# Laboratory 3

Title of the Laboratory Exercise: Database Design

1. Introduction and Purpose of Experiment

Students will design the database schema as per the ER diagram designed in the Laboratory 1 and 2.

1. Aim and Objectives

Aim

Objectives

At the end of this lab, the student will be able to

1. Experimental Procedure
2. Calculations/Computations/Algorithms

Creation of the database

DROP TABLE IF EXISTS PROJECT\_EXHIBITION;

DROP TABLE IF EXISTS EXHIBITION;

DROP TABLE IF EXISTS PROJECT\_STUDENT\_REGISTER;

DROP TABLE IF EXISTS PROJEKT;

DROP TABLE IF EXISTS STUDENT;

DROP TABLE IF EXISTS STUDENT\_LOGIN;

DROP TABLE IF EXISTS STAFF\_LOGIN;

CREATE TABLE STAFF\_LOGIN

(

    id INT(5) PRIMARY KEY AUTO\_INCREMENT,

    user\_name VARCHAR(20) UNIQUE KEY NOT NULL,

    hashed\_password CHAR(60) NOT NULL

);

CREATE TABLE STUDENT\_LOGIN

(

    id INT(5) PRIMARY KEY AUTO\_INCREMENT,

    user\_name VARCHAR(20) UNIQUE KEY NOT NULL,

    hashed\_password CHAR(60) NOT NULL

);

CREATE TABLE STUDENT

(

    id INT(5) UNIQUE KEY NOT NULL,

    reg\_no CHAR(12) PRIMARY KEY,

    name VARCHAR(30) NOT NULL,

    department ENUM('CSE', 'EEE', 'ECE', 'CIVIL'),

    course ENUM('B.Tech', 'M.Tech') NOT NULL,

    contact\_no VARCHAR(10) NOT NULL,

*FOREIGN KEY*(id) *REFERENCES* STUDENT\_LOGIN(id)

);

CREATE TABLE PROJEKT

(

    id INT(5) PRIMARY KEY AUTO\_INCREMENT,

    project\_leader\_regno CHAR(12) UNIQUE KEY NOT NULL,

    project\_name VARCHAR(100) UNIQUE KEY NOT NULL,

    mentor\_name VARCHAR(30) NOT NULL,

    department ENUM('CSE', 'EEE', 'ECE', 'CIVIL') NOT NULL,

    category VARCHAR(30) NOT NULL

);

CREATE TABLE PROJECT\_STUDENT\_REGISTER

(

    project\_id INT(5) NOT NULL,

    student\_reg\_no CHAR(12) NOT NULL,

*FOREIGN KEY*(project\_id) *REFERENCES* PROJEKT(id),

*FOREIGN KEY*(student\_reg\_no) *REFERENCES* STUDENT(reg\_no)

);

CREATE TABLE EXHIBITION

(

    room\_id INT(5) PRIMARY KEY AUTO\_INCREMENT,

    room\_name CHAR(20) UNIQUE KEY NOT NULL,

    capacity INT(5) NOT NULL

);

CREATE TABLE PROJECT\_EXHIBITION

(

    room\_id INT(5) NOT NULL,

    project\_id INT(5) UNIQUE KEY NOT NULL,

    table\_no INT(5) *CHECK* ( table\_no **>** 0 AND table\_no **<** ( SELECT **\*** FROM EXHIBITION WHERE EXHIBITION.*room\_id* **=** room\_id LIMIT 1 ) ),

*FOREIGN KEY*(room\_id) *REFERENCES* EXHIBITION(room\_id),

*FOREIGN KEY*(project\_id) *REFERENCES* PROJEKT(id)

);

Inserting data into the table

INSERT INTO `STUDENT\_LOGIN` (`id`, `user\_name`, `hashed\_password`) VALUES

(1, '17ETCS002159', '$2b$10$uVRx4ogFBi0owMljpvEilONnd9wWOMtrpgVwqw2Mw8.aNmo6yEU1u'),

(2, '17ETCS002122', '$2b$10$ATp9qxsPWBsOUXDAB1YvK.yTLi4GK1mzpIHBCfSOCQwtxLU/52Pk2'),

(3, '17ETCS002168', '$2b$10$3cfBMD3yRi3YJk.fFGrNY.Yx1RRonj4z2cqgOe2fgZ78yNaqRxFkC');

INSERT INTO `STUDENT` (`id`, `reg\_no`, `name`, `department`, `course`, `contact\_no`) VALUES

(2, '17ETCS002122', 'Prachi Poddar', 'CSE', 'B.Tech', '9856523658'),

(1, '17ETCS002159', 'Satyajit Ghana', 'CSE', 'B.Tech', '7892137665'),

(3, '17ETCS002168', 'Shikhar Singh', 'CSE', 'B.Tech', '9852145896');

INSERT INTO `PROJEKT` (`id`, `project\_leader\_regno`, `project\_name`, `mentor\_name`, `department`, `category`) VALUES

(2, '17ETCS002159', 'KrishiAI', 'Chaitra S', 'CSE', 'DL');

INSERT INTO `PROJECT\_STUDENT\_REGISTER` (`project\_id`, `student\_reg\_no`) VALUES

(2, '17ETCS002159'),

(2, '17ETCS002122'),

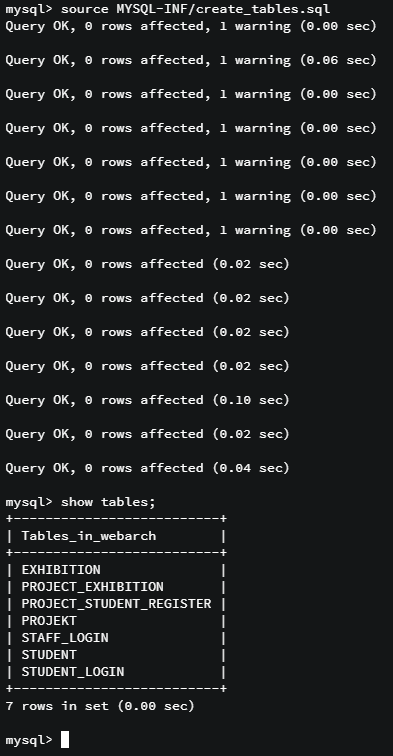
(2, '17ETCS002168');

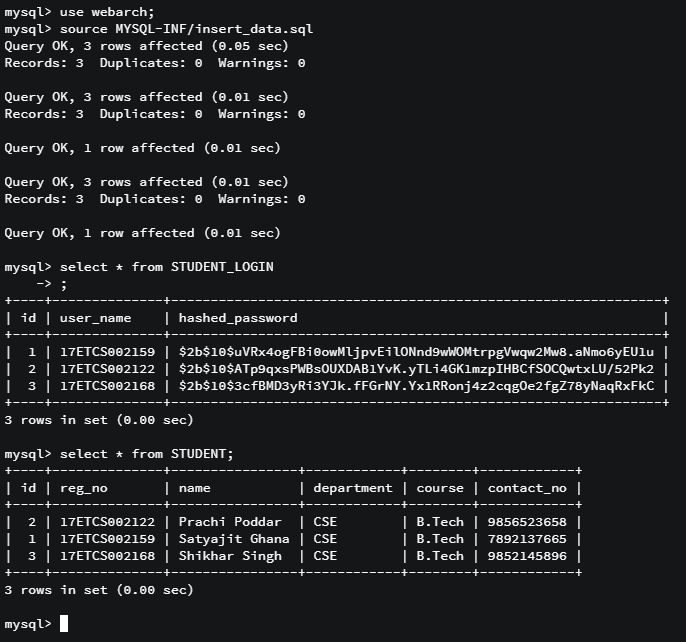
INSERT INTO `EXHIBITION` (`room\_id`, `room\_name`, `capacity`) VALUES

(1, 'A201', 60);

1. Presentation of Results

Now we run the created table sql file to create all the necessary tables with appropriate constraints.





1. Analysis and Discussions

The database schema was designed as per the ER diagram designed in the Laboratory 1 and 2. The data or information for the database are stored in tables. Tables are uniquely identified by their names and are comprised of columns and rows. All the seven tables represent seven different entities and their columns represent attributes of the entities. Each table has column “id” as their primary key.

To store users’ password hashing is used. Hashing is a one-way encryption that means you cannot get the original text back from the hash because in information security, passwords are recommended to be stored in a hashed format so applications/systems can verify if the correct password is entered without them storing your password. This makes it harder to steal. Because what you don't have has less likelihood of being stolen.

1. Conclusions

SQL stands for Structured Query Language. SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database.  The standard SQL commands such as "Select", "Insert", "Update", "Delete", "Create", and "Drop" were used to accomplish everything that was needed to create the database.

1. Comments

a. Limitations of Experiments

One limitation of SQL is that relations must have a fixed set of columns. This is a frequent annoyance of software developers, and drives the demand for non-relational databases.

SQL allows user to access the data stored in a relational database (your typical RDBMS) or even flat files or hadoop or MongoDB(when using tools like Apache Drill or Hive). Even though SQL concept and syntax remains same across platforms and tools, implementation and limitations of each platform are sometimes very different. The problem increases in scale when performance tuning is concerned.

b. Limitations of Results

None

c. Learning happened

We learnt how to create tables, add data, create database, modify data, using MySQL, and also how to implement a given schema/er diagram in MySQL

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| **Component** | **Max Marks** | **Marks Obtained** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| **Total** | **20** |  |