DEPARTMENT OF COMPUTER SCIENCE
COMPUTER PROGRAMMING LAB
PROJECT PROPOSAL FORM

SEMESTER	SPRING	CLASS AND SECTION	BSIT-1A

TITLE OF PROJECT

Smart Ticketing System (Railway Based Ticketing System)

GROUP MEMBERS

S#	Student(s) Name	Enrollment Number
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EXECUTIVE SUMMARY OF PROJECT PROPOSAL

The **Smart Ticketing System** is a console-based C++ application designed to automate the train ticket reservation process. It allows users to view train details, check seat availability, and book tickets in either Economy or Business class. The system keeps track of reservations, updates available seats in real-time, and provides a booking summary to the user.

PROJECT PURPOSE

We choose to work on the **Smart Ticketing System** because it gives us the perfect opportunity to showcase all the programming concepts and skills which we have learned in our Computer Programming Lab course. Through this project, we are applying a wide range of core C++ topics like loops, conditionals, functions, arrays, structures, file handling, pointers, and more in a real-world inspired scenario.

PROJECT SCOPE AND OBJECTIVES

Our project, the **Smart Ticketing System**, will include the following features:

- A list of trains with complete details such as route, seat availability, ticket price, departure date & time.
- A user-friendly menu to reserve tickets.
- Options for booking either **Economy** or **Business Class** seats.
- Real-time seat tracking and availability updates after each booking.
- A summary of the reservation showing train name, route, class, number of seats, total payable amount, and departure info after confirming reservation.
- Implementation of programming concepts like **functions, arrays, recursion, pointers, and structures**.

The main goal of this project is to **simulate a working train ticket booking system** and apply all the core C++ concepts which we have learned so far. It achieves a real-world problem-solving approach through programming, while also serving as a solid demonstration of our logical thinking, coding skills, and ability to handle user input, data processing, and output formatting in an organized way.

PROJECT DESCRIPTION (most important part)

The **Smart Ticketing System** is a C++ based console application designed to simulate the digital booking experience of train ticketing platform.

Main Features:

- **Train Details:** Users can view available trains, routes, total seats, ticket price and departure info.
- **Ticket Reservation System:** Users can reserve tickets in either **Economy** or **Business** class.
- **Seat Management:** The system updates seat availability in real-time after each booking.

- **Booking Summary:** A receipt-like summary is shown after a reservation, including seat type, number of seats booked, total price, departure date & time.
- **Modular Code Structure:** Features are divided into well-defined functions to improve readability and maintainability.

Modules:

1. **Train Management Module**
    - Stores train details (name, route, total seats, date, time, price).
    - Displays the information to users.
2. **Reservation Module**
    - Allows users to select train, seat type, and quantity.
    - Confirms or cancels booking based on user input.
3. **Booking Summary Module**
    - Shows a neat summary with reservation details and payable amount.
4. **Seat Update Module**
    - Automatically updates the remaining seat count after every reservation.

Technologies / Concepts Used:

- **If-Else Statements** – To make decisions like which seat to book or what the user wants to do.
- **Loops** – To repeat menus and actions until the user exits.
- **Functions** – To divide the code into small parts, like one for booking, one for showing trains, etc.
- **Arrays** – To store multiple trains, seats, or data in one place.
- **Multi-dimensional Arrays** – For managing more complex info, like seat types in each train.
- **Pointers** – To update values more easily in memory.
- **Pass by Value / Reference** – For giving data to functions in different ways.
- **Structures (struct)** – To keep all train-related data (name, route, seats) in one unit.
- **File Handling** – Can be used to save the booking details even after closing the program.

Project Goal:

The goal of this project is to **apply all the major programming concepts** in a meaningful, real-world inspired application. It demonstrates the practical use of C++ in problem-solving, data management, and creating user-friendly software solutions.

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TEAM PROFILE

Member 1 (Team Leader: MUHAMMAD HASAN)

- Responsible for **project planning**, structure, and logic flow.
- Created the **mind map** that outlines how the system works from start to end.
- Handles the **overall coordination**, keeps the team on track.
- Reviews the final code from a **user's POV**, ensuring it's understandable, smooth, & user-friendly.
- Helps debug or improve the flow wherever needed.

Member 2 & Member 3 (Development & Implementation Team)

- Both members work together on the **main coding part** of the project.
- They handle the **core features** like displaying train info, managing reservations, and updating seats.
- Take care of how the **console-based interface** looks and feels, including menus and prompts.
- Apply all key programming concepts like **conditions, loops, functions**, etc., while keeping the code neat and organized.
- Support each other during coding and **test each module** as it's built to make sure it works perfectly.

ASSUMPTIONS AND CONSTRAINTS

Assumptions:

- The system will be used in a console environment only.
- The user has basic knowledge of how to interact with console-based applications.
- Booking data will be reset each time the program restarts, unless file handling is used to persist data.

Limitations:

- No graphical user interface (GUI) will be implemented due to the scope of the course.
- Real-time train schedule integration is out of scope; data is hard-coded or file-based.
- Limited memory handling due to beginner-level C++ scope.
- We will handle one person at a time.

PROJECT DELIVERABLES

List all the items you will submit at the end of the project.

- Complete C++ source code files (.cpp)
- Executable (.exe) file for demonstration
- Documentation including:
- Code Explanation (maybe included through comments within the code)
- Test Cases and Results
- Project Report (PDF)
- Presentation Slides

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For Teacher Use Only

REMARKS (if any)

Course Teacher:		**Signature**		**Date:**	
Lab Teacher:		**Signature:**		**Date:**	