



Module 5

Extended Query Formulation with SQL

Lesson 3: Problems involving joins and grouping

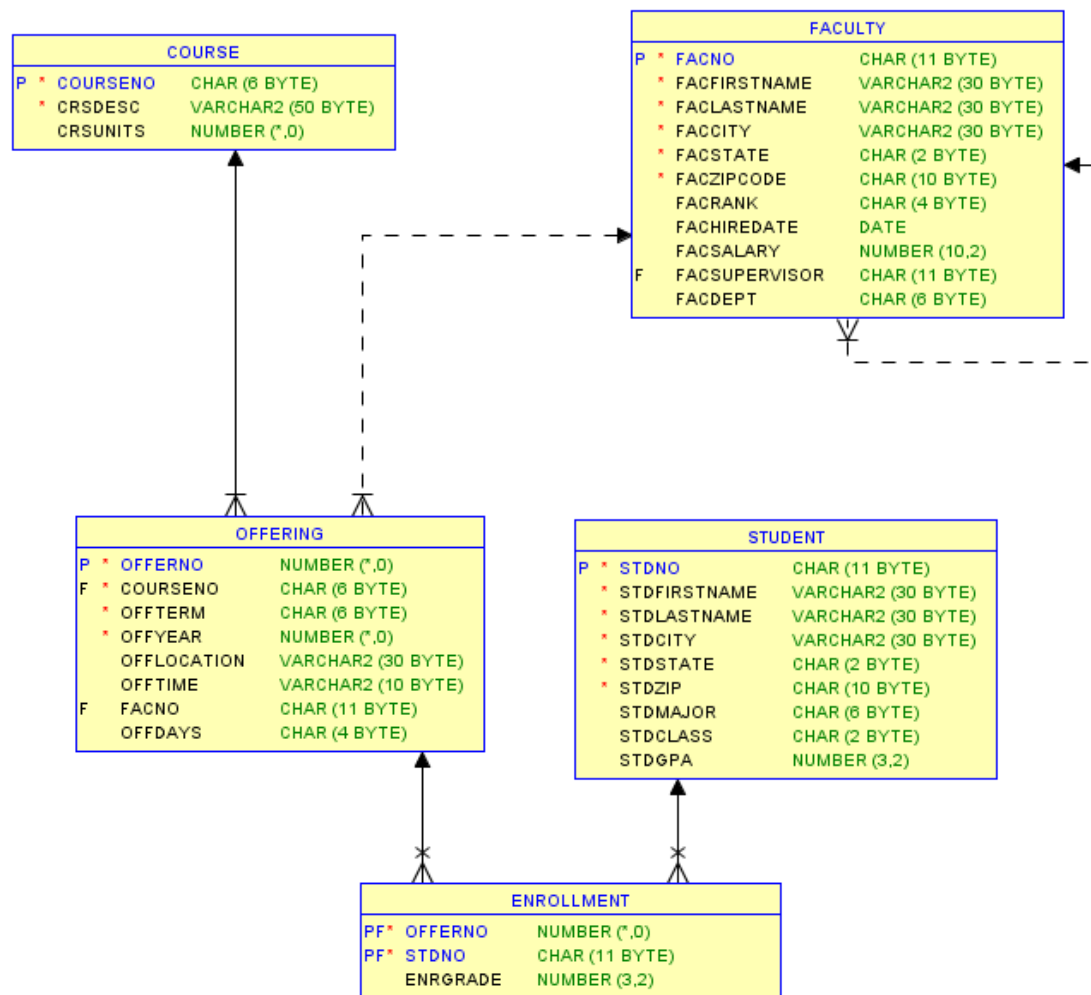


Lesson Objectives

- Use the critical questions to analyze problem statements
- Write SELECT statements involving joins and grouping



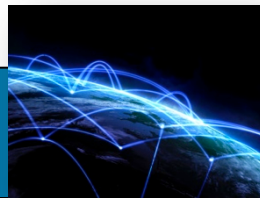
University Database



Joins and Summarization I

Example 1: List the offering number, number of students enrolled, and the average GPA in in each 2017 offering. Only include offerings with an average GPA greater than 3.3.

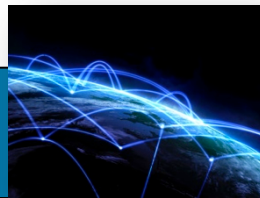
```
SELECT Offering.OfferNo,  
       COUNT(*) AS NumStudents,  
       AVG(StdGPA) AS AvgGPA  
FROM Enrollment, Offering, Student  
WHERE Offering.OfferNo = Enrollment.OfferNo  
      AND Student.StdNo = Enrollment.StdNo  
      AND OffYear = 2017  
GROUP BY Offering.OfferNo  
HAVING AVG(StdGPA) > 3.3;
```



Multiple Column Grouping

Example 2: List the course number, the offering number, and the number of students enrolled. Only include courses offered in spring 2017.

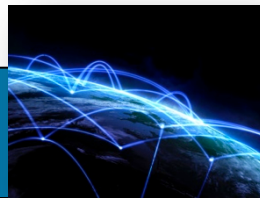
```
SELECT CourseNo, Enrollment.OfferNo,  
       Count(*) AS NumStudents  
FROM Offering, Enrollment  
WHERE Offering.OfferNo = Enrollment.OfferNo  
      AND OffYear = 2017 AND OffTerm = 'SPRING'  
GROUP BY Enrollment.OfferNo, CourseNo;
```



Joins and Summarization II

Example 3: List the offering number, course number, faculty first name, faculty last name, and average GPA. Only include courses offered in fall 2016 in which the average GPA is greater than 3.0.

```
SELECT Enrollment.OfferNo, CourseNo, FacFirstName,  
       FacLastName, AVG(StdGPA) AS AvgGPA  
FROM Offering, Enrollment, Student, Faculty  
WHERE Offering.OfferNo = Enrollment.OfferNo  
      AND Student.StdNo = Enrollment.StdNo  
      AND Faculty.FacNo = Offering.FacNo  
      AND OffYear = 2016 AND OffTerm = 'FALL'  
GROUP BY Enrollment.OfferNo, CourseNo,  
         FacFirstName, FacLastName  
HAVING AVG(StdGPA) > 3.0;
```



Summary

- Remember the query formulation process
- Use critical questions to convert a problem statement into a database representation
- Use a database diagram for connections among tables

