

# TITLE OF PROJECT REPORT



## FLIGHT RESERVATION SYSTEM

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# Introduction

This project implements a basic Airline Reservation System, designed to handle reservations, cancellations, and display information for a fictional airline, "Fokir Marka Airlines LTD." The system stores and manages booking information, including customer details, seat assignments, and ticket prices across three classes: Economy, Business, and First Class.

## Objectives

The main objectives of this project are to:

1. Facilitate efficient seat reservations and cancellations.
2. Display available seats and manage reservation data.
3. Calculate and track revenue generated from bookings.
4. Ensure seat assignment integrity across classes.

## Project Overview

The project utilizes C language, leveraging structures to manage reservation records and a combination of arrays and functions to track seat availability. Key functionalities include:

1. **Reservation and Cancellation** management.
2. **Seat availability** tracking.
3. **Revenue calculation** and display.
4. User **login** for security and access control.

## Code Structure

### • Data Structures

- **struct airline:** Manages customer details such as passport number, name, destination, seat class, seat number, and price.

### • Global Variables

- **Reservations Array:** An array of `struct airline` to store reservation details.
- **Seat Arrays:** Separate arrays (`seats_z`, `seats_j`, `seats_y`) track seat availability for First, Business, and Economy classes respectively.
- **Revenue Counter:** Tracks cumulative revenue.

## • Functions

### • Main Functions:

- `reserve()`: Collects customer details, assigns seat, and updates revenue.
- `cancel()`: Searches and removes reservations by passport number.
- `display()`: Lists all current reservations.
- `show_available_seats()`: Displays unreserved seats across classes.
- `check_seat_status()`: Checks if a specified seat is reserved.
- `display_revenue()`: Outputs total revenue generated.

### • Helper Functions:

- `remove_newline()`: Removes trailing newline from strings.
- `get_price()`: Retrieves ticket price based on seat class.
- `apply_discount()`: Applies discounts based on customer type (student, senior, regular).
- `login()`: Authenticates users before allowing access.

## Features

```
Enter username: admin
Enter password: admin123

Login successful! Welcome admin.
```

### • Reservation:

- Collects customer information, assigns the next available seat in a class, and dynamically updates seat availability and revenue.
- 
- Offers discount options based on customer type (student, senior, regular).

```
Enter the number of seats you would like to reserve: 2

Enter your passport number: 123456
Enter your name: Nafiz Kamal Talha
Enter your email address (without @gmail.com): nafiz
Enter the Destination: London

Seat Class Options:
- Economy (Y): $60
- Business (J): $150
- First Class (Z): $300
Enter seat class (Z for First Class, J for Business, Y for Economy): z

Are you a 'student', 'senior', or 'regular' customer? student

Applied 20% student discount. Discounted price: $240
Seat booking successful for reservation 1!
Seat: Z-1
Class: Z
Price: $240
Press enter to continue.

Enter your passport number: 3579
Enter your name: Ishmam Hossain
Enter your email address (without @gmail.com): ishmam
Enter the Destination: Uganda

Seat Class Options:
- Economy (Y): $60
- Business (J): $150
- First Class (Z): $300
Enter seat class (Z for First Class, J for Business, Y for Economy): j

Are you a 'student', 'senior', or 'regular' customer? senior

Applied 15% senior discount. Discounted price: $127
Seat booking successful for reservation 2!
Seat: J-1
Class: J
Price: $127
Press enter to continue.
```

- **Cancellation:**

- Allows searching for reservations by passport number, removes reservations, updates availability, and adjusts revenue.

```
Enter the passport number for the reservation to cancel: 3579
Reservation cancelled for Ishmam Hossain .
```

- **Display Functions:**

- Lists all reservations with comprehensive details including name, passport, destination, seat class, and price.
- Shows available seats and checks individual seat status.

```
++===== Reservations =====++
Name: Nafiz Kamal Talha | Passport: 123456 | Destination: london | Seat: Z-1 | Class: Z | Price: $240
++=====++
```

- **Revenue Tracking:**

- Maintains and displays total revenue from all reservations, adjusting automatically with reservations and cancellations.

```
Total Revenue: $240
```

## Error Handling

- **Invalid Inputs:** Prompts the user if an invalid class or seat number is entered.
- **Memory Management:** Ensures efficient memory allocation and deallocation upon reservation and cancellation.
- **Seat Assignment Integrity:** Prevents overbooking by notifying users if no seats are available in a selected class.

| ++===== Available Seats =====++ |                    |                   |
|---------------------------------|--------------------|-------------------|
| First Class (Z)                 | Business Class (J) | Economy Class (Y) |
|                                 | J-1                | Y-1               |
| Z-2                             | J-2                | Y-2               |
| Z-3                             | J-3                | Y-3               |
| Z-4                             | J-4                | Y-4               |
| Z-5                             | J-5                | Y-5               |
| Z-6                             | J-6                | Y-6               |
| Z-7                             | J-7                | Y-7               |
| Z-8                             | J-8                | Y-8               |
| Z-9                             | J-9                | Y-9               |
| Z-10                            | J-10               | Y-10              |
| Z-11                            | J-11               | Y-11              |
| Z-12                            | J-12               | Y-12              |
| Z-13                            | J-13               | Y-13              |
| Z-14                            | J-14               | Y-14              |
| Z-15                            | J-15               | Y-15              |
| Z-16                            | J-16               | Y-16              |
| Z-17                            | J-17               | Y-17              |
| Z-18                            | J-18               | Y-18              |
| Z-19                            | J-19               | Y-19              |
| Z-20                            | J-20               | Y-20              |
| Z-21                            | J-21               | Y-21              |
| Z-22                            | J-22               | Y-22              |
| Z-23                            | J-23               | Y-23              |
| Z-24                            | J-24               | Y-24              |
| Z-25                            | J-25               | Y-25              |
| Z-26                            | J-26               | Y-26              |
| Z-27                            | J-27               | Y-27              |
| Z-28                            | J-28               | Y-28              |
| Z-29                            | J-29               | Y-29              |
| Z-30                            | J-30               | Y-30              |
| ++-----++                       |                    |                   |
| Z-30                            | J-30               | Y-30              |
| Z-29                            | J-29               | Y-29              |
| Z-28                            | J-28               | Y-28              |
| Z-27                            | J-27               | Y-27              |
| Z-26                            | J-26               | Y-26              |

# Limitations and Future Improvements

- **Fixed Seat Capacity:** The system limits seats to 30 in each class. Future versions could expand capacity for larger aircraft.
  - **Console UI:** Transitioning to a graphical or web interface could improve user experience.
  - **Database Integration:** Currently, the system lacks persistent storage, which could be implemented through database integration.
- Advanced Error Checking:** Enhanced input validation for seat assignments and cancellations could further improve reliability.

# Conclusion

This Airline Reservation System demonstrates a functional, console-based system capable of managing basic reservation operations for an airline. The system effectively manages bookings, cancellations, seat tracking, and revenue generation using simple C structures and arrays. With further expansion, it has the potential to evolve into a more comprehensive, real-world reservation system for an airline.