COS20019 Cloud Computing Architecture

Assignment 1B

Creating and deploying photo album website onto a simple AWS infrastructure

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URL of the album.php page on EC2:
http://ec2-35-172-50-182.compute-1.amazonaws.com/cos20019/harrysalbum/album.php

1. VPC:

I've successfully created a new Amazon Virtual Private Cloud (VPC) named "HWorthyVPC" in the us-east-1 region. The VPC is designed to have two availability zones, each with its own private and public subnet. Public Subnet 1 uses the CIDR block 10.0.1.0/24, and Public Subnet 2 uses the CIDR block 10.0.2.0/24. Private Subnet 1 uses the CIDR block 10.0.3.0/24, and Private Subnet 2 uses the CIDR block 10.0.4.0/24. I've associated public subnets with a public route table that routes to the Internet Gateway. As a result, any traffic destined for the internet from these public subnets will be directed through the IGW. This setup enables efficient network management and allows resources in the public subnets to communicate with the internet while maintaining security and control over the private subnets.

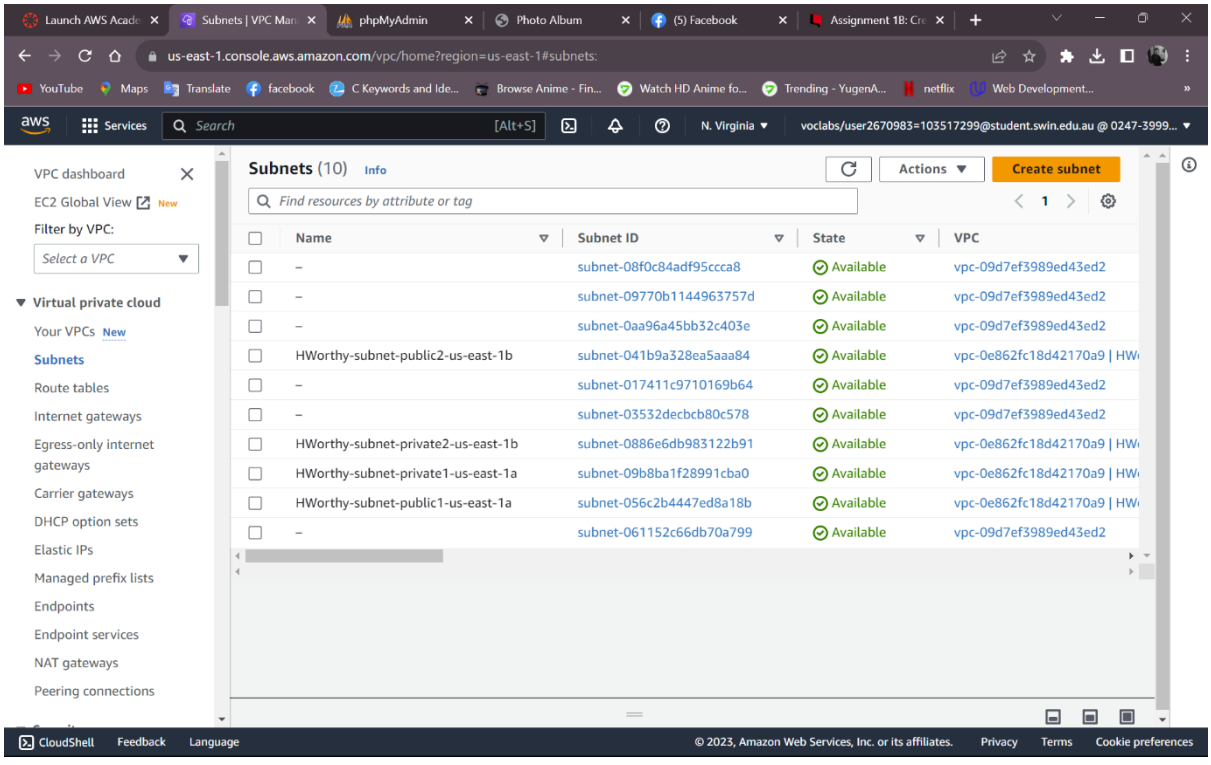


fig1: VPC subnets

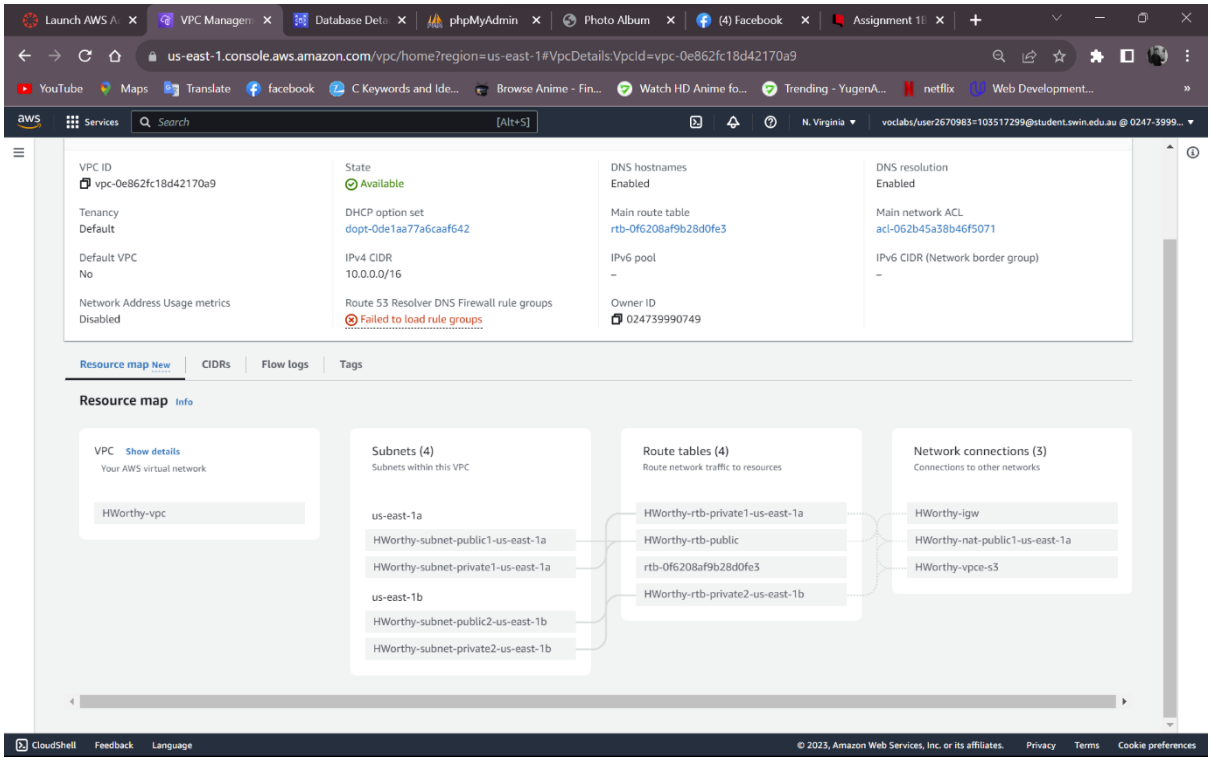


fig2: Route table

2.Security Groups:

I've created 3 security groups respectively TestInstanceSG, WebServerSG, And DBServerSG where one is for Test Instance, one is for Bastion server (Harrys Server) and the other is for RDS Database Instance. During the process of creating security groups, I initially configured outbound rules instead of inbound rules, which required some time to identify and rectify the issue.

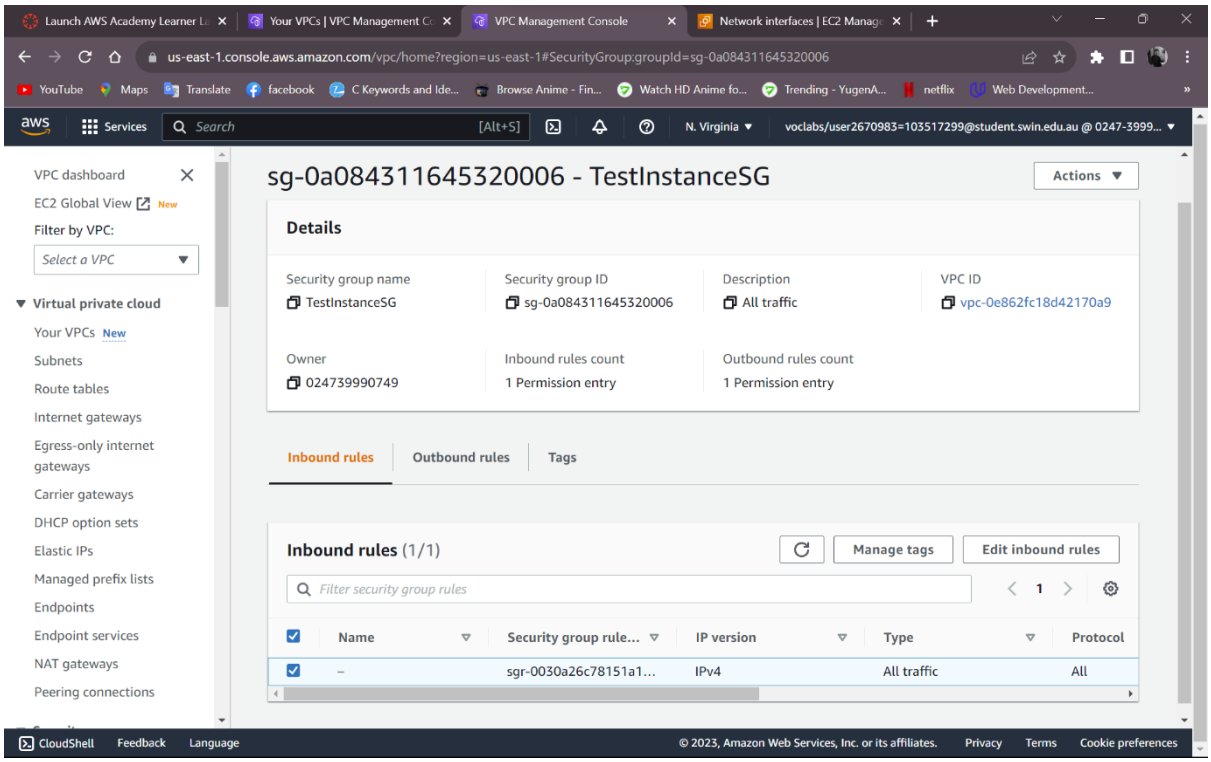


fig3: Test Instance SG

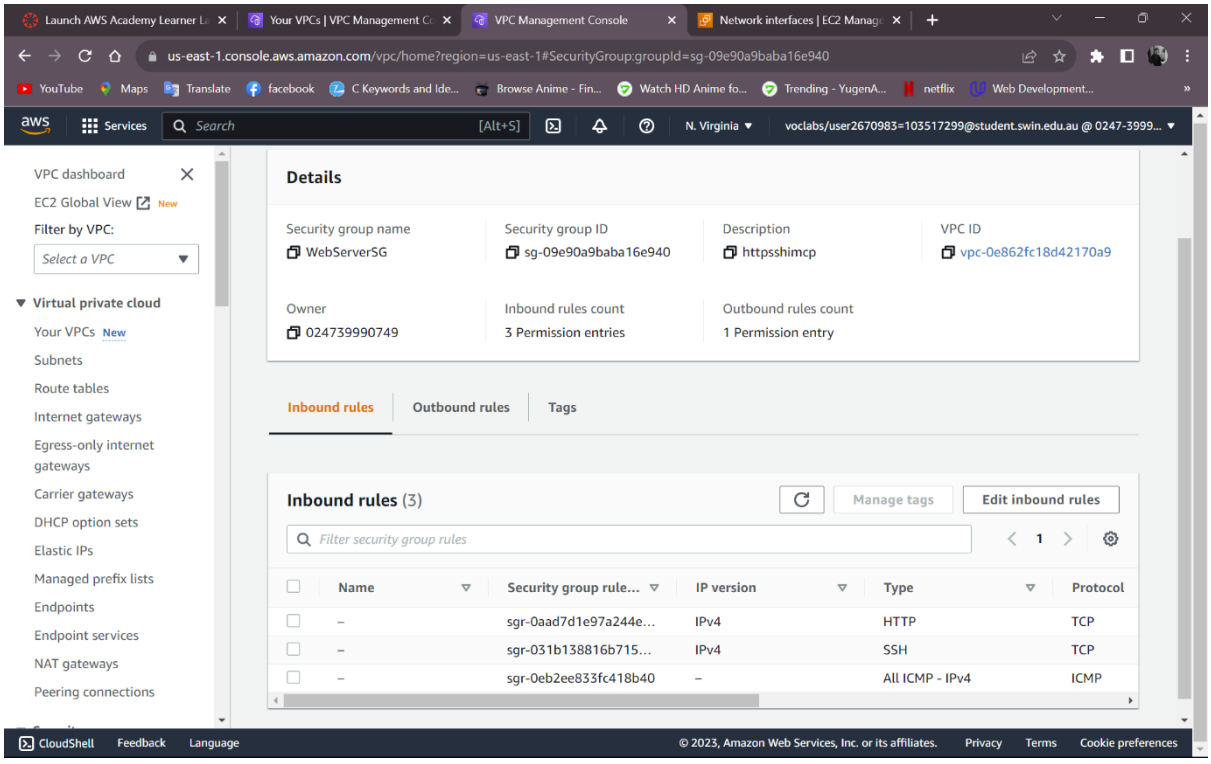


fig4: WebServer SG

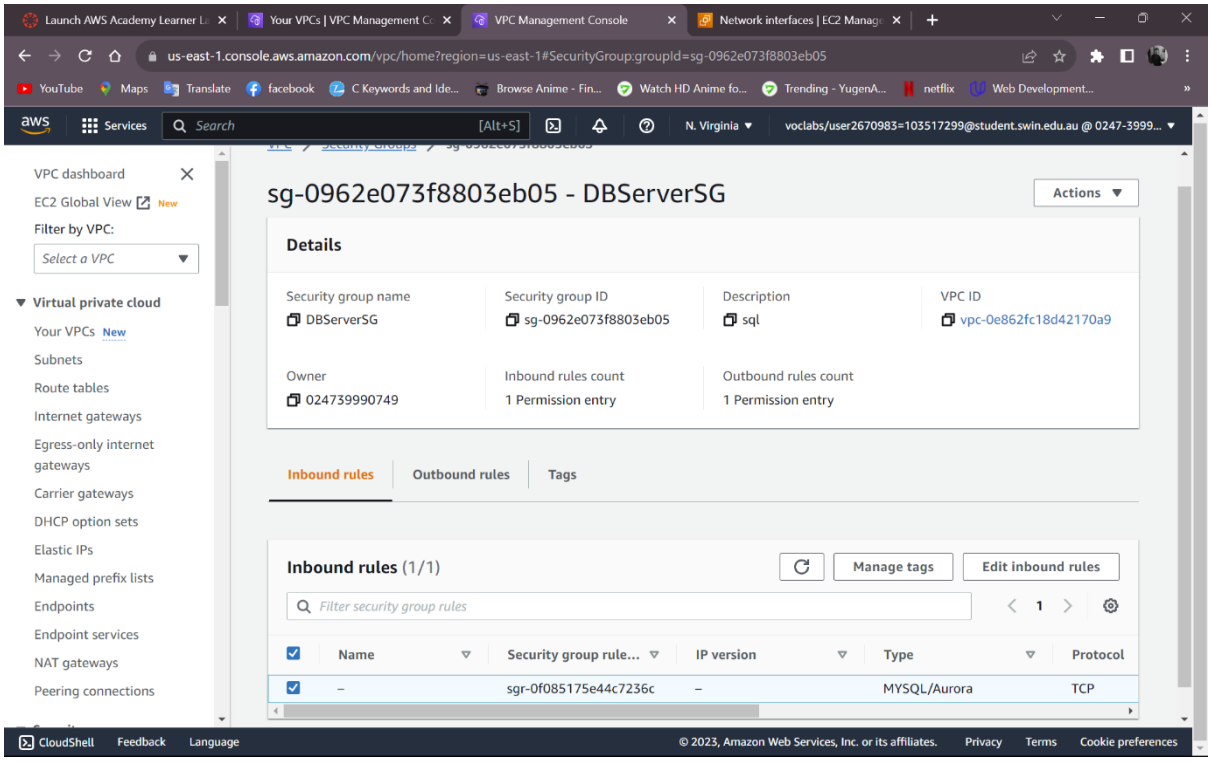


fig5: DBServerSG

3.EC2 Instances:

I have successfully deployed an EC2 instance named it Harrys Server in Public Subnet 2 to serve as both the web server for the Photo Album web application and a bastion host for SSH access to the Test instance in the private subnet. The instance is configured with Apache web server, PHP packages, and uses an Elastic IP address for consistent accessibility, ensuring the stability of the web application and facilitating secure remote access.

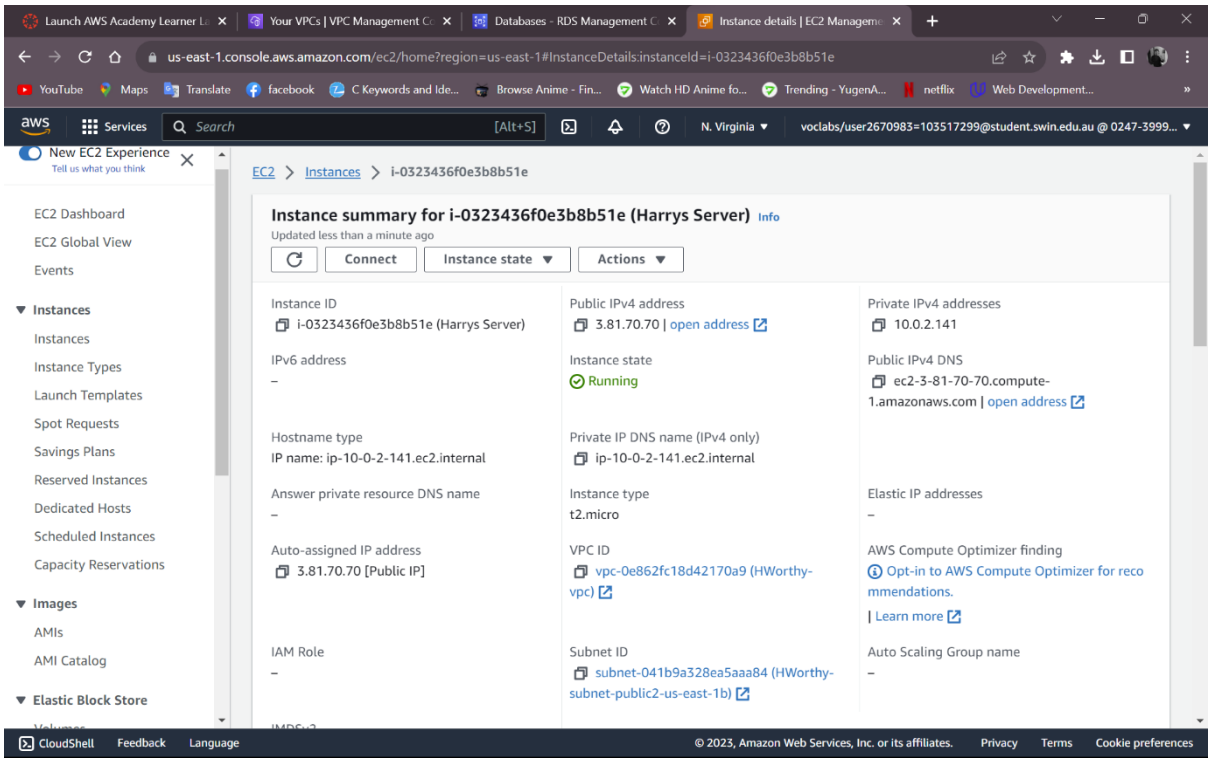


fig6: HarrysServer

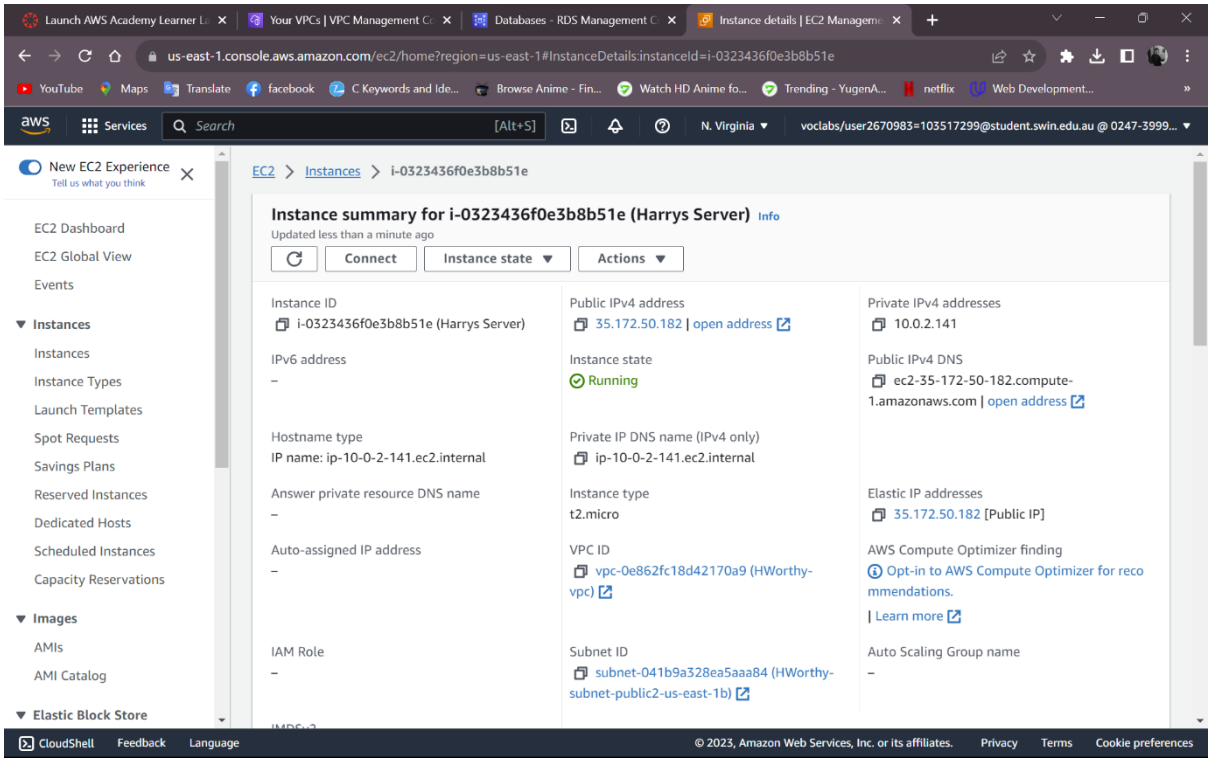


fig7: Elastic IP

Once connected to the test instance via PuTTY, use the ping 10.0.4.165 command to ping.

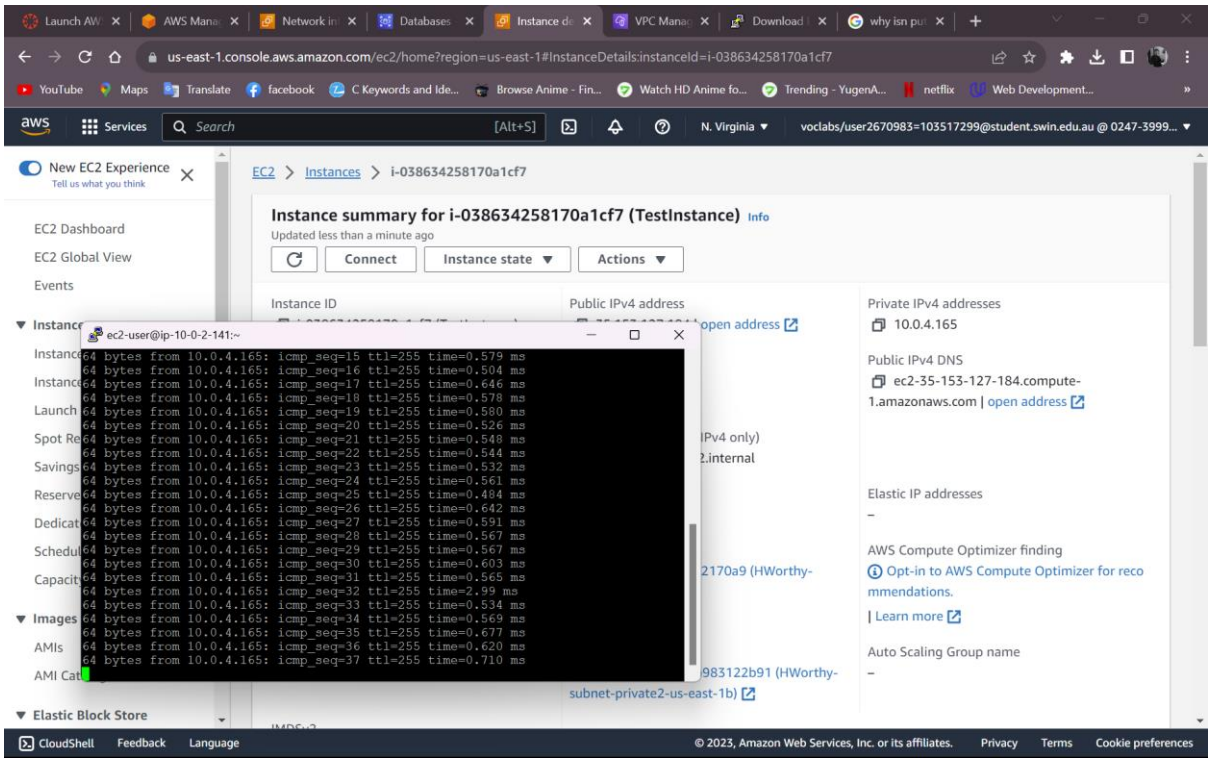


fig8: ping

4.RDS Database Instance:

I configured an RDS instance in a private subnet, ensuring security with access limited to the WebServerSG security group. While residing in a private subnet, I've established internet access for setup and maintenance. Furthermore, I've created a photos table within the database to store essential metadata about the images stored in the S3 bucket, including photo title, description, creation date, keywords, and references to the S3 objects.

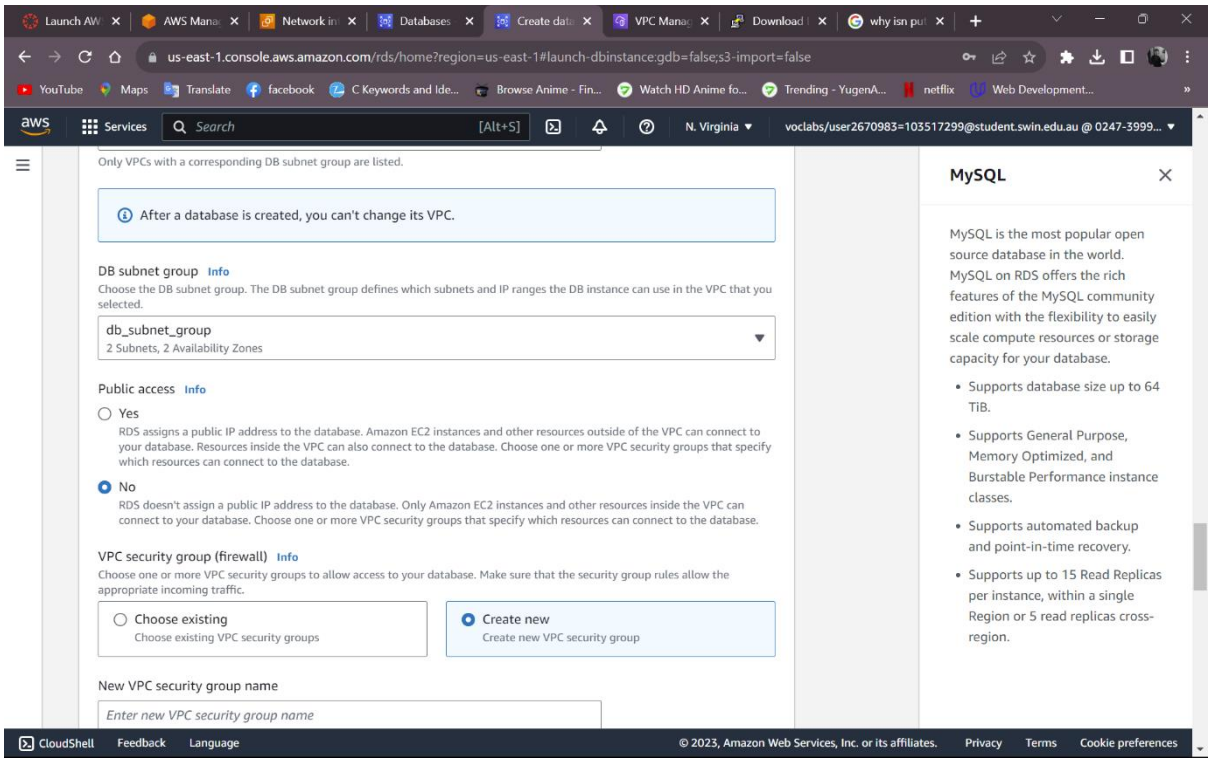


fig8: creating db instance

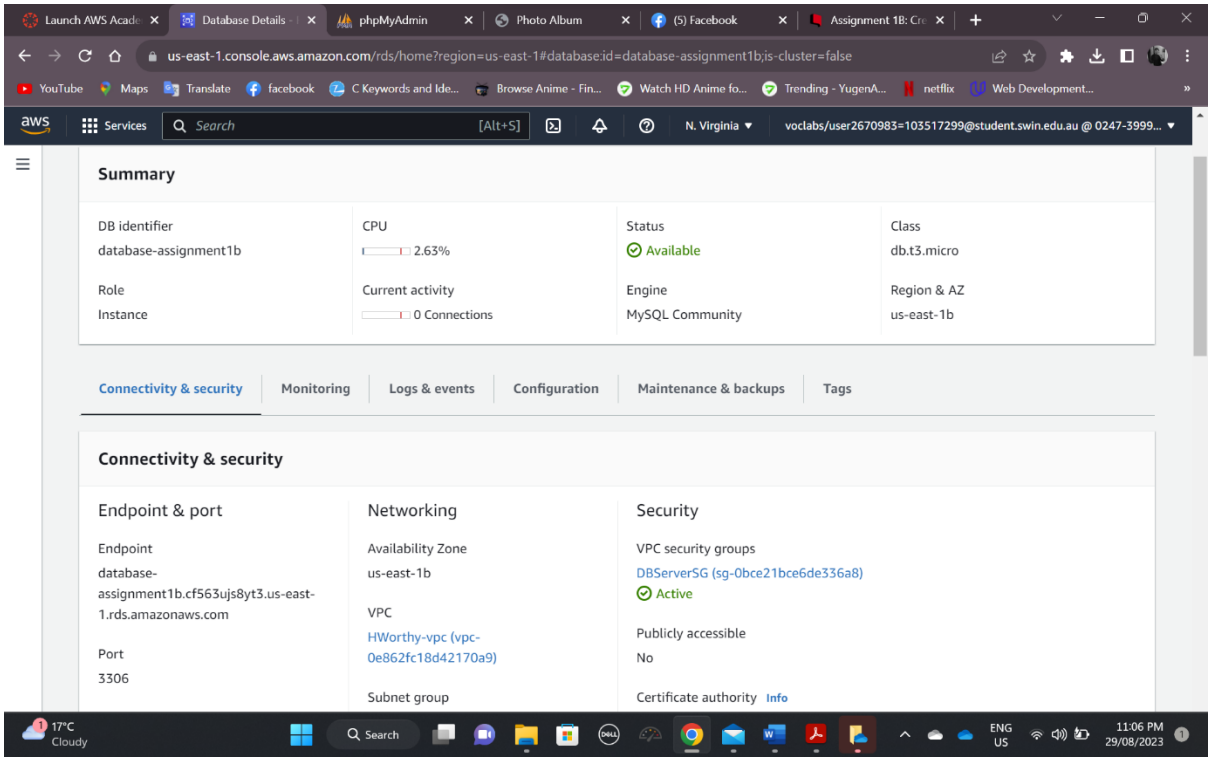


fig9:rds database instance

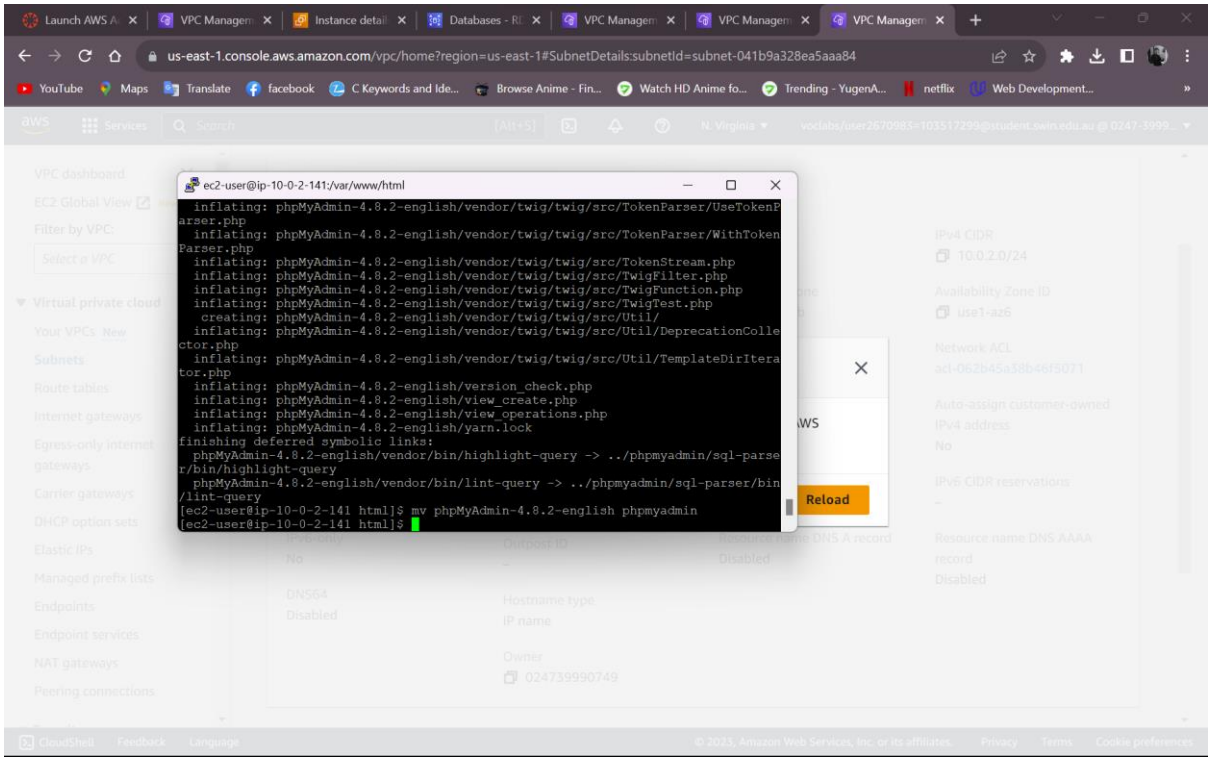


fig10: downloading phpadmin

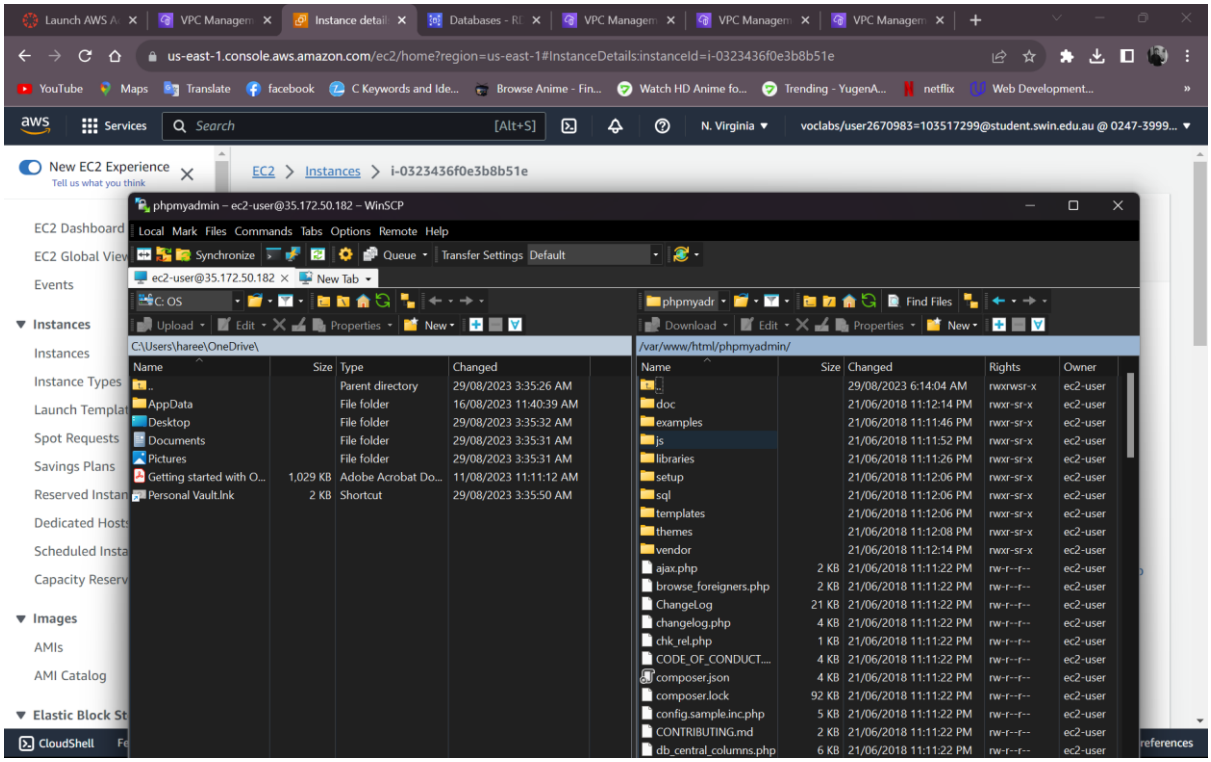


Fig11: php in winscp

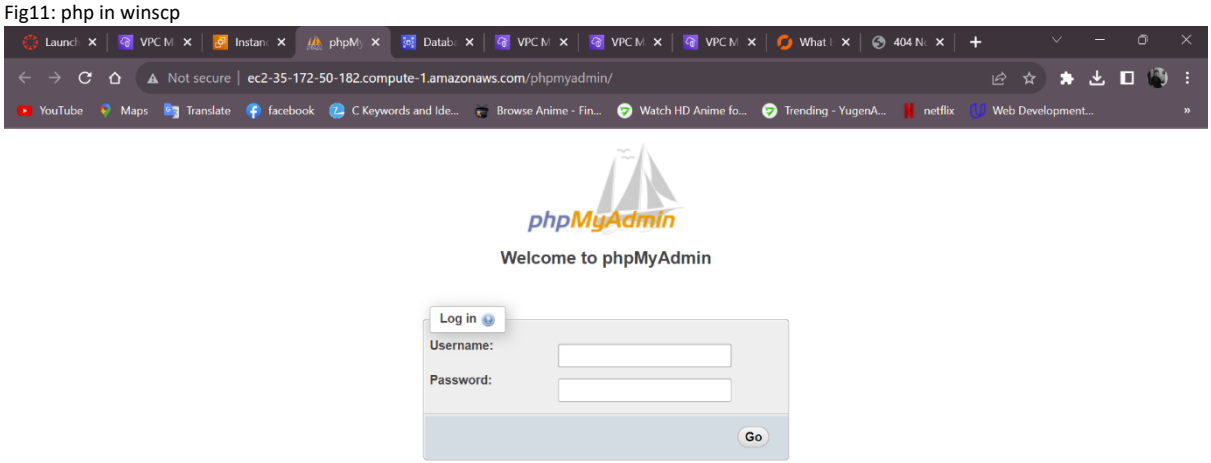


fig12: phpmyadminlogin

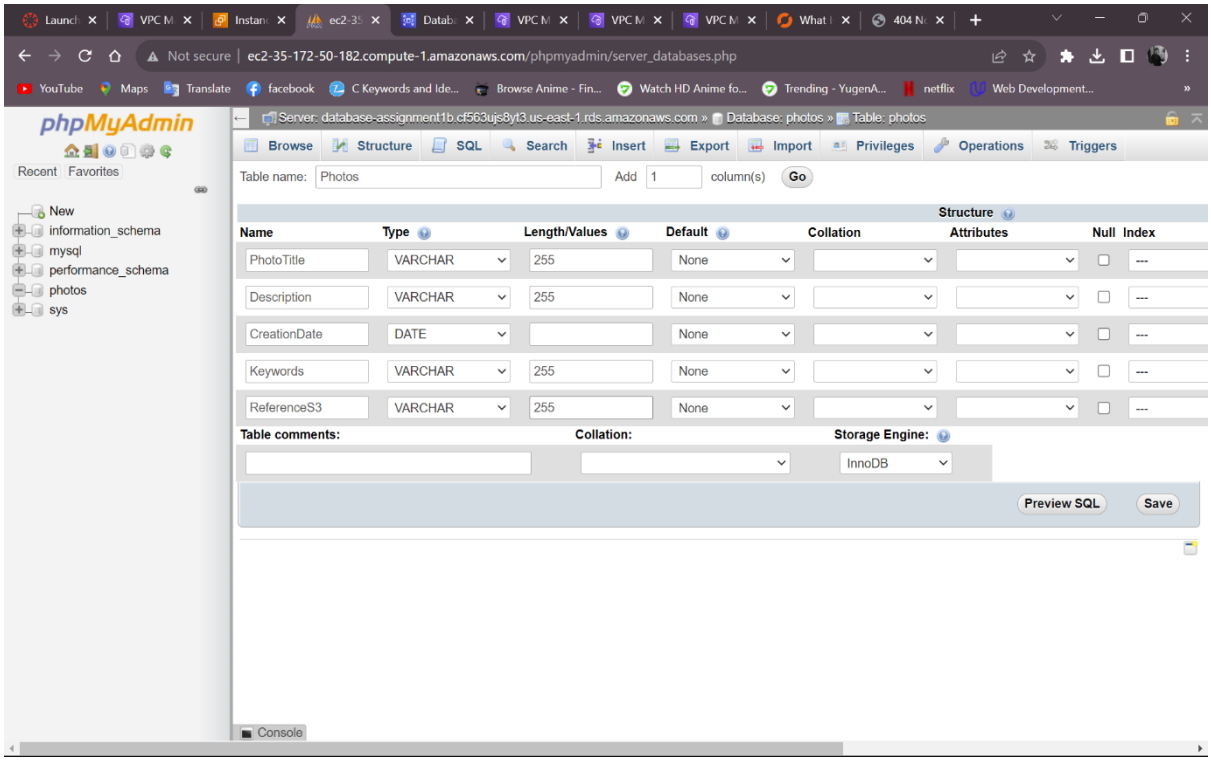


fig:tableinphpmyadmin

5. Network ACL

I've successfully designed and deployed a Network ACL named "PublicSubnet2NACL" for Public Subnet 2. The ACL allows SSH (port 22) traffic from anywhere, permits ICMP traffic exclusively from the Test instance's subnet, and allows necessary traffic for full functionality of the Photo Album website for instance TCP (Was suggested by ChatGPT).

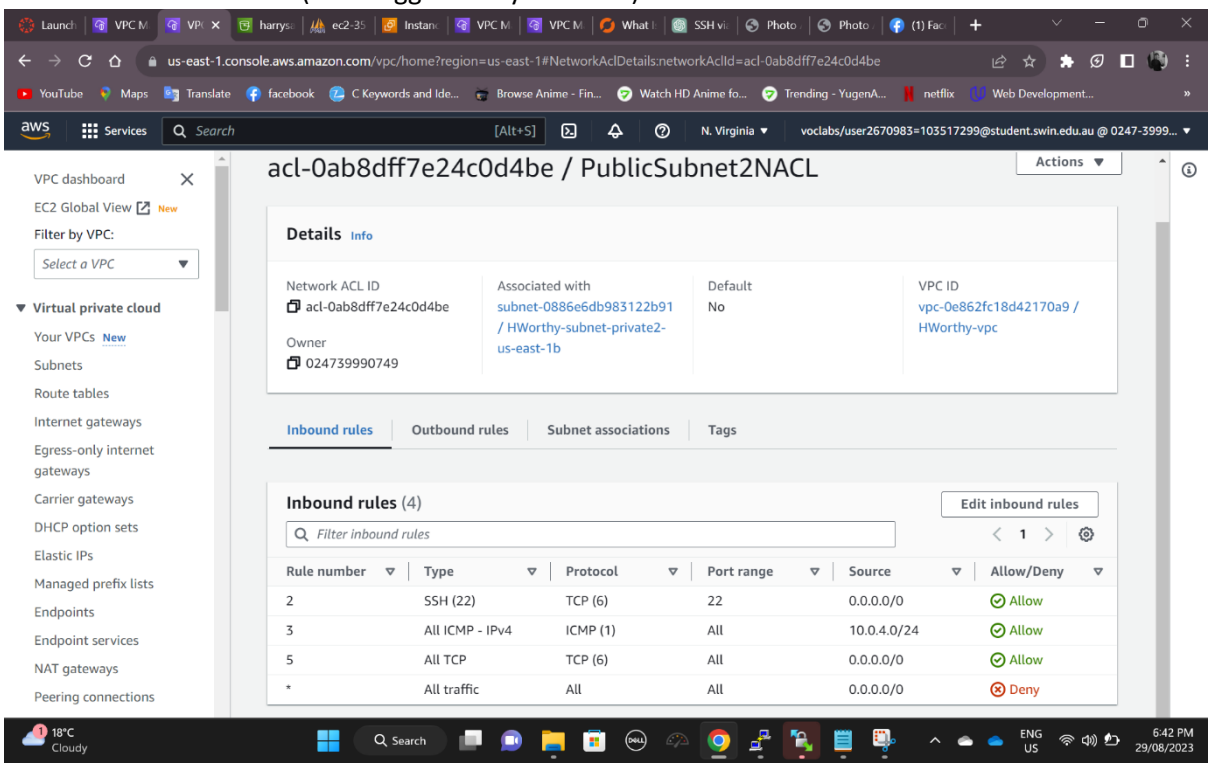


fig: Network ACL

6.S3 Bucket Photo Upload and Public Access:

I've created an S3 bucket(harrysalbum) to store photos, manually uploaded images, and confirmed their successful upload. I've applied an access policy to ensure all objects in the bucket are publicly accessible, achieving the desired level of public visibility for the photos.

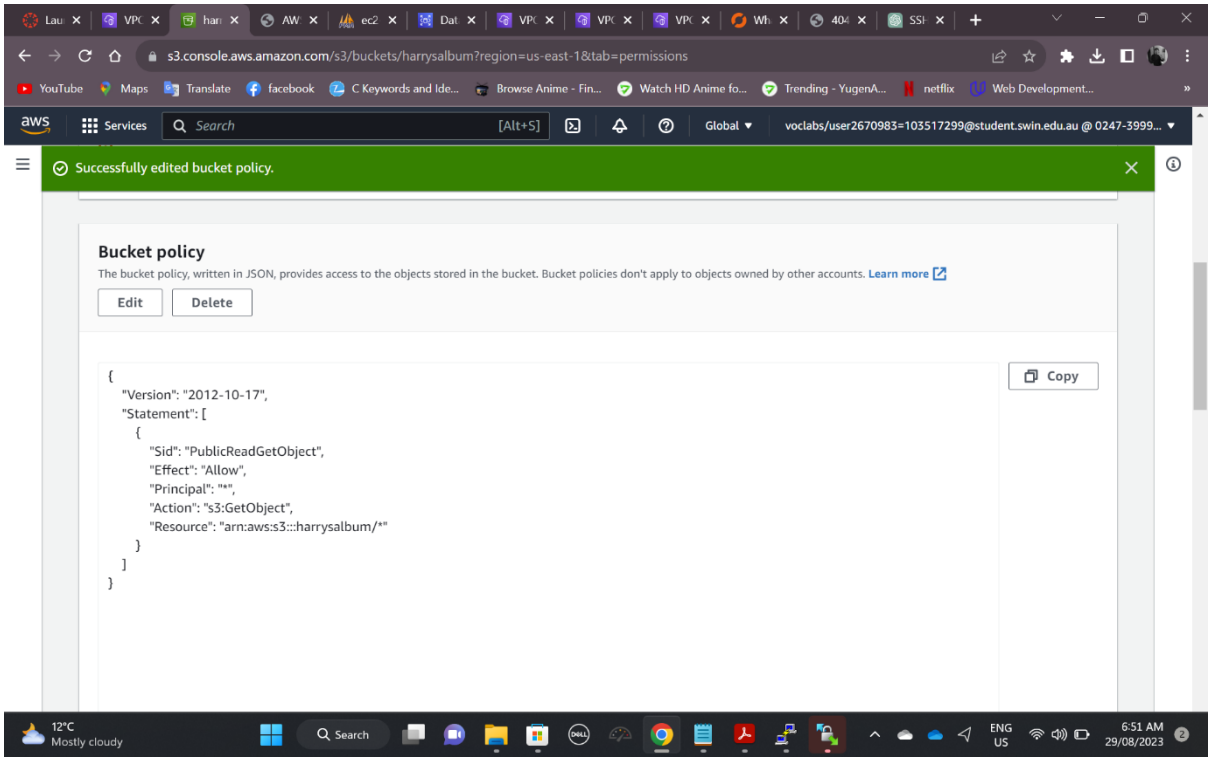


Fig:Bucketpolicy

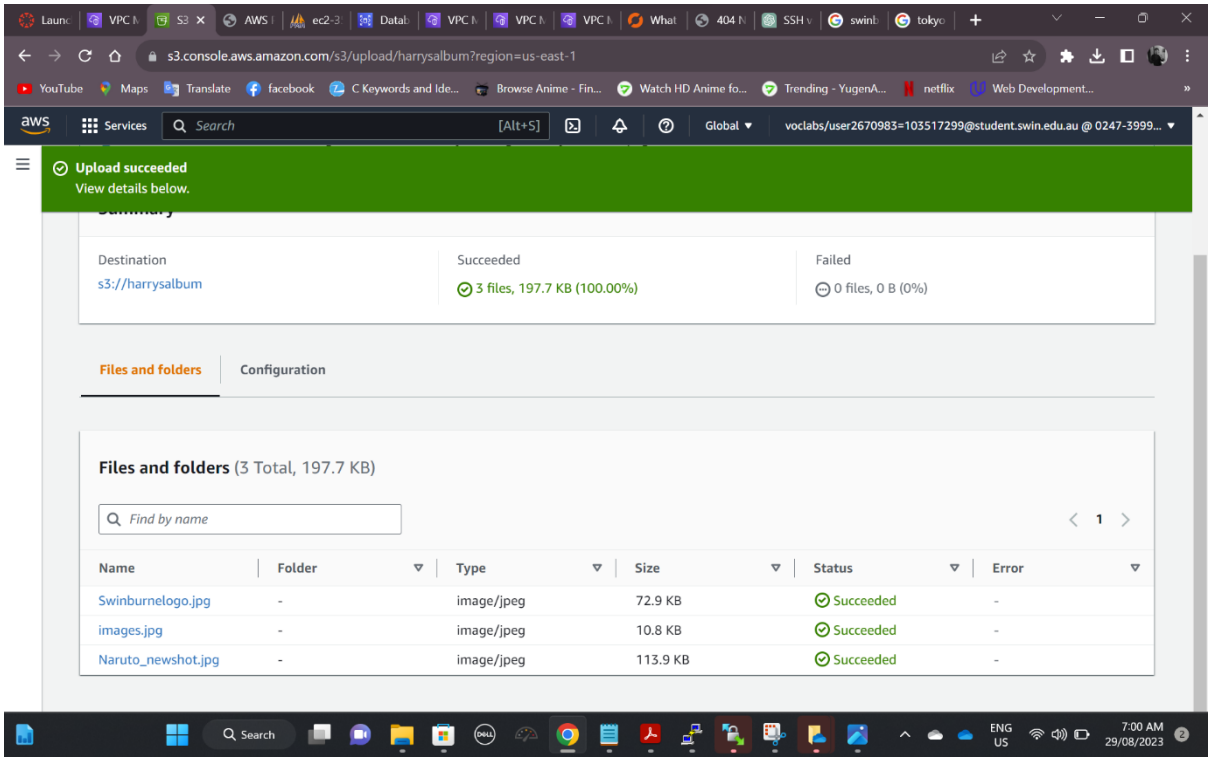


fig: uploading photos in S3

7.Photo album website Functionality:

I've integrated the provided Photo Album website code to display photos and their associated meta-data from the S3 bucket and RDS database. I've updated the constants.php file with the appropriate information to ensure seamless functionality.

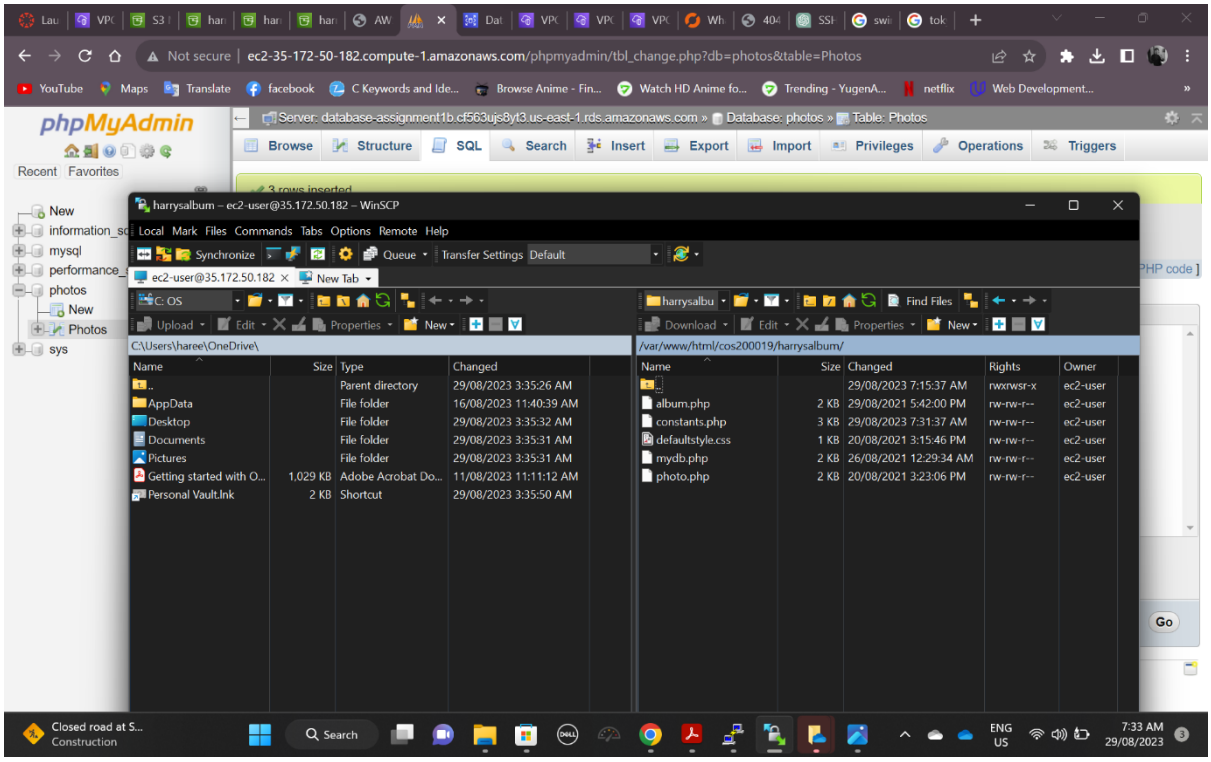


fig:photoalbumzipwinscp

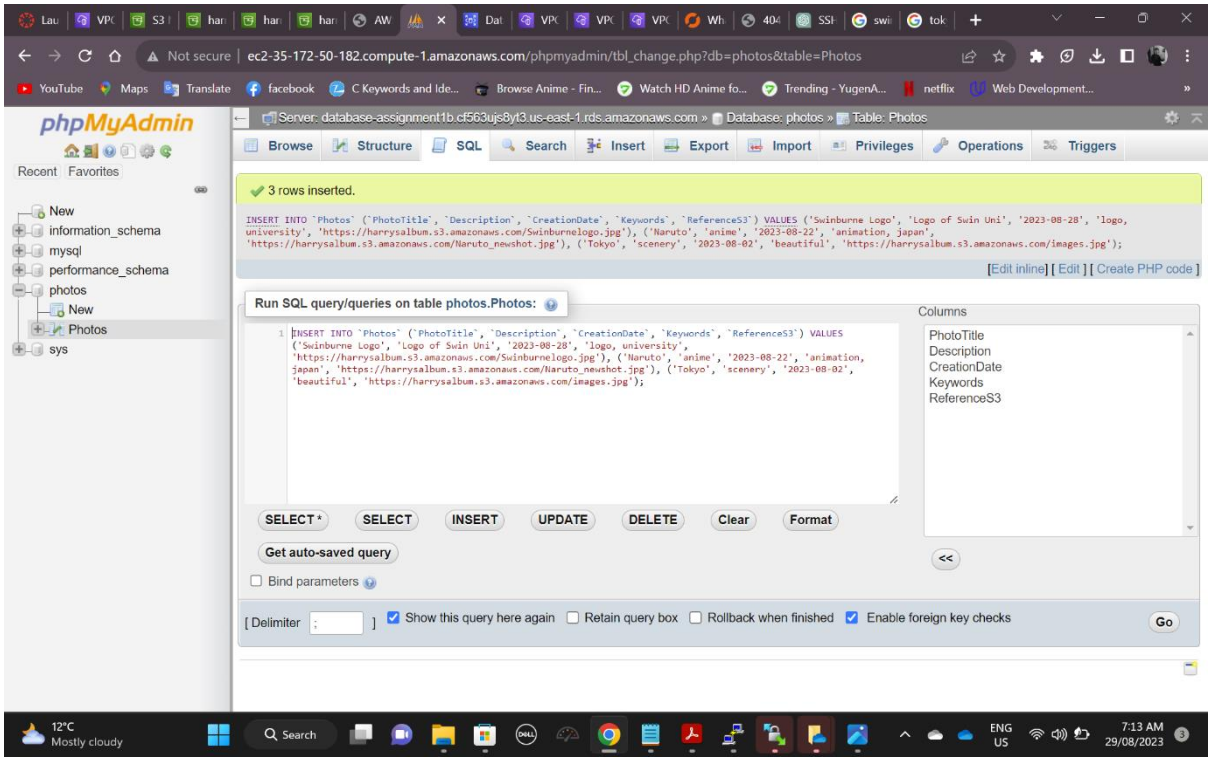
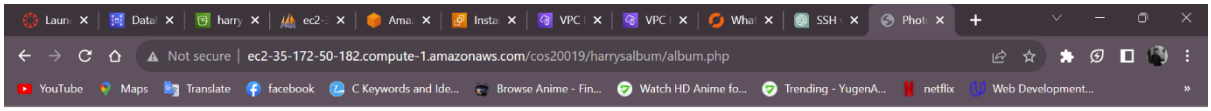


fig:metadata

Testing:



Student name: Harry

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Tutorial session: Thursday 20:00PM

Uploaded photos:

Photo	Name	Description	Creation date	Keywords
	Swinburne Logo	Logo of Swin Uni	2023-08-28	logo, university
	Naruto	anime	2023-08-22	animation, japan
	Tokyo	scenery	2023-08-02	beautiful

fig: yay