

EXPERIMENT 1.1

Title: Create Department and Course Tables with Normalization (up to 3NF)

Description:

You are designing an academic schema to manage departments and the courses they offer. Normalize the design into 3NF using two tables:

Departments

and

Courses

. Ensure each course belongs to exactly one department, and department names are not duplicated.

Input Format:

- Table **Departments** with columns:

- dept_id

(INT, Primary Key)

- dept_name

(VARCHAR(50))

- Table **Courses** with columns:

- course_id

(INT, Primary Key)

- course_name

(VARCHAR(100))

- dept_id

(INT, Foreign Key referencing Departments)

Constraints:

- Each course must be linked to a valid department.
- Department names must not repeat.
- All data should be in 3NF.

Query:

```
CREATE TABLE Departments (  
    dept_id INT PRIMARY KEY,  
    dept_name VARCHAR(50) UNIQUE NOT NULL);  
  
CREATE TABLE Courses (  
    course_id INT PRIMARY KEY,  
    course_name VARCHAR(100) NOT NULL,  
    dept_id INT NOT NULL,  
    FOREIGN KEY (dept_id) REFERENCES Departments(dept_id));  
  
SELECT * FROM Departments;  
  
SELECT * FROM Courses;
```

Output:

The screenshot shows the byteXL editor interface. The left sidebar contains a navigation menu with options: Home, Dashboard, Feedback Requests, Reports, Student Reports, Learning, AI Mentor (Beta), Courses, Classes, and Editor (selected). The main editor area displays a file named 'commands.sql' with the following SQL code:

```
1  
2 - CREATE TABLE Departments (  
3     dept_id INT PRIMARY KEY,  
4     dept_name VARCHAR(50) UNIQUE NOT NULL  
5 );  
6  
7 - CREATE TABLE Courses (  
8     course_id INT PRIMARY KEY,  
9     course_name VARCHAR(100) NOT NULL,  
10    dept_id INT NOT NULL,  
11    FOREIGN KEY (dept_id) REFERENCES Departments(dept_id)  
12 );  
13  
14  
15  
16 SELECT * FROM Departments;  
17 SELECT * FROM Courses;  
18  
19  
20  
21  
22  
23  
24  
25
```

On the right side of the editor, there is a 'STDOUT' panel. It shows the output of the executed queries:

```
CREATE TABLE  
CREATE TABLE  
dept_id | dept_name  
-----+-----  
(0 rows)  
  
course_id | course_name | dept_id  
-----+-----+-----  
(0 rows)
```

Learning Outcome:

Design tables with primary and foreign keys.

Maintain data integrity by enforcing constraints like PRIMARY KEY, FOREIGN KEY, and UNIQUE.