DBMS: Railway Reservation

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INFORMATION TECHNOLOGY **DELHI**

Individual efforts

Chaitanya Jain : SQL Queries, Embedded SQL Queries, Query optimization, Triggers

Mohit : SQL Queries, Embedded SQL Queries, Query optimization, Triggers

Deeksha Singh Duvesh : Views and Grants, Project documentation, Project Scope and Relational Schema, Indexing

Shivam Kumar Jha : Er Diagram , Indexing and Triggers and dumping data

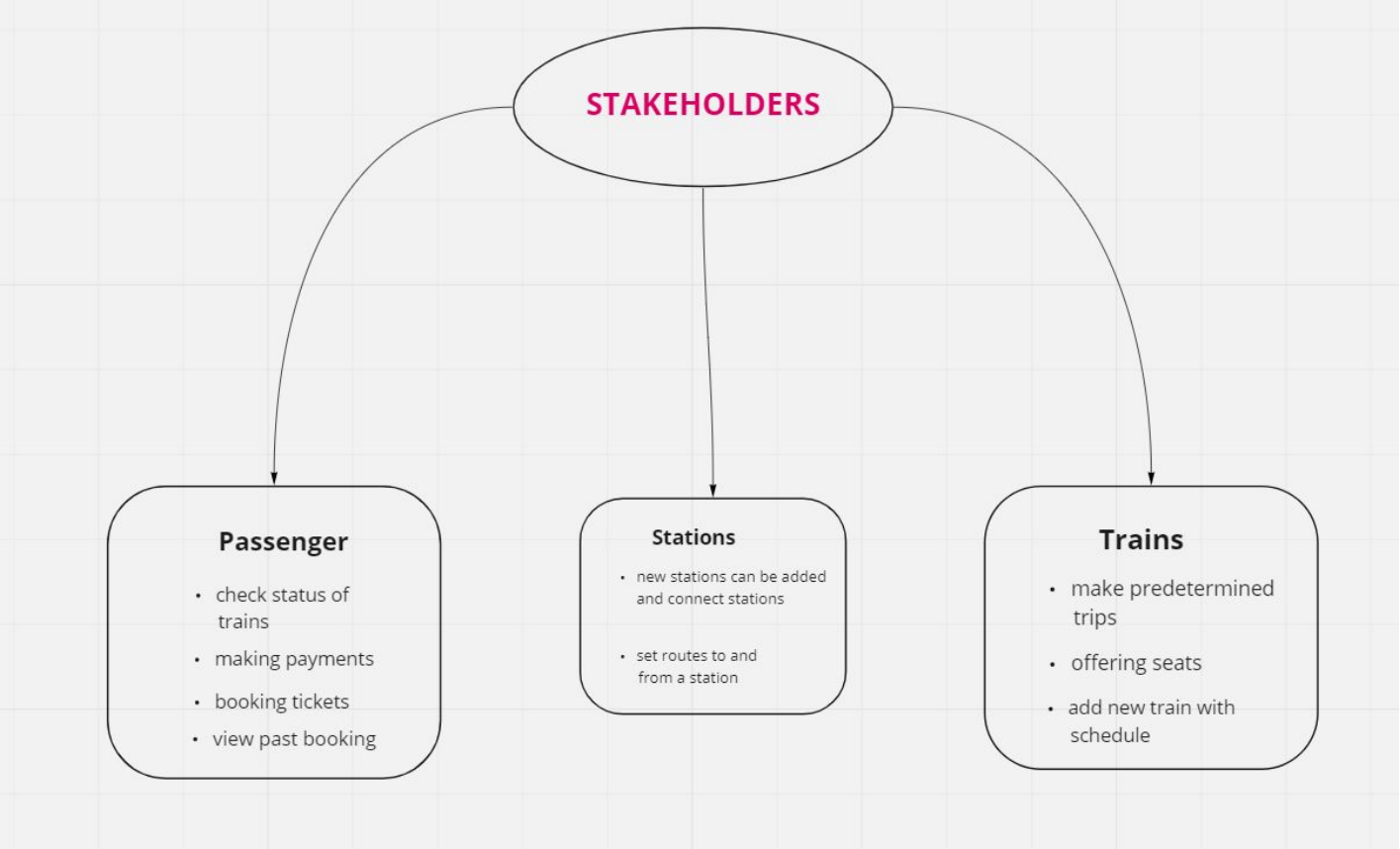
Problem Statement

We often face issues with getting proper information from the authorities during train travel like we don’t know the proper exact train timings, or how much long is the waiting list. The authorities also face issues managing all these many passengers on paper. So, we thought of making a portal/system that would cater to all these needs and make a passengers journey pleasurable. We have added admin side portal too for storing and showing details for their perusal too.

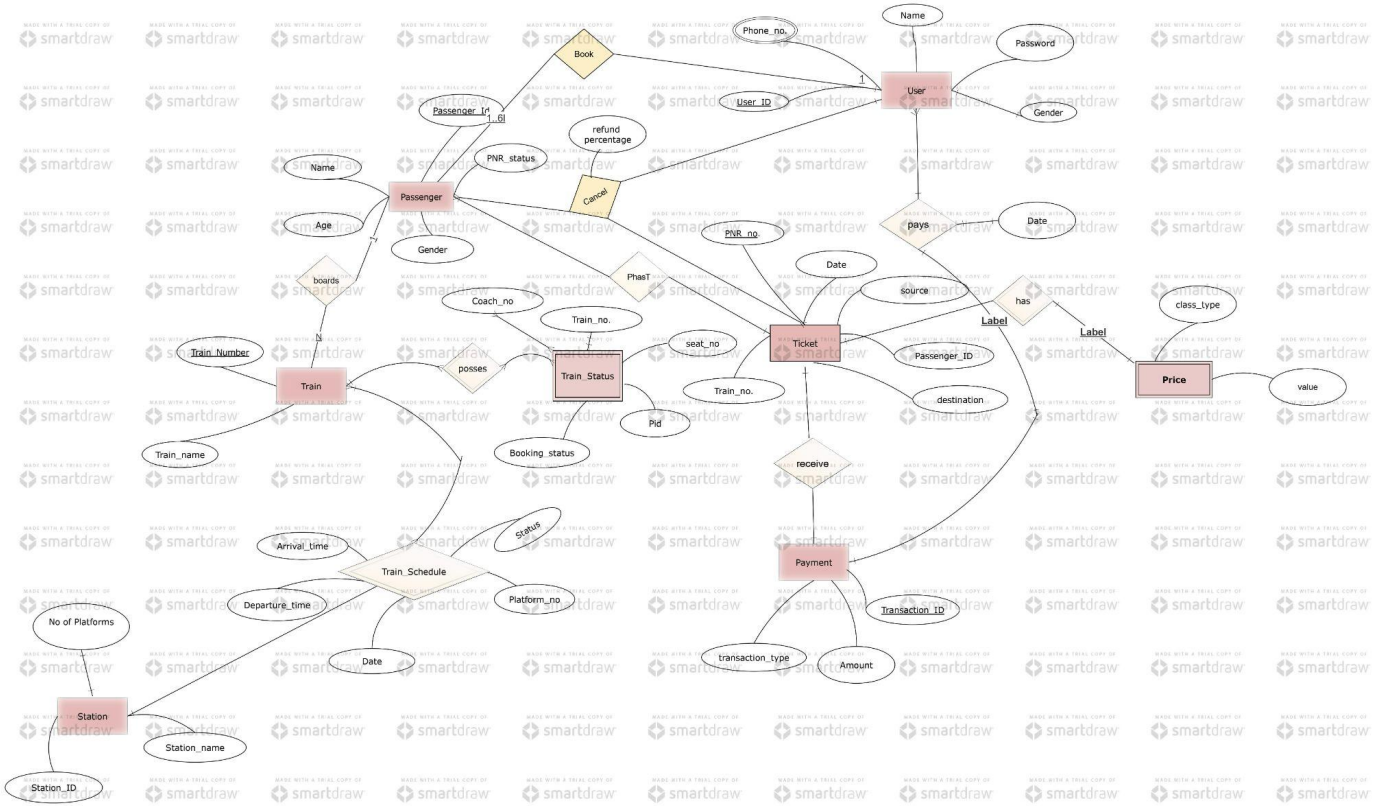
Scope:

This system is reserved only for booking tickets, informations about the management of trains(kilometers and etc), drivers(how much is their salaries). In this system, the user can: see available trips from one location to another see all trips the user made in a month buy tickets the train system control, can track all information about the passengers as well as the payments.

Stakeholders:



Entity Relationship(ER) Diagram:



Relation Schema:

Relation Schema (**Bold** represents relations)

Train (train_no., #train_name, #station_no., #p_id)
Station (station_no., station_id, no._of_platforms)
Train_status (coach_no., seat_no., p_id, booking_status)

Ticket (#p_id, #PRN_no, Date, destination, source,train_no, #transacton_id)

Payment (transaction_id, amount, transaction_type)
Price (class_type, value, p_id)
Passenger (p_id, name, age, gender)
User (u_id, , name, password, gender, #p_id, #transaction_id)
Train_schedule (arrival_time, Date, status, platform_no, dep_time)
Pays (Date)

Views and Grants:

View for passenger's booking details

```
    DEFINER = `root`@`localhost`
    SQL SECURITY DEFINER
VIEW `railwaybooking`.`passenger_booking_details_1` AS
    SELECT
        `p`.`Name` AS `name`,
        `p`.`Age` AS `age`,
        `p`.`Gender` AS `gender`,
        `t`.`Train_Number` AS `Train_number`,
        `t`.`Source` AS `source`,
        `t`.`Destination` AS `destination`,
        `t`.`Date` AS `date`,
        `ts`.`Coach_No` AS `coach_no`,
        `ts`.`Seat_No` AS `seat_no`
    FROM
        ((`railwaybooking`.`passenger` `p`
        JOIN `railwaybooking`.`ticket` `t` ON (((`p`.`Passenger_ID` = UTL())
            AND (`p`.`Passenger_ID` = `t`.`Passenger_ID`))))
        JOIN `railwaybooking`.`train_status` `ts` ON (((`p`.`Passenger_ID` = UTL())
            AND (`ts`.`Pid` = `p`.`Passenger_ID`))));;
```

View for showing train schedule

```
    DEFINER = `root`@`localhost`
    SQL SECURITY DEFINER
VIEW `railwaybooking`.`train_schedule_view` AS
    SELECT
        `railwaybooking`.`train_schedule`.`Station_ID` AS `station_id`,
        `railwaybooking`.`train_schedule`.`Platform_No` AS `Platform_No`,
        `railwaybooking`.`train_schedule`.`Arrival_Time` AS `Arrival_Time`,
        `railwaybooking`.`train_schedule`.`Departure_Time` AS `Departure_Time`,
        `railwaybooking`.`train_schedule`.`Status` AS `status`
    FROM
        `railwaybooking`.`train_schedule`
    WHERE
        (`railwaybooking`.`train_schedule`.`Train_number` = UTL())
    ORDER BY `railwaybooking`.`train_schedule`.`Arrival_Time`;;
```

TRIGGERS:

Trigger for checking age range.

```
CREATE DEFINER=`root`@`localhost` TRIGGER `passenger_BEFORE_INSERT`
BEFORE INSERT ON `passenger` FOR EACH ROW BEGIN
    DECLARE msg varchar(128) default '';
    IF NEW.age < 3 OR NEW.age > 120
    THEN SET msg = "Age should be between 3 and 120";
    END IF;

    IF msg != ''
    THEN SIGNAL SQLSTATE '45000'
    SET MESSAGE_TEXT = msg;
    END IF;
END
```

Trigger for checking minimum price constraint for change ticket price.

```
CREATE DEFINER=`root`@`localhost` TRIGGER `price_BEFORE_UPDATE` BEFORE UPDATE ON `price` FOR EACH ROW BEGIN
DECLARE msg varchar(128) default '';
    IF NEW.price < 100 THEN SET msg = "Price should be > 100";
    END IF;

    IF msg != '' THEN SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = msg;
    END IF;
END
```

Trigger for checking if the same train already exists.

```
CREATE DEFINER=`root`@`localhost` TRIGGER `train_BEFORE_INSERT` BEFORE INSERT ON `train` FOR EACH ROW BEGIN
    DECLARE msg varchar(128) default '';


    IF NEW.train_name in (select train_name from train )
    THEN SET msg = "Train already exists";
    END IF;

    IF msg != ''
    THEN SIGNAL SQLSTATE '45000'
    SET MESSAGE_TEXT = msg;
    END IF;
END
```

Trigger for checking if the station is present on the input train.(while changing platform number

```
CREATE DEFINER=`root`@`localhost` TRIGGER `train_schedule_BEFORE_UPDATE` BEFORE UPDATE ON `train_schedule` FOR EACH ROW BEGIN
    DECLARE msg varchar(128) default '';
    DECLARE tno int;
    declare sno int;
    declare temp int;

    select count(*) from train_schedule where train_number = NEW.train_number AND station_id = NEW.station_id into temp;
    IF temp = 0
    THEN SET msg = "Station is not present in the train's route";
    END IF;

    IF msg != '' THEN SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = msg;
    END IF;
END
```

Trigger for checking if the mobile number is already registered while signing up.

```
DROP TRIGGER IF EXISTS `railwaybooking`.`check_phone_registered`;

DELIMITER $$
USE `railwaybooking`$$
CREATE DEFINER=`root`@`localhost` TRIGGER `check_phone_registered` BEFORE INSERT ON `user` FOR EACH ROW BEGIN
    DECLARE message VARCHAR(128) DEFAULT '';
    declare pnum varchar(10);

    if NEW.phone_number in (select phone_number from user) then
        set message = "Phone Number already registered";
    end if;

END;$$
DELIMITER ;
```

Grants

```
create user 'admin'@'127.0.0.1' identified by '1234';
grant all on railwaybooking to 'admin'@'127.0.0.1';

create user 'user'@'127.0.0.1' identified by 'code';
grant all on railwaybooking to 'user'@'127.0.0.1';
```

Indexing:

```
ALTER TABLE `railwaybooking`.`train_status`
ADD INDEX `tdate` (`Date` ASC) VISIBLE;
;

ALTER TABLE `railwaybooking`.`train_schedule`
ADD INDEX `tnumber` (`Train_number` ASC, `Station_ID` ASC) VISIBLE;
;


ALTER TABLE `railwaybooking`.`ticket`
ADD INDEX `tpnr` (`PNR_Number` ASC) VISIBLE;
;

ALTER TABLE `railwaybooking`.`pays`
ADD INDEX `tuser` (`User_ID` ASC) VISIBLE;
;

ALTER TABLE `railwaybooking`.`book`
ADD INDEX `buser` (`User_ID` ASC) VISIBLE;
;
```

SQL QUERIES

```
-- Train boarded by passenger with given pid.
SELECT
    train_name
FROM
    train
WHERE
    train_number IN (SELECT
            train_no
        FROM
            boards
        WHERE
            passenger_id = $pid)
LIMIT 1;
```

```sql
-- Train arrival time of passenger with given pid.
SELECT
    TS.Arrival_Time
FROM
    train_schedule TS
WHERE
    (TS.Station_ID IN (SELECT
            S.Station_ID
        FROM
            station S
        WHERE
            S.Station_name IN (SELECT
                    T.source
                FROM
                    ticket T
                WHERE
                    T.Passenger_ID = $pid))
        AND TS.Train_number IN (SELECT
            T.Train_Number
        FROM
            ticket T
        WHERE
            T.Passenger_ID = $pid))
LIMIT 1;
```

```
-- First empty seat of a given coach and given train.
```

```
SELECT
    seat_no
FROM
    train_status
WHERE
    coach_no = '$c'
        AND train_no IN (SELECT
            train_number
        FROM
            train
        WHERE
            train_name = '$train')
        AND booking_status = 0
        AND date = '$date'
LIMIT 1;
```

```
-- inserting values into ticket and boards
```

```
INSERT INTO ticket VALUES($newPNR, (SELECT train_number FROM train WHERE train_name = '$train'),
'$orCity', '$dtCity', '$date', $newPassID);

INSERT INTO boards VALUES($newPassID, (SELECT train_number FROM train WHERE train_name = '$train'));
```

```
-- updating platform no of the given train with given station.

UPDATE train_schedule
SET
    platform_no = $newplat
WHERE
    train_number IN (SELECT
            train_number
        FROM
            train
        WHERE
            train_name = '$tname')
        AND station_id IN (SELECT
            station_id
        FROM
            station
        WHERE
            station_name = '$sname') LIMIT 1;
```

```
-- Renewing booked seats of all trains on a day.

DROP procedure IF EXISTS `railwaybooking`.`updateTrain_status_date`;
;

DELIMITER $$
USE `railwaybooking`$$
CREATE DEFINER=`root`@`localhost` PROCEDURE `updateTrain_status_date`()
BEGIN
DECLARE cur date;
declare cur2 int;
declare cur3 date;
declare temp date;
declare temp1 date;
declare temp2 date;
declare temp3 date;
declare temp4 date;
declare temp5 int;
```

```
SELECT
    MAX(date)
FROM
    train_status  INTO cur;
SELECT
    COUNT(train_no)
FROM
    train_status
WHERE
    date = CURDATE()  INTO cur2;
SELECT
    MIN(date)
FROM
    train_status  INTO cur3;


if cur = curDate()  then
    update train_status  set date = date_add(date, interval 3 day) where date != curDate();
UPDATE train_status
SET
    booking_status =  0,
    pid =  0;
```

```
elseif cur2 = 0 then
    select min(date) from train_status into temp;
    UPDATE train_status
SET
    date = CURDATE()
WHERE
    date = temp;
SELECT
    MIN(date)
FROM
    train_status INTO temp1;
UPDATE train_status
SET
    date = DATE_ADD(CURDATE(), INTERVAL1 DAY)
WHERE
    date = temp1;
SELECT
    MIN(date)
FROM
    train_status INTO temp2;
UPDATE train_status
SET
    date = DATE_ADD(CURDATE(), INTERVAL2 DAY)
WHERE
    date = temp2;
    UPDATE train_status
SET
    booking_status = 0,
    pid = 0;
```

```
elseif cur3 = curdate() then
    select count(train_no) from train_status into temp5;
```

```
else
        select min(date) from train_status into temp4;
        UPDATE train_status
SET
    date = DATE_ADD(date, INTERVAL 3 DAY)
WHERE
    date = temp4;
        UPDATE train_status
SET
    booking_status = 0,
    pid = 0;
end if;


END;$$

DELIMITER ;
;

CALL updateTrain_status_date()
```

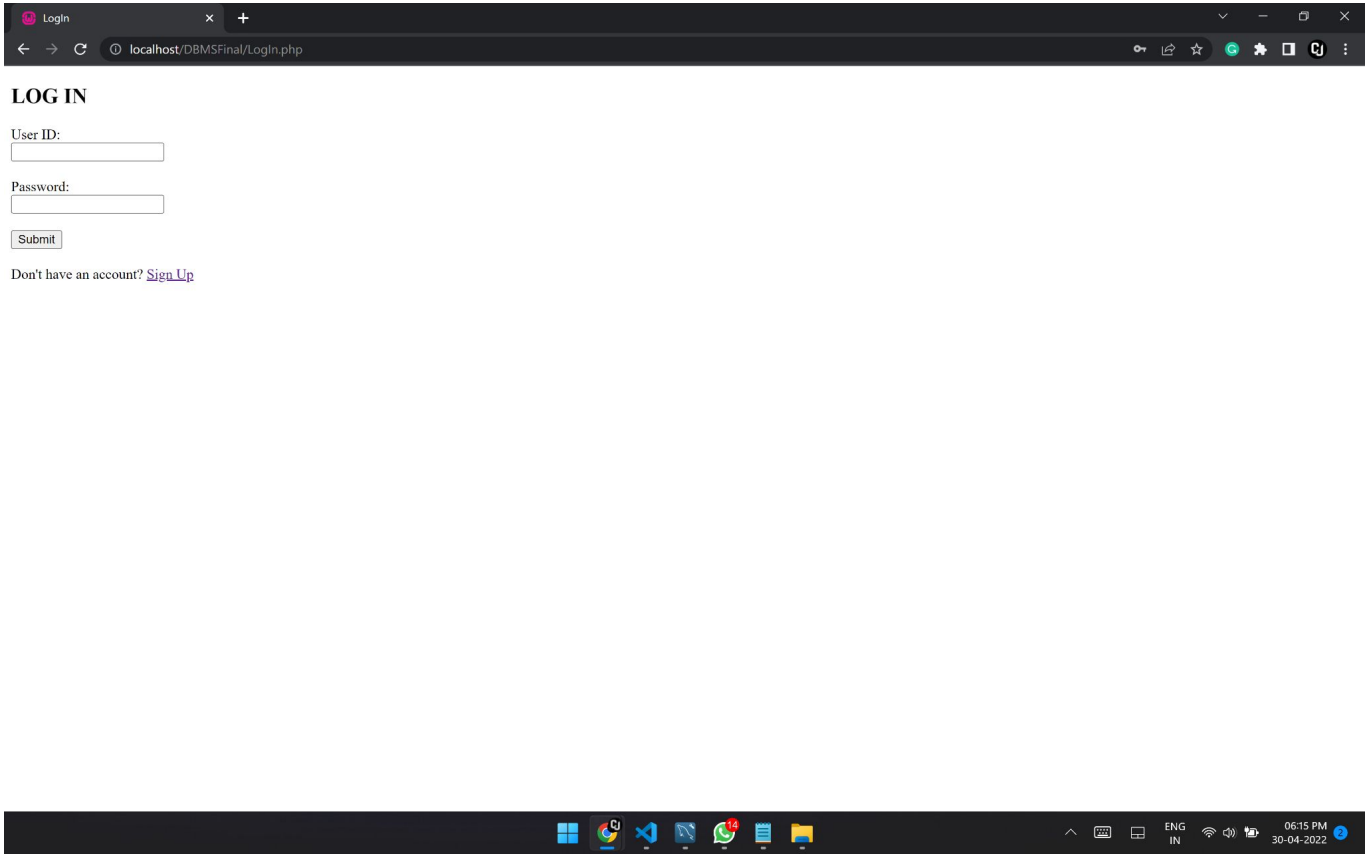
```
-- updating train status(whether departed or at staion or arriving).

DROP procedure IF EXISTS `railwaybooking`.`update_trainSchedule_status;
;

DELIMITER $$
USE `railwaybooking`$$
CREATE DEFINER=`root`@`localhost` PROCEDURE `update_trainSchedule_status`()
BEGIN
    UPDATE train_schedule
SET
    status = 0
WHERE
    CURTIME() > Departure_Timeand date = curDate() ;


    UPDATE train_schedule
SET
    status = 2
WHERE
    CURTIME() < Departure_Timeand date = curDate();
```

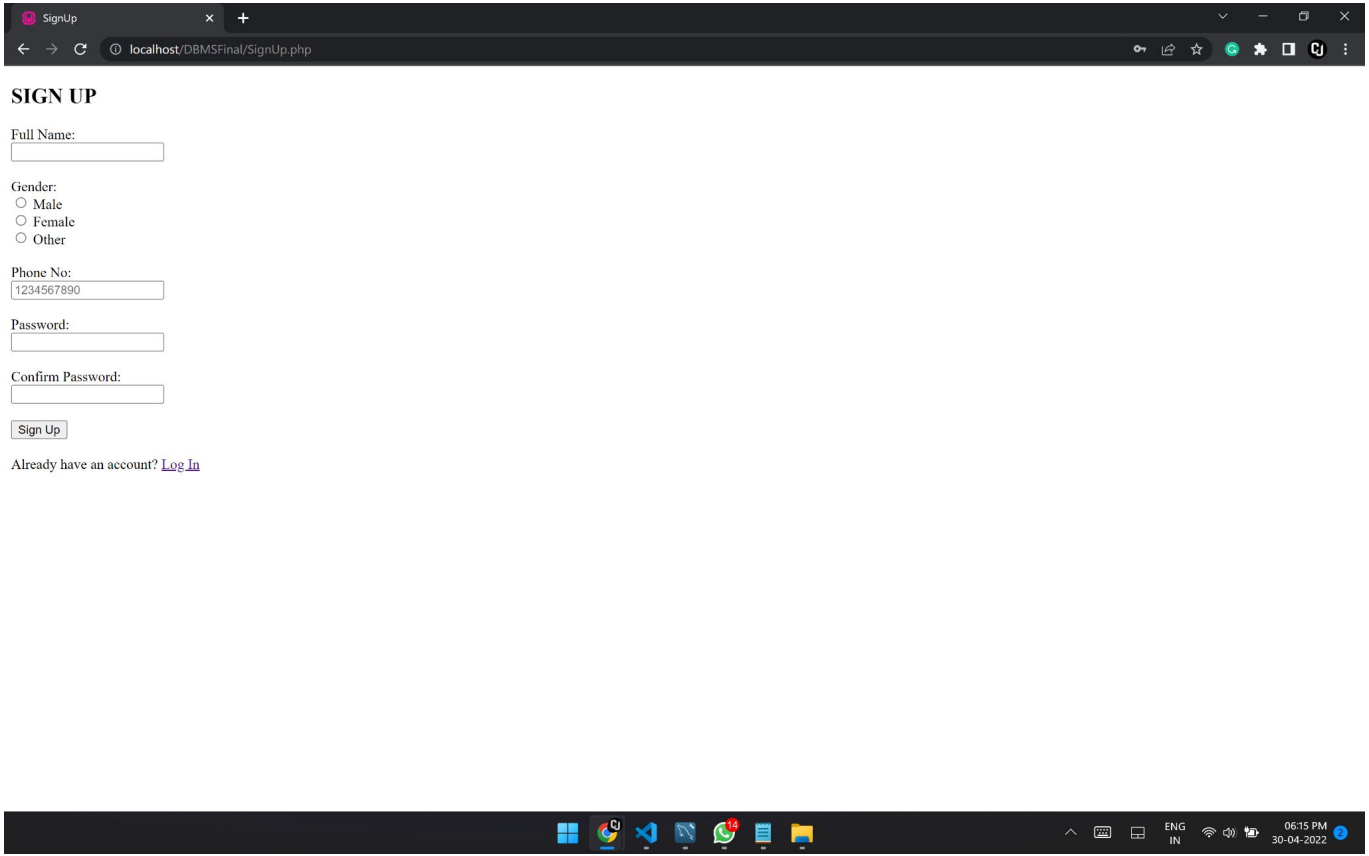
```
    UPDATE train_schedule
SET
    status = 1
WHERE
    CURTIME() < Departure_Time
        AND CURTIME() > arrival_timeand date = curDate();

UPDATE train_schedule
SET
    Date = CURDATE()
WHERE
    Date < CURDATE();
END;$$

DELIMITER ;
;

CALL update_trainSchedule_status();
DROP procedure IF EXISTS `railwaybooking`.`updateTrain_status`;
;
```

```
-- Booking seat in the given train and coach for the given passenger on a given date.
DELIMITER $$
USE `railwaybooking`$$
CREATE DEFINER=`root`@`localhost` PROCEDURE `updateTrain_status`(in pid int, in tno int, in cno
varchar(1), in sno int, in dat date)
BEGIN
    UPDATE train_status T
SET
    Booking_status = 1,
    T.Pid = pid
WHERE
    T.Booking_status = 0
        AND T.Train_no = tno
        AND T.coach_no = cno
        And T.seat_no = sno
        AND T.date = dat;
END$$

DELIMITER ;
;
```

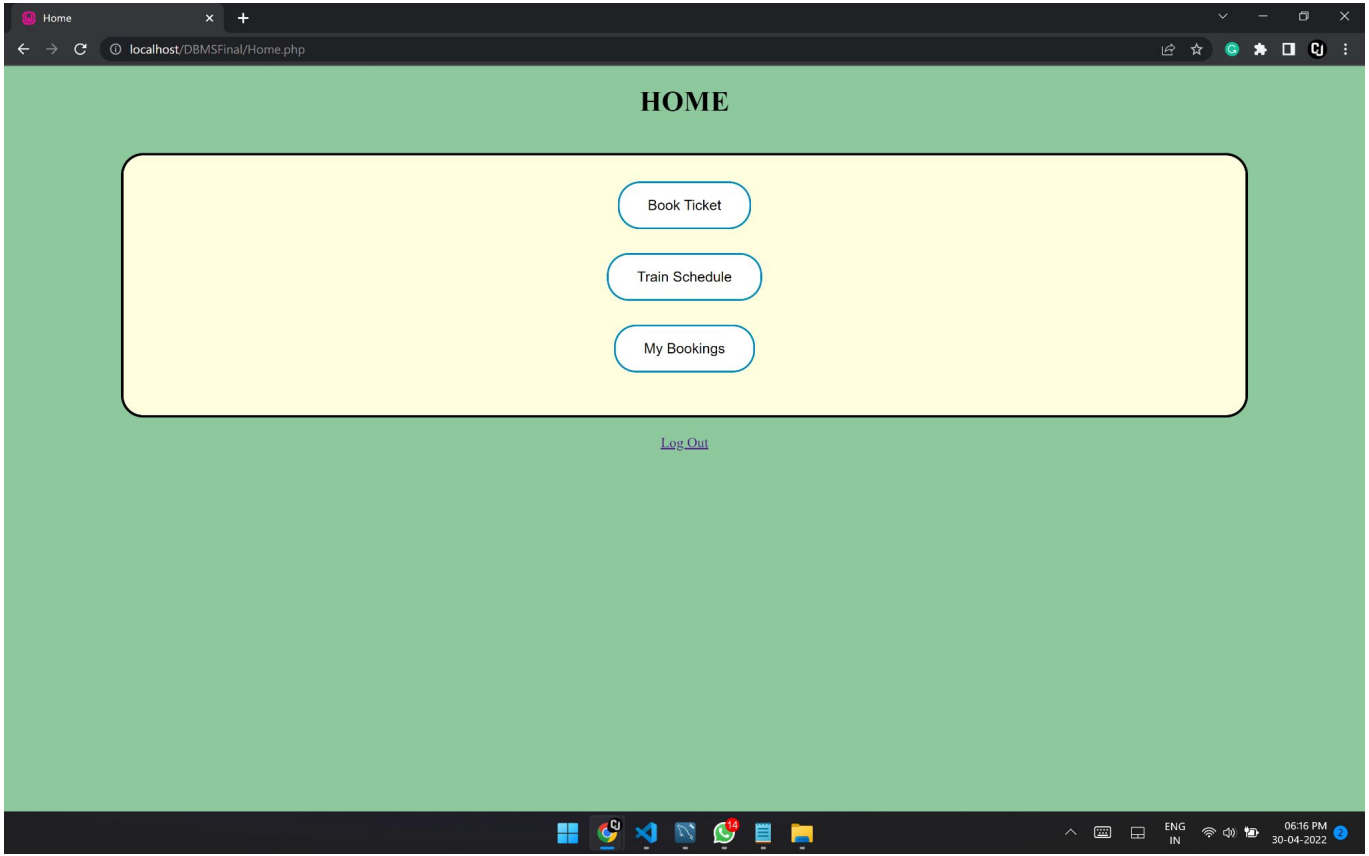
```sql
-- Deleting cancelled ticket

DELETE FROM ticket WHERE pnr_number = $cancelPnr;
```

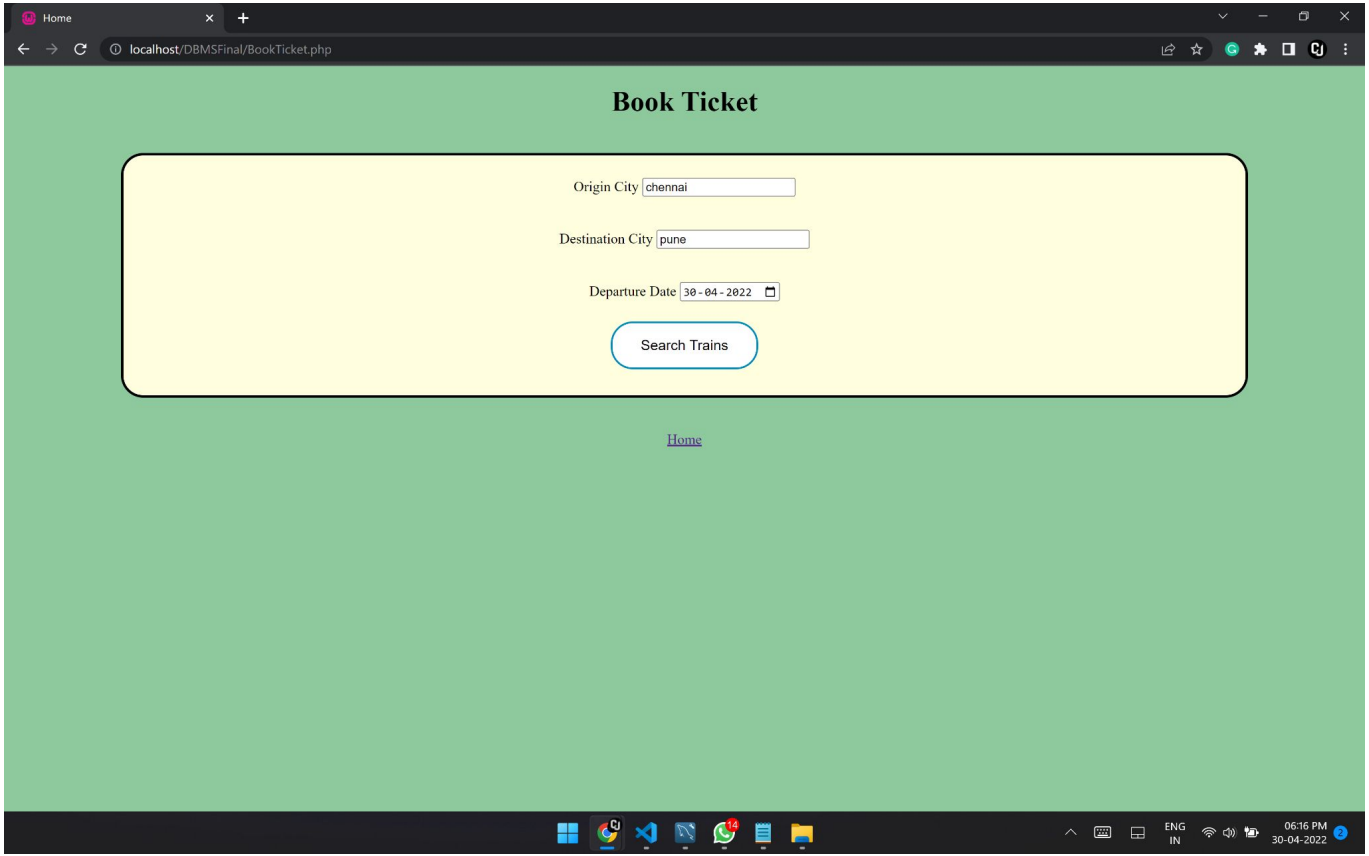
```sql
-- Selecting maximum statio id for adding a new station.
SELECT MAX(station_id) FROM station;
```

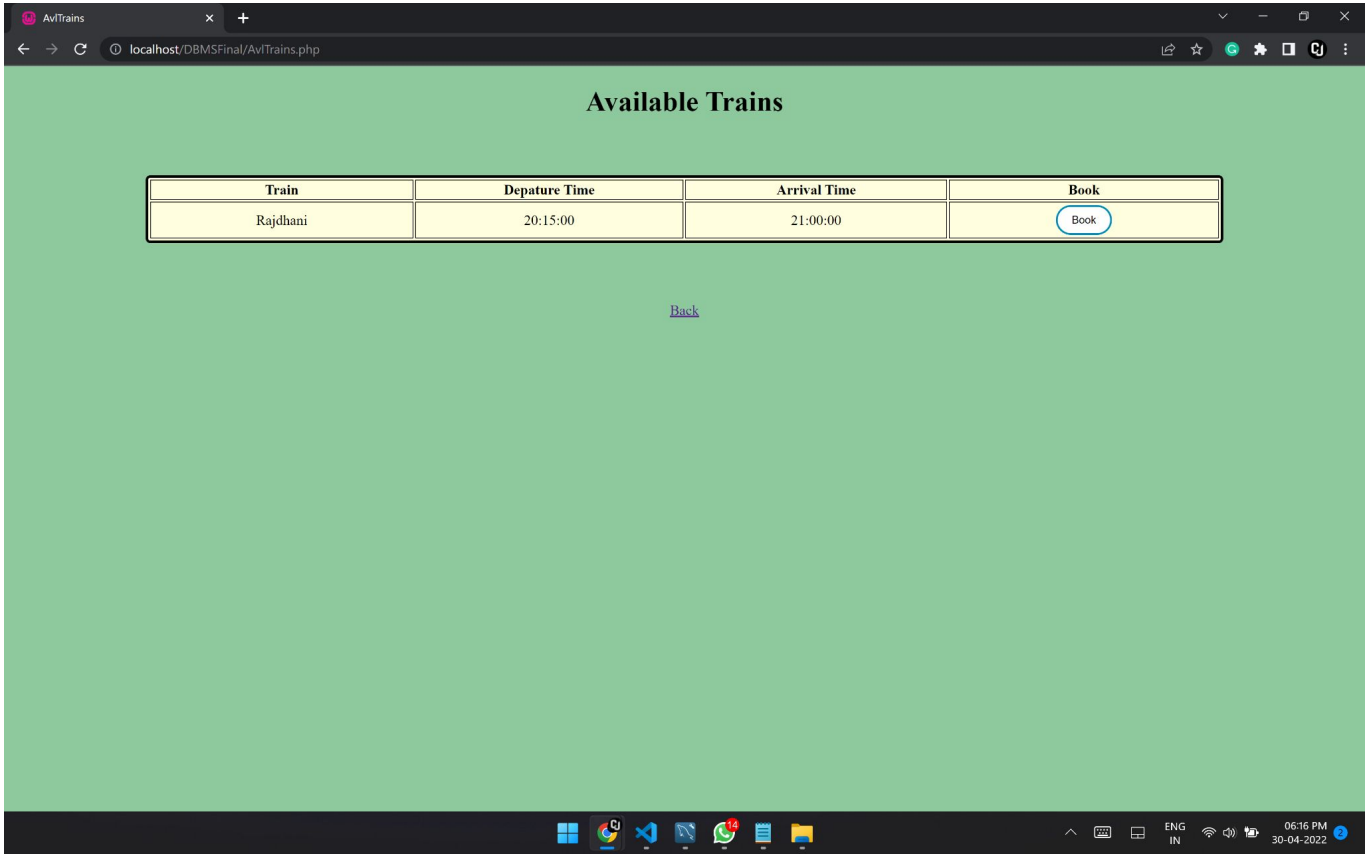

LogIn
localhost/DBMSFinal/LogIn.php
LOG IN
User ID:
Password:
Submit
Don't have an account? Sign Up
ENG
IN
06:15 PM
30-04-2022

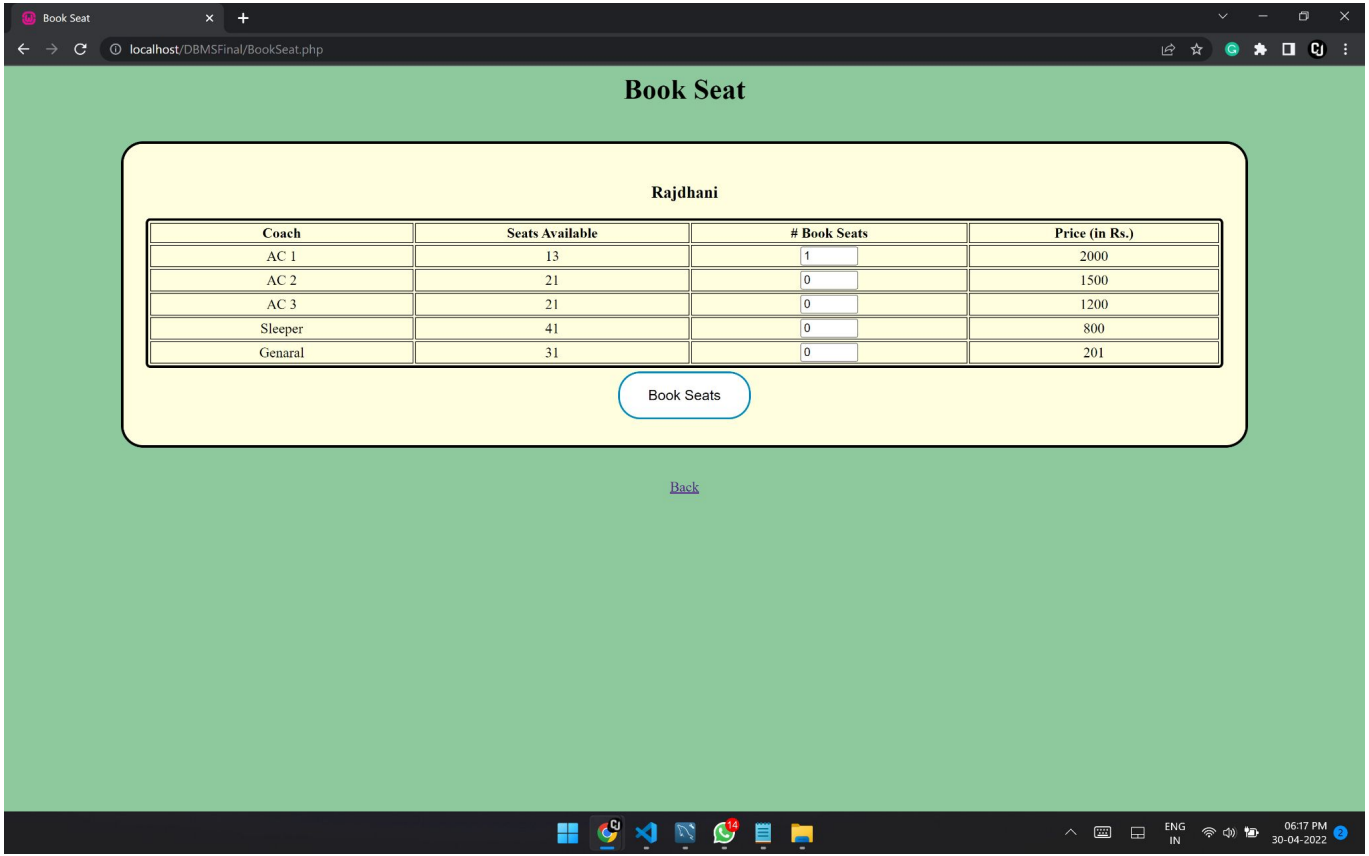

SignUp
localhost/DBMSFinal/SignUp.php
SIGN UP
Full Name:
Gender:
Male
Female
Other
Phone No:
1234567890
Password:
Confirm Password:
Sign Up
Already have an account? Log In
ENG
IN
06:15 PM
30-04-2022

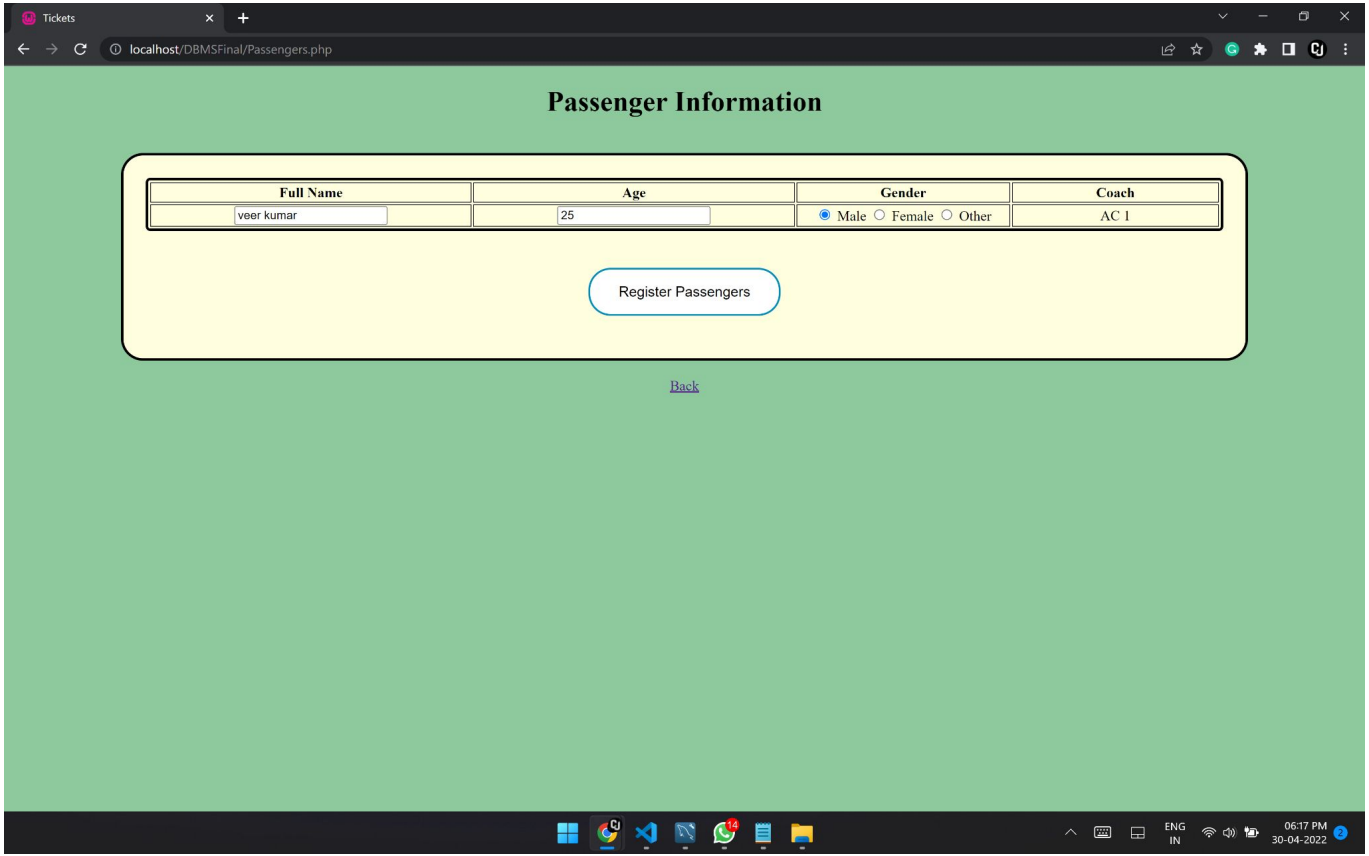
User Interface:

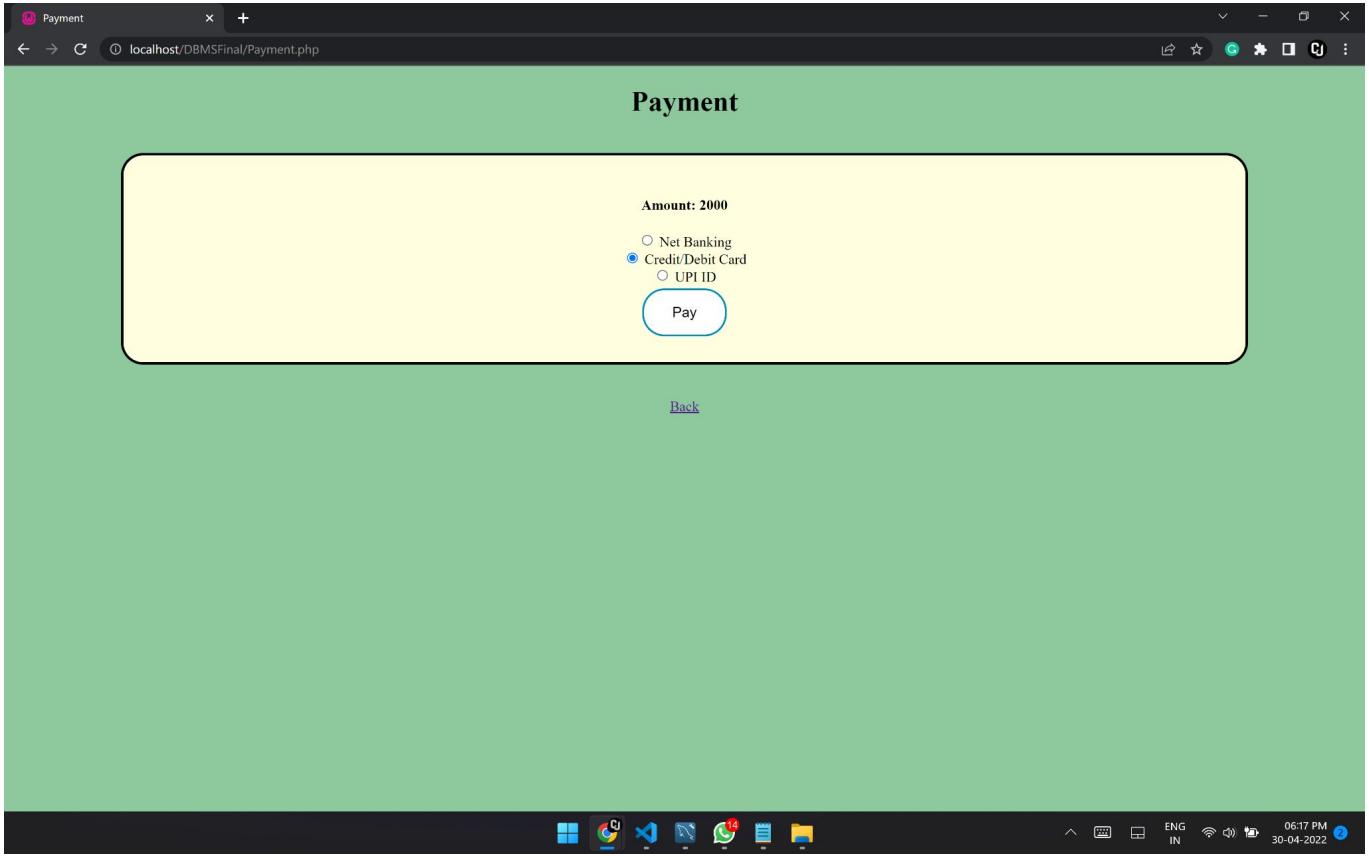


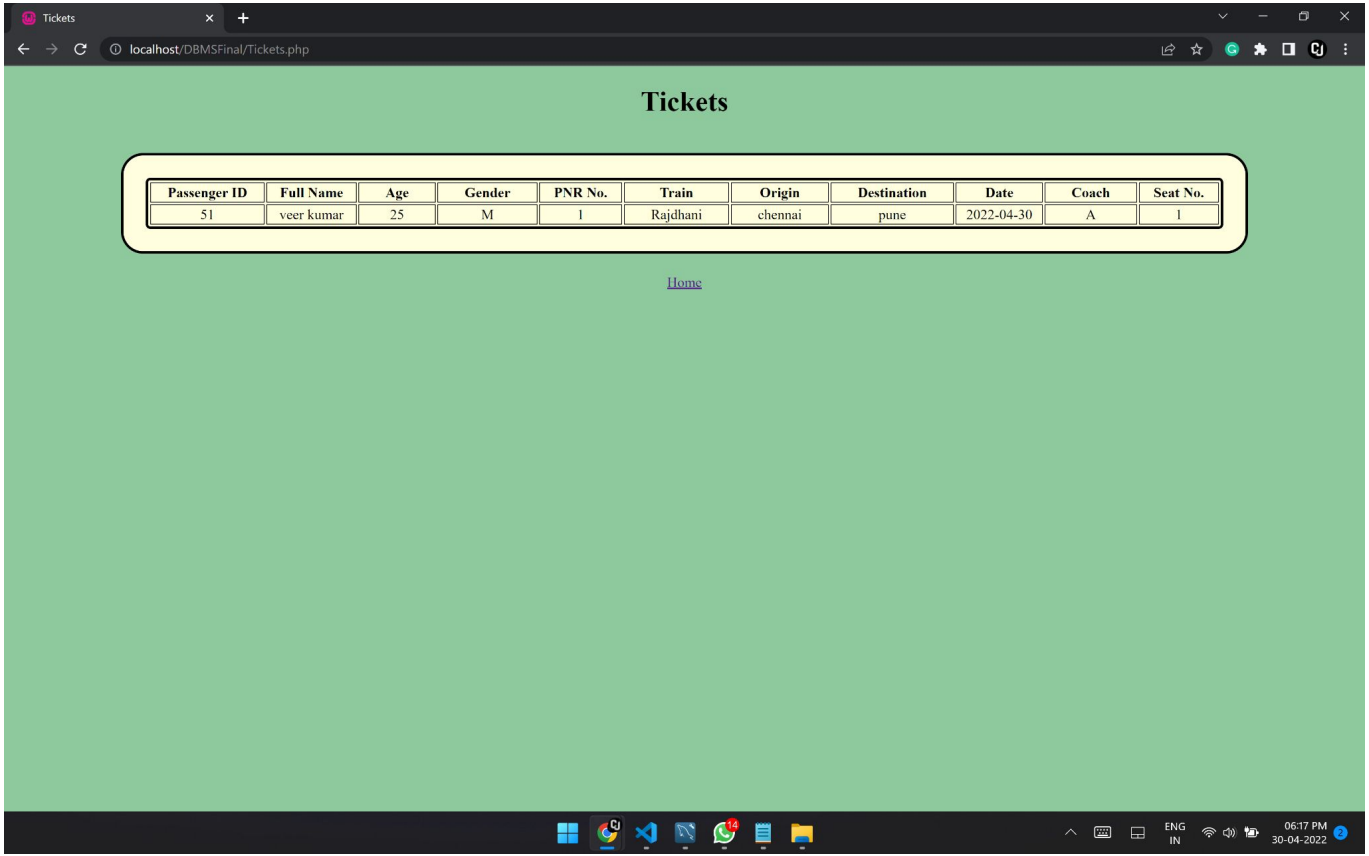

Home
localhost/DBMSFinal/BookTicket.php
Book Ticket
Origin City chennai
Destination City pune
Departure Date 30-04-2022
Search Trains
Home
ENG
IN
06:16 PM
30-04-2022

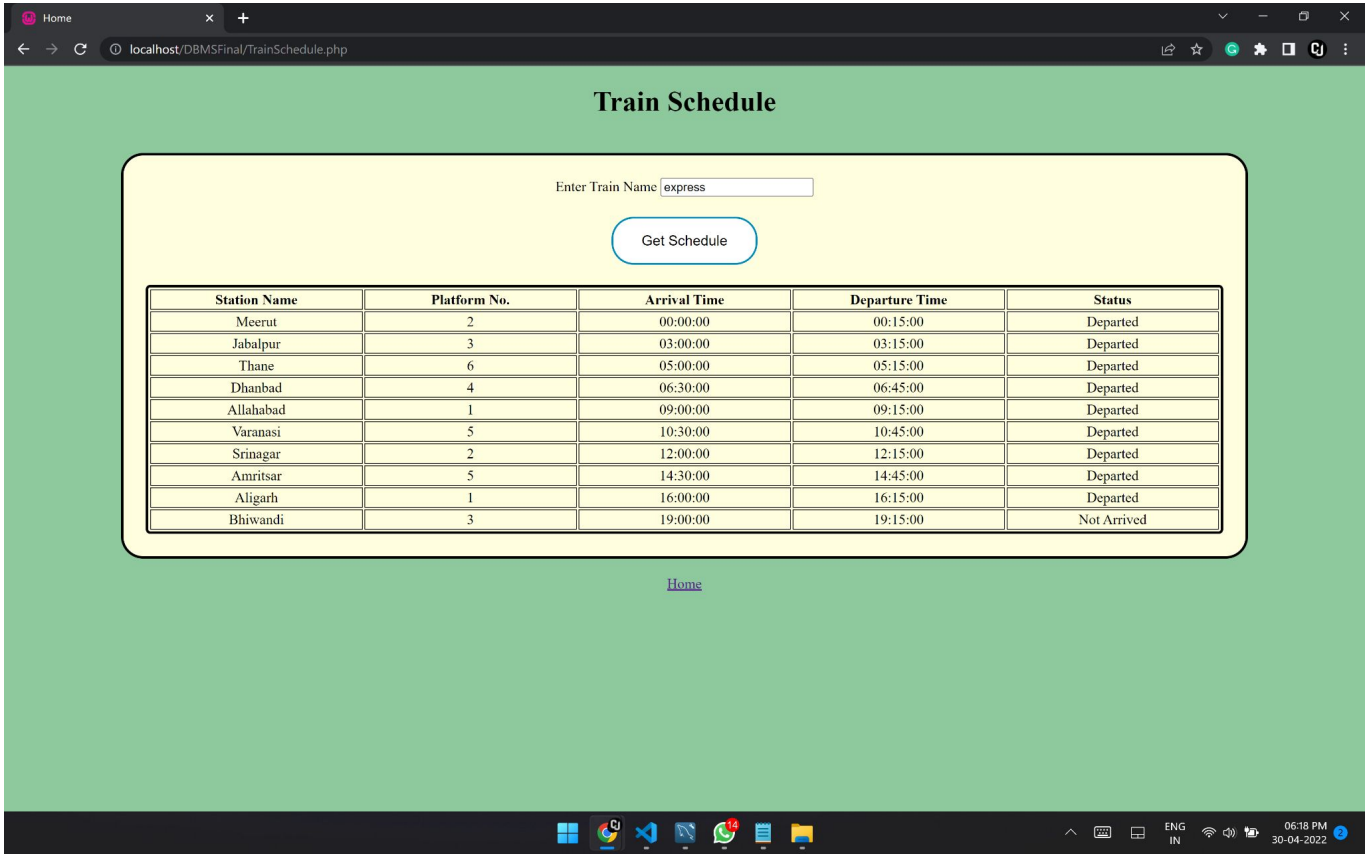

AvlTrains
localhost/DBMSFinal/AvlTrains.php
Available Trains
Train
Depature Time
Arrival Time
Book
Rajdhani
20:15:00
21:00:00
Book
Back
ENG
IN
06:16 PM
30-04-2022

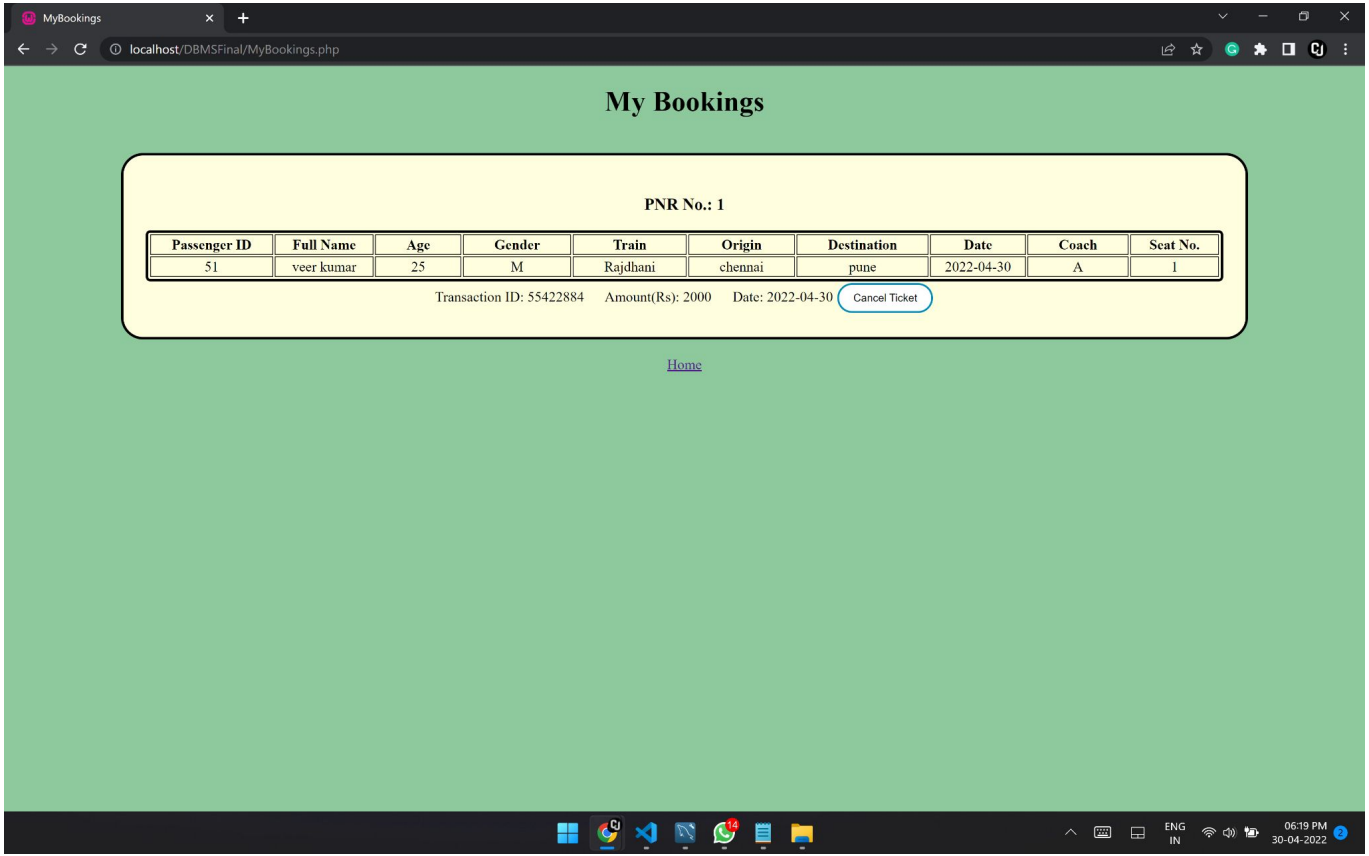

Book Seat
localhost/DBMSFinal/BookSeat.php
Book Seat
Rajdhani
Coach
Seats Available
Book Seats
Price (in Rs.)
AC 1
13
1
2000
AC 2
21
0
1500
AC 3
21
0
1200
Sleeper
41
0
800
Genaral
31
0
201
Book Seats
Back
ENG
IN
06:17 PM
30-04-2022

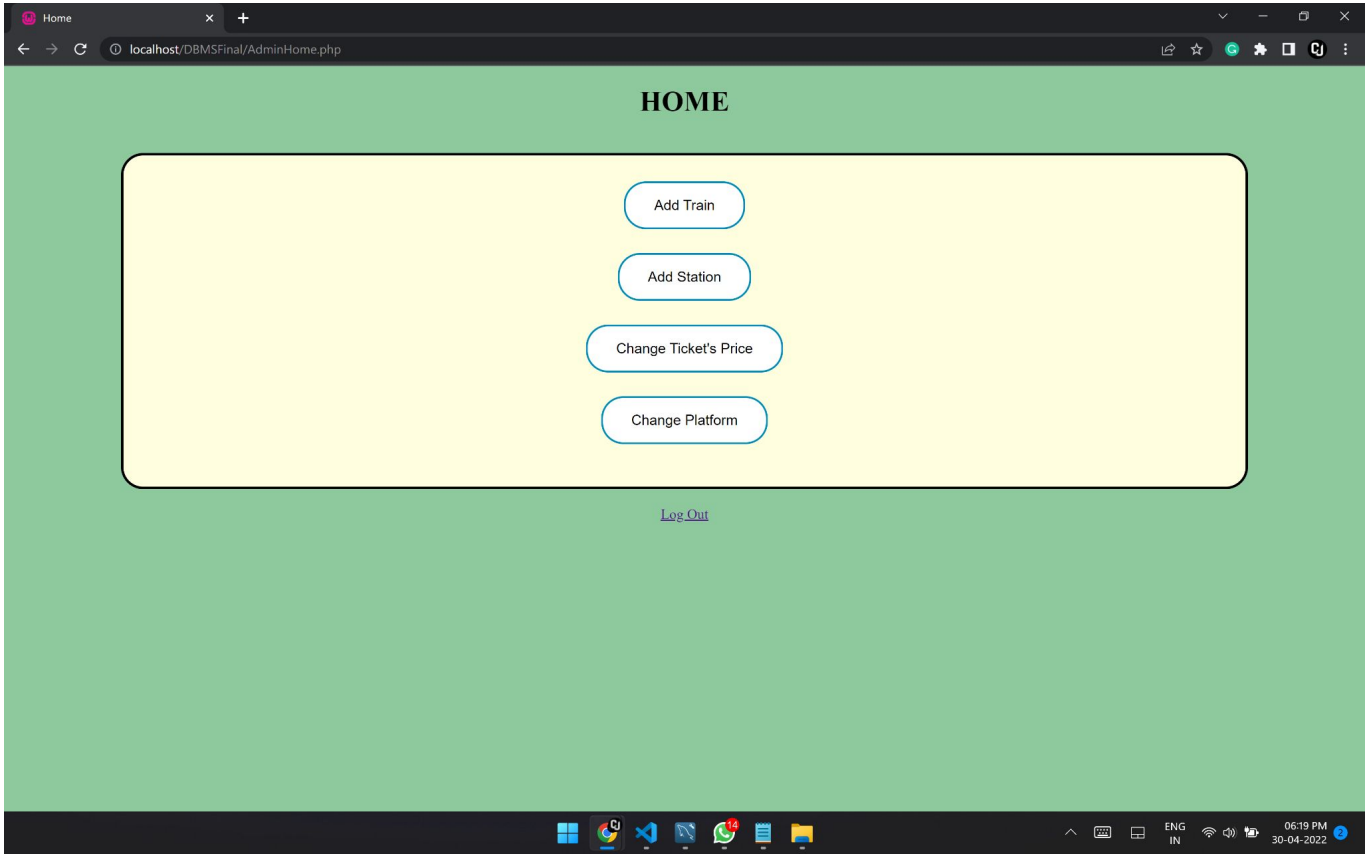

Tickets
localhost/DBMSFinal/Passengers.php
Passenger Information
Full Name
Age
Gender
Coach
veer kumar
25
Male
Female
Other
AC 1
Register Passengers
Back
ENG
IN
06:17 PM
30-04-2022

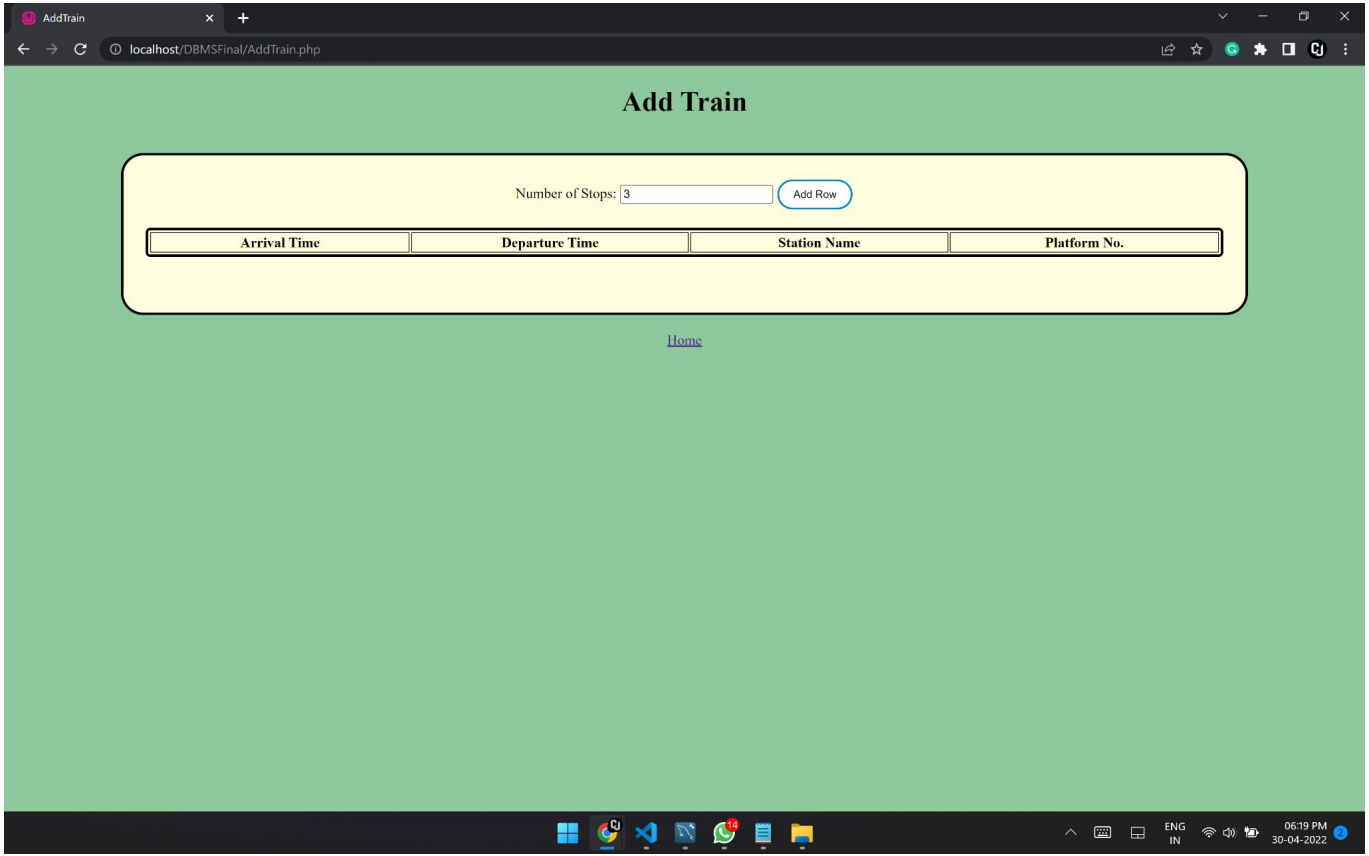

Payment
localhost/DBMSFinal/Payment.php
Payment
Amount: 2000
Net Banking
Credit/Debit Card
UPI ID
Pay
Back
ENG
IN
06:17 PM
30-04-2022

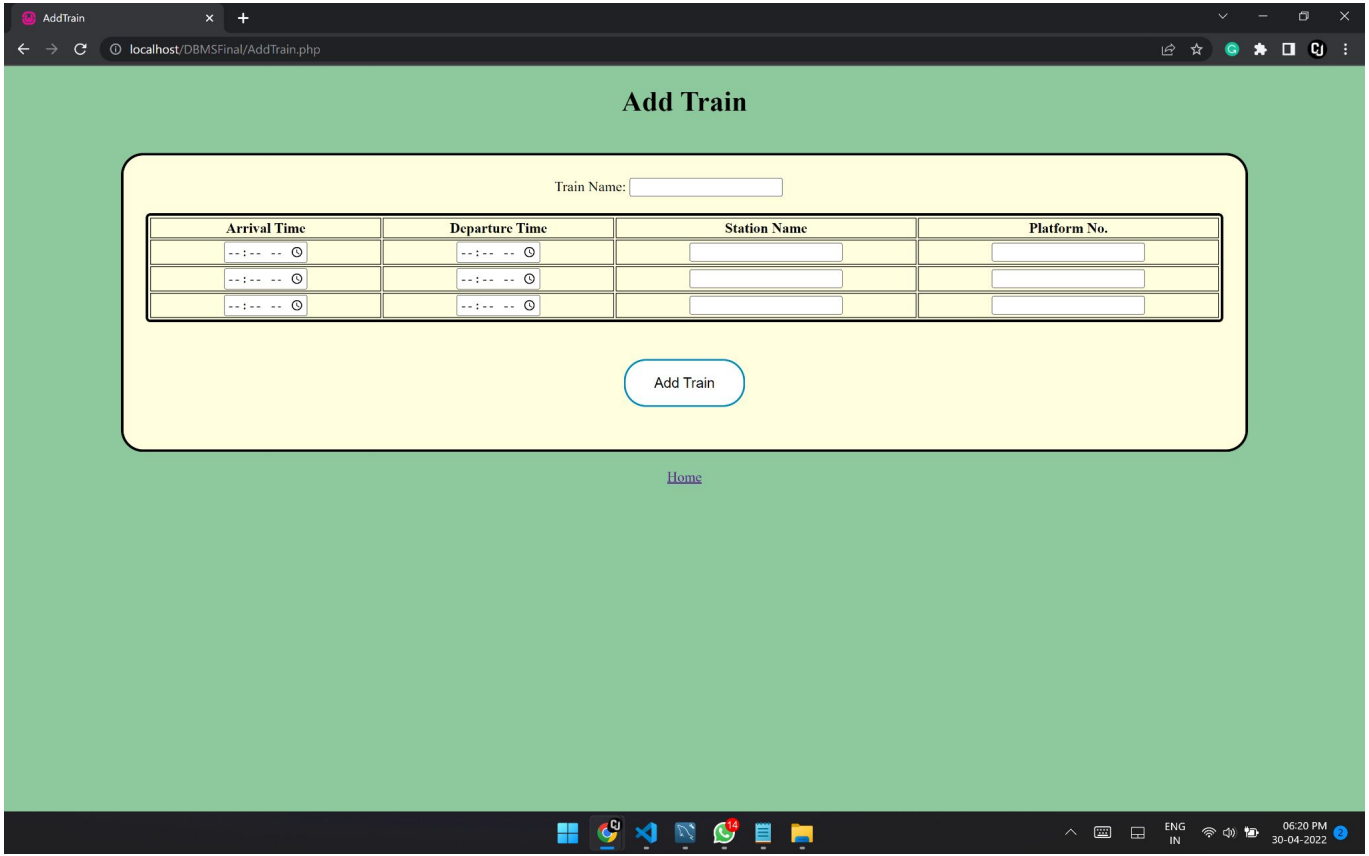

Tickets
localhost/DBMSFinal/Tickets.php
Tickets
Passenger ID | Full Name | Age | Gender | PNR No. | Train | Origin | Destination | Date | Coach | Seat No.
51 | veer kumar | 25 | M | 1 | Rajdhani | chennai | pune | 2022-04-30 | A | 1
Home
ENG
IN
06:17 PM
30-04-2022

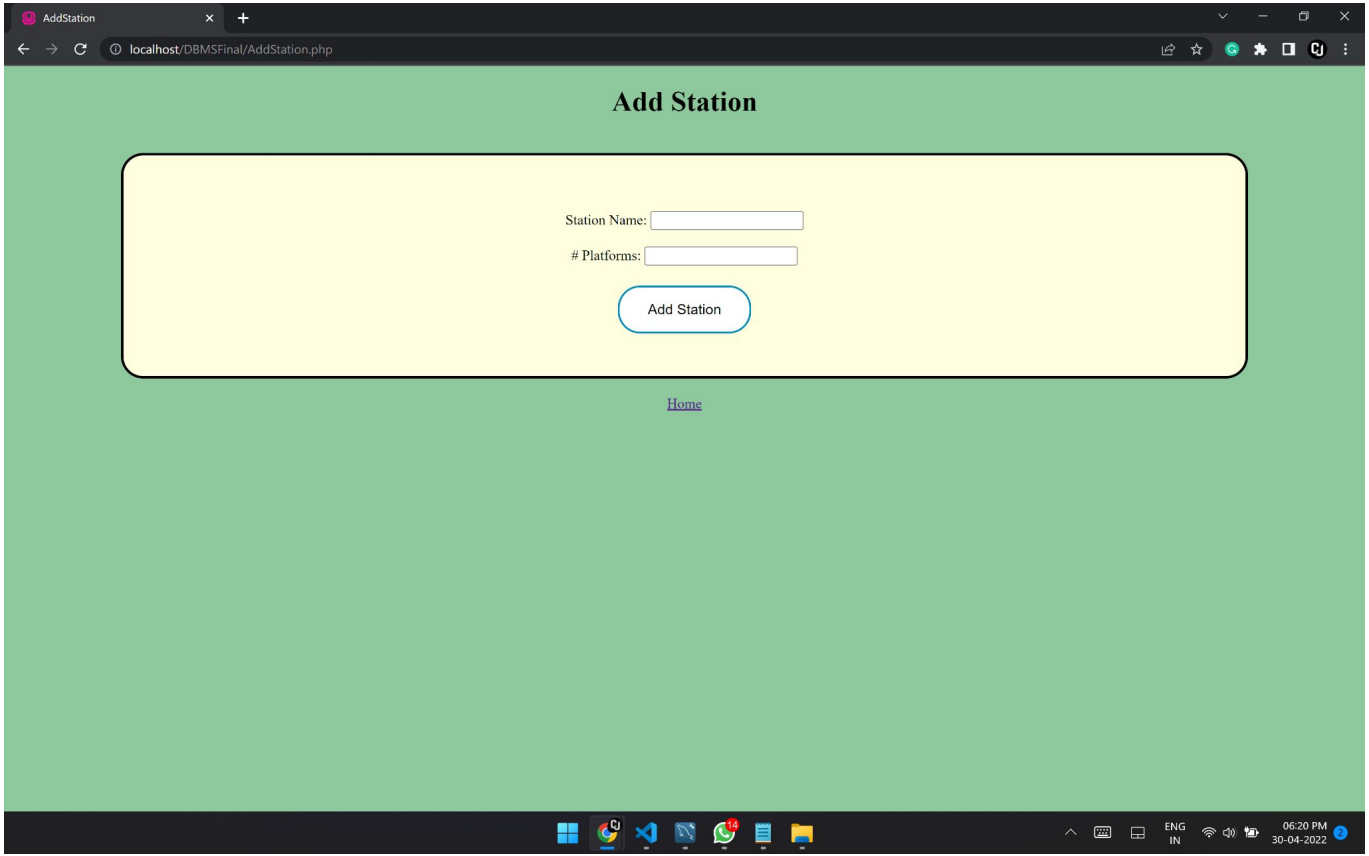

Home
localhost/DBMSFinal/TrainSchedule.php
Train Schedule
Enter Train Name express
Get Schedule
Station Name | Platform No. | Arrival Time | Departure Time | Status
Meerut | 2 | 00:00:00 | 00:15:00 | Departed
Jabalpur | 3 | 03:00:00 | 03:15:00 | Departed
Thane | 6 | 05:00:00 | 05:15:00 | Departed
Dhanbad | 4 | 06:30:00 | 06:45:00 | Departed
Allahabad | 1 | 09:00:00 | 09:15:00 | Departed
Varanasi | 5 | 10:30:00 | 10:45:00 | Departed
Srinagar | 2 | 12:00:00 | 12:15:00 | Departed
Amritsar | 5 | 14:30:00 | 14:45:00 | Departed
Aligarh | 1 | 16:00:00 | 16:15:00 | Departed
Bhiwandi | 3 | 19:00:00 | 19:15:00 | Not Arrived
Home
ENG
IN
06:18 PM
30-04-2022

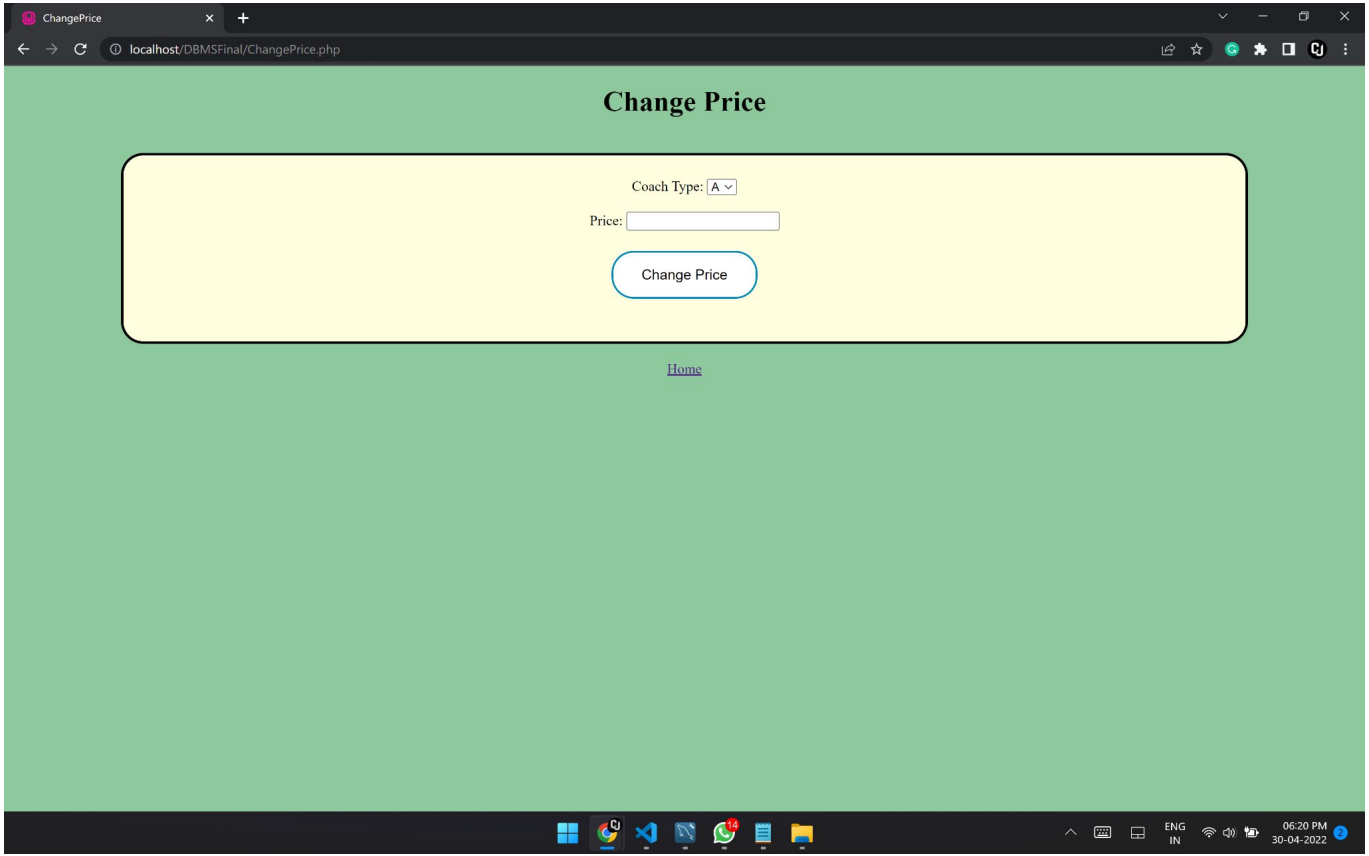

MyBookings
localhost/DBMSFinal/MyBookings.php
My Bookings
PNR No.: 1
Passenger ID | Full Name | Age | Gender | Train | Origin | Destination | Date | Coach | Seat No.
51 | veer kumar | 25 | M | Rajdhani | chennai | pune | 2022-04-30 | A | 1
Transaction ID: 55422884 Amount(Rs): 2000 Date: 2022-04-30 Cancel Ticket
Home
ENG IN
06:19 PM 30-04-2022

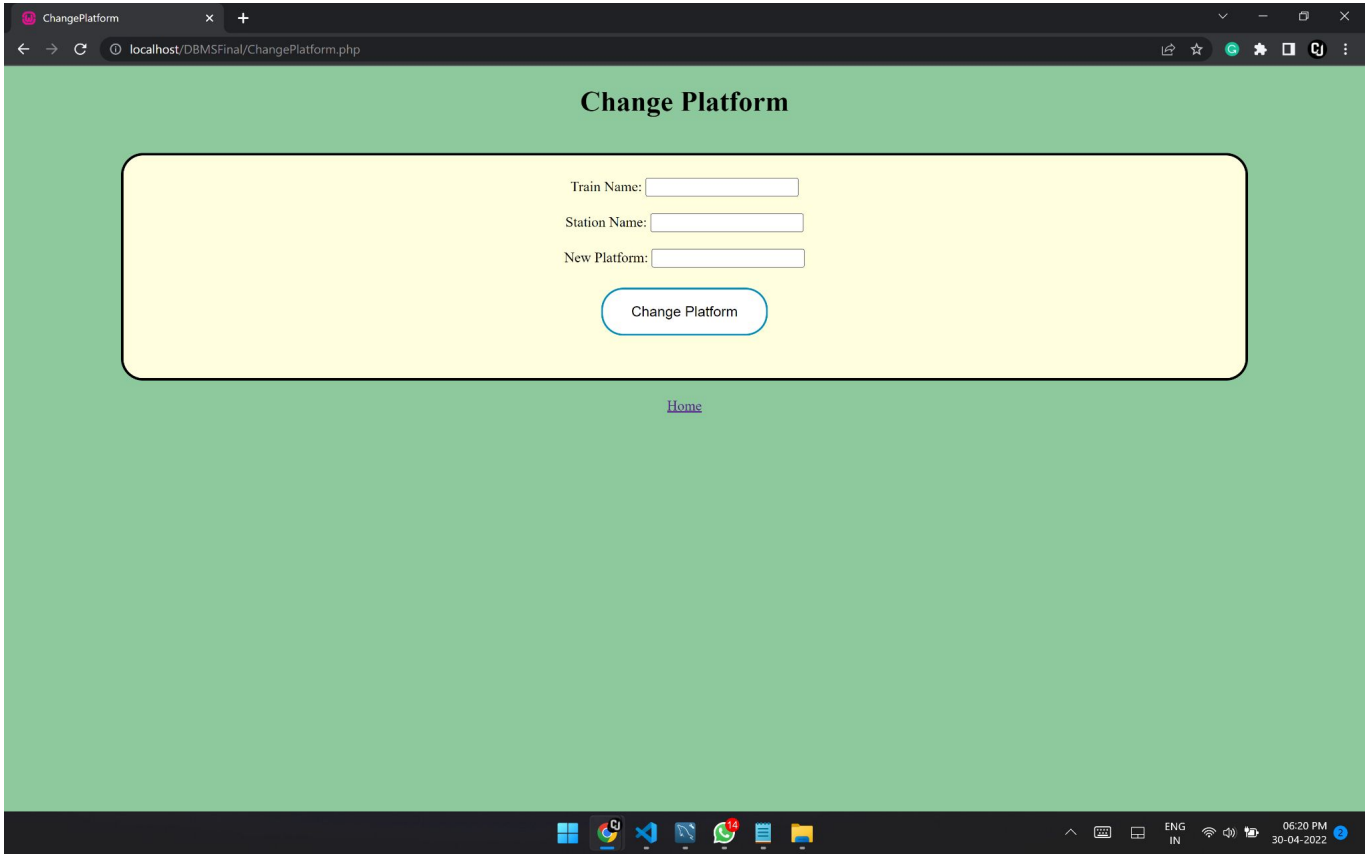

Home
localhost/DBMSFinal/AdminHome.php
HOME
Add Train
Add Station
Change Ticket's Price
Change Platform
Log Out
ENG
IN
06:19 PM
30-04-2022


AddTrain
localhost/DBMSFinal/AddTrain.php
Add Train
Number of Stops: 3
Add Row
Arrival Time
Departure Time
Station Name
Platform No.
Home
ENG
IN
06:19 PM
30-04-2022


AddTrain
localhost/DBMSFinal/AddTrain.php
Add Train
Train Name:
Arrival Time
Departure Time
Station Name
Platform No.
--:-- --
--:-- --
--:-- --
--:-- --
--:-- --
--:-- --
Add Train
Home
ENG
IN
06:20 PM
30-04-2022


AddStation
localhost/DBMSFinal/AddStation.php
Add Station
Station Name:
Platforms:
Add Station
Home
ENG
IN
06:20 PM
30-04-2022


ChangePrice
localhost/DBMSFinal/ChangePrice.php
Change Price
Coach Type: A
Price:
Change Price
Home
ENG
IN
06:20 PM
30-04-2022


ChangePlatform
localhost/DBMSFinal/ChangePlatform.php
Change Platform
Train Name:
Station Name:
New Platform:
Change Platform
Home
ENG
IN
06:20 PM
30-04-2022

Embedded Query

```
$i = 0;
while ($i < count($a)) {
    $query = "SELECT
    Departure_Time
FROM
    train_schedule
WHERE
    Train_Number IN (SELECT
            Train_Number
        FROM
            Train T
        WHERE
            T.Train_Name = '$a[$i]')
        AND Station_ID IN (SELECT
            Station_ID
        FROM
            station
        WHERE
            Station_Name = '$orCity');";
    $res1 = mysqli_query($conn, $query);
    while ($row = mysqli_fetch_row($res1)) {
        array_push($dtime, $row[0]);
    }
    mysqli_free_result($res1);
    $i+=1;
}
```

```
mysqli_query($conn, "INSERT INTO passenger VALUES('$n', $newPassID, $a, '$g')");
mysqli_query($conn, "INSERT INTO ticket VALUES($newPNR, (SELECT train_number FROM train WHERE train_name = '$train'), '$orCity', '
mysqli_query($conn, "INSERT INTO boards VALUES($newPassID, (SELECT train_number FROM train WHERE train_name = '$train'))");
$trainNo = mysqli_fetch_row(mysqli_query($conn, "SELECT train_number FROM train WHERE train_name = '$train'"))[0];

mysqli_query($conn, "CALL updateTrain_status($newPassID, $trainNo, '$c', $seat, '$date')");
// mysqli_query($conn, "CALL updateTrain_status($newPassID, $trainNo, '$ct', '$seat')");

$amount += mysqli_fetch_row(mysqli_query($conn, "SELECT price from price where coach = '$c'"))[0];
mysqli_query($conn, "INSERT INTO phast VALUES($newPassID, $newPNR)");
mysqli_query($conn, "INSERT INTO book VALUES($uid, $newPassID)");
$newPassID++;
// $newPNR++;
mysqli_query($conn, "INSERT INTO receive values($newPNR, $tranID)");
```

```php
$tno = mysqli_fetch_row(mysqli_query($conn, "SELECT train_number from train where train_name = '$trainName' limit 1"))[0];
$query = "SELECT * from (select @utl:=$tno) t, train_schedule_view;";

$res = mysqli_query($conn, $query);
$flag = 0;
while ($row = mysqli_fetch_row($res)) {
    $r = $row[1];
    $temp = mysqli_fetch_row(mysqli_query($conn, "SELECT station_name from station where station_id = $r limit 1;"))[0];
    array_push($sName, $temp);
    array_push($pNo, $row[2]);
    array_push($aTime, $row[3]);
    array_push($dTime, $row[4]);
    if ($row[5] == 0) {
        array_push($status, 'Departed');
    }
    else if ($row[5] == 1) {
        array_push($status, 'At Station');
    }
    else if ($row[5] == 2) {
        array_push($status, 'Not Arrived');
    }
    else {
        array_push($status, '---');
    }
    $flag = 1;
}
if ($flag == 0) {
    echo '<script type="text/javascript"> alert("The Train dosen\'t exist"); </script>';
}
```

```php
for ($j = 1; $j <= $_SESSION['i']; $j++) {
    if (isset($_POST['cancel'.$j])) {
        unset($_POST['cancel'.$j]);
        $cancel_pnr = $_SESSION['cancelPnr'];
        $cancelPnr = $cancel_pnr[$j-1];
        $uid = $_SESSION['uid'];
        // add in cancel
        mysqli_query($conn, "INSERT INTO cancel VALUES ($uid, $cancelPnr, 50)");
        // get pid
        $pids = array();
        $res = mysqli_query($conn, "SELECT passenger_id FROM ticket WHERE pnr_number = $cancelPnr");
        while ($row = mysqli_fetch_row($res)) {
            array_push($pids, $row[0]);
        }
        // update train status
        for ($k = 0; $k < count($pids); $k++) {
            $p = $pids[$k];
            mysqli_query($conn, "UPDATE train_status SET booking_status = 0, pid = 0 WHERE pid = $p");
        }
        $tranID = mysqli_fetch_row(mysqli_query($conn, "SELECT transaction_id FROM receive WHERE pnr_no = $cancelPnr LIMIT 1"))[0];
        // del payment
        mysqli_query($conn, "DELETE FROM payment WHERE transaction_id = $tranID");
        // del receive
        mysqli_query($conn, "DELETE FROM receive WHERE pnr_no = $cancelPnr LIMIT 1");
        // del book
        // del passanger
        for ($k = 0; $k < count($pids); $k++) {
            $p = $pids[$k];
            mysqli_query($conn, "DELETE FROM passenger WHERE passenger_id = $p");
            mysqli_query($conn, "DELETE FROM book WHERE passenger_id = $p");
            mysqli_query($conn, "DELETE FROM boards WHERE passenger_id = $p");
        }
        // del phat
        mysqli_query($conn, "DELETE FROM phast WHERE pnr_no = $cancelPnr");
        // del ticket
        mysqli_query($conn, "DELETE FROM ticket WHERE pnr_number = $cancelPnr");

        echo "<script> alert('Ticket Cancelled'); </script>";
    }
```