



**DATABASE
MANAGEMENT SYSTEM**

Academic Year: 2020-21

FLIGHT RESERVATION SYSTEM

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FLIGHT RESERVATION SYSTEM

A Project Report

Submitted by

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Under the Guidance of
Prof. Kamal Mistry

in partial fulfillment for the award of the degree of

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**MUKESH PATEL SCHOOL OF
TECHNOLOGY MANAGEMENT
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Date: 05th April, 2021

CERTIFICATE

This is to certify that the project entitled “Flight Reservation System” is the bonafide work carried out by Divya Sharma, Sumedha Mahendra, and Viraj Rajendra Sanap of MBA Tech, MPSTME (NMIMS), Mumbai, during the IV semester of the academic year 2020-21, in partial fulfillment of the requirements for the Course Database Management System.

Prof. Kamal Mistry

Internal Mentor

Examiner 1

Examiner 2

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We are also grateful for the assistance we received from our peers to help us formulate, plan and execute the ideas for this project. Their support, in whatever form it may have been, has helped us push through and make this idea into reality.

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Chapter 1: Introduction to the System

1. 1 Introduction

The Flight Reservation System Project is a user-friendly desktop application that allows the user to create a personal account on the application, and book tickets to various airlines, keep records of flight schedules and fare tariffs, passenger personal information like name, phone number and their ticket booking records.

The system's inventory contains all airlines with their available seats, time of arrival and departure and date of arrival and departure.

The application helps the user to book a flight in an efficient and easy manner at any time possible without going to the airports or booking centers.

1.2 Problem Statement

The Airline Reservation System provides an interface to schedule flights and reservations. Its responsibility is to keep track of the system: users, customers, airline information, client information and cancellation. The functionality of the airline reservation system is broken into various primary groups.

Customer reservation information and user were added, deleted and updated in the implementation phase of the account for the way we decide to implement security. The user keeps track of the username and password information.

Customers also keep track of different Flights Schedule, Flight Status of their upcoming flights and their own bookings. Customers can also easily book a flight for n number of passengers at any time according to the availability of the seats and flights.

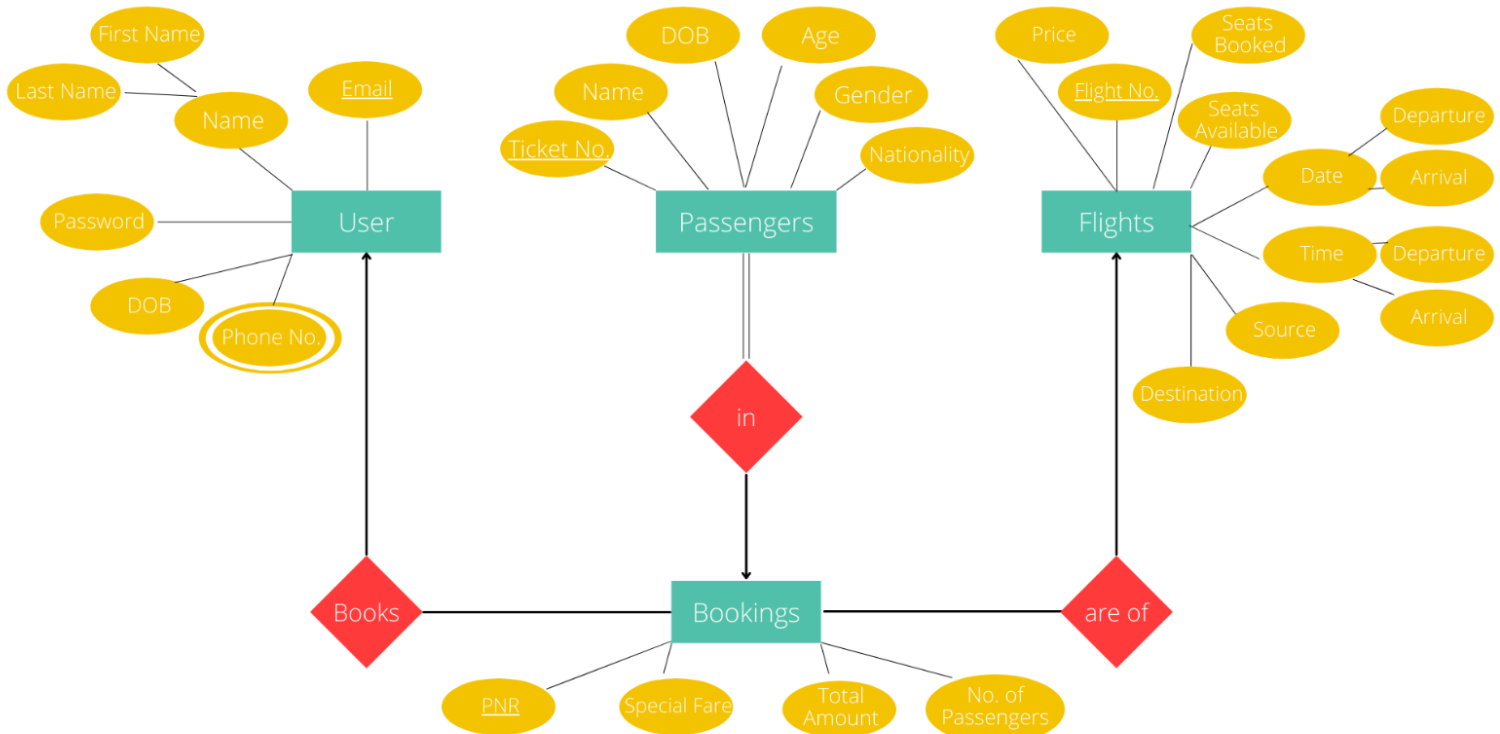
It also provides customers with an FAQ page for their query's and also provided with a 24hr customer service helpline number to contact to.

1.3 User of the System

This system can be used by any potential traveler who wants to book airline tickets from the given application. This system can also be used by the airline company that will update the flight details and keep a track of the bookings and passenger data.

Chapter 2: System Design and Constraints

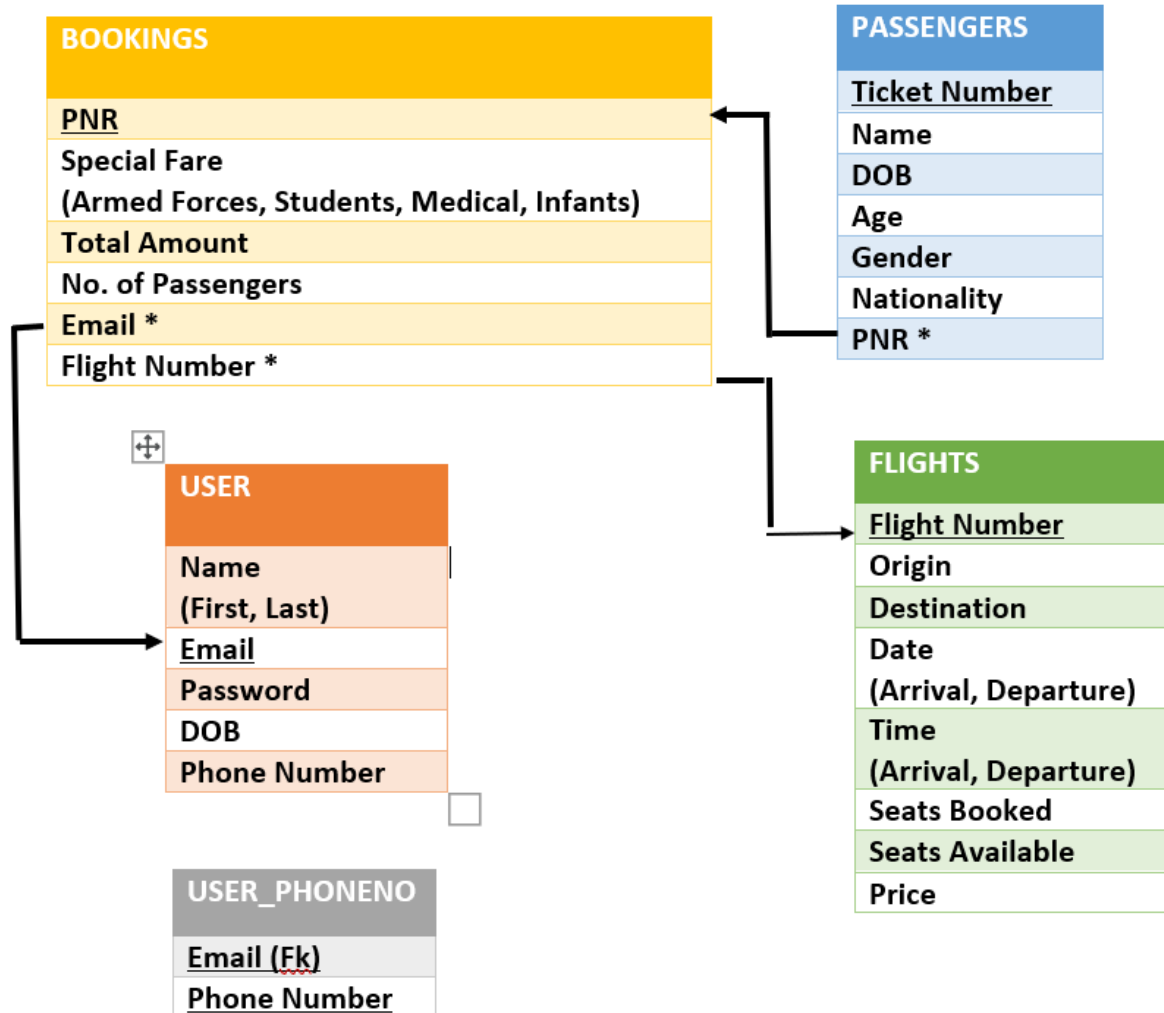
2.1 ER Model



2.2 Reduction of ER model to Relational Model

- USER (Email, First Name, Last Name, Password, DOB)
- FLIGHTS (Flight Number, Origin, Destination, Date_depart, Date_arrival, Time_depart, Time_arrival, Seats_booked, Seats_available, Price)
- BOOKINGS (PNR, Special_Fare, Totalamt, No_of_passengers, Email (FK), Flight_Number (FK))
- PASSENGERS (Ticket_no, Name, DOB, Age, Gender, Nationality, PNR (FK))
- USER_PHONENO (Email (FK), PhoneNo)

2.3 Schema Diagram



2.4 Constraints

- **USER**
 - Primary Key: Email
- **FLIGHTS**
 - Primary Key: Flight Number
- **BOOKINGS**
 - Primary Key: PNR
 - Foreign Keys: Email, Flight Number
- **PASSENGERS**
 - Primary Key: Ticket_no
 - Foreign Key: PNR
- **USER_PHONENO**
 - Primary Key: Email, PhoneNo
 - Foreign Key: Email

2.5 Normalization techniques applied on relational model

In the relations, USERS, FLIGHTS, BOOKINGS, PASSENGERS, since there are no multi-valued attributes, therefore they are in 1NF.

In table USER_PHONENO, PhoneNo is a multi-valued attribute, but the Primary Key is composite (Email, PhoneNo). Therefore, all values are atomic and hence it is also in 1NF.

All relations are in 2NF since partial dependencies do not exist.

Similarly, no transitive dependencies exist and relations are in 3NF.

As all determinants are primary keys in at least one table, it is in BCNF.

Chapter 3: Implementation

3.1 Hardware and Software

Hardware Requirements:

Processor:	11th Gen Intel(R) Core(TM) i7-1165G7 @ 2.80GHz 2.80 GHz
Installed memory (RAM):	16.0 GB (15.6 GB usable)
System type:	64-bit Operating System, x64-based processor
Pen and Touch:	Pen Support

- Intel core i7 11th generation was used as a processor because it is faster than others and is reliable and stable.
- In general, we recommend at least 4GB of RAM and think that most users will do well with 8GB. 16GB RAM will help the application work and process faster.

Windows OS:

Windows is a graphical operating system developed by Microsoft. It allows users to view and store files, run the software, play games, watch videos, and provides a way to connect to the internet. It was released for both home computing and professional works.

Software Requirements:

Database (DB Browser): Sqlite3 is used as database as it easy to maintain and retrieve records by simple functions.

Development tools and Programming language: Python is used to write the whole code and develop GUI using Tkinter, sqlite3 as the backend, for database.

Python 3.6 or above: the python interpreter to run the code written in python.

3.2 Tools or library used

Db Browser:

DB Browser is a visual tool used to organize commands sent to SQLite. With databases, it's easy to lose track of commands that have been run. DB Browser lets you see exactly the sequence of commands you are executing before you run them. We have used this software to create and store data in tables.

Pycharm:

It is developed by the Czech company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems (VCSes), and supports web development with Django as well as data science with Anaconda. PyCharm is cross-platform, with Windows, macOS and Linux versions.

It is an integrated development environment used in computer programming, specifically for the Python language.

We have used this software for the coding and designing for the app. This is an easier to use software, and far superior to IDLE. This software allows us to make a better GUI.

- Tkinter: Tkinter is a Python binding to the Tk GUI toolkit. It is the standard Python interface to the Tk GUI toolkit, and is Python's standard GUI.
- Sqlite3: This is the Python module used to integrate SQLite into the code. It serves the function of allowing the creation, deletion and entry of data into tables.

Python shell:

Python provides a Python Shell, which is used to execute a single Python command and display the result. It is also known as REPL (Read, Evaluate, Print, Loop), where it reads the command, evaluates the command, prints the result, and loop it back to read the command again.

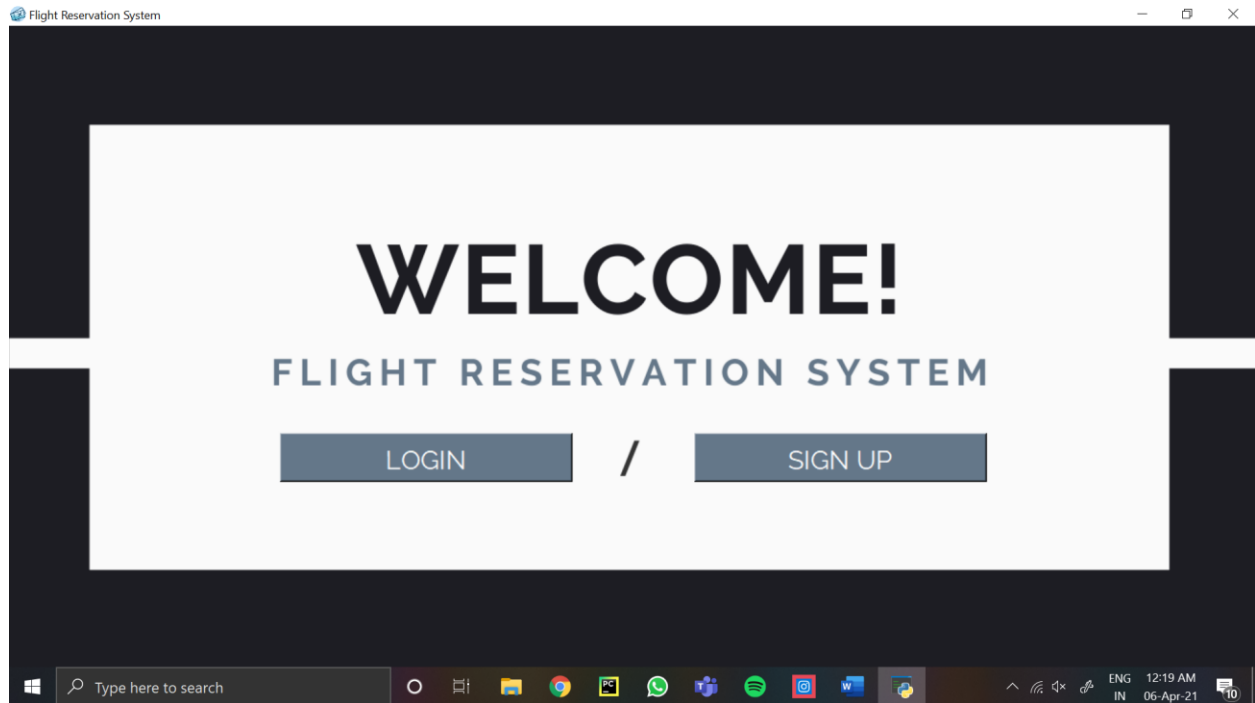
IDLE

IDLE (Integrated Development and Learning Environment) is an integrated development environment (IDE) for **Python**.

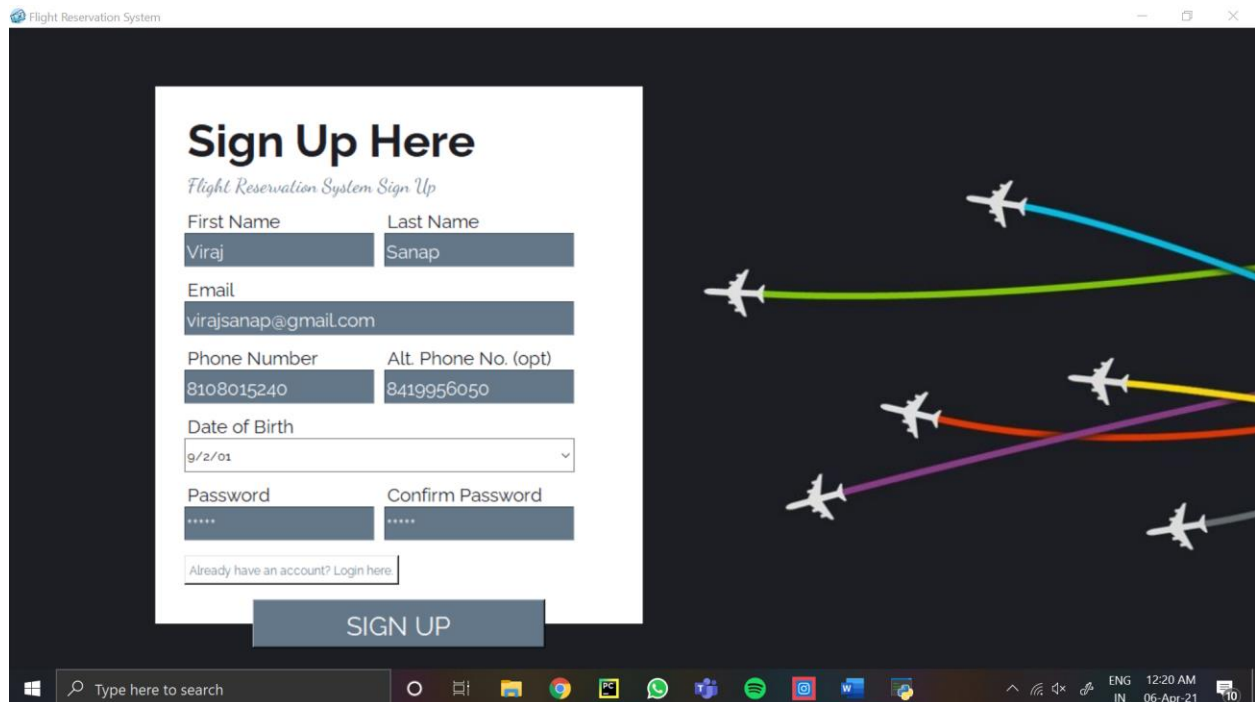
3.3 Screenshots and Description

GUI Screenshots

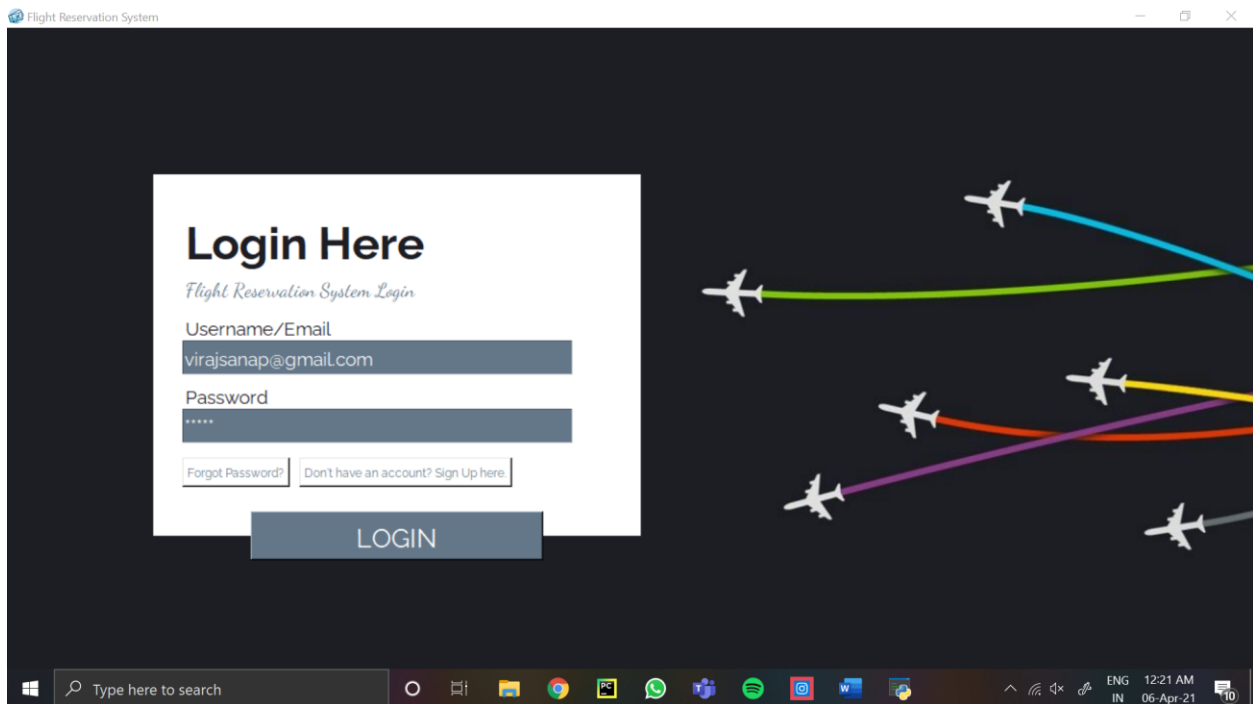
1. Welcome Page



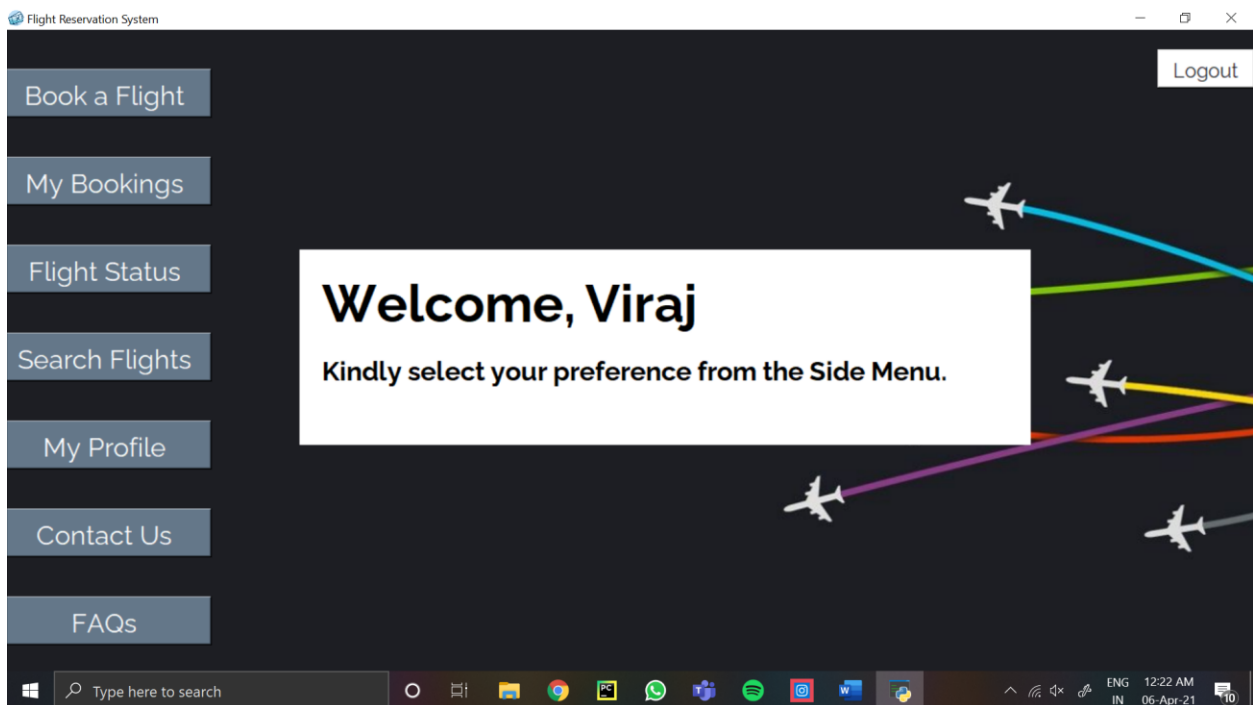
2. Sign Up Page



3. Login Page



4. Home Page



5. Book a Flight Page

Flight Reservation System

Logout

Book a Flight

My Bookings

Flight Status

Search Flights

My Profile

Contact Us

FAQs

From: Pune

To: Mumbai

Date of Departure: MM/DD/YY 4/6/21

Search Flights

Flight Number	Origin	Destina
195	Pune	Muml
200	Pune	Muml

Enter the flight number of the selected flight: 200

Number of passengers: 2

Special Fares: ☐ Armed Forces ☒ Students ☐ Medical
☐ Infants ☐ None

Click Here to Add Passenger Details

Type here to search

ENG 12:23 AM IN 06-Apr-21

6. Enter Passenger Details Page

Passenger Details

Cancel Booking

Enter Passenger Details

Name: Rajendra Sanap

Date of Birth: 8/15/74

Nationality: Indian

Gender: ☒ Male ☐ Female

Age: 46

Next

Type here to search

ENG 12:25 AM IN 06-Apr-21

7. Confirm Booking Page

Flight details

Cancel Booking

Confirm Booking

Origin: Destination:

Date of Departure: Date of Arrival:

Time of Departure: Time of Arrival:

Passengers:

Name	DOB	Nationality	Gender
Rajendra Sanap	8/15/74	Indian	Male
Vijaya Sanap	6/9/76	Indian	Female

Windows taskbar: Type here to search, O, File Explorer, Chrome, PC, WhatsApp, Teams, Spotify, Instagram, Word, Edge, Settings, Network, Volume, ENG IN, 12:25 AM, 06-Apr-21, 10

8. My Bookings Page

Flight Reservation System

Logout

Book a Flight

My Bookings

Flight Status

Search Flights

My Profile

Contact Us

FAQs

My Bookings

PNR	Flight Number	Origin	Destination
596.0	195	Pune	Mumbai

Enter your PNR number:

PNR: 596 Flight No: 195

Origin: Pune Destination: Mumbai

No of Passengers: 2 Total Amount: 2280.0

Date of Departure: 4/6/21 Date of Arrival: 4/6/21

Time of Departure: 9:30:15 Time of Arrival: 9:45:20

Ticket No.	Passenger Name	Date of Birth	Gender
1042.0	Rajendra Sanap	8/15/74	Male
1950.0	Vijaya Sanap	6/9/76	Female

Windows taskbar: Type here to search, O, File Explorer, Chrome, PC, WhatsApp, Teams, Spotify, Instagram, Word, Edge, Settings, Network, Volume, ENG IN, 12:29 AM, 06-Apr-21, 10

9. Flight Status Page

Flight Reservation System Logout

[Book a Flight](#)

[My Bookings](#)

[Flight Status](#)

[Search Flights](#)

[My Profile](#)

[Contact Us](#)

[FAQs](#)

Flight Status

Enter the Flight No.: [Show Details](#)

Flight No:	195	Price per ticket:	1900.0
Origin:	Pune	Destination:	Mumbai
Seats Available:	56	Seats Booked:	44
Date of Departure:	4/6/21	Date of Arrival:	4/6/21
Time of Departure:	9:30:15	Time of Arrival:	9:45:20

10. Search Flights Page

Flight Reservation System Logout

[Book a Flight](#)

[My Bookings](#)

[Flight Status](#)

[Search Flights](#)

[My Profile](#)

[Contact Us](#)

[FAQs](#)

Search Flights

Enter the Origin: Enter the Destination:

Enter the Date of Departure: [Show Details](#)

Flight Number	Origin	Destination	Date of Departure
110	Delhi	Hyderabad	4/7/21
162	Delhi	Hyderabad	4/7/21

11. My Profile Page

Flight Reservation System

Logout

Book a Flight

My Bookings

Flight Status

Search Flights

My Profile

Contact Us

FAQs

My Profile

First Name: Viraj
Last Name: Sanap
Email: virajsanap@gmail.com
Phone Number: 8108015240
Alt. Phone No.: 8419956050
Date of Birth: 9/2/01
Password: viraj

Edit Profile Delete Profile

Type here to search

ENG 12:30 AM IN 06-Apr-21

12. Edit Profile Page

Flight Reservation System

Logout

Book a Flight

My Bookings

Flight Status

Search Flights

My Profile

Contact Us

FAQs

Edit Profile

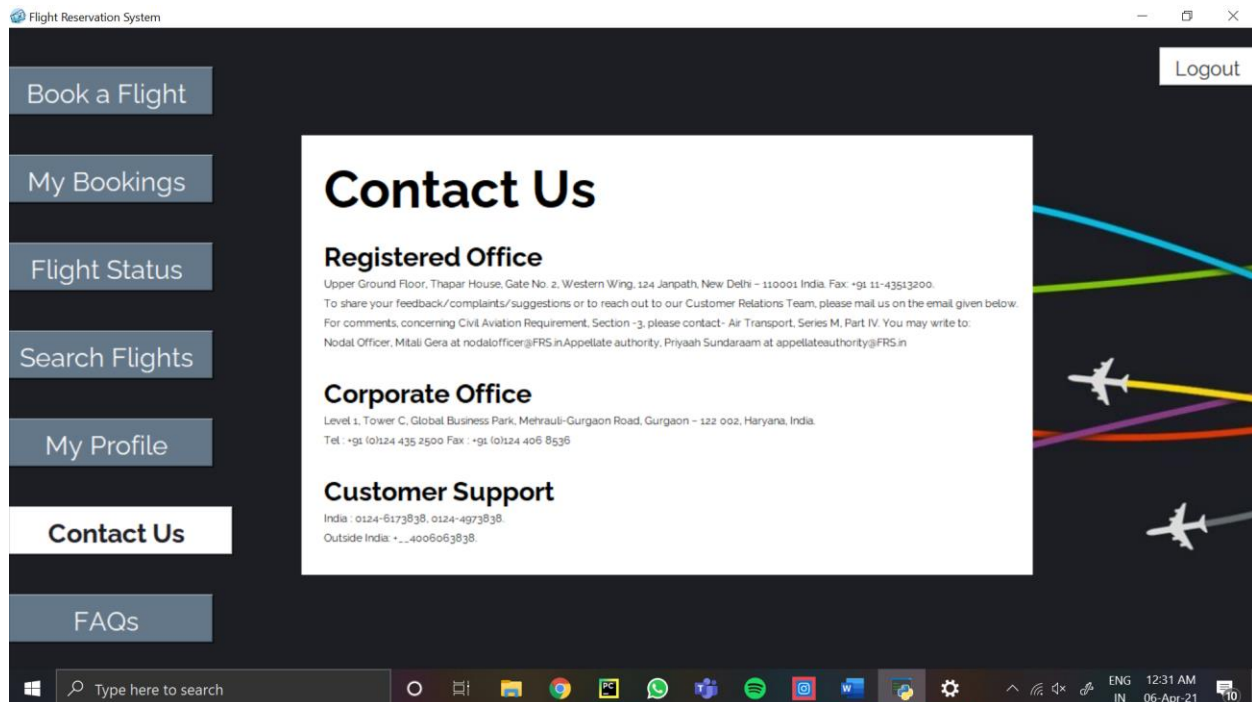
First Name:
Last Name:
Email: virajsanap@gmail.com
Phone Number:
Alt Phone No.:
Date of Birth:
Password:

Confirm Changes

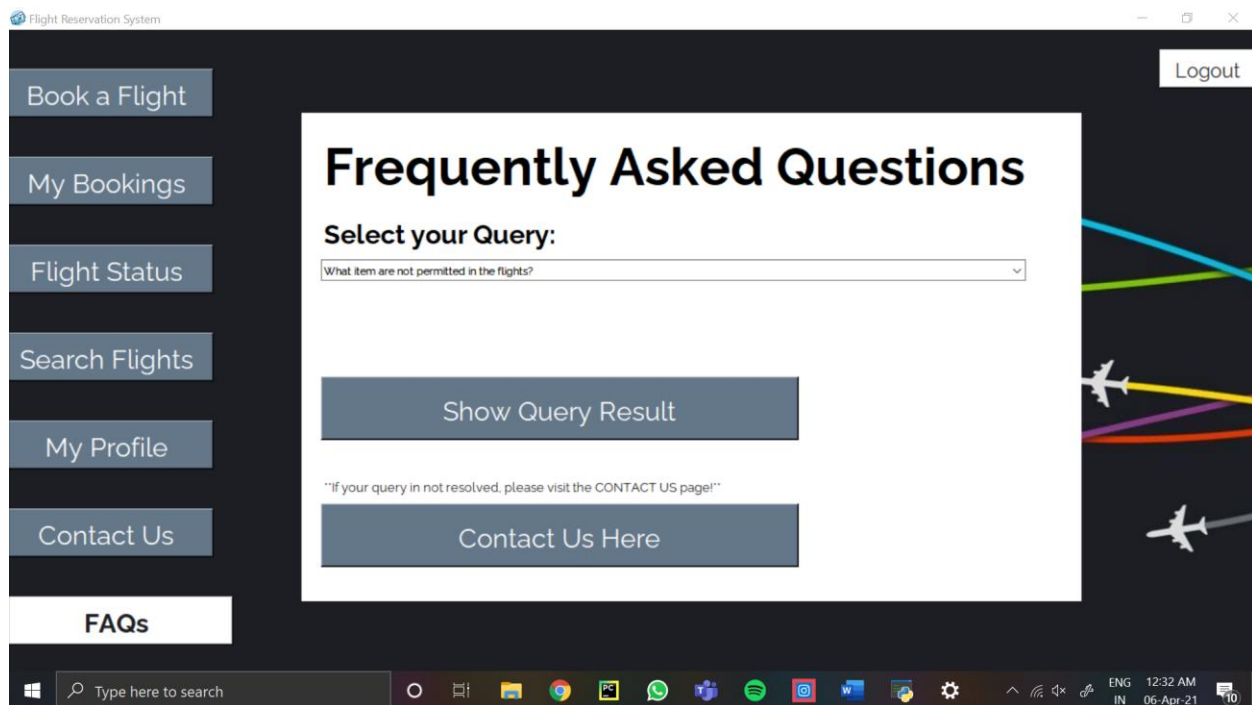
Type here to search

ENG 12:31 AM IN 06-Apr-21

13. Contact Us Page



14. FAQs Page



3.4 Database Structure

Table: USER					
	Email	First_Name	Last_Name	Password	DOB
	Filter	Filter	Filter	Filter	Filter
1	divyasharma@gmail.com	Divya	Sharma	divya	12/5/00
2	virsanap@gmail.com	Viraj	Sanap	viraj	9/2/01
3	sumedha@gmail.com	Sumedha	Mahendra	viraj	4/5/01

Table: FLIGHTS									
	flight_number ▼ ¹	origin	destination	Date_depart	Date_arrival	Time_depart	Time_arrival	seats_booked	seats_avail: ^
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	101	Delhi	Mumbai	4/5/21	4/5/21	7:30:15	9:30:00	33	
2	102	Delhi	Mumbai	4/7/21	4/7/21	10:30:15	12:30:00	28	
3	103	Mumbai	Delhi	4/6/21	4/6/21	5:00:00	6:30:10	38	
4	104	Mumbai	Delhi	4/8/21	4/8/21	6:30:15	8:00:00	58	
5	105	Delhi	Pune	4/5/21	4/5/21	11:15:00	13:00:00	30	
6	106	Delhi	Pune	4/7/21	4/5/21	15:30:15	17:15:20	78	
7	107	Pune	Delhi	4/6/21	4/6/21	6:30:15	8:30:00	34	
8	108	Pune	Delhi	4/8/21	4/8/21	19:00:30	21:00:15	98	
9	109	Delhi	Hyderabad	4/5/21	4/5/21	8:10:15	11:30:13	48	
10	110	Delhi	Hyderabad	4/7/21	4/7/21	20:00:00	22:20:25	29	
11	111	Mumbai	Hyderabad	4/6/21	4/6/21	13:00:15	15:50:40	48	
12	112	Hyderabad	Mumbai	4/7/21	4/7/21	18:00:00	20:30:15	68	
13	113	Mumbai	Pune	4/7/21	4/7/21	10:15:00	11:00:00	37	
14	114	Pune	Mumbai	4/8/21	4/8/21	9:30:15	9:45:20	44	
15	115	Mumbai	Hyderabad	4/6/21	4/6/21	21:00:15	23:30:00	34	
16	116	Hyderabad	Mumbai	4/8/21	4/8/21	12:15:00	2:45:15	73	
17	117	Pune	Hyderabad	4/5/21	4/5/21	8:10:15	11:30:13	28	
18	118	Hyderabad	Pune	4/7/21	4/7/21	20:00:00	22:20:25	31	

Table: BOOKINGS						
	PNR	SP	totalamt	no_of_passengers	email	flight_number
	Filter	Filter	Filter	Filter	Filter	Filter
1	521.0	Student	3000.0	3	divyasharma@gmail.com	173
2	363.0	None	13170.0	3	virsanap@gmail.com	134
3	406.0	None	4700.0	2	virsanap@gmail.com	112
4	179.0	Student	2880.0	1	virsanap@gmail.com	108
5	889.0	Student	4140.0	2	sumedha@gmail.com	187
6	596.0	Student	2280.0	2	virajsanap@gmail.com	195

Table: PASSENGERS							
	Ticket_no	Name	DOB	AGE	Gender	Nationality	PNR
	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	1402.0	Sumedha Mahendra	9/3/01	Female	20	Indian	521.0
2	1330.0	Viraj Sanap	9/2/01	Male	19	Indian	363.0
3	1800.0	Rajendra Sanap	8/15/74	Male	46	Indian	363.0
4	1497.0	Vijaya Sanap	6/9/76	Male	44	Indian	363.0
5	1539.0	Rathin Nair	12/20/00	Male	20	Indian	406.0
6	1277.0	Hemit Shah	10/26/01	Male	19	Indian	406.0
7	1517.0	Anushka Chaturvedi	1/27/01	Female	20	Indian	179.0
8	1591.0	Viraj Sanap	4/2/21	Male	19	Indian	889.0
9	1302.0	Divya Sharma	4/5/00	Female	20	Indian	889.0
10	1042.0	Rajendra Sanap	8/15/74	Male	46	Indian	596.0
11	1950.0	Vijaya Sanap	6/9/76	Female	44	Indian	596.0

Table: USER_PHONENO	
Email	PhoneNo
Filter	Filter
1 divyasharma@gmail.com	8108014321
2 divyasharma@gmail.com	7676712
3 virsanap@gmail.com	8108015240
4 virsanap@gmail.com	8422930505
5 sumedha@gmail.com	9898989898
6 sumedha@gmail.com	9873523211
7 virajsanap@gmail.com	8108015240
8 virajsanap@gmail.com	8419956050

Table Create Commands:

```
CREATE TABLE USER
(
Email TEXT Primary Key,
First_Name TEXT,
Last_Name TEXT,
Password TEXT,
DOB TEXT
);
```

```
CREATE TABLE FLIGHTS
(
flight_number INTEGER PRIMARY KEY,
origin TEXT,
destination TEXT,
Date_depart TEXT,
Date_arrival TEXT,
Time_depart TEXT,
Time_arrival TEXT,
seats_booked INTEGER,
seats_available INTEGER,
price REAL
);
```

```
CREATE TABLE BOOKINGS
(
PNR REAL PRIMARY KEY,
SP TEXT, totalamt REAL,
no_of_passengers INTEGER,
email TEXT,
flight_number INTEGER,
FOREIGN KEY (email) REFERENCES USER(email) on DELETE CASCADE on UPDATE CASCADE,
FOREIGN KEY (flight_number) REFERENCES flights(flight_number) on DELETE CASCADE on UPDATE CASCADE
);
```

```
CREATE TABLE PASSENGERS
(
Ticket_no REAL PRIMARY KEY,
Name VARCHAR(20),
DOB TEXT,
```

```
AGE VARCHAR(20),  
Gender VARCHAR(10),  
Nationality VARCHAR(20),  
PNR REAL,  
FOREIGN KEY(PNR) references Bookings(PNR)on DELETE CASCADE ON UPDATE  
CASCADE);
```

```
CREATE TABLE USER_PHONENO  
(  
Email TEXT,  
PhoneNo INTEGER,  
PRIMARY KEY(Email,PhoneNo),  
FOREIGN KEY(Email) references USER(Email) on delete cascade on update  
cascade  
);
```

Chapter 4: Conclusion and Future work

Conclusion

This has been a great pleasure for us to work on this exciting and challenging Project. This project proved good for us as it provided us with practical knowledge of programming.

With working employees travelling 24/7 this software speed up your reservation process and makes it convenient for the customers to book flights whenever and wherever!

It reduces the scope of manual error and conveniently maintains any modifications, cancellations in the reservations. It not only provides flight details but also creates a platform to book tickets, cancels or modifies ticket timings or dates and even informs about the number of people on board.

Future Scope

This Project designs and implements Air reservation system. This supports a well-designed database with all available air flights information which can be accessed easily through a single point.

It provides a friendly user interface with various combinations of searching a flight, finding the flight status and schedule, booking a flight etc. that can be fetched by the user and generates corresponding database search statements.