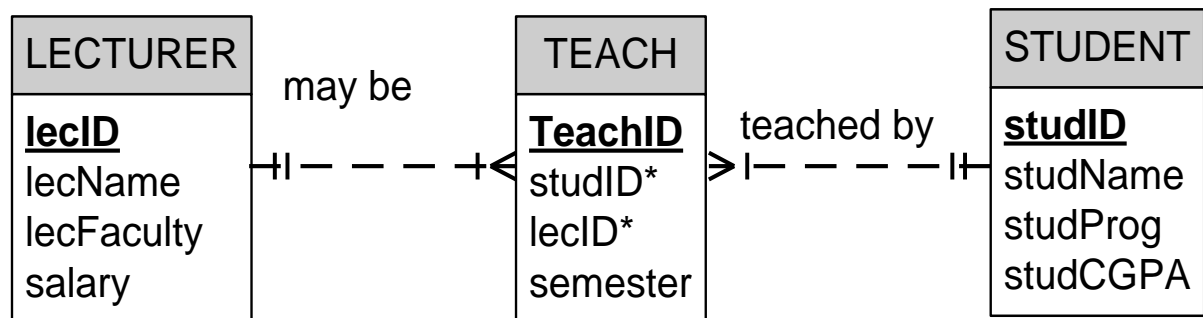


LAB 9: Data Maintenance and Data Definition Language

Based on ERD below:



ERD

1. Create new database (LEARN)

```
CREATE DATABASE Yourname_ LEARN
```

2. Create table statement according ERD above:

Syntax:

```
CREATE TABLE tablename1 (
    column1    datatype    [constraint],
    column2    datatype    [constraint],
    .....
    PRIMARY KEY (columnname)
);
```

```
CREATE TABLE tablename2 (
    column1    datatype    [constraint],
    column2    datatype    [constraint],
    .....
    PRIMARY KEY (columnname),
    FOREIGN KEY(columnname) REFERENCES tablename1 );
```

*** remember, attribute and data type FK must match with attribute and data type PK of related table.

Example:

```
CREATE TABLE VENDOR (
    V_CODE          INTEGER          NOT NULL    UNIQUE,
    V_NAME          VARCHAR(35)      NOT NULL,
    V_CONTACT       VARCHAR(15)      ,
    V_AREACODE      CHAR(3)          ,
    V_PHONE         CHAR(8)           ,
    V_STATE         CHAR(2)           ,
    V_ORDER         CHAR(1)           ,
    PRIMARY KEY (V_CODE));
```

```

CREATE TABLE PRODUCT (
P_CODE          VARCHAR(10)      NOT NULL   UNIQUE,
P_DESCRIPT      VARCHAR(35)      NOT NULL,
P_INDATE        DATE             NOT NULL,
P_QOH           INTEGER           NOT NULL,
P_MIN           INTEGER           NOT NULL,
P_PRICE         DECIMAL(8,2)      NOT NULL,
P_DISCOUNT     DECIMAL(5,2)     NOT NULL,
V_CODE          INTEGER,
PRIMARY KEY (P_CODE),
FOREIGN KEY(V_CODE) REFERENCES VENDOR(V_CODE) );

```

EXERCISE :

Table below Shows the table structure which will be used to create each table in database learn.

TABLE STUDENT

| Attribute name | Data declaration |
|----------------|------------------|
| STUD_ID (PK) | VARCHAR(10) |
| STUD_NAME | VARCHAR(50) |
| STUD_PROG | VARCHAR(15) |
| STUD_CGPA | DECIMAL(5,2) |

TABLE LECTURER

| Attribute name | Data declaration |
|----------------|------------------|
| LEC_ID (PK) | VARCHAR(6) |
| LEC_NAME | VARCHAR(50) |
| LEC_FACULTY | VARCHAR(6) |
| SALARY | DECIMAL(8,2) |

TABLE TEACH

| Attribute (Field) Name | Data Declaration |
|------------------------|------------------|
| TEACH_ID (PK) | INTEGER |
| STUD_ID (FK1) | VARCHAR(10) |
| LEC_ID (FK2) | VARCHAR(6) |
| SEMESTER | VARCHAR(10) |

Data Types in MySQL

| | Data Type | Example | Description |
|--------------------------|-----------------|---|--|
| String / Alphanumeric | CHAR(size) | fieldName CHAR(10) EX: COURSECODE CHAR(5) | Stores up to 255 characters. If the content is smaller than the field size, the content will have trailing spaces appended |
| | VARCHAR(size) | fieldName VARCHAR(100) EX: ADDRESS VARCHAR(50) | Stores up to 255 characters, and a minimum of 4 characters. No trailing spaces are appended to the end of this datatype. |
| Numeric | INTEGER | fieldName INT EX: QUANTITY INT | Round number |
| | DECIMAL | EX; PRICE DECIMAL (8,2) | Length of numeric value 8, decimal point 2 |
| | FLOAT | fieldName FLOAT | Used for single precision floating point numbers. |
| | DOUBLE | fieldName DOUBLE | Used for double precision floating point numbers |
| Date/Time | DATE | fieldName DATE | Stores dates in the format YYYY-MM-DD. |
| | TIMESTAMP(size) | fieldName DATETIME | Stores dates and times in the format YYYY-MM-DD HH:MM:SS. |
| | TIME | fieldName TIME | Stores times in the format HH:MM:SS. |
| | YEAR(size) | fieldName YEAR(4) | Stores the year as either a 2 digit number, or a 4 digit number, depending on the size provided. |

3. Insert Record into the table

Syntax:

**INSERT INTO tablename
VALUES (dataColumn1, dataColumn2,.....);**

**INSERT INTO tablename (ColumnA, ColumnB,.....)
VALUES (dataColumnA, dataColumnB,.....);**

EXERCISE:

Insert record. Show the sql statement and output (snipping tool) for each table.

STUDENT TABLE

| STUD_ID | STUD_NAME | STUD_PROG | STUD_CGPA |
|---------|-----------|-----------|-----------|
| S1234 | Siti | CS110 | 3.1 |
| S1235 | Muhamad | CS143 | 3.2 |
| S1236 | Aliya | CS111 | 3.3 |
| S1237 | Munir | CS143 | 2.5 |

LECTURER TABLE

| LEC_ID | LEC_NAME | LEC_FACULTY | SALARY |
|--------|-------------|-------------|---------|
| L01 | Nasir | CS143 | 3000.00 |
| L02 | Siti Rozana | CS110 | 4000.00 |
| L03 | Samsiah | CS110 | 2500.00 |

TABLE TEACH

| TEACH_ID | STUD_ID | LEC_ID | SEMESTER |
|----------|---------|--------|------------|
| 1 | S1234 | L01 | JULAI 2023 |
| 2 | S1236 | L01 | MAC 2024 |
| 3 | S1236 | L02 | MAC 2023 |

4. Altering the table structure

All changes in the table structure are made by using the **ALTER TABLE** command, followed by a keyword that produces the specific change you want to make.

Three options are available: ADD, MODIFY, and DROP.
ADD enables you to add a column,

EX: ALTER TABLE < TABLE NAME>
ADD ATTRIBUTE NAME DATA TYPE;

DROP enables you to drop column,
Ex: ALTER TABLE < TABLE NAME>
DROP ATTRIBUTE NAME ;

MODIFY enables you to change column characteristics
ALTER TABLE< TABLE NAME>
MODIFY ATTRIBUTE NAME DATATYPE

Supposing you wanted to add the column STUD_ADDRESS VARCHAR(50) **in the STUDENT table**

You would execute the following command:

```
ALTER TABLE STUDENT
ADD STUD_ADDRESS VARCHAR(50) ;
```

EXERCISE :

- a. Add new column STUD_ADDRESS VARCHAR (50) in the STUDENT table
- b. Add new column stud_DOB in student table. (Show the table record before add and after add)
- c. Remove STUD_ADDRESS from student table. (show the table record before and after remove)

5. Update data

Syntax:

```
UPDATE tablename
SET columnname = columnvalue
WHERE columnname = columvalue;
```

Example:

```
UPDATE      PRODUCT
SET  P_INDATE = '2008/1/18'
WHERE      P_CODE = '13-Q2/P2';
```

```
UPDATE      PRODUCT
SET  P_INDATE = '2008/1/18', P_PRICE = 17.99, P_MIN =10
WHERE      P_CODE = '13-Q2/P2';
```

EXERCISE:

- a. Update student name 'Siti' to 'siti Rahimah' for student id S1234 (show table record before and after update)
 - b. Update lecture name to mohd nasir and salary 6000.00 for lecturer id L01 (show table record before and after update)
6. Delete table rows and DROP database

Syntax:

DELETE FROM *tablename*
WHERE *columnname* = *columnvalue*;

(If WHERE condition is not specified, all rows from specified table will be deleted)

Example;

```
DELETE FROM PRODUCT
WHERE P_CODE = 'BRT-345';
```

Syntax:

DROP database <database name>

EXERCISE :

- a. Delete Record student where student id 'S1237' (show the table before and after delete)
- b. DROP database. (show before and after drop)