PROJECT REPORT

VAYUSETU – The Digital Bridge to the Skies
Advanced Airline Booking & Availability
Management System

Prepared by:

ADITYA GUATAM

590026405

B.Tech CSE

submitted to

MR. MOHSIN

FURKH DAR

Introduction

Airline reservation systems form the backbone of modern transportation networks, requiring precise computation, error-free booking logic, and efficient data management.

VAYUSETU

The Digital Bridge to the Skies is a C-based console application designed to simulate a real-world airline booking ecosystem.

This project implements structured data storage, seat allocation algorithms, menu-driven navigation, PNR generation, cancellation validation, and a complete user activity history logger, offering a realistic experience of airline reservation management.

The system demonstrates strong foundational programming concepts such as structures, functions, arrays, loops, conditional logic, and random number generation, making it a powerful learning model for real-world applications of C programming.

Problem Definition

Develop a C-based Airline Booking System which can:

- **Display all available flights**
- **Allow users to book a seat on a chosen flight**
- **Generate a unique PNR for every booking**
- **Handle cancellations safely and correctly**
- **Prevent cancellation of incorrect flights**
- **Compare ticket prices from different portals**
- **Track complete user activity history (logging each action)**
- **Provide a simple, menu-driven user interface**
- **Ensure correctness, reliability, and ease of use**

Main challenge:
Simulating a multi-operation airline system without databases, using only C structures and arrays.
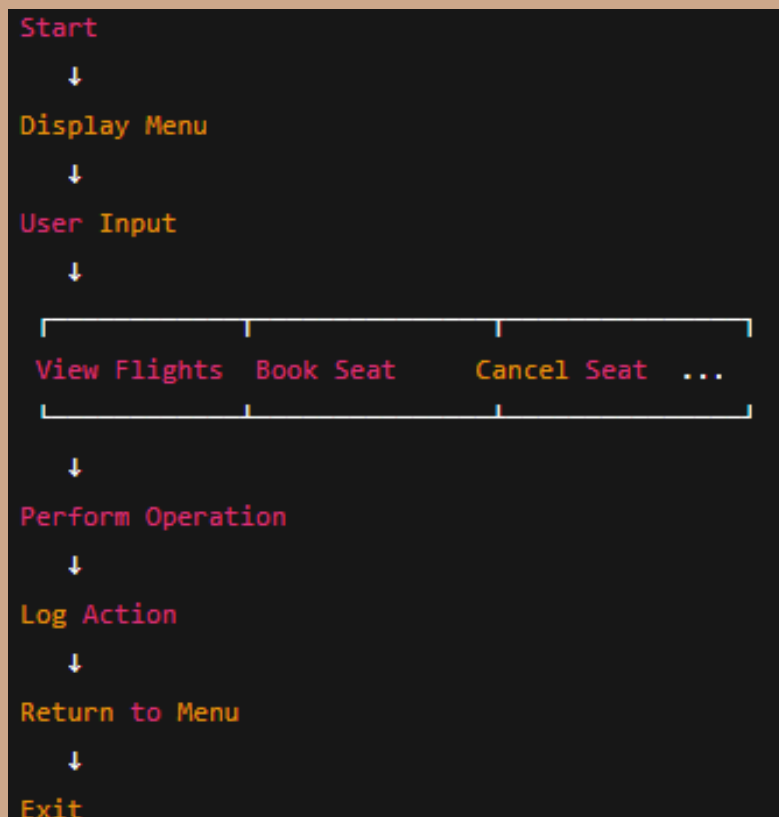
System Design

01

Architecture Diagram

User → Menu → Operation (Book, Cancel, View, Compare) → Update Data Structures → Log Activity → Display Output

02

FLOWCHART

```
Start
  ↓
Display Menu
  ↓
User Input
  ↓
┌──────────────┬──────────────┬──────────────────┐
│ View Flights   Book Seat        Cancel Seat    ... │
└──────────────┴──────────────┴──────────────────┘
  ↓
Perform Operation
  ↓
Log Action
  ↓
Return to Menu
  ↓
Exit
```

System Design

03

Algorithm 3:
Compare Prices

Step 1: Generate random
rates (Agoda, MMT, Yatra)

Step 2: Find minimum
Step 3: Display cheapest
Step 4: Log action

04

Algorithm 4:
View History

For each entry in
history[]:

display entry

Implementation Details

5.1 Technologies Used

- C Language
- Structures
- Functions
- Arrays
- Random Number Generation
- System Calls
- VS Code + GCC

5.2 Code Snippets (Add these in monospace font)

Structure Definition

```
struct AIRPLANE {
    int flight_number;
    char from[30];
    char to[30];
    int total_no_of_seats;
    int booked_no_of_seats;
```

PNR Generator

```
int create_pnr() {
 return 10000000 + (rand() % 90000000);
}
Booking Logic

myFlightIndex = index;
mySeat = a->booked_no_of_seats + 1;
myPNR = create_pnr();
```

History Logger

```
char history[200][200];
int history_count = 0;
void add_history(const char *event) {
 strcpy(history[history_count], event);
 history_count++;
```

6. Testing & Results

Test Case	Input	Expected Output	Result
View flights	1	All flights displayed	PASS
Book seat	Choose 2	Seat booked + PNR generated	PASS
Wrong cancel	Book 2, Cancel	Error message	PASS
Correct cancel	Book 2, Cancel 2	Seat successfully cancelled	PASS
Compare prices	5	Lowest fare displayed	PASS
View history	8	All actions logged	PASS
Exit	9	Program ended	PASS

7. Conclusion & Future Work

Conclusion

VAYUSETU successfully simulates an airline reservation environment using core C programming constructs.
It demonstrates:

- Structured programming
- Logical decision-making
- Real-time data manipulation
- User activity logging
- Random price simulation

The project meets all functional requirements and provides a smooth, menu-based user experience.

Future Work

The system can be enhanced with:

- File-based storage (saving bookings permanently)
- Real-time waitlist allocation
- Passenger database
- Admin login system
- Multiple seat bookings
- Boarding pass generator (PDF/QR)
- GUI version using Python/C++

References

References used while making the
- UPES SOCS Programming in C Study Material
- synopsis text ADITYA GAUTAM – 590026405
- Microsoft VS Code Documentation