In-Class Activity: Deploying a Public EC2 Instance with Networking using Terraform

Task Requirements:

1. **Create Networking Infrastructure:**
   - **VPC Creation:**
     - Create a Virtual Private Cloud (VPC) with CIDR block 10.0.0.0/23.
     - Enable DNS support and DNS hostnames for the VPC.
     - Tag the VPC as t2-vpc.
   - **Subnet Creation:**
     - Create a Subnet within the above VPC.
     - Use CIDR block 10.0.0.0/24.
     - Enable automatic public IP assignment on instance launch.
     - Tag the subnet as t2-subnet.
   - **Internet Gateway (IGW):**
     - Create and attach an Internet Gateway to the VPC.
     - Tag the IGW as t2-igw.
   - **Route Table Setup:**
     - Create a Public Route Table associated with the VPC.
     - Add a route that sends all outbound traffic (0.0.0.0/0) through the Internet Gateway.
     - Tag the Route Table as PublicRouteTable.
   - **Subnet-Route Table Association:**
     - Associate the created Subnet with the Public Route Table.
     - Ensure that no buckets have public access enabled.
2. **Create Security Group**
   - Create a Security Group within the VPC named allow_ssh_sg.

   Ingress Rule:

   - Allow inbound TCP traffic on port 22 (SSH) from anywhere (0.0.0.0/0).

Egress Rule:

- Allow all outbound traffic to any destination.
- Tag the Security Group as AllowSSH.

3. **Create EC2 Key Pair**:
   - Generate a new RSA private key using the tls_private_key Terraform resource.
   - Create a new EC2 Key Pair using the generated public key.
   - Name the Key Pair as terraform-key.
4. **Deploy an EC2 Instance:**
   - **Launch a new EC2 instance:**
   - AMI ID and Instance Type must come from input variables (var.ami_id, var.instance_type).
   - Deploy the instance into the created Subnet.
   - Associate the instance with the newly created Security Group.
   - Use the created Key Pair (terraform-key) for SSH access.
   - Tag the EC2 instance as Terraform-EC2.
5. **Provider Configuration**:
   - In **"provider.tf"**, configure **AWS authentication** using AWS Secret key and AWS Access key and AWS Authentication Token.
   - **Set the AWS region** to us-east-1.
6. **Terraform State Management**:
   - **Store the Terraform state file locally** on your laptop instead of using a remote backend.

Bonus Challenge:

- **Restrict the SSH access in the Security Group to** only your public IP address **instead of 0.0.0.0/0 for better security.**