**Data Structures and Algorithms – Project Report**

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**Introduction:**

The Airline Management System project is a console-based application developed in C++ to manage airline operations such as customer records, flight schedules, and seat bookings. In this project, we used singly linked lists for dynamic memory management and integrates file handling to store and retrieve data.

**Key Features:**

1. **Customer Management:**

* Add customer information (ID, name, passport number, CNIC)
* Display all registered customers in a formatted table
* Save customer data to a file (customer.txt) for future use
* Load customer data from the file into memory at start of program

1. **Flight Management:**

* Add flight details (ID, destination, departure time, seat capacity)
* Display all available flights in a structured format
* Store flight details in a file (flight.txt) for future use
* Load flight details from the file into memory at start of program

1. **Seat Booking:**

* Book a seat on a specific flight for a registered customer using their passport number
* Update the available seats dynamically upon successful booking
* Validate customer information and flight details before confirming the booking

1. **Seat Cancellation:**

* Cancel a reserved seat for a specific flight
* Increase the availability when a booking is canceled
* Ensure data integration by verifying the customer and flight details

1. **File Handling:**

* Data saved in structured text files (customer.txt, flight.txt)

**Conclusion:**

This Airline Management System is a well-structured and functional application for small to medium-scaled operations. It highlights important programming concepts like linked lists, and file handling while providing a solid foundation for future enhancements.