

COS20019 - Cloud Computing Architecture

Assignment 1 – Part B

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1.Infrastructure deployment

1.1 – VPC

The screenshot shows the AWS VPC console for a VPC named 'vpc-0dffaadc2898683fc' / PHONGPHAMVPC. The details panel shows the following information:

- VPC ID: vpc-0dffaadc2898683fc
- State: Available
- DNS hostnames: Enabled
- DNS resolution: Enabled
- Tenancy: Default
- DHCP option set: dopt-0a6d17b5749c436d7
- Main route table: rtb-0d8bc34f9639d4ac5
- Default VPC: No
- IPv4 CIDR: 10.0.0.0/16
- IPv6 pool: -
- Route 53 Resolver DNS Firewall rule groups: -
- Owner ID: 739376045381

I create my VPC (PPhamVPC)

The screenshot shows the AWS VPC console for a VPC named 'vpc-0dffaadc2898683fc' / PHONGPHAMVPC. The subnets list shows 4 subnets:

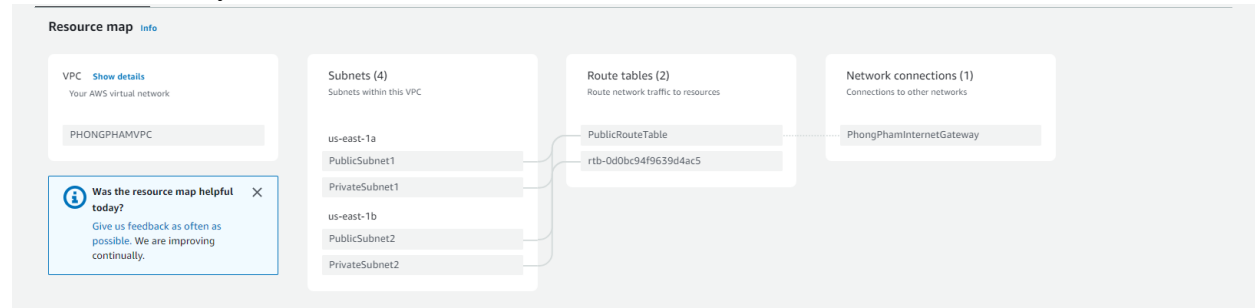
Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Available IPv4 addresses	Avail:
PrivateSubnet1	subnet-0c91ab8f5e5320d0f	Available	vpc-0dffaadc2898683fc PHON...	172.31.64.0/20	-	4091	us-east-1
PublicSubnet1	subnet-01ce4198dc0512ea2	Available	vpc-0dffaadc2898683fc PHON...	10.0.3.0/24	-	250	us-east-1
PublicSubnet2	subnet-0791299f6b7b7730	Available	vpc-0dffaadc2898683fc PHON...	10.0.3.0/24	-	251	us-east-1
PublicSubnet3	subnet-0f2aa1b0e8ca76da1	Available	vpc-0dffaadc2898683fc PHON...	10.0.3.0/24	-	250	us-east-1
PrivateSubnet2	subnet-059907ce40f6c0627	Available	vpc-0dffaadc2898683fc PHON...	172.31.0.0/20	-	4091	us-east-1
PrivateSubnet3	subnet-074a3f493682ea50f	Available	vpc-0dffaadc2898683fc PHON...	10.0.2.0/24	-	250	us-east-1
PublicSubnet4	subnet-09116f1d114f1cc9f	Available	vpc-0dffaadc2898683fc PHON...	10.0.1.0/24	-	251	us-east-1
PublicSubnet5	subnet-0cc538870a29968	Available	vpc-0dffaadc2898683fc PHON...	172.31.32.0/20	-	4091	us-east-1
PrivateSubnet4	subnet-0bd508dd77ca2441c	Available	vpc-0dffaadc2898683fc PHON...	10.0.4.0/24	-	250	us-east-1
PrivateSubnet5	subnet-05c5dc45100e2ff04	Available	vpc-0dffaadc2898683fc PHON...	10.0.4.0/24	-	251	us-east-1
PublicSubnet6	subnet-08f7ec6b5e838bb8	Available	vpc-0dffaadc2898683fc PHON...	10.0.2.0/24	-	250	us-east-1
PublicSubnet7	subnet-001af17aa0666b9f8	Available	vpc-0dffaadc2898683fc PHON...	172.31.48.0/20	-	4091	us-east-1
PublicSubnet8	subnet-06980d64bde9553d0	Available	vpc-0dffaadc2898683fc PHON...	10.0.1.0/24	-	251	us-east-1

4 subnets (2 public subnets and 2 private subnets)

The screenshot shows the AWS VPC console for a VPC named 'vpc-0dffaadc2898683fc' / PHONGPHAMVPC. The route tables list shows 6 route tables:

Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VPC	Owner ID
rtb-059fb7109dea0278	rtb-059fb7109dea0278	-	-	Yes	vpc-042bf480e82404d5 PHON...	739376045381
rtb-05b2025bb4d875da	rtb-05b2025bb4d875da	2 subnets	-	No	vpc-042bf480e82404d5 PHON...	739376045381
rtb-01b09d90877580b6	rtb-01b09d90877580b6	-	-	Yes	vpc-06792c31388cfa57d	739376045381
PublicRouteTable	rtb-0bdf96a5a1b5e556	2 subnets	-	No	vpc-0dffaadc2898683fc PHON...	739376045381
rtb-0d0bc94f9639d4ac5	rtb-0d0bc94f9639d4ac5	-	-	Yes	vpc-0dffaadc2898683fc PHON...	739376045381
rtb-09c6818a7506f93c	rtb-09c6818a7506f93c	-	-	Yes	vpc-061471dbd65bb3bcc PHON...	739376045381

2 public subnets associate with routable (PublicRouteTable) to Internet Gateways (PhongPha InternetGateWay)



This is my Resource map

1.2 – Security groups

Name	Security group ID	Security group name	VPC ID	Description	Owner	Inbound rules count	Outbound rules count
sg-0509d737692b4470e	sg-0509d737692b4470e	mywebserveruroupp	vpc-06792c31388cfa57d	launch-wizard-2 create...	739376045381	5 Permission entries	1 Permission entry
sg-08a191e7b0d376395	sg-08a191e7b0d376395	DB-Server-SG	vpc-0dffa6dc2898683fc	DB security group	739376045381	1 Permission entry	1 Permission entry
sg-0d2957c2627891c03	sg-0d2957c2627891c03	Web-Server-SG	vpc-042b0f480e82404d5	Security for Webserver	739376045381	3 Permission entries	1 Permission entry
sg-0a0668422a74e6614	sg-0a0668422a74e6614	Web-Server-SG	vpc-0dffa6dc2898683fc	Web Server security gr...	739376045381	3 Permission entries	1 Permission entry
sg-048965b8995b0b466	sg-048965b8995b0b466	default	vpc-061471dbd65bb3bcc	default VPC security gr...	739376045381	1 Permission entry	1 Permission entry
sg-0a0e0a74f36492ea2	sg-0a0e0a74f36492ea2	launch-wizard-2	vpc-061471dbd65bb3bcc	launch-wizard-2 create...	739376045381	1 Permission entry	1 Permission entry
sg-0e0ec09a73946f157	sg-0e0ec09a73946f157	launch-wizard-1	vpc-06792c31388cfa57d	launch-wizard-1 create...	739376045381	3 Permission entries	1 Permission entry
sg-04e0db286bda994c4	sg-04e0db286bda994c4	default	vpc-0dffa6dc2898683fc	default VPC security gr...	739376045381	1 Permission entry	1 Permission entry
sg-028d7150679786f66	sg-028d7150679786f66	Test-Instance-SG	vpc-0dffa6dc2898683fc	Test Instance	739376045381	1 Permission entry	1 Permission entry
sg-011662e89f0d09189	sg-011662e89f0d09189	default	vpc-06792c31388cfa57d	default VPC security gr...	739376045381	1 Permission entry	1 Permission entry
sg-05fec6b55560c970e	sg-05fec6b55560c970e	DBServerSG	vpc-061471dbd65bb3bcc	Allow MySQL from We...	739376045381	0 Permission entries	0 Permission entries

I create 3 security groups (3 security groups I selected are 3 SG I used for this assignment)

1.3 – EC2 virtual machine

1.3.1 – Bastion/Web server instance

Instance ID	Public IPv4 address	Private IPv4 addresses
i-070254bd214c63fb7 (Web-Server)	54.92.231.101 (Jpwn address)	10.0.2.60

Instance state: **Running**

Private IP DNS name (IPv4 only): ip-10-0-2-60.ec2.internal

Instance type: t2.micro

VPC ID: vpc-0dffa6dc2898683fc (PHONGPHAMVPC)

Subnet ID: subnet-08f76ecdb5e838bb8 (PublicSubnet2)

Elastic IP addresses: 54.92.231.101 [Public IP]

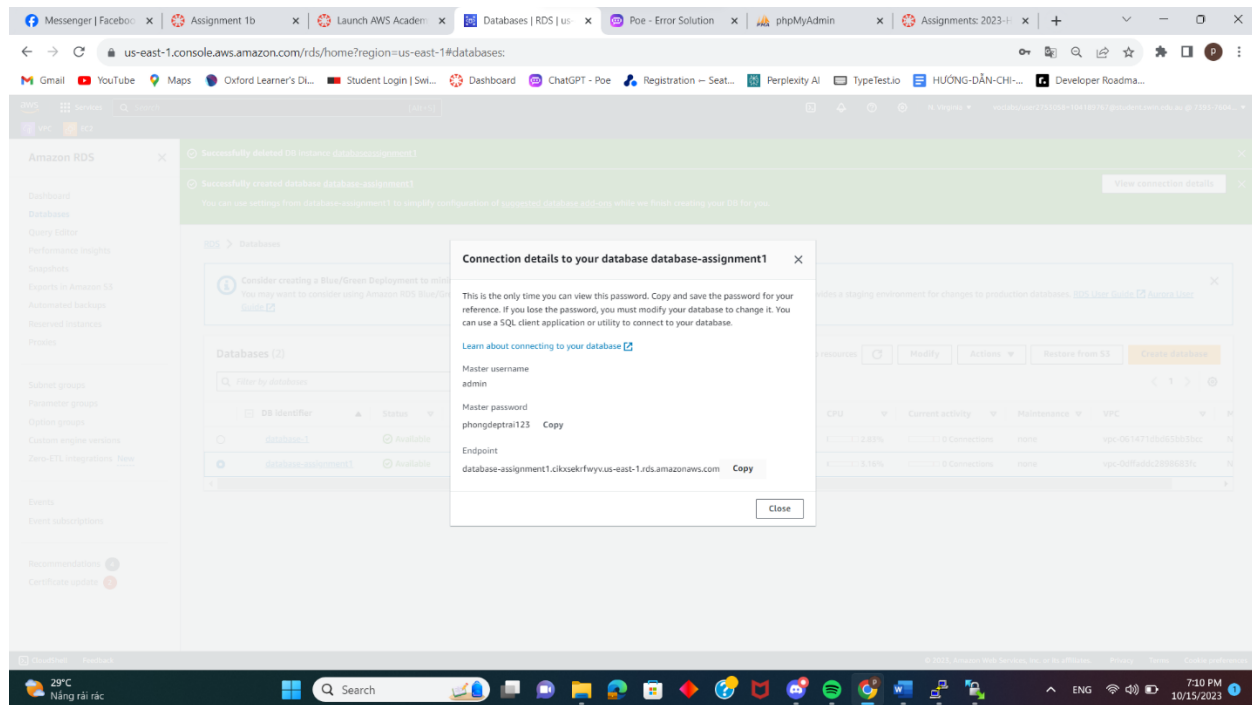
AWS Compute Optimizer finding: Opt-in to AWS Compute Optimizer for recommendations. | Learn more

Auto Scaling Group name: -

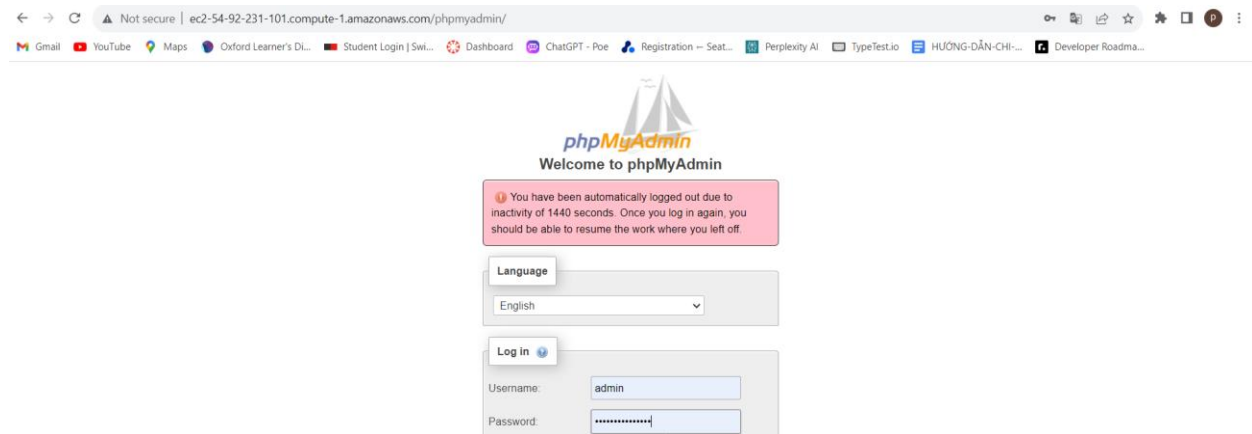
I create a Web server instance as well add an elastic IP address for it to ensure my Web-Server URL remains persistent.

1.3.2 – Test Instance

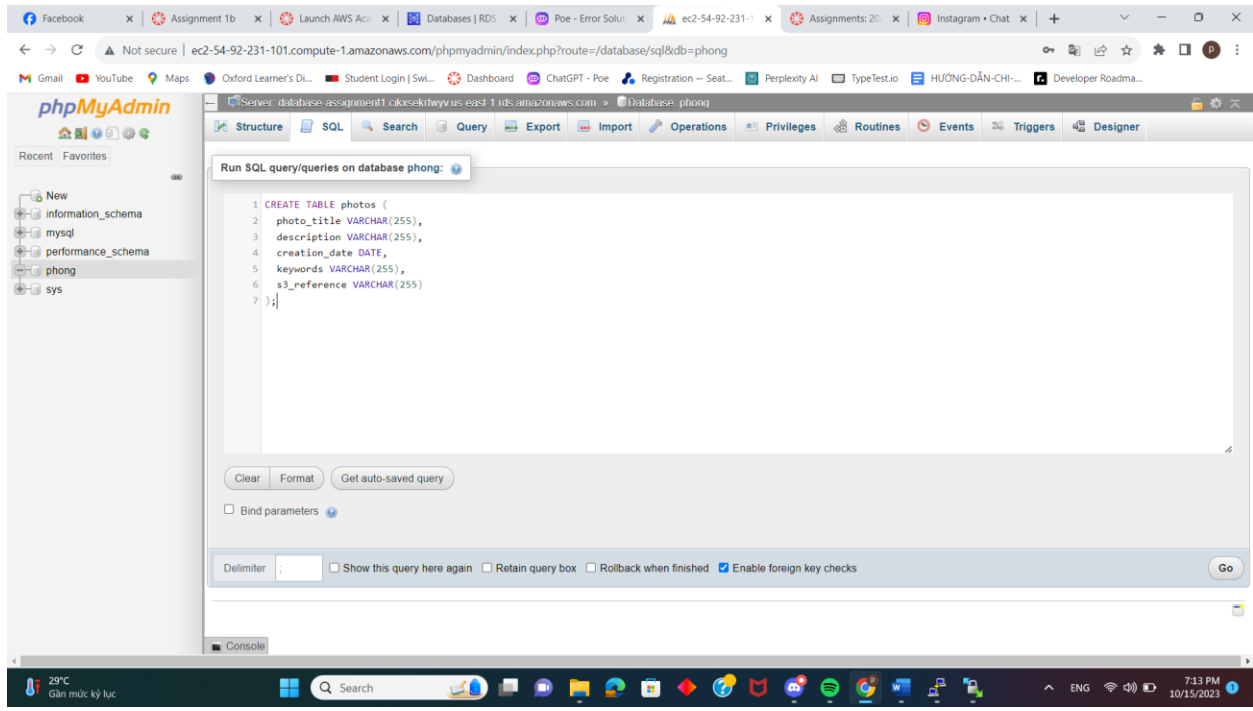
I can SSH into an instance in a private subnet (private subnet 2)



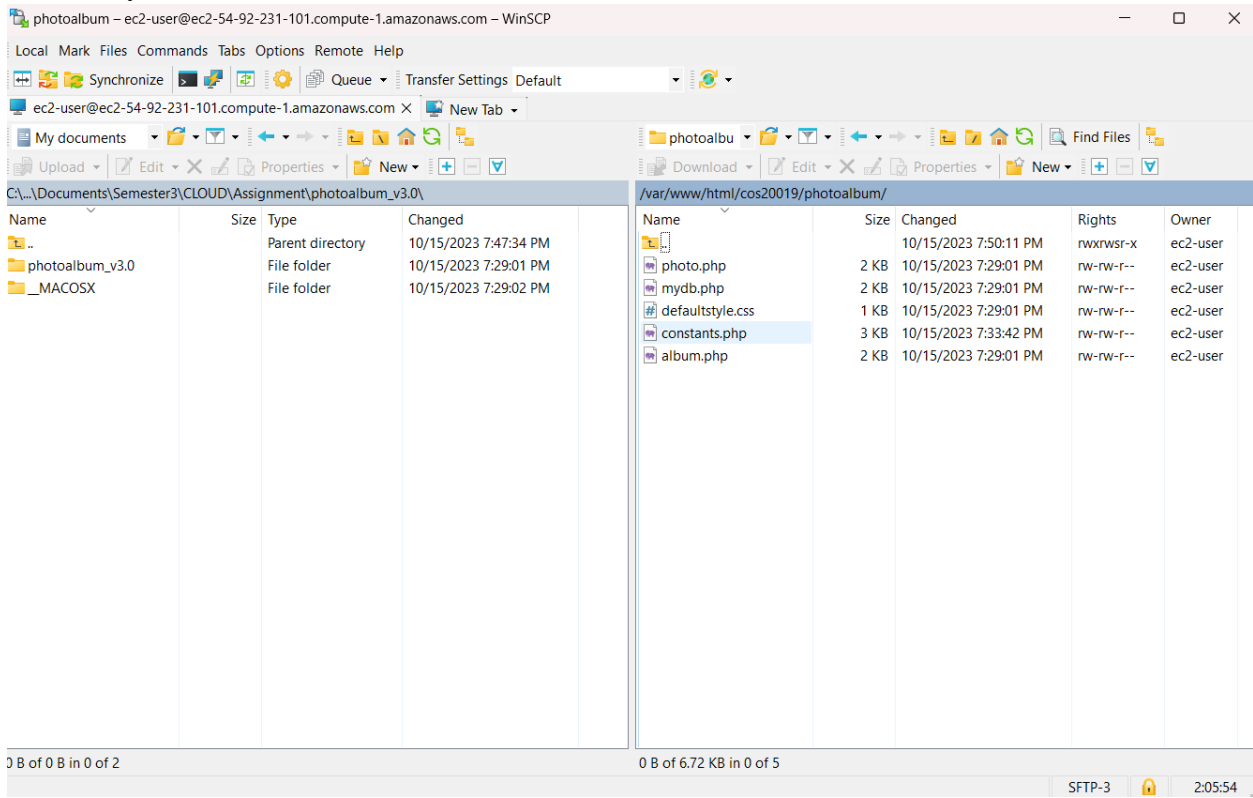
The details of my database.



This is the display of phpMyadmin . The username : admin and the password : phongdeptrai123.



This is mySQL command.



This is my WinSCP where I store the photos.

1.5 – Network ACL

The top screenshot displays the 'Inbound rules' tab for a Network ACL. It shows a list of rules with the following details:

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
200	SSH (22)	TCP (6)	22	0.0.0.0/0	Allow
300	All ICMP - IPv4	ICMP (1)	All	10.0.4.0/24	Allow
400	Custom TCP	TCP (6)	32768 - 65535	10.0.0.0/16	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

The bottom screenshot displays the 'Outbound rules' tab for the same Network ACL. It shows a list of rules with the following details:

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
200	Custom TCP	TCP (6)	32768 - 65535	0.0.0.0/0	Allow
300	SSH (22)	TCP (6)	22	10.0.0.0/16	Allow
400	MySQL/Aurora (3306)	TCP (6)	3306	10.0.0.0/16	Allow
500	All ICMP - IPv4	ICMP (1)	All	10.0.4.0/24	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

This is my network ACL with the requirements : Inbound Rules and Outbound Rules

1.Functional requirements of Photo Album website

2.1 Photo storage

Amazon S3 > Buckets > photoweb

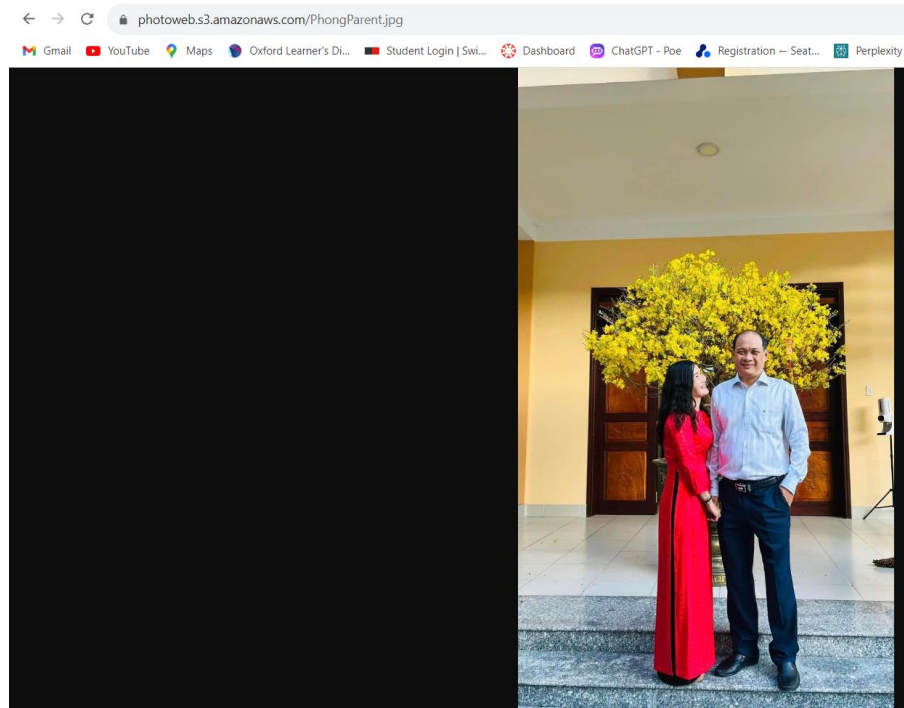
photoweb info
Publicly accessible

Objects (3)

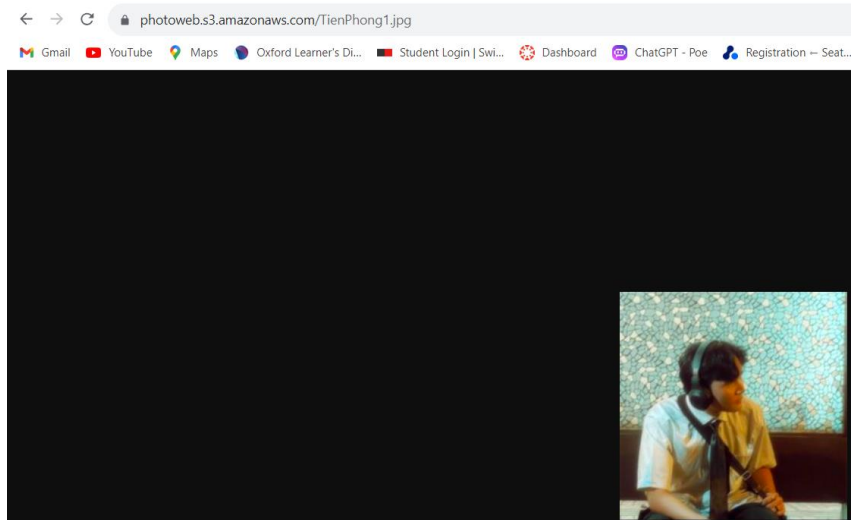
Find objects by prefix

	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	PhongParent.jpg	jpg	October 15, 2023, 20:17:15 (UTC+08:00)	175.9 KB	Standard
<input type="checkbox"/>	TienPhong1.jpg	jpg	October 15, 2023, 19:19:46 (UTC+08:00)	14.2 KB	Standard
<input type="checkbox"/>	TienPhong2.jpg	jpg	October 15, 2023, 19:19:47 (UTC+08:00)	21.7 KB	Standard

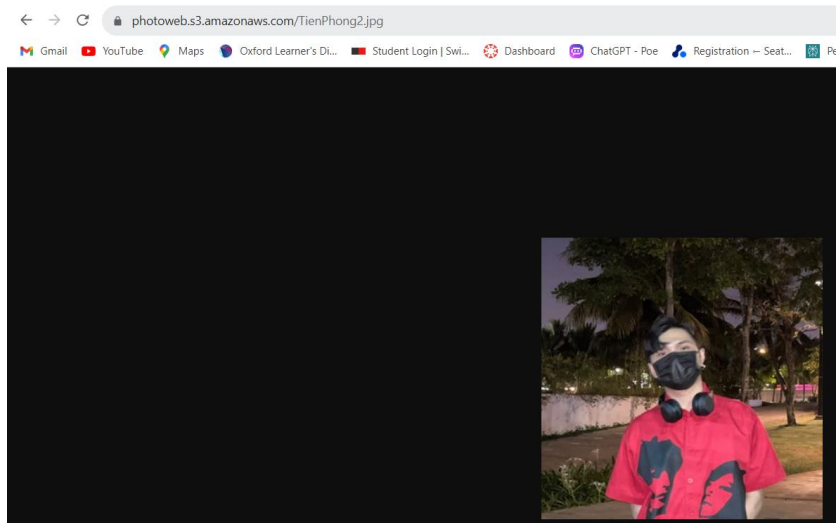
This is my S3 bucket where stores my photo.



<https://photoweb.s3.amazonaws.com/PhongParent.jpg>



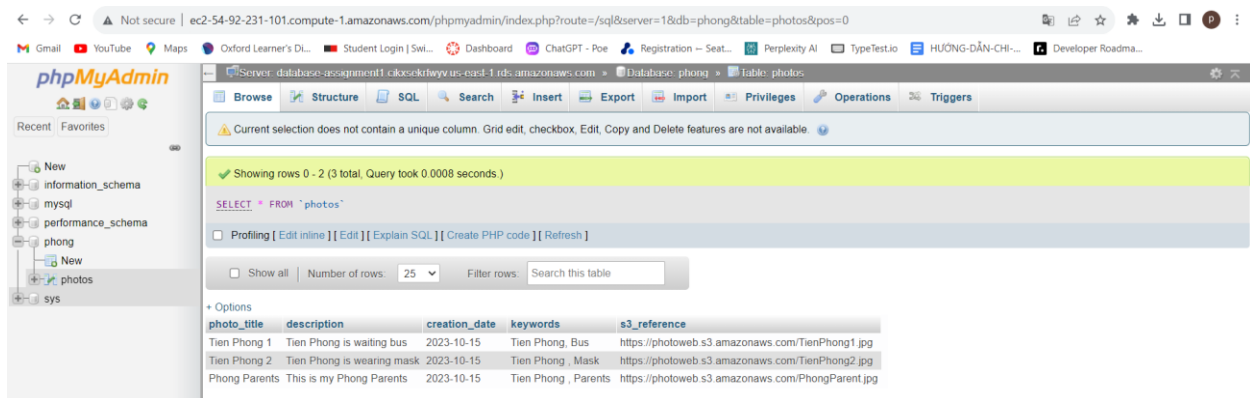
<https://photoweb.s3.amazonaws.com/TienPhong1.jpg>



<https://photoweb.s3.amazonaws.com/TienPhong2.jpg>

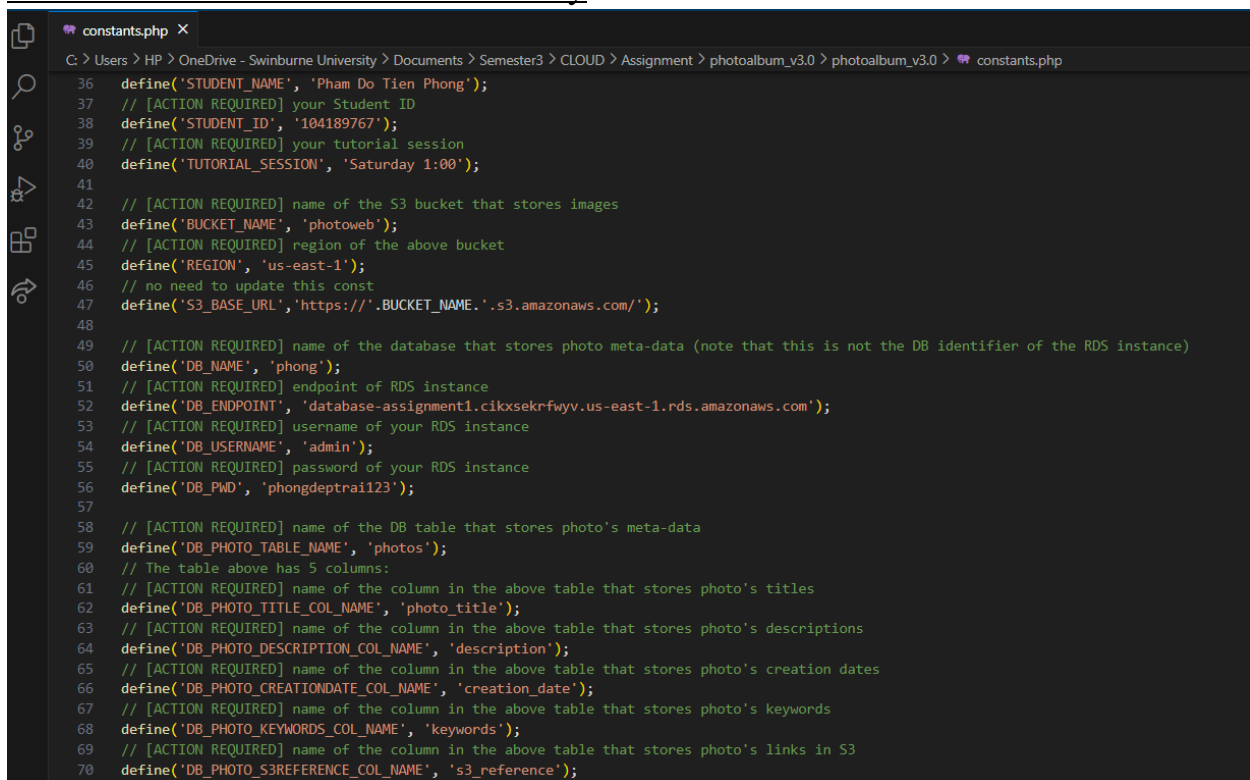
These pictures are the photos in the S3 bucket and links are accessed to it.

2.2 Photo meta-data in RDS database



I create a table to store the photo in phpmyadmin.

2.3 Photo Album website functionality




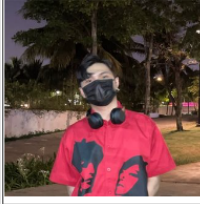

First of all, I modify the constant.php. The things I change are student name ; student id ; tutorial session; bucket name ; db name ; action required of endpoint, username, password ; db photo creationdate ; db photo s3 reference, respectively.

Student name: Pham Do Tien Phong

Student ID: 104189767

Tutorial session: Saturday 1:00

Uploaded photos:

Photo	Name	Description	Creation date	Keywords
	Tien Phong 1	Tien Phong is waiting bus	2023-10-15	Tien Phong, Bus
	Tien Phong 2	Tien Phong is wearing mask	2023-10-15	Tien Phong , Mask
	Phong Parents	This is my Phong Parents	2023-10-15	Tien Phong , Parents

And finally, this is my server.

This is my URL of the album.php page

<http://ec2-54-92-231-101.compute-1.amazonaws.com/cos20019/photoalbum/album.php>