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:

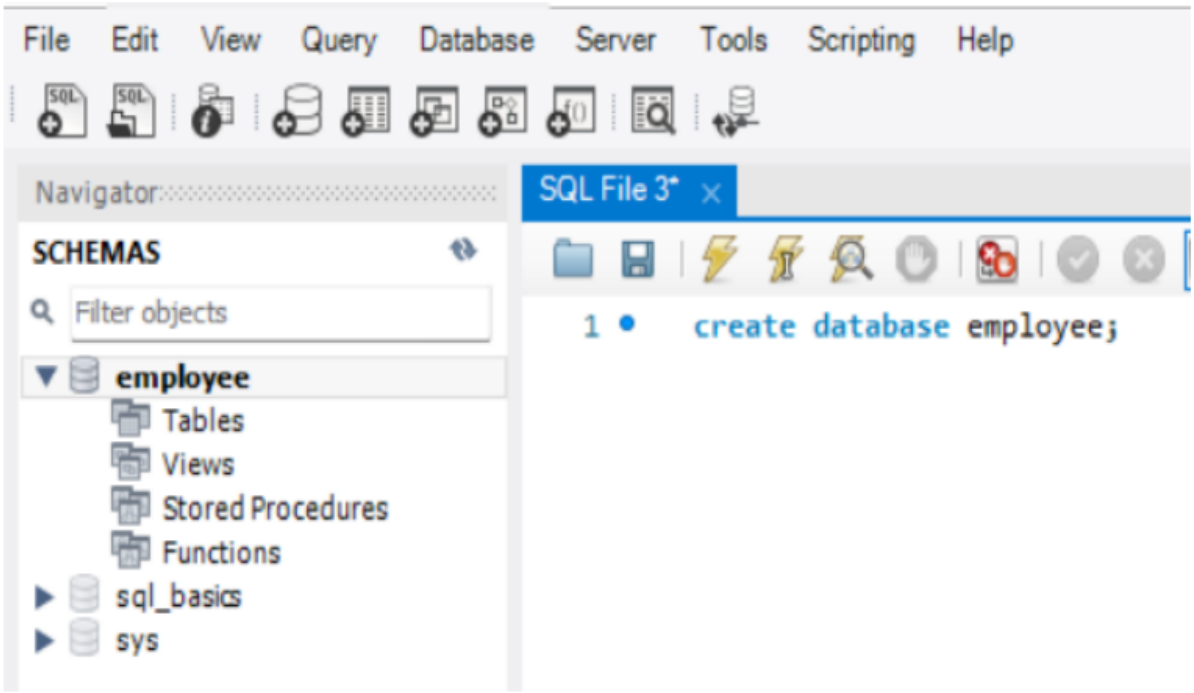
To facilitate a better understanding, managers have provided ratings for each employee which will help the HR department to finalize the employee performance mapping. As a DBA, you should find the maximum salary of the employees and ensure that all jobs are meeting the organization's profile standard. 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.

The tasks 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.

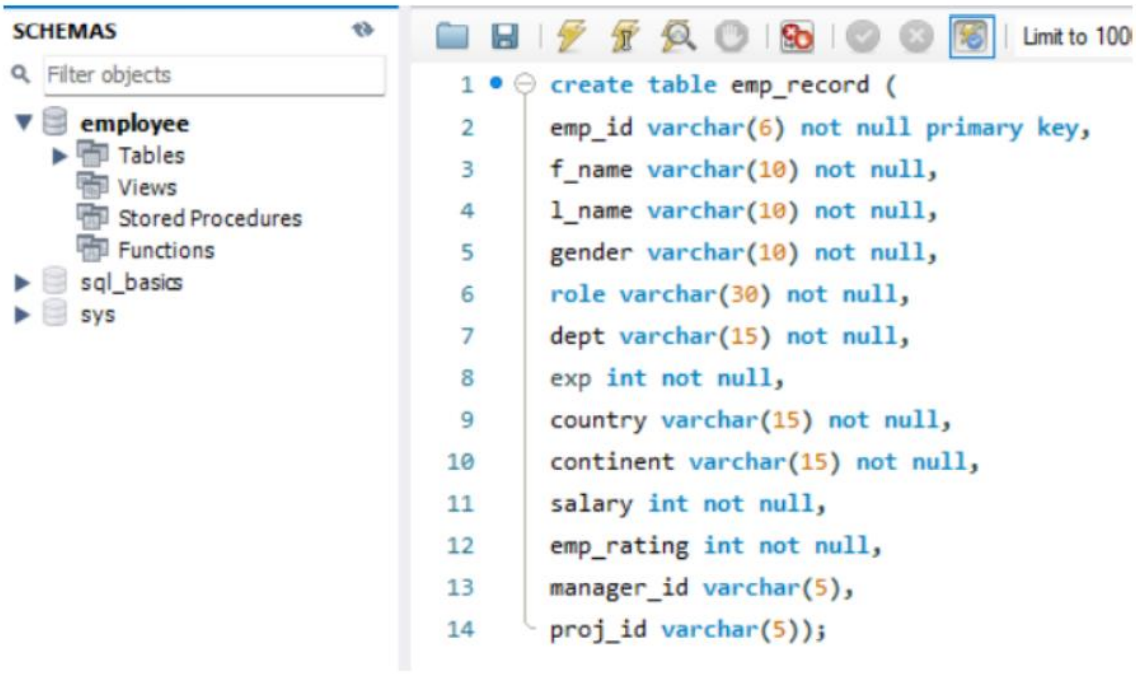
SQL code:

```
CREATE DATABASE employee;
```

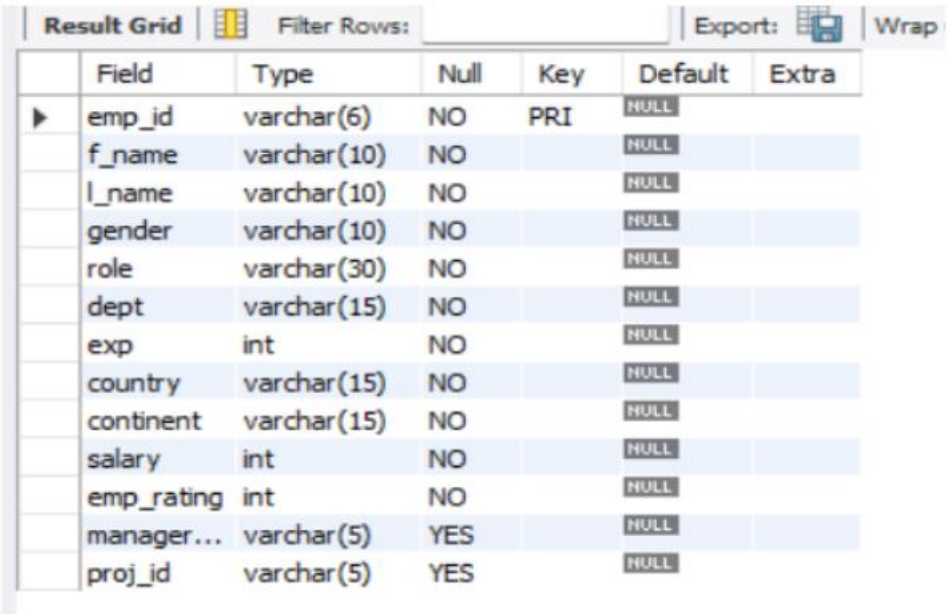


SQL Code: CREATE TABLE emp_record (

emp_id VARCHAR (6) not null PRIMARY KEY,
f_name VARCHAR (10) not null,
l_name VARCHAR (10) not null,
gender VARCHAR (10) not null,
role VARCHAR (30) not null,
dept VARCHAR (15) not null,
exp INT not null,
country VARCHAR (15) not null,
continent VARCHAR (15) not null,
salary INT not null,
emp_rating INT not null,
manager_id VARCHAR (5),
proj_id varchar (5));



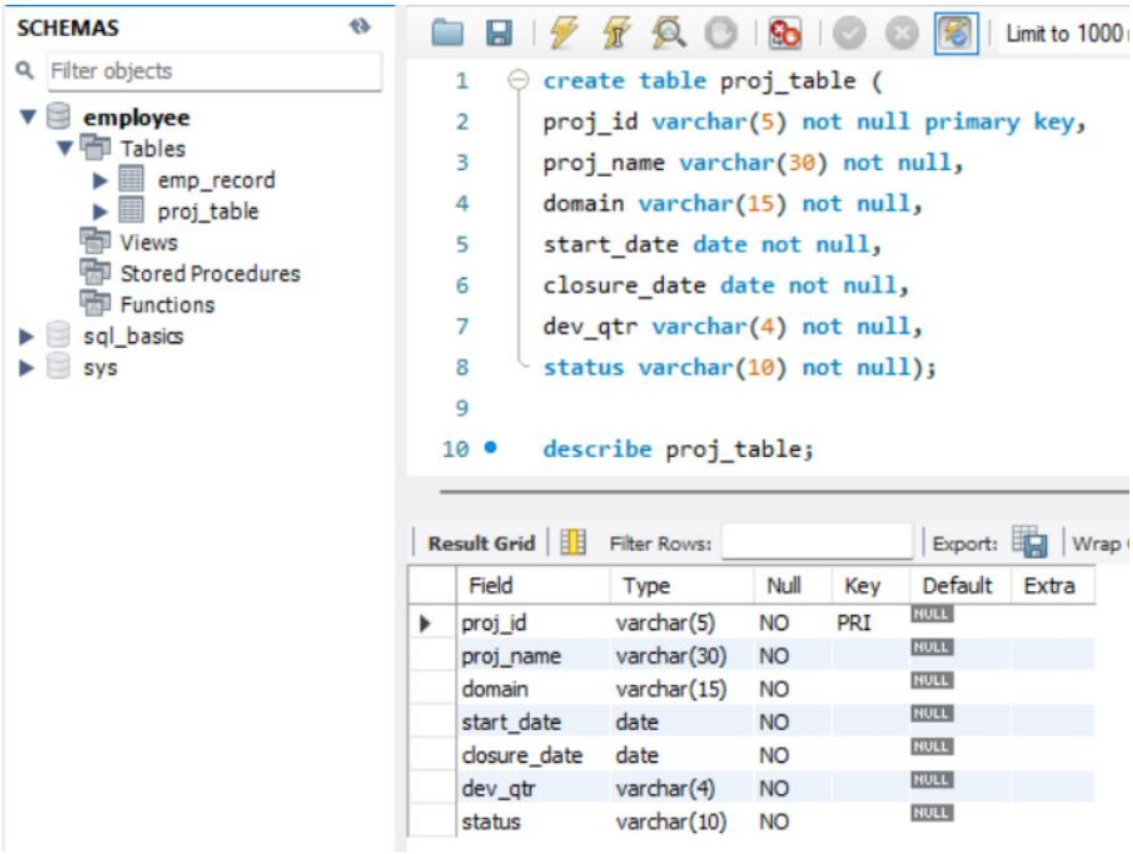
Desc emp_record;



Field	Type	Null	Key	Default	Extra
emp_id	varchar(6)	NO	PRI	NULL	
f_name	varchar(10)	NO		NULL	
l_name	varchar(10)	NO		NULL	
gender	varchar(10)	NO		NULL	
role	varchar(30)	NO		NULL	
dept	varchar(15)	NO		NULL	
exp	int	NO		NULL	
country	varchar(15)	NO		NULL	
continent	varchar(15)	NO		NULL	
salary	int	NO		NULL	
emp_rating	int	NO		NULL	
manager...	varchar(5)	YES		NULL	
proj_id	varchar(5)	YES		NULL	

SQL code:

```
CREATE TABLE proj_table (
proj_id VARCHAR (5) not null PRIMARY KEY,
proj_name VARCHAR (30) not null,
 domain VARCHAR (15) not null,
 start_date DATE not null,
 closure_date DATE not null,
 dev_qtr VARCHAR (4) not null,
status VARCHAR (10) not null);
```

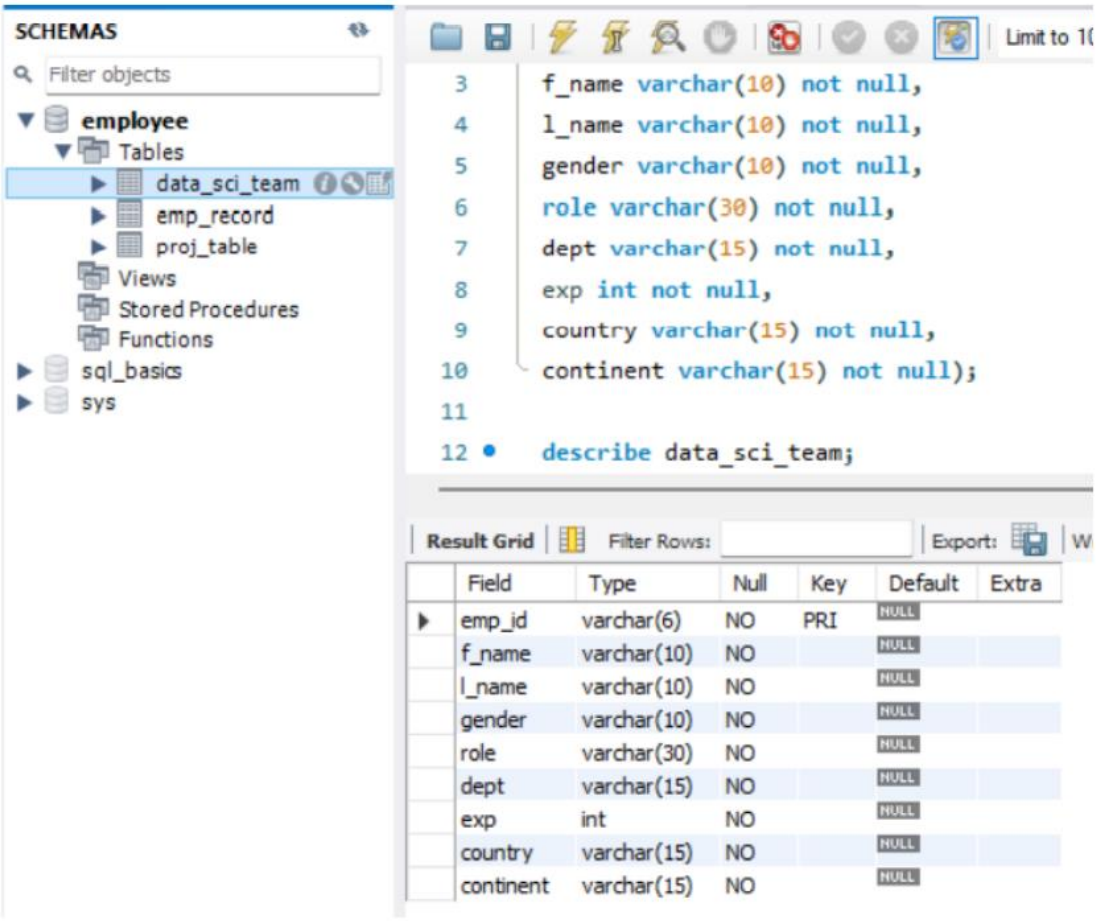


SQL code:

```
CREATE TABLE data_sci_team (
emp_id VARCHAR (6) not null PRIMARY KEY,
 f_name VARCHAR (10) not null,
 l_name VARCHAR (10) not null,
gender VARCHAR (10) not null,
 role VARCHAR (30) not null,
 dept VARCHAR (15) not null,
 exp INT not null,
 country VARCHAR (15) not null,
```

continent VARCHAR (15) not null);

Desc data_sci_team;

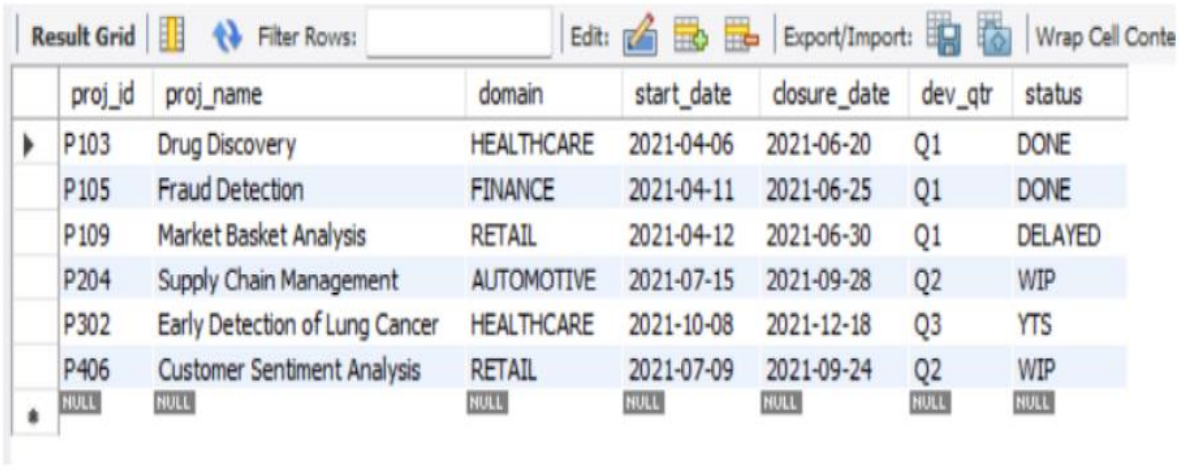


Import data into tables.

SQL code:

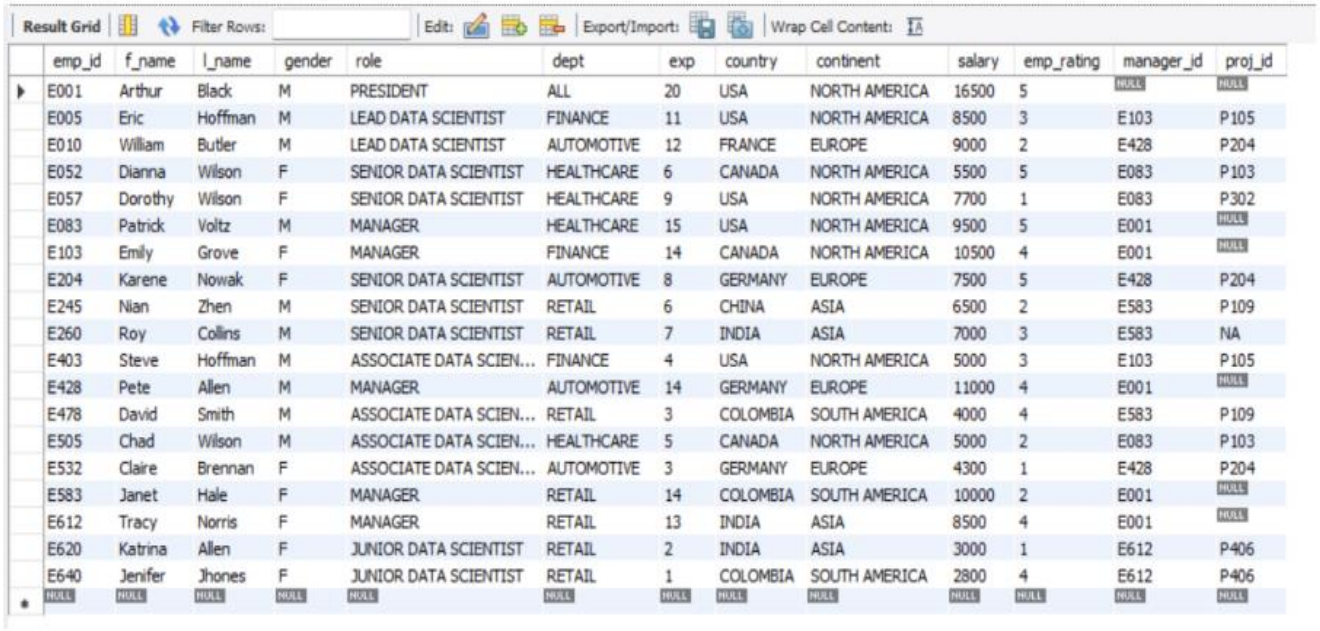
Output:

proj_table



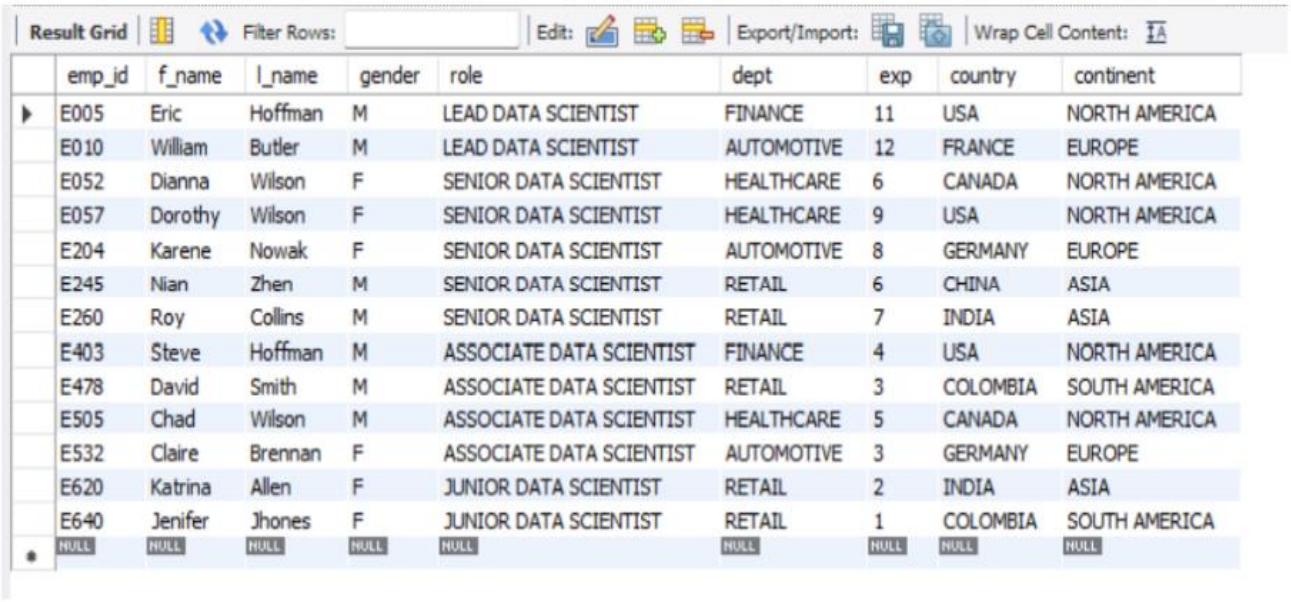
proj_id	proj_name	domain	start_date	closure_date	dev_qtr	status
P103	Drug Discovery	HEALTHCARE	2021-04-06	2021-06-20	Q1	DONE
P105	Fraud Detection	FINANCE	2021-04-11	2021-06-25	Q1	DONE
P109	Market Basket Analysis	RETAIL	2021-04-12	2021-06-30	Q1	DELAYED
P204	Supply Chain Management	AUTOMOTIVE	2021-07-15	2021-09-28	Q2	WIP
P302	Early Detection of Lung Cancer	HEALTHCARE	2021-10-08	2021-12-18	Q3	YTS
P406	Customer Sentiment Analysis	RETAIL	2021-07-09	2021-09-24	Q2	WIP
NULL	NULL	NULL	NULL	NULL	NULL	NULL

emp_record



emp_id	f_name	l_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
E260	Roy	Collins	M	SENIOR DATA SCIENTIST	RETAIL	7	INDIA	ASIA	7000	3	E583	NA
E403	Steve	Hoffman	M	ASSOCIATE DATA SCIEN...	FINANCE	4	USA	NORTH AMERICA	5000	3	E103	P105
E428	Pete	Allen	M	MANAGER	AUTOMOTIVE	14	GERMANY	EUROPE	11000	4	E001	NULL
E478	David	Smith	M	ASSOCIATE DATA SCIEN...	RETAIL	3	COLOMBIA	SOUTH AMERICA	4000	4	E583	P109
E505	Chad	Wilson	M	ASSOCIATE DATA SCIEN...	HEALTHCARE	5	CANADA	NORTH AMERICA	5000	2	E083	P103
E532	Claire	Brennan	F	ASSOCIATE DATA SCIEN...	AUTOMOTIVE	3	GERMANY	EUROPE	4300	1	E428	P204
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
E620	Katrina	Allen	F	JUNIOR DATA SCIENTIST	RETAIL	2	INDIA	ASIA	3000	1	E612	P406
E640	Jenifer	Jhones	F	JUNIOR DATA SCIENTIST	RETAIL	1	COLOMBIA	SOUTH AMERICA	2800	4	E612	P406
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Data_Science _Team:

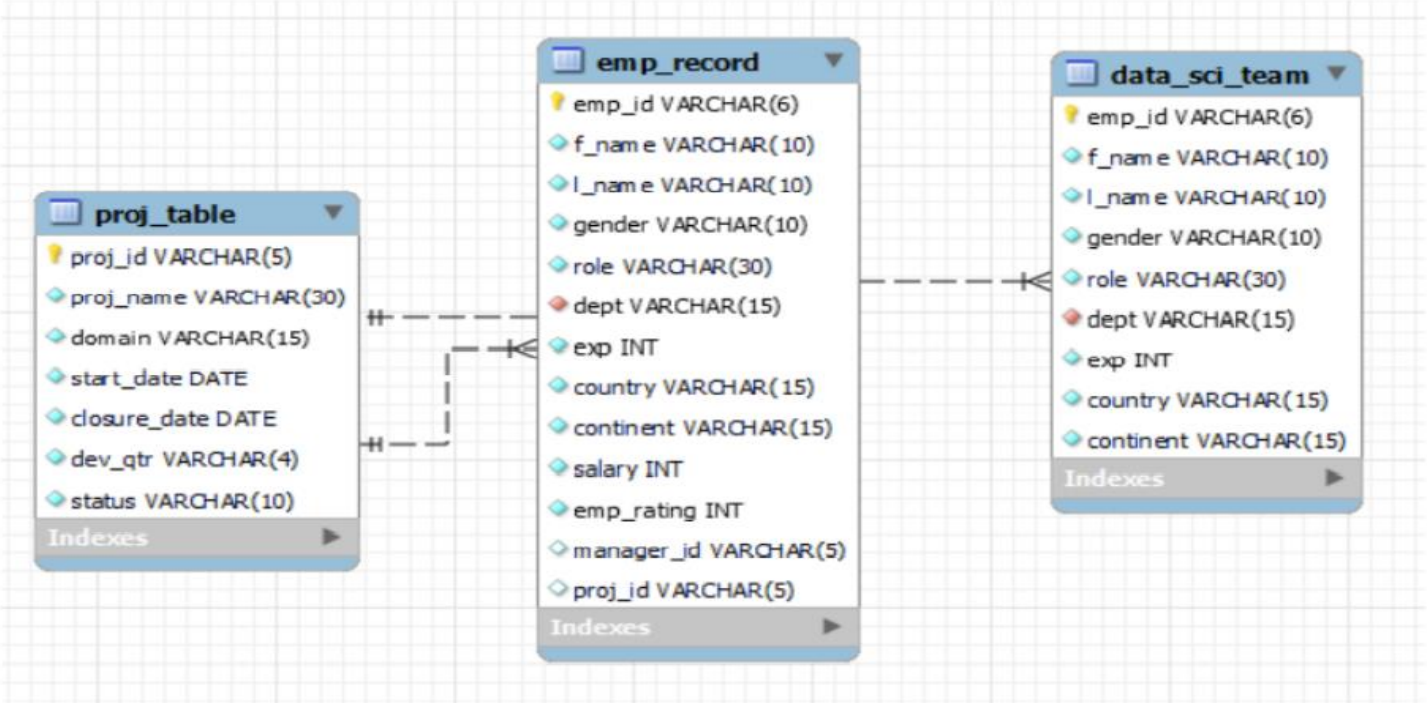


emp_id	f_name	l_name	gender	role	dept	exp	country	continent
E005	Eric	Hoffman	M	LEAD DATA SCIENTIST	FINANCE	11	USA	NORTH AMERICA
E010	William	Butler	M	LEAD DATA SCIENTIST	AUTOMOTIVE	12	FRANCE	EUROPE
E052	Dianna	Wilson	F	SENIOR DATA SCIENTIST	HEALTHCARE	6	CANADA	NORTH AMERICA
E057	Dorothy	Wilson	F	SENIOR DATA SCIENTIST	HEALTHCARE	9	USA	NORTH AMERICA
E204	Karene	Nowak	F	SENIOR DATA SCIENTIST	AUTOMOTIVE	8	GERMANY	EUROPE
E245	Nian	Zhen	M	SENIOR DATA SCIENTIST	RETAIL	6	CHINA	ASIA
E260	Roy	Collins	M	SENIOR DATA SCIENTIST	RETAIL	7	INDIA	ASIA
E403	Steve	Hoffman	M	ASSOCIATE DATA SCIENTIST	FINANCE	4	USA	NORTH AMERICA
E478	David	Smith	M	ASSOCIATE DATA SCIENTIST	RETAIL	3	COLOMBIA	SOUTH AMERICA
E505	Chad	Wilson	M	ASSOCIATE DATA SCIENTIST	HEALTHCARE	5	CANADA	NORTH AMERICA
E532	Claire	Brennan	F	ASSOCIATE DATA SCIENTIST	AUTOMOTIVE	3	GERMANY	EUROPE
E620	Katrina	Allen	F	JUNIOR DATA SCIENTIST	RETAIL	2	INDIA	ASIA
E640	Jenifer	Jhones	F	JUNIOR DATA SCIENTIST	RETAIL	1	COLOMBIA	SOUTH AMERICA
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

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

SQL code:

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, f_name, l_name, gender, dept
FROM emp_record;
```

Result Grid | Filter Rows: | Edit:

emp_id	f_name	l_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
E620	Katrina	Allen	F	RETAIL
E640	Jenifer	Jhones	F	RETAIL
NULL	NULL	NULL	NULL	NULL

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

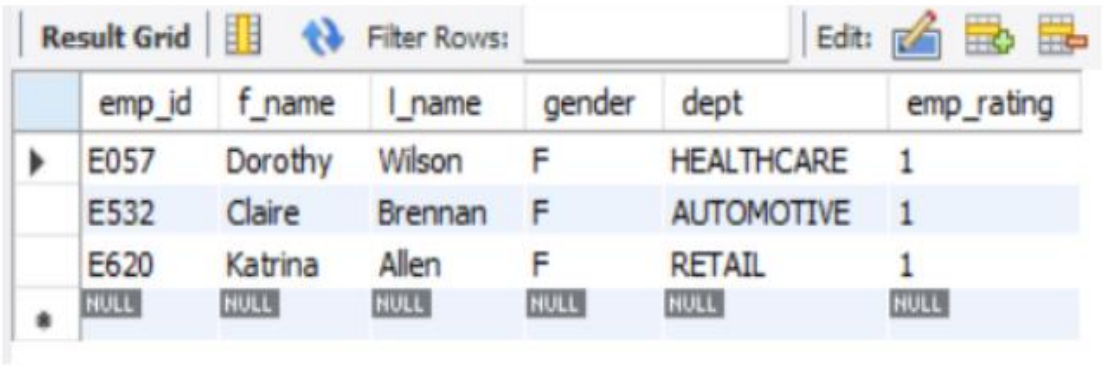
- less than two
- greater than four
- between two and four

EMP_RATING is Less than two

SQL code:

```
SELECT emp_id, f_name, l_name, gender, dept, emp_rating
 FROM emp_record
WHERE emp_rating < 2;
```

Output:



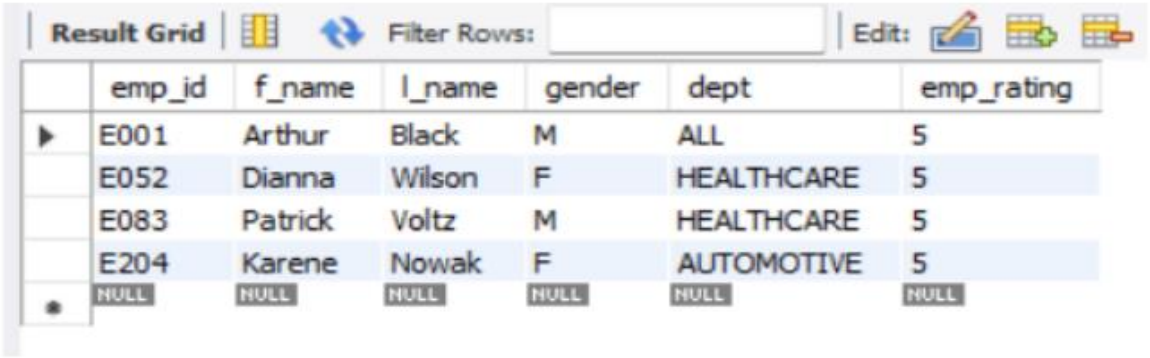
emp_id	f_name	l_name	gender	dept	emp_rating
E057	Dorothy	Wilson	F	HEALTHCARE	1
E532	Claire	Brennan	F	AUTOMOTIVE	1
E620	Katrina	Allen	F	RETAIL	1
NULL	NULL	NULL	NULL	NULL	NULL

EMP_RATING is Greater than four:

Sql code:

```
SELECT emp_id, f_name, l_name, gender, dept, emp_rating
FROM emp_record
WHERE emp_rating > 4;
```

Output:

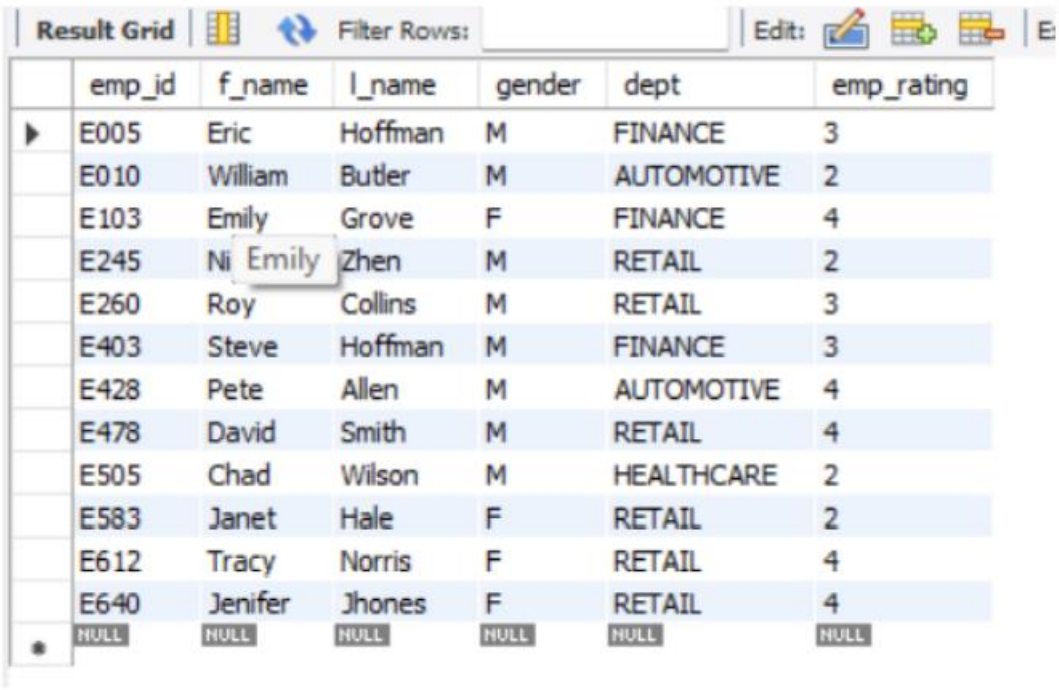


emp_id	f_name	l_name	gender	dept	emp_rating
E001	Arthur	Black	M	ALL	5
E052	Dianna	Wilson	F	HEALTHCARE	5
E083	Patrick	Voltz	M	HEALTHCARE	5
E204	Karene	Nowak	F	AUTOMOTIVE	5
NULL	NULL	NULL	NULL	NULL	NULL

EMP_ RATING is Between two and four:

SQL code:

```
SELECT emp_id, f_name, l_name, gender, dept, emp_rating
 FROM emp_record
WHERE emp_rating BETWEEN 2 AND 4;
```



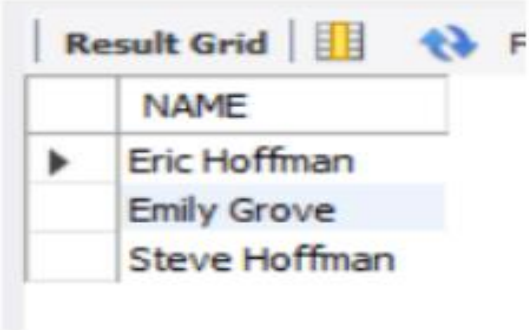
Result Grid | Filter Rows: | Edit:

emp_id	f_name	l_name	gender	dept	emp_rating
E005	Eric	Hoffman	M	FINANCE	3
E010	William	Butler	M	AUTOMOTIVE	2
E103	Emily	Grove	F	FINANCE	4
E245	Ni Emily	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
E583	Janet	Hale	F	RETAIL	2
E612	Tracy	Norris	F	RETAIL	4
E640	Jenifer	Jhones	F	RETAIL	4
NULL	NULL	NULL	NULL	NULL	NULL

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(f_name,' ',l_name)NAME
 FROM emp_record
WHERE dept = 'FINANCE';
```



Result Grid | F

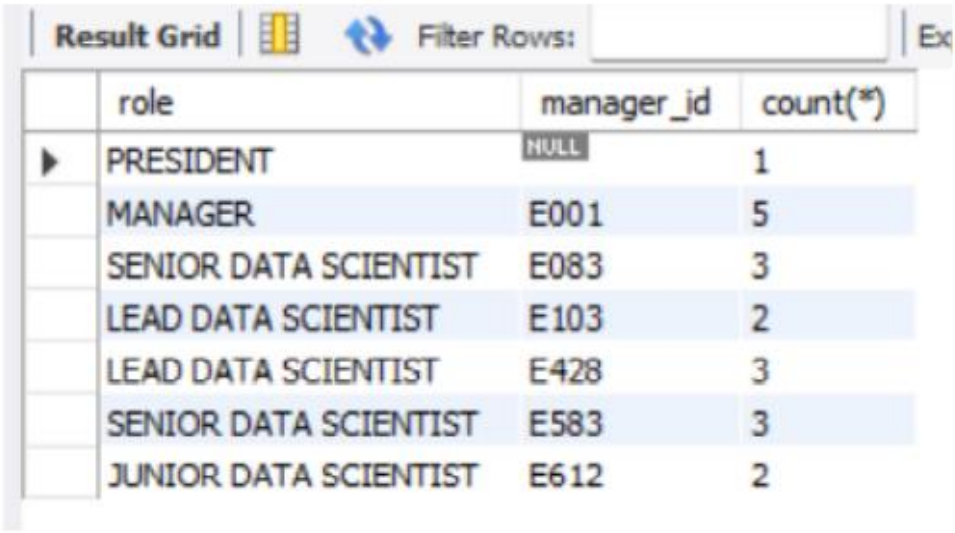
NAME
Eric Hoffman
Emily Grove
Steve Hoffman

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 role, manager_id,count(*)
FROM emp_record
GROUP BY manager_id
ORDER BY manager_id;
```

Output:


Result Grid | Filter Rows:

role	manager_id	count(*)
PRESIDENT	NULL	1
MANAGER	E001	5
SENIOR DATA SCIENTIST	E083	3
LEAD DATA SCIENTIST	E103	2
LEAD DATA SCIENTIST	E428	3
SENIOR DATA SCIENTIST	E583	3
JUNIOR DATA SCIENTIST	E612	2

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 f_name, l_name, dept
FROM emp_record
WHERE dept = 'HEALTHCARE'
UNION
SELECT f_name, l_name, dept
FROM emp_record
WHERE dept = 'FINANCE';
```

Output:

Result Grid | Filter Rows:

f_name	l_name	dept
Dianna	Wilson	HEALTHCARE
Dorothy	Wilson	HEALTHCARE
Patrick	Voltz	HEALTHCARE
Chad	Wilson	HEALTHCARE
Eric	Hoffman	FINANCE
Emily	Grove	FINANCE
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 emp_id, f_name, l_name, role, dept, emp_rating, emp_rating AS max_rating
FROM emp_record
 WHERE (dept, emp_rating)
IN (SELECT dept, MAX(emp_rating)FROM emp_record GROUP By dept)
ORDER BY dept ASC;
```

Output:

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

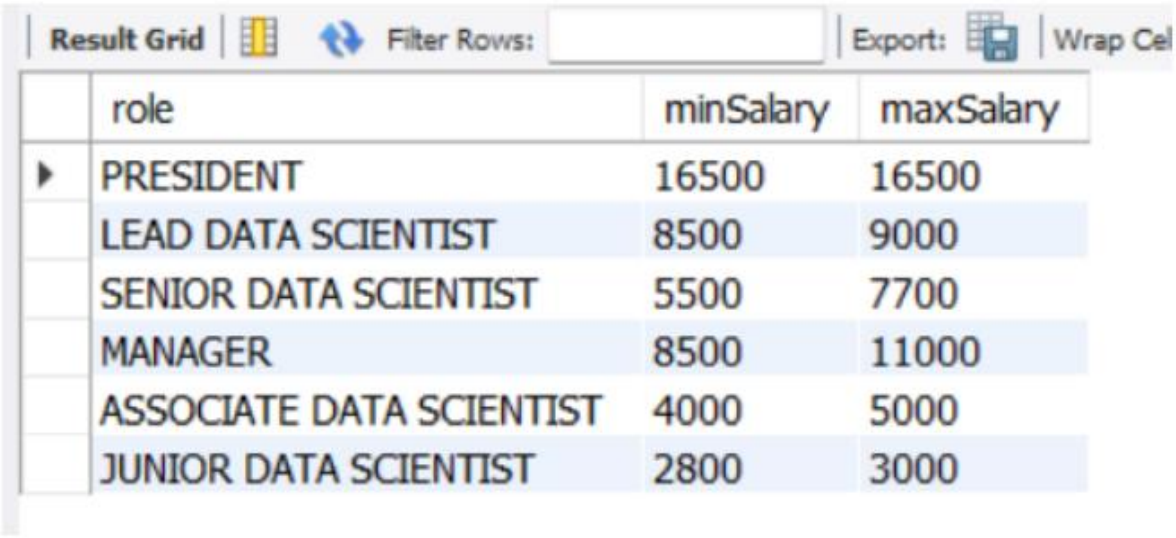
emp_id	f_name	l_name	role	dept	emp_rating	max_rating
E001	Arthur	Black	PRESIDENT	ALL	5	5
E204	Karene	Nowak	SENIOR DATA SCIENTIST	AUTOMOTIVE	5	5
E103	Emily	Grove	MANAGER	FINANCE	4	4
E052	Dianna	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	5	5
E083	Patrick	Voltz	MANAGER	HEALTHCARE	5	5
E478	David	Smith	ASSOCIATE DATA SCIENTIST	RETAIL	4	4
E612	Tracy	Norris	MANAGER	RETAIL	4	4
E640	Jenifer	Jhones	JUNIOR DATA SCIENTIST	RETAIL	4	4
NULL	NULL	NULL	NULL	NULL	NULL	NULL

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 minSalary, MAX(salary) AS maxSalary
FROM emp_record
 GROUP BY role;
```

Output:



Result Grid | Filter Rows: | Export: | Wrap Cel

role	minSalary	maxSalary
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 f_name, l_name, exp as experience,
DENSE_RANK()OVER (ORDER BY exp DESC) exp_rank
FROM emp_record;
```

Output:

Result Grid | Filter Rows:

f_name	l_name	experience	exp_rank
Arthur	Black	20	1
Patrick	Voltz	15	2
Emily	Grove	14	3
Pete	Allen	14	3
Janet	Hale	14	3
Tracy	Norris	13	4
William	Butler	12	5
Eric	Hoffman	11	6
Dorothy	Wilson	9	7
Karene	Nowak	8	8
Roy	Collins	7	9
Dianna	Wilson	6	10
Nian	Zhen	6	10
Chad	Wilson	5	11
Steve	Hoffman	4	12
David	Smith	3	13
Claire	Brennan	3	13
Katrina	Allen	2	14
Jenifer	Jhones	1	15

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 6K_salary AS
SELECT emp_id, f_name, l_name, country, salary
FROM emp_record
WHERE salary > 6000;

SELECT * FROM 6k_salary;
```

Output:

Result Grid | Filter Rows: | Export:

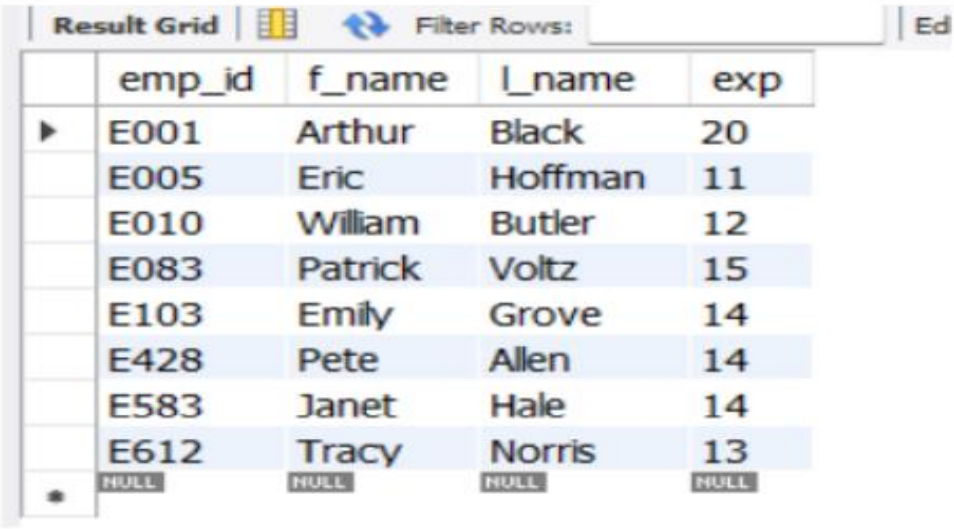
emp_id	f_name	l_name	country	salary
E001	Arthur	Black	USA	16500
E005	Eric	Hoffman	USA	8500
E010	William	Butler	FRANCE	9000
E057	Dorothy	Wilson	USA	7700
E083	Patrick	Voltz	USA	9500
E103	Emily	Grove	CANADA	10500
E204	Karene	Nowak	GERMANY	7500
E245	Nian	Zhen	CHINA	6500
E260	Roy	Collins	INDIA	7000
E428	Pete	Allen	GERMANY	11000
E583	Janet	Hale	COLOMBIA	10000
E612	Tracy	Norris	INDIA	8500

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 emp_id, f_name, l_name, exp
FROM emp_record
WHERE exp IN (
SELECT exp
FROM emp_record
 WHERE exp > 10);
```

Output:



Result Grid | Filter Rows: | Ed

emp_id	f_name	l_name	exp
E001	Arthur	Black	20
E005	Eric	Hoffman	11
E010	William	Butler	12
E083	Patrick	Voltz	15
E103	Emily	Grove	14
E428	Pete	Allen	14
E583	Janet	Hale	14
E612	Tracy	Norris	13
NULL	NULL	NULL	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 Employee3()
BEGIN
        SELECT * FROM emp_record
        WHERE exp > 3;
END //
DELIMITER;
CALL Employee3;
```

Output:

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

emp_id	f_name	l_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
E260	Roy	Collins	M	SENIOR DATA SCIENTIST	RETAIL	7	INDIA	ASIA	7000	3	E583	NA
E403	Steve	Hoffman	M	ASSOCIATE DATA SCIEN...	FINANCE	4	USA	NORTH AMERICA	5000	3	E103	P105
E428	Pete	Allen	M	MANAGER	AUTOMOTIVE	14	GERMANY	EUROPE	11000	4	E001	NULL
E505	Chad	Wilson	M	ASSOCIATE DATA SCIEN...	HEALTHCARE	5	CANADA	NORTH AMERICA	5000	2	E083	P103
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

14. 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:

```
ALTER TABLE emp_record ADD INDEX fname_index (f_name);
SELECT * FROM emp_record WHERE f_name = 'Eric';
```

Output:

emp_id	f_name	l_name	gender	role	dept	exp	country	continent	salary	emp_rating	manager_id	proj_id
E005	Eric	Hoffman	M	LEAD DATA SCIENTIST	FINANCE	11	USA	NORTH AMERICA	8500	3	E103	P105
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

15. 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 f_name, l_name, salary, ((salary * .05)*emp_rating) AS bonus
FROM emp_record;
```

Output:

Result Grid | Filter Rows: | Expor

f_name	l_name	salary	bonus
Arthur	Black	16500	4125.00
Eric	Hoffman	8500	1275.00
William	Butler	9000	900.00
Dianna	Wilson	5500	1375.00
Dorothy	Wilson	7700	385.00
Patrick	Voltz	9500	2375.00
Emily	Grove	10500	2100.00
Karene	Nowak	7500	1875.00
Nian	Zhen	6500	650.00
Roy	Collins	7000	1050.00
Steve	Hoffman	5000	750.00
Pete	Allen	11000	2200.00
David	Smith	4000	800.00
Chad	Wilson	5000	500.00
Claire	Brennan	4300	215.00
Janet	Hale	10000	1000.00
Tracy	Norris	8500	1700.00
Katrina	Allen	3000	150.00
Jenifer	Jhones	2800	560.00

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

Average salary based on the continent:

SQL Code:

```
SELECT continent, AVG (salary)
FROM emp_record
GROUP BY continent
ORDER BY continent ASC;
```

Output:

Result Grid | Filter Rows:

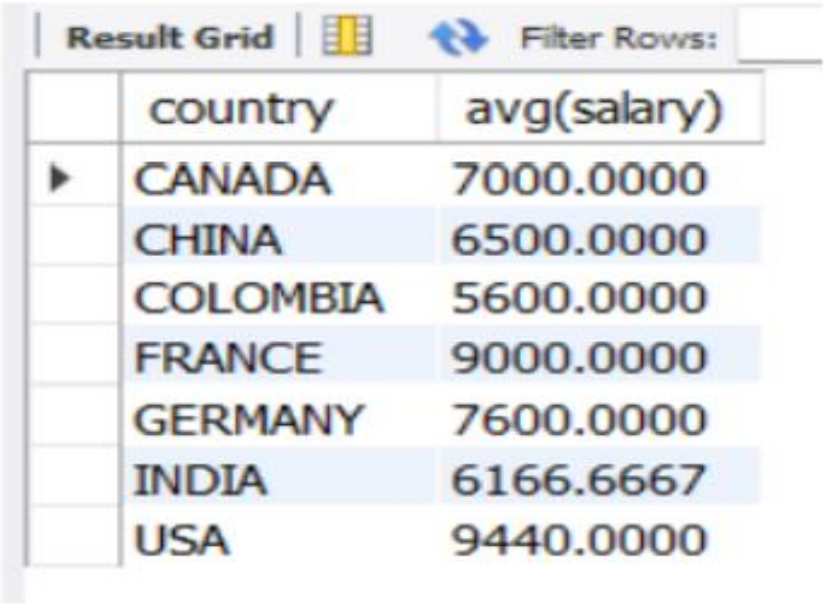
continent	avg(salary)
ASIA	6250.0000
EUROPE	7950.0000
NORTH AMERICA	8525.0000
SOUTH AMERICA	5600.0000

Average salary based on the country:

SQL Code:

```
SELECT country, AVG(salary)
FROM emp_record
GROUP BY country
ORDER BY country ASC;
```

Output:



country	avg(salary)
CANADA	7000.0000
CHINA	6500.0000
COLOMBIA	5600.0000
FRANCE	9000.0000
GERMANY	7600.0000
INDIA	6166.6667
USA	9440.0000