

# RAILWAY MANAGEMENT SYSTEM



**BHARATI VIDYAPEETH**  
**COLLEGE OF ENGINEERING FOR WOMEN**  
KATRAJ-DHANKAWADI, PUNE-43.

**INFORMATION TECHNOLOGY DEPARTMENT**  
**A PROJECT REPORT**  
**ON**

**“RAILWAY MANAGEMENT SYSTEM”**

Project Guided by

**Prof. A. V. Kanade**

Submitted by

**Miss.Swapnali Shipankar(3335)**

**Miss.Gayatri Sawale(3330)**

**Miss.Rajeshree Shelke(3365)**

**CLASS TE.IT**

**Academic year:2020-2021**

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#### **CERTIFICATE**

*This is to certify that the Project titled*

**“RAILWAY MANAGEMENT SYSTEM”**

**was prepared and presented by**

**Miss. Swapnali Shipankar (Roll no. 3335)**

**Miss. Gayatri Sawale(Roll no. 3330)**

**Miss. Rajeshree Shelke (Roll no. 3365)**

**Class: TE IT**

Under the guidance of

**Prof A.V.Kanade**

Towards partial fulfillment of

TE IT course under

Savitribai Phule Pune University

(Year 2020-21)

**Prof. A.V. Kanade**

**GUIDE**

**Prof.Dr.D.A.Godse.**

**HOD IT**

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**Date:-**

**Miss. Swapnali Shipankar (Roll no. 3335)**

**Miss. Gayatri Sawale (Roll no. 3330)**

**Miss. Rajeshree Shelke (Roll no. 3365)**

**T.E. (I.T)**

**Place:-BVCOEW,Pune.**

# RAILWAY MANAGEMENT SYSTEM

## ABSTRACT

The Railway Management System facilitates the passengers to enquire about the trains available on the basis of source and destination, Booking and Cancellation of tickets, enquire about the status of the booked ticket, etc. The aim of case study is to design and develop a database maintaining the records of different trains, train status and passengers.

This project contains Introduction to the Railway Management System. It is the computerized system of reserving the seats of train seats in advanced. It is mainly used for long route. On-line reservation has made the process for the reservation of seats very much easier than ever before.

In our country India, there are number of counters for the reservation of the seats and one can easily make reservation and get tickets. Then this project contains entity relationship model diagram based on railway station management system and introduction to relation model. There is also design of the database of the railway station management system based on relation model. Example of some SQL queries to retrieves data from rail management database.

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## CHAPTER 1

### INTRODUCTION

Database is an organized collection of data. The data is typically organized to model aspects of reality in a way that supports processes requiring information.

A DBMS makes it possible for end users to create ,read ,update and delete data in a database. The DBMS essentially serves as an interface between the database and end users or application programs, ensuring the data is consistently organized and remains easily accessible. The DBMS manages the three important things: the data , the database engine that allows data to be accessed, locked and modified and the database schema, which defines the database's logical structure . These three foundational elements help provide concurrency , security, data integrity and uniform administration procedures. The DBMS can offer both logical and physical data independence. That means it can protect user and application from needing to know where data is stored or having to be concerned about changes to the physical structure of data.

The main purpose of maintaining database for Railway Station Management System is to reduce the manual errors involved in the booking and cancellation of tickets and make it convenient for the customers and providers to maintain the data about their customers and providers to maintain the data about their customers and also about the seats available at them. Due to automation many loopholes that exist in the manual maintenance of the records can be removed. The speed of obtaining and

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processing the data will be fast. For future expansion the proposed system can be web enabled so that clients can make various enquiries about trains between stations. Due to this, sometimes a lot of problems occur and they are facing many disputes with customers. To solve the above problem, we design a data base which includes customer details, availability of seats in trains. No. of trains and their details.

### 1.1 EXISTING SYSTEM

Under Railway Station Management System passengers were only provided with list of trains between two stations and train number is only the available information by they can take an action. Under existing system passengers were not able to get information on their arrival and department and route by which particular train will travel. Passenger were only able to select the seat number and not provided which seat type they want to select and this sometimes not creates a familiar environment during their journey. During making payment final validation and authorization was one by system to identify the particular passengers to make deduction for their fare charges to make final reservation.

#### DRAWBACKS OF THE EXISTING SYSTEM:

- Manual entry consumes more time.
- It is difficult to maintain bulk of record in manual.
- Not easy to prepare the reports.
- Lot of paperwork.
- Non-secure.
- No method to trace details.

## 1.3 PROPOSED SYSTEM:

The online railway station management system is user-friendly application. This automated system makes all functionality easier for both owners and customers. It is very simple in design and to implement. The system requirements are very low. System resources and the system will work in almost all configurations.

The development of this new system contains the following activities, which try to automate the entire process keeping in the view of database integration approach.

- This system makes the overall project management much easier and flexible.
- Staff as well as customers/members can access.
- This system is providing more memory to store or maintain the data.

## Modules & Features

### Module

There are two basic modules in this system as describe briefly in below

- Administrative module: This user is an admin type who has full rights on the system.
- User module: This is a normal level of user who will be very few number of functionality of website.

### Administrative Module

This module includes storing and retrieving the details of the data.

- Create , Update, Manage, Delete User
- Creating Offer Plan



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- Manage Billing
- Manage User Enquiry through Email
- Manage Owner Info

User Module Depends on the privilege user's access to features of the application is granted. Below are the some important functionality of user module.

- Applying for Package
- Account Update
- Online Payment Facility
- Phone and Email Address Verification on Sign Up
- Enquiry to Authority

## CHAPTER 2

### GOALS AND OBJECTIVE

#### **GOALS:**

Our project introduces railway management system with an objective to make the reservation system more efficient, easier and fast. This project explores how computer technology can be used to solve the problem of user. The main objectives provided by this software are as follows:

- To enquire about availability of trains
- To reserve and cancel their seats
- To modify the information related to

#### a.) Trains

1. Time Table
2. Train Name
3. Train Number

#### b.) Ticket Fare

This project is dedicated to model existing railway station management systems that aim at development of railway station management system that facilitates the railway customer to manage their reservations and the railway administration to modify the backend database in a user-friendly manner.

#### **OBJECTIVES:**

The main objective of the Railway Management System is to manage the details of Booking, Stations, Customers, Trains, Fare. The purpose of the project is to build an application program to reduce the manual work for managing the Booking, Stations, Timetable, Customers.

#### **MOTIVE:**

## RAILWAY MANAGEMENT SYSTEM

- The motive of our project is to control various activities performed in the reservation using the computer with the work RAILWAY MANGEMENT SYSTEM.
- To store properly all the data releated software in order to maintain their security.
- To enter and preserve details of the various issues and keep a track on their returns.

## CHAPTER 3

### REQUIREMENT ANALYSIS

#### 3.1 HARDWARE REQUIREMENTS:

- Processor : Intel(R) core(TM) i3-7020 U CPU @ 2.30 GHZ 2.30GHZ
- RAM : 4GB
- Hard disk : 1TB
- Monitor : VGA/SVGA
- Keyboard : 104 Keys
- Mouse : 2 buttons/ 3 buttons

#### 3.2 SOFTWARE REQUIREMENTS:

- Operating System : Windows 10
- Front end : NetBeans IDE 12.0
- Back end : Mysql 8.8

#### a) Java(Front End):

**Java SE**

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- Java SE is a computing Platform for development and deployment of portable code for desktop and server environment.
- Java SE includes much awaited new features like the modularization of java Platform, better Performance, support for new standards.
- Java SE defines the range of general-purpose APIs-such as Java APIs for the Java class library.
- Java Mission Control is one of the key feature of Java SE it enable you to monitor and manage Java application without introducing the performance overhead.
- New Release: Java SE 9, Oracle java SE 8u144, JMC(Java Mission Control), etc.

### Features of Java:

#### 1) Simple

Java is easy to learn and its syntax is quite simple, clean and easy to understand. The confusing and ambiguous concepts of C++ are either left out in Java or they have been re-implemented in a cleaner way.

Eg : Pointers and Operator Overloading are not there in java but were an important part of C++.

#### 2) Object Oriented

In java everything is Object which has some data and behaviour. Java can be easily extended as it is based on Object Model.

#### 3) Robust

Java makes an effort to eliminate error prone codes by emphasizing mainly on compile time error checking and runtime checking. But the main areas which Java improved were Memory Management and mishandled Exceptions by introducing automatic Garbage Collector and Exception Handling.

#### 4) Platform Independent

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Unlike other programming languages such as C, C++ etc which are compiled into platform specific machines. Java is guaranteed to be write-once, run-anywhere language. On compilation Java program is compiled into bytecode. This bytecode is platform independent and can be run on any machine, plus this bytecode format also provide security. Any machine with Java Runtime Environment can run Java Programs.

### **5) Secure**

When it comes to security, Java is always the first choice. With java secure features it enable us to develop virus free, temper free system. Java program always runs in Java runtime environment with almost null interaction with system OS, hence it is more secure.

### **6) Multi Threading**

Java multithreading feature makes it possible to write program that can do many tasks simultaneously. Benefit of multithreading is that it utilizes same memory and other resources to execute multiple threads at the same time, like While typing, grammatical errors are checked along.

### **7) Architectural Neutral**

Compiler generates bytecodes, which have nothing to do with a particular computer architecture, hence a Java program is easy to intrepret on any machine.

### **8) Portable**

Java Byte code can be carried to any platform. No implementation dependent features. Everything related to storage is predefined, example: size of primitive data types

### **9) High Performance**

Java is an interpreted language, so it will never be as fast as a compiled language like C or C++. But, Java enables high performance with the use of just-in-time compiler.

### **NETBEANS IDE 8.2:**

It empowers developers to create and debug rich web and mobile applications using the latest HTML5, JavaScript, and CSS3 standards. Developers can expect state of the

## RAILWAY MANAGEMENT SYSTEM

art rich web development experience with a page inspector and CSS style editor, completely revamped JavaScript editor, new JavaScript debugger, and more.

Additional highlights available in 8.2 include continued enhancements to the IDE's support for Groovy, PHP, JavaFX and C/C++. NetBeans IDE 8.2 is available in English, Brazilian Portuguese, Japanese, Russian, and Simplified Chinese.

NetBeans IDE lets you quickly and easily develop Java desktop, mobile, and web applications, as well as HTML5 applications with HTML, JavaScript, and CSS. The IDE also provides a great set of tools for PHP and C/C++ developers. It is free and open source and has a large community of users and developers around the world.

### **a) Mysql(Back End) :**

MySQL is (as of 2008) the world's most widely used open source relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. RDBMS (Relational Database Management System) A short definition of an RDBMS may be a DBMS in which data is stored in the form of tables and the relationship among the data is also stored in the form of tables. MySQL is a popular choice of database for use in web application

s, and is a central component of the widely used LAMP open source web application software stack (and other 'AMP' stacks). LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python." Free-software-open source projects that require a full-featured database management system often use MySQL.

- ☐ High Performance.
- ☐ Embedding makes reads and writes fast.
- ☐ Indexes can include keys from embedded documents and arrays.
- ☐ Optional streaming writes (no acknowledgments).
- ☐ High Availability
- ☐ Replicated servers with automatic master failover.
- ☐ Easy Scalability
- ☐ Automatic sharding distributes collection data across machines.

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- Eventually-consistent reads can be distributed over replicated servers.

### **Advanced Operations:**

With Mysql Services, mysql supports a complete backup solution and full deployment monitoring.



## CHAPTER 4

### SCOPE AND LIMITATION

#### **SCOPE:**

This project has a large scope as it has the following features which help in making it easy to use, understand and modify :

- Automation of Reservation Status.
- To increase the accuracy and efficiency of the software.
- Management of online database.
- Management of online payment.
- The software lets the user know which all services and facilities are available. This makes it considerably faster.

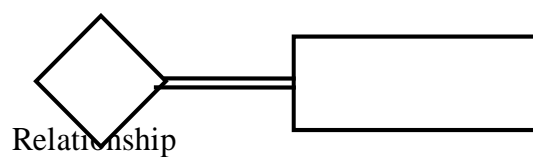
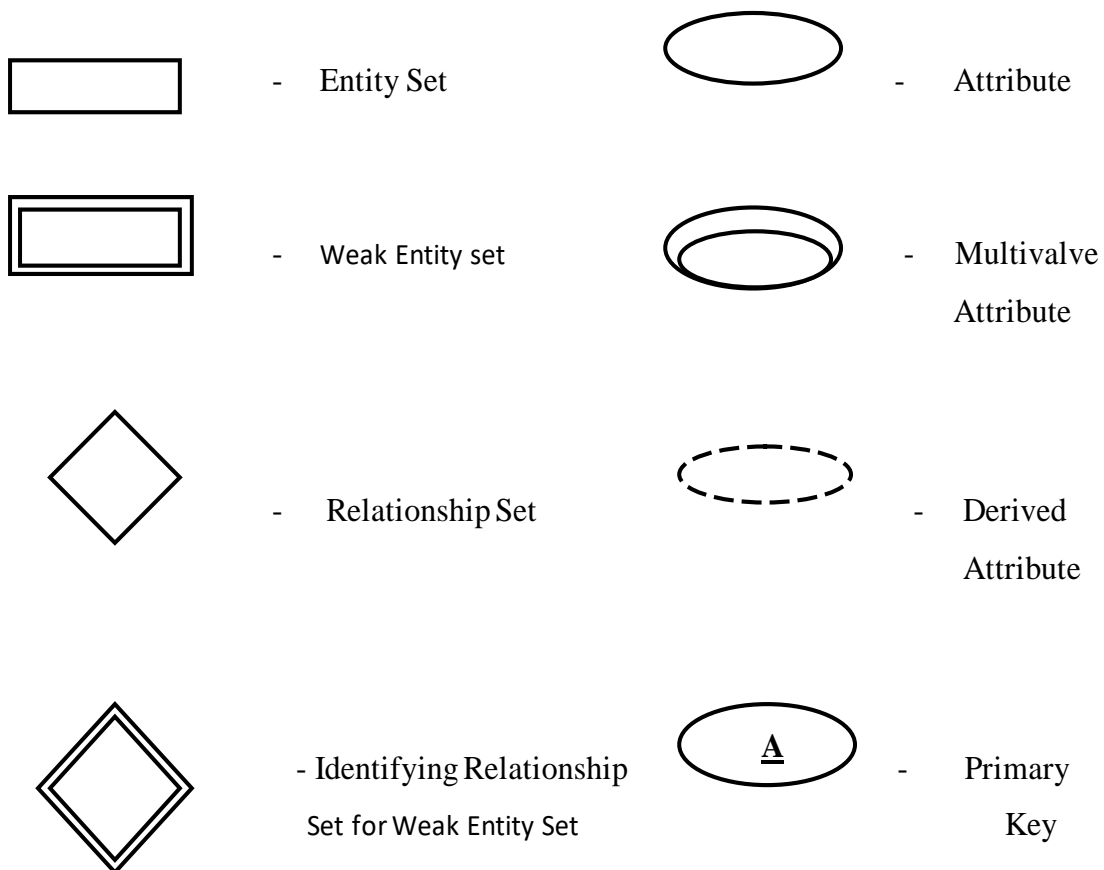
#### **LIMITATIONS:**

- Booking agencies on the high street may close down due to lack of customers.
- You must have a credit card or debit card.
- Not everyone has the knowledge or confidence to book online.

## CHAPTER 5

### DESIGN (ER DIAGRAMS)

#### ER DIAGRAM WITH EER FEATURES:



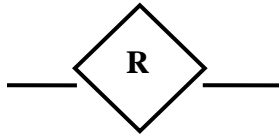
Total Participation of Entity set in



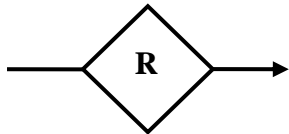
## RAILWAY MANAGEMENT SYSTEM

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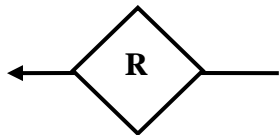
- Discriminating Attributes of Weak Entity Set



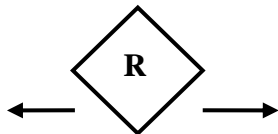
- Many to Many Relationships



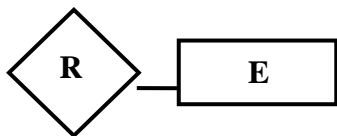
- Many to One Relationship



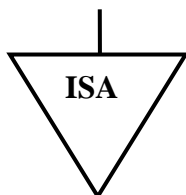
- One to Many Relationship



- One to One Relationship

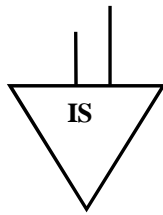


- Cardinality Limits

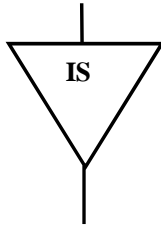


- ISA (Specialization or Generalization)

# RAILWAY MANAGEMENT SYSTEM



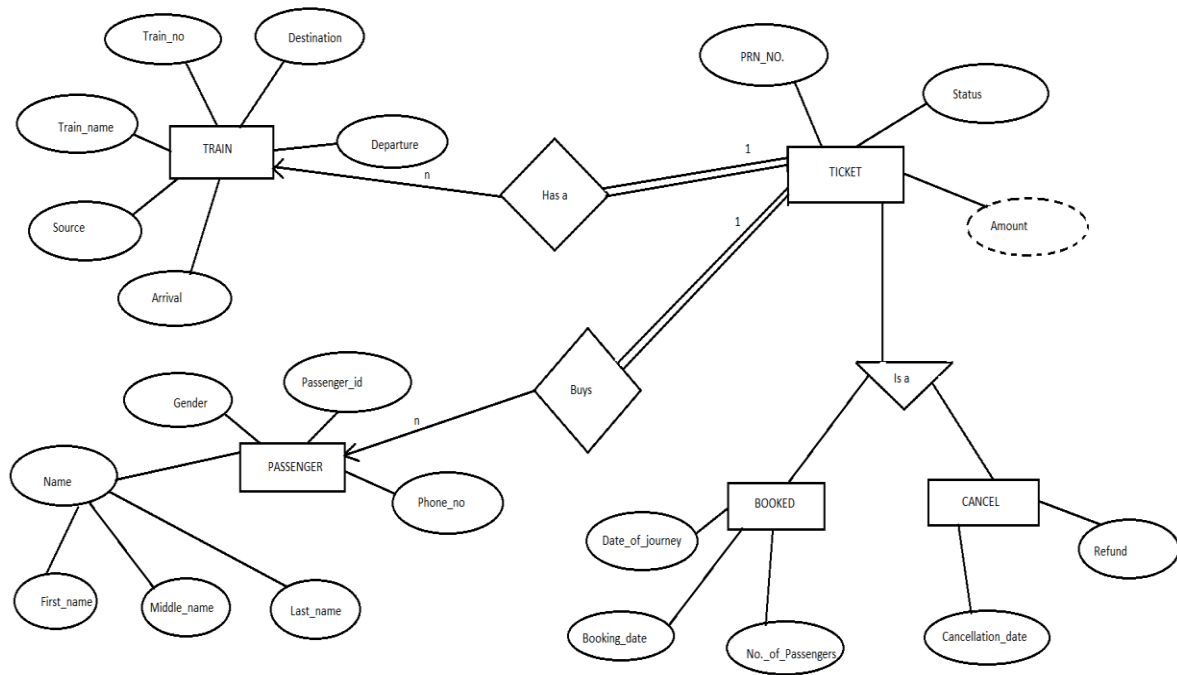
- Total Generalization



- Disjoint Generalization

# RAILWAY MANAGEMENT SYSTEM

## E-R Diagram for the proposed system



# RAILWAY MANAGEMENT SYSTEM

## CHAPTER 6

### ER DIAGRAM TO TABLE CONVERSION

#### **TRAIN:-**

FIELD NAME	DESCRIPTION	DATA TYPE	CONSTRAINT
<b>Train_no</b>	Train no.	Int	PRIMARY KEY NOT NULL
<b>Train_name</b>	Train Name	Varchar(50)	NOT NULL
<b>Available_seats</b>	Available seats	Varchar(50)	NOT NULL
<b>Source</b>	Source	Varchar(50)	NOT NULL
<b>Destination</b>	Destination	Varchar(50)	NOT NULL
<b>Amount</b>	Amount	Int	NOT NULL

#### **PASSENGERS:-**

FIELD NAME	DESCRIPTION	DATA TYPE	CONSTRAINT
<b>Passenger_id</b>	Passenger ID	Int	PRIMARY KEY AUTO_INCREMENT
<b>First_name</b>	First name	Varchar(50)	NOT NULL
<b>Middle_name</b>	Middle name	Varchar(50)	NOT NULL
<b>Last_name</b>	Last name	Varchar(50)	NOT NULL
<b>Gender</b>	Gender	Varchar(50)	NOT NULL
<b>Phone_no.</b>	Phone No.	Int	NOT NULL

## RAILWAY MANAGEMENT SYSTEM

### BOOK:-

FIELD NAME	DESCRIPTION	DATA TYPE	CONSTRAINT
<b>Ticket_no.</b>	Ticket Number	Int	PRIMARY KEY AUTO_INCREMENT
<b>No_of_Passenger</b>	Passengers	Int	NOT NULL
<b>Date_of_journey</b>	Journey date	Date	NOT NULL
<b>Booking_date</b>	Booking date	Date	NOT NULL
<b>Source</b>	Source	Varchar(50)	NOT NULL
<b>Destination</b>	Destination	Varchar(50)	NOT NULL

### CANCEL:-

FIELD NAME	DESCRIPTION	DATA TYPE	CONSTRAINT
<b>Ticket_no</b>	Ticket Number	Int	PRIMARY KEY NOT NULL
<b>Train_no</b>	Train Number	Int	NOT NULL
<b>Passenger_id</b>	Passenger Id	Int	NOT NULL
<b>Booking_date</b>	Booking Date	Date	NOT NULL
<b>Cancellation_date</b>	Cancellation Date	Date	NOT NULL
<b>Refund</b>	Refund	Int	NOT NULL

## CHAPTER 7

### NORMALIZATION

#### **NORMALISATION:**

Database normalization, or simply normalization, is the process of organizing the columns (attributes) and tables (relations) of a relational database to reduce data redundancy and improve data integrity. Informally, a relational database relation is often described as "normalized" ssif it meets third normal form.

Train::

1 NF

1. The 1NF defines that all attributes in a relation cannot be further divided and it should be single value.

2. The The Train Table consists of the fields:

Train (Train\_no, Train\_name, Available\_seats, Source, Destination, Amount)

3. Here a each field is having a unique value which cannot be further divided.

Therefore this table is in 1NF.

2NF

1. The design must be in 1NF.

2. According to the 2NF all non-prime key attribute should be depends upon the prime attributes.

3. Here the Train\_no Primary key and others i.e Train\_name, Available\_seats, Source, Destination, Amount are non primary keys.

4. And therefore we can determine the Non-prime keys with help of Prime keys.

Train\_no->Train Name

Train\_no->Available seats



## RAILWAY MANAGEMENT SYSTEM

Train\_no->Source

Train\_no->Destination

Train\_no->Amount

5. Therefore the table is in 2NF.

3NF

1. The design must be in 2NF.
2. And no non-prime key attributes should be transitively depends on primary key, means there should be fully dependency.
3. Hence in Train table all non-prime key attributes are fully depended on the primary key i.e. Train\_no.
4. There is no transitivity present, hence the given Train Table satisfies 3NF rule.

Booking::

1NF

1. The 1NF defines that all attributes in a relation cannot be further divided and it should be single value.
2. The Booking Table consists of the fields:  
Booking (Ticket\_no, No\_of\_passenger, Date\_of\_journey, Booking\_date, Source, Destination)
3. Here each field is having a unique value which cannot be further divided.  
Therefore this table is in 1NF.

2NF

1. The design must be in 1NF.
2. According to the 2NF all non-prime key attribute should be depends upon the prime attributes.
3. Here the Ticket\_no Primary key and others i.e No\_of\_passenger, Date\_of\_journey, Booking\_date, Source, Destination are non primary keys.

## RAILWAY MANAGEMENT SYSTEM

4. And therefore we can determine the Non-prime keys with help of Prime keys.

Ticket\_no->No. of passengers

Ticket\_no->Date of journey

Ticket\_no->Booking date

Ticket\_no->Source

Ticket\_no->Destination

5. Therefore the table is in 2NF.

3NF

1. The design must be in 2NF.

2. And no non-prime key attributes should be transitively depends on primary key, means there should be fully dependency.

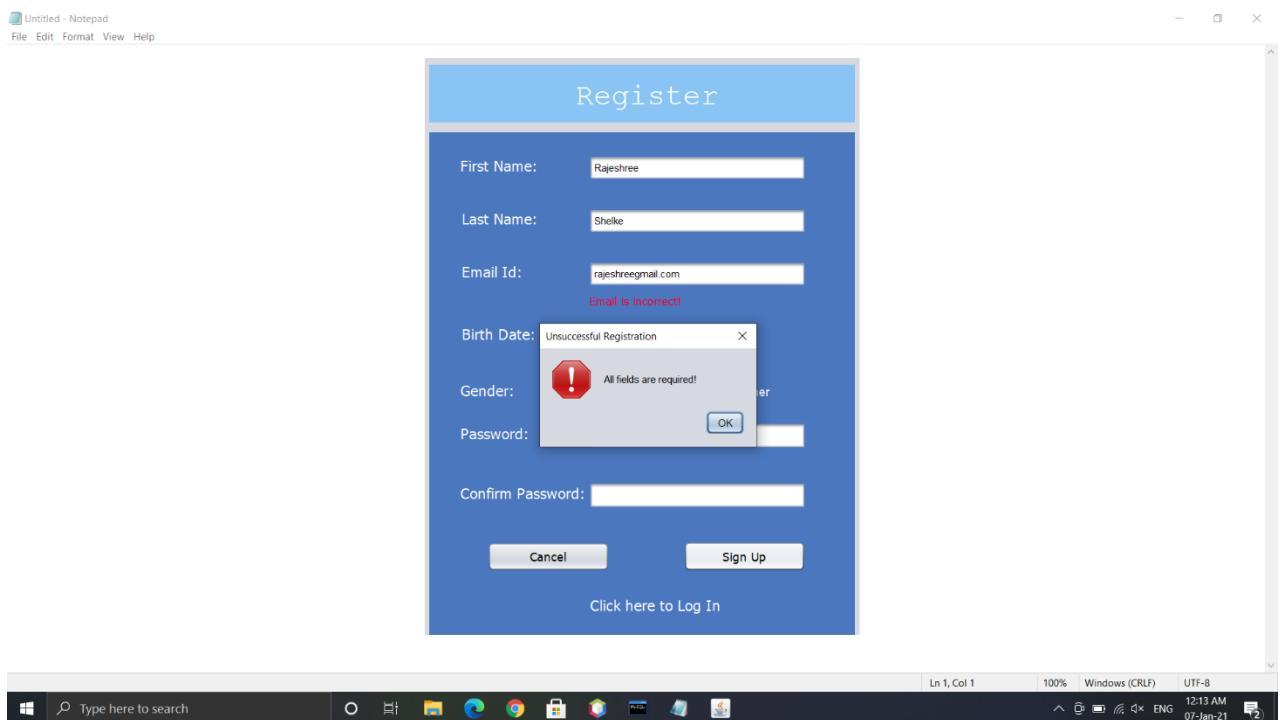
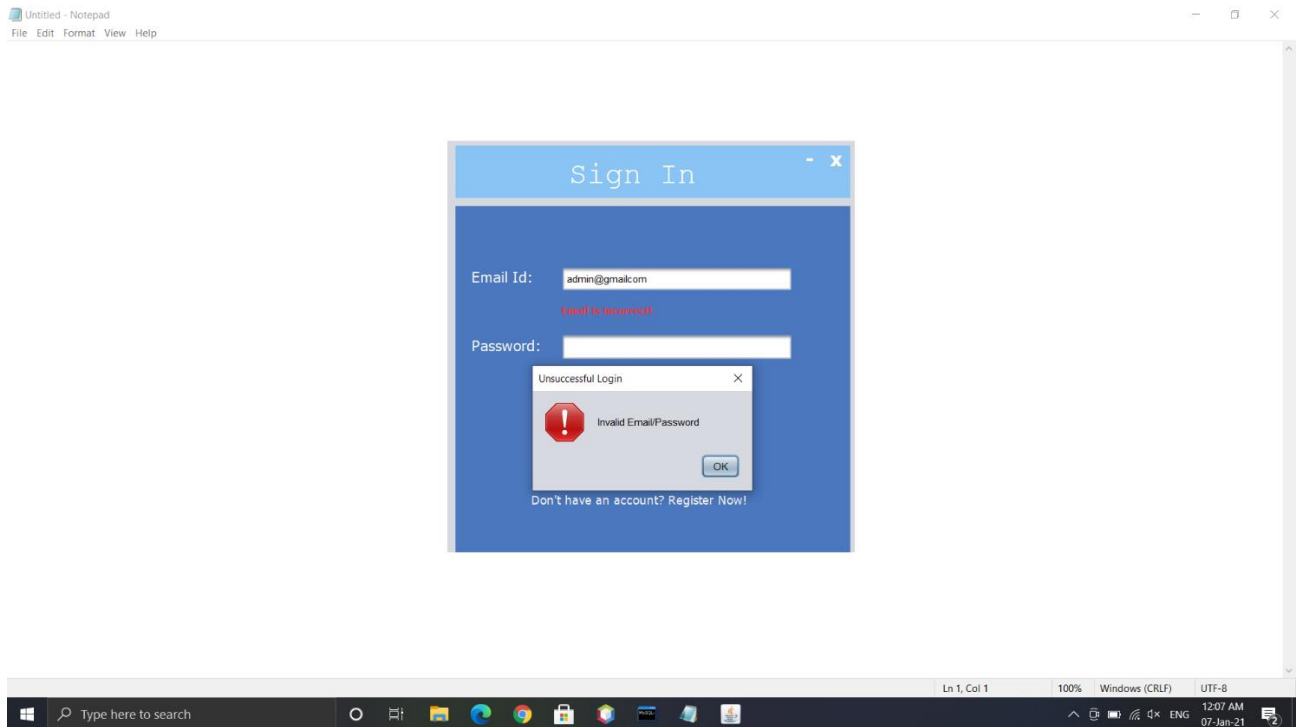
3. Hence in Booking table all non-prime key attributes are fully depended on the primary key i.e. Ticket\_no.

4. There is no transitivity present, hence the given Train Table satisfies 3NF rule.

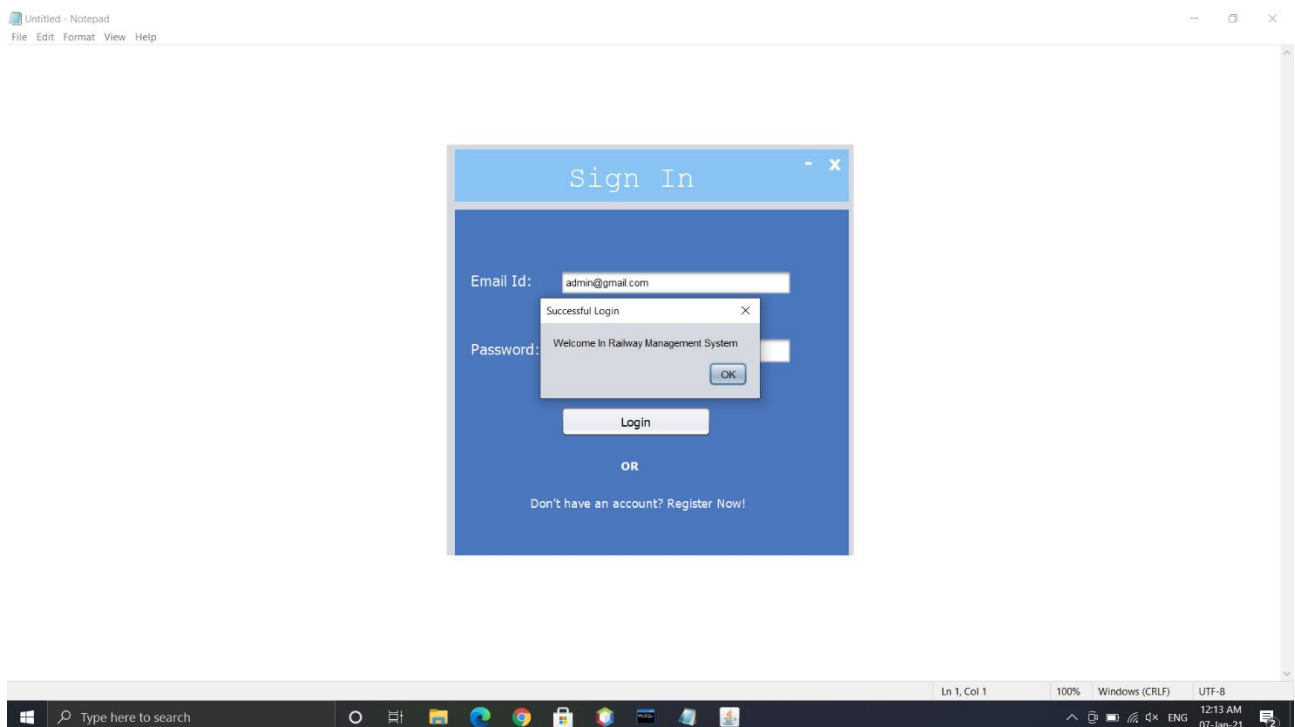
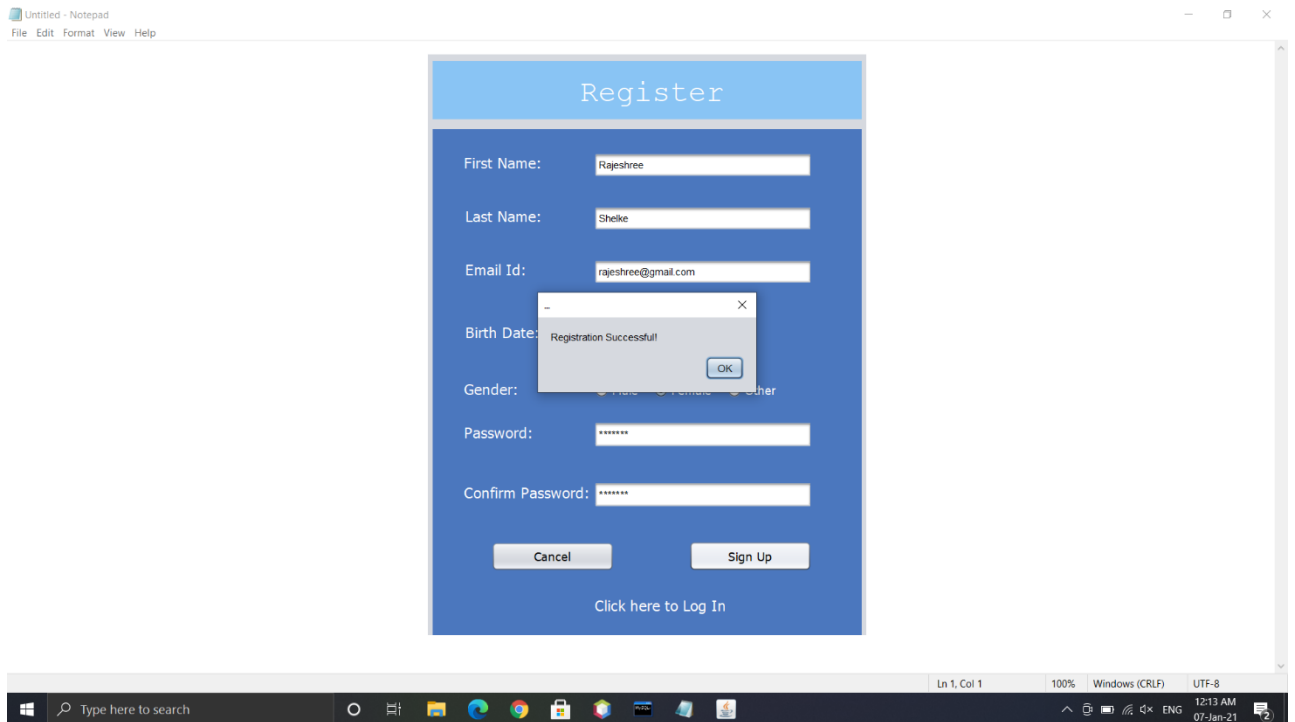
# RAILWAY MANAGEMENT SYSTEM

## CHAPTER 8

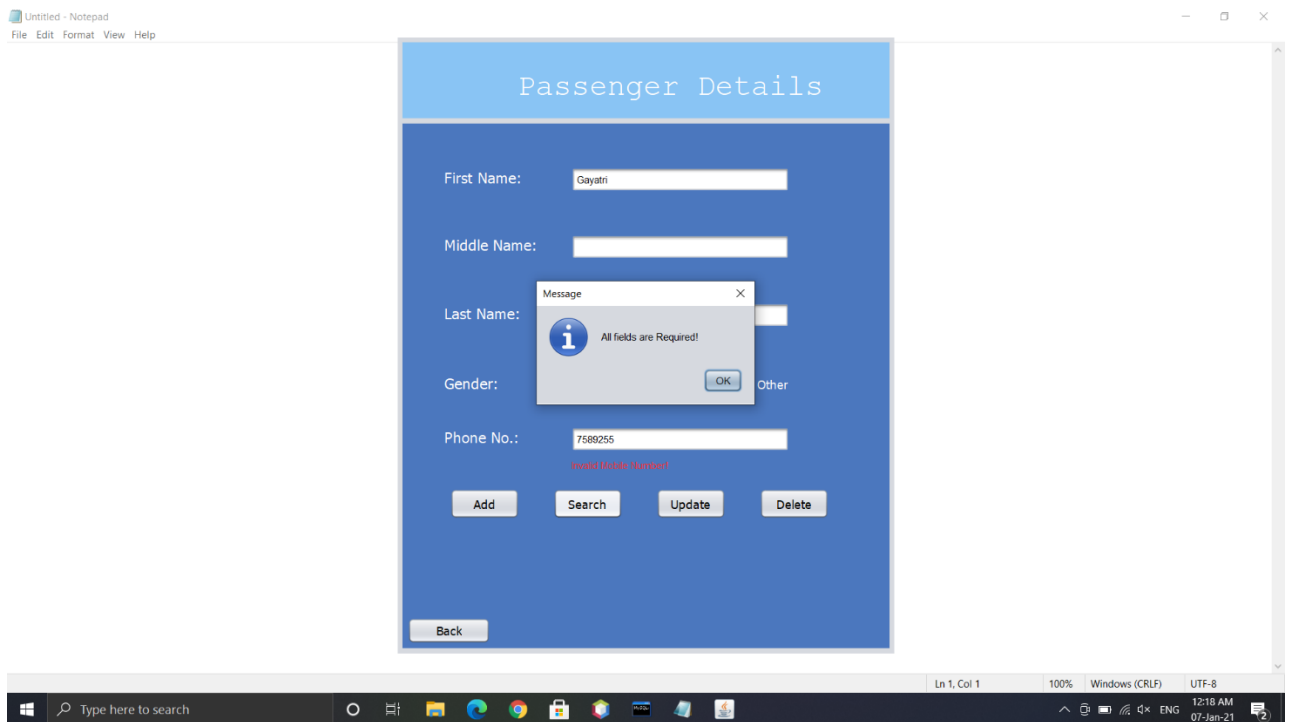
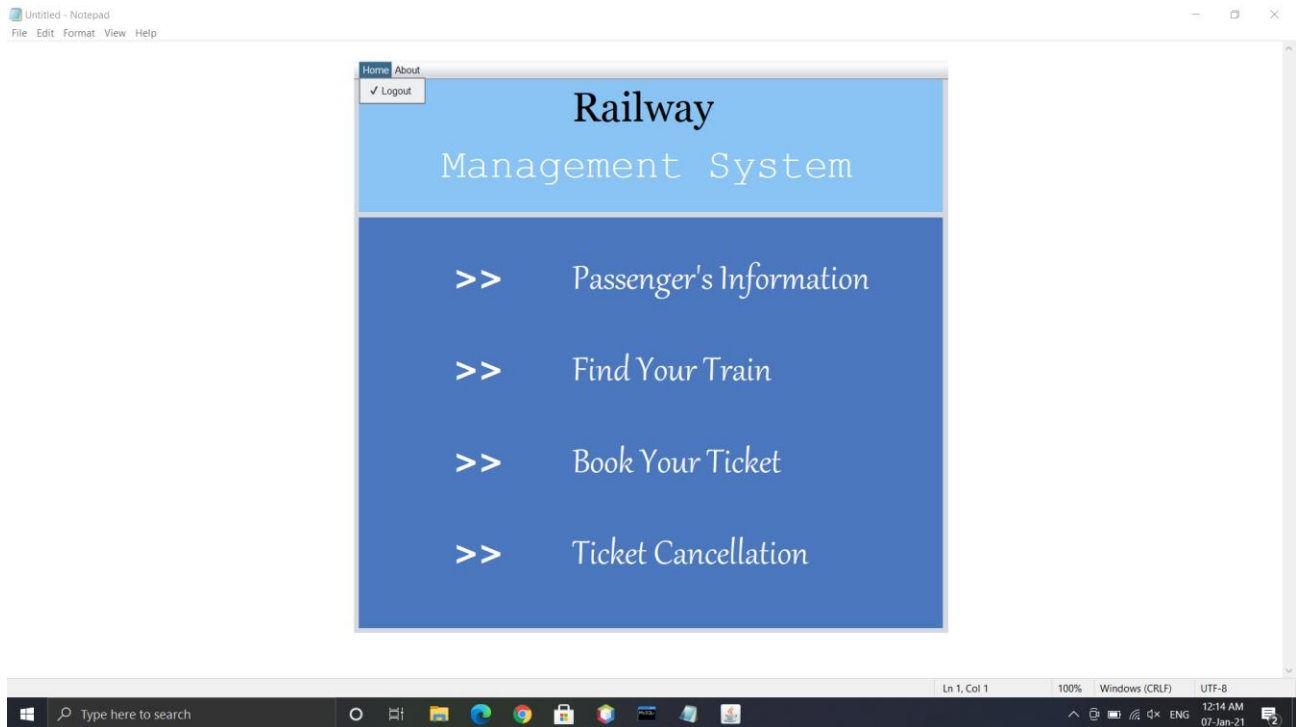
### SCREENSHOTS



# RAILWAY MANAGEMENT SYSTEM



# RAILWAY MANAGEMENT SYSTEM



# RAILWAY MANAGEMENT SYSTEM

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File Edit Format View Help

## Passenger Details

First Name:

Middle Name:

Last Name:

Gender: ☐ Male ☐ Female ☐ Other

Phone No.:

Message

Now, you can see passenger!

Ln 1, Col 1 100% Windows (CRLF) UTF-8 12:19 AM 07-Jan-21

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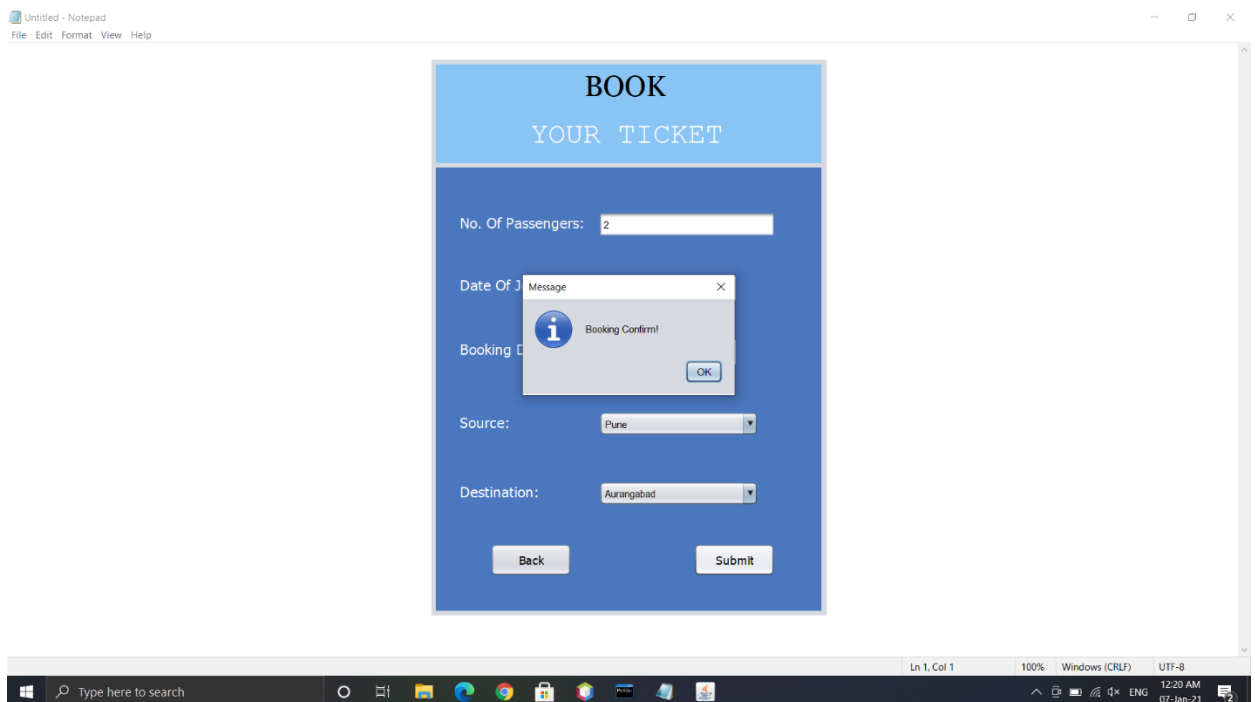
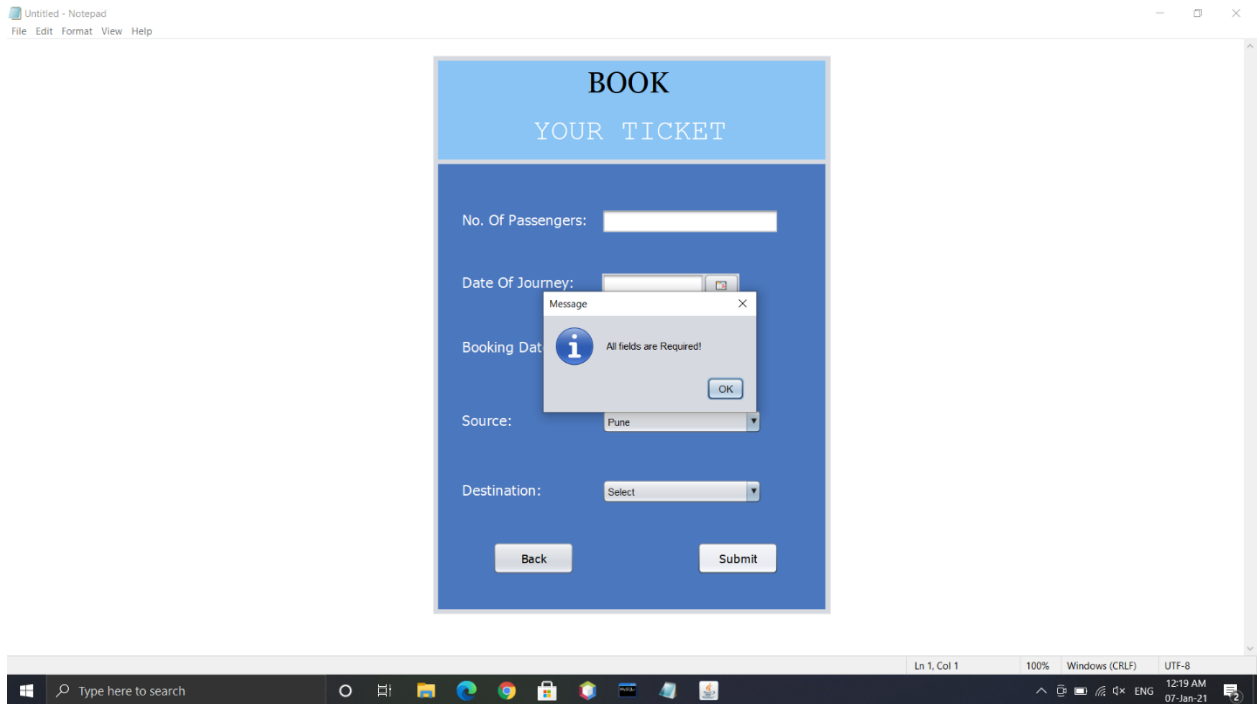
## Trains Availability

Source:  Destination:

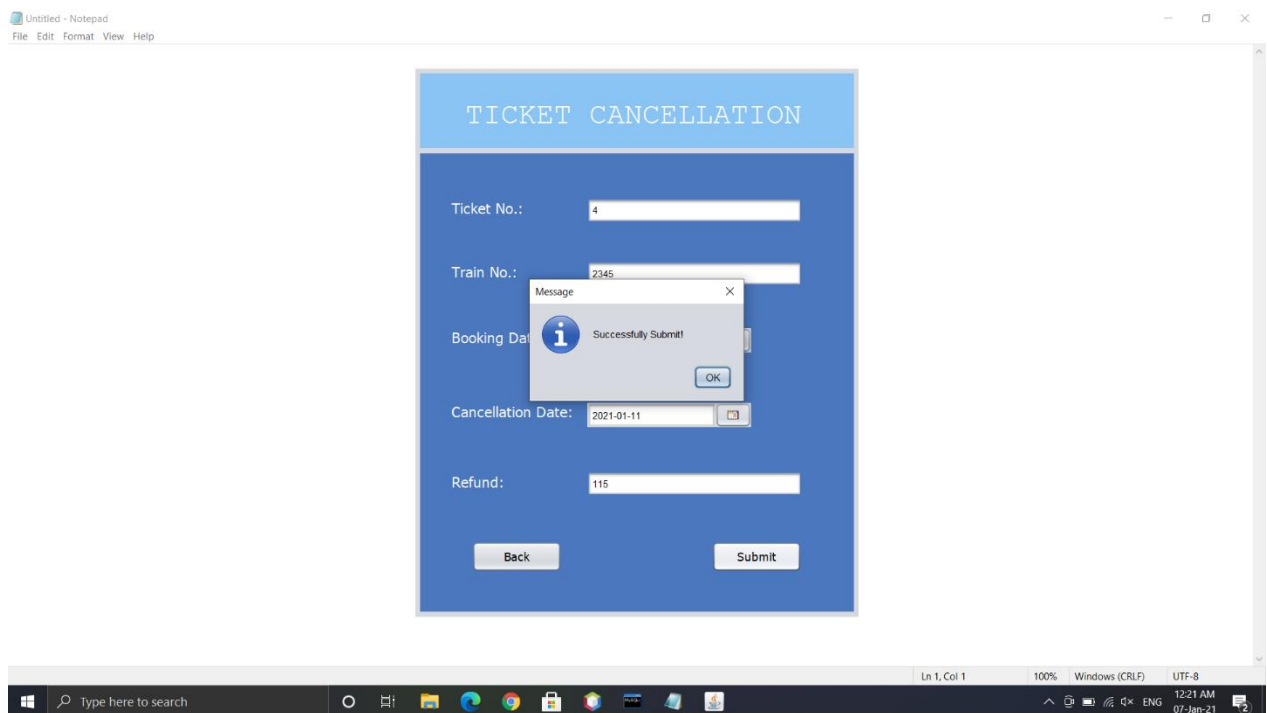
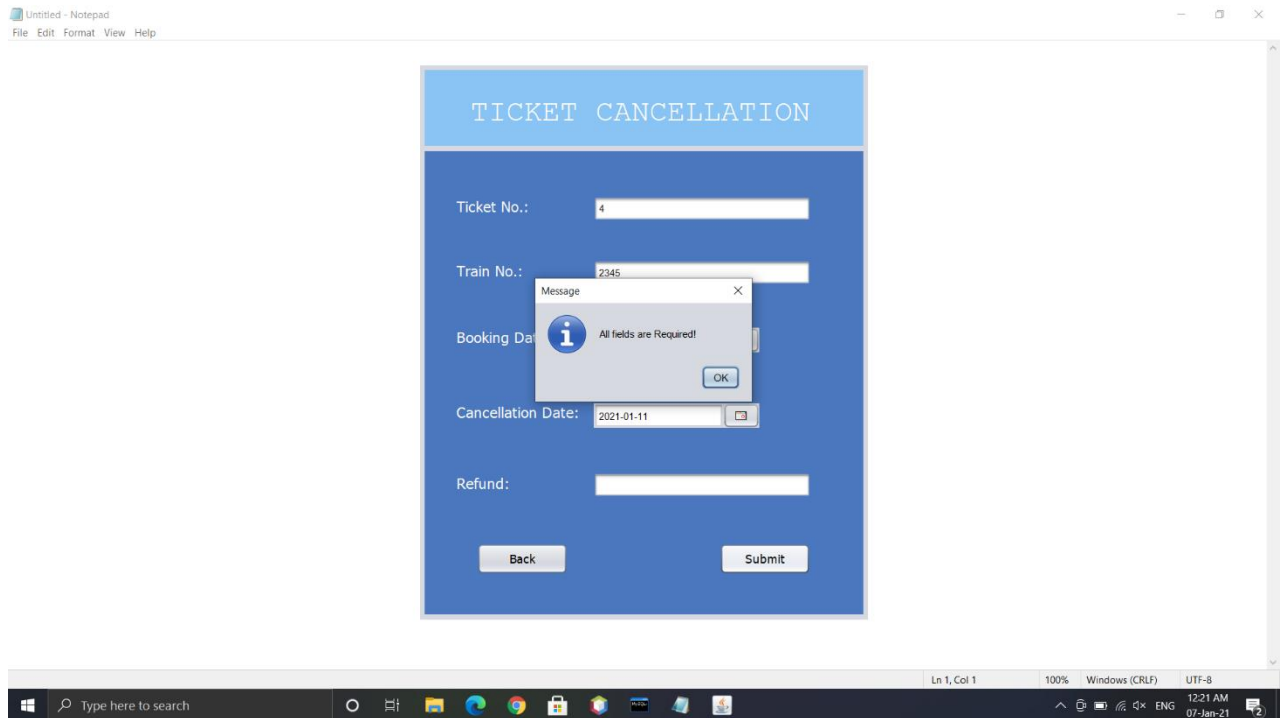
Train Number	Train Name	Available Seats	Source	Destination	Amount
1234	Konark Express	25	Pune	Solapur	100
2345	Hutalma Express	20	Pune	Solapur	115

Ln 1, Col 1 100% Windows (CRLF) UTF-8 12:23 AM 07-Jan-21

# RAILWAY MANAGEMENT SYSTEM



# RAILWAY MANAGEMENT SYSTEM





## CHAPTER 9

### FUTURE SCOPE

- The scope of this system in creating Reservation is that, from any Railway Station we can Create Reservation, which is updated automatically in all the stations. Hence, there is no confusion to the Reservation Clerk in all the stations to create the Reservation. This can be possible by maintaining Global Database.
- Providing Facilities for booking a railway ticket.
- Enquiry Facilities.
- Provisions for Tatkaal Tickets booking.
- Facilities for cancellation and Refunds.
- Managing users and maintaining the database for users and transactions.

## CHAPTER 10

### CONCLUSION

- Our project is only the gist of the online railway station management system.
- Due to time constraints it was not possible to incorporate all the concepts related to the topic.
- So the program created is just an instance of the original online Railway Station Management System.

## CHAPTER 11

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2. Java by **Balgurusamy**
3. The complete reference mysql by **vikram vaswani**

#### **Web references:**

1. <https://stackoverflow.com/questions/21898053/display-records-from-mysql-database-using-jtable-in-java>
2. <https://www.tutorialspoint.com/jdbc/jdbc-sample-code.htm>
3. <https://netbeans.org/kb/docs/ide/mysql.html>
4. <http://camposha.info/source/java-mysql-database-jcombobox-insert-select-update-delete-full-source>