(Phase 2) SQL for Data Analysis – Team Project

Team Structure

- Each team must choose a **unique project idea**
- Teams must clearly state the **role of each member**

Project Objective

The objective of this project is to design and implement a **complete data analysis workflow** starting from a business idea and ending with analytical insights.

Students are required to:

- Design a relational database using an **ER diagram**
- Implement the database using **SQL**
- Perform data analysis using **advanced SQL queries**
- Use **Window Functions**
- Visualize insights using **Excel**

Using SQL, Excel, and Window Functions is mandatory.

Stage 1: Project Idea

Each team must select a realistic business scenario suitable for data analysis, such as:

- E-commerce platform
- Hospital or clinic management system
- University management system
- Food delivery application
- Banking system
- Hotel booking system
- Gym or fitness platform

The idea must support:

- Performance analysis

- Trend analysis

- Comparisons and rankings

- Time-based insights

Stage 2: ER Diagram and Database Design

Each team must submit:

- A complete ER diagram including:

    o Entities

    o Attributes

    o Primary keys

    o Foreign keys

    o Relationships

- A normalized design

- A brief explanation of design decisions

Stage 3: Database Implementation (SQL)

Using SQL only:

- Create all tables using CREATE TABLE

- Apply constraints, such as:

    o PRIMARY KEY

    o FOREIGN KEY

    o NOT NULL

    o UNIQUE

- Insert realistic sample data

Minimum requirement: 100 rows distributed across the tables

Stage 4: Data Analysis Using SQL

Each team must provide:

- **At least 15 analytical SQL queries**

- Queries must include:

    o Multiple JOINs (minimum three tables)

    o GROUP BY and HAVING

    o Subqueries

    o Aggregate functions (SUM, AVG, COUNT, etc.)

    o Time-based analysis where applicable

Each query must answer a **clear analytical or business question**.

Stage 5: Window Functions (Mandatory)

Window Functions must be used as part of the analysis.

Minimum requirements:

- **At least 3 queries using Window Functions**

Example use cases:

- Ranking customers or products

- Running totals

- Month-over-month comparisons

- Comparing an item's performance to its category average

- Top-N analysis per group

Stage 6: Excel Analysis and Dashboard (Mandatory)

- Export query results from SQL to Excel

- Use:

    o Pivot Tables

    o Charts

- Create a simple dashboard

Minimum requirements:

- **At least 5 visualizations and KPIs**

- Each visualization must be linked to:

    o A supporting SQL query

    o A written insight (2–3 lines)

Final Deliverables

Each team must submit:

1. **Project Report (PDF or Word)** including:

    o Project description

    o ER diagram

    o Database schema

    o SQL analysis queries

    o Insights and interpretation

2. **SQL file** containing:

    o Table creation

    o Data insertion

    o Analysis queries (including Window Functions)

3. **Excel file** containing:

    o Charts

- Dashboard

Evaluation Criteria

Component	Weight
Project idea originality	10%
ER diagram and database design	20%
SQL analysis and Window Functions	35%
Excel dashboard and visualizations	20%
Insights and presentation quality	15%

Important Notes

- Any project missing **SQL, Excel, or Window Functions** will be considered incomplete.

- Visualizations without a supporting SQL query will not be evaluated.