SQL Queries

Project 1

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ScienceQtech Employee Performance Mapping

Description

ScienceQtech is a startup that works in the Data Science field. ScienceQtech has worked on fraud detection, market basket, self-driving cars, supply chain, algorithmic early detection of lung cancer, customer sentiment, and the drug discovery field. With the annual appraisal cycle around the corner, the HR department has asked you (Junior Database Administrator) to generate reports on employee details, their performance, and on the project that the employees have undertaken, to analyze the employee database and extract specific data based on different requirements.

Objective:

To facilitate a better understanding, managers have provided ratings for each employee which will help the HR department to finalize the employee performance mapping. As a DBA, you should find the maximum salary of the employees and ensure that all jobs are meeting the organization's profile standard. You also need to calculate bonuses to find extra cost for expenses. This will raise the overall performance of the organization by ensuring that all required employees receive training.

Note: You must download the dataset from the course resource section in LMS and create a table to perform the above objective.

Dataset description:

emp_record_table: It contains the information of all the employees.

- EMP_ID – ID of the employee
- FIRST_NAME – First name of the employee
- LAST_NAME – Last name of the employee
- GENDER – Gender of the employee
- ROLE – Post of the employee
- DEPT – Field of the employee
- EXP – Years of experience the employee has
- COUNTRY – Country in which the employee is presently living
- CONTINENT – Continent in which the country is
- SALARY – Salary of the employee
- EMP_RATING – Performance rating of the employee
- MANAGER_ID – The manager under which the employee is assigned
- PROJ_ID – The project on which the employee is working or has worked on

Proj_table: It contains information about the projects.

- PROJECT_ID – ID for the project
- PROJ_Name – Name of the project
- DOMAIN – Field of the project
- START_DATE – Day the project began
- CLOSURE_DATE – Day the project was or will be completed
- DEV_QTR – Quarter in which the project was scheduled
- STATUS – Status of the project currently

Data_science_team: It contains information about all the employees in the Data Science team.

- EMP_ID – ID of the employee
- FIRST_NAME – First name of the employee
- LAST_NAME – Last name of the employee
- GENDER – Gender of the employee
- ROLE – Post of the employee
- DEPT – Field of the employee
- EXP – Years of experience the employee has
- COUNTRY – Country in which the employee is presently living
- CONTINENT – Continent in which the country is

The task to be performed:

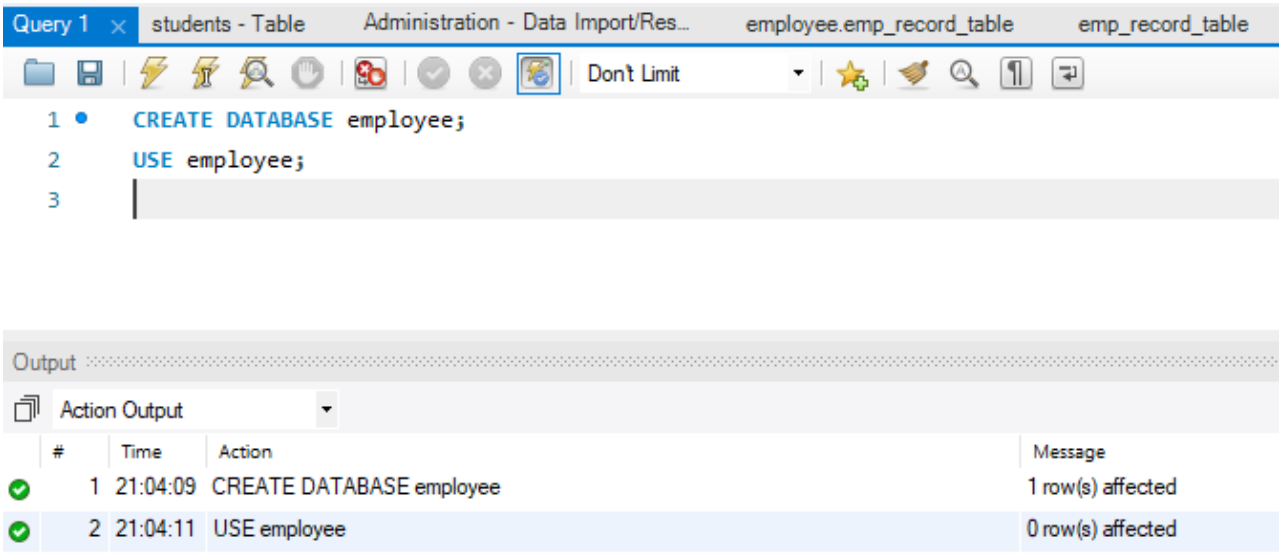
1. **Create a database named employee, then import data_science_team.csv proj_table.csv and emp_record_table.csv into the employee database from the given resources.**

SQL code:

```
CREATE DATABASE employee;

USE employee;
```

Output:



2. Create an ER diagram for the given employee database.

SQL code:

```
DESCRIBE data_science_team;

DESCRIBE emp_record_table;

DESCRIBE proj_table;

-- ----------------------------------------------------------------------


ALTER TABLE emp_record_table

ADD primary key (EMP_ID);


ALTER TABLE emp_record_table

MODIFY EMP_ID VARCHAR(30);


ALTER TABLE data_science_team

MODIFY EMP_ID VARCHAR(30);


ALTER TABLE data_science_team

MODIFY EMP_ID VARCHAR(30);


ALTER TABLE proj_table

MODIFY PROJECT_ID VARCHAR(50);


ALTER TABLE emp_record_table

MODIFY PROJ_ID VARCHAR(50);
```

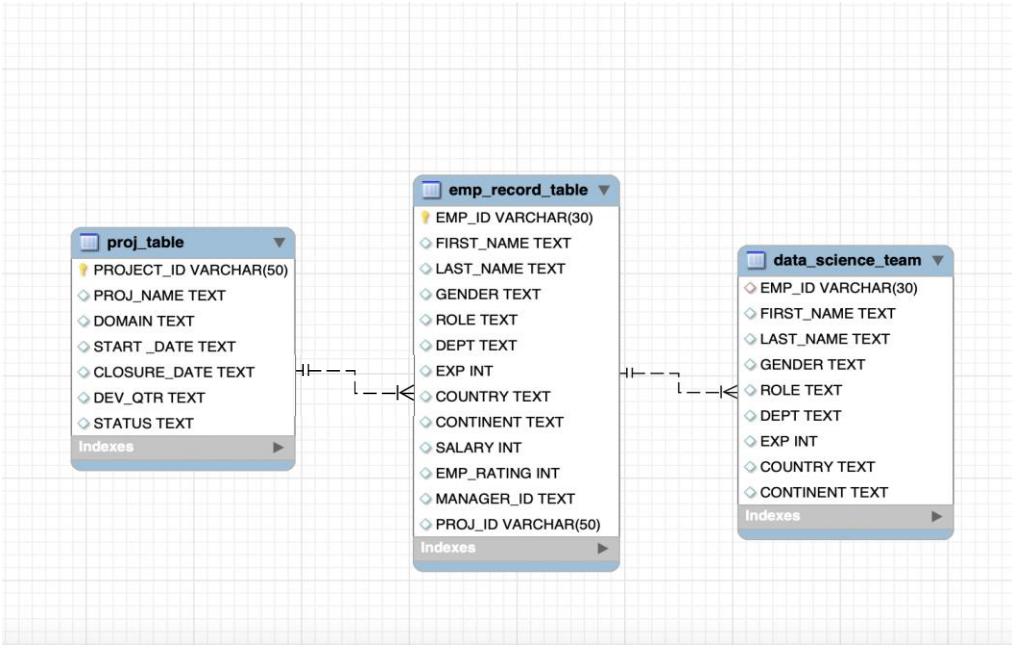
```
ALTER TABLE proj_table
ADD primary key (PROJECT_ID);

ALTER TABLE emp_record_table
ADD foreign key (PROJ_ID)
REFERENCES proj_table(PROJECT_ID);

ALTER TABLE emp_record_table
ADD FOREIGN KEY(PROJ_ID)
REFERENCES proj_table(PROJECT_ID);

ALTER TABLE data_science_team
ADD FOREIGN KEY(EMP_ID)
REFERENCES emp_record_table(EMP_ID);
```

Output:



3. **Write a query to fetch EMP_ID, FIRST_NAME, LAST_NAME, GENDER, and DEPARTMENT from the employee record table, and make a list of employees and details of their department.**

SQL code:

```
SELECT EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT

FROM emp_record_table;
```

Output:

```
USE employee;

SELECT EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT
FROM emp_record_table;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	LAST_NAME	GENDER	DEPT
E001	Arthur	Black	M	ALL
E005	Eric	Hoffman	M	FINANCE
E010	William	Butler	M	AUTOMOTIVE
E052	Dianna	Wilson	F	HEALTHCARE
E057	Dorothy	Wilson	F	HEALTHCARE
E083	Patrick	Voltz	M	HEALTHCARE
E103	Emily	Grove	F	FINANCE
E204	Karene	Nowak	F	AUTOMOTIVE
E245	Nian	Zhen	M	RETAIL
E260	Roy	Collins	M	RETAIL
E403	Steve	Hoffman	M	FINANCE
E428	Pete	Allen	M	AUTOMOTIVE
E478	David	Smith	M	RETAIL
E505	Chad	Wilson	M	HEALTHCARE
E532	Claire	Brennan	F	AUTOMOTIVE
E583	Janet	Hale	F	RETAIL
E612	Tracy	Norris	F	RETAIL

mp_record_table 139

4. **Write a query to fetch EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPARTMENT, and EMP_RATING if the EMP_RATING is:**

   less than two

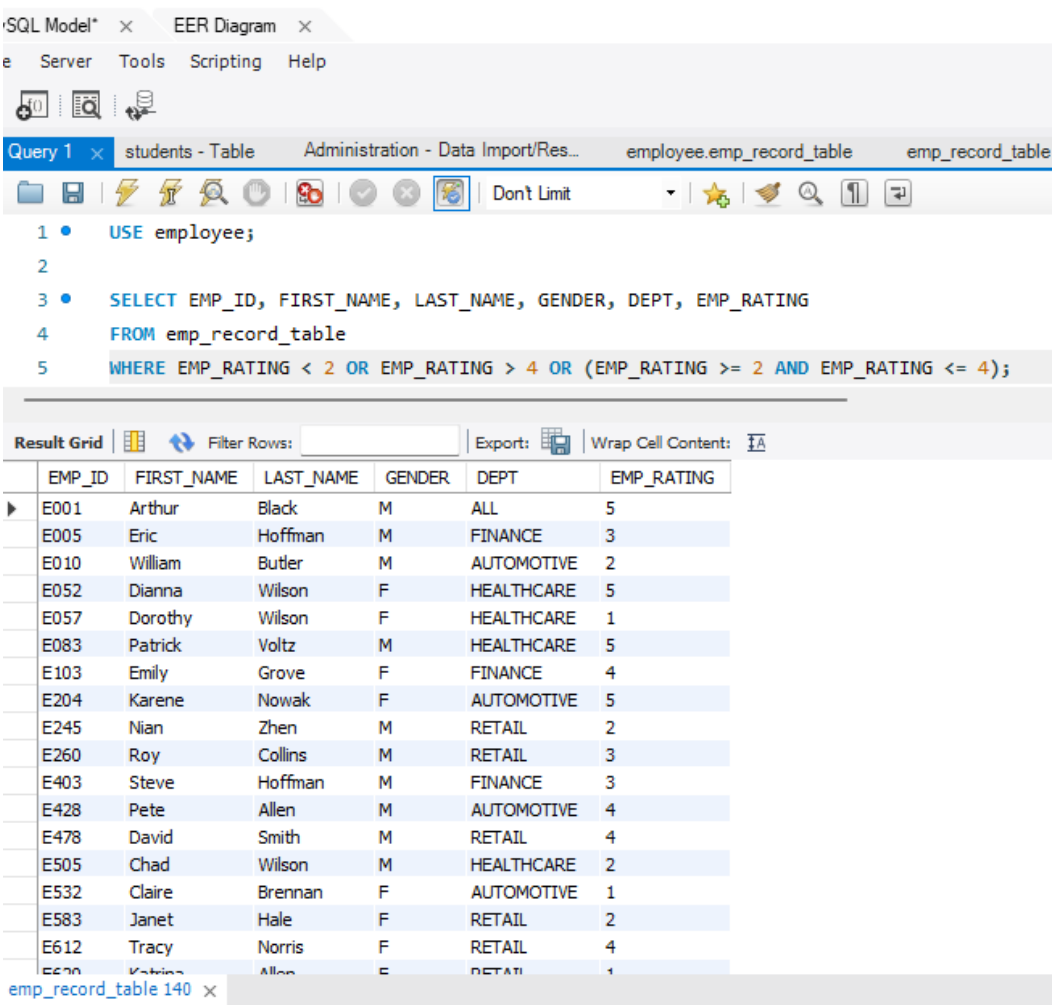
   greater than four

   between two and four

SQL code:

```
SELECT EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT, EMP_RATING
FROM emp_record_table
WHERE EMP_RATING < 2 OR EMP_RATING > 4 OR (EMP_RATING >= 2 AND EMP_RATING <= 4);
```

Output:



EMP_ID	FIRST_NAME	LAST_NAME	GENDER	DEPT	EMP_RATING
E001	Arthur	Black	M	ALL	5
E005	Eric	Hoffman	M	FINANCE	3
E010	William	Butler	M	AUTOMOTIVE	2
E052	Dianna	Wilson	F	HEALTHCARE	5
E057	Dorothy	Wilson	F	HEALTHCARE	1
E083	Patrick	Voltz	M	HEALTHCARE	5
E103	Emily	Grove	F	FINANCE	4
E204	Karene	Nowak	F	AUTOMOTIVE	5
E245	Nian	Zhen	M	RETAIL	2
E260	Roy	Collins	M	RETAIL	3
E403	Steve	Hoffman	M	FINANCE	3
E428	Pete	Allen	M	AUTOMOTIVE	4
E478	David	Smith	M	RETAIL	4
E505	Chad	Wilson	M	HEALTHCARE	2
E532	Claire	Brennan	F	AUTOMOTIVE	1
E583	Janet	Hale	F	RETAIL	2
E612	Tracy	Norris	F	RETAIL	4

5. **Write a query to concatenate the FIRST_NAME and the LAST_NAME of employees in the Finance department from the employee table and then give the resultant column alias as NAME.**

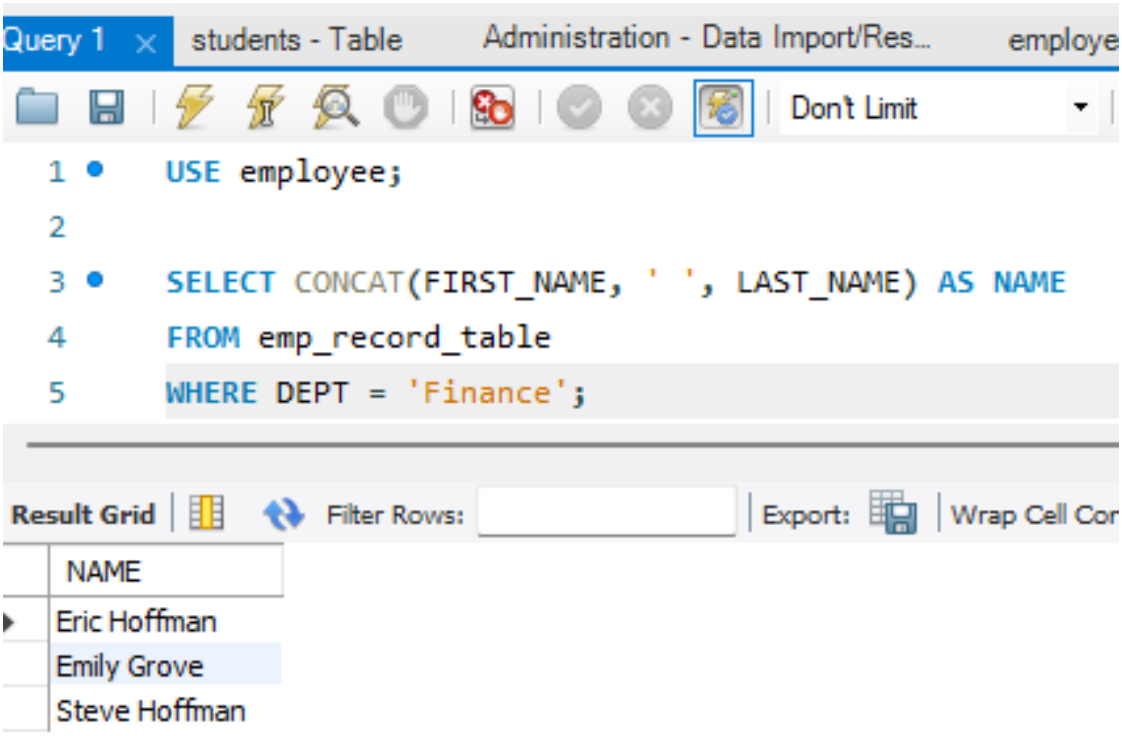
SQL code:

```
SELECT CONCAT(FIRST_NAME, ' ', LAST_NAME) AS NAME

FROM emp_record_table

WHERE DEPT = 'Finance';
```

Output:



6. **Write a query to list only those employees who have someone reporting to them. Also, show the number of reporters (including the President).**

SQL code:

```
SELECT e.EMP_ID , e.FIRST_NAME , e.LAST_NAME, e.DEPT, e.MANAGER_ID, p.PROJECT_ID

FROM emp_record_table e

INNER JOIN proj_table p

WHERE e.ROLE NOT IN ("MANAGER","PRESIDENT","CEO")

ORDER BY e.MANAGER_ID;
```

Output:

Query 1 | students - Table | Administration - Data Import/Res... | employee.emp_record_table | emp_record_tab

Don't Limit

```
SELECT e.EMP_ID , e.FIRST_NAME , e.LAST_NAME, e.DEPT, e.MANAGER_ID, p.PROJECT_ID
FROM emp_record_table e
INNER JOIN proj_table p
WHERE e.ROLE NOT IN ("MANAGER","PRESIDENT","CEO")
ORDER BY e.MANAGER_ID;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	LAST_NAME	DEPT	MANAGER_ID	PROJECT_ID
E057	Dorothy	Wilson	HEALTHCARE	E083	P406
E052	Dianna	Wilson	HEALTHCARE	E083	P103
E057	Dorothy	Wilson	HEALTHCARE	E083	P103
E057	Dorothy	Wilson	HEALTHCARE	E083	P302
E057	Dorothy	Wilson	HEALTHCARE	E083	P204
E057	Dorothy	Wilson	HEALTHCARE	E083	P109
E052	Dianna	Wilson	HEALTHCARE	E083	P406
E505	Chad	Wilson	HEALTHCARE	E083	P109
E505	Chad	Wilson	HEALTHCARE	E083	P204
E057	Dorothy	Wilson	HEALTHCARE	E083	P105
E505	Chad	Wilson	HEALTHCARE	E083	P302
E505	Chad	Wilson	HEALTHCARE	E083	P406
E505	Chad	Wilson	HEALTHCARE	E083	P103
E052	Dianna	Wilson	HEALTHCARE	E083	P302
E052	Dianna	Wilson	HEALTHCARE	E083	P204
E052	Dianna	Wilson	HEALTHCARE	E083	P109
E052	Dianna	Wilson	HEALTHCARE	E083	P105
E505	Chad	Wilson	HEALTHCARE	E083	P105

Result 142

7. **Write a query to list down all the employees from the healthcare and finance departments using union. Take data from the employee record table.**

SQL code:

```
SELECT EMP_ID, FIRST_NAME, LAST_NAME, DEPT

FROM emp_record_table

WHERE DEPT = 'Healthcare'

UNION

SELECT EMP_ID, FIRST_NAME, LAST_NAME, DEPT

FROM emp_record_table

WHERE DEPT = 'Finance';
```

Output:

Query 1 | students - Table | Administration - Data Import/Res...

Don't Limit

```
FROM emp_record_table
WHERE DEPT = 'Healthcare'
UNION
SELECT EMP_ID, FIRST_NAME, LAST_NAME, DEPT
FROM emp_record_table
```

Result Grid | Filter Rows: | Export:

EMP_ID	FIRST_NAME	LAST_NAME	DEPT
E052	Dianna	Wilson	HEALTHCARE
E057	Dorothy	Wilson	HEALTHCARE
E083	Patrick	Voltz	HEALTHCARE
E505	Chad	Wilson	HEALTHCARE
E005	Eric	Hoffman	FINANCE
E103	Emily	Grove	FINANCE
E403	Steve	Hoffman	FINANCE

8. **Write a query to list down employee details such as EMP_ID, FIRST_NAME, LAST_NAME, ROLE, DEPARTMENT, and EMP_RATING grouped by dept. Also include the respective employee rating along with the max emp rating for the department.**

SQL code:

```
SELECT e.EMP_ID, e.FIRST_NAME, e.LAST_NAME, e.ROLE, e.DEPT, e.EMP_RATING,
m.MAX_EMP_RATING

FROM emp_record_table e

JOIN (

   SELECT DEPT, MAX(EMP_RATING) AS MAX_EMP_RATING

   FROM emp_record_table

   GROUP BY DEPT

) m ON e.DEPT = m.DEPT;
```

Output:

Query 1 | students - Table | Administration - Data Import/Res... | employee.emp_record_table | emp_record_table

Don't Limit

```
JOIN (
    SELECT DEPT, MAX(EMP_RATING) AS MAX_EMP_RATING
    FROM emp_record_table
    GROUP BY DEPT
) m ON e.DEPT = m.DEPT;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	LAST_NAME	ROLE	DEPT	EMP_RATING	MAX_EMP_RATING
E001	Arthur	Black	PRESIDENT	ALL	5	5
E403	Steve	Hoffman	ASSOCIATE DATA SCIENTIST	FINANCE	3	4
E103	Emily	Grove	MANAGER	FINANCE	4	4
E005	Eric	Hoffman	LEAD DATA SCIENTIST	FINANCE	3	4
E532	Claire	Brennan	ASSOCIATE DATA SCIENTIST	AUTOMOTIVE	1	5
E428	Pete	Allen	MANAGER	AUTOMOTIVE	4	5
E204	Karene	Nowak	SENIOR DATA SCIENTIST	AUTOMOTIVE	5	5
E010	William	Butler	LEAD DATA SCIENTIST	AUTOMOTIVE	2	5
E505	Chad	Wilson	ASSOCIATE DATA SCIENTIST	HEALTHCARE	2	5
E083	Patrick	Voltz	MANAGER	HEALTHCARE	5	5
E057	Dorothy	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	1	5
E052	Dianna	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	5	5
E640	Jenifer	Jhones	JUNIOR DATA SCIENTIST	RETAIL	4	4
E620	Katrina	Allen	JUNIOR DATA SCIENTIST	RETAIL	1	4
E612	Tracy	Norris	MANAGER	RETAIL	4	4
E583	Janet	Hale	MANAGER	RETAIL	2	4
E478	David	Smith	ASSOCIATE DATA SCIENTIST	RETAIL	4	4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Result 144

9. **Write a query to calculate the minimum and the maximum salary of the employees in each role. Take data from the employee record table.**

SQL code:

```
SELECT ROLE, MIN(SALARY) AS MIN_SALARY, MAX(SALARY) AS MAX_SALARY

FROM emp_record_table

GROUP BY ROLE;
```

Output:

Query 1 | students - Table | Administration - Data Import/Res... | employee.emp_record_table

Don't Limit

```
USE employee;
SELECT ROLE, MIN(SALARY) AS MIN_SALARY, MAX(SALARY) AS MAX_SALARY
FROM emp_record_table
GROUP BY ROLE;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ROLE	MIN_SALARY	MAX_SALARY
PRESIDENT	16500	16500
LEAD DATA SCIENTIST	8500	9000
SENIOR DATA SCIENTIST	5500	7700
MANAGER	8500	11000
ASSOCIATE DATA SCIENTIST	4000	5000
JUNIOR DATA SCIENTIST	2800	3000

10. Write a query to assign ranks to each employee based on their experience. Take data from the employee record table.

SQL code:

```
SELECT EMP_ID, FIRST_NAME, LAST_NAME, EXP, RANK() OVER (ORDER BY EXP DESC) AS EMP_RANK

FROM emp_record_table;
```

Output:

Query 1 | students - Table | Administration - Data Import/Res... | employee.emp_record_table | emp_record_table

Don't Limit

```
USE employee;
SELECT EMP_ID, FIRST_NAME, LAST_NAME, EXP, RANK() OVER (ORDER BY EXP DESC) AS EMP_RANK
FROM emp_record_table;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	LAST_NAME	EXP	EMP_RANK
E001	Arthur	Black	20	1
E083	Patrick	Voltz	15	2
E103	Emily	Grove	14	3
E428	Pete	Allen	14	3
E583	Janet	Hale	14	3
E612	Tracy	Norris	13	6
E010	William	Butler	12	7
E005	Eric	Hoffman	11	8
E057	Dorothy	Wilson	9	9
E204	Karene	Nowak	8	10
E260	Roy	Collins	7	11
E052	Dianna	Wilson	6	12
E245	Nian	Zhen	6	12
E505	Chad	Wilson	5	14
E403	Steve	Hoffman	4	15
E478	David	Smith	3	16
E532	Claire	Brennan	3	16

Result 147

11. Write a query to create a view that displays employees in various countries whose salary is more than six thousand. Take data from the employee record table.

SQL code:

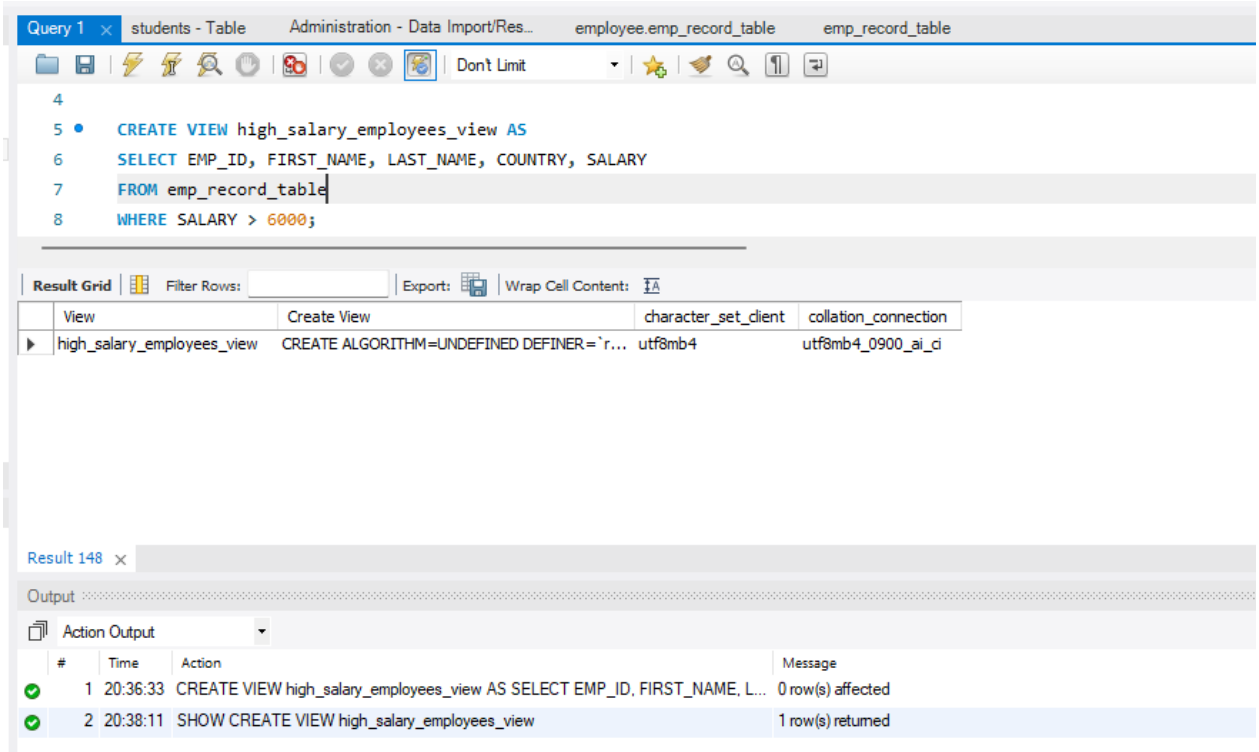
```
CREATE VIEW high_salary_employees_view AS

SELECT EMP_ID, FIRST_NAME, LAST_NAME, COUNTRY, SALARY

FROM emp_record_table

WHERE SALARY > 6000;
```

Output:

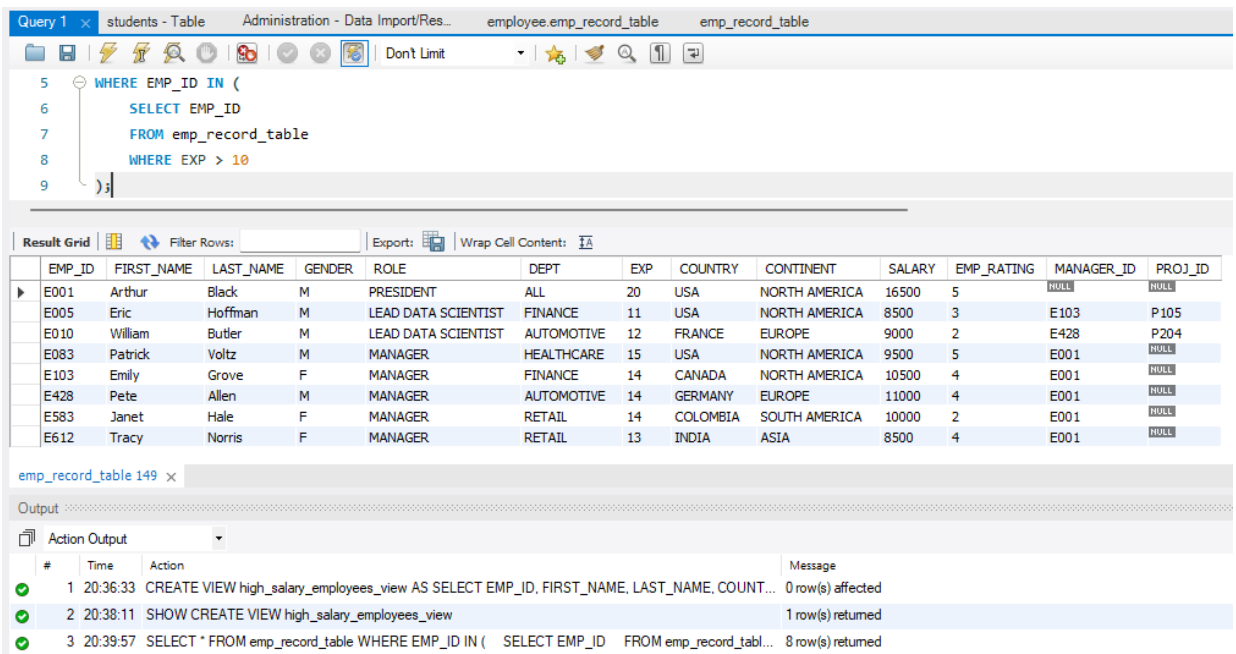


12. Write a nested query to find employees with experience of more than ten years. Take data from the employee record table.

SQL code:

```
SELECT *
FROM emp_record_table
WHERE EMP_ID IN (
   SELECT EMP_ID
   FROM emp_record_table
   WHERE EXP > 10
);
```

Output:



EMP_ID	FIRST_NAME	LAST_NAME	GENDER	ROLE	DEPT	EXP	COUNTRY	CONTINENT	SALARY	EMP_RATING	MANAGER_ID	PROJ_ID
E001	Arthur	Black	M	PRESIDENT	ALL	20	USA	NORTH AMERICA	16500	5	NULL	NULL
E005	Eric	Hoffman	M	LEAD DATA SCIENTIST	FINANCE	11	USA	NORTH AMERICA	8500	3	E103	P105
E010	William	Butler	M	LEAD DATA SCIENTIST	AUTOMOTIVE	12	FRANCE	EUROPE	9000	2	E428	P204
E083	Patrick	Voltz	M	MANAGER	HEALTHCARE	15	USA	NORTH AMERICA	9500	5	E001	NULL
E103	Emily	Grove	F	MANAGER	FINANCE	14	CANADA	NORTH AMERICA	10500	4	E001	NULL
E428	Pete	Allen	M	MANAGER	AUTOMOTIVE	14	GERMANY	EUROPE	11000	4	E001	NULL
E583	Janet	Hale	F	MANAGER	RETAIL	14	COLOMBIA	SOUTH AMERICA	10000	2	E001	NULL
E612	Tracy	Norris	F	MANAGER	RETAIL	13	INDIA	ASIA	8500	4	E001	NULL

13. Write a query to create a stored procedure to retrieve the details of the employees whose experience is more than three years. Take data from the employee record table.

SQL code:

```
DELIMITER &&

CREATE PROCEDURE get_experience()
BEGIN
SELECT * FROM emp_record_table WHERE EXP > 3;
END &&
DELIMITER ;
```

Output:

Query 1 | students - Table | Administration - Data Import/Res... | employee.emp_record_table | emp_record_table

Don't Limit

```
END &&
DELIMITER ;

CALL get_experience();
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	LAST_NAME	GENDER	ROLE	DEPT	EXP	COUNTRY	CONTINENT	SALARY	EMP_RATING	MANAGER_ID	PROJ_ID
E001	Arthur	Black	M	PRESIDENT	ALL	20	USA	NORTH AMERICA	16500	5	NULL	NULL
E005	Eric	Hoffman	M	LEAD DATA SCIENTIST	FINANCE	11	USA	NORTH AMERICA	8500	3	E103	P105
E010	William	Butler	M	LEAD DATA SCIENTIST	AUTOMOTIVE	12	FRANCE	EUROPE	9000	2	E428	P204
E052	Dianna	Wilson	F	SENIOR DATA SCIENTIST	HEALTHCARE	6	CANADA	NORTH AMERICA	5500	5	E083	P103
E057	Dorothy	Wilson	F	SENIOR DATA SCIENTIST	HEALTHCARE	9	USA	NORTH AMERICA	7700	1	E083	P302
E083	Patrick	Voltz	M	MANAGER	HEALTHCARE	15	USA	NORTH AMERICA	9500	5	E001	NULL
E103	Emily	Grove	F	MANAGER	FINANCE	14	CANADA	NORTH AMERICA	10500	4	E001	NULL
E204	Karene	Nowak	F	SENIOR DATA SCIENTIST	AUTOMOTIVE	8	GERMANY	EUROPE	7500	5	E428	P204
E245	Nian	Zhen	M	SENIOR DATA SCIENTIST	RETAIL	6	CHINA	ASIA	6500	2	E583	P109

Result 150

Output

Action Output

#	Time	Action	Message
4	20:42:15	USE employee	0 row(s) affected
5	20:42:19	CREATE PROCEDURE get_experience() BEGIN SELECT * FROM emp_record_table WHERE EXP > 3...	0 row(s) affected
6	20:42:32	CALL get_experience()	15 row(s) returned

14. Write a query using stored functions in the project table to check whether the job profile assigned to each employee in the data science team matches the organization's set standard.

The standard being:

For an employee with experience less than or equal to 2 years assign 'JUNIOR DATA SCIENTIST',

For an employee with the experience of 2 to 5 years assign 'ASSOCIATE DATA SCIENTIST',

For an employee with the experience of 5 to 10 years assign 'SENIOR DATA SCIENTIST',

For an employee with the experience of 10 to 12 years assign 'LEAD DATA SCIENTIST',

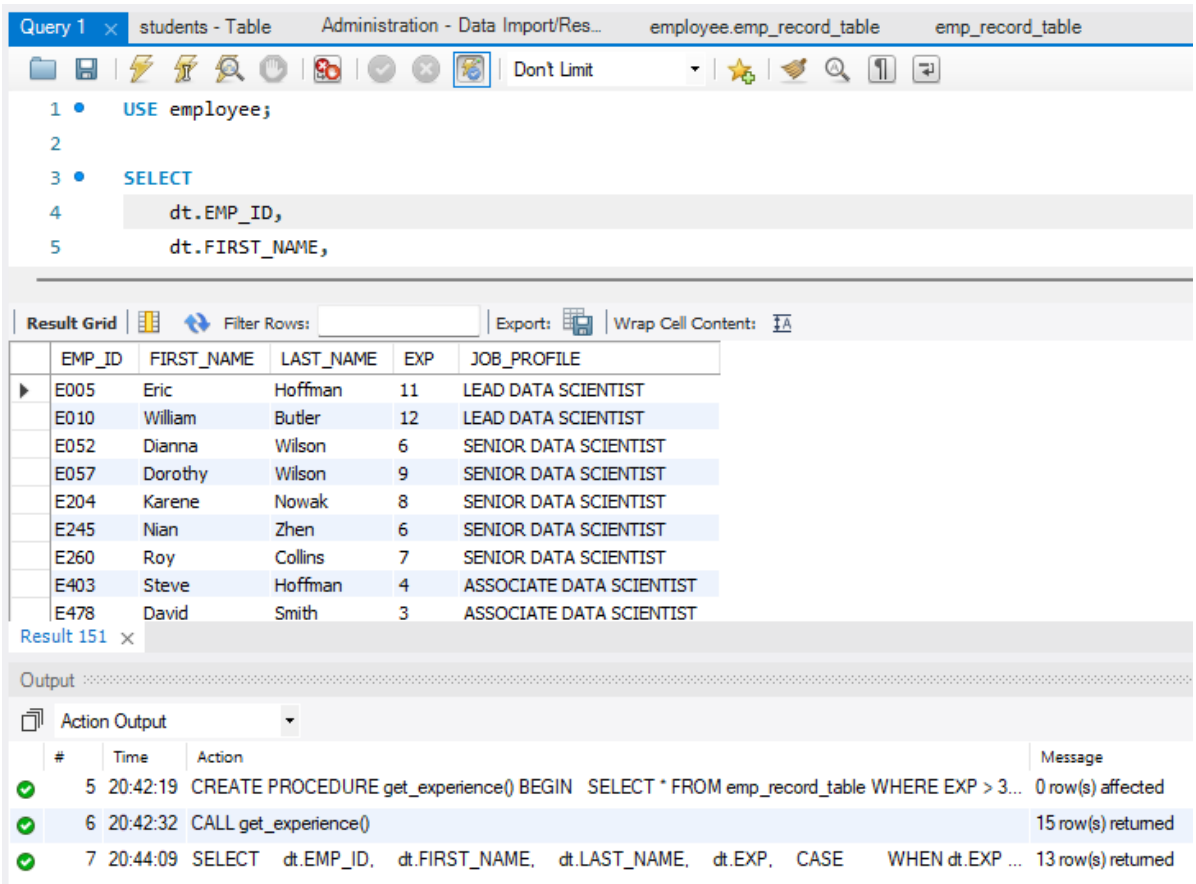
For an employee with the experience of 12 to 16 years assign 'MANAGER'.

SQL code:

```
SELECT
  dt.EMP_ID,
  dt.FIRST_NAME,
  dt.LAST_NAME,
  dt.EXP,
  CASE
    WHEN dt.EXP <= 2 THEN 'JUNIOR DATA SCIENTIST'
    WHEN dt.EXP > 2 AND dt.EXP <= 5 THEN 'ASSOCIATE DATA SCIENTIST'
    WHEN dt.EXP > 5 AND dt.EXP <= 10 THEN 'SENIOR DATA SCIENTIST'
    WHEN dt.EXP > 10 AND dt.EXP <= 12 THEN 'LEAD DATA SCIENTIST'
    WHEN dt.EXP > 12 AND dt.EXP <= 16 THEN 'MANAGER'
  END AS JOB_PROFILE
FROM
  data_science_team dt
LEFT JOIN
  (
```

```
SELECT
    PROJECT_ID,
    ROW_NUMBER() OVER (PARTITION BY PROJECT_ID ORDER BY START_DATE DESC) AS rn
FROM
    proj_table
) pt ON dt.EMP_ID = pt.PROJECT_ID AND pt.rn = 1;
```

Output:

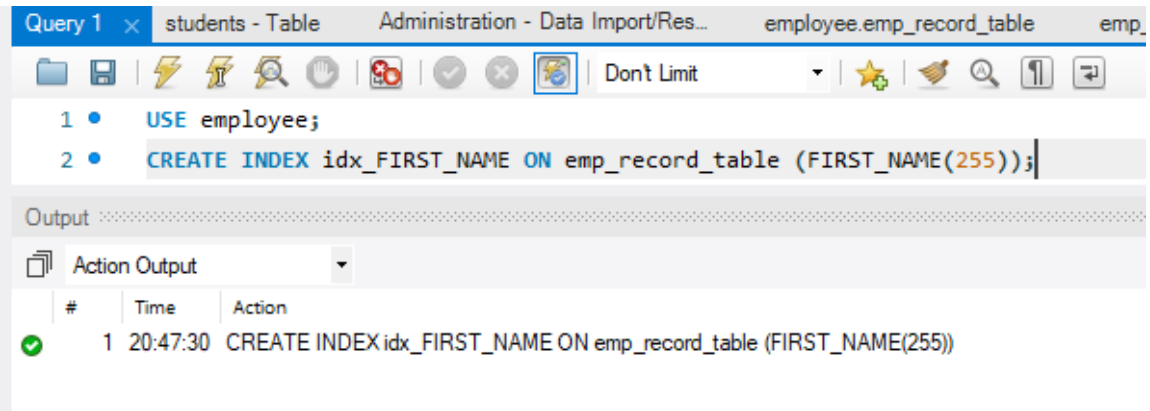


15. Create an index to improve the cost and performance of the query to find the employee whose FIRST_NAME is 'Eric' in the employee table after checking the execution plan.

SQL code:

```
CREATE INDEX idx_FIRST_NAME ON emp_record_table (FIRST_NAME(255));
```

Output:



16. **Write a query to calculate the bonus for all the employees, based on their ratings and salaries (Use the formula: 5% of salary * employee rating).**

SQL code:

```
SELECT EMP_ID, FIRST_NAME, SALARY, EMP_RATING, (0.05 * SALARY * EMP_RATING) AS bonus

FROM emp_record_table;
```

Output:

Query 1 | students - Table | Administration - Data Import/Res... | employee.emp_record_table | emp_record_table

Don't Limit

```
USE employee;
SELECT EMP_ID, FIRST_NAME, SALARY, EMP_RATING, (0.05 * SALARY * EMP_RATING) AS bonus
FROM emp_record_table;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	SALARY	EMP_RATING	bonus
E001	Arthur	16500	5	4125.00
E005	Eric	8500	3	1275.00
E010	William	9000	2	900.00
E052	Dianna	5500	5	1375.00
E057	Dorothy	7700	1	385.00
E083	Patrick	9500	5	2375.00
E103	Emily	10500	4	2100.00
E204	Karene	7500	5	1875.00
E245	Nian	6500	2	650.00
E260	Roy	7000	3	1050.00
E403	Steve	5000	3	750.00
E428	Pete	11000	4	2200.00
E478	David	4000	4	800.00
E505	Chad	5000	2	500.00

Result 152

17. Write a query to calculate the average salary distribution based on the continent and country. Take data from the employee record table.

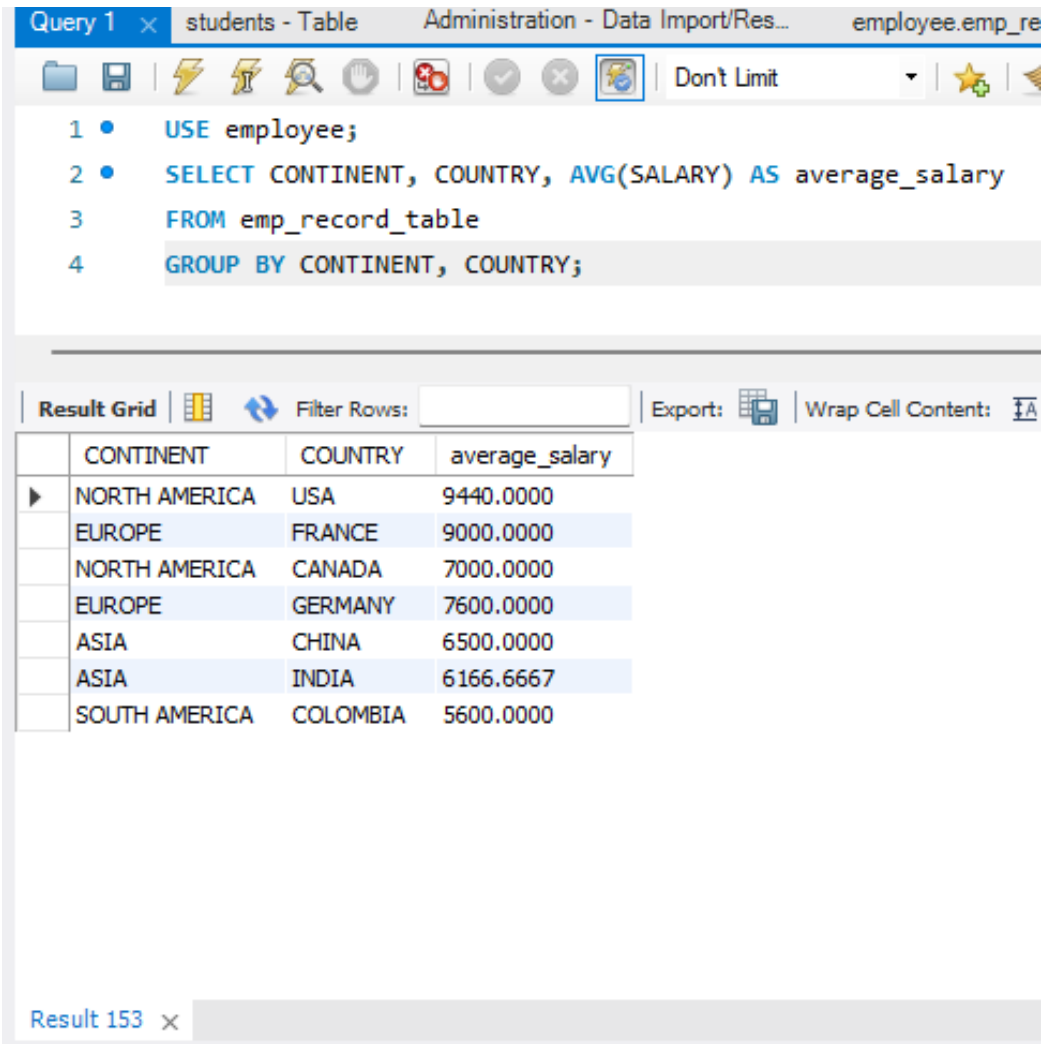
SQL code:

```
SELECT CONTINENT, COUNTRY, AVG(SALARY) AS average_salary

FROM emp_record_table

GROUP BY CONTINENT, COUNTRY;
```

Output:



CONTINENT	COUNTRY	average_salary
NORTH AMERICA	USA	9440.0000
EUROPE	FRANCE	9000.0000
NORTH AMERICA	CANADA	7000.0000
EUROPE	GERMANY	7600.0000
ASIA	CHINA	6500.0000
ASIA	INDIA	6166.6667
SOUTH AMERICA	COLOMBIA	5600.0000