Fundamentals for Applied Data Science

TUT 3 - SQL Query Exercises

Exercise 1

Given the UNIVERSITY database schema, specify the SQL queries.

STUDENT

Name	Student_number	Class	Major
Smith	17	1	CS
Brown	8	2	CS

COURSE

Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

SECTION

Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	07	King
92	CS1310	Fall	07	Anderson
102	CS3320	Spring	08	Knuth
112	MATH2410	Fall	08	Chang
119	CS1310	Fall	08	Anderson
135	CS3380	Fall	08	Stone

GRADE_REPORT

Student_number	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

PREREQUISITE

Course_number	Prerequisite_number
CS3380	CS3320
CS3380	MATH2410
CS3320	CS1310

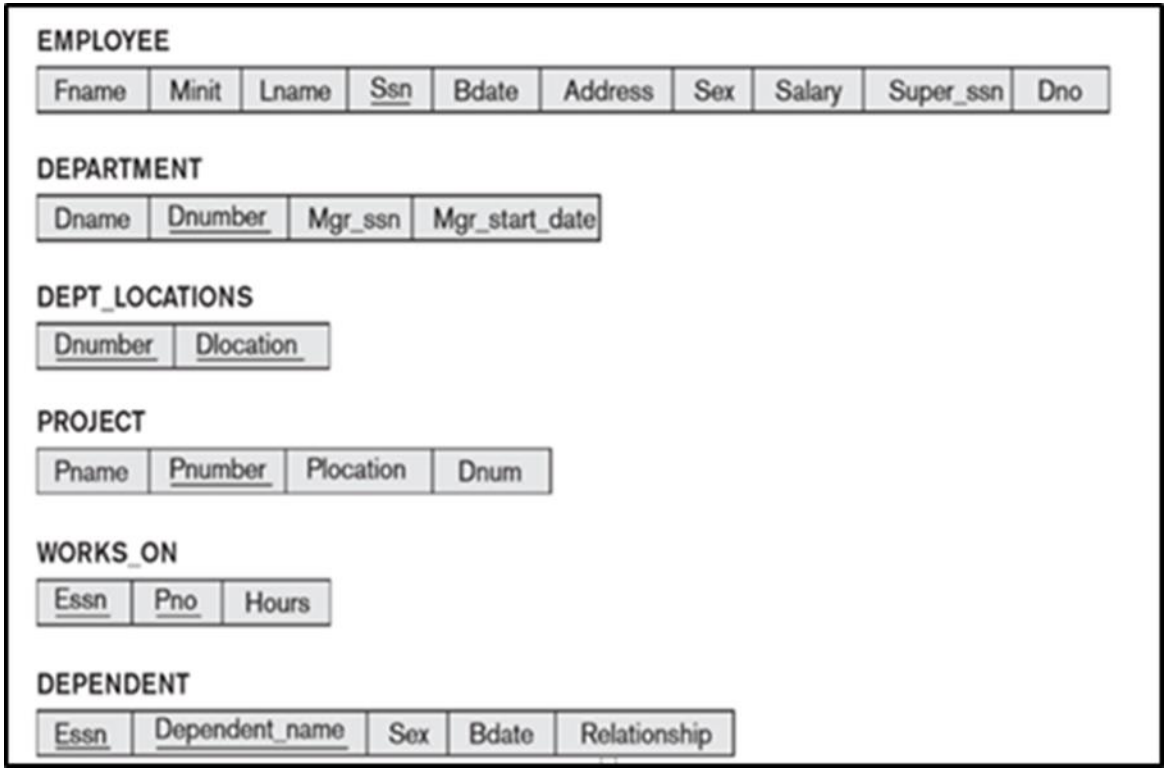
Exercise 1

1. Retrieve the names and major departments of all straight-A students (i.e., those that got ‘A’ in all their courses)

2. Retrieve the names and major departments of all students who do not have any grade of A in any of their courses.

Exercise 2

- Specify the following queries on the COMPANY database
- Use nested queries for Question 3-5



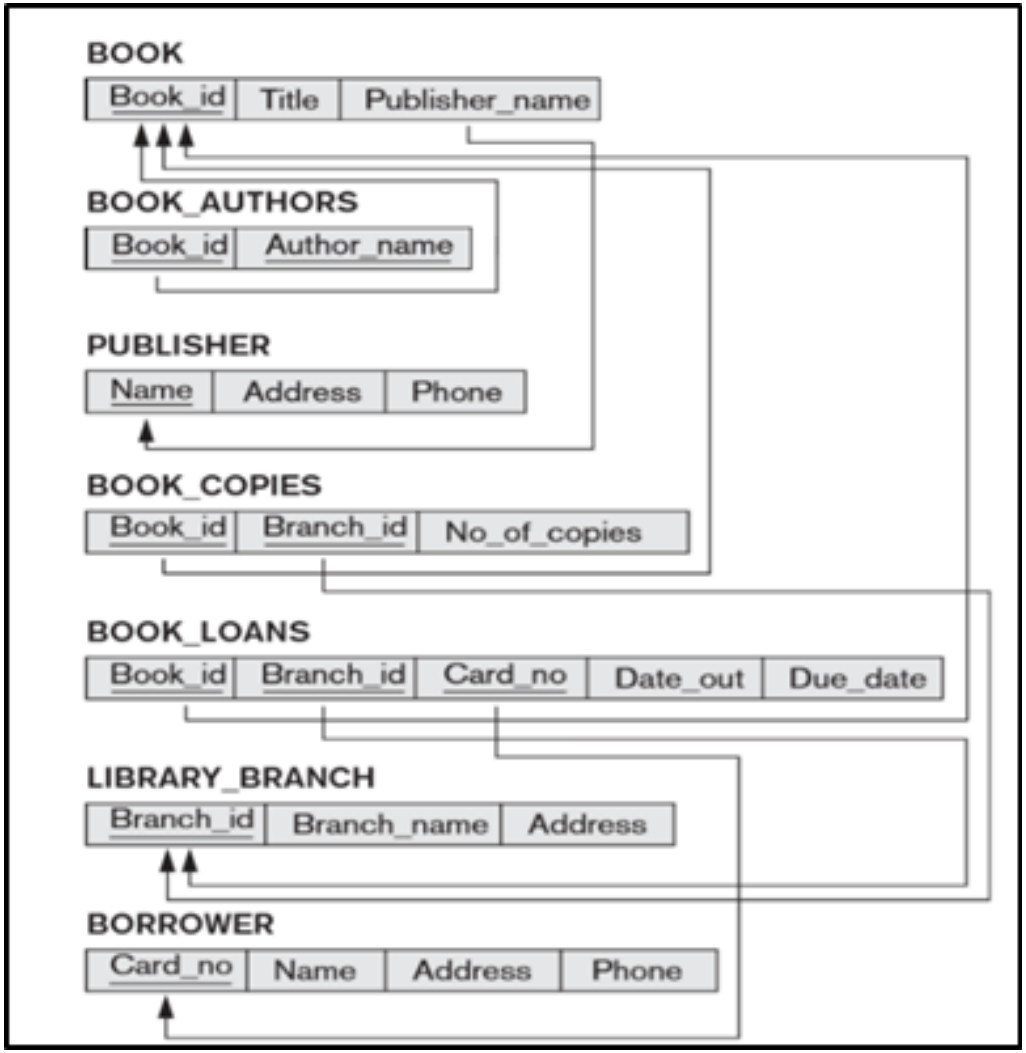
Exercise 2

1. For each department whose average employee salary is over 30K, retrieve the department name and the number of employees working for it
2. In addition to the above query, suppose we want the number of male employees in each department rather than all employees
3. Retrieve the names of all employees who work in the department that has the employee with the highest salary among all employees
4. Retrieve the names of all employees whose supervisor have '888665555' for SSN
5. Retrieve the names of employees who make at least 10K more than the employee who is paid the least in the company.

Exercise 3

Consider the LIBRARY relational database schema shown in Figure.

- Write appropriate SQL DDL statements for declaring the LIBRARY relational database schema.



Exercise 4

- Write SQL update statements to do the following on the database schema shown in the Figure.

1. Insert a new student, <'Johnson', 25, 1, 'Math'>, in the database.
2. Change the class of student 'Smith' to 2.
3. Insert a new course, <'Knowledge Engineering', 'CS4390', 3, 'CS'>.
4. Delete the record for the student whose name is 'Smith' and whose student number is 17.

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CS3380	MATH2410
CS3320	CS1310

Exercise 5

- Consider the schema given in the Figure. Write SQL queries for the following:

Branch	(branchNo, street, city, postcode)
Staff	(staffNo, fName, lName, position, sex, DOB, salary, branchNo)
PropertyForRent	(propertyNo, street, city, postcode, type, rooms, rent, ownerNo, staffNo, branchNo)
Client	(clientNo, fName, lName, telNo, prefType, maxRent)
PrivateOwner	(ownerNo, fName, lName, address, telNo)
Viewing	(clientNo, propertyNo, viewDate, comment)
Registration	(clientNo, branchNo, staffNo, dateJoined)

a) Produce a list of salaries for all staff, showing only the staff number, the first and last names, and the salary details.

b) Produce a list of monthly salaries for all staff, showing the staff number, the first and last names, and the salary details.

Exercise 5

c) List the addresses of all branch offices in London or Glasgow

d) List all managers and supervisors.

e) Find all owners with the string ‘Glasgow’ in their address.

f) List the details of all viewings on property PG4 where a comment has not been supplied.

g) Produce a list of salaries for all staff, arranged in descending order of salary.

h) How many properties cost more than £350 per month to rent?

i) Find the minimum, maximum, and average staff salary.

j) List the staff who work in the branch at ‘163 Main St’.

k) List the properties that are handled by staff who work in the branch at ‘163 Main St’.

Exercise 5

l) Find all staff whose salary is larger than the salary of at least one member of staff at branch B003.

m) List all branch offices and any properties that are in the same city.

n) Find all staff who work in a London branch office using the 'EXISTS' clause.

o) Construct a list of all cities where there is either a branch office or a property.

p) Construct a list of all cities where there is both a branch office and a property.

q) Construct a list of all cities where there is a branch office but no properties.

Exercise 6

Hotel	(hotelNo, hotelName, city)
Room	(roomNo, hotelNo, type, price)
Booking	(hotelNo, guestNo, dateFrom, dateTo, roomNo)
Guest	(guestNo, guestName, guestAddress)

a) Create a view containing the hotel name and the names of the guests staying at the hotel.

b) Create a view containing the account for each guest at the Grosvenor Hotel.