Private EC2 Instance ID
    Value: !Ref PrivateInstance
```

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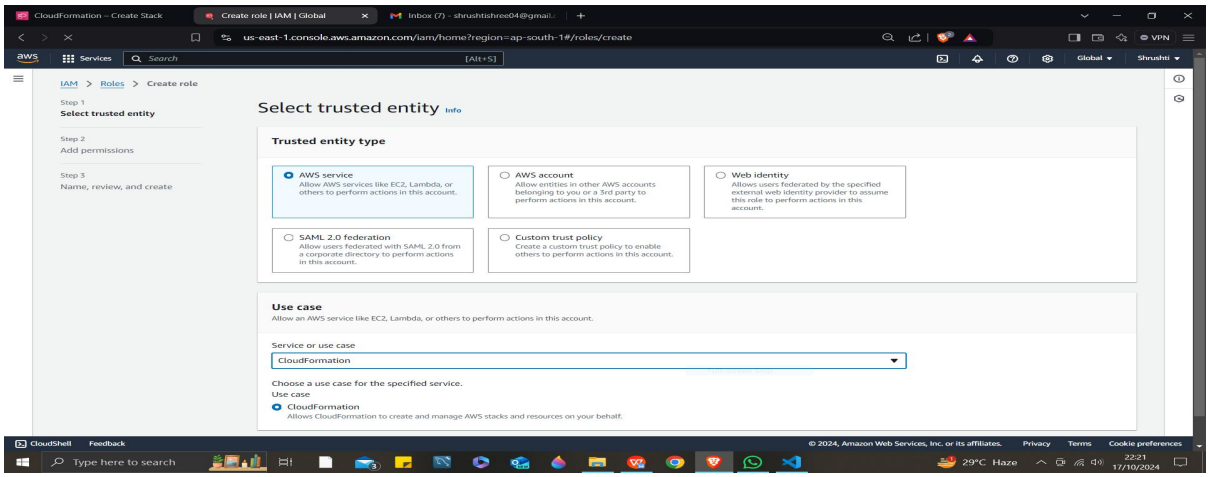
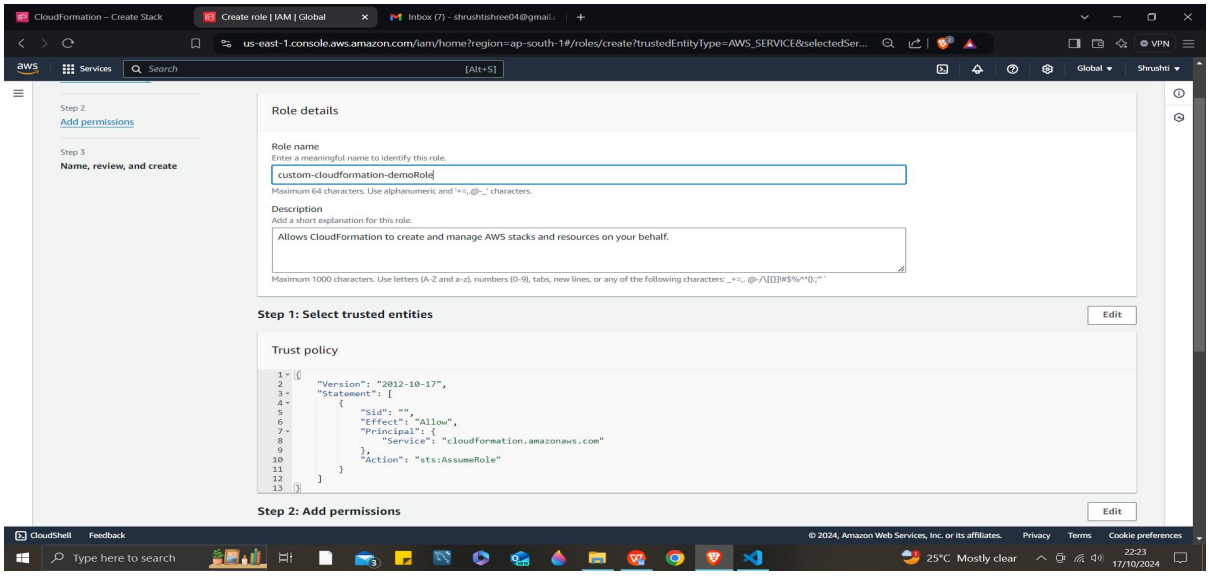
Step2: CREATE ROLE FOR CLOUDFORMATION

Go to IAM service-- roles-- create role with 3 policies
A)AmazonEC2FullAccess
B)AmazonVPCFullAccess
C)AmazonSNSFullAccess





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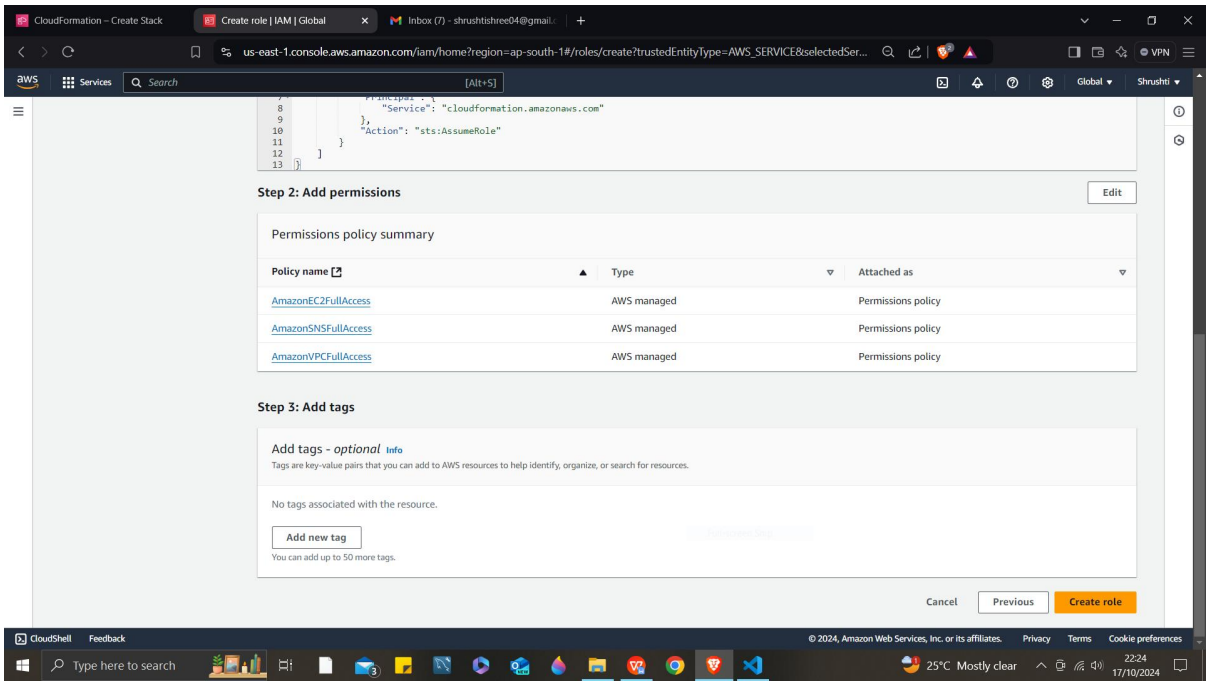

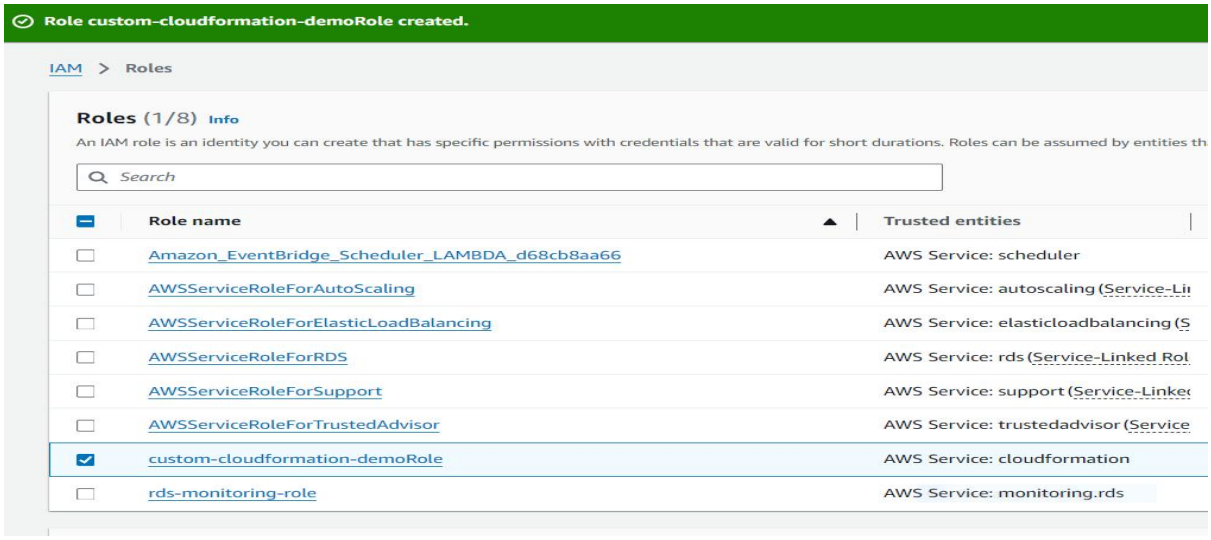

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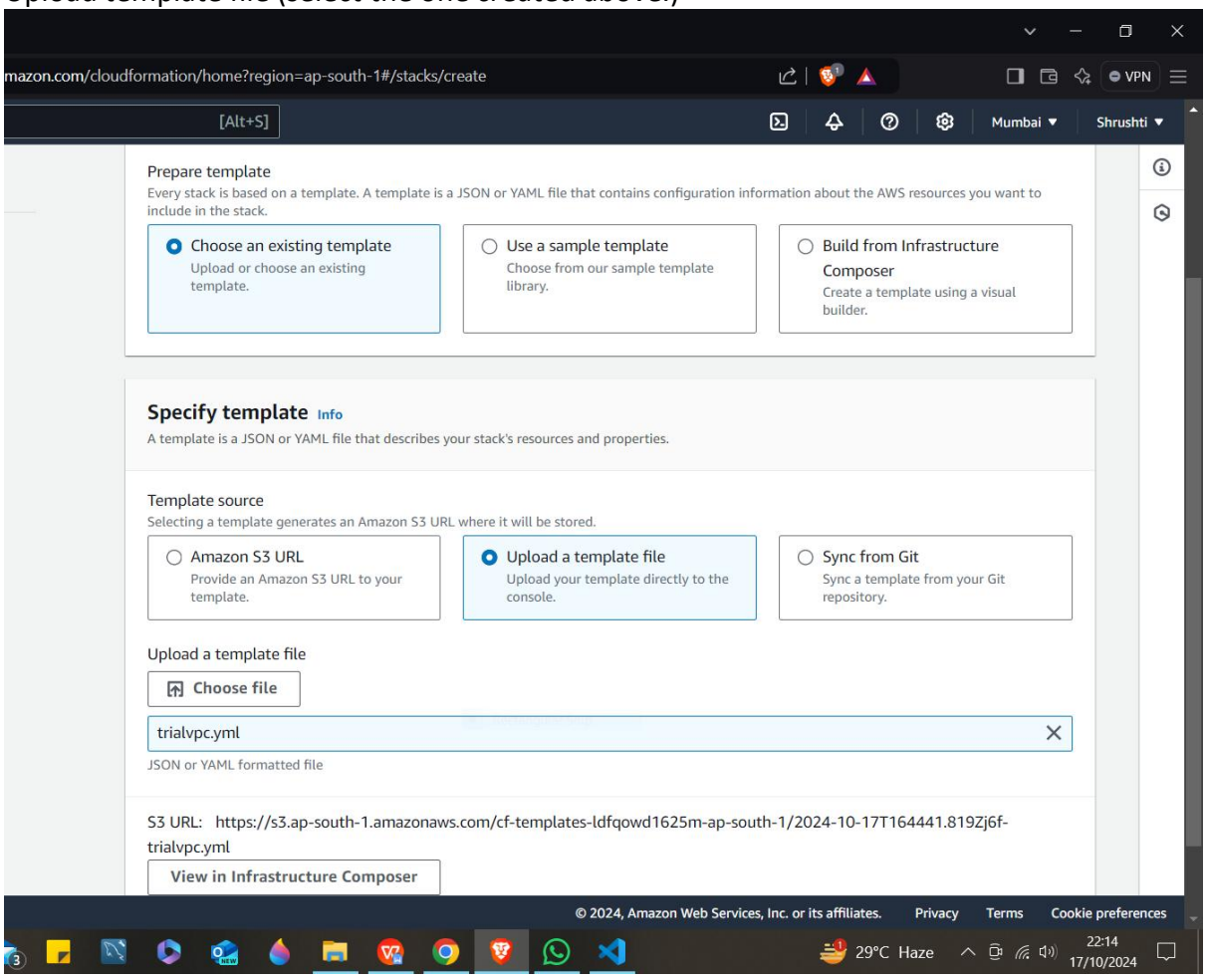
Step3: CREATE STACK IN CLOUDFORMATION

Go to CloudFormation service-- create stack-- (4 steps to create stack)

A)Create Stack---

Choose an existing template (we need to attach the one we created using vscode.)
Upload template file (select the one created above.)



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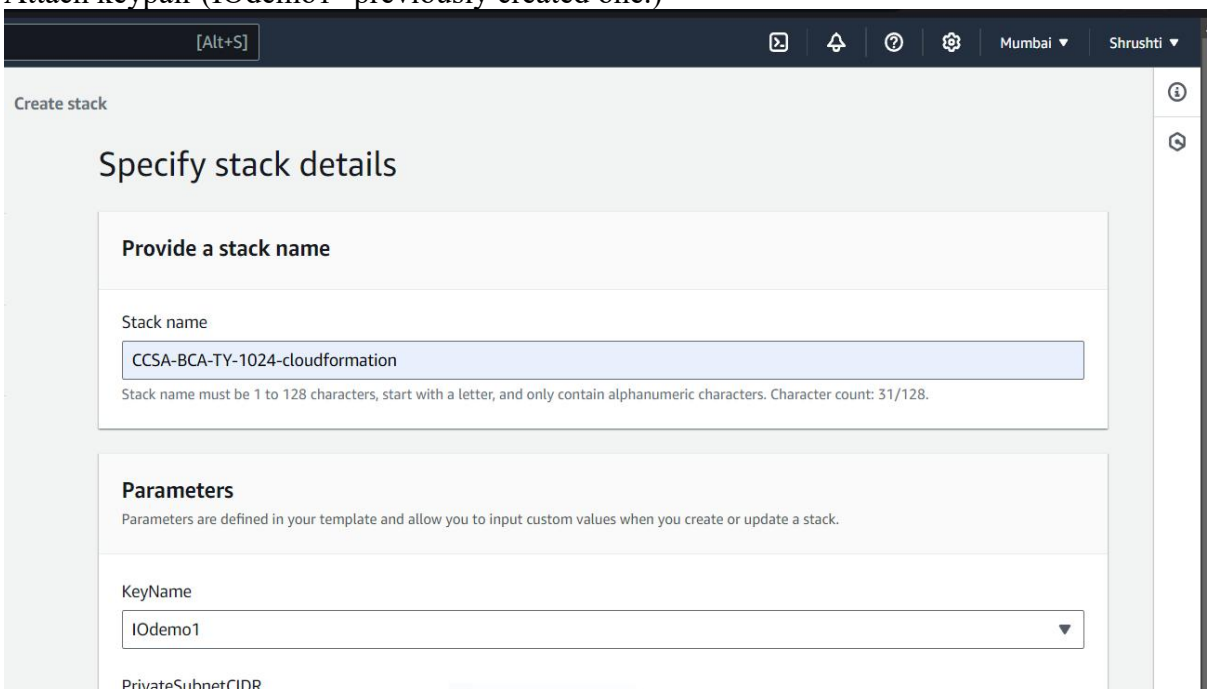
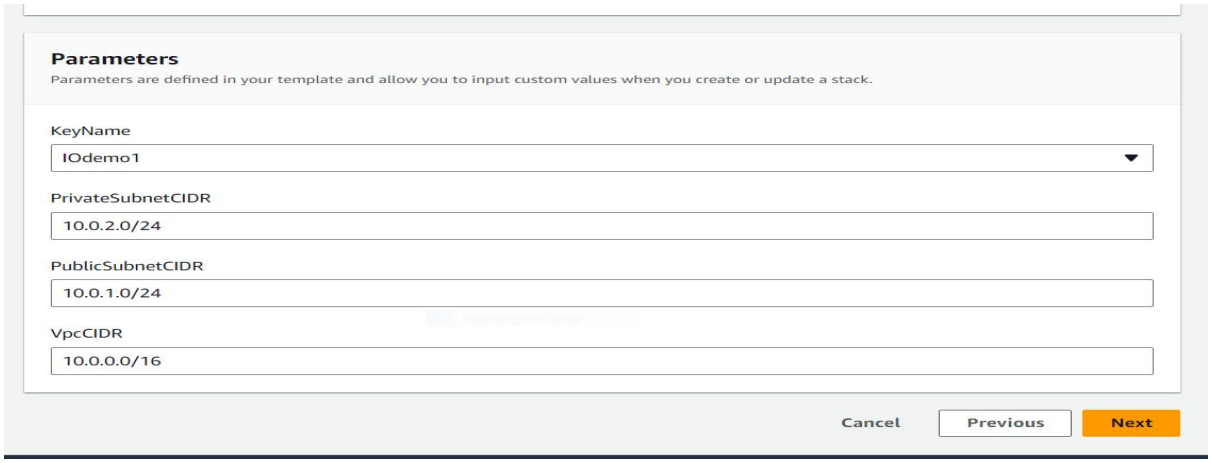
B) specify stack detail-----

Name the stack (CCSA-BCA-TY-1024-cloudformation)
Attach keypair (IOdemo1--previously created one.)





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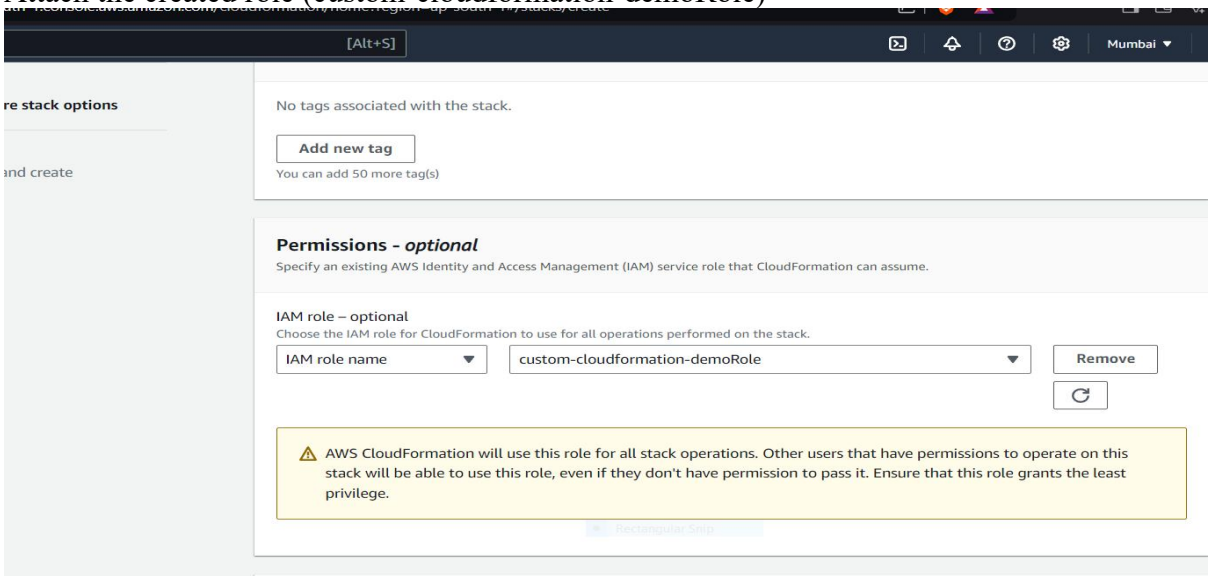
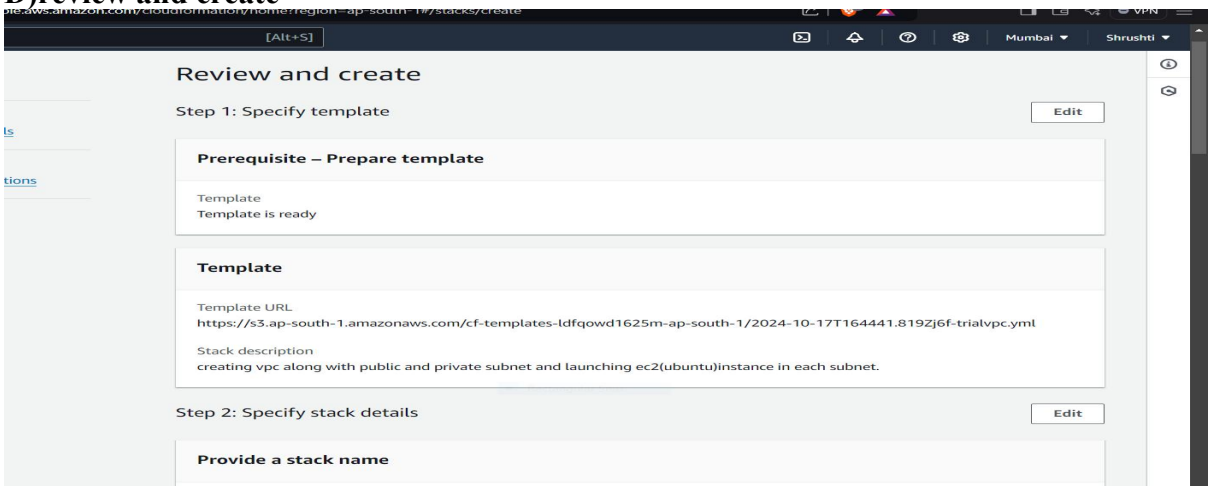
C)configure stack options----

Attach the created role (custom-cloudformation-demoRole)



D)review and create------



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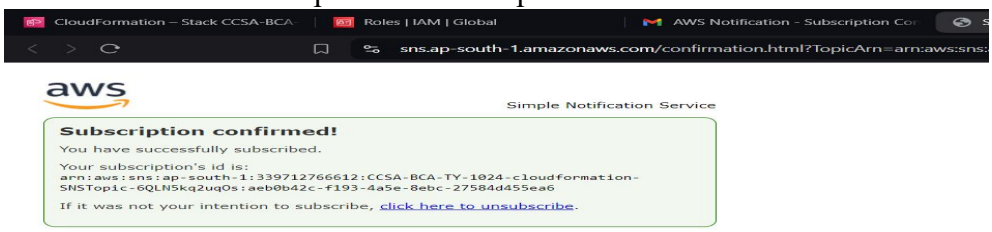
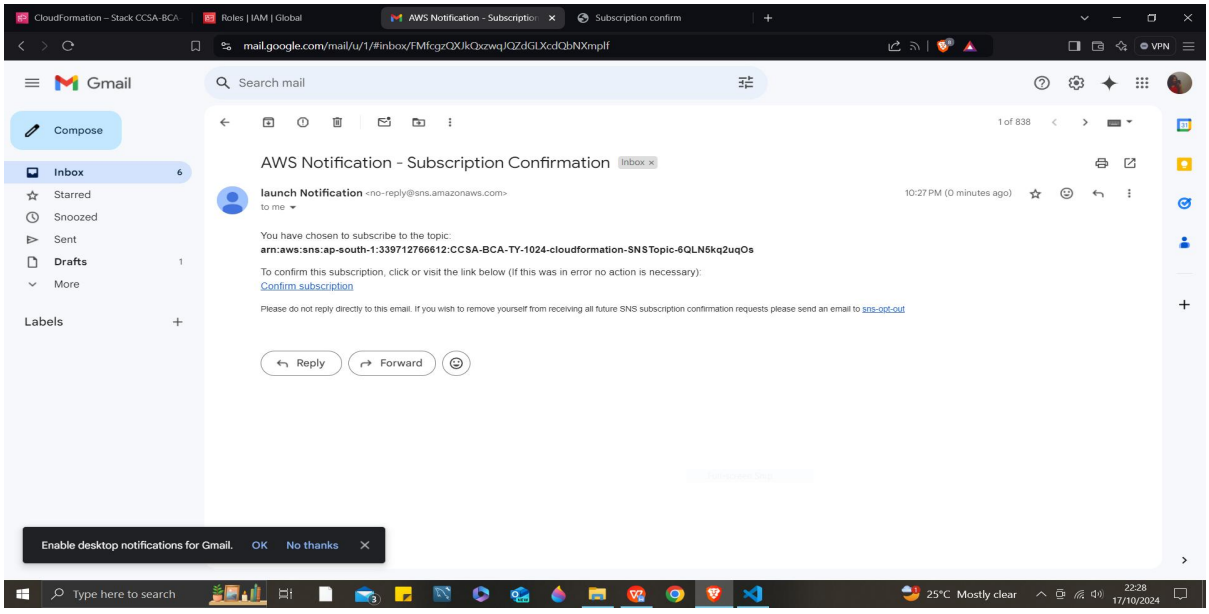
Step4: SUBSCRIBE.

Go to the email address provided in template and subscribe to SNS





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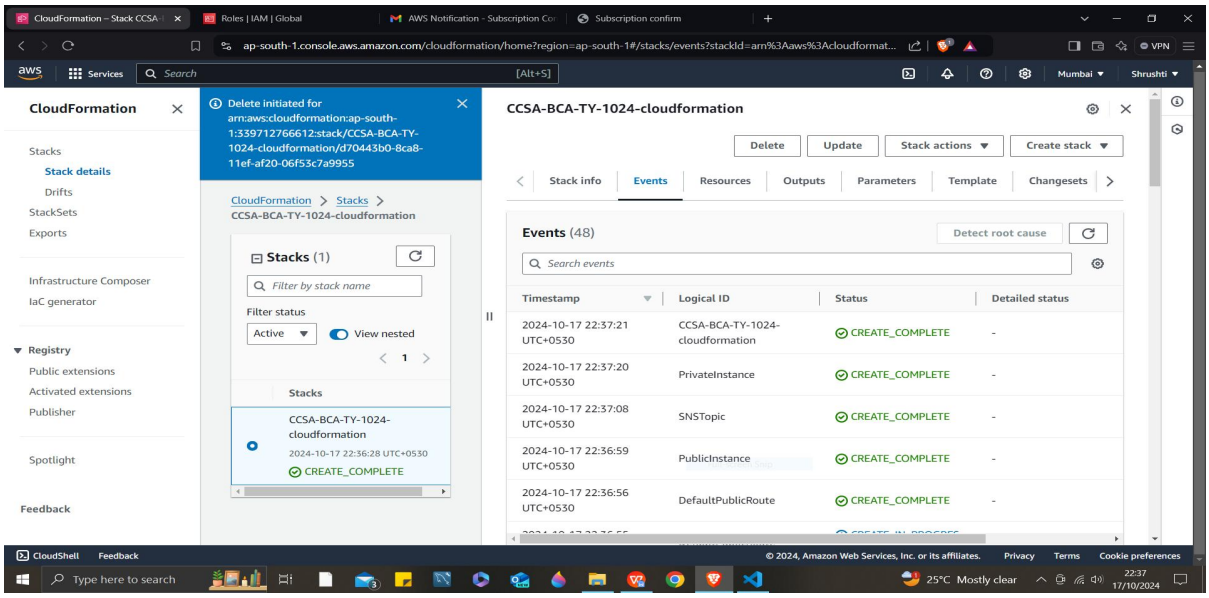
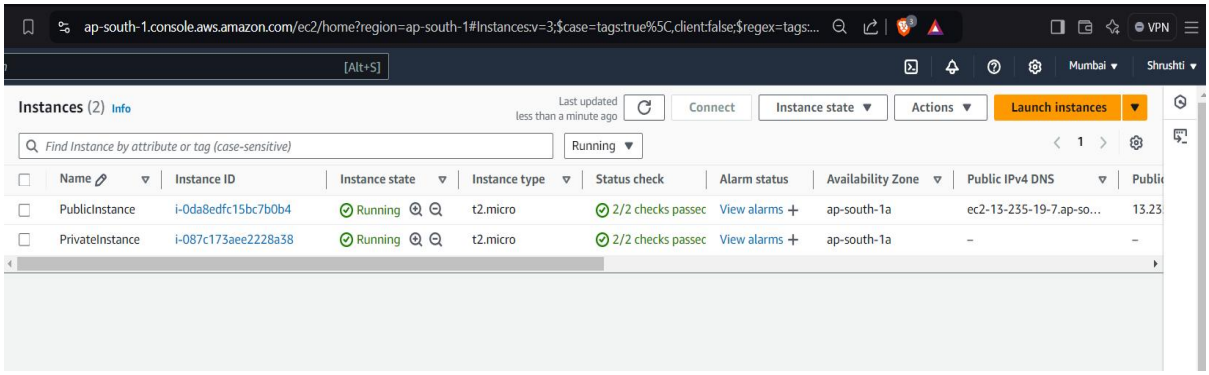
Step5: CHECK THE STATUS OF STACK



Step6: CHECK IF INSTANCE, VPC, ROUTETABLE, INTERNETGATEWAY ARE CREATED TOO

--instance (public and private):



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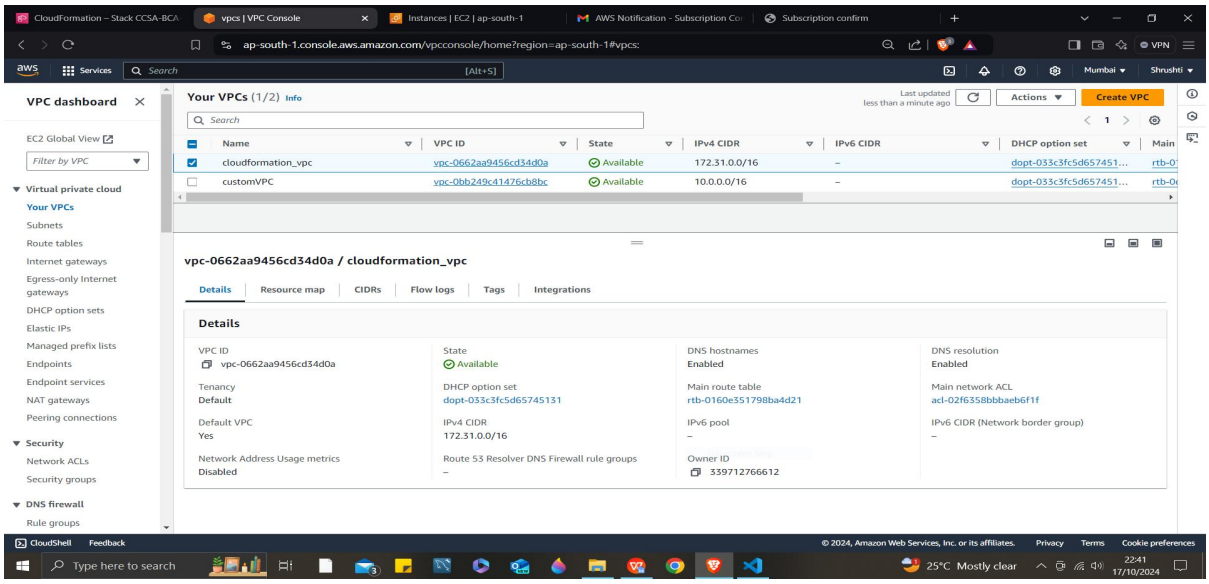
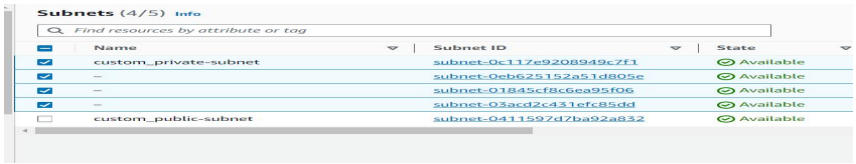
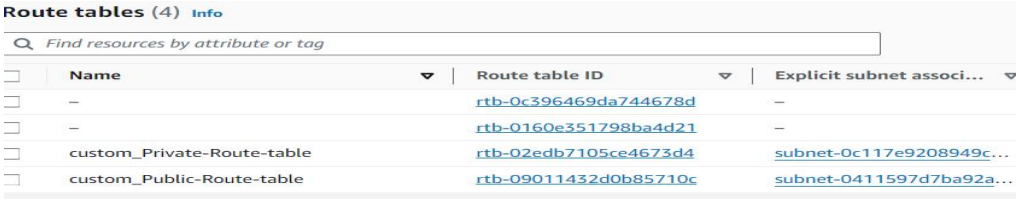
--vpc(customVPC):



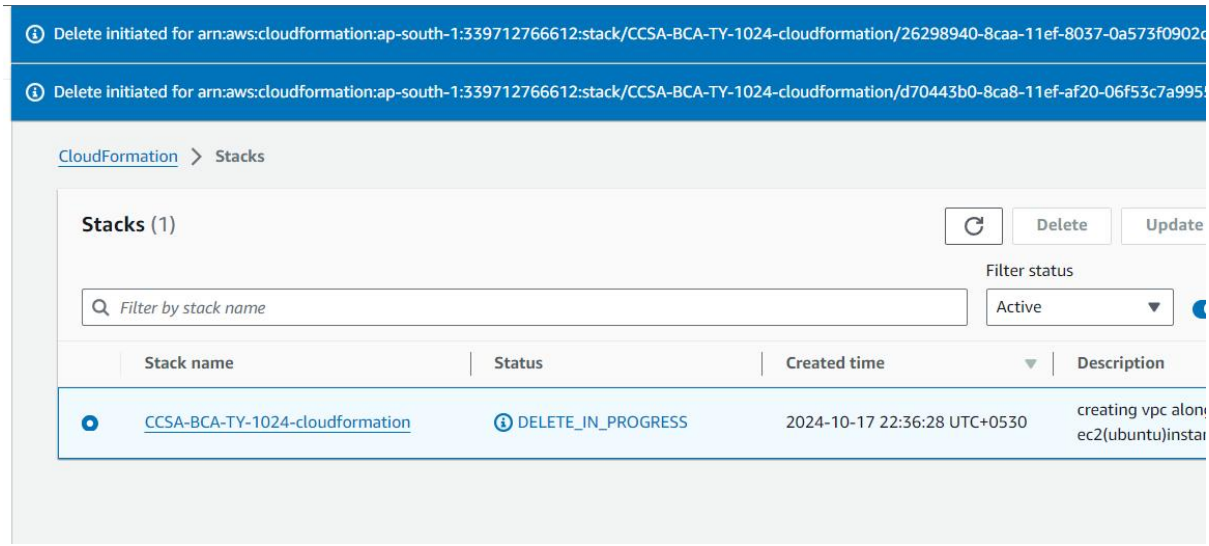
--subnet, routetable, internetgateway





Step7: DELETE STACK

Once you delete the stack all the components created will be deleted automatically along with stack



Done.