MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Skill Based Mini Project Report

On

Railway Management System Database Project

Submitted By:

Princika Rai

0901CS201089

Faculty Mentor:

Ms. Jaimala Jha

Assistant Professor

Submitted to:

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE
GWALIOR - 474005 (MP) est. 1957

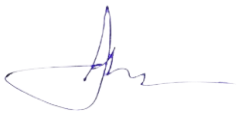
JAN-JUNE 2022

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

CERTIFICATE

This is certified that **Princika Rai**(**0901CS201089**) has submitted the project report titled **Railway Management System Database Project** under the mentorship of **Ms. Jaimala Jha**, in partial fulfilment of the requirement for the award of degree of Bachelor of Technology in Computer Science and Engineering from Madhav Institute of Technology and Science, Gwalior.



Ms. Jaimala Jha
Faculty Mentor
Assistant Professor
Computer Science and Engineering

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

DECLARATION

I hereby declare that the work being presented in this project report, for the partial fulfilment of requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the mentorship of **Ms. Jaimala Jha, Assistant Professor, Computer Science and engineering**

I declare that I have not submitted the matter embodied in this report for the award of any degree or diploma anywhere else.

Princika Rai

0901CS201089

2nd Year,

Computer Science and Engineering

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

ACKNOWLEDGEMENT

The full semester project has proved to be pivotal to my career. I am thankful to my institute, **Madhav Institute of Technology and Science** to allow me to continue my disciplinary/interdisciplinary project as a curriculum requirement, under the provisions of the Flexible Curriculum Scheme (based on the AICTE Model Curriculum 2018), approved by the Academic Council of the institute. I extend my gratitude to the Director of the institute, **Dr. R. K. Pandit** and Dean Academics, **Dr. Manjaree Pandit** for this.

I would sincerely like to thank my department, **Department of Computer Science and Engineering, for allowing** me to explore this project. I humbly thank **Dr. Manish Dixit**, Professor and Head, Department of Computer Science and Engineering, for her continued support during the course of this engagement, which eased the process and formalities involved.

I am sincerely thankful to my faculty mentors. I am grateful to the guidance of **Ms. Jaimala Jha**, Assistant Professor, Computer Science & Engineering, for her continued support and guidance throughout the project. I am also very thankful to the faculty and staff of the department.

Princika Rai

0901CS201089

2nd Year,

Computer Science and Engineering

ABSTRACT

The Railway Reservation 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 Railways reservation 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 reservations and get tickets. Then this project contains entity relationship model diagram based on railway reservation system and introduction to relation model .There is also design of the database of the railway reservation system based on relation model. Example of some SQL queries to retrieves data from rail management database.

TABLE OF CONTENTS

LIST OF FIGURES

.

CHAPTER 1:INTRODUCTION

1.1 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 that data is consistently organized and remains easily accessible. The DBMS manages 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 users and applications 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 Reservation System is to reduce the manual errors involved in the booking and cancelling of tickets and make it convenient for the 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 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.

1.2 OBJECTIVE AND SCOPE:

Database is an organised collection of data. The data is typically organised 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 main purpose of maintaining database for railway reservation system is to reduce the manual errors involved in the booking and cancelling of tickets and make it convenient for the customers and providers to maintain the data about their customers and also the seats available at them.

This project is about creating the database for railway reservation system.
The aim is to design and develop a database maintaining the records of different trains, passengers, tracks, stations, schedule and routes.

The project also consists of station names, the tracks that connect those stations, schedules of the train and the information of the station.

1.3 PROBLEM STATEMENT

The railway network of our country is one of the most complex public establishments. You can design a database solution for this network and make the management of the same more natural. Your system should have the following pieces of information:

Station names:Tracks that connect those stations (to keep things simple, you can assume that only onetrack runs between two stations) Train IDs with names

Schedules of the trains:The train schedules should have information on the stations from where the train starts and by when it reaches the destination. It should also include information on which stations it passes through during its journey.

To keep things simple, you can assume that every train completes its journey within a day, and they run daily. However, you'll also need to store information on the sequence of the stations a train passes through. For example, if a train starts from Delhi and goes to Kolkata through Lucknow, then you'll need to add the arrival and departure times of the

train for all these stations. Keeping the stations in sequence will allow easy management of trains and their data.

Till here, the project is rather easy. You can make it more challenging by adding the passenger information of every train such as its coaches, seat numbers, types of coaches, passenger names, and so on. This project might take some time to complete, but it'll help you showcase your knowledge of database management solutions while solving a significant issue of a public authority.

Chapter 2: DEVELOPMENT TOOLS

2.1 Hardware Essentials :

- Processor: Minimum 1 GHz; Recommended 2GHz or more.
- Ethernet connection (LAN) OR a wireless adapter (Wi-Fi).
- Memory (RAM): Minimum 1 GB; Recommended 4 GB or above.

2.2 Software Essentials :

- Any Web Browser (e.g. Chrome).
- Operating system: Windows or MacOs or Linux.
- Language: SQL Language.
- Database: Access 2000.

2.3 Introduction to Development Tools :

2.3.1 SQL language :

SQL is the abbreviation of Structured Query Language, the earliest developed by IBM in 1970, after the International Organization for Standardization ISO Association adopted as an international standard, which combines data manipulation, definition, control and management functions in one, easy to learn and use.

- Advantages of SQL language:
  Non-procedural language for set manipulation.
  Integration.
  The common language of all relational databases.

2.3.2 ACCESS 2000 Database

Access is Microsoft Corporation began in 1994 published computer database management system. As a powerful MIS system development tool, it has a friendly interface, easy to learn and use, simple development, flexible interface and other characteristics, is a typical new generation of data management and information systems development tools.

Chapter 3: Implementation Details

3.1 Listing of Entities

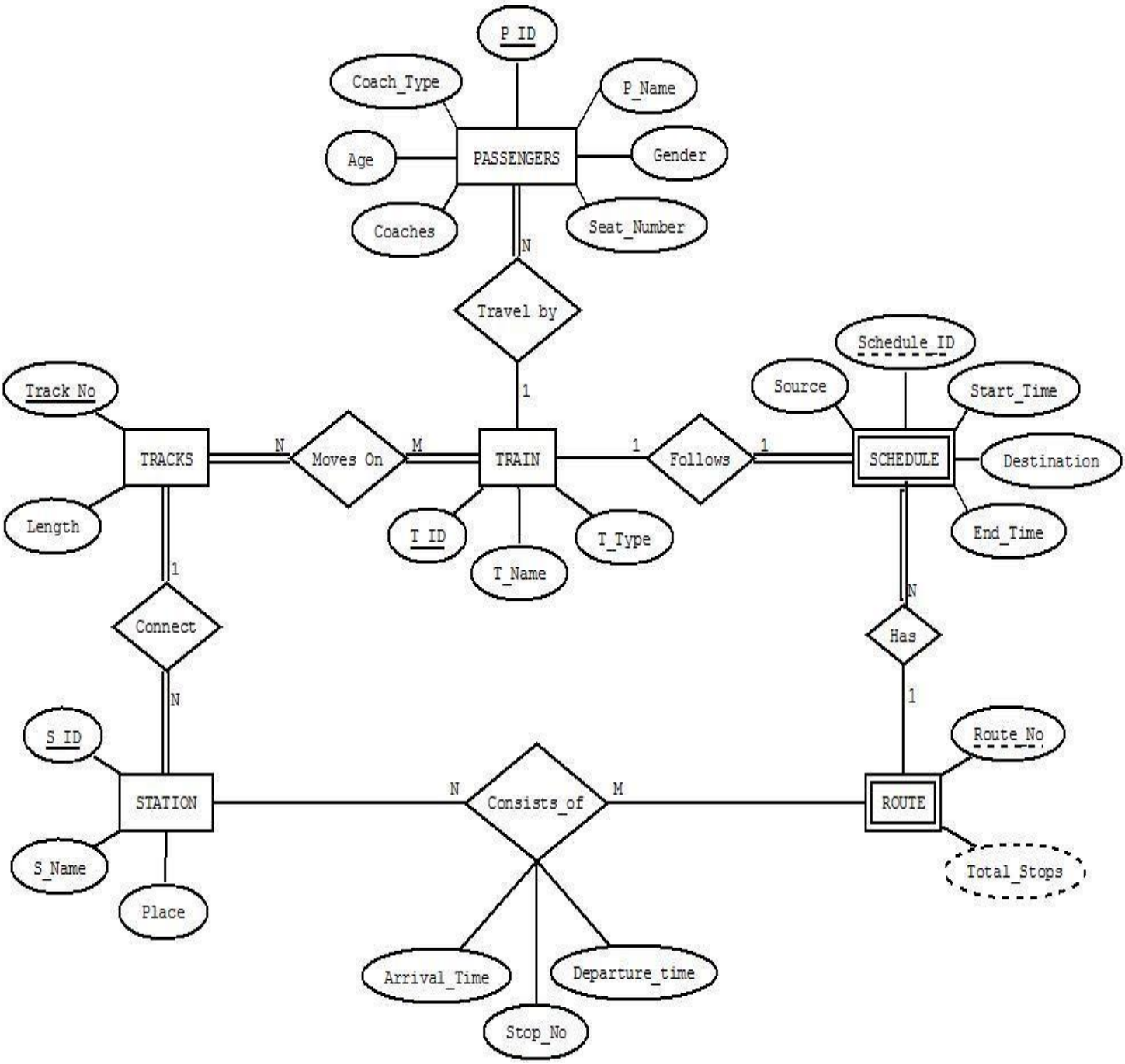
Entities, Attributes, Key Attributes:

- TRAIN (T_ID, T_Name, T_Type)
- PASSENGERS (P_ID, P_Name, Gender, Seat_Number, Coaches, Age,Coach_Type)
- TRACKS (Track_No, Length)
- STATION (S_ID, S_Name, Place)
- SCHEDULE (Schedule_ID, Start_Time, Source, End_Time, Destination)
- ROUTE (Route_no, Total_Stops)

Relationship and Cardinality Ratio

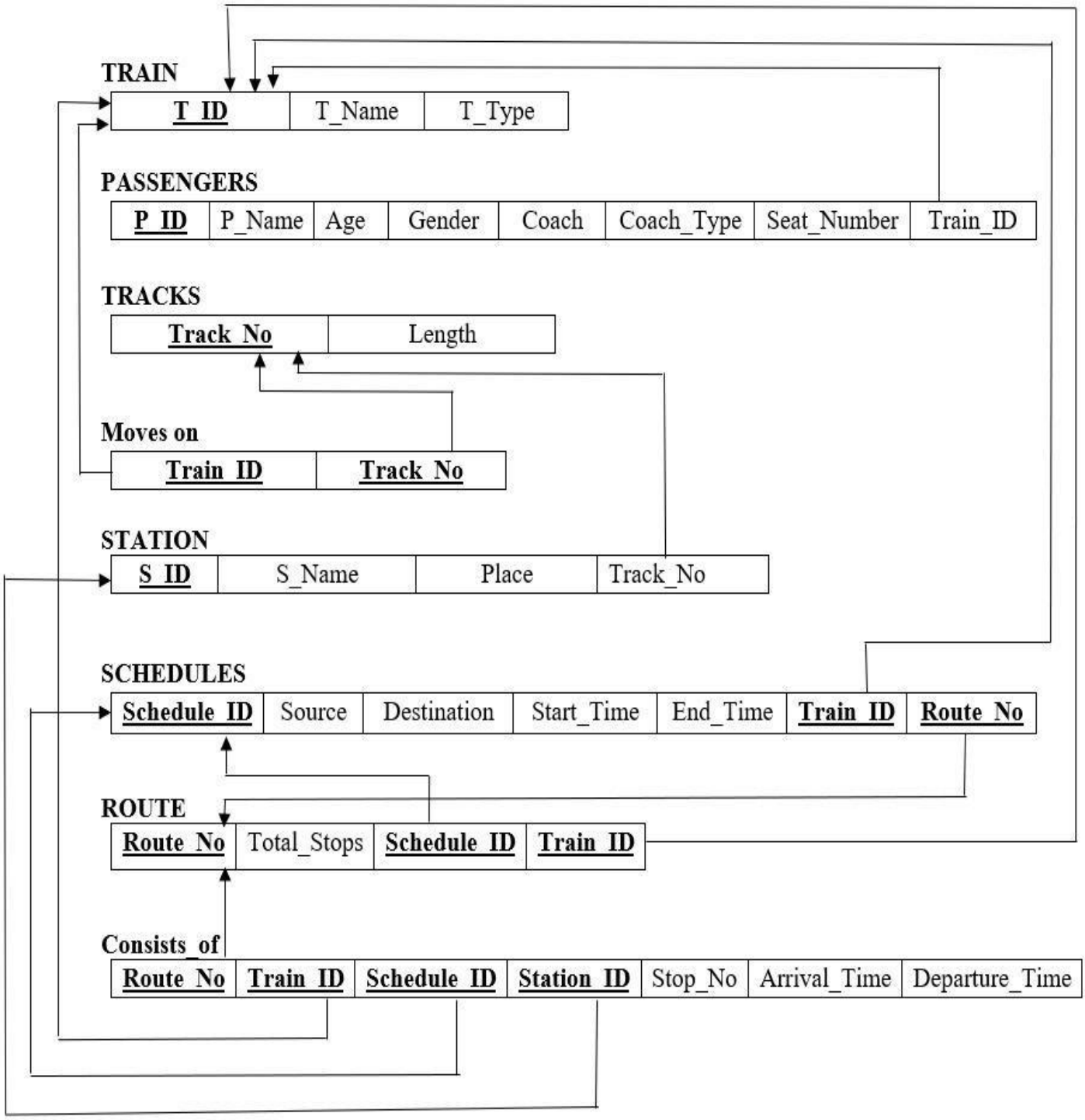
- PASSENGERS Travel by TRAIN (N:1)
- TRAIN Moves on TRACKS (M:N)
- TRACKS Connect STATION (1:N)
- TRAIN Follows SCHEDULE (1:1)
- SCHEDULE Has ROUTE (N:1)
- ROUTE Consists_of STATION (M:N)

3.2 ER Diagram:



3.3 **Schema Diagram:**

SCHEMA DIAGRAM OF RAILWAY SYSTEM



3.4 Create Table Statements and their Outputs:

1) TRAIN

```
CREATE TABLE TRAIN
(
TID INT PRIMARY KEY,
TNAME VARCHAR(20),
TTYPE VARCHAR(20)
);
```

Number of Records: 5

TID	TNAME	TTYPE
1	RAJDHANI	DIESEL TRAIN
2	ANDAMAN EXPRESS	PASSENGER TRAIN
3	BAGHMATI EXPRESS	REGIONAL TRAIN
4	RANI CHENAMMA EXPRESS	LOCOMOTIVE TRAIN
5	CHAMUNDI EXPRESS	SHORT-DISTANCE TRAIN

2) PASSENGERS

```
CREATE TABLE PASSENGERS(
PID INT PRIMARY KEY, P_NAME
VARCHAR(20),AGE INT,
GENDER VARCHAR(20), COACH
INT,
COACH_TYPE VARCHAR(20),
```

SEAT_NO VARCHAR(20),

TRAIN_ID INT,

FOREIGN KEY (TRAIN_ID) REFERENCES TRAIN(TID)

);

Number of Records: 6

PID	P_NAME	AGE	GENDER	COACH	COACH_TYPE	SEAT_NO	TRAIN_ID
200	HARSHITA	20	FEMALE	1	FIRST-CLASS	25A	1
201	TANISHKA	20	FEMALE	2	FIRST-CLASS	28C	3
202	VAISHAVI KUL	21	FEMALE	3	SUPREME-CLASS	2E	5
203	VAISHAVI BH	21	FEMALE	3	SUPREME-CLASS	6D	4
204	DEV	41	MALE	5	SECOND-CLASS	7A	6
205	NEEL	18	MALE	6	FIRST-CLASS	4C	5

3) TRACKS

CREATE TABLE TRACKS(

TRACK_NO INT PRIMARY KEY,

LENGTH VARCHAR(20)

);

Number of Records: 6

TRACK_NO	LENGTH
12	100 KMS
20	560 KMS
10	160 KMS
34	1200 KMS
53	791 KMS
61	911 KMS

4) MOVES_ON

```
CREATE TABLE MOVES_ON(
TRAIN_ID INT PRIMARY KEY,
TRACK_NO INT PRIMARY KEY,
FOREIGN KEY(TRAIN_ID) REFERENCES TRAIN(TID),
FOREIGN KEY(TRACK_NO) REFERENCES TRACKS(TRACK_NO)
);
```

Number of Records: 5

TRAIN_ID	TRACK_NO
1	53
3	34
2	61
4	10
5	20

5) STATION

```
CREATE TABLE STATION(
S_ID INT PRIMARY KEY,
S_NAME VARCHAR(20),
PLACE VARCHAR(20),
 TRACK_NO INT,
FOREIGN KEY (TRACK_NO) REFERENCES TRACKS(TRACK_NO)
);
```

Number of Records: 5

S_ID	S_NAME	PLACE	TRACK_NO
1	AGRA FORT	AGRA	10
2	BANGALORE MAJESTIC	BANGALORE	20
3	HUBBLI JUNCTION	HUBBLI	53
4	CHANDIGHAR	CHANDIGHAR ROAD	61
5	COONOOR JUNCTION	COONOOR	12

6) SCHEDULES

```
CREATE TABLE SCHEDULES(
SCHEDULES_ID INT,
SOURCE VARCHAR(20),
DESTINATION VARCHAR(20),
START_TIMEVARCHAR(20),
 END_TIME VARCHAR(20),
TRAIN_ID INT,
ROUTE_NO INT,
PRIMARY KEY(SCHEDULES_ID,TRAIN_ID,ROUTE_NO), FOREIGN
KEY(TRAIN_ID) REFERENCES TRAIN(TID), FOREIGN KEY(ROUTE_NO)
REFERENCES ROUTE(ROUTE_NO)
);
```

Number of Records: 7

SCHEDULES_ID	SOURCE	DESTINATION	START_TIME	END_TIME	TRAIN_ID	ROUTE_NO
1	BELGAUM	GOA	12PM	1:30PM	2	13
2	BANGALORE	CHANDIGHAR	1AM	12:30PM	3	8
3	DELHI	CHANDIGHAR	1AM	2:30AM	4	25
4	HUBBLI	BANGALORE	3PM	1AM	5	19
5	BELGAUM	MUMBAI	9PM	6AM	13	92
6	PUNE	BELGAUM	2PM	9PM	12	45
7	PUNE	MUMBAI	12PM	2PM	41	61

7) ROUTE

```
CREATE TABLE ROUTE(
ROUTE_NO INT,
TOTAL_STOPS INT,
SCHEDULE_ID INT,
TRAIN_ID INT,
PRIMARY KEY(ROUTE_NO,SCHEDULE_ID,TRAIN_ID),
FOREIGN KEY(SCHEDULE_ID) REFERENCES SCHEDULES(SCHEDULE_ID),
FOREIGN KEY(TRAIN_ID) REFERENCES TRAIN(TID)
);
```

Number of Records: 4

ROUTE_NO	TOTAL_STOPS	SCHEDULE_ID	TRAIN_ID
13	2	1	2
25	4	3	4
61	0	7	41
8	6	2	3

8) CONSISTS_OF

```
CREATE TABLE CONSISTS_OF(
ROUTE_NO INT,
TRAIN_ID INT,
SCHEDULE_ID INT,
```

```
STATION_ID INT,
STOP_NO INT,
ARRIVAL_TIMEVARCHAR(20),
DEPARTURE_TIMEVARCHAR(20),
PRIMARY KEY(ROUTE_NO,TRAIN_ID,SCHEDULE_ID,STATION_ID),
FOREIGN KEY(ROUTE_NO) REFERENCES ROUTE(ROUTE_NO),
FOREIGN KEY(TRAIN_ID) REFERENCES TRAIN(TID),
FOREIGN KEY(SCHEDULE_ID) REFERENCES SCHEDULES(SCHEDULE_ID),
FOREIGN KEY(STATION_ID) REFERENCES STATION(S_ID)
);
```

Number of Records: 5

ROUTE_NO	TRAIN_ID	SCHEDULE_ID	STATION_ID	STOP_NO	ARRIVAL_TIME	DEPARTURE_TIME
13	2	1	2	3	12PM	9AM
25	4	2	4	1	1AM	6PM
92	13	5	1	3	9AM	5PM
8	3	2	4	2	6PM	1AM
45	12	6	3	1	1PM	9AM

CHAPTER 4: RESULT & CONCLUSION

4.1 Result & Conclusion:

In our project railway system we have all the information saved regarding the train, passengers, tracks, where and how The Train moves, station, schedules, routes and what it consists of. We had considered the most important requirements only many more features and details can be added to our project in order to obtain even more user-friendly applications .These applications are already in progress and in future they can be upgraded and may become part of Amazing Technology.

References:

1. Fundamentals_of_Database_Systems.
2. w3schools.com/sql/sql_create_db.asp
3. SQL Tryit Editor v1.6
4. https://www.w3schools.com/sql/trysql.asp?filename=trysql_op_in