



# Hands-on Lab: Working with Multiple Tables in MySQL using phpMyAdmin

Estimated time needed: 20 minutes

In this lab, you will learn how to create tables and load data in the MySQL database service using the phpMyAdmin graphical user interface (GUI) tool.

### **Software Used in this Lab**

In this lab, you will use MySQL MySQL is a Relational Database Management System (RDBMS) designed to efficiently store, manipulate, and retrieve data.



To complete this lab you will utilize MySQL relational database service available as part of IBM Skills Network Labs (SN Labs) Cloud IDE. SN Labs is a virtual lab environment used in this course.

### **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

EMPLOYEES										
EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID
E1001	John	Thomas	123456	1976-01-09	М	5631 Rice, Oak Park,IL	100	100000	30001	2
E1002	Alice	James	123457	1972-07-31	F	980 Berry In, Elgin,IL	200	80000	30002	5
E1003	Steve	Wells	123458	1980-08-10	М	291 Springs, Gary,IL	300	50000	30002	5

JOB_HISTORY									
EMPL_ID	START_DATE	JOBS_ID	DEPT_ID	JOB_					
E1001	2000-01-30	100	2	100					
E1002	2010-08-16	200	5	200					
F1003	2016-08-10	300	5	300					

JOBS									
JOB_IDENT	JOB_TITLE	MIN_SALARY	MAX_SALARY						
100	Sr. Architect	60000	100000						
200	Sr.SoftwareDeveloper	60000	80000						
300	Jr.SoftwareDeveloper	40000	60000						

DEPT_ID_DEP	DEP_NAME	MANAGER_ID	LOC_ID
2	Architect Group	30001	L0001
5	Software Development	30002	L0002
7	Design Team	30003	L0003
5	Software	30004	L0004

LOCATIONS						
LOCT_ID	DEP_ID_LOG					
L0001	2					
L0002	5					
L0003	7					

### **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

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;

# **Exercise 1: Accessing Multiple Tables with Sub-Queries**

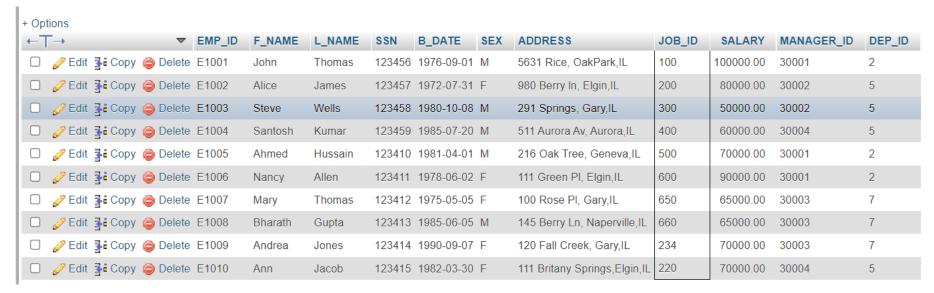
1. Problem:

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



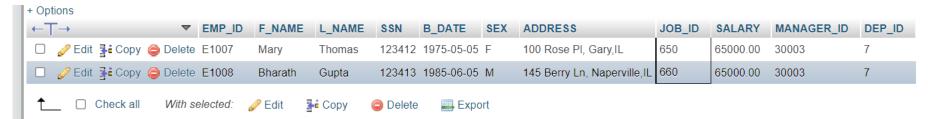
#### 2. Problem:

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



#### 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 );



#### 4. Problem:

Retrieve JOB information and list of 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 );

**▼** Output



#### 5. Problem:

Retrieve JOB information and list of 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' );



# **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;

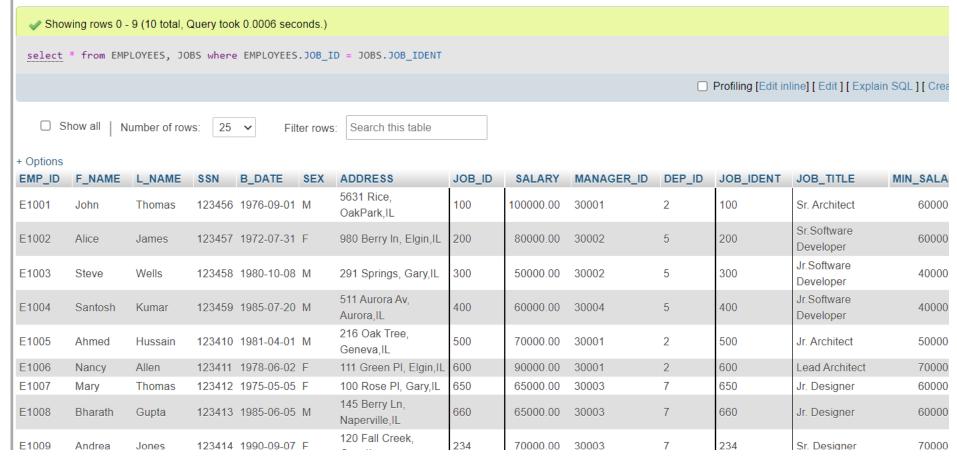
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EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID	JOB_IDENT	JOB_TITLE	MIN_SALA
E1010	Ann	Jacob	123415	1982-03-30	F	111 Britany Springs,Elgin,IL	220	70000.00	30004	5	100	Sr. Architect	60000.
E1009	Andrea	Jones	123414	1990-09-07	F	120 Fall Creek, Gary,IL	234	70000.00	30003	7	100	Sr. Architect	60000.
E1008	Bharath	Gupta	123413	1985-06-05	M	145 Berry Ln, Naperville,IL	660	65000.00	30003	7	100	Sr. Architect	60000.
E1007	Mary	Thomas	123412	1975-05-05	F	100 Rose Pl, Gary,IL	650	65000.00	30003	7	100	Sr. Architect	60000
E1006	Nancy	Allen	123411	1978-06-02	F	111 Green PI, Elgin,IL	600	90000.00	30001	2	100	Sr. Architect	60000
E1005	Ahmed	Hussain	123410	1981-04-01	М	216 Oak Tree, Geneva,IL	500	70000.00	30001	2	100	Sr. Architect	60000.
E1004	Santosh	Kumar	123459	1985-07-20	М	511 Aurora Av, Aurora,IL	400	60000.00	30004	5	100	Sr. Architect	60000.
E1003	Steve	Wells	123458	1980-10-08	M	291 Springs, Gary,IL	300	50000.00	30002	5	100	Sr. Architect	60000
E1002	Alice	James	123457	1972-07-31	F	980 Berry In, Elgin,IL	200	80000.00	30002	5	100	Sr. Architect	60000
E1001	John	Thomas	123456	1976-09-01	М	5631 Rice, OakPark,IL	100	100000.00	30001	2	100	Sr. Architect	60000
E1010	Ann	Jacob	123415	1982-03-30	F	111 Britany Springs,Elgin,IL	220	70000.00	30004	5	200	Sr.Software Developer	60000.
E1009	Andrea	Jones	123414	1990-09-07	F	120 Fall Creek, Gary,IL	234	70000.00	30003	7	200	Sr.Software Developer	60000.
E1008	Bharath	Gupta	123413	1985-06-05	М	145 Berry Ln, Naperville,IL	660	65000.00	30003	7	200	Sr.Software Developer	60000.
E1007	Mary	Thomas	123412	1975-05-05	F	100 Rose Pl, Gary,IL	650	65000.00	30003	7	200	Sr.Software Developer	60000
Consol	Nancy le	Allen	123411	1978-06-02	F	111 Green PI, Elgin,IL	600	90000.00	30001	2	200	Sr.Software Developer	60000.

### 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;



#### 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;

✓ Showing rows 0 - 9 (10 total, Query took 0.0008 seconds.)

select \* from EMPLOYEES E, JOBS J where E.JOB\_ID = J.JOB\_IDENT

□ Profiling [Edit inline] [Edit] [Explain SQL] [Created to the second secon

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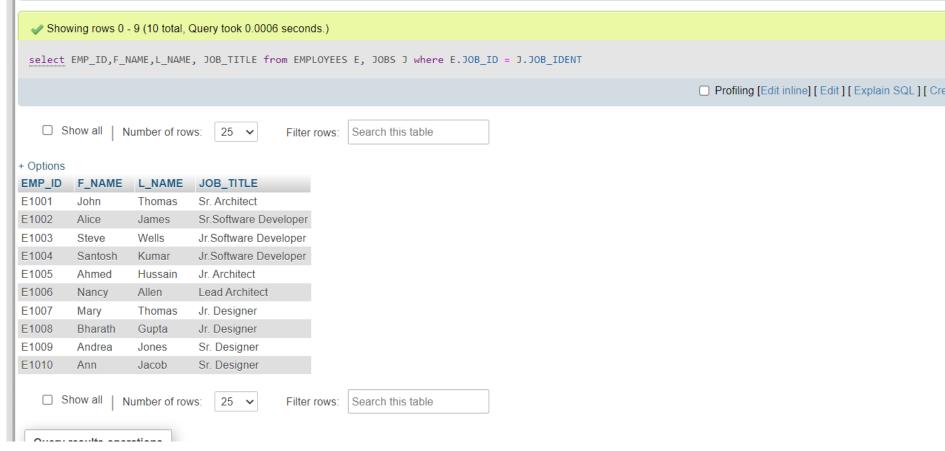
EMP_ID	F_NAME	L_NAME	SSN	B_DATE	SEX	ADDRESS	JOB_ID	SALARY	MANAGER_ID	DEP_ID	JOB_IDENT	JOB_TITLE	MIN_SALAF
E1001	John	Thomas	123456	1976-09-01	M	5631 Rice, OakPark,IL	100	100000.00	30001	2	100	Sr. Architect	60000.(
E1002	Alice	James	123457	1972-07-31	F	980 Berry In, Elgin,IL	200	80000.00	30002	5	200	Sr.Software Developer	60000.0
E1003	Steve	Wells	123458	1980-10-08	M	291 Springs, Gary,IL	300	50000.00	30002	5	300	Jr.Software Developer	40000.(
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E1005	Ahmed	Hussain	123410	1981-04-01	M	216 Oak Tree, Geneva,IL	500	70000.00	30001	2	500	Jr. Architect	50000.(
E1006	Nancy	Allen	123411	1978-06-02	F	111 Green PI, Elgin,IL	600	90000.00	30001	2	600	Lead Architect	70000.0
E1007	Mary	Thomas	123412	1975-05-05	F	100 Rose PI, Gary,IL	650	65000.00	30003	7	650	Jr. Designer	60000.0
E1008	Bharath	Gupta	123413	1985-06-05	M	145 Berry Ln, Naperville,IL	660	65000.00	30003	7	660	Jr. Designer	60000.0
E1009  Consol	Andrea	Jones	123414	1990-09-07	F	120 Fall Creek, Gary,IL	234	70000.00	30003	7	234	Sr. Designer	70000.(

#### 4. Problem:

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

**▼** Solution

select EMP\_ID,F\_NAME,L\_NAME, JOB\_TITLE from EMPLOYEES E, JOBS J where E.JOB\_ID = J.JOB\_IDENT;

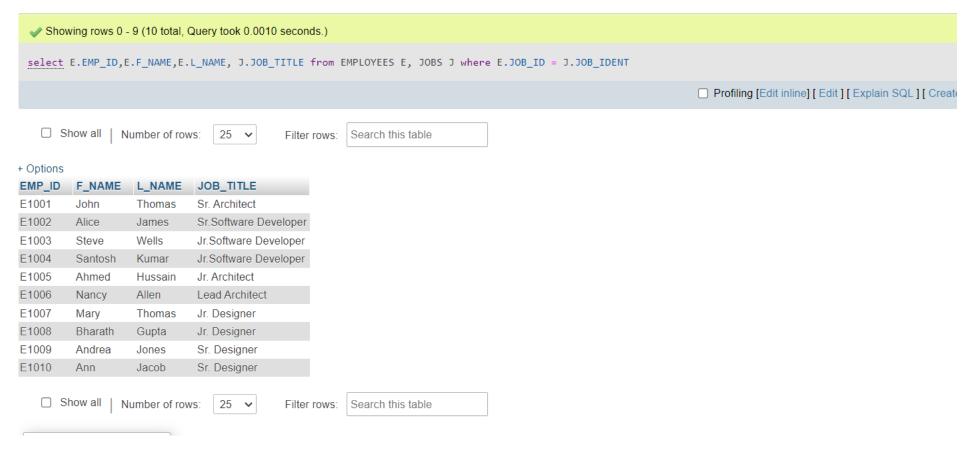


#### 5. Problem:

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;



# **Solution Script**

If you would like to run all the solution queries of the SQL problems of this lab with a script, download the script below. Import the script to mysql phpadmin interface and run. Follow <u>Hands-on Lab</u>: <u>Create tables using SQL scripts and Load data into tables</u> on how to import a script to MYsql phpadmin interface and run it.

• <u>MultipleTablesSolutionScript.sql</u>

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

# Author(s)

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## Changelog

Date	Version	Changed by	<b>Change Description</b>
2021-11-01	0.1	Lakshmi Holla, Malika Singla	Initial Version

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