SQL Lab

Estimated Time Needed: 60 min

In this challenge, you will create a database, import data from three sources to populate tables, and perform database operations in the MySQL database service using the phpMyAdmin graphical user interface (GUI) tool.

Objectives

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

- Create and populate a database and tables.
- Execute Structured Query Language (SQL) commands to perform basic database operations.
- Retrieve data from tables using SELECT statements.
- Filter the data output using WHERE statements.
- Aggregate data get ordered results using functions like SUM, MIN, MAX, ORDER BY.
- Use window functions to get specified output.
- Retrieve data from two or more tables using SQL JOINS.

Software used in this lab

You will use MySQL to complete this lab. MySQL is a free, open-source relational database system that offers a command line interface (MySQL) and a third-party web interface (phpMyAdmin) to efficiently store, manipulate, and retrieve data.

MySQL is a service available on Skills Network Labs (SN Labs) Cloud IDE, a virtual lab environment used in this course. SN Labs Cloud IDE is great way to do projects without downloading, installing, configuring, and integrating software on your own computer.

Two Components of the SN Labs Cloud IDE:

- The instructions that you will follow to complete this lab are displayed on the left side of the screen.
- The area on the right side of the screen is where you will use the menus, terminals, and tools to complete the lab exercises.

Dataset used in This Lab

The datasets used in this lab are three SQL files called **Salary Data**, **Sales Data** and **Employee Data**. To complete the exercises in this lab, you will be instructed to save and upload the datasets to your local machine and use a locally installed database or the tool provided in the course.

Import the given SQL input files into a database.

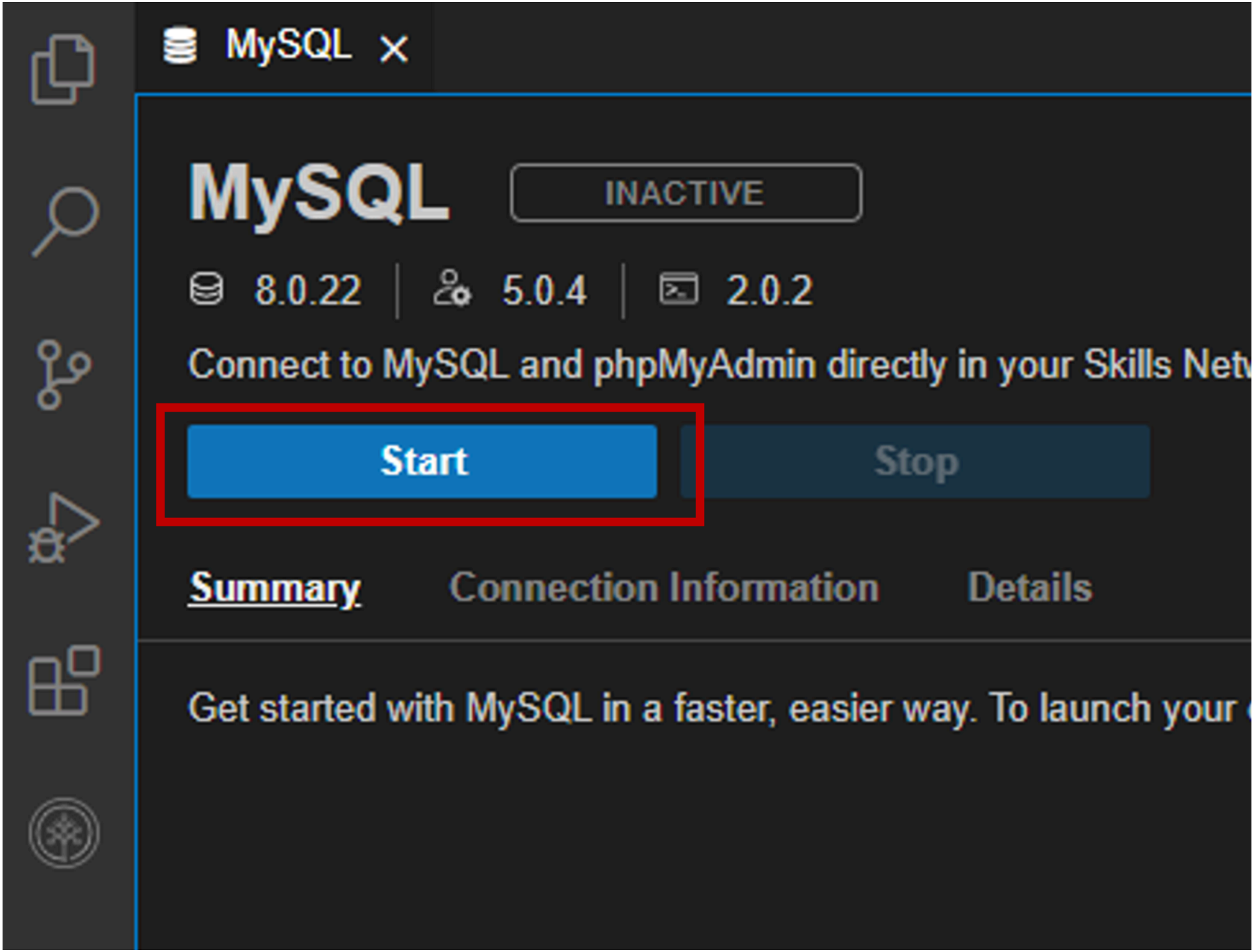
Prework - Create and populate database

TASK A: Create a Database

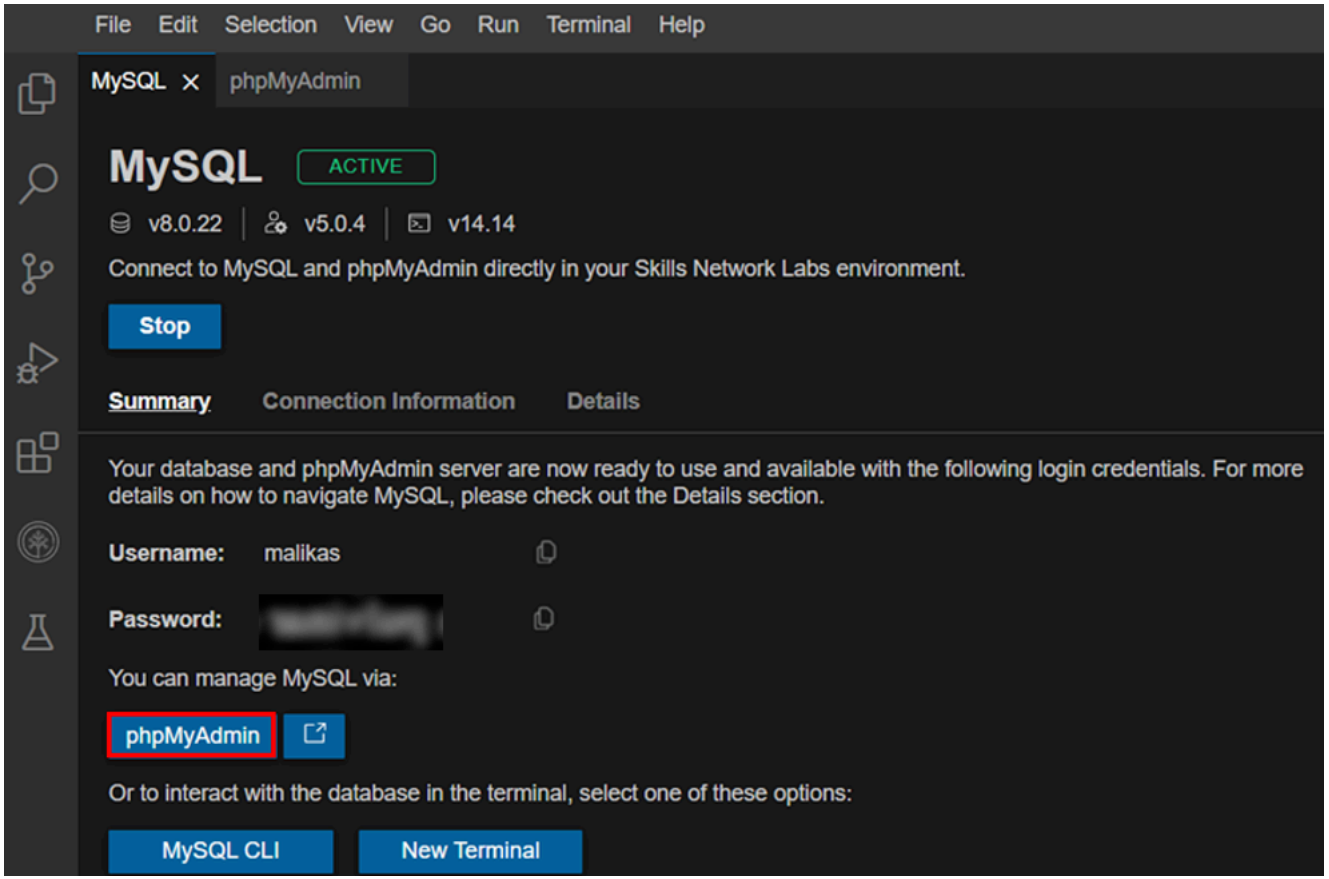
1. Start the MySQL service session using the `Open MySQL Page in IDE` button.

Open MySQL Page in IDE

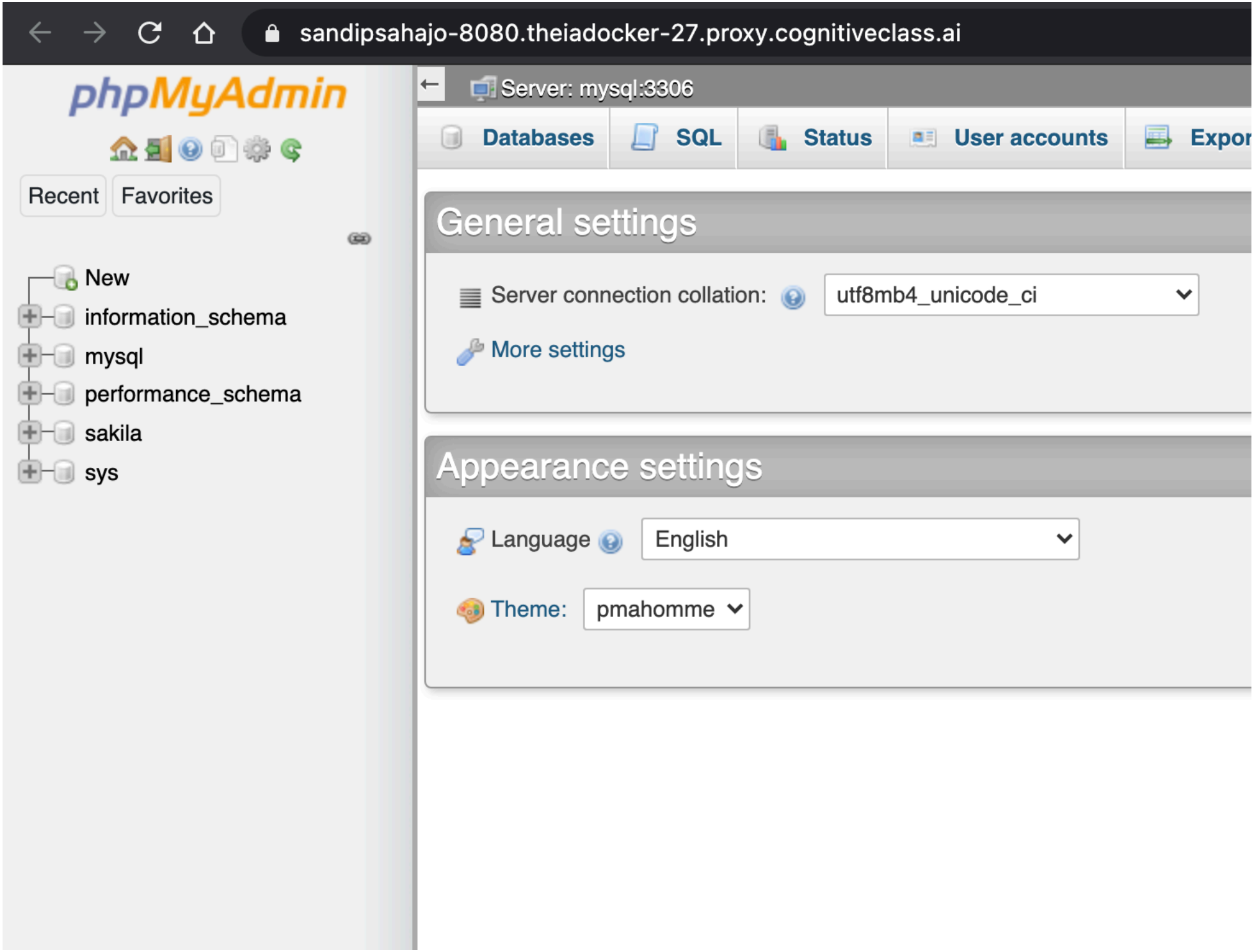
To start the MySQL, click `Start`.


MySQL
MySQL
INACTIVE
8.0.22
5.0.4
2.0.2
Connect to MySQL and phpMyAdmin directly in your Skills Net
Start
Stop
Summary
Connection Information
Details
Get started with MySQL in a faster, easier way. To launch your

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

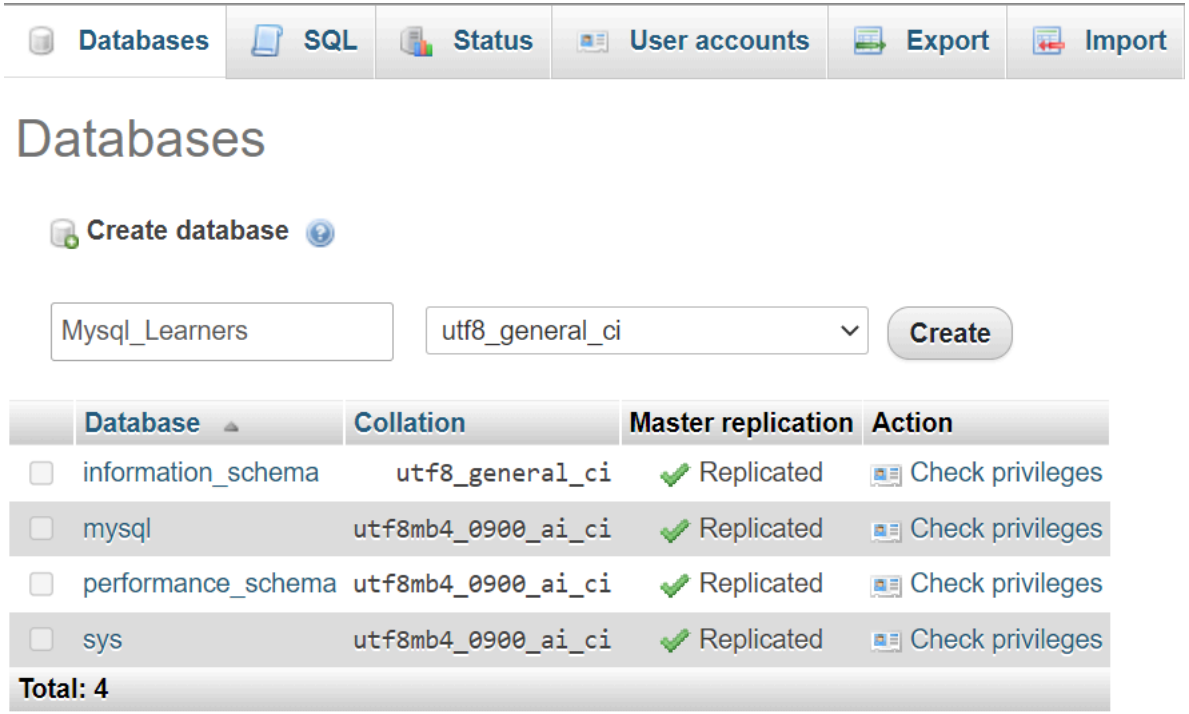

File Edit Selection View Go Run Terminal Help
MySQL
phpMyAdmin
MySQL
ACTIVE
v8.0.22
v5.0.4
v14.14
Connect to MySQL and phpMyAdmin directly in your Skills Network Labs environment.
Stop
Summary
Connection Information
Details
Your database and phpMyAdmin server are now ready to use and available with the following login credentials. For more details on how to navigate MySQL, please check out the Details section.
Username:
malikas
Password:
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.


sandipsahajo-8080.theiadocker-27.proxy.cognitiveclass.ai
phpMyAdmin
Recent
Favorites
New
information_schema
mysql
performance_schema
sakila
sys
Server: mysql:3306
Databases
SQL
Status
User accounts
Expor
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` or any other name you desire, as the name of the database and select utf8_general_ci and click `Create`.

   UTF-8 is the most commonly used character encoding for content or data.



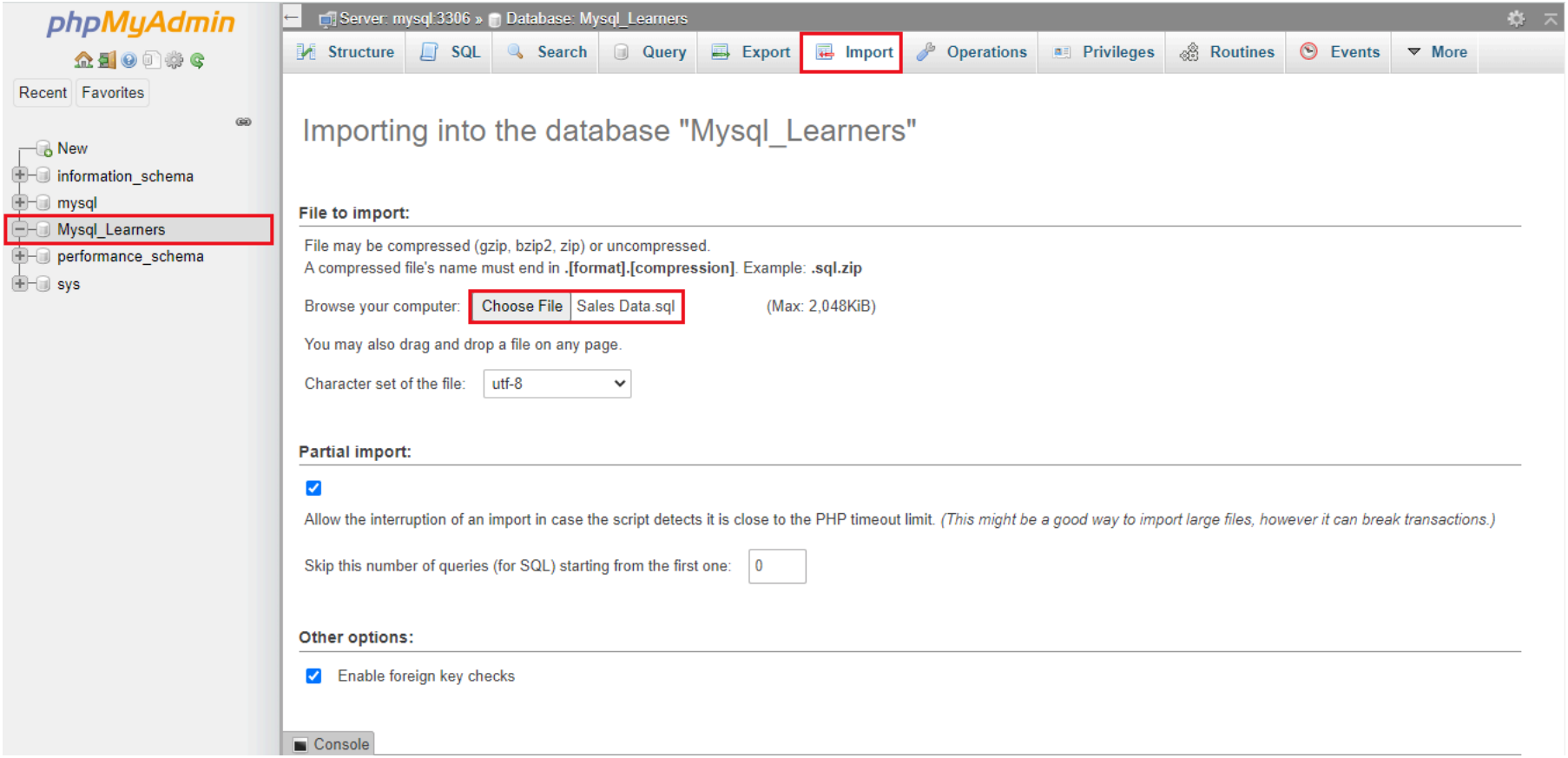
TASK B: Create and load tables using sql files.

1. Download the 3 sql files below to your local computer:

- Employee Data.sql
- Salary Data.sql
- Sales Data.sql

2. To load each sql file do the following steps.

   - Select your database, in the case of the example shown if it is **Mysql_Learners** and click on **Import** tab.
   - Click on `Choose File`. Browse for the file and upload it .
   - Later scroll down and click the `Go` button.



- Once the scripts are loaded, you will get a message that, it is imported successfully.

Import has been successfully finished, 3 queries executed. (Sales Data.sql)

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0366 seconds.)

```
CREATE TABLE `Sales` ( `SalesID` varchar(10) DEFAULT NULL, `EmpID` varchar(10) DEFAULT NULL
varchar(10) DEFAULT NULL, `Units_Sold` double DEFAULT NULL, `Sale_Price` double DEFAULT NUL
NULL, `Profit` double DEFAULT NULL, `Date` varchar(10) DEFAULT NULL )
```

24 rows inserted. (Query took 0.0068 seconds.)

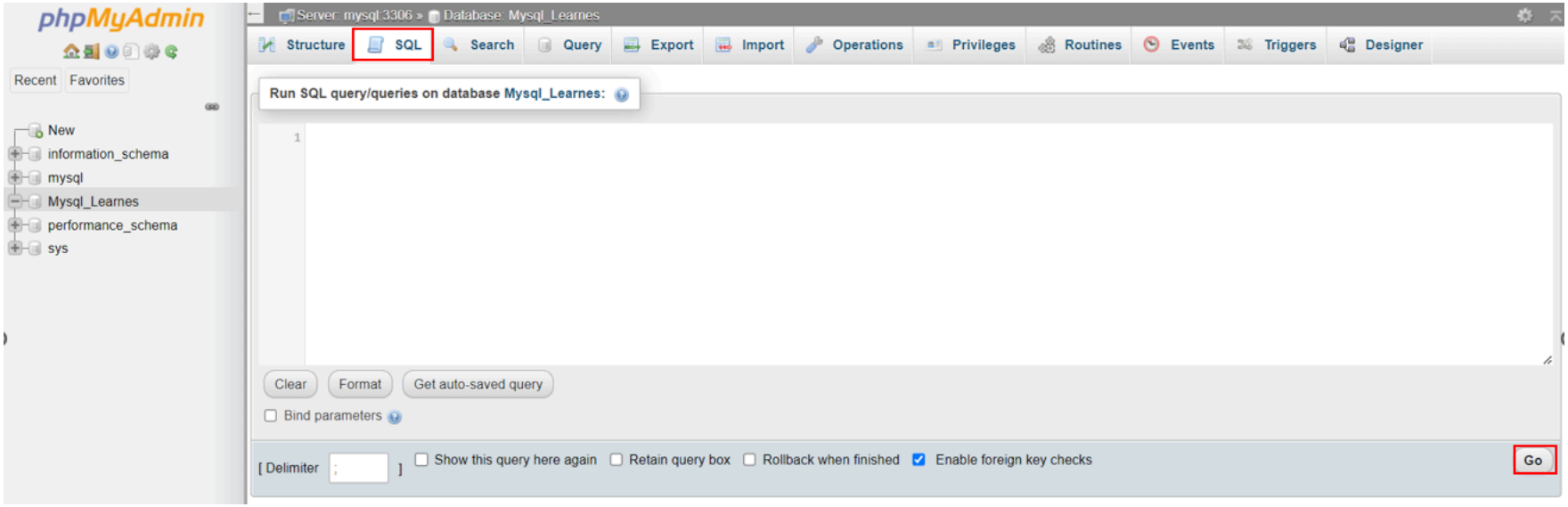
```
INSERT INTO `Sales` (`SalesID`, `EmpID`, `Segment`, `Product`, `Units_Sold`, `Sale_Price`,
'E04732', 'Government', 'Product2', 252, 20, 5040, 2920, 2120, '04/02/2021'), ('S2534', 'E0
571, '07/24/2021'), ('S2530', 'E03496', 'Midmarket', 'Product2', 211, 41, 8651, 7554, 1097,
'Product1', 2133, 7, 14931, 10730, 4201, '09/29/2022'), ('S2512', 'E02166', 'Midmarket', 'P
('S2513', 'E04732', 'Channel Partners', 'Product1', 1001, 30, 30030, 13210, 16820, '01/15/2
'Product1', 2513, 12, 30156, 7554, 22602, '06/21/2022'), ('S2514', 'E00530', 'Government',
```

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

```
COMMIT
```

You can import the other sql files in the same way.

3. To run the SQL queries you need to copy the given codes and paste it to the text area of the SQL page and click on Go.



Data Engineering

In this section you will perform data cleansing (removing duplicates) and data transformation (change column name) operations on the data.

1. Identify the duplicate entry for employees in the employee table using GROUP BY and HAVING statements.

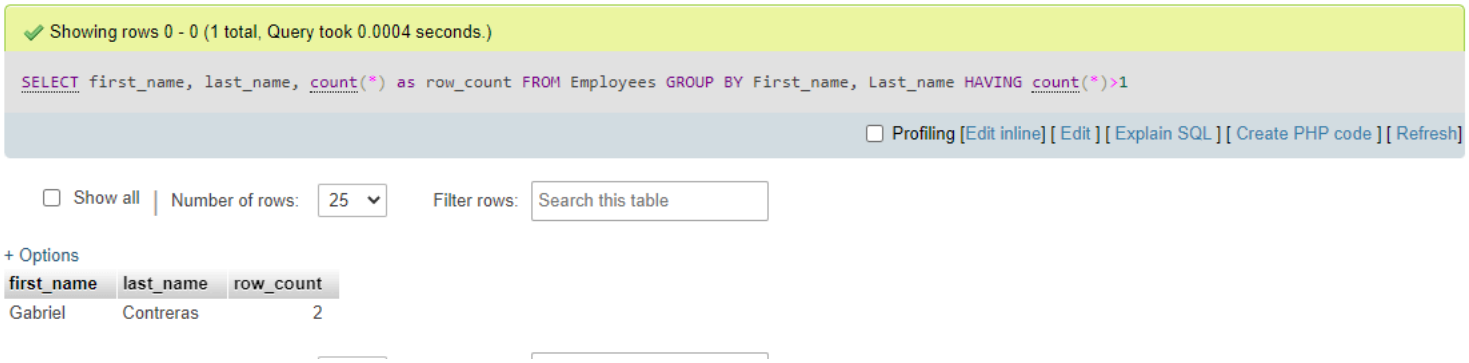
▼ Solution syntax

```
1. 1
2. 2
3. 3
4. 4
```

```
1. SELECT first_name, last_name, count(*) as row_count
2.     FROM Employees
3.     GROUP BY First_name, Last_name
4.     HAVING count(*)>1;
```

Copied!

▼ Output



2. Select the duplicate entry for employees and delete the row with the higher EMPID.

▼ Solution syntax

```
1
2
3
4
5
6
```

```
    CREATE TABLE my_cte(Emp_ID VARCHAR(100), First_Name VARCHAR(100),
    Last_Name VARCHAR(100), Row_Num INT) as
    (SELECT Emp_ID, First_Name,Last_Name,ROW_NUMBER() Over (PARTITION BY
    First_Name,Last_Name ORDER BY Emp_ID )as Row_Num FROM Employees);

    SELECT * FROM my_cte WHERE Row_Num > 1;
```

Copied!

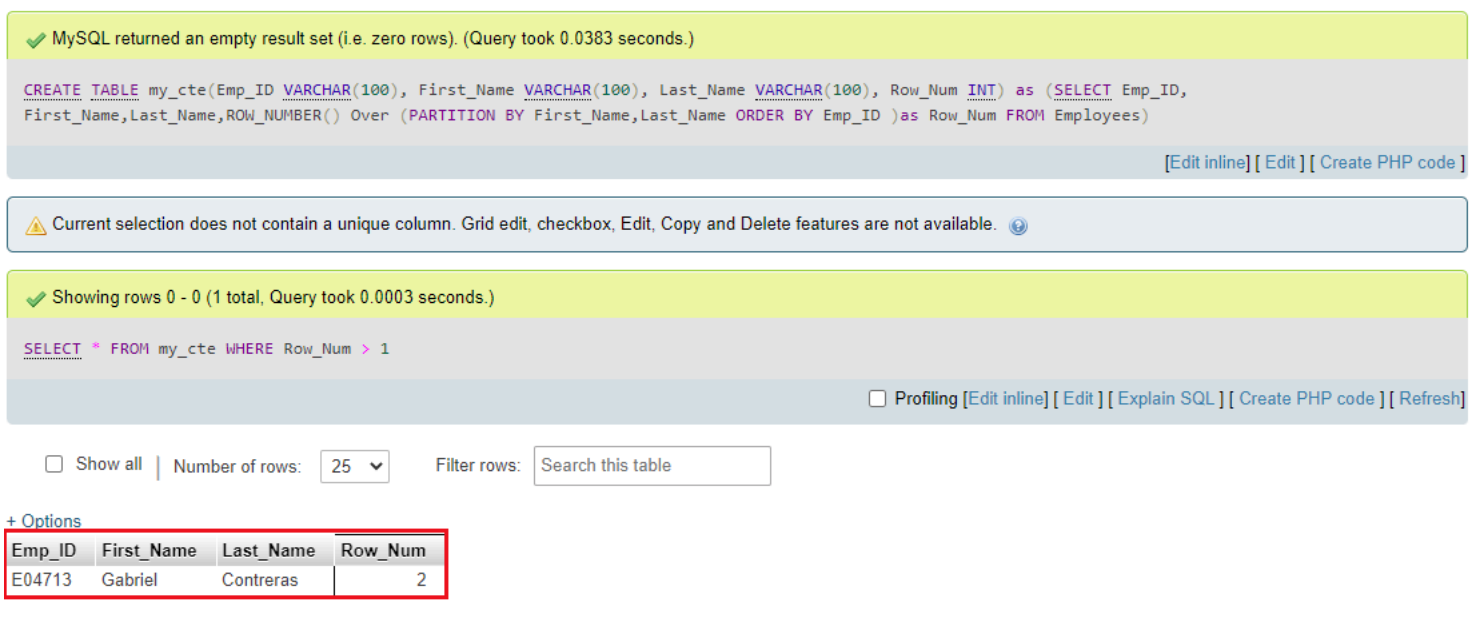
Once the duplicate entry is displayed on screen, delete the row using the EMP_ID

```
1
```

```
    delete from Employees where EMP_ID = "E04713";
```

Copied!

▼ Output



3. Data Transformation – Change the column Salary in the Salary table to “Annual_Income”

▼ Solution syntax

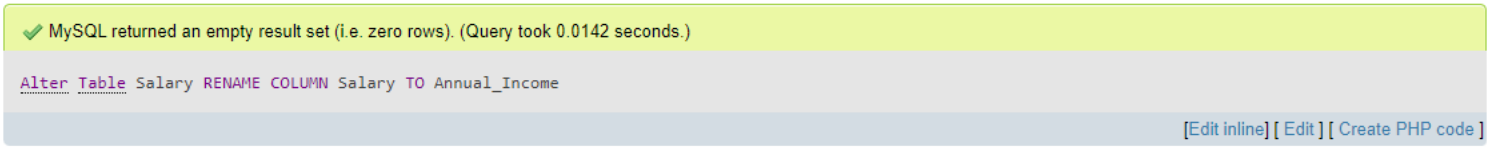
```
1. 1
```

```
1. Alter Table Salary RENAME COLUMN Salary TO Annual_Income;
```

Copied!

▼ Output

Show query box



SQL JOINS, Aggregations

Use SQL JOINS, Aggregations where needed, to derive metrics from the database tables.

1. Using the tables given, find out the Total number of men and women employees in the company who are aged below 50 yrs.

▶ Solution syntax
▶ Output

2. Using the tables, find the employees whose salary is greater than $150000.

   Note – Rename column Annual_Income back to Salary in the table Salary

▶ Solution syntax

▶ Output

SQL GROUP BY, HAVING

Use SQL GROUP BY and HAVING statements to get some count metrics from database tables.

1. Display products grouped by segments with total Sales greater than $100,000.

▶ Solution syntax
▶ Output

Formatted Output

Show output result ordered in a certain way (Use window functions row_number() or rank() and order by statements).

1. Show an output table of Sales generated by employees ordered highest to lowest.

▶ Solution syntax
▶ Output

2. Show an output table of Sales(ordered highest to lowest) generated by employees in different segments and rank them for each employee.

▶ Solution syntax
▶ Output

Explain the following:

▶ When you would use COALESCE function
▶ What is the difference between Union and Union
▶ What is the difference between clustered and non-clustered indexes

Author

Roopa Raghavan