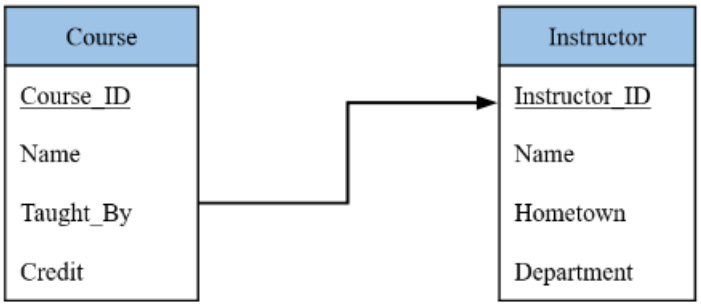
Bangladesh University of Business and Technology
Department of Computer Science and Engineering

CSE 232: Database Systems Lab

Lab 02 Tasks - Schema Diagram, Keys, and ALTER

Schema Diagram

A database schema along with primary key and foreign key dependencies, can be depicted by schema diagrams.



Foreign Key dependencies appear as arrows from the foreign key attributes of the referencing relation (Course) to the primary key of the referenced relation (Instructor).

Keys

Primary Key

Structure 1:

```
CREATE TABLE table_name
(
    column_1 data_type PRIMARY KEY,
    column_2 data_type,
    .
    .
    column_n data_type
);
```

Example:

```
CREATE TABLE instructor
    (
        i_id INT PRIMARY KEY,
        i_name VARCHAR(15),
        i_hometown VARCHAR(15),
        i_department VARCHAR(15)
    );
```

Structure 2:

```
CREATE TABLE table_name
(
    column_1 data_type,
    column_2 data_type,
    .
    .
    column_n data_type,
    PRIMARY KEY(column_1, column_2 ...)
);
```

Example:

```
CREATE TABLE instructor
    (
        i_id INT,
        i_name VARCHAR(15),
        i_hometown VARCHAR(15),
        i_department VARCHAR(15),
        PRIMARY KEY(i_id)
    );
```

Foreign Key

Structure:

```
CREATE TABLE table_1
    (
        column_1 data_type PRIMARY KEY,
        column_2 data_type,
        .
        .
        column_n data_type,
        CONSTRAINT constraint_name FOREIGN KEY(column_name) REFERENCES
    table_2(column_name)
    );
```

Example:

```
CREATE TABLE course
    (
        course_id INT PRIMARY KEY,
        name VARCHAR(15),
        taught_by INT,
        credit FLOAT,
        CONSTRAINT refer_taught_by FOREIGN KEY(taught_by) REFERENCES
   instructor(i_id)
    );
```

The INSERT INTO statement

Structure 1:

```
INSERT INTO table_name
VALUES (value1, value2, ...);
```

Example:

```
INSERT INTO instructor
VALUES (41201, 'Samia', 'Dhaka', 'CSE');
INSERT INTO course
VALUES (101, 'Database', 41201, 3.00);
```

The ALTER TABLE - ADD Column statement

Structure:

```
ALTER TABLE table_name
ADD column_name data_type;
```

Example:

```
ALTER TABLE instructor
ADD salary FLOAT;
```

The ALTER TABLE - ALTER/MODIFY Column statement

Structure:

```
ALTER TABLE table_name
ALTER COLUMN column_name data_type;
```

Example:

```
ALTER TABLE instructor
ALTER COLUMN salary INT;
```

Note: For some versions of MySQL, you would need to use MODIFY instead.
Structure:

```
ALTER TABLE table_name
MODIFY COLUMN column_name data_type;
```

Example:

```
ALTER TABLE instructor
MODIFY COLUMN salary INT;
```

The ALTER TABLE - DROP Column statement

Structure:

```
ALTER TABLE table_name
DROP column_name;
```

Example:

```
ALTER TABLE instructor
DROP salary;
```

For detailed description and example, visit here.

The ALTER TABLE - ADD CONSTRAINT statement

Structure:

```
ALTER TABLE table_name
ADD CONSTRAINT constraint_name constraint1, constraint2 ...;
```

Example:

```
ALTER TABLE Course
ADD CONSTRAINT PK_Course PRIMARY KEY (Course_ID);
```

The ALTER TABLE - DROP CONSTRAINT statement

Structure:

```
ALTER TABLE table_name
DROP CONSTRAINT constraint_name;
```

Example:

```
ALTER TABLE Course
DROP CONSTRAINT PK_Course;
```

For detailed description and example, visit here.

The ALTER TABLE - DROP PRIMARY KEY statement

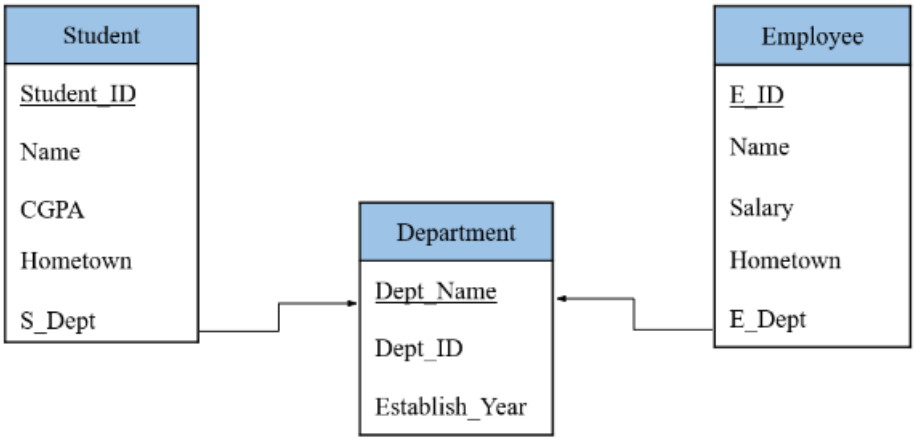
Structure:

```
ALTER TABLE table_name
DROP PRIMARY KEY;
```

Example:

```
ALTER TABLE Course
DROP PRIMARY KEY;
```

Tasks



1. Construct a database by following the given schema diagram.
2. Add 5 valid and 2 invalid data to each of the three tables. Check whether your database design is discarding invalid data properly or not.
3. Display all values of the student table.
4. Display all values of the employee table.
5. Display all values of the department table.
6. Display only the student ID and department of the students.
7. Display only the employee ID and department of the employees.
8. Change the primary key of the employee table from employee ID to employee name.