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**SCHOOL OF INFORMATION TECHNOLOGY AND
ENGINEERING**

ITE3007 - CLOUD COMPUTING AND VIRTUALIZATION

PROJECT REPORT on

PAAS-INDIAN METRO TRAIN BOOKING SYSTEM USING AWS

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SLOT: C2+TC2

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1. Abstract:

The main objective for developing this AWS Cloud Based on Ticket Reservation System is to provide interface to the manage Ticket, Passengers, Trains. The current metro train ticket booking system is human dependent and tedious with regards to the ticket booking process. The core objective of our project is to develop the web-application which will serve as a medium for students/employees/anyone to book the tickets to travel metro trains.

The principal motive force of this web-application is to ease the process of ticket booking by avoiding the hectic and boisterous process to stand in a queue and book the ticket for the short distance for travelling in the trains. Several applications are available in the market which give information about the travelling destinations and their fares. However, none of these applications incorporate the ticket booking process coordinated for trains.

Our application contrasts from such a lot of existing applications as it would book the ticket as well as save the ticket in the cloud database train.

This website is for metro train ticket booking and one can easily validate those booked tickets using mobile. Ticket can be bought with the help of smart phone, laptop using the web-application where your metro train tickets can be carried in your phone. The ticketing information of the user is securely stored in the cloud database.

2. Introduction:

The project is based on the PaaS – metro train ticket booking system. The cloud-based application helps users to book ticket online. This project is designed and coded by using technologies HTML, CSS, PHP and MySQL.

Paas – metro train ticketing application is a web application, designed to help application owner(admin) booked and organize customer booking.

There has been no advancement in Indian public transport system particularly railways, still follows the regular old pattern of ticket booking and checking. With the growing population, the number of travelers ready to travel day by day is expanding abruptly and now the circumstances are deteriorating that individuals don't bother whether they have a ticket or not, they knowingly or sometimes because of some issue they are entered in the train without a ticket. Indian public transport system and IT are loosely bounded.

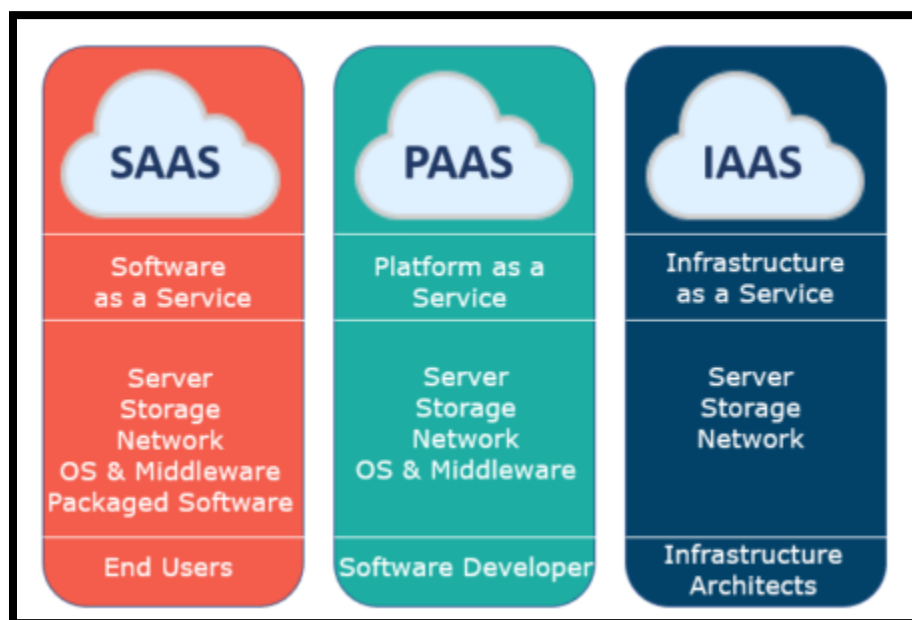
Presently the use of Information Technology is only limited to online checking of schedules and fares of public transport. The main motive of this web-application is to ease the process of ticket booking by avoiding the hectic process to stand in long queues and book the ticket for the short distance travelling in the trains.

Users can purchase the ticket over the Internet, 24 hours a day throughout the year, this solves the issue of Train ticket being misplaced or stolen in a real-life scenario. The application may get overloaded due to a huge number of users visiting at once. Thus, to solve the issue this system is built up using cloud infrastructure for improved performance.

3. Cloud computing:

Cloud Computing is a form of distributed computing which has been evolving recently. Typically, the cloud symbol is used to represent the Internet. Cloud computing is now widely used to describe the delivery of software, infrastructure and storage services over the internet. Cloud computing provides tools and technologies for various parallel applications with far more affordable prices compared to traditional parallel computing techniques.

The main purpose of cloud computing is to profit from all of these technologies without the necessity for deep knowledge or expertise with each of them. At present, whether large or small, all companies depend on public cloud platforms to host and implement applications because they supply flexibility, mobility, scalability, sustainability and it is cost-effective.



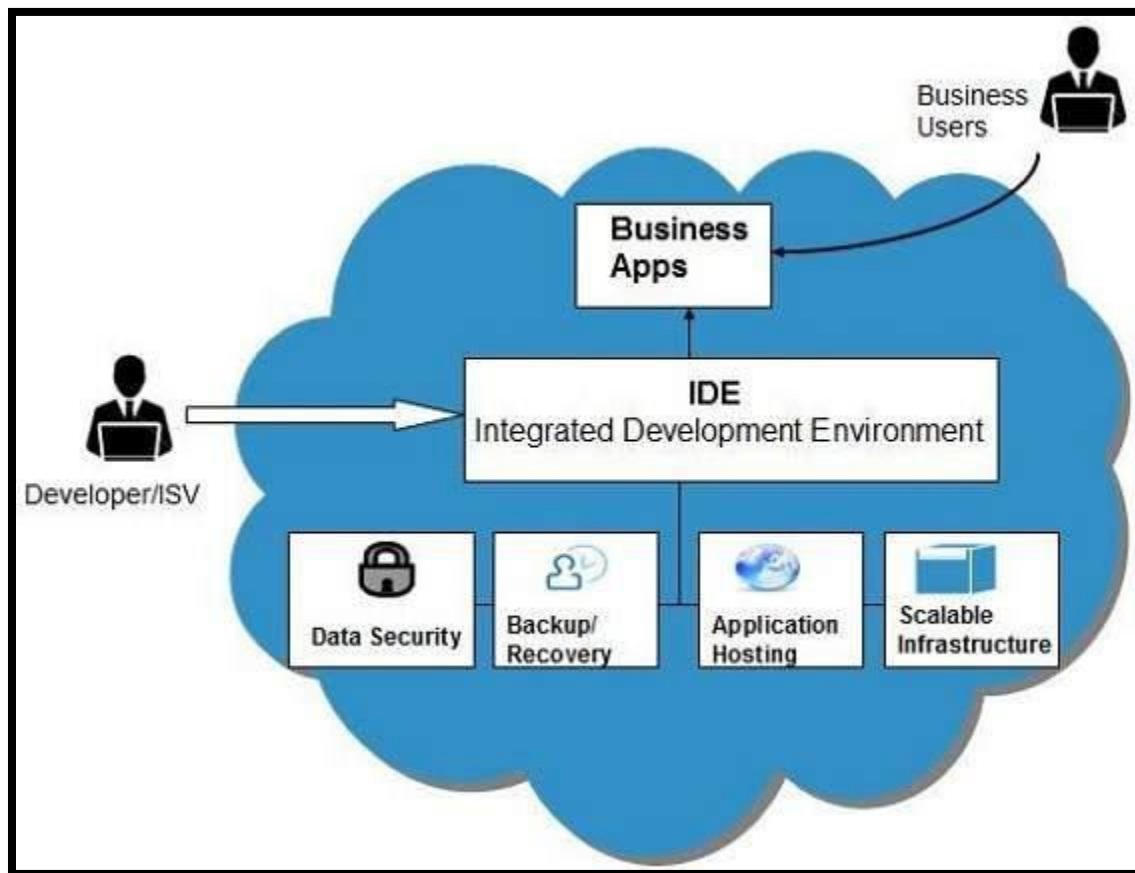
Cloud service models

Platform as a Service (PaaS):

PaaS cloud computing platform is created for the programmer to develop, test, run, and manage the applications.

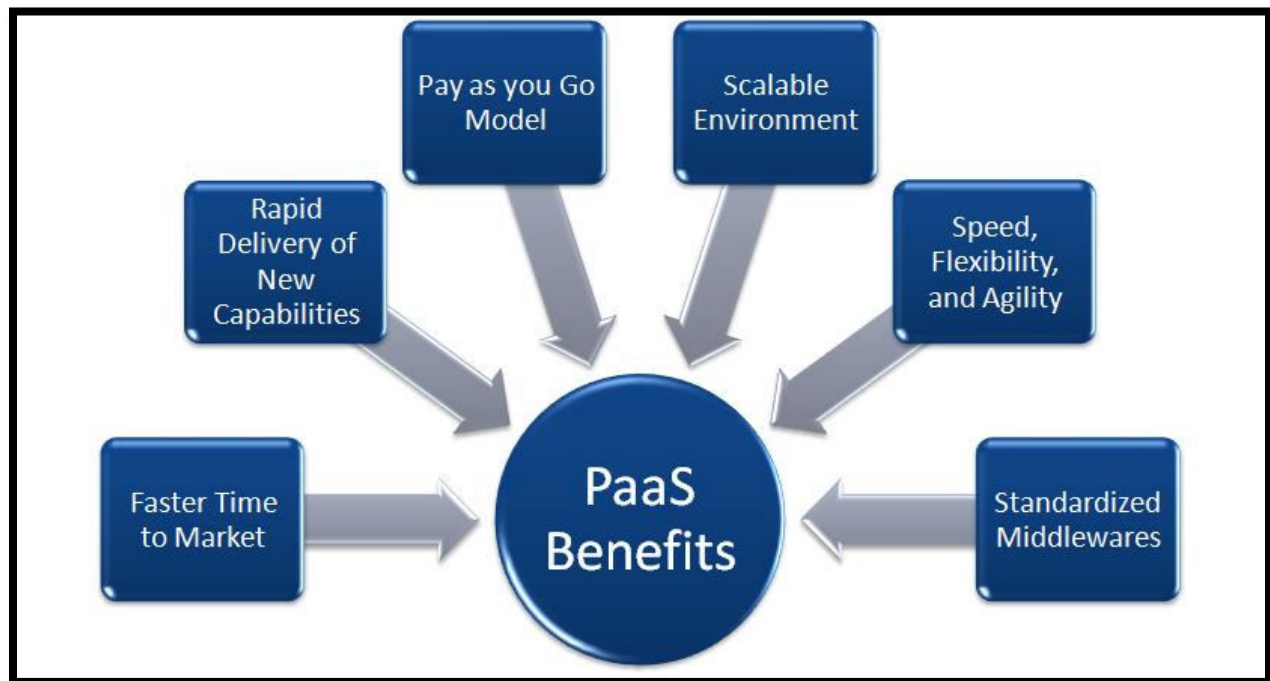
There are the following characteristics of PaaS -

- ✓ Accessible to various users via the same development application.
- ✓ Integrates with web services and databases.
- ✓ Builds on virtualization technology, so resources can easily be scaled up or down as per the organization's need.
- ✓ Support multiple languages and frameworks.
- ✓ Provides an ability to "**Auto-scale**".



Beginner Guide of PaaS

Benefits of PaaS:



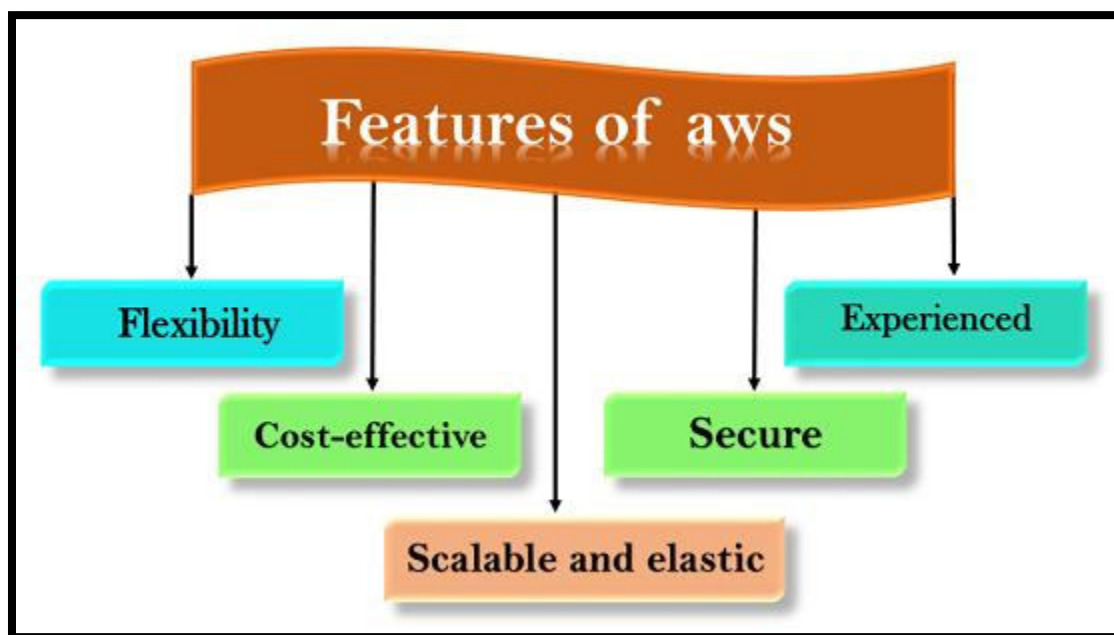
benefits of PaaS model

AWS:

Amazon Web Services, Inc. (AWS) is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered, pay-as-you-go basis. Often times, clients will use this in combination with autoscaling (a process that allows a client to use more compute in times of high application usage, and then scale down to reduce costs when there is less traffic). These cloud computing web services provide various services related to networking, compute, storage, middleware, IOT and other processing capacity, as well as software tools via AWS server farms. This frees clients from managing, scaling, and patching hardware and operating systems. One of the foundational services is Amazon Elastic Compute Cloud (EC2), which allows users to have at their disposal a virtual cluster of computers, with extremely high availability, which can be interacted with over the internet via REST APIs, a CLI or the AWS console. AWS's virtual computers emulate most of the attributes of a real computer, including hardware central processing units (CPUs) and graphics processing units (GPUs) for processing; local/RAM memory; hard-disk/SSD storage; a choice of operating systems; networking; and pre-loaded application software such as web servers, databases, and customer relationship management (CRM).

AWS services are delivered to customers via a network of AWS server farms located throughout the world. Fees are based on a combination of usage (known as a "Pay-as-you-go" model), hardware, operating system, software, or networking features chosen by the subscriber required availability, redundancy, security, and service options. Subscribers can pay for a single virtual AWS computer, a dedicated physical computer, or clusters of either. Amazon provides select portions of security for subscribers (e.g. physical security of the data centers) while other aspects of security are the responsibility of the subscriber (e.g. account management, vulnerability scanning, patching). AWS operates from many global geographical regions including seven in North America.

Features of AWS:



4. Amazon EC2:

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers. Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction.

Role of EC2:

EC2 Instance Role provides the Instance access to a set of IAM Credentials and – if the associated IAM Policies permit – access to AWS services.

Benefits OF Amazon EC2:

1. RELIABILITY: Amazon EC2 offers 99.9% availability for each Amazon EC2 region. The services are highly reliable where replacement of instances can be done easily and rapidly.

2. SECURITY: Amazon works with Amazon VPC to provide robust networking and security for the compute resources. The compute instances are located in a VPC (Virtual Private Cloud) in a specific IP range. This specific function helps the user in deciding which instances are exposed to the internet and which remains private.

3. FLEXIBILITY: EC2 provides you with choices of multiple instance types, software packages, instance storages, and operating systems. EC2 lets us configure memory, CPU and boot partition size which is optimal for the operating system and application.

4. COST SAVING: EC2 is inexpensive as it allows the user to select plans as per the requirement. This will help the user to save cost and utilize the resources fully. EC2 passes the benefits of Amazon's scale as the user has to pay a very low amount compared to the services they provide.

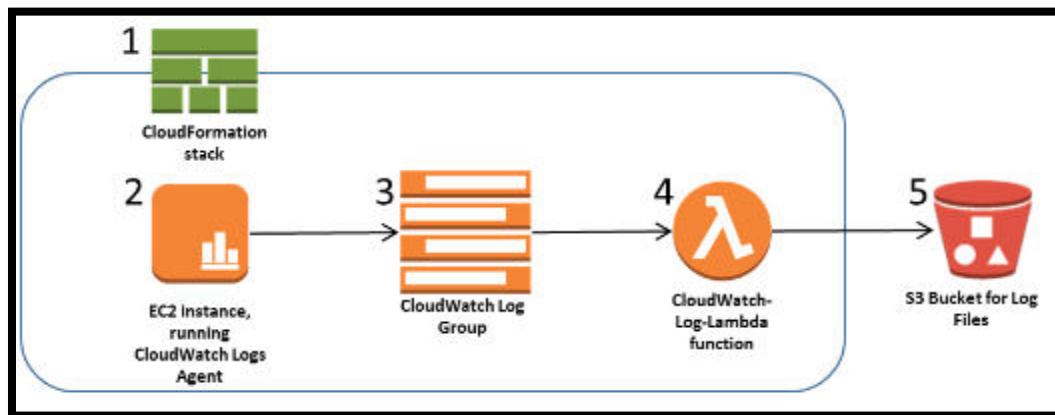
5. COMPLETE COMPUTING SOLUTION: EC2 works fine with Amazon RDS, S3, Dynamo DB and Amazon SQS. This provides complete computing, processing and storage solution.

6. ELASTIC WEB-SCALE COMPUTING: Enterprises can easily increase or decrease capacity within minutes. They can commission thousands of server instances simultaneously. Additionally, all the server instances are handled by the web service APIs which can scale the servers up and down depending on the requirements.

7. COMPLETELY CONTROLLED: One has complete control over the instances. Also, One can have root access to each instance and they can interact with them as any other machine. The user can stop instance while retaining the data on the boot partition and restart the same using web service APIs.

Working of EC2:

EC2 uses the AWS Management Console, the AWS Command Line Interface (CLI), or AWS Software Developer Kits (SDKs) for managing the scaling according to changing needs and makes it simple to deploy virtual servers and maintain storage.



During the setup, AMI(Amazon Machine Image) has to be created, which includes an operating system, apps, and configurations. After launching an instance, in the console, the user can either select an AMI template or create one. That AMI is loaded to the Amazon S3(Simple Storage Service), and it is registered with AWS EC2, creating an AMI identifier, at which point users can launch instances as per the requirement.

Virtual Machines:

A virtual machine, commonly shortened to just VM, is no different than any other physical computer like a laptop, smart phone or server. It has a CPU, memory, disks to store your files and can connect to the internet if needed. While the parts that make up your computer (called hardware) are physical and tangible, VMs are often thought of as virtual computers or software-defined computers within physical servers, existing only as code.

Advantages:

While virtual machines run like individual computers with individual operating systems and applications, they have the advantage of remaining completely independent of one another and the physical host machine. A piece of software called a hypervisor or virtual machine manager, lets you run different operating systems on different virtual machines at the same time. This makes it

possible to run Linux VMs, for example, on a Windows OS or to run an earlier version of Windows on more current Windows OS.

And, because VMs are independent of each other, they are also extremely portable. You can move a VM on a hypervisor to another hypervisor on a completely different machine almost instantaneously.

Because of their flexibility and portability, virtual machines provide many benefits, such as:

- **Cost savings**—running multiple virtual environments from one piece of infrastructure means that you can drastically reduce your physical infrastructure footprint. This boosts your bottom line—decreasing the need to maintain nearly as many servers and saving on maintenance costs and electricity.
- **Agility and speed**—Spinning up a VM is relatively easy and quick and is much simpler than provisioning an entire new environment for your developers. Virtualisation makes the process of running dev-test scenarios a lot quicker.
- **Lowered downtime**—VMs are so portable and easy to move from one hypervisor to another on a different machine—this means that they are a great solution for backup, in the event the host goes down unexpectedly.
- **Scalability**—VMs allow you to more easily scale your apps by adding more physical or virtual servers to distribute the workload across multiple VMs. As a result you can increase the availability and performance of your apps.
- **Security benefits**— Because virtual machines run in multiple operating systems, using a guest operating system on a VM allows you to run apps of questionable security and protects your host operating system. VMs also allow for better security forensics and are often used to safely study computer viruses, isolating the viruses to avoid risking their host computer.

Setting Up Virtual Machine On Cloud Environment:

- Creating a Workspace
- Open the Workspaces console at <https://console.aws.amazon.com/workspaces/>.
- In the navigation pane, choose Workspaces.
- Choose Launch Workspaces.

On the Select a Directory page, do the following:

- For Directory, choose the directory that you created.
- For Enable Self Service Permissions, choose Yes or No and enter a description.
- For Enable Amazon WorkDocs, choose Yes.

5. Literature Review:

S. No	Author's Name	Title	Methodology	Advantage	Challenges
1	Rushabh, Patel ¹ Rahul Raghvendra Joshi ²	Envision of I-RS (I-Railway System) - based on Cloud Computing	QR-Scanner and GPS technique	Achieves economies of scale, Reduces expenditure on technological infrastructure, Globalization of proposed system, Streamlined processing, Reduced capital costs, Improved accessibility, Effective Monitoring, Less personnel training requirement	Possible downtime, Security issues.
2	Subarnarekha Ghosal, Shalini Chaturvedi, Akshay Taywade and N. Jaisankar*	Android Application for Ticket Booking and Ticket Checking in Suburban Railways	Near Field Communication (NFC), QR-Scanner and GPS technique	Low investment, automated failure recovery, automated scaling, better performance and maintainability. But some drawbacks include security and privacy and loss of critical data in the case of any disaster.	Android Suburban Railway (ASR) ticketing is basically a way of buying tickets for suburban railway which is an extremely challenging task

3	Kaustubh Bhattar	System for Advanced Locking and Ticketing (S.A.L.T)	wireless communication, LCD Display, Magnetic Lock, NodeMCU ESP8266:	The main advantage is that it doesn't change anything on the servers; it just retrieves the data from the server, without after effect	there is no guarantee of delivery, ordering, or duplicate protection
4	Karthick. S I ,Velmurugan. A 2	Android Suburban Railway Ticketing with GPS as Ticket Checker	Android Cloud to Device Messaging (C2DM), Android SDK, QR-Scanner and GPS technique	It uses the smart phones "GPS" facility to validate and delete your ticket automatically after a specific interval of time once the user reaches the destination. User's ticket information is stored in a CLOUD database for security purpose which is missing in the present suburban system. Also, the ticket checker is provided with a checker application to search for the user's ticket with the ticket number in the	One of the biggest challenges in the current ticketing facility is "QUEUE" in buying our suburban railway tickets Android Suburban Railway (ASR) ticketing is mainly to buy the suburban tickets which are the most challenging.

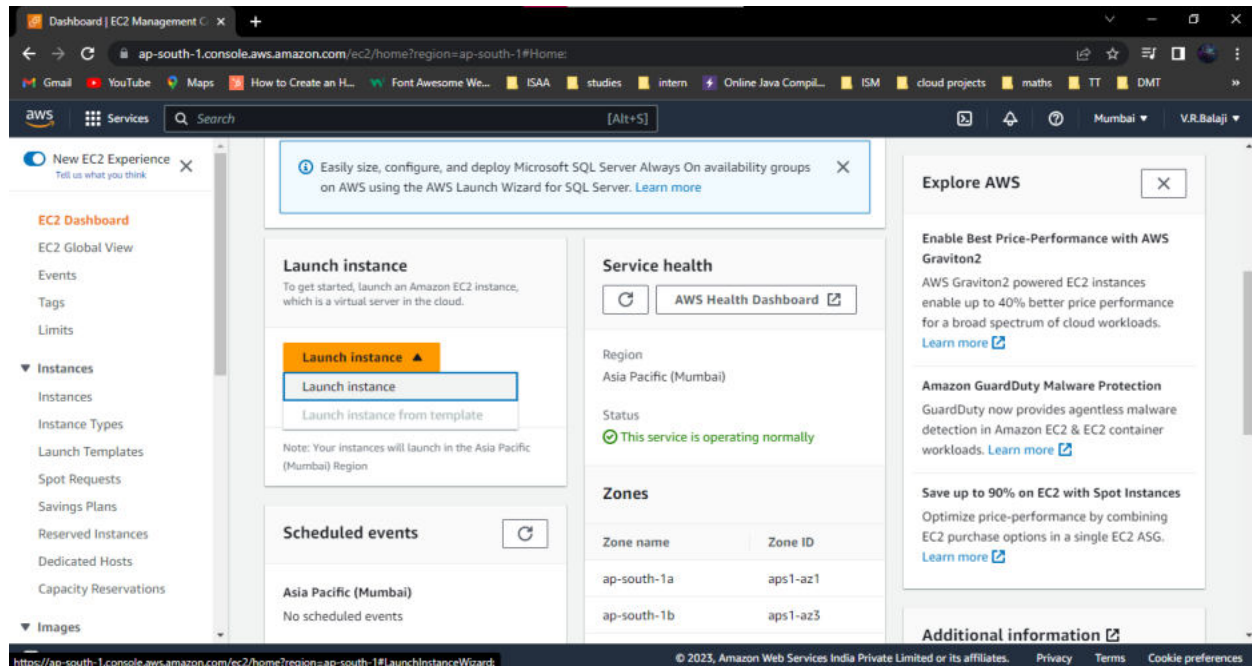
				cloud database for checking purposes.	
5	Chatterjee, Parag, and Asoke Nath	Smart Computing Applications in Railway Systems - A case study in Indian Railways Passenger Reservation System	UID-Unique Identification, PRS-Passenger Reservation System, Smart computing	The no breach in verification of the passengers travelling in the reserved coaches of the train. The new system involves comprehensive check of identity in case of every passenger travelling onboard. Also, the huge overhead of typing the details of all the passengers is bypassed by a more intelligent and efficient method of data entry using UID	In this vast system, it is a herculean task to efficiently handle the passenger data, which is a key point of consideration now-a-days.
6	Abhishek Nair M, Smit Taunk, Panyam Gangadhar Reddy, Parveen Sultana H	Smart Metro Rail Ticketing System	AES algorithm, dynamic S-Box Generation and Dynamic key generation, RSA or DES, ECC (Elliptic curve Cryptography), UID	DynamoDB on the whole, storing the data in the cloud are high availability, easy scalability, pay-as-you-go basis and so on. low	we need to carry our ticket as well as a UID card which is always a hectic task for day-to-day travel.

				installation cost.	
7	Chen, T., Zhou, Z. N., Zhang, J. R., & Ni, S. Q., Kaohsiung, Taiwan	Railway Passenger Service Mode on “Internet+”	Traditional passenger travel chain demand analysis, customer relationship analysis, Relying on the Internet platform, cloud computing, big data mining, Internet of things technology	The service chain theory is used to study the content, scope and mechanism of passenger service	the Internet of passenger service is still not high. In terms of passenger product development, promotion of passenger service mode, improvement of passenger service quality, passenger service business development and other aspects, there is still a large gap between passengers’ expectations.
8	Ms.Apeksha Waghmare1 , Ms.Suvarna Pansambal2 Ms.Aruna Pavate3 , Ms.Divya Kumawat4	QR code-based Railway e-Ticket	QR code, time- based technique, Near Field Communication (NFC) device.	The main advantage of using this application in our own devices is that you can book your tickets online, of your own choice and you don’t need to have waste your time just waiting in the queue for your number to come for buying tickets.	Possible downtime, Security issues.

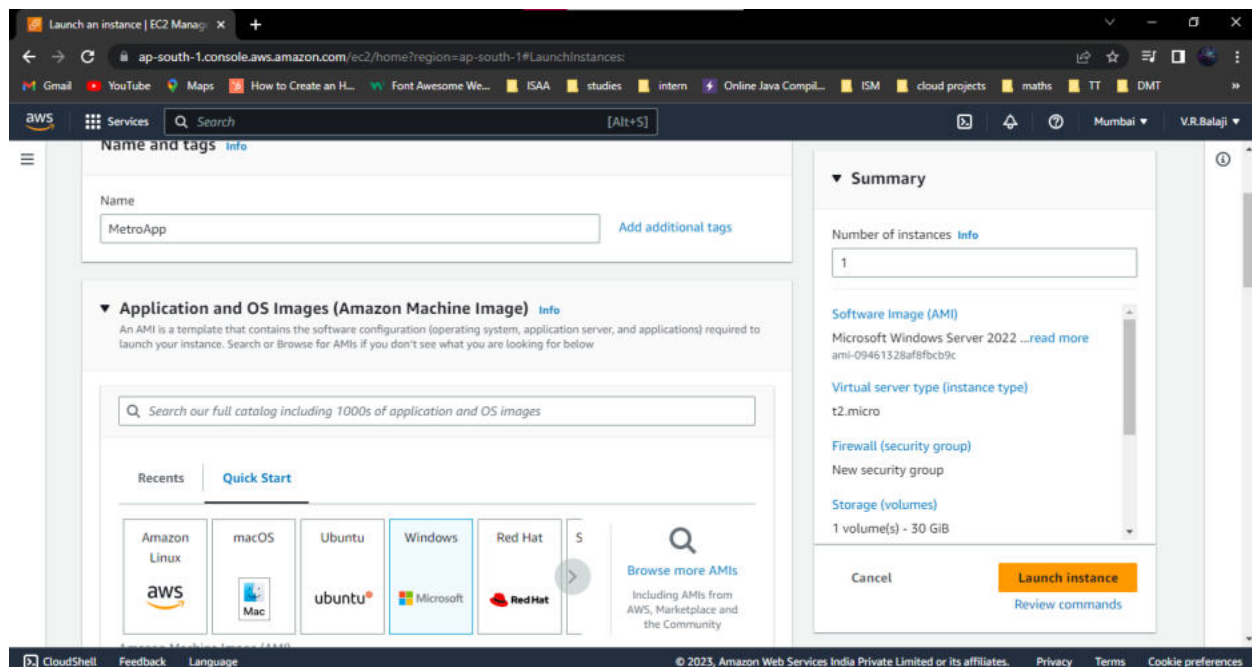
9	Sani, Yahaya Mohammed; Mariann, Temitayo Usman; Mamman, Adamu	WEB-BASED E-TICKETING SYSTEM FOR BOOKING AND RESERVATION FOR RAILWAY TRANSPORTATION USING QUICK RESPONSE CODES	Peripheral Interface Controller (PIC), QR code, MATLAB	Use of minutia approaches which employs characteristics such as ridge bifurcation to plot points on a fingerprint, accurate system recognition and quick identification of fingerprint.	A major weakness of this system is not integrating the Aadhar card system, which holds the details of every Indian citizen, making the process of purchasing tickets and verifying tickets inefficient
10	Huihong He1 , ZhiYi Ma1+, Xiang Li2 , Hongjie Chen1 , Weizhong Shao2	An Approach to Estimating Cost of Running Cloud Applications based on AWS	AWS, cloud pricing schema, ELB	Provide a resource allocation and recommend suitable purchase plan according to the allocation	long running, budget when the application has Quality of Service (QoS) requirements. The developers have to design application more delicately to meet requirements of the both. Hence, an effective process is urgently needed to reflect automatically whether the design satisfies needs and guide developers to adjust application design

6. Implementation:

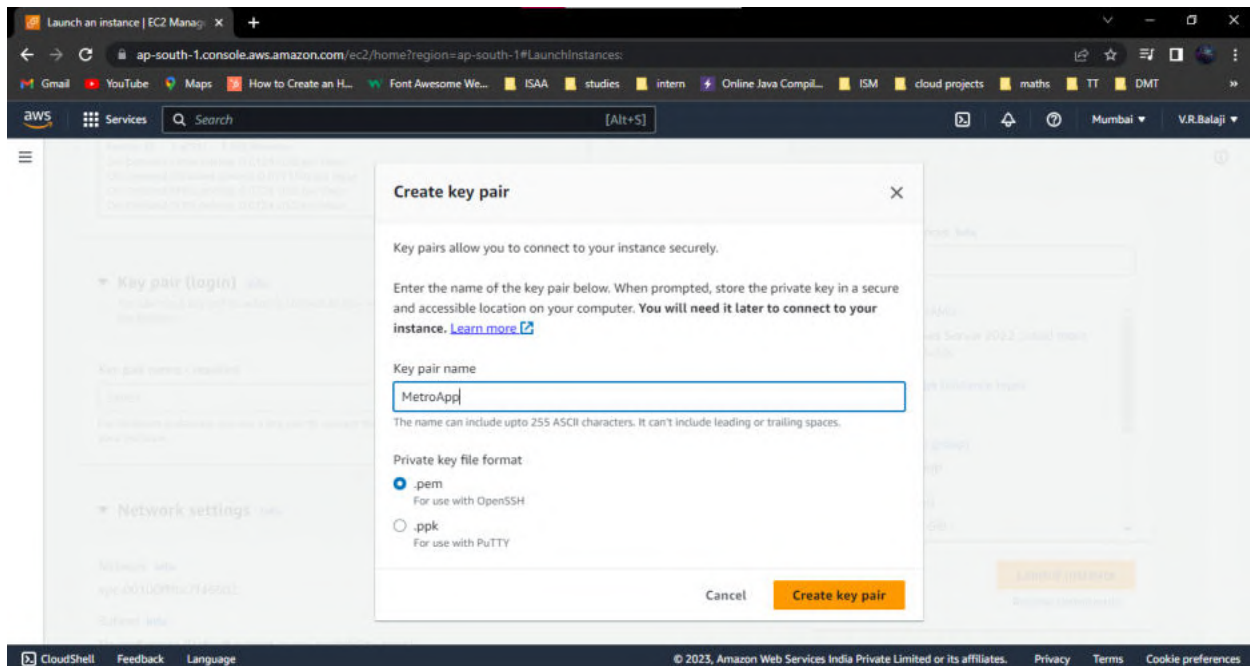
Creating EC2 Instance in AWS



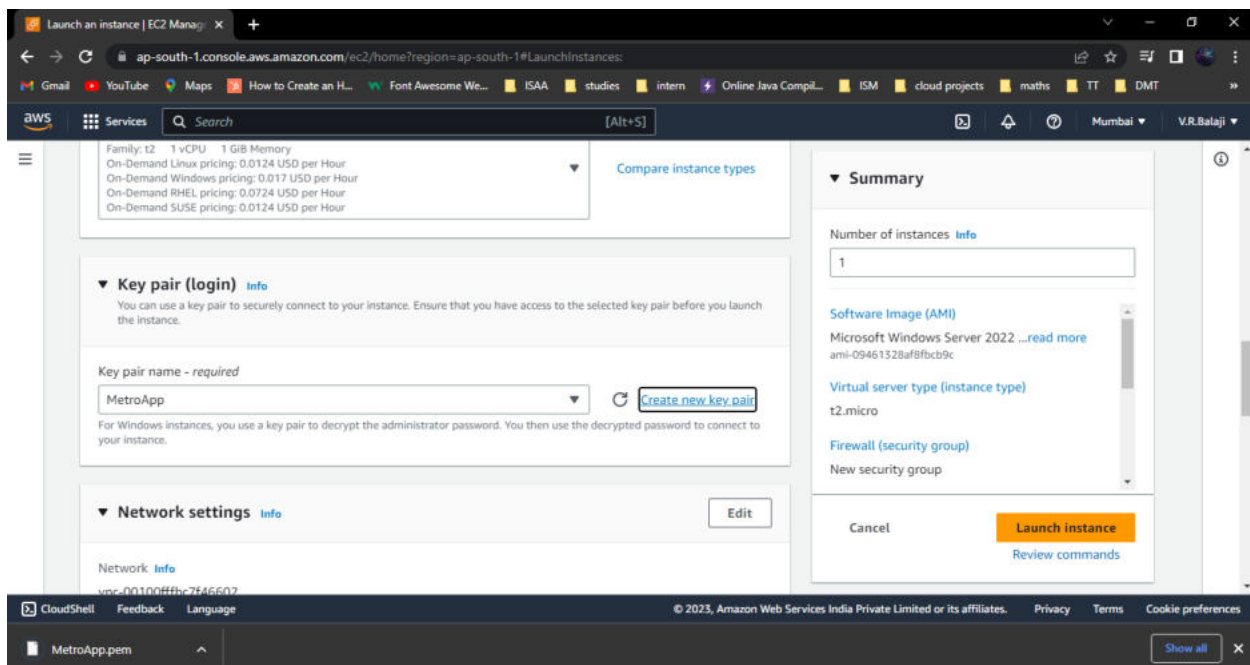
Setting name & Selecting windows



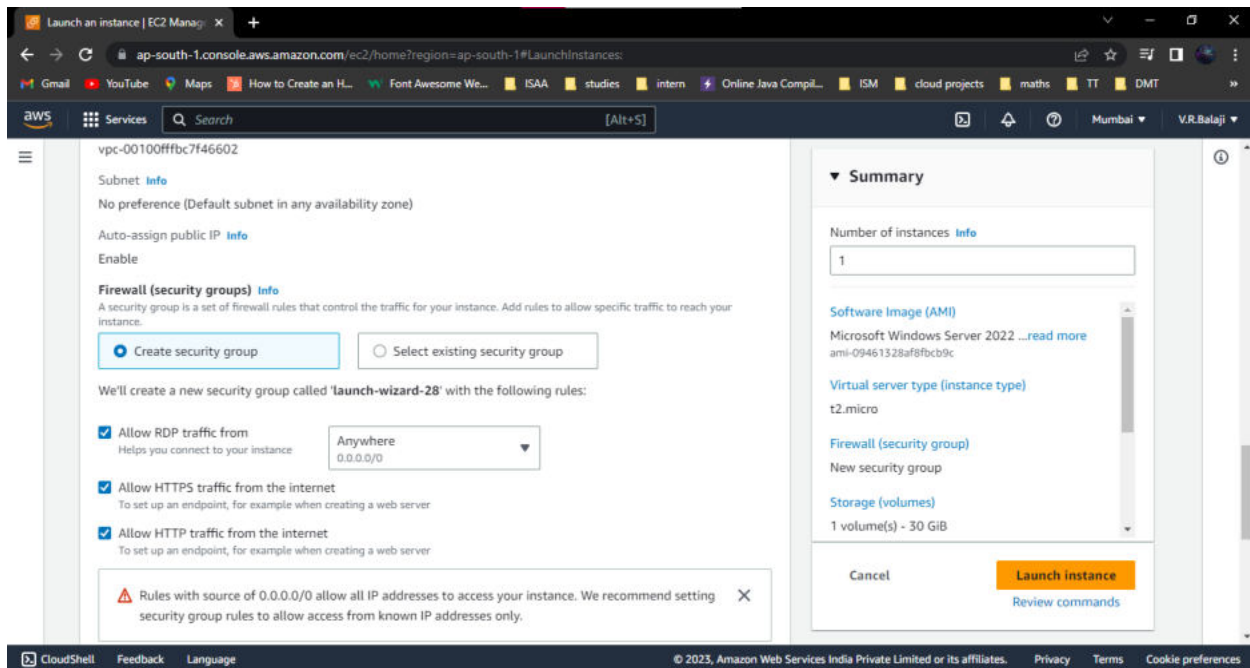
Creating new Key Pair,



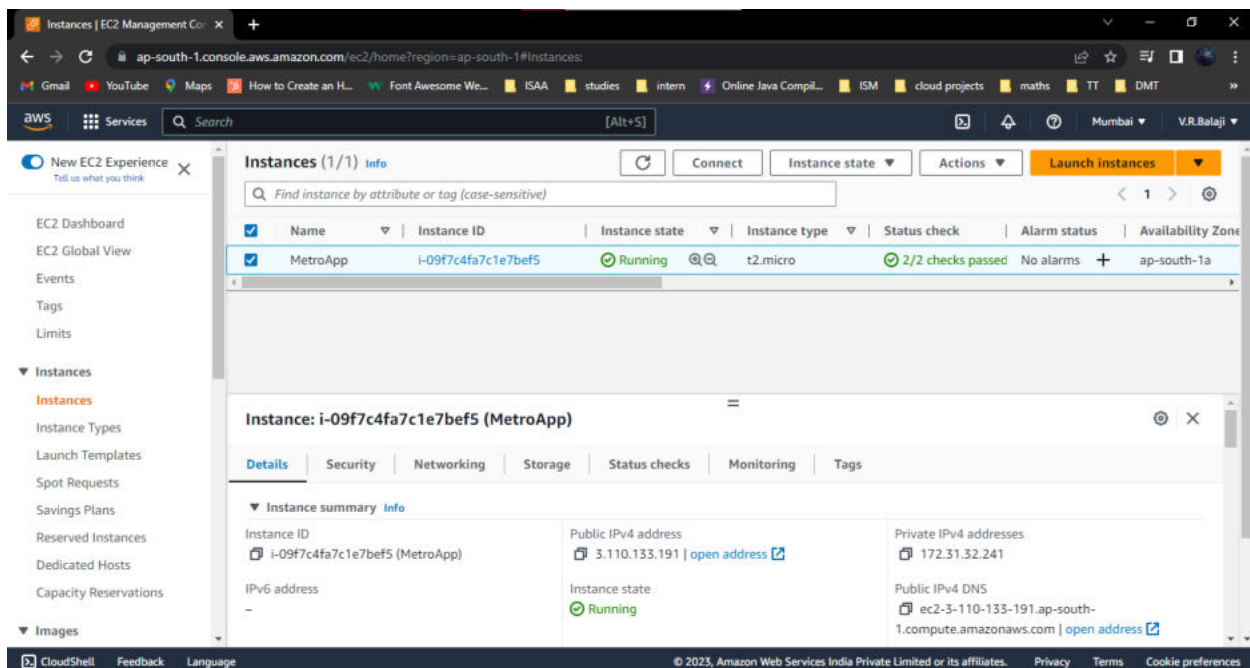
Created new Key pair,



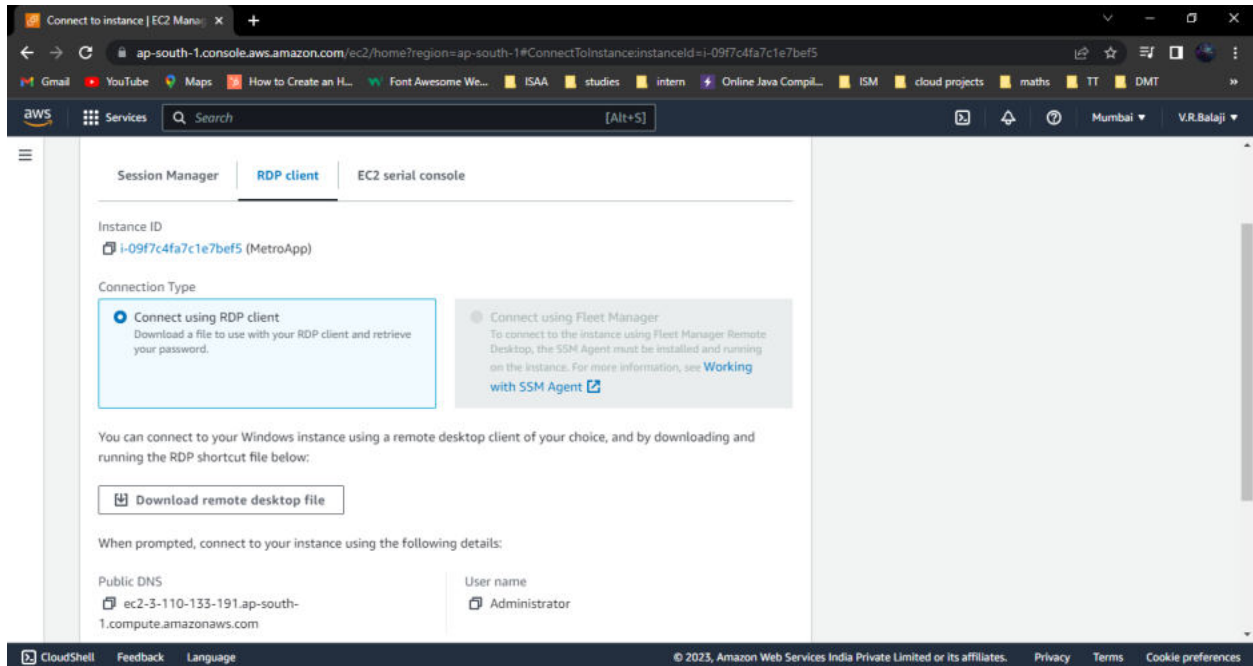
Setting Network firewall Security,



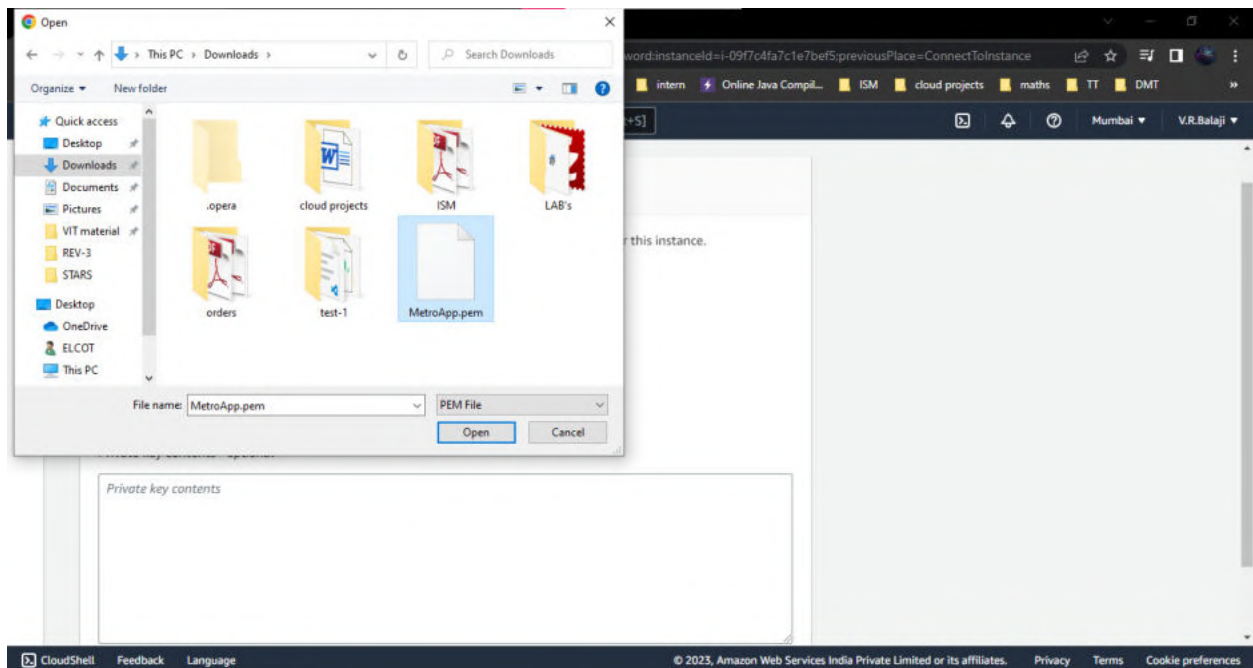
Instance created successfully,



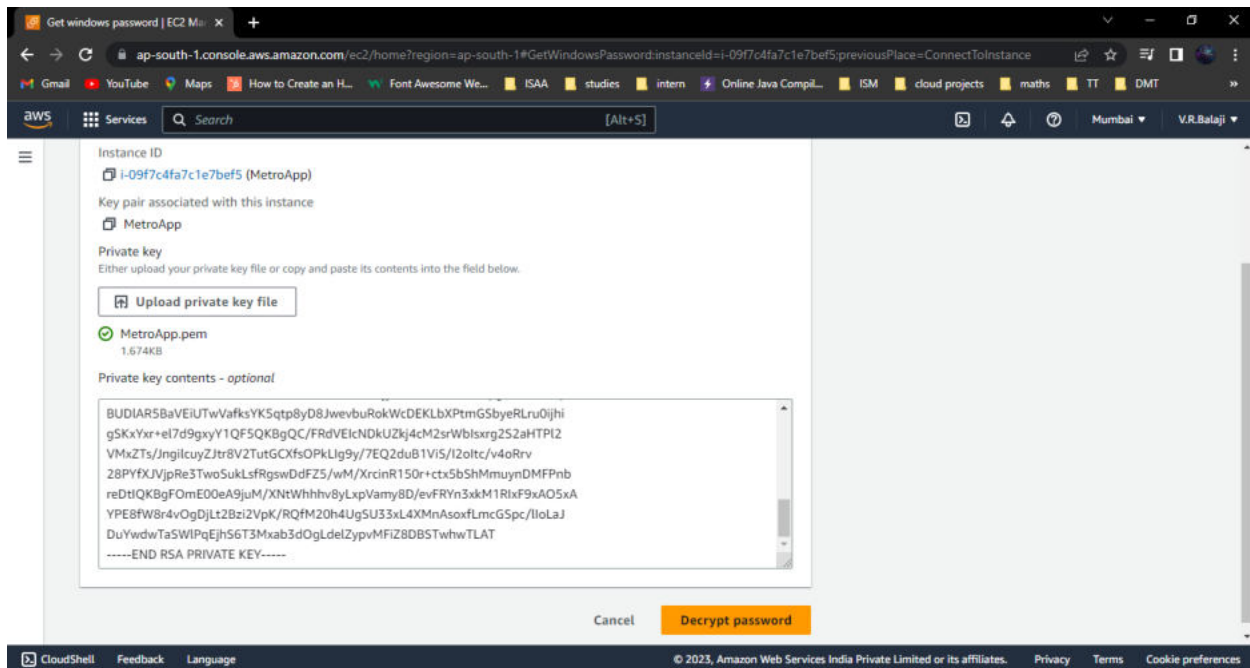
Getting password,



Selecting downloaded keypair value (MetroApp),

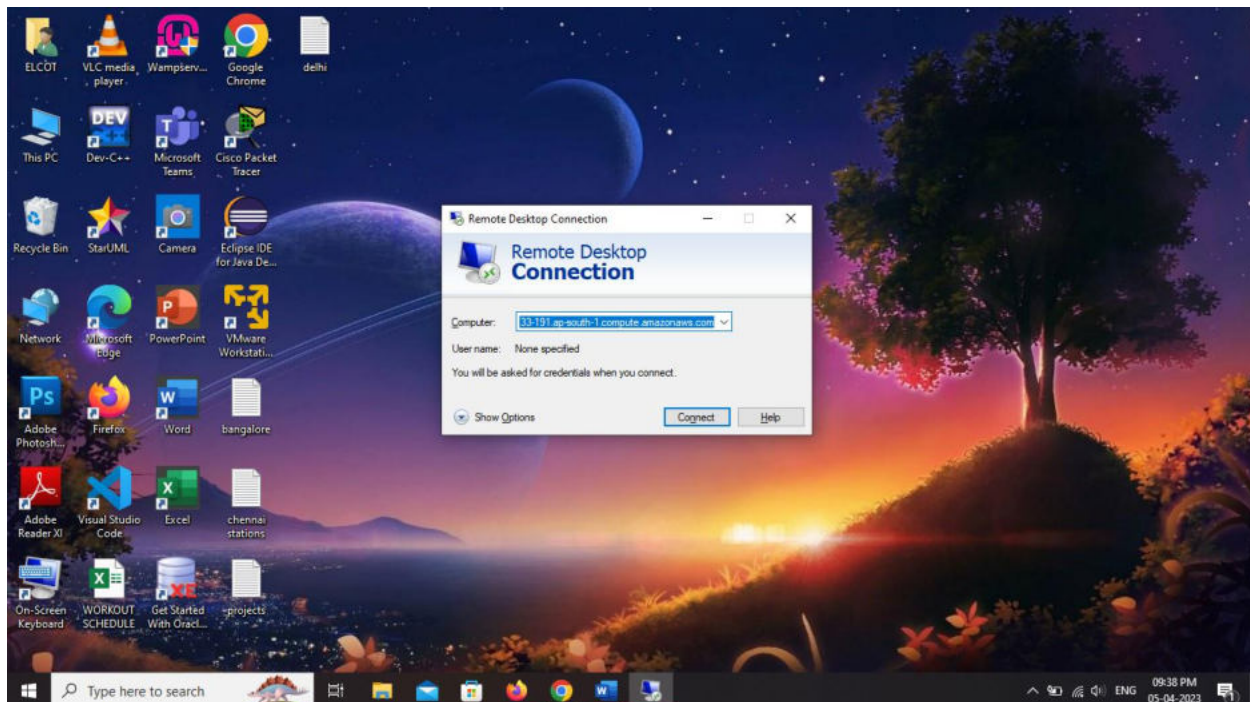


Decrypting password,

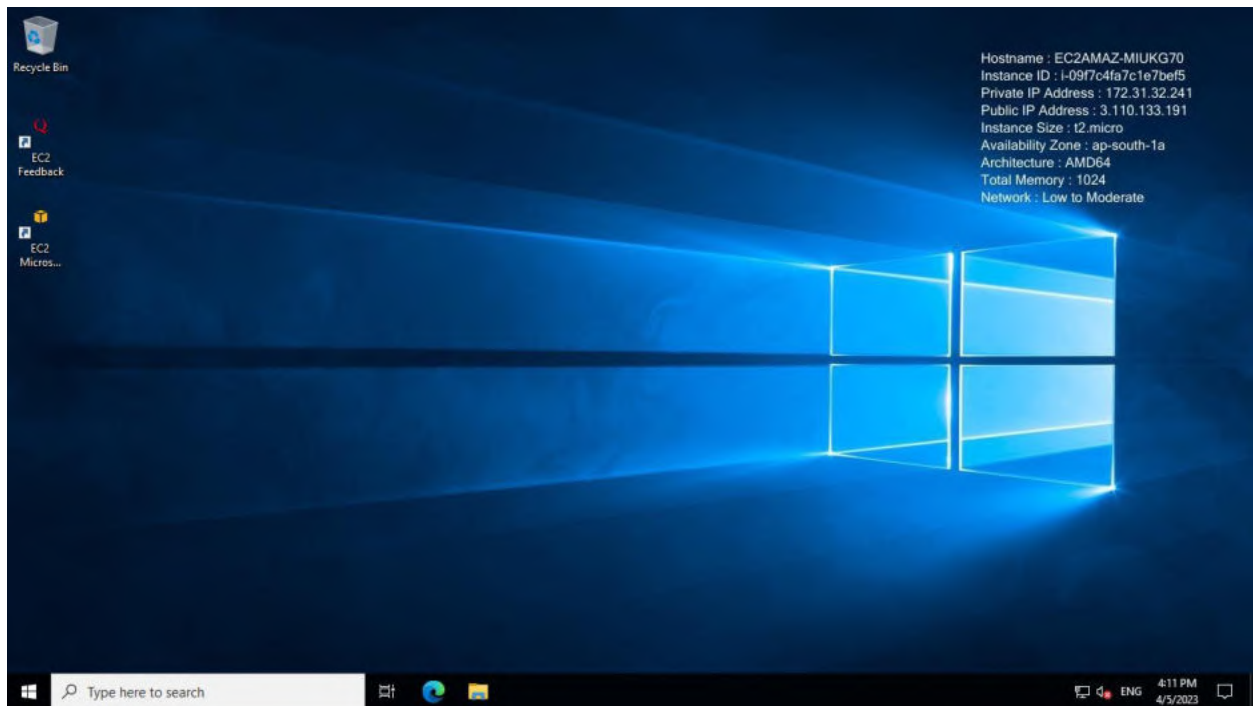


Connecting Remote VM

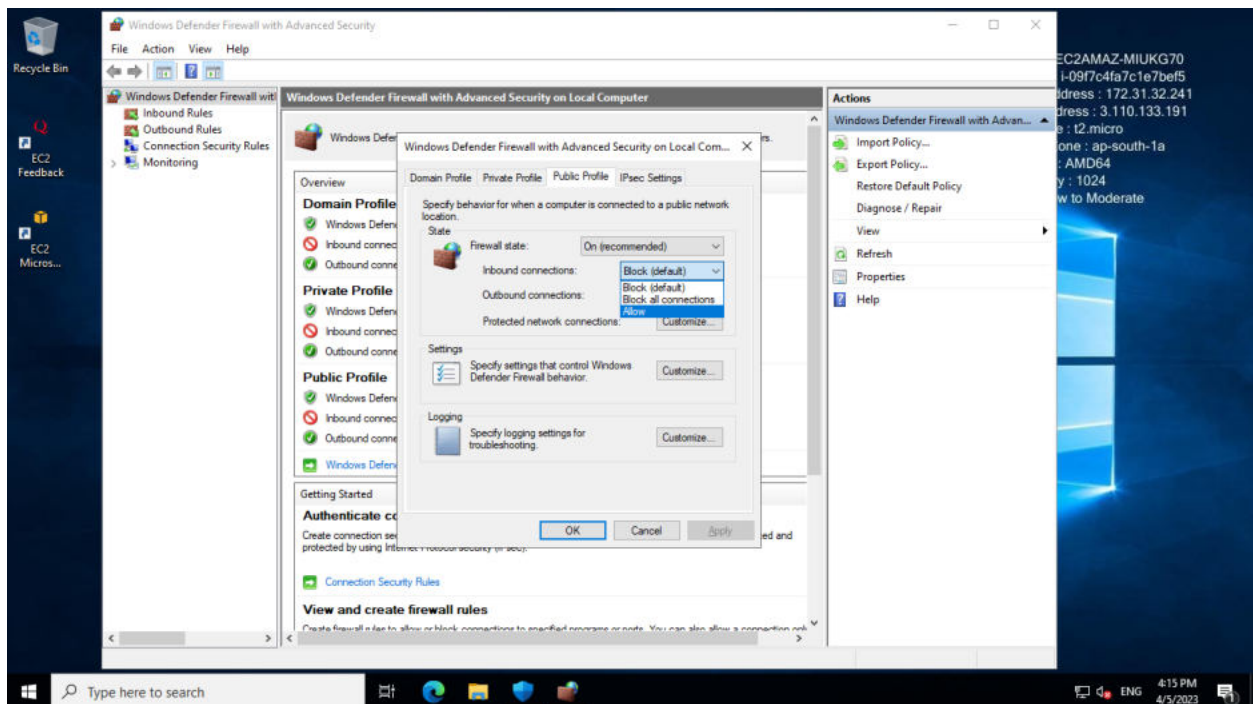
Connecting with public DNS,



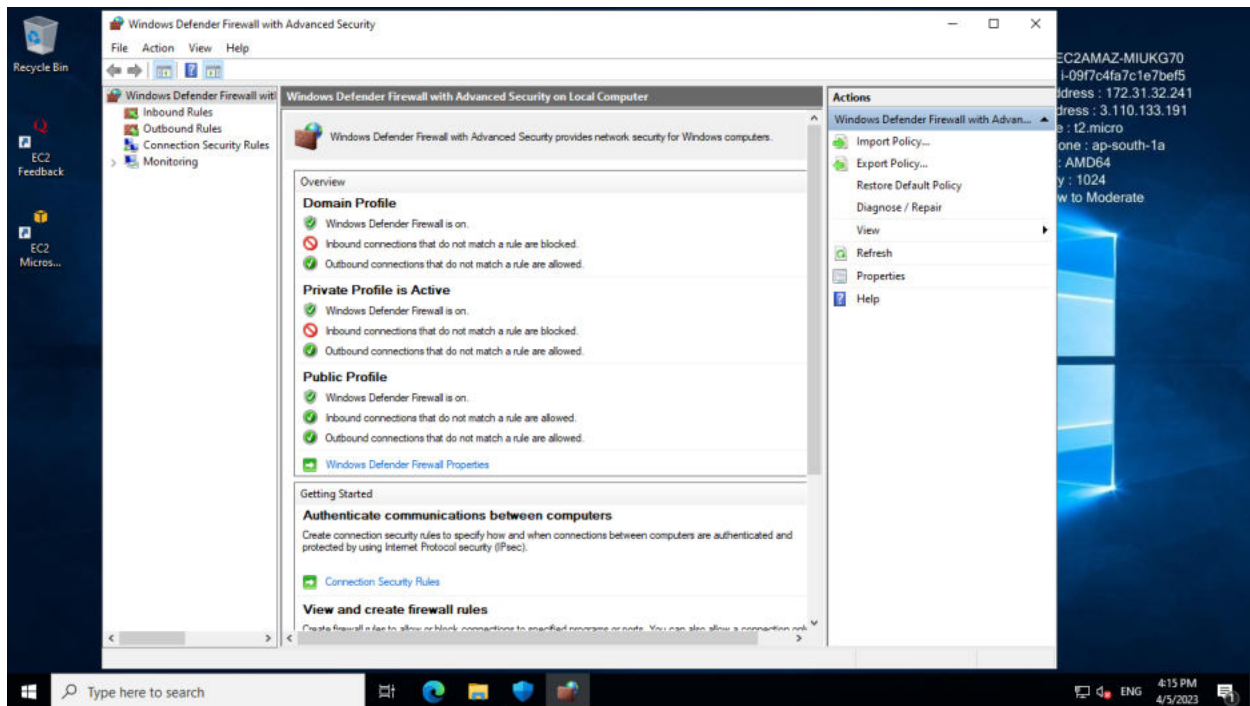
Connected to remote Desktop,



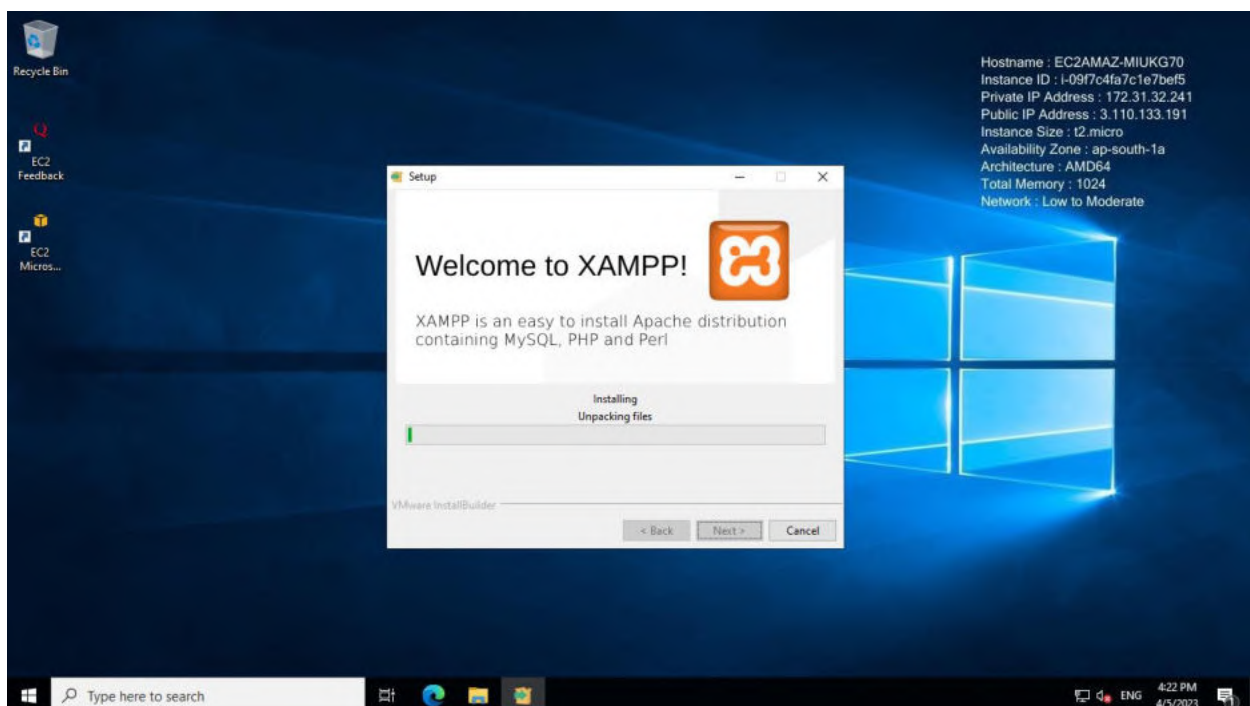
Allowing Inbound access,



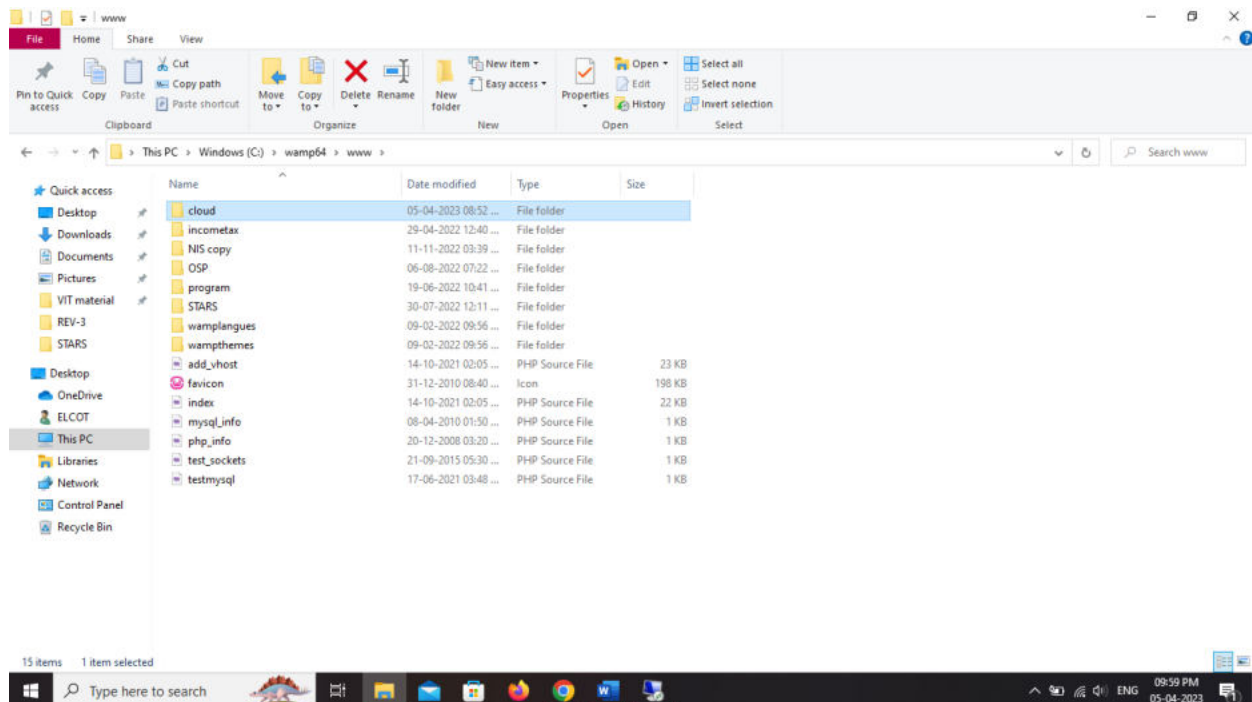
Inbound access allowed,



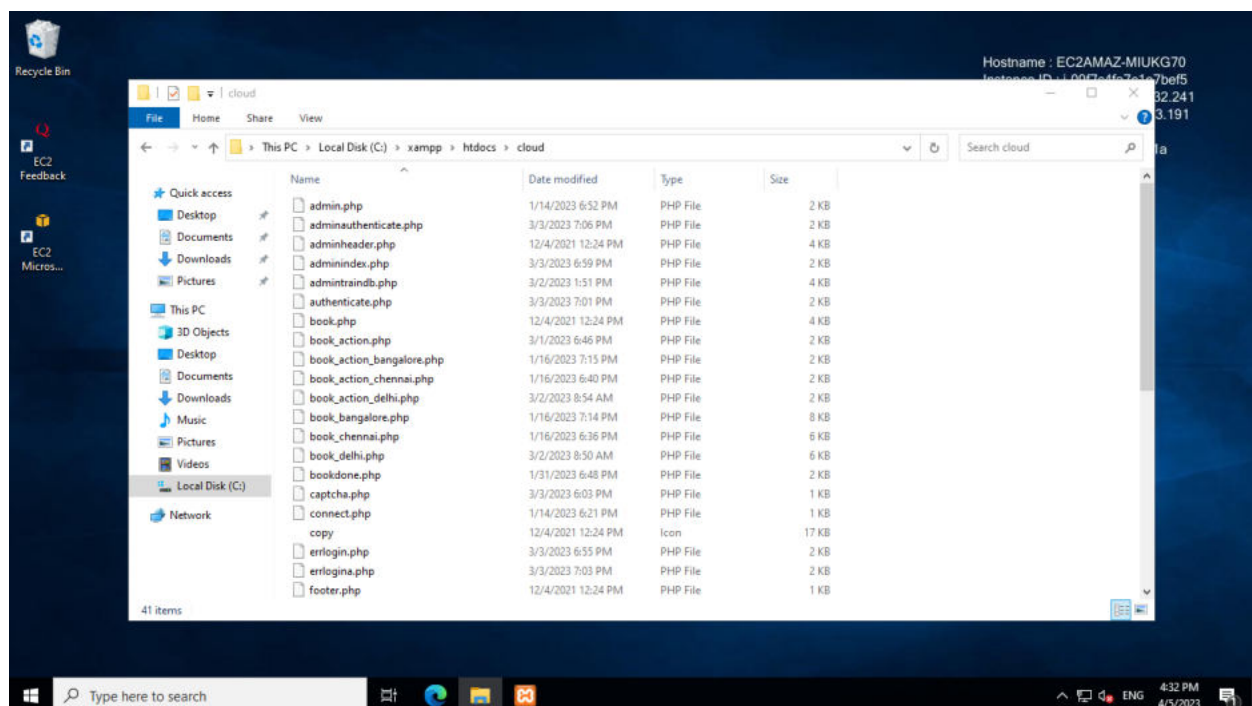
Installing Xampp server on remote VM,



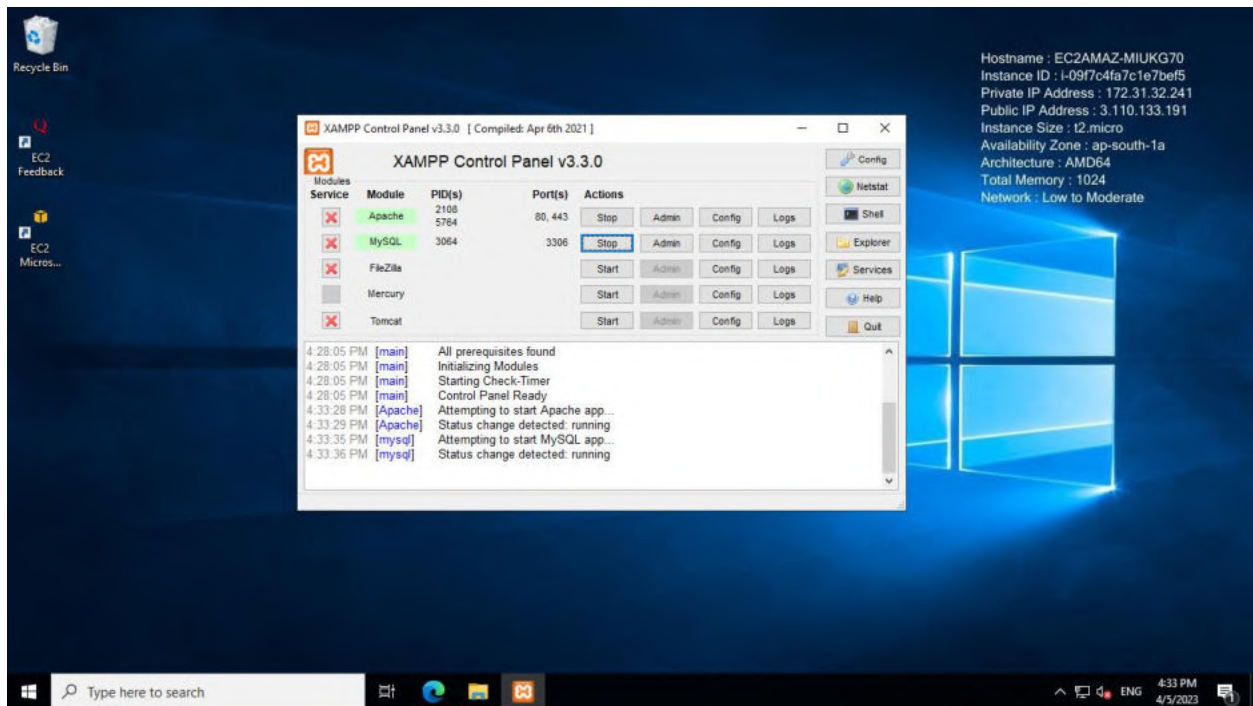
Copying web Application folder that created in host machine,



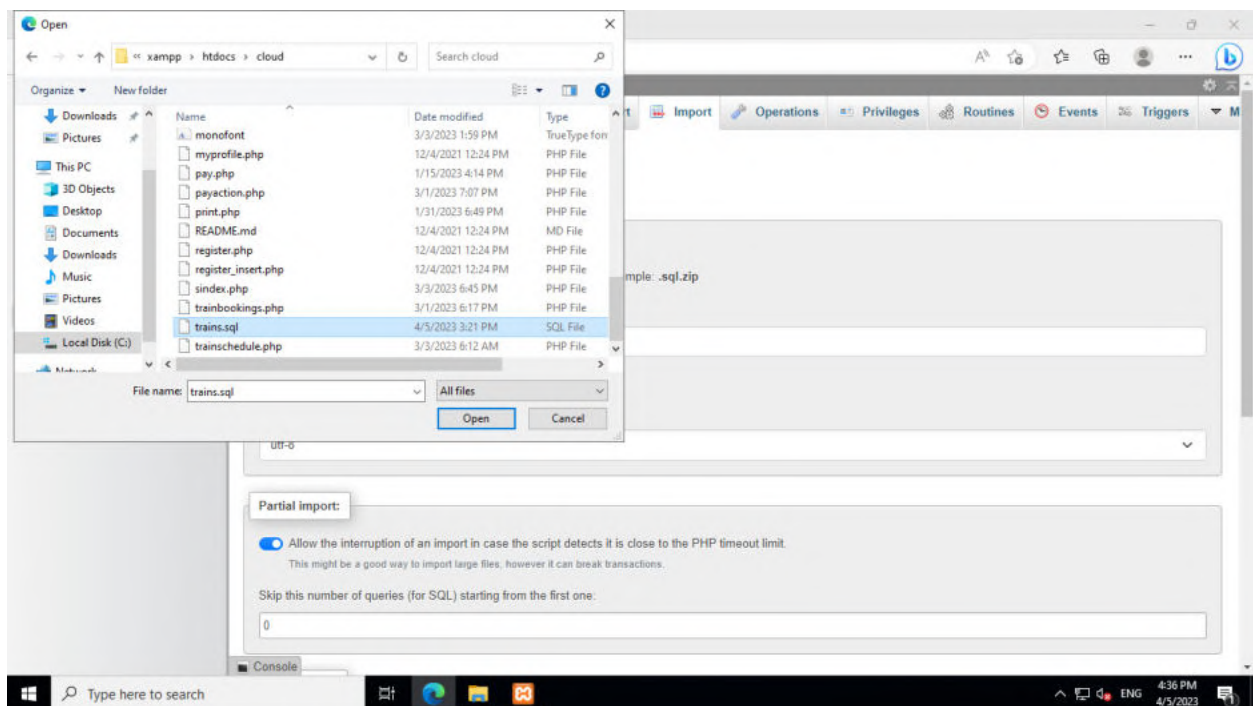
Pasted project folder to remote machine,



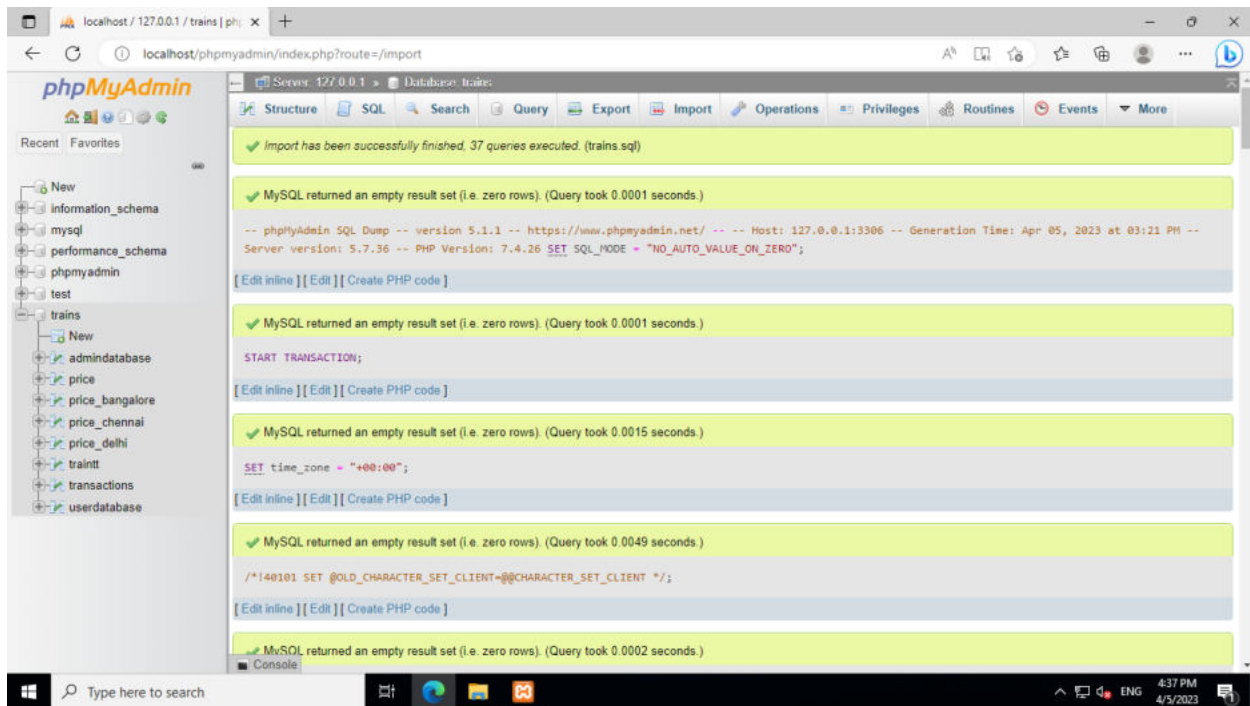
Starting Apache & Mysql Server,



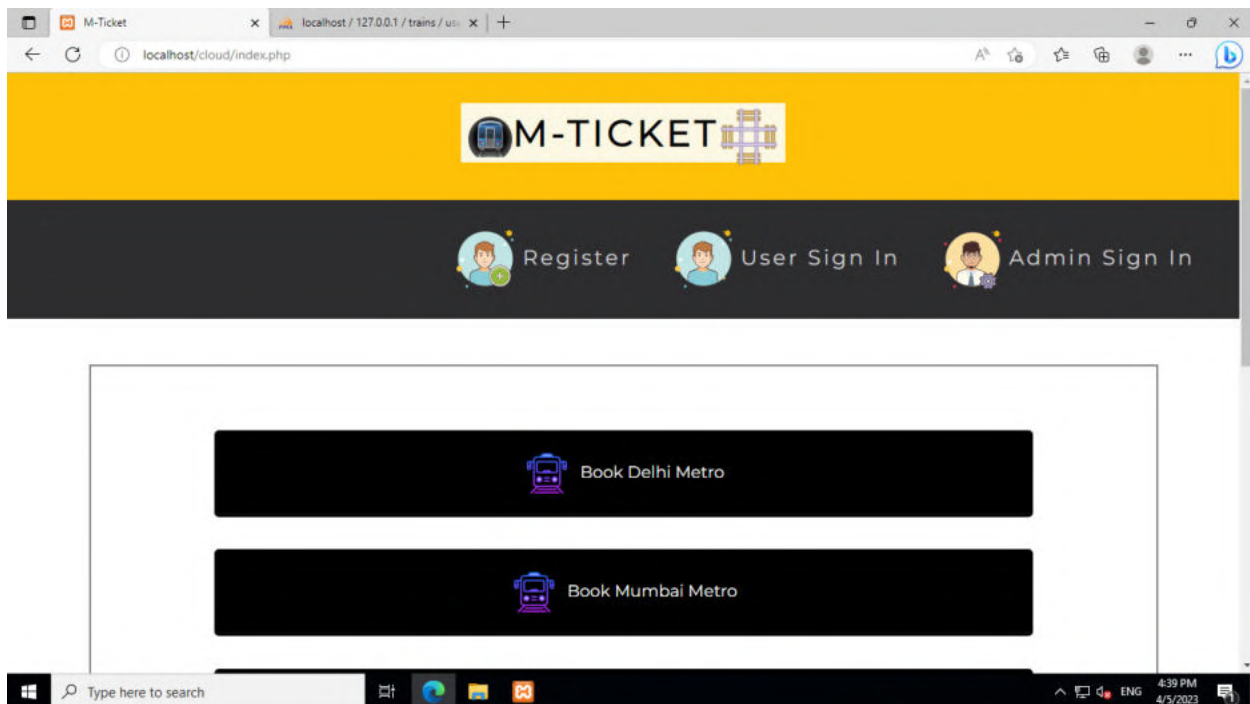
Importing database in remote VM,



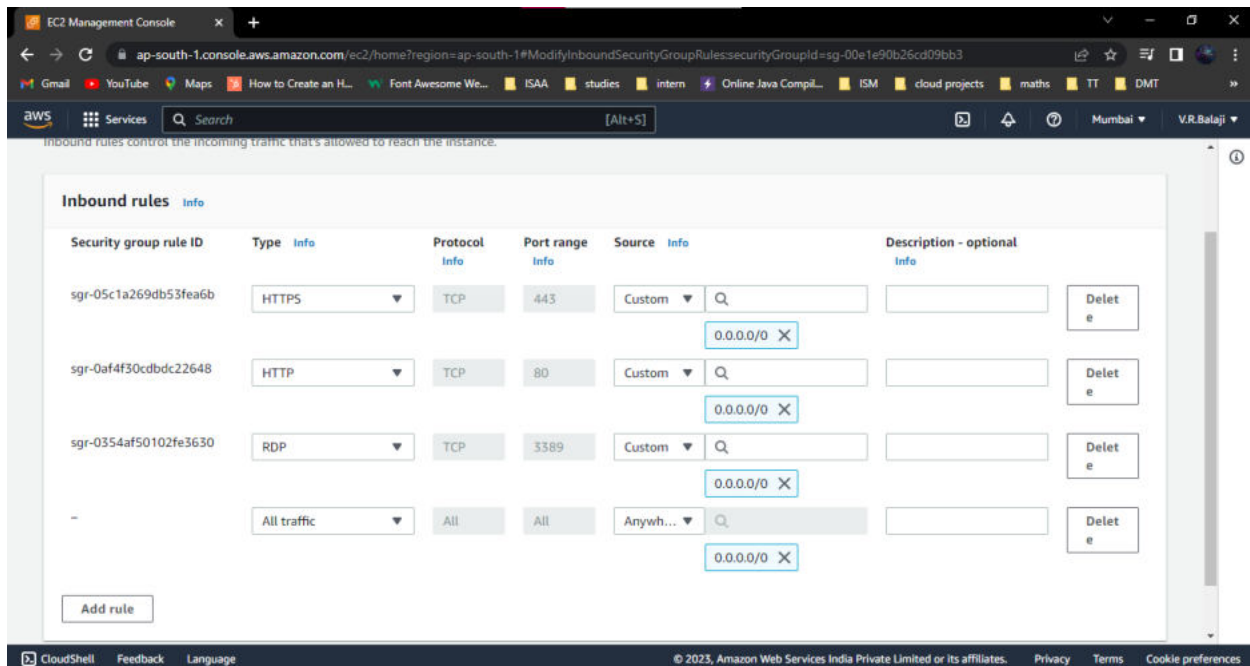
Imported successfully,



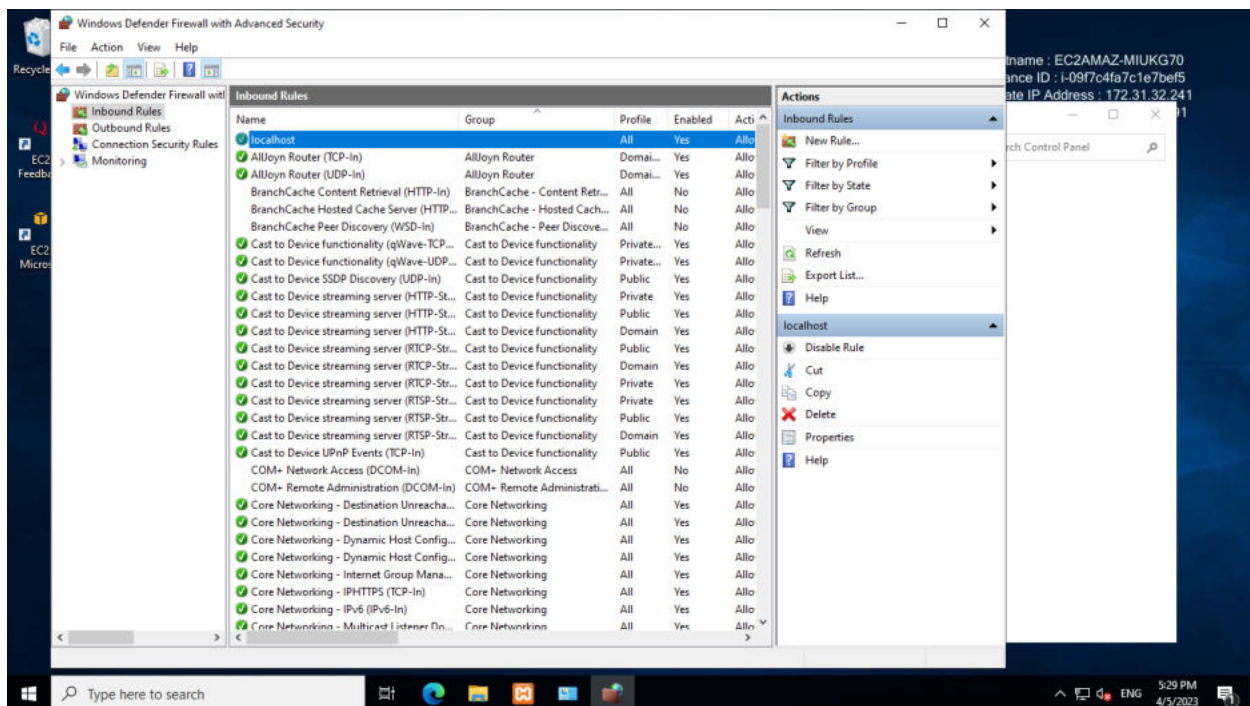
Hosted successfully in remote VM,



Add rule of allowing from anywhere & all traffic,

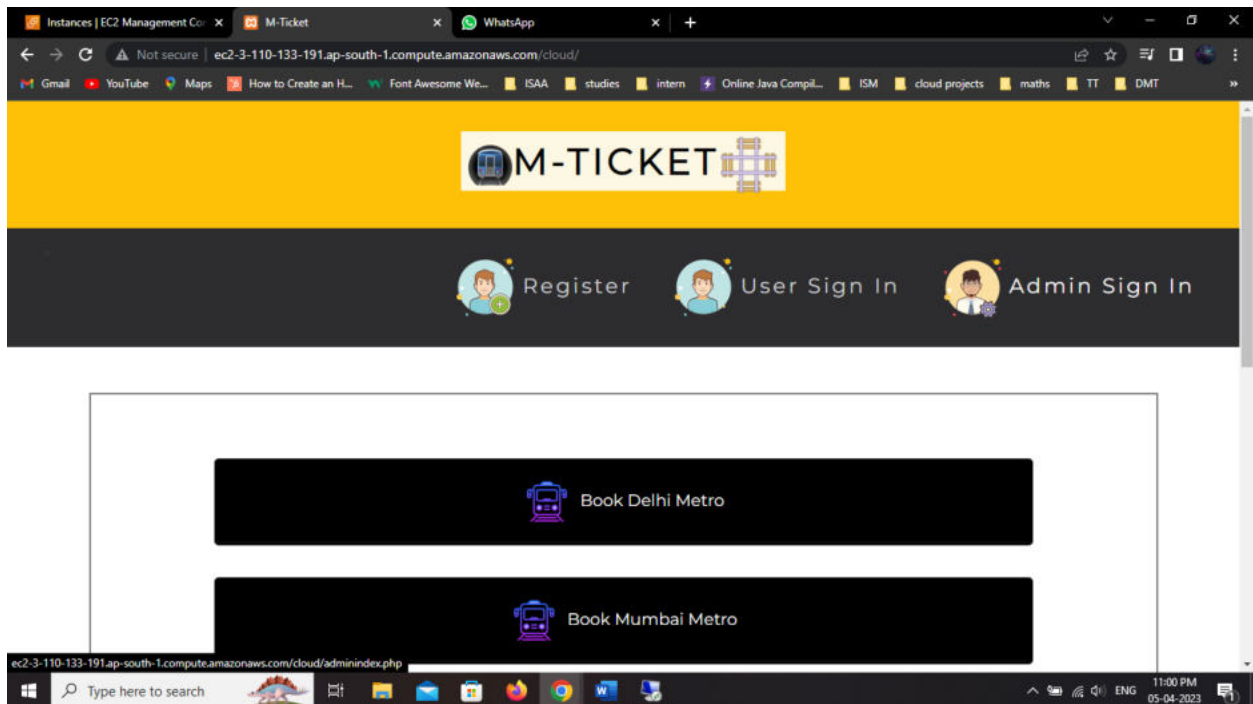


Setting new rule in remote VM,

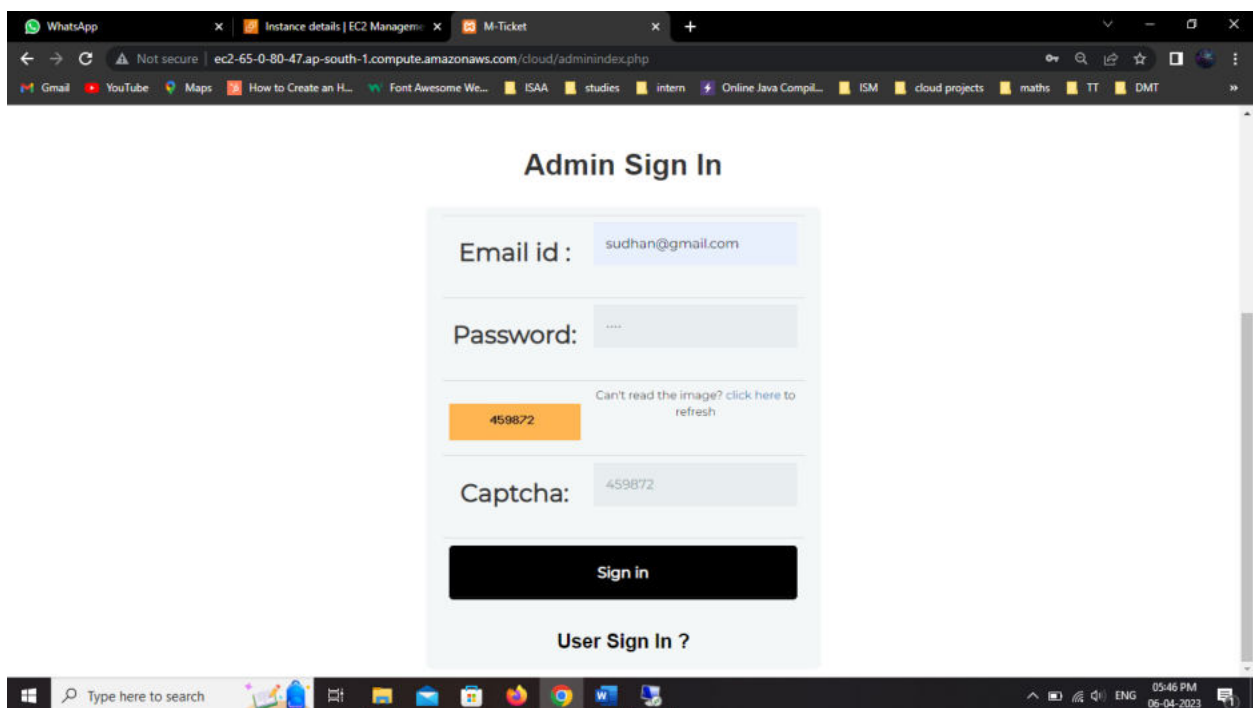


Accessing throw internet by public DNS

Accessing through our normal browser,



Login in as Admin,



Admin view of user data's,

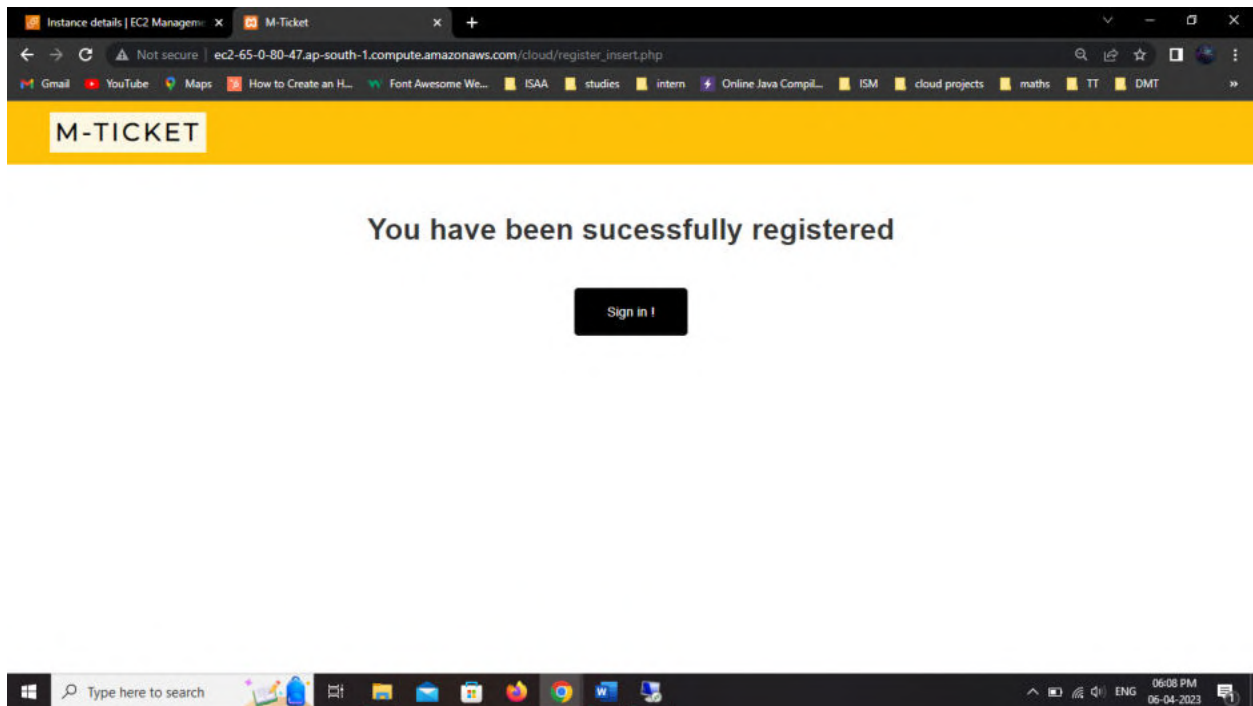
The screenshot shows a web browser window with the URL `ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/admintraindb.php`. The browser's address bar shows the URL and a search icon. The page title is "Admin : sudhan". The main content area is titled "TRAIN PASSENGERS DATABASE". Below the title, there is a "Show 10 entries" dropdown menu and a "Search:" input field. A table displays the train passengers data with the following columns: Date & Time, Booking ID, Name, Source, Destination, and Amount Paid. The table contains 8 rows of data.

Date & Time	Booking ID	Name	Source	Destination	Amount Paid
2023-01-08 02:34:04	1	sudhan	Panvel	Nerul	75
2023-01-08 04:54:46	2	sudhan	Panvel	Khandeshwar	50
2023-01-08 05:07:59	3	sudhan	Panvel	Khandeshwar	50
2023-01-08 18:56:52	4	kalamegam	Panvel	Seawood Darave	75
2023-01-09 23:34:48	5	kalamegam	Panvel	Kharghar	50
2023-01-09 23:39:47	6	kalamegam	Panvel	Thane	155
2023-01-09 23:44:10	7	kalamegam	Panvel	Manasarovar	50
2023-04-09 23:01:14	8	kalamegam	Panvel	Nerul	75

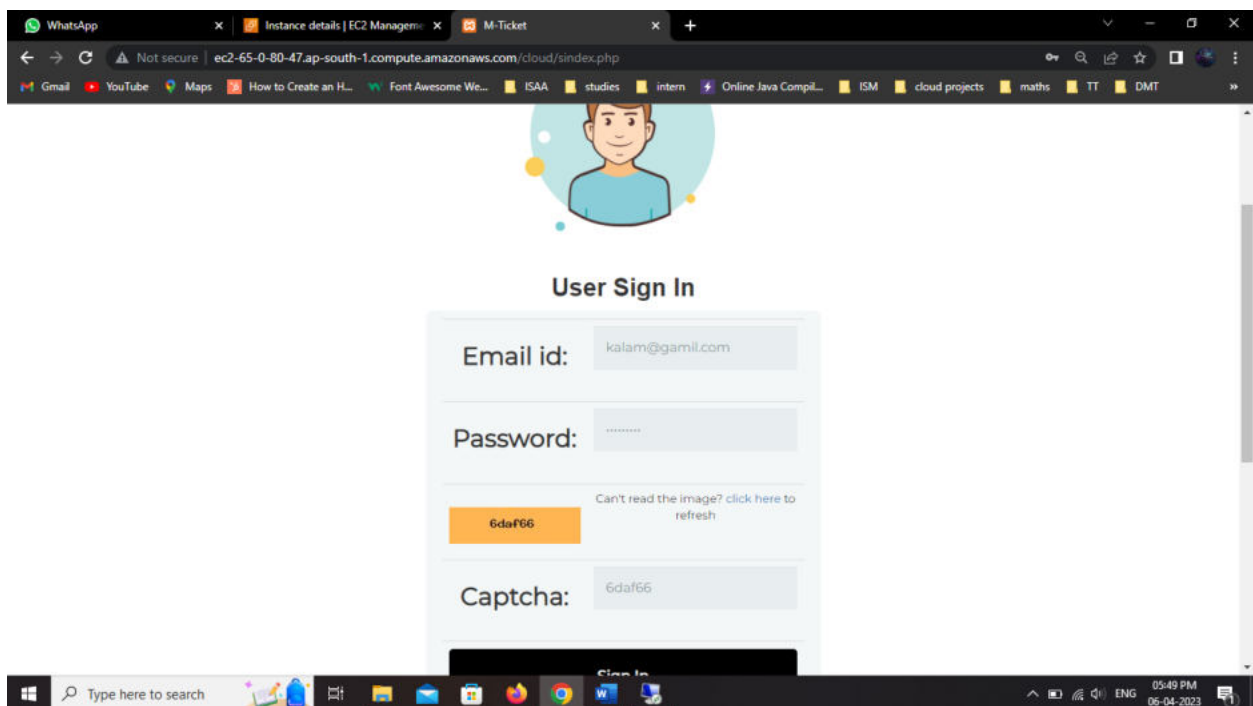
New User registration,

The screenshot shows a web browser window with the URL `ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/register.php`. The browser's address bar shows the URL and a search icon. The page title is "User Registration". Below the title, there is a registration form with the following fields: Name (filled with "kalamegam"), Email Id (filled with "kalam@gamil.com"), Gender (radio buttons for Male and Female, with Male selected), and Date of Birth (filled with "2022-03-03").

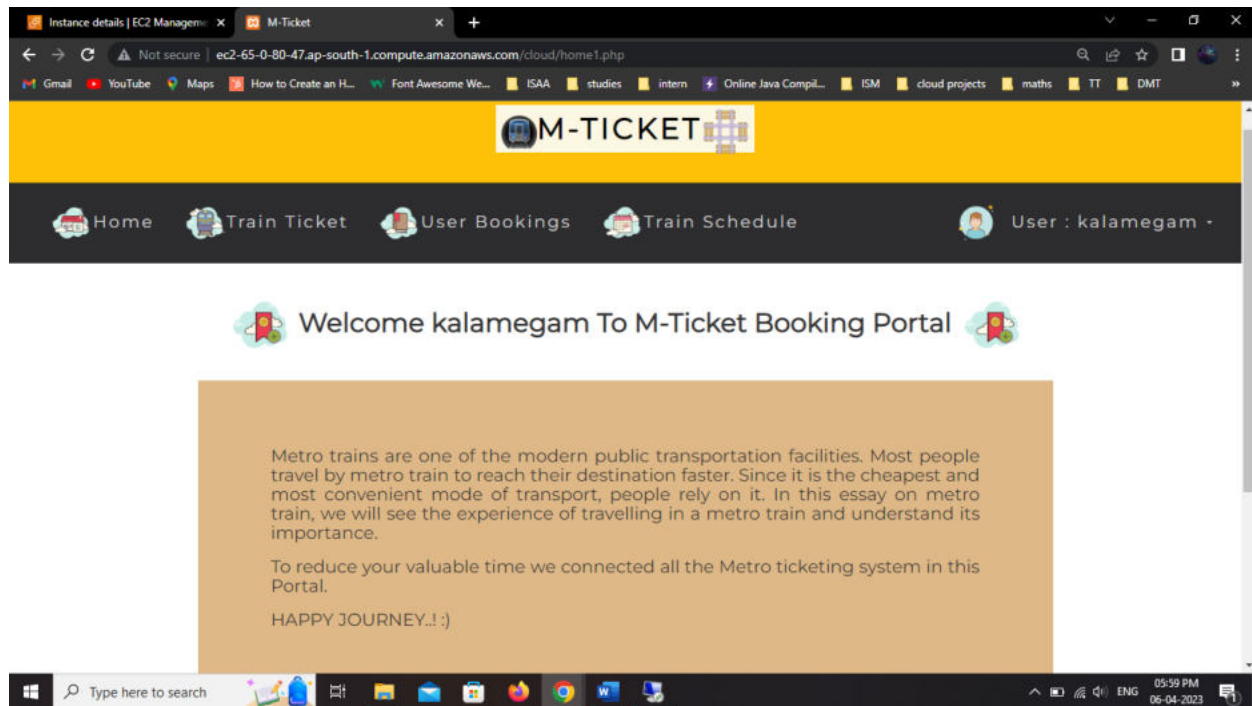
Account created successfully,



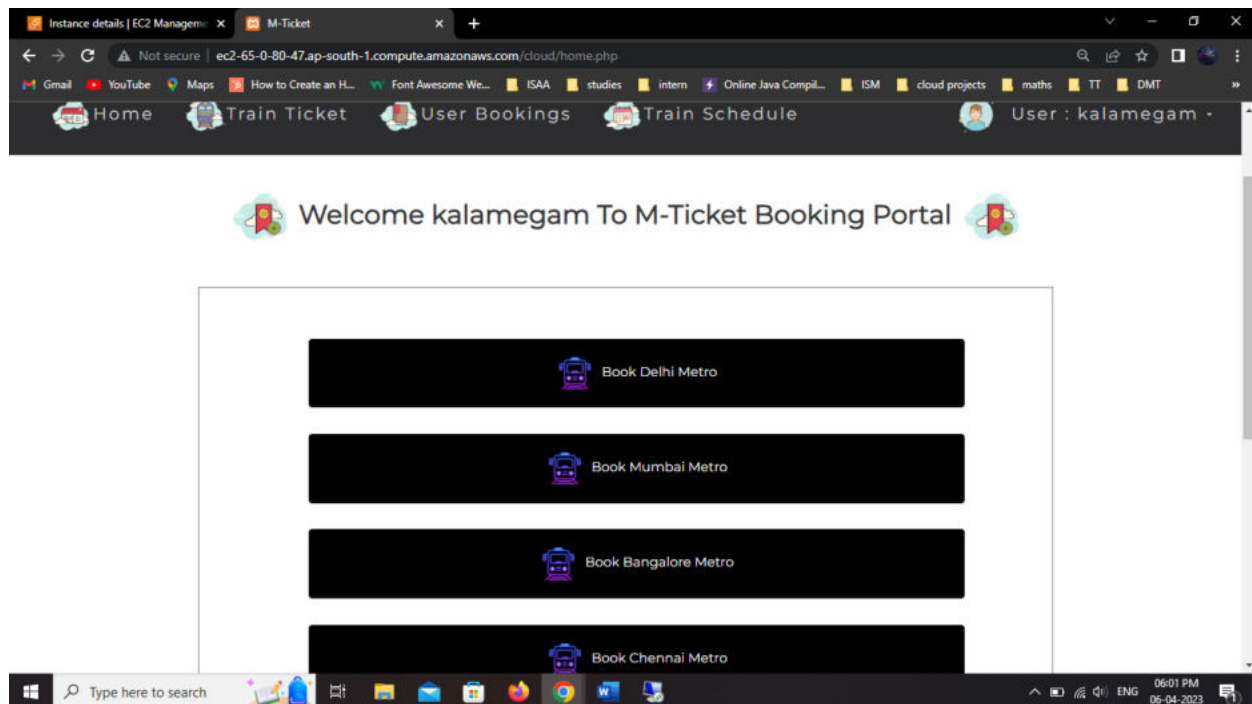
Login as normal user,



Logged in successfully as a user,



Select location to book Metro ticket,



Selecting journey details,

Instance details | EC2 Managem... x M-Ticket x +

Not secure | ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/book_chennai.php

Gmail YouTube Maps How to Create an HL... Font Awesome We... ISAA studies intern Online Java Compil... ISM cloud projects maths TT DMT

Home Train Ticket User Bookings Train Schedule

User : kalamegam

Welcome To Chennai Metro

SOURCE STATION : AG-DMS

FINAL DESTINATION : Kaladipet Metro

JOURNEY TYPE : Single

NO OF PASSENGERS : 3

Proceed

Type here to search

05:55 PM 06-04-2023

Instance details | EC2 Managem... x M-Ticket x +

Not secure | ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/book_action_chennai.php

Gmail YouTube Maps How to Create an HL... Font Awesome We... ISAA studies intern Online Java Compil... ISM cloud projects maths TT DMT

Home Train Ticket User Bookings Train Schedule

User : kalamegam

SELECT ROUTE AND PROCEED TO CHECKOUT :

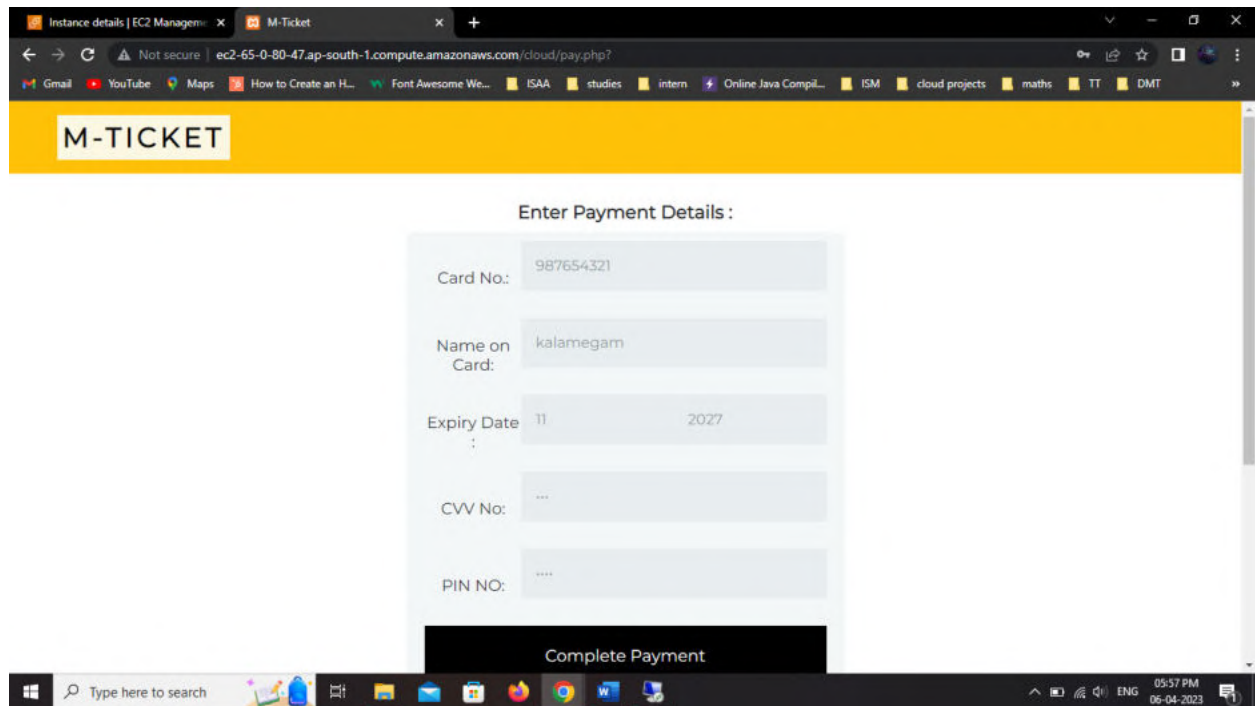
Total Single Journey type fare from AG-DMS to Kaladipet Metro is : ₹ 120 and route via AG-DMS Kaladipet Metro

Checkout

Type here to search

05:55 PM 06-04-2023

Checkout for payment process,

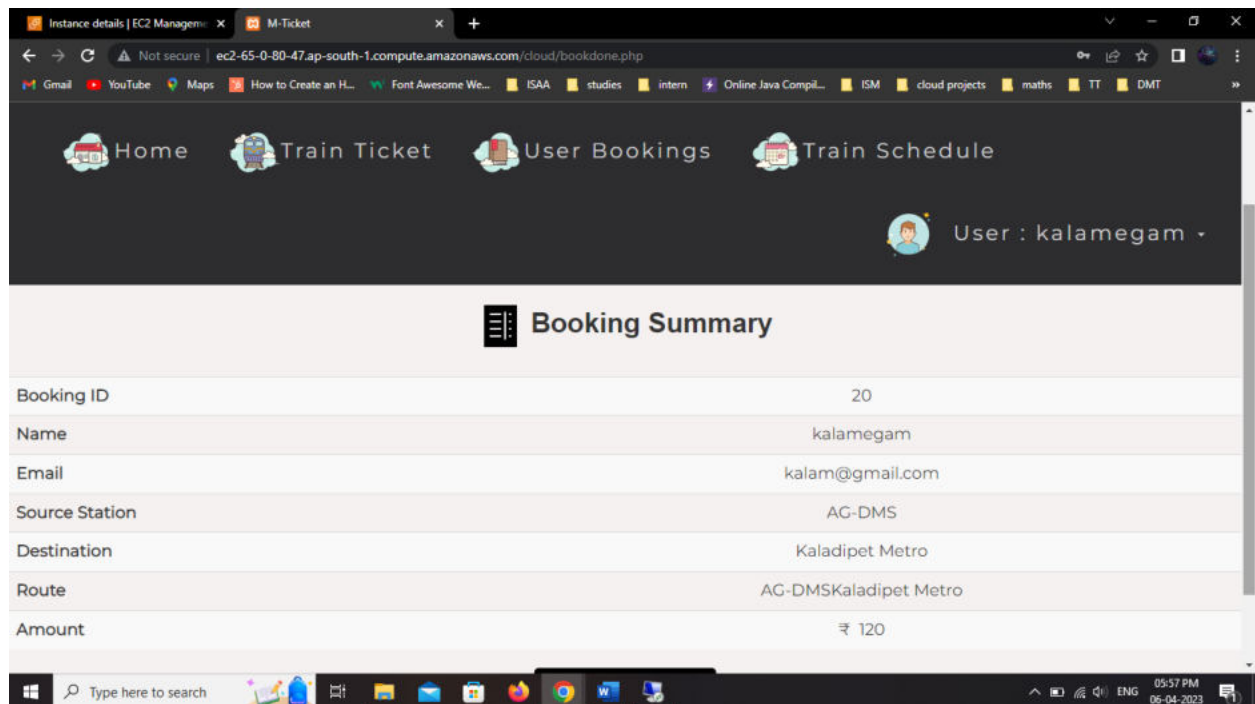


The screenshot shows a web browser window with the URL `ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/pay.php?`. The page has a yellow header with the text "M-TICKET". Below the header, there is a form titled "Enter Payment Details :". The form contains the following fields:

- Card No.: 987654321
- Name on Card: kalamegam
- Expiry Date: 11 / 2027
- CVV No.: ***
- PIN NO.: ****

At the bottom of the form is a black button labeled "Complete Payment". The browser's taskbar at the bottom shows the Windows logo, a search bar, and various application icons. The system tray on the right indicates the time is 05:57 PM on 06-04-2023.

Booking confirmed,



The screenshot shows a web browser window with the URL `ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/bookdone.php`. The page has a dark header with navigation links: Home, Train Ticket, User Bookings, and Train Schedule. A user profile icon and the text "User : kalamegam" are visible on the right. Below the header, there is a section titled "Booking Summary" with a table containing the following information:

Booking ID	20
Name	kalamegam
Email	kalam@gmail.com
Source Station	AG-DMS
Destination	Kaladipet Metro
Route	AG-DMSKaladipet Metro
Amount	₹ 120

The browser's taskbar at the bottom shows the Windows logo, a search bar, and various application icons. The system tray on the right indicates the time is 05:57 PM on 06-04-2023.

Viewing the ticket in transaction history,

Instance details | EC2 Managem... x M-Ticket x +

Not secure | ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/trainbookings.php

Home Train Ticket User Bookings Train Schedule

User : kalamegam

USER'S TRAIN BOOKINGS

Show 10 entries Search:

Date & Time	Booking ID	Name	Source	Destination	Class	Type	Amount Paid	Download
2023-01-13 08:10:25	20	kalamegam	Panvel	Khandeshwar	First	Single	₹ 50	Click Here
2023-01-12 08:07:27	19	kalamegam	Panvel	Manasarovar	First	Single	₹ 50	Click Here
2023-01-12 08:02:30	18	kalamegam	Panvel	Khandeshwar	First	Single	₹ 50	Click Here
2023-01-12 08:01:06	17	kalamegam	Panvel	Khandeshwar	First	Single	₹ 50	Click Here
2023-01-12 07:20:19	16	kalamegam	Panvel	Manasarovar	First	Single	₹ 50	Click Here
2023-01-11 03:31:56	15	kalamegam	Panvel	Airoli	First	Single	₹ 140	Click Here
2023-04-09 23:01:14	8	kalamegam	Panvel	Nerul	First	Single	₹ 75	Click Here

Train Schedule for Mumbai,

Instance details | EC2 Managem... x M-Ticket x +

Not secure | ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/trainschedule.php

PANVEL TO THANE TRAIN SCHEDULE

Show 10 entries Search:

Panvel	Khandeshwar	Manasarovar	Kharghar	Belapur CBD	Seawood Darave	Nerul	Juinagar	Turbhe	Koparkhairne	Ghansoli	Rabale	Airoli	Thane
04:33	04:38	04:41	04:44	04:48	04:52	04:56	05:00	05:04	05:08	05:11	05:14	05:17	05:25
04:53	04:58	05:01	05:04	05:08	05:12	05:16	05:20	05:24	05:28	05:31	05:34	05:37	05:45
05:21	05:26	05:29	05:32	05:36	05:40	05:44	05:48	05:52	05:56	05:59	06:02	06:05	06:13
05:44	05:49	05:52	05:55	05:59	06:03	06:07	06:11	06:15	06:19	06:22	06:25	06:28	06:36
06:17	06:22	06:25	06:28	06:32	06:36	06:40	06:44	06:48	06:52	06:55	06:58	07:01	07:09
06:37	06:42	06:45	06:48	06:52	06:56	07:00	07:04	07:08	07:12	07:15	07:18	07:21	07:29
07:01	07:06	07:09	07:12	07:16	07:20	07:24	07:28	07:32	07:36	07:39	07:42	07:45	07:53
07:19	07:24	07:27	07:30	07:34	07:38	07:42	07:46	07:50	07:55	07:58	08:01	08:04	08:12
07:43	07:48	07:51	07:54	07:58	08:02	08:06	08:11	08:15	08:19	08:22	08:22	08:28	08:36
08:04	08:09	08:12	08:15	08:19	08:23	08:27	08:31	08:35	08:39	08:42	08:45	08:48	08:56

Showing 1 to 10 of 34 entries

Previous 1 2 3 4 Next

User Profile,

The screenshot shows a web browser window with the URL `ec2-65-0-80-47.ap-south-1.compute.amazonaws.com/cloud/myprofile.php`. The page has a dark header with navigation links: Home, Train Ticket, User Bookings, and Train Schedule. A user profile icon and the text "User : kalamegam" are on the right. Below the header, the title "USER PROFILE DETAILS" is centered. A table displays the user's information:

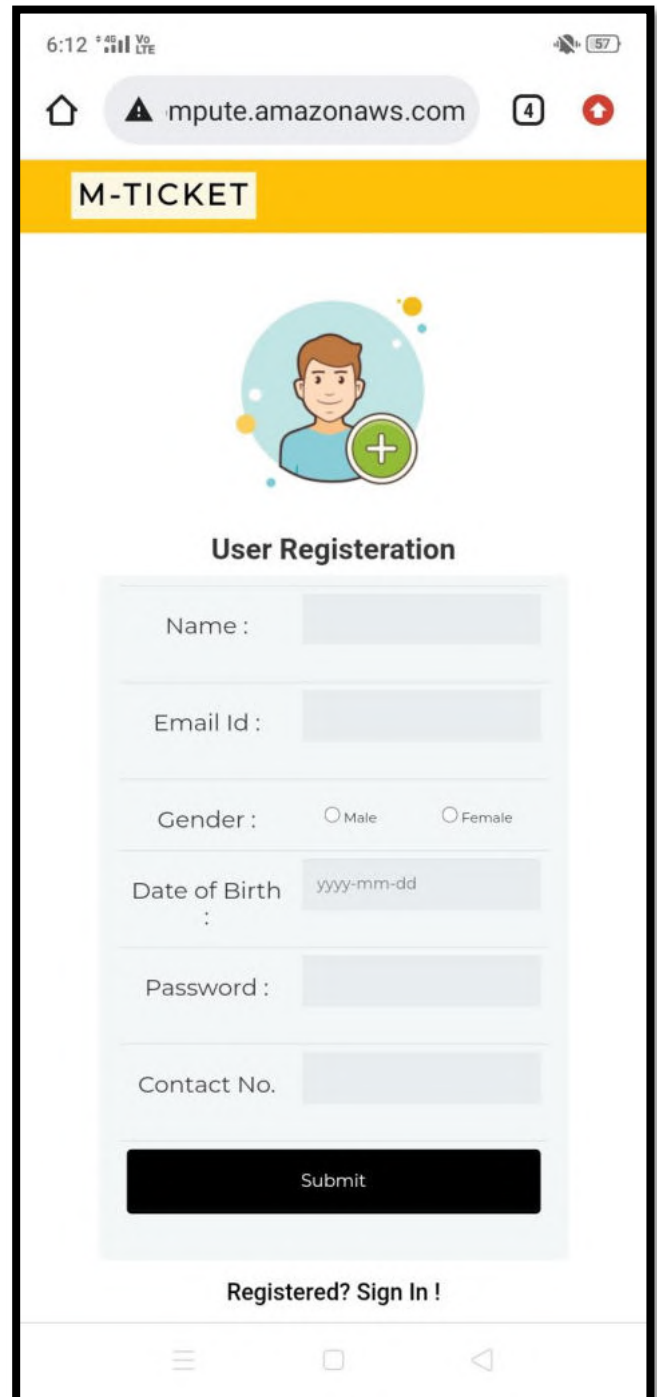
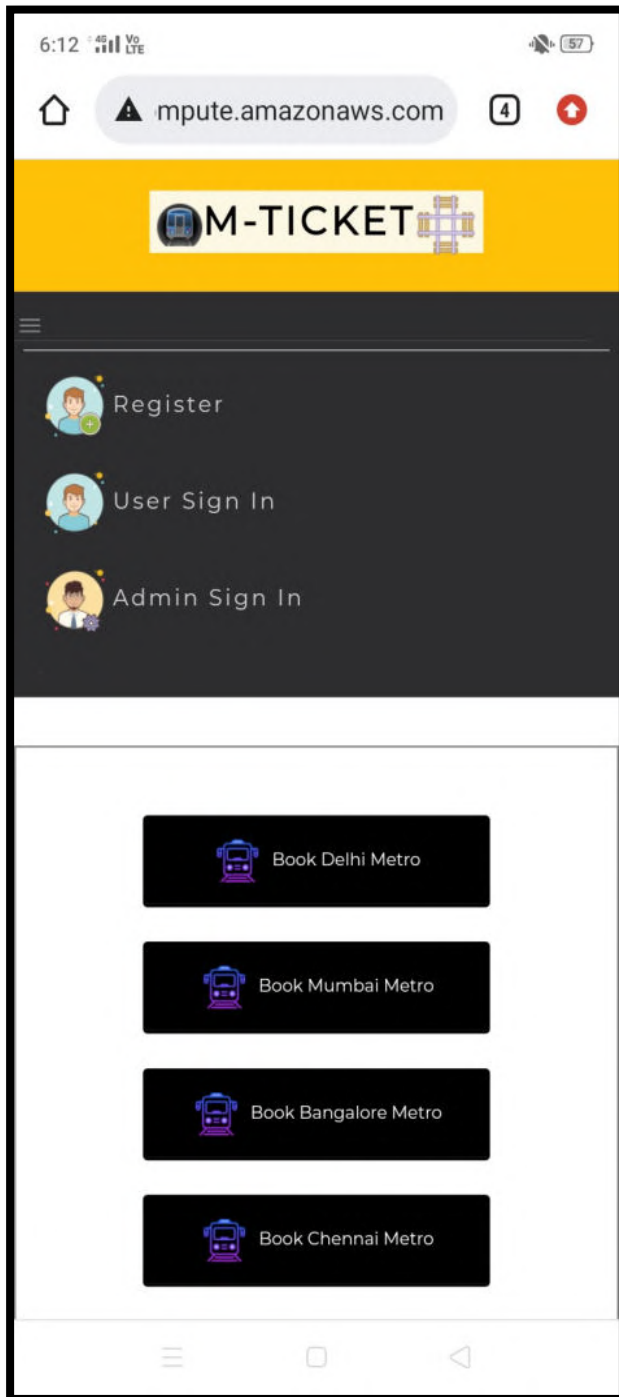
Name	kalamegam
Email	kalam@gmail.com
User Id	23
Gender	M
Date of Birth	2002-03-03
Contact Number	8898999998

The Windows taskbar at the bottom shows the time as 06:04 PM on 06-04-2023.

Logged out successfully,

The screenshot shows the M-Ticket login page. A yellow banner at the top contains the text "M-TICKET". Below it, the message "Thank You for using M-Ticket Booking Application" is displayed. A black button with the text "Sign in ! Again" is centered on the page. The Windows taskbar at the bottom shows the time as 06:05 PM on 06-04-2023.


Accessing throw mobile by public DNS



6:13 4G Vo LTE 56

mpute.amazonaws.com 4

M-TICKET



User Sign In

Email id: sudhan@gmail.com

Password:

Can't read the image? click here to refresh

80295e

Captcha: 80295e

Sign In

Register

Admin Sign In ?

6:14 4G Vo LTE 56

- Please Select -

Baiyappanahalli

Swami Vivekananda Road

Indiranagar

Halasuru

Trinity

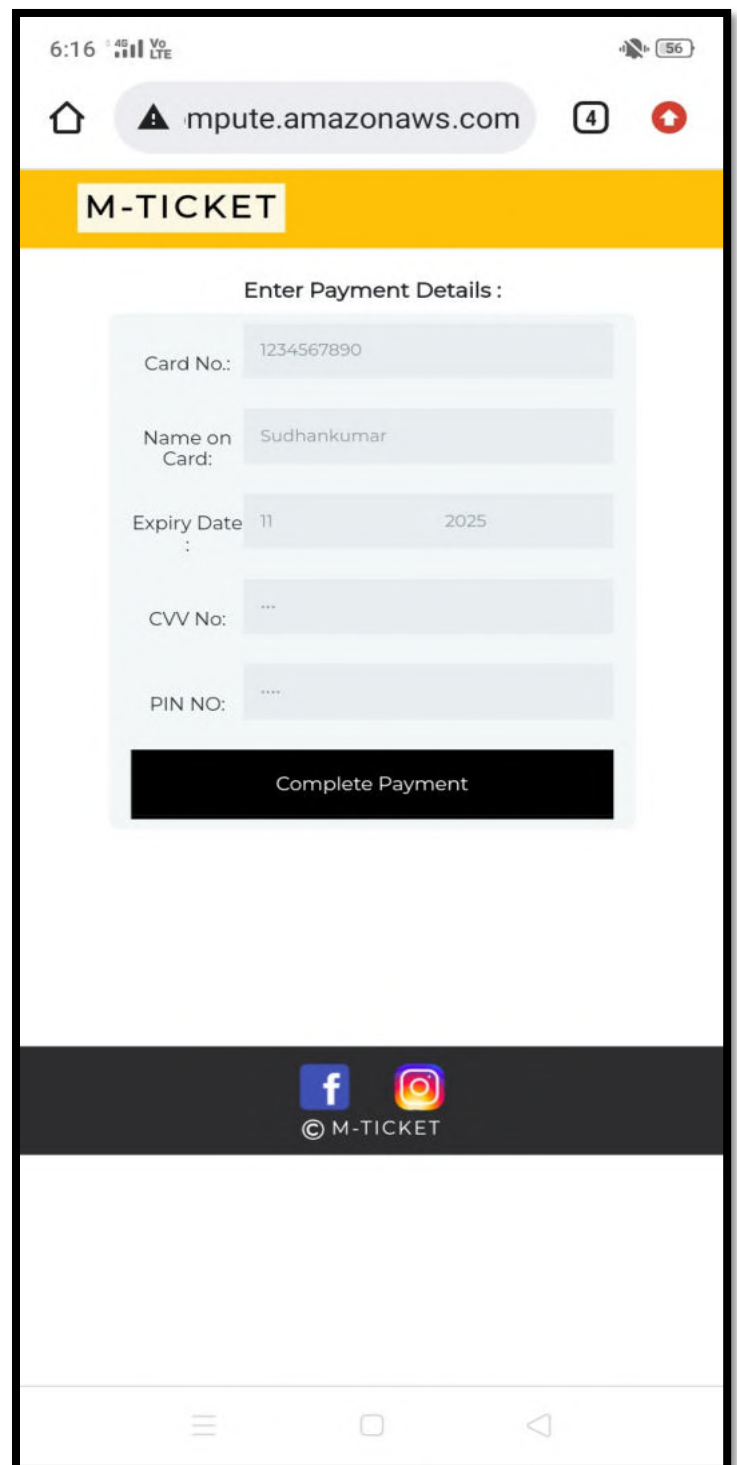
Mahathma Gandhi Road

Cubbon Park

Dr. B. R. Ambedkar Stn.,
Vidhana Soudha

Sir M Visveswaraya Station,
Central College

Nadaprabhu Kempegowda
Station, Majestic



6:16
4G Vo LTE
56

mpute.amazonaws.com
4

Booking Summary

Booking ID	21
Name	sudhan
Email	sudhan@gmail.com
Source Station	Baiyappanahalli
Destination	Nadaprabhu Kempegowda Station, Majestic
Route	BaiyappanahalliNadaprabhu Kempegowda Station, Majestic
Amount	₹ 36

Print Ticket

6:17
4G Vo LTE
56

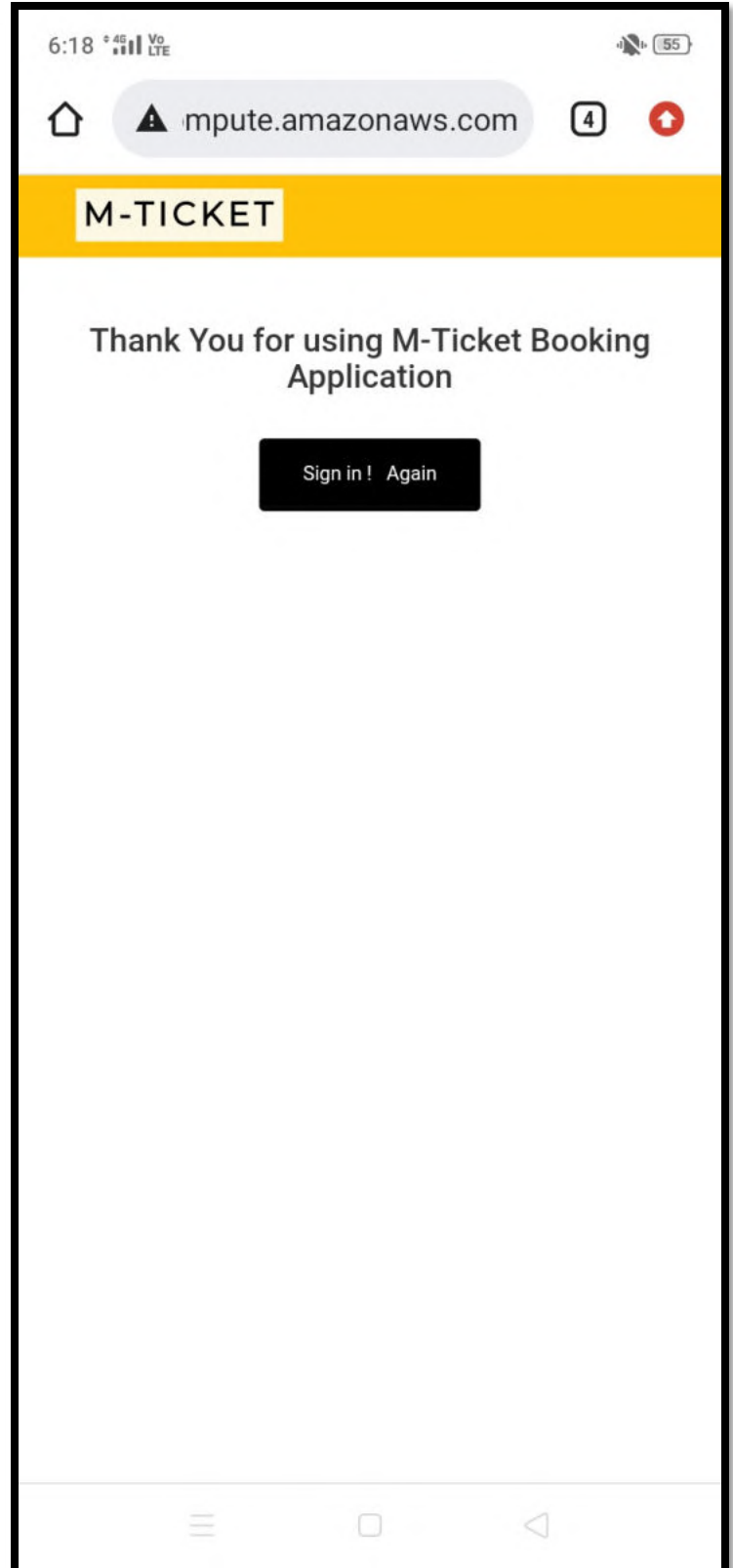
mpute.amazonaws.com
4

USER'S TRAIN BOOKINGS

Show 10 entries
Search:

Date & Time	Booking ID	Name	Source	Destination	Class	Type	Amount Paid	Download
2023-02-20 02:34:04	21	sudhan	Baiyappanahalli	Sandal Soap Factory		Single	₹ 54	Click Here
2023-01-11 02:08:03	14	sudhan	Panvel	Seawood Darave	First	Return	₹ 150	Click Here
2023-01-10 23:55:04	13	sudhan	Panvel	Manasarovar	First	Return	₹ 100	Click Here
2023-01-10 23:53:54	12	sudhan	Panvel	Khandeshwar	First	Return	₹ 100	Click Here
2023-01-10 23:50:28	11	sudhan	Panvel	Khandeshwar	First	Return	₹ 100	Click Here
2023-04-10 23:49:50	10	sudhan	Panvel	Airoli	First	Single	₹ 140	Click Here
2023-01-10 23:49:20	9	sudhan	Panvel	Seawood Darave	First	Single	₹ 75	Click Here
2023-01-08 05:07:59	3	sudhan	Panvel	Khandeshwar	First	Single	₹ 50	Click Here
2023-01-08 04:54:46	2	sudhan	Panvel	Khandeshwar	First	Single	₹ 50	Click Here
2023-01-08 02:34:04	1	sudhan	Panvel	Nerul	First	Single	₹ 75	Click Here

Showing 1 to 10 of 10 entries
Previous 1 Next



7. Code Implementation:

```
C:\wamp64\www\cloud\index.php (cloud) - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
book_action_bangalore.php
book_action_chennai.php
book_action_delhi.php
book_bangalore.php
book_chennai.php
book_delhi.php
bookdone.php
captcha.php
connect.php
copy.ico
erlogin.php
erlogina.php
footer.php
head2.php
header.php
home.php
home1.php
homehead.php
index.css
index.php
logout.php
monofont.ttf
myprofile.php
pay.php
payaction.php
print.php
README.md
register.php
register_insert.php
sindex.php
trainbookings.php
trains.sql
trainschedule.php

index.php
28
29
30 <td><a href='book_delhi.php'><button style='background-color: black ; border-color:
    black ' ><img src='https://img.icons8.com/nolan/54/train.png'/>&nbsp;&nbsp;&nbsp;Book
    Delhi Metro</button></a></td></td>
31 </tr>
32 <br> <br>
33
34 <td><a href='book.php'><button style='background-color: black ; border-color:black
    ' ><img src='https://img.icons8.com/nolan/54/train.png'/>&nbsp;&nbsp;&nbsp;Book
    Mumbai Metro </button></a></td>
35 </tr>
36 <br> <br>
37
38 <td><a href='book_bangalore.php'><button style='background-color: black ;
    border-color:black ' ><img src='https://img.icons8.com/nolan/54/train.png'/>
    &nbsp;&nbsp;&nbsp;Book Bangalore Metro </button></a></td>
39 </tr>
40 <br> <br>
41
42 <tr>
43 <td><a href='book_chennai.php'><button style='background-color: black ; border-color
    :black ' ><img src='https://img.icons8.com/nolan/54/train.png'/>&nbsp;&nbsp;&nbsp;Book
    Chennai Metro</button></a></td></td>
44 </tr>
```

```
C:\wamp64\www\cloud\register.php (cloud) - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
book_action_bangalore.php
book_action_chennai.php
book_action_delhi.php
book_bangalore.php
book_chennai.php
book_delhi.php
bookdone.php
captcha.php
connect.php
copy.ico
erlogin.php
erlogina.php
footer.php
head2.php
header.php
home.php
home1.php
homehead.php
index.css
index.php
logout.php
monofont.ttf
myprofile.php
pay.php
payaction.php
print.php
README.md
register.php
register_insert.php
sindex.php
trainbookings.php
trains.sql
trainschedule.php

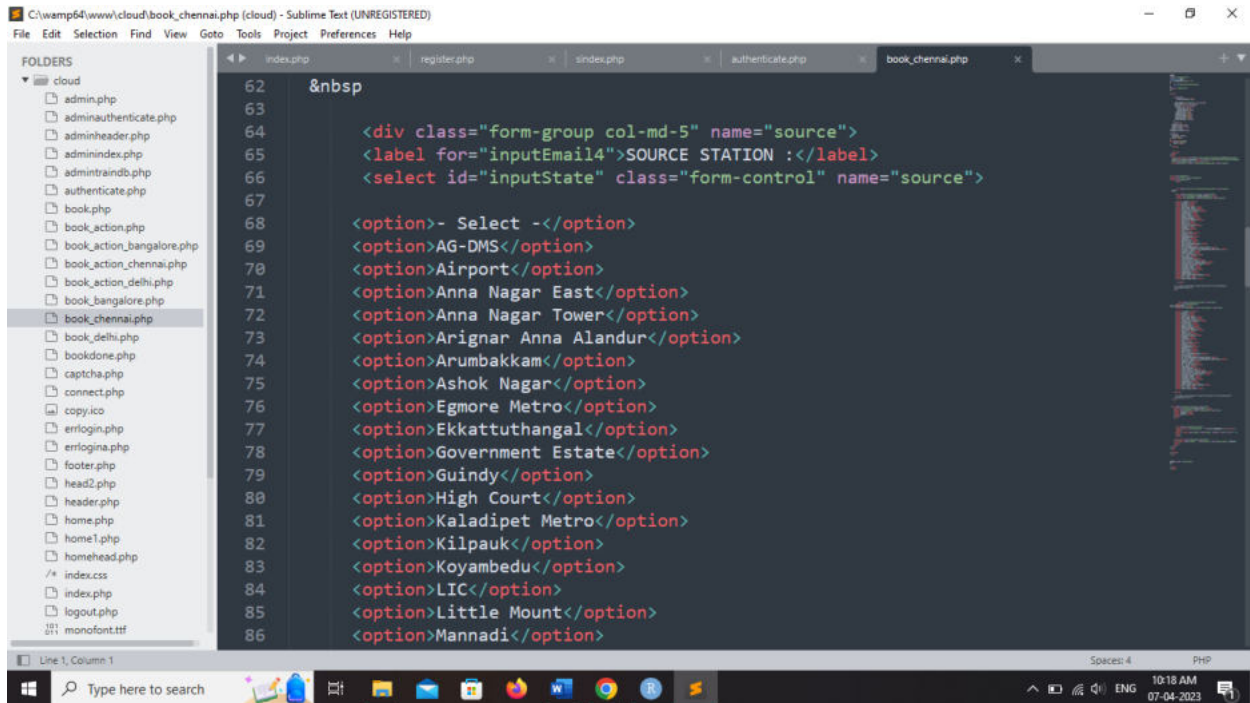
register.php
21
22 <body style='background-color: F5F1F0;'>
23 <form method='post' action='register_insert.php' >
24 <table align='center' class='table'>
25 <tr><td><h3>Name : </h3></td> <td colspan='2'><input type='Text' name='name'
    maxlength='50' required></td></tr>
26 <tr><td><h3>Email Id : </h3></td> <td colspan='2'><input type='email' name='email'
    maxlength='50' required></td></tr>
27 <tr><td><h3>Gender : </h3></td> <td colspan='2'><input type='Radio' name='Gender' value='M'>
    Male</td><td><input type='Radio' name='Gender' value='F' required>Female</td></tr>
28 <tr><td><h3>Date of Birth : </h3></td> <td colspan='2'><input type='Text' name='dob'
    maxlength='50' placeholder='yyyy-mm-dd' required></td></tr>
29 <tr><td><h3>Password : </h3></td> <td colspan='2'><input type='password' name='
    password' maxlength='50' required></td></td></tr>
30 <tr><td><h3>Contact No.</h3></td> <td colspan='2'><input type='tel' name='phone'
    maxlength='10' required></td></td></tr>
31
32 <tr><td colspan='3'><center><button type='Submit' style='background-color:black ;
    border-color:black' name='register_submit' required>Submit</button></center></td></tr>
33 </div>
34 </table>
35 </form>
36 <div align='center' >
```


C:\wamp64\www\cloud\index.php (cloud) - Sublime Text (UNREGISTERED)

```
18 <body style="background-color: F5F1F0;">
19 <form method='post' action='authenticate.php' >
20 <div>
21 <table align="center" class="table">
22 <tr><td><h2><b>Email id: </b></h2></td> <td><input type="email" name="email"
23   maxlength='50'></td></tr>
24 <tr><td><h2><b> Password: </b></h2></td> <td><input type="password" name="password"
25   maxlength='50'></td>
26 <tr><td><p><br />
27 
28 </p></td><td><p>Can't read the image?
29 <a href='javascript: refreshCaptcha();'>click here</a>
30 to refresh</p></td>
31 <tr><td><h2><b>Captcha: </b></h2></td> <td><input type="captcha" name="captcha"
32   maxlength='50' required></td>
33 </td></tr>
34 <tr><td colspan='2'><center><button type='Submit' style="background-color:black;
35   border-color:black" name='login_submit' ><b>Sign In </b> </button></center></td>
36 </tr></table>
37 <div align="center" >
38 <h3><a href='register.php' style="color: black"><b>Register</b></a></h3>
39 <br>
```

C:\wamp64\www\cloud\authenticate.php (cloud) - Sublime Text (UNREGISTERED)

```
1 <style > .table{ font-family: Montserrat, sans-serif;
2 align-items: center}
3
4 </style>
5 <link rel="stylesheet" type="text/css" href="index.css">
6 <?php
7 session_start();
8 include 'connect.php' ;
9 include 'head2.php';
10 $email = $_POST['email'];
11 $password = $_POST['password'];
12 $sql_userdatabase = "Select * from userdatabase where email = '$email' and
13   password='$password' ";
14 $result_userdatabase = mysqli_query($connect, $sql_userdatabase);
15 if ( isset($_POST['captcha']) && ($_POST['captcha']!="") ){
16 // Validation: Checking entered captcha code with the generated captcha code
17 if(strcmp($_SESSION['CAPTCHA_CODE'], $_POST['captcha']) != 0){
18 // Note: the captcha code is compared case insensitively.
19 // if you want case sensitive match, check above with strcmp()
20 header("location:errlogin.php");
21
22 }
23
24 else if(mysqli_num_rows($result_userdatabase) <= 0)
```



```
62 &nbsp;
63
64 <div class="form-group col-md-5" name="source">
65 <label for="inputEmail4">SOURCE STATION :</label>
66 <select id="inputState" class="form-control" name="source">
67
68 <option>- Select -</option>
69 <option>AG-DMS</option>
70 <option>Airport</option>
71 <option>Anna Nagar East</option>
72 <option>Anna Nagar Tower</option>
73 <option>Arignar Anna Alandur</option>
74 <option>Arumbakkam</option>
75 <option>Ashok Nagar</option>
76 <option>Egmore Metro</option>
77 <option>Ekkattuthangal</option>
78 <option>Government Estate</option>
79 <option>Guindy</option>
80 <option>High Court</option>
81 <option>Kaladipet Metro</option>
82 <option>Kilpauk</option>
83 <option>Koyambedu</option>
84 <option>LIC</option>
85 <option>Little Mount</option>
86 <option>Mannadi</option>
```

8. Conclusion:

There are many issues in existing railways ticket booking system, To deal over this issue, we are working towards a web-based platform. We have identified the loopholes and started our systematic investigation. Our investigation focuses on these major issues and have put forward a desired result for the same. We have introduced an application on how to secure passenger information. With this experimental analysis, there will be an increased usage of public transport systems, as everything can be done independently. There is no need of any dependence on the conductor or ticket collector while entering into the railways for collecting the ticket, all that we need to do is get a digital ticket by using the web application available in the mobile device and verify it by using users Booking Id or other credentials. This would eventually boost the will of the people and people will use the transport very often. We can visualize that Indian Metro-Ticket system will have an application portfolio with a mix of cloud-based services delivered across a combination of private, hybrid, and public cloud-based infrastructure deployment models. Thus, using cloud computing technology in train system is the most efficient, cost-saving, time-saving and serializable technique for waiting ticket holders.

References:

- 1- https://www.researchgate.net/profile/Rahul-Joshi-9/publication/278029921_Envision_of_I-RS_I-Railway_System_-_based_on_Cloud_Computing/links/557a6f5708aeacff2003d3f6/Envision-of-I-RS-I-Railway-System-based-on-Cloud-Computing.pdf
- 2- <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=d397dac4b0f79cecf8f70d884792bd00c6492049>
- 3- <https://aip.scitation.org/doi/abs/10.1063/5.0074301>
- 4- <https://sci-hub.se/https://ieeexplore.ieee.org/abstract/document/6320742>
- 5- https://www.researchgate.net/profile/Parag-Chatterjee/publication/268153640_Smart_Computing_Applications_in_Railway_System_-_A_case_study_in_Indian_Railways_Passenger_Reservation_System/links/546328290cf2c0c6aec1e1e9/Smart-Computing-Applications-in-Railway-Systems-A-case-study-in-Indian-Railways-Passenger-Reservation-System.pdf
- 6- <https://reader.elsevier.com/reader/sd/pii/S1877050920300119?token=9E08D0F6B695F61650228892841A6799AEF9F3363558E6AFE5B6EBF98E281D9B519FB0C60FB9D3F3C48A610A52A6CA70&originRegion=eu-west-1&originCreation=20230301142118>
- 7- https://sci-hub.se/https://link.springer.com/chapter/10.1007/978-3-319-70730-3_9
- 8- https://www.researchgate.net/profile/Aruna-Pavate/publication/333344979_QR_code_based_Railway_e-Ticket/links/5ce7e344a6fdccc9ddcabd2b/QR-code-based-Railway-e-Ticket.pdf
- 9- http://repository.futminna.edu.ng:8080/xmlui/bitstream/handle/123456789/8674/2-Yahaya%20Mohammed%20Sani_Published%20PDF.pdf?sequence=1&isAllowed=y
- 10- <https://sci-hub.se/https://ieeexplore.ieee.org/abstract/document/6462712>