Project Report: Bus Reservation System

Group Members:

- B24CM1030 Honey Singh
- B24CH1011 Anshuman Raj
- B24CH1035 Sankalp Charpota
- B24CY1004 Ankit
- B24BB1007 Banoth Santosh

Objective

The objective of this project is to design and implement a console-based bus reservation system using modular C programming. The system aims to simulate a real-world bus ticket booking scenario with basic user and booking management.

System Design

Modules

- 1. Main Module:
 - Drives the program and provides the main menu to the user.
- 2. Bus Functions Module:
 - Displays available buses
 - Handles seat allocation and booking
- 3. User Functions Module:
 - Handles user registration and validation
- 4. bus.h (Header File)
 - -Contains shared structure definitions and function declarations used across modules

Data Handling

- `.dat` files (`bookings.dat`, `users.dat`) are used for saving and loading user and booking data.
- Data is appended or read using standard file I/O in C.

Challenges

1. The booking data was not saving permanently and getting removed after closing the terminal.

Fix:

- We realized that we needed to use file handling properly.

- We used fopen() in "ab+" or "rb+" mode to append and read data from .dat files (bookings.dat, users.dat).
- After every booking or user update, we used fwrite() to save the data.
- 2. Debugging the code is also most challenging part.
- 3. errors faced while compiling all files together

Fix:

- Initially, we tried running one file at a time which caused linker errors.
- After researching, we learned how to compile all source files together using a single command: gcc main.c bus_functions.c user_functions.c -o main.exe
- We also made sure that all .c files included the shared header file bus.h so that declarations were available to all files.
- 4. Taking clean user input, clearing buffers, and avoiding scanf issues.

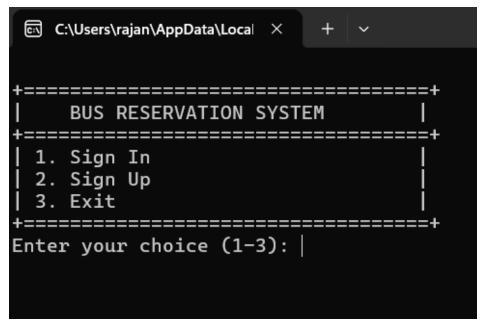
Fix:

- Avoided using gets() (unsafe) and used fgets() instead.
- Used getchar() where necessary to clear the input buffer.
- Carefully managed scanf() and string inputs to avoid newline character issues

Conclusion

The Bus Reservation System was successfully developed and tested. It demonstrates effective use of file handling, structures, and modular programming in C. Further improvements can include a GUI and support for database integration.

Snapshots of Program :-



1. View All Buses & Schedules 2. View Seats for a Bus 3. Book a Seat 4. View My Bookings 5. Logout
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```
BOOKING CONFIRMATION

Bus: Marwar Travels
Route: Jodhpur to Mumbai
Departure: 10:30
Arrival: 23:45
Seat Number: 3
Passenger Name: sankalp
Contact Phone: 8107162058
Fare: Rs1425.00

Press Enter to return to menu...
```