Assignment 1

Total Marks: 50

Problem Statement

Design and implement a **Bus Ticket Booking & Billing System** for a transportation company. The system must allow users to book bus tickets, select seats, receive invoices, and make payments. The project must be implemented using **Object-Oriented Programming (OOP)** principles and must demonstrate proper use of **SOLID**, **KISS**, and **DRY** principles.

System Requirements

1. User Management

- The system must allow creation of users.
- Each user should have:
    - A unique ID
    - Name
    - Mobile number
    - Email address
- A user can book multiple tickets.

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2. Bus Management

- The system must support multiple buses.
- Each bus must have:
    - Unique ID
    - Coach number
    - Bus type (e.g., Business, Economy)

○ Total number of seats based on bus type
● The system must track booked and available seats.

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3. Schedule Management

● Each bus can have multiple schedules.
● A schedule must include:
    ○ Departure city
    ○ Arrival city
    ○ Departure date and time
    ○ Ticket price
● Each schedule must be linked to a bus.

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4. Ticket Booking

● A user must be able to:
    ○ Select a schedule
    ○ Choose a seat
    ○ Book a ticket
● The system must:
    ○ Validate seat numbers based on bus type
    ○ Prevent double booking of seats

● On successful booking (after payment):
    ○ A ticket must be generated
    ○ The seat must be marked as booked

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5. Invoice & Payment

● Every ticket booking must generate an invoice.

- An invoice must include
    - Invoice ID
    - Ticket ID
    - User ID
    - Amount
    - Invoice date
    - Payment status (Paid / Unpaid)

- Users must be able to:
    - View their invoices
    - Pay unpaid invoices

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6. Viewing Information

The system must allow:

- Create User
- Show Users
- Create Bus
- Show Buses
- Create Schedule
- Show Schedules
- Show Schedule Details
- Book Ticket
- Show Invoices of a user
- Pay Invoice
- Show Tickets of a User