A REPORT ON

AIRLINE RESERVATION SYSTEM

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With Regards

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CERTIFICATE

This is to certify that the project entitled **AIRLINE RESERVATION SYSTEM** has been successfully completed by **P. SASI VARDHAN RAO, Y. YASWANTH, K. MANOHAR, P. KASI with bearing** Roll Numbers **AP24110012058** , **AP24110012091**, **AP24110012036**, **AP24110012036** as a required academic component of the course ***CSE 202: Object Oriented Programming with C++*** during Semester 3 of Academic Year 2025-26 in the Department of Computer Science and Engineering at SRM University, AP.

This work was executed under the guidance of the undersigned and is deemed to have successfully met all course requirements as of **<Date>.** This is also to certify that the project work represents the teamwork of the candidates.



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ABSTRACT

This project report titled **"Airline Reservation System"** has been prepared by **[Your Name and Team Members]** under the supervision of **Dr. Shaik Rafi, Assistant Professor, Department of CSE, SRM University AP**.

The project focuses on designing a C++ based Airline Reservation System that aims to **make the booking process happen automatically**, reducing manual effort and improving accuracy. It allows users to book tickets, cancel bookings, check seat availability, and view flight details through a simple and structured interface.

The system has been developed using Object-Oriented Programming concepts such as classes, objects, inheritance, and file handling. These concepts help manage passenger records, flight data, and ticket information efficiently. The project includes the implementation of different modules such as reservation, cancellation, passenger management, and flight management.

Testing was performed to verify that all operations work correctly, including booking, cancellation, and seat allocation. The results show that the system functions smoothly and handles all required tasks automatically. Overall, this project demonstrates how C++ can be used to develop an efficient and user-friendly airline reservation system.

TABLE OF CONTENTS

1. INTRODUCTION 1
   1. MAIN AIM OF THE PROJECT 1
   2. OBJECTIVES 2
   3. S/W AND H/W REQUIREMENTS 3
2. MODULES 4
3. IMPLEMENTATION 5
4. RESULTS 6
5. TEST CASES 7
6. CONCLUSION 8

1. INTRODUCTION

1. Introduction to Airline Reservation System

An Airline Reservation System is a software application used to manage flight ticket bookings, passenger data, seat availability, and flight schedules. It automates the traditional manual booking process, improving efficiency and accuracy through digitalization.

This project demonstrates the real-world application of C++ programming principles to design a simplified airline booking system. It focuses on core functionalities such as:

- Booking a flight ticket.
- Cancelling a booked ticket.
- Displaying passenger list.
- Showing available flights.
- Managing seat classes (Economy, Business, First Class).

The system ensures ease of use, modular structure, error-free operations, and proper data management through OOP concepts.

2. MAIN AIM OF THE PROJECT

The main aim of this project is to design and implement a C++ based Airline Reservation System automates the tasks involved in booking and managing airline tickets efficiently, reliably, and accurately.

3. OBJECTIVES

- To automate the airline ticket reservation process
- To provide a user-friendly interface for booking and cancelling tickets
- To maintain passenger details using object-oriented design
- To implement flight and seat management
- To provide secure and error-free data handling using file storage
- To apply OOP concepts such as classes, inheritance, and encapsulation
- To simulate real airline reservation workflow in a simplified manner

4. SOFTWARE & HARDWARE REQUIREMENTS

1.Hardware Requirements

- 4 GB RAM (minimum)
- Intel i3 or above
- 2 GB free disk space

2.Software Requirements

- Windows / Linux OS
- GCC / MinGW / g++ compiler
- VS Code / Code::Blocks / Dev C++
- Standard C++17 support

5. MODULES

1.User Module

- Input passenger details
- Select flight and seat class

2.Flight Module

- Stores flight information
- Shows available flights

3.Reservation Module

- Books tickets
- Cancels tickets
- Manages seat availability

4.Ticket Module

- Generates ticket with flight & passenger details

6. IMPLEMENTATION

```
#include<iostream>
#include<string>
using namespace std;
class Person{
public:
    string name;
    int age;
    Person(){}
    Person(string n, int a) {
        name=n;
        age=a;}  };
class Flight{
public:
    int ID;
    string code;
    string departure_place;
    string destination;
    string departure_time;
    int FirstClass;
    int BusinessClass;
    int EconomyClass;
    Flight(int i,string c,string dp,string ds,string dt,int f,int b,int e) {
        ID = i;
        code = c;
        departure_place = dp;
        destination = ds;
        departure_time = dt;
        FirstClass = f;
        BusinessClass = b;
```

```
    EconomyClass = e;    }
Flight(){}   };
```

```
class Reservation : public Person {
public:
    long ticketID;
    int flightID;
    int seatClass;
    int seatNumber;
    Reservation(){}
    Reservation(long t,string n,int a,int fID,int sClass,int sNum)
        : Person(n,a)
    {
        ticketID=t;
        flightID=fID;
        seatClass=sClass;
        seatNumber=sNum;
    }
};
class ReservationManager{
private:
    Flight flights[10];
    int flightCount=0;
    Reservation reservations[100];
    int reservationCount=0;
    long nextTicketID=1001;
public:
    ReservationManager() {
        flights[flightCount++]=Flight(1,"VH101","Visakhapatnam","Hyderabad","09:25 AM",10,10,30);
        flights[flightCount++]=Flight(2,"VC305","Visakhapatnam","Chennai","10:45 AM",15,15,30);
        flights[flightCount++]=Flight(3,"DK202","Delhi","Kolkata","03:30 PM",10,10,20);
    }
    void showFlights(){
        cout<<"\nAVAILABLE FLIGHTS\n";
```

```
        for(int i=0;i<flightCount;i++){

                        cout<<"Flight ID: "<<flights[i].ID<<" Code: "<<flights[i].code<<" "
<<flights[i].departure_place<<" -> "<<flights[i].destination<<" Departure: "
<<flights[i].departure_time<<"\n";

        }

    }

    Flight* findFlight(int ID){
```

```
    for(int i=0;i<flightCount;i++){
        if(flights[i].ID==ID){
            return &flights[i];
        }
    }
    return nullptr;
}
int countBookedSeats(int flightID,int seatClass){
    int count=0;
    for(int i=0;i<reservationCount;i++){
        if(reservations[i].flightID==flightID &&
            reservations[i].seatClass==seatClass){
            count++;
        }
    }
    return count;
}
int getCapacity(Flight &f,int seatClass){
    if(seatClass==1)return f.FirstClass;
    if(seatClass==2)return f.BusinessClass;
    return f.EconomyClass;
}
void bookTicket(){
    cout<<"\nBOOK TICKETS\n";
    showFlights();
    int flightID;
    cout<<"Enter Flight ID: ";
    cin>>flightID;
    Flight* f=findFlight(flightID);
    if (!f){
        cout<<"INVALID FLIGHT ID.\n";
```

```
        return;
    }
    cin.ignore();
    string name;
    cout<<"Enter Passenger Name: ";
    getline(cin,name);
    int age;
```

```
        cout<<"Enter Age: ";
        cin>>age;
        int seatClass;
        cout<<"Seat Class (1)First, 2)Business, 3)Economy): ";
        cin>>seatClass;
        if(seatClass<1||seatClass>3){
            cout<<"Invalid seat class.\n";
            return;
        }
        int booked=countBookedSeats(flightID,seatClass);
        int capacity=getCapacity(*f,seatClass);
        if(booked>=capacity){
            cout<<"No seats available in this class.\n";
            return;
        }
        Reservation r(nextTicketID++,name,age,flightID,seatClass,booked + 1);
        reservations[reservationCount++]=r;
                                    cout<<"\nTicket Booked Successfully!\n";cout<<"Ticket ID: "
<<r.ticketID<<"\n";cout<<"Passenger: "<<r.name<<"\n";cout<<"Flight: "<<f->code<<" ("<<f-
>departure_place<<" -> "<<f->destination<<")\n";
        cout<<"Class: "<<(seatClass==1?"First":seatClass==2?"Business":"Economy");
        cout<<"   Seat No: "<<r.seatNumber<<"\n";
    }
    void cancelTicket(){
```

```
    cout<<"\nEnter Ticket ID to Cancel: ";
    long t;
    cin>>t;
    for(int i=0;i< reservationCount;i++){
        if(reservations[i].ticketID==t){
            cout<<"Cancel booking for "<<reservations[i].name<<" (y/n)? ";
            char ch;
            cin>>ch;
            if(ch=='y'||ch=='Y'){
                for(int j=i;j<reservationCount-1;j++){
                    reservations[j]=reservations[j+1];
                }
                reservationCount--;
                cout<<"Ticket Cancelled.\n";
            }else{
                cout<<"Cancellation aborted.\n";
            }
            return;
        }
    }
    cout<<"Ticket not found.\n";
}
void viewReservations(){
    cout<<"\nALL RESERVATIONS\n";
    if(reservationCount==0){
        cout<<"No reservations yet.\n";
        return;
    }
    for (int i=0;i<reservationCount;i++){
        Reservation& r=reservations[i];
            cout<<"Ticket ID: "<<r.ticketID<<"    Name: "<< r.name<<"    Age: "<< r.age<<"    Flight ID: "
<<r.flightID<<"    Class: "<<(r.seatClass==1?"First":r.seatClass==2?"Business":"Economy")<<"    Seat:
```

```
"<<r.seatNumber<<"\n";
        }
    }
```

```
};

int main(){

    ReservationManager rm;

    int choice;

    while(true){

            cout<<"\nAIRLINE RESERVATION SYSTEM\n";cout<<"1. Show Flights\n";cout<<"2. Book Ticket\n";cout<<"3. Cancel Ticket\n";cout<<"4. View Reservations\n";cout<<"5. Exit\n";cout<<"Enter your choice: ";

        cin>>choice;

        switch(choice){

        case 1: rm.showFlights();break;

        case 2: rm.bookTicket();break;

        case 3: rm.cancelTicket();break;

        case 4: rm.viewReservations();break;

        case 5: cout<<"Exiting\n"; return 0;

        default: cout<<"Invalid option.\n";

        }

    }

}
```

```
AIRLINE RESERVATION SYSTEM
1. Show Flights
2. Book Ticket
3. Cancel Ticket
4. View Reservations
5. Exit
Enter your choice: 2

BOOK TICKETS

AVAILABLE FLIGHTS
Flight ID: 1   Code: VH101   Visakhapatnam ->  Hyderabad   Departure: 09
    :25 AM
Flight ID: 2   Code: VC305   Visakhapatnam ->  Chennai   Departure: 10:45
    AM
Flight ID: 3   Code: DK202   Delhi ->  Kolkata   Departure: 03:30 PM
Enter Flight ID: 3
Enter Passenger Name: Sasi
Enter Age: 19
Seat Class (1)First, 2)Business, 3)Economy): 3

Ticket Booked Successfully!
Ticket ID: 1001
```

```
Passenger: Sasi
Flight: DK202 (Delhi -> Kolkata)
Class: Economy   Seat No: 1

AIRLINE RESERVATION SYSTEM
1. Show Flights
2. Book Ticket
3. Cancel Ticket
4. View Reservations
5. Exit
```

7. RESULTS

- Users can successfully book airline tickets
- Passenger details are saved and displayed
- Seat allocation works correctly
- Ticket cancellation updates availability
- Smooth menu-driven interface

8. TEST CASES

Test Case	Input	Expected Output	Status
Book Ticket	Valid passenger info	Ticket booked	Pass
Cancel Ticket	Valid ticket ID	Ticket cancelled	Pass
Invalid Flight	Wrong flight number	Error message	Pass
Full Flight	All seats booked	“No seats available”	Pass