LAB NO: 03

LAB TITLE: To establish a relation between various tables with the help of primary and foreign key.

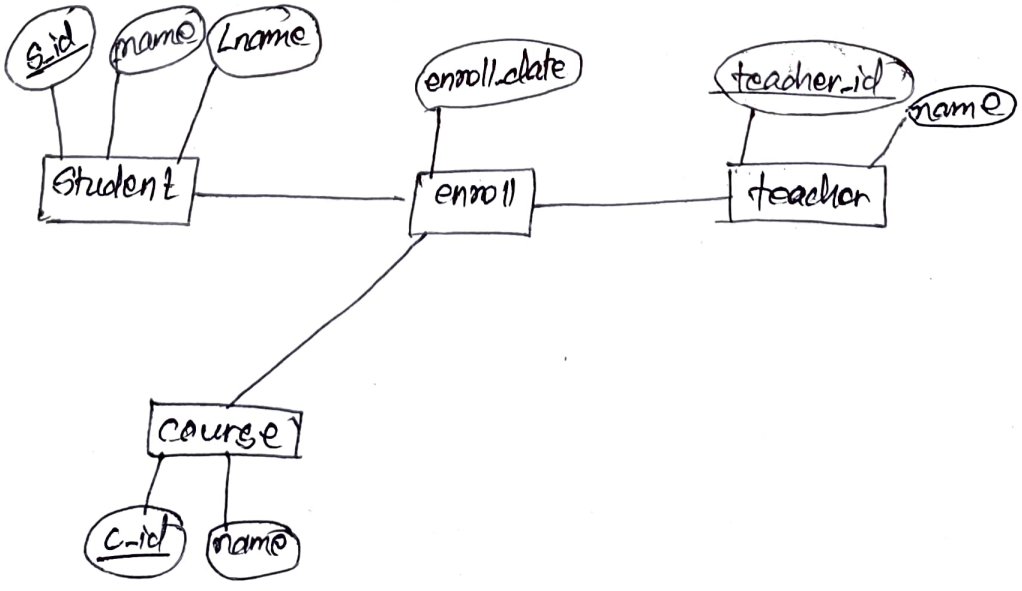
THEORY:

Primary key can be defined as the column whose value will be unique and identifies the row in the table. To be primary key in table, following rules must be followed:

(i) Primary key must contain unique value
(ii) If the primary key contains multiple columns, the combination of these columns, must leads to unique value.
(iii) Primary key cannot have NULL value

Foreign key can be defined as column or group of colums that links to a column or group of column in another table. The foreign places constraints on the another table, which allows to maintain referential integrity. Foreign key matches the primary key field of another table. That simply means the foreign key of one table refers to the primary key of another table.

Note: Primary key is denoted by solid underline in erdiagram whereas foreign key is denoted by dotted underline as show below:



(200204, "Bad Traverse");

LAB WORK :

(1) create a database named Infosys_db that contains the table student, teacher, course and enroll and some of the specified attribute shown in the below ER diagram and insert atleast 5 row in the tables.

```
1. create database infosys_db; -- creates the database
   /* for student */
2. create table student (
   id int primary key not null,
   f_name varchar(20),
   l_name varchar(20)
   ); -- creates a table student where f_nam, l_name, id is attribute
3. insert into student values
   (1, "Aayush", "karki"),
   (2, "Nischal", "khanal"),
   (3, "Praagya", "pokherel"),
   (4, "Rabin", "Mishra"),
   (5, "Ankit", "khadka"); /* inserts the provided data */

4. select * from student; /* checking whether data is inserted
                             or not */

   /* for teacher */
5. create table teacher(
   id int primary key not null,
   name varchar(20), /* creates a table for teacher information */
years_of_experience int);

6. desc teacher; -- checking whether teacher table is formed
                    or not.

7. insert into teacher values
   (200101, "Nitish Singh"),
   (200102, "Hitesh Choudhary"),
   (200103, "Navin Reddy");
```

(200704, "Bad Traversy"),
(200705, "David J Malan");

8. Select * from teacher; -- checking data is inserted or not
/* for course */

9. create table course (
id int primary key not null,
varchar(40),
rate decimal(10,5)
);

10. Insert into course values
(100, "Machine Learning"),
(102, "full.stack.web.development"),
(102, "Complete Java development"),
(103, "Mern stack development"),
(104, "CS50-a Complete intro course for CS");
/* for enrollment */

11. create table enrollment (
student_id int, teacher_id int, course_id int, date_enrollment int,
primary key (student_id, teacher_id, course_id),
foreign key (student_id) reference student (id),
foreign key (course_id) reference course(course_id),
foreign key (teacher_id) reperences teacher(id)
);

/* Here we have made a table enrollment that contains the attribute student id, teacher id, course id and date of enrollment. Since date of enrollment can be same for multiple student, hence we make primary key as combo of student id, teacher id and course as same student can't read the same course with same teacher */

12. insert into enrollment values
(1, 200101, 111, '2021-02-05');
(1, 200102, 115, '2021-02-05');
(2, 200103, 113, '2020-05-29');
(4, 200104, 112, '2028-07-19');
(5, 200105, 111, '2021-02-10');

13. select * from enrollment;

DISCUSSION :

In this lab work we made a database named infosys_db where different tables like student, teacher, course, enrollment is made. The student table contains s_id, name, Similarly, the teacher consists of attribute like id, name. Here we insert data on those mentioned table and lastly linked all of the table with enrollment table which itself consist attribute like date of enrollment. Here the foreign key is student_id, teacher_id, course_id which is again acting as primary key in enrollment table such that there could be no chances of same student taking same course with same factor (Hence no duplicacy chances exists).

CONCLUSION :

Here in this lab work, we did the work related to primary and foreign key in the table. We learnt how to use the primary key of one table as foreign key of other. Also, we got to learn how to set multiple foreign key as a primary key.

We can conclude that Primary Key in a table can be defined as the attribute which needs to be unique such that it helps to retrieve data as per the developers preferences. Also, foreign key is the key that is shared by other tables, where they used to act as primary key.