Module 5 – Introduction to DBMS

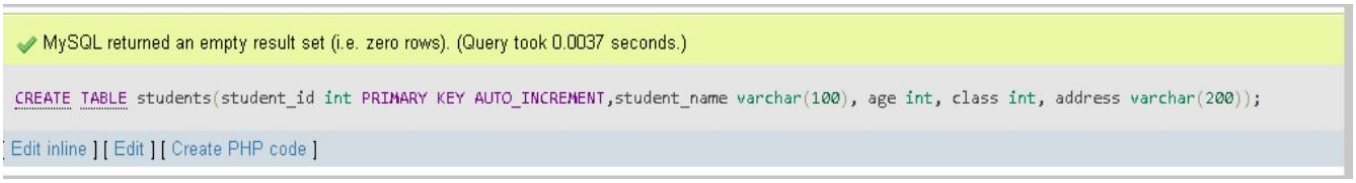
(lab-ex)

-BARAD VIPUL

Introduction to SQL

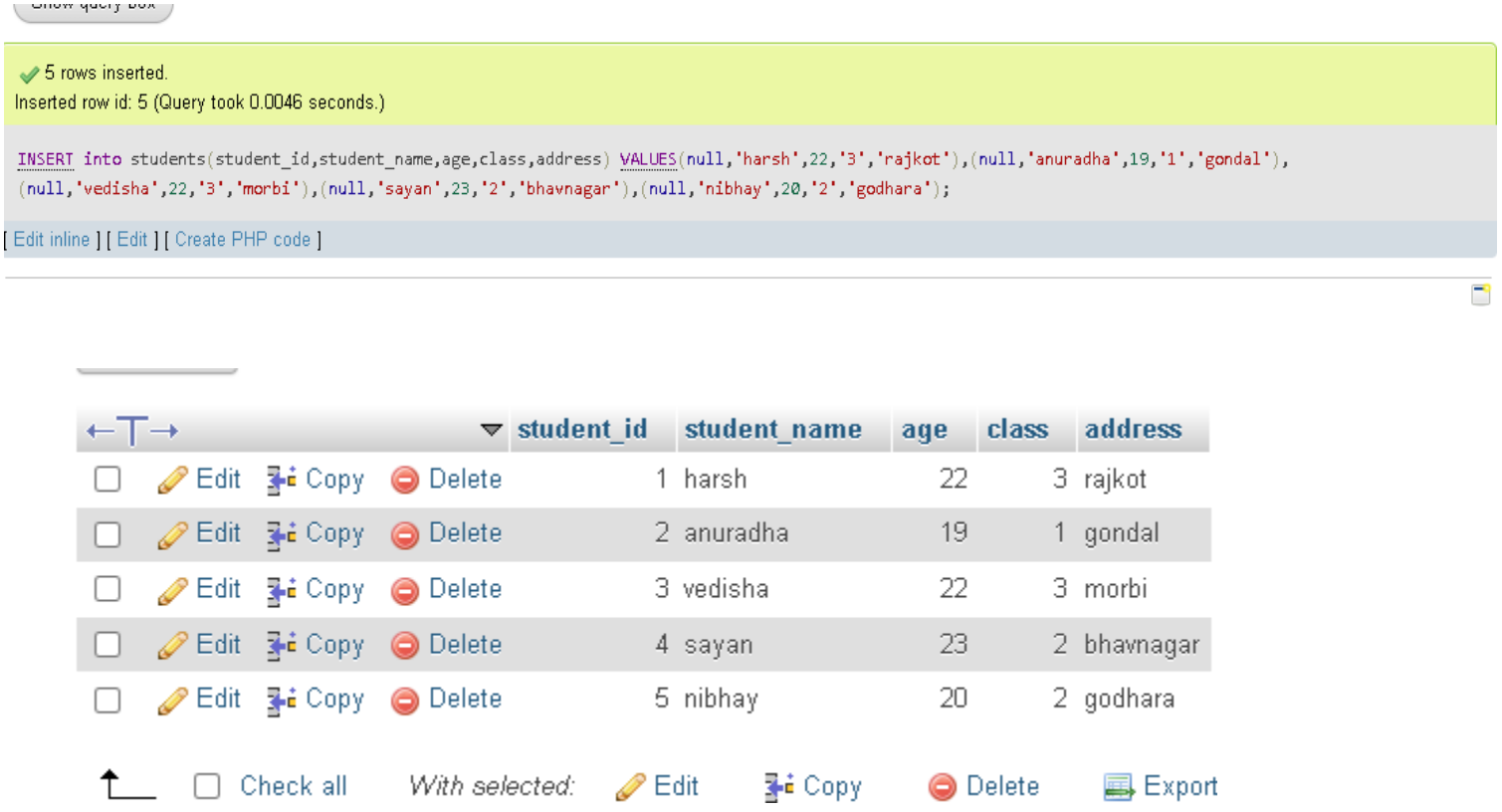
Lab 1: Create a new database named school_db and a table called students with the following columns: student_id, student_name, age, class, and address.

CREATE TABLE students(student_id int PRIMARY KEY AUTO_INCREMENT,student_name varchar(100), age int, class int, address varchar(200))



	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	**student_id**	int(11)			No	*None*		AUTO_INCREMENT	Change Drop More
☐	2	**student_name**	varchar(100)	utf8mb4_general_ci		Yes	*NULL*			Change Drop More
☐	3	**age**	int(11)			Yes	*NULL*			Change Drop More
☐	4	**class**	int(11)			Yes	*NULL*			Change Drop More
☐	5	**address**	varchar(200)	utf8mb4_general_ci		Yes	*NULL*			Change Drop More

Lab 2: Insert five records into the students table and retrieve all records using the SELECT statement.



5 rows inserted.
Inserted row id: 5 (Query took 0.0046 seconds.)

```
INSERT into students(student_id,student_name,age,class,address) VALUES(null,'harsh',22,'3','rajkot'),(null,'anuradha',19,'1','gondal'),
(null,'vedisha',22,'3','morbi'),(null,'sayan',23,'2','bhavnagar'),(null,'nibhay',20,'2','godhara');
```

[Edit inline] [Edit] [Create PHP code]

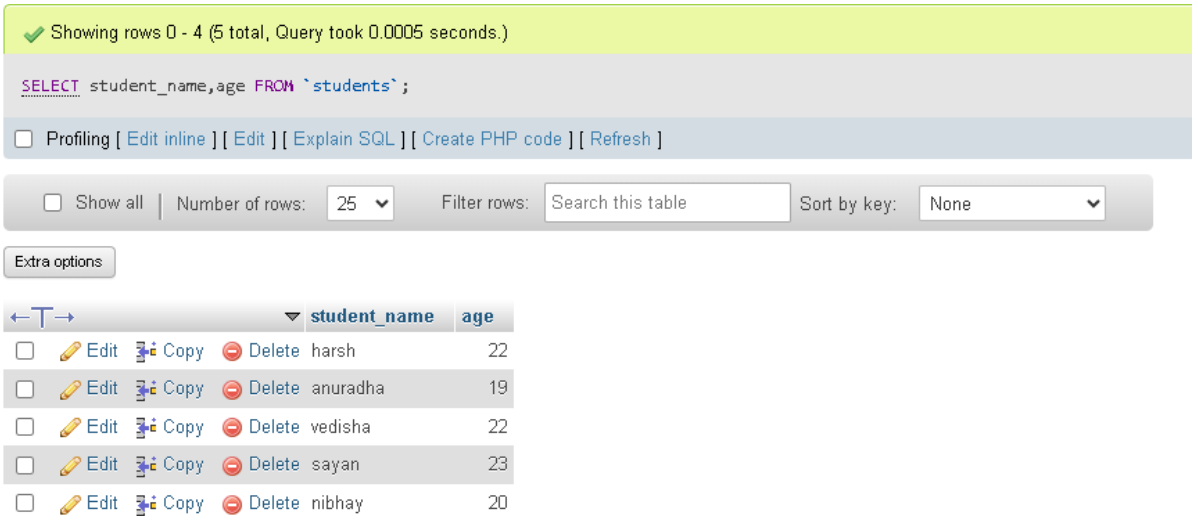
	student_id	student_name	age	class	address
Edit Copy Delete	1	harsh	22	3	rajkot
Edit Copy Delete	2	anuradha	19	1	gondal
Edit Copy Delete	3	vedisha	22	3	morbi
Edit Copy Delete	4	sayan	23	2	bhavnagar
Edit Copy Delete	5	nibhay	20	2	godhara

Check all With selected: Edit Copy Delete Export

SQL Syntax

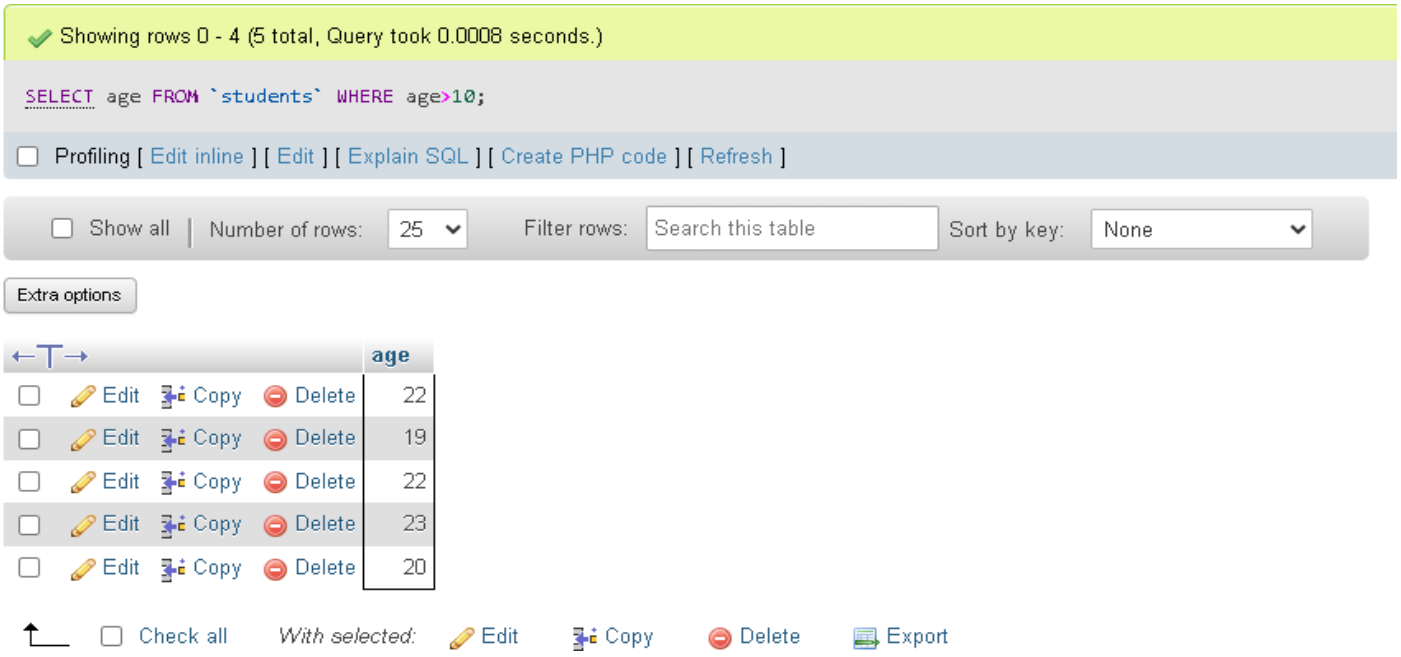
Lab 1: Write SQL queries to retrieve specific columns (student_name and age) from the students table.

SELECT student_name,age FROM `students`



• Lab 2: Write SQL queries to retrieve all students whose age is greater than 10.

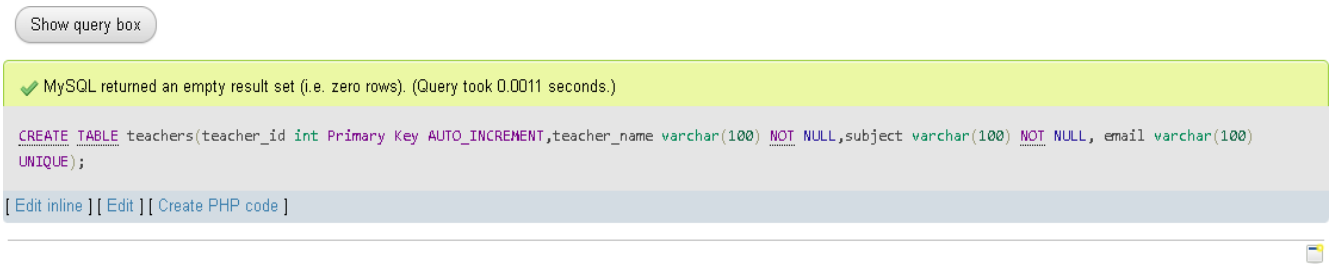
SELECT age FROM `students` WHERE age>10

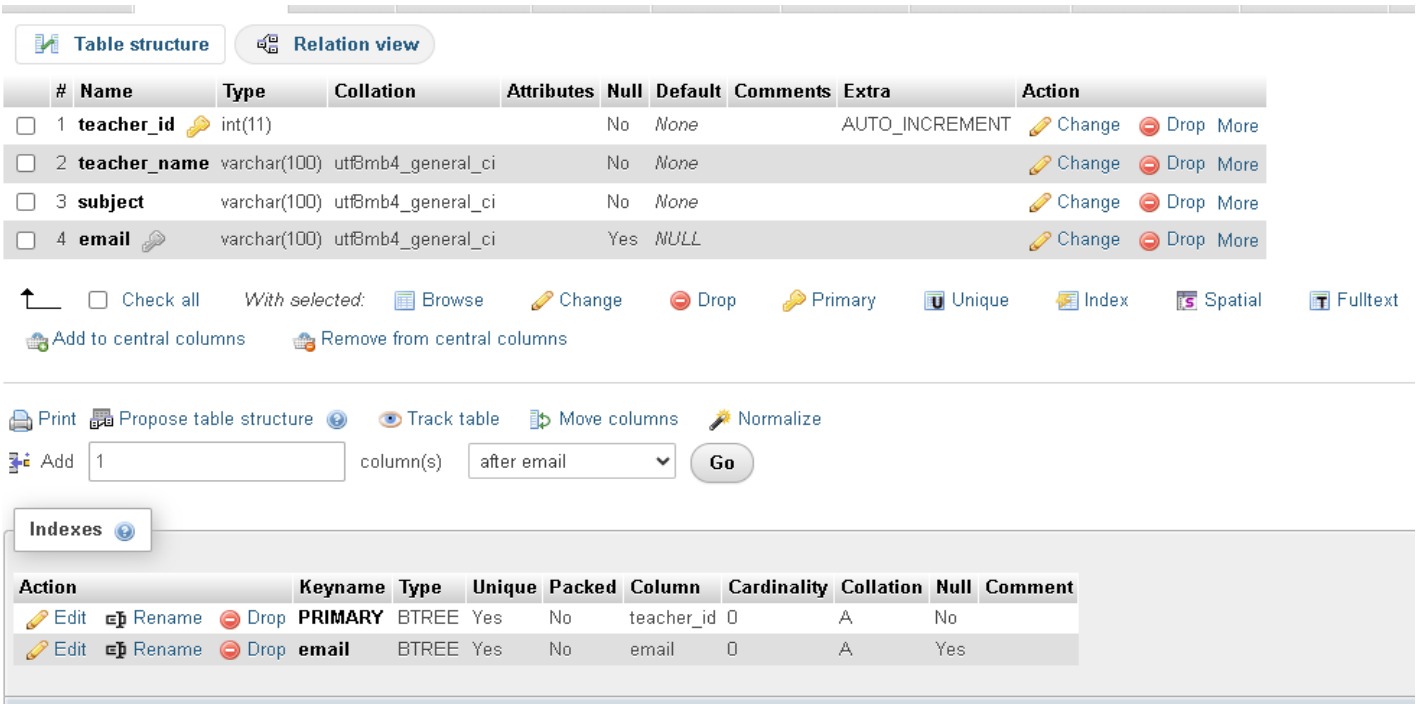


SQL Constraints

- Lab 1: Create a table teachers with the following columns: teacher_id (Primary Key), teacher_name (NOT NULL), subject (NOT NULL), and email (UNIQUE).

CREATE TABLE teachers(teacher_id int Primary Key AUTO_INCREMENT,teacher_name varchar(100) NOT NULL,subject varchar(100) NOT NULL, email varchar(100) UNIQUE)





• Lab 2: Implement a FOREIGN KEY constraint to relate the teacher_id from the teachers table with the students table.

ALTER TABLE students ADD teacher_id int;
ALTER TABLE students ADD FOREIGN KEY (teacher_id) REFERENCES teachers(teacher_id);

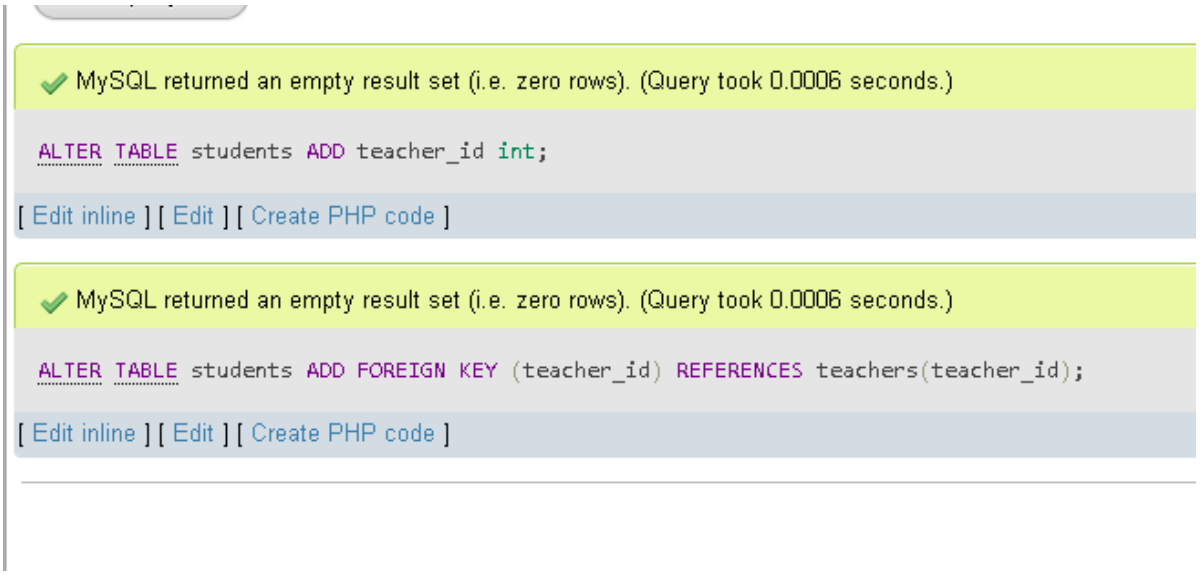


Table structure | Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	student_id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	student_name	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	age	int(11)			Yes	NULL			Change Drop More
4	class	int(11)			Yes	NULL			Change Drop More
5	address	varchar(200)	utf8mb4_general_ci		Yes	NULL			Change Drop More
6	teacher_id	int(11)			Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Spatial F

Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Normalize

Add 1 column(s) after teacher_id Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Rename Drop	PRIMARY	BTREE	Yes	No	student_id	5	A	No	
Edit Rename Drop	teacher_id	BTREE	No	No	teacher_id	2	A	Yes	

Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

```
SELECT * FROM `students`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

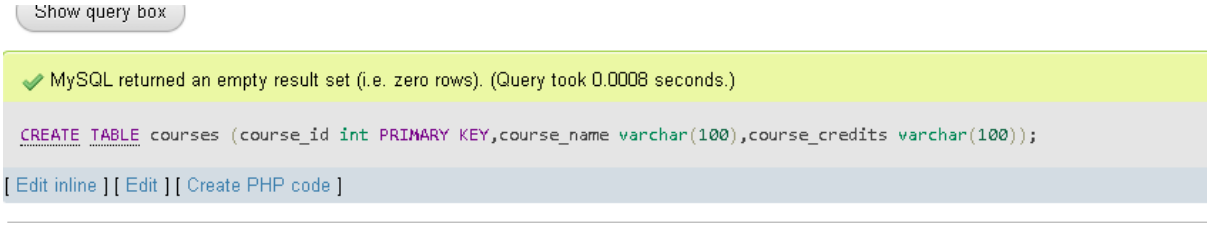
	student_id	student_name	age	class	address	teacher_id
Edit Copy Delete	1	harsh	22	3	rajkot	NULL
Edit Copy Delete	2	anuradha	19	1	gondal	NULL
Edit Copy Delete	3	vedisha	22	3	morbi	NULL
Edit Copy Delete	4	sayan	23	2	bhavnagar	NULL
Edit Copy Delete	5	nibhay	20	2	godhara	NULL

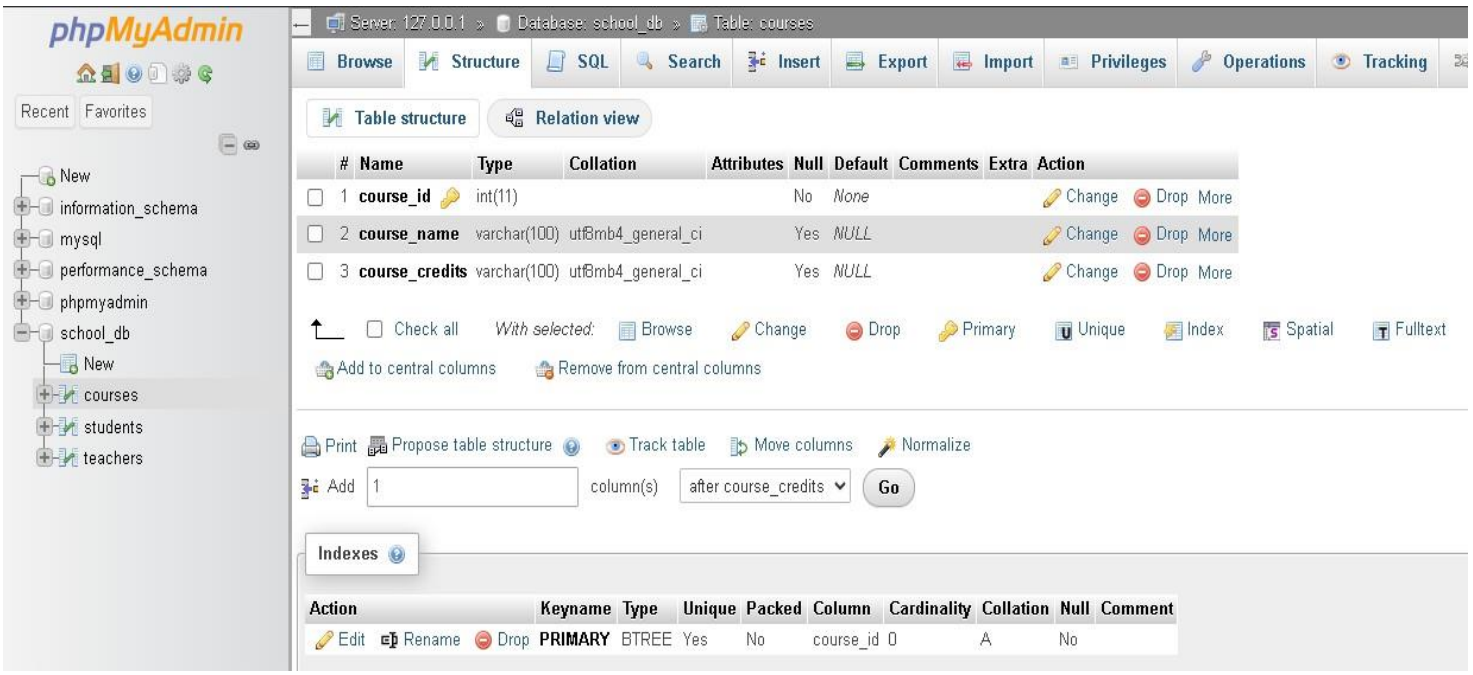
Check all With selected: Edit Copy Delete Export

Main SQL Commands and Sub-commands (DDL)

• Lab 1: Create a table courses with columns: course_id, course_name, and course_credits. Set the course_id as the primary key.

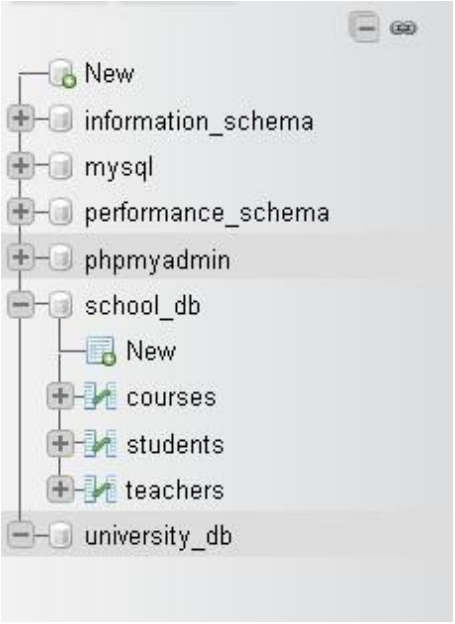
CREATE TABLE courses (course_id int PRIMARY KEY,course_name varchar(100),course_credits varchar(100))





• Lab 2: Use the CREATE command to create a database university_db.

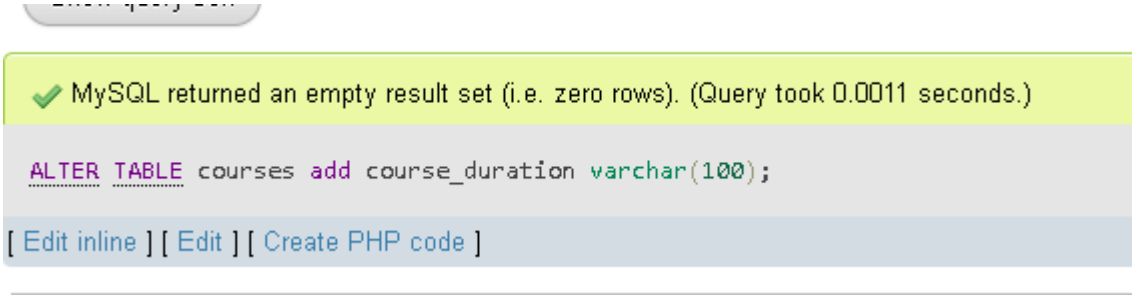
CREATE DATABASE university_db

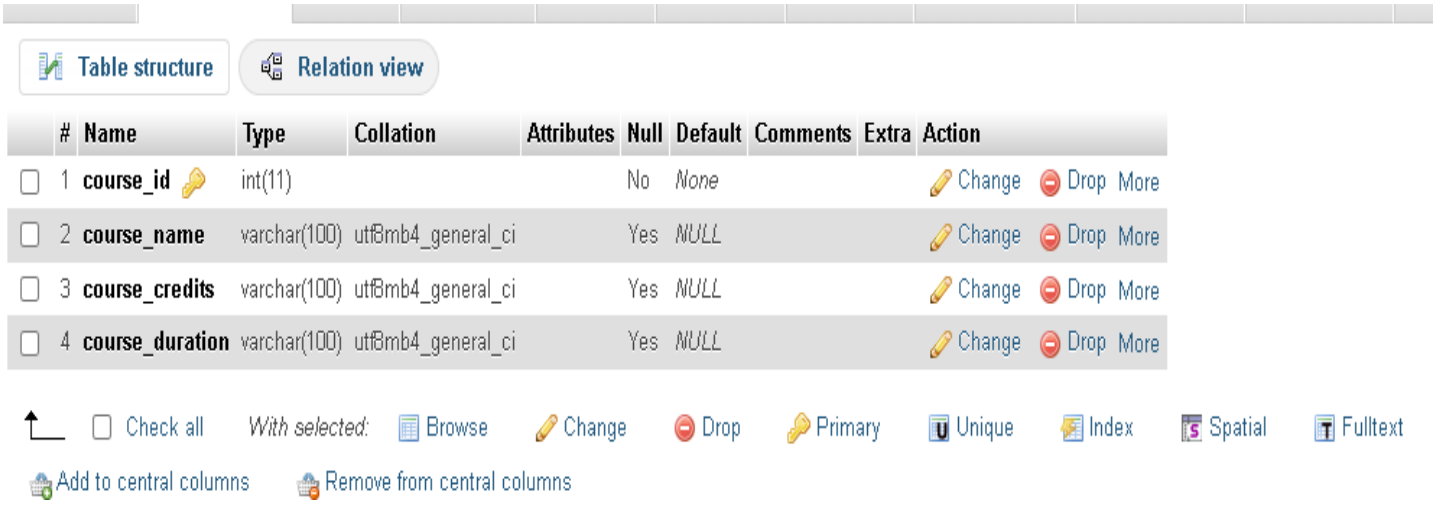


ALTER Command

• Lab 1: Modify the courses table by adding a column course_duration using the ALTER command.

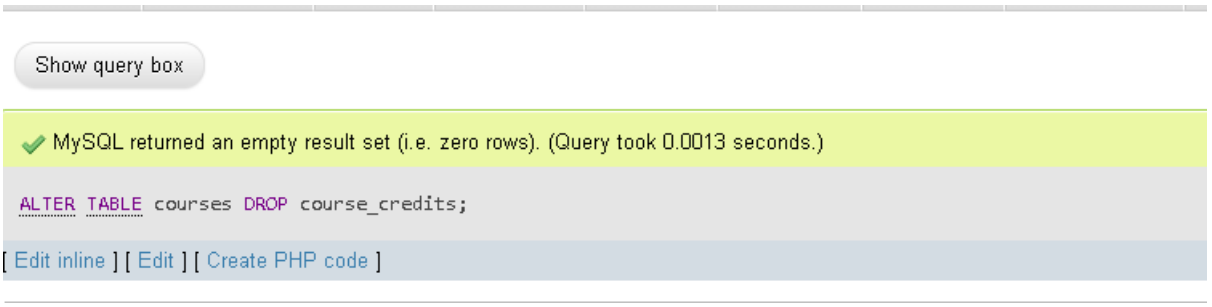
ALTER TABLE courses add course_duration varchar(100)

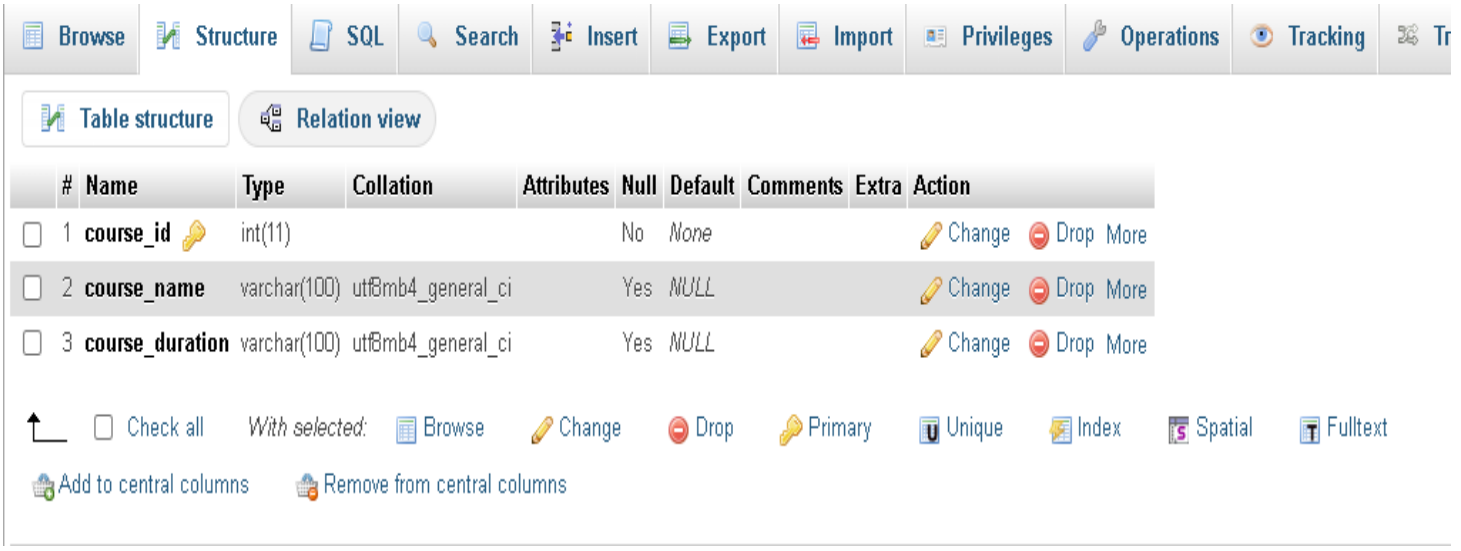




• Lab 2: Drop the course_credits column from the courses table.

ALTER TABLE courses DROP course_credits





DROP Command

- Lab 1: Drop the teachers table from the school_db database.
- Lab 2: Drop the students table from the school_db database and verify that the table has been removed.

First we have to remove constraint key from tables
For that first we have to know what is name of key and for that go to `information_schema` database then go to `KEY_COLUMN_USAGE`
And find ‘students’ in table_name column and ‘teacher_id’ in column_name column.
This is where you can see the name of the constraint key name in the constraint_name column.

```
ALTER TABLE students DROP CONSTRAINT
students_ibfk_1;
```

Show query box

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0013 seconds.)

```
ALTER TABLE students DROP CONSTRAINT students_ibfk_1;
```

[Edit inline] [Edit] [Create PHP code]

drop TABLE teachers;
drop TABLE students

Show query box

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0006 seconds.)

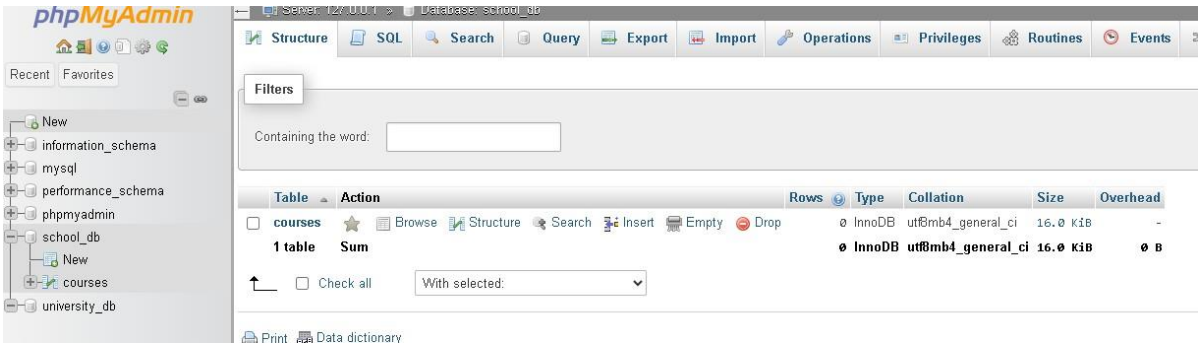
```
drop TABLE teachers;
```

[Edit inline] [Edit] [Create PHP code]

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0009 seconds.)

```
drop TABLE students;
```

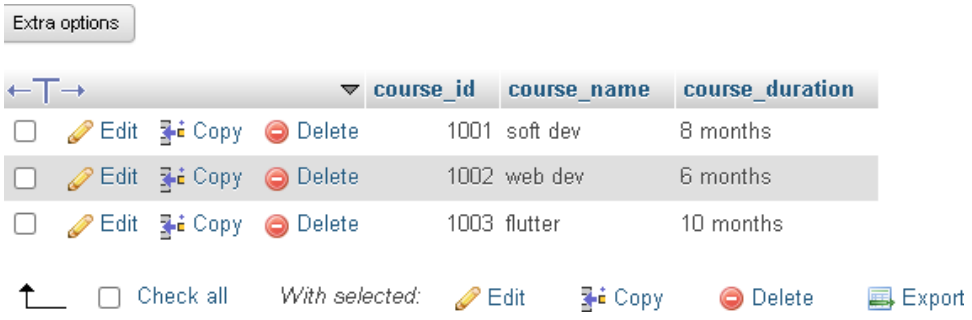
[Edit inline] [Edit] [Create PHP code]



Data Manipulation Language (DML)

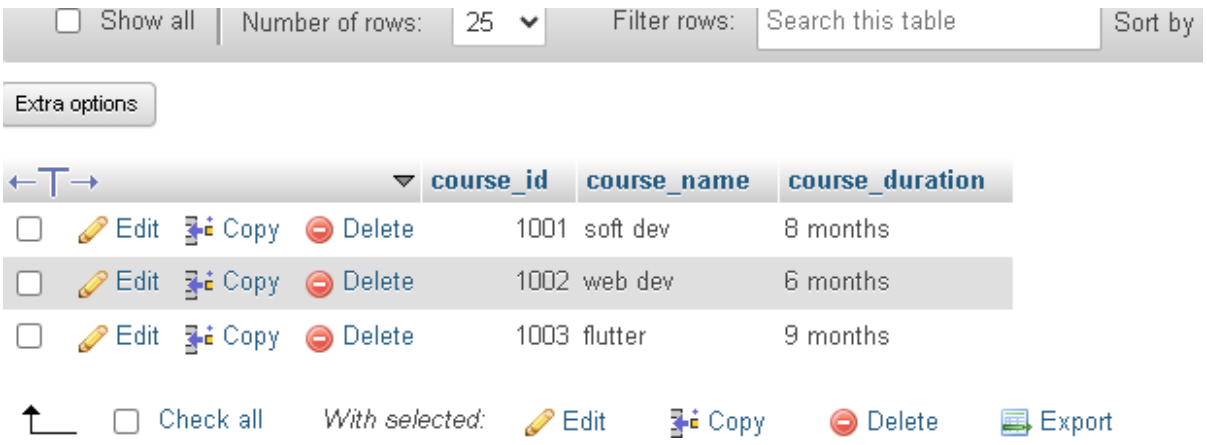
the INSERT command.

INSERT INTO courses (course_id,course_name,course_duration) VALUES (1001,'soft dev','8 months'),(1002,'web dev','6 months'),(1003,'flutter','10 months')



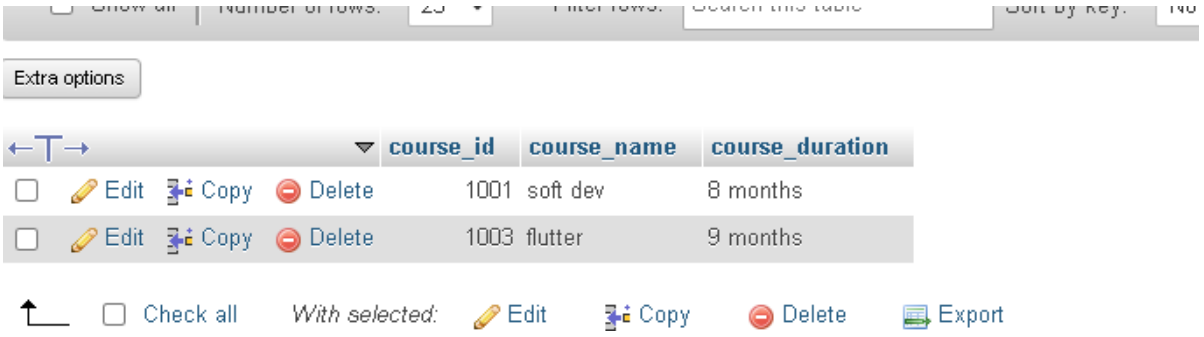
• Lab 2: Update the course duration of a specific course using the UPDATE command.

UPDATE courses SET course_duration = '9 months'
WHERE course_id = 1003;



• Lab 3: Delete a course with a specific course_id from the courses table using the DELETE command.

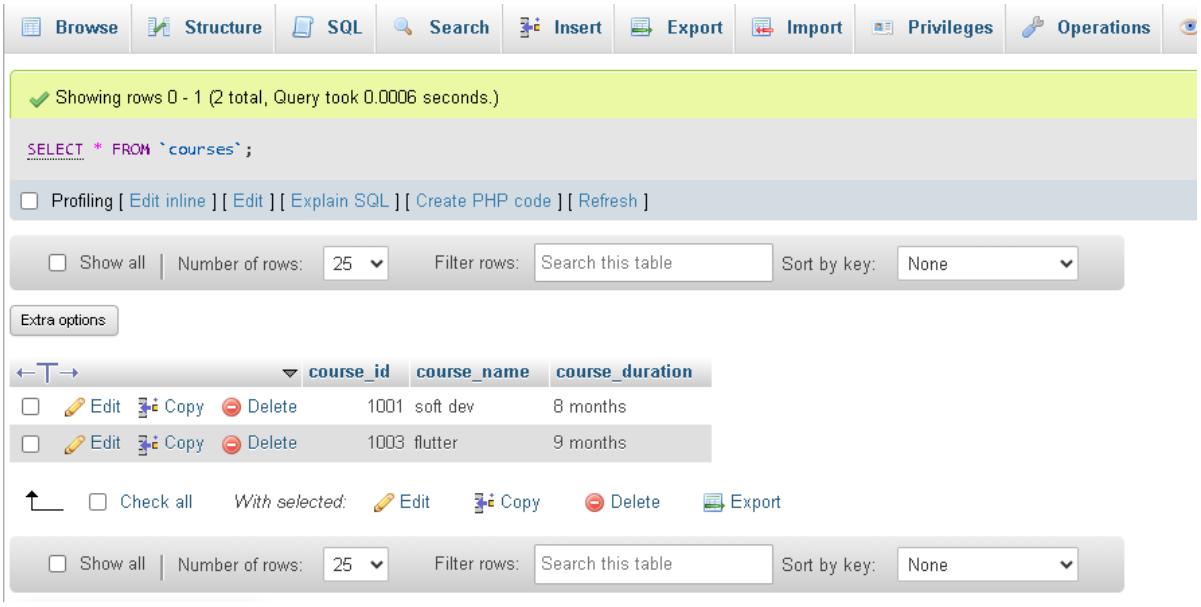
delete from courses where course_id=1002



Data Query Language (DQL)

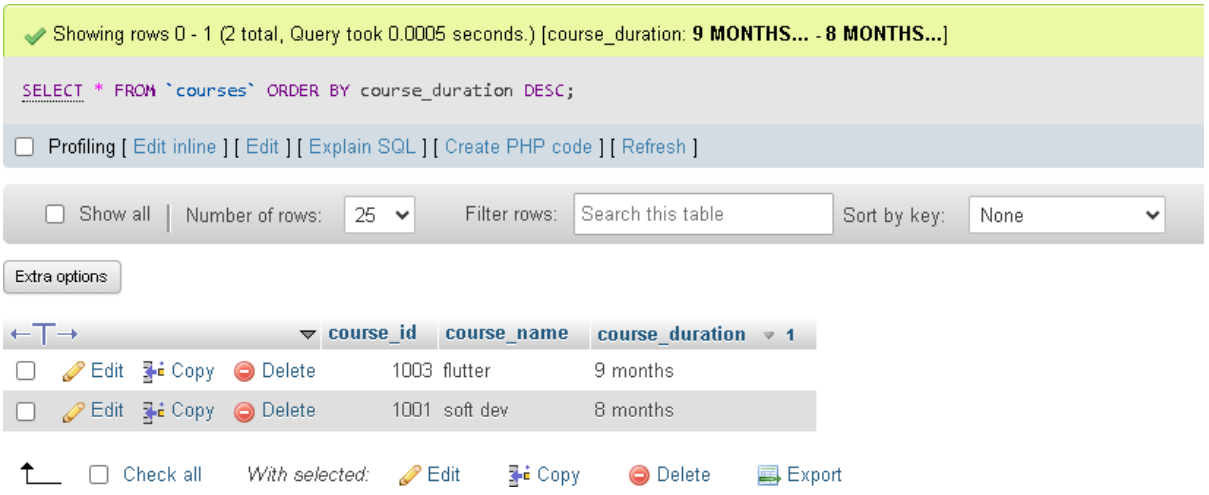
- Lab 1: Retrieve all courses from the courses table using the SELECT statement.

SELECT * FROM `courses`



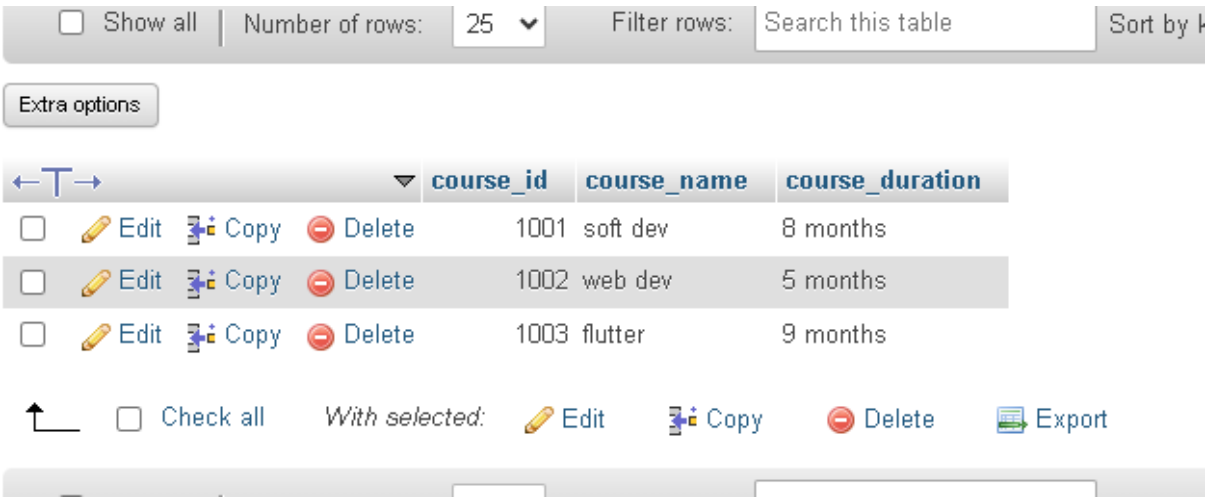
- Lab 2: Sort the courses based on course_duration in descending order using ORDER BY.

SELECT * FROM `courses` ORDER BY course_duration DESC

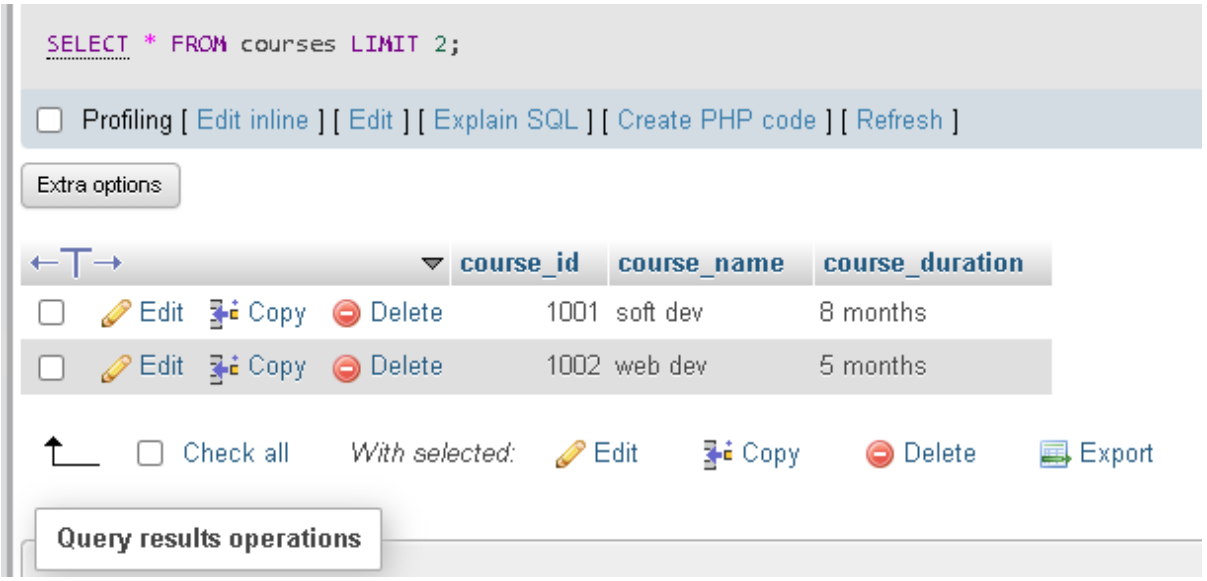


• Lab 3: Limit the results of the SELECT query to show only the top two courses using LIMIT.

Adding one entry just for more convenience



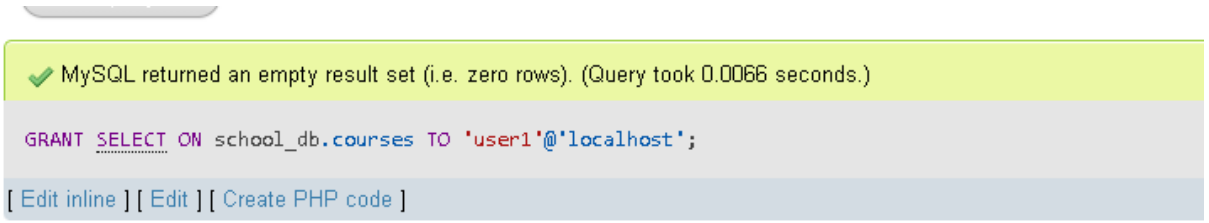
SELECT * FROM courses LIMIT 2

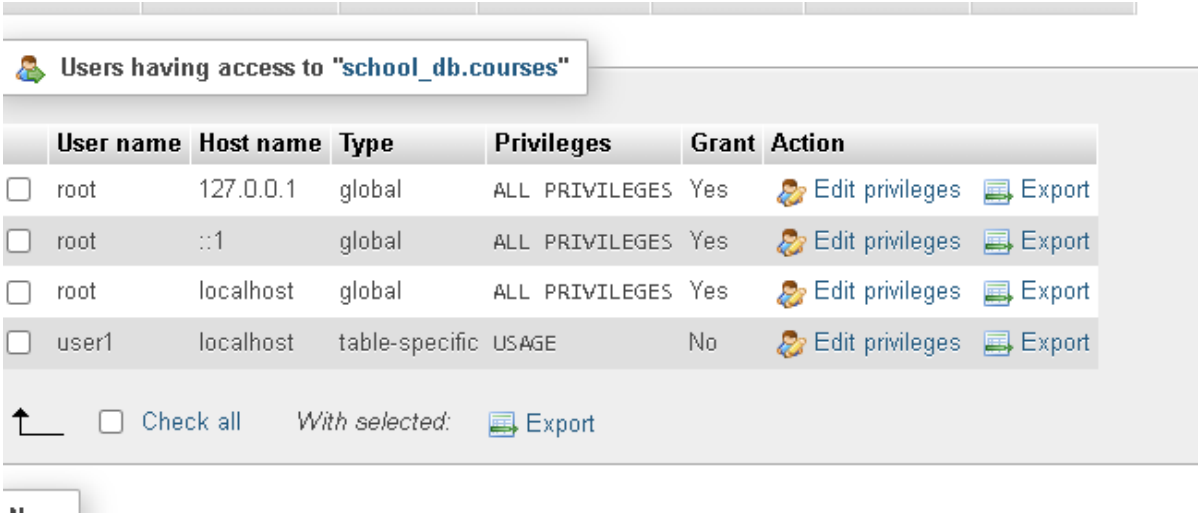


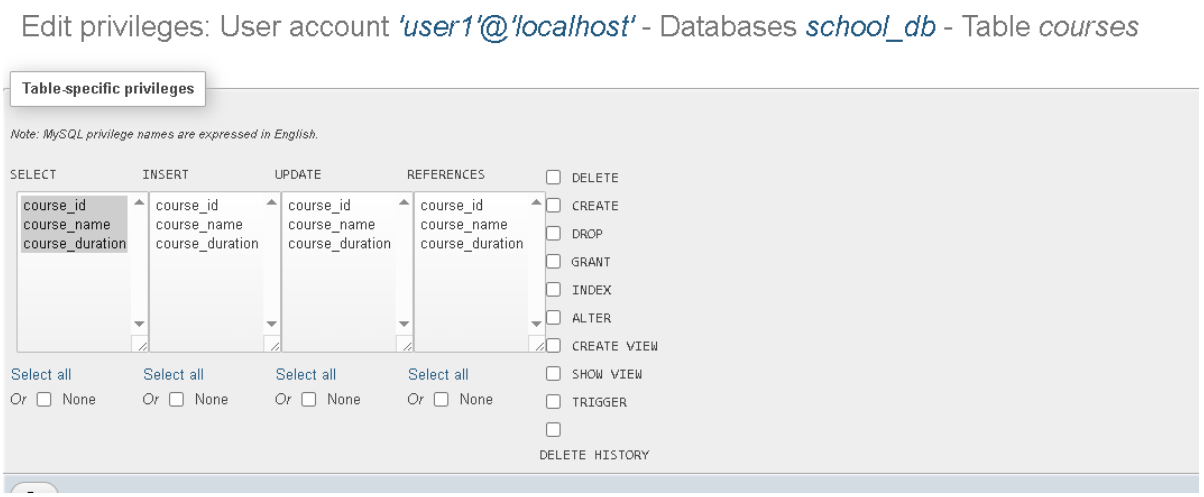
Data Control Language (DCL)

- Lab 1: Create two new users user1 and user2 and grant user1 permission to SELECT from the courses table.

```
CREATE USER 'user1'@'localhost' IDENTIFIED BY
    'password1';
CREATE USER 'user2'@'localhost' IDENTIFIED BY
    'password2';

GRANT SELECT ON school_db.courses TO
    'user1'@'localhost';
```

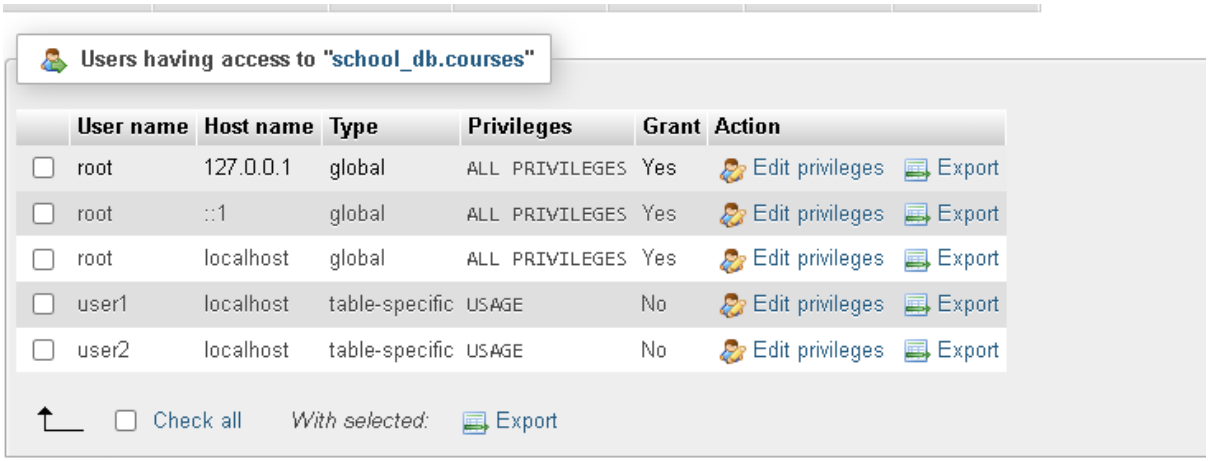


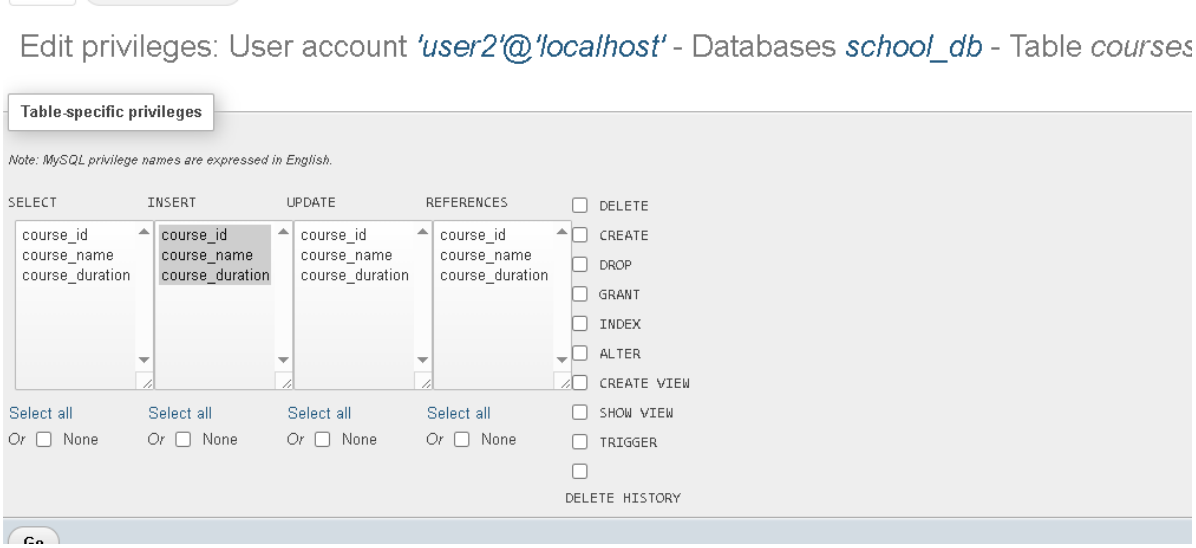



Edit privileges: User account 'user1'@'localhost' - Databases school_db - Table courses
Table-specific privileges
Note: MySQL privilege names are expressed in English.
SELECT
INSERT
UPDATE
REFERENCES
course_id
course_name
course_duration
Select all
Or None
DELETE
CREATE
DROP
GRANT
INDEX
ALTER
CREATE VIEW
SHOW VIEW
TRIGGER
DELETE HISTORY

- Lab 2: Revoke the INSERT permission from user1 and give it to user2.

```
REVOKE INSERT ON school_db.courses FROM
    'user1'@'localhost';
GRANT INSERT ON school_db.courses TO
    'user2'@'localhost';
FLUSH PRIVILEGES;
```


Users having access to "school_db.courses"
User name
Host name
Type
Privileges
Grant
Action
root
127.0.0.1
global
ALL PRIVILEGES
Yes
Edit privileges
Export
root
::1
global
ALL PRIVILEGES
Yes
Edit privileges
Export
root
localhost
global
ALL PRIVILEGES
Yes
Edit privileges
Export
user1
localhost
table-specific
USAGE
No
Edit privileges
Export
user2
localhost
table-specific
USAGE
No
Edit privileges
Export
Check all
With selected:
Export
New


Edit privileges: User account 'user2'@'localhost' - Databases school_db - Table courses
Table-specific privileges
Note: MySQL privilege names are expressed in English.
SELECT
INSERT
UPDATE
REFERENCES
course_id
course_name
course_duration
DELETE
CREATE
DROP
GRANT
INDEX
ALTER
CREATE VIEW
SHOW VIEW
TRIGGER
DELETE HISTORY
Select all
Or None

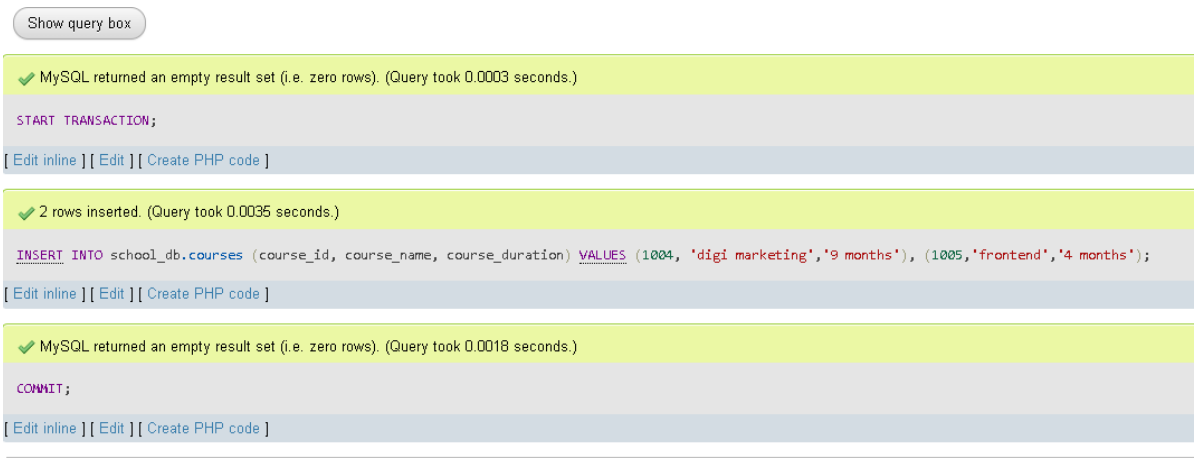
Transaction Control Language (TCL)

- Lab 1: Insert a few rows into the courses table and use COMMIT to save the changes.

START TRANSACTION;

INSERT INTO school_db.courses (course_id, course_name, course_duration) VALUES (1004, 'digi marketing','9 months'), (1005,'frontend','4 months');

COMMIT;



```
SELECT * FROM `courses`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	course_id	course_name	course_duration
Edit Copy Delete	1001	soft dev	8 months
Edit Copy Delete	1002	web dev	5 months
Edit Copy Delete	1003	flutter	9 months
Edit Copy Delete	1004	digi marketing	9 months
Edit Copy Delete	1005	frontend	4 months

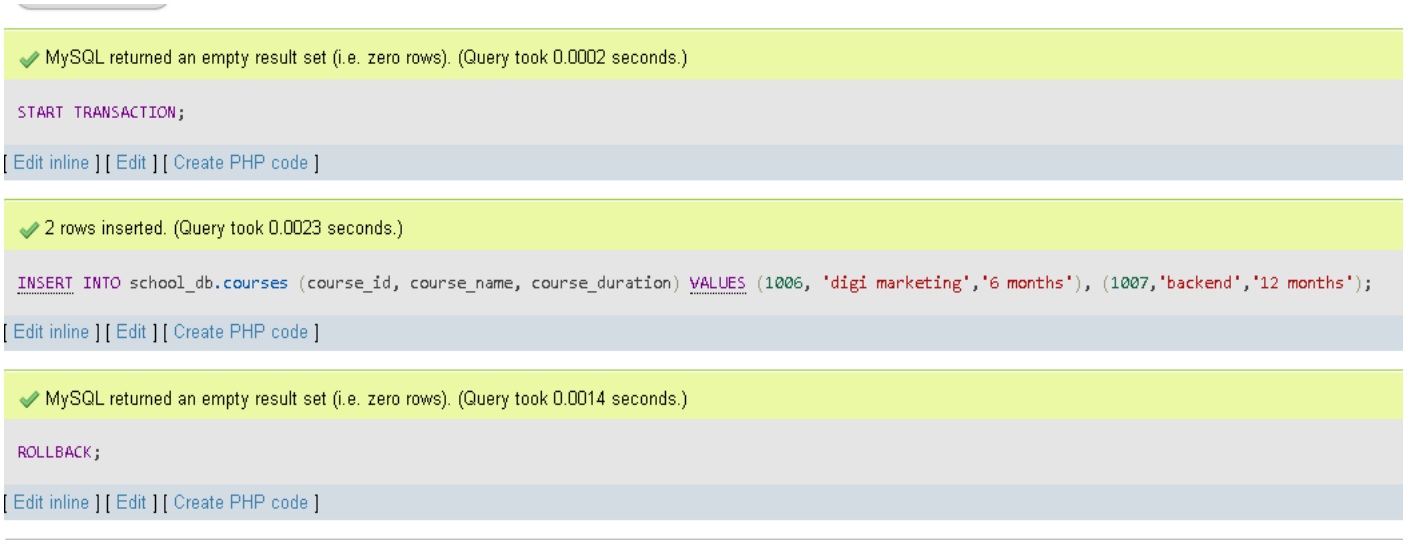
Check all *With selected:* Edit Copy Delete Export

• Lab 2: Insert additional rows, then use ROLLBACK to undo the last insert operation.

START TRANSACTION;

INSERT INTO school_db.courses (course_id, course_name, course_duration) VALUES (1006, 'digi marketing','6 months'), (1007,'backend','12 months');

ROLLBACK;



• Lab 3: Create a SAVEPOINT before updating the courses table, and use it to roll back specific changes.

START TRANSACTION;

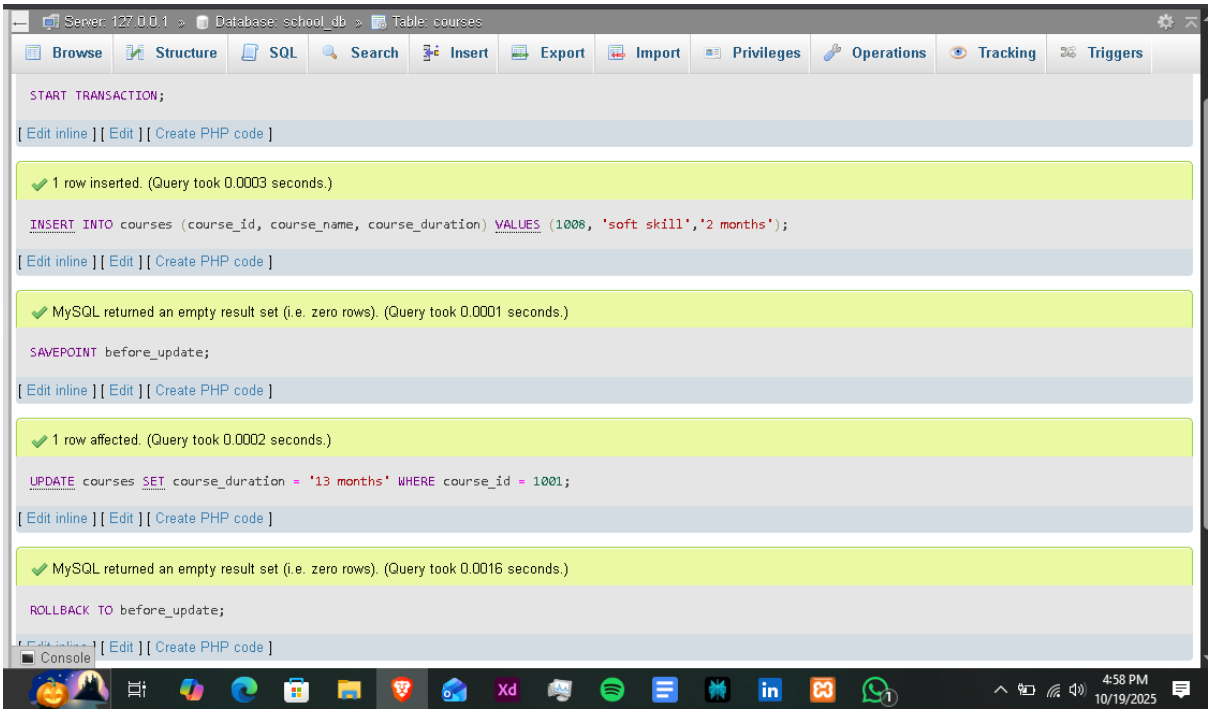
INSERT INTO courses (course_id, course_name, course_duration) VALUES (1008, 'soft skill','2 months');

SAVEPOINT before_update;

UPDATE courses SET course_duration = '13 months' WHERE course_id = 1001;

ROLLBACK TO before_update;

COMMIT;



```
SELECT * FROM `courses`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

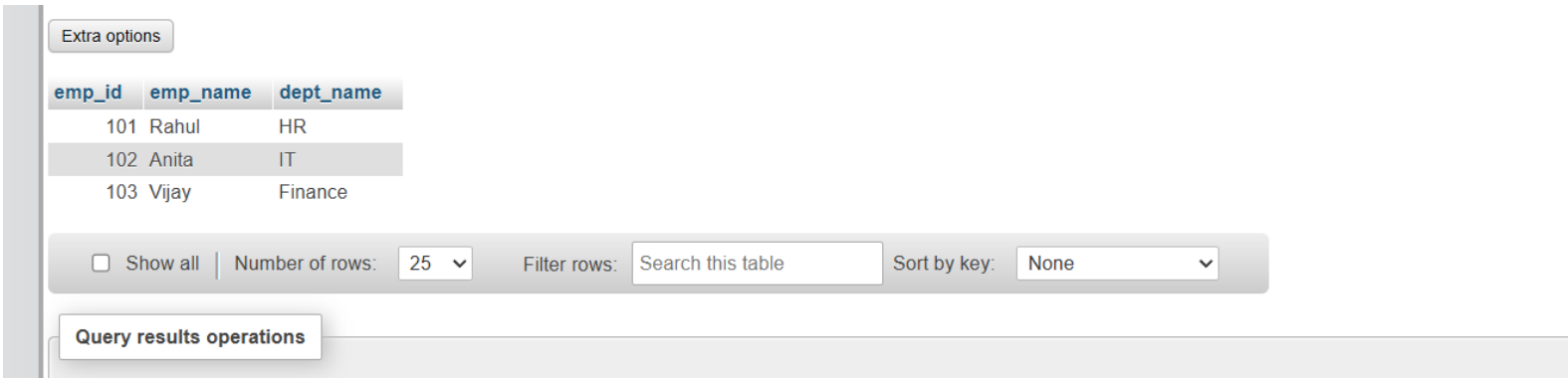
Extra options

	course_id	course_name	course_duration
Edit Copy Delete	1001	soft dev	8 months
Edit Copy Delete	1002	web dev	5 months
Edit Copy Delete	1003	flutter	9 months
Edit Copy Delete	1004	digi marketing	9 months
Edit Copy Delete	1005	frontend	4 months
Edit Copy Delete	1008	soft skill	2 months

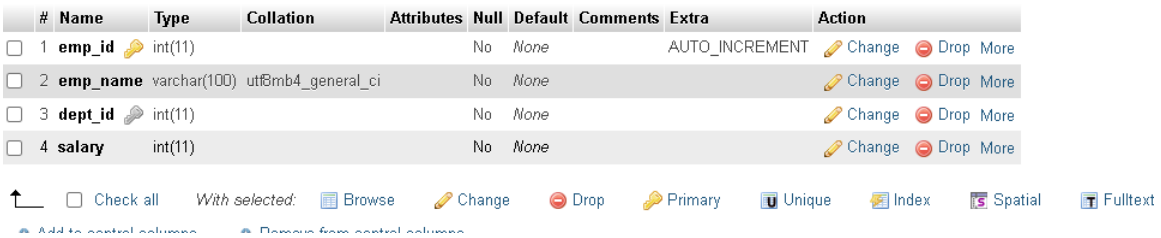
Check all *With selected:* Edit Copy Delete Export

SQL Joins

- Lab 1: Create two tables: departments and employees. Perform an INNER JOIN to display employees along with their respective departments.



```
ALTER TABLE employee ADD CONSTRAINT fk_dept
    FOREIGN KEY (dept_id) REFERENCES
    departments(dept_id);
```



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	**emp_id**	int(11)			No	*None*		AUTO_INCREMENT	Change Drop More
2	**emp_name**	varchar(100)	utf8mb4_general_ci		No	*None*			Change Drop More
3	**dept_id**	int(11)			No	*None*			Change Drop More
4	**salary**	int(11)			No	*None*			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Spatial Fulltext

```
SELECT
    employee.emp_id,employee.emp_name,departments.dept
    _name FROM employee
INNER JOIN departments
ON employee.dept_id = departments.dept_id;
```

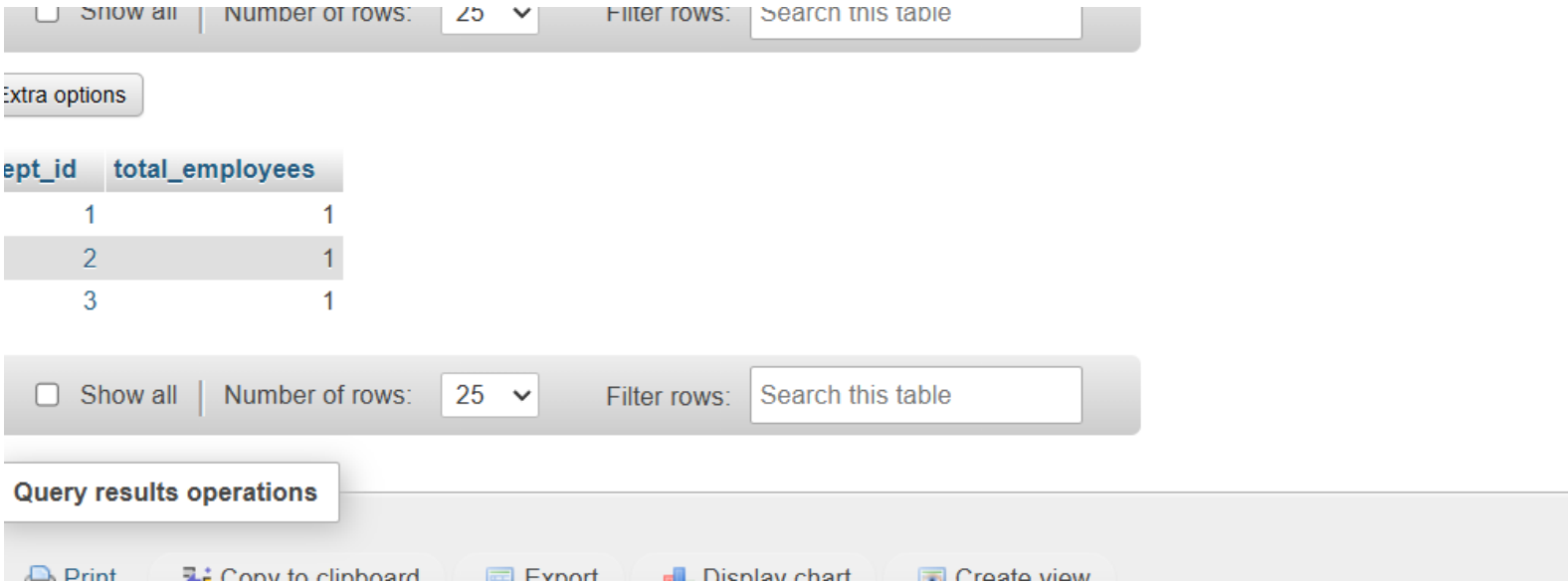
- Lab 2: Use a LEFT JOIN to show all departments, even those without employees.

```
SELECT
    departments.dept_id,departments.dept_name,employee.e
    mp_id,employee.emp_name FROM departments
LEFT JOIN employee
ON departments.dept_id = employee.dept_id;
```

SQL Group By

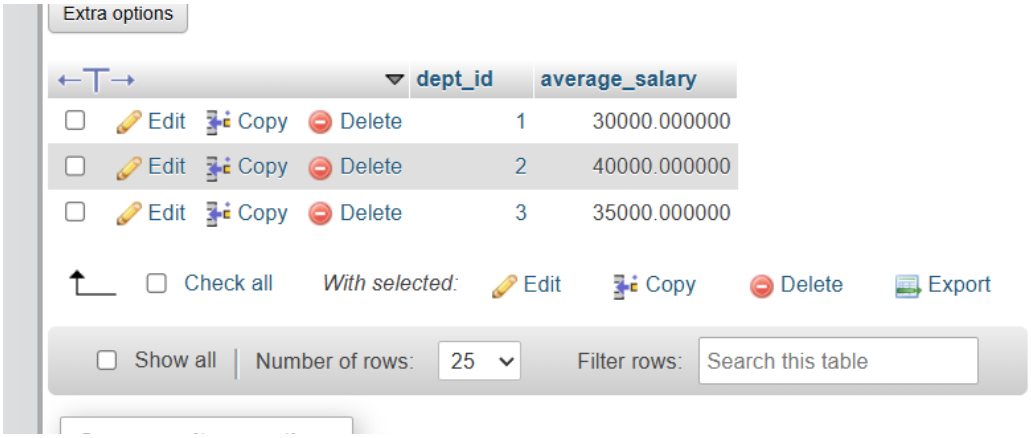
- Lab 1: Group employees by department and count the number of employees in each department using GROUP BY.

SELECT dept_id,COUNT(emp_id) AS total_emp FROM employee GROUP BY dept_id



- Lab 2: Use the AVG aggregate function to find the average salary of employees in each department.

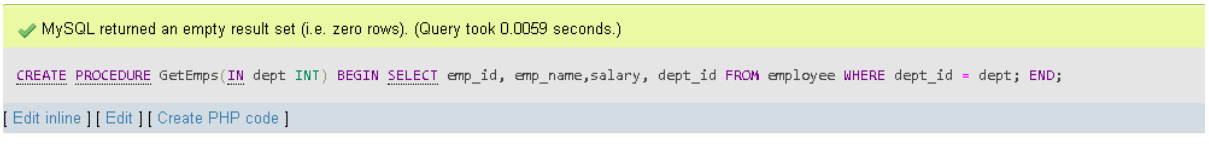
SELECT dept_id,AVG(salary) AS avg_salary FROM employee GROUP by dept_id



SQL Stored Procedure

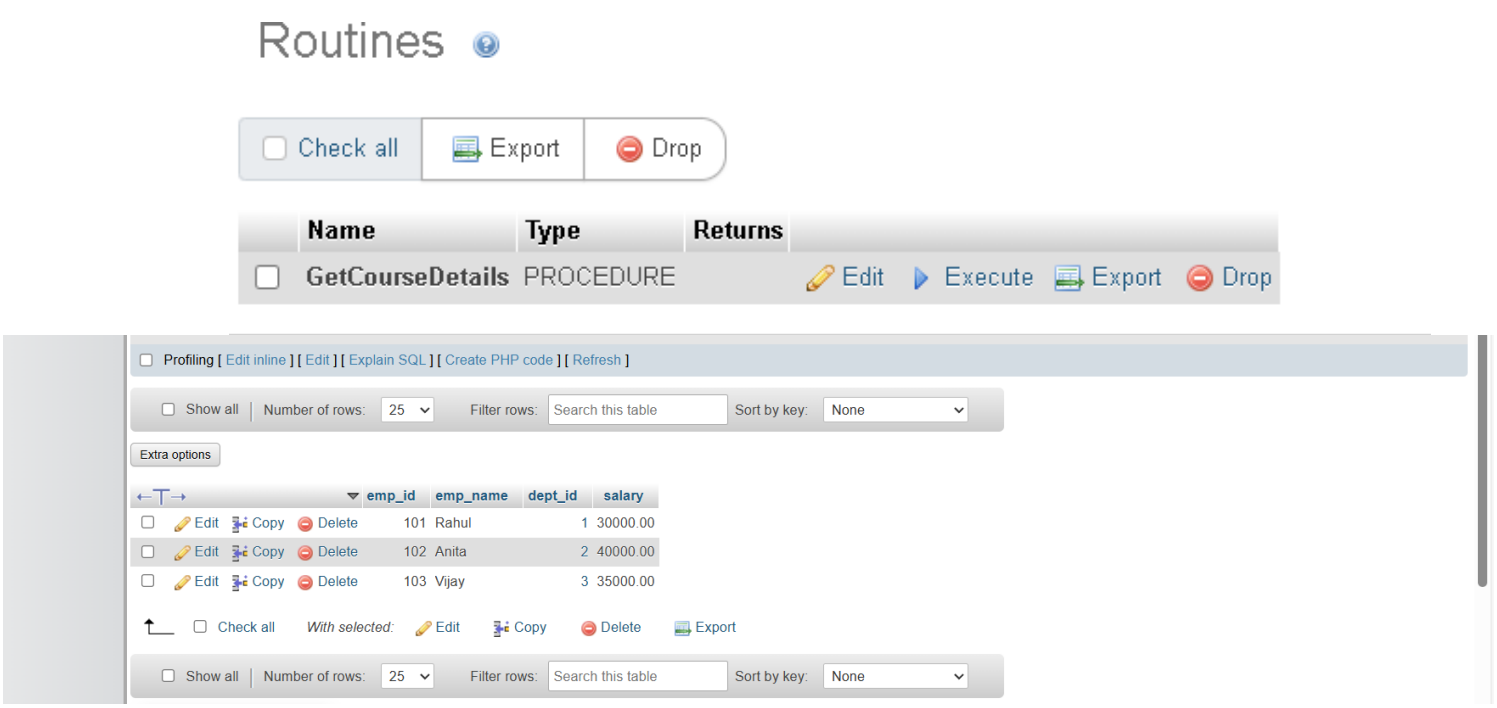
- Lab 1: Write a stored procedure to retrieve all employees from the employees table based on department.

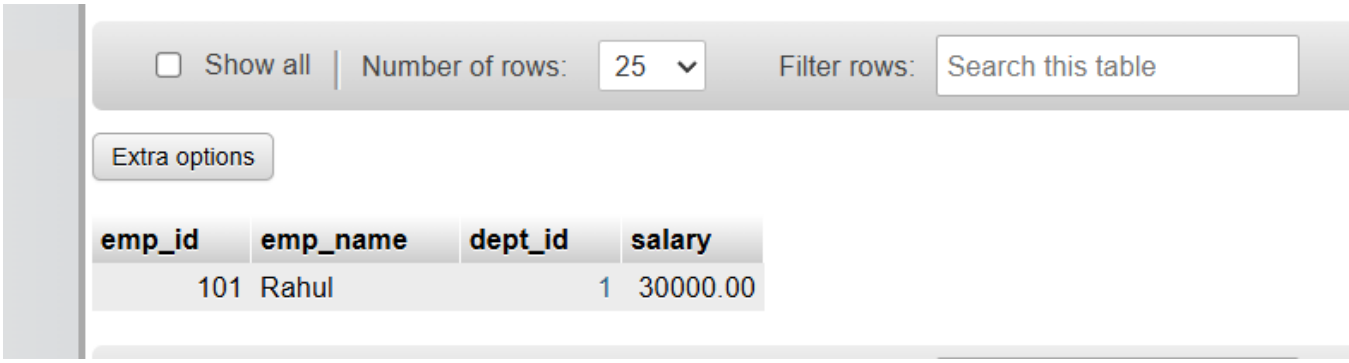
```
DELIMITER $$

CREATE PROCEDURE GetEmps(IN dept INT)
BEGIN
    SELECT emp_id, emp_name,salary, dept_id
    FROM employee
    WHERE dept_id = dept;
END $$

DELIMITER ;
```



- Lab 2: Write a stored procedure that accepts course_id as input and returns the course details.

```
DELIMITER //

CREATE PROCEDURE GetCourseDetails(IN course INT)
BEGIN
    SELECT *
    FROM courses
    WHERE course_id = course;
END //

DELIMITER ;
```



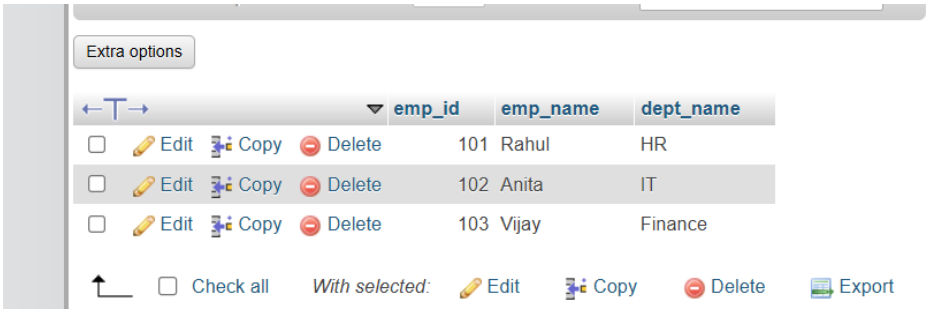


emp_id	emp_name	dept_id	salary
101	Rahul	1	30000.00

SQL View

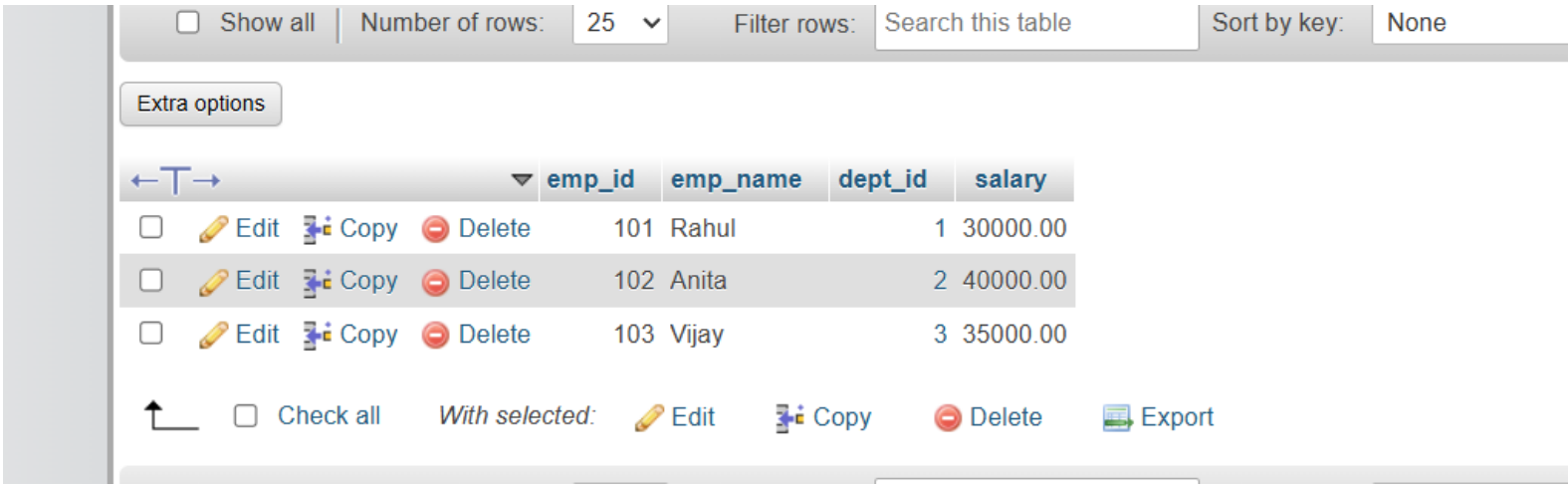
- Lab 1: Create a view to show all employees along with their department names.

```
CREATE VIEW emp_dept_view AS
SELECT employee.emp_id, employee.emp_name,
    departments.dept_name
FROM employee
INNER JOIN departments
ON employee.dept_id = departments.dept_id;
```



- Lab 2: Modify the view to exclude employees whose salaries are below $50,000.

```
CREATE VIEW emp_dept_view_less_50k+ AS
SELECT employee.emp_id, employee.emp_name,
    departments.dept_name, employee.salary
FROM employee
INNER JOIN departments
ON employee.dept_id = departments.dept_id
WHERE employee.salary >= 50000;
```

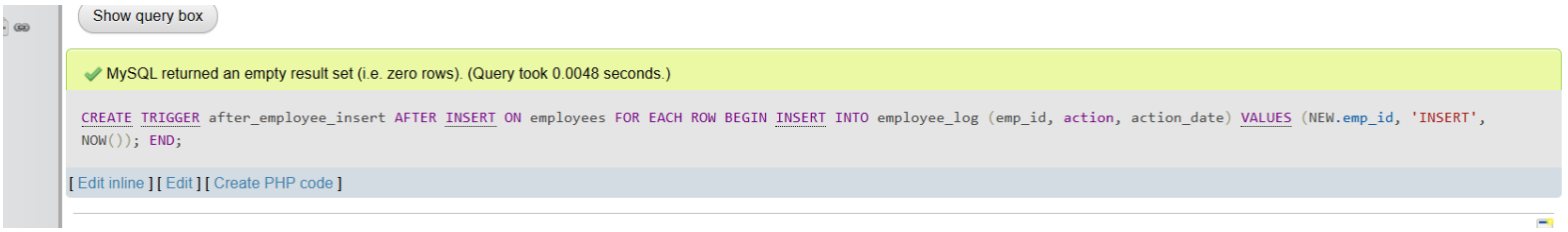


SQL Triggers

- Lab 1: Create a trigger to automatically log changes to the employees table when a new employee is added.

```
CREATE TABLE employee_log
(
    log_id INT AUTO_INCREMENT PRIMARY KEY,
    emp_id INT, emp_name VARCHAR(200), dept_id INT,
    action_time DATETIME,action_description
    VARCHAR(200)
);
```

```
DELIMITER $$

CREATE TRIGGER employee_add
AFTER INSERT ON employee
FOR EACH ROW
BEGIN
    INSERT INTO employee_log (emp_id, emp_name,
    dept_id, action_time, action_description)
    VALUES (NEW.emp_id, NEW.emp_name,
    NEW.dept_id, NOW(), 'new employee added');
END $$

DELIMITER ;
```

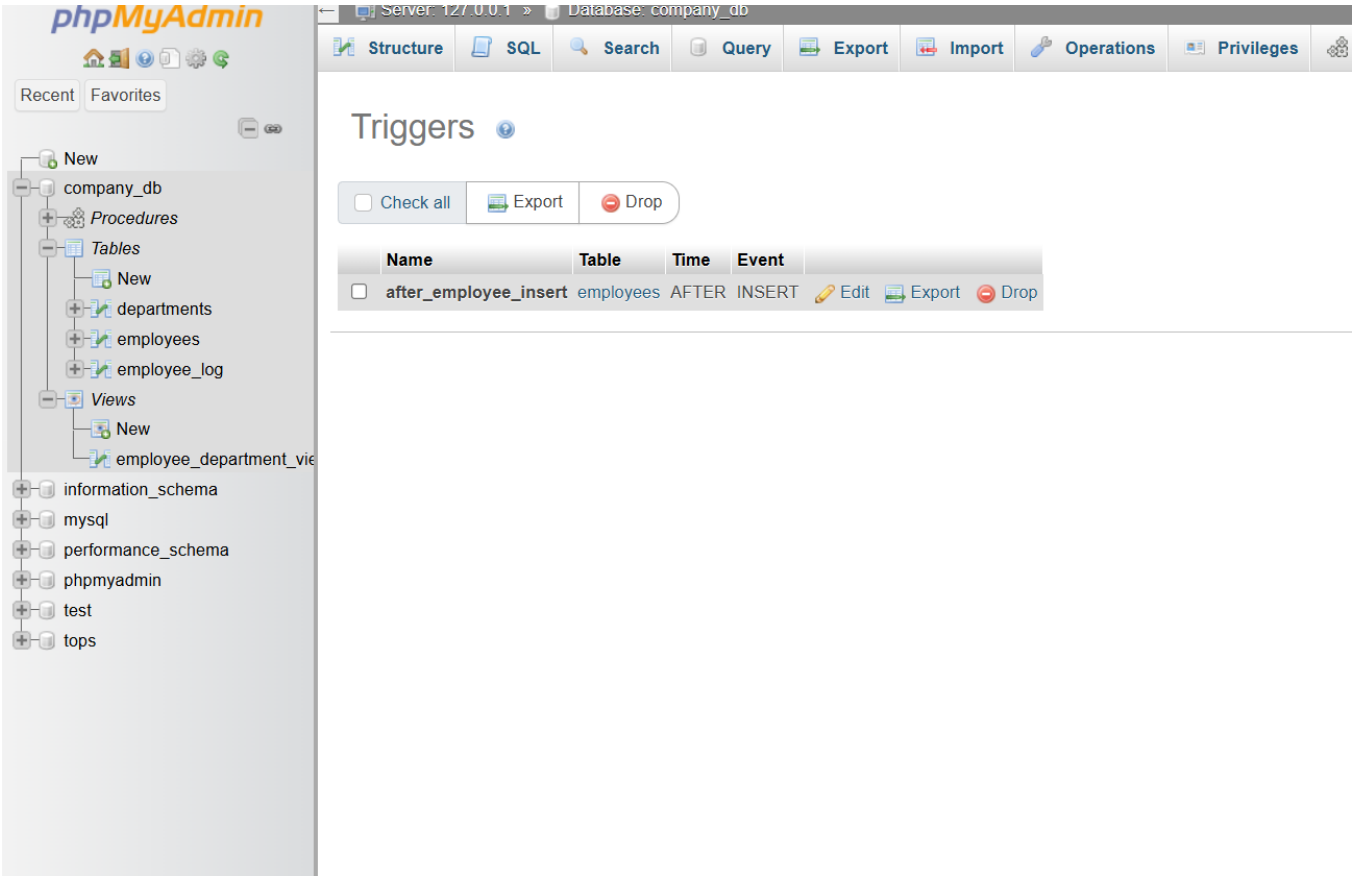


Lab 2: Create a trigger to update the last_modified timestamp whenever an employee record is updated.

```
DELIMITER $$

    CREATE TRIGGER emp_modification
    BEFORE UPDATE ON employee
    FOR EACH ROW

    BEGIN
     INSERT INTO employee_log (emp_id, emp_name,
    dept_id, salary, action_time, action_description)
    VALUES (NEW.emp_id, NEW.emp_name,
    NEW.dept_id, NEW.salary, NOW(),'UPDATED');

    END$$

    DELIMITER ;
```

For checking

```
update employee set salary=10000 where emp_id=2
```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Privileges
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Export
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Time
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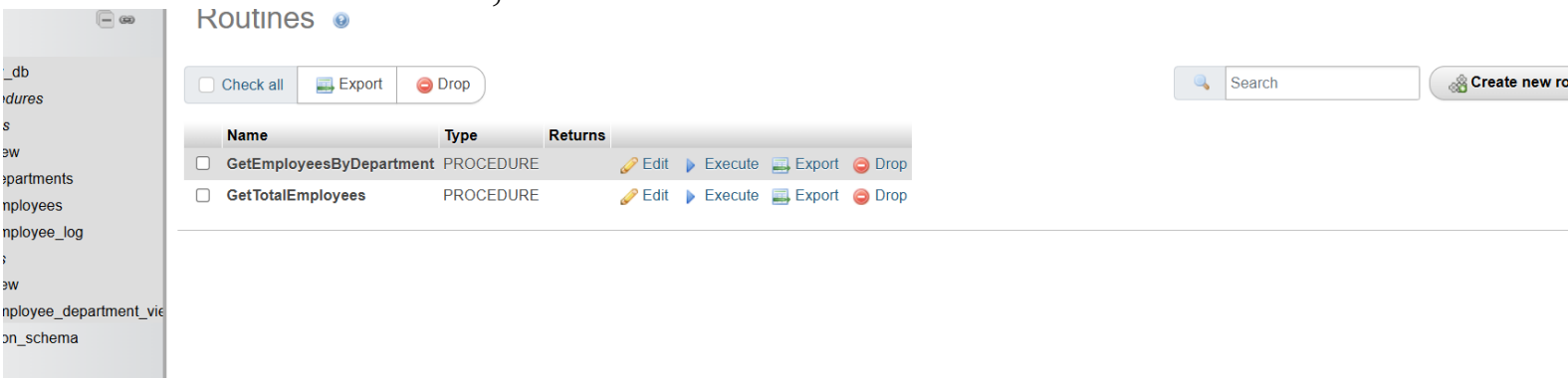
after_employee_insert
employees
AFTER
INSERT
Edit
Export
Drop

Introduction to PL/SQL

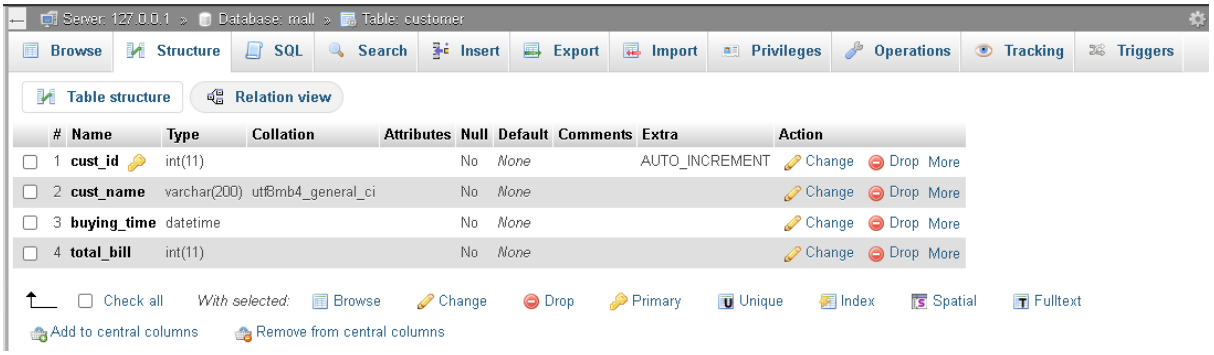
- Lab 1: Write a PL/SQL block to print the total number of employees from the employees table.

```
DELIMITER $$

CREATE PROCEDURE total_emp()
BEGIN
  DECLARE total_employees INT;

  SELECT COUNT(emp_id) AS total_employees FROM employee;


END$$

DELIMITER ;
```

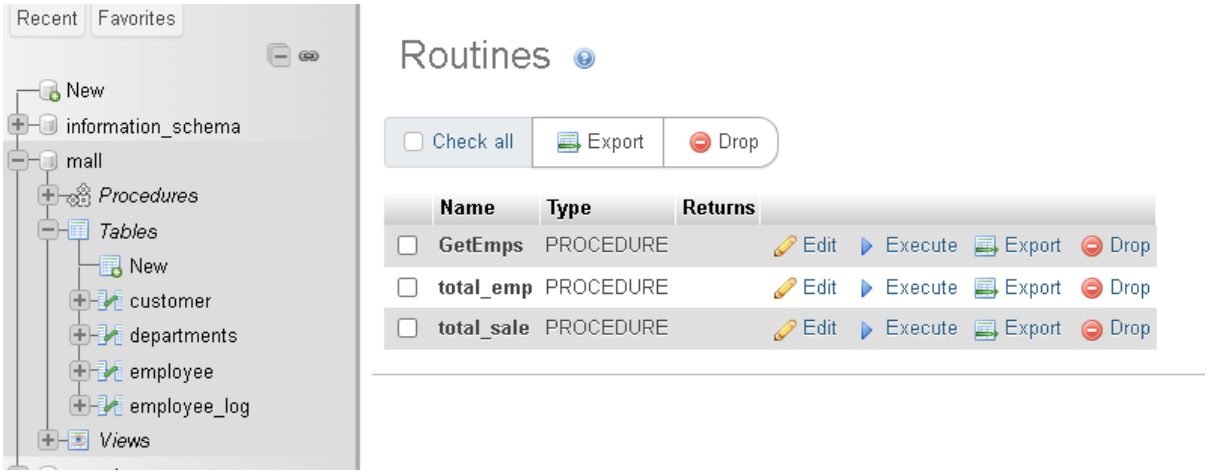


• Lab 2: Create a PL/SQL block that calculates the total sales from an orders table.

Customer table structure




```
DELIMITER $$

CREATE PROCEDURE total_sale()
BEGIN

  SELECT SUM(total_bill) AS total_sale FROM customer;
END$$

DELIMITER ;
```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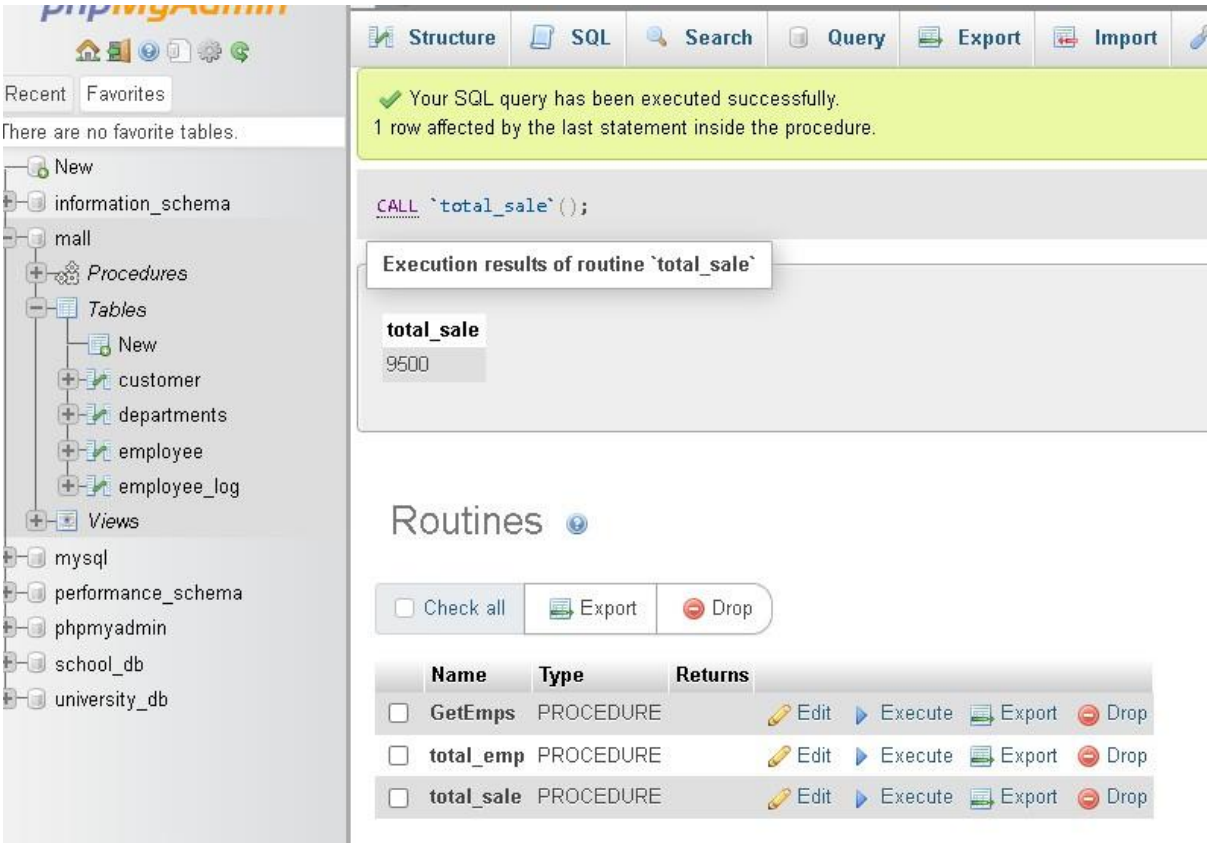
total_sale PROCEDURE Edit Execute Export Drop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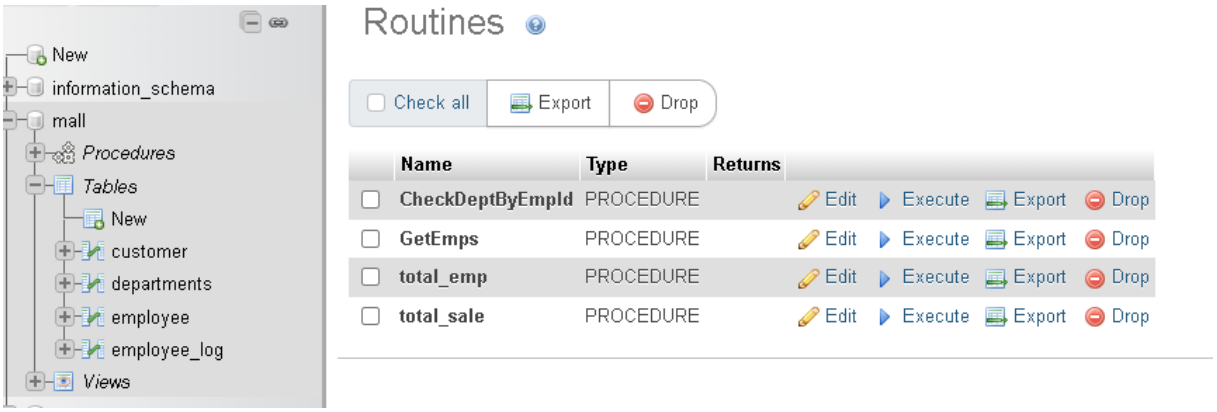
performance_schema
phpmyadmin
school_db
university_db
Structure
SQL
Search
Query
Export
Import
Your SQL query has been executed successfully.
1 row affected by the last statement inside the procedure.
CALL `total_sale`();
Execution results of routine `total_sale`
total_sale
9500
Routines
Check all
Export
Drop
Name
Type
Returns
GetEmps PROCEDURE Edit Execute Export Drop
total_emp PROCEDURE Edit Execute Export Drop
total_sale PROCEDURE Edit Execute Export Drop

PL/SQL Control Structures

• Lab 1: Write a PL/SQL block using an IF-THEN condition to check the department of an employee.

```
DELIMITER $$

CREATE PROCEDURE CheckDeptByEmpId(IN emp INT)
BEGIN
  DECLARE temp_name VARCHAR(100);

  SELECT d.dept_name INTO temp_name
  FROM employee e
  JOIN departments d ON e.dept_id = d.dept_id
  WHERE e.emp_id = emp;

  IF temp_name IS NOT NULL THEN
    SELECT CONCAT('Employee is in ', temp_name) AS
Message;
  ELSE
    SELECT 'Employee id is invalid ' AS Message;
  END IF;

END $$

DELIMITER ;
```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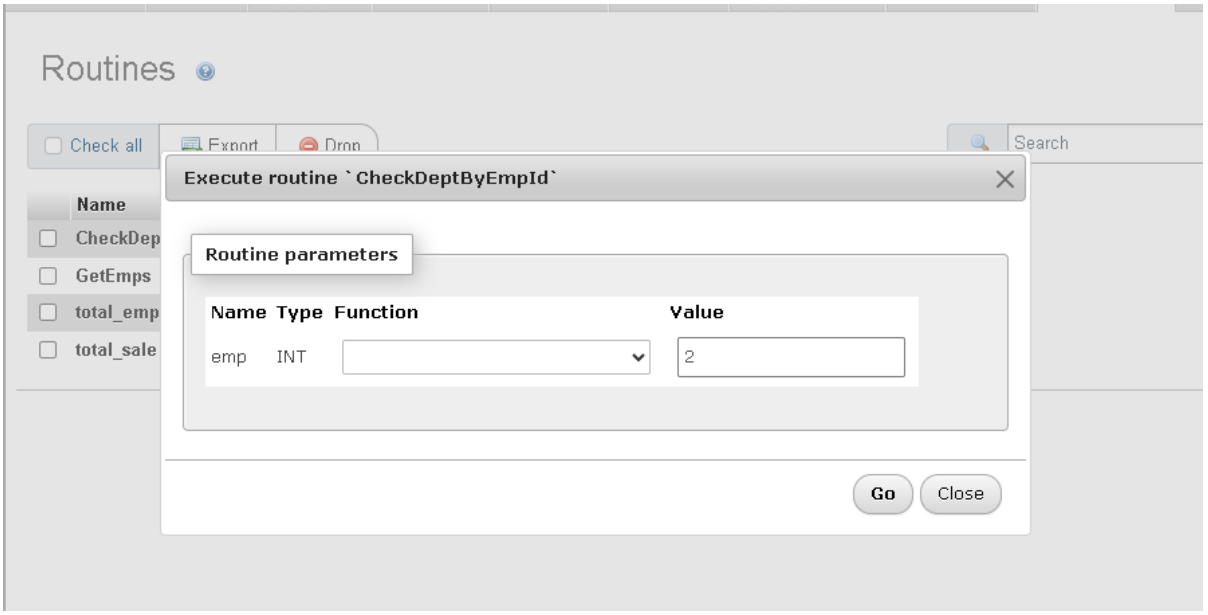
total_sale PROCEDURE Edit Execute Export Drop


Routines
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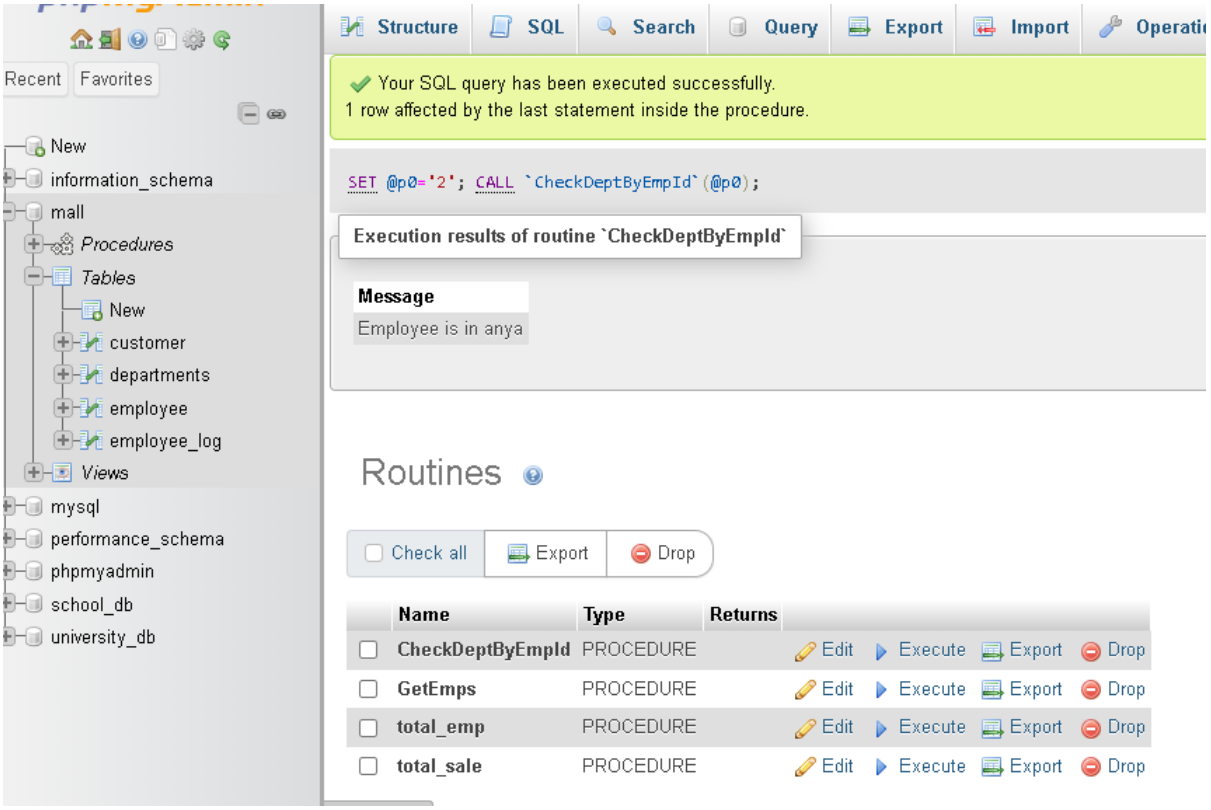
Routine parameters
Name Type Function Value
emp INT 2
Go
Close


Structure
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departments
employee
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Views
mysql
performance_schema
phpmyadmin
school_db
university_db
Your SQL query has been executed successfully.
1 row affected by the last statement inside the procedure.
SET @p0='2'; CALL `CheckDeptByEmpId`(@p0);
Execution results of routine `CheckDeptByEmpId`
Message
Employee is in anya
Routines
Check all
Export
Drop
Name
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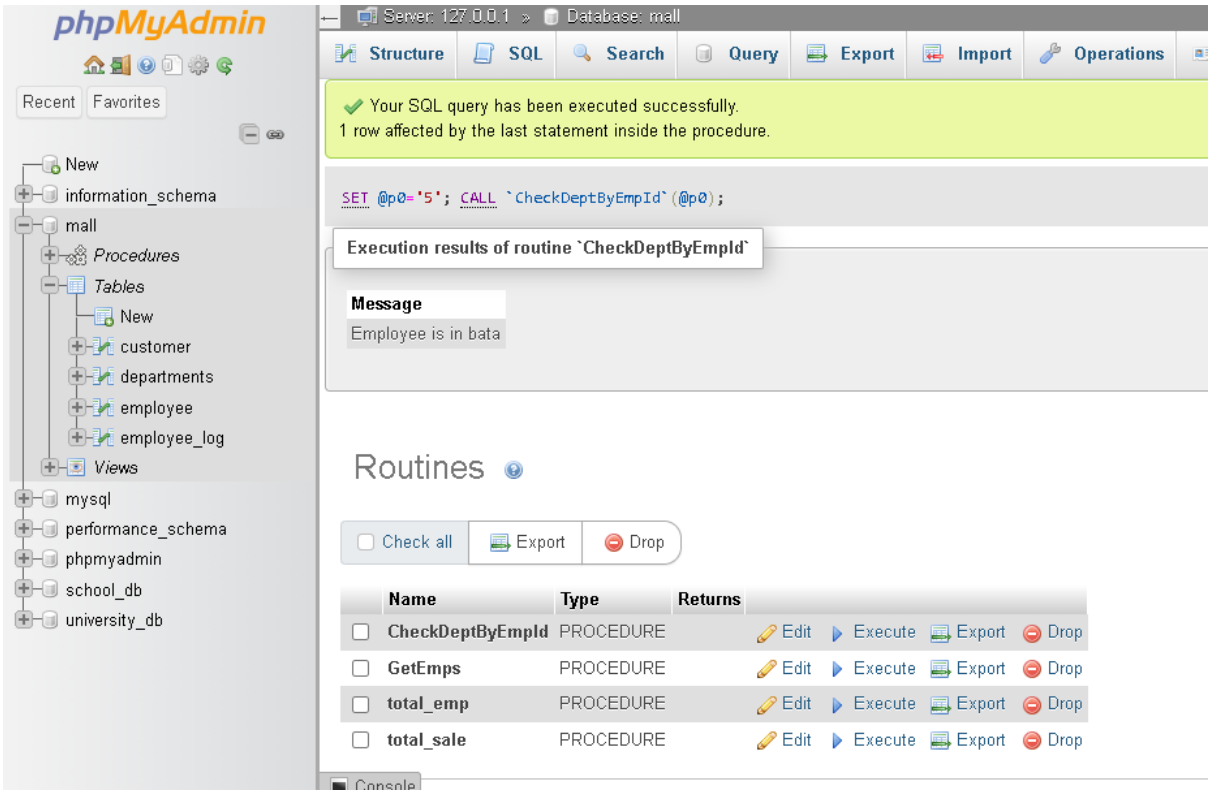
GetEmps PROCEDURE Edit Execute Export Drop
total_emp PROCEDURE Edit Execute Export Drop
total_sale PROCEDURE Edit Execute Export Drop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Server: 127.0.0.1 » Database: mall
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New
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Tables
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customer
departments
employee
employee_log
Views
mysql
performance_schema
phpmyadmin
school_db
university_db
Your SQL query has been executed successfully.
1 row affected by the last statement inside the procedure.
SET @p0='5'; CALL `CheckDeptByEmpId`(@p0);
Execution results of routine `CheckDeptByEmpId`
Message
Employee is in bata
Routines
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Drop
Name
Type
Returns
CheckDeptByEmpId PROCEDURE Edit Execute Export Drop
GetEmps PROCEDURE Edit Execute Export Drop
total_emp PROCEDURE Edit Execute Export Drop
total_sale PROCEDURE Edit Execute Export Drop
Console

• Lab 2: Use a FOR LOOP to iterate through employee records and display their names.

```
DELIMITER $$

CREATE PROCEDURE DisplayEmployeeNames()
BEGIN
    DECLARE total INT DEFAULT 0;
    DECLARE counter INT DEFAULT 1;
    DECLARE empName VARCHAR(100);

    SELECT COUNT(*) INTO total FROM employee;

    WHILE counter <= total DO
        SELECT emp_name INTO empName
        FROM employee
        WHERE emp_id = counter;

        SELECT CONCAT(counter, '-> ', empName) AS
'Employee name';

        SET counter = counter + 1;
    END WHILE;
END $$

DELIMITER ;
```


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departments
employee
employee_log
Views
Server: 127.0.0.1 » Database: mall
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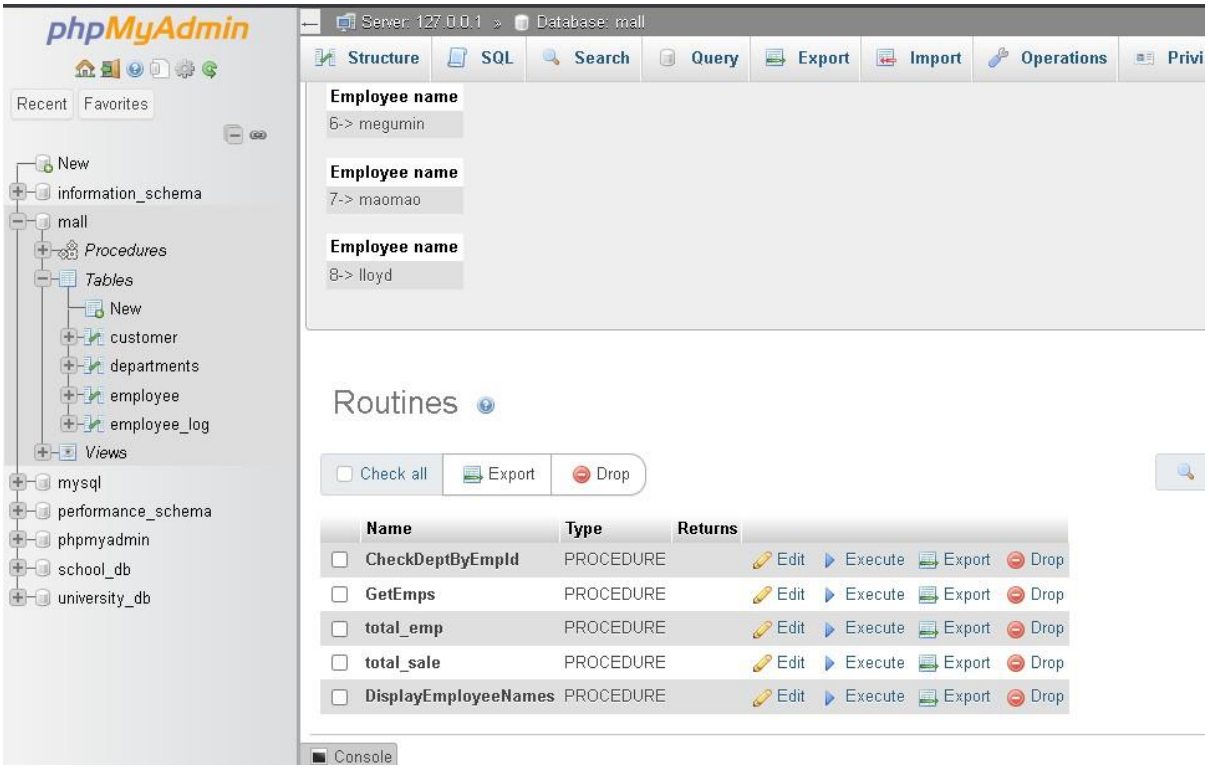
CheckDeptByEmpId PROCEDURE Edit Execute Export Drop
DisplayEmployeeNames PROCEDURE Edit Execute Export Drop
GetEmps PROCEDURE Edit Execute Export Drop
total_emp PROCEDURE Edit Execute Export Drop
total_sale PROCEDURE Edit Execute Export Drop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phpmyadmin
school_db
university_db
Server: 127.0.0.1 » Database: mall
Structure
SQL
Search
Query
Export
Import
Operations
Employee name
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Employee name
7-> maomao
Employee name
8-> lloyd
Routines
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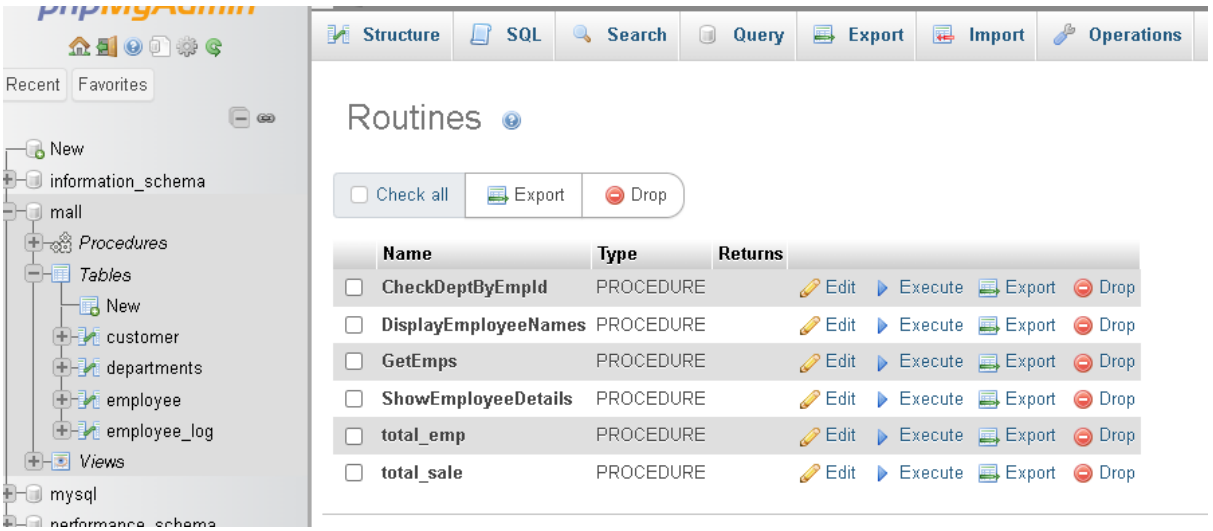
Export
Drop
Name
Type
Returns
CheckDeptByEmpId PROCEDURE Edit Execute Export Drop
GetEmps PROCEDURE Edit Execute Export Drop
total_emp PROCEDURE Edit Execute Export Drop
total_sale PROCEDURE Edit Execute Export Drop
DisplayEmployeeNames PROCEDURE Edit Execute Export Drop
Console

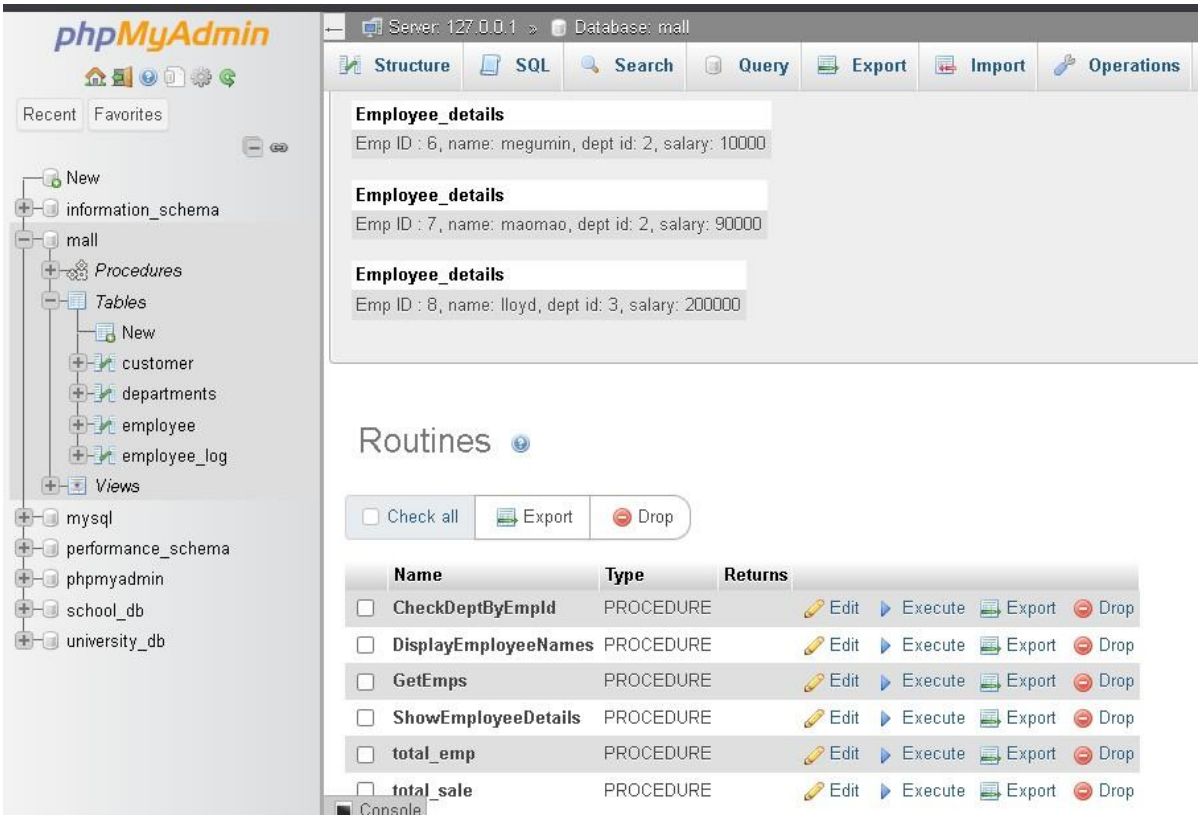
SQL Cursors

• Lab 1: Write a PL/SQL block using an explicit cursor to retrieve and display employee details.

```
DELIMITER $$

CREATE PROCEDURE ShowEmployeeDetails()
BEGIN
    DECLARE h_id INT;
    DECLARE h_name VARCHAR(100);
    DECLARE h_dept INT;
    DECLARE h_salary INT;
    DECLARE done INT DEFAULT 0;

    DECLARE emp_cursor CURSOR FOR
        SELECT emp_id, emp_name, dept_id, salary FROM
employee;

    DECLARE CONTINUE HANDLER FOR NOT FOUND
SET done = 1;

    OPEN emp_cursor;

    read_loop: LOOP
        FETCH emp_cursor INTO h_id, h_name, h_dept,
h_salary;
        IF done = 1 THEN
```

```
        LEAVE read_loop;
    END IF;

    SELECT CONCAT('Emp ID : ', h_id, ', name: ', h_name,
', dept id: ', h_dept, ', salary: ', h_salary) AS
Employee_details;
  END LOOP;

  CLOSE emp_cursor;
END $$

DELIMITER ;
```

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customer
departments
employee
employee_log
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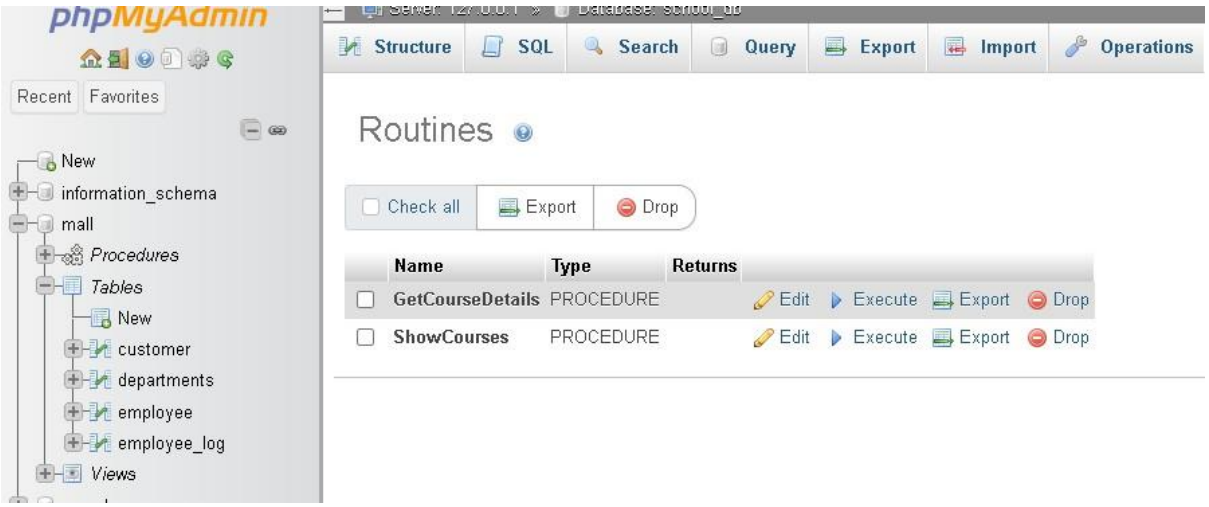
performance_schema
phpmyadmin
school_db
university_db
Server: 127.0.0.1 » Database: mall
Structure
SQL
Search
Query
Export
Import
Operations
Employee_details
Emp ID : 6, name: megumin, dept id: 2, salary: 10000
Employee_details
Emp ID : 7, name: maomao, dept id: 2, salary: 90000
Employee_details
Emp ID : 8, name: lloyd, dept id: 3, salary: 200000
Routines
Check all
Export
Drop
Name
Type
Returns
CheckDeptByEmpId PROCEDURE Edit Execute Export Drop
DisplayEmployeeNames PROCEDURE Edit Execute Export Drop
GetEmps PROCEDURE Edit Execute Export Drop
ShowEmployeeDetails PROCEDURE Edit Execute Export Drop
total_emp PROCEDURE Edit Execute Export Drop
total_sale PROCEDURE Edit Execute Export Drop
Console

• Lab 2: Create a cursor to retrieve all courses and display them one by one.

```
DELIMITER $$

CREATE PROCEDURE ShowCourses()
BEGIN
    DECLARE c_id INT;
    DECLARE c_name VARCHAR(100);
    DECLARE c_duration VARCHAR(50);
    DECLARE done INT DEFAULT 0;

    DECLARE course_cursor CURSOR FOR
        SELECT course_id, course_name, course_duration
FROM courses;

    DECLARE CONTINUE HANDLER FOR NOT FOUND
SET done = 1;

    OPEN course_cursor;

    read_loop: LOOP
        FETCH course_cursor INTO c_id, c_name, c_duration;
        IF done = 1 THEN
            LEAVE read_loop;
        END IF;
        SELECT CONCAT('course id : ', c_id, ', name: ',
c_name, ', duration: ', c_duration) AS course_details;
    END LOOP;
```

```
    CLOSE course_cursor;
END $$

DELIMITER ;
```



Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

←T→	order_id	customer_id	order_amount	order_date
Edit Copy Delete	1	101	500.00	2025-12-01
Edit Copy Delete	2	102	1200.50	2025-12-05
Edit Copy Delete	3	101	750.25	2025-12-10

Check all *With selected:* Edit Copy Delete Export

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Query results operations

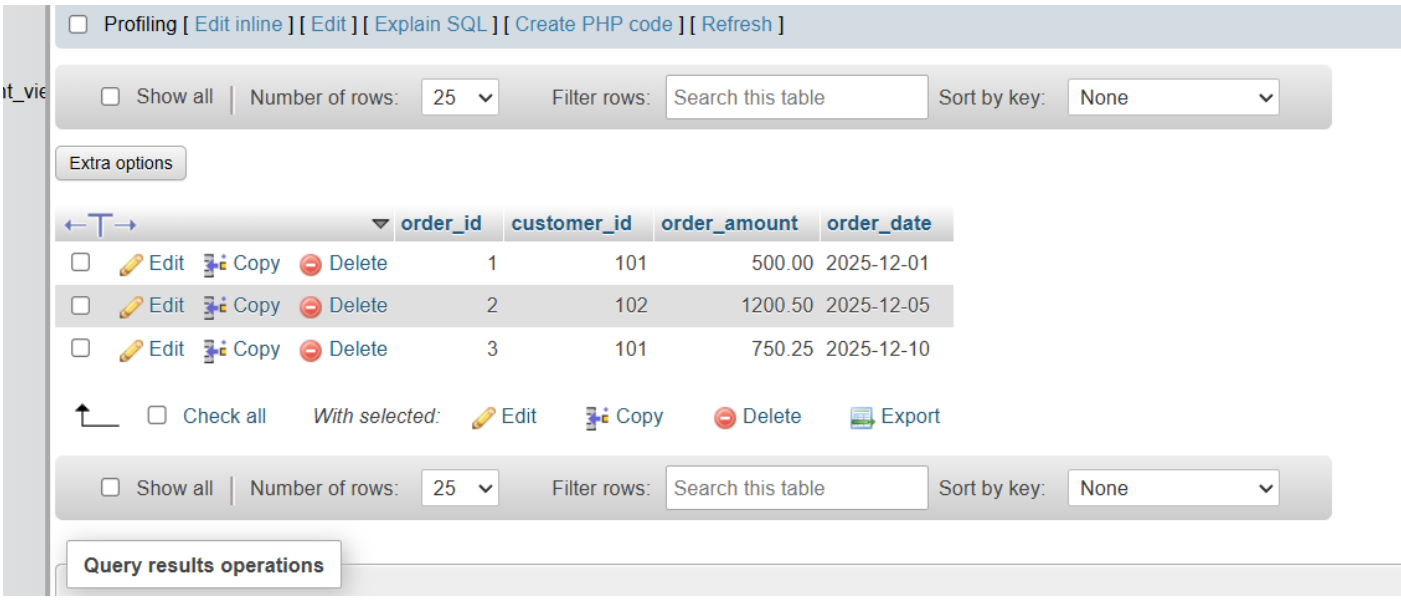
Rollback and Commit Savepoint

• Lab 1: perform a transaction where you create a savepoint, insert records, then rollback to the savepoint.

START TRANSACTION;

INSERT INTO employee (emp_name, dept_id, salary)
VALUES ('vasu', 3, 70000);
SAVEPOINT after_first_insert;

INSERT INTO employee (emp_name, dept_id, salary)
VALUES ('khwab', 1, 52000);



ROLLBACK TO after_first_insert;

COMMIT;

• Lab 2: Commit part of a transaction after using a savepoint and then rollback the remaining changes.

```
START TRANSACTION;

INSERT INTO courses (course_id, course_name,
course_duration)
VALUES (1009, 'cloud basics', '6 months');

SAVEPOINT after_first_course;

INSERT INTO courses (course_id, course_name,
course_duration)
VALUES (1010, 'data analytics', '7 months');

RELEASE SAVEPOINT after_first_course;
COMMIT;

START TRANSACTION;

INSERT INTO courses (course_id, course_name,
course_duration)
VALUES (1011, 'ai ml', '8 months');

SAVEPOINT after_new_course;

INSERT INTO courses (course_id, course_name,
course_duration)
VALUES (1012, 'seo', '5 months');
```

ROLLBACK TO after_new_course;

COMMIT;