Travaux pratiques : fonctions intégrées

Temps estimé nécessaire : 20 minutes

Dans SQL, vous pouvez accéder à de nombreuses fonctions intégrées qui peuvent être utilisées pour obtenir plus de variété dans notre analyse de données. Ces fonctions incluent des fonctions d'agrégation (comme `MAX`, `MIN`, `SUM`et `AVG`), des fonctions de chaîne (comme `LENGTH`, `UCASE`et `LCASE`), des fonctions scalaires (comme `ROUND`) et une variété de fonctions de date également. Dans cet onglet, vous pourrez vous entraîner à les utiliser toutes.

Logiciel utilisé dans ce laboratoire

Dans ce laboratoire, vous utiliserez MySQL . MySQL est un système de gestion de base de données relationnelle (SGBDR) conçu pour stocker, manipuler et récupérer des données efficacement.

Pour réaliser ce laboratoire, vous utiliserez le service de base de données relationnelle MySQL disponible dans le cadre d'IBM Skills Network Labs (SN Labs) Cloud IDE. SN Labs est un environnement de laboratoire virtuel utilisé dans ce cours.

Objectifs

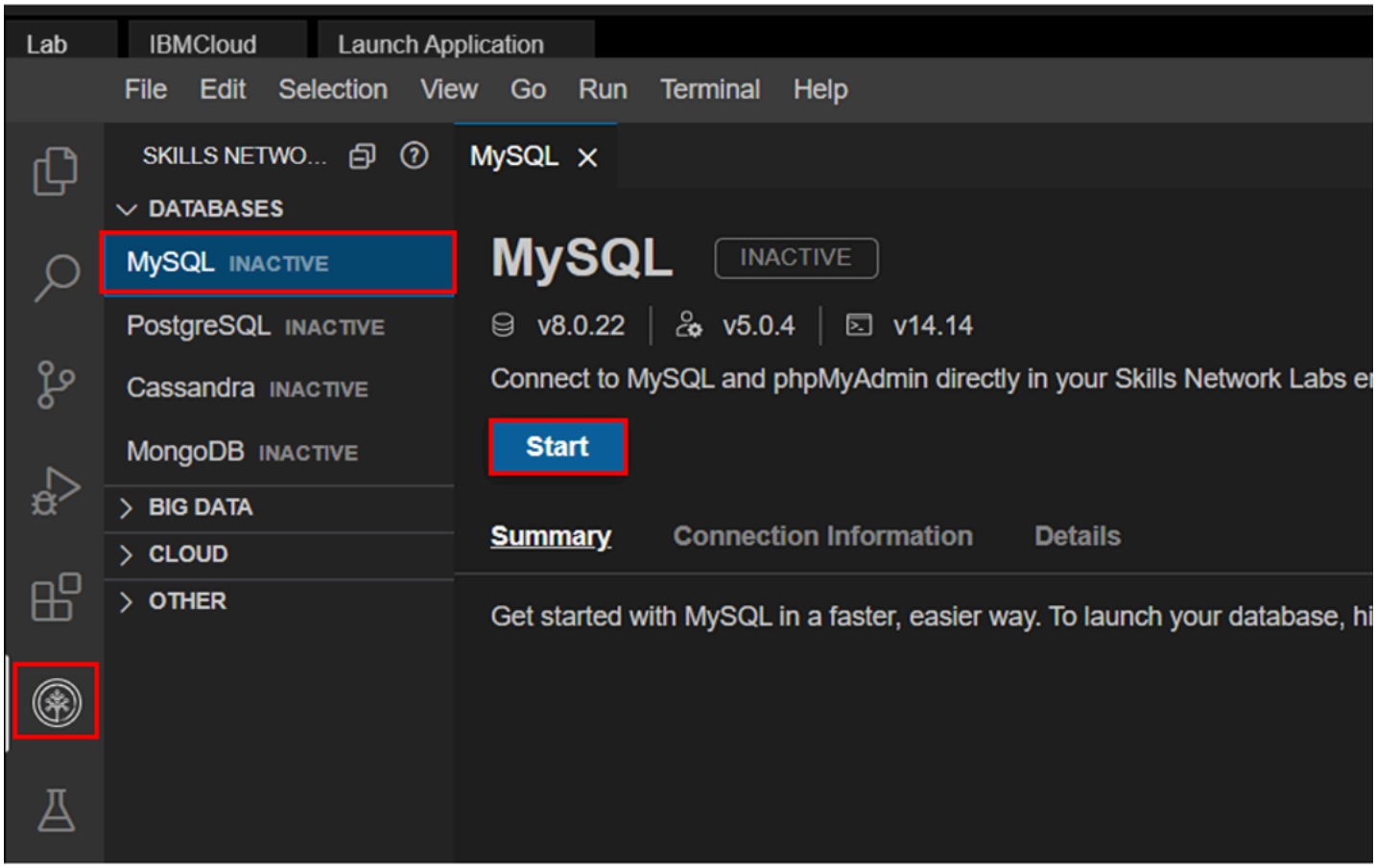
Après avoir terminé ce laboratoire, vous serez capable de composer des requêtes dans phpMyAdmin avec MySQL en utilisant :

- Fonctions d'agrégation
- Fonctions scalaires
- Fonctions de chaîne
- Fonctions de date

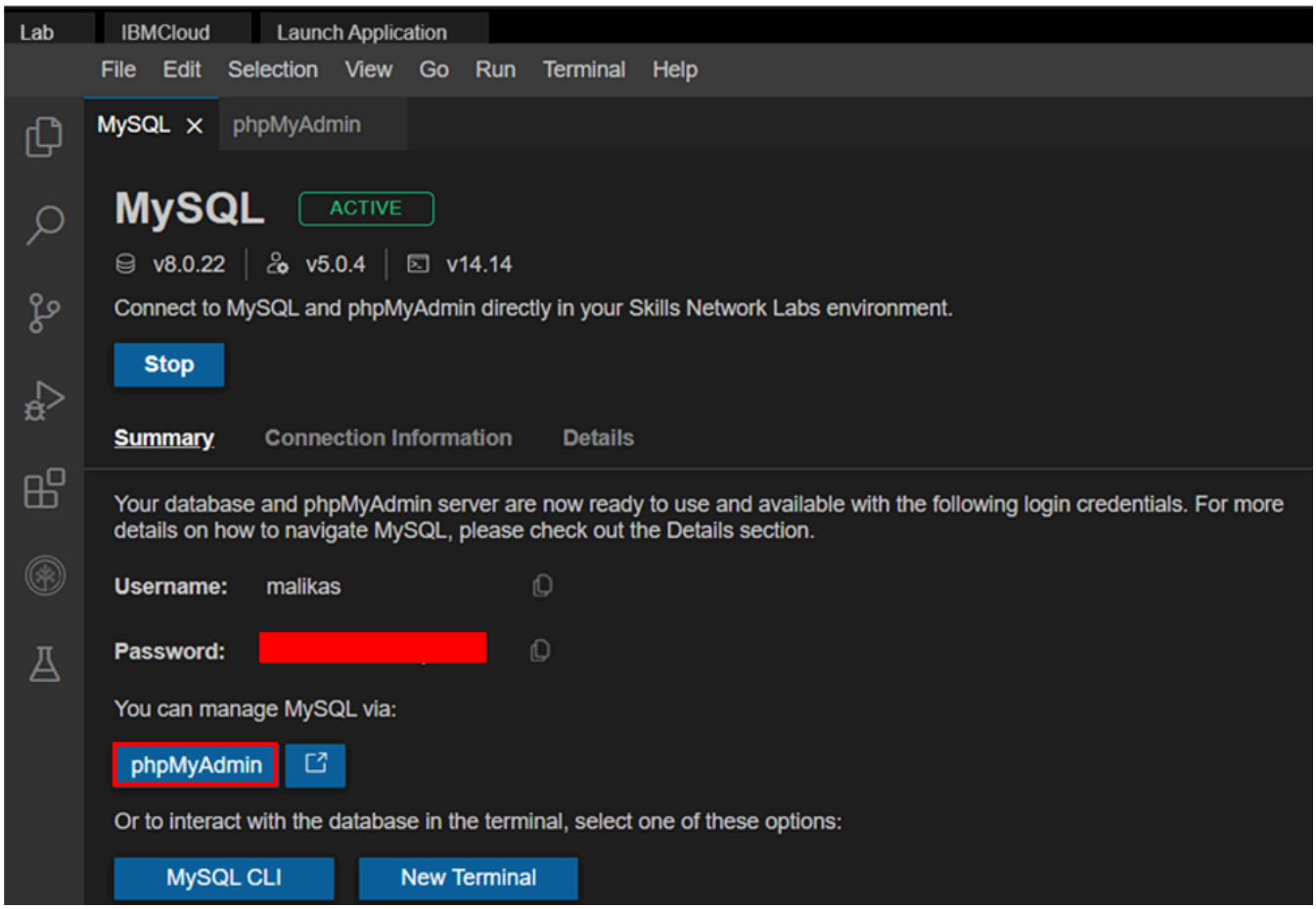
Créer la base de données

Cliquez sur **Skills Network Toolbox** dans le ruban de l'interface de programmation. Dans la section **Base de données** , cliquez sur **MySQL** .

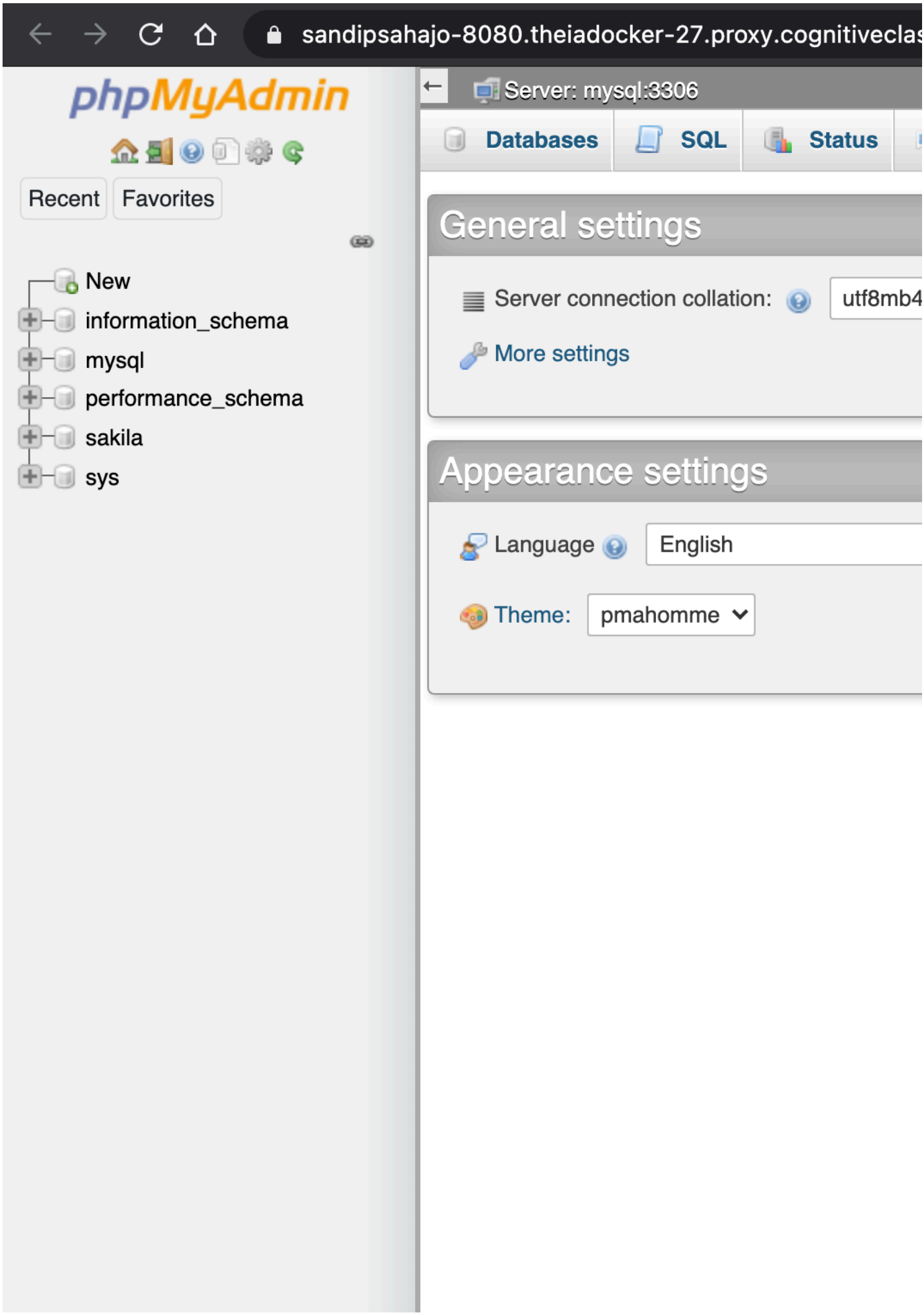
Pour démarrer le moteur MySQL, cliquez sur **Démarrer** .



Une fois **MySQL** démarré, cliquez sur le **bouton phpMyAdmin** pour ouvrir **phpMyAdmin** dans la même fenêtre.

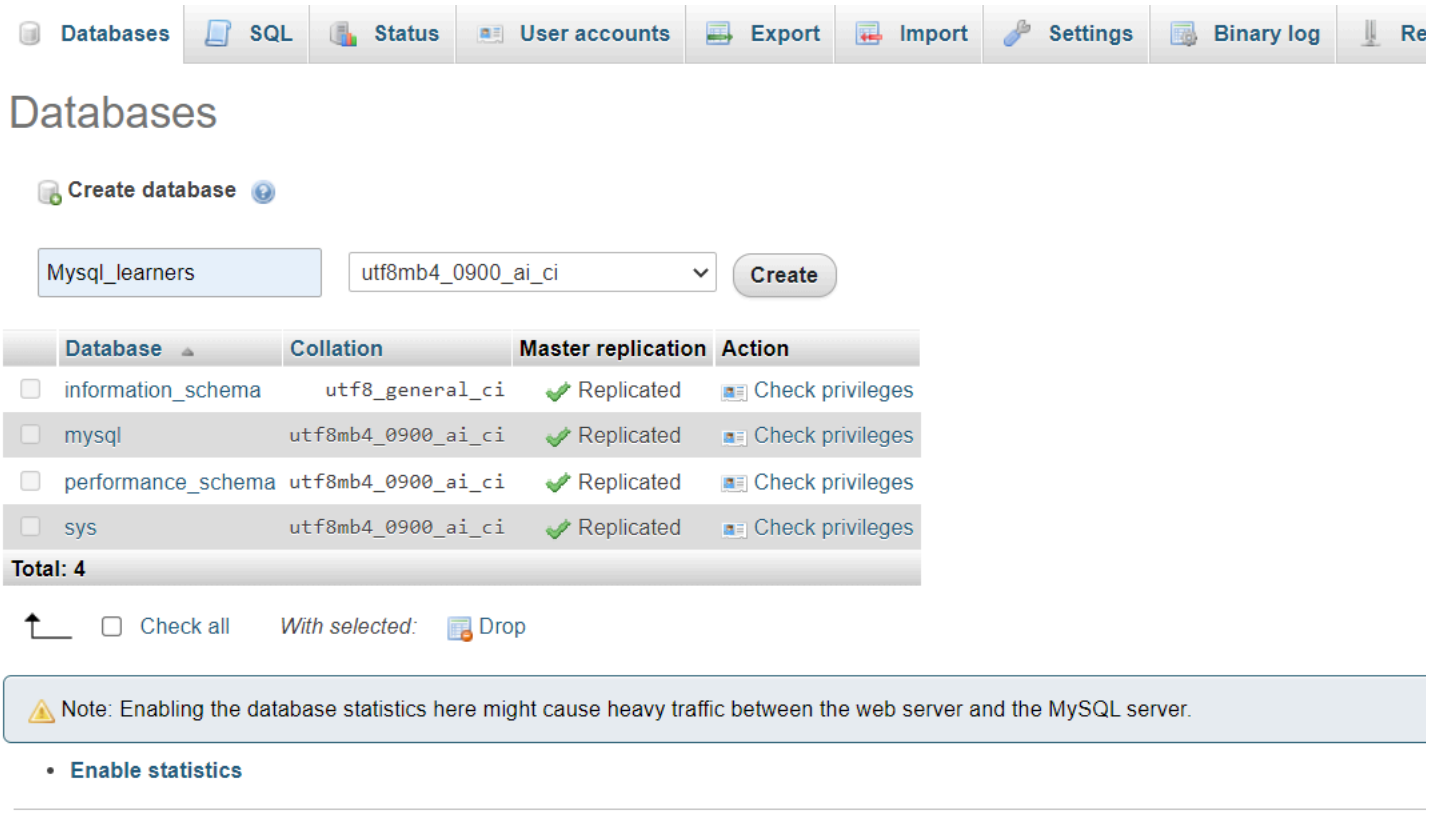


Vous verrez l'outil GUI phpMyAdmin.



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**.

Leave the default **utf8** encoding. UTF-8 is the most commonly used character encoding for content or data.



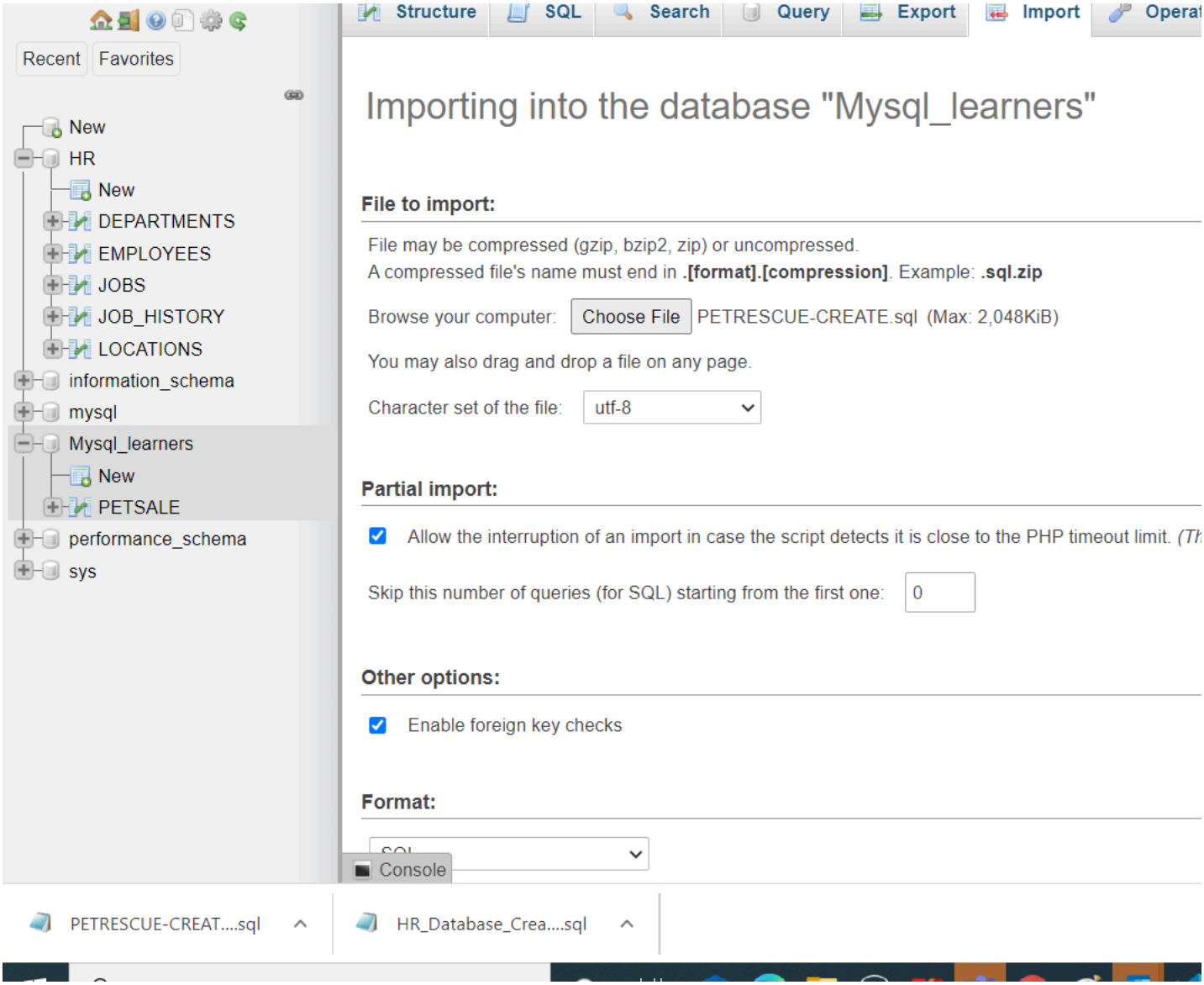
Create the PETRESCUE table

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.

Download the script file PETRESCUE-CREATE.sql

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

Next, load the `.sql` file to your database using the `Import` option as shown in the image below.



Upon execution, the table PETRESCUE will be created in the `Mysql_Learners` database and loaded with a set of values as well. The attributes of the PETRESCUE table are:

Column Name	Data Type	Description
ID	INTEGER	ID of the entry
ANIMAL	VARCHAR(20)	Type of animal
QUANTITY	INTEGER	Number of animals
COST	DECIMAL(6,2)	Cost incurred
RESCUEDATE	DATE	Date of Rescue

Once the table is loaded, you may open the sql editor to start executing the queries.

Aggregation Functions

1. Write a query that calculates the total cost of all animal rescues in the PETRESCUE table.

For this query, we will use the function `SUM(COLUMN_NAME)`. The output of this query will be the total value of all elements in the column. The query for this question can be written as:

```
1
```

```
SELECT SUM(COST) FROM PETRESCUE;
```

Copied!

You can further assign a label to the query `SUM_OF_COST`.

```
1
```

```
SELECT SUM(COST) AS SUM_OF_COST FROM PETRESCUE;
```

Copied!

2. Write a query that displays the maximum quantity of animals rescued (of any kind).

For this query, we will use the function `MAX(COLUMN_NAME)`. The output of this query will be the maximum value of all elements in the column. The query for this question can be written as:

```
1. 1
```

```
1. SELECT MAX(QUANTITY) FROM PETRESCUE;
```

Copied!

The query can easily be changed to display the minimum quantity using the `MIN` function instead.

```
1. 1
```

```
1. SELECT MIN(QUANTITY) FROM PETRESCUE;
```

Copied!

3. Write a query that displays the average cost of animals rescued.

For this query, we will use `AVG(COLUMN_NAME)`. The output of this query will be the average of all elements in the column. The query for this question can be written as

```
1. 1
```

```
1. SELECT AVG(COST) FROM PETRESCUE;
```

Copied!

Fonctions scalaires et fonctions de chaîne

1. Écrivez une requête qui affiche le coût intégral arrondi de chaque sauvetage.

Pour cette requête, nous utiliserons la fonction `ROUND(COLUMN_NAME, NUMBER_OF_DECIMALS)`. La sortie de cette requête sera la valeur de chaque élément de la colonne arrondie au nombre de décimales spécifié. Notez que le deuxième argument est facultatif et, s'il est omis, il aboutit à un arrondi à une valeur entière. La requête pour cette question peut être écrite comme suit :

```
1. 1
```

```
1. SELECT ROUND(COST) FROM PETRESCUE;
```

Copié!

La requête pourrait également être écrite comme suit :

```
1. 1
```

```
1. SELECT ROUND(COST, 0) FROM PETRESCUE;
```

Copié!

Si la question consistait à arrondir la valeur à 2 décimales, la requête deviendrait :

```
1. 1
```

```
1. SELECT ROUND(COST, 2) FROM PETRESCUE;
```

Copié!

2. Écrivez une requête qui affiche la longueur de chaque nom d'animal.

Pour cette requête, nous utiliserons la fonction `LENGTH(COLUMN_NAME)`. Le résultat de cette requête sera la longueur de chaque élément de la colonne. La requête pour cette question peut être écrite comme suit :

```
1. 1
```

```
1. SELECT LENGTH(ANIMAL) FROM PETRESCUE;
```

Copié!

3. Écrivez une requête qui affiche le nom de l'animal de chaque sauvetage en majuscules.

Pour cette requête, nous utiliserons la fonction `UCASE(COLUMN_NAME)`. Le résultat de cette requête sera chaque élément de la colonne en majuscules. La requête pour cette question peut être écrite comme suit :

```
1. 1
```

```
1. SELECT UCASE(ANIMAL) FROM PETRESCUE;
```

Copié!

Tout aussi facilement, l'utilisateur pourrait demander une représentation en minuscules, et la requête serait modifiée en :

```
1. 1
```

```
1. SELECT LCASE(ANIMAL) FROM PETRESCUE;
```

Copié!

Date Functions

1. Write a query that displays the rescue date.

For this query, we will use the function `DAY(COLUMN_NAME)`. The output of this query will be only the `DAY` part of the date in the column. The query for this question can be written as:

```
1. 1
```

```
1. SELECT DAY(RESCUEDATE) FROM PETRESCUE;
```

Copied!

In case the query was asking for `MONTH` of rescue, the query would change to:

```
1. 1
1. SELECT MONTH(RESCUEDATE) FROM PETRESCUE;
```

Copied!

In case the query was asking for `YEAR` of rescue, the query would change to:

```
1. 1
1. SELECT YEAR(RESCUEDATE) FROM PETRESCUE;
```

Copied!

2. Animals rescued should see the vet within three days of arrival. Write a query that displays the third day of each rescue.

For this query, we will use the function `DATE_ADD(COLUMN_NAME, INTERVAL Number Date_element)`. Here, the quantity in `Number` and in `Date_element` will combine to form the interval to be added to the date in the column. For the given question, the query would be:

```
1. 1
1. SELECT DATE_ADD(RESCUEDATE, INTERVAL 3 DAY) FROM PETRESCUE
```

Copied!

If the question was to add 2 months to the date, the query would change to:

```
1. 1
1. SELECT DATE_ADD(RESCUEDATE, INTERVAL 2 MONTH) FROM PETRESCUE
```

Copied!

Similarly, we can retrieve a date before the one given in the column by a given number using the function `DATE_SUB`. By modifying the same example, the following query would provide the date 3 days before the rescue.

```
1. 1
1. SELECT DATE_SUB(RESCUEDATE, INTERVAL 3 DAY) FROM PETRESCUE
```

Copied!

3. Write a query that displays the length of time the animals have been rescued, for example, the difference between the current date and the rescue date.

For this query, we will use the function `DATEDIFF(Date_1, Date_2)`. This function calculates the difference between the two given dates and gives the output in number of days. For the given question, the query would be:

```
1. 1
1. SELECT DATEDIFF(CURRENT_DATE, RESCUEDATE) FROM PETRESCUE
```

Copied!

CURRENT_DATE is also an inbuilt function that returns the present date as known to the server.

To present the output in a YYYY-MM-DD format, another function `FROM_DAYS(number_of_days)`can be used. This function takes a number of days and returns the required formatted output. The query above would thus be modified to

```
1. 1
1. SELECT FROM_DAYS(DATEDIFF(CURRENT_DATE, RESCUEDATE)) FROM PETRESCUE
```

Copied!

Practice Problems

1. Write a query that displays the average cost of rescuing a single dog. Note that the cost per dog would not be the same in different instances.

▶ Click here for a hint
▶ Click here for the solution

2. Write a query that displays the animal name in each rescue in uppercase without duplications.

▶ Click here for a hint
▶ Click here for the solution

3. Write a query that displays all the columns from the PETRESCUE table where the animal(s) rescued are cats. Use **cat** in lowercase in the query.

▶ Click here for a hint
▶ Click here for the solution

4. Write a query that displays the number of rescues in the 5^{th} month.

▶ Click here for a hint
▶ Click here for the solution

5. The rescue shelter is supposed to find good homes for all animals within 1 year of their rescue. Write a query that displays the ID and the target date.

▶ Click here for a hint
▶ Click here for Solution

Conclusion

Congratulations on completing this lab.

You are now able to:

- Use aggregation functions to calculate total, maximum, minimum, and average values of numerical attributes.
- Use scalar functions to round a floating value to the desired number of decimal places.
- Use string functions to convert text into upper or lower cases.
- Use date operations to manipulate data columns with the attribute as date.

Author(s)

Lakshmi Holla

Malika Singla

Abhishek Gagneja