BTech/II Year CSE/III Semester

19CSE202/Database Management Systems

Case Study Report

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Chapter 1

ACKNOWLEDGEMENT

This project has been possible due to the sincere and dedicated efforts of many. First of all, we would like to thank the dean of our college for giving us the opportunity to get involved in a project and express our skill. We thank our “Data Base Management Systems (DBMS)” faculty, assistant professor Mr. Chakravartula Raghavachari for his guidance and support without which this project would have been impossible. Last but not least; we thank our parents and our classmates who encouraged us throughout the project.

Introduction

Road accidents are an unfortunate reality of our lives. The daily news report always contains at least a couple of accidents that cover up the front page. Over time, there has been an increase in alcohol and drug use which has aggravated the current situation.

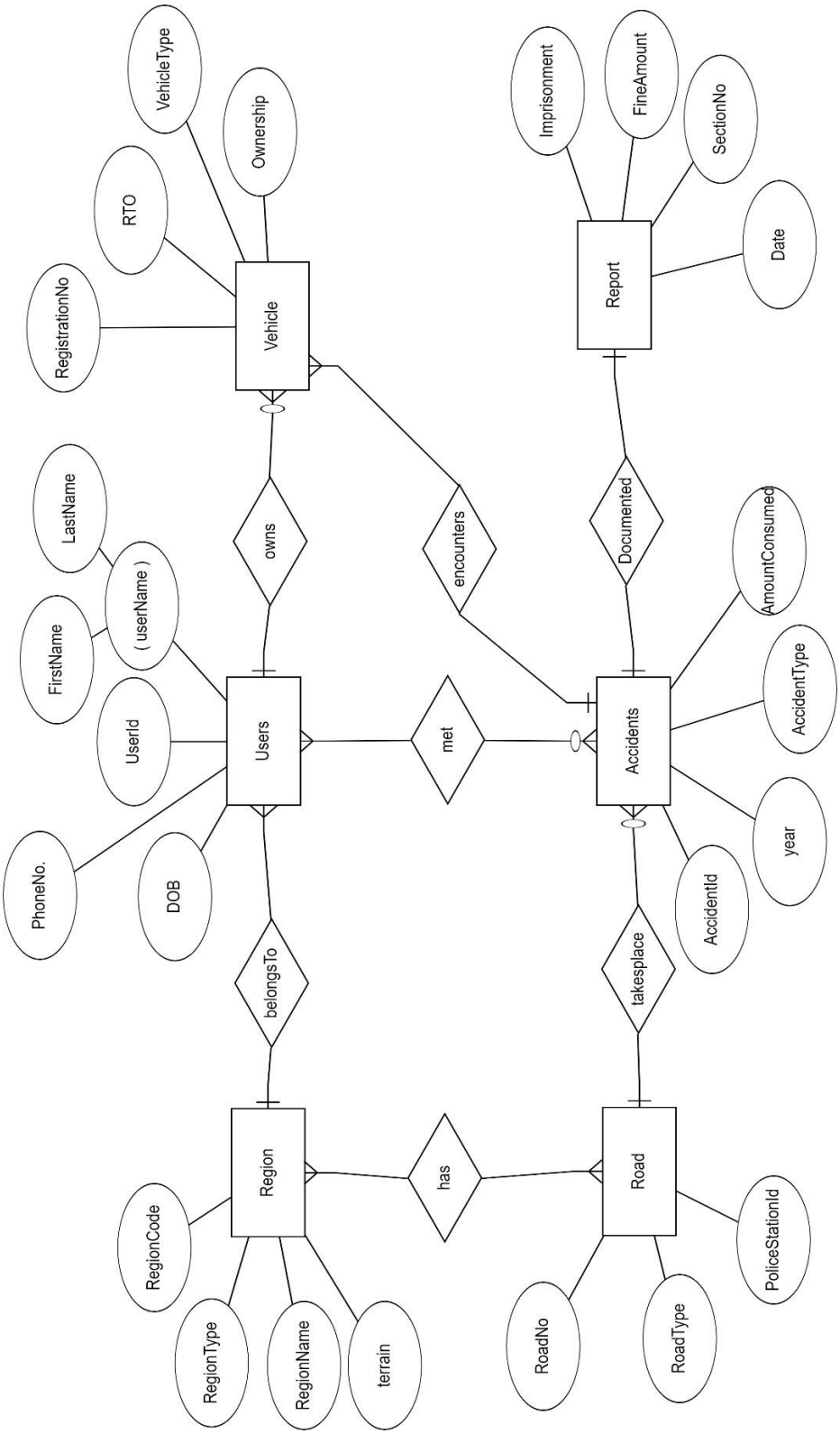
The purpose of our project is to keep track and provide information regarding these accidents.

Chapter 2 Logical Database Design ER Diagram

Entities:

1. Vehicle
    a. Registration
    b. RTO
    c. VehicleType
    d. Ownership
2. Accidents
    a. AccidentID
    b. Year
    c. AccidentType
    d. AmountConsumed
    e. NoOfInjuries
3. Users
    a. UserID
    b. UserName
        i. FirstName
        ii. LastName
    c. DOB
    d. PhoneNo
4. Roads
    a. RoadNo
    b. PoliceStationId
    c. RoadType
5. Region
    a. RegionCode
    b. RegionName
    c. RegionType
    d. Terrain
6. Penance
    a. SectionNo
    b. FineAmount
    c. Imprisonment

Chapter 3 ER to Relational Schema Mapping



Normalization

R{userId(A), name(B), DOB(D), phoneNo(E), regNo(F), RTO(G), vehicleType(H), ownership(I), regionCode(J), regionName(K), regionType(L), terrain(M), roadNo(N), policeStationId(O), roadType(P), accidentId(Q), year(R), accidentType(S), amountConsumed(T), numberOfInjured(U), sectionNo(V), fineAmount(W), imprisonment(Y) }

NORMALISING TO 1NF :

Here in our table we have one composite attribute that is name which can have last name and first name so its not in 1NF because its not flat so we decompose table into below one

R{userId(A), firstname(B), lastname(c) DOB(D), phoneNo(E), regNo(F), RTO(G), vehicleType(H), ownership(I), regionCode(J), regionName(K), regionType(L), terrain(M), roadNo(N), policeStationId(O), roadType(P), accidentId(Q), year(R), accidentType(S), amountConsumed(T), numberOfInjured(U), sectionNo(V), fineAmount(W), imprisonment(Y) }

ORIGINAL TABLE :

Table Creation:

```
create table road_accidents(USERID int primary key,FIRSTNAME varchar(20),LASTNAME varchar(20),DOB datetime,PHONENUMBER bigint,

REGNO int,RTO varchar(20),VEHICLE_TYPE varchar(20),OWNERSHIP varchar(20),

REGION_CODE int,REGION_NAME varchar(20),REGION_TYPE varchar(20),TERRAIN varchar(20),

ROAD_NO int,POLICE_STATIONID varchar(20),ROAD_TYPE varchar(20),

ACCIDENT_ID int,YEAR int,ACCIDENT_TYPE varchar(20),AMOUNT_CONSUMED int,NUMBER_OF_INJURED int,

SECTION_NO int,FINE_AMOUNT  varchar(50),IMPRISONMENT int);
```

Insert Queries:

```
INSERT INTO road_accidents VALUES ('1', 'ganesh', 'k', '17.08.2004', '9790171847', '4508', '4356', 'four wheeler', 'ganesh', '11', 'chennai', 'urban', 'flat', '001', '07', 'national highway', '101', '2021', 'drug', '500', '5', '305', '5000', '2');
```

INSERT INTO road_accidents VALUES ('2', 'sanjay', 'b', '19.05.2001', '2476125417', '7609', '3366', 'four wheeler', 'balamurugan', '12', 'palakad', 'rural', 'rough', '002', '08', 'state highway', '102', '2022', 'alcohol', '250', '4', '306', '6000', '2');

INSERT INTO road_accidents VALUES ('3', 'shreyas', 'v', '18.09.2005', '1567545376', '5634', '3366', 'two wheeler', 'shreyas', '12', 'palakad', 'rural', 'rough', '003', '08', 'national highway', '103', '2021', 'alcohol', '250', '3', '307', '6000', '1');

INSERT INTO road_accidents VALUES ('4', 'akhila', 'p', '26.11.2003', '1265761246', '7346', '4142', 'two wheeler', 'akhila', '14', 'ooty', 'urban', 'mountain', '004', '09', 'other roads', '104', '2022', 'drug', '500', '4', '308', '7000', '3');

INSERT INTO road_accidentsVALUES ('5', 'ram', 'n', '12.12.2003', '1245245626', '3412', '4356', 'four wheeler', 'naresh', '11', 'chennai', 'urban', 'flat', '005', '10', 'national highway', '105', '2020', 'drug', '100', '5', '309', '8000', '1');

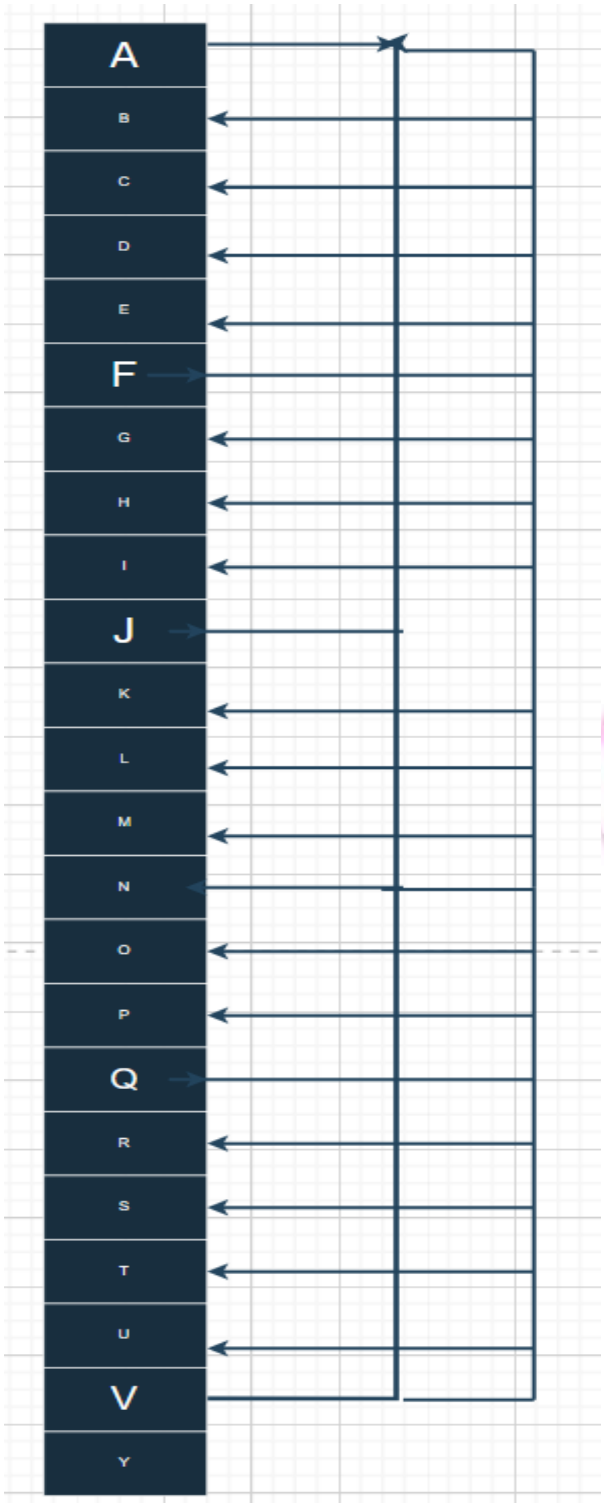
INSERT INTO road_accidents VALUES ('6', 'aravindh', 'b', '13.04.2004', '4567465488', '3254', '4142', 'two wheeler', 'aravindh', '14', 'ooty', 'urban', 'mountain', '006', '09', 'other roads', '106', '2022', 'alcohol', '900', '2', '310', '5000', '2');

USERID	FIRSTNAME	LASTNAME	DOB	PHONENUMBER	REGNO	RTO	VEHICLE_TYPE	OWNERSHIP	REGION_CODE	REGION_NAME	REGION_TYPE	TERRAIN	ROAD_NO	POLICE_STATIONID	ROAD_TYPE	ACCIDENT_ID	YEAR	ACCIDENT_TYPE	AMOUNT_CONSUMED	NUMBER_OF_INJURED	SECTION_NO	FINE_AMOUNT	IMPRISONMENT
1	ganesh	k	201...	9790173647	4508	4356	four wheeler	ganesh	11	chennai	urban	flat	1	07	national hig...	101	2021	drug	500	5	305	5000	2
2	sanjay	b	201...	2476125417	7609	3366	four wheeler	balamurugan	12	palakad	rural	rough	2	08	state highway	102	2022	alcohol	250	4	306	6000	2
3	shreyas	v	201...	1567545376	5634	3366	two wheeler	shreyas	12	palakad	rural	rough	3	08	national hig...	103	2021	alcohol	250	3	307	6000	1
4	akhila	p	202...	1265761246	7346	4142	two wheeler	akhila	14	ooty	urban	mountain	4	09	other roads	104	2022	drug	500	4	308	7000	3
5	ram	n	201...	1245245626	3412	4356	four wheeler	naresh	11	chennai	urban	flat	5	10	national hig...	105	2020	drug	100	5	309	8000	1
6	aravindh	b	201...	4567465488	3254	4142	two wheeler	aravindh	14	ooty	urban	mountain	6	09	other roads	106	2022	alcohol	900	2	310	5000	2

Attribute Closure:

1. $A^+ = \{A,B,C,D,E\}$
2. $B^+ = \{B\}$
3. $C^+ = \{C\}$
4. $D^+ = \{D\}$
5. $E^+ = \{E\}$
6. $F^+ = \{F,G,H,I\}$
7. $G^+ = \{G\}$
8. $H^+ = \{H\}$
9. $I^+ = \{I\}$
10. $J^+ = \{J,K,L,M\}$
11. $K^+ = \{K\}$
12. $L^+ = \{L\}$
13. $M^+ = \{M\}$
14. $N^+ = \{N,O,P\}$
15. $O^+ = \{O\}$
16. $P^+ = \{P\}$
17. $Q^+ = \{Q,R,S,T,U\}$
18. $R^+ = \{R\}$
19. $S^+ = \{S\}$
20. $T^+ = \{T\}$
21. $U^+ = \{U\}$
22. $V^+ = \{V,W,Y\}$
23. $W^+ = \{W\}$
24. $Y^+ = \{Y\}$

Dependency Diagram



Canonical Cover:

A→E

A→B

A→D

A→C

F→G

F→H

F→I

J→K

J→L

J→M

N→O

N→P

Q→R

Q→S

Q→T

Q→U

V→W

V→Y

The candidate key is:

AFJNQV

Prime Attributes: { A,F,J,N,Q,V }

A→E

A→B

A→D

A→C

F→G

F→H

F→I

J→K

J→L

J→M

N→O

N→P

Q→R

Q→S

Q→T

Q→U

V→W

V→Y

Normalising to 2NF:

R_1(QRSTU)

Q→RSTU

R_2(ABCDE)

A→BCDE

R_3(FGHI)

F→GHI

R_4(JKLM)

J→KLM

R_5(NOP)

N→OP

R_6(VWY)

V→WY

R_7(AFJNQV)

Normalizing to 3NF:

Here the table is already in 3NF so tables will remain same

AEDCB

A→ B C D E

FIHG

F →I H G

JLKM

J → K L M

NPO

N → P O

QUTSR

Q → U T S R

VYW

V → YW

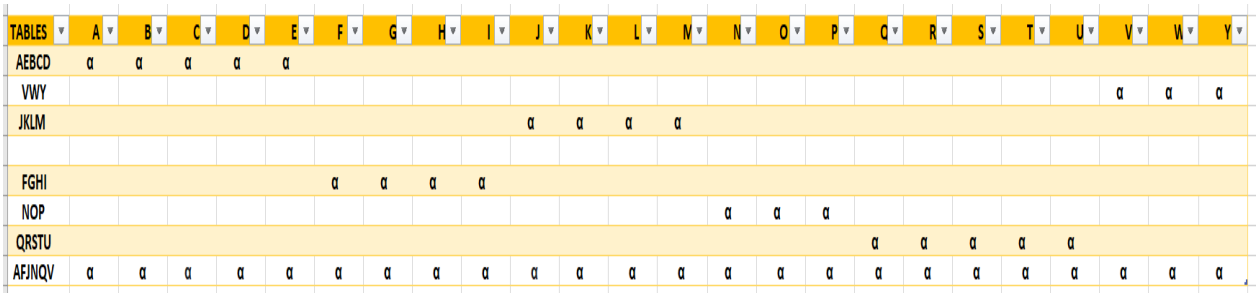
AFJNQV

It is also in BCNF as all the LHS attributes are super key

DECOMPOSION :

FINDING IF IT IS **LOSSLESS** :

Since we get the entire last row . The decomposition is lossless.



TABLES	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y
AEBCD	α	α	α	α	α																			
VWY																						α	α	α
JKLM										α	α	α	α											
FGHI						α	α	α	α															
NOP														α	α	α								
QRSTU																	α	α	α	α	α			
AFJNQV	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α

The table that we decomposed is lossless, attribute preserving and functional dependency preserving and is in BCNF.

Chapter 4 Create tables and Insert values

create table user(USERID int primary key,FIRSTNAME varchar(20),LASTNAME varchar(20),DOB datetime,PHONENUMBER bigint,

INSERT INTO `proj`.`user` (`USERID`, `FIRSTNAME`, `LASTNAME`, `DOB`, `PHONENUMBER`) VALUES ('1', 'ganesh', 'k', '01.01.2001', '9790171847');

INSERT INTO `proj`.`user` (`USERID`, `FIRSTNAME`, `LASTNAME`, `DOB`, `PHONENUMBER`) VALUES ('2', 'sanjay', 'b', '02.02.2002', '2476125417');

INSERT INTO `proj`.`user` (`USERID`, `FIRSTNAME`, `LASTNAME`, `DOB`, `PHONENUMBER`) VALUES ('3', 'shreyas', 'v', '03.03.2003', '1567545376');

INSERT INTO `proj`.`user` (`USERID`, `FIRSTNAME`, `LASTNAME`, `DOB`, `PHONENUMBER`) VALUES ('4', 'akhila', 'p', '04.04.2004', '1265761246');

INSERT INTO `proj`.`user` (`USERID`, `FIRSTNAME`, `LASTNAME`, `DOB`, `PHONENUMBER`) VALUES ('5', 'ram', 'n', '05.05.2005', '1245245626');

INSERT INTO `proj`.`user` (`USERID`, `FIRSTNAME`, `LASTNAME`, `DOB`, `PHONENUMBER`) VALUES ('6', 'aravindh', 'b', '06.06.2006', '4567465488');

USERID	FIRSTNAME	LASTNAME	DOB	PHONENUMBER
1	ganesh	k	2001-01-20 01:00:00	9790171847
2	sanjay	b	2002-02-20 02:00:00	2476125417
3	shreyas	v	2003-03-20 03:00:00	1567545376
4	akhila	p	2004-04-20 04:00:00	1265761246
5	ram	n	2005-05-20 05:00:00	1245245626
6	aravindh	b	2006-06-20 06:00:00	4567465488

Create table Accidents (ACCIDENTID primary key , YEAR int , accidenttype varchar(20) , AMOUNTCONSUMED int , NOOFINJURIES int);

INSERT INTO `proj`.`accident` (`ACCIDENT_ID`, `YEAR`, `ACCIDENT_TYPE`, `AMOUNT_CONSUMED`, `NUMBER_OF_INJURED`) VALUES ('101', '2021', 'drug', '500', '5');

INSERT INTO `proj`.`accident` (`ACCIDENT_ID`, `YEAR`, `ACCIDENT_TYPE`, `AMOUNT_CONSUMED`, `NUMBER_OF_INJURED`) VALUES ('102', '2022', 'alcohol', '250', '4');

INSERT INTO `proj`.`accident` (`ACCIDENT_ID`, `YEAR`, `ACCIDENT_TYPE`, `AMOUNT_CONSUMED`, `NUMBER_OF_INJURED`) VALUES ('103', '2021', 'alcohol', '250', '3');

INSERT INTO `proj`.`accident` (`ACCIDENT_ID`, `YEAR`, `ACCIDENT_TYPE`, `AMOUNT_CONSUMED`, `NUMBER_OF_INJURED`) VALUES ('104', '2022', 'drug', '500', '4');

INSERT INTO `proj`.`accident` (`ACCIDENT_ID`, `YEAR`, `ACCIDENT_TYPE`, `AMOUNT_CONSUMED`, `NUMBER_OF_INJURED`) VALUES ('105', '2020', 'drug', '100', '5');

INSERT INTO `proj`.`accident` (`ACCIDENT_ID`, `YEAR`, `ACCIDENT_TYPE`, `AMOUNT_CONSUMED`, `NUMBER_OF_INJURED`) VALUES ('106', '2022', 'alcohol', '900', '2');

ACCIDENT_ID	YEAR	ACCIDENT_TYPE	AMOUNT_CONSUMED	NUMBER_OF_INJURED
101	2021	drug	500	5
102	2022	alcohol	250	4
103	2021	alcohol	250	3
104	2022	drug	500	4
105	2020	drug	100	5
106	2022	alcohol	900	2

Create table roads (ROAD_NO int primary key, `POLICE_STATIONID`int, `ROAD_TYPE varchar(20);))

INSERT INTO `proj`.`road` (`ROAD_NO`, `POLICE_STATIONID`, `ROAD_TYPE`) VALUES ('1', '07', 'national highway');

INSERT INTO `proj`.`road` (`ROAD_NO`, `POLICE_STATIONID`, `ROAD_TYPE`) VALUES ('2', '08', 'state highway');

INSERT INTO `proj`.`road` (`ROAD_NO`, `POLICE_STATIONID`, `ROAD_TYPE`) VALUES ('3', '08', 'national highway');

INSERT INTO `proj`.`road` (`ROAD_NO`, `POLICE_STATIONID`, `ROAD_TYPE`) VALUES ('4', '09', 'other roads');

INSERT INTO `proj`.`road` (`ROAD_NO`, `POLICE_STATIONID`, `ROAD_TYPE`) VALUES ('5', '10', 'national highway');

INSERT INTO `proj`.`road` (`ROAD_NO`, `POLICE_STATIONID`, `ROAD_TYPE`) VALUES ('6', '09', 'other roads');

ROAD_NO	POLICE_STATIONID	ROAD_TYPE
1	07	national hig...
2	08	state highway
3	08	national hig...
4	09	other roads
5	10	national hig...
6	09	other roads

CREATE TABLE VEHICLE (REGNO` INT PRIMARY KEY, `RTO`VARCHAR(20), `VEHICLE_TYPE`VARCHAR(20), `OWNERSHIP`VARCHAR(20));

INSERT INTO `proj`.`vehicle` (`REGNO`, `RTO`, `VEHICLE_TYPE`, `OWNERSHIP`) VALUES ('4508', '4356', 'four wheeler', 'ganesh');

INSERT INTO `proj`.`vehicle` (`REGNO`, `RTO`, `VEHICLE_TYPE`, `OWNERSHIP`) VALUES ('7609', '3366', 'four wheeler', 'balamurugan');

INSERT INTO `proj`.`vehicle` (`REGNO`, `RTO`, `VEHICLE_TYPE`, `OWNERSHIP`) VALUES ('5634', '3366', 'two wheeler', 'shreyas');

INSERT INTO `proj`.`vehicle` (`REGNO`, `RTO`, `VEHICLE_TYPE`, `OWNERSHIP`) VALUES ('7346', '4142', 'two wheeler', 'akhila');

INSERT INTO `proj`.`vehicle` (`REGNO`, `RTO`, `VEHICLE_TYPE`, `OWNERSHIP`) VALUES ('3412', '4356', 'four wheeler', 'naresh');

INSERT INTO `proj`.`vehicle` (`REGNO`, `RTO`, `VEHICLE_TYPE`, `OWNERSHIP`) VALUES ('3254', '4142', 'two wheeler', 'aravindh');

REGNO	RTO	VEHICLE_TYPE	OWNERSHIP
3254	4142	two wheeler	aravindh
3412	4356	four wheeler	naresh
4508	4356	four wheeler	ganesh
5634	3366	two wheeler	shreyas
7346	4142	two wheeler	akhila
7609	3366	four wheeler	balamurugan

CREATE TABLE REGION (REGION_CODE`INT PRIMARY KEY, `REGION_NAME VARCHAR(20)`, `REGION_TYPE`VARCHAR(20), `TERRAIN VARCHAR(20)

INSERT INTO `proj`.`region` (`REGION_CODE`, `REGION_NAME`, `REGION_TYPE`, `TERRAIN`) VALUES ('11', 'chennai', 'urban', 'flat');

INSERT INTO `proj`.`region` (`REGION_CODE`, `REGION_NAME`, `REGION_TYPE`, `TERRAIN`) VALUES ('12', 'palakad', 'rural', 'rough');

INSERT INTO `proj`.`region` (`REGION_CODE`, `REGION_NAME`, `REGION_TYPE`, `TERRAIN`) VALUES ('14', 'ooty', 'urban', 'mountain');

REGION_CODE	REGION_NAME	REGION_TYPE	TERRAIN
11	chennai	urban	flat
12	palakad	rural	rough
14	ooty	urban	mountain

CREATE TABLE PENANCE (SECTIOID INT PRIMARY KEY , FINEAMOUNT INT , IMPRISONMENT VARCHAR(20));

INSERT INTO `proj`.`penance` (`SECTION_NO`, `FINE_AMOUNT`, `IMPRISONMENT`) VALUES ('305', '5000', '2');

INSERT INTO `proj`.`penance` (`SECTION_NO`, `FINE_AMOUNT`, `IMPRISONMENT`) VALUES ('306', '6000', '2');

INSERT INTO `proj`.`penance` (`SECTION_NO`, `FINE_AMOUNT`, `IMPRISONMENT`) VALUES ('307', '6000', '1');

INSERT INTO `proj`.`penance` (`SECTION_NO`, `FINE_AMOUNT`, `IMPRISONMENT`) VALUES ('308', '7000', '3');

INSERT INTO `proj`.`penance` (`SECTION_NO`, `FINE_AMOUNT`, `IMPRISONMENT`) VALUES ('309', '8000', '1');

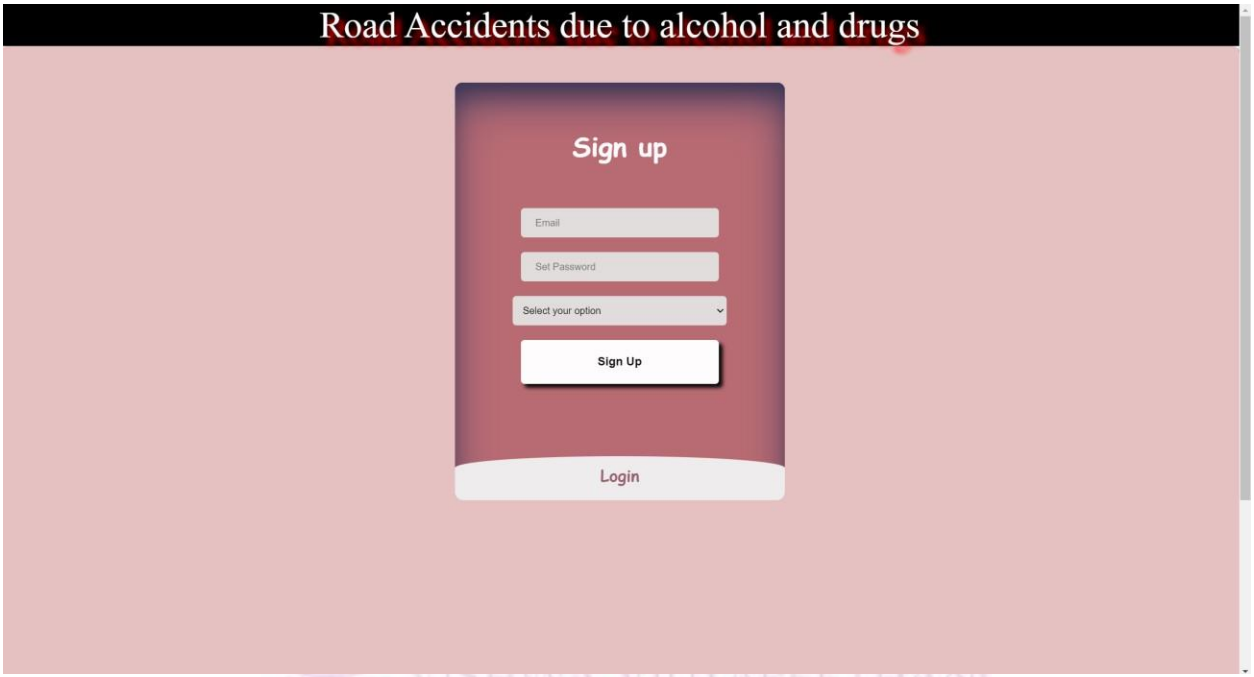
INSERT INTO `proj`.`penance` (`SECTION_NO`, `FINE_AMOUNT`, `IMPRISONMENT`) VALUES ('310', '5000', '2');

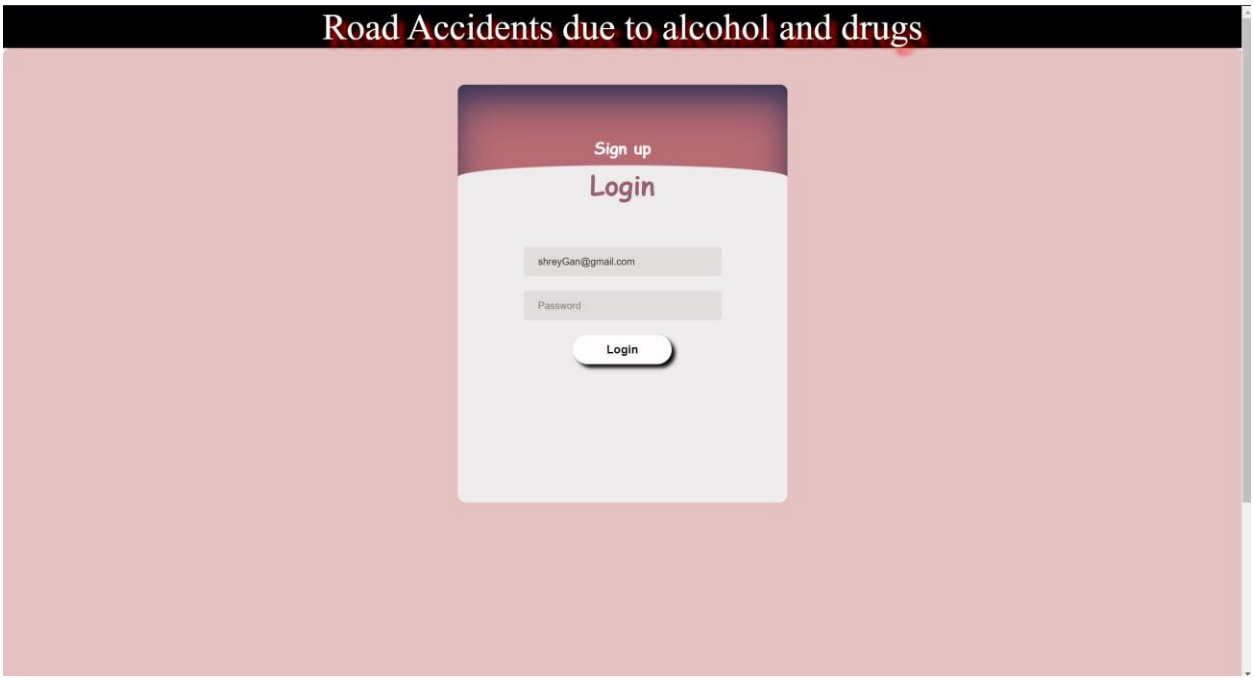
SECTION_NO	FINE_AMOUNT	IMPRISONMENT
305	5000	2
306	6000	2
307	6000	1
308	7000	3
309	8000	1
310	5000	2

Chapter 5 User Interface design

USER:

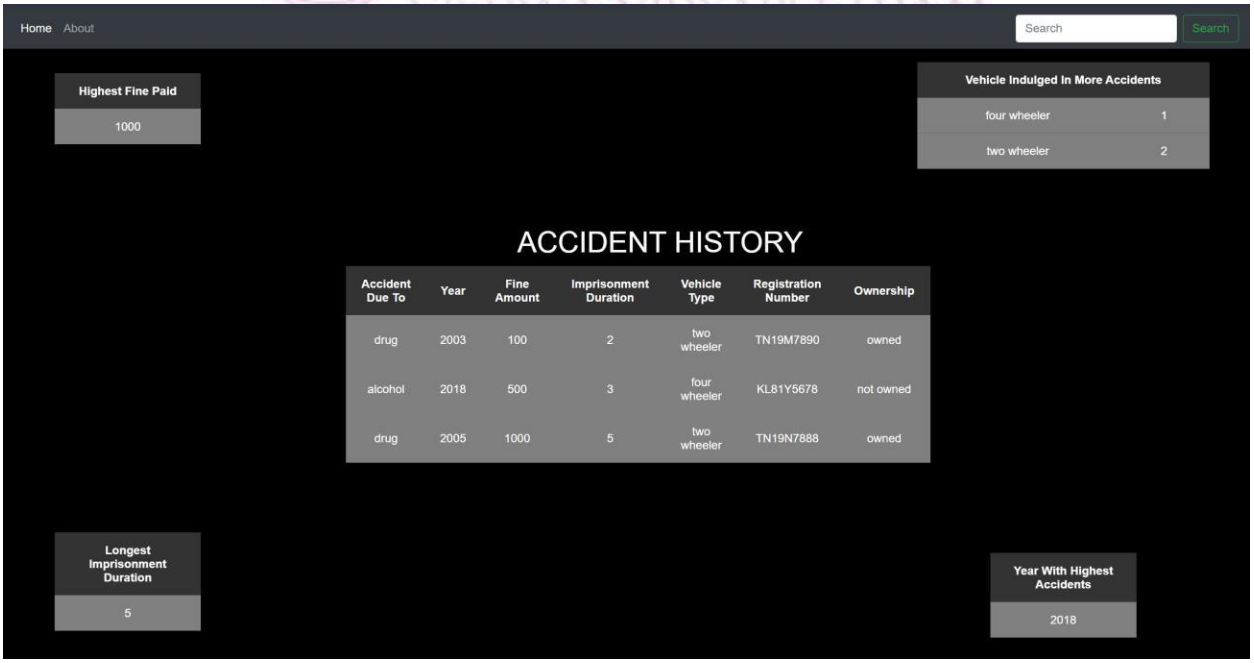
LOGIN / SIGN UP PAGE:





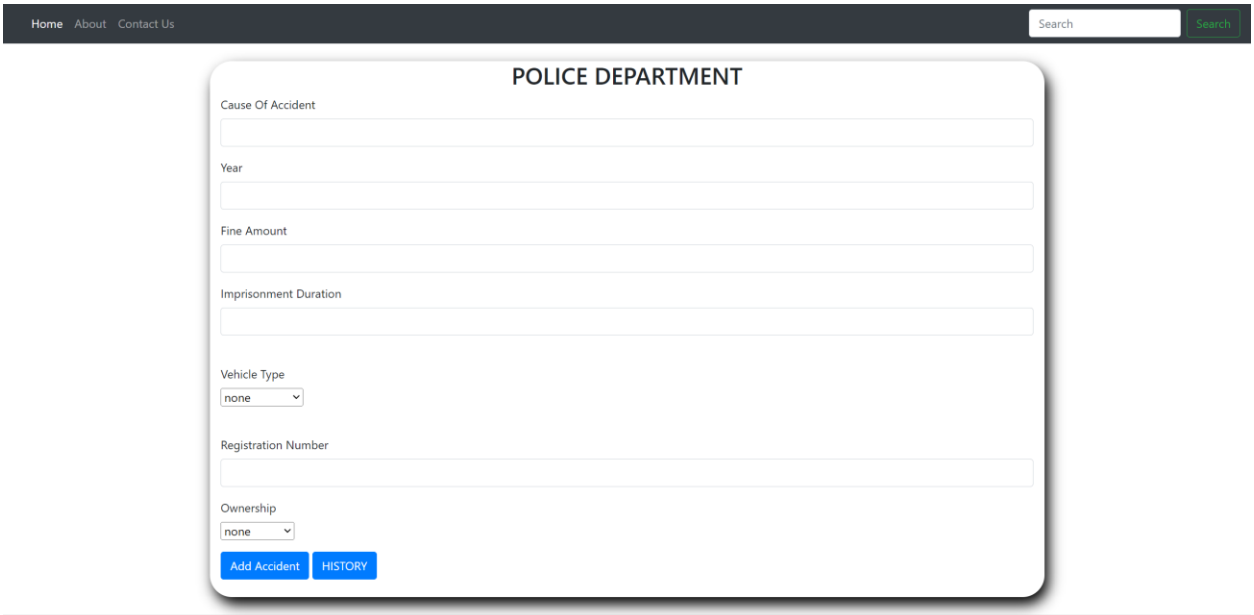
USER INNER SCREEN:

VIEW:

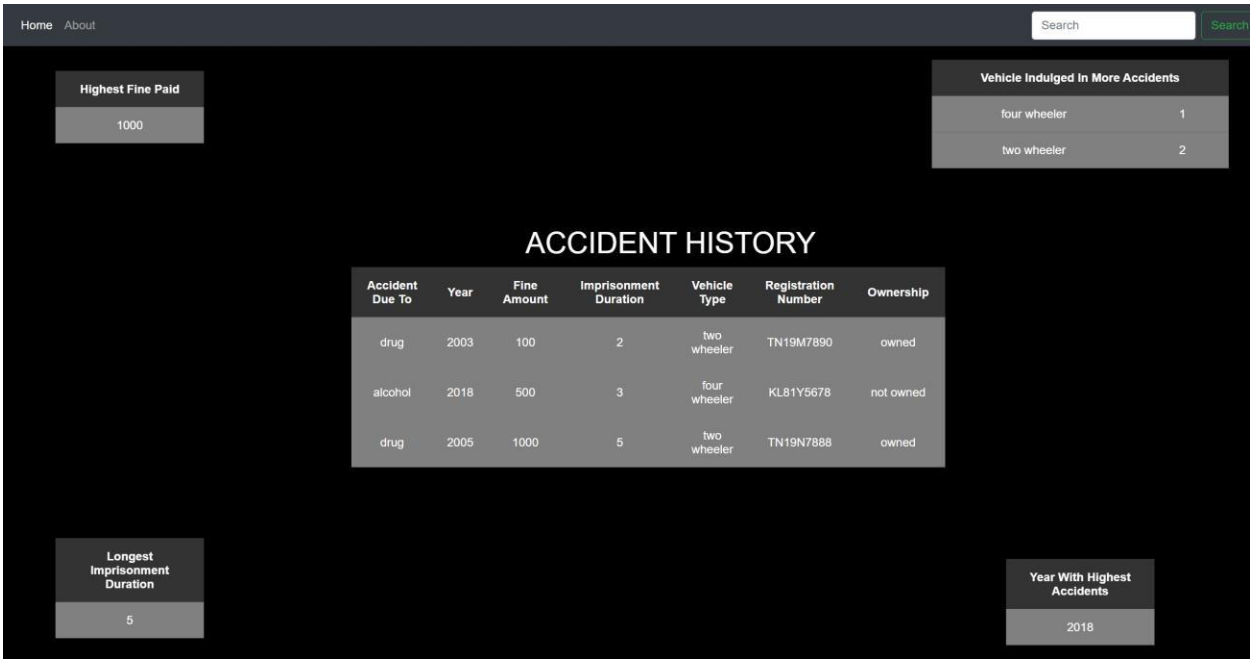


SEARCH:

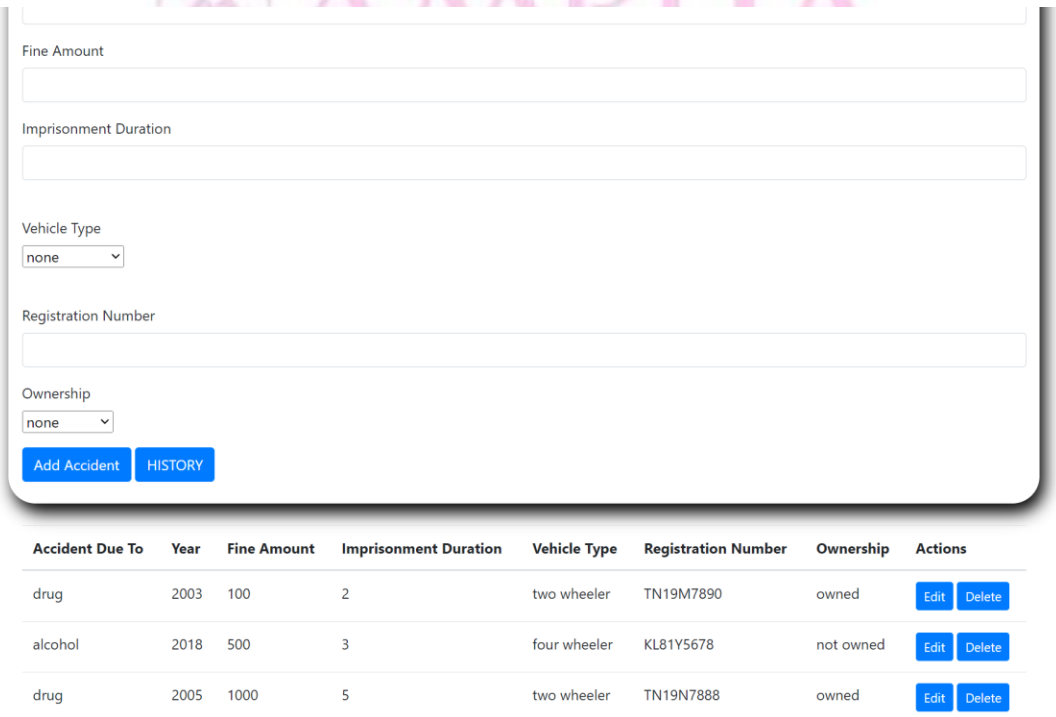
POLICE:



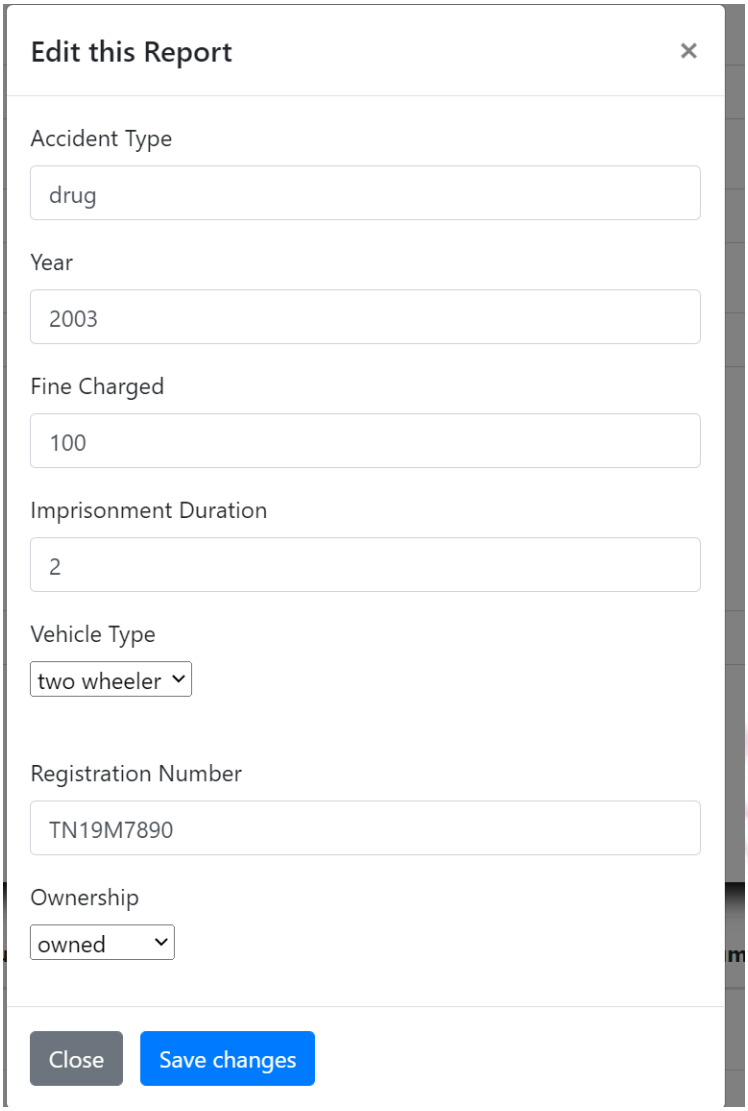
THE HISTORY BUTTONS LEADS TO AGAIN HISTORY.PHP



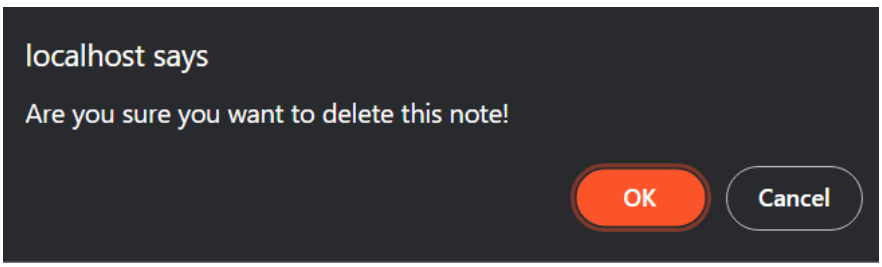
ADMINISTRATOR:



EDITING:



If delete is prompted, then



Chapter 6 Database Connectivity using PHP

A popular general-purpose open-source scripting language that is particularly well suited for web development is PHP (Hypertext Preprocessor). It was developed in 1993 by Danish-Canadian programmer Rasmus Lerdorf and released in 1995. It is a form of server-side programming that is typically utilized with HTML (client-side programming language). Front-end development, which arranges the website's content, use HTML. It is a well-liked all-purpose scripting language that is particularly appropriate for web development. Many well-known websites throughout the world are powered by PHP, which is quick, adaptable, and practical. They include Wikipedia, Facebook, and many more things.

Since PHP is a simple language to learn and has many useful features, we have chosen to use it for our backend. We are using XAMPP to run phpMyAdmin for our project.

ACCIDENT TABLE:

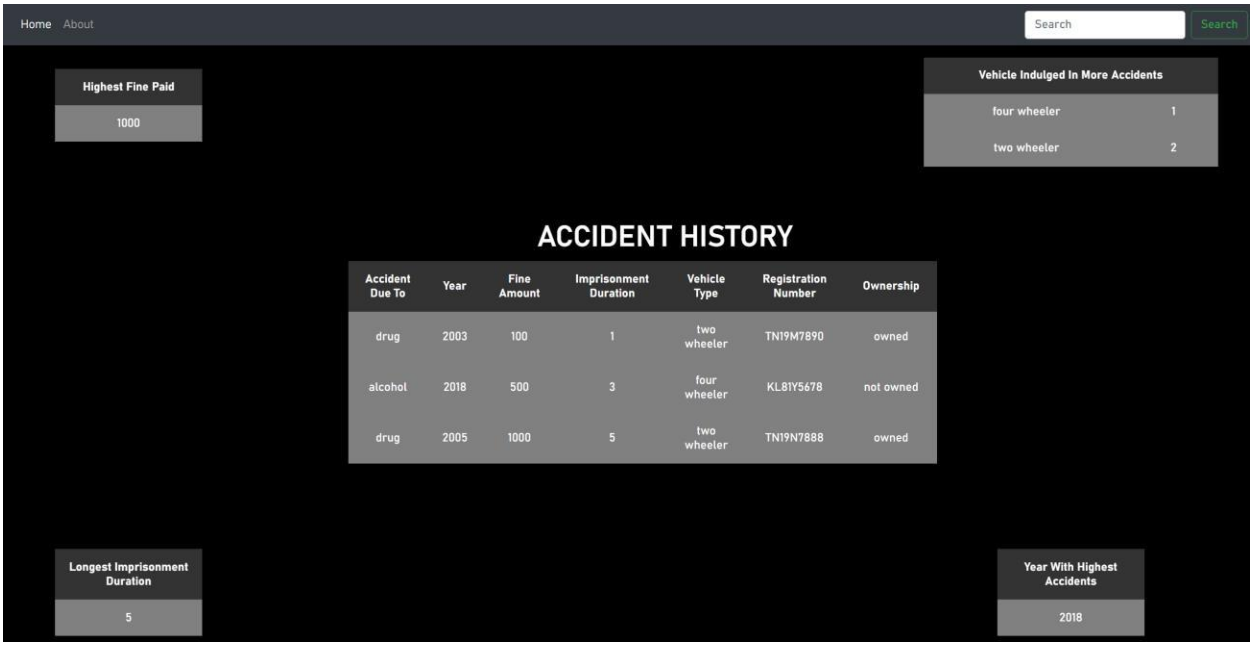
Chapter 7 Analysis of Data and Reports generated.

Our project demonstrated the successful working of a front-end and back-end interface. The tables under use were login, accident table and vehicle table. At first when a person enters to our website, he/she is directed straight to our login and sign-up page. We have categorized the users into – User(can only view), Police(can only add and update accident records), Administrator (has the complete authority to add, view as well as delete records).

This validation of user is being done by the login table, which has email, password and user type as its attributes. Now, let us connect the dots – Two users cannot have the same email identity or what if the password is incorrect? Don't worry, we have validated that too. We now have 3 screens to choose when a person logs in.

If he/she is police, we direct the person to the add record page, and can also view the past accident records that had been recorded under the history, which navigates to another screen when tapped. If admin, you now have the privilege to delete records. If you are only here to use it and not make any changes, then u will see two options after your login screen – Search & View. The view button now navigates you to the history page of the police tab, which again shows the past accidents. Search button leads you to another screen of content, where you can now perform search operations and sort by order operations.

The actual content comes to play when you click on the view button. The main table that you will see is an inner joined table version of accident table and vehicle table. In this way, you don't have to scroll through multiple tables to match the records.



This window not only has the table, but also the extra functionalities required by the user to see the records without any hustle. The above functionalities include:

- **Searching**

- **Highest Fine Paid**

Highest Fine Paid
1000

- **Vehicle Indulged in More Accidents**

Vehicle Indulged In More Accidents	
four wheeler	1
two wheeler	2

- **Longest Imprisonment**

Longest Imprisonment Duration
5

- **Year with Highest Accidents**

Year With Highest Accidents
2018

At last, we have a contact us page which tells us who we are and where we are from with the integration of iframes for integrating google maps for our location.

References

Books reference format

Websites reference format

CodeWithHarry (no date) *YouTube*. YouTube. Available at: https://www.youtube.com/@CodeWithHarry (Accessed: January 11, 2023).

A computer science portal for geeks (no date) *GeeksforGeeks*. Available at: https://www.geeksforgeeks.org/ (Accessed: January 11, 2023).

W3Schools free online web tutorials (no date) *W3Schools Online Web Tutorials*. Available at: https://www.w3schools.com/ (Accessed: January 11, 2023).

wikiHow (2022) *How to install xampp for windows (with pictures)*, *wikiHow*. wikiHow. Available at: https://www.wikihow.com/Install-XAMPP-for-Windows (Accessed: January 11, 2023).

PHP Manual (2023) *php*. Available at: https://www.php.net/manual/en/index.php (Accessed: January 11, 2023).

Newest questions (no date) *Stack Overflow*. Available at: https://stackoverflow.com/questions/ (Accessed: January 11, 2023).

PHP Programming language tutorial - full course (2018) *YouTube*. Available at: https://youtu.be/OK_JCtrrv-c (Accessed: January 11, 2023).

CodePen feature (no date). Available at: https://codepen.io/features/ (Accessed: January 11, 2023).