

**CMP020L012A**

**Data Analytics**

**2022/23**

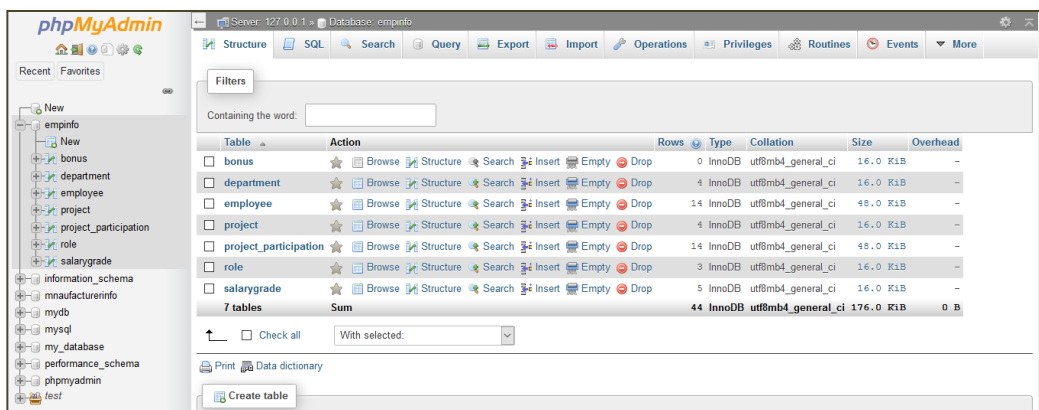
**Week-4**

**Managing Data in RDBMS using SQL  
(Advanced SQL Operations)  
Lab Task Solution**

1. Before starting with the lab task today, keep the sample tables of “EmployeeInfo” database from Week-5 ready in your MySQL server. You can copy and paste the SQL statements step by step to define the tables and populate them with values as it is provided to you in the file.

**\*\*\*This task SHOULD NOT take you more than 15 minutes.**

**Ans:**



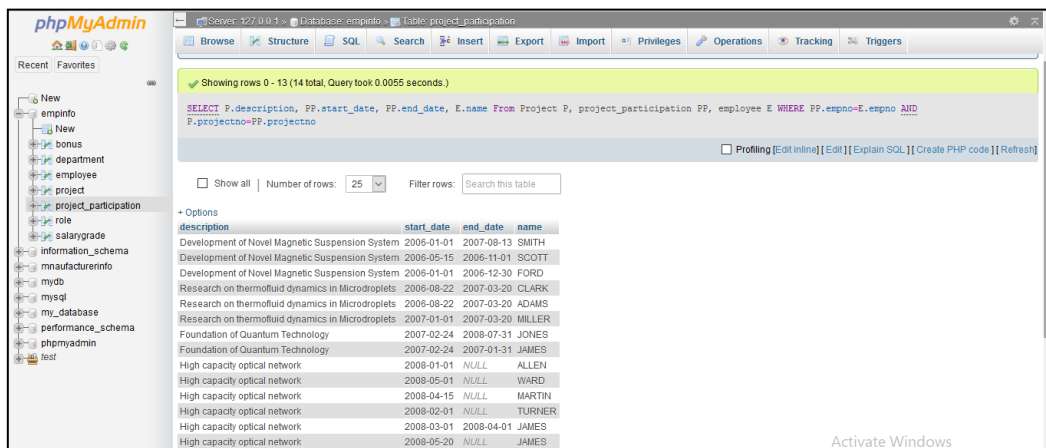
| Table  | Action     | Rows      | Type          | Collation                 | Size             | Overhead   |
|--|------------|-----------|---------------|---------------------------|------------------|------------|
| <input type="checkbox"/> bonus                 |            | 0         | InnoDB        | utf8mb4_general_ci        | 16.0 K1B         | -          |
| <input type="checkbox"/> department            |            | 4         | InnoDB        | utf8mb4_general_ci        | 16.0 K1B         | -          |
| <input type="checkbox"/> employee              |            | 14        | InnoDB        | utf8mb4_general_ci        | 48.0 K1B         | -          |
| <input type="checkbox"/> project               |            | 4         | InnoDB        | utf8mb4_general_ci        | 16.0 K1B         | -          |
| <input type="checkbox"/> project_participation |            | 14        | InnoDB        | utf8mb4_general_ci        | 48.0 K1B         | -          |
| <input type="checkbox"/> role                  |            | 3         | InnoDB        | utf8mb4_general_ci        | 16.0 K1B         | -          |
| <input type="checkbox"/> salarygrade           |            | 5         | InnoDB        | utf8mb4_general_ci        | 16.0 K1B         | -          |
| <b>7 tables</b>                                | <b>Sum</b> | <b>44</b> | <b>InnoDB</b> | <b>utf8mb4_general_ci</b> | <b>176.0 K1B</b> | <b>0 B</b> |

**Tasks (Joining):**

2. In “EmployeeInfo” Database, continue executing the following SQLs:

- a) Find the project description, project start date, end date and the employee’s name who are working in those projects.

Ans:



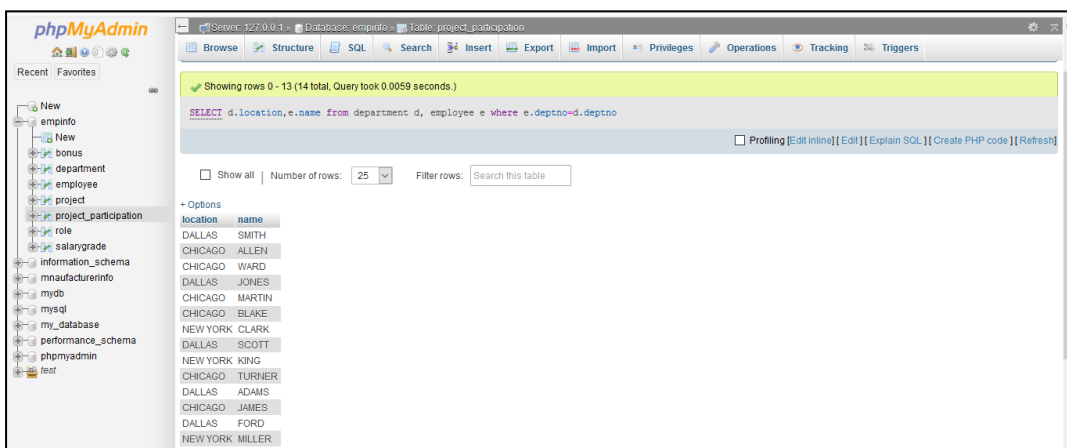
Showing rows 0 - 13 (14 total, Query took 0.0055 seconds)

```
SELECT P.description, PP.start_date, PP.end_date, E.name From Project P, project_participation PP, employee E WHERE PP.empno=E.empno AND P.projectno=PP.projectno
```

| description                                       | start_date | end_date   | name   |
|---|------------|------------|--------|
| Development of Novel Magnetic Suspension System   | 2006-01-01 | 2007-08-13 | SMITH  |
| Development of Novel Magnetic Suspension System   | 2006-05-15 | 2006-11-01 | SCOTT  |
| Development of Novel Magnetic Suspension System   | 2006-01-01 | 2006-12-30 | FORD   |
| Research on thermofluid dynamics in Microdroplets | 2006-08-22 | 2007-03-20 | CLARK  |
| Research on thermofluid dynamics in Microdroplets | 2006-08-22 | 2007-03-20 | ADAMS  |
| Research on thermofluid dynamics in Microdroplets | 2007-01-01 | 2007-03-20 | MILLER |
| Foundation of Quantum Technology                  | 2007-02-24 | 2008-07-31 | JONES  |
| Foundation of Quantum Technology                  | 2007-02-24 | 2007-01-31 | JAMES  |
| High capacity optical network                     | 2008-01-01 | NULL       | ALLEN  |
| High capacity optical network                     | 2008-05-01 | NULL       | WARD   |
| High capacity optical network                     | 2008-04-15 | NULL       | MARTIN |
| High capacity optical network                     | 2008-02-01 | NULL       | TURNER |
| High capacity optical network                     | 2008-03-01 | 2008-04-01 | JAMES  |
| High capacity optical network                     | 2008-05-20 | NULL       | JAMES  |

b) Find the department's location and the employee's name who are working in different locations

Ans:



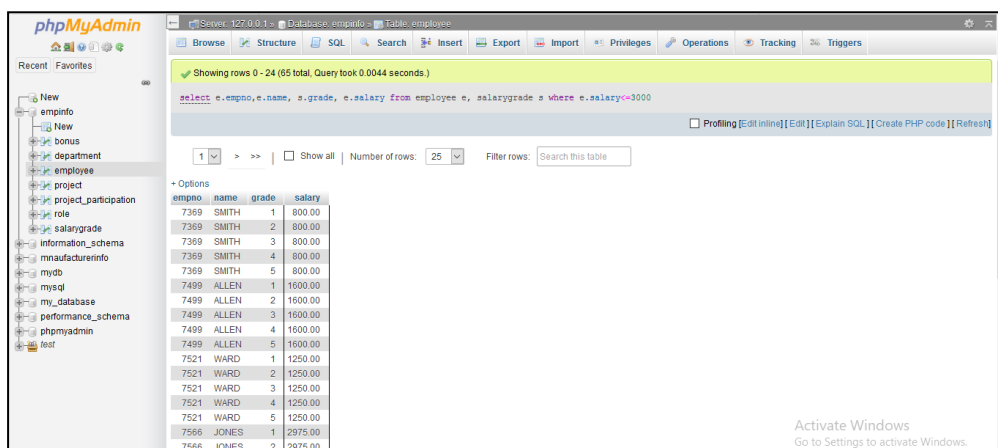
Showing rows 0 - 13 (14 total, Query took 0.0059 seconds)

```
SELECT d.location, e.name from department d, employee e where e.deptno=d.deptno
```

| location | name   |
|----------|--------|
| DALLAS   | SMITH  |
| CHICAGO  | ALLEN  |
| CHICAGO  | WARD   |
| DALLAS   | JONES  |
| CHICAGO  | MARTIN |
| CHICAGO  | BLAKE  |
| NEW YORK | CLARK  |
| DALLAS   | SCOTT  |
| NEW YORK | KING   |
| CHICAGO  | TURNER |
| DALLAS   | ADAMS  |
| CHICAGO  | JAMES  |
| DALLAS   | FORD   |
| NEW YORK | MILLER |

c) Find the employee's number, name, salary and salarygrade who do not earn more than 3000.

Ans:



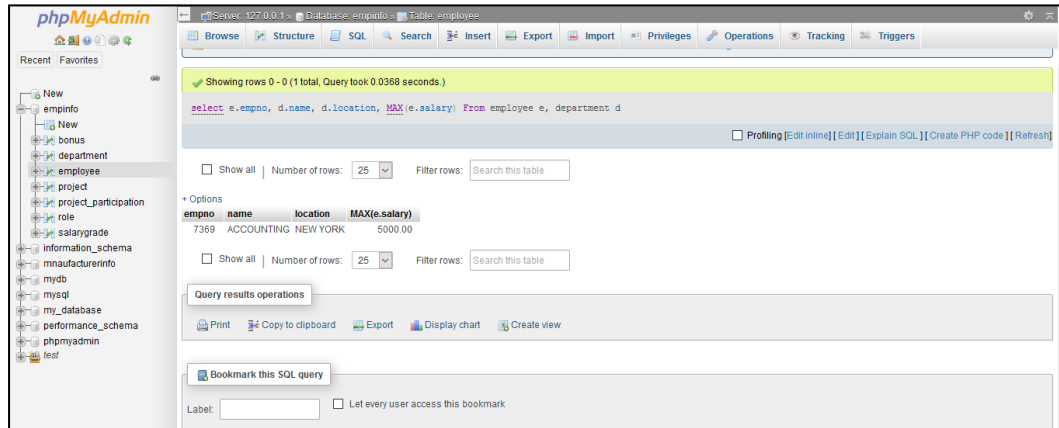
Showing rows 0 - 24 (25 total, Query took 0.0044 seconds)

```
select e.empno, e.name, s.grade, e.salary from employee e, salarygrade s where e.salary<=3000
```

| empno | name  | grade | salary  |
|-------|-------|-------|---------|
| 7369  | SMITH | 1     | 800.00  |
| 7369  | SMITH | 2     | 800.00  |
| 7369  | SMITH | 3     | 800.00  |
| 7369  | SMITH | 4     | 800.00  |
| 7369  | SMITH | 5     | 800.00  |
| 7499  | ALLEN | 1     | 1600.00 |
| 7499  | ALLEN | 2     | 1600.00 |
| 7499  | ALLEN | 3     | 1600.00 |
| 7499  | ALLEN | 4     | 1600.00 |
| 7499  | ALLEN | 5     | 1600.00 |
| 7521  | WARD  | 1     | 1250.00 |
| 7521  | WARD  | 2     | 1250.00 |
| 7521  | WARD  | 3     | 1250.00 |
| 7521  | WARD  | 4     | 1250.00 |
| 7521  | WARD  | 5     | 1250.00 |
| 7566  | JONES | 1     | 2975.00 |
| 7566  | JONES | 2     | 2975.00 |

d) Find the employee's number department name, location, salary who earn the highest salary among all.

Ans:

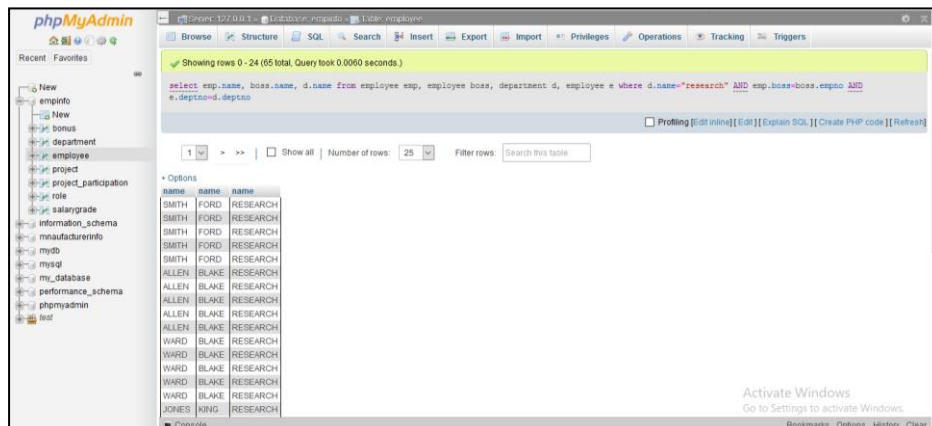


The screenshot shows the phpMyAdmin interface with a query executed: `select e.empno, d.name, d.location, MAX(e.salary) From employee e, department d`. The result shows one row: 7369, ACCOUNTING, NEW YORK, 5000.00.

| empno | name       | location | MAX(e.salary) |
|-------|------------|----------|---------------|
| 7369  | ACCOUNTING | NEW YORK | 5000.00       |

e) Find the employee's name and their boss's name who work in the research department.

Ans:

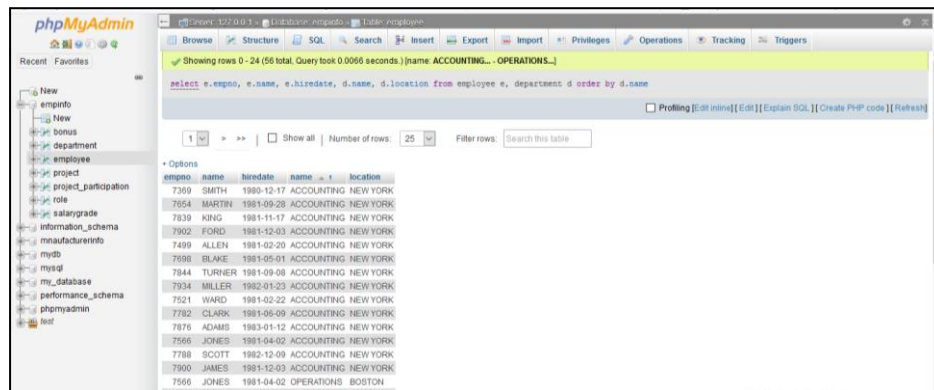


The screenshot shows the phpMyAdmin interface with a query executed: `select emp.name, boss.name, d.name from employee emp, employee boss, department d, employee e where d.name="research" AND emp.boss=empno AND e.deptno=d.deptno`. The result shows multiple rows of employee names and their bosses in the research department.

| name  | name  | name     |
|-------|-------|----------|
| SMITH | FORD  | RESEARCH |
| SMITH | FORD  | RESEARCH |
| SMITH | FORD  | RESEARCH |
| SMITH | FORD  | RESEARCH |
| SMITH | FORD  | RESEARCH |
| ALLEN | BLAKE | RESEARCH |
| ALLEN | BLAKE | RESEARCH |
| ALLEN | BLAKE | RESEARCH |
| ALLEN | BLAKE | RESEARCH |
| ALLEN | BLAKE | RESEARCH |
| WARD  | BLAKE | RESEARCH |
| WARD  | BLAKE | RESEARCH |
| WARD  | BLAKE | RESEARCH |
| WARD  | BLAKE | RESEARCH |
| WARD  | BLAKE | RESEARCH |
| JONES | KING  | RESEARCH |

f) Find employee's number, name, hiredate, department's name and location in ascending order with their department's name.

Ans:



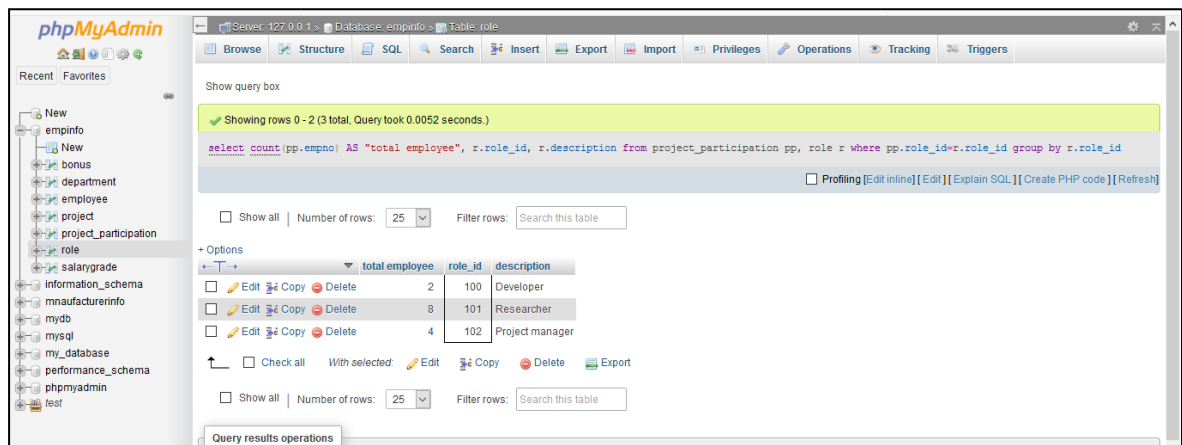
Showing rows 0 - 24 (56 total. Query took 0.0066 seconds.) [name: ACCOUNTING...- OPERATIONS...]

```
select e.empno, e.sname, e.hiredate, d.sname, d.location from employee e, department d order by d.sname
```

| empno | sname  | hiredate   | sname      | location |
|-------|--------|------------|------------|----------|
| 7369  | SMITH  | 1980-12-17 | ACCOUNTING | NEW YORK |
| 7564  | MARTIN | 1981-09-28 | ACCOUNTING | NEW YORK |
| 7839  | KING   | 1981-11-17 | ACCOUNTING | NEW YORK |
| 7902  | FORD   | 1981-12-03 | ACCOUNTING | NEW YORK |
| 7499  | ALLEN  | 1981-02-20 | ACCOUNTING | NEW YORK |
| 7598  | BLAKE  | 1981-05-01 | ACCOUNTING | NEW YORK |
| 7844  | TURNER | 1981-09-08 | ACCOUNTING | NEW YORK |
| 7934  | MILLER | 1982-01-23 | ACCOUNTING | NEW YORK |
| 7521  | WARD   | 1981-03-22 | ACCOUNTING | NEW YORK |
| 7782  | CLARK  | 1981-06-09 | ACCOUNTING | NEW YORK |
| 7876  | ADAMS  | 1983-01-12 | ACCOUNTING | NEW YORK |
| 7566  | JONES  | 1981-04-02 | ACCOUNTING | NEW YORK |
| 7788  | SCOTT  | 1982-12-09 | ACCOUNTING | NEW YORK |
| 7900  | JAMES  | 1981-12-03 | ACCOUNTING | NEW YORK |
| 7566  | JONES  | 1981-04-02 | OPERATIONS | BOSTON   |

g) Find the total number of employees working under different roles along with the role description.

Ans:



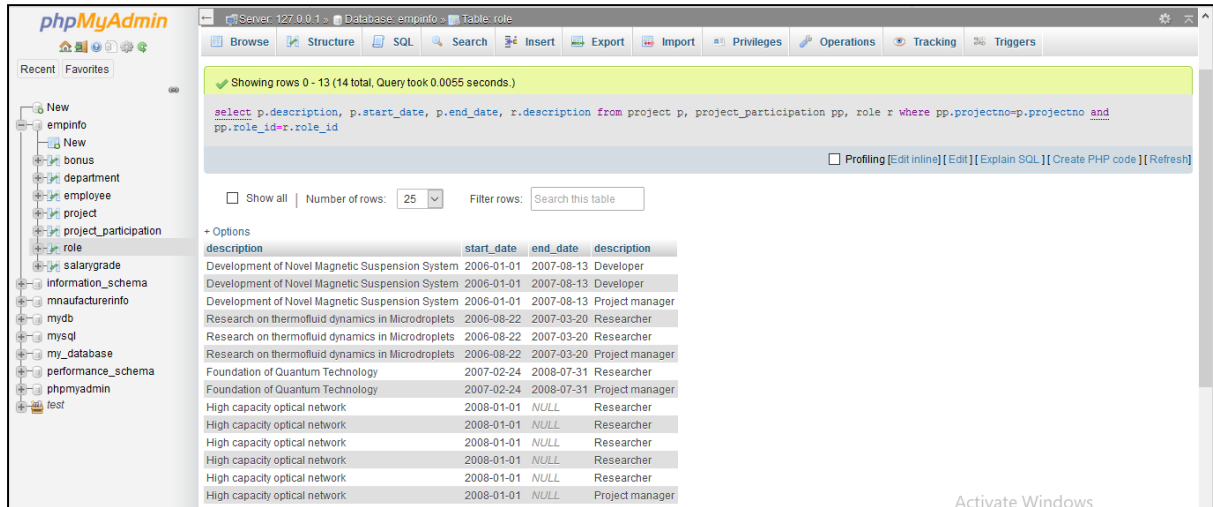
Showing rows 0 - 2 (3 total. Query took 0.0052 seconds.)

```
select count(pp.empno) AS "total employee", r.role_id, r.description from project_participation pp, role r where pp.role_id=r.role_id group by r.role_id
```

| total employee | role_id | description     |
|----------------|---------|-----------------|
| 2              | 100     | Developer       |
| 8              | 101     | Researcher      |
| 4              | 102     | Project manager |

h) Find the project description, start date, end date and the employee's role description in those projects.

Ans:



Showing rows 0 - 13 (14 total, Query took 0.0055 seconds.)

```
select p.description, p.start_date, p.end_date, r.description from project p, project_participation pp, role r where pp.projectno=p.projectno and pp.role_id=r.role_id
```

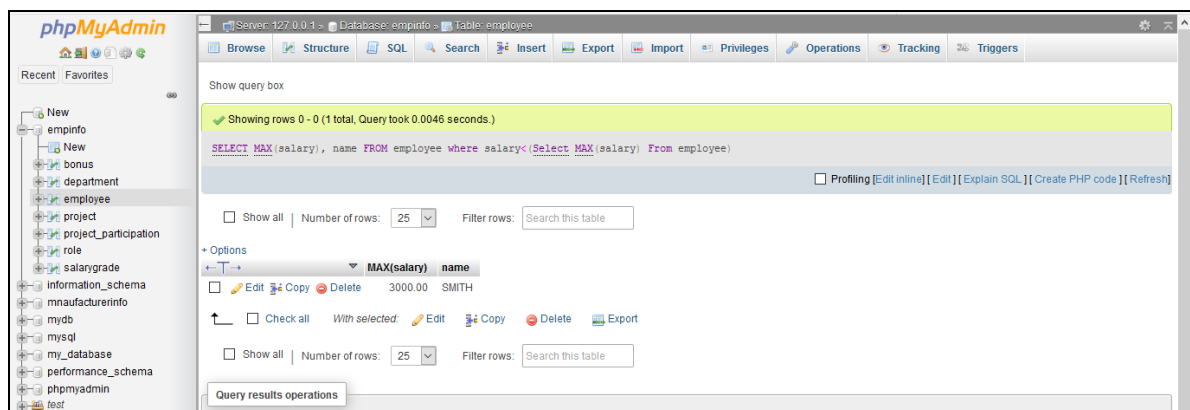
| description                                       | start_date | end_date   | description     |
|---|------------|------------|-----------------|
| Development of Novel Magnetic Suspension System   | 2006-01-01 | 2007-08-13 | Developer       |
| Development of Novel Magnetic Suspension System   | 2006-01-01 | 2007-08-13 | Developer       |
| Development of Novel Magnetic Suspension System   | 2006-01-01 | 2007-08-13 | Project manager |
| Research on thermofluid dynamics in Microdroplets | 2006-08-22 | 2007-03-20 | Researcher      |
| Research on thermofluid dynamics in Microdroplets | 2006-08-22 | 2007-03-20 | Researcher      |
| Research on thermofluid dynamics in Microdroplets | 2006-08-22 | 2007-03-20 | Project manager |
| Foundation of Quantum Technology                  | 2007-02-24 | 2008-07-31 | Researcher      |
| Foundation of Quantum Technology                  | 2007-02-24 | 2008-07-31 | Project manager |
| High capacity optical network                     | 2008-01-01 | NULL       | Researcher      |
| High capacity optical network                     | 2008-01-01 | NULL       | Researcher      |
| High capacity optical network                     | 2008-01-01 | NULL       | Researcher      |
| High capacity optical network                     | 2008-01-01 | NULL       | Researcher      |
| High capacity optical network                     | 2008-01-01 | NULL       | Researcher      |
| High capacity optical network                     | 2008-01-01 | NULL       | Project manager |

## Tasks (Subquery):

3. In “EmployeeInfo” Database, continue executing the following SQLs:

- Find the second maximum salary and the employee’s name who is paid that.

Ans:



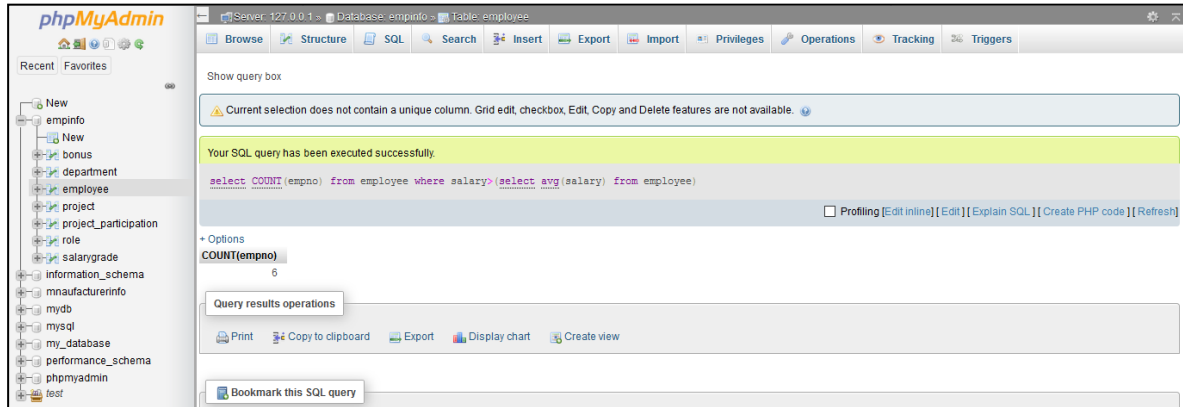
Showing rows 0 - 0 (1 total, Query took 0.0046 seconds.)

```
SELECT MAX(salary), name FROM employee where salary < (Select MAX(salary) From employee)
```

| MAX(salary) | name  |
|-------------|-------|
| 3000.00     | SMITH |

b) Find the total number of employees who earns more than the average salary.

Ans:



Server: 127.0.0.1 - Database: empinfo - Table: employee

Show query box

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Your SQL query has been executed successfully.

```
select COUNT(empno) from employee where salary > (select avg(salary) from employee)
```

Options

COUNT(empno)

6

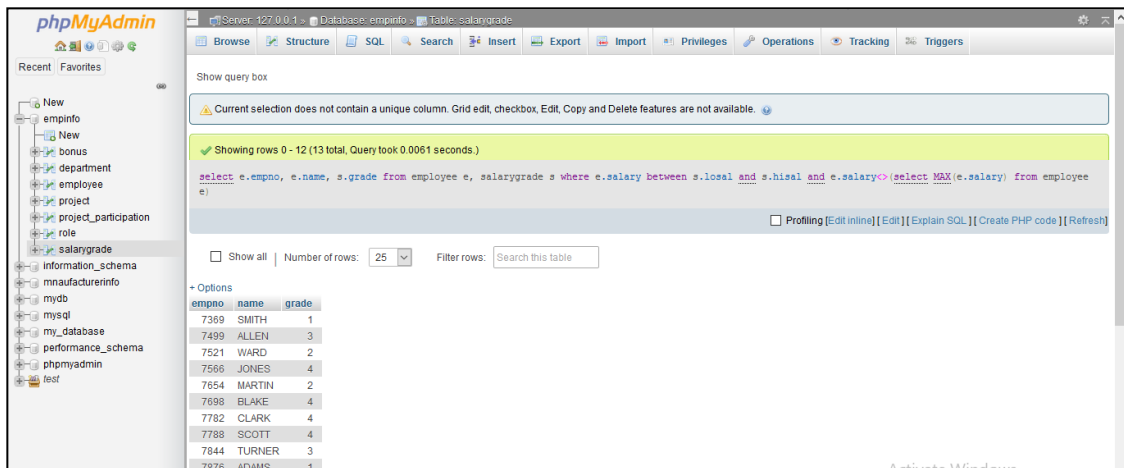
Query results operations

Print Copy to clipboard Export Display chart Create view

Bookmark this SQL query

c) Find the employee's number, name and salary grade except for the employee who earns the highest salary.

Ans:



Server: 127.0.0.1 - Database: empinfo - Table: salarygrade

Show query box

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Showing rows 0 - 12 (13 total, Query took 0.0061 seconds)

```
select e.empno, e.name, s.grade from employee e, salarygrade s where e.salary between s.losal and s.hisal and e.salary < (select MAX(e.salary) from employee e)
```

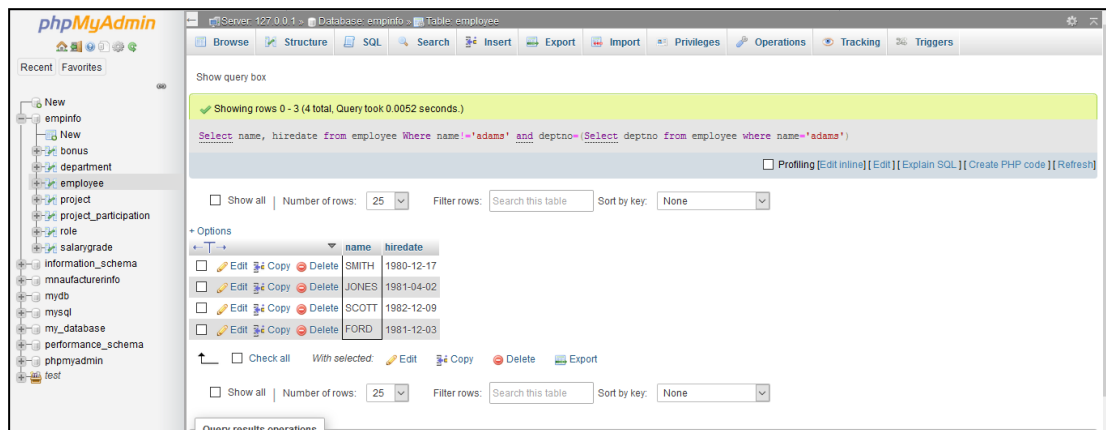
Options

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

| empno | name   | grade |
|-------|--------|-------|
| 7369  | SMITH  | 1     |
| 7499  | ALLEN  | 3     |
| 7521  | WARD   | 2     |
| 7566  | JONES  | 4     |
| 7654  | MARTIN | 2     |
| 7698  | BLAKE  | 4     |
| 7782  | CLARK  | 4     |
| 7788  | SCOTT  | 4     |
| 7844  | TURNER | 3     |
| 7876  | ADAMS  | 1     |

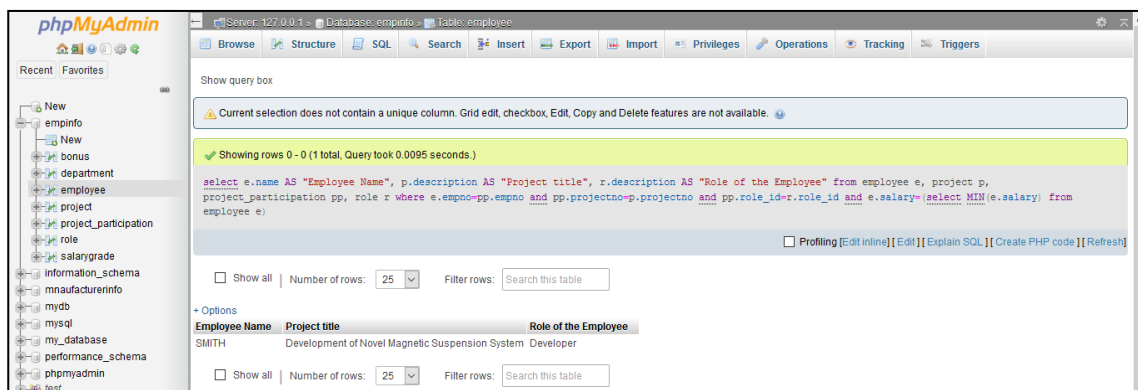
d) Write a query to display the employee name and hiredate for all employees in the same department as John. Also Exclude John's info.

Ans:



e) Find the employee's name as "Employee Name", the project description he is working in as "Project title" and the description of the role as "Role of the Employee" who earns the minimum salary.

Ans:



f) Find the salaries for all the employees except for the one who earns the highest salary in a descending order.

Ans:

