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Belgaum, Karnataka- 590014



Second Year Project Report On
“DBMS Mini Project”

Submitted in the partial fulfilment of the requirements for the award of the Degree of
BACHELOR OF ENGINEERING
In
COMPUTER SCIENCE AND ENGINEERING
DATA SCIENCE
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2024-2025

DEPARTMENT OF CSE (DATA SCIENCE)

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2024-2025

Certificate

This is to certify that the Project Work entitled **“DBMS Mini Project”** is a Bonafide work carried out by **Pranav B (1DS23CD036)**, **Tejpal Aradhya CP (1DS23CD057)**, **Shodhan (1DS23CD050)**, **Kshitij Singh (1DS23CD026)** in partial fulfilment for the 4th semester of Bachelor of Engineering in CSE (Data Science) of the Visvesvaraya Technological University, Belgaum during the year 2024-2025. The Project report has been approved as it satisfies the academics prescribed for the Bachelor of Engineering degree.

Signature of Guide
[Prof. Bhagyashree Kulkarni]

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Abstract

The Gym Management System is a software application designed to streamline and automate the administrative and operational tasks of a gym or fitness center. It provides an efficient solution for managing member registrations, tracking attendance, handling payments, and organizing trainer schedules. The system replaces the traditional paper-based or manual methods, reducing the chances of human error and saving time for both gym staff and members. It allows gym administrators to generate detailed reports, monitor member activity, and manage different membership plans with ease. The system also improves communication between members and trainers through structured scheduling. By centralizing data and offering userfriendly interfaces, the Gym Management System enhances the overall efficiency, transparency, and user experience of gym operations.

1. Introduction

A Gym Management System is a software-based solution that helps fitness centers efficiently manage their day-to-day activities, such as member enrollment, payment tracking, trainer scheduling, and attendance monitoring. It provides a centralized platform that reduces manual workload, improves data accuracy, and enhances operational efficiency. In this project, we used [Tool Name – e.g., MySQL Workbench or XAMPP with PHPMyAdmin] as our DBMS tool to design and implement the Gym Management System. The main objectives were to:

- Understand the basics of data modeling and Entity-Relationship (ER) design
- Learn to create and manage normalized tables in a relational database
- Execute SQL queries for data manipulation and definition (DML/DDL)
- Implement stored procedures, triggers, and views to automate tasks and maintain data consistency.

2. Overview of the DBMS Tool

Tool Name: Oracle Database XE (Express Edition)

Key Features:

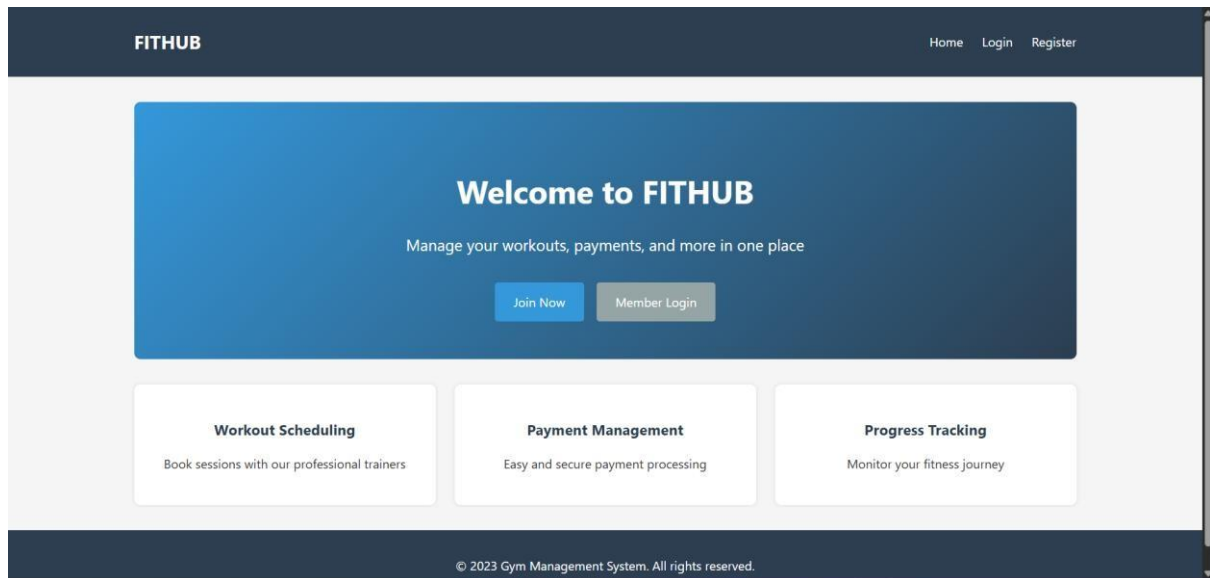
- Powerful and lightweight edition of Oracle Database suitable for development and learning
- Support for advanced SQL features, including stored procedures, triggers, views, and functions
- Integrated data integrity, security, and transaction management
- Oracle SQL Developer compatibility for visual schema design and query execution
- Efficient memory and resource usage, ideal for small to medium applications

Why This Tool Was Chosen:

Oracle Database XE was chosen due to its robust capabilities, enterprise-level features, and ease of use in a development environment. It is widely used in both academic and professional settings for learning database concepts and building real-world applications. The tool provides full SQL and PL/SQL support, making it ideal for implementing complex business logic required in a Gym Management System. Its compatibility with Oracle SQL Developer also allows for efficient schema design and management.

Installation Experience:

The installation process was straightforward. Oracle Database XE was downloaded from Oracle's official website, installed on a local machine, and configured for development use. Once the database service was running, a connection was established using Oracle SQL Developer, allowing us to create tables, write queries, and develop stored procedures with ease.



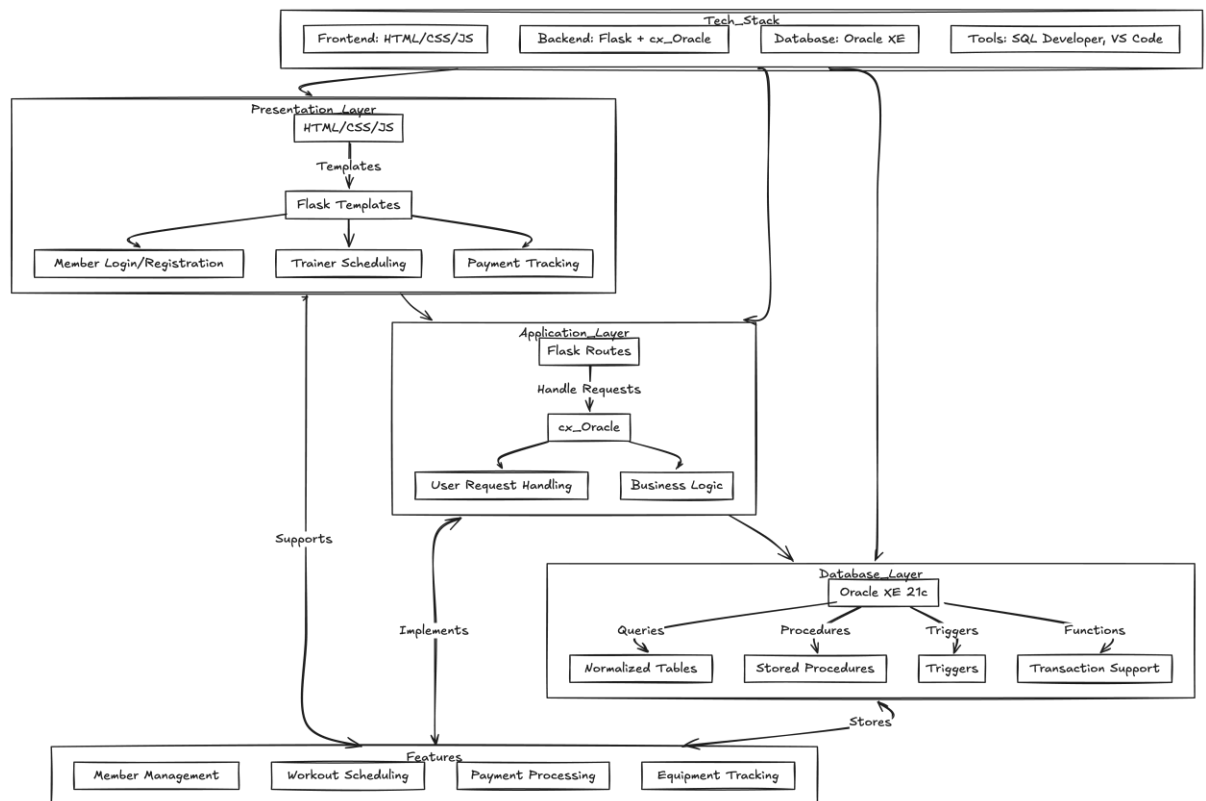
3. Practical Activities Performed

3.1 Requirement Gathering and Analysis

- Identified core functionalities required in a gym system.
- Collected data on how gyms manage members, trainers, and payments.
- Defined project goals and scope based on research.

3.2 System Design

- Designed the system architecture using diagrams (Use Case, ER, DFD).
- Created a modular structure for each component of the system.
- Prepared user interface (UI) wireframes.



3.3 Database Design and Implementation

- Designed database schema with tables like Members, Trainers, Payments, Attendance, etc.
- Defined relationships and constraints using foreign keys.
- Implemented the database using [MySQL/SQLite/PostgreSQL].

3.4 Frontend/GUI Development

- Developed user-friendly interfaces for:

- Member registration ◦ Trainer dashboard
- Login and authentication
- Used [e.g., JavaFX / HTML-CSS-JS] for GUI design.

3.5 Backend Development

- Wrote backend logic for CRUD operations (Create, Read, Update, Delete).
- Implemented member search, fee status, attendance tracking features.
- Connected frontend to the database using [e.g., Python-MySQL connector / JDBC / PHP-MySQL].

3.6 User Authentication

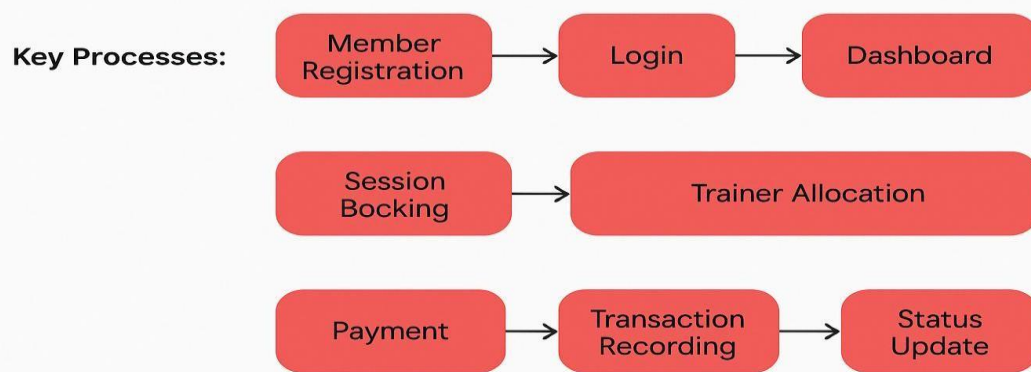
- Developed login system with role-based access (Admin, Trainer).
- Implemented basic password validation and error handling.

3.7 Testing and Debugging

- Tested each module individually and in integration.
- Fixed bugs in registration, login, and data fetching.
- Validated inputs for all forms (e.g., date formats, required fields).

3.8 Documentation

- Prepared a detailed report including:
 - System design and implementation
 - Database schema ◦ Screenshots
 - of the working system ◦ Challenges
 - and future improvements



4. Understanding of DBMS Concepts

4.1 Database Design and Entity Modeling

- Identified main entities such as Member, Trainer, WorkoutPlan, Attendance, and Payments.
- Designed an **Entity-Relationship (ER) diagram** to visualize relationships (e.g., Oneto-Many between Trainers and Members).
- Applied **normalization (up to 3NF)** to eliminate redundancy and improve data integrity.

4.2 Table Creation and Normalization

Each table was created with a clear primary key, and no data duplication existed. All attributes were dependent on the primary key, satisfying 3NF.

4.3 Relationships

Understanding and defining relationships (one-to-many, many-to-one) made it clear how data entities interact. These were enforced using foreign keys.

4.4 Query Writing and Execution


Using SQL queries, we learned:

- How to fetch and filter records using SELECT
- How to modify data using UPDATE and DELETE
- How to build complex queries with JOINS
- How to interpret results and debug logic.

4.5 Constraints and Data Integrity

By applying:

- CHECK constraints (e.g., valid age, blood quantity)
- ENUM types (e.g., gender, blood type, status)
- TRIGGERS and PROCEDURES to enforce business logic,



Register as a Member

Username:

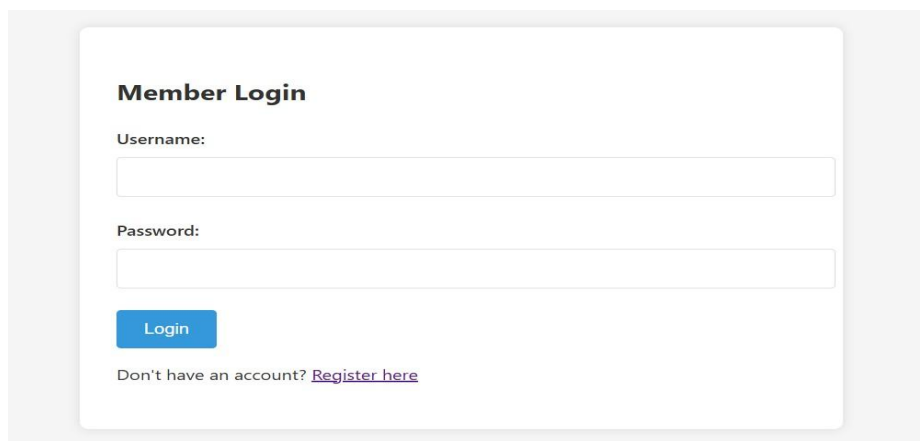
Password:

Full Name:

Email:

Phone:

Membership Type:



Member Login

Username:

Password:

Don't have an account? [Register here](#)

5. Conclusion

This project offered a comprehensive hands-on experience in working with DBMS tools and SQL within the context of a gym management environment. From designing a fully normalized relational database to implementing structured queries and handling user data securely, we covered the key components of backend development and data handling in a practical, realworld scenario.

Through this project, we built a strong foundation in:

- Data modeling and entity-relationship design
- Schema normalization and table structuring
- SQL query development for CRUD operations
- Ensuring data consistency and integrity through constraints and relationships

The Gym Management System now stands as a solid backend framework capable of supporting a functional, scalable gym operations platform. With further development, it can be extended into a full-stack application with advanced features like mobile access, cloud integration, and analytics.