

Hands-on Lab: Built-in functions - Aggregate, Scalar, String, Date and Time Functions 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

Mysql_learners database has been used in this lab.

Objectives

After completing this lab, you will be able to use phpMyAdmin with MySQL to:

- Compose queries consting of built in functions and check the results.

Exercise

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

Task A: Create a database

1. Click on **Skills Network Toolbox**. In **Database** section, click **MySQL**.

To start the MySQL click **Start**.

The screenshot displays the IBM Cloud Skills Network Labs interface. At the top, there are tabs for 'Lab', 'IBMCLOUD', and 'Launch Application'. Below these is a menu bar with 'File', 'Edit', 'Selection', 'View', 'Go', 'Run', 'Terminal', and 'Help'. The left sidebar contains a list of categories: 'SKILLS NETWORK...', 'DATABASES', 'BIG DATA', 'CLOUD', and 'OTHER'. The 'DATABASES' category is expanded, showing 'MySQL INACTIVE', 'PostgreSQL INACTIVE', 'Cassandra INACTIVE', and 'MongoDB INACTIVE'. The 'MySQL INACTIVE' item is highlighted with a red box. Below the list, there is a red box around a circular icon with a tree-like structure. The main panel shows the 'MySQL' service details, including the version 'v8.0.22', 'v5.0.4', and 'v14.14'. A 'Start' button is highlighted with a red box. Below the button, there are tabs for 'Summary', 'Connection Information', and 'Details'. The 'Summary' tab is selected, showing the text: 'Get started with MySQL in a faster, easier way. To launch your database, hit the Start button.'

2. Once **MySQL** has started, click on **phpMyAdmin** button to open **phpMyAdmin** in the same window.

The screenshot shows the IBM Cloud Skills Network Labs interface. At the top, there are tabs for 'Lab', 'IBMCLOUD', and 'Launch Application'. Below these is a menu bar with 'File', 'Edit', 'Selection', 'View', 'Go', 'Run', 'Terminal', and 'Help'. The main content area has a dark theme. On the left, there is a sidebar with icons for file management, search, connections, and a terminal. The main area displays the 'MySQL' tab, which is marked as 'ACTIVE'. It shows the version 'v8.0.22' and 'v5.0.4' for phpMyAdmin, and 'v14.14' for the MySQL client. A message states: 'Connect to MySQL and phpMyAdmin directly in your Skills Network Labs environment.' Below this is a 'Stop' button. There are three tabs: 'Summary', 'Connection Information', and 'Details'. The 'Summary' tab is selected and shows: 'Your database and phpMyAdmin server are now ready to use and available with the following login credentials. For more details on how to navigate MySQL, please check out the Details section.' The login credentials are: 'Username: malikas' and 'Password: [REDACTED]'. Below this, it says 'You can manage MySQL via:' and there is a button labeled 'phpMyAdmin' with a link icon. At the bottom, it says 'Or to interact with the database in the terminal, select one of these options:' and there are two buttons: 'MySQL CLI' and 'New Terminal'.

Lab IBMCLOUD Launch Application

File Edit Selection View Go Run Terminal Help

MySQL x phpMyAdmin

MySQL

ACTIVE

v8.0.22 | v5.0.4 | v14.14

Connect to MySQL and phpMyAdmin directly in your Skills Network Labs environment.

Stop

Summary Connection Information Details

Your database and phpMyAdmin server are now ready to use and available with the following login credentials. For more details on how to navigate MySQL, please check out the Details section.

Username: malikas

Password: [REDACTED]

You can manage MySQL via:

phpMyAdmin

Or to interact with the database in the terminal, select one of these options:

MySQL CLI New Terminal

3. You will see the phpMyAdmin GUI tool.

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phpMyAdmin

🏠 📄 ? 📄 ⚙️ ↻

Recent Favorites

- New
- + information_schema
- + mysql
- + performance_schema
- + sakila
- + sys

← Server: mysql:3306

Databases SQL Status User accounts Export

General settings

☰ Server connection collation: ⓘ utf8mb4_unicode_ci ▼

🔑 [More settings](#)

Appearance settings

🗣️ Language ⓘ English ▼

🎨 Theme: pmahomme ▼

4. In the tree-view, click **New** to create a new empty database. Then enter **Mysql_Learners** as the name of the database and click **Create**.

The encoding will be left as **utf8mb4_0900_ai_ci**. UTF-8 is the most commonly used character encoding for content or data.

Proceed to Task B.



Databases

Create database

	Database	Collation	Master replication	Action
<input type="checkbox"/>	information_schema	utf8_general_ci	✓ Replicated	Check privileges
<input type="checkbox"/>	mysql	utf8mb4_0900_ai_ci	✓ Replicated	Check privileges
<input type="checkbox"/>	performance_schema	utf8mb4_0900_ai_ci	✓ Replicated	Check privileges
<input type="checkbox"/>	sys	utf8mb4_0900_ai_ci	✓ Replicated	Check privileges
Total: 4				

☐ Check all With selected: Drop

Note: Enabling the database statistics here might cause heavy traffic between the web server and the MySQL server.

- [Enable statistics](#)

Compose and run the following queries in the textarea of the **SQL** page. Click **Go** to execute the queries and observe the the results.

Note: The solutions are provided at the end of this lab, but please try to compose the queries on your own before checking the solutions.

Exercise 1: Create the Pet Rescue table

Rather than create the table manually by typing the DDL commands in the SQL editor, you will execute a script containing the create table command.

1. Download the script file [PETRESCUE-CREATE.sql](#)

Note: To download, just right-click on the link above and click on **Save As..** or **Save Link As...** depending on your browser. Save the file as a .sql file and not HTML.

2. Next load the sql to your database using the Import option.

The screenshot shows a MySQL management tool interface. On the left is a sidebar with a tree view of databases: 'New', 'HR', 'DEPARTMENTS', 'EMPLOYEES', 'JOBS', 'JOB_HISTORY', 'LOCATIONS', 'information_schema', 'mysql', 'Mysql_learners' (selected), 'New', 'PETALE', 'performance_schema', and 'sys'. The main panel is titled 'Importing into the database "Mysql_learners"'. It contains sections for 'File to import:', 'Partial import:', 'Other options:', and 'Format:'. The 'File to import:' section has a 'Choose File' button and shows 'PETRESCUE-CREATE.sql (Max: 2,048KiB)'. The 'Partial import:' section has a checkbox for 'Allow the interruption of an import...' and a text input for 'Skip this number of queries...' set to '0'. The 'Other options:' section has a checkbox for 'Enable foreign key checks'. The 'Format:' section has a dropdown menu set to 'SQL'. At the bottom, there are tabs for 'PETRESCUE-CREAT....sql' and 'HR_Database_Crea....sql', and a 'Console' button.

Recent Favorites

New

HR

New

DEPARTMENTS

EMPLOYEES

JOBS

JOB_HISTORY

LOCATIONS

information_schema

mysql

Mysql_learners

New

PETALE

performance_schema

sys

Importing into the database "Mysql_learners"

File to import:

File may be compressed (gzip, bzip2, zip) or uncompressed.
A compressed file's name must end in **[format].[compression]**. Example: **.sql.zip**

Browse your computer: PETRESCUE-CREATE.sql (Max: 2,048KiB)

You may also drag and drop a file on any page.

Character set of the file:

Partial import:

☒ Allow the interruption of an import in case the script detects it is close to the PHP timeout limit. *(This might be a good way to import large files, however it can break transactions)*

Skip this number of queries (for SQL) starting from the first one:

Other options:

☒ Enable foreign key checks

Format:

PETRESCUE-CREAT....sql

HR_Database_Crea....sql

3. Once the table is loaded open the sql editor to start executing the functions.

The screenshot shows the phpMyAdmin web interface. The top navigation bar includes links for Structure, SQL, Search, Query, Export, Import, Operations, Privileges, Routines, Events, and Triggers. The left sidebar displays a tree view of databases, with 'Mysql_learners' selected. The main panel shows the 'Run SQL query/queries on database Mysql_learners:' interface. The query editor contains a single line with the number '1'. Below the editor are buttons for 'Clear', 'Format', and 'Get auto-saved query'. There is a checkbox for 'Bind parameters' and a row of checkboxes for 'Show this query here again', 'Retain query box', 'Rollback when finished', and 'Enable foreign key checks' (which is checked). The delimiter is set to semicolon (;).

Exercise 2: Aggregate Functions

Query A1: Enter a function that calculates the total cost of all animal rescues in the PETRESCUE table.

Query A2: Enter a function that displays the total cost of all animal rescues in the PETRESCUE table in a column called SUM_OF_COST.

Query A3: Enter a function that displays the maximum quantity of animals rescued.

Query A4: Enter a function that displays the average cost of animals rescued.

Query A5: Enter a function that displays the average cost of rescuing a dog.

Exercise 3: Scalar and String Functions

Query B1: Enter a function that displays the rounded cost of each rescue.

Query B2: Enter a function that displays the length of each animal name.

Query B3: Enter a function that displays the animal name in each rescue in uppercase.

Query B4: Enter a function that displays the animal name in each rescue in uppercase without duplications.

Query B5: Enter a query that displays all the columns from the PETRESCUE table, where the animal(s) rescued are cats. Use **cat** in lower case in the query.

Exercise 4: Date and Time Functions

Query C1: Enter a function that displays the day of the month when cats have been rescued.

Query C2: Enter a function that displays the number of rescues on the 5th month.

Query C3: Enter a function that displays the number of rescues on the 14th day of the month.

Query C4: Animals rescued should see the vet within three days of arrivals. Enter a function that displays the third day from each rescue.

Query C5: Enter a function that displays the length of time the animals have been rescued; the difference between today's date and the rescue date.

Lab Solutions

Exercise 2 Solutions: Aggregate Functions

Query A1: Enter a function that calculates the total cost of all animal rescues in the PETRESCUE table.

```
select SUM(COST) from PETRESCUE;
```

Query A2: Enter a function that displays the total cost of all animal rescues in the PETRESCUE table in a column called SUM_OF_COST.

```
select SUM(COST) AS SUM_OF_COST from PETRESCUE;
```

Query A3: Enter a function that displays the maximum quantity of animals rescued.

```
select MAX(QUANTITY) from PETRESCUE;
```

Query A4: Enter a function that displays the average cost of animals rescued.

```
select AVG(COST) from PETRESCUE;
```

Query A5: Enter a function that displays the average cost of rescuing a dog.

Hint - Bear in my the cost of rescuing one dog on day, is different from another day. So you will have to use and average of averages.

```
select AVG(COST/QUANTITY) from PETRESCUE where ANIMAL = 'Dog';
```

Exercise 3 Solutions: Scalar and String Functions

Query B1: Enter a function that displays the rounded cost of each rescue.

```
select ROUND(COST) from PETRESCUE;
```


Query B2: Enter a function that displays the length of each animal name.

```
select LENGTH(ANIMAL) from PETRESCUE;
```

Query B3: Enter a function that displays the animal name in each rescue in uppercase.

```
select UCASE(ANIMAL) from PETRESCUE;
```

Query B4: Enter a function that displays the animal name in each rescue in uppercase without duplications.

```
select DISTINCT(UCASE(ANIMAL)) from PETRESCUE;
```

Query B5: Enter a query that displays all the columns from the PETRESCUE table, where the animal(s) rescued are cats. Use **cat** in lower case in the query.

```
select * from PETRESCUE where LCASE(ANIMAL) = 'cat';
```

Exercise 4 Solutions: Date and Time Functions

Query C1: Enter a function that displays the day of the month when cats have been rescued.

```
select DAY(RESCUEDATE) from PETRESCUE where ANIMAL = 'Cat';
```

Query C2: Enter a function that displays the number of rescues on the 5th month.

```
select SUM(QUANTITY) from PETRESCUE where MONTH(RESCUEDATE)='05';
```

Query C3: Enter a function that displays the number of rescues on the 14th day of the month.

```
select SUM(QUANTITY) from PETRESCUE where DAY(RESCUEDATE)='14';
```

Query C4: Animals rescued should see the vet within three days of arrivals. Enter a function that displays the third day from each rescue.

```
select DATE_add(RESCUEDATE, INTERVAL 3 DAY) from PETRESCUE;
```

Query C5: Enter a function that displays the length of time the animals have been rescued; the difference between today’s date and the rescue date.

```
select DATEDIFF(CURRENT_TIMESTAMP, RESCUEDATE) from PETRESCUE;
```

Summary

You can now compose and run queries, check results and view the logs. You will use these skills in later labs.

Author(s)

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Changelog

Date	Version	Changed by	Change Description
2023-05-05	0.5	Rahul Jaideep	Updated Markdown file
2022-10-28	0.4	Appalabhaktula Hema	Corrected the query
2022-07-27	0.3	Lakshmi Holla	Updated HTML tag
2022-07-04	0.2	Malika	Updated screenshot

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

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