CSC-430 – Database Management Systems
Lab 3: HANDS ON
TIME: max 60 mins

Table Relationship

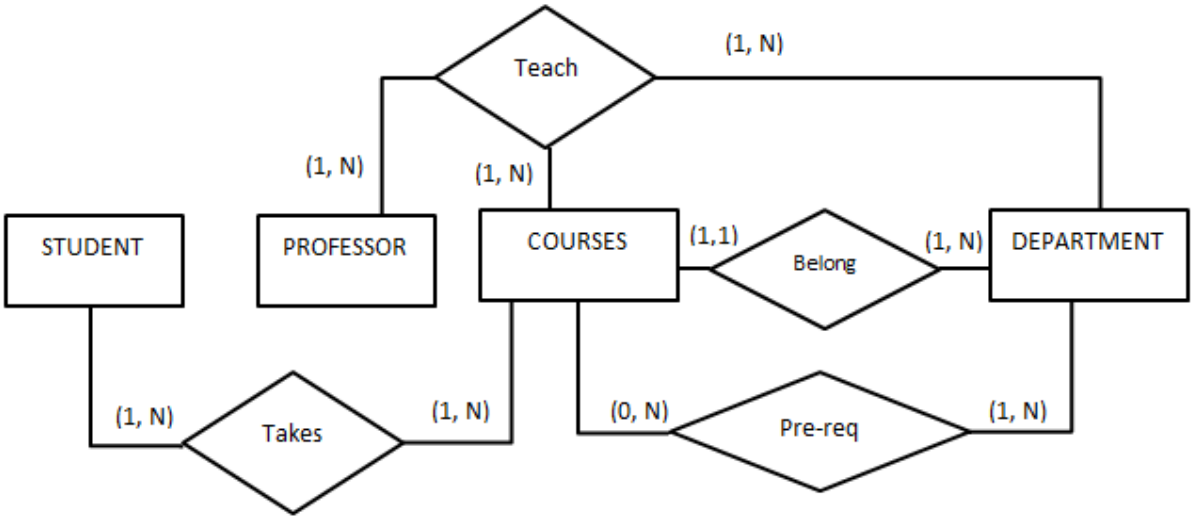

Table Descriptions

The tables are described in order of relationship described in the previous figure.

STUDENT

There is one row in the STUDENT table for each student registering for the course.

Column Name	Data Type	Meaning	NULL allowed
SID	Varchar (10)	Student ID	No
Name	Varchar (45)	Last, First Name	Yes
Address	Varchar (45)	Address	Yes

PROFESSOR

There is one row in the PROFESSOR table for each professor in the department

Column Name	Data Type	Meaning	NULL allowed
PID	Varchar (10)	Professor ID	No
Name	Varchar (45)	Last, First Name	Yes
Office	Varchar (10)	Office number	Yes
DateofBirth	Date	Age of Professor	Yes

COURSE

There is one row in the COURSE table for each course offered that quarter.

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Column Name	Data Type	Meaning	NULL allowed
CourseNum	Integer	Course number	No
DeptName	Varchar(45)	Name of Department	No
CourseName	Varchar(45)	Course Name	Yes
ClassRoom	Varchar(45)	Room Number	Yes
Enrollment	Integer	Number of Students Enrolled	Yes

DEPARTMENTS

There is one row in the DEPARTMENTS table for each department in the University.

Column Name	Data Type	Meaning	NULL allowed
DeptName	Varchar (45)	Name of Department	No
ChairmanID	Varchar (45)	Name of Chairman	Yes

PREREQ

There is one row in the PREREQ table for each pre-requite for any course.

Column Name	Data Type	Meaning	NULL allowed
CourseNum	Integer	Course Number	No
DeptName	Varchar (45)	Name of Department	No
PreReqNumber	Integer	Pre requisite Number	Yes
PreReqDeptName	Varchar (45)	Pre requisite Dept Name	Yes

TEACH

There is a row in the TEACH table for each course taught by a professor.

Column Name	Data Type	Meaning	NULL allowed
PID	Varchar(10)	Professor who teaches the course	No
CourseNum	Integer	The course taught	No
DeptName	Varchar (45)	The department the course taught	No

TAKE

There is a row in the TAKE table for each course enrolled by a student.

Column Name	Data Type	Meaning	NULL allowed
SID	Varchar (10)	ID of student taking a course	No
CourseNum	Integer	The course take by student	No
DeptName	Varchar (45)	The department of course	No
Grade	Decimal(4,2)	The grade obtained	Yes
ProfessorEval	Decimal(4,2)	The professor evaluation	Yes

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HANDSON

Example 1: Using **INNER JOIN** and **ON**:

Question: Write an SQL query that joins the COURSES with the PREREQ relation with the condition that their corresponding *CourseNum* match.

```
SELECT * FROM COURSES c
JOIN PREREQ p
ON c.CourseNum = p.CourseNum;
```

Example 2: **Using INNER JOIN and ON with additional conditions:**

Question: Write an SQL query that joins the COURSES with the PREREQ relation with a condition that their corresponding *CourseNum* match AND the enrollment > 25

```
SELECT * FROM COURSES c
JOIN PREREQ p
ON c.CourseNum = p.CourseNum
AND c.enrollment > 25;
```

Example 3: **Natural Join:**

Question: Write an SQL for the NATURAL JOIN of PROFESSORS and TEACH relations

```
SELECT * FROM PROFESSORS
NATURAL JOIN TEACH;
```

Example 4: **INNER JOIN and USING:**

Question: Write an SQL that matches COURSES and PREREQ relations USING *CourseNum* and *DeptName* attributes to join these relations.

```
SELECT * FROM COURSES c
JOIN PREREQ p
USING (coursenum, deptname);
```

Example 5: LEFT OUTER JOIN:

Question: Write an SQL to return all details from the PROFESSORS relation and joins details from TEACH relation whether or not the Professor's *PID* exists in the TEACH relation.

```
SELECT * FROM PROFESSORS p
LEFT JOIN TEACH t
ON p.pid = t.pid;
```

Example 6: AGGREGATION , GROUP BY, HAVING:

Question: SELECT the *deptname* and their minimum and maximum *enrollments* from the COURSES relation and GROUP the result BY *deptname* and HAVING min(enrollments) > 20.

```
SELECT deptname, min(enrollment),max(enrollment)
FROM COURSES
GROUP BY deptname
HAVING min(enrollment) > 20;
```