Database Project Report: Student-Course-Doctor System

1. Introduction

This project presents the design of a relational database system to manage the relationships between students, courses, and doctors. The goal is to organize and handle student enrollment, mentorship, course allocation, and student contact information.

2. Purpose of the Database

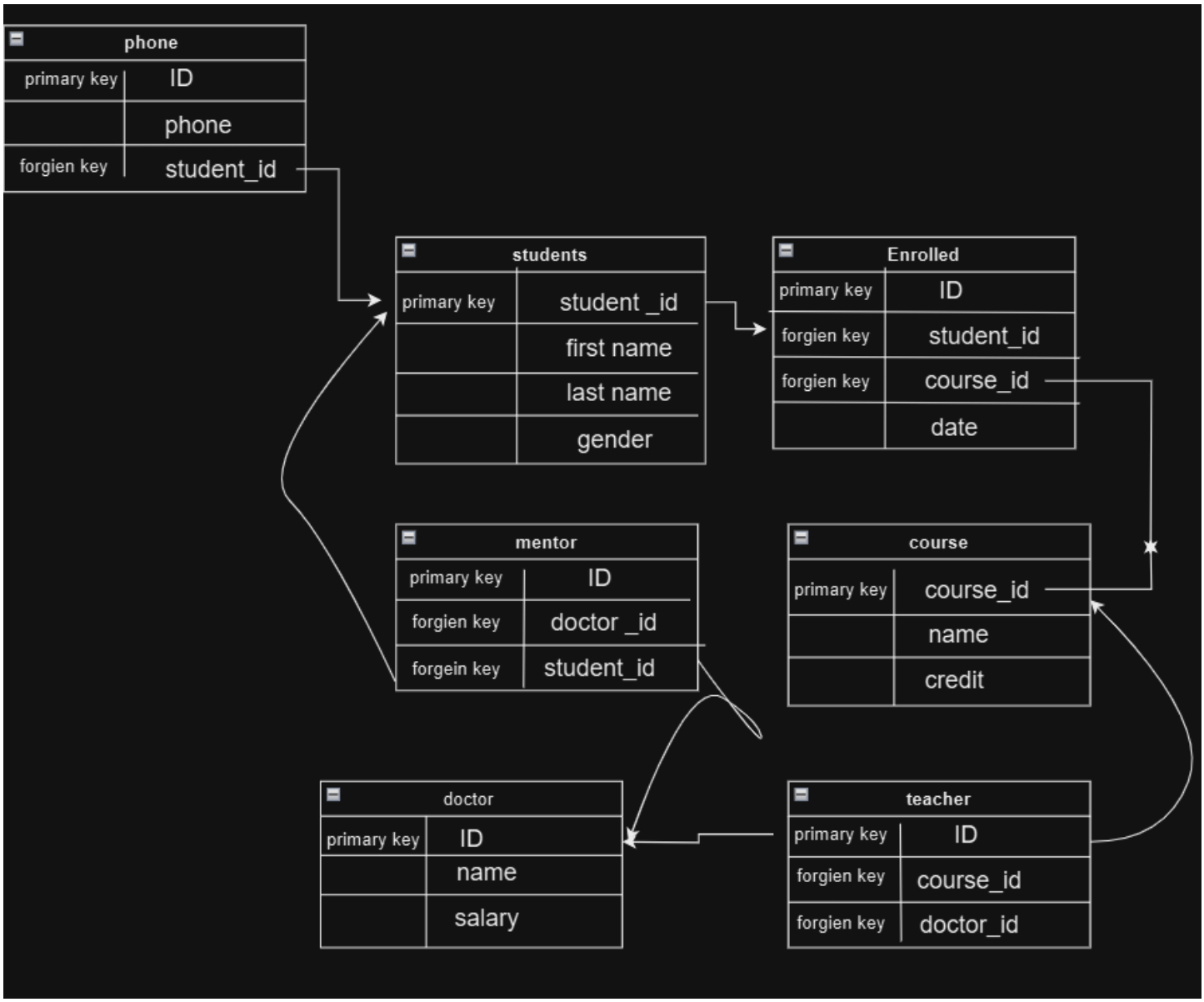
The database is designed to:

- Track student information and contacts
- Manage courses and their credit hours
- Record course enrollments
- Assign mentors to students
- Track which doctor teaches which course

3. Entities & Their Attributes

- Student: student_id (PK), first_name, last_name, gender
- Phone: ID (PK), phone, student_id (FK)
- Course: course_id (PK), name, credit_hours
- Doctor: ID (PK), name, salary
- Mentor: ID (PK), doctor_id (FK), student_id (FK)
- Teacher: ID (PK), course_id (FK), doctor_id (FK)
- Enrolled: ID (PK), student_id (FK), course_id (FK), date

4.



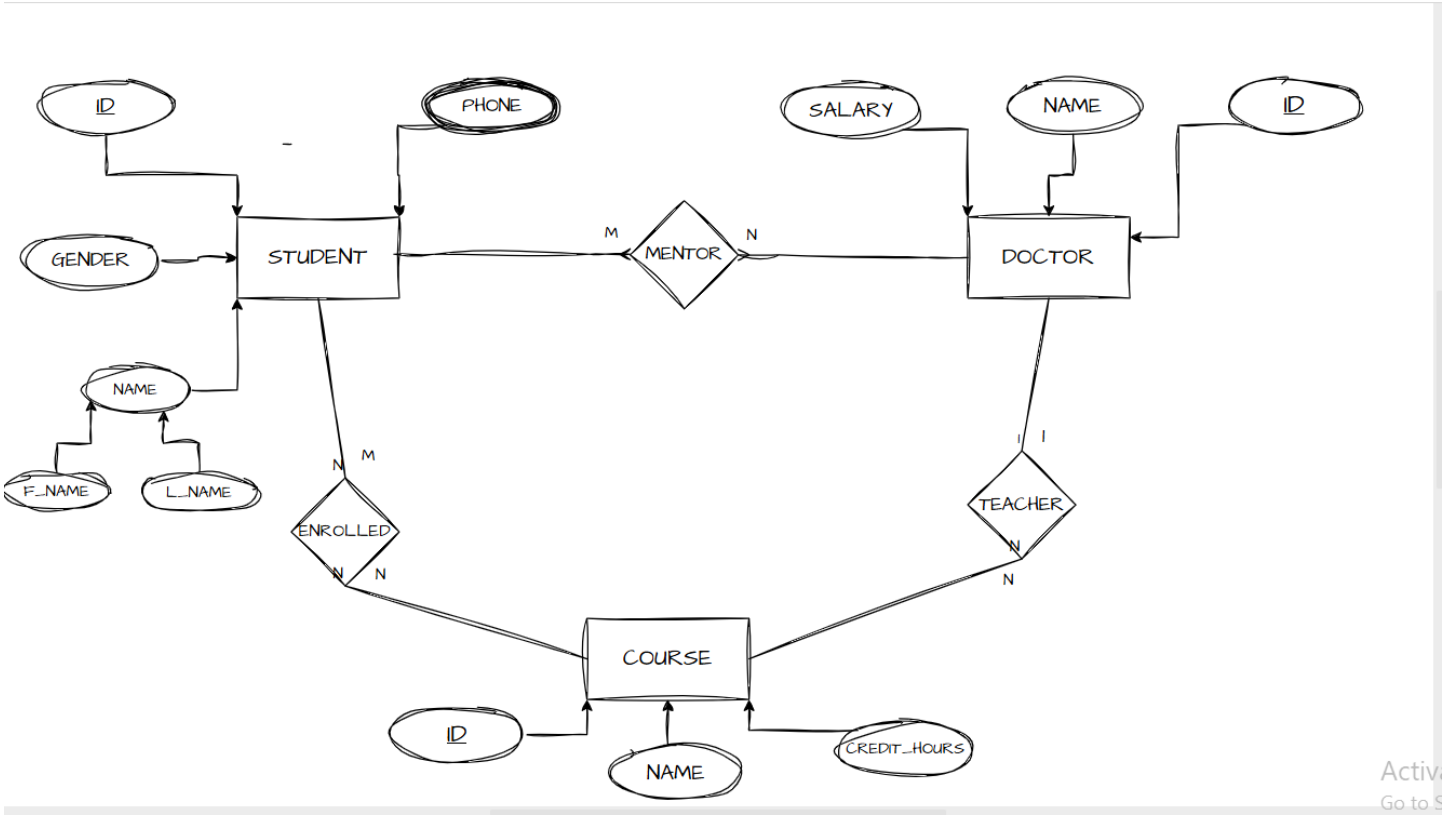
5. Relationships

- Mentor: Many-to-One - Each student has one doctor mentor, each doctor can mentor many students.

- Enrolled: Many-to-Many - Students enroll in multiple courses, and courses have many students.

- Teacher: One-to-Many - A doctor can teach many courses, but a course is taught by one doctor.

- Phone: One-to-Many - A student can have multiple phone numbers.



1) MySQL Login and Table List:

```
Microsoft Windows [Version 10.0.22631.5335]
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C:\Users\Wasem>mysql -h localhost -u root -p project_ds <"C:\Users\Wasem\Desktop\project_database_backup.sql"
Enter password: *****

C:\Users\Wasem>mysql -h localhost -u root -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.42 MySQL Community Server - GPL

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use project_ds;
Database changed
mysql> show tables;
+----------------------+
| Tables_in_project_ds |
+----------------------+
| course               |
| doctor               |
| enrolled             |
| mentor               |
| phone                |
| students             |
| teacher              |
+----------------------+
```

2) Students Table Description and Data:

```
mysql> describe students;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| student_id | int         | NO   | PRI | NULL    |       |
| first_name | varchar(50) | YES  |     | NULL    |       |
| last_name  | varchar(50) | YES  |     | NULL    |       |
| gender     | char(1)     | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.01 sec)

mysql> select * from students;
+------------+------------+-----------+--------+
| student_id | first_name | last_name | gender |
+------------+------------+-----------+--------+
|          1 | Ahmed      | Ali       | M      |
|          2 | Sara       | Youssef   | F      |
|          3 | Omar       | Adel      | M      |
|          4 | Mona       | Khaled    | F      |
|          5 | Youssef    | Ibrahim   | M      |
|          6 | Laila      | Hassan    | F      |
|          7 | Mostafa    | Nabil     | M      |
|          8 | Dina       | Fouad     | F      |
|          9 | Khaled     | Sami      | M      |
|         10 | Nour       | Ahmed     | F      |
+------------+------------+-----------+--------+
```

3)Course Table and Average Doctor Salary:

```
mysql> select * from course;
+-----------+---------------------+--------------+
| course_id | name                | credit_hours |
+-----------+---------------------+--------------+
|         1 | DB Systems          |            3 |
|         2 | Algorithms          |            4 |
|         3 | Networks            |            3 |
|         4 | AI Basics           |            2 |
|         5 | Operating Systems   |            3 |
|         6 | Data Science        |            4 |
|         7 | Cyber Security      |            3 |
|         8 | Machine Learning    |            4 |
|         9 | Cloud Computing     |            3 |
|        10 | Software Engineering |            3 |
+-----------+---------------------+--------------+
10 rows in set (0.00 sec)

mysql> select avg(salary) from doctor ;
+--------------+
| avg(salary)  |
+--------------+
| 16210.000000 |
+--------------+
1 row in set (0.01 sec)

mysql> select first_name, course_id from students as S join enrolled as
+------------+-----------+
| first_name | course_id |
+------------+-----------+
| Ahmed      |         1 |
| Ahmed      |         2 |
| Sara       |         1 |
| Sara       |         3 |
| Omar       |         2 |
| Mona       |         5 |
| Youssef    |         4 |
```

4) Course Table, Average Salary, and Enrollments:

```
mysql> select * from course;
+-----------+---------------------+--------------+
| course_id | name                | credit_hours |
+-----------+---------------------+--------------+
|         1 | DB Systems          |            3 |
|         2 | Algorithms          |            4 |
|         3 | Networks            |            3 |
|         4 | AI Basics           |            2 |
|         5 | Operating Systems   |            3 |
|         6 | Data Science        |            4 |
|         7 | Cyber Security      |            3 |
|         8 | Machine Learning    |            4 |
|         9 | Cloud Computing     |            3 |
|        10 | Software Engineering |            3 |
+-----------+---------------------+--------------+
10 rows in set (0.00 sec)

mysql> select avg(salary) from doctor ;
+--------------+
| avg(salary)  |
+--------------+
| 16210.000000 |
+--------------+
1 row in set (0.01 sec)

mysql> select first_name, course_id from students as S join enrolled as E on S.student_id =E.student_id;
+------------+-----------+
| first_name | course_id |
+------------+-----------+
| Ahmed      |         1 |
| Ahmed      |         2 |
| Sara       |         1 |
| Sara       |         3 |
| Omar       |         2 |
| Mona       |         5 |
| Youssef    |         4 |
| Youssef    |         3 |
| Mona       |         1 |
| Omar       |         5 |
+------------+-----------+
```

5) Doctor Salaries (Descending Order):

```
mysql> select salary from doctor order by salary desc;
+----------+
| salary   |
+----------+
| 18000.00 |
| 17200.00 |
| 17000.00 |
| 16500.00 |
| 16200.00 |
| 16000.00 |
| 15800.00 |
| 15500.00 |
| 15000.00 |
| 14900.00 |
+----------+
10 rows in set (0.00 sec)
```

6. Summary

This database models an educational environment. Students register in courses, have mentors, and can be contacted through phone numbers. Doctors teach and mentor students. The schema

maintains data integrity with proper use of keys.