

SQL Language

Exercises on JOIN, GROUP BY clauses

1. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

STUDENT (StudID, SName, City)

COURSE(CourseID, CName, TeacherID)

TEACHER (TeacherID, TName)

EXAM(CourseID, StudID, Date, Grade)

- Find the student ID and the maximum, minimum and average exam grade for each student
- Find the student ID, the name, and the maximum, minimum and average exam grade for each student
- For each student with an average grade higher than 28, find the studentID, name, and the maximum, minimum and average exam grade for each student
- For each student with an average grade higher than 28 and who has had exams in at least 10 different dates, find the student ID, the name and the maximum, minimum and average exam grade for each student

2. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

PERSON (TaxID, Name, BirthDate)

PRIVATE_LESSON (TaxID, Date, Hour, InstID)

INSTRUCTOR (InstID, NameI)

- For each person view the tax code and the number of lessons attended
- For each person view the tax code, the name and the number of lessons attended
- For each person view the tax code, the name, the number of lessons attended and the number of (different) instructors with whom he or she has done lessons
- For each person born after 1970 who has attended at least 5 lessons, view the tax code, the name, the number of lessons attended and the number of (different) instructors with whom he has taken lessons

3. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

COURSE (CourseID, CourseName, Year, Semester)

COURSE_SCHEDULE (CourseID, WeekDay, StartTime, EndTime, Room)

- a) Find course code, course name and total number of lessons per week for third-year courses for which the total number of lessons per week is greater than 10 and lessons are on more than three different days of the week.

4. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

ACCOMMODATION (CodeA, Address, City, Area)

LEASE (CodC, StartDate, EndDate*, PersonName, CodeA, MonthlyRent)

Note: Area expressed in square meters. For current contracts, EndDate is NULL.

- a) Find the name of people who have entered into more than two rental contracts for the same apartment (at different times).
- b) Find, for cities where at least 100 contracts have been signed, the city, the maximum monthly cost of rents, the average monthly cost of rents, the maximum duration of contracts, the average duration of contracts and the total number of contracts concluded.

Nested queries (in, not in, exists, not exists)

5. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

ORCHESTRA (CodeO, NameO, DirectorName, NoElements)

CONCERT(CodeC, Date, CodeO, CodeH, TicketPrice)

HALL (CodeH, Name, City, Capacity)

- a) Find the code and name of the orchestras with more than 30 elements that have given concerts both in Turin and in Milan and have never held concerts in Bologna.

6. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

COURSE (CourseID, CourseName, Year, Semester)

COURSE_SCHEDULE (CourseID, WeekDay, StartTime, EndTime, Room)

- a) Find classrooms where first-year classes were never held.

7. Given the following relational schema (primary keys are underlined, optional attributes are indicated by “*”)

ACCOMMODATION (CodeA, Address, City, Area)

LEASE (CodC, StartDate, EndDate*, PersonName, CodeA, MonthlyRent)

Note: Area expressed in square meters. For current contracts, EndDate is NULL.

- a) Find the name of people who have never rented accommodation with an area of more than 80 square meters.
- b) Find the code and address of the apartments in Turin where the monthly fee has always been higher than 500 euros and for which at most 5 rental contracts have been stipulated.

Correlated queries

1. Sia dato il seguente schema relazionale (le chiavi primarie sono sottolineate, gli attributi opzionali sono indicati con “*”)

ACCOMMODATION (CodeA, Address, City, Area)

LEASE (CodC, StartDate, EndDate*, PersonName, CodeA, MonthlyRent)

Note: Area expressed in square meters. For current contracts, EndDate is NULL.

- a) Find the code, address and city of the accommodations that have an area greater than the average area of the accommodations of the cities in which they are located.

2. Sia dato il seguente schema relazionale (le chiavi primarie sono sottolineate, gli attributi opzionali sono indicati con “*”)

AIRCRAFT (SerialNumber, Model, Capacity)

SCHEDULE (Code, Departure, Destination, DepartureTime, ArrivalTime)

FLIGHTS (Code, SerialNumber, Date, NoReservations)

- a) Find the routes (city of departure, city of arrival) that have never been made with a Boeing-747 aircraft.