DATABASE Laboratory Manual

Name: _____

Schedule: _____

CONTENTS

Exercise Description

Read the General Information and the description of the lab tables before attempting to perform the exercises.

Feel free to consult with the instructor if you need assistance or clarifications while you are formulating a query.

Problem List – Contains a listing of the problems and the expected result of the query for that exercise.

Expected Result – Shows the generated temporary table from the successful query. In most cases, the complete result is shown. In case where the result set is too large, an ellipses (...) is shown to indicate that there are additional rows in the result. The number of rows for the result set is shown so you may verify the result of your query.

General Information

This laboratory workbook provides the information necessary to complete the review lab exercises for the course.

This exercises will be done in-class environment. You may use any query tools. Please take note that the emphasis of this course is on teaching **SQL**, not on tool use. Therefore, only the basics of the tool use is covered.

Write your solutions of your queries is a must.

Table Relationships

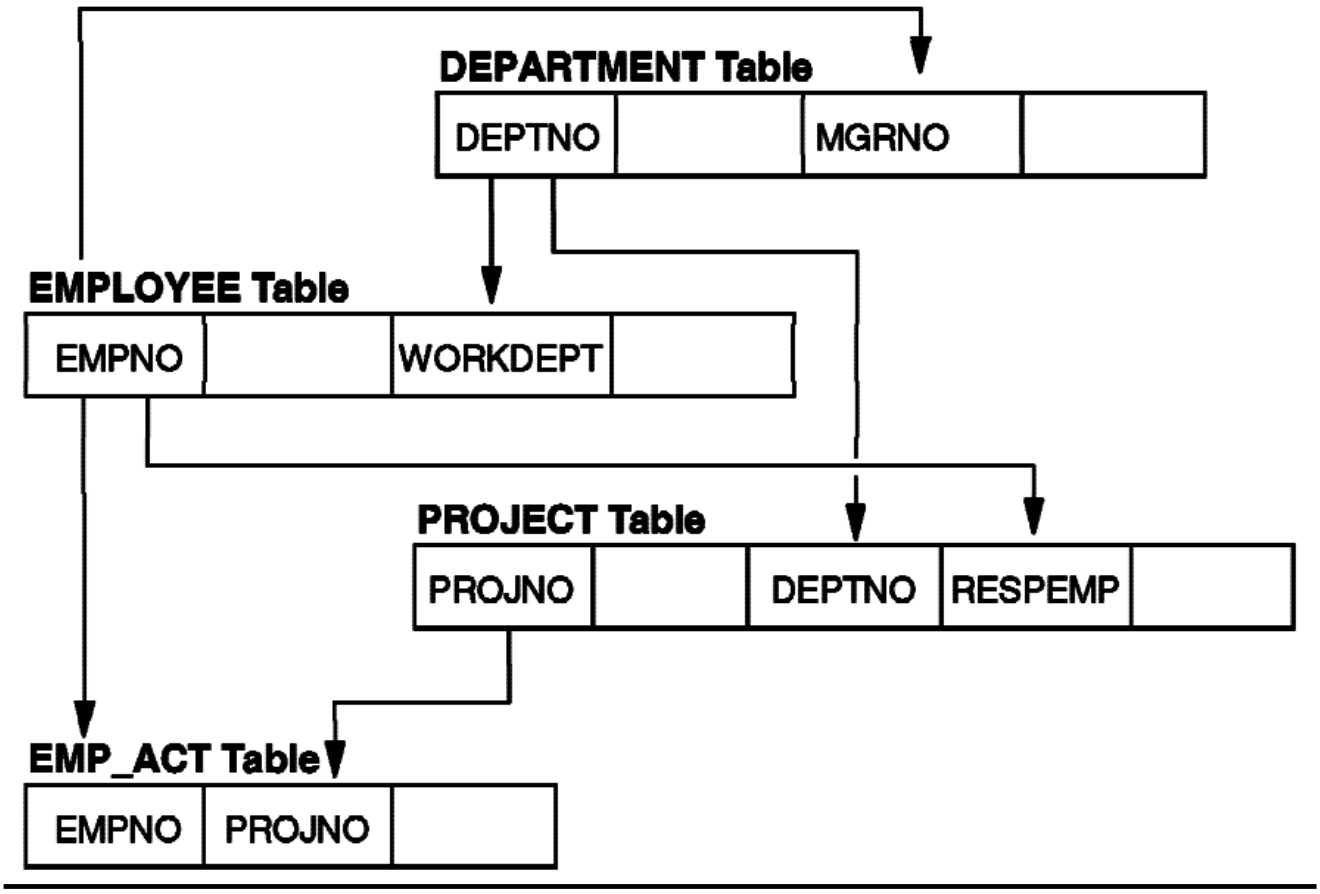

Figure 0-1. Table Relationships

Note:

This diagram illustrates the relationships between the tables used in the exercises for this course. The arrow lines show the connection of the tables using the primary key attribute to the foreign key attribute.

Table Descriptions/Structures

The tables are described in hierarchical order, as shown in the Table Relationships on the previous page.

DEPARTMENT Table

There is only one row/tuple in the DEPARTMENT table for each department in the company.

Column Name	Meaning	Data Type	NULLS allowed
DEPTNO	Department Number	CHAR(3)	N
DEPTNAME	Department Name	VARCHAR(36)	N
MGRNO	Employee Number of the Responsible Manager	CHAR(6)	Y
ADMRDEPT	Department Number of the Department to which the Department reports	CHAR(3)	N
LOCATION	Location Number	CHAR(5)	Y

EMPLOYEE Table

There is only one row/tuple in the EMPLOYEE table for each employees in the company.

Column Name	Meaning	Data Type	NULLS allowed
EMPNO	Employee Number	CHAR(6)	N
FIRSTNME	First Name	VARCHAR(20)	N
MIDINIT	Middle Initial	CHAR(1)	N
LASTNAME	Last Name	VARCHAR(15)	N
WORKDEPT	Department in which the Employee Works	CHAR(3)	Y
PHONENO	Phone Number	CHAR(4)	Y
HIREDATE	Date of Hire	DATE	Y
JOB	Job	CHAR(8)	Y
EDLEVEL	Number of Years of Formal Education	SMALLINT	Y
SEX	Sex (M male, F female)	CHAR(1)	Y
BIRTHDATE	Date of Birth	DATE	Y
SALARY	Yearly Salary	DECIMAL(9, 2)	Y
BONUS	Yearly Bonus	DECIMAL(9, 2)	Y
COMM	Yearly Commission	DECIMAL(9, 2)	Y

PROJECT Table

There is only one row/tuple in the PROJECT table for each project.

Column Name	Meaning	Data Type	NULLS allowed
PROJNO	Project Number	CHAR(6)	N
PROJNAME	Project Name	VARCHAR(24)	N
DEPTNO	Responsible Department	CHAR(3)	N
RESPEMP	Employee Number of the Responsible Employee	CHAR(6)	N
PRSTAFF	Estimated Mean Staffing	DECIMAL(5, 2)	Y
PRSTDATE	Estimated Start Date	DATE	Y
PRENDATE	Estimated End Date	DATE	Y
MAJPROJ	Major Project for a Subproject	CHAR(6)	Y

EMP_ACT Table

There is only one row/tuple in the PROJECT table for any employee or any project.

Column Name	Meaning	Data Type	NULLS allowed
EMPNO	Employee Number of Employee Performing the Activity	CHAR(6)	N
PROJNO	Project Number	CHAR(6)	N
ACTNO	Activity Number	SMALLINT	N
EMPTIME	Proportion of Employee's Time Spent on Project	DECIMAL(5, 2)	Y
EMSTDATE	Date Activity Starts	DATE	Y
EMENDATE	Date Activity Ends	DATE	Y

Table Rows/Tuples

DEPARTMENT Table

DEPTNO	DEPTNAME	MGRNO	ADMRDEPT	LOCATION
A00	SPIFFY COMPUTER SERVICE DIV.	000010	A00	
B01	PLANNING	000020	A00	
C01	INFORMATION CENTER	000030	A00	
D01	DEVELOPMENT CENTER	-	A00	
D11	MANUFACTURING SYSTEMS	000060	D01	
D21	ADMINISTRATION SYSTEMS	000070	D01	
E01	SUPPORT SERVICES	000050	A00	
E11	OPERATIONS	000090	E01	
E21	SOFTWARE SUPPORT	000100	E01	

EMPLOYEE Table

EMPNO	FIRSTNME	MIDINIT	LASTNAME	WORKDEPT	PHONENO	HIREDATE
000010	CHRISTINE	I	HAAS	A00	3978	1965-01-01
000020	MICHAEL	L	THOMPSON	B01	3476	1973-10-10
000030	SALLY	A	KWAN	C01	4738	1975-04-05
000050	JOHN	B	GEYER	E01	6789	1949-08-17
000060	IRVING	F	STERN	D11	6423	1973-09-14
000070	EVA	D	PULASKI	D21	7831	1980-09-30
000090	EILEEN	W	HENDERSON	E11	5498	1970-08-15
000100	THEODORE	Q	SPENSER	E21	0972	1980-06-19
000110	VINCENZO	G	LUCCHESI	A00	3490	1958-05-16
000120	SEAN		O'CONNELL	A00	2167	1963-12-05
000130	DOLORES	M	QUINTANA	C01	4578	1971-07-28
000140	HEATHER	A	NICHOLLS	C01	1793	1976-12-15
000150	BRUCE		ADAMSON	D11	4510	1972-02-12
000160	ELIZABETH	R	PIANKA	D11	3782	1977-10-11
000170	MASATOSHI	J	YOSHIMURA	D11	2890	1978-09-15
000180	MARILYN	S	SCOUTTEN	D11	1682	1973-07-07
000190	JAMES	H	WALKER	D11	2986	1974-07-26
000200	DAVID		BROWN	D11	4501	1966-03-03
000210	WILLIAM	T	JONES	D11	0942	1979-04-11
000220	JENNIFER	K	LUTZ	D11	0672	1968-08-29
000230	JAMES	J	JEFFERSON	D21	4265	1966-11-21
000240	SALVATORE	M	MARINO	D21	3780	1979-12-05
000250	DANIEL	S	SMITH	D21	0961	1969-10-30
000260	SYBIL	V	JOHNSON	D21	8953	1975-09-11
000270	MARIA	L	PEREZ	D21	9001	1980-09-30
000280	ETHEL	R	SCHNEIDER	E11	8997	1967-03-24
000290	JOHN	R	PARKER	E11	4502	1980-05-30
000300	PHILIP	X	SMITH	E11	2095	1972-06-19
000310	MAUDE	F	SETRIGHT	E11	3332	1964-09-12
000320	RAMLAL	V	MEHTA	E21	9990	1965-07-07
000330	WING		LEE	E21	2103	1976-02-23
000340	JASON	R	GOUNOT	E21	5698	1947-05-05

EMPLOYEE Table (continued)

JOB	EDLEVEL	SEX	BIRTHDATE	SALARY	BONUS	COMM
PRES	18	F	1933-08-14	52750.00	1000.00	4220.00
MANAGER	18	M	1948-02-02	41250.00	800.00	3300.00
MANAGER	20	F	1941-05-11	38250.00	800.00	3060.00
MANAGER	16	M	1925-09-15	40175.00	800.00	3214.00
MANAGER	16	M	1945-07-07	32250.00	600.00	2580.00
MANAGER	16	F	1953-05-26	36170.00	700.00	2893.00
MANAGER	16	F	1941-05-15	29750.00	600.00	2380.00
MANAGER	14	M	1956-12-18	26150.00	500.00	2092.00
SALESREP	19	M	1929-11-05	46500.00	900.00	3720.00
CLERK	14	M	1942-10-18	29250.00	600.00	2340.00
ANALYST	16	F	1925-09-15	23800.00	500.00	1904.00
ANALYST	18	F	1946-01-19	28420.00	600.00	2274.00
DESIGNER	16	M	1947-05-17	25280.00	500.00	2022.00
DESIGNER	17	F	1955-04-12	22250.00	400.00	1780.00
DESIGNER	16	M	1951-01-05	24680.00	500.00	1974.00
DESIGNER	17	F	1949-02-21	21340.00	500.00	1707.00
DESIGNER	16	M	1952-06-25	20450.00	400.00	1636.00
DESIGNER	16	M	1941-05-29	27740.00	600.00	2217.00
DESIGNER	17	M	1953-02-23	18270.00	400.00	1462.00
DESIGNER	18	F	1948-03-19	29840.00	600.00	2387.00
CLERK	14	M	1935-05-30	22180.00	400.00	1774.00
CLERK	17	M	1954-03-31	28760.00	600.00	2301.00
CLERK	15	M	1939-11-12	19180.00	400.00	1534.00
CLERK	16	F	1936-10-05	17250.00	300.00	1380.00
CLERK	15	F	1953-05-26	27380.00	500.00	2190.00
OPERATOR	17	F	1936-03-28	26250.00	500.00	2100.00
OPERATOR	12	M	1946-07-09	15340.00	300.00	1227.00
OPERATOR	14	M	1936-10-27	17750.00	400.00	1420.00
OPERATOR	12	F	1931-04-21	15900.00	300.00	1272.00
FIELDREP	16	M	1932-08-11	19950.00	400.00	1596.00
FIELDREP	14	M	1941-07-18	25370.00	500.00	2030.00
FIELDREP	16	M	1926-05-17	23840.00	500.00	1907.00

PROJECT Table

PROJNO	PROJNAME	DEPTNO	RESPEMP	PRSTAFF	PRSTDATE	PRENDATE	MAJPROJ
AD3100	ADMIN SERVICES	D01	000010	6.50	1982-01-01	1983-02-01	-
AD3110	GENERAL AD SYSTEMS	D21	000070	6.00	1982-01-01	1983-02-01	AD3100
AD3111	PAYROLL PROGRAMMING	D21	000230	2.00	1982-01-01	1983-02-01	AD3110
AD3112	PERSONNEL PROGRAMMG	D21	000250	1.00	1982-01-01	1983-02-01	AD3110
AD3113	ACCOUNT.PROGRAMMING	D21	000270	2.00	1982-01-01	1983-02-01	AD3110
IF1000	QUERY SERVICES	C01	000030	2.00	1982-01-01	1983-02-01	-
IF2000	USER EDUCATION	C01	000030	1.00	1982-01-01	1983-02-01	-
MA2100	WELD LINE AUTOMATION	D01	000010	12.00	1982-01-01	1983-02-01	-
MA2110	W L PROGRAMMING	D11	000060	9.00	1982-01-01	1983-02-01	MA2100
MA2111	W L PROGRAM DESIGN	D11	000220	2.00	1982-01-01	1982-12-01	MA2110
MA2112	W L ROBOT DESIGN	D11	000150	3.00	1982-01-01	1982-12-01	MA2110
MA2113	W L PROD CONT PROGS	D11	000160	3.00	1982-02-15	1982-12-01	MA2110
OP1000	OPERATION SUPPORT	E01	000050	6.00	1982-01-01	1983-02-01	-
OP1010	OPERATION	E11	000090	5.00	1982-01-01	1983-02-01	OP1000
OP2000	GEN SYSTEMS SERVICES	E01	000050	5.00	1982-01-01	1983-02-01	-
OP2010	SYSTEMS SUPPORT	E21	000100	4.00	1982-01-01	1983-02-01	OP2000
OP2011	SCP SYSTEMS SUPPORT	E21	000320	1.00	1982-01-01	1983-02-01	OP2010
OP2012	APPLICATIONS SUPPORT	E21	000330	1.00	1982-01-01	1983-02-01	OP2010
OP2013	DB/DC SUPPORT	E21	000340	1.00	1982-01-01	1983-02-01	OP2010
PL2100	WELD LINE PLANNING	B01	000020	1.00	1982-01-01	1982-09-15	MA2100

EMP_ACT Table

EMPNO	PROJNO	ACTNO	EMPTIME	EMSTDATE	EMENDATE
000010	AD3100	10	0.50	1982-01-01	1982-07-01
000070	AD3110	10	1.00	1982-01-01	1983-02-01
000230	AD3111	60	1.00	1982-01-01	1982-03-15
000230	AD3111	60	0.50	1982-03-15	1982-04-15
000230	AD3111	70	0.50	1982-03-15	1982-10-15
000230	AD3111	80	0.50	1982-04-15	1982-10-15
000230	AD3111	180	1.00	1982-10-15	1983-01-01
000240	AD3111	70	1.00	1982-02-15	1982-09-15
000240	AD3111	80	1.00	1982-09-15	1983-01-01
000250	AD3112	60	0.50	1982-02-01	1982-03-15
000250	AD3112	60	1.00	1982-01-01	1982-02-01
000250	AD3112	60	1.00	1983-01-01	1983-02-01
000250	AD3112	60	0.50	1982-12-01	1983-01-01
000250	AD3112	70	1.00	1982-03-15	1982-08-15
000250	AD3112	70	0.50	1982-02-01	1982-03-15
000250	AD3112	70	0.25	1982-08-15	1982-10-15
000250	AD3112	80	0.25	1982-08-15	1982-10-15
000250	AD3112	80	0.50	1982-10-15	1982-12-01
000250	AD3112	180	0.50	1982-08-15	1983-01-01
000260	AD3113	70	0.50	1982-06-15	1982-07-01
000260	AD3113	70	1.00	1982-07-01	1983-02-01
000260	AD3113	80	1.00	1982-01-01	1982-03-01
000260	AD3113	80	0.50	1982-03-01	1982-04-15
000260	AD3113	180	0.50	1982-03-01	1982-04-15
000260	AD3113	180	0.50	1982-06-01	1982-07-01
000260	AD3113	180	1.00	1982-04-15	1982-06-01
000270	AD3113	60	0.25	1982-09-01	1982-10-15
000270	AD3113	60	1.00	1982-04-01	1982-09-01
000270	AD3113	60	0.50	1982-03-01	1982-04-01
000270	AD3113	70	0.75	1982-09-01	1982-10-15
000270	AD3113	70	1.00	1982-10-15	1983-02-01
000270	AD3113	80	1.00	1982-01-01	1982-03-01
000270	AD3113	80	0.50	1982-03-01	1982-04-01
000030	IF1000	10	0.50	1982-06-01	1983-01-01
000130	IF1000	90	1.00	1982-01-01	1982-10-01
000130	IF1000	100	0.50	1982-10-01	1983-01-01
000140	IF1000	90	0.50	1982-10-01	1983-01-01

Exercise 1. SQL DDL – Data Definition Language

What is this Exercise is About

This exercise provides a knowledge to code SQL statements in order to perform Database operations using data definition language.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code CREATE statement to create Database and Database objects such as tables, views, schemas, etc.
- Code ALTER statement to modify table structure.
- Code DROP statement to remove Database from the server machine.
- Code RENAME statement to change table names.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, handouts, notes, etc.)

Problem 1:

Create the Database that is specified by your instructor in the default drive.

Problem 2:

Verify if the Database created in problem 1 was successfully created, write the details of the result below.

Problem 3:

Create the table DEPARTMENT.

Problem 4:

Create the table EMPLOYEE.

Problem 5:

Create the table PROJECT.

Problem 6:

Create the table EMP_ACT.

Problem 7:

Verify if the tables were successfully created.

Problem 8:

Give the result of the above SQL statement.

Problem 9:

Give the SQL statement to view the structure of DEPARTMENT table.

Problem 10:

Give the result of the above SQL statement.

Problem 11:

Modify the structure of the DEPARTMENT table to define MGRNO as the foreign key used to relate to the EMPLOYEE table.

Problem 12:

Modify the structure of the DEPARTMENT table to change the data type of the attribute/column name LOCATION to VARCHAR 30.

Problem 13:

Change the name of EMP_ACT table to ACCOUNT.

_____

Is the SQL statement successful?

_____ Why? _____

Problem 14:

Perform the given SQL command.

```
CREATE TABLE  mytbl (
        MyNumber  SMALLINT  NOT NULL,
        MyName       VARCHAR (30) NOT NULL);
```

Change the name of table mytbl to newtbl

_____

Is the SQL statement successful? _____

Exercise 2. SQL DML – Data Manipulation Language

What is this Exercise is About

This exercise provides a knowledge to code SQL statements in order to perform Database operations using data manipulation language.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code INSERT statement to store rows or records into tables of the Database.
- Code UPDATE statement to modify rows or records of the table.
- Code DELETE statement to remove rows or records from the tables of the Database.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, hand outs, notes, etc.)

Problem 1:

Store the first 5 rows/tuples of DEPARTMENT table.

Problem 2:

Store the first 5 rows/tuples of EMPLOYEE table.

Problem 3:

Store the first 5 rows/tuples of PROJECT table.

Problem 4:

Store the first 5 rows/tuples of EMP_ACT table.

Problem 5:

Update the rows/tuples of the DEPARTMENT table to store the values of the attribute LOCATION.

DEPTNO	**LOCATION**
A00	R. Palma St. Cebu City
B01	CCICT Bldg. 2nd Flr.
C01	CCICT Bldg. 2nd Flr.
D01	CCICT Bldg. 3rd Flr.
D11	CCICT Bldg. 1st Flr.

Problem 6:

Jason R. Gounot with an employee number 000340 retired from the company, perform the necessary table adjustment.

Exercise 3. SQL DQL – SIMPLE QUERY

What is this Exercise is About

This exercise provides a knowledge to code SQL statements in order to perform Database operations using data query language.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code SELECT statements using four clauses of an SQL SELECT statement.
- Use SELECT statement to:
  - ~ Retrieve all rows/records of a table.
  - ~ Retrieve specific columns/attributes of a table.
  - ~ Retrieve specific rows/records based on some relational or logical expressions.
- Code SELECT statement using keywords BETWEEN, IN, LIKE and DISTINCT.
- Produce a result table in which rows/records are sorted in a desired sequence.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, hand outs, notes, etc.)

Problem List With Expected Results

Problem 1:

List employee number, last name, data of birth, and salary for all employees who make more than $30,000.00 a year. Sequence the results in descending order by salary.

Result list:

EMPNO	LASTNAME	BIRTHDATE	SALARY
000010	HAAS	1933-08-14	52750.00
000110	LUCCHESI	1929-11-05	46500.00
000020	THOMPSON	1948-02-02	41250.00
000050	GEYER	1925-09-15	40175.00
000030	KWAN	1941-05-11	38250.00
000070	PULASKI	1953-05-26	36170.00
000060	STERN	1945-07-07	32250.00

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 name should be sorted in descending order.

Result list:

LASTNAME	FIRSTNME	WORKDEPT
SPENSER	THEODORE	E21
MEHTA	RAMLAL	E21
LEE	WING	E21
GOUNOT	JASON	E21
SMITH	PHILIP	E11
SETRIGHT	MAUDE	E11
SCHNEIDER	ETHEL	E11
PARKER	JOHN	E11
HENDERSON	EILEEN	E11
GEYER	JOHN	E01
.....	.....	...

The complete result set contains 32 rows.

Problem 3:

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

Result list:

```
EDLEVEL
-------
     20
     19
     18
     17
     16
     15
     14
     12
```

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 result rows. Sort the result rows by employee number.

(Use the EMP_ACT table)

Result list:

```
EMPNO   PROJNO
---------+----
000010  AD3100
000010  MA2100
000010  MA2110
000020  PL2100
000030  IF1000
000030  IF2000
000050  OP1000
000050  OP2010
000070  AD3110
000090  OP1010
000100  OP2010
```

Problem 5:

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

Result list:

LASTNAME	SALARY	BONUS
THOMPSON	41250.00	800.00
GEYER	40175.00	800.00
STERN	32250.00	600.00
SPENSER	26150.00	500.00
LUCCHESI	46500.00	900.00
O'CONNELL	29250.00	600.00
ADAMSON	25280.00	500.00
YOSHIMURA	24680.00	500.00
WALKER	20450.00	400.00
BROWN	27740.00	600.00
JONES	18270.00	400.00
JEFFERSON	22180.00	400.00
MARINO	28760.00	600.00
SMITH	19180.00	400.00
PARKER	15340.00	300.00
SMITH	17750.00	400.00
MEHTA	19950.00	400.00
LEE	25370.00	500.00
GOUNOT	23840.00	500.00

Problem 6:

List last name, salary, and commission for all employees with a salary greater than $29,000.00 and was hired after 1979.

Result list:

LASTNAME	SALARY	COMM
PULASKI	36170.00	2893.00
SPENSER	26150.00	2092.00
PEREZ	27380.00	2190.00

Problem 7:

List last name, salary, bonus, and commission for all employees with a salary greater than $22,000.00 and a bonus of $400.00, or for all employees with a bonus of $500.00 and a commission lower than

$1,900.00. The list should be ordered by last name.

Result list:

LASTNAME	SALARY	BONUS	COMM
JEFFERSON	22180,00	400,00	1774,00
PIANKA	22250,00	400,00	1780,00
SCOUTTEN	21340,00	500,00	1707,00

Problem 8:

List last name, salary, bonus, and commission for all employees with a salary greater than $22,000.00, a bonus of $400.00, or $500.00 and a commission less than $1,900.00. The list should be ordered by last name.

Result list:

LASTNAME	SALARY	BONUS	COMM
JEFFERSON	22180.00	400.00	1774.00
PIANKA	22250.00	400.00	1780.00

Problem 9:

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

Result list:

DEPTNO	DEPTNAME
D11	MANUFACTURING SYSTEMS
E11	OPERATIONS

Problem 10:

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 of activity
- Ending date of activity

Order the list by activity number within project number.

Result list:

PROJNO	ACTNO	EMSTDATE	EMENDATE
AD3100	10	1982-01-01	1982-07-01
AD3110	10	1982-01-01	1983-02-01
AD3111	80	1982-04-15	1982-10-15
AD3111	80	1982-09-15	1983-01-01
AD3111	180	1982-10-15	1983-01-01
AD3112	80	1982-08-15	1982-10-15
AD3112	80	1982-10-15	1982-12-01
AD3112	180	1982-08-15	1983-01-01
AD3113	80	1982-01-01	1982-03-01
AD3113	80	1982-01-01	1982-03-01
AD3113	80	1982-03-01	1982-04-15
AD3113	80	1982-03-01	1982-04-01
AD3113	180	1982-03-01	1982-04-15
AD3113	180	1982-04-15	1982-06-01
AD3113	180	1982-06-01	1982-07-01

Problem 11:

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

The list should be ordered by manager number.

Result list:

MGRNO	DEPTNO
000010	A00
000020	B01
000030	C01
000050	E01
000060	D11
000070	D21
000090	E11
000100	E21

Problem 12:

List employee number, last name, salary, and bonus for all employees that have a bonus ranging from $800.00 to $1,000.00.

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

Result list:

EMPNO	LASTNAME	SALARY	BONUS
000020	THOMPSON	41250.00	800.00
000030	KWAN	38250.00	800.00
000050	GEYER	40175.00	800.00
000110	LUCCHESSI	46500.00	900.00
000010	HAAS	52750.00	1000.00

Problem 13:

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.

Result list:

EMPNO	LASTNAME	SALARY	WORKDEPT
000010	HAAS	52750.00	A00
000030	KWAN	38250.00	C01
000110	LUCCHESI	46500.00	A00
000140	NICHOLLS	28420.00	C01
000120	O'CONNELL	29250.00	A00
000130	QUINTANA	23800.00	C01
000020	THOMPSON	41250.00	B01

Problem 14:

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

Result list:

PROJNO	PROJNAME
OP1000	OPERATION SUPPORT
OP2010	SYSTEMS SUPPORT
OP2011	SCP SYSTEMS SUPPORT
OP2012	APPLICATIONS SUPPORT
OP2013	DB/DC SUPPORT

Problem 15:

List department number, department name, and manager number for all departments that have 1 as the middle character in the department number. Order the cursor list by department number.

Exercise 4. SQL DQL – JOIN QUERY

What is this Exercise is About

This exercise provides a knowledge to code SQL statements to retrieve data from multiple tables using JOIN query.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code JOIN statements applying four types of JOIN clause to retrieve data from multiple tables.
- Apply the four types of JOIN clauses:
  - ~ Inner Join (Default Join Query).
  - ~ Cross Join or Cartesian Product (Must be avoided).
  - ~ Self-Join (Joining Table to Itself).
  - ~ Outer Join.

    Left Outer Join Right

    Outer Join Full Outer

    Join

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, hand outs, notes, etc.)

Problem 1:

Produce a report that lists employee's last name, first name, and department names. Sequence the result list on first name within last name, within department name.

Result list:

LASTNAME	FIRSTNME	DEPTNAME
JEFFERSON	JAMES	ADMINISTRATION SYSTEMS
JOHNSON	SYBIL	ADMINISTRATION SYSTEMS
MARINO	SALVATORE	ADMINISTRATION SYSTEMS
PEREZ	MARIA	ADMINISTRATION SYSTEMS
PULASKI	EVA	ADMINISTRATION SYSTEMS
SMITH	DANIEL	ADMINISTRATION SYSTEMS
KWAN	SALLY	INFORMATION CENTER
NICHOLLS	HEATHER	INFORMATION CENTER
QUINTANA	DOLORES	INFORMATION CENTER
ADAMSON	BRUCE	MANUFACTURING SYSTEMS
BROWN	DAVID	MANUFACTURING SYSTEMS
JONES	WILLIAM	MANUFACTURING SYSTEMS
LUTZ	JENNIFER	MANUFACTURING SYSTEMS
PIANKA	ELIZABETH	MANUFACTURING SYSTEMS
SCOUTTEN	MARILYN	MANUFACTURING SYSTEMS
STERN	IRVING	MANUFACTURING SYSTEMS
WALKER	JAMES	MANUFACTURING SYSTEMS
YOSHIMURA	MASATOSHI	MANUFACTURING SYSTEMS
HENDERSON	EILEEN	OPERATIONS
PARKER	JOHN	OPERATIONS
SCHNEIDER	ETHEL	OPERATIONS
SETRIGHT	MAUDE	OPERATIONS
SMITH	PHILIP	OPERATIONS
THOMPSON	MICHAEL	PLANNING
GOUNOT	JASON	SOFTWARE SUPPORT
LEE	WING	SOFTWARE SUPPORT
MEHTA	RAMLAL	SOFTWARE SUPPORT
SPENSER	THEODORE	SOFTWARE SUPPORT
HAAS	CHRISTINE	SPIFFY COMPUTER SERVICE DIV.
LUCCHESSI	VINCENZO	SPIFFY COMPUTER SERVICE DIV.
O'CONNELL	SEAN	SPIFFY COMPUTER SERVICE DIV.
GEYER	JOHN	SUPPORT SERVICES

Problem 2:

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

Result list:

LASTNAME	FIRSTNME	DEPTNAME	JOB
JEFFERSON	JAMES	ADMINISTRATION SYSTEMS	CLERK
JOHNSON	SYBIL	ADMINISTRATION SYSTEMS	CLERK
MARINO	SALVATORE	ADMINISTRATION SYSTEMS	CLERK
PEREZ	MARIA	ADMINISTRATION SYSTEMS	CLERK
SMITH	DANIEL	ADMINISTRATION SYSTEMS	CLERK
NICHOLLS	HEATHER	INFORMATION CENTER	ANALYST
QUINTANA	DOLORES	INFORMATION CENTER	ANALYST
ADAMSON	BRUCE	MANUFACTURING SYSTEMS	DESIGNER
BROWN	DAVID	MANUFACTURING SYSTEMS	DESIGNER
JONES	WILLIAM	MANUFACTURING SYSTEMS	DESIGNER
LUTZ	JENNIFER	MANUFACTURING SYSTEMS	DESIGNER
PIANKA	ELIZABETH	MANUFACTURING SYSTEMS	DESIGNER
SCOUTTEN	MARILYN	MANUFACTURING SYSTEMS	DESIGNER
WALKER	JAMES	MANUFACTURING SYSTEMS	DESIGNER
YOSHIMURA	MASATOSHI	MANUFACTURING SYSTEMS	DESIGNER

Problem 3:

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

Result list:

DEPTNAME	LASTNAME	FIRSTNME
ADMINISTRATION SYSTEMS	PULASKI	EVA
INFORMATION CENTER	KWAN	SALLY
MANUFACTURING SYSTEMS	STERN	IRVING
OPERATIONS	HENDERSON	EILEEN
PLANNING	THOMPSON	MICHAEL
SOFTWARE SUPPORT	SPENSER	THEODORE
SPIFFY COMPUTER SERVICE DIV.	HAAS	CHRISTINE
SUPPORT SERVICES	GEYER	JOHN

Problem 4:

Modify the previous report (Query #3) by using WORKDEPT and DEPTNO as the joining predicate. Include a local predicate that looks for people whose job is manager.

Are the results from both queries the same? _____.

Why?

_____

_____

_____

_____

_____

Result list:

DEPTNAME	LASTNAME	FIRSTNME
ADMINISTRATION SYSTEMS	PULASKI	EVA
INFORMATION CENTER	KWAN	SALLY
MANUFACTURING SYSTEMS	STERN	IRVING
OPERATIONS	HENDERSON	EILEEN
PLANNING	THOMPSON	MICHAEL
SOFTWARE SUPPORT	SPENSER	THEODORE
SUPPORT SERVICES	GEYER	JOHN

Problem 5:

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

Result list:

PROJNO	PROJNAME	ACTNO
AD3100	ADMIN SERVICES	10
AD3110	GENERAL AD SYSTEMS	10
AD3111	PAYROLL PROGRAMMING	60
AD3111	PAYROLL PROGRAMMING	70
AD3111	PAYROLL PROGRAMMING	80
AD3111	PAYROLL PROGRAMMING	180
AD3112	PERSONNEL PROGRAMMG	60
AD3112	PERSONNEL PROGRAMMG	70
AD3112	PERSONNEL PROGRAMMG	80
AD3112	PERSONNEL PROGRAMMG	180
AD3113	ACCOUNT.PROGRAMMING	60
AD3113	ACCOUNT.PROGRAMMING	70
AD3113	ACCOUNT.PROGRAMMING	80
AD3113	ACCOUNT.PROGRAMMING	180

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.

Result list:

EMPNO	LASTNAME	PROJNO
000260	JOHNSON	AD3113
000270	PEREZ	AD3113

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, the project name, activity number, and the starting date of the activity. Order the list by project number, then by employee number, and then by activity number.

Result list:

EMPNO	PROJNO	PROJNAME	ACTNO	EMSTDATE
000130	IF1000	QUERY SERVICES	100	1982-10-01
000140	IF1000	QUERY SERVICES	90	1982-10-01
000140	IF2000	USER EDUCATION	110	1982-10-01
000190	MA2112	W L ROBOT DESIGN	80	1982-10-01
000210	MA2113	W L PROD CONT PROGS	80	1982-10-01
000210	MA2113	W L PROD CONT PROGS	180	1982-10-01

Problem 8:

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

Result list:

WORKDEPT	LASTNAME	PROJNAME	ACTNO
A00	HAAS	ADMIN SERVICES	10
A00	HAAS	W L PROGRAMMING	10
A00	HAAS	WELD LINE AUTOMATION	10
A00	LUCCHESI	WELD LINE AUTOMATION	20

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.

Result list:

WORKDEPT	LASTNAME	PROJNAME	ACTNO
A00	HAAS	ADMIN SERVICES	10
A00	HAAS	W L PROGRAMMING	10
A00	HAAS	WELD LINE AUTOMATION	10
A00	LUCCHESI	WELD LINE AUTOMATION	20
B01	THOMPSON	WELD LINE PLANNING	30
C01	KWAN	QUERY SERVICES	10
C01	KWAN	USER EDUCATION	10
C01	NICHOLLS	QUERY SERVICES	90
C01	NICHOLLS	USER EDUCATION	100
C01	NICHOLLS	USER EDUCATION	110
C01	QUINTANA	QUERY SERVICES	90
C01	QUINTANA	QUERY SERVICES	100

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 manger number of the manager assigned to the project, the starting date of the activity, the project number, and the last name of the employee performing the activity. The list should be ordered by activity number and then by the activity start date.

Result list:

ACTNO	MGRNO	EMSTDATE	PROJNO	LASTNAME
60	000070	1982-12-01	AD3112	SMITH
60	000070	1983-01-01	AD3112	SMITH
70	000070	1982-10-15	AD3113	PEREZ
80	000070	1982-10-15	AD3112	SMITH
180	000070	1982-10-15	AD3111	JEFFERSON

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.

Result list:

DEPTNO	MANAGER	EMPLOYEE	M_HIREDATE	E_HIREDATE
A00	HAAS	LUCCHESI	1965-01-01	1958-05-16
A00	HAAS	O'CONNELL	1965-01-01	1963-12-05

Exercise 5. SQL DQL – SCALAR FUNCTION AND ARITHMETIC QUERY

What is this Exercise is About

This exercise provides a knowledge to code SQL statements using SCALAR functions and ARITHMETIC expressions.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code queries that uses scalar functions.
- Code queries by using calculated expressions in the SELECT list and in the WHERE clause.
- Use basic and advance SCALAR function queries.
- Use the CONCAT operator in queries.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, handouts, notes, etc.)

Problem 1:

For employees, whose salary is increased by 5 percent, is less than or equal to $20,000.00, list the following:

- Last name
- Current Salary
- Salary increased by 5 percent
- Monthly salary increased by 5 percent

Use the following 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 digits to the right of the decimal point. Sort the results by annual salary.

Result list:

LASTNAME	SALARY	INC-Y-SALARY	INC-M-SALARY
PARKER	15340.00	16107.00	1342.25
SETRIGHT	15900.00	16695.00	1391.25
JOHNSON	17250.00	18112.50	1509.37
SMITH	17750.00	18637.50	1553.12
JONES	18270.00	19183.50	1598.62

Problem 2:

All employees with an education level of 18 or 20 will receive a salary increase of $1,200.00 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.

Result list:

LASTNAME	EDLEVEL	NEW-SALARY	NEW-BONUS
KWAN	20	39450.00	400.00
NICHOLLS	18	29620.00	300.00
LUTZ	18	31040.00	300.00
THOMPSON	18	42450.00	400.00
HAAS	18	53950.00	500.00

Problem 3:

The salary will be decreased by $1,000.00 for all employees matching the following criteria:

- They belong to department D11
- Their salary is more than or equal to 80 percent of $20,000.00
- Their salary is less than or equal to 120 percent of $20,000.00

Use the name DECR-SALARY for the generated column.
List department number, last name, salary, and decreased salary. Sort the result list by salary.

Result list:

WORKDEPT	LASTNAME	SALARY	DECR-SALARY
D11	JONES	18270.00	17270.00
D11	WALKER	20450.00	19450.00
D11	SCOUTTEN	21340.00	20340.00
D11	PIANKA	22250.00	21250.00

Problem 4:

Produce a list of all employees in department D11 that have an income (sum of salary, bonus, and commission) 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 set in descending order by income. For this problem, assume that all employees have non-null salaries, bonus, and commission.

Result list:

WORKDEPT	LASTNAME	INCOME
D11	LUTZ	32827.00
D11	BROWN	30557.00
D11	YOSHIMURA	27154.00
D11	SCOUTTEN	23547.00
D11	JONES	20132.00

Problem 5:

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

Result list:

DEPTNO	DEPTNAME	MGRNO
D01	DEVELOPMENT CENTER	UNKNOWN

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.

Result list:

PROJNO	MAJOR PROJECT
MA2100	MAIN PROJECT
MA2110	MA2100
MA2111	MA2110
MA2112	MA2110
MA2113	MA2110

Problem 7:

List all employees who were younger than 25 years old 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.

Result list:

EMPNO	LASTNAME	AGE
000220	LUTZ	20
000340	GOUNOT	20
000120	O'CONNELL	21
000160	PIANKA	22
000190	WALKER	22
000050	GEYER	23
000100	SPENSER	23
000150	ADAMSON	24
000180	SCOUTTEN	24
000200	BROWN	24

Problem 8:

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

Result list:

YEAR	MONTH	PROJNO
1982	1	MA2111
1982	1	MA2112
1982	2	MA2113

Problem 9:

List the project number and duration, in weeks, for 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 project number.

Result list:

PROJNO	WEEKS
MA2100	56.6
MA2110	56.6
MA2111	47.7
MA2112	47.7
MA2113	41.3

Problem 10:

For project 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.
Rename the column PRENDATE to ESTIMATED and the derived column EXPECTED. Order the list by project number.

Result list:

PROJNO	ESTIMATED	EXPECTED
MA2100	1983-02-01	1983-03-12
MA2110	1983-02-01	1983-03-12
MA2111	1982-12-01	1983-01-03
MA2112	1982-12-01	1983-01-03
MA2113	1982-12-01	1982-12-29

Problem 11:

How many days are there 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 your Database.
Include a WHERE clause that derives a single result row.

Name the derived column DAYS.

Result list

DAYS
11122

Exercise 6. SQL DQL – COLUMN FUNCTION AND GROUP BY WITHOUT OR WITH HAVING CLAUSE

What is this Exercise is About

This exercise provides a knowledge to code SQL statements using COLUMN functions and GROUP BY with or without HAVING clause.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code queries that uses column functions.
- Code queries with complete SQL clauses.
- Code queries that use GROUP BY clause to group values together as one row.
- Code queries that include HAVING clause to produce a cursor with grouped rows.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, handouts, notes, etc.)

Problem 1:

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

Result list:

WORKDEPT	SUM_SALARY
A00	128500.00
B01	41250.00
C01	90470.00
D11	222100.00
D21	150920.00
E01	40175.00
E11	104990.00
E21	95310.00

Problem 2:

For all departments, display department number and the number of employees in each department.

Name the derived column EMP_COUNT.

Result list:

WORKDEPT	EMP_COUNT
A00	3
B01	1
C01	3
D11	9
D21	6
E01	1
E11	5
E21	4

Problem 3:

Display those departments which have more than 3 employees.

Result list:

```
WORKDEPT
--------
D11
D21
E11
E21
```

Problem 4:

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

Result list:

```
DESIGNER  WORKDEPT
------+---------+-
        8  D11
```

Problem 5:

Show the average salary for men and the average salary for women in each department. Display the work department, sex, the average salary, the average bonus, the 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

Result list:

WORKDEPT	SEX	AVG-SALARY	AVG-BONUS	AVG-COMM	COUNT
A00	M	37875.00	750.00	3030.00	2
C01	F	30156.66	633.33	2412.66	3
D11	F	24476.66	500.00	1958.00	3
D11	M	24778.33	500.00	1981.83	6
D21	F	26933.33	500.00	2154.33	3
D21	M	23373.33	466.66	1869.66	3
E11	F	23966.66	466.66	1917.33	3
E11	M	16545.00	350.00	1323.50	2
E21	M	23827.50	475.00	1906.25	4

Problem 6:

Display the average bonus and average commission for all departments with an average bonus greater than $500.00 and an average commission greater than $2,000.00. 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.

Result list:

WORKDEPT	AVG-BONUS	AVG-COMM
A00	833.33	3426.66
B01	800.00	3300.00
C01	633.33	2412.66
E01	800.00	3214.00

Exercise 7. SQL DQL – UNION QUERY

What is this Exercise is About

This exercise provides a knowledge to code SQL statements using UNION statement.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Code queries that uses UNION statement to combine multiple cursors or result table from multiple SELECT statements.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, hand outs, notes, etc.)

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 guide. Apply an appropriate ORDER BY clause to achieve the required results. Use the column headings as shown in the result list below.

Result list:

LASTNAME	FIRSTNME	WHEN	SALARY
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
MARINO	SALVATORE	BEFORE A RAISE	28760.000
MARINO	SALVATORE	AFTER A RAISE	31636.000
PEREZ	MARIA	BEFORE A RAISE	27380.000
PEREZ	MARIA	AFTER A RAISE	30118.000
SMITH	DANIEL	BEFORE A RAISE	19180.000
SMITH	DANIEL	AFTER A RAISE	21098.000

Problem 2:

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

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

Result list:

WORKDEPT	EMPNO	SALARY
A00	000120	29250.00
A00	000110	46500.00
A00	000010	52750.00
A00	SUM	128500.00

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 result list for clarifications of the problem. First

line (one per department)

- Department number
- Text: DEPARTMENT
- Department name

Second line(s) (if data are available – one line per project)

- Department number
- Project number
- Project name

Subsequent line(s) (if data are available – one line per employee)

- Department number
- Employee number
- Last name

Result list:

DEPTNO	INFO	DEPTNAME	
A00	DEPARTMENT	SPIFFY COMPUTER SERVICE DIV.	1
A00	000010	HAAS	3
A00	000110	LUCCHESI	3
A00	000120	O'CONNELL	3
B01	DEPARTMENT	PLANNING	1
B01	PL2100	WELD LINE PLANNING	2
B01	000020	THOMPSON	3
C01	DEPARTMENT	INFORMATION CENTER	1
C01	IF1000	QUERY SERVICES	2
C01	IF2000	USER EDUCATION	2
C01	000030	KWAN	3
C01	000130	QUINTANA	3
C01	000140	NICHOLLS	3

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 the employee number, and finally by the starting date.

Result list:

	PROJNO	RESPEMP	PRSTDATE	PRENDATE
PROJECT	IF1000	000030	1982-01-01	1983-02-01
	IF1000	000030	1982-06-01	1983-01-01
	IF1000	000130	1982-01-01	1982-10-01
	IF1000	000130	1982-10-01	1983-01-01
	IF1000	000140	1982-10-01	1983-01-01
PROJECT	IF2000	000030	1982-01-01	1983-02-01
	IF2000	000030	1982-01-01	1983-01-01
	IF2000	000140	1982-01-01	1982-03-01
	IF2000	000140	1982-03-01	1982-07-01
	IF2000	000140	1982-03-01	1982-07-01
	IF2000	000140	1982-10-01	1983-01-01

Exercise 8. SQL DQL – SUBQUERY

What is this Exercise is About

This exercise provides a knowledge to code SQL statements using Subqueries.

What You Should Be Able to Do

At the end of the lab exercises, you should be able to:

- Code basic subqueries - A query that is place inside another query.
- Code complex subqueries by using the keyword **EXISTS** and **IN**.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, hand outs, notes, etc.)

Problem 1:

List those employees that have a salary which is greater than or equal to the average salary of all employees plus $500.00.
Display department number, employee number, last name, and salary. Sort the list by the department number and employee number.

Result list:

WORKDEPT	EMPNO	LASTNAME	SALARY
A00	000010	HAAS	52750.00
A00	000110	LUCCHESI	46500.00
B01	000020	THOMPSON	41250.00
C01	000030	KWAN	38250.00
D21	000070	PULASKI	36170.00
E01	000050	GEYER	40175.00

Problem 2:

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

Result list:

EMPNO	LASTNAME
000060	STERN
000120	O'CONNELL

Problem 3:

List project number and duration (in days) of the project with the shortest duration. Name the derived column DAYS.

Result list:

PROJNO	DAYS
PL2100	257

Problem 4:

List department number, department name, last name, and first name of those employees in departments that have only male employees.

Result list:

DEPTNO	DEPTNAME	LASTNAME	FIRSTNME
B01	PLANNING	THOMPSON	MICHAEL
E01	SUPPORT SERVICES	GEYER	JOHN
E21	SOFTWARE SUPPORT	SPENSER	THEODORE
E21	SOFTWARE SUPPORT	MEHTA	RAMLAL
E21	SOFTWARE SUPPORT	LEE	WING
E21	SOFTWARE SUPPORT	GOUNOT	JASON

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.

Result list:

LASTNAME	JOB	EDLEVEL	YEARS	SALARY
GEYER	MANAGER	16	50	40175.00
PULASKI	MANAGER	16	19	36170.00
STERN	MANAGER	16	26	32250.00
HENDERSON	MANAGER	16	29	29750.00

Exercise 9. SQL DQL – QUERY WITH INTERSECT AND EXCEPT STATEMENTS

What is this Exercise is About

This exercise provides a knowledge to code SQL statements using INTERSECT and EXCEPT keywords.

What You Should Be Able To Do

- t the end of the lab exercises, you should be able to:
- Code queries with INTERSECT and EXCEPT keywords.

Contrast between INTERSECT and EXCEPT keywords.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, handouts, notes, etc.)

Problem 1:

Open 3 separate command editors.

In the first command editor, code the query that list the last name, education level, and job for all ANALYST employees.

Result list:

LASTNAME	EDLEVEL	JOB
QUINTANA	16	ANALYST
NICHOLLS	18	ANALYST
NATZ	18	ANALYST

In the second command editor, code the query that list last name, education level, and job for employees, whose education level is 18.

Result list:

LASTNAME	EDLEVEL	JOB
HAAS	18	PRES
THOMPSON	18	MANAGER
NICHOLLS	18	ANALYST
LUTZ	18	DESIGNER
HEMMINGER	18	SALESREP
NATZ	18	ANALYST
JOHN	18	DESIGNER

In the third command editor, code the query that combines your first query from the command editor 1 and your second query from the command editor 2 using INTERSECT keyword.

Explain the cursor (result table)

Problem 2:

Open 3 separate command editors.

In the first command editor, code the query that list employee number, last name, job, work department, project number, and project name for all employees who works at departments A00 through D11.

Result list:

EMPNO	LASTNAME	JOB	WORKDEPT	PROJNO	PROJNAME
000010	HAAS	PRES	A00	AD3100	ADMIN SERVICES
000010	HAAS	PRES	A00	MA2100	WELD LINE AUTOMATION
000020	THOMPSON	MANAGER	B01	PL2100	WELD LINE PLANNING
000030	KWAN	MANAGER	C01	IF1000	QUERY SERVICES
000030	KWAN	MANAGER	C01	IF2000	USER EDUCATION
000060	STERN	MANAGER	D11	MA2110	W L PROGRAMMING
000150	ADAMSON	DESIGNER	D11	MA2112	W L ROBOT DESIGN
000160	PIANKA	DESIGNER	D11	MA2113	W L PROD CONT PROGS
000220	LUTZ	DESIGNER	D11	MA2111	W L PROGRAM DESIGN

In the second command editor, code the query that list employee number, last name, job, work department, project number, and project name for all employees who are not President nor Managers.

Result list:

EMPNO	LASTNAME	JOB	WORKDEPT	PROJNO	PROJNAME
000150	ADAMSON	DESIGNER	D11	MA2112	W L ROBOT DESIGN
000160	PIANKA	DESIGNER	D11	MA2113	W L PROD CONT PROGS
000220	LUTZ	DESIGNER	D11	MA2111	W L PROGRAM DESIGN
000230	JEFFERSON	CLERK	D21	AD3111	PAYROLL PROGRAMMING
000250	SMITH	CLERK	D21	AD3112	PERSONNEL PROGRAMMING
000270	PEREZ	CLERK	D21	AD3113	ACCOUNT PROGRAMMING
000320	MEHTA	FIELDREP	E21	OP2011	SCP SYSTEMS SUPPORT
000330	LEE	FIELDREP	E21	OP2012	APPLICATIONS SUPPORT
000340	GOUNOT	FIELDREP	E21	OP2013	DB/DC SUPPORT

Problem 2: (continued)

In the third command editor, code the query that combines your first query from the command editor 1 and your second query from the command editor 2 using INTERSECT keyword.

Explain the cursor (result table)

Problem 3:

Consider your INTERSECT query in problem #1. Replace the keyword INTERSECT with EXCEPT keyword.

Explain the cursor (result table)

Problem 4:

Consider your INTERSECT query in problem #2. Replace the keyword INTERSECT with EXCEPT keyword.

Explain the cursor (result table)

Exercise 10. SQL DQL – SQL VIEWS AND MERGE STATEMENTS

What is this Exercise is About

This exercise provides a knowledge to work with VIEWS and MERGE statements.

What You Should Be Able To Do

At the end of the lab exercises, you should be able to:

- Create views from existing tables in the Database.
- Code MERGE statement that combines an INSERT statement with an UPDATE or DELETE statement.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

Instructor's instructional materials

SQL References (Online resources, handouts, notes, etc.)

Problem 1:

Create a view called MYEMPVW1 that contains the data; employee number, last name, first name, work department, and salary for employees from employee table.

Result list:

EMPNO	LASTNAME	FIRSTNME	WORKDEPT	SALARY
000010	HAAS	CHRISTINE	A00	152,750.00
000020	THOMPSON	MICHAEL	B01	94,250.00
000030	KWAN	SALLY	C01	98,250.00
000050	GEYER	JOHN	E01	80,175.00
000060	STERN	IRVING	D11	72,250.00
000070	PULASKI	EVA	D21	96,170.00
000090	HENDERSON	EILEEN	E11	89,750.00
000100	SPENSER	THEODORE	E21	86,150.00
000110	LUCCHESSI	VINCENZO	A00	66,500.00
000120	O'CONNELL	SEAN	A00	49,250.00
000130	QUINTANA	DELORES	C01	73,800.00
000140	NICHOLLS	HEATHER	C01	68,420.00
000150	ADAMSON	BRUCE	D11	55,280.00
000160	PIANKA	ELIZABETH	D11	62,250.00
000170	YOSHIMURA	MASATOSHI	D11	44,680.00
000180	SCOUTTEN	MARILYN	D11	51,340.00
000190	WALKER	JAMES	D11	50,450.00
000200	BROWN	DAVID	D11	57,740.00
000210	JONES	WILLIAM	D11	68,270.00

. . .

42 row(s) in memory

Problem 2:

Create a view called MYEMPVW2 that contains the data; employee number, last name, first name, work department, and income for all employees working in departments A00, C01, and E11.
The income is the sum of the salary, bonus, and commission of the employee.

Name the view derived column TOTAl_INCOME.

Result list:

EMPNO	LASTNAME	FIRSTNME	WORKDEPT	TOTAL_INCOME
000010	HAAS	CHRISTINE	A00	157,970.00
000030	KWAN	SALLY	C01	102,110.00
000090	HENDERSON	EILEEN	E11	92,730.00
000110	LUCCHESSI	VINCENZO	A00	71,120.00
000120	O'CONNELL	SEAN	A00	52,190.00
000130	QUINTANA	DELORES	C01	76,204.00
000140	NICHOLLS	HEATHER	C01	71,294.00
000280	SCHNEIDER	ETHEL	E11	38,850.00
000290	PARKER	JOHN	E11	36,867.00
000300	SMITH	PHILIP	E11	39,570.00
000310	SETRIGHT	MAUDE	E11	37,472.00
200010	HEMMINGER	DIAN	A00	51,720.00
200120	ORLANDO	GREG	A00	42,190.00
200140	NATZ	KIM	C01	71,294.00
200280	SCHWARTZ	EILEEN	E11	48,850.00
200310	SPRINGER	MICHELLE	E11	37,472.00

Problem 3:

Create a view called MYEMPVW3 that contains the data; employee number, last name, and the number of years the employee has served the company up to the current date. Create new column names for the view as EMP_ID, LAST_NAME, and YRS_SERVED respectively.

Problem 4:

Create a view called MYEMPVW4 that contains the data; employee number, last name, first name, and education level for employees from employee table. The view should contain only rows with education level greater than 17.

Problem 5:

Create a view called MYEMPVW5 that contains the data; employee number, last name, first name, and education level for employees from employee table. The view should restrict users to insert into the view an education level that is less than 12.

Problem 6:

Create a view called MYEMPVW6 that contains the data from view MYEMPVW5. MYEMPVW6 should contain rows with an education level between 15 and 18.

Exercise 11. XML AND XQUERY

What is this Exercise is About

This exercise provides a knowledge to work with XML and XQUERY.

What You Should Be Able To Do

- At the end of the lab exercises, you should be able to:

  Create XML tables.
- Insert XML data into XML tables.
- Code XQUERY statements to retrieve XML data from XML tables.
- Code XQUERY with FLWOR expression.

Introduction

See the data model at the start of this exercise guide to get the table names, column names and descriptions for each table.

Supporting Resources

- Instructor's instructional materials
- SQL References (Online resources, handouts, notes, etc.)

Problem 1:

Create an XML-enabled database named **`IM_XMLDB`**.

Problem 2:

Create an XML-enabled tables named **`xml_employee`** and **`xml_clients`** inside **`IM_XMLDB`** Database.

XML_EMPLOYEE table

Column Name	Meaning	Data Type	NULLS Allowed
EMPNO	Employee number	SMALLINT	N
(**PK**) NAME	Name of employee	VARCHAR(30)	N
ADDRESS	Address of employee	VARCHAR(30)	N
JOB	Job Position of employee	**XML**	N
CONTACTINFO	Detailed contact information	**XML**	N
CIDNO (**FK**)	ID number of the client	SMALLINT	Y

XML_CLIENTS table

Column Name	Meaning	Data Type	NULLS Allowed
CIDNO (**PK**)	ID number of the client	SMALLINT	N
NAME	Name of the client	VARCHAR(30)	N
ADDRESS	Address of the client	**XML**	N
STATUS	Marital status	VARCHAR(10)	Y
CONTACTINFO	Detailed contact information	**XML**	N

Problem 3:

Insert 5 rows/records into XML_EMPLOYEE table by using the data of your 5 classmates.

Insert 3 rows/records into XML_CLIENTS table by using the data of your 3 neighbours.

Problem 4:

List employee number, employee name, and job for all employees who served more than 5 years.

Problem 5:

List employee number, employee name, job, client name, and client contact information for all employees who served 1 or more clients.

Problem 6:

List employee job in hierarchical format for all employees.

Problem 7:

List client address in hierarchical format for all single clients.

Problem 8:

List client address and contact information in tabular format.

Problem 9:

List department name, department head, and position for all employees creating a XML element nodes for each column names respectively. List only those employees who served less than 5 years.

Problem 10:

Code XQuery that returns a hierarchical output for the employee's job.

Problem 11:

Code XQuery that returns a hierarchical output for the clients contact information.

Problem 12:

Code XQuery with FLWOR expression that returns a hierarchical output for the clients contact information. Set a WHERE clause to retrieved any client/s that matches your predicate.

Problem 13:

Code XQuery with FLWOR expression that returns HTML format of the column, job for all employees.

Problem 14:

Demonstrate XQuery with three-part conditional expression and XQuery with embedded SQL statement.