MINOR PROJECT

UNIVERSITY MANAGEMENT SYSTEM

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INTRODUCTION

The University Management System (UMS) is a database-driven application designed to efficiently manage and organize the academic and administrative activities of a university. It serves as a centralized system to handle various aspects of university operations such as student records, faculty information, course registrations, departmental structures, hostel allocations, and examination details.

In a real-world university setting, managing large volumes of data manually can lead to inefficiencies, errors, and a lack of coordination between departments. The UMS addresses these challenges by offering a structured and relational database solution built using principles of Database Management Systems (DBMS). It ensures data integrity, reduces redundancy, and supports easy retrieval and manipulation of data.

This project implements several interconnected tables including **students**, **faculty**, **departments**, **courses**, **teaches**, **enrollments**, **hostels**, and **exams**, each with at least 20 sample entries. These tables are normalized and related using primary and foreign keys to maintain consistency and logical relationships among data entities.

By providing a reliable backend database design, this University Management System acts as a foundational tool for developing a complete university ERP system, paving the way for future enhancements like automation, reporting, and real-time data access.

OBJECTIVE

The primary objective of the University Management System project is to design and implement a relational database that efficiently manages the core academic and administrative data of a university.

This system aims to:

- Organize and store data related to students, faculty, departments, courses, hostels, and examinations.

- Establish proper relationships between different entities using primary and foreign keys.

- Ensure data consistency, integrity, and security through normalization and constraints.

- Provide easy and efficient data retrieval, insertion, updating, and deletion operations using SQL.

- Reduce redundancy and manual workload through a centralized and systematic data structure.

- Lay the foundation for further development of a complete university ERP system.

MySQL Language

MySQL is an open-source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL) to manage and manipulate databases. It is widely used in both academic and industrial applications due to its reliability, performance, and ease of use.

MySQL allows users to create, retrieve, update, and delete data efficiently while ensuring data integrity and security. It supports complex queries, transactions, indexing, and stored procedures, making it suitable for large-scale systems like a University Management System.

Some key features of MySQL include:

- Open-source and free under the GNU General Public License (GPL)
- Cross-platform compatibility
- Support for ACID compliance for reliable transaction processing
- Scalability and flexibility for managing growing datasets
- Integration with various programming languages and tools

In this project, MySQL is used as the backend database to manage the core functionalities of the University Management System through the design and implementation of normalized relational tables.

MySQL Code

```
-- University Management System - MySQL Code

-- 1. Departments Table
CREATE TABLE departments (
   dept_id INT PRIMARY KEY,
   dept_name VARCHAR(100) NOT NULL
);

-- 2. Students Table
CREATE TABLE students (
   student_id INT PRIMARY KEY,
   name VARCHAR(100),
   age INT,
   gender VARCHAR(10),
   dept_id INT,
   FOREIGN KEY (dept_id) REFERENCES departments(dept_id)
);

-- 3. Faculty Table
CREATE TABLE faculty (
   faculty_id INT PRIMARY KEY,
   name VARCHAR(100),
   dept_id INT,
   designation VARCHAR(50),
   FOREIGN KEY (dept_id) REFERENCES departments(dept_id)
);

-- 4. Courses Table
CREATE TABLE courses (
   course_id INT PRIMARY KEY,
   course_name VARCHAR(100),
   credits INT,
    dept_id INT,
    FOREIGN KEY (dept_id) REFERENCES departments(dept_id)
);

-- 5. Teaches Table
CREATE TABLE teaches (
    faculty_id INT,
    course_id INT,
    semester VARCHAR(10),
    PRIMARY KEY (faculty_id, course_id),
    FOREIGN KEY (faculty_id) REFERENCES faculty(faculty_id),
    FOREIGN KEY (course_id) REFERENCES courses(course_id)
);

-- 6. Enrollments Table
CREATE TABLE enrollments (
    student_id INT,
    course_id INT,
    semester VARCHAR(10),
    grade VARCHAR(2),
    PRIMARY KEY (student_id, course_id),
    FOREIGN KEY (student_id) REFERENCES students(student_id),
    FOREIGN KEY (course_id) REFERENCES courses(course_id)
);

-- 7. Hostel Table
CREATE TABLE hostel (
    hostel_id INT PRIMARY KEY,
    hostel_name VARCHAR(100),
    capacity INT
);

-- 8. Hostel Allocation
CREATE TABLE hostel_allocation (
    student_id INT PRIMARY KEY,
    hostel_id INT,
    room_number VARCHAR(10),
    FOREIGN KEY (student_id) REFERENCES students(student_id),
    FOREIGN KEY (hostel_id) REFERENCES hostel(hostel_id)
);

-- 9. Exams Table
CREATE TABLE exams (
    exam_id INT PRIMARY KEY,
    course_id INT,
    exam_date DATE,
    exam_type VARCHAR(20),
    FOREIGN KEY (course_id) REFERENCES courses(course_id)
);

-- INSERT DATA FOR departments
INSERT INTO departments VALUES
(1, 'Computer Science'), (2, 'Electronics'), (3, 'Mechanical'), (4,
'Civil'), (5, 'Electrical'),
(6, 'Information Technology'), (7, 'Chemical'), (8, 'Biotechnology'), (9,
'Mathematics'), (10, 'Physics'),
(11, 'Chemistry'), (12, 'Management'), (13, 'Economics'), (14,
'English'), (15, 'History'),
(16, 'Geography'), (17, 'Political Science'), (18, 'Sociology'), (19,
'Philosophy'), (20, 'Statistics');

-- INSERT DATA FOR students
INSERT INTO students VALUES
(1, 'Alice', 20, 'Female', 1), (2, 'Bob', 21, 'Male', 2), (3, 'Charlie', 22,
'Male', 3), (4, 'Daisy', 19, 'Female', 4),
(5, 'Ethan', 20, 'Male', 5), (6, 'Fiona', 21, 'Female', 6), (7, 'George', 22,
'Male', 7), (8, 'Hannah', 19, 'Female', 8),
(9, 'Ian', 20, 'Male', 9), (10, 'Jane', 21, 'Female', 10), (11, 'Kyle', 22,
'Male', 11), (12, 'Lily', 19, 'Female', 12),
(13, 'Mike', 20, 'Male', 13), (14, 'Nina', 21, 'Female', 14), (15, 'Oscar',
22, 'Male', 15), (16, 'Paula', 19, 'Female', 16),
(17, 'Quinn', 20, 'Male', 17), (18, 'Rachel', 21, 'Female', 18), (19,
'Sam', 22, 'Male', 19), (20, 'Tina', 19, 'Female', 20);
```

```
-- INSERT DATA FOR faculty
INSERT INTO faculty VALUES
(1, 'Dr. Smith', 1, 'Professor'), (2, 'Dr. Clark', 2, 'Associate Professor'),
(3, 'Dr. Adams', 3, 'Professor'),
(4, 'Dr. Baker', 4, 'Assistant Professor'), (5, 'Dr. Jones', 5, 'Professor'),
(6, 'Dr. Lee', 6, 'Associate Professor'),
(7, 'Dr. White', 7, 'Professor'), (8, 'Dr. Green', 8, 'Assistant Professor'),
(9, 'Dr. Black', 9, 'Professor'),
(10, 'Dr. Brown', 10, 'Associate Professor'), (11, 'Dr. Taylor', 11,
'Professor'), (12, 'Dr. Hall', 12, 'Assistant Professor'),
(13, 'Dr. King', 13, 'Professor'), (14, 'Dr. Wright', 14, 'Associate
Professor'), (15, 'Dr. Lopez', 15, 'Professor'),
(16, 'Dr. Hill', 16, 'Assistant Professor'), (17, 'Dr. Scott', 17,
'Professor'), (18, 'Dr. Young', 18, 'Associate Professor'),
(19, 'Dr. Walker', 19, 'Professor'), (20, 'Dr. Allen', 20, 'Assistant
Professor');

-- INSERT DATA FOR courses
INSERT INTO courses VALUES
(1, 'Data Structures', 4, 1), (2, 'Digital Electronics', 3, 2), (3,
'Thermodynamics', 3, 3), (4, 'Structural Engineering', 4, 4),
(5, 'Power Systems', 3, 5), (6, 'Networking', 3, 6), (7, 'Fluid
Mechanics', 4, 7), (8, 'Genetics', 3, 8),
(9, 'Algebra', 3, 9), (10, 'Quantum Physics', 4, 10), (11, 'Organic
Chemistry', 4, 11), (12, 'Marketing', 3, 12),
(13, 'Microeconomics', 3, 13), (14, 'Literature', 2, 14), (15, 'Modern
History', 3, 15), (16, 'Cartography', 2, 16),
(17, 'Political Theory', 3, 17), (18, 'Social Research', 3, 18), (19,
'Logic', 2, 19), (20, 'Probability', 3, 20);

-- INSERT DATA FOR teaches
INSERT INTO teaches VALUES
(1, 1, 'S1'), (2, 2, 'S1'), (3, 3, 'S1'), (4, 4, 'S1'), (5, 5, 'S1'),
(6, 6, 'S1'), (7, 7, 'S1'), (8, 8, 'S1'), (9, 9, 'S1'), (10, 10, 'S1'),
(11, 11, 'S1'), (12, 12, 'S1'), (13, 13, 'S1'), (14, 14, 'S1'), (15, 15, 'S1'),
(16, 16, 'S1'), (17, 17, 'S1'), (18, 18, 'S1'), (19, 19, 'S1'), (20, 20, 'S1');
```

```
-- INSERT DATA FOR enrollments
INSERT INTO enrollments VALUES
(1, 1, 'S1', 'A'), (2, 2, 'S1', 'B'), (3, 3, 'S1', 'C'), (4, 4, 'S1', 'A'), (5, 5,
'S1', 'B'),
(6, 6, 'S1', 'A'), (7, 7, 'S1', 'C'), (8, 8, 'S1', 'B'), (9, 9, 'S1', 'A'), (10, 10,
'S1', 'A'),
(11, 11, 'S1', 'B'), (12, 12, 'S1', 'C'), (13, 13, 'S1', 'A'), (14, 14, 'S1', 'B'),
(15, 15, 'S1', 'A'),
(16, 16, 'S1', 'C'), (17, 17, 'S1', 'A'), (18, 18, 'S1', 'B'), (19, 19, 'S1',
'C'), (20, 20, 'S1', 'A');

-- INSERT DATA FOR hostel
INSERT INTO hostel VALUES
(1, 'Alpha', 100), (2, 'Beta', 90), (3, 'Gamma', 80), (4, 'Delta', 70), (5,
'Epsilon', 60),
(6, 'Zeta', 50), (7, 'Eta', 45), (8, 'Theta', 40), (9, 'Iota', 35), (10, 'Kappa',
30),
(11, 'Lambda', 25), (12, 'Mu', 20), (13, 'Nu', 15), (14, 'Xi', 10), (15,
'Omicron', 8),
(16, 'Pi', 6), (17, 'Rho', 4), (18, 'Sigma', 3), (19, 'Tau', 2), (20,
'Upsilon', 1);

-- INSERT DATA FOR hostel_allocation
INSERT INTO hostel_allocation VALUES
(1, 1, 'A101'), (2, 2, 'B102'), (3, 3, 'C103'), (4, 4, 'D104'), (5, 5,
'E105'),
(6, 6, 'F106'), (7, 7, 'G107'), (8, 8, 'H108'), (9, 9, 'I109'), (10, 10,
'J110'),
(11, 11, 'K111'), (12, 12, 'L112'), (13, 13, 'M113'), (14, 14, 'N114'),
(15, 15, 'O115'),
(16, 16, 'P116'), (17, 17, 'Q117'), (18, 18, 'R118'), (19, 19, 'S119'), (20,
20, 'T120');

-- INSERT DATA FOR exams
INSERT INTO exams VALUES
(1, 1, '2025-04-01', 'Midterm'), (2, 2, '2025-04-02', 'Midterm'), (3, 3,
'2025-04-03', 'Midterm'),
(4, 4, '2025-04-04', 'Midterm'), (5, 5, '2025-04-05', 'Midterm'), (6, 6,
'2025-04-06', 'Midterm'),
(7, 7, '2025-04-07', 'Midterm'), (8, 8, '2025-04-08', 'Midterm'), (9, 9,
'2025-04-09', 'Midterm'),
(10, 10, '2025-04-10', 'Midterm'), (11, 11, '2025-04-11', 'Midterm'),
(12, 12, '2025-04-12', 'Midterm'),
(13, 13, '2025-04-13', 'Midterm'), (14, 14, '2025-04-14', 'Midterm'),
(15, 15, '2025-04-15', 'Midterm'),
(16, 16, '2025-04-16', 'Midterm'), (17, 17, '2025-04-17', 'Midterm'),
(18, 18, '2025-04-18', 'Midterm'),
(19, 19, '2025-04-19', 'Midterm'), (20, 20, '2025-04-20', 'Midterm');

-- USEFUL QUERIES

-- 1. Table Name: departments
SELECT * FROM departments;

-- 2. Table Name: students
SELECT * FROM students;

-- 3. Table Name: faculty
SELECT * FROM faculty;

-- 4. Table Name: courses
SELECT * FROM courses;

-- 5. Table Name: teaches
SELECT * FROM teaches;

-- 6. Table Name: enrollments
SELECT * FROM enrollments;

-- 7. Table Name: hostel
SELECT * FROM hostel;

-- 8. Table Name: hostel_allocation
SELECT * FROM hostel_allocation;
```

```
-- 9. Table Name: exams
SELECT * FROM exams;

-- 10. List all students in a specific department (e.g., Computer Science)
SELECT s.student_id, s.name, d.dept_name
FROM students s
JOIN departments d ON s.dept_id = d.dept_id
WHERE d.dept_name = 'Computer Science';

-- 11. View courses taught by a specific faculty (e.g., Dr. Smith)
SELECT f.name AS faculty_name, c.course_name, t.semester
FROM faculty f
JOIN teaches t ON f.faculty_id = t.faculty_id
JOIN courses c ON t.course_id = c.course_id
WHERE f.name = 'Dr. Smith';

-- 12. See all enrollments of a student (e.g., Alice)
SELECT s.name AS student_name, c.course_name, e.semester, e.grade
FROM students s
JOIN enrollments e ON s.student_id = e.student_id
JOIN courses c ON e.course_id = c.course_id
WHERE s.name = 'Alice';

-- 13. Find faculty in a specific department (e.g., Electronics)
SELECT f.name, f.designation, d.dept_name
FROM faculty f
JOIN departments d ON f.dept_id = d.dept_id
WHERE d.dept_name = 'Electronics';

-- 14. List exams scheduled for a particular course (e.g., Data Structures)
SELECT c.course_name, e.exam_date, e.exam_type
FROM exams e
JOIN courses c ON e.course_id = c.course_id
WHERE c.course_name = 'Data Structures';
```

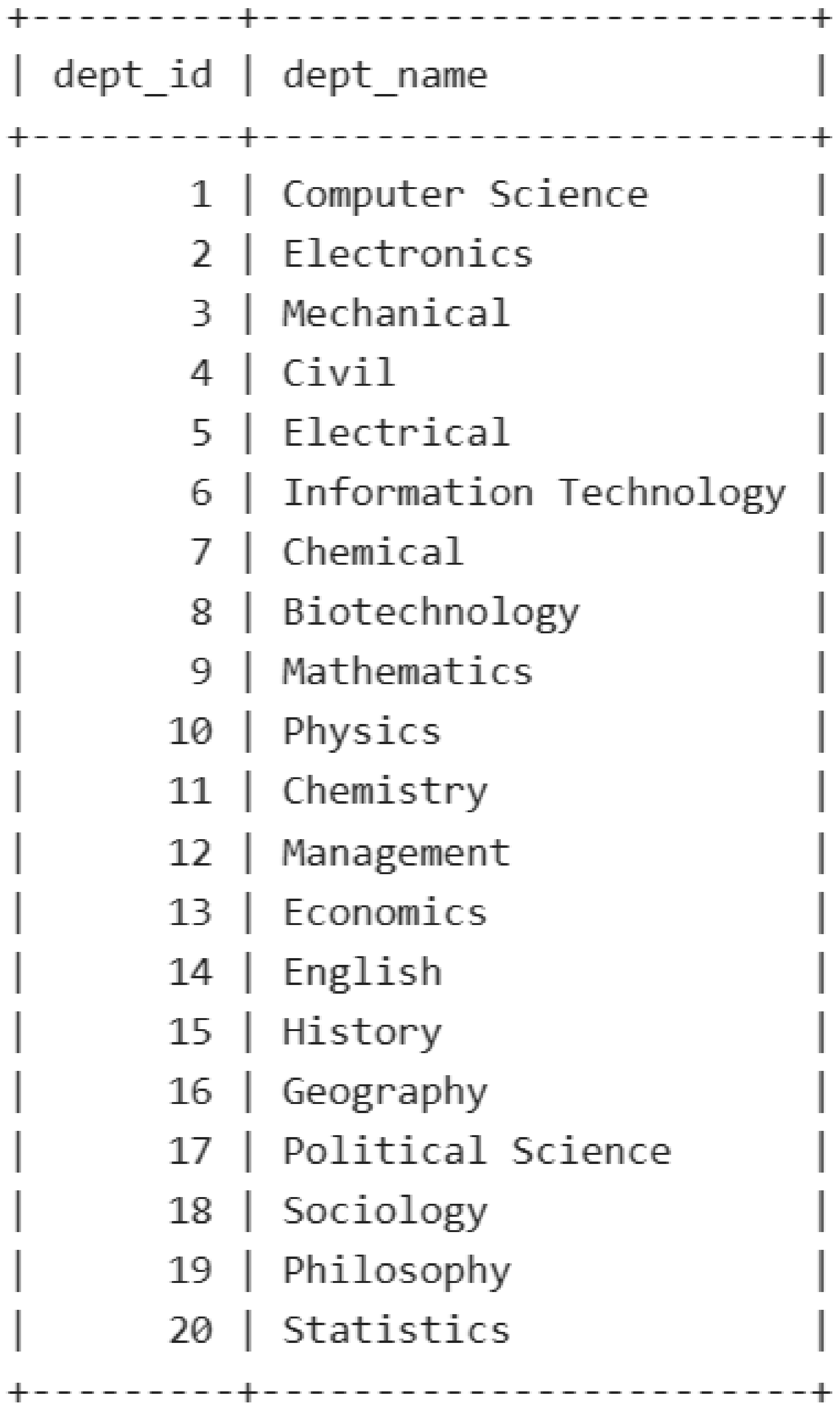
```
-- 15. Show hostel allocations
SELECT s.name AS student_name, h.hostel_name, ha.room_number
FROM students s
JOIN hostel_allocation ha ON s.student_id = ha.student_id
JOIN hostel h ON ha.hostel_id = h.hostel_id;

-- 16. Get all students along with their department and hostel
SELECT s.student_id, s.name, d.dept_name, h.hostel_name
FROM students s
JOIN departments d ON s.dept_id = d.dept_id
LEFT JOIN hostel_allocation ha ON s.student_id = ha.student_id
LEFT JOIN hostel h ON ha.hostel_id = h.hostel_id;

-- 17. Courses offered by each department
SELECT d.dept_name, c.course_name, c.credits
FROM departments d
JOIN courses c ON d.dept_id = c.dept_id
ORDER BY d.dept_name;
```

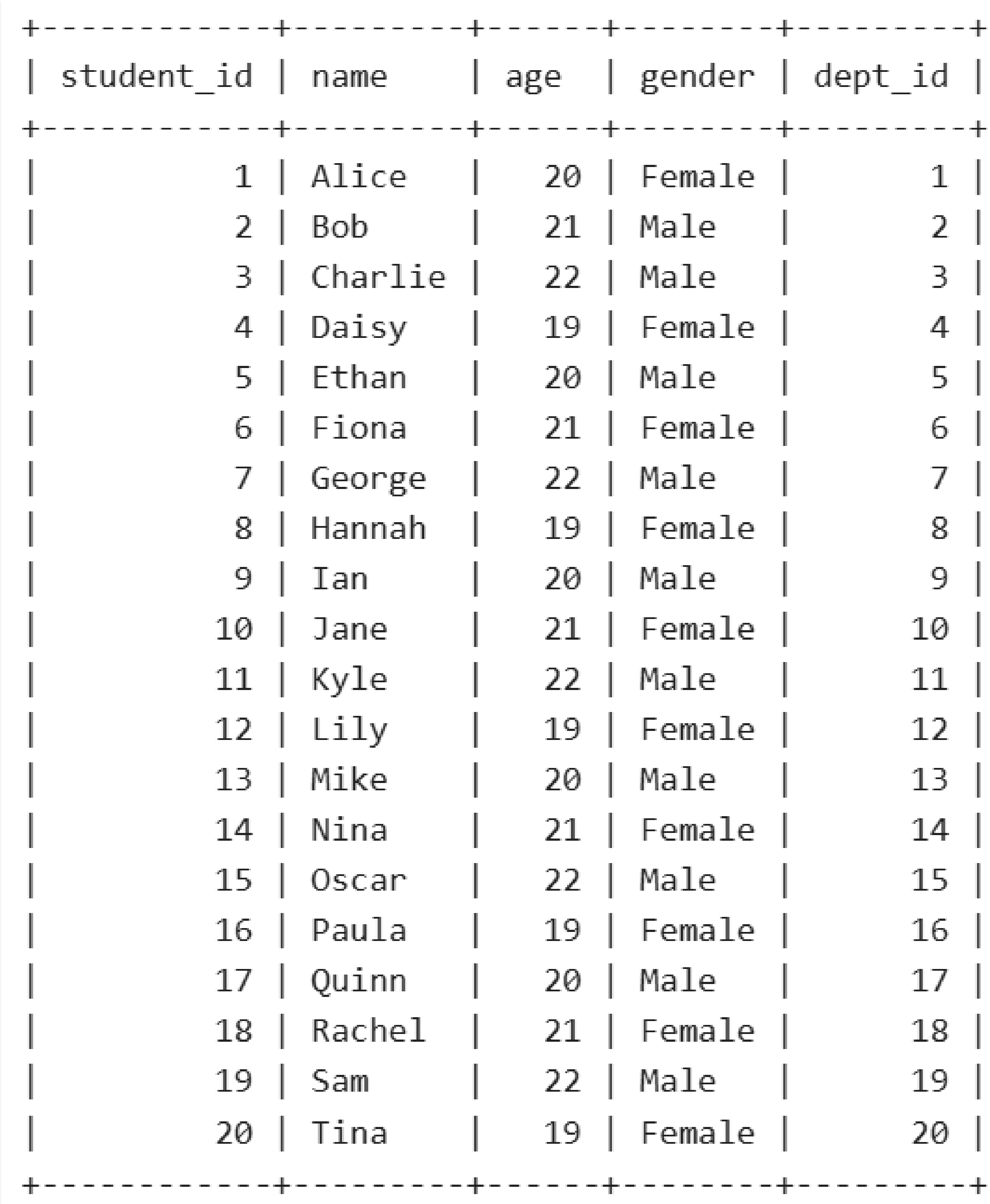
SCREENSHOT(OUTPUT)

1st Output: Departments Table



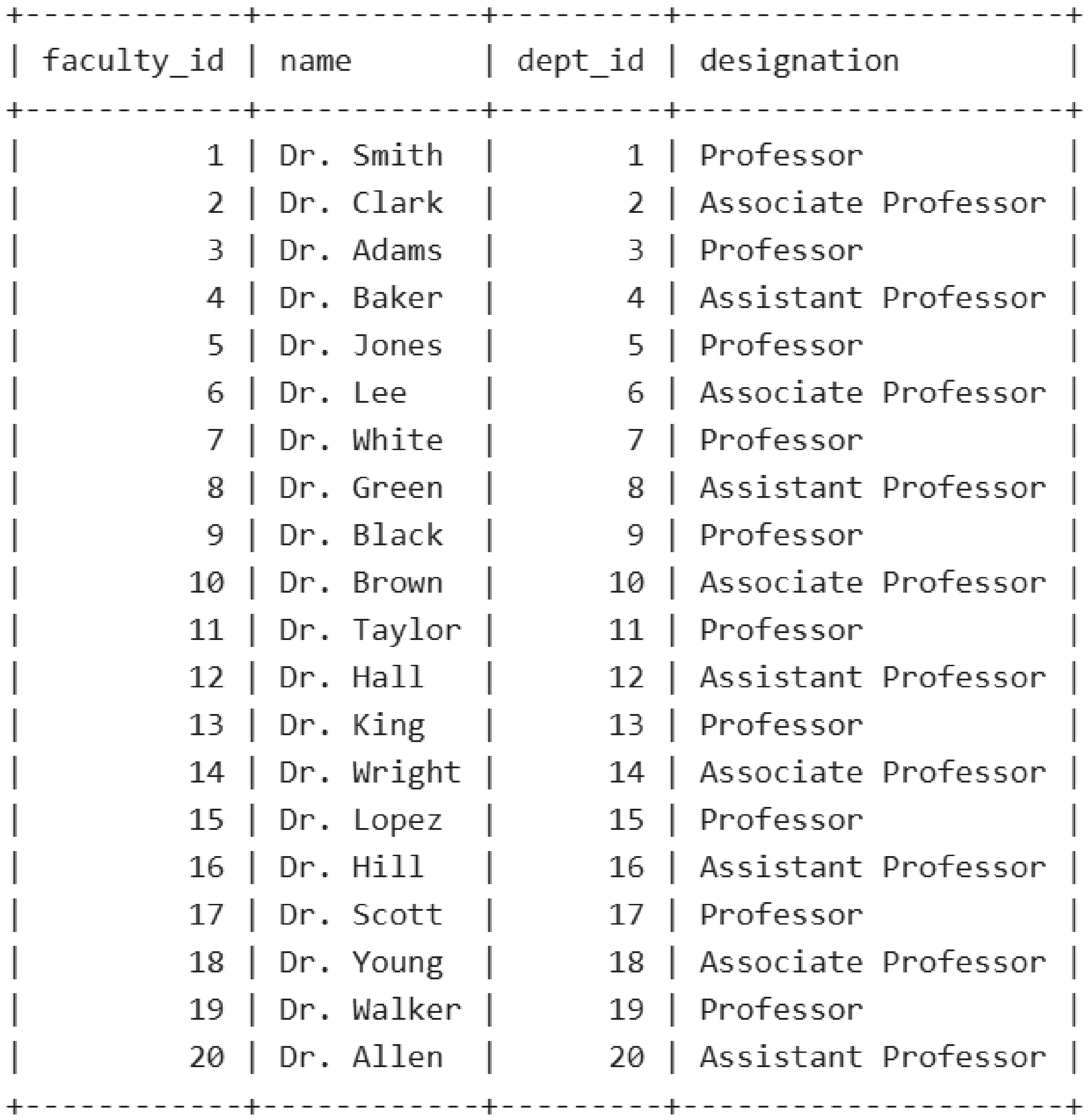
```
+---------+------------------------+
| dept_id | dept_name              |
+---------+------------------------+
|       1 | Computer Science       |
|       2 | Electronics            |
|       3 | Mechanical             |
|       4 | Civil                  |
|       5 | Electrical             |
|       6 | Information Technology |
|       7 | Chemical               |
|       8 | Biotechnology          |
|       9 | Mathematics            |
|      10 | Physics                |
|      11 | Chemistry              |
|      12 | Management             |
|      13 | Economics              |
|      14 | English                |
|      15 | History                |
|      16 | Geography              |
|      17 | Political Science      |
|      18 | Sociology              |
|      19 | Philosophy             |
|      20 | Statistics             |
+---------+------------------------+
```

2nd Output: Students Table



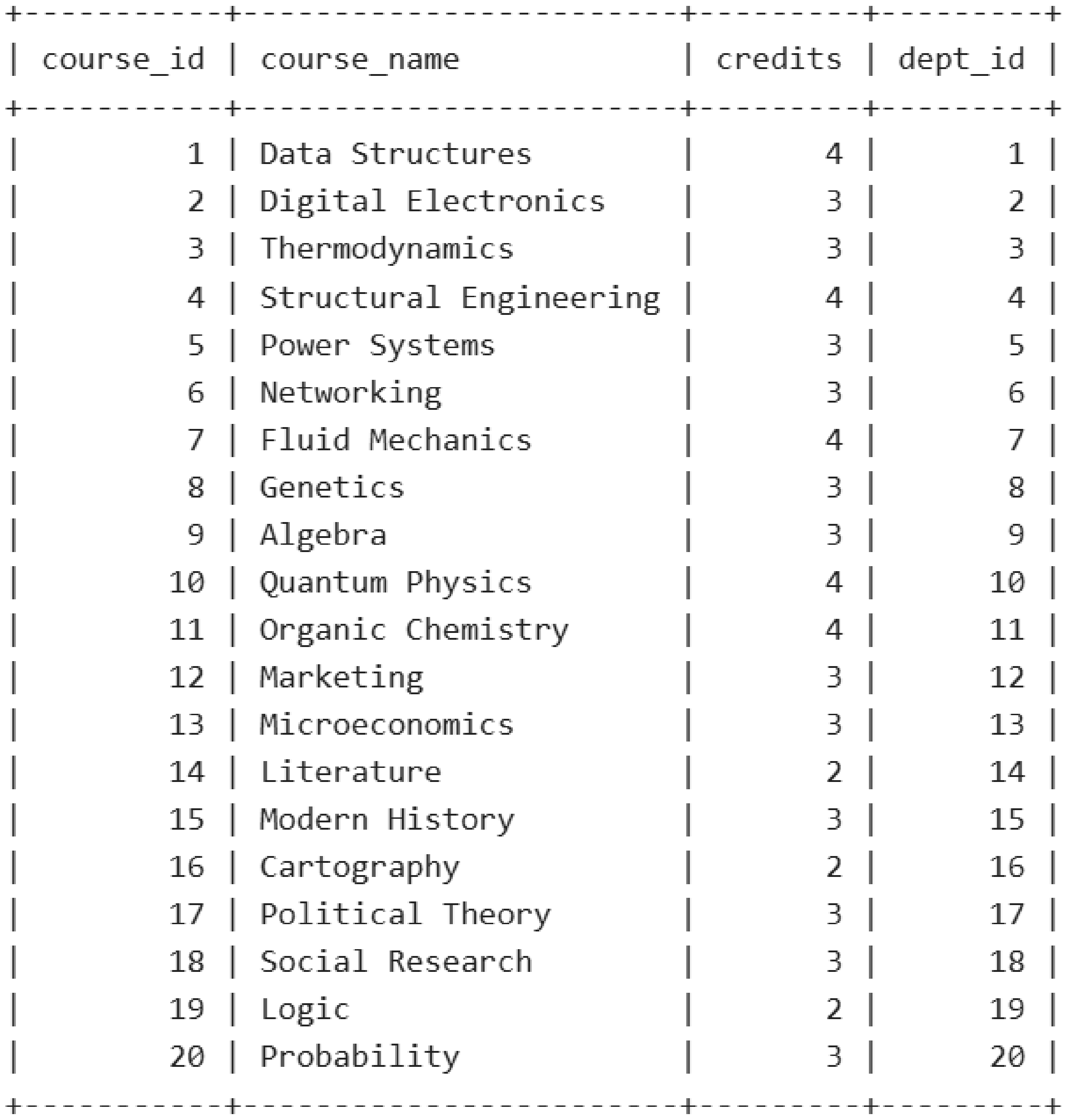
```
+------------+---------+-----+--------+---------+
| student_id | name    | age | gender | dept_id |
+------------+---------+-----+--------+---------+
|          1 | Alice   |  20 | Female |       1 |
|          2 | Bob     |  21 | Male   |       2 |
|          3 | Charlie |  22 | Male   |       3 |
|          4 | Daisy   |  19 | Female |       4 |
|          5 | Ethan   |  20 | Male   |       5 |
|          6 | Fiona   |  21 | Female |       6 |
|          7 | George  |  22 | Male   |       7 |
|          8 | Hannah  |  19 | Female |       8 |
|          9 | Ian     |  20 | Male   |       9 |
|         10 | Jane    |  21 | Female |      10 |
|         11 | Kyle    |  22 | Male   |      11 |
|         12 | Lily    |  19 | Female |      12 |
|         13 | Mike    |  20 | Male   |      13 |
|         14 | Nina    |  21 | Female |      14 |
|         15 | Oscar   |  22 | Male   |      15 |
|         16 | Paula   |  19 | Female |      16 |
|         17 | Quinn   |  20 | Male   |      17 |
|         18 | Rachel  |  21 | Female |      18 |
|         19 | Sam     |  22 | Male   |      19 |
|         20 | Tina    |  19 | Female |      20 |
+------------+---------+-----+--------+---------+
```

3rd Output: Faculty Table



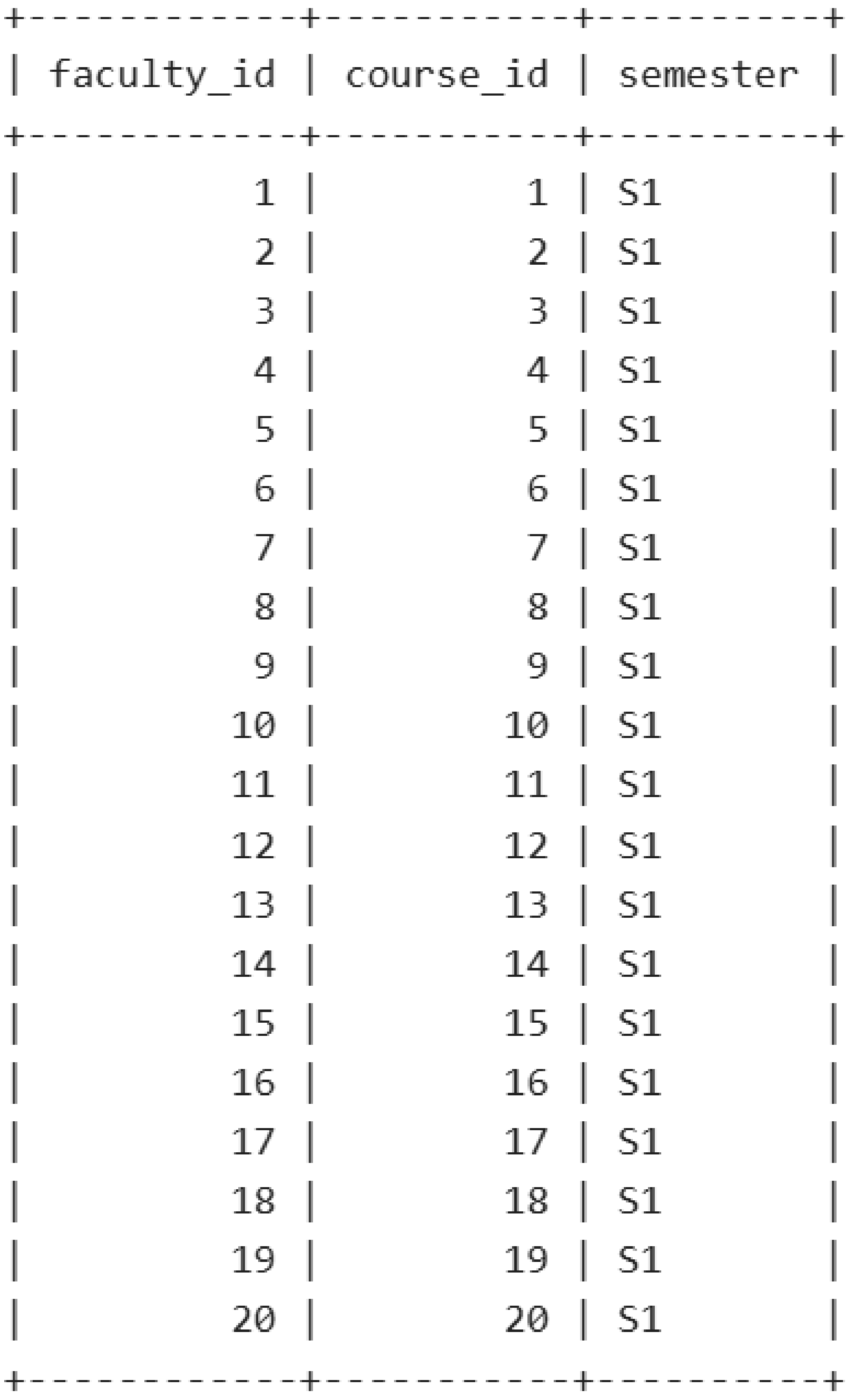
```
+------------+------------+---------+---------------------+
| faculty_id | name       | dept_id | designation         |
+------------+------------+---------+---------------------+
|          1 | Dr. Smith  |       1 | Professor           |
|          2 | Dr. Clark  |       2 | Associate Professor |
|          3 | Dr. Adams  |       3 | Professor           |
|          4 | Dr. Baker  |       4 | Assistant Professor |
|          5 | Dr. Jones  |       5 | Professor           |
|          6 | Dr. Lee    |       6 | Associate Professor |
|          7 | Dr. White  |       7 | Professor           |
|          8 | Dr. Green  |       8 | Assistant Professor |
|          9 | Dr. Black  |       9 | Professor           |
|         10 | Dr. Brown  |      10 | Associate Professor |
|         11 | Dr. Taylor |      11 | Professor           |
|         12 | Dr. Hall   |      12 | Assistant Professor |
|         13 | Dr. King   |      13 | Professor           |
|         14 | Dr. Wright |      14 | Associate Professor |
|         15 | Dr. Lopez  |      15 | Professor           |
|         16 | Dr. Hill   |      16 | Assistant Professor |
|         17 | Dr. Scott  |      17 | Professor           |
|         18 | Dr. Young  |      18 | Associate Professor |
|         19 | Dr. Walker |      19 | Professor           |
|         20 | Dr. Allen  |      20 | Assistant Professor |
+------------+------------+---------+---------------------+
```

4th Output: Courses Table



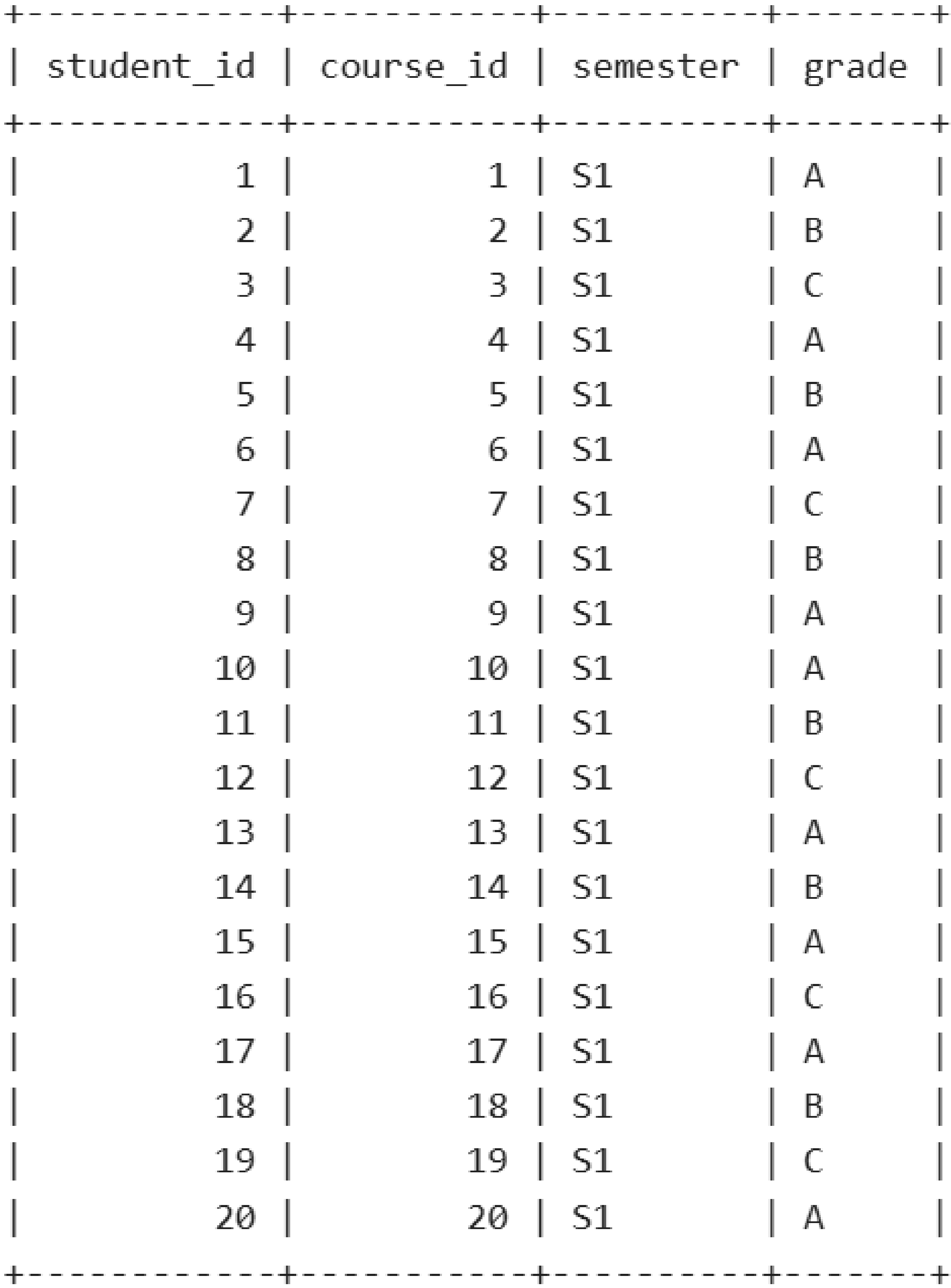
```
+-----------+------------------------+---------+---------+
| course_id | course_name            | credits | dept_id |
+-----------+------------------------+---------+---------+
|         1 | Data Structures        |       4 |       1 |
|         2 | Digital Electronics    |       3 |       2 |
|         3 | Thermodynamics         |       3 |       3 |
|         4 | Structural Engineering |       4 |       4 |
|         5 | Power Systems          |       3 |       5 |
|         6 | Networking             |       3 |       6 |
|         7 | Fluid Mechanics        |       4 |       7 |
|         8 | Genetics               |       3 |       8 |
|         9 | Algebra                |       3 |       9 |
|        10 | Quantum Physics        |       4 |      10 |
|        11 | Organic Chemistry      |       4 |      11 |
|        12 | Marketing              |       3 |      12 |
|        13 | Microeconomics         |       3 |      13 |
|        14 | Literature             |       2 |      14 |
|        15 | Modern History         |       3 |      15 |
|        16 | Cartography            |       2 |      16 |
|        17 | Political Theory       |       3 |      17 |
|        18 | Social Research        |       3 |      18 |
|        19 | Logic                  |       2 |      19 |
|        20 | Probability            |       3 |      20 |
+-----------+------------------------+---------+---------+
```

5th Output: Teaches Table



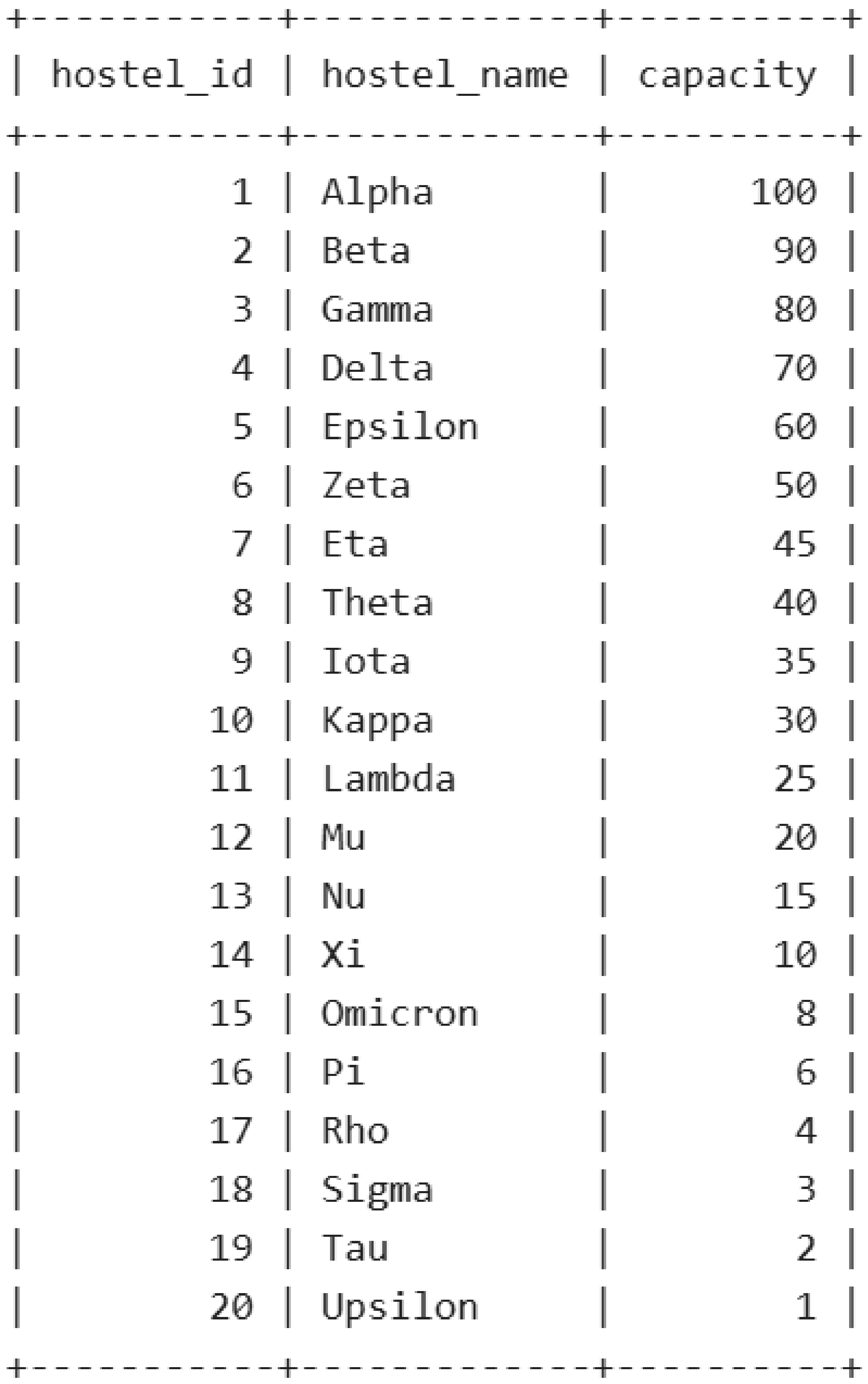
```
+------------+-----------+----------+
| faculty_id | course_id | semester |
+------------+-----------+----------+
|          1 |         1 | S1       |
|          2 |         2 | S1       |
|          3 |         3 | S1       |
|          4 |         4 | S1       |
|          5 |         5 | S1       |
|          6 |         6 | S1       |
|          7 |         7 | S1       |
|          8 |         8 | S1       |
|          9 |         9 | S1       |
|         10 |        10 | S1       |
|         11 |        11 | S1       |
|         12 |        12 | S1       |
|         13 |        13 | S1       |
|         14 |        14 | S1       |
|         15 |        15 | S1       |
|         16 |        16 | S1       |
|         17 |        17 | S1       |
|         18 |        18 | S1       |
|         19 |        19 | S1       |
|         20 |        20 | S1       |
+------------+-----------+----------+
```

6th Output: Enrollments Table



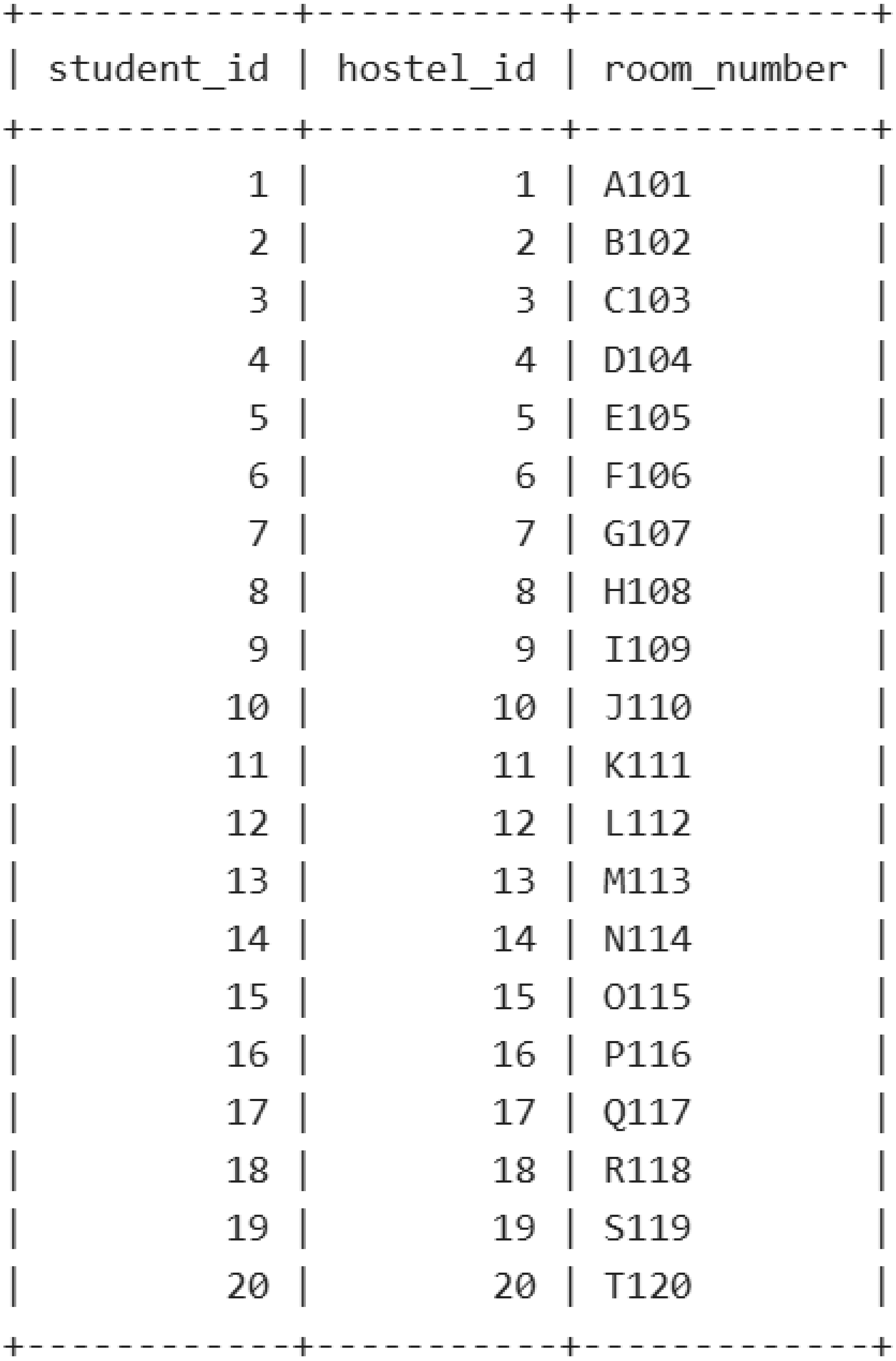
```
+------------+-----------+----------+-------+
| student_id | course_id | semester | grade |
+------------+-----------+----------+-------+
|          1 |         1 | S1       | A     |
|          2 |         2 | S1       | B     |
|          3 |         3 | S1       | C     |
|          4 |         4 | S1       | A     |
|          5 |         5 | S1       | B     |
|          6 |         6 | S1       | A     |
|          7 |         7 | S1       | C     |
|          8 |         8 | S1       | B     |
|          9 |         9 | S1       | A     |
|         10 |        10 | S1       | A     |
|         11 |        11 | S1       | B     |
|         12 |        12 | S1       | C     |
|         13 |        13 | S1       | A     |
|         14 |        14 | S1       | B     |
|         15 |        15 | S1       | A     |
|         16 |        16 | S1       | C     |
|         17 |        17 | S1       | A     |
|         18 |        18 | S1       | B     |
|         19 |        19 | S1       | C     |
|         20 |        20 | S1       | A     |
+------------+-----------+----------+-------+
```

7th Output: Hostel Table



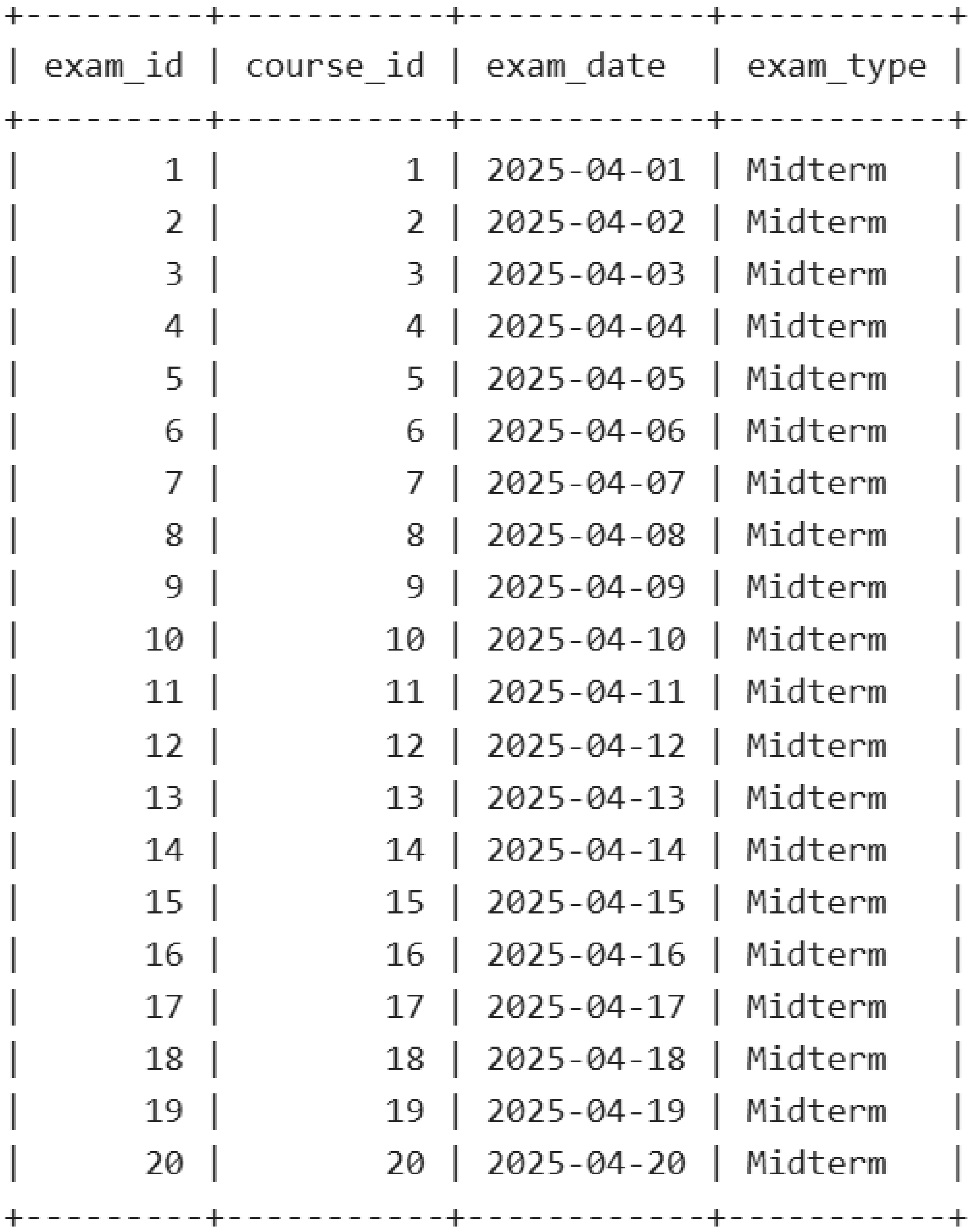
```
+-----------+-------------+----------+
| hostel_id | hostel_name | capacity |
+-----------+-------------+----------+
|         1 | Alpha       |      100 |
|         2 | Beta        |       90 |
|         3 | Gamma       |       80 |
|         4 | Delta       |       70 |
|         5 | Epsilon     |       60 |
|         6 | Zeta        |       50 |
|         7 | Eta         |       45 |
|         8 | Theta       |       40 |
|         9 | Iota        |       35 |
|        10 | Kappa       |       30 |
|        11 | Lambda      |       25 |
|        12 | Mu          |       20 |
|        13 | Nu          |       15 |
|        14 | Xi          |       10 |
|        15 | Omicron     |        8 |
|        16 | Pi          |        6 |
|        17 | Rho         |        4 |
|        18 | Sigma       |        3 |
|        19 | Tau         |        2 |
|        20 | Upsilon     |        1 |
+-----------+-------------+----------+
```

8th Output: Hostel_allocation Table



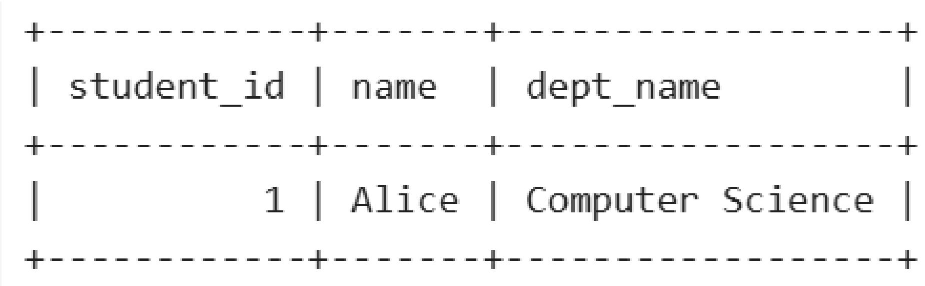
```
+------------+-----------+-------------+
| student_id | hostel_id | room_number |
+------------+-----------+-------------+
|          1 |         1 | A101        |
|          2 |         2 | B102        |
|          3 |         3 | C103        |
|          4 |         4 | D104        |
|          5 |         5 | E105        |
|          6 |         6 | F106        |
|          7 |         7 | G107        |
|          8 |         8 | H108        |
|          9 |         9 | I109        |
|         10 |        10 | J110        |
|         11 |        11 | K111        |
|         12 |        12 | L112        |
|         13 |        13 | M113        |
|         14 |        14 | N114        |
|         15 |        15 | O115        |
|         16 |        16 | P116        |
|         17 |        17 | Q117        |
|         18 |        18 | R118        |
|         19 |        19 | S119        |
|         20 |        20 | T120        |
+------------+-----------+-------------+
```

9th Output: Exams Table



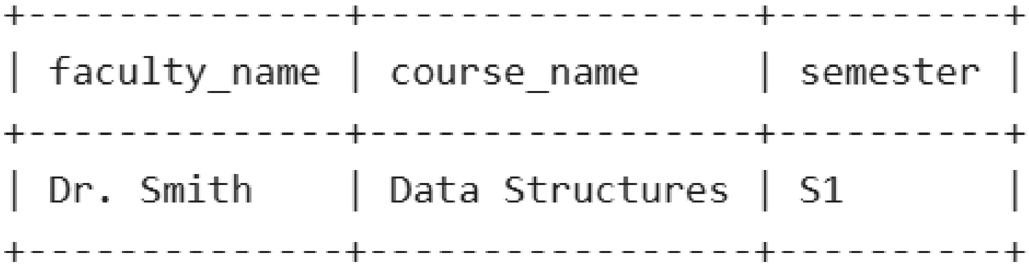
```
+---------+-----------+------------+-----------+
| exam_id | course_id | exam_date  | exam_type |
+---------+-----------+------------+-----------+
|       1 |         1 | 2025-04-01 | Midterm   |
|       2 |         2 | 2025-04-02 | Midterm   |
|       3 |         3 | 2025-04-03 | Midterm   |
|       4 |         4 | 2025-04-04 | Midterm   |
|       5 |         5 | 2025-04-05 | Midterm   |
|       6 |         6 | 2025-04-06 | Midterm   |
|       7 |         7 | 2025-04-07 | Midterm   |
|       8 |         8 | 2025-04-08 | Midterm   |
|       9 |         9 | 2025-04-09 | Midterm   |
|      10 |        10 | 2025-04-10 | Midterm   |
|      11 |        11 | 2025-04-11 | Midterm   |
|      12 |        12 | 2025-04-12 | Midterm   |
|      13 |        13 | 2025-04-13 | Midterm   |
|      14 |        14 | 2025-04-14 | Midterm   |
|      15 |        15 | 2025-04-15 | Midterm   |
|      16 |        16 | 2025-04-16 | Midterm   |
|      17 |        17 | 2025-04-17 | Midterm   |
|      18 |        18 | 2025-04-18 | Midterm   |
|      19 |        19 | 2025-04-19 | Midterm   |
|      20 |        20 | 2025-04-20 | Midterm   |
+---------+-----------+------------+-----------+
```

10th Output: List all students in a specific department (e.g., Computer Science)



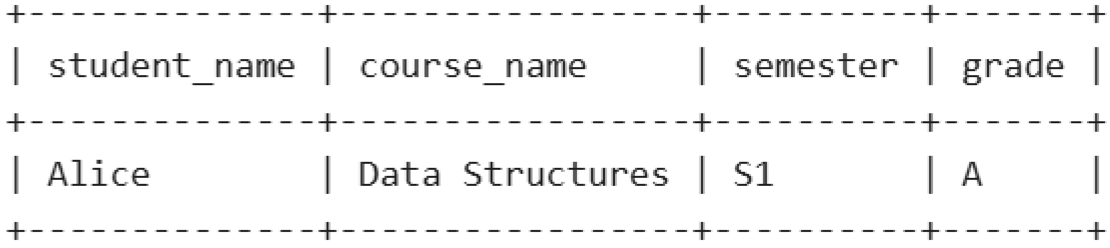
```
+------------+-------+------------------+
| student_id | name  | dept_name        |
+------------+-------+------------------+
|          1 | Alice | Computer Science |
+------------+-------+------------------+
```

11th Output: View courses taught by a specific faculty (e.g., Dr. Smith)



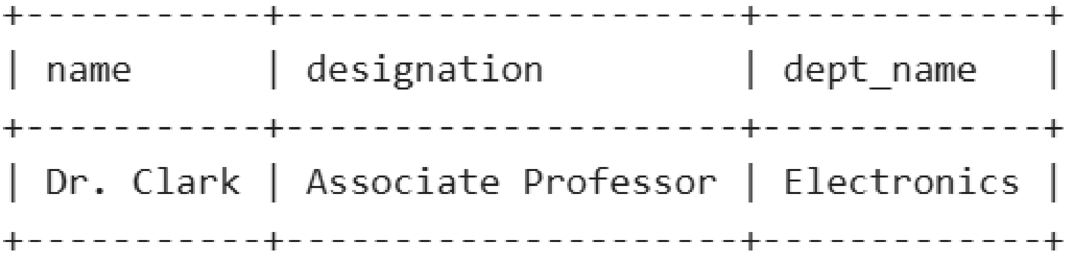
```
+--------------+-----------------+----------+
| faculty_name | course_name     | semester |
+--------------+-----------------+----------+
| Dr. Smith    | Data Structures | S1       |
+--------------+-----------------+----------+
```

12th Output: See all enrollments of a student (e.g., Alice)



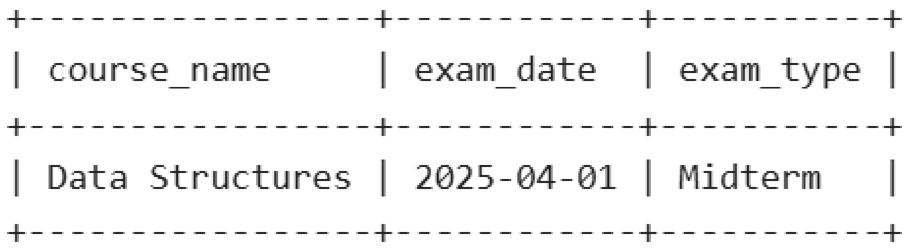
```
+--------------+-----------------+----------+-------+
| student_name | course_name     | semester | grade |
+--------------+-----------------+----------+-------+
| Alice        | Data Structures | S1       | A     |
+--------------+-----------------+----------+-------+
```

13th Output: Find faculty in a specific department (e.g., Electronics)



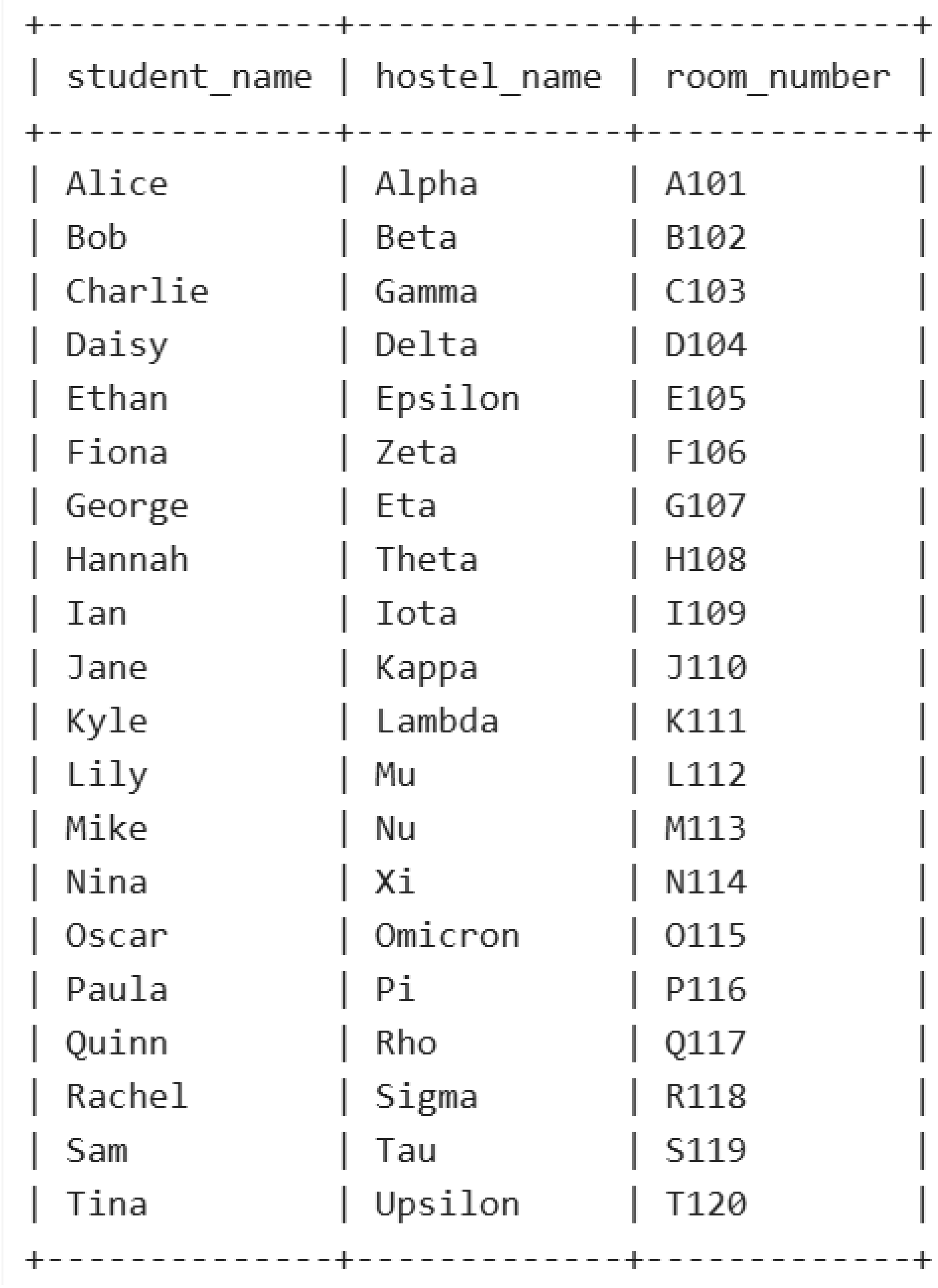
```
+-----------+---------------------+-------------+
| name      | designation         | dept_name   |
+-----------+---------------------+-------------+
| Dr. Clark | Associate Professor | Electronics |
+-----------+---------------------+-------------+
```

14th Output: List exams scheduled for a particular course (e.g., Data Structures)



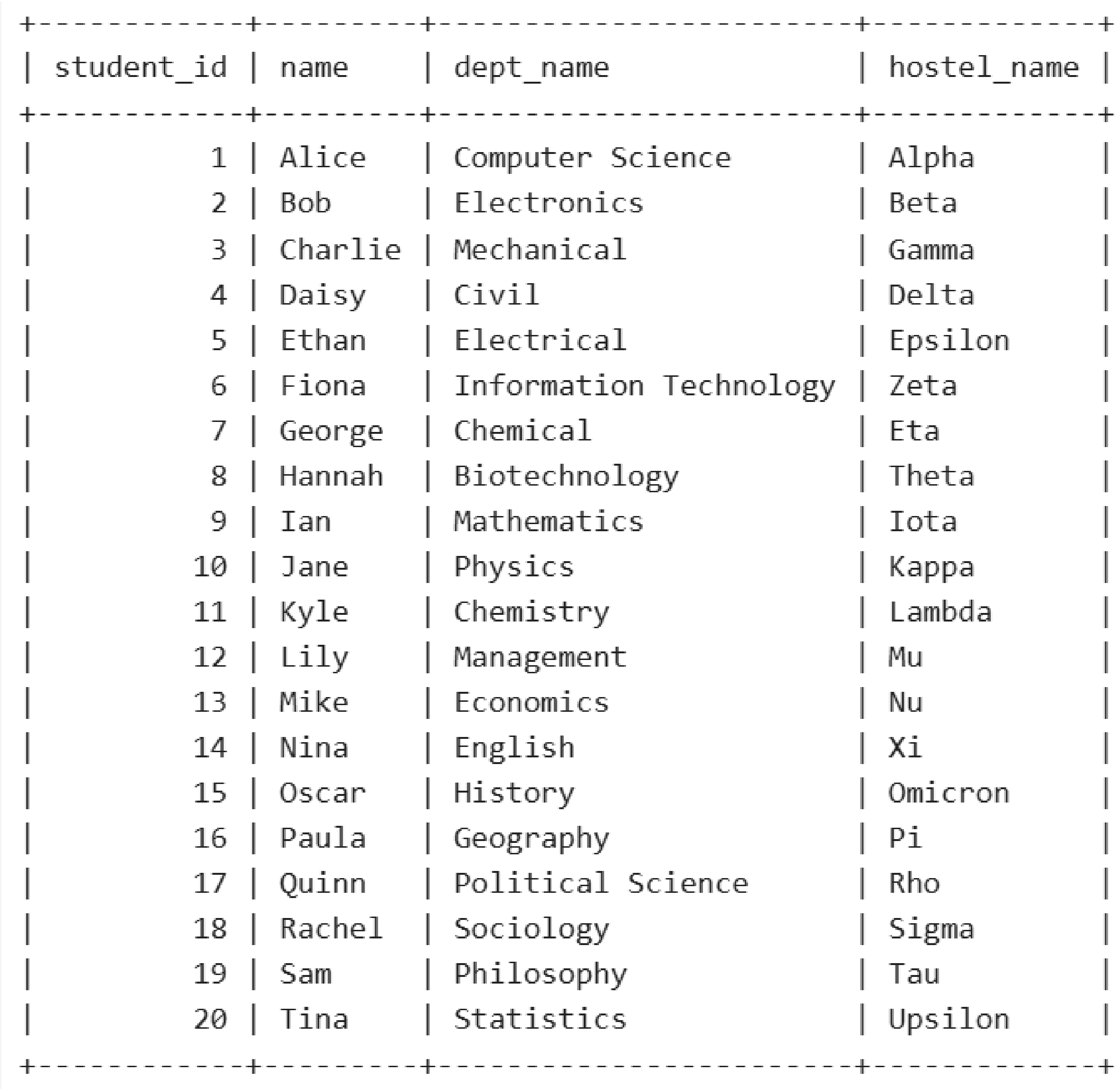
```
+----------------+------------+-----------+
| course_name    | exam_date  | exam_type |
+----------------+------------+-----------+
| Data Structures | 2025-04-01 | Midterm   |
+----------------+------------+-----------+
```

15th Output: Show hostel allocations



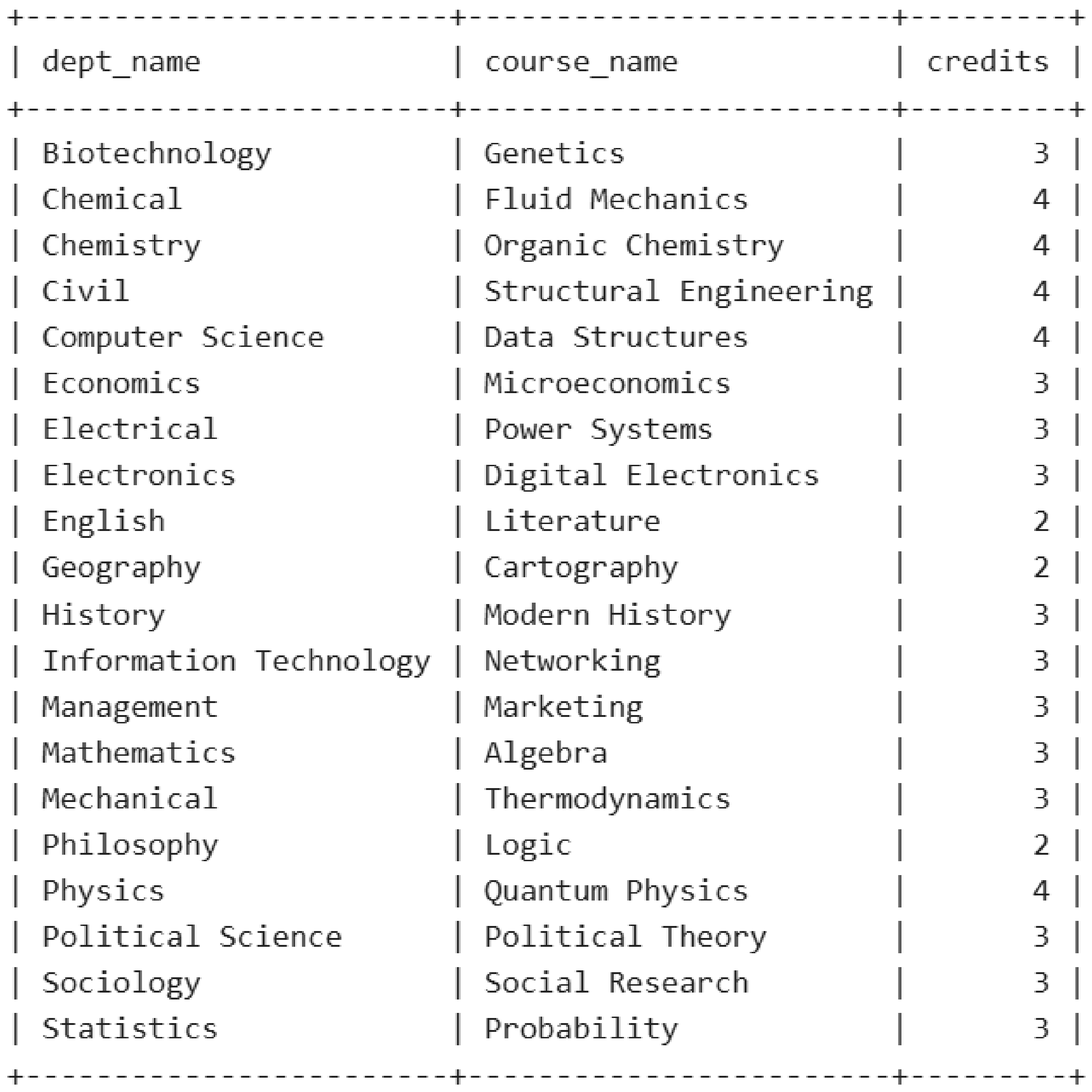
```
+--------------+-------------+-------------+
| student_name | hostel_name | room_number |
+--------------+-------------+-------------+
| Alice        | Alpha       | A101        |
| Bob          | Beta        | B102        |
| Charlie      | Gamma       | C103        |
| Daisy        | Delta       | D104        |
| Ethan        | Epsilon     | E105        |
| Fiona        | Zeta        | F106        |
| George       | Eta         | G107        |
| Hannah       | Theta       | H108        |
| Ian          | Iota        | I109        |
| Jane         | Kappa       | J110        |
| Kyle         | Lambda      | K111        |
| Lily         | Mu          | L112        |
| Mike         | Nu          | M113        |
| Nina         | Xi          | N114        |
| Oscar        | Omicron     | O115        |
| Paula        | Pi          | P116        |
| Quinn        | Rho         | Q117        |
| Rachel       | Sigma       | R118        |
| Sam          | Tau         | S119        |
| Tina         | Upsilon     | T120        |
+--------------+-------------+-------------+
```

16th Output: Get all students along with their department and hostel



```
+------------+---------+------------------------+-------------+
| student_id | name    | dept_name              | hostel_name |
+------------+---------+------------------------+-------------+
|          1 | Alice   | Computer Science       | Alpha       |
|          2 | Bob     | Electronics            | Beta        |
|          3 | Charlie | Mechanical             | Gamma       |
|          4 | Daisy   | Civil                  | Delta       |
|          5 | Ethan   | Electrical             | Epsilon     |
|          6 | Fiona   | Information Technology | Zeta        |
|          7 | George  | Chemical               | Eta         |
|          8 | Hannah  | Biotechnology          | Theta       |
|          9 | Ian     | Mathematics            | Iota        |
|         10 | Jane    | Physics                | Kappa       |
|         11 | Kyle    | Chemistry              | Lambda      |
|         12 | Lily    | Management             | Mu          |
|         13 | Mike    | Economics              | Nu          |
|         14 | Nina    | English                | Xi          |
|         15 | Oscar   | History                | Omicron     |
|         16 | Paula   | Geography              | Pi          |
|         17 | Quinn   | Political Science      | Rho         |
|         18 | Rachel  | Sociology              | Sigma       |
|         19 | Sam     | Philosophy             | Tau         |
|         20 | Tina    | Statistics             | Upsilon     |
+------------+---------+------------------------+-------------+
```

17th Output: Courses offered by each department



```
+------------------------+------------------------+---------+
| dept_name              | course_name            | credits |
+------------------------+------------------------+---------+
| Biotechnology          | Genetics               |       3 |
| Chemical               | Fluid Mechanics        |       4 |
| Chemistry              | Organic Chemistry      |       4 |
| Civil                  | Structural Engineering |       4 |
| Computer Science       | Data Structures        |       4 |
| Economics              | Microeconomics         |       3 |
| Electrical             | Power Systems          |       3 |
| Electronics            | Digital Electronics    |       3 |
| English                | Literature             |       2 |
| Geography              | Cartography            |       2 |
| History                | Modern History         |       3 |
| Information Technology | Networking             |       3 |
| Management             | Marketing              |       3 |
| Mathematics            | Algebra                |       3 |
| Mechanical             | Thermodynamics         |       3 |
| Philosophy             | Logic                  |       2 |
| Physics                | Quantum Physics        |       4 |
| Political Science      | Political Theory       |       3 |
| Sociology              | Social Research        |       3 |
| Statistics             | Probability            |       3 |
+------------------------+------------------------+---------+
```

CONCLUSION

The University Management System (UMS) project successfully demonstrates the effective use of a relational database to manage and organize the essential operations of a university. By implementing this system using MySQL, we have created a structured and efficient way to store and retrieve information related to students, faculty, departments, courses, hostels, and examinations.

Through the use of normalization, relational integrity, and SQL queries, the project ensures minimal data redundancy, consistent relationships between entities, and accurate data handling. This system not only simplifies administrative processes but also provides a strong foundation for future expansion, such as adding a user interface, automation features, and advanced reporting tools.

Overall, this project highlights the practical importance of Database Management Systems in solving real-world problems and showcases how database design can improve the efficiency and reliability of institutional data management.