PARSHVANATH CHARITABLE TRUST'S

A.P. Shah Institute of Technology

Thane, 400615

Academic Year: 2022-23
Department of Computer Engineering

CSL605 SKILL-BASED LAB COURSE: CLOUD COMPUTING

Mini Project Report

Title of Project: Canteen Food Ordering System

Year and Semester: T.E. (Sem VI)

made by

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Abstract

Large educational institutes have a huge number of students studying, and a number of teaching and non-teaching staff working there. Heavy crowds during lunchtime are a recurring issue in the college canteen. This prevents students and faculty from receiving food on time, which causes them to be late for their respective lectures and work. The cloud-based canteen food ordering project is designed to provide a seamless and efficient food ordering experience for students and staff members. By leveraging the power of the cloud, customers can easily place their food orders using an application from anywhere, anytime. The cloud-based infrastructure ensures scalability, flexibility, and reliability, enabling the system to handle a large number of orders without any hiccups.

The application allows customers to browse through the menu, select their preferred items, and make online payments. Once the order is placed, it is immediately sent to the canteen manager for approval. The canteen manager has admin access, which enables them to manage the menu, add new items, and approve or reject orders.The cloud-based solution provides real-time updates on the status of the order, allowing customers to track their orders and estimate their waiting time. The system also sends notifications to customers when their orders are ready for pickup, reducing wait times and ensuring timely delivery of food.The cloud-based canteen food ordering project is designed to provide a streamlined, hassle-free food ordering experience for customers while improving the efficiency of canteen operations.

Introduction

Large educational institutions often face the challenge of managing heavy crowds during lunchtime in their canteens. This results in delays and frustration for students and staff who may be late for lectures and work due to long queues. To address this issue, a cloud-based canteen food ordering system, Canteenwala, has been developed to provide a convenient solution for students and staff to purchase food from anywhere using their mobile devices.

Canteenwala is a cloud-based application that allows the canteen manager to digitize the entire canteen management system, making it easier for both the manager and customers. The application enables customers to order food in advance, reducing the number of people waiting in the canteen premises. To access the application, customers must have a valid ID associated with the institution and log in using their credentials. The application displays the daily updated food menu and combo options, allowing customers to select their desired items and add them to their cart. The application also provides an overview of the order in the cart, which customers can review before making payment. Once payment is complete, the application sends notifications to the user regarding the order status. Additionally, customers can view their order history and past orders through the application.

The canteen manager can manage the application using their admin credentials, which grant them various rights to manage the canteen. The manager can add or remove items from the daily menu based on the availability of resources and change the food menu and combo options anytime. The manager can also add new items to the menu and design new combos to meet customer needs. The application has a separate module for managing orders, enabling the manager to view the status of each order and sort past orders by dates. The application also generates sales modules on a daily, monthly, and yearly basis.

By using cloud-based technology, Canteenwala provides several advantages over a web-based application. Cloud-based applications provide greater flexibility in terms of scalability, availability, and reliability. The cloud-based infrastructure can automatically scale to accommodate changing user demands, ensuring that the application can handle a high volume of users during peak hours. Additionally, the cloud-based application is available on any device with internet connectivity, making it more accessible to users. The cloud-based infrastructure also provides a high level of reliability, ensuring that the application is always available to users.

The cloud-based canteen food ordering system is a highly efficient solution to the problem of managing large crowds during peak hours in educational institutions. By enabling users to place orders in advance, the system helps to reduce congestion and wait times, allowing students and faculty to receive their food on time and attend their classes and meetings promptly. The system is easy to use and highly customizable, with features that enable the canteen manager to update the menu and monitor orders in real-time.

Problem Statement

The most frequent issue with the manual canteen system is that both management efficiency and customer happiness could not be met. People today don't have much time to wait around in the canteen to place their orders.

The canteen has a big number of customers. They include students of the college, teaching faculties, and non teaching faculties as well. During breaks, a lot of students and teachers visit the canteen, leaving them very little time to eat before heading back to their respective classes and work.With the heavy rush, it is very difficult for the canteen manager to keep up with the payments and manage the orders. They are instances that the canteen manager might lose track of the orders he has taken and even misses out on payments. This can have an adverse effect on their business.

While the web-based canteen food ordering system has helped to improve management efficiency and customer satisfaction to a certain extent, it still faces several challenges. One of the main limitations of the web-based system is its inability to handle a large volume of traffic. During peak hours, when the canteen is crowded, the website may slow down, and users may experience difficulties while placing orders. Another significant limitation is the lack of flexibility in scaling the system. If the number of users increases, the server may not be able to handle the load, leading to website crashes and user frustration. In such a scenario, the canteen manager may have to upgrade the hardware, which can be time-consuming and expensive.

Objective and Scope

The objective of this project is to use the advantage of cloud services to run and manage this web application efficiently and smoothly. Canteen Ordering System is to facilitate high-speed services to their students, staff members, etc. It will be essential in facilitating lunch breaks for customers and the canteen. This project will avail them of the benefits of digitization. The goal of cloud computing is to provide easy, scalable access to computing resources and IT services. Cloud infrastructure involves the hardware and software components required for the proper implementation of a cloud computing model.
The scope of the project increases with the use of cloud services:

- User Portal: To access the system for ordering meals from the canteen, the customer is registered to the system here using a college email address or ID.
- Admin Portal: Managing orders, menu, and looking into sales will be available in one place for the canteen manager.
- Menu Management: The menu can be created and updated by the canteen manager depending on the food's availability.
- Order Management: The canteen manager can access the user information, payment details, and order details and manage it as necessary.
- Pre-Ordering One can place their order before the break or whenever they want. This saves a lot of time and prevents chaos in the canteen.
- Payment: Students and teachers will have the option to choose between making cash payments or online payments (both in takeaway and delivery).
- Notification: Users will get an update about their order through mail or can track their order on the website.
- Sales Report: This new system can bring greater profit for the canteen as it can enhance the efficiency of the daily business processes, generate useful reports on the basis of sales, and so on.
- Scalable: This project with the help of the cloud can be upscaled and downscaled easily according to the needs.
- Efficiency Improvement: With this new online system, many of the existing business processes such as total calculation, and order taking are done with the aid of this. This not only can save time, but it is also error-free provided the correct input.
- Cloud Computing: Cloud Computing provides us means of accessing applications as utilities over the internet. It allows us to create, configure and customize the applications online.

Description

Cloud computing is the delivery of computing services, including servers, storage, databases, networking, software, analytics, and intelligence, over the internet to offer faster innovation, flexible resources, and economies of scale.
The cloud service we have used in this project is AWS Cloud Services.
Services used for the implementation of the Canteen Food Ordering System are:

- Elastic Beanstalk: Elastic Beanstalk is a service for deploying and scaling web applications and services. The user can simply upload their code and Elastic Beanstalk automatically handles the deployment. This platform as a service (PaaS) provisions the supporting architecture and compute resources required for your code to run. Elastic Beanstalk also fully manages the patching and security updates for those provisioned resources. When you deploy an application using elastic beanstalk to a web server environment the environment will typically create the following architecture structure.
    - Elastic Beanstalk Environment: The Elastic Beanstalk environment is the container for this unique version of the application and it provides a name and URL entry point for users to access the application.
    - Elastic Load Balancer: The elastic load balancer distributes HTTP requests to the EC2 instances that have been provisioned within the environment.
    - Auto Scaling Group: The Auto Scaling Group will scale in and scale out the number of EC2 instances that exist within the environment based on traffic load.
    - EC2 Instances: Amazon Elastic Compute Cloud (Amazon EC2) offers the broadest and deepest compute platform, with over 600 instances and a choice of the latest processor, storage, networking, operating system, and purchase model to help you best match the needs of your workload. Elastic Beanstalk will suggest the size and type of EC2 instance required to run the code.
    - Host Manager: The host manager is present on each of your EC2 instances and is responsible for monitoring and reporting on the performance of your application, reports on resource instance level events, and sends logs to your cloud watch dashboard.
    - Security Groups: A security group acts as a firewall that controls the traffic allowed to and from the resources in your virtual private cloud (VPC). You can choose the ports and protocols to allow for inbound traffic and for outbound traffic.

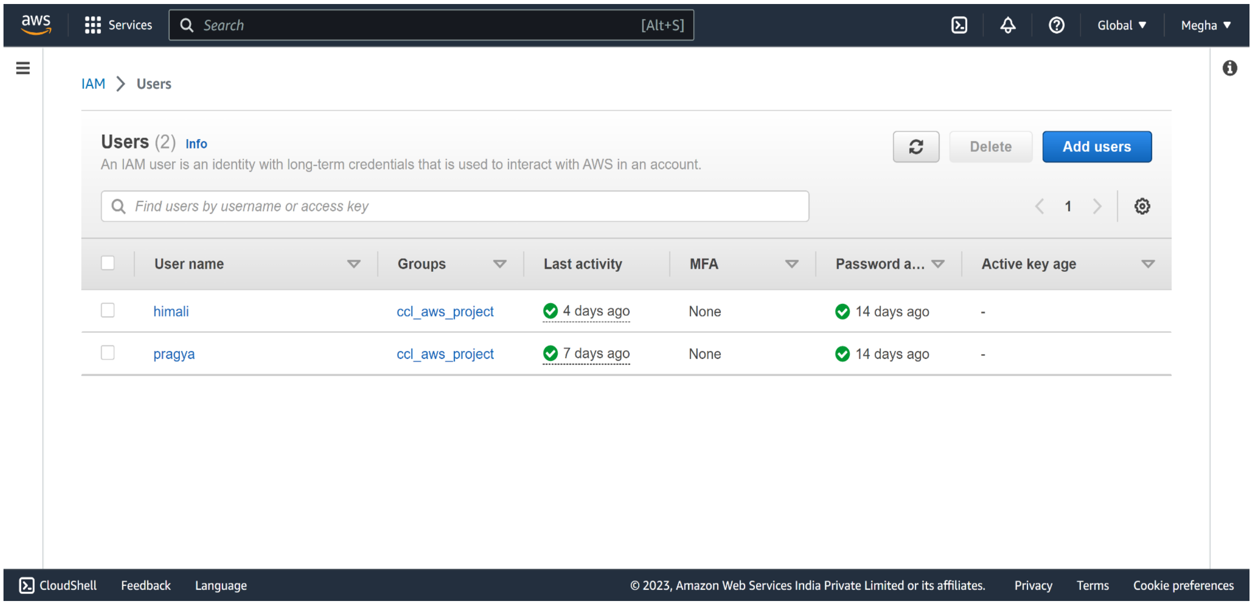
In our cloud-based canteen food ordering system, we used Elastic Beanstalk to deploy and manage our PHP application. We configured the environment as per our requirements to run this project. The Elastic Beanstalk provided us with an easy connection to the RDS instance which stored our data.

- Amazon Simple Storage Service (Amazon S3): It is an object storage service offering industry-leading scalability, data availability, security, and performance. With cost-effective storage classes and easy-to-use management features, you can optimize costs, organize data, and configure fine-tuned access controls to meet specific business, organizational, and compliance requirements.
  We have used this service in order to store all the static data such as the images in the S3 bucket. Certain changes were made in the code in order to access the objects of the bucket seamlessly.

- Amazon Relational Database Service (Amazon RDS): It is a collection of managed services that makes it simple to set up, operate, and scale databases in the cloud. It is used to Build web and mobile applications as it supports growing apps with high availability, throughput, and storage scalability.
  In this project, we have used the RDS instance of MySQL Engine in order to store the data such as orders and user data. This instance was connected to our MYSQL Workbench which originally contained the database. The required changes were made in the config file to connect to the RDS instance.

Implementation

Step No: 01 - Creating IAM users for the project.



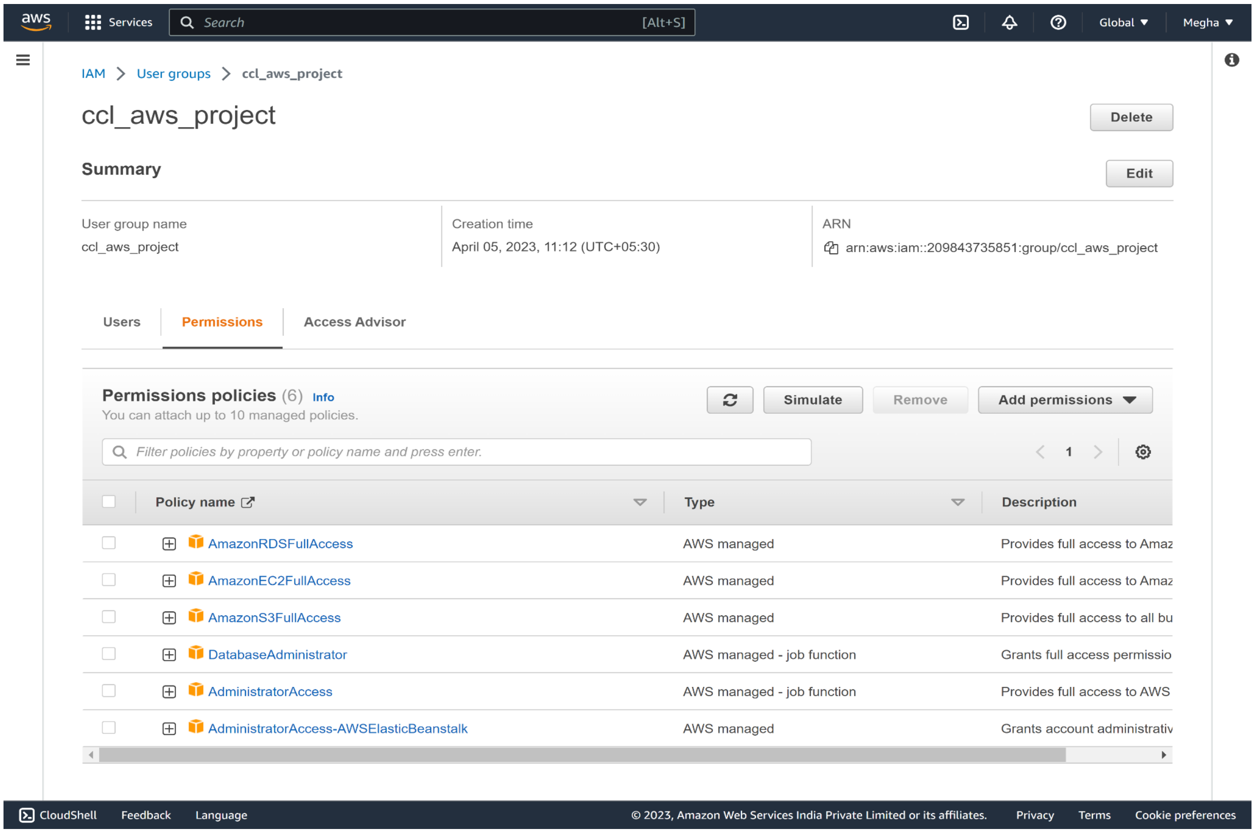
Users (2) Info

An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.

Find users by username or access key

□	User name	Groups	Last activity	MFA	Password a...	Active key age
□	himali	ccl_aws_project	✓ 4 days ago	None	✓ 14 days ago	-
□	pragya	ccl_aws_project	✓ 7 days ago	None	✓ 14 days ago	-

Step No: 02 - Giving access to the services to the users.



ccl_aws_project

Summary

User group name	Creation time	ARN
ccl_aws_project	April 05, 2023, 11:12 (UTC+05:30)	arn:aws:iam::209843735851:group/ccl_aws_project

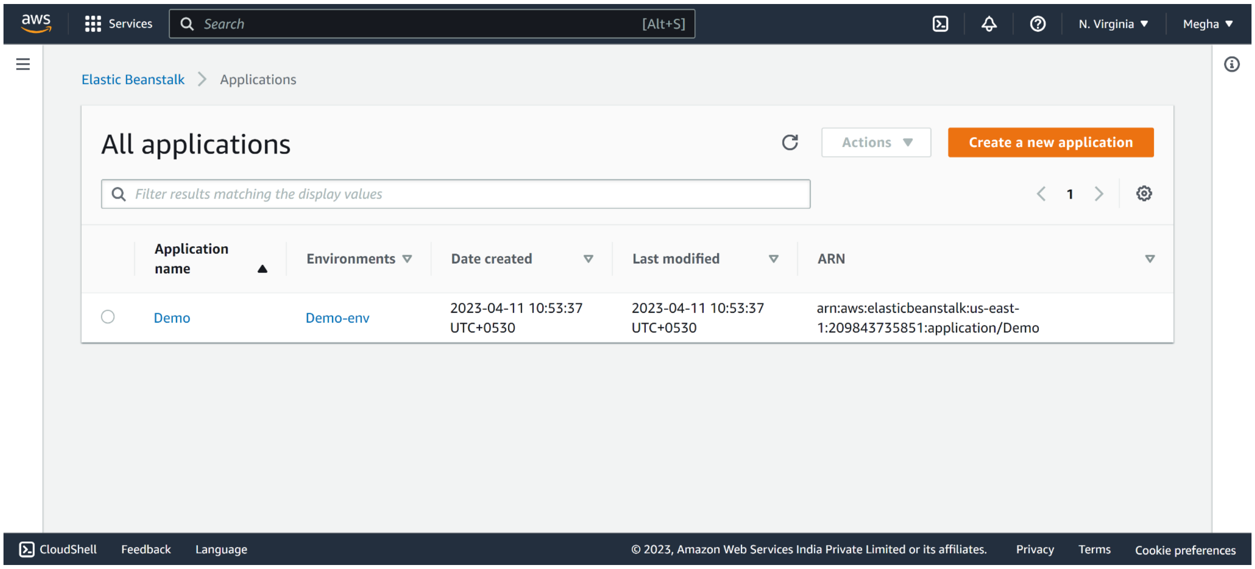
Permissions policies (6) Info

You can attach up to 10 managed policies.

Filter policies by property or policy name and press enter.

□	Policy name	Type	Description
□	⊞ AmazonRDSFullAccess	AWS managed	Provides full access to Amaz
□	⊞ AmazonEC2FullAccess	AWS managed	Provides full access to Amaz
□	⊞ AmazonS3FullAccess	AWS managed	Provides full access to all bu
□	⊞ DatabaseAdministrator	AWS managed - job function	Grants full access permissio
□	⊞ AdministratorAccess	AWS managed - job function	Provides full access to AWS
□	⊞ AdministratorAccess-AWSElasticBeanstalk	AWS managed	Grants account administrativ

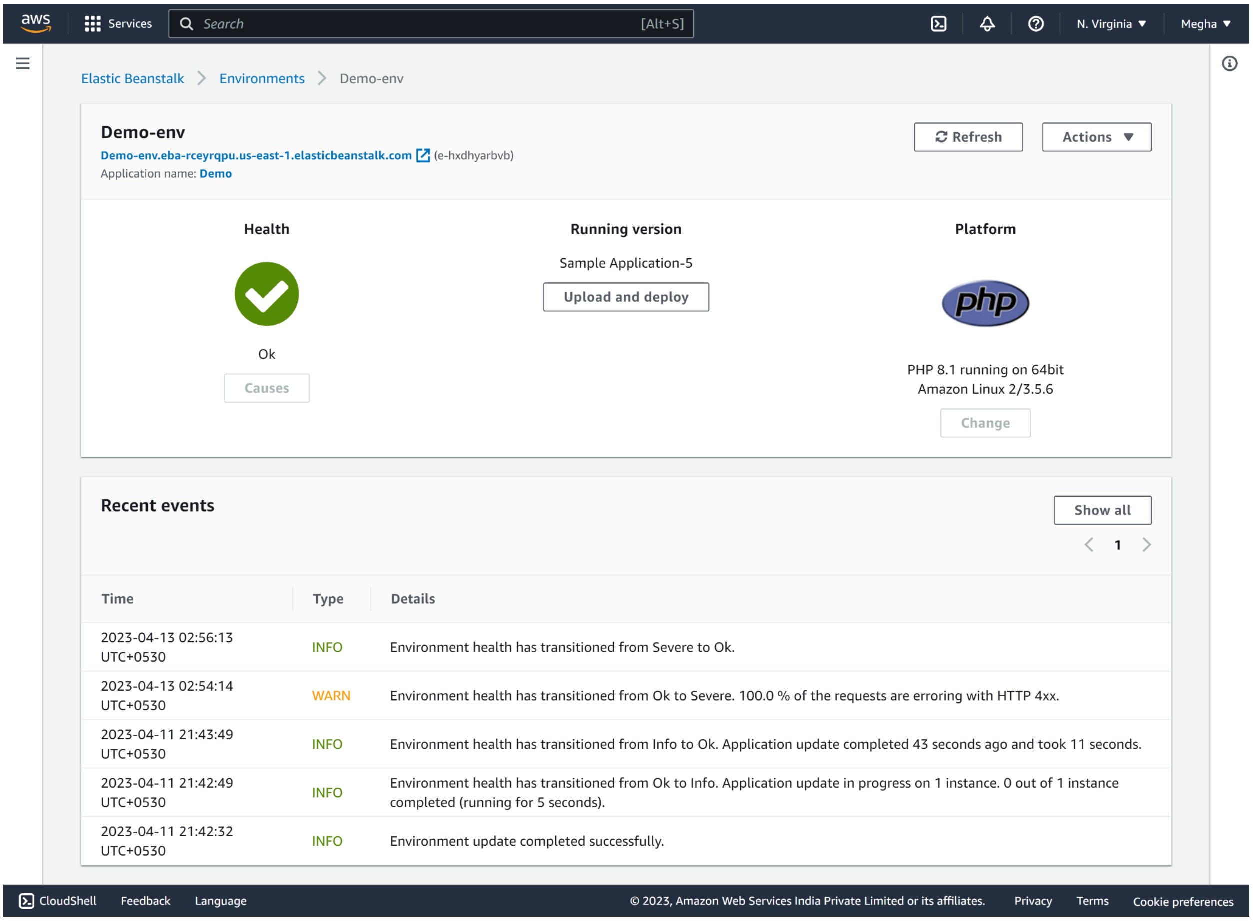
Step No:03 - Creating the Application in Elastic Beanstalk.


aws
Services
Search [Alt+S]
N. Virginia
Megha
Elastic Beanstalk > Applications
Actions
Create a new application
Filter results matching the display values
1
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences

All applications

	Application name	Environments	Date created	Last modified	ARN
○	Demo	Demo-env	2023-04-11 10:53:37 UTC+0530	2023-04-11 10:53:37 UTC+0530	arn:aws:elasticbeanstalk:us-east-1:209843735851:application/Demo

Step No:04 - Creating Environment in Elastic Beanstalk.



Demo-env

Demo-env.eba-rceyrqpu.us-east-1.elasticbeanstalk.com (e-hxdhyarbvb)

Application name: Demo

Health: Ok

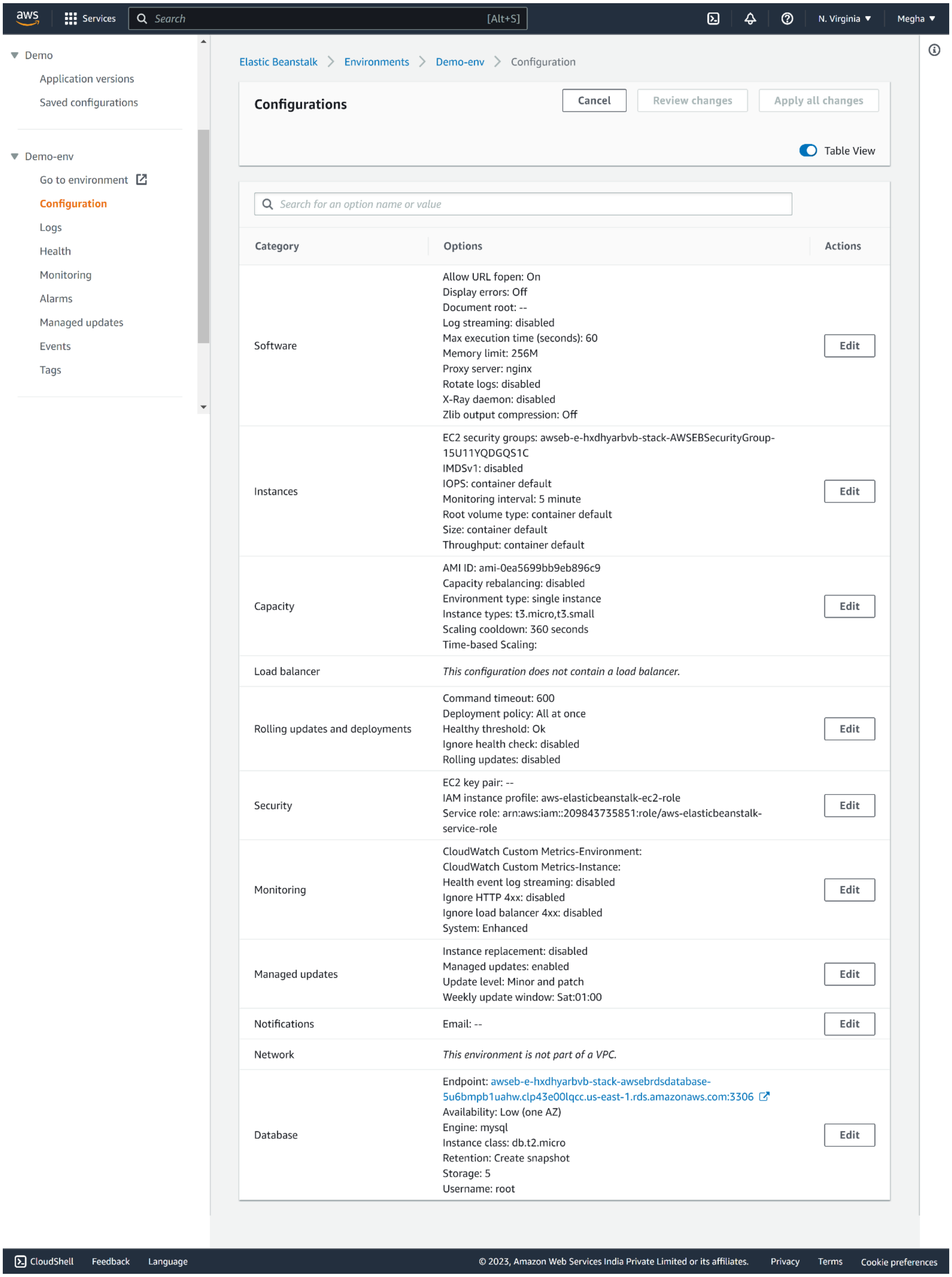
Running version: Sample Application-5

Platform: PHP 8.1 running on 64bit Amazon Linux 2/3.5.6

Recent events

Time	Type	Details
2023-04-13 02:56:13 UTC+0530	INFO	Environment health has transitioned from Severe to Ok.
2023-04-13 02:54:14 UTC+0530	WARN	Environment health has transitioned from Ok to Severe. 100.0 % of the requests are erroring with HTTP 4xx.
2023-04-11 21:43:49 UTC+0530	INFO	Environment health has transitioned from Info to Ok. Application update completed 43 seconds ago and took 11 seconds.
2023-04-11 21:42:49 UTC+0530	INFO	Environment health has transitioned from Ok to Info. Application update in progress on 1 instance. 0 out of 1 instance completed (running for 5 seconds).
2023-04-11 21:42:32 UTC+0530	INFO	Environment update completed successfully.

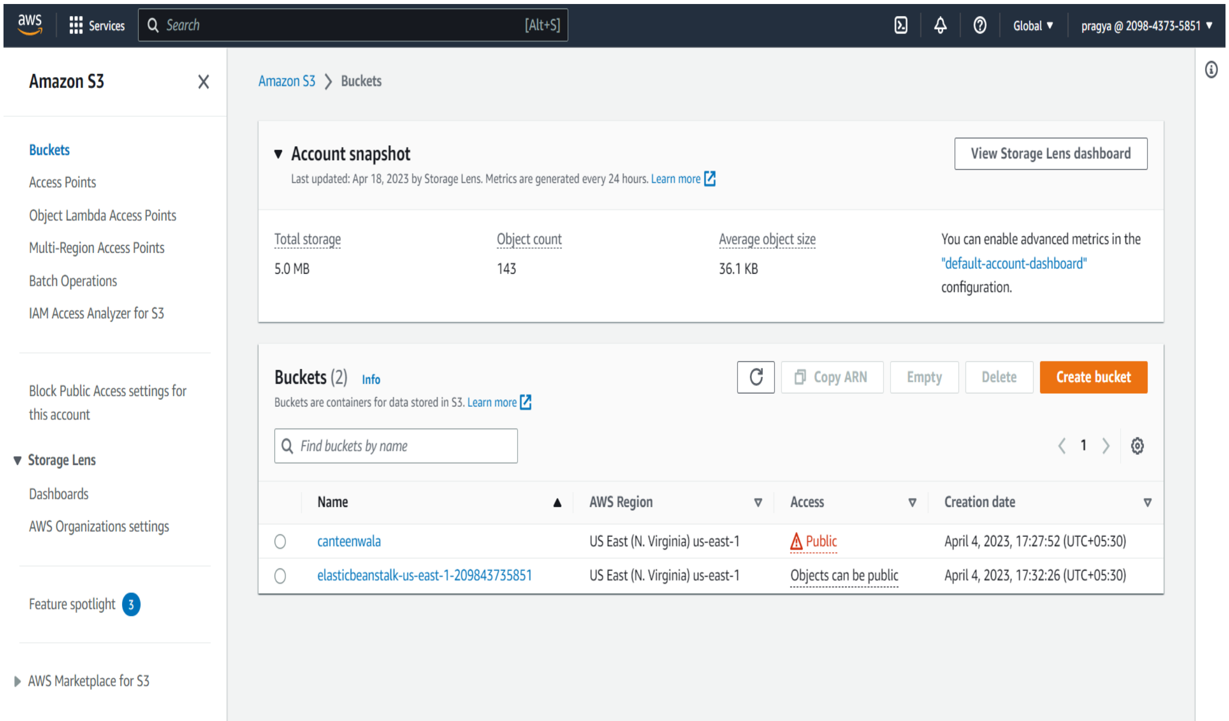
Step No:05 - Setting the configurations for the EBS.



Configurations

Category	Options	Actions
Software	Allow URL fopen: On Display errors: Off Document root: -- Log streaming: disabled Max execution time (seconds): 60 Memory limit: 256M Proxy server: nginx Rotate logs: disabled X-Ray daemon: disabled Zlib output compression: Off	Edit
Instances	EC2 security groups: awseb-e-hxdhyarbvb-stack-AWSEBSecurityGroup-15U11YQDGQS1C IMDSv1: disabled IOPS: container default Monitoring interval: 5 minute Root volume type: container default Size: container default Throughput: container default	Edit
Capacity	AMI ID: ami-0ea5699bb9eb896c9 Capacity rebalancing: disabled Environment type: single instance Instance types: t3.micro,t3.small Scaling cooldown: 360 seconds Time-based Scaling:	Edit
Load balancer	*This configuration does not contain a load balancer.*	
Rolling updates and deployments	Command timeout: 600 Deployment policy: All at once Healthy threshold: Ok Ignore health check: disabled Rolling updates: disabled	Edit
Security	EC2 key pair: -- IAM instance profile: aws-elasticbeanstalk-ec2-role Service role: arn:aws:iam::209843735851:role/aws-elasticbeanstalk-service-role	Edit
Monitoring	CloudWatch Custom Metrics-Environment: CloudWatch Custom Metrics-Instance: Health event log streaming: disabled Ignore HTTP 4xx: disabled Ignore load balancer 4xx: disabled System: Enhanced	Edit
Managed updates	Instance replacement: disabled Managed updates: enabled Update level: Minor and patch Weekly update window: Sat:01:00	Edit
Notifications	Email: --	Edit
Network	*This environment is not part of a VPC.*	
Database	Endpoint: awseb-e-hxdhyarbvb-stack-awsebrdsdatabase-5u6bmpb1uahw.clp43e00lqcc.us-east-1.rds.amazonaws.com:3306 Availability: Low (one AZ) Engine: mysql Instance class: db.t2.micro Retention: Create snapshot Storage: 5 Username: root	Edit

Step No:06 - Creating S3 bucket.



▼ Account snapshot

Last updated: Apr 18, 2023 by Storage Lens. Metrics are generated every 24 hours. Learn more

Total storage	Object count	Average object size
5.0 MB	143	36.1 KB

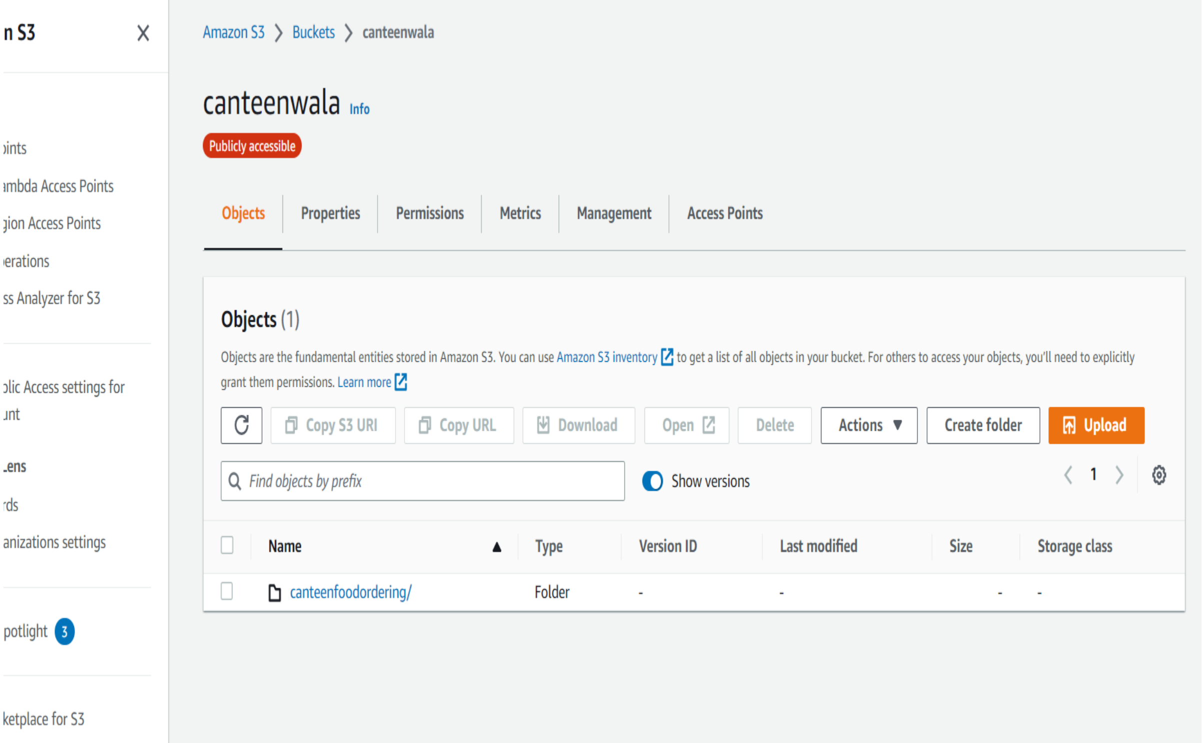
You can enable advanced metrics in the "default-account-dashboard" configuration.

Buckets (2) Info

Buckets are containers for data stored in S3. Learn more

	Name ▲	AWS Region ▽	Access ▽	Creation date ▽
○	canteenwala	US East (N. Virginia) us-east-1	⚠ Public	April 4, 2023, 17:27:52 (UTC+05:30)
○	elasticbeanstalk-us-east-1-209843735851	US East (N. Virginia) us-east-1	Objects can be public	April 4, 2023, 17:32:26 (UTC+05:30)

Step No:07 - Storing files in the S3 bucket.



canteenwala Info

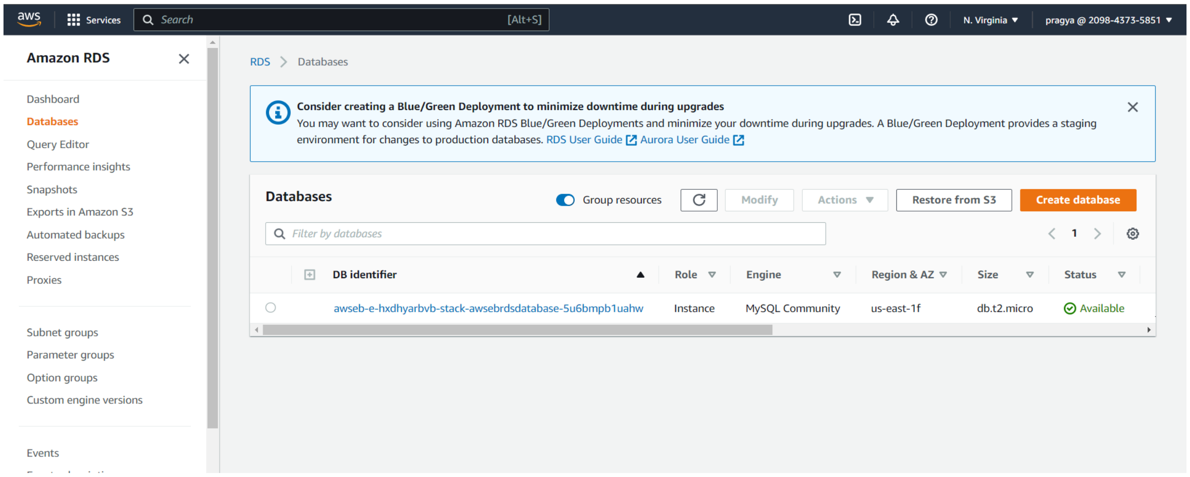
Publicly accessible

Objects (1)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

□	Name ▲	Type	Version ID	Last modified	Size	Storage class
□	canteenfoodordering/	Folder	-	-	-	-

Step No:08 - Creating RDS DB Instance for database building.

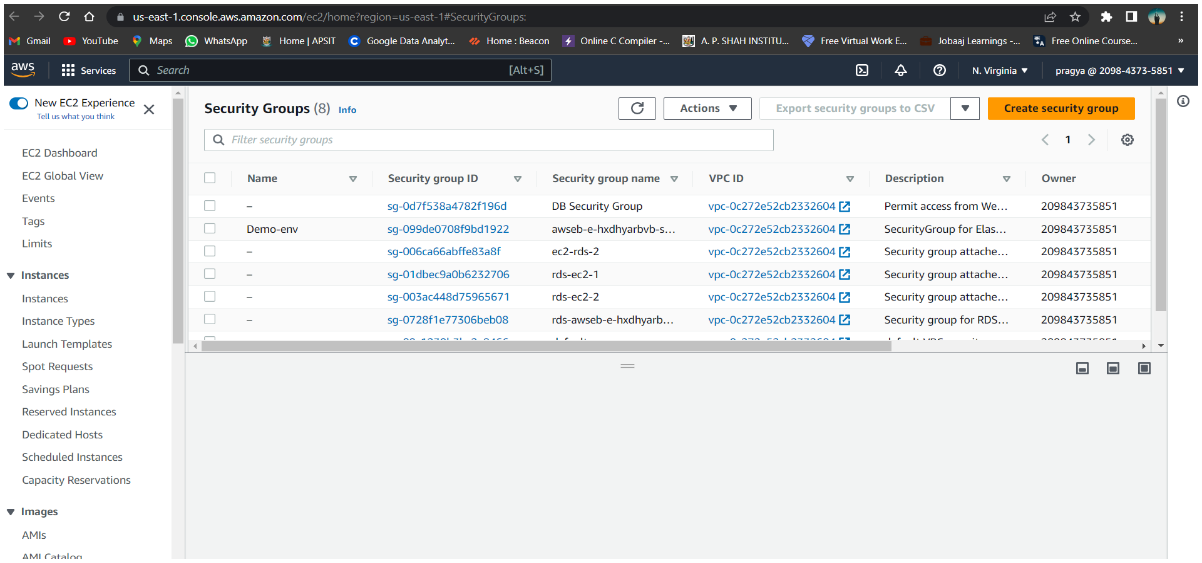


Consider creating a Blue/Green Deployment to minimize downtime during upgrades
You may want to consider using Amazon RDS Blue/Green Deployments and minimize your downtime during upgrades. A Blue/Green Deployment provides a staging environment for changes to production databases. RDS User Guide Aurora User Guide

Databases

	DB identifier	Role	Engine	Region & AZ	Size	Status
○	awseb-e-hxdhyarbvb-stack-awsebrdsdatabase-5u6bmpb1uahw	Instance	MySQL Community	us-east-1f	db.t2.micro	✓ Available

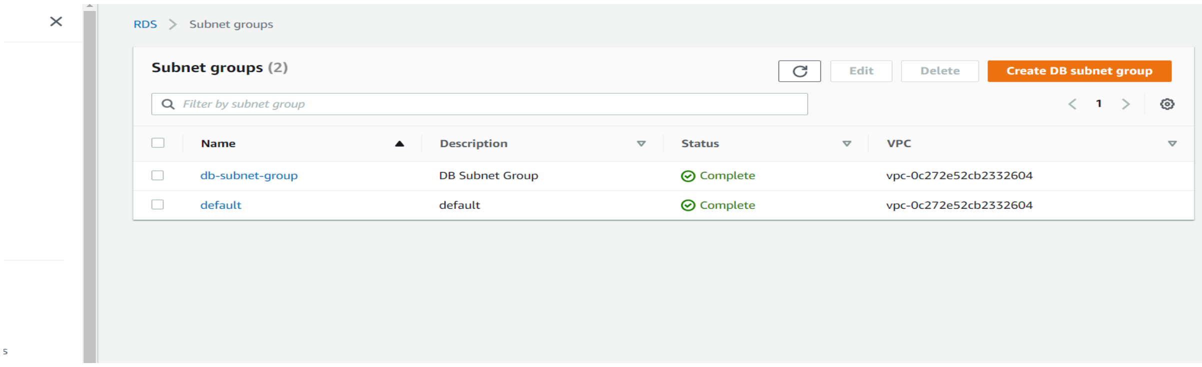
Step No:09 - Creating Security Groups for the services used.



Security Groups (8)

	Name	Security group ID	Security group name	VPC ID	Description	Owner
□	–	sg-0d7f538a4782f196d	DB Security Group	vpc-0c272e52cb2332604	Permit access from We…	209843735851
□	Demo-env	sg-099de0708f9bd1922	awseb-e-hxdhyarbvb-s…	vpc-0c272e52cb2332604	SecurityGroup for Elas…	209843735851
□	–	sg-006ca66abffe83a8f	ec2-rds-2	vpc-0c272e52cb2332604	Security group attache…	209843735851
□	–	sg-01dbec9a0b6232706	rds-ec2-1	vpc-0c272e52cb2332604	Security group attache…	209843735851
□	–	sg-003ac448d75965671	rds-ec2-2	vpc-0c272e52cb2332604	Security group attache…	209843735851
□	–	sg-0728f1e77306beb08	rds-awseb-e-hxdhyarb…	vpc-0c272e52cb2332604	Security group for RDS…	209843735851

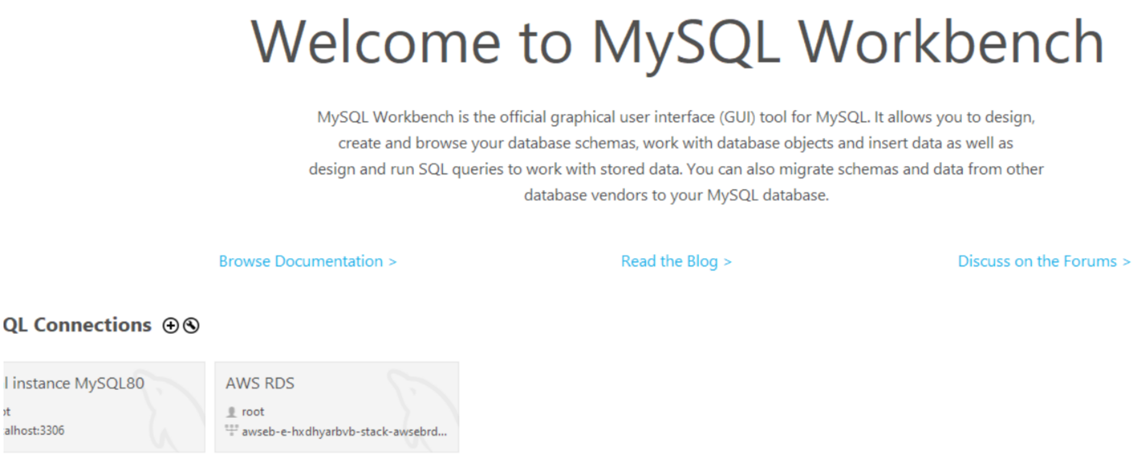
Step No: 10- Create Subnet Group for DB instance.



Subnet groups (2)

	Name	Description	Status	VPC
□	db-subnet-group	DB Subnet Group	✓ Complete	vpc-0c272e52cb2332604
□	default	default	✓ Complete	vpc-0c272e52cb2332604

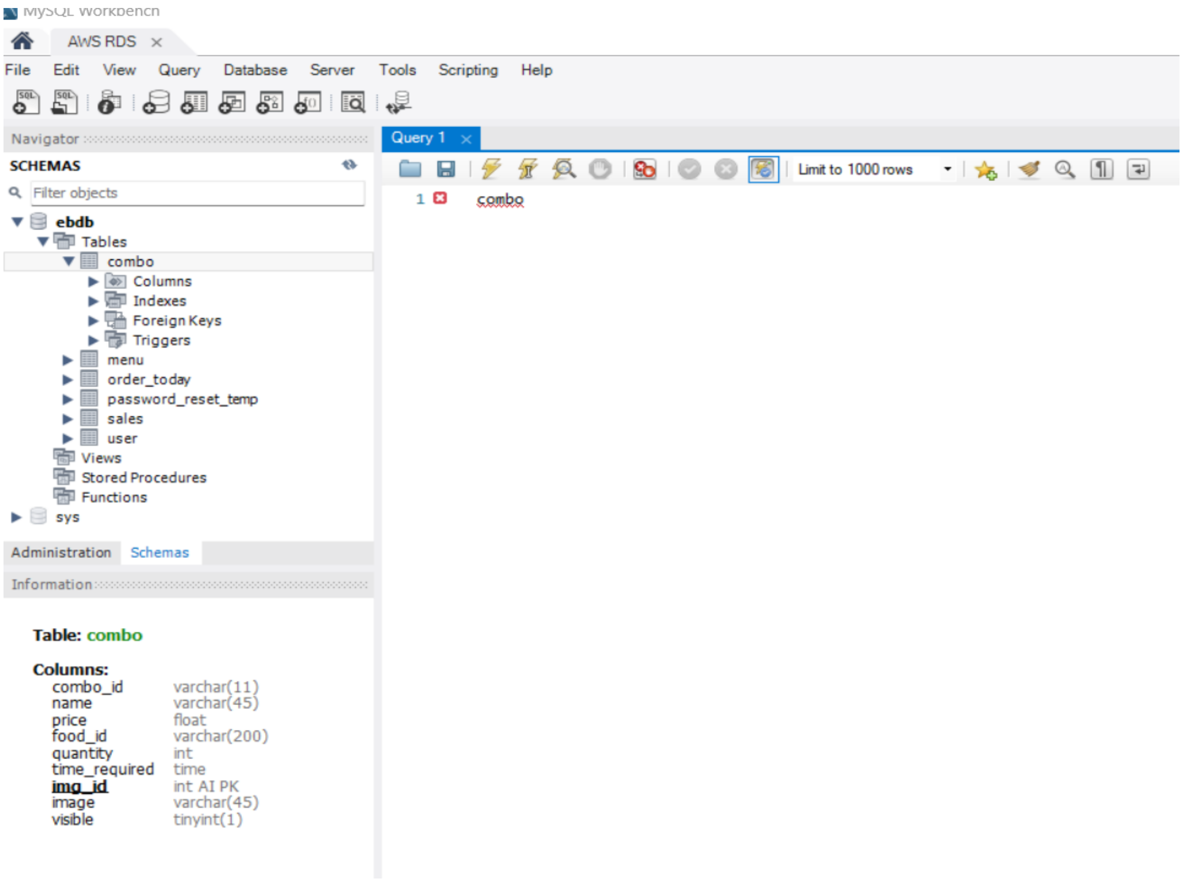
Step No: 11 - Connecting RDS with Mysql Workbench.



Welcome to MySQL Workbench

MySQL Workbench is the official graphical user interface (GUI) tool for MySQL. It allows you to design, create and browse your database schemas, work with database objects and insert data as well as design and run SQL queries to work with stored data. You can also migrate schemas and data from other database vendors to your MySQL database.

Step No: 12 - Importing Database in MySql Workbench.

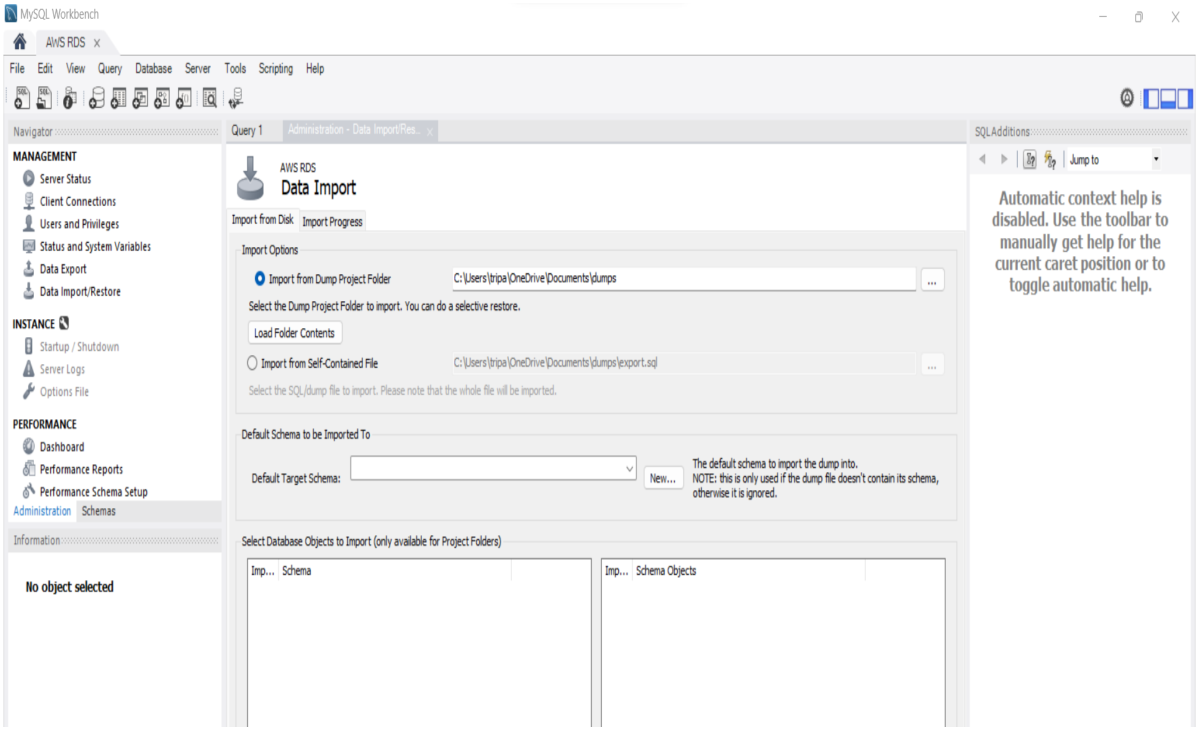


```
1 combo
```

Table: combo

Columns:

combo_id	varchar(11)
name	varchar(45)
price	float
food_id	varchar(200)
quantity	int
time_required	time
img_id	int AI PK
image	varchar(45)
visible	tinyint(1)



AWS RDS
Data Import

Import Options

● Import from Dump Project Folder C:\Users\tripa\OneDrive\Documents\dumps

Select the Dump Project Folder to import. You can do a selective restore.

○ Import from Self-Contained File C:\Users\tripa\OneDrive\Documents\dumps\export.sql

Select the SQL/dump file to import. Please note that the whole file will be imported.

Default Schema to be Imported To

Default Target Schema:

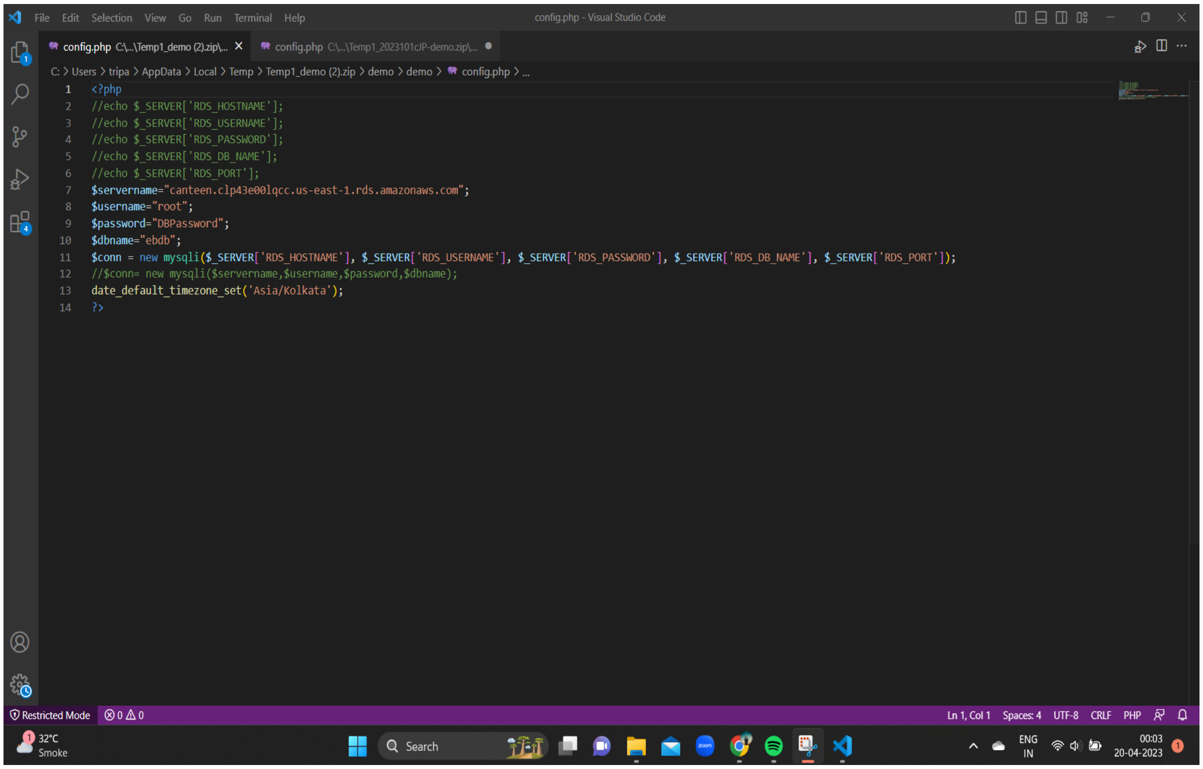
The default schema to import the dump into.
NOTE: this is only used if the dump file doesn't contain its schema, otherwise it is ignored.

Select Database Objects to Import (only available for Project Folders)

No object selected

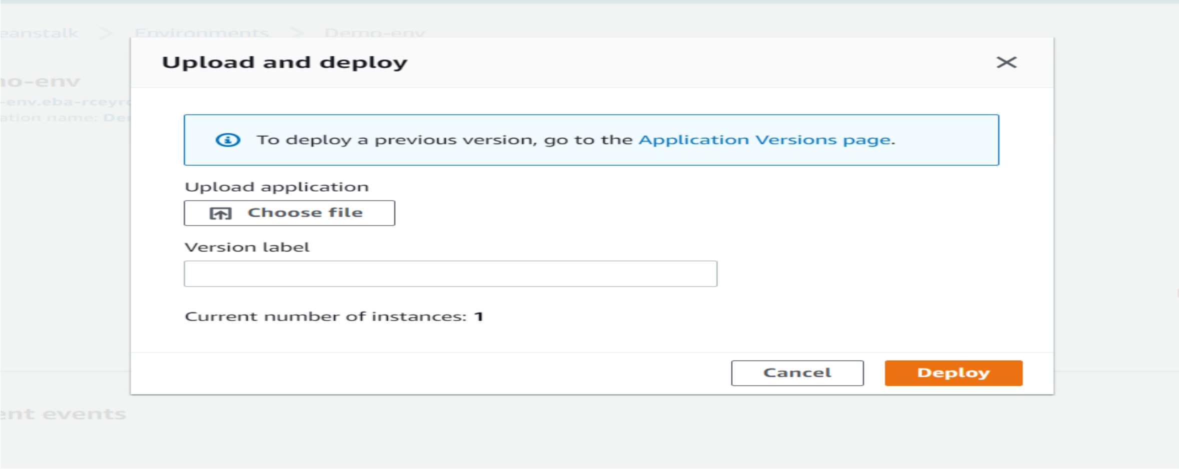
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Step No:13 - Changing the entries in the config file of the project.


File Edit Selection View Go Run Terminal Help
config.php - Visual Studio Code
config.php C:\...\Temp1_demo (2).zip\...
config.php C:\...\Temp1_2023101cJP-demo.zip\...
C: > Users > tripa > AppData > Local > Temp > Temp1_demo (2).zip > demo > demo > config.php > ...
Restricted Mode
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF PHP
32°C
Smoke
Search
ENG
IN
00:03
20-04-2023

```php
<?php
//echo $_SERVER['RDS_HOSTNAME'];
//echo $_SERVER['RDS_USERNAME'];
//echo $_SERVER['RDS_PASSWORD'];
//echo $_SERVER['RDS_DB_NAME'];
//echo $_SERVER['RDS_PORT'];
$servername="canteen.clp43e00lqcc.us-east-1.rds.amazonaws.com";
$username="root";
$password="DBPassword";
$dbname="ebdb";
$conn = new mysqli($_SERVER['RDS_HOSTNAME'], $_SERVER['RDS_USERNAME'], $_SERVER['RDS_PASSWORD'], $_SERVER['RDS_DB_NAME'], $_SERVER['RDS_PORT']);
//$conn= new mysqli($servername,$username,$password,$dbname);
date_default_timezone_set('Asia/Kolkata');
?>
```

Step No:14 Redeploying the updated project files.



Upload and deploy

To deploy a previous version, go to the Application Versions page.

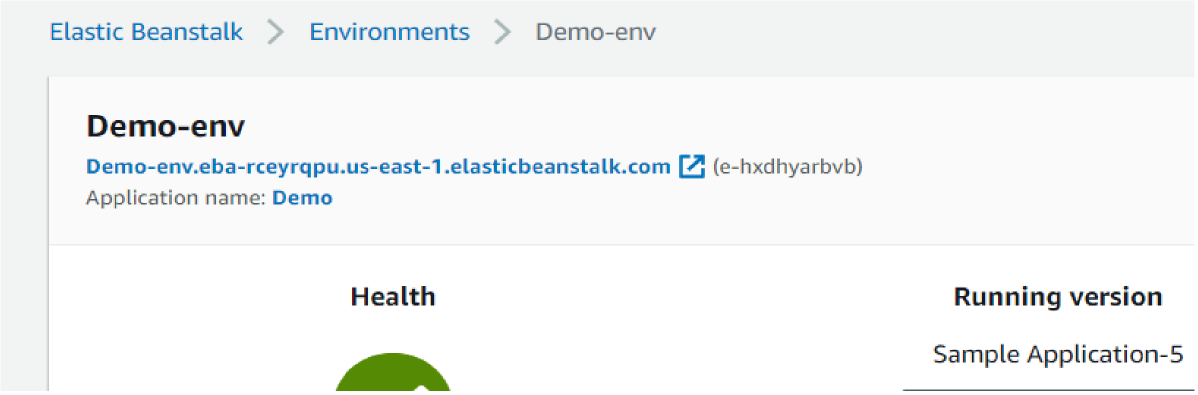
Upload application

Choose file

Version label

Current number of instances: 1

Step No:15 - Running the project.



Demo-env

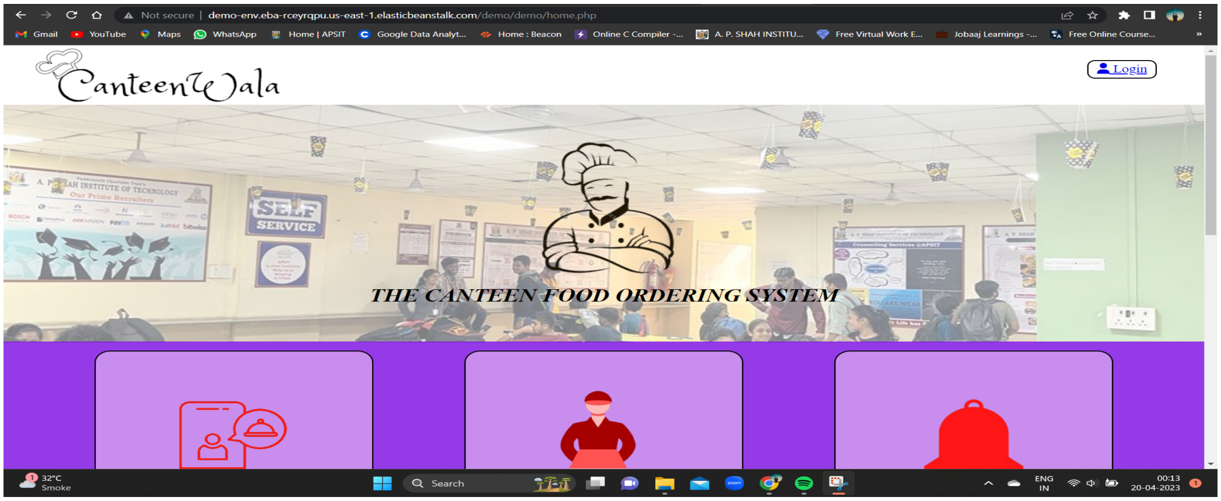
Demo-env.eba-rceyrqpu.us-east-1.elasticbeanstalk.com (e-hxdhyarbvb)

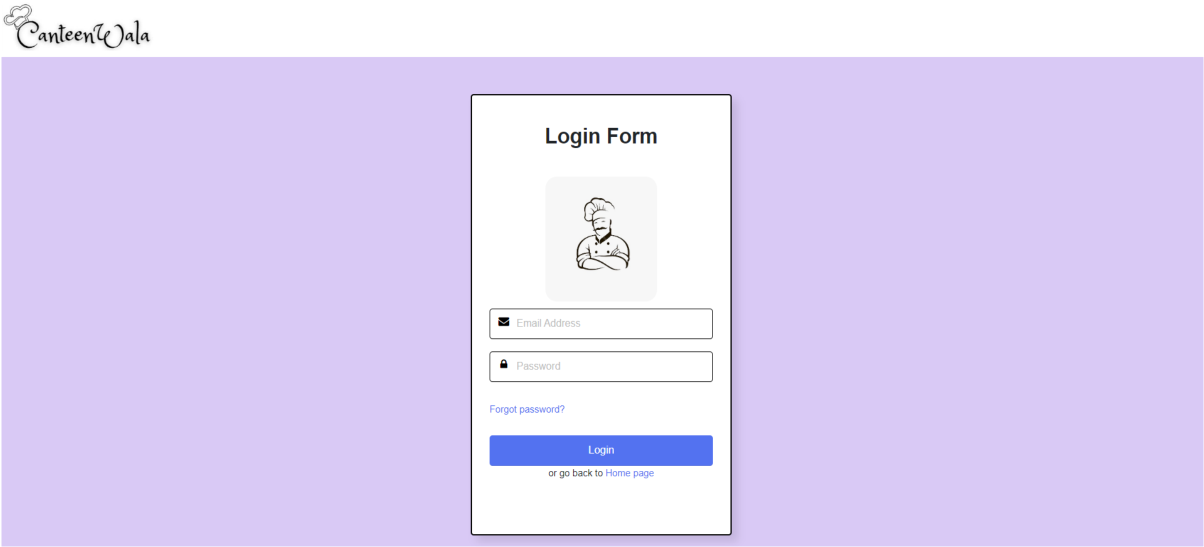
Application name: Demo

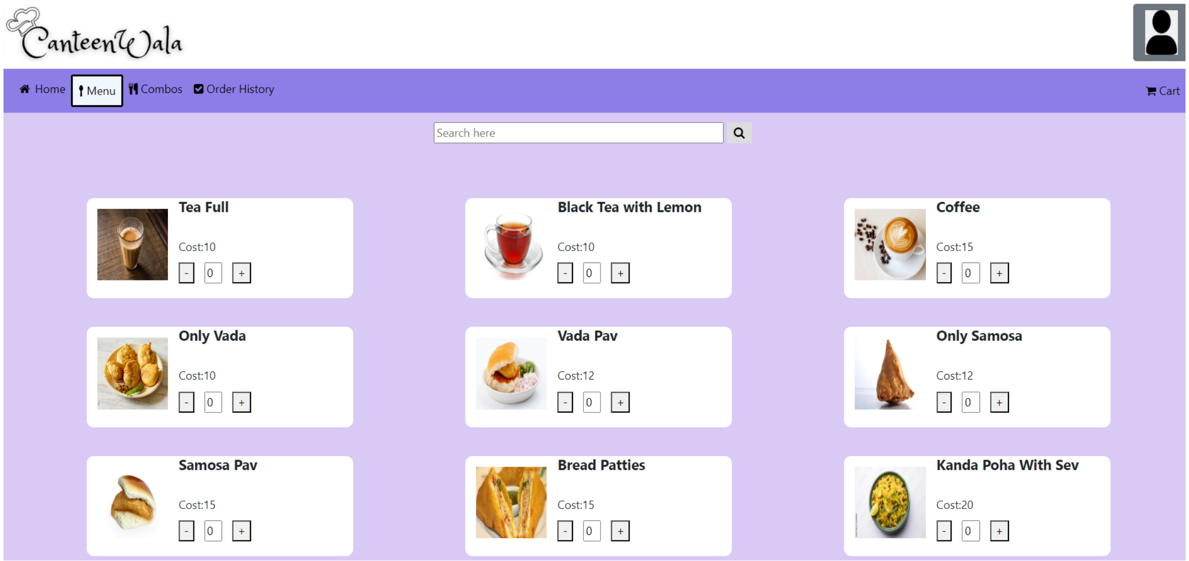
Health

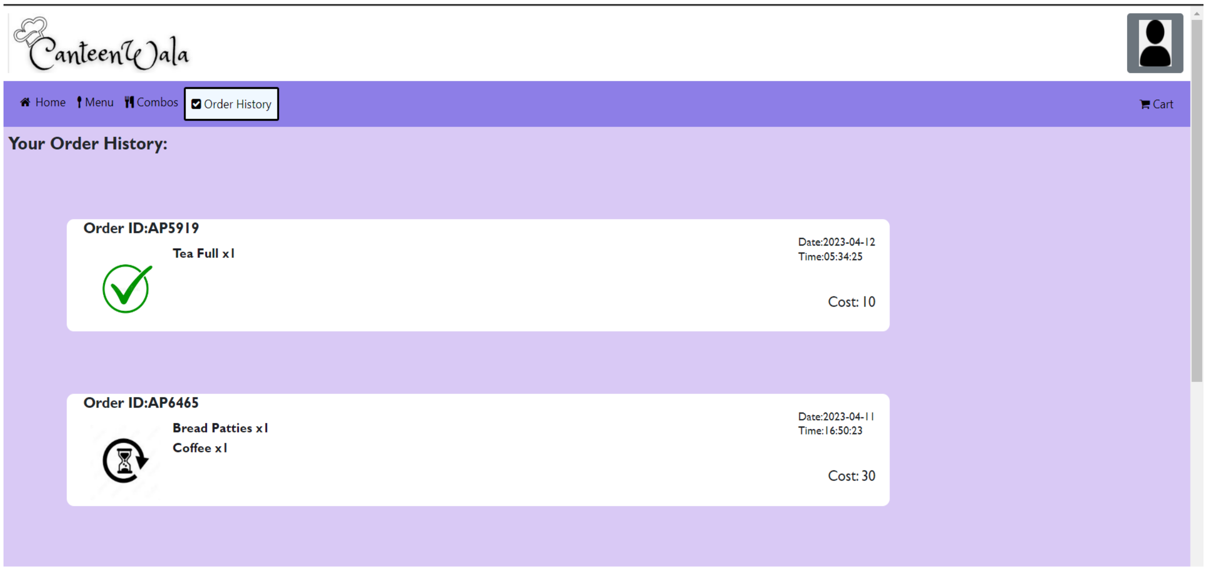
Running version: Sample Application-5

Step No : 16 - Final Output (Working Project)









Your Order History:

Order ID:AP5919
Tea Full x1
Date:2023-04-12
Time:05:34:25
Cost: 10

Order ID:AP6465
Bread Patties x1
Coffee x1
Date:2023-04-11
Time:16:50:23
Cost: 30

Learning Outcomes

The field of cloud computing has gained widespread popularity due to its numerous advantages, such as high scalability, flexibility, and cost-efficiency. The "CANTEENWALA" project was a practical application of cloud computing concepts, where we were able to utilize various cloud-based services to create and manage a functional application.

One of the key services used in the project was Elastic Beanstalk (EBS). EBS is a cloud service provided by Amazon Web Services (AWS), which simplifies the deployment and scaling of web applications. With EBS, we created a web application and deployed it to an environment in a matter of minutes. EBS also provides automatic scaling, which ensured that the application could handle varying levels of traffic without compromising its performance.

In addition to EBS, we also utilized Amazon S3 buckets. S3 is an object storage service that allows the team to store and retrieve data from anywhere on the web. S3 provided a highly scalable and durable storage solution, which was necessary for storing and managing large amounts of data associated with the application.

We used RDS to manage the databases. RDS is a managed database service provided by AWS, which supports various relational database engines such as MySQL, Oracle, and Microsoft SQL Server. We imported the databases into MySQL Workbench to establish a connection and manage the databases effectively. This allowed us to scale the databases efficiently, which was necessary to handle the large amounts of data generated by the application.

Another service used in the project was IAM. IAM is an identity and access management service that allows the team to manage access to their AWS resources securely. With IAM, we were able to create and manage user accounts, grant or revoke permissions, and ensure the security of the cloud infrastructure. Overall, the "CANTEENWALA" project provided us practical experience in using different cloud-based services to create and manage a successful project. We were able to leverage the power of cloud computing to create a highly scalable, reliable, and cost-efficient application. The knowledge gained from the project will be useful in future endeavors that involve cloud computing.

References

Reference from our mini project.

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