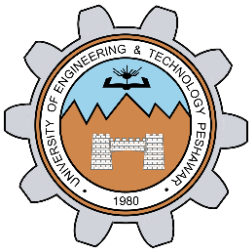
MILESTONE 3:

DBMS Lab Project SQL Implementation



CSE-403L Database Management System Lab

Spring 2025

Group Members:

Muhammad Umar (22PWCSE2148)

Muhammad Okasha (22PWCSE2146)

Sajjad Ahmad (22PWCSE2140)

Class Section: C

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Submitted to:

Engr. Sumayyea Salahuddin

June 02, 2025

Department of Computer Systems Engineering

UET Peshawar

Exam and Result Management System - Database Documentation

1. Introduction

The Exam and Result Management System is designed to manage student exam details, results, courses, instructors, and related information efficiently. This document describes the database structure, including tables, keys, sample data, and example queries used in the system.

2. Entities (Tables)

- Student
- Instructor
- Course
- Exam
- Result

---

3. Table Structures and Metadata

Table: Student

Column Name	Data Type	Constraints
student_id	INT	PRIMARY KEY, NOT NULL
name	VARCHAR(50)	NOT NULL
email	VARCHAR(50)	UNIQUE, NOT NULL
phone	VARCHAR(15)	

Table: Instructor

Column Name	Data Type	Constraints
instructor_id	INT	PRIMARY KEY, NOT NULL
name	VARCHAR(50)	NOT NULL
email	VARCHAR(50)	UNIQUE, NOT NULL
phone	VARCHAR(15)	

Table: Course

Column Name	Data Type	Constraints
course_id	INT	PRIMARY KEY, NOT NULL
course_name	VARCHAR(100)	NOT NULL
instructor_id	INT	FOREIGN KEY REFERENCES Instructor (instructor_id)

Table: Exam

Column Name	Data Type	Constraints
exam_id	INT	PRIMARY KEY, NOT NULL
course_id	INT	FOREIGN KEY REFERENCES Course (course_id)
exam_date	DATE	NOT NULL

Table: Result

Column Name	Data Type	Constraints
result_id	INT	PRIMARY KEY, NOT NULL
student_id	INT	FOREIGN KEY REFERENCES Student(student_id)
exam_id	INT	FOREIGN KEY REFERENCES Exam(exam_id)
marks	INT	NOT NULL

4. Keys and Relationships

- **Primary Keys:** Each table has a unique primary key, e.g., `student_id` for Student, `instructor_id` for Instructor.
- **Foreign Keys:**
  - `Course.instructor_id` references `Instructor.instructor_id`.
  - `Exam.course_id` references `Course.course_id`.
  - `Result.student_id` references `Student.student_id`.
  - `Result.exam_id` references `Exam.exam_id`.
- **Relationships:**
  - One Instructor teaches many Courses.
  - One Course has many Exams.
  - One Exam has many Results.
  - One Student can have many Results.

5. Sample Data

Student

student_id	name	email	phone
1	John Doe	john@example.com	1234567890
2	Jane Smith	jane@example.com	0987654321

Instructor

instructor_id	name	email	phone
1	Dr. Alan	alan@example.com	1112223333
2	Prof. Mary	mary@example.com	4445556666

Course

course_id	course_name	instructor_id
101	Database Systems	1
102	Operating Systems	2

Exam

exam_id	course_id	exam_date
1001	101	2025-06-15
1002	102	2025-06-20

Result

result_id	student_id	exam_id	marks
1	1	1001	85
2	2	1002	90

6. Sample Queries

- **Retrieve all students:**

```
SELECT * FROM Student;
```

- **Find results for a student:**

```
SELECT r.result_id, c.course_name, r.marks
FROM Result r
JOIN Exam e ON r.exam_id = e.exam_id
JOIN Course c ON e.course_id = c.course_id
WHERE r.student_id = 1;
```

- **List all courses taught by an instructor:**

```
SELECT course_name
FROM Course
WHERE instructor_id = 1;
```