

Scenario to ER Diagram: Step by Step solution Example

The Scenario:

A University contains many Faculties. The Faculties in turn are divided into several Schools. Each School offers numerous programs and each program contains many courses. Lecturers can teach many different courses and even the same course numerous times. Courses can also be taught by many lecturers. A student is enrolled in only one program but a program can contain many students. Students can be enrolled in many courses at the same time and the courses have many students enrolled.

Step 1 - Identify Entities

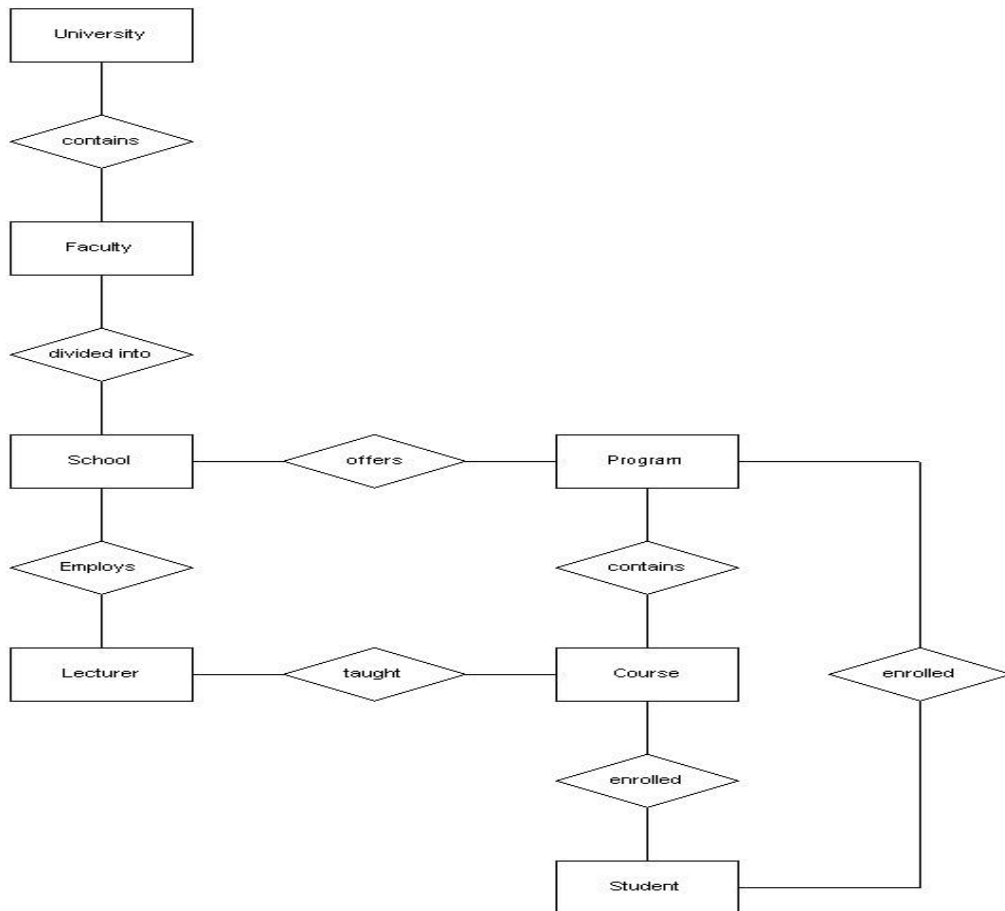
The entities in this scenario are

- University
- Faculty
- School
- Program
- Course
- Lecturer
- Student

Step 2 - Find relationships

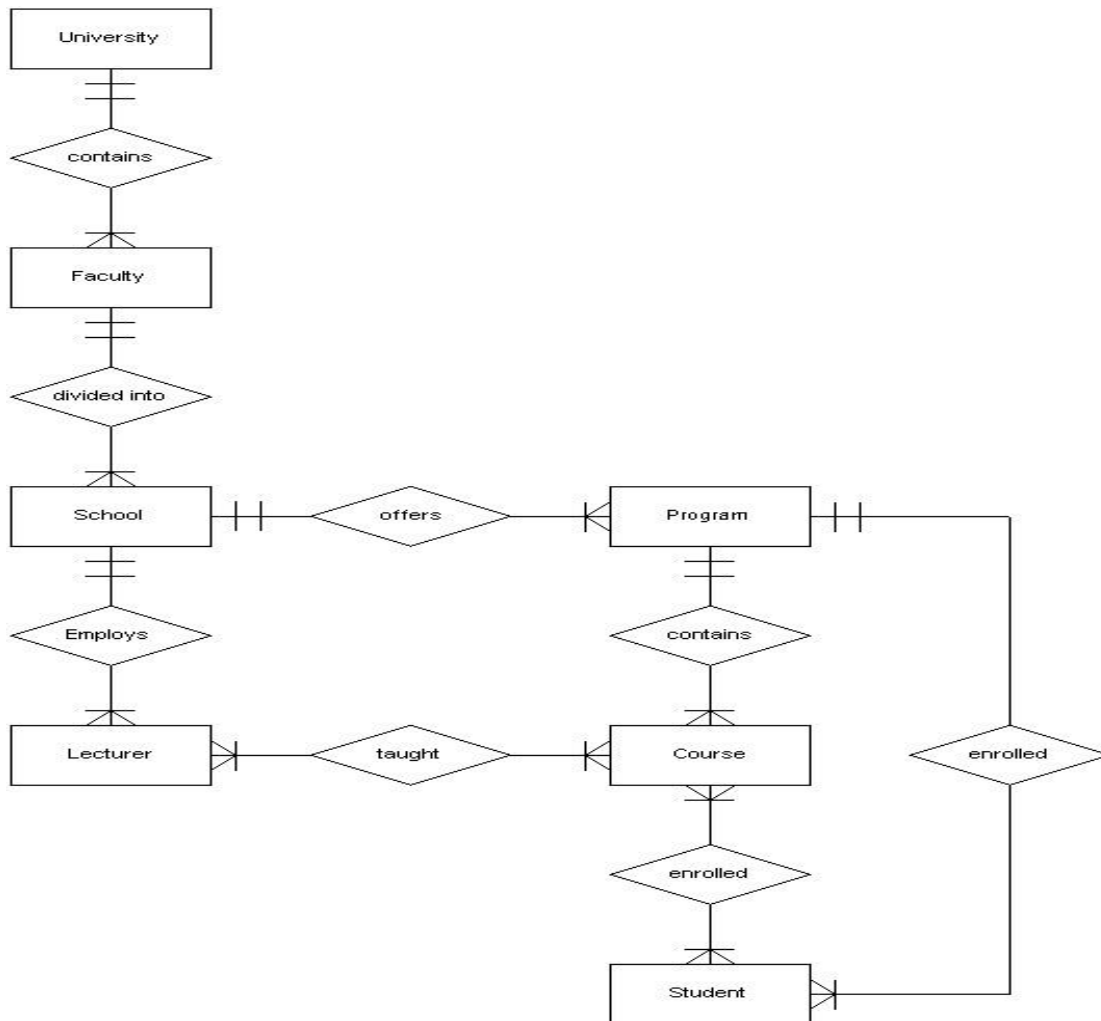
	University	Faculty	School	Program	Course	Lecturer	Student
University		contains					
Faculty			divided into				
School				offers		employs	
Program					contains		
Course							taken by
Lecturer					taught		
Student				enrolled	enrolled		

Step 3 - Draw rough ERD



Step 4 - Fill in cardinality

- The university contains many faculties
- Each faculty is divided into several schools
- Each school offers numerous programs
- Each program contains many courses
- Each school employs many lecturers
- Lecturers can teach many courses
- Lecturers can teach the same course many times
- Courses can be taught by more than one lecturer
- A student is enrolled in only one program
- Students can be enrolled in many courses at the same time
- Courses have many students enrolled

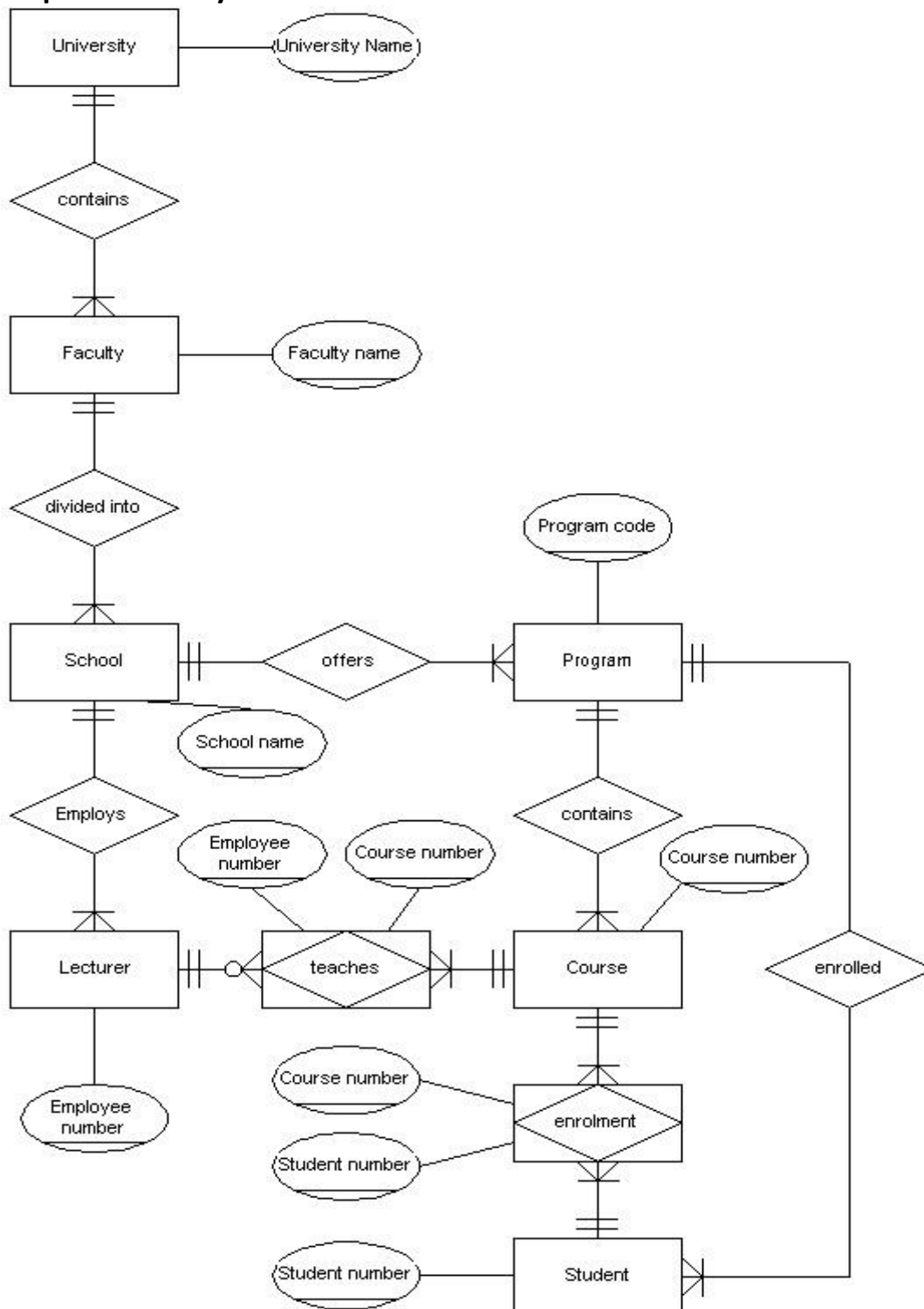


Step 5 - Define primary keys

The primary keys could be

- University – University name
- Faculty – Faculty name
- School – School name
- Program – Program code
- Course – Course number
- Lecturer – Employee number
- Student – Student number

Step 6 - Draw key-based ERD



In this step any many-to-many relationships have to be eliminated. In the ERD so far there are two relationships that fall into this category. They are Lecturer – Course and Course – Student. As you can see Associative entities have been included to rectify the situation.

Step 7 - Identify attributes

In the scenario there are no attributes indicated, so it is up to the analyst to ascertain what data needs to be kept about each particular entity.

For example other attributes for Lecturer could be

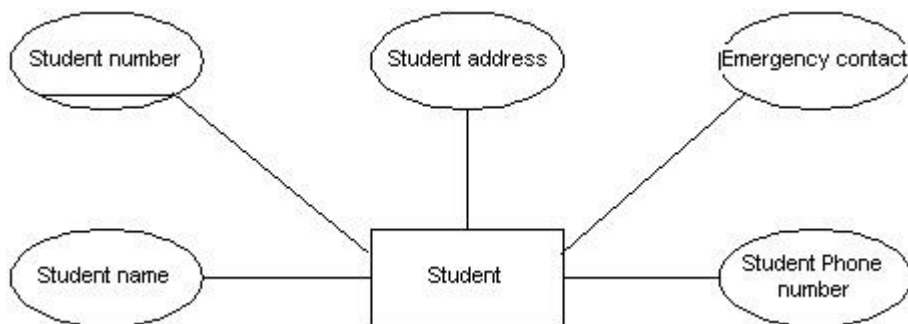
- Employee Name
- Employee Address
- Speciality

Step 8 - Map attributes

An example of mapping the attributes would be

Attribute	Entity	Attribute	Entity
Employee_name	Lecturer	Faculty_name	Faculty
Employee_number	Lecturer	Student_number	Student
Course_number	Course	Student_name	Student

Step 9 - Draw fully attributes ERD



Now, add attributes of all entities. This is an example of what all the entities should look like when they have been fully attributed.

[illegible]