

Hands-on Lab: Working with Multiple Tables

Estimated time needed: 30 minutes

In this lab, you will through some SQL practice problems that will provide hands-on experience with SQL queries that access multiple tables. You will be:

- Accessing Multiple Tables with Sub-Queries
- Accessing Multiple Tables with Implicit Joins

How does an Implicit version of CROSS JOIN (also known as Cartesian Join) statement syntax look?

```
SELECT column_name(s)
FROM table1, table2;
```

How does an Implicit version of INNER JOIN statement syntax look?

```
SELECT column_name(s)
FROM table1, table2
WHERE table1.column_name = table2.column_name;
```

Software Used in this Lab

In this lab, you will use IBM Db2 Database. Db2 is a Relational Database Management System (RDBMS) from IBM, designed to store, analyze and retrieve the data efficiently.

To complete this lab you will utilize a Db2 database service on IBM Cloud. If you did not already complete this lab task earlier in this module, you will not yet have access to Db2 on IBM Cloud, and you will need to follow the lab below first:

Hands-on Lab: Sign up for IBM Cloud, Create Db2 service instance and Get started with the Db2 console

Database Used in this Lab

The database used in this lab is an internal database. You will be working on a sample HR database. This HR database schema consists of 5 tables called **EMPLOYEES**, **JOB HISTORY**, **JOBS**, **DEPARTMENTS** and **LOCATIONS**. Each table has a few rows of sample data. The following diagram shows the tables for the HR database:

SAMPLE HR DATABASE TABLES

EMPLOYE	EES													
EMP_ID	F_NAME	L_NAME	SSN	B_DATE		SEX	ADDRESS		JOB_ID	SALARY MANAG		MANAGE	R_ID	DEP_ID
E1001	John	Thomas	123456	1976-01	09 I	М	5631 Rice, OakPark,IL		100	100000 30001			2	
E1002	Alice	James	123457	1972-07	-31	F	980 Berry In, E	lgin,IL	200	80000	0	30002		5
E1003	Steve	Wells	123458	1980-08	3-10 I	М	291 Springs, Gary, IL		300	50000 30002			5	
JOB_HIST	TORY					J	OBS							
EMPL_ID	START_D	START_DATE JOBS		_ID DEPT_ID		JO	JOB_IDENT JOB_		TLE		MIN_SALARY		MA	X_SALAI
E1001	2000-01	2000-01-30 100		2		10	100 Sr. Arch		itect		6000	60000		000
E1002	2010-08	2010-08-16 200		5		20	200 Sr.Softv		ftwareDeveloper		60000		800	00
E1003	2016-08	2016-08-10 300		5		30	00 Jr.Softw		ftwareDeveloper		40000		600	00
DEPARTN	MENTS						LOCATIO	NS						
DEPT_ID_D	DEP_NA	DEP_NAME N			LOC_ID		LOCT_ID		DEP	_ID_LOC	:			
2	Architec	Architect Group		30001			L0001		2					
5	Softwar	Software Development		30002			L0002		5					
7	Design 1	Design Team			L0003		L0003		7					
5	Softwar	Software		30004 10004										

NOTE: This lab requires you to have all 5 of these tables of the HR database populated with sample data on Db2. If you didn't complete the earlier lab in this module, you won't have the tables above populated with sample data on Db2, so you will need to go through the lab below first:

• Hands-on Lab: Create tables using SQL scripts and Load data into tables

Objectives

After completing this lab you will be able to:

- Write SQL queries that access more than one table
- Compose queries that access multiple tables using a nested statement in the WHERE clause
- Build queries with multiple tables in the FROM clause
- Write Implicit Join queries with join criteria specified in the WHERE clause
- Specify aliases for table names and qualify column names with table aliases

NOTE: Make sure that you are using the CSV file and datasets from the same instruction file.

Instructions

When you approach the exercises in this lab, follow the instructions to run the queries on Db2:

- Go to the <u>Resource List</u> of IBM Cloud by logging in where you can find the Db2 service instance that you created in a previous lab under Services section. Click on the Db2-xx service. Next, open the Db2 Console by clicking on Open Console button. Click on the 3-bar menu icon in the top left corner and go to the **Run SQL** page. The Run SQL tool enables you to run SQL statements.
 - If needed, follow <u>Hands-on Lab: Sign up for IBM Cloud, Create Db2 service instance and Get started with the Db2 console</u>

Exercise 1: Accessing Multiple Tables with Sub-Queries

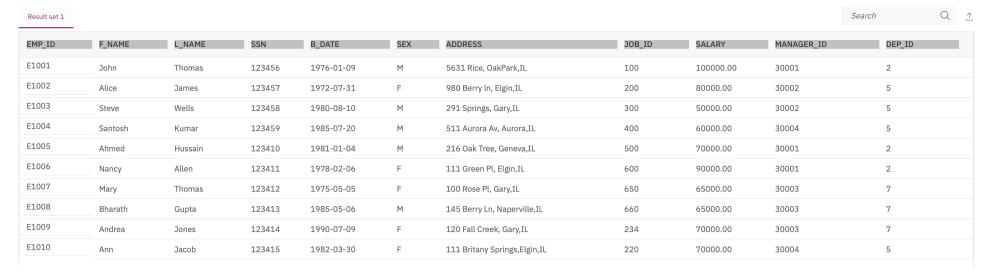
1. Problem:

Retrieve only the EMPLOYEES records that correspond to jobs in the JOBS table.

▼ Solution

select * from employees where JOB ID IN (select JOB IDENT from jobs);

▼ Output



2. Problem:

Retrieve only the list of employees whose JOB_TITLE is Jr. Designer.

▼ Solution

select * from employees where JOB_ID IN (select JOB_IDENT from jobs where JOB_TITLE= 'Jr. Designer');

▼ Output

Result set 1										Search	Q 1
EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID	
E1007	Mary	Thomas	123412	1975-05-05	F	100 Rose Pl, Gary,IL	650	65000.00	30003	7	
E1008	Bharath	Gupta	123413	1985-05-06	М	145 Berry Ln, Naperville,IL	660	65000.00	30003	7	

3. Problem:

Retrieve JOB information and who earn more than \$70,000.

▼ Solution

select JOB_TITLE, MIN_SALARY,MAX_SALARY,JOB_IDENT from jobs where JOB_IDENT IN (select JOB_ID from employees where SALARY > 70000);

▼ Output



4. Problem:

Retrieve JOB information and whose birth year is after 1976.

Solution

select JOB_TITLE, MIN_SALARY,MAX_SALARY,JOB_IDENT from jobs where JOB_IDENT IN (select JOB_ID from employees where YEAR(B_DATE)>1976);

▼ Output

https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DB0201EN-SkillsNetwork/labs/Labs_Coursera_V5/labs/Lab - Working with Multiple Tables /instru... 9/16/22, 12:41 AM



5. Problem:

Retrieve JOB information for female employees whose birth year is after 1976.

▼ Solution

select JOB_TITLE, MIN_SALARY, MAX_SALARY, JOB_IDENT from jobs where JOB_IDENT IN (select JOB_ID from employees where YEAR(B_DATE)>1976 and SEX='F');

▼ Output



Exercise 2: Accessing Multiple Tables with Implicit Joins

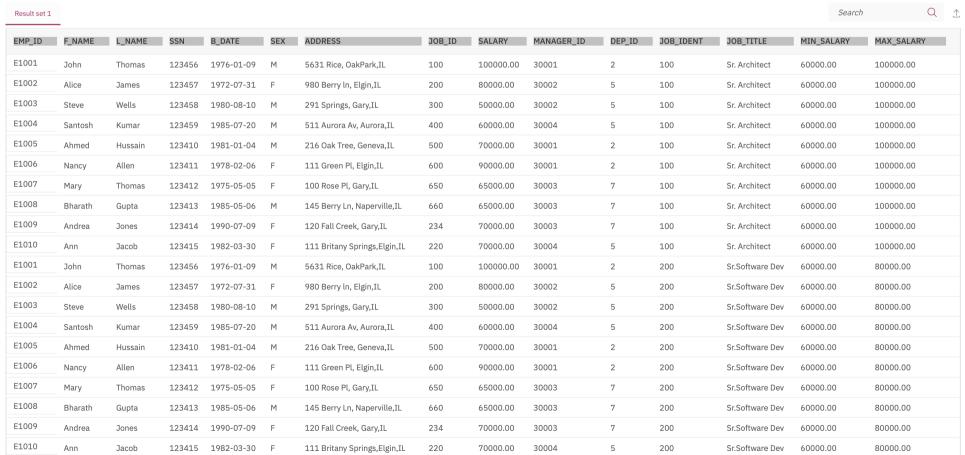
1. Problem:

Perform an implicit cartesian/cross join between EMPLOYEES and JOBS tables.

▼ Solution

select * from employees, jobs;

Output



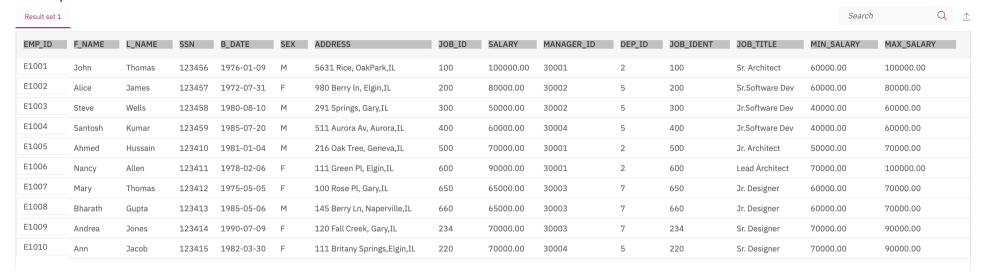
2. Problem:

Retrieve only the EMPLOYEES records that correspond to jobs in the JOBS table.

Solution

select * from employees, jobs where employees.JOB_ID = jobs.JOB_IDENT;

▼ Output



3. Problem:

Redo the previous query, using shorter aliases for table names.

▼ Solution

select * from employees E, jobs J where E.JOB_ID = J.JOB_IDENT;

▼ Output



4. Problem:

Redo the previous query, but retrieve only the Employee ID, Employee Name and Job Title.

▼ Solution

▼ Output



5. Problem:

Redo the previous query, but specify the fully qualified column names with aliases in the SELECT clause.

▼ Solution

select E.EMP_ID, E.F_NAME, E.L_NAME, J.JOB_TITLE from employees E, jobs J where E.JOB_ID = J.JOB_IDENT;

▼ Output



Solution Script

If you would like to run all the solution gueries of the SQL problems of this lab with a script, download the script below. Upload the script to the Db2 console and run. Follow Hands-on Lab: Create tables using SQL scripts and Load data into tables on how to upload a script to Db2 console and run it.

• MultipleTables Solution Script.sql

Congratulations! You have completed this lab, and you are ready for the next topic.

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Other Contributor(s)

Changelog

Date	Version	Changed by	Change Description					
2022-01-20	2.2	Malika	Updated Exercise 1 problem statement 3,4 and 5					
2020-12-25	2.1	Steve Ryan	ID Reviewed					
2020-12-10	2.0	Sandip Saha Joy	Created revised version from DB0201EN					
2020	1.0	Rav Ahuja	Created initial version					

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