VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Jnana Sangama, Belagavi – 590 018

A DLithe Report

On

"AIRLINE SEAT RESERVATION SYSTEM"

By

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ABSTRACT

Airline Reservation System is a computerized system used to store and retrieve information and conduct transactions related to Air travel. The project is aimed at exposing the relevance and importance of Airline Reservation Systems. It is projected towards enhancing the relationship between customers and airline agencies through the use of Airline Seat Reservation System, and thereby making it convenient for the customers to book the flights as when they require such that they can utilize this software to make reservations. This software has two parts. First is User part and the Administrator part. User part is Used as a Front End and Administrator is the Back End. Administrator is used by Airline Authority. It will allow the customers to access database and allow new customers to Sign Up for online access. The system allows the Airline Passenger to search for Flights that are available between the two travel cities, namely the "Departure City" and "Arrival City" for a particular departure and arrival dates. The system displays all the Flight's Details such as Flight No, Name, and Price Etc. after search the system display list of available Flights and allows customer to choose a particular Flight. Then the system checks for the availability of Seats on the Flight. If the Seats are available then the system allows the Passenger to Book a Seat. Otherwise, it asks the User to choose another Flight. To Book a Flight the system asks the customer to enter his/her Details such as Name, Age, Arrival City, Departure City, and Contact Number. Then it checks the Validity of Details and Book the Flight and update the Airline Database and User Database. The system also allows the customer to Cancel his/her Reservation, if any problem occurs. The main purpose of this software is to reduce the manual errors involved in the Airline Reservation process and make it convenient for the customers to Book the Flights as when they require such that they can utilize this software to make Reservations, Modify Reservations or Cancel a Particular Reservation

1. INTRODUCTION

The Airline Seat Reservation System is a foundational and indispensable component of the modern aviation landscape. It plays a pivotal role in shaping the way airlines operate and passengers experience air travel. This report delves into the intricate workings and significance of the Airline Seat Reservation System, shedding light on its critical functions, its impact on airlines and travelers, as well as the challenges it faces in an ever-evolving industry.

In an era where air travel has become an integral part of global mobility, the Airline Seat Reservation System stands as a technological cornerstone that underpins the success of airlines worldwide. It seamlessly connects passengers with their desired flights, enables seat selection, and facilitates the management of reservations, all while optimizing operational efficiency for airlines and enhancing the overall travel experience for passengers.

This report seeks to provide a comprehensive understanding of the Airline Seat Reservation System, exploring its essential functionalities, its pivotal role in shaping the industry's landscape, the challenges it encounters, and the avenues for future improvement and innovation. By examining the intricate interplay between technology, operations, and customer satisfaction, we gain valuable insights into how this system continues to be a driving force in the aviation sector.

1.1 BACKGROUND

The Airline Seat Reservation System has a storied history dating back to the mid-20th century when the airline industry began its ascent as a major mode of transportation. Originally, reservations were handled manually with paper tickets, but the pivotal turning point came in the 1960s with the advent of computer technology. American Airlines introduced SABRE, the first automated reservation system, revolutionizing booking processes and setting the stage for further technological advancements.

Since then, reservation systems have evolved significantly, transitioning from mainframe computers to distributed systems, offering online booking platforms, and integrating seamlessly with web and mobile technologies. Today, the Airline Seat Reservation System not only underpins airline operations but also plays a critical role in the passenger experience, driving revenue management and decision-making. In the face of emerging technologies and evolving passenger expectations, its continued adaptation and innovation remain essential to the aviation industry's success.

1.2 OBJECTIVES

This report aims to achieve the following objectives:

- **Understanding Significance:** To elucidate the critical role played by the Airline Seat Reservation System in modern air travel, highlighting its impact on operational efficiency, passenger satisfaction, and revenue generation for airlines.

- **Functional Overview:** To provide a comprehensive insight into the core functionalities of the system, including booking and reservation management, seat allocation, ticketing, reservation modifications, and reporting and analytics.

- **Challenges:** To identify and analyze the challenges faced by the system, such as scalability concerns, security issues, integration complexities, and the need for real-time updates.

- **Potential Improvements:** To explore opportunities for enhancement, including the integration of AI and machine learning, blockchain for security, cloud migration, and improved mobile experiences.

2. TECHNOLOGIES USED

Tool used in this project is VS Code.

The libraries and functions used in the code are:

1. stdio.h: It stands for Standard Input Output. It has the information related to input/output functions.

2. stdbool.h: In C, the bool data type is not a built-in data type. However, the C99 standard for C language supports bool variables. Boolean can store values as true-false, 0-1, or can be yes-no.

3. string.h: It is a standard header file in the C language that contains functions for manipulating strings (arrays of characters).

4. printf(): It is used to print the strings, integer, character etc. on the output screen.

5. scanf(): It reads the character, string, integer etc. from the keyboard.

6. fopen(): It opens the file and all file handling functions are defined in stdio.h header file.

7. fclose(): It closes the opened file.

8. ANSI escape code: The ANSI escape code is a standardized code that can be used to change the color and formatting of text in the terminal.

3. SYSTEM ARCHITECTURE

The system architecture of Airline Seat Reservation System project can be divided into the following components:

1. User interface: This module interacts with the user. The user interface is responsible for displaying the menu options, accepting user input, and displaying the results of the operations. It can be implemented using a text-based user interface or a graphical user interface. In this project we used ANSI escape code to implement graphical text-based interface from the terminal.

2. Data storage: This module stores the passenger data. It can be a file system, a database, or a cloud storage service. The choice of data storage depends on the size and complexity of the passenger data, as well as the requirements of the project. In this project file system has been used as a means to store the data and access it whenever needed.

3. Data processing: This module performs operations on the passenger's data. This includes tasks such as adding new passengers, updating and modifying records, and searching for seat availability. The data processing component is implemented using C programming in this project by using file operations.

4. DESIGN AND IMPLEMENTATION

The Airline Seat Reservation System is a C-based application designed to facilitate seat reservations for airline passengers. It offers a comprehensive set of features for booking, modifying, viewing, and cancelling tickets, as well as checking the current airline status. The system utilizes data structures, file operations, and a user-friendly interface to provide a seamless experience for both passengers and administrators.

The implementation details of Airline Seat Reservation System are as follows:

1. Data Structures: The system employs a structured data model using the Passenger struct to store passenger information. This struct contains attributes such as name, age, phone number, departure city, arrival city, journey date, reservation status, and class type.

2. Global Variables: A global array of Passenger structs, denoted as seats[MAX_SEATS], serves as the core data store for seat reservations. The array is dimensioned to accommodate up to 100 seats.

3. File Operations: File operations are implemented to persistently store and retrieve reservation data. The system includes functions for saving data to a file (saveDataToFile) and loading data from a file (loadDataFromFile). Data is organized in a structured format to ensure readability and manageability.

4. User Interface: The system presents an intuitive, text-based user interface through a menu (displayMenu). Users can interact with the system by selecting from a range of available operations, enhancing usability and accessibility.

5. Modularity: To maintain code clarity and ease of development, the main program is subdivided into discrete functions for each operation, such as booking (bookTicket), modifying (modifyTicket), viewing (viewBookedTicket), modifying airline records (modifyAirlineRecord), checking status (checkAirlineStatus), and cancelling (cancelTicket). This modular structure promotes code reusability and simplifies maintenance.

6. Input Validation: The system includes robust input validation mechanisms to validate user inputs. For instance, it verifies seat numbers, class selections, and user-entered passenger information to ensure data integrity and prevent errors.

7. Visual Representation: ANSI escape codes are used to apply color coding to seat displays based on reservation status and class type. This visual enhancement aids users in distinguishing between available and reserved seats.

8. Error Handling: The system provides informative error messages to guide users when invalid inputs or operations occur, improving user experience and problem resolution.
9. Looping Structure: A do-while loop is employed to create a continuous interactive session with users. The menu is repeatedly displayed, and user input is processed until the user chooses to exit the application.

5. FEATURES & FUNCTIONALITY

The features & functionality of Airline Seat Reservation System project can be divided into the following:

1. Color: This module contains the code for implementing color codes to the texts in the terminal to make the interfacing visually appealing.

2. Passenger: This module is a structure which is used to store data about different passengers.

3. Load & Save: These modules contain the code to load data from the files and also store the data into it for each user.

4. Book Ticket & Modify Ticket function: It uses a loop to iterate through the seats array to find an available seat. If an available seat is found, the function reserves the seat and updates the passenger information.

5. View Booked Ticket function: It checks if the ticket ID is valid and if the seat is reserved. If the ticket ID is invalid or the seat is not reserved, the function prints an error message and returns. If the ticket ID is valid and the seat is reserved, the function prints the information about the ticket.

6. Modify Airline Record function: It checks if the ticket ID is valid and if the seat is reserved. If the ticket ID is invalid or the seat is not reserved, the function prints an error message and returns. If the ticket ID is valid and the seat is reserved, the function allows the user to modify the passenger information. The user can choose to modify the passenger's name, age, phone number, departure city, arrival city, or journey date.

7. Check Airline Status function: It prints the available seats in each class. It then calls the Set Color function to color the reserved seats red.

8. Cancel Ticket function: It checks if the ticket ID is valid and if the seat is reserved. If the ticket ID is invalid or the seat is not reserved, the function prints an error message and returns. If the ticket ID is valid and the seat is reserved, the function sets the reserved flag to false for the seat and clears the passenger information.

6. CHALLENGES & TESTING

Developing a sophisticated software system like the Airline Seat Reservation System is a complex task with many challenges. It requires careful planning and problem-solving skills throughout the development and testing phases. Here are some of the challenges faced while developing:

Challenges During Development:

1. Design Complexity: Designing a system to handle seat reservations, passenger data, and various operations (booking, modifying, cancelling, etc.) required careful planning and structuring of the code.

2. Data Handling: Managing a large dataset of passenger information and seat reservations while maintaining data integrity was challenging. Deciding how to organize and structure the data was crucial.

3. File I/O: Implementing file operations for data persistence required handling potential errors, such as file not found, read/write errors, and ensuring that data is correctly formatted in the file.

4. User Interface: Creating user-friendly interface that guides users through the reservation process and provides meaningful feedback was challenging with updating the seats matrix to let user know about reserved and unreserved seats.

5. Input Validation: Validating user inputs to ensure that they are within acceptable ranges and formats is essential to prevent data corruption and runtime errors.

6. Visual Enhancements: Implementing color coding for seat displays using ANSI escape codes requires an understanding of terminal compatibility and was tricky to get it right.

7. Error Handling: Implementing error handling and providing clear error messages to users can be challenging, especially when dealing with various possible error scenarios.

Challenges During Testing:

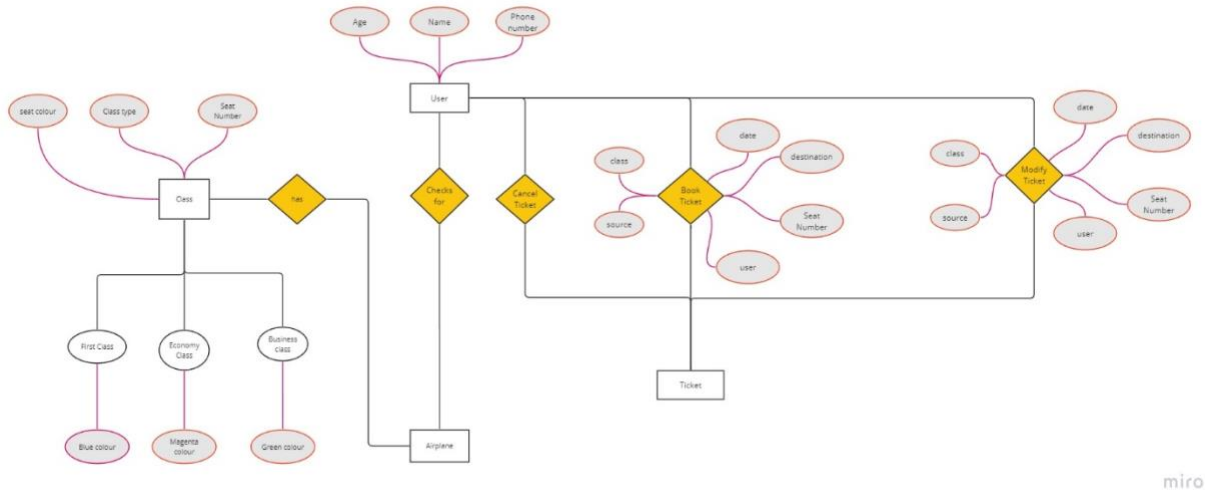
1. Data Consistency: Ensuring that the data loaded from and saved to files remains consistent and that there are no data corruption issues can be challenging to test comprehensively.

2. Boundary Testing: Testing edge cases, such as booking the last available seat, modifying a fully booked seat, or attempting to access an invalid seat ID, requires careful consideration and thorough testing.

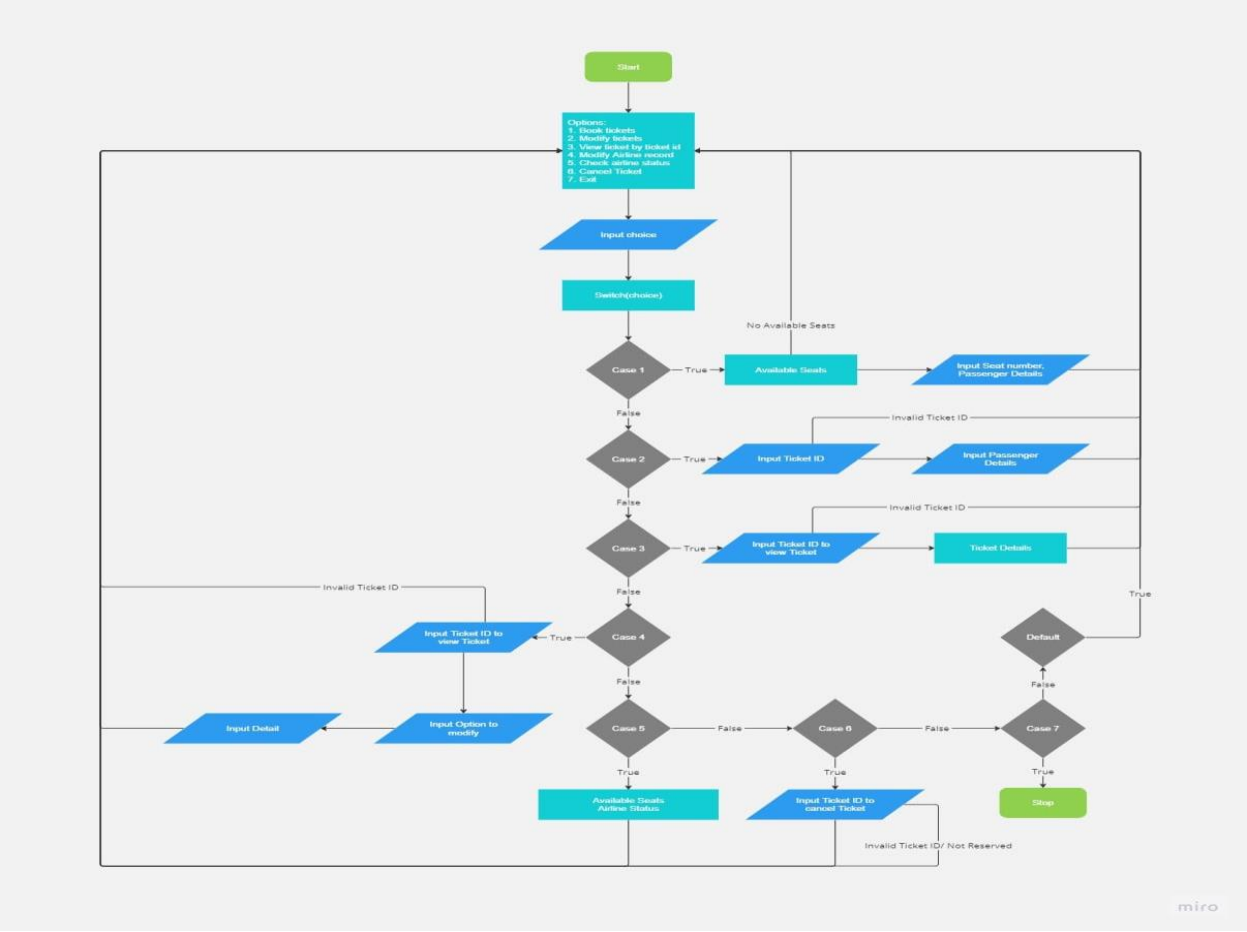
3. Regression Testing: Testing was done to make sure that new features don't break existing features.

7. MINDMAP & FLOWCHART

Mindmap:



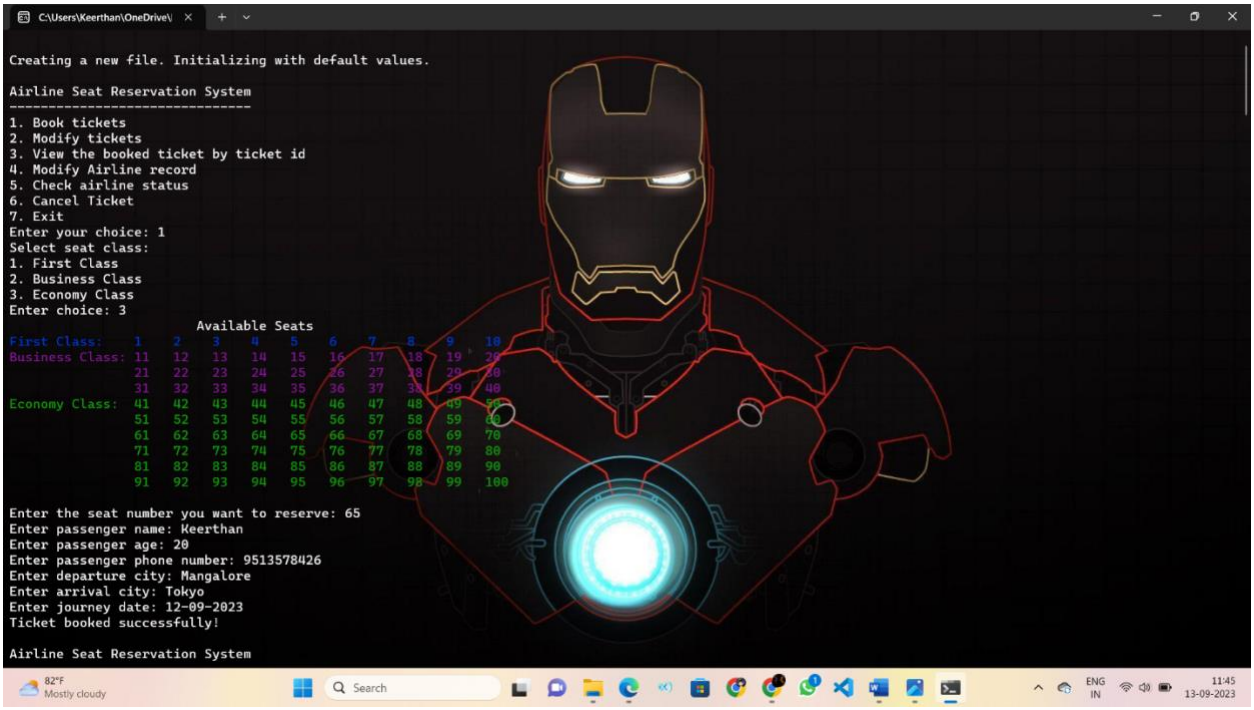
Flowchart:

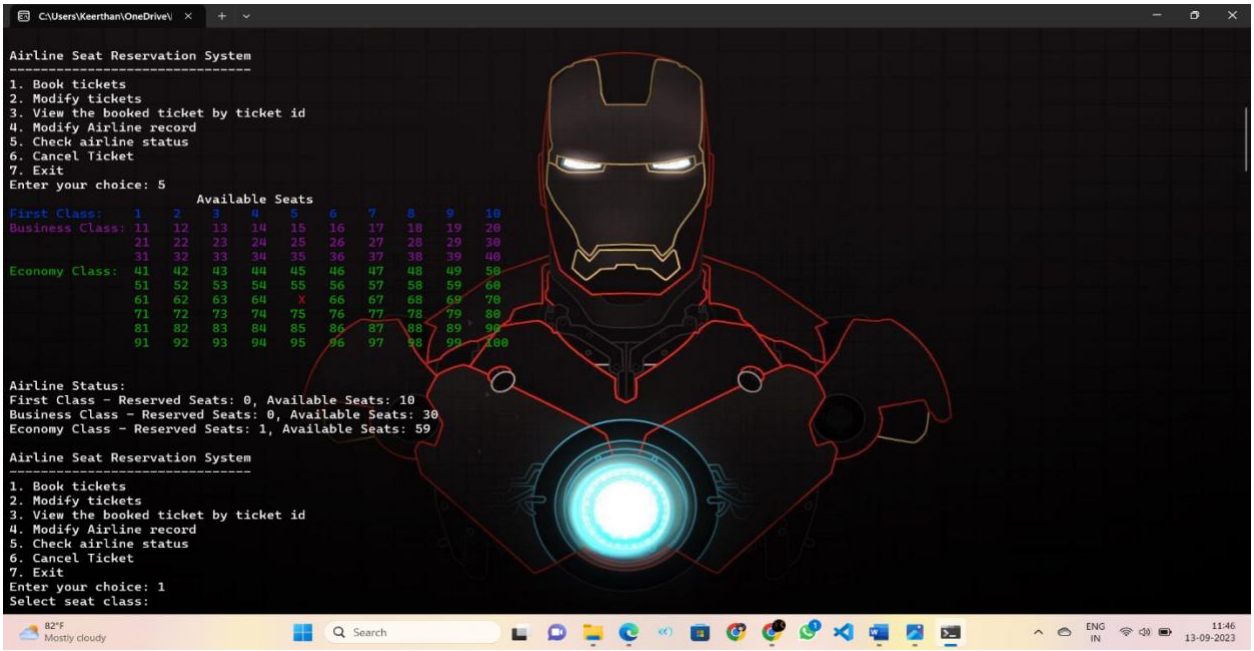


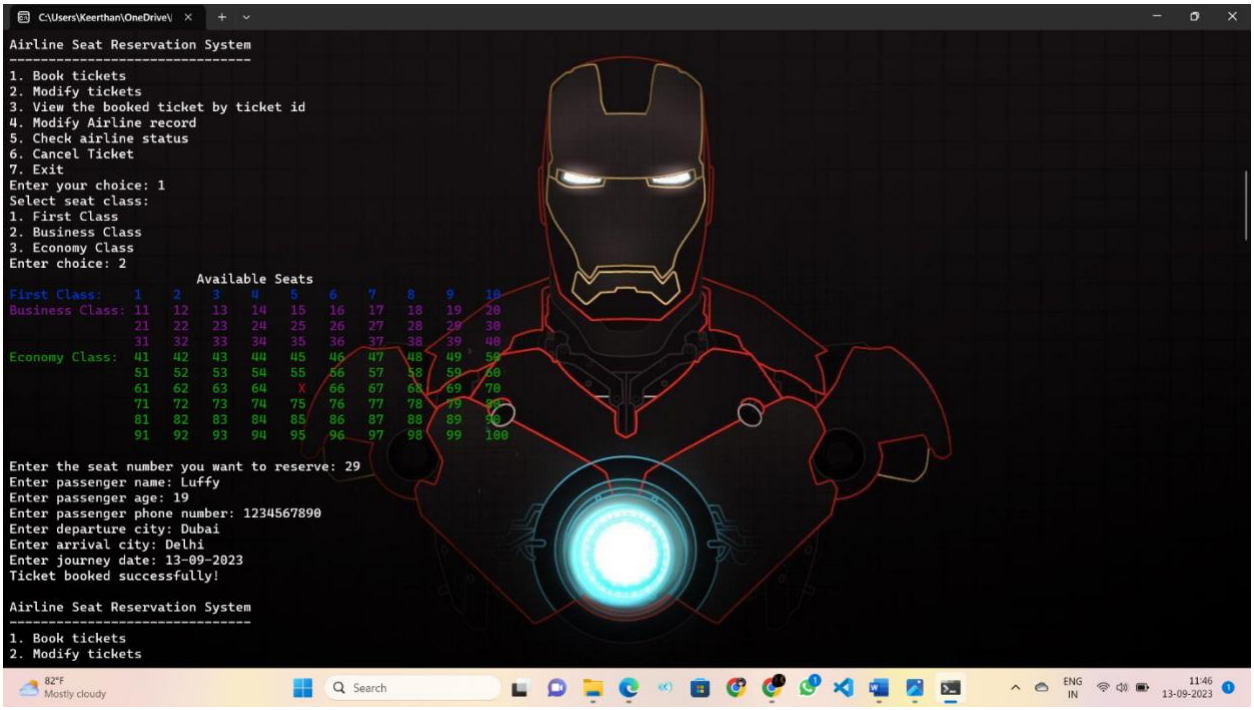
8. CODE & OUTPUT

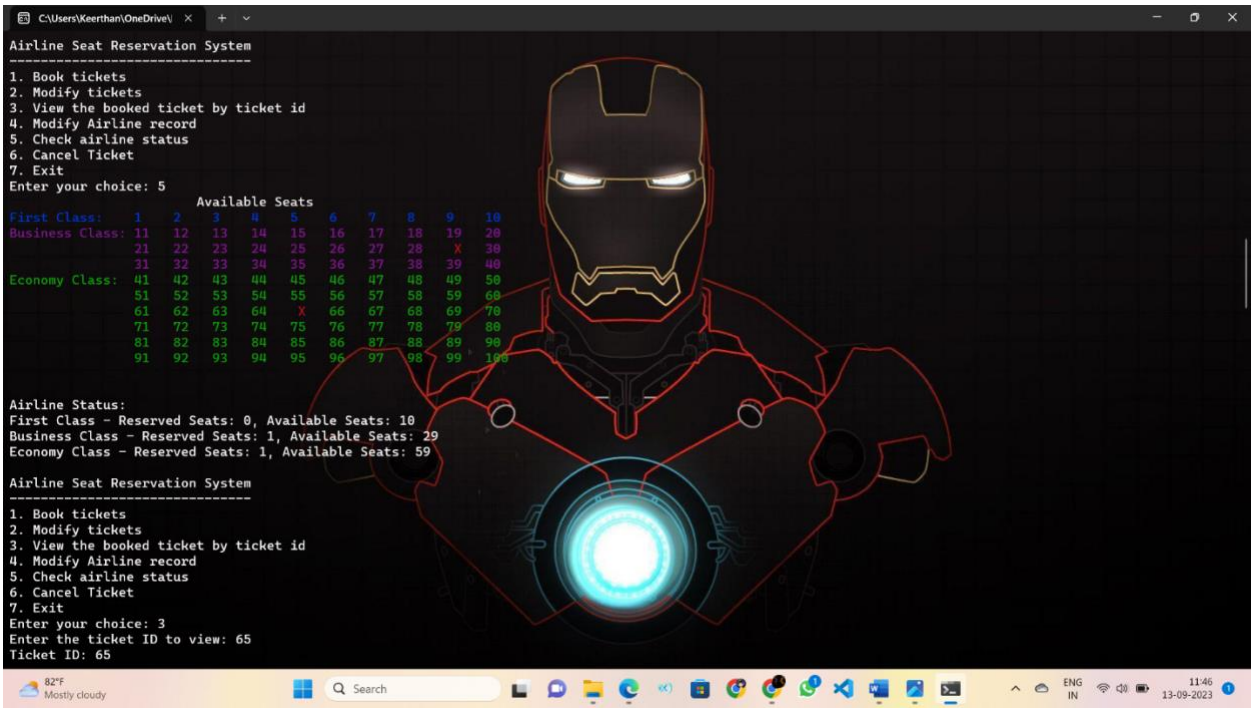
https://github.com/Keerth1n/Airline_Seat_Reservation_System-/blob/main/asr.c

OUTPUT:






C:\Users\Keerthan\OneDrive\
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 1
Select seat class:
1. First Class
2. Business Class
3. Economy Class
Enter choice: 2
Available Seats
First Class: 1 2 3 4 5 6 7 8 9 10
Business Class: 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
Economy Class: 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 X 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100
Enter the seat number you want to reserve: 29
Enter passenger name: Luffy
Enter passenger age: 19
Enter passenger phone number: 1234567890
Enter departure city: Dubai
Enter arrival city: Delhi
Enter journey date: 13-09-2023
Ticket booked successfully!
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
82°F
Mostly cloudy
Search
ENG
IN
11:46
13-09-2023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1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 5
Available Seats
First Class: 1 2 3 4 5 6 7 8 9 10
Business Class: 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 X 30
31 32 33 34 35 36 37 38 39 40
Economy Class: 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 X 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100
Airline Status:
First Class - Reserved Seats: 0, Available Seats: 10
Business Class - Reserved Seats: 1, Available Seats: 29
Economy Class - Reserved Seats: 1, Available Seats: 59
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 3
Enter the ticket ID to view: 65
Ticket ID: 65
82°F
Mostly cloudy
Search
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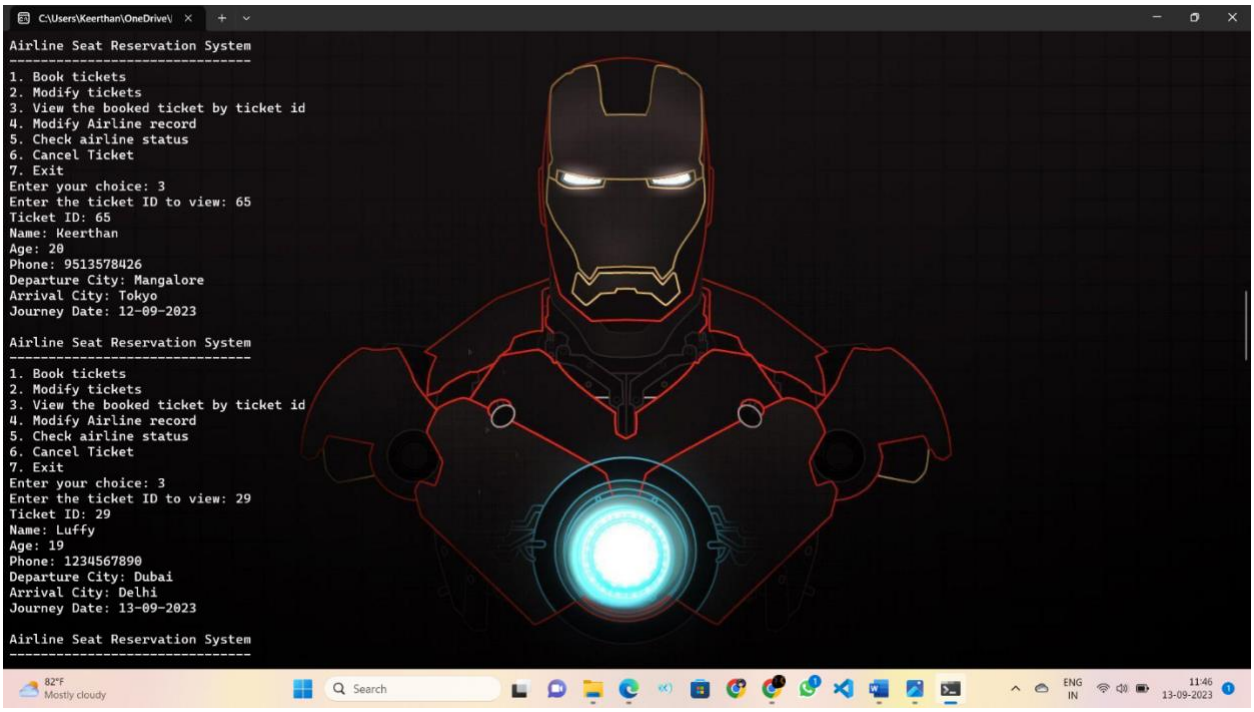
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Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 3
Enter the ticket ID to view: 65
Ticket ID: 65
Name: Keerthan
Age: 20
Phone: 9513578426
Departure City: Mangalore
Arrival City: Tokyo
Journey Date: 12-09-2023
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 3
Enter the ticket ID to view: 29
Ticket ID: 29
Name: Luffy
Age: 19
Phone: 1234567890
Departure City: Dubai
Arrival City: Delhi
Journey Date: 13-09-2023
Airline Seat Reservation System
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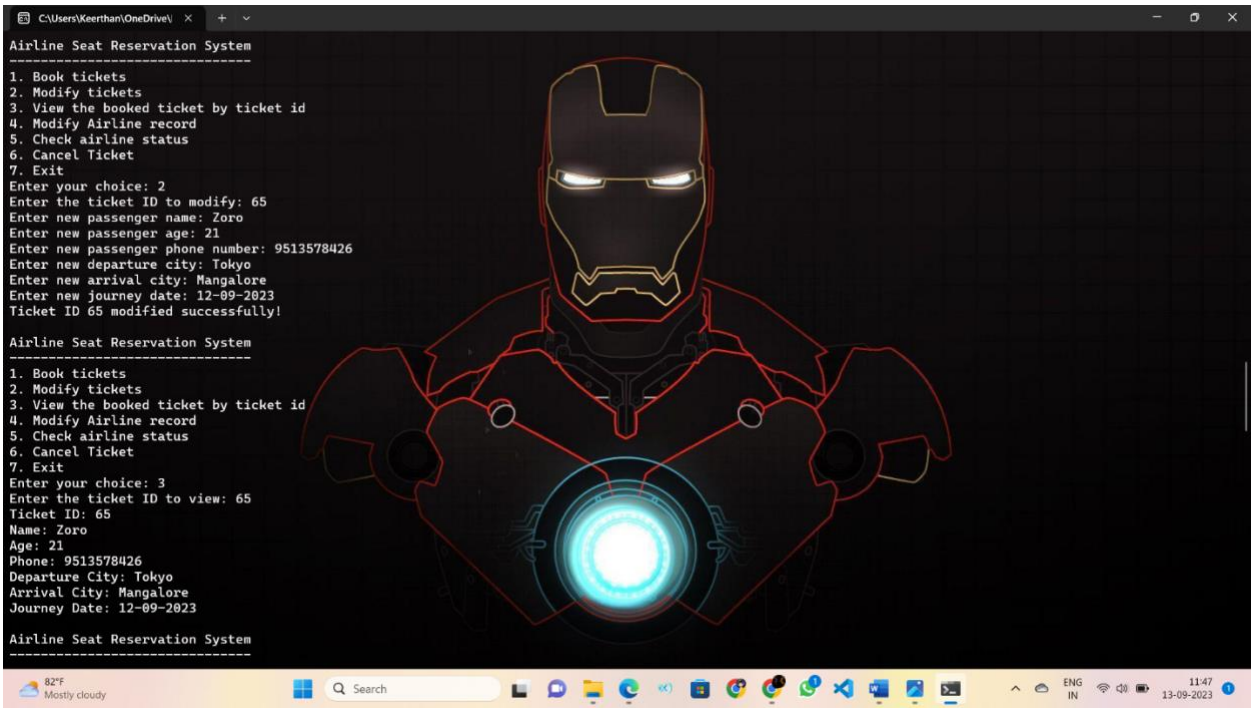
13-09-2023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Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 2
Enter the ticket ID to modify: 65
Enter new passenger name: Zoro
Enter new passenger age: 21
Enter new passenger phone number: 9513578426
Enter new departure city: Tokyo
Enter new arrival city: Mangalore
Enter new journey date: 12-09-2023
Ticket ID 65 modified successfully!
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 3
Enter the ticket ID to view: 65
Ticket ID: 65
Name: Zoro
Age: 21
Phone: 9513578426
Departure City: Tokyo
Arrival City: Mangalore
Journey Date: 12-09-2023
Airline Seat Reservation System
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Mostly cloudy
Search
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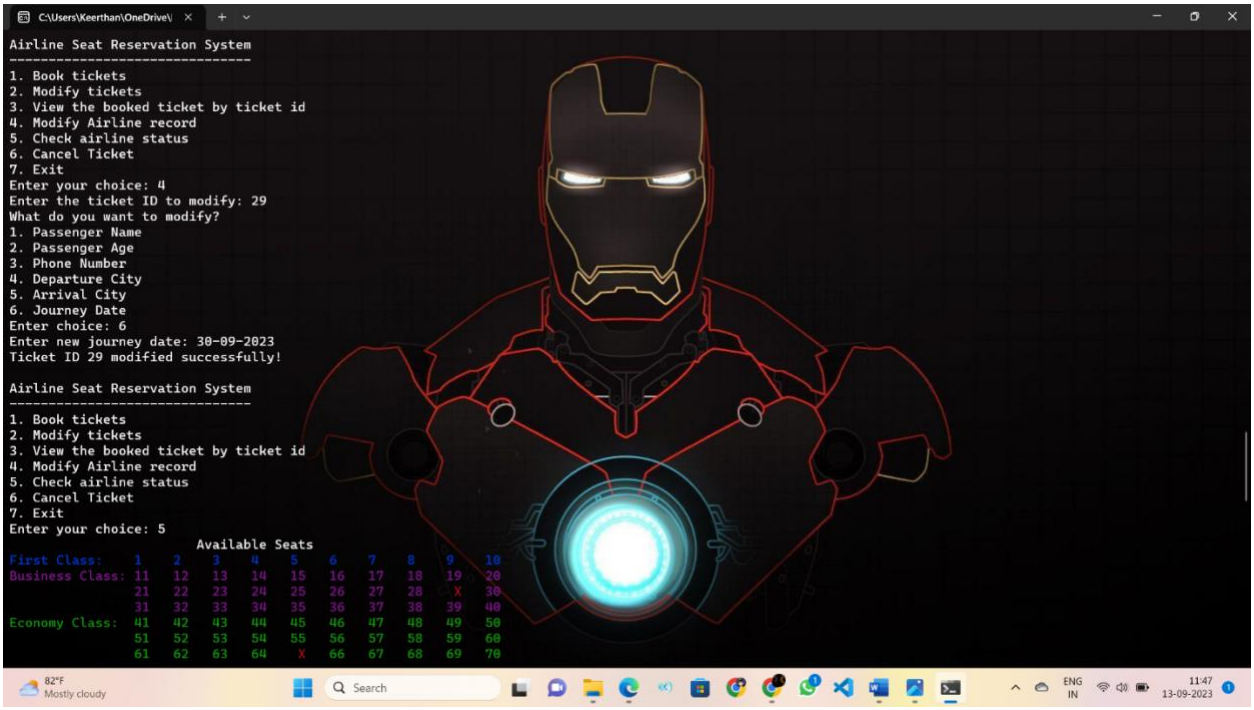
13-09-2023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Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 4
Enter the ticket ID to modify: 29
What do you want to modify?
1. Passenger Name
2. Passenger Age
3. Phone Number
4. Departure City
5. Arrival City
6. Journey Date
Enter choice: 6
Enter new journey date: 30-09-2023
Ticket ID 29 modified successfully!
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 5
Available Seats
First Class: 1 2 3 4 5 6 7 8 9 10
Business Class: 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 X 30
31 32 33 34 35 36 37 38 39 40
Economy Class: 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 X 66 67 68 69 70
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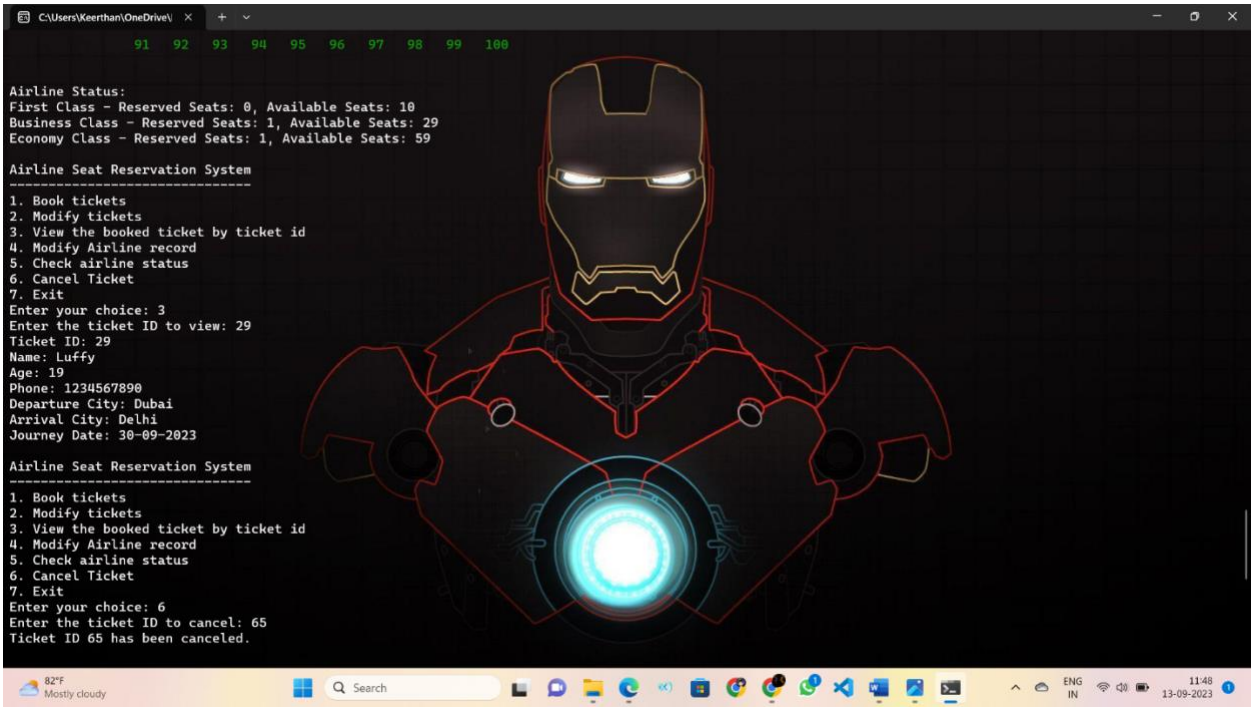
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91 92 93 94 95 96 97 98 99 100
Airline Status:
First Class - Reserved Seats: 0, Available Seats: 10
Business Class - Reserved Seats: 1, Available Seats: 29
Economy Class - Reserved Seats: 1, Available Seats: 59
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 3
Enter the ticket ID to view: 29
Ticket ID: 29
Name: Luffy
Age: 19
Phone: 1234567890
Departure City: Dubai
Arrival City: Delhi
Journey Date: 30-09-2023
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 6
Enter the ticket ID to cancel: 65
Ticket ID 65 has been canceled.
82°F
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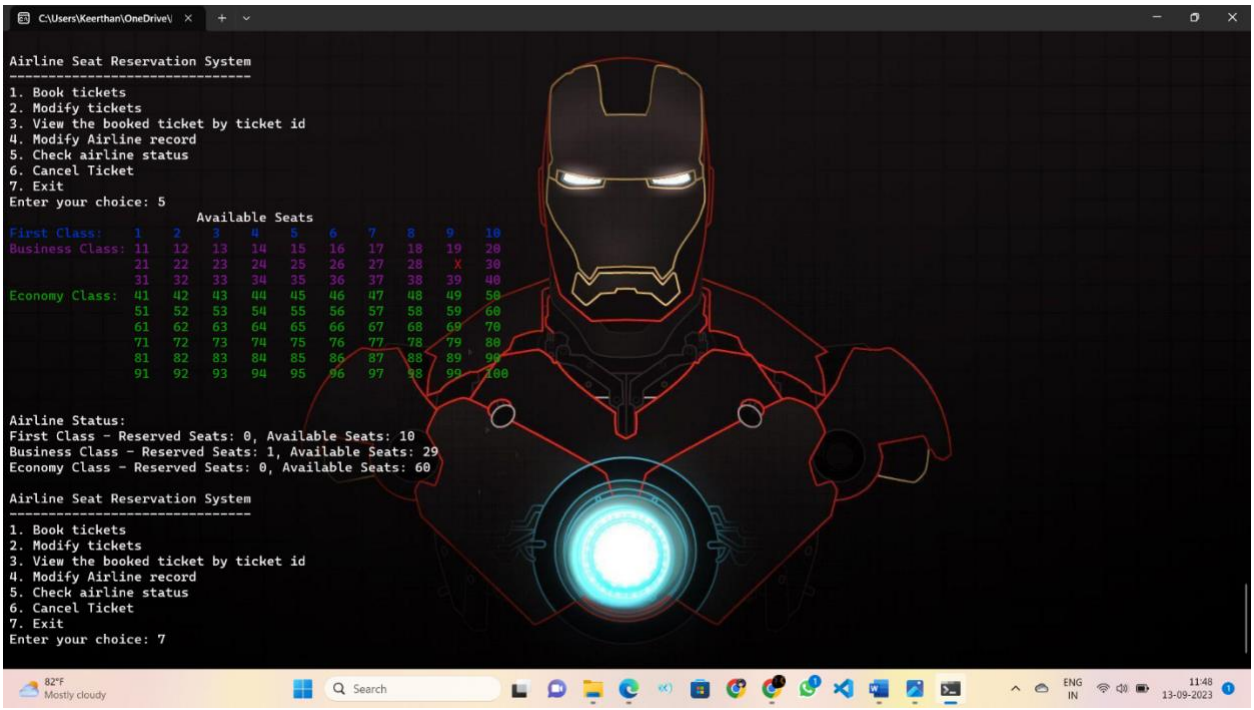
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2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 5
Available Seats
First Class: 1 2 3 4 5 6 7 8 9 10
Business Class: 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 X 30
31 32 33 34 35 36 37 38 39 40
Economy Class: 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100
Airline Status:
First Class - Reserved Seats: 0, Available Seats: 10
Business Class - Reserved Seats: 1, Available Seats: 29
Economy Class - Reserved Seats: 0, Available Seats: 60
Airline Seat Reservation System
1. Book tickets
2. Modify tickets
3. View the booked ticket by ticket id
4. Modify Airline record
5. Check airline status
6. Cancel Ticket
7. Exit
Enter your choice: 7
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9. CONCLUSION

In conclusion, the Airline Reservation System presented here demonstrates a comprehensive approach to streamlining the airline booking process. By allowing passengers to select seat classes, view seat availability, and make reservations with ease, it enhances the overall user experience. Moreover, the system's flexibility is underscored by its ticket modification feature, empowering travelers to adapt their bookings as needed. On the administrative side, the ability to modify airline records can be invaluable for airline staff in maintaining an up-to-date and efficient operation. Additionally, the "Check Airline Status" function provides a vital tool for passengers and staff alike to stay informed about flight-related information and any pertinent updates. Overall, this system not only simplifies the booking process but also contributes to the efficient management of airline operations.

However, for a comprehensive assessment, it's important to consider potential security and data privacy aspects to ensure the protection of passenger information. Furthermore, the system's scalability and integration with other airline systems may also be important factors to consider for its successful implementation and long-term sustainability. In conclusion, while this Airline Reservation System boasts several valuable features, its effectiveness will ultimately depend on the quality of its implementation, user-friendly interface, and the extent to which it addresses the specific needs and expectations of both passengers and airline personnel.

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