MINI PROJECT REPORT

AIRLINE TICKET BOOKING AGENCY

EEX3417
SOFTWARE DEVELOPMENT FOR ENGINEERS

M.N.M. Fazeel
220260734
TMA09
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Table of Contents

Introduction

This system is built for an airline ticket booking agency to accomplish their day-to-day business tasks. If we take the brief idea of this system is for;

This airline ticket agency does the seat booking for passengers. A separate booking reference number is given to each passenger. An airplane has a number of seats allowed for each ticket agent. Any airplane flight has a unique flight number, a departure airport, a destination airport, departure date and time, and arrival date and time. A passenger has a passport number, given names, a surname, and an email address.

While building this system I had to consider stakeholders such as Admins, Passengers, Users who are looking for a good offer, and so on. I had to add every detail that stakeholders want to know in the system. I had to follow some important steps to gather and process the data to build a clear and simple system.

Requirement Analysis

This session describes gathering analyzing and drawing use case diagrams and analyzing reorganizing functional and non-functional requirements from the data received.

High-level design

After requirement analysis and gathering of information step into the process of high-level designing and creating an entity-relationship diagram. This session describes the above processes.

Data Modelling

This session describes how organized Business rules, Entities, Tables, and attributes. Setting up field lengths and Relations. Normalization of tables and Interacting users of attributes.

Detail design

This session shows how the user interfaces are designed and the flow diagram of the system.

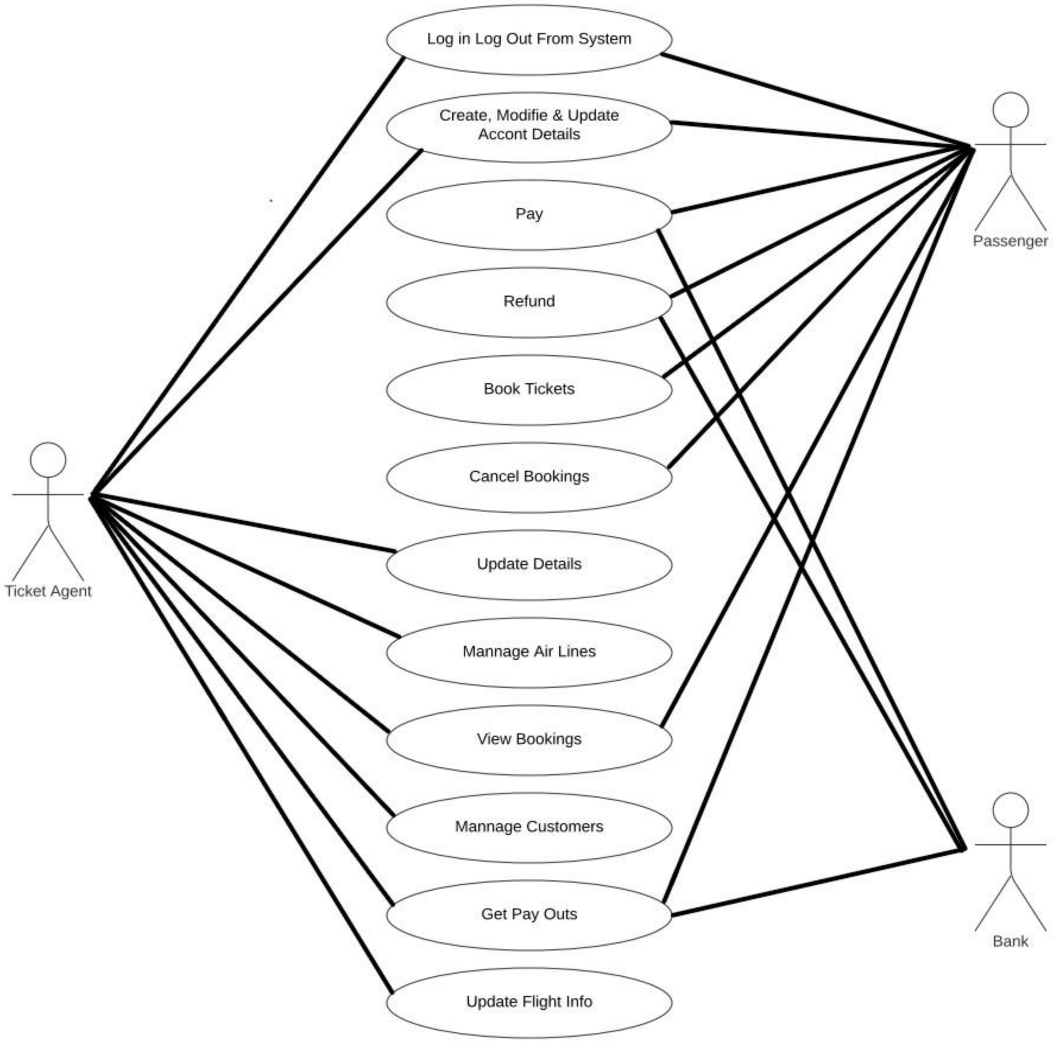
Requirement Analysis

In the requirement Analysis process first of all I had to Identify the user's possible interaction with this system had to be built. For that, I had to identify the basic functions of this system and how they connect with the users of this system. After that draw the user case diagram for this system using gathered data.

What is a User Case Diagram?

A use case diagram is a graphical representation of a user's possible interactions with a system. A use case diagram is used to represent the dynamic behavior of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application.

User Case Diagram For Airline Ticket Booking System



After that, the other process of the next step of the Requirement Analysis is to identify the Functional and Non-Functional Requirements of the system.

What are Functional and Non-Functional Requirement?

- Functional Requirement defines a system or its component
- Non-Functional Requirement defines the performance attribute of a software system

Functional Requirements and Non-Functional Requirements of the Airline Ticket Booking Agency

Functional Requirements

1. The administrator should be able to add delete or modify information.
2. The administrator should be able to see reservation cancellation requests.
3. The administrator should be able to log in and log out.
4. The administrator should be able to check the payment status.
5. Passengers should be able to see details about flights. Such as flight departure date/airport/time, and arrival date/airports/time.
6. Passengers should be able to log in, Book tickets, Pay, Cancel reservations.
7. Passengers should be able to add delete or modify information.

Non-Functional Requirements

1. Usability - the system should be user-friendly.
2. Efficiency - the system should respond quickly to users.
3. Performance - system loading time, time to respond to order, handling many transactions at once
4. Security - protect logging details, customer details, chatting histories.
5. Responsible - Payment refunds and ticketing
6. High Capacity - Storing large amounts of user data and details about business
7. Availability - availability over every platform and every region.

High-Level Design

In the High-level designing process, I had to identify the classes (entities) and attributes of each class.

What is a class(entity)?

A class (entity) is defined as a uniquely identifiable element about which data is stored in a database

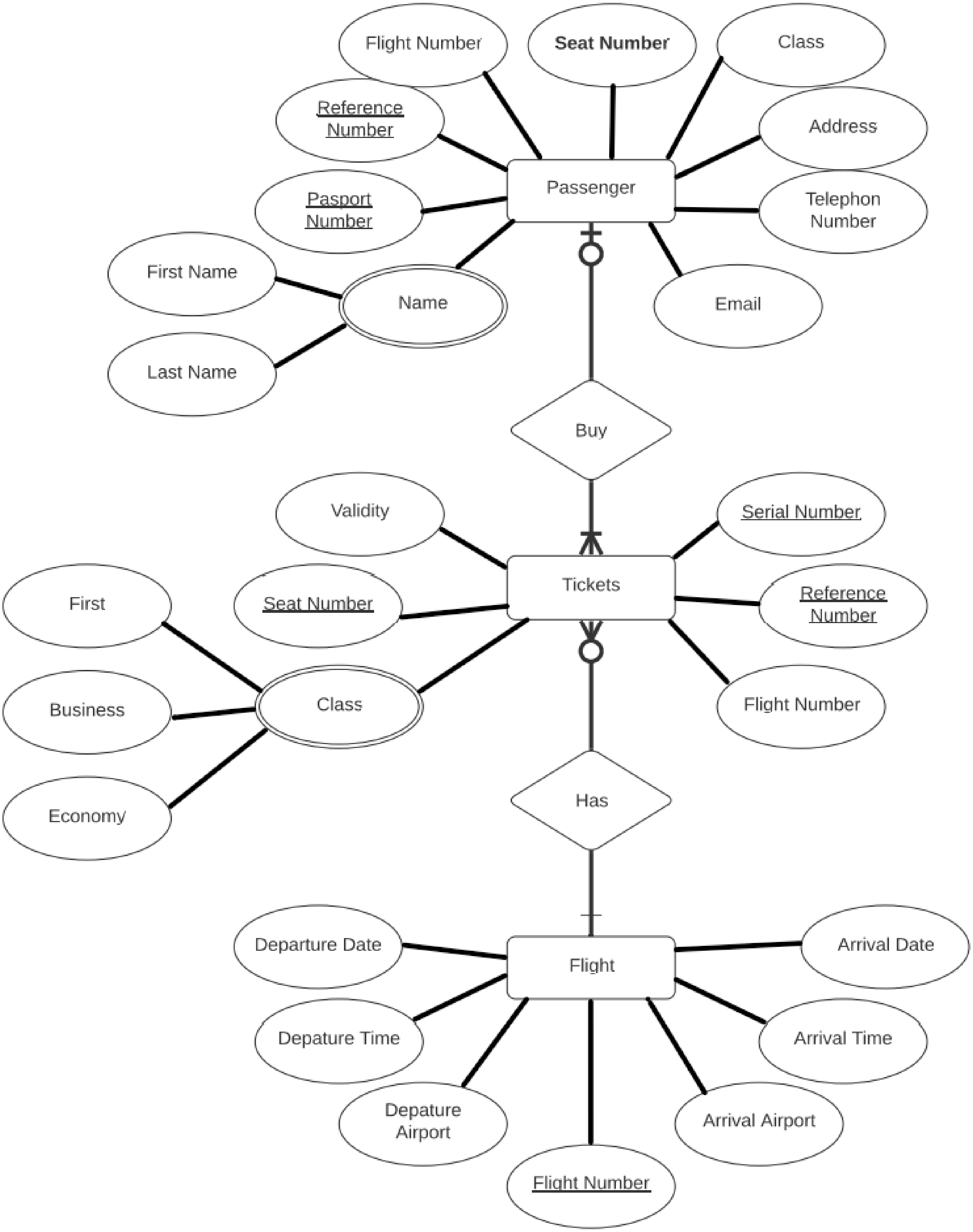
A class is used to model any “thing” in the company that is to be represented in our database. As mentioned, it could be a physical “thing” (e.g., a store, an animal, etc) or simply a fact about the company or an event that happens in the real world (e.g., the lending of a book). Each class is uniquely defined by its set of attributes**.** Each attribute is one piece of information that characterizes the class(entity). Together, they provide the structure for Class.

After identifying the classes and their attributes we can select a unique attribute as a primary key to a certain class. This primary key is unique to a certain class so we can use that to find records in tables and use them to normalize our database. We can draw an Entity Relationship Diagram to graphically represent the relation between classes in the database.

What is an Entity Relationship Diagram?

An Entity Relationship Diagram is a type of flowchart that illustrates how “entities” such as people, objects, or concepts relate to each other within a system.

Entity Relationship Diagram for Airline Ticket Agency Database



Data Modelling

Data modeling is the process of creating a simple diagram of a complex software system. We can do this using text and symbols to represent the way data will flow. The goal is to illustrate the types of data used and stored within the system, the relationships among these data types, the ways the data can be grouped and organized, and its formats and attributes. There are 6 important steps in the data modeling process

- **Identify the entities.** The process of data modeling begins with the identification of the things, events, or concepts that are represented in the data set that is to be modeled.
- **Identify key properties of each entity.** Each entity type can be differentiated from all others because it has one or more unique properties, called attributes.
- **Identify relationships among entities.**
- **Map attributes to entities completely.**
- **Assign keys as needed, and decide on a degree of normalization that balances the need to reduce redundancy with performance requirements.** Normalization is a technique for organizing data models (and the databases they represent) in which numerical identifiers, called keys, are assigned to groups of data to represent relationships between them without repeating the data. For instance, if customers are each assigned a key, that key can be linked to both their address and their order history without having to repeat this information in the table of customer names. Normalization tends to reduce the amount of storage space a database will require, but it can at a cost to query performance.
- **Finalize and validate the data model.**

Tables

First step is to Identify the entities and there attributes. In this system, there are 3 main entities and they have separate attributes that define a certain entity. Then attributes have certain data type and field length. The entities and their attributes listed below;

Passenger	**Tickets**	**Flight**
Reference Number	Serial Number	Flight Number
Passport Number	Flight Number	Arrival Airport
Flight Number	Validity	Arrival Date
Class	Class	Arrival Time
Seat Number	Seat Number	Departure Airport
First Name	Reference Number	Departure Date
Last Name	Passport Number	Departure Time
Address		
Email		
Telephone Number		

Next step is to decide the field names, data type and field length. Then we have to Assign keys as needed.

Tables Passenger, Ticket and Flight with their field types and length are shown below. Primary keys (pk), foreign keys (fk) are also indicated.

Database Name		agency		
Table Name		passengers		
No	Field Name	Field Type	Size	Key
1	reference_no	int	20	pk
2	passport_no	int	20	pk
3	flight_no	varchar	20	
4	f_class	int	10	
5	seat_no	int	10	unique
6	firstname	varchar	100	
7	lastname	varchar	100	
8	address	varchar	250	
9	email	varchar	100	
10	tel_no	int	20	

Table Nme		tickets		
No	Field Name	Field Type	Size	Key
1	serial_no	int	20	pk
2	flight_no	varchar	20	
3	validity	date		
4	f_class	int	10	
5	seat_no	int	10	unique
6	reference_no	int	20	unique
7	passport_no	int	20	unique

Table Nme		flight		
No	Field Name	Field Type	Size	Key
1	flight_no	varchar	20	pk
2	arrival_airport	varchar	100	
3	arrival_date	date		
4	arrival_time	varchar	40	
5	departure_airport	varchar	100	
6	departure_date	date		
7	departure_time	varchar	40	

While creating the database had to add two separated tables to save user registration data and admin data their fields types and lengths are shown as below;

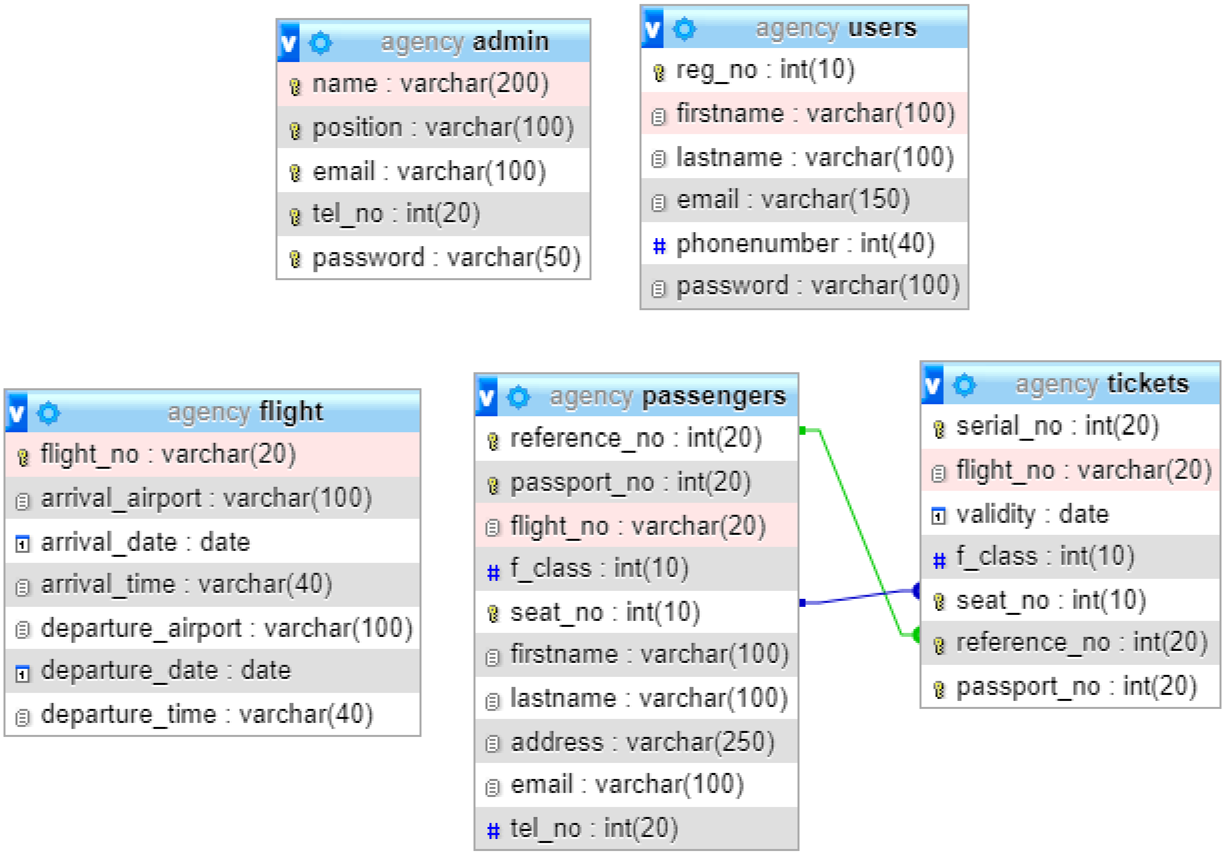
Table Nme		users		
No	Field Name	Field Type	Size	Key
1	reg_no	int	10	pk
2	firstname	varchar	100	
3	lastname	varchar	100	
4	email	varchar	150	
5	phonenumber	int	40	
6	password	varchar	100	

Table Nme		admin		
No	Field Name	Field Type	Size	Key
1	name	varchar	200	pk
2	position	varchar	100	unique
3	email	varchar	100	unique
4	tel_no	int	20	unique
5	password	varchar	50	unique

Then we have to Identify relationships among entities. Before creating relationships have to identify Business rules in this system. Recognized Business rules of this system are,

- Passengers must log in to the system before booking any ticket.
- One email address can only be used once to register to the system.
- To do any administrative task in the user must log in as an admin.
- One user can book any number of tickets for various passport numbers.
- Only the admin can delete or edit records.
- Customers can cancel tickets before a deadline.

After identifying the business rules can create relations between entities. In this database user and admin, tables are separated and they don't have any relations to any entity. Then the relations between flight entity and other entities cant be created because flight_no (primary key of flight table) can't be set as a unique key in other tables. Because if flight_no is set as a unique key more than one ticket can't book for one flight. Relations between tables(entities) as follows,



agency admin
name : varchar(200)
position : varchar(100)
email : varchar(100)
tel_no : int(20)
password : varchar(50)

agency users
reg_no : int(10)
firstname : varchar(100)
lastname : varchar(100)
email : varchar(150)
phonenumber : int(40)
password : varchar(100)

agency flight
flight_no : varchar(20)
arrival_airport : varchar(100)
arrival_date : date
arrival_time : varchar(40)
departure_airport : varchar(100)
departure_date : date
departure_time : varchar(40)

agency passengers
reference_no : int(20)
passport_no : int(20)
flight_no : varchar(20)
f_class : int(10)
seat_no : int(10)
firstname : varchar(100)
lastname : varchar(100)
address : varchar(250)
email : varchar(100)
tel_no : int(20)

agency tickets
serial_no : int(20)
flight_no : varchar(20)
validity : date
f_class : int(10)
seat_no : int(10)
reference_no : int(20)
passport_no : int(20)

Normalization

Normalization is the process of organizing the data in the database. Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate undesirable characteristics like Insertion, Update, and Deletion Anomalies. There are 3 types of normalization forms.

First normal form

- Eliminate repeating groups in individual tables.
- Create a separate table for each set of related data.
- Identify each set of related data with a primary key.

Second normal form

- Create separate tables for sets of values that apply to multiple records.
- Relate these tables with a foreign key.

Third normal form

- Eliminate fields that do not depend on the key.

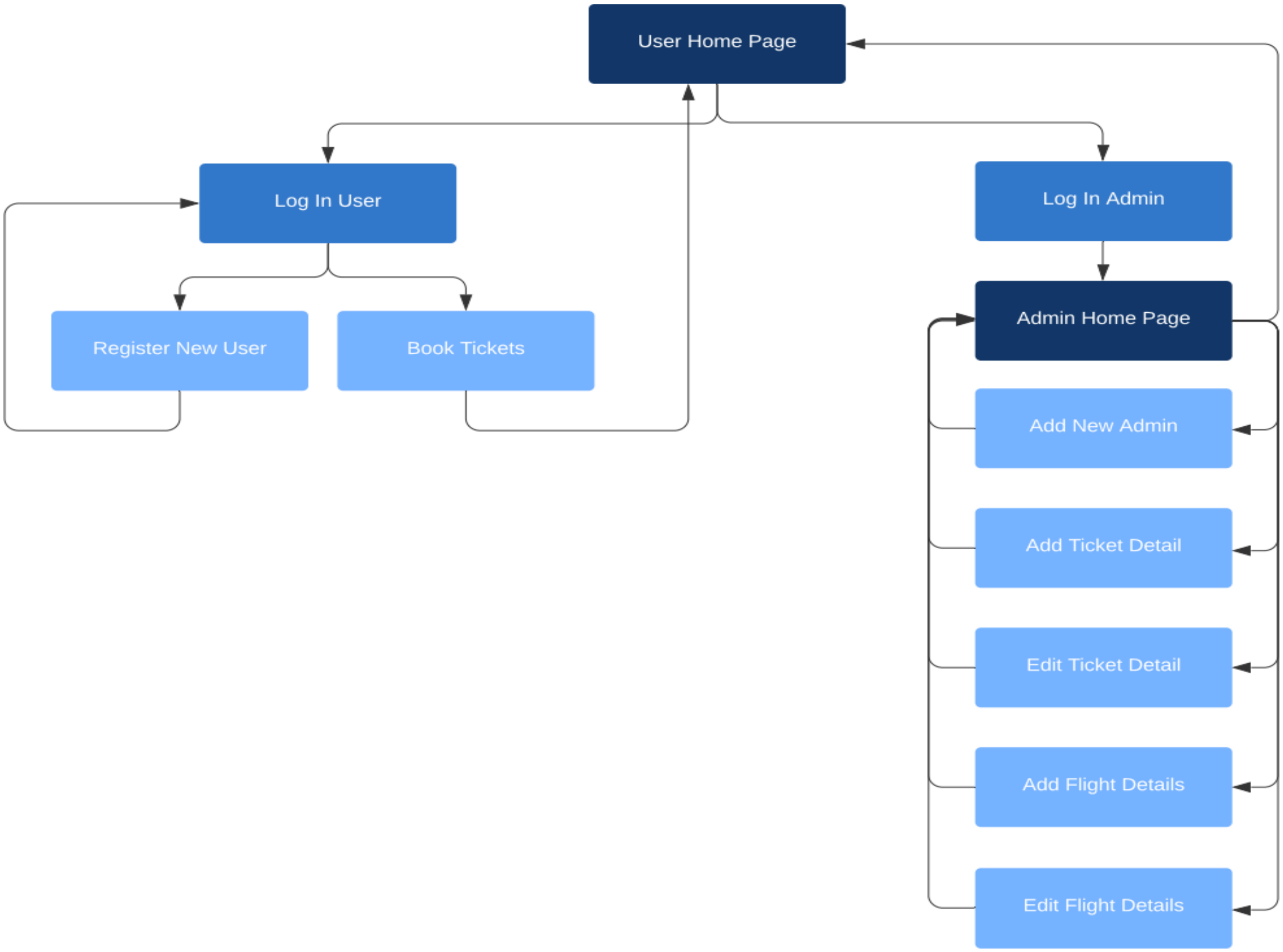
Detail Design

The final step is to create GUI for the system.

In this system, I have created has 11 pages that can access through links on the home page that include;

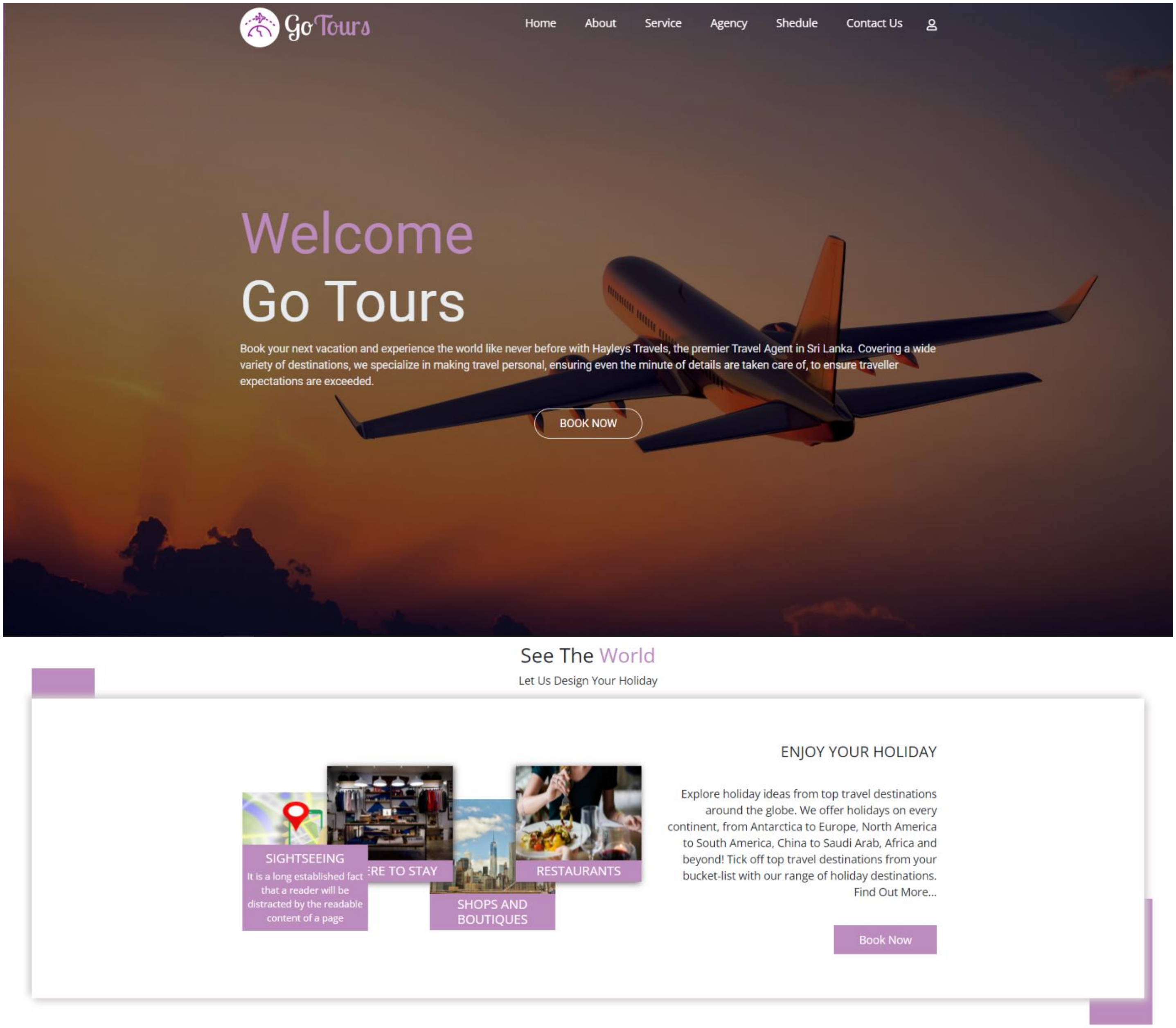
- 2 Home pages - one for admin, one for visitors who are looking for offers
- 2 Login pages - Admin Login and User Login
- 2 Registration Pages - One for registering new users and one for registering new admins
- 2 Edit page
- 3 record adding pages
- One record viewing page

All pages are connected through links on home pages.



Results

User Home Page



Welcome

Go Tours

Book your next vacation and experience the world like never before with Hayleys Travels, the premier Travel Agent in Sri Lanka. Covering a wide variety of destinations, we specialize in making travel personal, ensuring even the minute of details are taken care of, to ensure traveller expectations are exceeded.

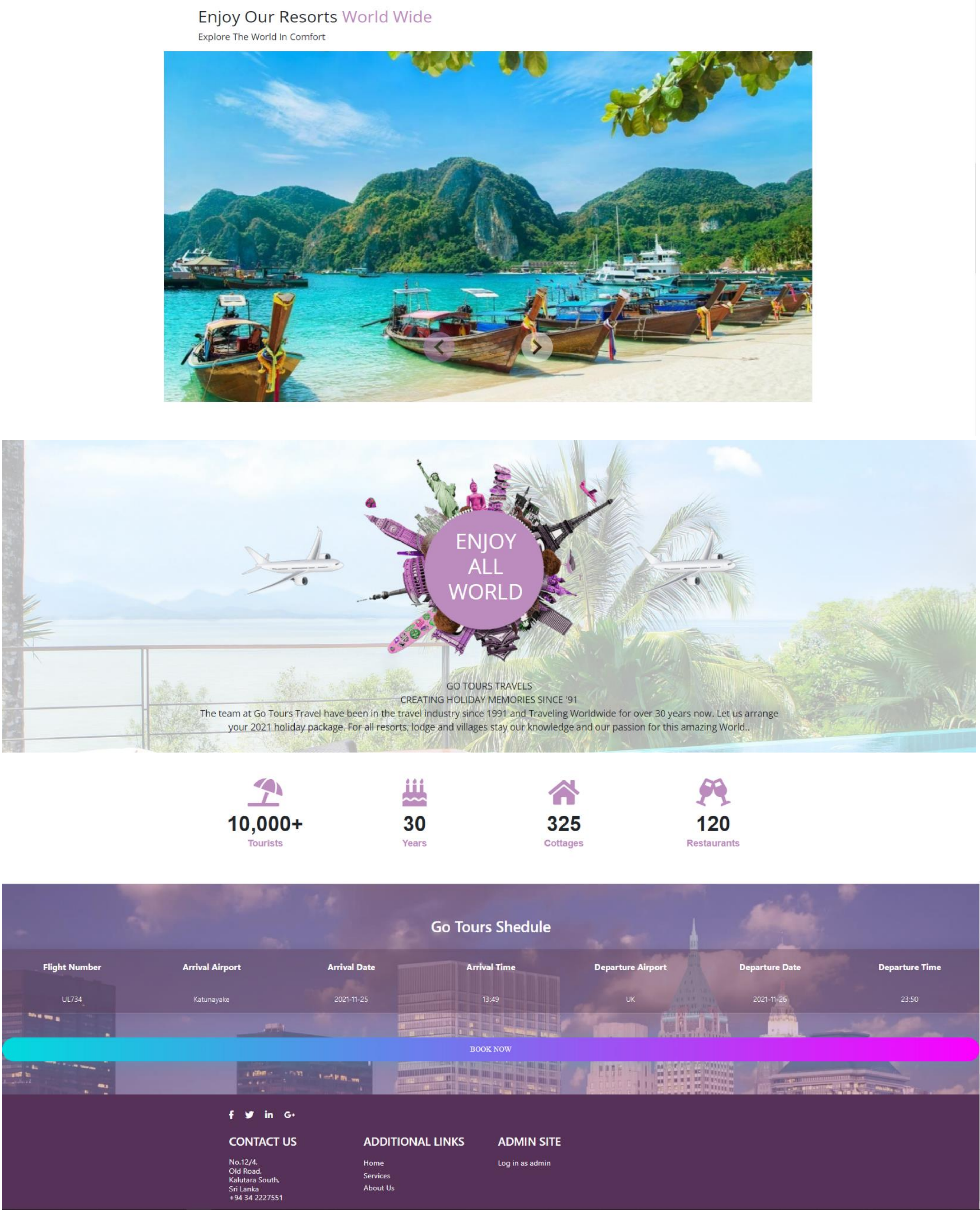
See The World

Let Us Design Your Holiday

It is a long established fact that a reader will be distracted by the readable content of a page

ENJOY YOUR HOLIDAY

Explore holiday ideas from top travel destinations around the globe. We offer holidays on every continent, from Antarctica to Europe, North America to South America, China to Saudi Arab, Africa and beyond! Tick off top travel destinations from your bucket-list with our range of holiday destinations. Find Out More...



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Tourists	Years	Cottages	Restaurants

Go Tours Shedule

Flight Number	Arrival Airport	Arrival Date	Arrival Time	Departure Airport	Departure Date	Departure Time
UL734	Katunayake	2021-11-25	13:49	UK	2021-11-26	23:50

BOOK NOW

f 🐦 in G+

CONTACT US

No.12/4,
Old Road,
Kalutara South,
Sri Lanka
+94 34 2227551

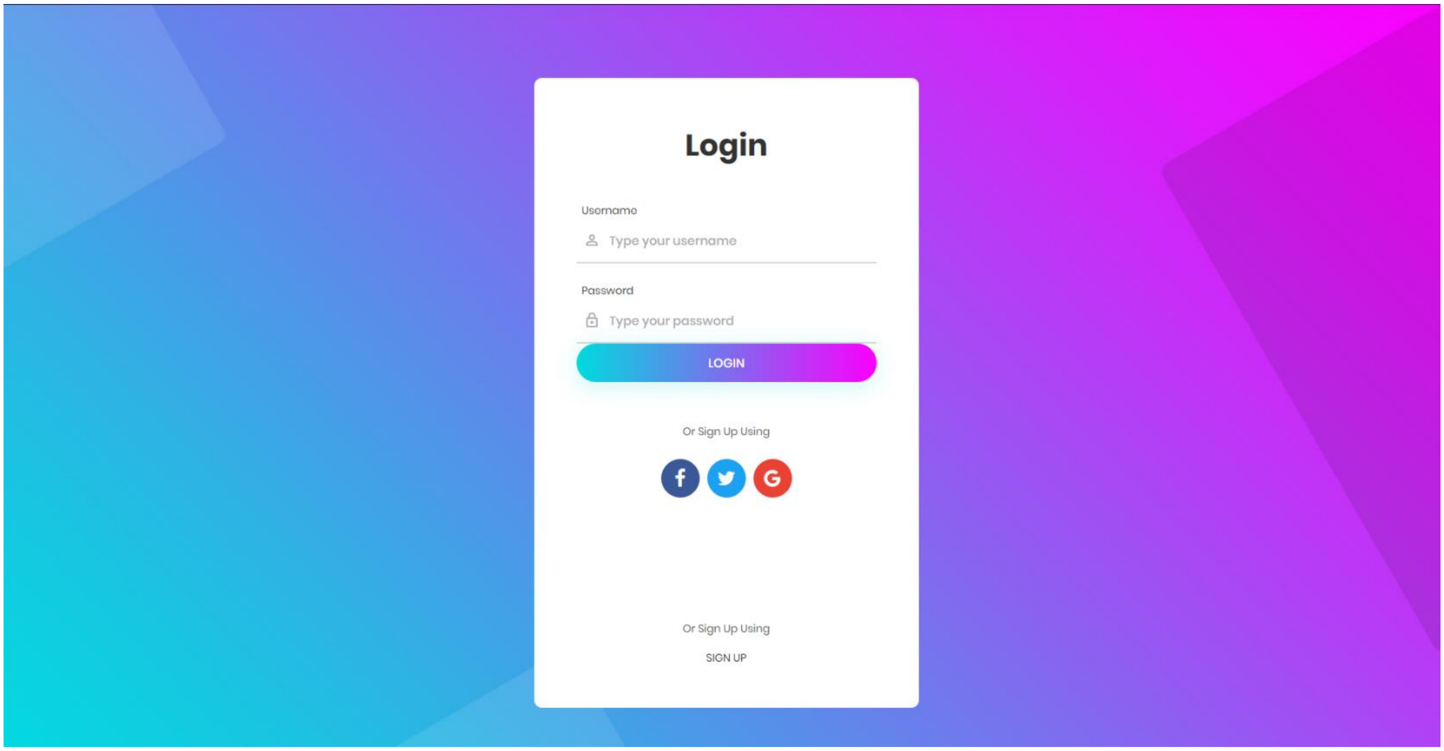
ADDITIONAL LINKS

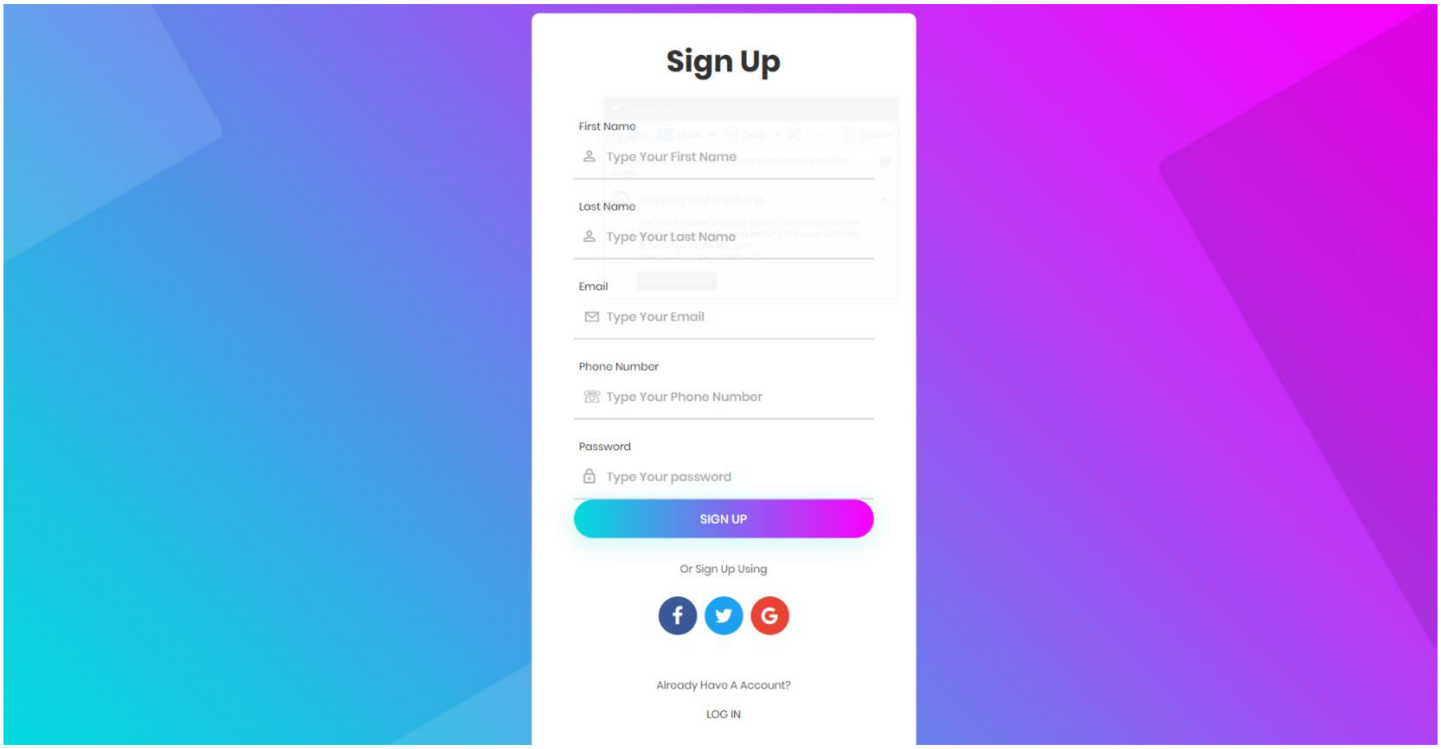
Home
Services
About Us

ADMIN SITE

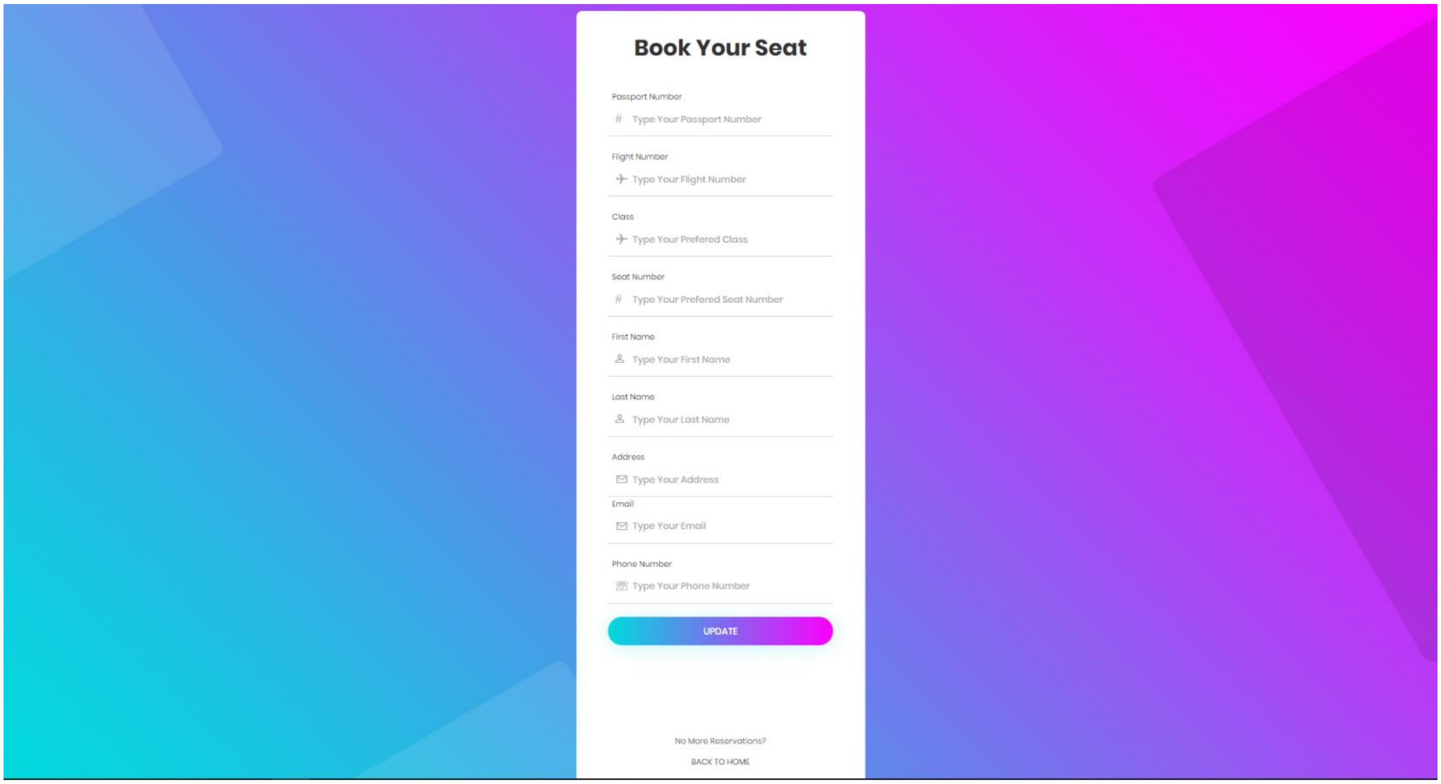
Log in as admin

User Log In and Registration

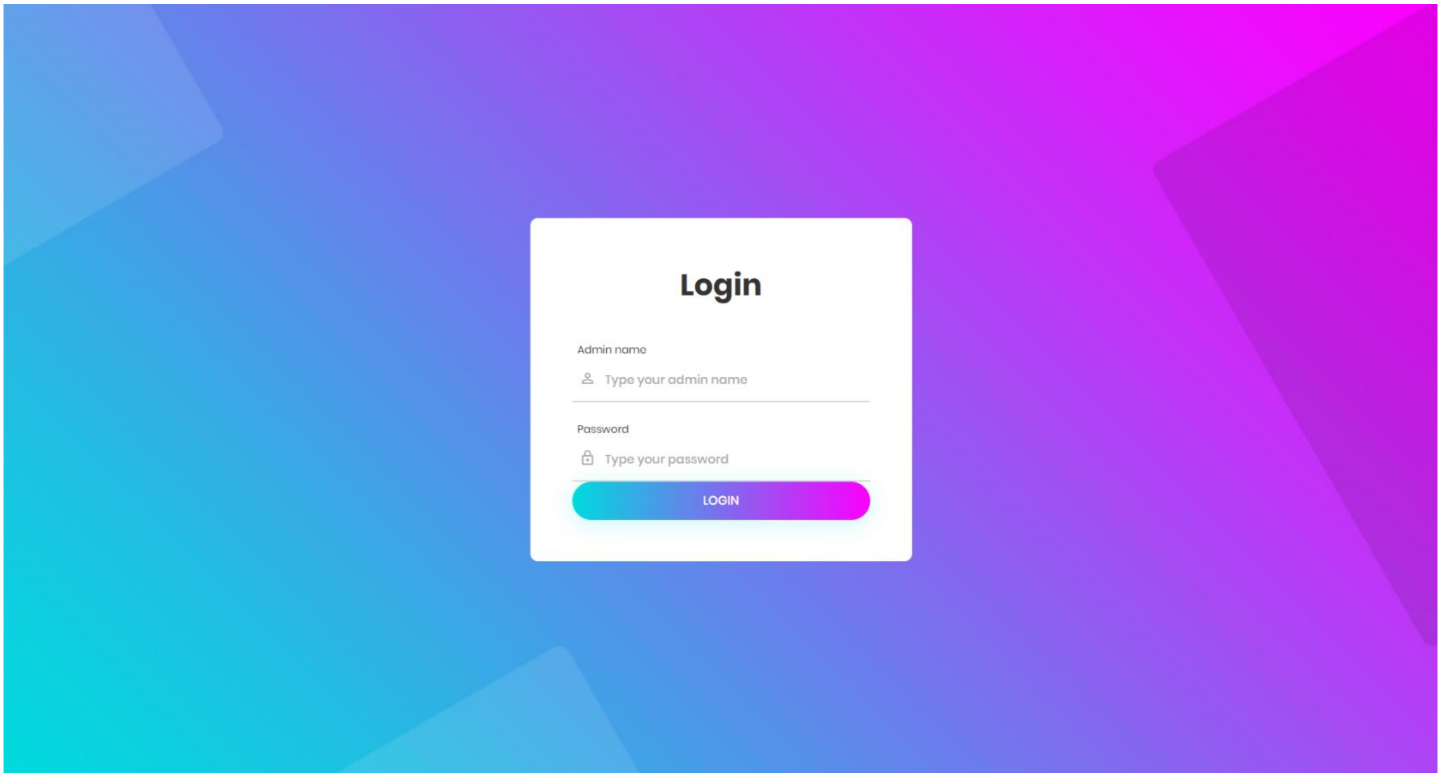




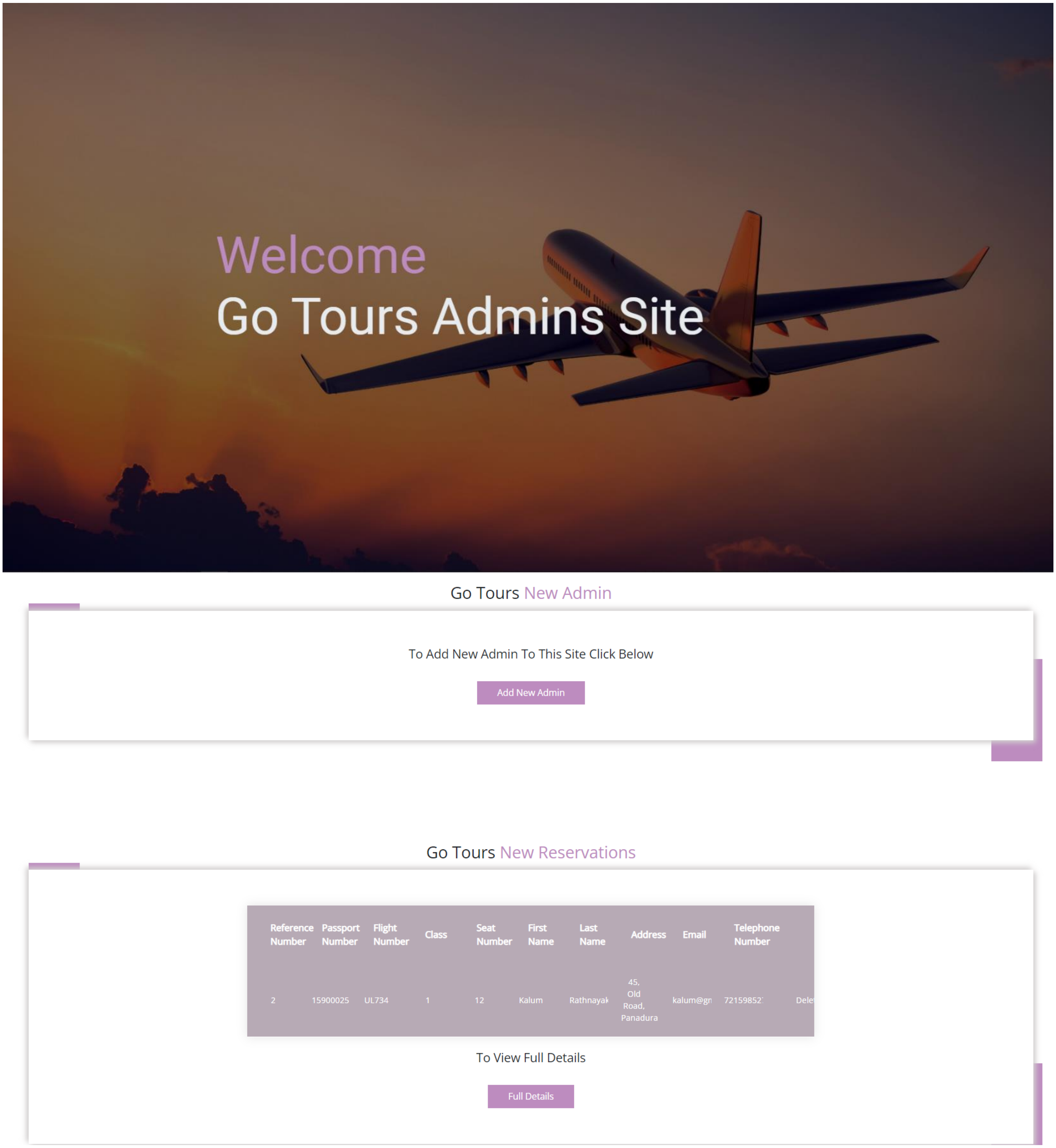
Ticket Booking Page



Admin Log In



Admin Home Page



Welcome

Go Tours Admins Site

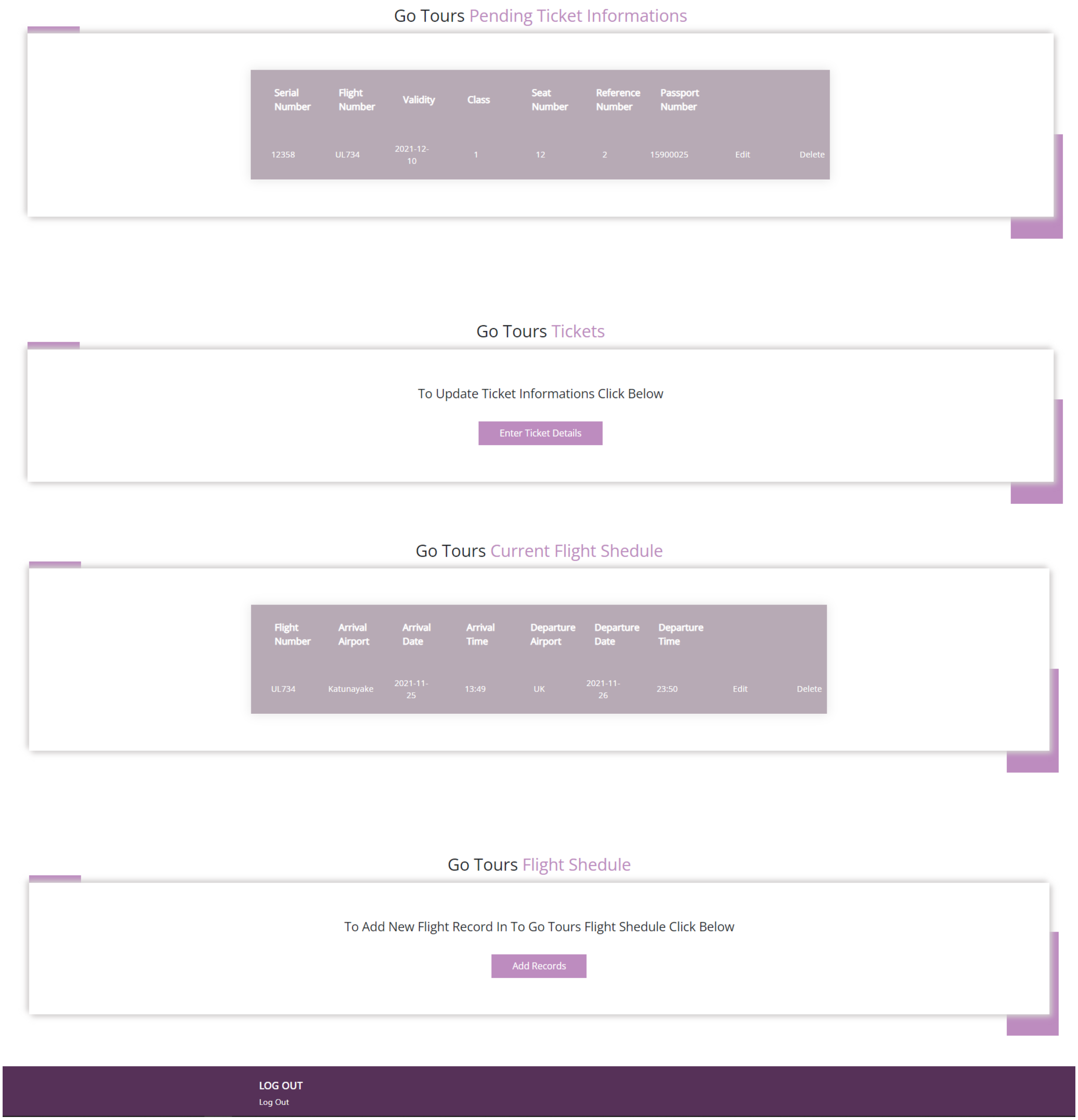
Go Tours New Admin

To Add New Admin To This Site Click Below

Go Tours New Reservations

Reference Number	Passport Number	Flight Number	Class	Seat Number	First Name	Last Name	Address	Email	Telephone Number	
2	15900025	UL734	1	12	Kalum	Rathnayak	45, Old Road, Panadura	kalum@gn	72159852	Dele

To View Full Details



Go Tours Pending Ticket Informations

Serial Number	Flight Number	Validity	Class	Seat Number	Reference Number	Passport Number		
12358	UL734	2021-12-10	1	12	2	15900025	Edit	Delete

Go Tours Tickets

To Update Ticket Informations Click Below

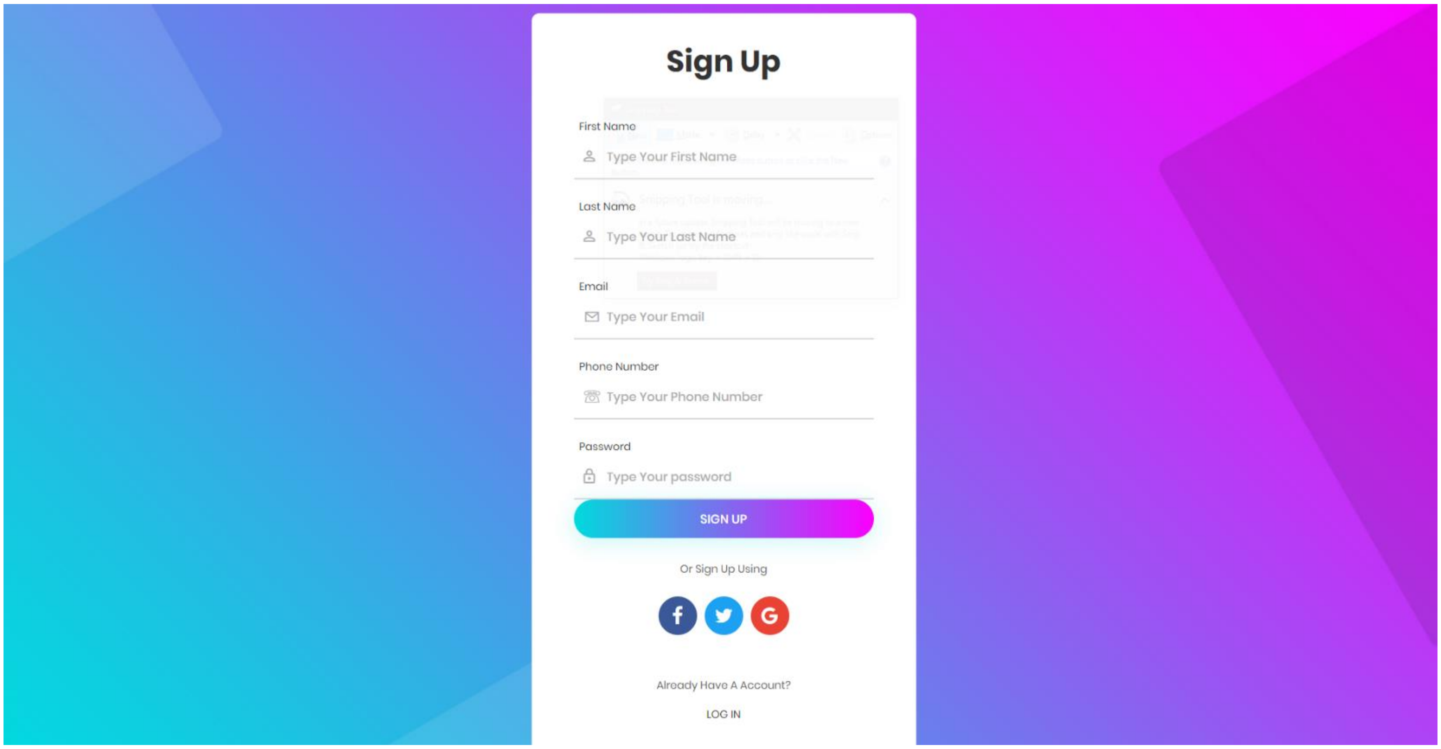
Go Tours Current Flight Shedule

Flight Number	Arrival Airport	Arrival Date	Arrival Time	Departure Airport	Departure Date	Departure Time		
UL734	Katunayake	2021-11-25	13:49	UK	2021-11-26	23:50	Edit	Delete

Go Tours Flight Shedule

To Add New Flight Record In To Go Tours Flight Shedule Click Below

New Admin Adding Page



Sign Up

First Name
Type Your First Name

Last Name
Type Your Last Name

Email
Type Your Email

Phone Number
Type Your Phone Number

Password
Type Your password

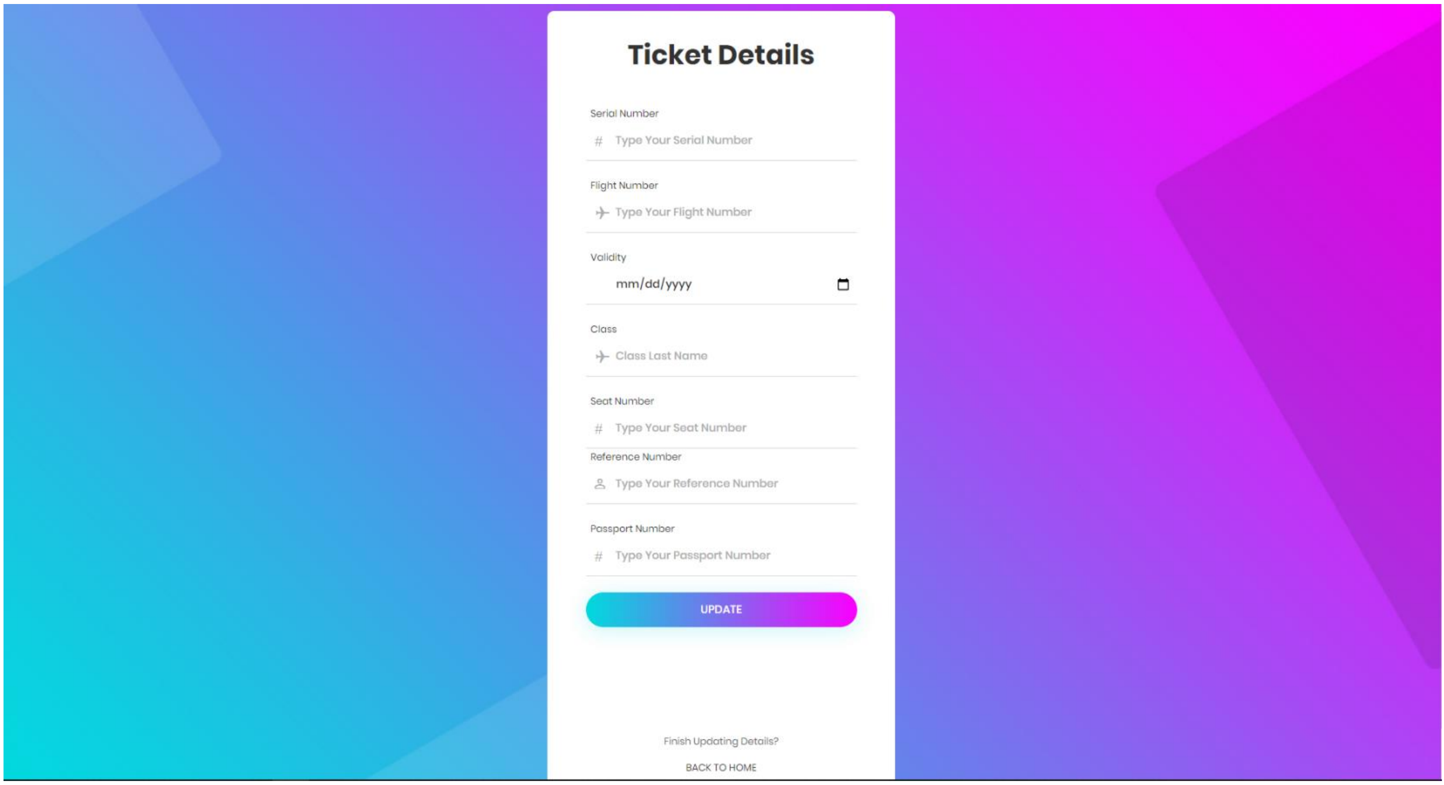
SIGN UP

Or Sign Up Using

Already Have A Account?

LOG IN

Ticket Details Adding Page



Ticket Details

Serial Number
Type Your Serial Number

Flight Number
Type Your Flight Number

Validity
mm/dd/yyyy

Class
Class Last Name

Seat Number
Type Your Seat Number

Reference Number
Type Your Reference Number

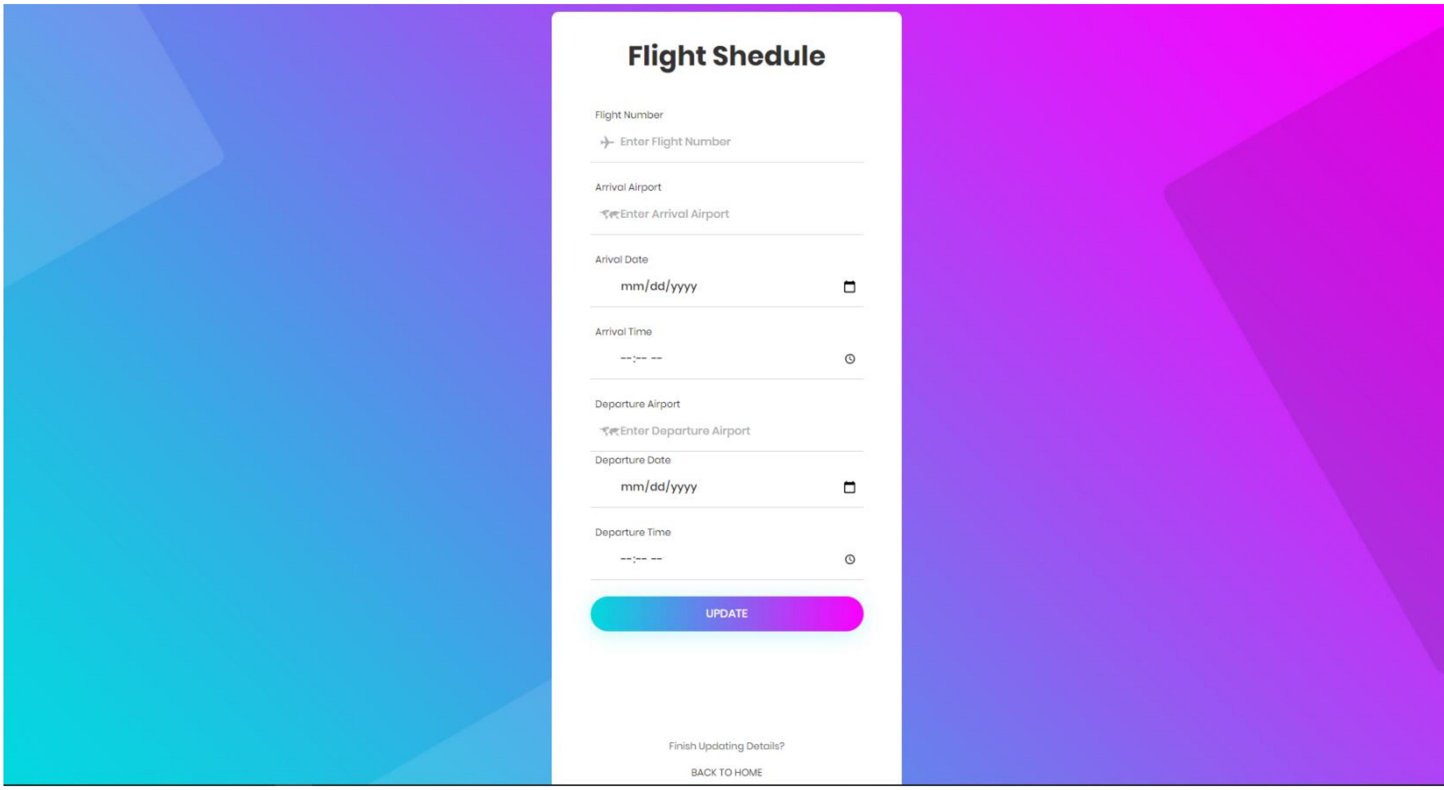
Passport Number
Type Your Passport Number

UPDATE

Finish Updating Details?

BACK TO HOME

Flight Details Adding Page



Flight Shedule

Flight Number

Enter Flight Number

Arrival Airport

Enter Arrival Airport

Arival Date

mm/dd/yyyy

Arrival Time

--:-- --

Deporture Airport

Enter Deporture Airport

Deporture Date

mm/dd/yyyy

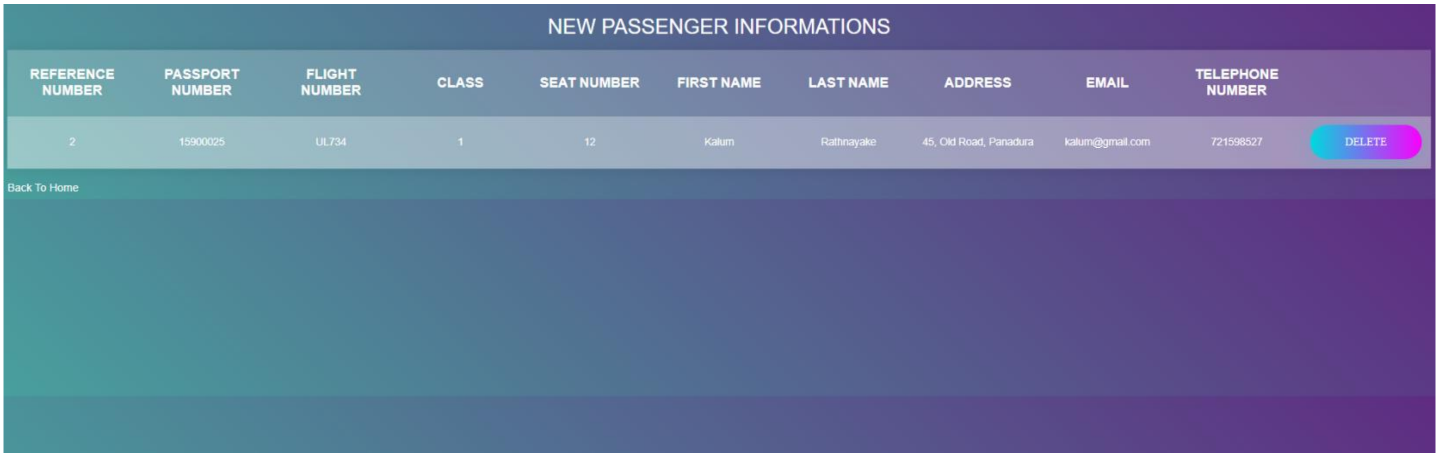
Deporture Time

--:-- --

Finish Updating Details?

BACK TO HOME

New Reservation Viewing Page

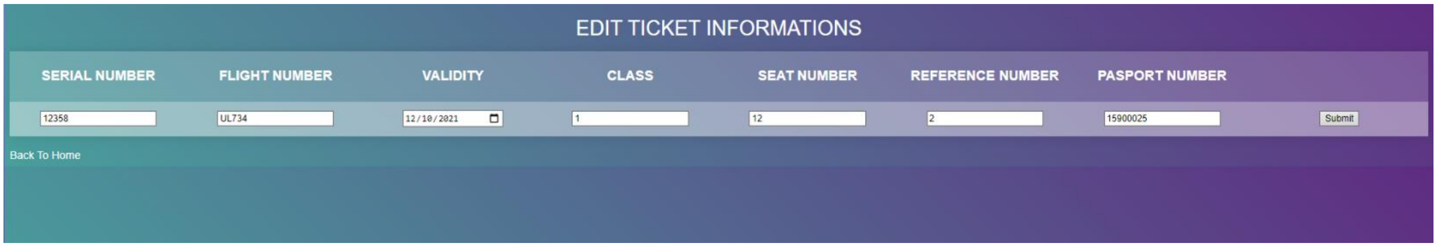


NEW PASSENGER INFORMATIONS

REFERENCE NUMBER	PASSPORT NUMBER	FLIGHT NUMBER	CLASS	SEAT NUMBER	FIRST NAME	LAST NAME	ADDRESS	EMAIL	TELEPHONE NUMBER	
2	15900025	UL734	1	12	Kalum	Rathnayake	45, Old Road, Panadura	kalum@gmail.com	721598527	DELETE

Back To Home

Ticket Details Edditing Page

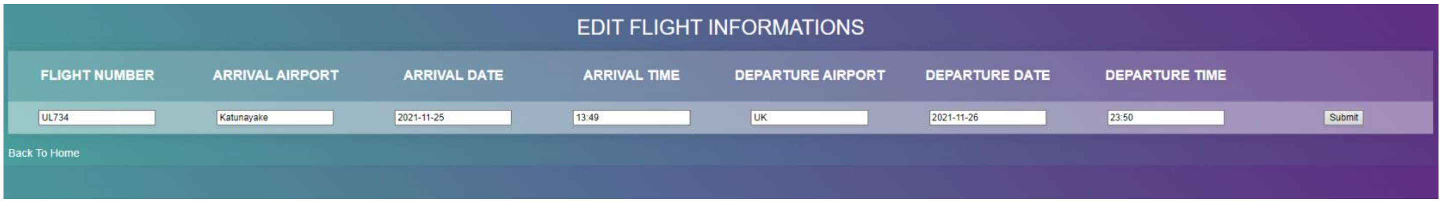


EDIT TICKET INFORMATIONS

SERIAL NUMBER	FLIGHT NUMBER	VALIDITY	CLASS	SEAT NUMBER	REFERENCE NUMBER	PASPORT NUMBER	
12358	UL734	12/10/2021	1	12	2	15900025	Submit

Back To Home

Flight Details Edditing Page



EDIT FLIGHT INFORMATIONS

FLIGHT NUMBER	ARRIVAL AIRPORT	ARRIVAL DATE	ARRIVAL TIME	DEPARTURE AIRPORT	DEPARTURE DATE	DEPARTURE TIME	
UL734	Katunayake	2021-11-25	13:49	UK	2021-11-26	23:50	Submit

Back To Home

Discussion

Making of GUI

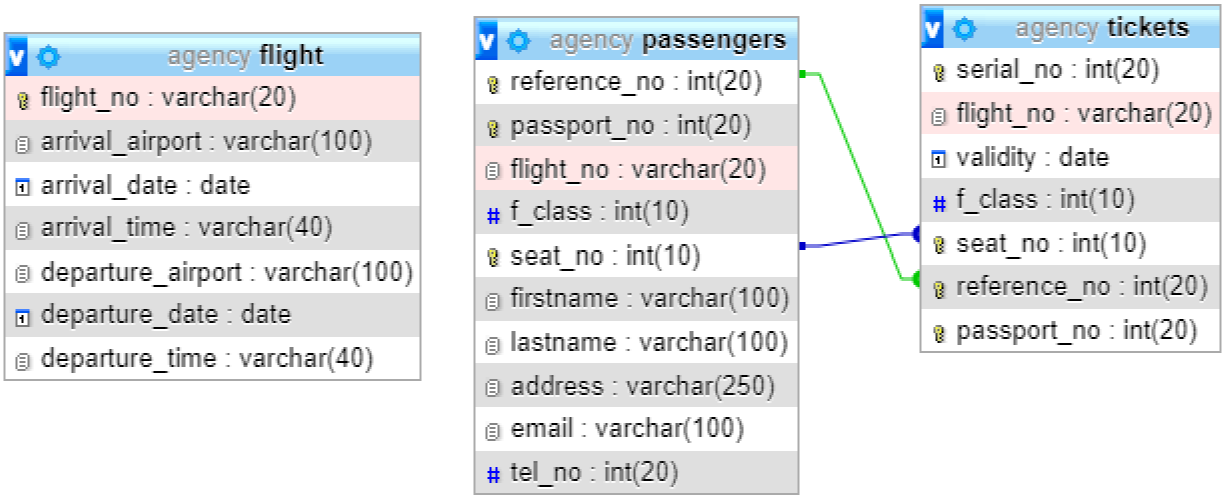
- To build my Graphical User Interface I used CSS Codes, Bootsrap, Some Java Script Codes to beautify the interface and improve the user experience. Some of those code examples took from the internet and edited according to my GUI.

- I have used the Same CSS files to all Data Input pages and the same CSS files to all output tables.

- Home page idea and other details like logo, name and some paragraphs taken from the internet.

Issues I faced

- While creating relations between tables   I could not create relations between the flight table and the other 2 tables because a foreign key must be unique in that table. Making flight_no(Primary Key of flight table) Unique in the other 2 Tables is not practical so I kept the flight table isolated.



agency flight

- flight_no : varchar(20)
- arrival_airport : varchar(100)
- arrival_date : date
- arrival_time : varchar(40)
- departure_airport : varchar(100)
- departure_date : date
- departure_time : varchar(40)

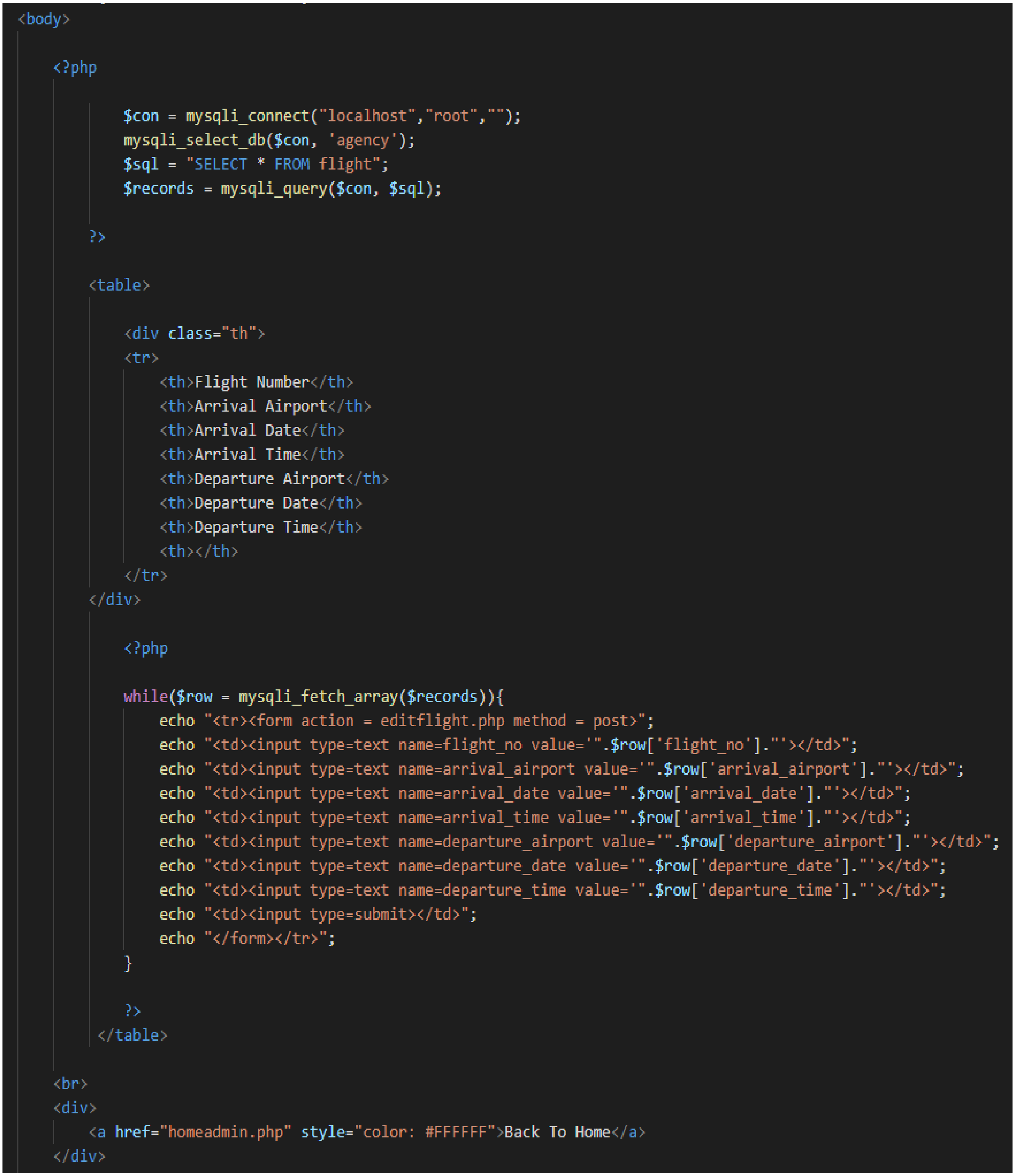
agency passengers

- reference_no : int(20)
- passport_no : int(20)
- flight_no : varchar(20)
- f_class : int(10)
- seat_no : int(10)
- firstname : varchar(100)
- lastname : varchar(100)
- address : varchar(250)
- email : varchar(100)
- tel_no : int(20)

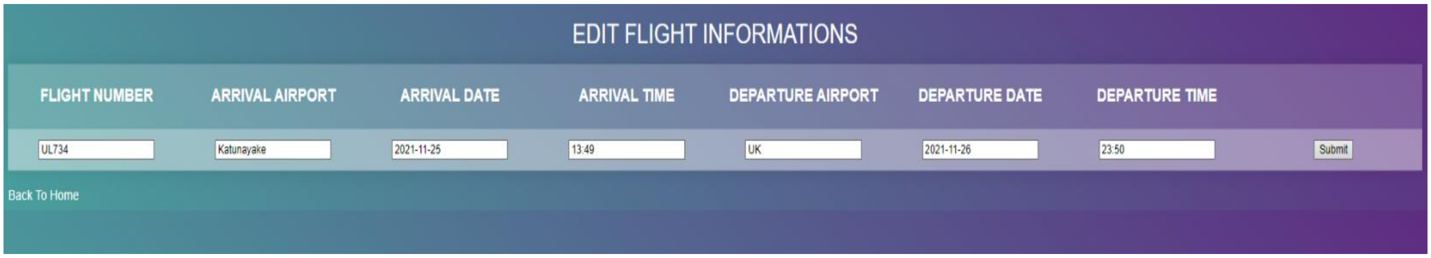
agency tickets

- serial_no : int(20)
- flight_no : varchar(20)
- validity : date
- f_class : int(10)
- seat_no : int(10)
- reference_no : int(20)
- passport_no : int(20)

- ➢ Adding Complete table CSS to two edit pages is not possible because every table cell in the edit table is surrounded by PHP command so the CSS not working in that case.



```
<body>

    <?php

            $con = mysqli_connect("localhost","root","");
            mysqli_select_db($con, 'agency');
            $sql = "SELECT * FROM flight";
            $records = mysqli_query($con, $sql);

        ?>

        <table>

            <div class="th">
            <tr>
                <th>Flight Number</th>
                <th>Arrival Airport</th>
                <th>Arrival Date</th>
                <th>Arrival Time</th>
                <th>Departure Airport</th>
                <th>Departure Date</th>
                <th>Departure Time</th>
                <th></th>
            </tr>
        </div>

            <?php

            while($row = mysqli_fetch_array($records)){
                echo "<tr><form action = editflight.php method = post>";
                echo "<td><input type=text name=flight_no value='".$row['flight_no']."'></td>";
                echo "<td><input type=text name=arrival_airport value='".$row['arrival_airport']."'></td>";
                echo "<td><input type=text name=arrival_date value='".$row['arrival_date']."'></td>";
                echo "<td><input type=text name=arrival_time value='".$row['arrival_time']."'></td>";
                echo "<td><input type=text name=departure_airport value='".$row['departure_airport']."'></td>";
                echo "<td><input type=text name=departure_date value='".$row['departure_date']."'></td>";
                echo "<td><input type=text name=departure_time value='".$row['departure_time']."'></td>";
                echo "<td><input type=submit></td>";
                echo "</form></tr>";
            }

            ?>
         </table>

    <br>
    <div>
        <a href="homeadmin.php" style="color: #FFFFFF">Back To Home</a>
    </div>
```

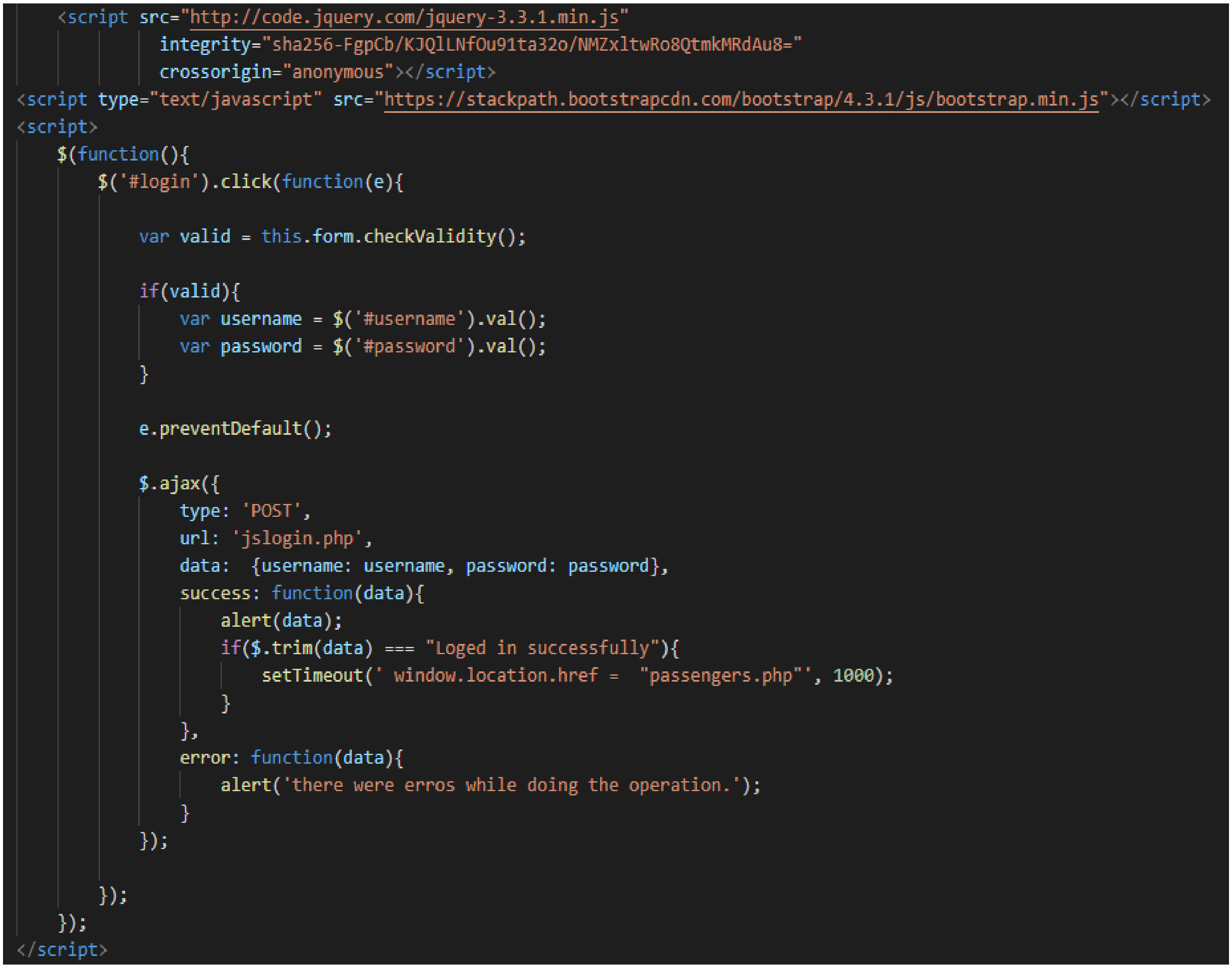


EDIT FLIGHT INFORMATIONS

FLIGHT NUMBER	ARRIVAL AIRPORT	ARRIVAL DATE	ARRIVAL TIME	DEPARTURE AIRPORT	DEPARTURE DATE	DEPARTURE TIME	
UL734	Katunayake	2021-11-25	13:49	UK	2021-11-26	23:50	Submit

Back To Home

- ➢ Add sessions to this website but that not working.
- ➢ Java script used to validate login and check whether username and password are matching and display alerts.



```
    <script src="http://code.jquery.com/jquery-3.3.1.min.js"
              integrity="sha256-FgpCb/KJQlLNfOu91ta32o/NMZxltwRo8QtmkMRdAu8="
              crossorigin="anonymous"></script>
<script type="text/javascript" src="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js"></script>
<script>
    $(function(){
        $('#login').click(function(e){

            var valid = this.form.checkValidity();

            if(valid){
                var username = $('#username').val();
                var password = $('#password').val();
            }

            e.preventDefault();

            $.ajax({
                type: 'POST',
                url: 'jslogin.php',
                data:  {username: username, password: password},
                success: function(data){
                    alert(data);
                    if($.trim(data) === "Loged in successfully"){
                        setTimeout(' window.location.href =  "passengers.php"', 1000);
                    }
                },
                error: function(data){
                    alert('there were erros while doing the operation.');
                }
            });

        });
    });
</script>
```