



## Airline Reservation System: Project Report

### INTRODUCTION

#### **1.1 Purpose**

Airline Reservation System aims to automate the flight operations and ticketing / seat booking and confirmation system of an Airline company. The software is providing options for viewing different flights available within a different timing for a specific day. That provide customers within facility to able to book ticket smoothly. The customers can modify and able to cancel the ticket for any reason. That prepare within a role and policies. The software should provide option for checking availability of the tickets. That is important for the customers to get message if the ticket unavailable. That will be displayed into customers. The customers should be noted when the change has been made or any further changes.

#### **1.2 Scope**

The airline booking website is an application stored in the user server. The purpose of the website is to resolve the client to allow website users to perform tasks related to booking an airline flight. The system enables to perform the following functions:

Automation of flight operations

Automation of ticketing/ seat booking

confirmation system

Cancellation

Improved and optimized service

#### **1.3 Glossary**

ARS-Airline Reservation System

LAN-Local Area Network

GUI-Graphical User Interface

OS-Operating System

RAM-Random Access Memory

MB-Mega Bytes

GB-Giga Bytes

Mbps-Megabits per second

HDD-Hard Disk Drive 1

UML-unified modeling language

#### **1.4 Overview**

The remaining section of this document provide a general description including characteristic of the users of this product, the product's hardware, and functional and non-functional requirements of the product.

### OVERALL DISCRIPTION

## 2.1 Problem Statement

Developing an AIRLINE RESERVATION SYSTEM- ARS for an airline company that want to automate its flight operations and ticketing / seat booking and confirmation system.

## 2.2 Existing System

Before the automation the system suffered from following DRAWBACKS:

Existing system is highly manual and involves a lot of paper work and calculation and therefore may be prone to errors. This lead to inconsistency and inaccuracy.

The data may be lost, stolen or destroyed because it is stored on paper.

The existing system consumes a lot of time causing inconveniencing to customers and the staff.

Its difficult to update, delete, or view the data due its manual nature.

Increasing number of passengers leads to difficulty in maintaining and retrieving details.

## 2.3 Proposed System

The ARS is proposed with the following,

The computerization of the reservation system will reduce a lot of paperwork and hence load on the hence the load on airline admin and staff.

The machine will perform all calculations. Hence chances of error are nearer to nil.

The passenger, reservation, cancellation list can be easily retrieved and any required addition, deletion, updation can be performed easily and fast.

Proper way of confirmation of bookings etc.

## 2.4 Product Functions

Booking agents with varying levels of familiarity with computers will mostly use this system. With this on mind, an important feature of this software is that it will be relatively simple to use. The scope of this product encompasses:

**SEARCH:** This function allows the booking agent to search for airplane's and ticket's availability between two cities, i.e. departure city and arrival city, the date of departure, preferred time and number of passengers.

**SELECTION:** This function allows a particular airplane to be selected from the displayed list. All details such as;

- Airplane number
- Date, time and place of departure
- Date, time and place of arrival
- Fare per head etc.

**Review:** If seats are available, then system prompt's for the booking. All the information including total fare with taxes and flight details are reviewed.

**Traveler Information:** The details of all passengers supposed to travel including name, address, contact number, email etc.

**Payment:** It asks the agent to enter the various credit card details of the person making reservation i.e.

- Credit card type
- Credit card number
- Expiration date of the card
- The name on card etc.

**Cancellation:** The system allows the passenger to cancel a reservation and register the information regarding his/her ticket. It includes Confirmation no, name, date of journey, fare deducted.

## 2.5 User Characteristics

### 2.5.1 User requirements

User properties like Name, Address, Age,

Associated with Flight Miles accumulated and Credit Card information.

Flight properties like Departing/Arriving City, Departure/Arrival dates and times, Miles, and an identifying Flight Number.

Flight Seat properties of identifying seat number, reserved and flight

- Associated to Flight by flight number

### 2.5.2 User Education Level

At least user of the system should be comfortable with English Language.

### 2.5.3 User's Technical Expertise

User should be comfortable using general purpose applications on the computer system.

## 2.6 Constraints

System constraints:

The system is a web base, so it will run on a web browser i.e. IE, Chrome, Firefox etc.

The system will run under any OS with internet functionality.

### 2.7 Assumption and Dependencies

Booking agent will be having a valid user name and password to access the system.

The software needs booking agent to have complete knowledge of ARS.

Software is dependent on access to internet.

# REQUIREMENT SPECIFICATION

This section highlights the functional requirements, non-functional requirements and other requirements.

### 3.1 Functional Requirements

#### 3.1.1 Performance requirements

**User Satisfaction:** The system is such that it stands up to the user expectations.

**Response Time:** The response of all operations is good.

**Error Handling:** Response to user errors and undesired situation has been taken care of to ensure that the system operates without halting.

**Safety and Robustness:** The system is able to avoid or tackle disastrous action. In other words it should be fool proof.

**Portable:** The software should not be architecture specific. It should be easily transferable to other platforms if needed.

**User Friendliness:** The system is easy to learn and understand. A native user can also use the system effectively, without any difficulties.

#### 3.1.2 Design constrain

There are a number of factors in the client's environment that may restrict the choices of a designer. Such factors include standards that must be followed, resource limits, operating environment, reliability and security requirements and policies that may have an impact on the design of the system.

- **Standard Compliances** This specifies the requirement for standards the system must follow. The standards may include the report format and accounting properties.
- **Hardware Limitations** Hardware limitations can include the types of machine to be used, operating system available on the system, languages support and limits on primary and secondary storage.
- **Reliability and Fault Tolerance** Fault tolerance requirement can be placed a constraint on how the system is to be designed. Recovery requirements are often an integral part here, detailing what the system should do if some failure occurs to ensure certain properties. Reliability requirements are very important for critical application.

**Security** requirements are particularly significant in defense system and database system. They place restrictions on the use of certain commands, control access to data, provide different kinds of access requirements for different people, require the use of passwords and cryptography techniques and maintain a log of activities in the system.

#### 3.1.3 Hardware Requirements

For the hardware requirements like memory restrictions, cache size, the processor, RAM size etc... those are required for the software to run.

##### MINIMUM Hardware Requirements

Processor Pentium IV

Hard Disk Drive 100 GB

RAM 1 Gb

##### PREFERRED HARDWARE REQUIREMENTS

Processor Core i3

Hard Disk Drive 500 GB

RAM 4 GB

#### 3.1.4 Software Requirements

Any window-based operating system with DOS support are primary requirements for software development. Windows 7 and up are required. The system must be connected via LAN and connection to internet is mandatory.

#### 3.1.5 Other Requirement

Security

Portability

Correctness

Efficiency

Flexibility

Testability

Reusability

### 3.2 Non-Functional Requirements

#### 3.2.1 Security

The system must automatically log out all customers after a period of inactivity. The system should not leave any cookies on the customer's computer containing the user's password. The system's back-end servers shall only be accessible to authenticated management.

#### 3.2.2 Reliability

The reliability of the overall project depends on the reliability of the separate components. The main pillar of reliability of the system is the backup of the database which is continuously maintained and updated to reflect the most recent changes. Also the system will be functional under a container. Thus the overall stability of the system depends on the stability of the container and its underlying OS.

#### 3.2.3 Availability

The system should be available at all the times, meaning the user can access it using a web browser, only restricted by the downtime of the server on which system runs. A customer friendly system which is in access of people around the world should work 24 hours. In case of hardware failure or database corruption, a replacement page will be shown. Alison caseofhardwarefailureordatabasecorruptionbackupsofthedatabaseshouldbe retrieved from the server and saved by the Organizer. Then the service will be restarted. It means 24x7 availability.

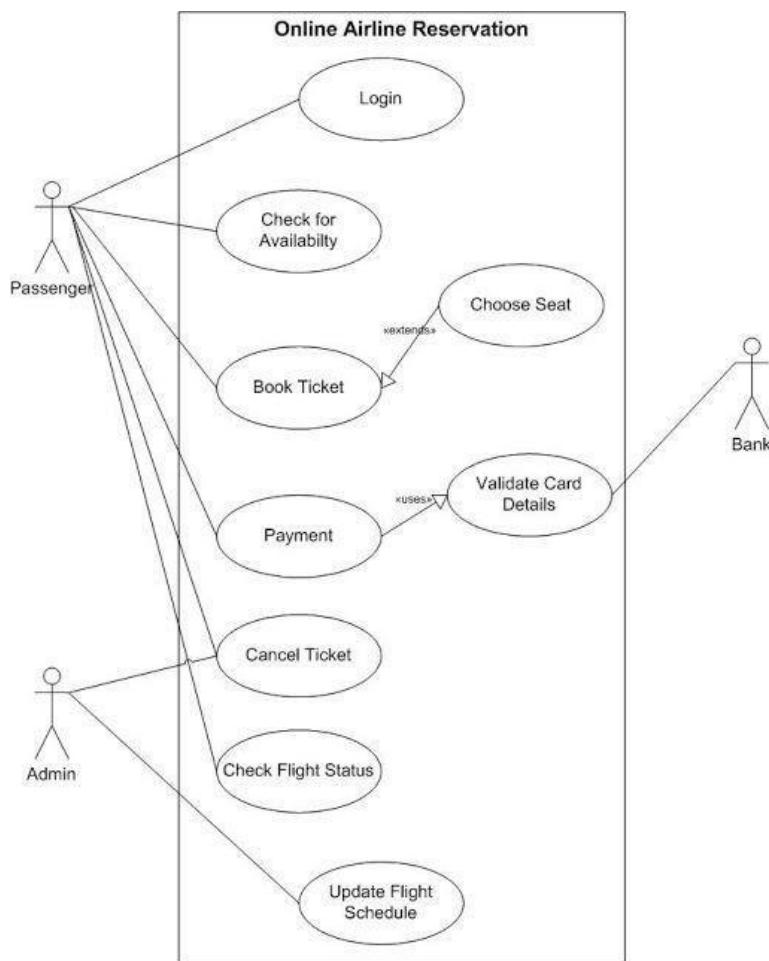
#### 3.2.4 Maintainability

In case of a failure, re-installation of the system will be done. Also, the software design is being done with modularity in mind so that maintainability can be done efficiently.

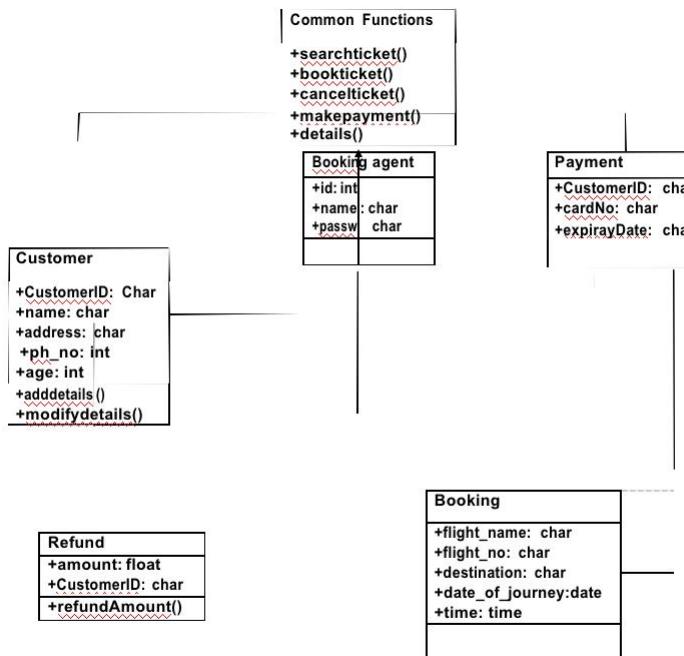
#### 3.2.6 Supportability

The code and supporting modules of the system will be well documented and easy to understand. Online user documentation and Help system requirements will be provided.

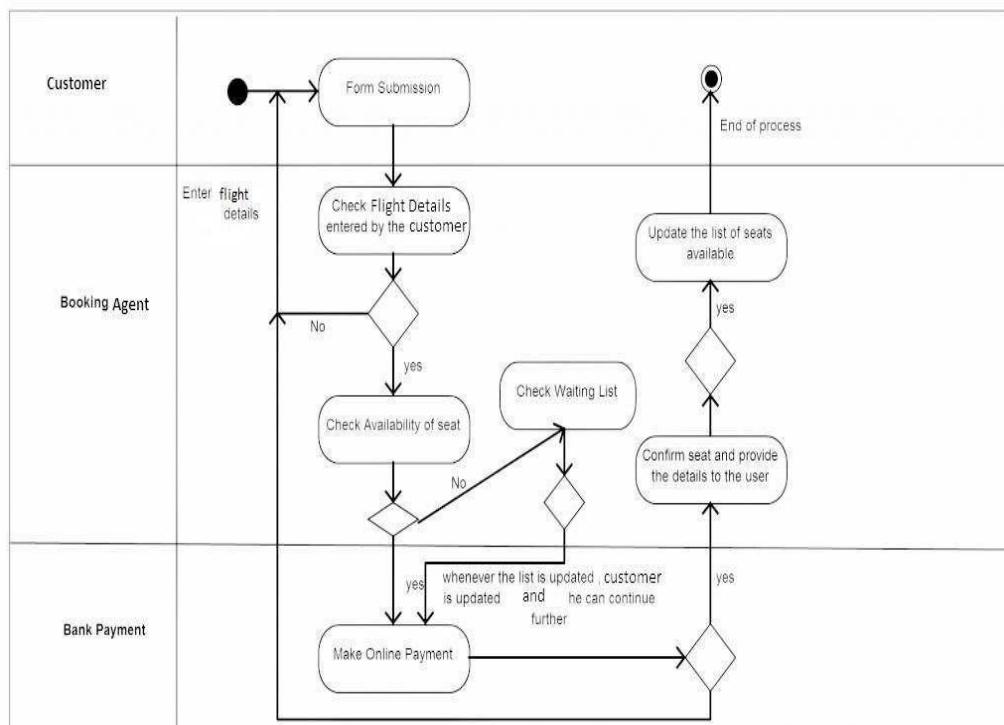
## ALL THE DIAGRAMS USE CASE



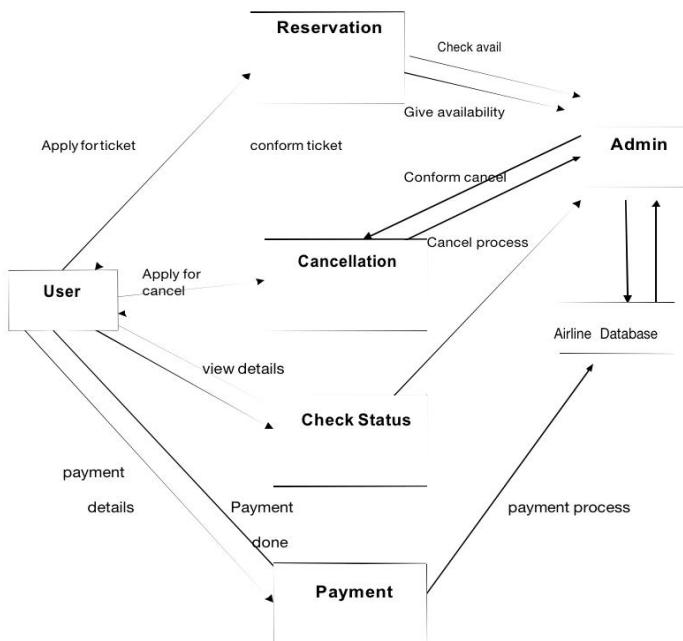
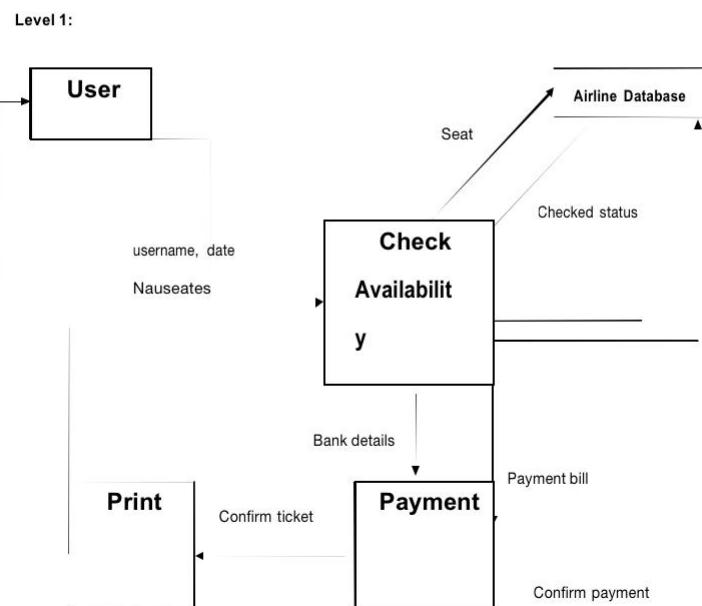
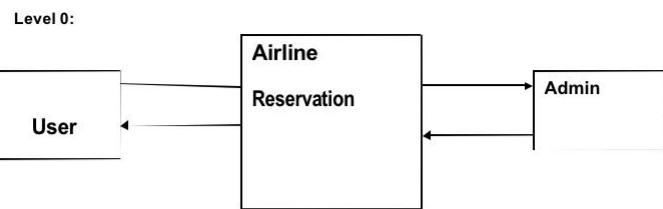
## CLASS DIAGRAM



## STATE DIAGRAM

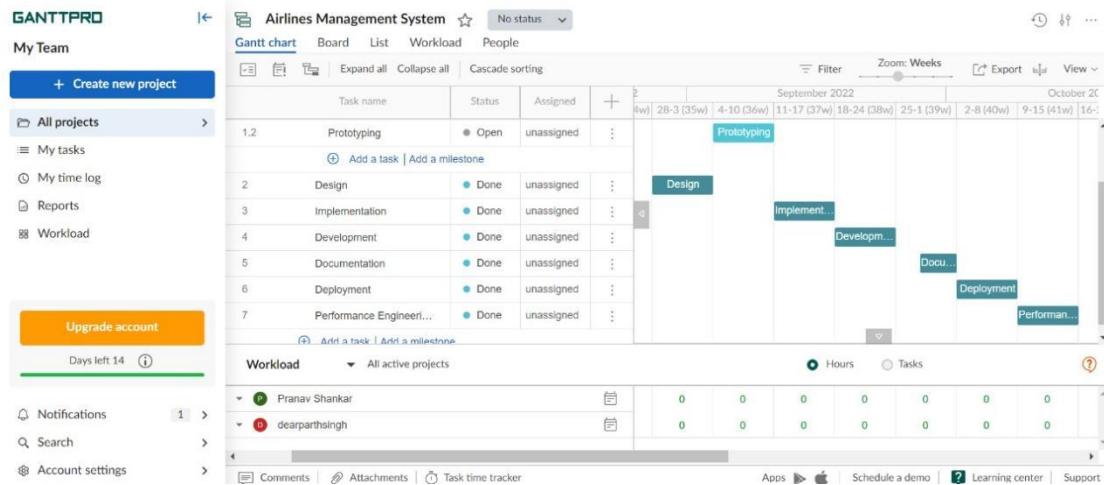


# DATA FLOW DIAGRAM



# CHARTS

## GANTT CHART

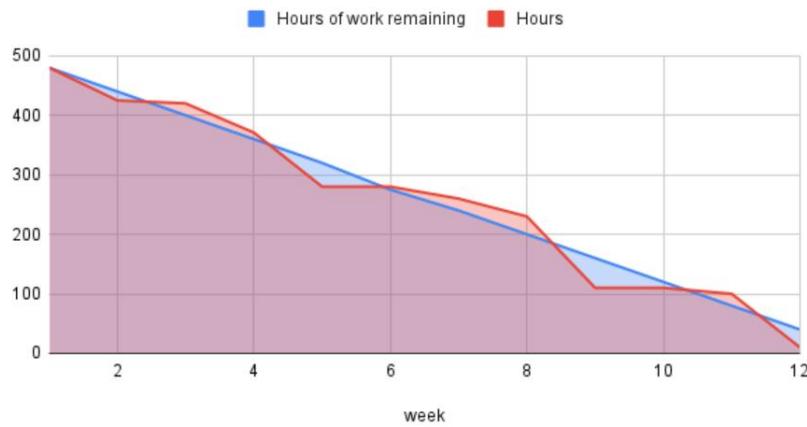


## BURNDOWN CHART

### BURNDOWN CHART :

- Burndown graph shows the amount of work that is done in the sprint or epic and total work remaining.

Hours of work remaining and Hours



## ROADMAP

	Sprint-1				Sprint-2				Sprint-3			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
DevOps	Develop the basic structure of the website based on requirements	Finalize the website (Front-End & Back-End)	Prepare Setup for Testing	User feedback portal	Alpha and Beta Testing	Integrate finance into website	Prepare for a soft launch	Compile user requests and prioritize them				
Finance	Legal processes to register the company				Set up bank accounts				Manage the bank accounts			
Releases	Almost finished Website		Final website (no finance) (2 stages of testing done)		Final website released							
Media	Work with DevOps Teams to develop the themes and flow of the website		Planning marketing campaign		Launch the marketing campaign							

## OUR GITHUB LINK

<https://github.com/Prth123/SE>

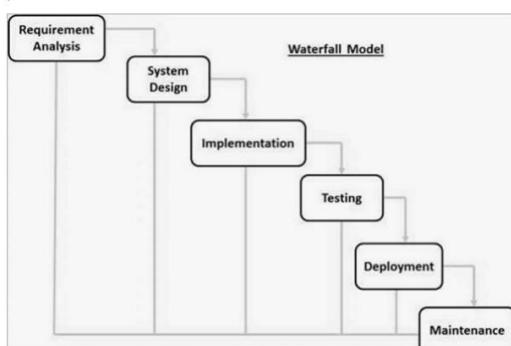
## WHY WATERFALL MODEL?

### 1. Life Cycle Model - WATERFALL MODEL

#### Waterfall Model – Design

Waterfall approach was first SDLC Model to be used widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model, typically, the outcome of one phase acts as the input for the next phase sequentially.

The following illustration is a representation of the different phases of the Waterfall Model.



The sequential phases in Waterfall model are –

**Requirement Gathering and analysis** — All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

**System Design** — The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

**Implementation** — With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

**Integration and Testing** — All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

**Deployment of system** — Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.

**Maintenance** — There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

### WHY WE USED WATERFALL MODEL?

Simple and easy to understand and use

Easy to manage due to the rigidity of the model. Each phase has specific deliverables and a review process.

Phases are processed and completed one at a time.

Works well for smaller projects where requirements are very well understood.

Clearly defined stages.

Well understood milestones.

Easy to arrange tasks.

Process and results are well documented.

## 2. Tools used throughout the lifecycle

## Planning tools- Gantt Pro

## Design tools-Canvas, Draw.io

## Version control-GitHub

Development tool-Jango, Python3.10, HTML,

JSS,Gantt Pros

### 3. Deliverables categorised as reuse or built

## Built Components -

Detailed Documentation

Front end of the project i.e creating the website with HTML, CSS and JS.

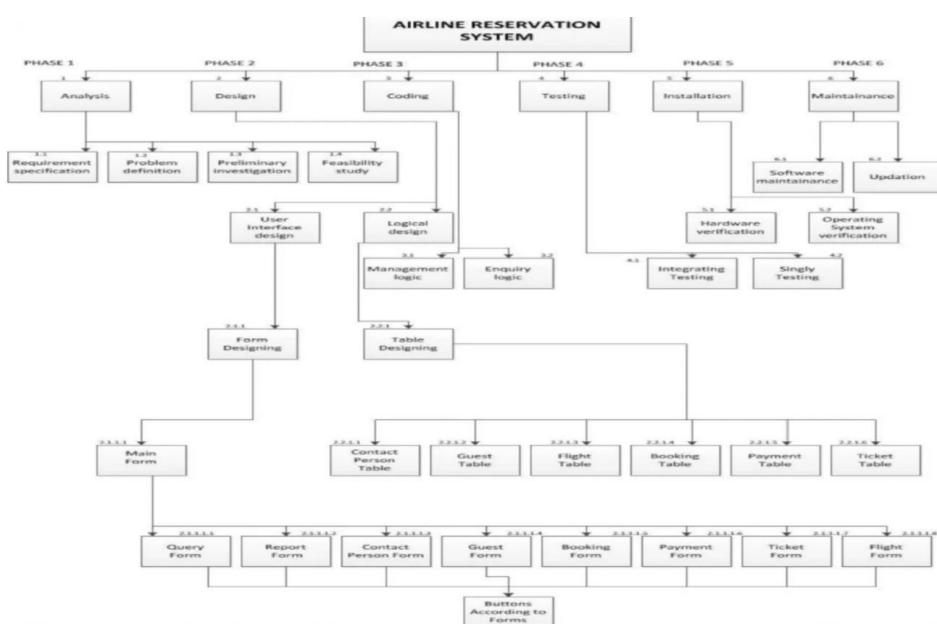
Backend where the database stores the contents, integrating this with PHP.

## Reused Components -

## Images, user interface components

## Payment gateway and ticket display page

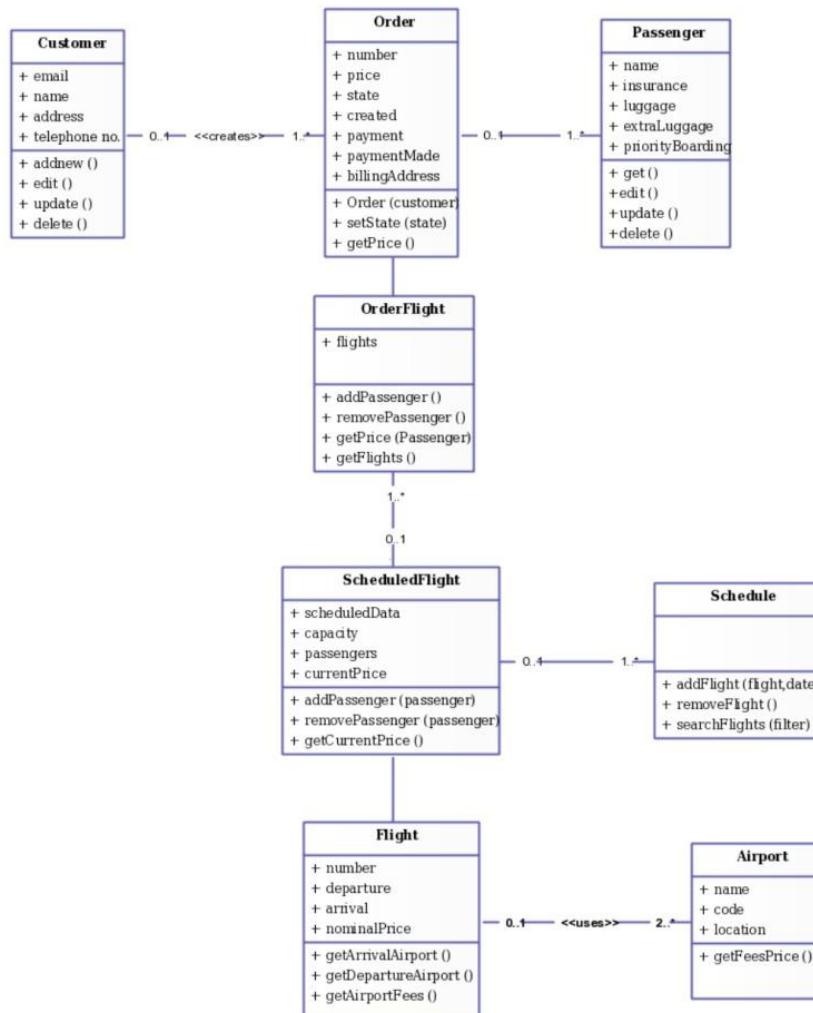
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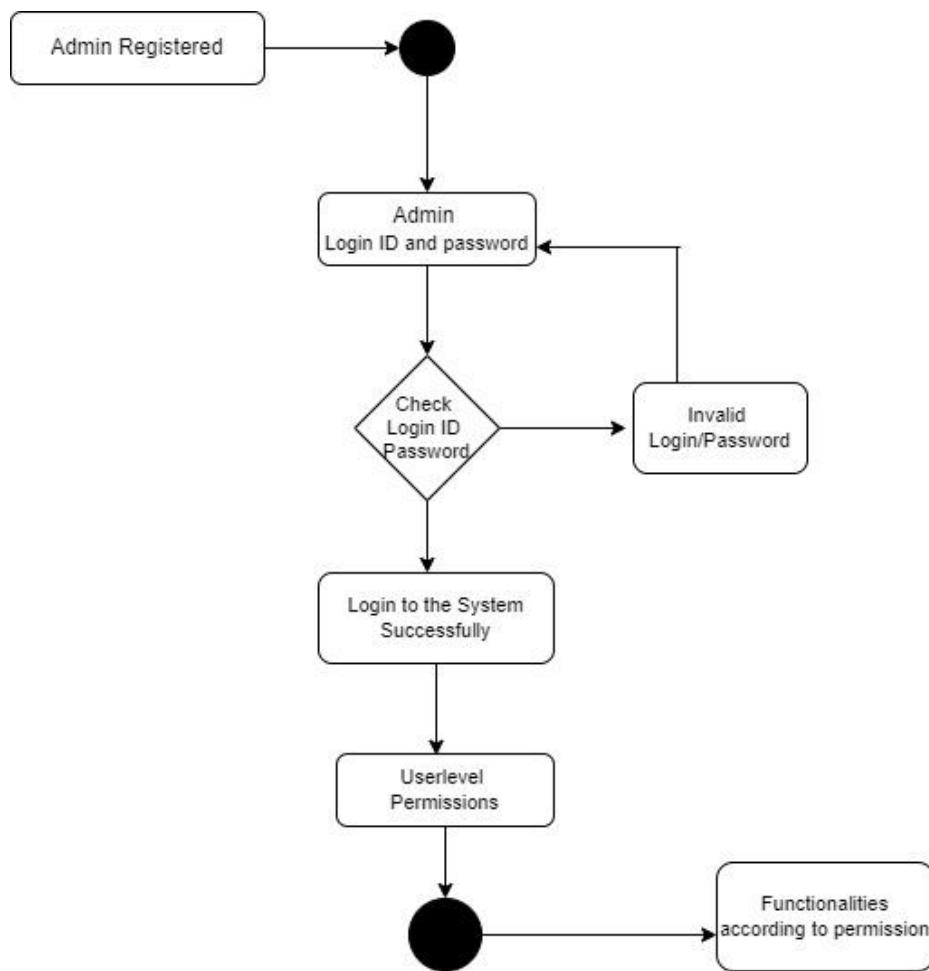
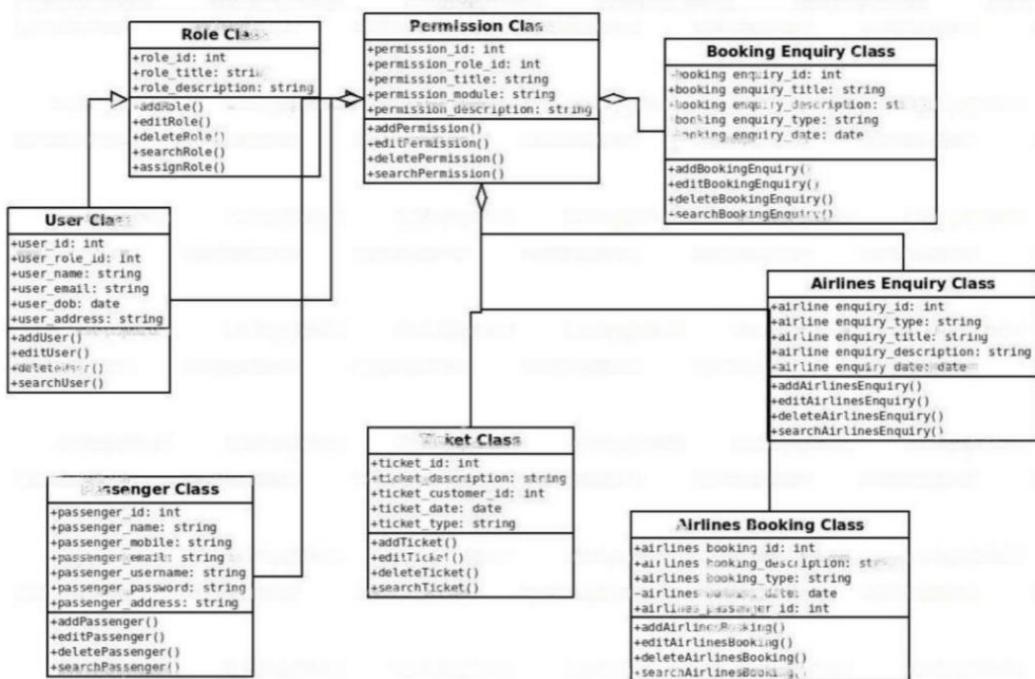


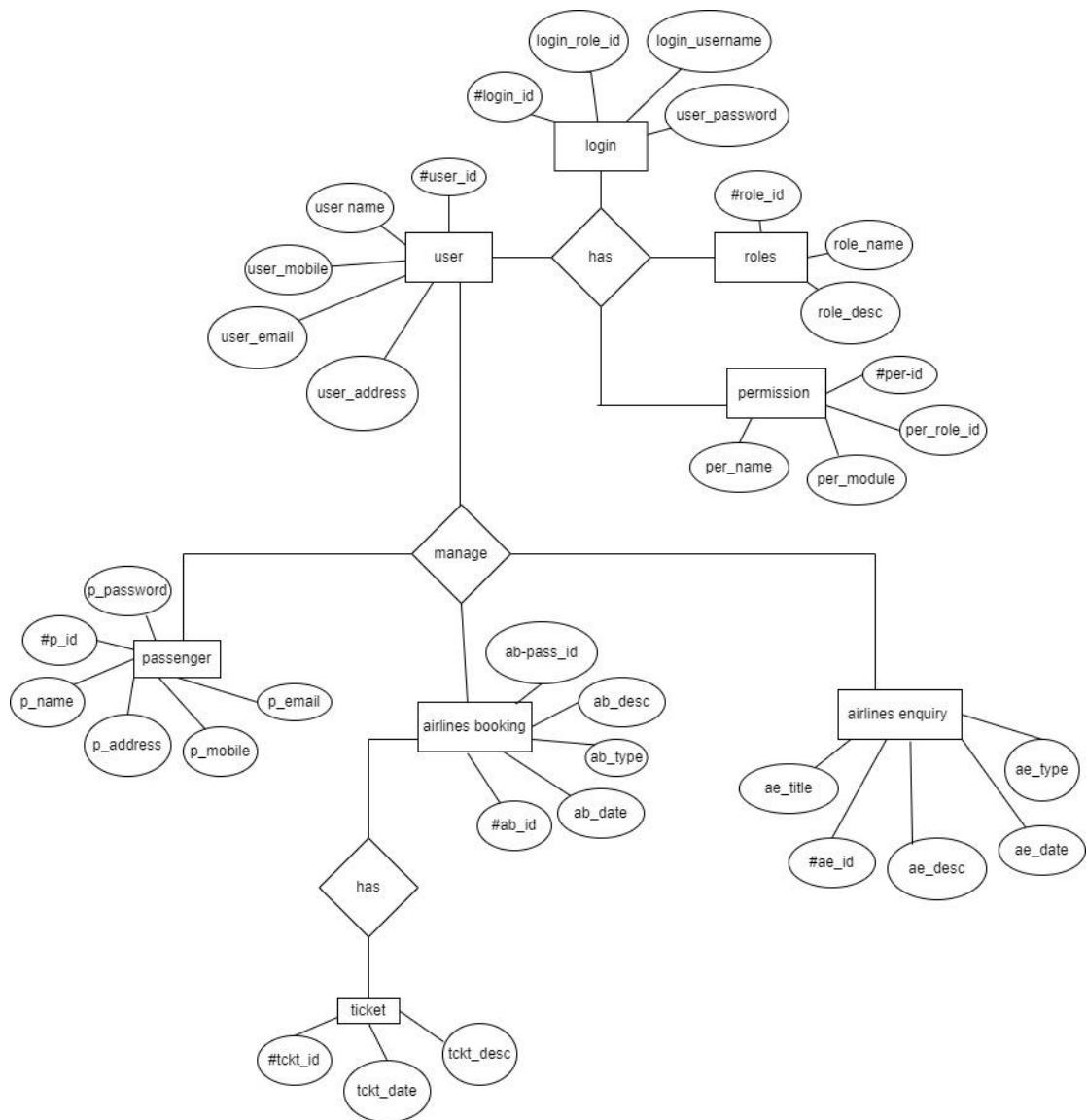
5. Rough estimate of effort required to  
accomplish each task in terms of person  
months

The team consists of 5 members.  
Estimated time : 2-3 months for about 2000 lines  
of code.

## UML DIAGRAMS







## OUTPUT SCREENSHOT

The screenshot shows the homepage of a flight booking application. The header includes the PES University logo, a navigation bar with 'Home' and 'My Bookings', and a 'My Account' dropdown. The main visual is a large graphic featuring a globe with a colorful map of Earth, set against a background of blue and orange starburst shapes. Overlaid on this graphic is the text 'Book Domestic and International Flight Tickets'. To the right of the graphic is a search form for flight bookings. The search form includes fields for 'From' (set to 'DEL'), 'To' (set to 'MAD'), 'Departure Date' (set to '17/11/2022'), 'Return Date' (set to '26/11/2022'), 'Class' (set to 'Economy'), and a 'Search Flight' button. The bottom of the screen shows a Mac OS X-style dock with various application icons.

The screenshot shows the 'Popular Destination' section of the application. The title 'Popular Destination' is centered at the top. Below it are six destination cards, each featuring a small image and the name of the destination. The destinations and their corresponding images are: Italy (a woman in front of the Eiffel Tower), Brazil (a road through a forest with autumn foliage), America (a city street with yellow taxis), Nepal (a paraglider in the sky), Maldives (a person standing on a rock with arms raised under a green aurora borealis), and Indonesia (a person sitting on a cliff overlooking a lake and mountains). The bottom of the screen shows a Mac OS X-style dock with various application icons.

Search | Flight + 

127.0.0.1:8000/flight?TripType=2&Origin=DEL&Destination=BOM&DepartDate=2022-11-17&ReturnDate=2022-11-26&SeatClass=economy

 Home My Bookings My Account ▾

From Delhi (DEL)	To Mumbai (BOM)	Depart Thu, 17 Nov 2022	Return Sat, 26 Nov 2022	Class Economy	<a href="#">Modify Search</a>
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**DEL → BOM**   **BOM → DEL**

Filter Results		Sort By:	Depart	Arrive	Price
<b>Price</b> 		 SpiceJet SG8709	19:00 Delhi	21:10 Mumbai	₹ 4940.0 <input type="radio"/>
<b>Departure Time</b> 		 SpiceJet SG711	21:40 Delhi	23:55 Mumbai	₹ 4940.0 <input type="radio"/>
<b>Arrival Time</b> 		 SpiceJet SG8169	19:45 Delhi	22:00 Mumbai	₹ 4940.0 <input type="radio"/>
<a href="#">Reset Filters</a>		 SpiceJet SG8709	19:00 Delhi	21:10 Mumbai	₹ 4958.0 <input type="radio"/>
		 SpiceJet SG8152	21:40 Delhi	23:55 Mumbai	₹ 4958.0 <input type="radio"/>

DEL → BOM @ ₹ 4882.0  
SG8701 07:20 • 09:35
BOM → DEL @ ₹ 5269.0  
SG8152 07:20 • 09:35
TOTAL FARE  
₹ 10151
[Continue →](#)



Search | Flight + 

127.0.0.1:8000/flight?TripType=2&Origin=BOM&Destination=DEL&DepartDate=2022-11-17&ReturnDate=2022-11-26&SeatClass=economy

 Home My Bookings My Account ▾

From Delhi (DEL)	To Mumbai (BOM)	Depart Thu, 17 Nov 2022	Return Sat, 26 Nov 2022	Class Economy	<a href="#">Modify Search</a>
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**DEL → BOM**   **BOM → DEL**

Filter Results		Sort By:	Depart	Arrive	Price
<b>Price</b> 		 SpiceJet SG8152	07:20 Mumbai	09:35 Delhi	₹ 5269.0 <input checked="" type="radio"/>
<b>Departure Time</b> 		 SpiceJet SG712	00:35 Mumbai	03:00 Delhi	₹ 5269.0 <input type="radio"/>
<b>Arrival Time</b> 		 SpiceJet SG8152	07:20 Mumbai	09:35 Delhi	₹ 5288.0 <input type="radio"/>
<a href="#">Reset Filters</a>		 SpiceJet SG712	00:35 Mumbai	03:00 Delhi	₹ 5288.0 <input type="radio"/>
		 SpiceJet SG8158	19:35 Mumbai	21:55 Delhi	₹ 5329.0 <input type="radio"/>

DEL → BOM @ ₹ 4882.0  
SG8701 07:20 • 09:35
BOM → DEL @ ₹ 5269.0  
SG8152 07:20 • 09:35
TOTAL FARE  
₹ 10151
[Continue →](#)





**We manage your trip, so you can live the destination.**

Back in the 90s, booking a ticket meant going all the way to the airport and standing in long airport queues waiting for your turn. Then came the internet, and everything changed. People could book their tickets online. Despite ongoing restrictions, travel has become more affordable than ever before. 2018 saw approximately 2 billion trips by Indian travellers.

However, the travel experience has remained largely unchanged - travel is still chaotic and uncertain. People still have bad trips.

We discovered that this is largely due to information asymmetry. Travellers generally have to work hard to find information that concerns their trip. Travel is very information rich, but the information resides with different stakeholders and often doesn't reach the traveller in time - thus resulting in frustration, anger, and unpleasantness.

Today, we make bookings without a clear idea of what our trip is going to be like - what time we'll leave home, what time we'll reach our destination, and how comfortable we'll be while we get this trip. On the day of the trip, we still frantically search for a cab, get nervous when we encounter traffic, and run to the boarding gate to get there on-time.

We felt that there's got to be a better way. So, we built Blinclip - your personal travel assistant that watches your trip experience and mindfully delivers the right information to you at the right time. That means no more running.



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**2. Prices on the Website:**  
Service Charge, Cancellation Charge, Reschedule charge are inclusive of GST  
The price, which we offer on flight-web-app.herokuapp.com, is generally includes accommodation charges, taxes (unless specified otherwise) and in special cases some meals (Breakfast /Lunch / Dinner). It never comprises any personal expense or other additional charges like telephone calls, personal-man services, entrance fees of any monuments and bar charges, etc.



**Ticket Details**

SpiceJet SG8701	<b>07:20</b> Thu, 17 Nov 22 Delhi Indira Gandhi International Airport	2h 15m	<b>09:35</b> Thu, 17 Nov 22 Mumbai Chhatrapati Shivaji International Airport
SpiceJet SG8152	<b>07:20</b> Sat, 26 Nov 22 Mumbai Chhatrapati Shivaji International Airport	2h 15m	<b>09:35</b> Sat, 26 Nov 22 Delhi Indira Gandhi International Airport

30 Kgs Check-in, 7 Kgs Cabin

**Contact Information**

Country Code India (+91)	Mobile No	Email
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**Fare Summary**

Base Fare:	₹ 10151
Fee & Surcharges:	₹ 100.0
<b>Total Fare:</b>	<b>₹ 10251</b>

Have a coupon code?  **Apply**



30 Kgs Check-in, 7 Kgs Cabin

**Contact Information**

Country Code Israel (+972)	Mobile No 9205767228	Email dearparthsingh@gmail.com
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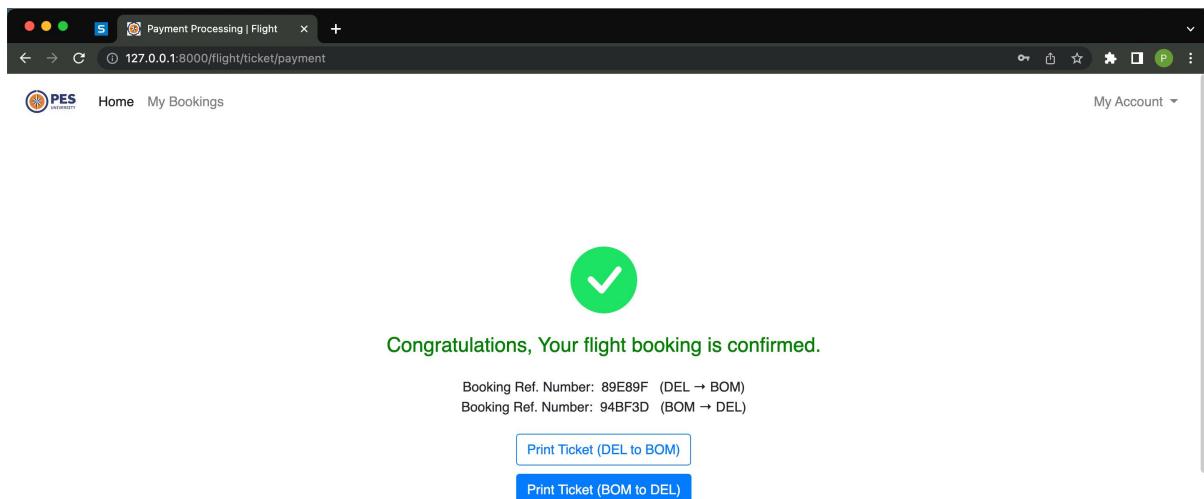
**Passenger Details** 1 Passengers

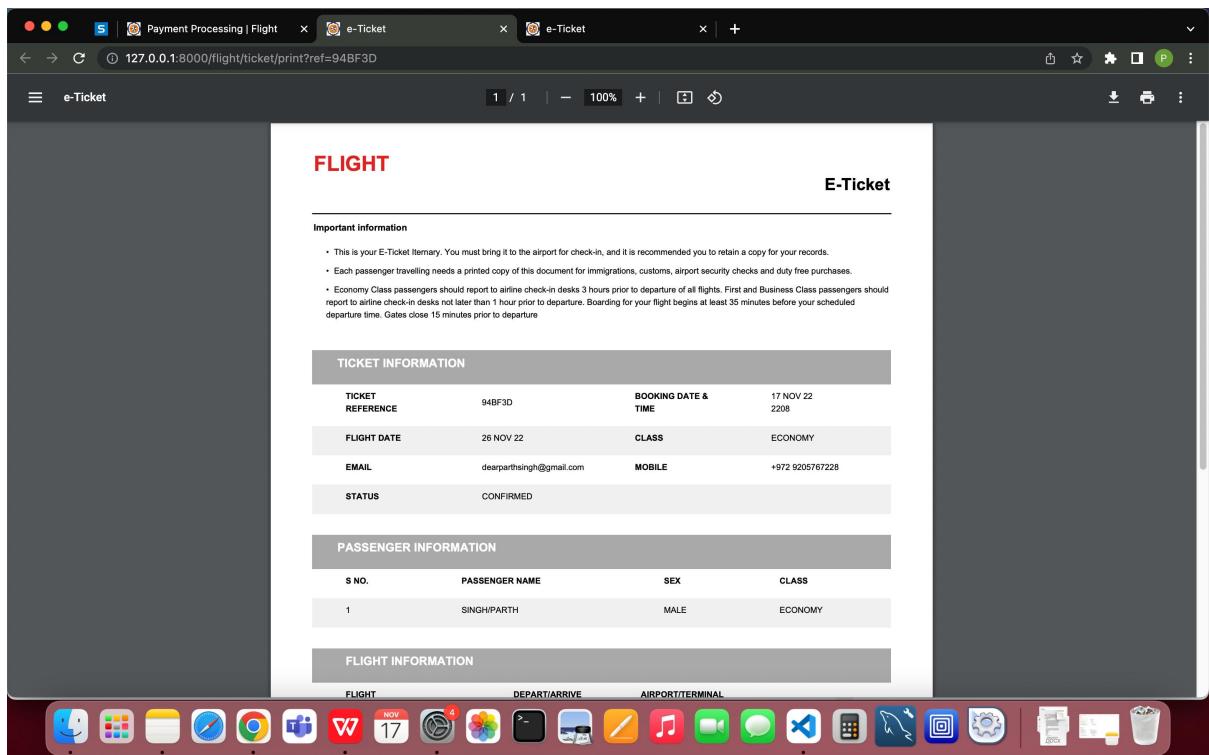
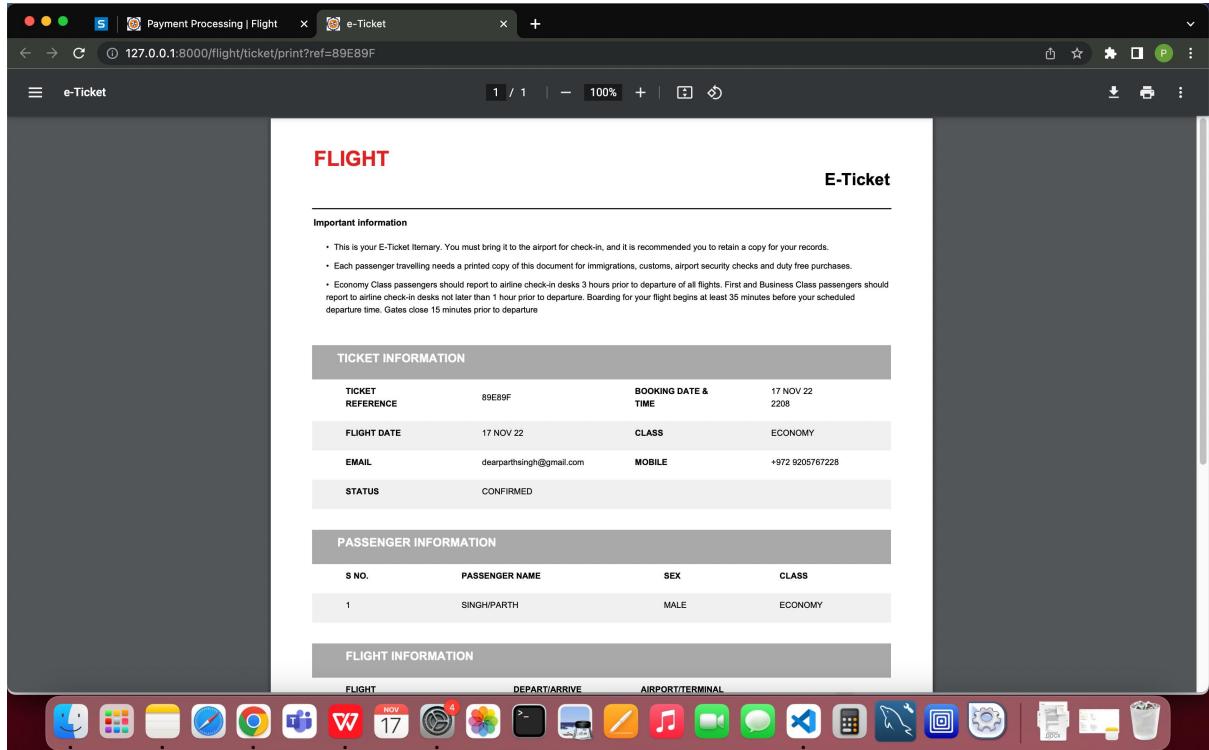
Parth Singh, MALE <span style="float: right;">×</span>	
IMPORTANT : Enter your name as it is mentioned on your passport or any government approved ID.	
First name	Last name
Gender: <input type="radio"/> Male <input type="radio"/> Female	
Add	
+ ADD ADULT	

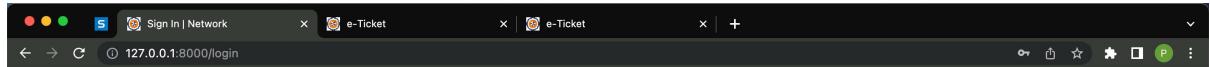
**Proceed to payment**



A screenshot of a web browser window titled "Payment | Flight". The URL is 127.0.0.1:8000/flight/ticket/book. The page displays a "Payment Details" form. At the top, there are icons for VISA, MasterCard, DISCOVER, and AMEX. Below these are fields for PAYMENT AMOUNT (\$ 10251.0), CARD NUMBER (placeholder "Enter card number"), CARD HOLDER'S NAME (placeholder "Enter name"), EXPIRY DATE (Month and Year dropdowns), and CVV CODE. A red "Make payment" button is at the bottom.





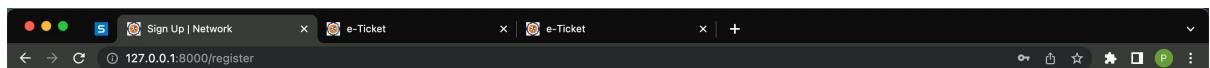


## Log in to Flight

First Name

Last Name

Don't have an account? [Sign Up](#)



## Sign up for Flight

First Name \*

Last Name \*

Username \*

Email Address \*

Password \*

Confirm Password \*

Already have an account? [Log in](#)



The screenshot shows a web browser window with a dark theme. The address bar displays the URL `127.0.0.1:8000/flight/bookings`. The page header includes the PES University logo, a "Home" link, and a "My Account" dropdown menu. The main content area lists four flight bookings:

Date	Flight Details	Ticket Number	Status	Actions
17 Thu Nov'22	Delhi - Mumbai SpiceJet - SG8701 · 1 Passengers	89E89F	CONFIRMED Booked on: Thu, Nov 17 2022	<a href="#">Cancel</a>
26 Sat Nov'22	Mumbai - Delhi SpiceJet - SG8152 · 1 Passengers	94BF3D	CONFIRMED Booked on: Thu, Nov 17 2022	<a href="#">Cancel</a>
17 Thu Nov'22	Delhi - Mumbai SpiceJet - SG711 · 1 Passengers	8F30FD	CONFIRMED Booked on: Thu, Nov 17 2022	<a href="#">Cancel</a>
25 Fri Nov'22	Mumbai - Delhi SpiceJet - SG8702 · 1 Passengers	359191	CONFIRMED Booked on: Thu, Nov 17 2022	<a href="#">Cancel</a>

At the bottom of the screen, a Mac OS X-style dock contains various application icons.