CS4400: Introduction to Database Systems

"Hints" for Practicing SQL Queries (v3 – last updated on Sun, 24 May 2020)

## Practice Queries from the Textbook: All Categories

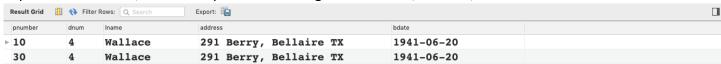
practiceQuery0: [book 0] Retrieve the birth date and address of the employees whose name is 'John Smith'.



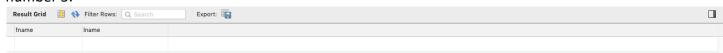
**practiceQuery1:** [book 1] Retrieve the first name, last name and address of all employees who work for the 'Research' department.



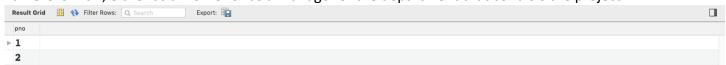
**practiceQuery2:** [book 2] For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.



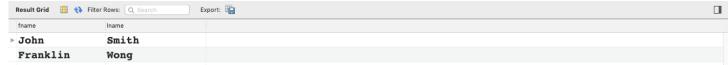
*practiceQuery3:* [book 3] Find the names of employees who work on all the projects controlled by department number 5.



**practiceQuery4:** [book 4] Make a list of project numbers for projects that involve an employee whose last name is 'Smith', either as a worker or as a manager of the department that controls the project.



practiceQuery5: [book 5] List the names of all employees with two or more dependents.



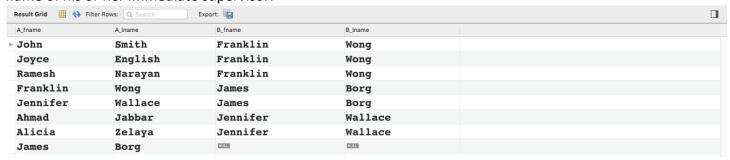
practiceQuery6: [book 6] Retrieve the names of employees who have no dependents.



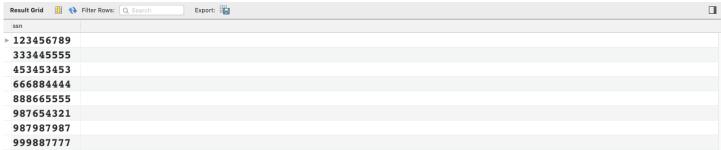
practiceQuery7: [book 7] List the names of managers who have at least one dependent.



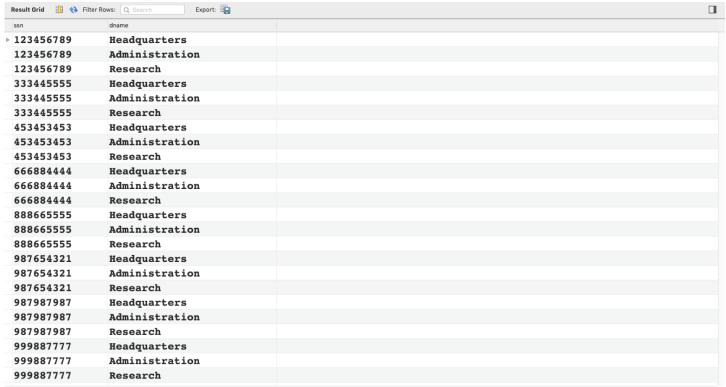
**practiceQuery8:** [book 8] For each employee, retrieve the employee's first and last name and the first and last name of his or her immediate supervisor.



practiceQuery9: [book 9] Select all of the employee's Social Security Numbers.



*practiceQuery10:* [book 10] Select all possible combinations of the employee's Social Security Numbers and department names.



practiceQuery11: [book 11] Retrieve the distinct salaries of all of the employees.



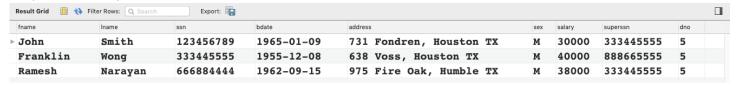
*practiceQuery12:* [book 12] Retrieve the first and last names of all employees whose address is in Houston, Texas.



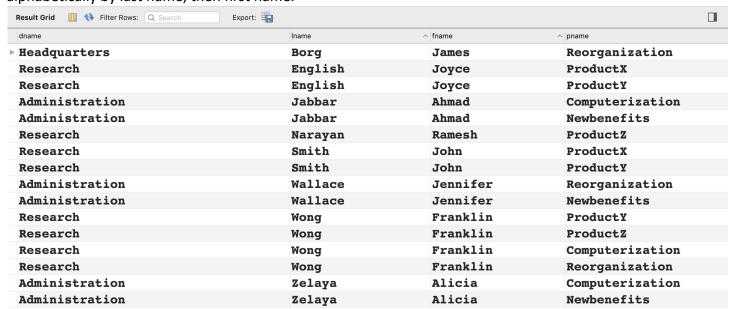
*practiceQuery13:* [book 13] Show the first and last names and resulting salaries if every employee working on the 'ProductX' project is given a 10% raise.



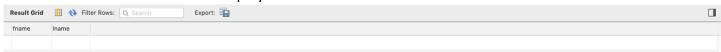
*practiceQuery14:* [book 14] Retrieve all information for employees in department 5 whose salary is between \$30,000 and \$40,000.



*practiceQuery15:* [book 15] Retrieve a list of department names, employee first and last names, and the project names they are working on, ordered by department and, within each department, ordered alphabetically by last name, then first name.



**practiceQuery16:** [book 16] Retrieve the name of each employee who has a dependent with the same first name and is the same sex as the employee.



*practiceQuery17:* [book 17] Retrieve the Social Security numbers of all employees who work on project numbers 1, 2 or 3.



practiceQuery18: [book 18] Retrieve the names of all employees who do not have supervisors.



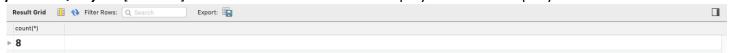
**practiceQuery19:** [book 19] Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary.



**practiceQuery20:** [book 20] Find the sum of the salaries of all employees of the 'Research' department, as well as the maximum salary, the minimum salary, and the average salary in this department.



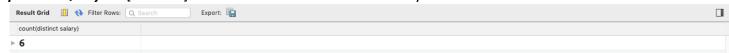
practiceQuery21: [book 21] Retrieve the total number of employees in the company.



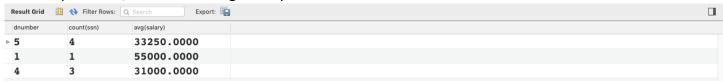
practiceQuery22: [book 22] Retrieve the total number of employees in the 'Research' department.



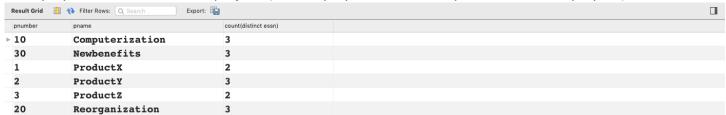
practiceQuery23: [book 23] Count the number of distinct salary values in the database.



*practiceQuery24:* [book 24] For each department, retrieve the department number, the number of employees in the department, and their average salary.



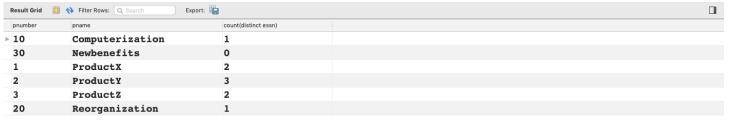
*practiceQuery25:* [book 25] For each project, retrieve the project number, the project name, and the number of employees who work on that project. (Null employees will be interpreted as zero employees).



*practiceQuery26:* [book 26] For each project on which more than two employees work, retrieve the project number, the project name, and the number of employees who work on the project.



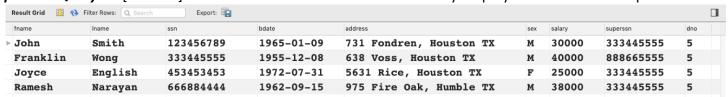
*practiceQuery27:* [book 27] For each project, retrieve the project number, the project name, and the number of employees from department 5 who work on the project.



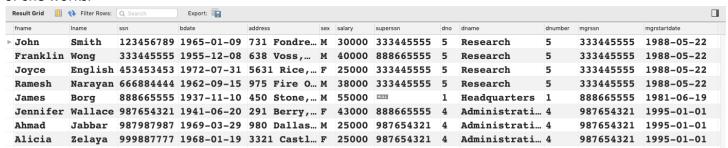
practiceQuery28: [book 28] For each department that has less than four\* employees, retrieve the department number and the number of its employees who are making more than \$25,000\*. (Less than four employees instead of more than five, and \$25,000 instead of \$40,000 to make the results more fruitful.)



practiceQuery29: [book 1c] Retrieve all of the attribute values for any employee who works in department 5.



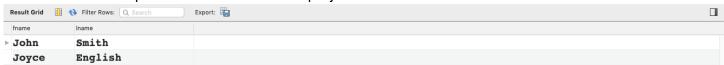
*practiceQuery30:* [book 1d] Retrieve all of the attributes for each employee and the department for which he or she works.



*practiceQuery31:* [book 12a] Find the first name, last name and birthdate of the employees who were born during the 1950s.



*practiceQuery32:* [book 6\_10a] Retrieve the first and last names of all employees in department 5 who work more than 10 hours per week on the ProductX project.



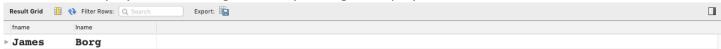
*practiceQuery33:* [book 6\_10b] List the first and last names of all employees who have a dependent with the same first name as themselves.



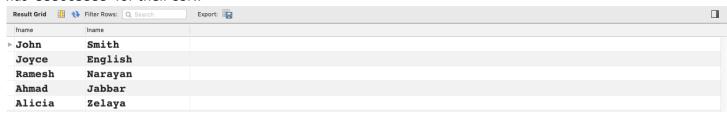
*practiceQuery34:* [book 6\_10c] Find the first and last names of all employees who are directly supervised by 'Franklin Wong'.



**practiceQuery35:** [book 7\_7a] Retrieve the first and last names of all employees who work in the department that has the employee with the highest salary among all employees.



*practiceQuery36:* [book 7\_7b] Retrieve the first and last names of all employees whose supervisor's supervisor has '888665555' for their SSN.



**practiceQuery37:** [book 7\_7c] Retrieve the first and last names of employees who make at least \$10,000 more than the employee who is paid the least in the company.

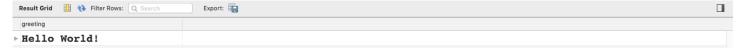


### **Practice Queries: Introductory Level Select Only**

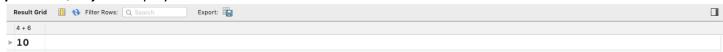
practiceQuery40: Display the words 'Hello World!'



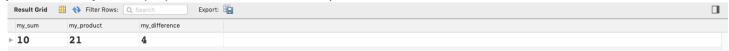
practiceQuery41: Display the words 'Hello World!' as a 'greeting'



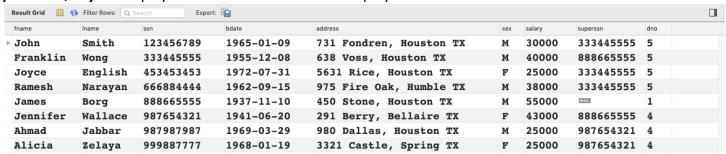
### practiceQuery42: Display the sum of 4 and 6



practiceQuery43: Display the sum of 4 and 6, the product of 3 and 7, and the difference of 9 and 5

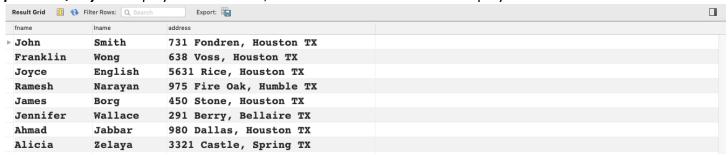


#### practiceQuery44: Display the entire contents of the employees table

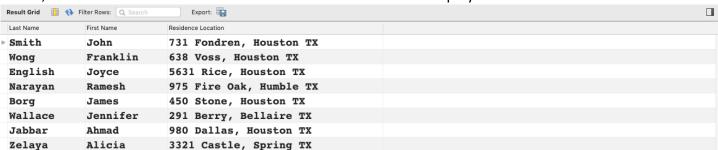


## Practice Queries: Select - From - Where - Order By

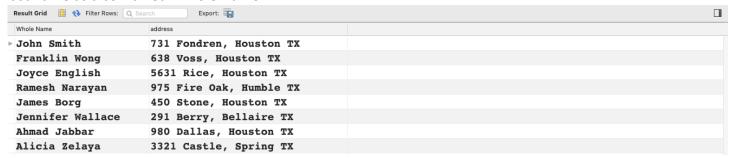
practiceQuery50: Display the first name, last name and address of all employees.



*practiceQuery51:* Display the last name in a column titled 'Last Name', first name in a column titled 'First Name', and address in a column titled 'Residence Location' for all employees.



*practiceQuery52:* Retrieve the first name, last name and address of all employees, and display the first and last name as a combined 'Whole Name'.



practiceQuery53: Retrieve the department numbers for all employees.



practiceQuery54: Retrieve the unique department numbers for all employees.



practiceQuery55: Retrieve the salary and department number combinations for all employees.



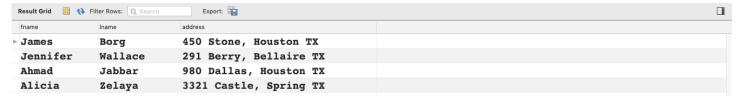
*practiceQuery56:* Retrieve the distinct salary and department number combinations for all employees.



practiceQuery60: Retrieve the first name, last name and address of all employees in department 5.



*practiceQuery61:* Retrieve the first name, last name and address of all employees who are not in department 5.



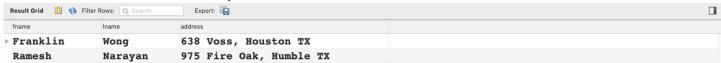
*practiceQuery62:* Retrieve the first name, last name and address of all employees who earn more than 30000 in salary.



*practiceQuery63:* Retrieve the first name, last name and address of all employees who are in department 5 or earn more than 30000 in salary.



*practiceQuery64:* Retrieve the first name, last name and address of all employees who are in department 5 and earn more than 30000 in salary.



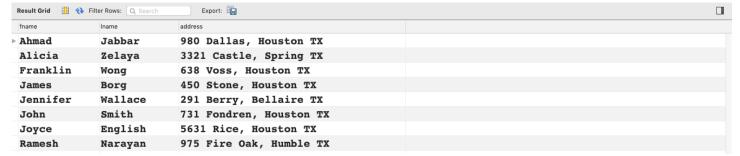
*practiceQuery65:* Retrieve the first name, last name, address and birthdate of all employees born after January 1st, 1968.



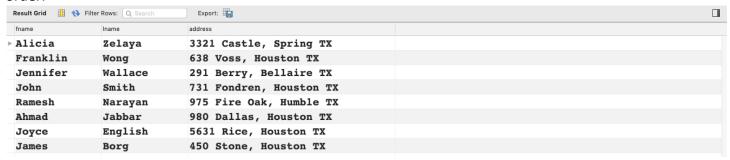
*practiceQuery66:* Retrieve the first name, last name, address and birthdate of all employees born after January 1st, 1964 and before August 10th, 1970.



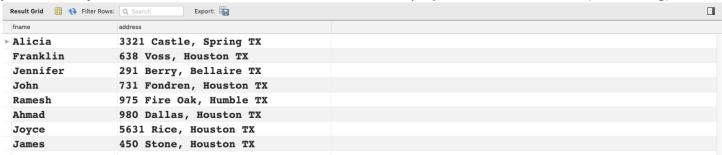
practiceQuery67: Retrieve the first name, last name and address of all employees in first name order.



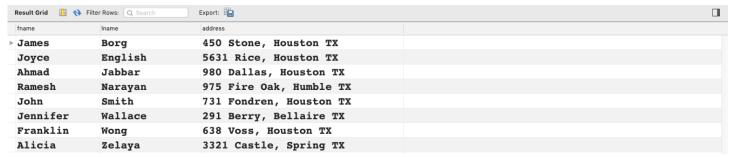
**practiceQuery68:** Retrieve the first name, last name and address of all employees in descending last name order.



practiceQuery69: Retrieve the first name and address of all employees in last name order (descending).



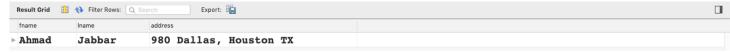
*practiceQuery70:* Retrieve the first name, last name and address of all employees in the order of last name and then first name.



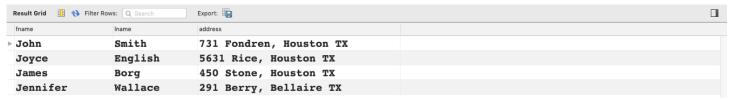
practiceQuery71: Retrieve the first name, last name and address of all employees who live in Houston.



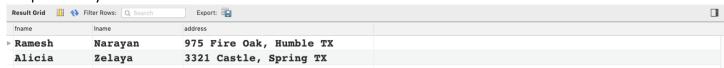
practiceQuery72: Retrieve the first name, last name and address of all employees who live in Dallas.



*practiceQuery73:* Retrieve the first name, last name and address of all employees whose first names begin with the letter 'J'.



*practiceQuery74:* Retrieve the first name, last name and address of all employees whose last names contain the pattern 'aya'.



**practiceQuery75:** Retrieve the first name, last name and address of all employees whose last names contain the pattern 'aya' where the pattern is not at the end of the string.

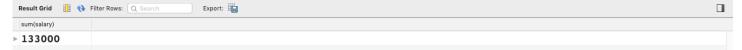


Practice Queries: Select – From – Where – Group By – Having – Order By (with Aggregates)

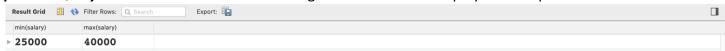
*practiceQuery80:* Retrieve the first name, last name and salary of the employees in department number 5 if they were all given a 10% raise in salary.



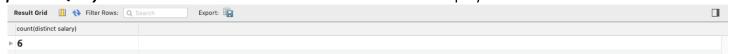
practiceQuery81: Retrieve the sum of the salaries for all employees in department number 5.



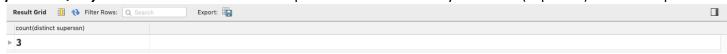
practiceQuery82: Retrieve the smallest and largest salaries for all employees in department number 5.



practiceQuery83: Retrieve the number of different salaries for all employees.



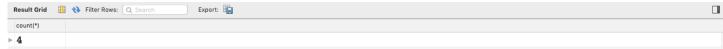
practiceQuery84: Retrieve the number of Supervisor's Social Security Numbers (superssn) without duplicates.



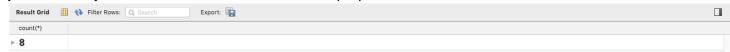
practiceQuery85: Retrieve the number of employees whose superssn is equal to 333445555.



*practiceQuery86:* Retrieve the number of employees whose superssn is not equal to 333445555.



practiceQuery87: Retrieve the total number of employees.



practiceQuery88: Retrieve the minimum, average and maximum salary for the employees in each department.

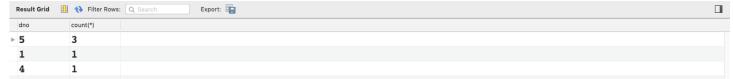


**practiceQuery89:** Retrieve the minimum, average and maximum salary for the employees in each department with less than four employees.



Practice Queries: Nested Queries & Set Operations (including Union & Correlated Subqueries)

*practiceQuery100:* Retrieve the total number of employees whose salaries exceed \$25,000 in each department.



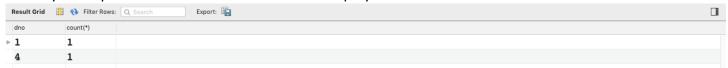
*practiceQuery101:* Retrieve the total number of employees whose salaries exceed \$25,000 in all of the departments except Headquarters.



*practiceQuery102:* Retrieve the department numbers for departments where fewer than four employees work.



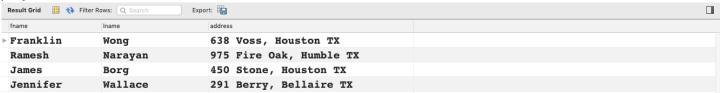
*practiceQuery103:* Retrieve the total number of employees whose salaries exceed \$25,000 per department, but only for departments where fewer than four employees work.



*practiceQuery104:* Retrieve the first name, last name and address for each employee that has a dependent daughter.



*practiceQuery105:* Retrieve the first name, last name and address for each employee that is working on a project that is located in Houston.



*practiceQuery106:* Retrieve the Social Security Number (ssn) of employees who earn more than 25000 in salary or work on project 20.



*practiceQuery107:* Retrieve the Social Security Number (ssn) of each employee who earns more than 25000 in salary and also works on project 20.

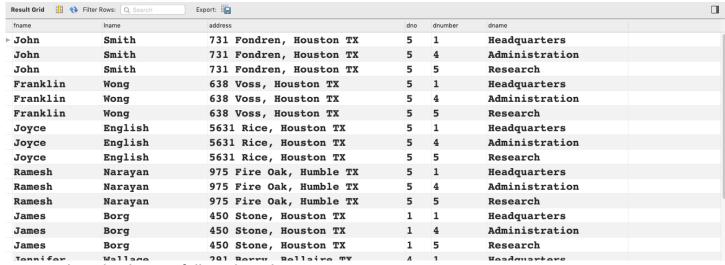


*practiceQuery108:* Retrieve the Social Security Number (ssn) of each employee who earns more than 25000 in salary but doesn't work on project 20.



# Practice Queries: Cartesian Products & Joins (Inner, Outer & Natural)

**practiceQuery120:** Display the first name, last name, address, department number (dno and dnumber) and department name for all combinations of the employee and department record sets.

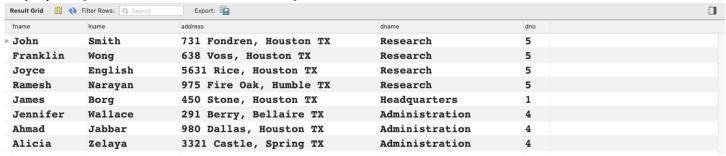


truncated results shown – full result set has 24 rows

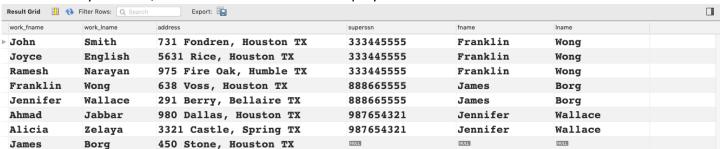
*practiceQuery121:* Retrieve the first name, last name, address, department name and number of all employees. [USE CARTESIAN PRODUCT TECHNIQUE]

*practiceQuery122:* Retrieve the first name, last name, address, department name and number of all employees. [USE INNER JOIN TECHNIQUE]

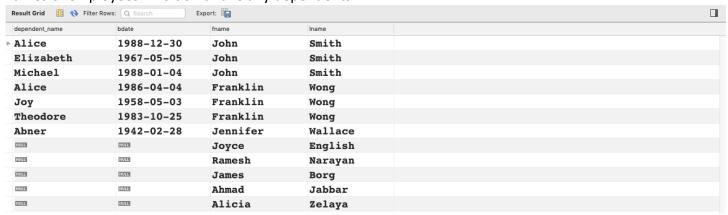
*practiceQuery123:* Retrieve the first name, last name, address, department name and number of all employees. [USE NATURAL JOIN TECHNIQUE]



*practiceQuery124:* Retrieve the employee's first and last name and address, along with their supervisor's Social Security Number, first and last names for all employees.



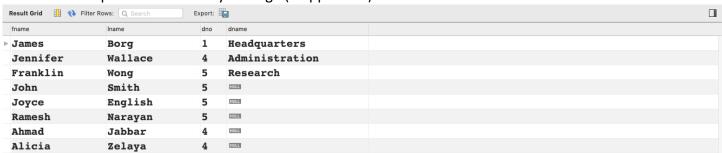
**practiceQuery125:** Retrieve the name and birthdate of all dependents, along with the first and last name of their sponsor (employee). Include the names of all employees in your response, to include the first and last names of employees who don't have any dependents.



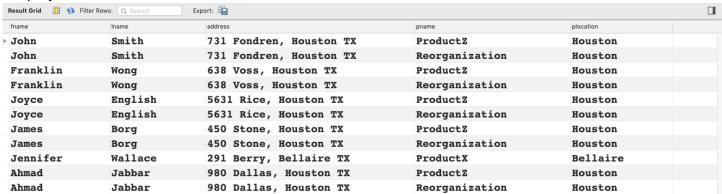
*practiceQuery126:* Retrieve the first and last name, department number and department name for all department managers.



*practiceQuery127:* Retrieve the first and last name, department number of all employees, along with the name of the department that they manage (if applicable).



practiceQuery128: Display the first and last names of employees along with the names of projects that are located in the city where they live (using the employee's address). Include the employee's address along with the project's location.



*practiceQuery129:* Find the first and last names and birthdates of the employees (supervisors included) who are old as (or older than) one or more of the department managers. Include the first and last names and birthdates of the managers as well.

