Project 1 (15 marks)

Deadline: 3rd March, 2026, 4 AM

Demo dates: 3rd, 5th, 6th, 7th March, 2026

The objective of this project is to design and implement a complete database-backed information system using any **Relational Database Management System (RDBMS)**. Students will apply database design principles to model real-world requirements, implement a relational database, and build a functional front-end interface for data interaction.

The project emphasizes data modelling, enforcement of integrity constraints, and practical system implementation.

Project Requirements

Each group/student must design and implement a system for a **realistic application domain** (e.g., Library Management System, Hospital Management System, Course Registration System, Inventory Management System, etc.).

The project must include the following components:

1. Conceptual Design (ER Modeling)

- Identify entities, attributes, and relationships
- Specify:
    - Primary keys
    - Relationship cardinalities and participation constraints
- Draw a complete **Entity–Relationship (ER) diagram**

- Convert the ER model into a relational schema

2. Constraints Identification

Explicitly identify and justify all constraints, including:

- Domain constraints
- Key constraints
- Entity integrity constraints
- Referential integrity constraints
- Additional semantic constraints (if any)

Constraints must be **enforced in the database design** wherever possible.

3. Database Implementation

- Implement the relational schema using SQL
- Create tables with appropriate:
    - Data types
    - Primary and foreign keys
    - NOT NULL, UNIQUE, CHECK constraints
- Populate the database with representative sample data

4. Front-End Application

Develop a simple front-end interface that interacts with the database and supports:

- Data insertion
- Data modification
- Data deletion
- Data retrieval (queries/reports)

The front end may be implemented using any suitable technology (e.g., web-based UI or desktop application).

5. Documentation and Demonstration

Submit a project report containing:

- Problem description and assumptions
- ER diagram and schema design
- Constraint specifications
- Description of the front-end interface

A live demonstration of the working system is required during the demo.

Project options

Some websites that can be (but not limited to) reverse engineered for the project:

1. BookMyShow
2. RedBus
3. Moodle

4. Swiggy
5. Urban Company
6. Zomato
7. Coursera
8. Practo
9. BigBasket
10. IRCTC
11. Amazon
12. Flipkart
13. Netflix
14. Spotify
15. LinkedIn
16. Instagram

Evaluation

The project has to be done in groups of 6 students. Fill up this sheet to form groups.

1) The deadline for submission is **3rd March, 2026, 4 AM**. Each group will make one submission, titled **“Group X.zip” (X is their group number)** on LMS containing
    a) Report describing all steps of creating the system

b) Supporting SQL scripts and front end code

2) Demos will take place on **3rd, 5th, 6th, and 7th of March, 2026.** Every member of the group has to be physically present for the demo failing which no marks will be awarded to them.
3) Evaluation strategy (15 marks)
    a) (5) Viva voce
    b) (5) Correctness of ER modelling, some pointers:
        i) All entities are clearly identified and named
        ii) All integrity constraints are identified
        iii) Relationship cardinalities are correctly specified
        iv) Participation constraints are clearly indicated
        v) Weak entities (if any) are correctly identified and modeled
    c) (5) Demo: During the demo, students will be asked to perform updates through both the front-end interface and direct database operations and marks will be accordingly awarded.