

# Hands-on Lab: Stored Procedures



**Estimated time needed:** 20 minutes

Stored Procedures in SQL are a type of database object that allow you to encapsulate a series of SQL statements into a single routine. They are stored in the database data dictionary and can be invoked from an application program or from the database command interface. Stored procedures can accept input parameters and return multiple values of output parameters. They can also include control-of-flow constructs such as loops and conditional statements. Stored procedures offer several benefits including improved performance, higher productivity, ease of use, and increased scalability. They also provide a mechanism for enforcing business rules and data integrity in the database system.

## Objectives

After completing this lab, you will be able to:

- Create stored procedures
- Execute stored procedures

## 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.

## Data Used in this Lab

The data used in this lab is internal data. You will be working on the **PETSALE** table.

ID ▲	ANIMAL	SALEPRICE
1	Cat	450.09
2	Dog	666.66
3	Parrot	50.00
4	Hamster	60.60
5	Goldfish	48.48

This lab requires you to have the PETSALE table populated with sample data on mysql phpadmin interface. You might have created and populated a PETSALE table in a previous lab.

For this lab, you need to create a database PETS in the phpMyAdmin interface. Download the PETSALE-CREATE-v2.sql script below, upload it to console under the PETS database. Upon execution, the script will create a new PETSALE table dropping any previous PETSALE table if exists, and will populate it with the required sample data.

- [PETSALE-CREATE-v2.sql](#)

## Stored Procedure: Exercise 1

In this exercise, you will create and execute a stored procedure to read data from a table on mysql phpadmin using SQL.

- You will create a stored procedure routine named **RETRIEVE\_ALL**.
  - This **RETRIEVE\_ALL** routine will contain an SQL query to retrieve all the records from the PETSALE table, so you don't need to write the same query over and over again. You just call the stored procedure routine to execute the query everytime.
  - To create the stored procedure routine, copy the code below and paste it to the textarea of the **SQL** page. Click **Go**.


```
DELIMITER //
CREATE PROCEDURE RETRIEVE_ALL()
BEGIN
    SELECT * FROM PETSALE;
END //
DELIMITER ;
```

```
1 DELIMITER //
2
3 CREATE PROCEDURE RETRIEVE_ALL()
4
5 BEGIN
6
7     SELECT * FROM PETSALE;
8
9
10 END //
11
12 DELIMITER ;
```

Clear

Format

Get auto-saved query

☐ Bind parameters 

[ Delimiter  ]

☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☒ Enable foreign key checks

Hide query box

✔ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0064 seconds.)

CREATE PROCEDURE RETRIEVE\_ALL() BEGIN SELECT \* FROM PETSALE; END

[\[Edit inline\]](#) [\[ Edit \]](#) [\[ Create PH](#)

2. To call the RETRIEVE\_ALL routine, open another **SQL** tab by clicking **Open in new Tab**

← → ↻ lakshmih-8080.theiadocker-1-labs-prod-theiak8s-4-tor01.proxy.cognitiveclass.ai/tbl\_sql.php?db=HR&table=EMPLOYEES

Apps Count\_Coursera\_DS... DataAnayst\_Count... DataEngg\_Count.xlsx DS\_DA\_DE\_CountS... www.google.com Checking your Bro... (251) Zoho People New Tab Lakshmihol

**phpMyAdmin**

Recent Favorites

- New
- HR
  - New
  - DEPARTMENTS
  - EMPLOYEES
  - JOBS
  - JOB\_HISTORY
  - LOCATIONS
- information\_schema
- mysql
- Mysql\_learners
  - New
  - PETRESCUE
  - PETSALE
- performance\_schema
- sys

Server: mysql:3306 » Database: HR » Table: EMPLOYEES

Browse Structure SQL Search Insert Export Import Privileges Operations Triggers

Run SQL query/queries on table HR

1 `SELECT * FROM `EMPLOYEES``

Columns

EMP_ID
F_NAME
L_NAME
SSN
B_DATE
SEX
ADDRESS
JOB_ID
SALARY
MANAGER_ID
DEP_ID

SELECT \* SELECT INSERT UPDATE DELETE Clear Format Get auto-saved query

☐ Bind parameters

[ Delimiter ; ] ☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☒ Enable foreign key checks

Delete the default line which appears so that you will get a blank window.

Copy the code below and paste it to the textarea of the **SQL** page. Click **Go**.

```
CALL RETRIEVE_ALL;
```

11 CALL RETRIEVE\_ALL;

Clear

Format

Get auto-saved query

☐ Bind parameters

Delimiter ; ]

☐ Show this query here again

☐ Retain query box

☐ Rollback when finished

☒ Enable foreign key checks

Go

Hide query box

✓ Showing rows 0 - 4 (5 total, Query took 0.0010 seconds.)

CALL RETRIEVE\_ALL

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

☐ Show all | Number of rows: 25 Filter rows: Search this table

Options

	ANIMAL	SALEPRICE	SALEDATE	QUANTITY
1	Cat	450.09	2018-05-29	9
2	Dog	666.66	2018-06-01	3
3	Parrot	50.00	2018-06-04	2
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

3. You can view the created stored procedure routine RETRIEVE\_ALL. On the left panel, expand the **PETS** database option and click on **Procedures** to view the procedure.

Current server: phpMyAdmin demo - M

Recent Favorites

Type to filter these, Enter t

performance\_schema

PETS

Procedures

Tables

New

PETSALE

Routines

☐ Check all Export Drop

Name	Type	Returns
<input type="checkbox"/> RETRIEVE_ALL	PROCEDURE	Edit Execute Export Drop

phpMyAdmin Demo Server: Git information missing!

4. If you wish to drop the stored procedure routine RETRIEVE\_ALL, copy the code below and paste it to the textarea of the **SQL** page. Click **Go**.

```
DROP PROCEDURE RETRIEVE_ALL;
```

CALL RETRIEVE\_ALL;

The screenshot shows a MySQL IDE interface. At the top is a toolbar with icons and labels for Structure, SQL, Search, Query, Export, Import, Operations, Privileges, Routines, Events, Triggers, and Designer. Below the toolbar is a text area containing the following SQL code:

```
1
2 DROP PROCEDURE RETRIEVE_ALL;
3
4 CALL RETRIEVE_ALL;
5
6
```

Below the text area are three buttons: Clear, Format, and Get auto-saved query. Underneath these buttons is a checkbox labeled "Bind parameters" with a help icon. At the bottom of the interface is a status bar with the text "[ Delimiter ; ]" and several checkboxes: "Show this query here again", "Retain query box", "Rollback when finished", and "Enable foreign key checks" (which is checked). A "Go" button is partially visible on the right.

## Error

SQL query: [Copy](#)

```
CALL RETRIEVE_ALL
```

MySQL said: [?](#)

#1305 - PROCEDURE Mysql\_learners.RETRIEVE\_ALL does not exist

## Stored Procedure: Exercise 2

In this exercise, you will create and execute a stored procedure to write/modify data in a table on MySQL using SQL.

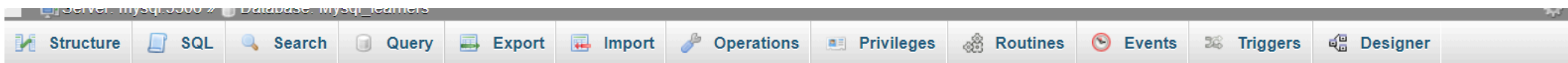
You will create a stored procedure routine named **UPDATE\_SALEPRICE** with parameters **Animal\_ID** and **Animal\_Health**.

- This **UPDATE\_SALEPRICE** routine will contain SQL queries to update the sale price of the animals in the PETSALE table depending on their health conditions, **BAD** or **WORSE**.
- This procedure routine will take animal ID and health conditon as parameters which will be used to update the sale price of animal in the PETSALE table by an amount depending on their health condition. Suppose that:
  - For animal with ID XX having BAD health condition, the sale price will be reduced further by 25%.
  - For animal with ID YY having WORSE health condition, the sale price will be reduced further by 50%.
  - For animal with ID ZZ having other health condition, the sale price won't change.
- To create the stored procedure routine, copy the code below and paste it to the textarea of the **SQL** page. Click **Go**.

```

DELIMITER @
CREATE PROCEDURE UPDATE_SALEPRICE (IN Animal_ID INTEGER, IN Animal_Health VARCHAR(5))
BEGIN
    IF Animal_Health = 'BAD' THEN
        UPDATE PETALE
        SET SALEPRICE = SALEPRICE - (SALEPRICE * 0.25)
        WHERE ID = Animal_ID;
    ELSEIF Animal_Health = 'WORSE' THEN
        UPDATE PETALE
        SET SALEPRICE = SALEPRICE - (SALEPRICE * 0.5)
        WHERE ID = Animal_ID;
    ELSE
        UPDATE PETALE
        SET SALEPRICE = SALEPRICE
        WHERE ID = Animal_ID;
    END IF;
END @
DELIMITER ;

```



Run SQL query/queries on database **Mysql\_learners**:

```

15
16 ELSE
17     UPDATE PETALE
18     SET SALEPRICE = SALEPRICE
19     WHERE ID = Animal_ID;
20
21 END IF;
22
23 END @
24
25 DELIMITER ;
26

```

Clear Format Get auto-saved query

☐ Bind parameters

[ Delimiter ; ] ☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☒ Enable foreign key checks

Hide query box

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0214 seconds.)

```

CREATE PROCEDURE UPDATE_SALEPRICE ( IN Animal_ID INTEGER, IN Animal_Health VARCHAR(5) ) BEGIN IF Animal_Health = 'BAD' THEN UPDATE PETALE SET SALEPRICE = SALEPRICE -
(SALEPRICE * 0.25) WHERE ID = Animal_ID; ELSEIF Animal_Health = 'WORSE' THEN UPDATE PETALE SET SALEPRICE = SALEPRICE - (SALEPRICE * 0.5) WHERE ID = Animal_ID; ELSE UPDATE
PETALE SET SALEPRICE = SALEPRICE WHERE ID = Animal_ID; END IF; END

```

[\[Edit inline\]](#) [\[ Edit \]](#) [\[ Create PHP code \]](#)

1. Let's call the UPDATE\_SALEPRICE routine. We want to update the sale price of animal with ID **1** having **BAD** health condition in the PETALE table. open another **SQL** tab by clicking **Open in new Tab**

← → ↻ [lakshmih-8080.theiadocker-1-labs-prod-theiak8s-4-tor01.proxy.cognitiveclass.ai/tbl\\_sql.php?db=HR&table=EMPLOYEES](http://lakshmih-8080.theiadocker-1-labs-prod-theiak8s-4-tor01.proxy.cognitiveclass.ai/tbl_sql.php?db=HR&table=EMPLOYEES)

Apps Count\_Coursera\_DS... DataAnayst\_Count... DataEngg\_Count.xlsx DS\_DA\_DE\_CountS... www.google.com Checking your Bro... (251) Zoho People New Tab Lakshmihol

**phpMyAdmin**

Recent Favorites

- New
- HR
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  - JOBS
  - JOB\_HISTORY
  - LOCATIONS
- information\_schema
- mysql
- Mysql\_learners
  - New
  - PETRESCUE
  - PETSALE
- performance\_schema
- sys

Server: mysql:3306 » Database: HR » Table: EMPLOYEES

Browse Structure SQL Search Insert Export Import Privileges Operations Triggers

Run SQL query/queries on table HR

1 `SELECT * FROM `EMPLOYEES``

Columns

EMP_ID
F_NAME
L_NAME
SSN
B_DATE
SEX
ADDRESS
JOB_ID
SALARY
MANAGER_ID
DEP_ID

SELECT \* SELECT INSERT UPDATE DELETE Clear Format Get auto-saved query

☐ Bind parameters ⓘ

[ Delimiter ; ] ☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☒ Enable foreign key checks

Open link in new tab  
Open link in new window  
Open link in incognito window  
Save link as...  
Copy link address  
Inspect

Delete the default line which appears so that you will get a blank window.

Copy the code below and paste it to the textarea of the **SQL** page. Click **Go**.

Note if you have dropped RETREIVE\_ALL procedure rerun the creation script of that procedure before executing these lines.

```
CALL RETRIEVE_ALL;  
CALL UPDATE_SALEPRICE(1, 'BAD');  
CALL RETRIEVE_ALL;
```



✓ Showing rows 0 - 4 (5 total, Query took 0.0007 seconds.)

[CALL](#) RETRIEVE\_ALL

☐ Show all | Number of rows: 25 ▼ Filter rows:

+ Options

ID	ANIMAL	SALEPRICE	SALEDATE	QUANTITY
1	Cat	450.09	2018-05-29	9
2	Dog	666.66	2018-06-01	3
3	Parrot	50.00	2018-06-04	2
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

⚠ Note: #1265 Data truncated for column 'SALEPRICE' at row 1

✓ Showing rows 0 - 4 (5 total, Query took 0.0015 seconds.)

[CALL](#) RETRIEVE\_ALL

☐ Show all | Number of rows: 25 ▼ Filter rows:

+ Options

ID	ANIMAL	SALEPRICE	SALEDATE	QUANTITY
1	Cat	337.57	2018-05-29	9
2	Dog	666.66	2018-06-01	3
3	Parrot	50.00	2018-06-04	2
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

2. Let's call the UPDATE\_SALEPRICE routine once again. We want to update the sale price of animal with ID **3** having **WORSE** health condition in the PETSALE table. copy the code below and paste it to the textarea of the **SQL** page. Click **Go**. You will have all the records retrieved from the PETSALE table.

```
CALL RETRIEVE_ALL;  
CALL UPDATE_SALEPRICE(3, 'WORSE');  
CALL RETRIEVE_ALL;
```

Showing rows 0 - 4 (5 total, Query took 0.0005 seconds.)

CALL RETRIEVE\_ALL

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Options

	ANIMAL	SALEPRICE	SALEDATE	QUANTITY
1	Cat	337.57	2018-05-29	9
2	Dog	666.66	2018-06-01	3
3	Parrot	50.00	2018-06-04	2
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

☐ Show all | Number of rows: 25 | Filter rows: Search this table

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Options

D	ANIMAL	SALEPRICE	SALEDATE	QUANTITY
1	Cat	337.57	2018-05-29	9
2	Dog	666.66	2018-06-01	3
3	Parrot	25.00	2018-06-04	2
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Query results operations

3. You can view the created stored procedure routine UPDATE\_SALEPRICE. Click on the **Routines** and view the procedure.

StructureSQLSearchQueryExportImportOperationsPrivilegesRoutinesEventsTriggersDesigner

Routines

Name	Action	Type	Returns
<input type="checkbox"/> RETRIEVE_ALL	Edit  Execute  Export  Drop	PROCEDURE	
<input type="checkbox"/> UPDATE_SALEPRICE	Edit  Execute  Export  Drop	PROCEDURE	

☐ Check all With selected: Export Drop

New

Add routine

4. If you wish to drop the stored procedure routine UPDATE\_SALEPRICE, copy the code below and paste it to the textarea of the **SQL** page. Click **Go**.


```
DROP PROCEDURE UPDATE_SALEPRICE;  
CALL UPDATE_SALEPRICE;
```

```
7
8
9 DROP PROCEDURE UPDATE_SALEPRICE;
10
11 CALL UPDATE_SALEPRICE;
```

Clear

Format

Get auto-saved query

☐ Bind parameters 

[ Delimiter  ] ☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☒ Enable foreign key checks


Go

Hide query box

## Error

SQL query: [Copy](#)

```
DROP PROCEDURE UPDATE_SALEPRICE
```

MySQL said: 

#1305 - PROCEDURE Mysql\_learners.UPDATE\_SALEPRICE does not exist

## Conclusion

Congratulations! You have completed this lab on creating stored procedures in MySQL.

You are now able to:

- Write a stored procedure as per requirement
- Call or Execute a stored procedure
- Drop a stored procedure once its utility is over

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