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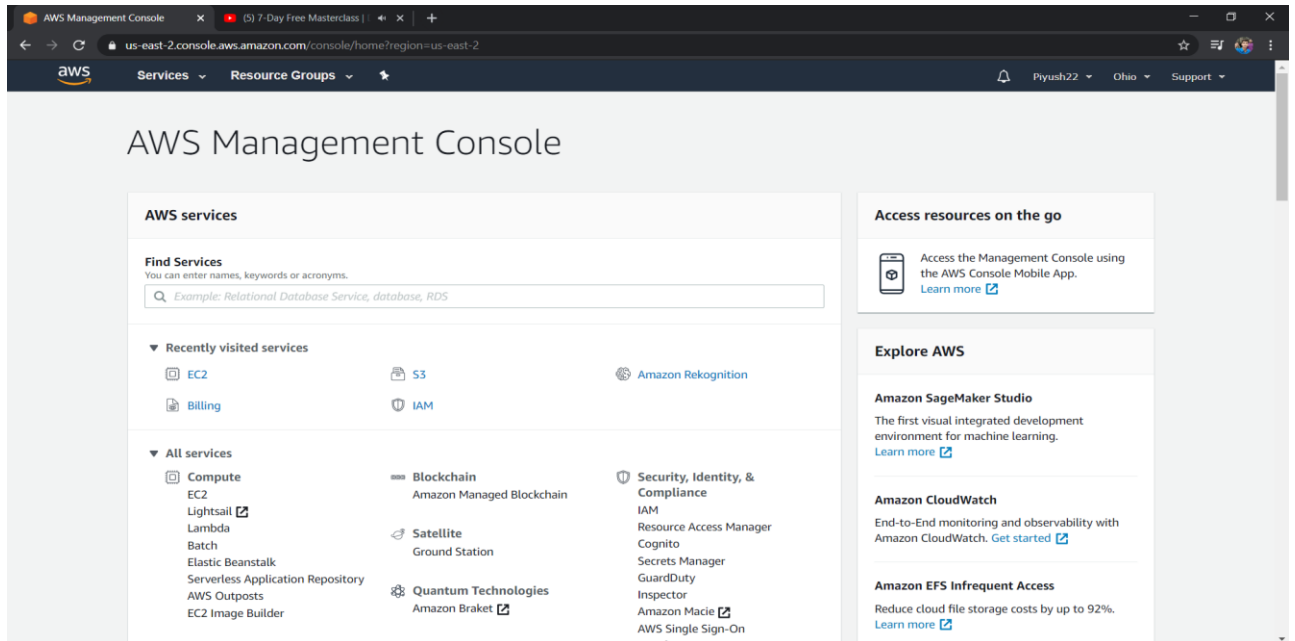
ETHNUS CODEMITHRA – BUILDING A FACE DETECTION APP ON AWS

INDEX

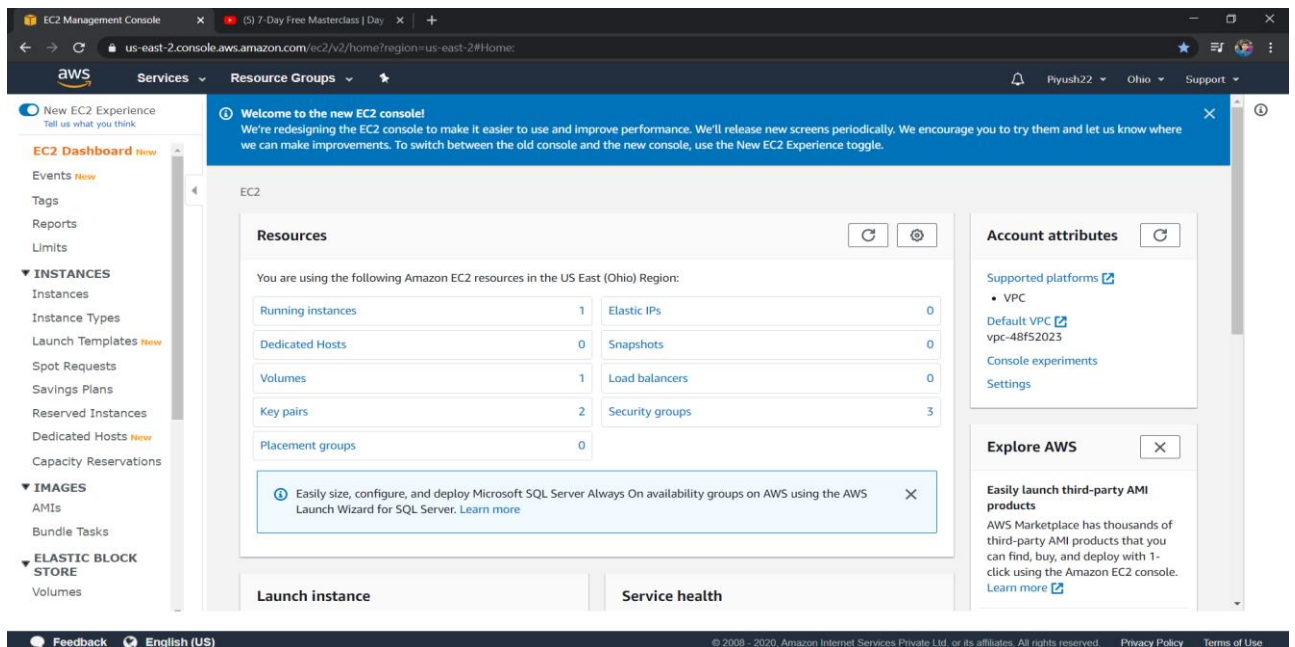
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1. AWS

a. AWS Login Screen with Username



b. EC2 Dashboard



c. S3 Dashboard

The screenshot shows the Amazon S3 Management Console. The left sidebar contains navigation links: Buckets, Batch operations, Access analyzer for S3, Block public access (account settings), and Feature spotlight. The main content area displays a notification about console updates and a 'Buckets (1)' section. This section includes a search bar, a table with one bucket, and buttons for 'Copy ARN', 'Empty', 'Delete', and 'Create bucket'.

Name	Region	Access	Bucket created
piyush2-aws	US East (Ohio) us-east-2	Objects can be public	2020-03-28T18:00:51.000Z

d. Rekognition Dashboard

The screenshot shows the Amazon Rekognition console landing page. The left sidebar lists navigation options: Custom Labels, Demos, Image moderation, Facial analysis, Celebrity recognition, Face comparison, Text in image, Video Demos, Metrics, and Additional Resources. The main content area features a large header with the text 'Amazon Rekognition' and 'Deep learning-based visual analysis service'. Below this are three columns of information: 'Easily Integrate Powerful Visual Analysis into Your App', 'Continuously Learning', and 'Integrated with AWS Services'.

Easily Integrate Powerful Visual Analysis into Your App
You don't need computer vision or deep learning expertise to take advantage of Rekognition's high quality image and video analysis for your web, mobile, enterprise or device applications. Amazon Rekognition removes the complexity of building visual recognition capabilities by making powerful

Continuously Learning
Amazon Rekognition is designed to use deep learning technology to analyze billions of images and videos daily. It is continuously learning as we add support for new capabilities and learn from more and more data.

Integrated with AWS Services
Amazon Rekognition is designed to work seamlessly with other AWS services. Rekognition integrates directly with Amazon S3 and AWS Lambda so you can build scalable, affordable, and reliable visual analysis applications. You can start analyzing images and videos stored in Amazon S3 without moving any data. You can also run real-time

2. EC2

a. Choosing an AMI

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows"

Quick Start

My AMIs

AWS Marketplace

Community AMIs

☐ Free tier only

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0e01ce4ee18447327 (64-bit x86) / ami-03201f374ab66a26e (64-bit Arm)

Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-01b01bdd08f24c7a8

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-0520e698dd500b1d1 (64-bit x86) / ami-0099847d600887c9f (64-bit Arm)

Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

SUSE Linux Enterprise Server 15 SP4 (HVM), SSD Volume Type - ami-04c5b0b51ee146025 (64-bit x86) / ami-02c73000019018171 (64-bit Arm)

b. Choosing an Instance Type

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: **All Instance types** **Current generation** [Show/Hide Columns](#)

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t3a.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

c. Adding Storage

The screenshot shows the 'Add Storage' step (Step 4) of the AWS Launch Instance Wizard. The breadcrumb trail at the top indicates the sequence: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, 7. Review. The main heading is 'Step 4: Add Storage'. Below it, a paragraph explains that the instance will be launched with the following storage device settings and that additional EBS volumes can be attached after launch. A table lists the storage configuration for the 'Root' volume: Device is '/dev/xvda', Snapshot is 'snap-0f54692056aaa4c20', Size is '8' GiB, Volume Type is 'General Purpose SSD (gp2)', IOPS is '100 / 3000', Throughput is 'N/A', Delete on Termination is checked, and Encryption is 'Not Encrypted'. An 'Add New Volume' button is present. A blue information box states that free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. At the bottom, there are 'Cancel', 'Previous', 'Review and Launch', and 'Next: Add Tags' buttons. The footer includes 'Feedback', 'English (US)', and copyright information for 2008-2020 Amazon Internet Services Private Ltd.

7-Day Free Masterclass | Day 4 | Launch instance wizard | EC2 Ma...
us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

Services Resource Groups

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-0f54692056aaa4c20	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

Cancel Previous **Review and Launch** Next: Add Tags

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d. Configuring Security Group

The screenshot shows the 'Configure Security Group' step (Step 6) of the AWS Launch Instance Wizard. The breadcrumb trail at the top indicates the sequence: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, 7. Review. The main heading is 'Step 6: Configure Security Group'. Below it, a paragraph explains that a security group is a set of firewall rules that control traffic. Under 'Assign a security group', the 'Create a new security group' option is selected. The 'Security group name' is 'launch-wizard-2' and the 'Description' is 'launch-wizard-2 created 2020-03-28T19:36:01.884+05:30'. A table lists the configured rules: Type is 'SSH', Protocol is 'TCP', Port Range is '22', Source is 'Custom' with IP '0.0.0.0/0', and Description is 'e.g. SSH for Admin Desktop'. An 'Add Rule' button is present. A yellow warning box states that rules with source 0.0.0.0/0 allow all IP addresses to access the instance. At the bottom, there are 'Cancel', 'Previous', 'Review and Launch', and 'Next: Add Tags' buttons. The footer includes 'Feedback', 'English (US)', and copyright information for 2008-2020 Amazon Internet Services Private Ltd.

7-Day Free Masterclass | Day 4 | Launch instance wizard | EC2 Ma...
us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

Services Resource Groups

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group
☐ Select an existing security group

Security group name: launch-wizard-2

Description: launch-wizard-2 created 2020-03-28T19:36:01.884+05:30

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

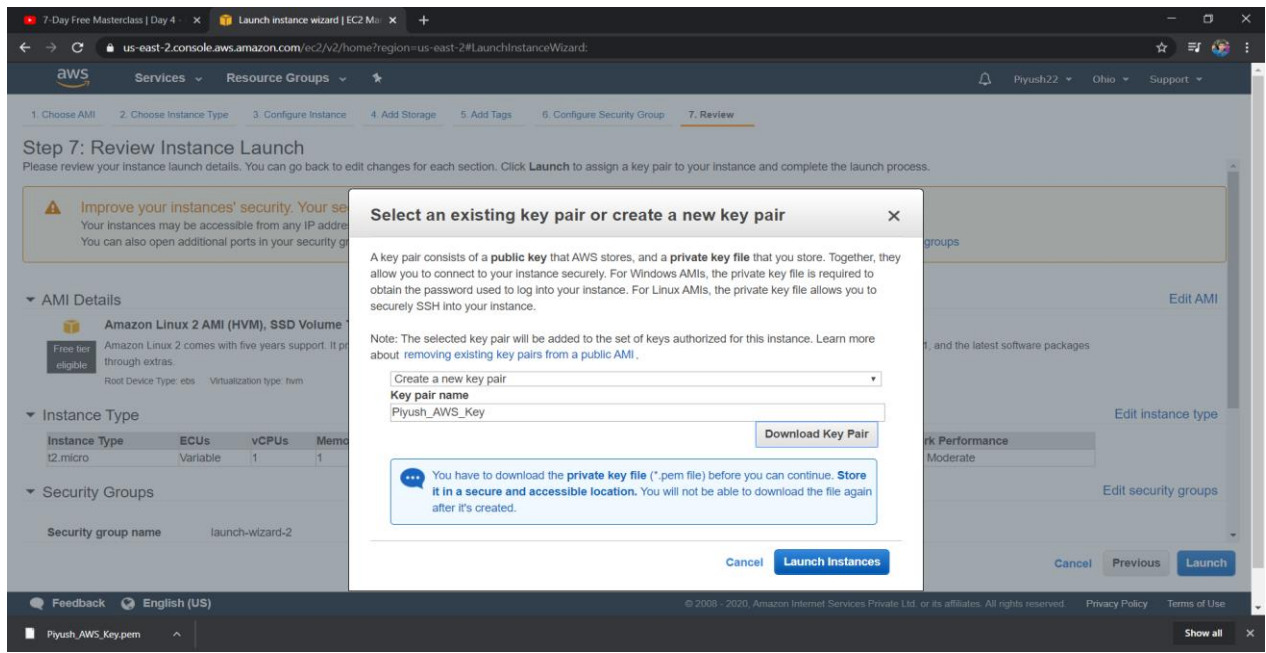
Add Rule

Warning
Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

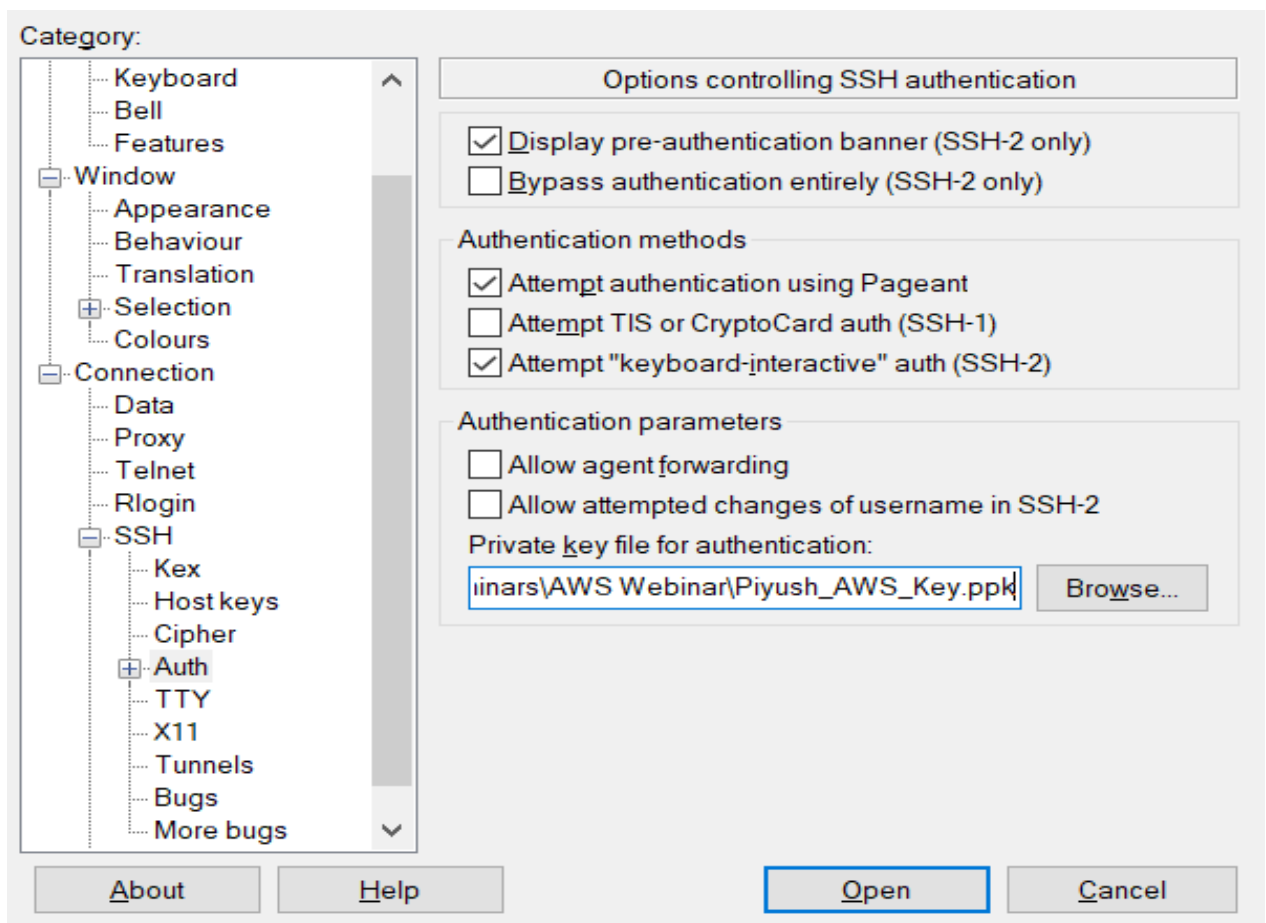
Cancel Previous **Review and Launch** Next: Add Tags

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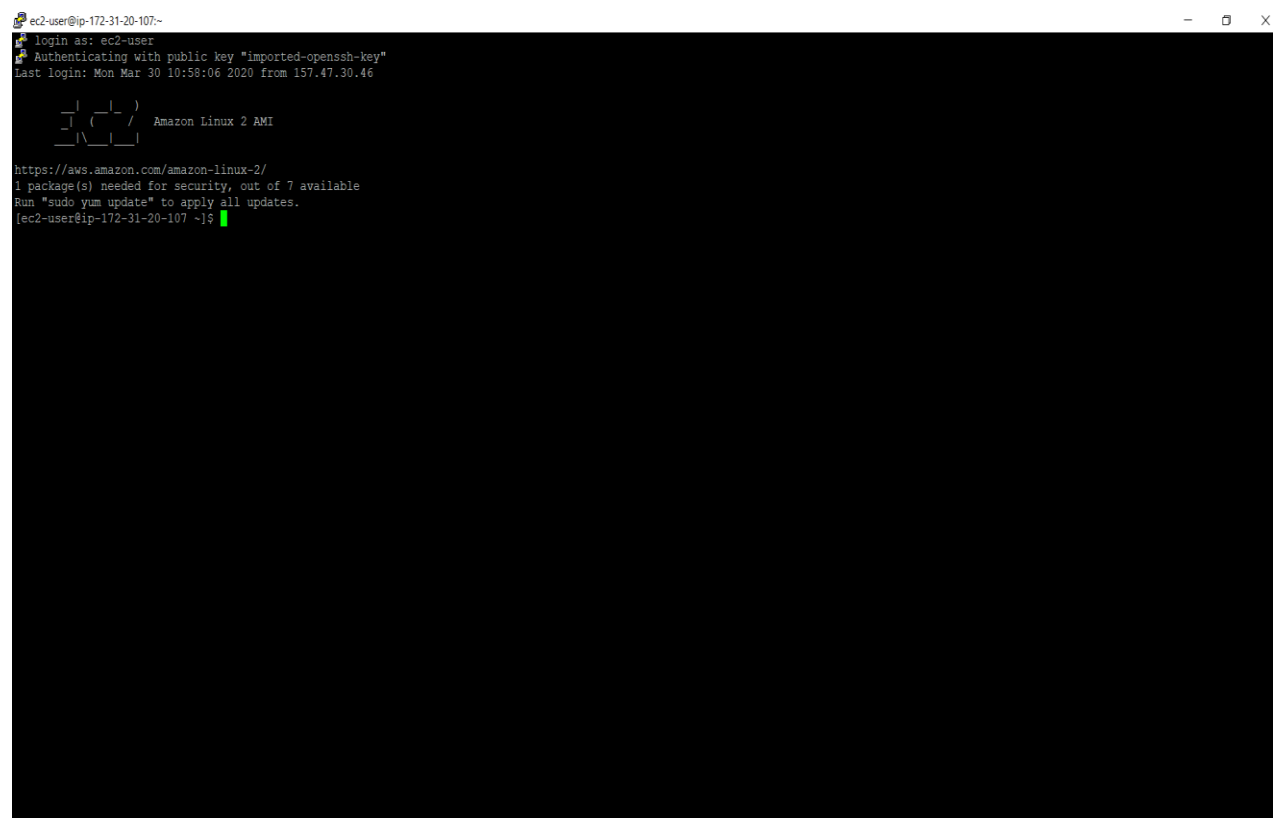
e. Key Pair Download



f. PuTTYgen conversion from pem to ppk



g. Logged in EC2 Black Screen

A terminal window with a black background and white text. The window title bar shows 'ec2-user@ip-172-31-20-107:~' and standard window controls. The terminal output shows the login process for 'ec2-user' using a public key, followed by the Amazon Linux 2 AMI logo and system messages about security updates. The prompt is '[ec2-user@ip-172-31-20-107 ~]\$' with a green cursor.

```
ec2-user@ip-172-31-20-107:~  
login as: ec2-user  
Authenticating with public key "imported-openssh-key"  
Last login: Mon Mar 30 10:58:06 2020 from 157.47.30.46  
  
  _ | _ | _ )  
  _ | ( _ | /  
  _ \| _ | _ |  
      Amazon Linux 2 AMI  
  
https://aws.amazon.com/amazon-linux-2/  
1 package(s) needed for security, out of 7 available  
Run "sudo yum update" to apply all updates.  
[ec2-user@ip-172-31-20-107 ~]$
```


3. S3

a. Creating a Bucket

S3 Management Console

s3.console.aws.amazon.com/s3/bucket/create?region=us-east-2

Services Resource Groups

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We're gradually updating the design of the Amazon S3 console. You will notice some updated screens as we improve the performance and user interface. To help us improve the experience, give feedback on the recent updates.

Amazon S3 > Create bucket

Create bucket

General configuration

Bucket name

Piyush2-aws

Bucket name must be unique and must not contain spaces or uppercase letters. [See rules for bucket naming](#)

Region

US East (Ohio) us-east-2

Bucket settings for Block Public Access

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to this bucket and its objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to this bucket or objects within, you can customize the individual settings below to suit your specific storage use cases. [Learn more](#)

☒ **Block all public access**

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

☒ Block public access to buckets and objects granted through new access control lists (ACLs)

Feedback English (US)

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S3 Management Console

s3.console.aws.amazon.com/s3/bucket/create?region=us-east-2

Services Resource Groups

Piyush22 Global Support

Bucket settings for Block Public Access

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to this bucket and its objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to this bucket or objects within, you can customize the individual settings below to suit your specific storage use cases. [Learn more](#)

☒ **Block all public access**

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

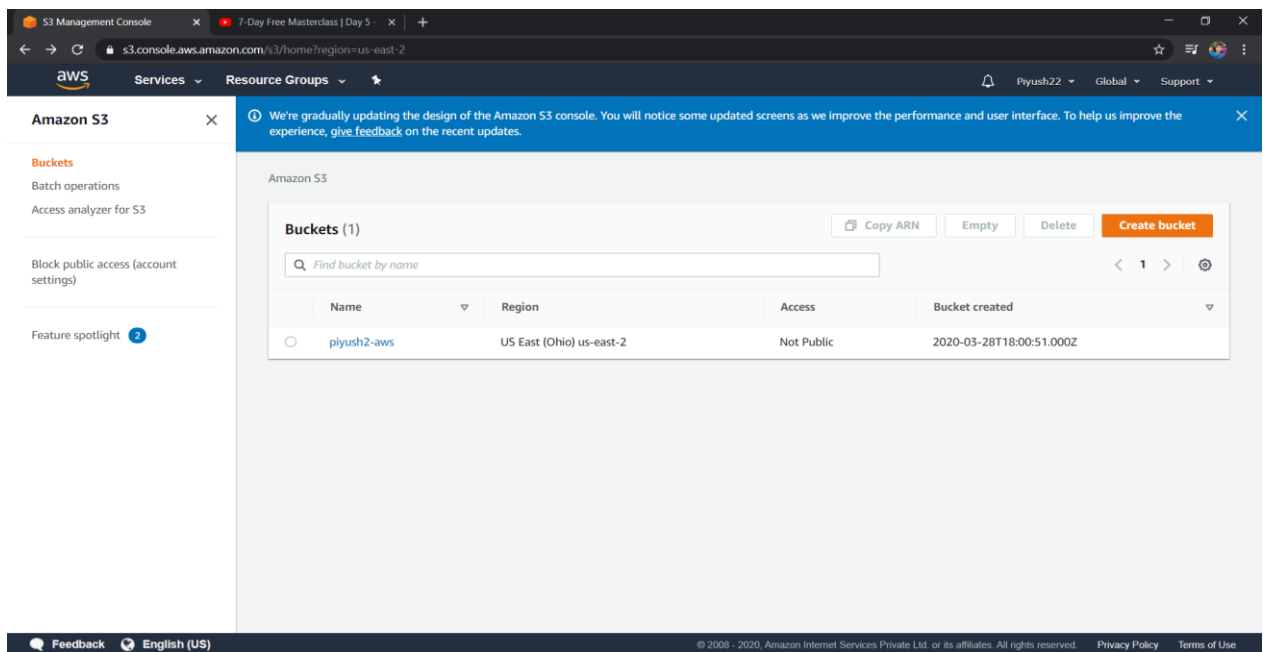
- ☒ **Block public access to buckets and objects granted through new access control lists (ACLs)**
S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.
- ☒ **Block public access to buckets and objects granted through any access control lists (ACLs)**
S3 will ignore all ACLs that grant public access to buckets and objects.
- ☒ **Block public access to buckets and objects granted through new public bucket or access point policies**
S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources.
- ☒ **Block public and cross-account access to buckets and objects through any public bucket or access point policies**
S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to buckets and objects.

► Advanced settings

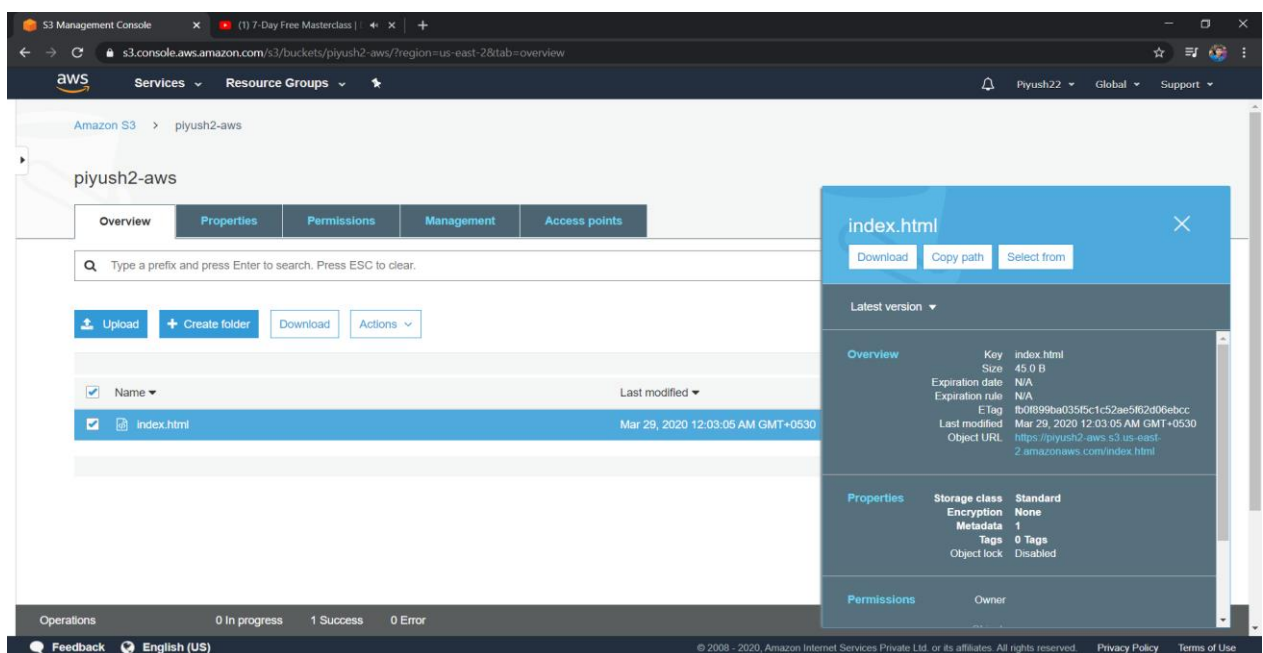
Cancel Create bucket

Feedback English (US)

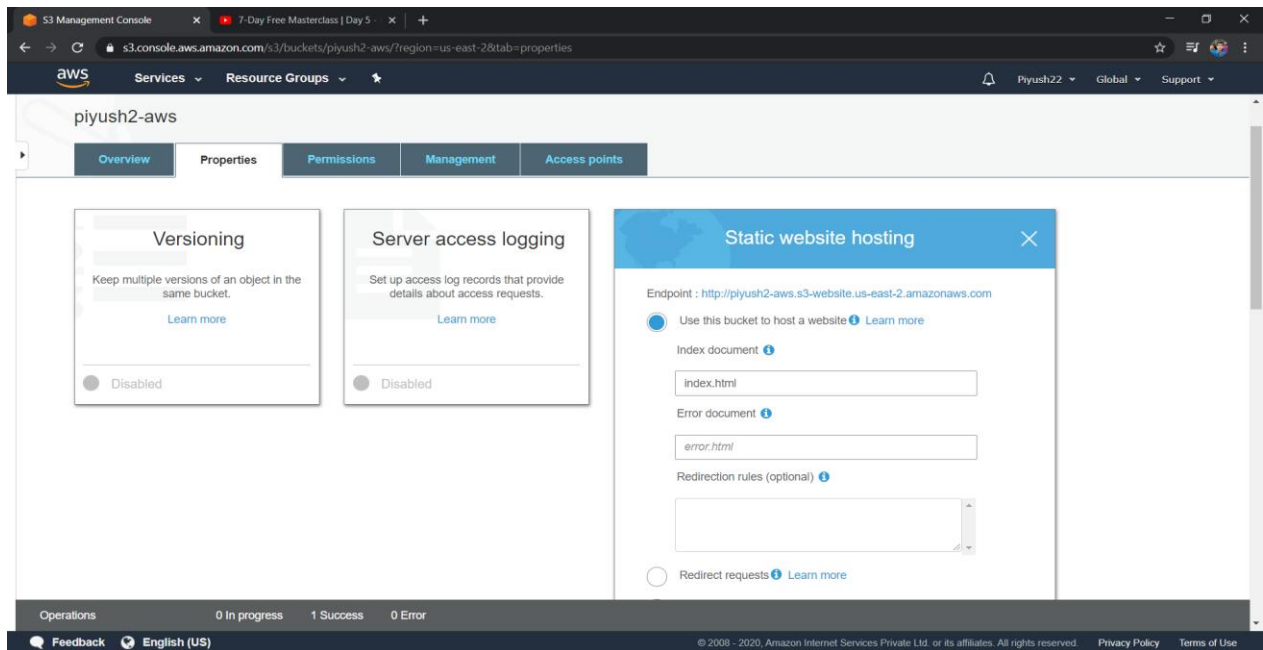
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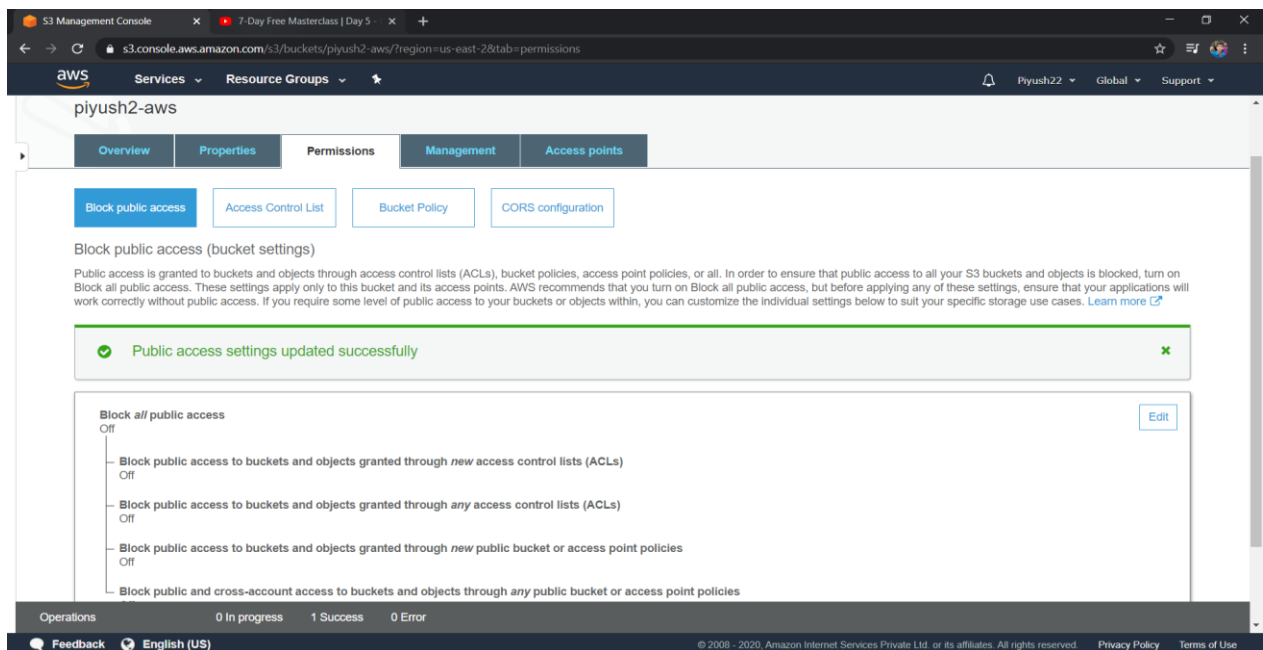
b. Uploading an Object



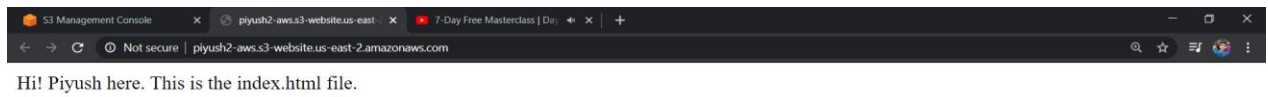
c. Logged in EC2 Black Screen



d. Making the Object Public



e. Checking the S3 link on the browser



4. Rekognition

a. Face Detect

The screenshot shows the Amazon Rekognition console interface. The left sidebar contains navigation links for Amazon Rekognition, Custom Labels, Demos, Object and scene detection, Image moderation, Facial analysis (selected), Celebrity recognition, Face comparison, Text in image, Video Demos, Video analysis, Metrics, and Additional Resources. The main content area is titled "Facial analysis" and includes a description: "Get a complete analysis of facial attributes, including confidence scores." Below this is a large image of a woman wearing sunglasses, with a bounding box around her face. To the right of the image is a "Results" section showing various attributes and their confidence scores:

Attribute	Confidence Score
looks like a face	99.9 %
appears to be female	99.9 %
age range	17 - 29 years old
smiling	91.7 %
appears to be happy	99.5 %
wearing glasses	99.8 %

Below the image, there are options to "Choose a sample image" or "Use your own image" (with an "Upload" button). The bottom of the console shows a footer with "Feedback", "English (US)", and copyright information.

b. Face Compare

The screenshot shows the Amazon Rekognition console interface for the "Face comparison" demo. The left sidebar is the same as in the previous screenshot, with "Face comparison" selected. The main content area is titled "Face comparison" and includes a description: "Compare faces to see how closely they match based on a similarity percentage." Below this are two image upload sections: "Reference face" and "Comparison faces". The "Reference face" section shows a single image of a young girl. The "Comparison faces" section shows two images of the same girl. To the right of the images is a "Results" section showing the similarity score:

Comparison	Similarity Score
Reference face vs. Comparison face 1	99.8 %
Reference face vs. Comparison face 2	Not similar
Reference face vs. Comparison face 3	Not similar

Below the images, there are options to "Choose a sample image" or "Choose a sample image" (with an "Upload" button). The bottom of the console shows a footer with "Feedback", "English (US)", and copyright information.

c. Celebrity Recognition

The screenshot shows the AWS Rekognition Console interface for the Celebrity Recognition demo. The left sidebar lists various services, with 'Celebrity recognition' highlighted. The main content area features a large image of Jeff Bezos with a bounding box around his face. Below this, there are options to 'Choose a sample image' (showing two thumbnails) or 'Use your own image' (with an 'Upload' button and a 'Go' button). The right sidebar displays the results, including a 'Learn more' link, a 'Results' section with a small image of Jeff Bezos and his name, and a 'Match confidence' of 100%. The footer includes 'Feedback', 'English (US)', and copyright information.

d. Text in Image

The screenshot shows the AWS Rekognition Console interface for the Text in Image demo. The left sidebar lists various services, with 'Text in image' highlighted. The main content area features a large image of a coffee cup with a smiley face and the text 'IT'S MONDAY but keep Smiling'. Below this, there are options to 'Choose a sample image' (showing two thumbnails) or 'Use your own image' (with an 'Upload' button and a 'Go' button). The right sidebar displays the results, including a 'Learn more' link, a 'Results' section with the text 'IT'S MONDAY but keep Smiling', and a 'Request' and 'Response' section. The footer includes 'Feedback', 'English (US)', and copyright information.

c. index.php file code

```
ec2-user@ip-172-31-20-107:/var/www/html/face
[[200~c7php
require_once(__DIR__ . '/vendor/autoload.php');

use Aws\S3\S3Client;
use Aws\Rekognition\RekognitionClient;

$bucket = 'piyush2-aws';
$keyname = 's.jpg';

$s3 = new S3Client([
    'region' => 'us-east-2',
    'version' => '2006-03-01',
    'signature'=> 'v4'
]);

try {
    $result = $s3->putObject([
        'Bucket' => $bucket,
        'Key' => $keyname,
        'SourceFile' => __DIR__ . "/" . $keyname,
        'ACL' => 'public-read-write'
    ]);

    $imageUrl = $result['ObjectURL'];
    if($imageUrl) {
        echo "Image upload done... Here is the URL: " . $imageUrl;

        $rekognition = new RekognitionClient([
            'region' => 'us-east-2',
            'version' => 'latest',
        ]);

        $result = $rekognition->detectFaces([
            'Attributes' => ['ORIGIN'],
            'Image' => [
                'S3Object' => [
                    'Bucket' => $bucket,
                    'Name' => $keyname,
                    'Key' => $keyname,
                ],
            ],
        ]);

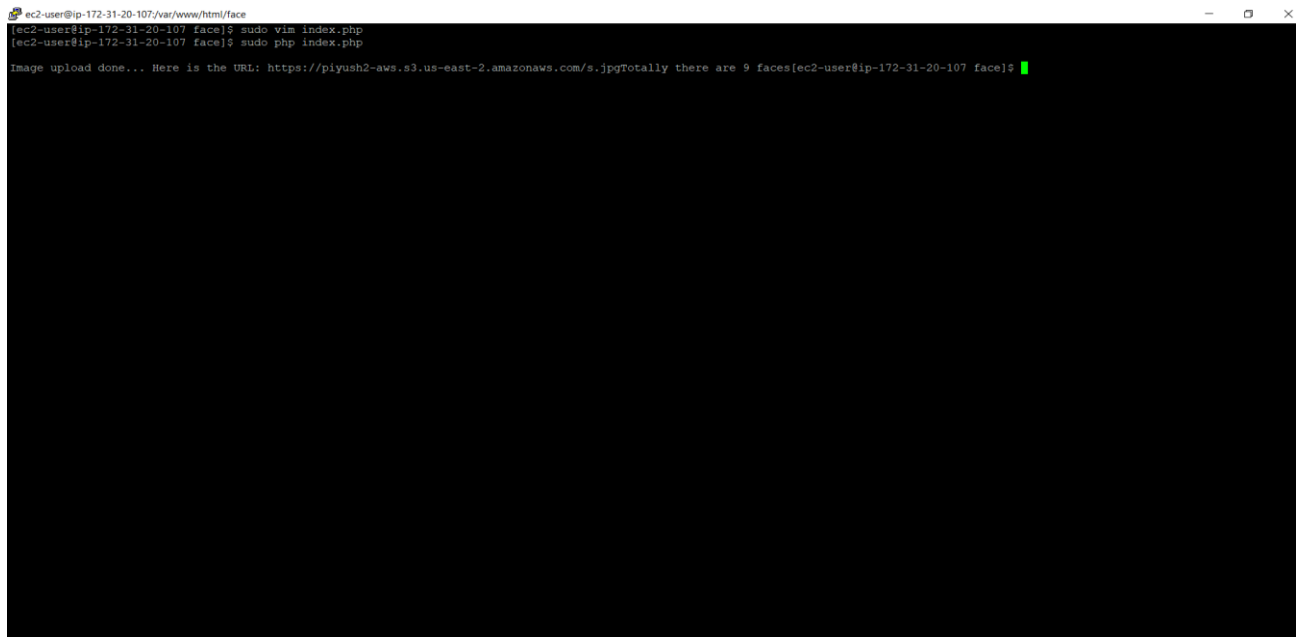
        echo "Totally there are " . count($result["FaceDetails"]) . " faces";
    }
} catch (Exception $e) {
    echo $e->getMessage() . PHP_EOL;
}
```

d. Upload Success Screenshot

```
ec2-user@ip-172-31-20-107:/var/www/html/face
[ec2-user@ip-172-31-20-107 face]$ ls
b97ea33b5842c7894b804923c6c05580.jpg  composer.lock  s.jpg
composer.json  index.php      vendor
[ec2-user@ip-172-31-20-107 face]$ sudo mv ^C
[ec2-user@ip-172-31-20-107 face]$ sudo mv b97ea33b5842c7894b804923c6c05580.jpg s.jpg
[ec2-user@ip-172-31-20-107 face]$ ls
composer.json  composer.lock  index.php  s.jpg  vendor
[ec2-user@ip-172-31-20-107 face]$ sudo php index.php
Image upload done... Here is the URL: https://piyush2-aws.s3.us-east-2.amazonaws.com/s.jpg[ec2-user@ip-172-31-20-107 face]$
```


6. EC2 & Rekognition

a. Face Detect Success Screenshot

A terminal window with a black background and white text. The text shows a sequence of commands and their outputs. The first command is 'sudo vim index.php'. The second command is 'sudo php index.php'. The output of the second command is 'Image upload done... Here is the URL: https://piyush2-aws.s3.us-east-2.amazonaws.com/s.jpgTotally there are 9 faces[ec2-user@ip-172-31-20-107 face]\$'. The terminal window has a title bar with a small icon on the left and three buttons (minimize, maximize, close) on the right.

```
ec2-user@ip-172-31-20-107/var/www/html/face
[ec2-user@ip-172-31-20-107 face]$ sudo vim index.php
[ec2-user@ip-172-31-20-107 face]$ sudo php index.php
Image upload done... Here is the URL: https://piyush2-aws.s3.us-east-2.amazonaws.com/s.jpgTotally there are 9 faces[ec2-user@ip-172-31-20-107 face]$
```