A MINI PROJECT REPORT

ON

Cloud Computing Project

Submitted in partial fulfilment of the requirement of the University of Mumbai for the Course

Cloud Computing Lab
In
Computer Engineering (VIII SEM)

Submitted By
Anuj Mishra (18102059)
Ishan Sathe (20502001)

Subject Incharge
Prof. Deepak Khachane

Department of Computer Engineering
A. P. Shah Institute of Technology
Thane - 400615
UNIVERSITY OF MUMBAI

Academic Year 2021 - 22

A. P. Shah Institute of Technology
Thane - 400615

CERTIFICATE

This is to certify that the requirements for the project report entitled '**Notix**' have been successfully completed by the following students:

Name Roll No.

Anuj Mishra 38

Ishan Sathe 52

in partial fulfilment of the course Cloud Computing Lab in Computer Engineering (VIII SEM) of Mumbai University in the Department of Computer Engineering, A.P. Shah Institute of Technology, Thane – 400615 during the Academic Year 2021 – 22.

(Prof. Deepak Khachane)

Subject Incharge

Department of Computer Engineering
A. P. Shah Institute of Technology
Thane - 400615

PROJECT APPROVAL

This project entitled “Notix” by Anuj Mishra and Ishan Sathe is approved for the course Cloud Computing Lab in Computer Engineering (VIII sem) of Mumbai University in the Department of Computer Engineering.

Subject Incharge: Prof. Deepak Khachane

_____

Date:

Place: Thane

Department of Computer Engineering
A. P. Shah Institute of Technology
Thane - 400 615

DECLARATION

We declare that this written submission for the Cloud Computing Lab mini-project entitled “Notix” represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any ideas/data/fact/source in our submission. We understand that any violation of the above will cause disciplinary action by the institute and also evoke penal action from the sources which have not been properly cited or from whom prior permission has not been taken when needed.

`

Project Group Members:

Anuj Mishra

_____

Ishan Sathe

_____

Place: Thane

Table of Contents

Abstract

In technical words, a cloud is just a location at the other end of an internet connection where you may access apps and services, as well as securely store your data. A cloud environment requires no work on the part of the user to maintain or operate, and it is virtually endless in size, so there is no need to be concerned about it running out of space. With a simple internet connection, cloud-based applications and services may be accessible from anywhere in the world. The cloud has become so pervasive in our daily lives that most people don't even realize it. In fact, many people's lives would be drastically altered if they didn't have access to the cloud. There would be no Facebook, Twitter, Gmail, or other social media platforms.

The cloud has transformed the business landscape as millions of organizations worldwide rely on cloud services for everything from document creation and backup to social CRM and accounts. Cloud provides instant scaling, fast implementation, no up-front costs, and maintenance-free services with excellent security. As cloud services can be accessed from anywhere, our goal for this project was to deploy an application on the AWS Cloud environment such that it won’t be system dependent and can be run on any device. In this project, we have used AWS Cloud services like IAM, EC2 Instance, and MySQL. We have developed a project which contains a website for note-making. The project is based on the Software as a Service (SaaS) model as it provides a portal for users to maintain their notes.

Problem Definition

Cloud provides an ease of access to several services that can be used to deploy and maintain a project on a remote server and access the project/application from anywhere with just the help of the internet. To achieve such ease of accessibility, we created a website where we can easily make notes just by logging into the website and can also save them for future. This application is a helpful tool that can simplify the process of note making in times of classes or meetings.

We deployed this project on AWS Cloud by making use of different cloud services.

Introduction

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 200 fully featured services from data centers globally. AWS has significantly more services, and more features within those services, than any other cloud provider–from infrastructure technologies like compute, storage, and databases–to emerging technologies, such as machine learning and artificial intelligence, data lakes and analytics, and Internet of Things. This makes it faster, easier, and more cost effective to move your existing applications to the cloud and build nearly anything you can imagine.

To develop our project, we first researched the summarization approaches in NLP and started to develop the project based on the extractive approach of text summarization. We have used the flask frame to develop our application which we then deployed on AWS Cloud. In this project, to deploy the application on cloud we have utilized three services of AWS which are as follows:

- EC2 Instance
- IAM
- MySQL

AWS provides these services for users using the Free Tier in AWS but for specific intervals of time, which once exceed incurs some cost for the utilization of the resources. These services, combined, helped us to deploy our application in the cloud environment and access it without having to depend on the system on which it was developed.

Project Design Flow

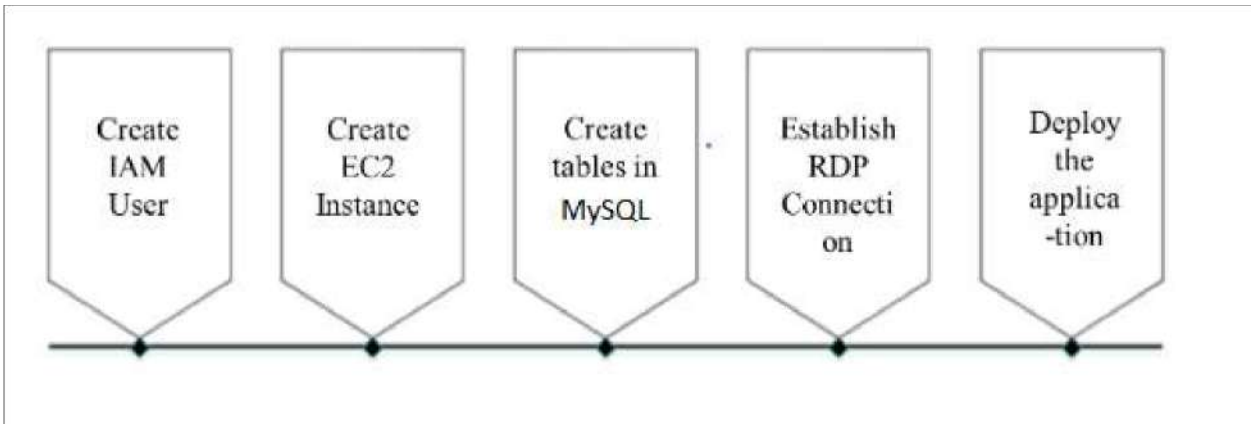


Fig. 1: Flow of Events

Description

The cloud services used in this project have different functionalities which are explained below.

- **EC2 Instance:** Amazon Elastic Compute Cloud (Amazon EC2) provides the most comprehensive and deep compute platform, with over 500 instances and a selection of the most recent processor, storage, networking, operating system, and purchase model to help you best match the needs of your workload. They are the first major cloud provider to support Intel, AMD, and Arm processors, as well as the only cloud to offer on-demand EC2 Mac instances and 400 Gbps Ethernet networking. They provide the best value for money for machine learning training as well as the lowest cost per inference instance in the cloud. AWS hosts more SAP, high performance computing (HPC), machine learning (ML), and Windows workloads than any other cloud.

  EC2 enables users to access reliable, scalable infrastructure on demand, scale capacity within minutes with a SLA commitment of 99.99 percent availability, optimize performance and cost with flexible options such as AWS Graviton-based instances, Amazon EC2 Spot instances, and AWS Savings Plans, and provide secure compute for all applications.

  Technology Stack –

  - Cloud Platform - AWS
  - Javascript
  - AJAX
  - HTML, CSS Backend Framework
  - PHP

EC2 Use Cases:

- **Hosting environments**

  One of the foremost uses of EC2 is for hosting a variety of applications, software and websites on the cloud. Users are even hosting games on the cloud, turning the servers on and off when needed. And the best part of this dynamic and scalable environment is that its compute capacity can grow along with the need of the application. This in turn ensures the best quality service for all end users at all times. Companies like Netflix, Reddit, and Nintendo are proof of the EC2 hosting success.

- **Development and test environments**

  The scalable nature of EC2 means that organizations now have the ability to create and deploy large scale testing and development environments with unprecedented ease. The Amazon cloud does away with any heavy upfront investments for hardware, all the while providing a scalable solution.

- **Backup and disaster recovery**

  Companies are leveraging EC2 as a medium for performing disaster recovery for both active and passive environments. The fact that the Amazon Elastic Compute Cloud can be turned up quickly in case of an emergency, means that businesses have access to a faster failover with minimal downtime for their applications.

➢ **IAM:**

AWS Identity and Access Management (IAM) is a web service that helps you securely control access to AWS resources. IAM is used to control who is authenticated (signed in) and authorized (has permissions) to use resources.

AWS Identity and Access Management (IAM) allows for fine-grained access management throughout the whole AWS platform. You may use IAM to control who has access to which services and resources and under what conditions. You control rights to your workforce and

systems with IAM policies to guarantee least-privilege permissions. IAM is an AWS service that is provided at no extra cost. IAM allows users to control AWS authorization for workforce members and workloads. AWS SSO simplifies the provisioning and management of IAM roles and rules throughout your AWS company. IAM roles and policies may be utilized for workload permissions by allowing just the necessary access to all workloads. IAM allows you to determine who has access to what by setting fine-grained permissions. The permissions are then enforced for each request by IAM. Access is forbidden by default, and access is allowed only when permissions include the word "Allow." Fine-grained access control, delegation of access via IAM Roles, IAM Access

Analyzer, permission guardrails, and attribute-based access control are all elements of IAM.

- **MySQL:** MySQL is an Oracle-backed open source relational database management system (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX and Windows. Although it can be used in a wide range of applications, MySQL is most often associated with web applications and online publishing. MySQL is an important component of an open source enterprise stack called LAMP. LAMP is a web development platform that uses Linux as the operating system, Apache as the web server, MySQL as the relational database management system and PHP as the object-oriented scripting language (Sometimes Perl or Python is used instead of PHP). MySQL is based on a client-server model. The core of MySQL is MySQL server, which handles all of the database instructions (or commands).

Literature Survey

- **Optimizing MySQL database system on information systems research, publications and community service: K. I. Satoto, R. R. Isnanto, R. Kridalukmana and K. T.**

  Martono,2016

  Many of the most popular and highly-trafficked websites in the world are built on MySQL database. Process optimization is done on the design of the database system. Database design plays an important role in determining system performance. This virtual table process to be performed by the system to be faster.

- **A Comparative Analysis of the Performance of Implementing a Java Application Based on the Microservices Architecture, for Various AWS EC2 Instances**

  D. Kubiak and W. Zabierowski,2021

  The article summarizes the performance of three AWS EC2 instances for various test cases running on a Java, microservices-based application. The analysis' goal was to show what procedures should be followed when selecting an acceptable environment for the deployed application.

- **Amazon EC2**

  Amazon Elastic Compute Cloud (Amazon EC2) offers the broadest and deepest compute platform, with over 500 instances and choice of the latest processor, storage, networking, operating system, and purchase model to help you best match the needs of your workload. We are the first major cloud provider that supports Intel, AMD, and Arm processors, the

only cloud with on-demand EC2 Mac instances, and the only cloud with 400 Gbps Ethernet networking. We offer the best price-performance for machine learning training, as well as the lowest cost per inference instance in the cloud. More SAP, high performance computing (HPC), ML, and Windows workloads run on AWS than any other cloud.

- **My SQL**

  MySQL server is available as a separate program for use in a client-server networked environment and as a library that can be embedded (or linked) into separate applications.

  MySQL operates along with several utility programs which support the administration of MySQL databases. Commands are sent to MySQLServer via the MySQL client, which is installed on a computer. MySQL was originally developed to handle large databases quickly. Although MySQL is typically installed on only one machine, it is able to send the database to multiple locations, as users are able to access it via different MySQL client interfaces. These interfaces send SQL statements to the server and then display the results.

Implementation

The following steps and screenshots depict the implementation of deployment of the application on AWS Cloud environment.

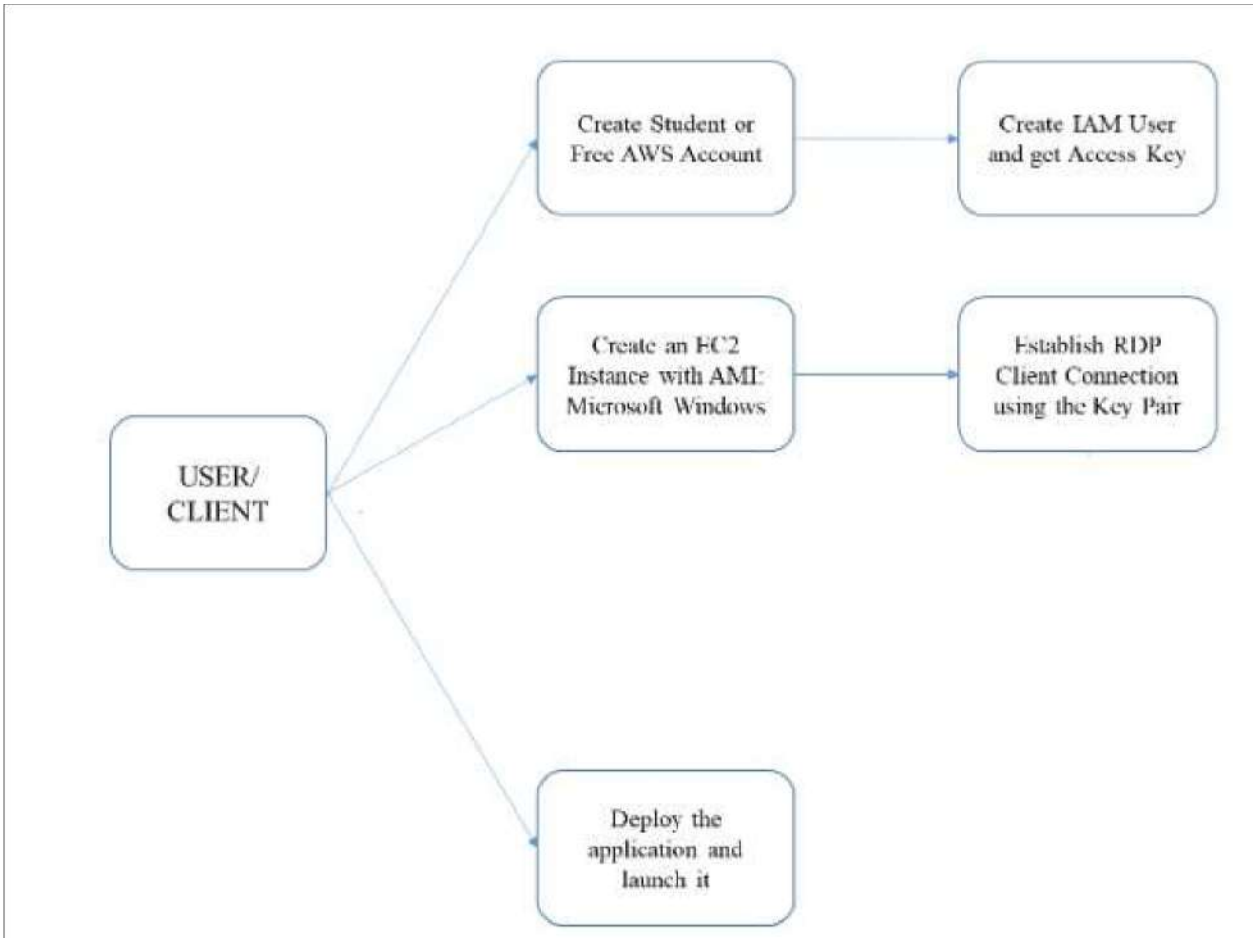
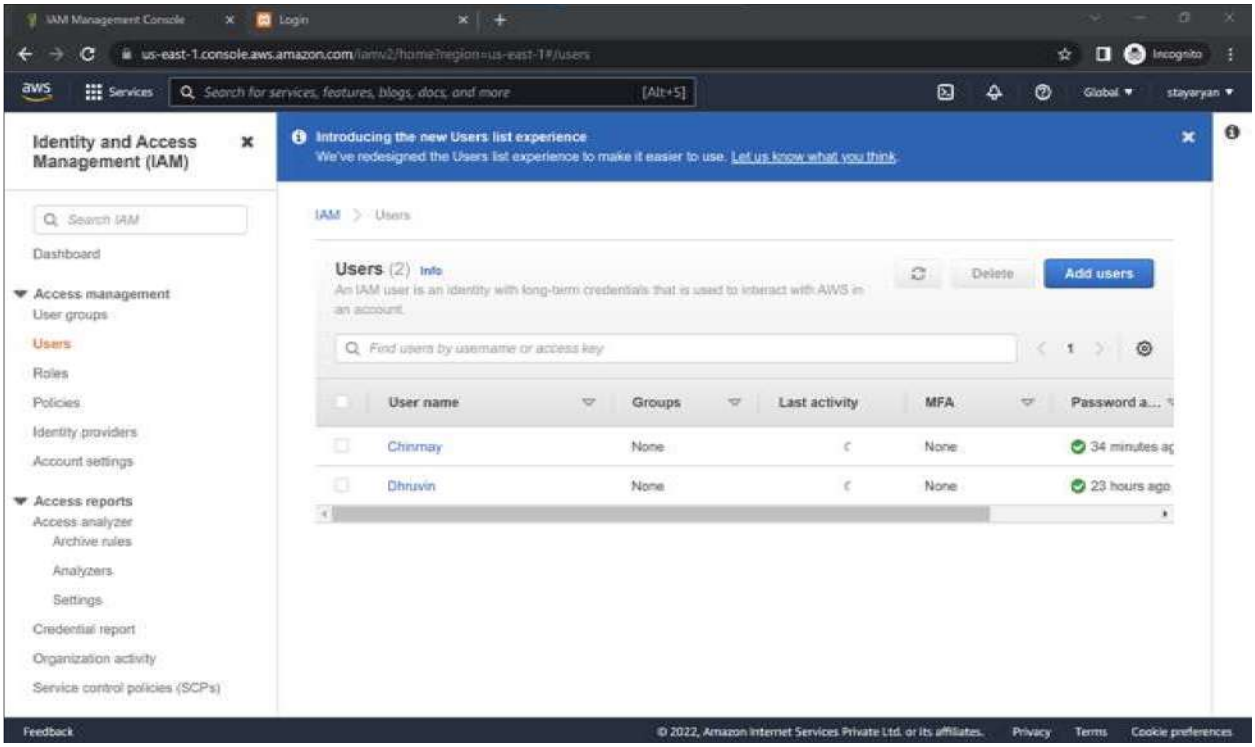
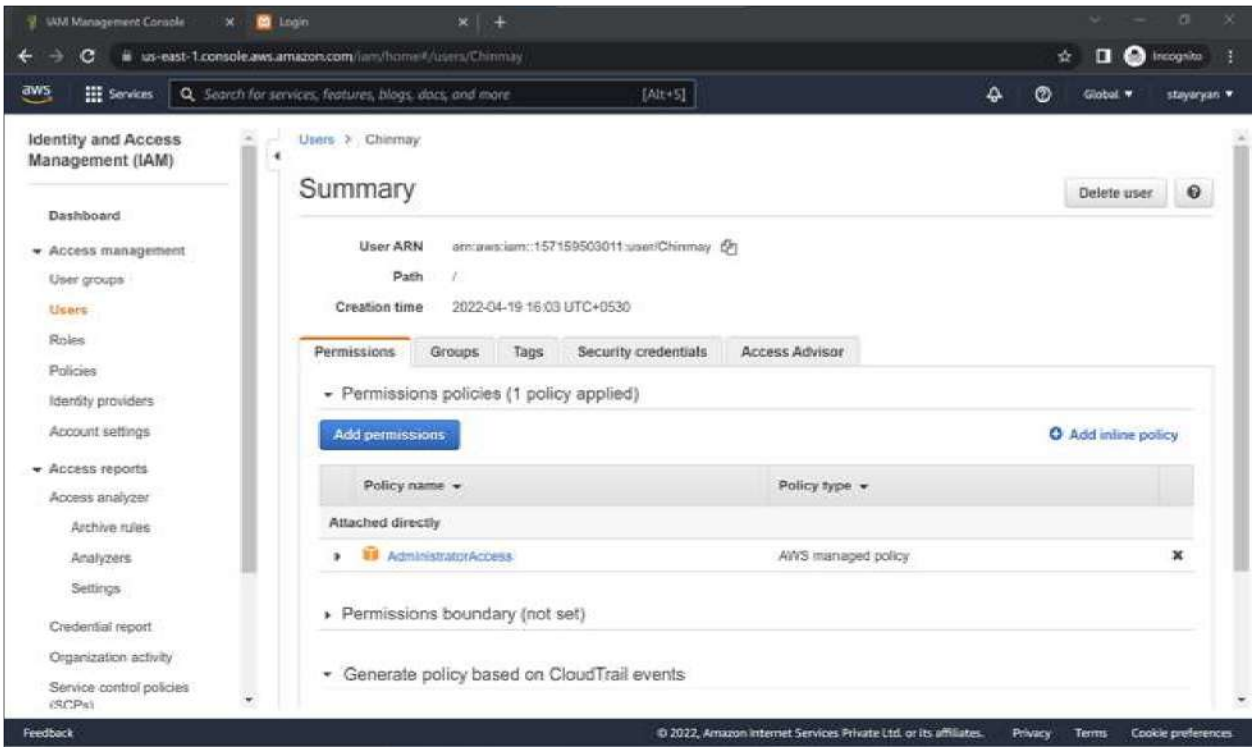


Fig.2 Use-Case Diagram

1. Create a New User via IAM service on the AWS Console named **admin_user**.
   A. Choose to create an **Access key - Programmatic access** and give the name for the user.
   B. To Set Permissions select: **AdministratorAccess.**
   C. Add tags if you wish to and create the user.

D. **Download CSV File** of the credentials of Access Key when prompted as it is essential for future steps. Incase you forget to save the Secret Access Key then once user is created, select the User and in Security Credentials tab, generate new Access Key and save it. (Creating an IAM User can help you or maybe your team to access the project on the console without having to share the Root User credentials as every user created, gets a separate set of credentials assigned.)





2. Create an EC2 Instance. Make the following changes while creating an Instance.

A. Choose AMI: Microsoft Windows Server 2022 Base (in Free Tier)

B. Instance Type: t2.micro

C. No change in Instance Details.

D. No change is Storage. Assigned storage is sufficient.

E. Add a tag: Key: Name

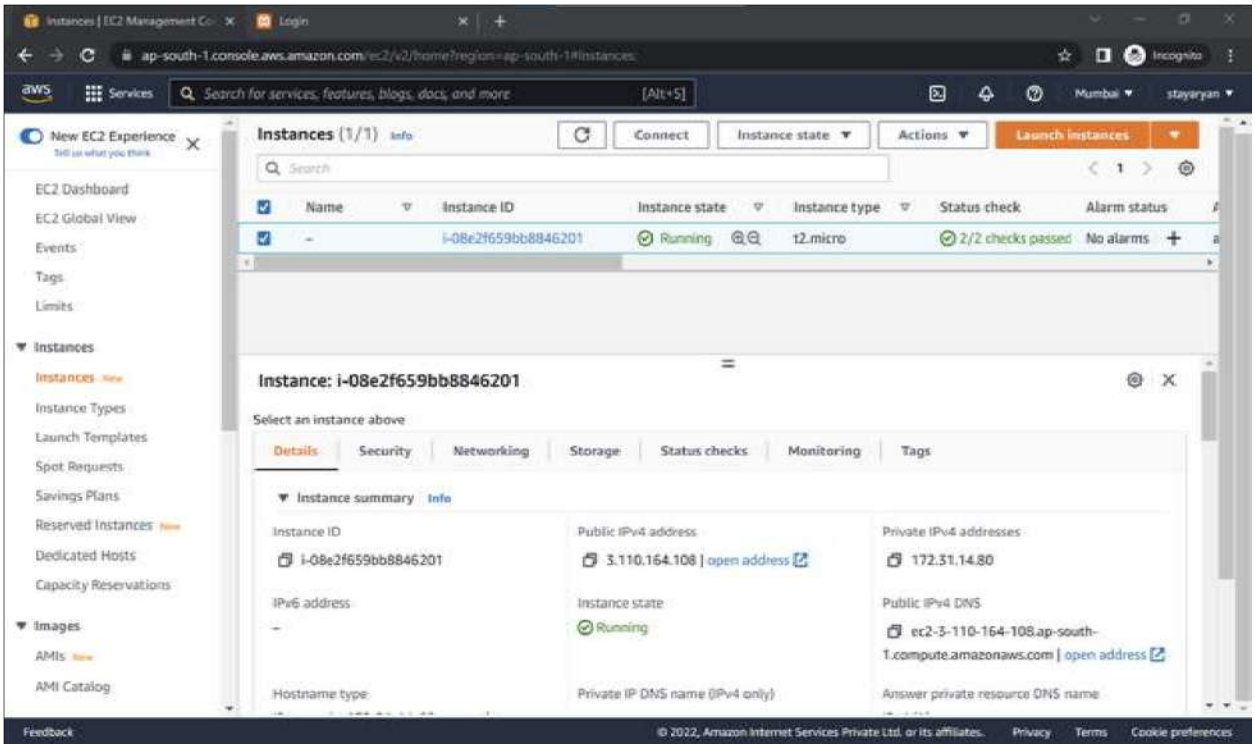
F. Value: instance_1 (name of instance you want)

G. Security Group Configuration: Add Rules: Custom TCP protocol and set port number to 8080. Add HTTP and HTTPS rules as well.

H. When asked for Key Pair, select Create a new Key Pair. Name the Key Pair and create. A .pem file will be downloaded. Know the location of this file for further use.

I. Launch the instance

J. Go to EC2>>Instances and wait for the Instance State to display Running and Status Check to display 2/2 checks passed before proceeding.



3. Create RDP Connect.

A. Select the instance you created and click on Connect in the top panel.

B. Navigate to the RDP Client section.

C. Click on Download remote desktop file, and a .rdp file will be downloaded.

D. In the password section, click on Get Password.

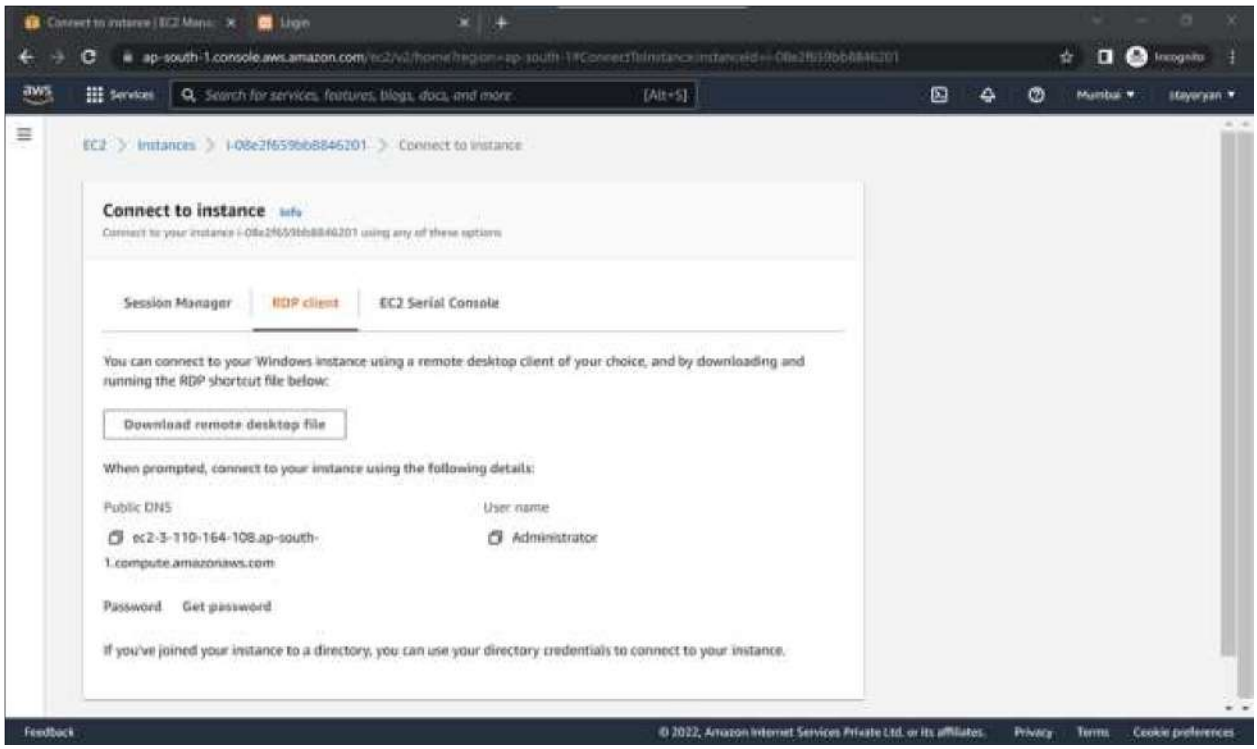
E. Here, browse and select the Key Pair file we downloaded in the previous step in .pem format. Click on Decrypt Password. You will be redirected to the previous page and will see the password.

F. Open the .rdp file now. Click on Connect in the pop-up. You will be asked to enter a password for the Administrator user. Copy the Decrypted password from the console and paste in the dialogue box and connect to the RDP client. Click on Yes if another pop-up appears.

G. As we have chosen Windows AMI, a VM will open up with Windows OS. Wait till you see the instance details on the Desktop of this VM before moving further. Select Refresh by right-clicking

in the VM if you don't see the details in the top right corner. H. RDP Connection is now established.

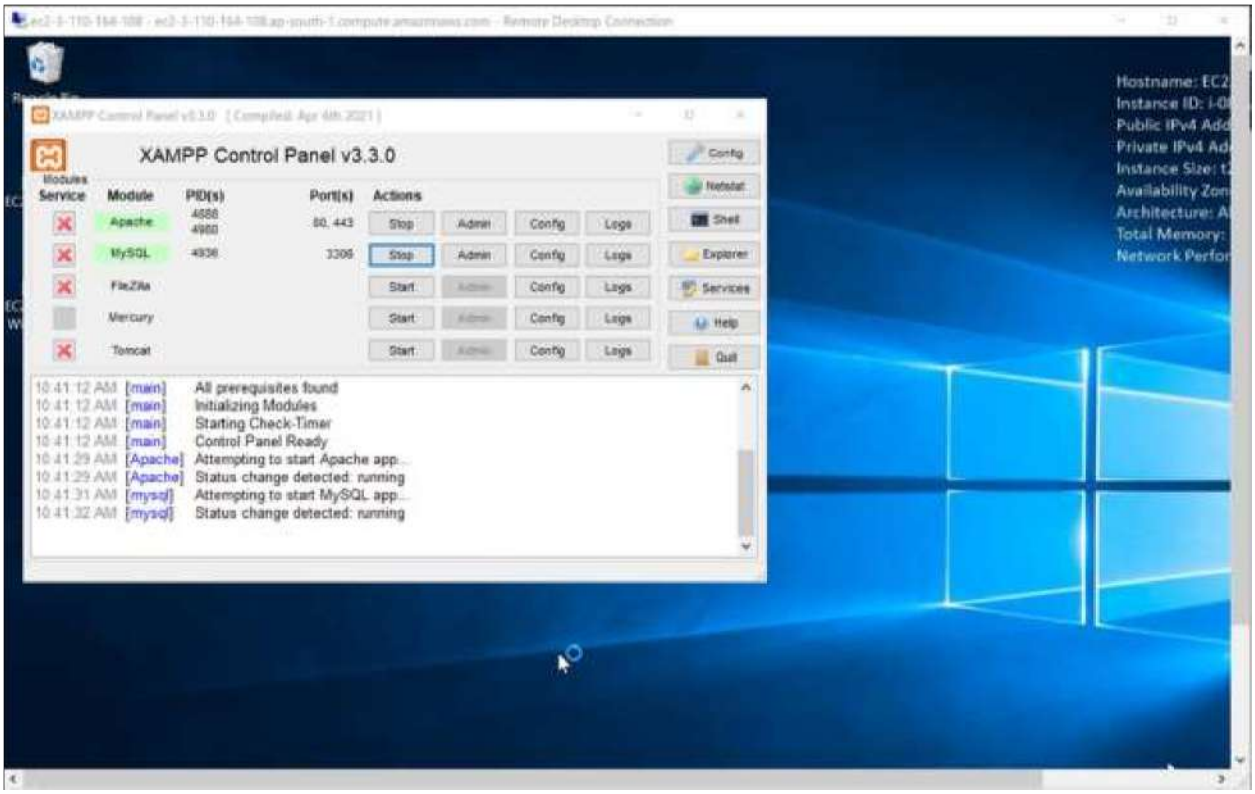
I. To run this project, install Python and/or Xampp if you wish to check the SQL connectivity. You open the Apache and MySQL connection on Xampp, create a database by the name of text_summarizer in phpMyAdmin and import the .sql file.



4. Connecting to XAMPP.

Start the Apache and MySQL application through the XAMPP Control Panel. XAMPP Control Panel is a management tool that offers to supervise the actions of individual components of XAMPP. It controls each component of the text server. The user can initiate or halt discrete modules by operating upon the buttons below the "Actions" column. Control panels efficiently manage all the components of the XAMPP Package. One can use the Control Panel to determine whether Apache, MySQL, Mercury, etc. are currently in function or not. The development environment can only be used when Apache and MySQL are in running state. The XAMPP Control

Panel icon exists in the system tray. It is an orange-colored icon that is visible when Panel is in running state.



5. Launching the project in the instance.

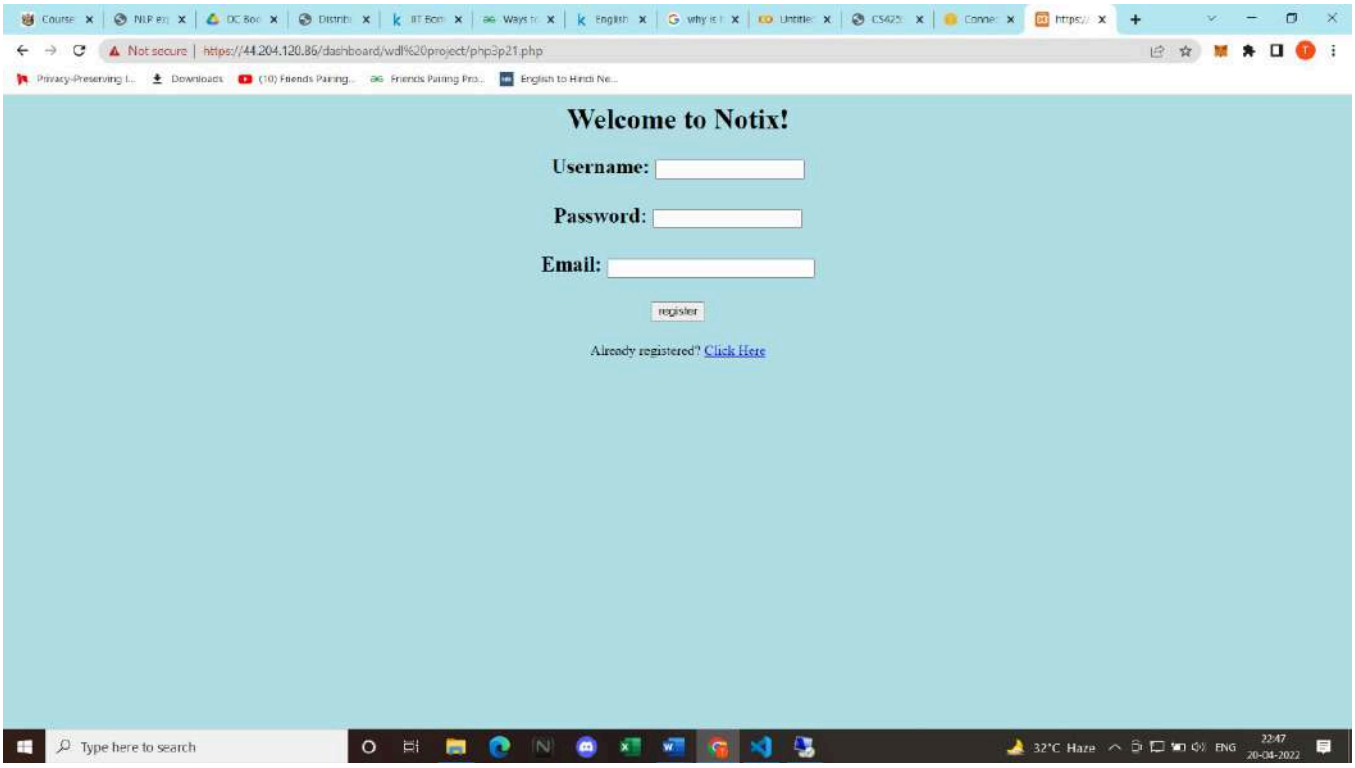
A. To run the application, open the Google Chrome and open the following link: 44.202.202.60

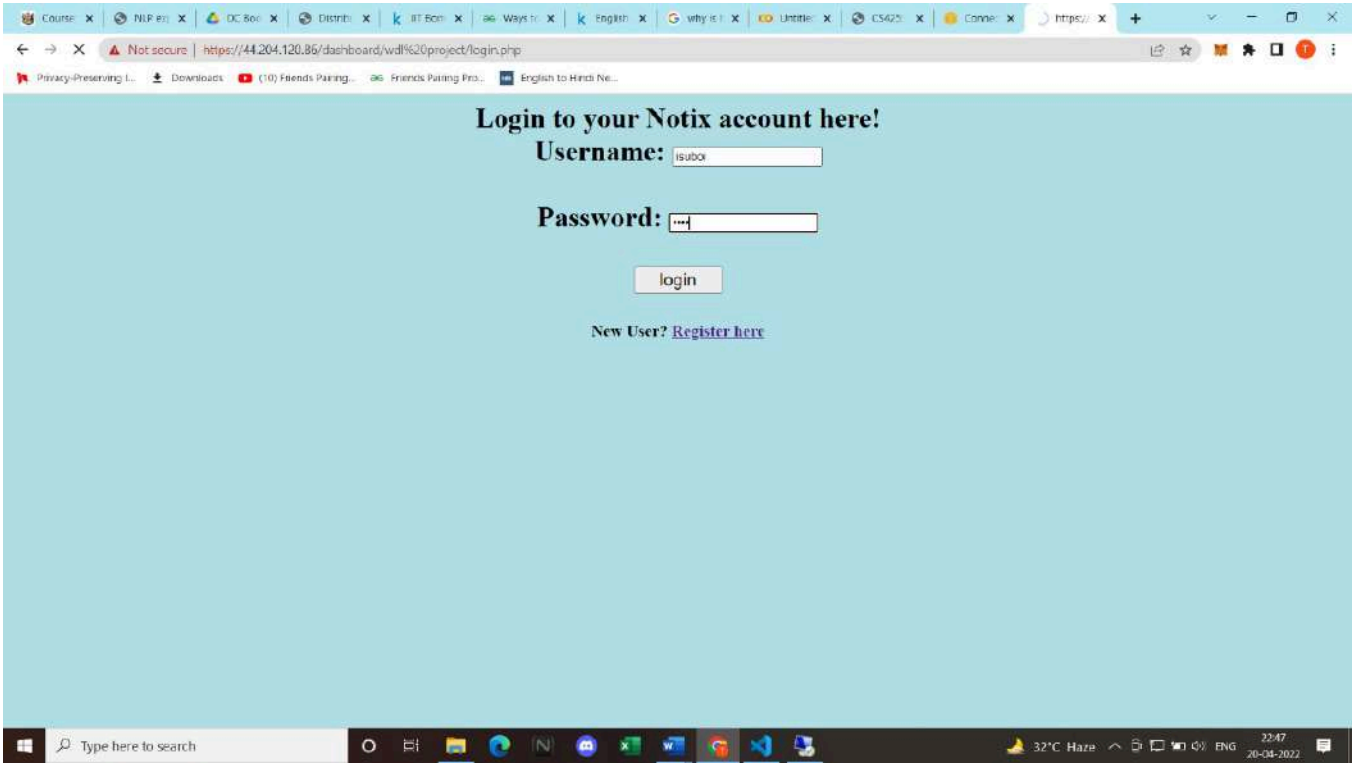
B. Log in using your username and password. If you don't have an account then click on register.

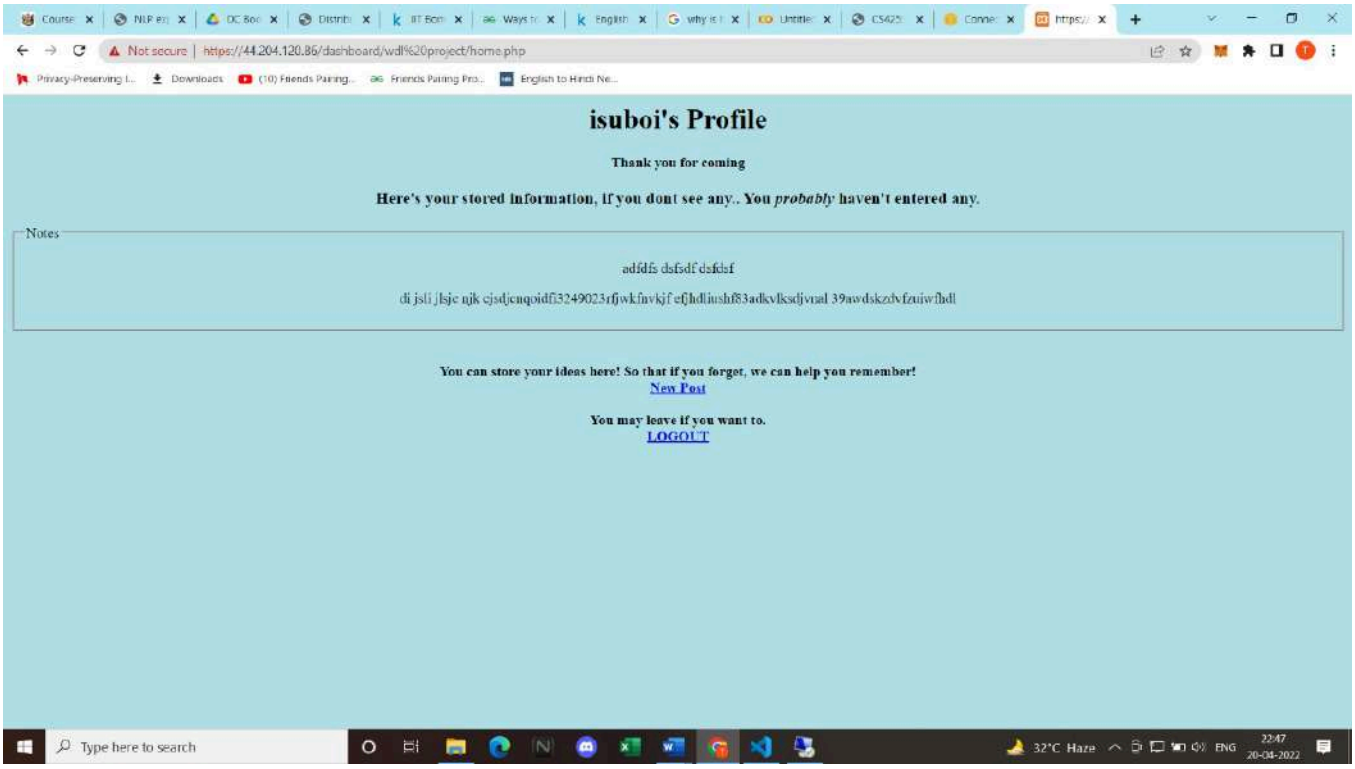
C. Enter your details and create your profile. Go back to the login page and then log in to your account.

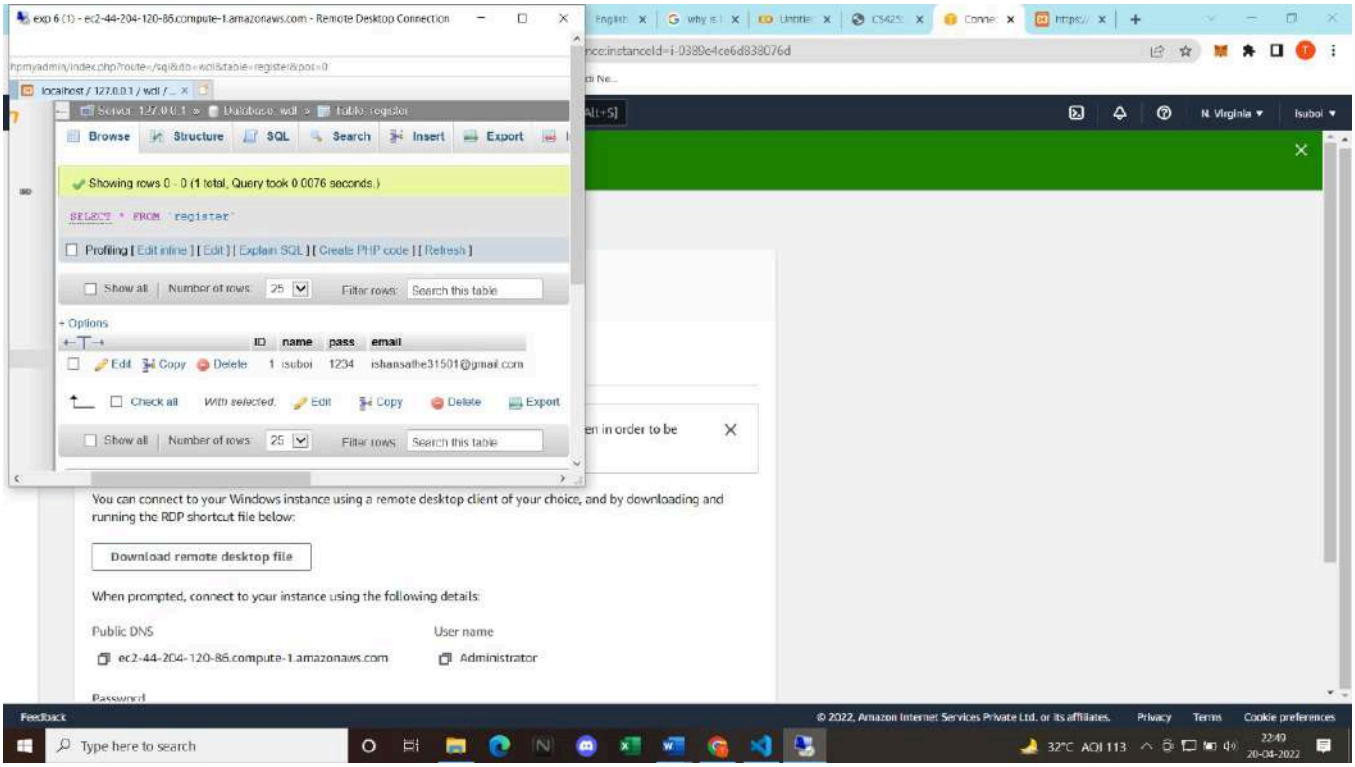
D. Give a name to the notes you want to create.

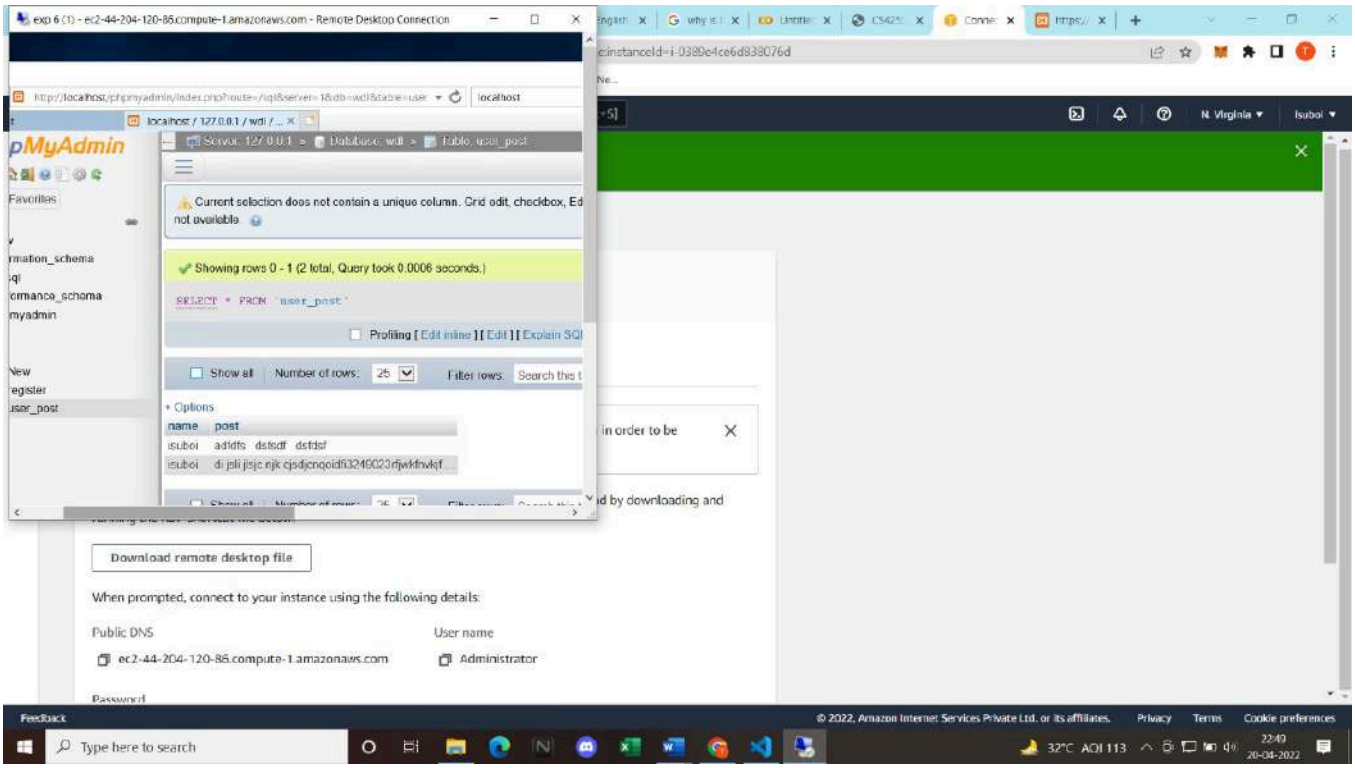
E. Provide the content for the notes that you want to save and post it.


Not secure | https://44.204.120.86/dashboard/wdl%20project/php3p21.php
Welcome to Notix!
Username:
Password:
Email:
register
Already registered? Click Here
Type here to search
32°C Haze
ENG
22:47
20-04-2022


Not secure | https://44.204.120.86/dashboard/wdl%20project/login.php
Login to your Notix account here!
Username: isuboi
Password:
login
New User? Register here
Type here to search
32°C Haze
ENG
22:47
20-04-2022


Not secure | https://44.204.120.86/dashboard/wdl%20project/home.php
isuboi's Profile
Thank you for coming
Here's your stored information, if you dont see any.. You probably haven't entered any.
Notes
adfdfs dsfsdf dsfdsf
di jsli jlsjc njk cjsdjcnqoidfi3249023rfjwkfnvkjf efjhdliushf83adkvlksdjvnal 39awdskzdvfzuiwflhdl
You can store your ideas here! So that if you forget, we can help you remember!
New Post
You may leave if you want to.
LOGOUT
Type here to search
32°C Haze
ENG
22:47
20-04-2022


exp 6 (1) - ec2-44-204-120-86.compute-1.amazonaws.com - Remote Desktop Connection
Browse
Structure
SQL
Search
Insert
Export
Showing rows 0 - 0 (1 total, Query took 0.0076 seconds.)
SELECT * FROM `register`
Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]
Show all
Number of rows: 25
Filter rows: Search this table
+ Options
ID name pass email
Edit Copy Delete 1 isuboi 1234 ishansathe31501@gmail.com
Check all With selected: Edit Copy Delete Export
You can connect to your Windows instance using a remote desktop client of your choice, and by downloading and running the RDP shortcut file below:
Download remote desktop file
When prompted, connect to your instance using the following details:
Public DNS
ec2-44-204-120-86.compute-1.amazonaws.com
User name
Administrator
Password
N. Virginia
isuboi
Feedback
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
32°C AQI 113
22:40
20-04-2022


pMyAdmin
Favorites
Showing rows 0 - 1 (2 total, Query took 0.0006 seconds.)
Download remote desktop file
When prompted, connect to your instance using the following details:
Public DNS
ec2-44-204-120-86.compute-1.amazonaws.com
User name
Administrator
Type here to search

Summary

By the means of this project, we learned to implement the concepts of Cloud Computing such as Infrastructure as a Service and Software as a Service. Software as a service (or SaaS) is a way of delivering applications over the Internet—as a service. Instead of installing and maintaining software, you simply access it via the Internet, freeing yourself from complex software and hardware management. SaaS applications are sometimes called Web-based software, on-demand software, or hosted software. Infrastructure as a Service or IaaS provides the users of the cloud greater flexibility to a lower level than other services. It even gives CPU clocks with OS-level control to the developers.

Learning Outcomes

The main aim of this project was to understand the concepts of cloud computing and implement them by the means of a project. During the course of development of this project we learned to use the AWS Cloud console in terms of using the different services provided by AWS. We have studied and implemented the following concepts and used the cloud services:

- Software as a Service
- Storage as a Service
- EC2
- IAM
- MySQL

References

- https://aws.amazon.com/ec2/
- https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/Introduction.html
- https://aws.amazon.com/websites/
- https://www.signitysolutions.com/blog/register-host-and-deploy-website-on-aws/
- https://www.guru99.com/what-is-aws.html

Acknowledgement

We have deployed our website on AWS Cloud with help of guidelines provided by the AWS Account. This was possible only by the support of our subject incharge and our department to whom we express our gratitude.