

Exercise 1. Simple SQL Queries

Problem 1

List employee number, last name, date of birth, and salary for all employees who make more than \$30,000 a year. Sequence the results in descending order by salary.

Problem 2

List last name, first name, and the department number for all employees. The listing should be ordered by descending department numbers. Within the same department, the last names should be sorted in descending order.

Problem 3

List the different education levels in the company in descending order. List only one occurrence of duplicate result rows.

Problem 4

List employees, by employee number, and their assigned projects, by project number. Display only those employees with an employee number less than or equal to 100. List only one occurrence of duplicate rows. Sort the result rows by employee number.

(Use the EMP_ACT table.)

Problem 5

List last name, salary, and bonus of all male employees.

Problem 6

List last name, salary, and commission for all employees with a salary greater than \$20,000 and hired after 1979.

Problem 7

List last name, salary, bonus, and commission for all employees with a salary greater than \$22,000 and a bonus of \$400, or for all employees with a bonus of \$500 and a commission lower than \$1,900. The list should be ordered by last name.

Problem 8

List last name, salary, bonus, and commission for all employees with a salary greater than \$22,000, a bonus of \$400 or \$500, and a commission less than \$1,900. The list should be ordered by last name.

Problem 9

Using the EMP_ACT table, for all projects that have a project number beginning with AD and have activities 10, 80, and 180 associated with them, list the following:

Project number

Activity number

Starting date for activity

Ending date for activity

Order the list by activity number within project number.

Problem 10

List manager number and department number for all departments to which a manager has been assigned.

The list should be ordered by manager number.

Problem 11

List employee number, last name, salary, and bonus for all employees that have a bonus ranging from \$800 to \$1,000.

Sort the report by employee number within bonus, lowest bonus first.

Problem 12

List employee number, last name, salary, and department number for all employees in departments A00 through C01 (inclusive).

Order the results alphabetically by last name and employee number.

Problem 13

List all projects that have SUPPORT as part of the project name. Order the results by project number.

Problem 14

List all departments that have a 1 as the middle character in the department number.

Order the results by department number.

Problem 15

List the last name, first name, middle initial, and salary of the five highest paid non-manager, non-president employees.

Order the results by highest salary first.

END OF LAB

Exercise 2. Retrieving Data from Multiple Tables

Problem 1

Produce a report that lists employees' last names, first names, and department names. Sequence the report on first name within last name, within department name.

Problem 2

Modify the previous query to include job. Also, list data for only departments between A02 and D22, and exclude managers from the list. Sequence the report on first name within last name, within job, within department name.

Problem 3

List the name of each department and the lastname and first name of its manager. Sequence the list by department name. Use the EMPNO and MGRNO columns to relate the two tables. Sequence the result rows by

department name.

Problem 4

Try the following: modify the previous query using WORKDEPT and DEPTNO as the join predicate. Include a local predicate that looks for people whose job is manager.

Are the results from both queries the same? _____
Why?

Problem 5

For all projects that have a project number beginning with AD, list project number, project name, and activity number. List identical rows once. Order the list by project number and then by activity number.

Problem 6

Which employees are assigned to project number AD3113? List employee number, last name, and project number. Order the list by employee number and then by project number. List only one occurrence of duplicate result rows.

Problem 7

Which activities began on October 1, 1982? For each of these activities, list the employee number of the person performing the activity, the project number, project name, activity number, and starting date of the activity. Order the list by project number, then by employee number, and then by activity number.

Problem 8

Display department number, last name, project name, and activity number for activities performed by the employees in department A00. Sequence the results first by project name and then by activity number.

Problem 9

List department number, last name, project name, and activity number for those employees in work departments A00 through C01. Suppress identical rows.

Sort the list by department number, last name, and activity number.

Problem 10

The second line manager needs a list of activities which began on October 15, 1982 or thereafter.

For these activities, list the activity number, the manager number of the manager of the department assigned to the project, the starting date for the activity, the project number, and the last name of the employee performing the activity.

The list should be ordered by the activity number and then by the activity start date.

Problem 11

Which employees in department A00 were hired before their manager?

List department number, the manager's last name, the employee's last name, and the hiring dates of both the manager and the employee.

Order the list by the employee's last name.

END OF LAB

Exercise 3. Scalar Functions and Arithmetic

Problem 1

For employees whose salary, increased by 5 percent, is less than or equal to \$20,000, list the following:

Last name

Current Salary

Salary increased by 5 percent

Monthly salary increased by 5 percent

Use the following column names for the two generated columns:

INC-Y-SALARY and INC-M-SALARY Use the proper conversion function to display the increased salary and monthly salary with two of the digits to the right of the decimal point. Sort the results by annual salary.

Problem 2

All employees with an education level of 18 or 20 will receive a salary increase of \$1,200 and their bonus will be cut in half. List last name, education level, new salary, and new bonus for these employees.

Display the new bonus with two digits to the right of the decimal point.

Use the column names NEW-SALARY and NEW-BONUS for the generated columns.

Employees with an education level of 20 should be listed first. For employees with the same education level, sort the list by salary.

Problem 3

The salary will be decreased by \$1,000 for all employees matching the following criteria:

They belong to department D11

Their salary is more than or equal to 80 percent of \$20,000

Their salary is less than or equal to 120 percent of \$20,000

Use the name DECR-SALARY for the generated column.

List department number, last name, salary, and decreased salary. Sort the result by salary.

Problem 4

Produce a list of all employees in department D11 that have an income (sum of salary, commission, and bonus) that is greater than their salary increased by 10 percent.

Name the generated column INCOME.

List department number, last name, and income. Sort the result in descending order by income.

For this problem assume that all employees have non-null salaries, commissions, and bonuses.

Problem 5

List all departments that have no manager assigned. List department number, department name, and manager number. Replace unknown manager numbers with the word UNKNOWN and name the column MGRNO.

Problem 6

List the project number and major project number for all projects that have a project number beginning with MA. If the major project number is unknown, display the text 'MAIN PROJECT.'

Name the derived column MAJOR PROJECT.

Sequence the results by PROJNO.

Problem 7

List all employees who were younger than 25 when they joined the company.

List their employee number, last name, and age when they joined the company.

Name the derived column AGE.

Sort the result by age and then by employee number.

Problem 8

Provide a list of all projects which ended on December 1, 1982. Display the year and month of the starting date and the project number. Sort the result by project number.

Name the derived columns YEAR and MONTH.

Problem 9

List the project number and duration, in weeks, of all projects that have a project number beginning with MA. The duration should be rounded and displayed with one decimal position.

Name the derived column WEEKS.

Order the list by the project number.

Problem 10

For projects that have a project number beginning with MA, list the project number, project ending date, and a modified ending date

assuming the projects will be delayed by 10 percent.

Name the column containing PRENDATE, ESTIMATED. Name the derived column EXPECTED.

Order the list by project number.

Problem 11

How many days are between the first manned landing on the moon (July 20, 1969) and the first day of the year 2000?

Since no columns from a specific table are used in this problem, you can use any table in the FROM clause but you should indicate a WHERE condition that derives a single result row (unique key). You may also select from the SYSIBM.SYSDUMMY1 table which produces a one row result.

Name the derived column DAYS.

Exercise 4. Column Functions and Grouping

Problem 1

For all departments, display department number and the sum of all salaries for each department. Name the derived column SUM_SALARY.

Problem 2

For all departments, display the department number and the number of employees. Name the derived column EMP_COUNT.

Problem 3

Display those departments which have more than 3 employees.

Problem 4

For all departments with at least one designer, display the number of designers and the department number. Name the derived column DESIGNER.

Problem 5

Show the average salary for men and the average salary for women for each department. Display the work department, the sex, the average salary, average bonus, average commission, and the number of people in each group. Include only those groups that have two or more people.

Show only two decimal places in the averages.

Use the following names for the derived columns: AVG-SALARY, AVG-BONUS, AVG-COMM, and COUNT.

Problem 6

Display the average bonus and average commission for all departments

with an average bonus greater than \$500 and an average commission greater than \$2,000. Display all averages with two digits to the right of the decimal point. Use the column headings AVG-BONUS and AVG-COMM for the derived columns.

END OF LAB

Exercise 5. UNION

Problem 1

List the names and salaries for the non-managers working in department D21 showing the effects of a 10 percent raise. Use the following output as a guide. Apply and appropriate ORDER BY clause to achieve the required results. Use the column headings shown.

LASTNAME FIRSTNME WHEN SALARY

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-----  
JEFFERSON JAMES BEFORE A RAISE 22180.000  
JEFFERSON JAMES AFTER A RAISE 24398.000  
JOHNSON SYBIL BEFORE A RAISE 17250.000  
JOHNSON SYBIL AFTER A RAISE 18975.000
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.....

Problem 2

List the department number, employee number, and salaries of all employees in department A00.

For the last line of the report, display the sum of all the salaries.

Problem 3

For departments A00, B01, and C01, list the projects assigned to them and the employees in each department. The output should consist of up to three types of lines for each department as follows:

See expected results for clarification of the following instructions.

First line (one per department):

Department number

Text: DEPARTMENT

Department name

Second line(s) (if data available - one line per project):

Department number

Project number

Project name

Subsequent line(s) (if data available - one line per employee):

Department number

Employee number

Last name

Problem 4

For all projects that have a project number that begins with IF, display the following:

First line:

Text: PROJECT

Project number

The employee number of the employee responsible for the project

Estimated starting date

Estimated ending date

Subsequent line(s) (one per employee working on the project):

Project number

The employee number of the employee performing the activity

Activity starting date

Activity ending date

Sequence the results by the project number, then by employee number, and finally by the starting date.

Exercise 6. Using Subqueries

Problem 1

List those employees that have a salary which is greater than or equal to the average salary of all employees plus \$5,000.

Display department number, employee number, last name, and salary.

Sort the list by the department number and employee number.

Problem 2

List employee number and last name of all employees not assigned to any projects. This means that table EMP_ACT does not contain a row with their employee number.

Problem 3

List project number and duration (in days) of the project with the shortest duration.

Name the derived column DAYS.

Problem 4

List department number, department name, last name, and first name of

all those employees in departments that have only male employees.

Problem 5

We want to do a salary analysis for people that have the same job and education level as the employee Stern. Show the last name, job, edlevel, the number of years they've worked as of January 1, 2000, and their salary.

Name the derived column YEARS.

Sort the listing by highest salary first.

Exercise 7. Maintaining Data

Problem 1

Create table TESTEMP with the following columns:

EMPNO, LASTNAME, WORKDEPT, HIREDATE, SALARY, and BONUS

The data types and null characteristics for these columns should be the same as the corresponding columns in the EMPLOYEE table described at the beginning of the lab exercises. For the OS/390 environment, use the following IN clause at the end of your statement: IN DBCF12xx.TSxx (where xx is your assigned lab number).

Problem 2

Mr. Smith, Ms Baker, and Ms Thomas joined the company. Their data is as follows:

Employee numbers: 000111, 000222, 000333

Last name: SMITH, BAKER, THOMAS

Department number: C01, A00, D11

Date hired: June 6, 2000

Salary: \$25,000, \$28,000, \$33,000

Bonus: \$0, NULL, \$0

Add the new employees to the TESTEMP table.

Problem 3

Insert data into the TESTEMP table by copying the appropriate columns in the EMPLOYEE table for those employees that have an employee number less than or equal to 50.

Problem 4

Mr. Smith receives a bonus of \$500. Make the appropriate data change.

Problem 5

All employees in department C01 have done a good job. Therefore, they

receive a salary increase of \$1,000.

Problem 6

After a short time Mr. Smith leaves the company. Make the appropriate changes.

Problem 7

Insert data into the TESTEMP table by copying the columns in the EMPLOYEE table where the employees have an employee number greater than 50.

Problem 8

Make the appropriate changes for the following situation:

Theodore Spenser is assigned to department E01.

Problem 9

Mrs. Brown joined the company.

For Mrs. Brown enter the following data:

Employee number: 360

Last name: BROWN

Department number: D01

Date hired: Date when data is entered

Salary: \$45,000

Bonus: unknown

Problem 10

Delete all rows from the TESTEMP table and examine the contents.

Then drop the TESTEMP table and try to examine the contents.