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Step 1 of 8

# Hands-on Lab: String Patterns, Sorting and Grouping 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 | M | 5631 Rice, OakPark,IL | 100 | 100000 | 30001 | 2 |
| E1002 | Alice | James | 123457 | 1972-07-31 | F | 980 Berry ln, Elgin,IL | 200 | 80000 | 30002 | 5 |
| E1003 | Steve | Wells | 123458 | 1980-08-10 | M | 291 Springs, Gary,IL | 300 | 50000 | 30002 | 5 |

**JOB_HISTORY**

| EMPL_ID | START_DATE | JOBS_ID | DEPT_ID |
|---|---|---|---|
| E1001 | 2000-01-30 | 100 | 2 |
| E1002 | 2010-08-16 | 200 | 5 |
| E1003 | 2016-08-10 | 300 | 5 |

**JOBS**

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

**DEPARTMENTS**

| 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**

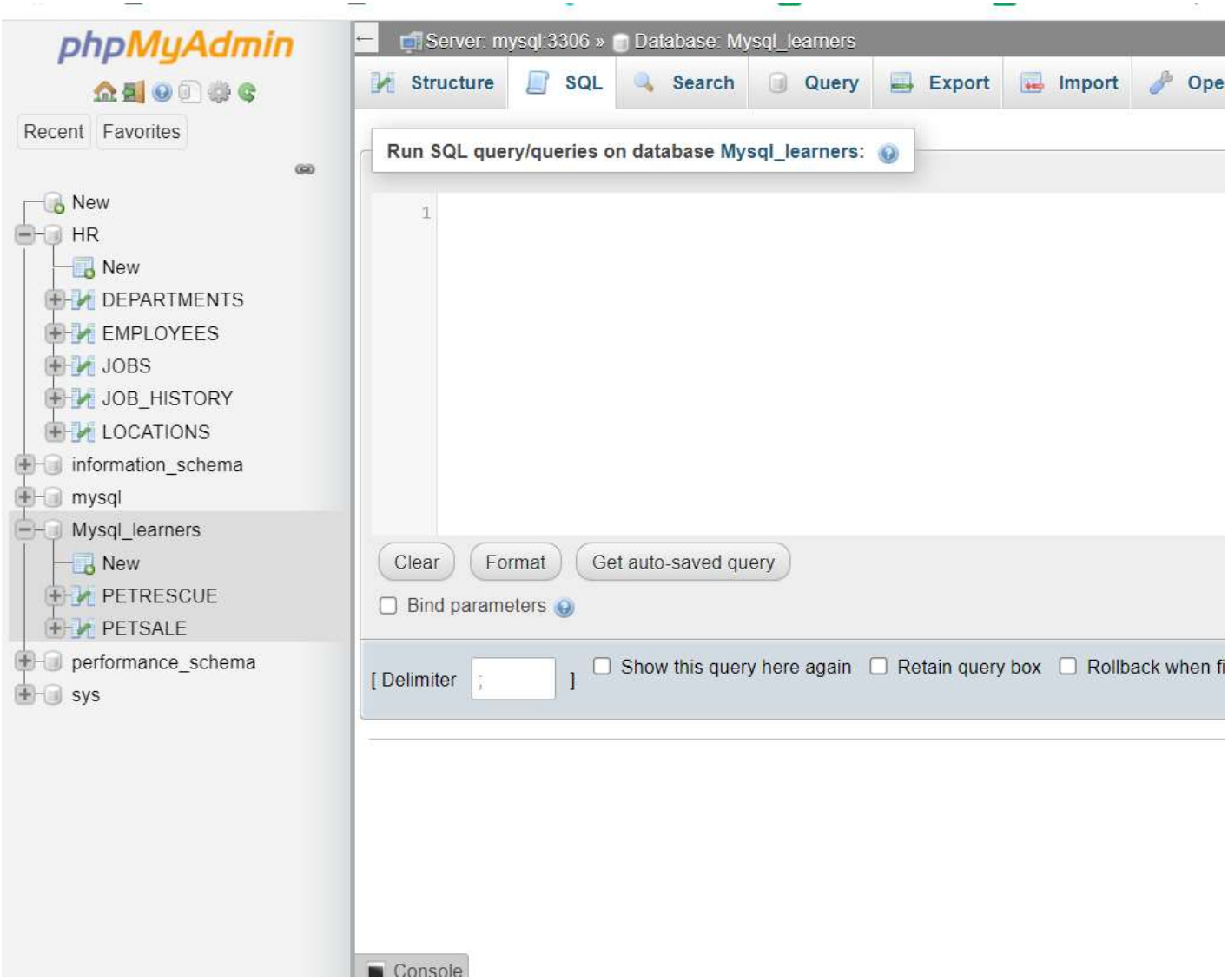
| LOCT_ID | DEP_ID_LOC |
|---|---|
| L0001 | 2 |
| L0002 | 5 |
| L0003 | 7 |

## Objectives

After completing this lab, you will be able to:

- Simplify a SELECT statement by using string patterns, ranges, or sets of values
- Sort the result set in either ascending or descending order and identify which column to use for the sorting order
- Eliminate duplicates from a result set and further restrict a result set

Once the tables are loaded open the sql editor to start executing the functions.




# Exercise 1: String Patterns

In this exercise, you will go through some SQL problems on String Patterns.

1. Problem:

   *Retrieve all employees whose address is in Elgin,IL.*

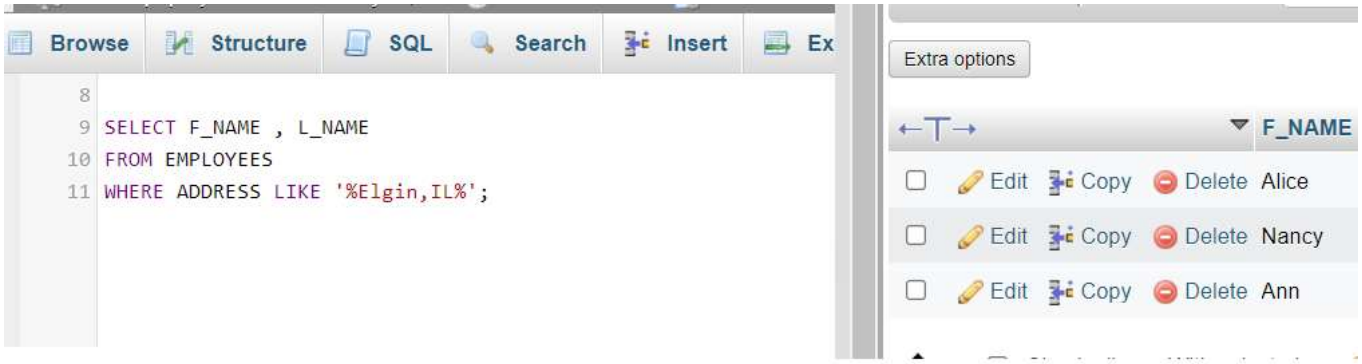
   ▼ Hint

   Use the LIKE operator to find similar strings.

   ▼ Solution

```
SELECT F_NAME , L_NAME
FROM EMPLOYEES
WHERE ADDRESS LIKE '%Elgin,IL%';
```

   ▼ Output




2. Problem:

   *Retrieve all employees who were born during the 1970's.*

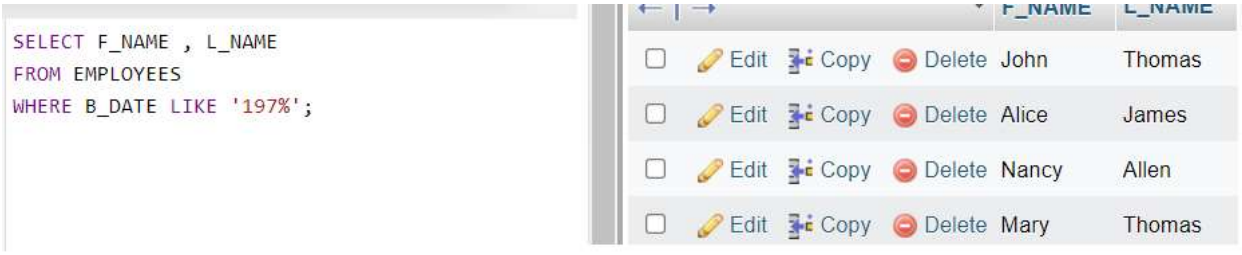
▼ Hint

Use the LIKE operator to find similar strings.

▼ Solution

```
SELECT F_NAME , L_NAME
FROM EMPLOYEES
WHERE B_DATE LIKE '197%';
```

▼ Output




3. Problem:

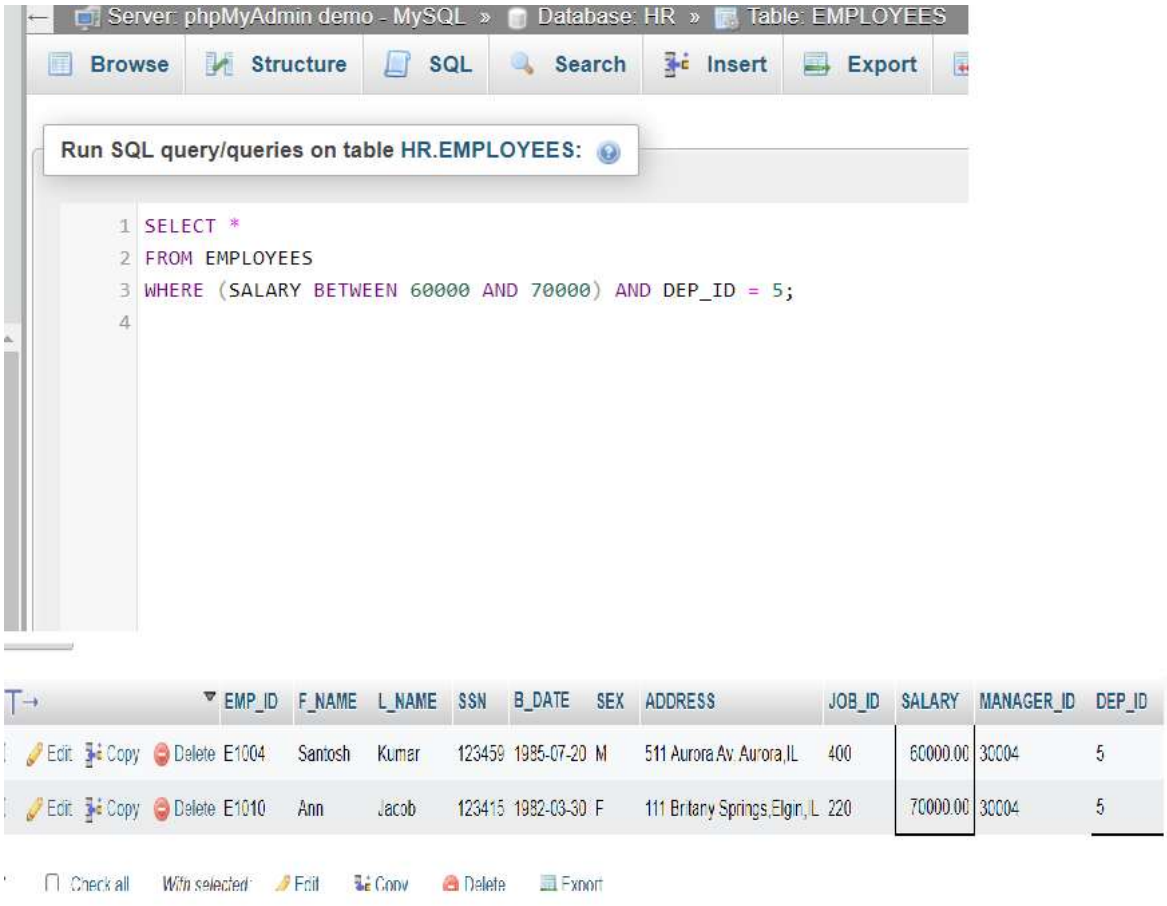
*Retrieve all employees in department 5 whose salary is between 60000 and 70000.*

▶ Hint

▼ Solution

```
SELECT *
FROM EMPLOYEES
WHERE (SALARY BETWEEN 60000 AND 70000) AND DEP_ID = 5;
```

▼ Output




# Exercise 2: Sorting

In this exercise, you will go through some SQL problems on Sorting.

1. Problem:

*Retrieve a list of employees ordered by department ID.*

▶ Hint

▶ Solution

- ▶ Output

2. Problem:

   *Retrieve a list of employees ordered in descending order by department ID and within each department ordered alphabetically in descending order by last name.*

- ▶ Hint
- ▶ Solution
- ▶ Output

3. (Optional) Problem:

   *In SQL problem 2 (Exercise 2 Problem 2), use department name instead of department ID. Retrieve a list of employees ordered by department name, and within each department ordered alphabetically in descending order by last name.*

- ▶ Hint
- ▶ Solution
- ▶ Output

# Exercise 3: Grouping

In this exercise, you will go through some SQL problems on Grouping.

**NOTE:** The SQL problems in this exercise involve usage of SQL Aggregate functions AVG and COUNT. COUNT has been covered earlier. AVG is a function that can be used to calculate the Average or Mean of all values of a specified column in the result set. For example, to retrieve the average salary for all employees in the EMPLOYEES table, issue the query: `SELECT AVG(SALARY) FROM EMPLOYEES;`. You will learn more about AVG and other aggregate functions later in the lecture **Built-in Database Functions**.

1. Problem:

   *For each department ID retrieve the number of employees in the department.*

- ▶ Hint
- ▶ Solution
- ▶ Output

2. Problem:

   *For each department retrieve the number of employees in the department, and the average employee salary in the department..*

- ▶ Hint
- ▶ Solution
- ▶ Output

3. Problem:

   *Label the computed columns in the result set of SQL problem 2 (Exercise 3 Problem 2) as NUMEMPLOYEES and AVGSALARY.*

- ▶ Hint
- ▶ Solution
- ▶ Output

4. Problem:

   *In SQL problem 3 (Exercise 3 Problem 3), order the result set by Average Salary..*

- ▶ Hint
- ▶ Solution
- ▶ Output

5. Problem:

   *In SQL problem 4 (Exercise 3 Problem 4), limit the result to departments with fewer than 4 employees.*

- ▶ Hint
- ▶ Solution
- ▶ Output

# 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 phpadmin mysql interface and run. Follow Hands-on Lab : Create tables using SQL scripts and Load data into tables on how to upload a script to phpmyadmin console and run it.

- StringPattern-Sorting-Grouping*Solution*Script.sql

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

# Author(s)

Lakshmi Holla

Malika Singla

## Changelog

| Date | Version | Changed by | Change Description |
|---|---|---|---|
| 2021-11-01 | 0.1 | Lakshmi Holla, Malika Singla | Initial Version |



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