ScienceQtech Employee Performance Mapping

Project 1

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.

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.

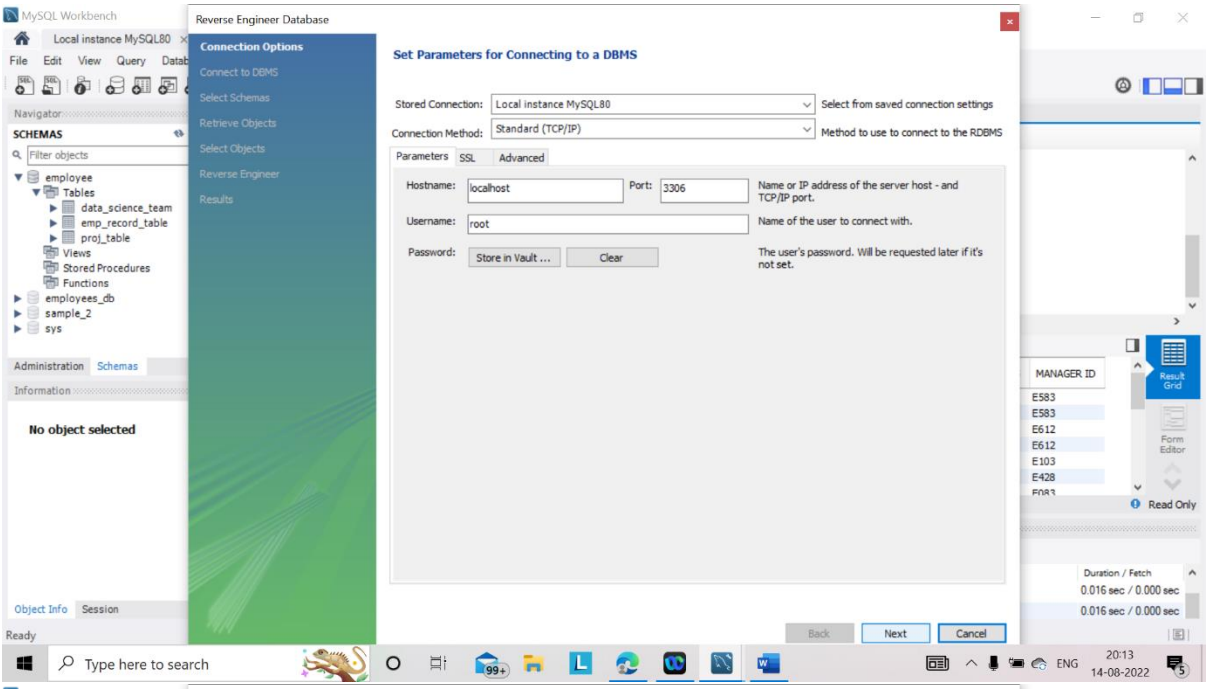
CREATE DATABASE employee;

USE employee;

>> Right click on Table Tab >> Click on Table Data Import Wizard >> Select file Path >> import data

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

-- Database> Reverse Engineering> Click on 'Next'> Select the "employee" database> click on 'Next'> Select the tables> Click on "Execute"> EER diagram ready


MySQL Workbench
Reverse Engineer Database
Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results
Set Parameters for Connecting to a DBMS
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Select from saved connection settings
Connection Method: Standard (TCP/IP)
Method to use to connect to the RDBMS
Parameters SSL Advanced
Hostname: localhost
Port: 3306
Name or IP address of the server host - and TCP/IP port.
Username: root
Name of the user to connect with.
Password: Store in Vault ... Clear
The user's password. Will be requested later if it's not set.
Back Next Cancel
No object selected
Object Info Session
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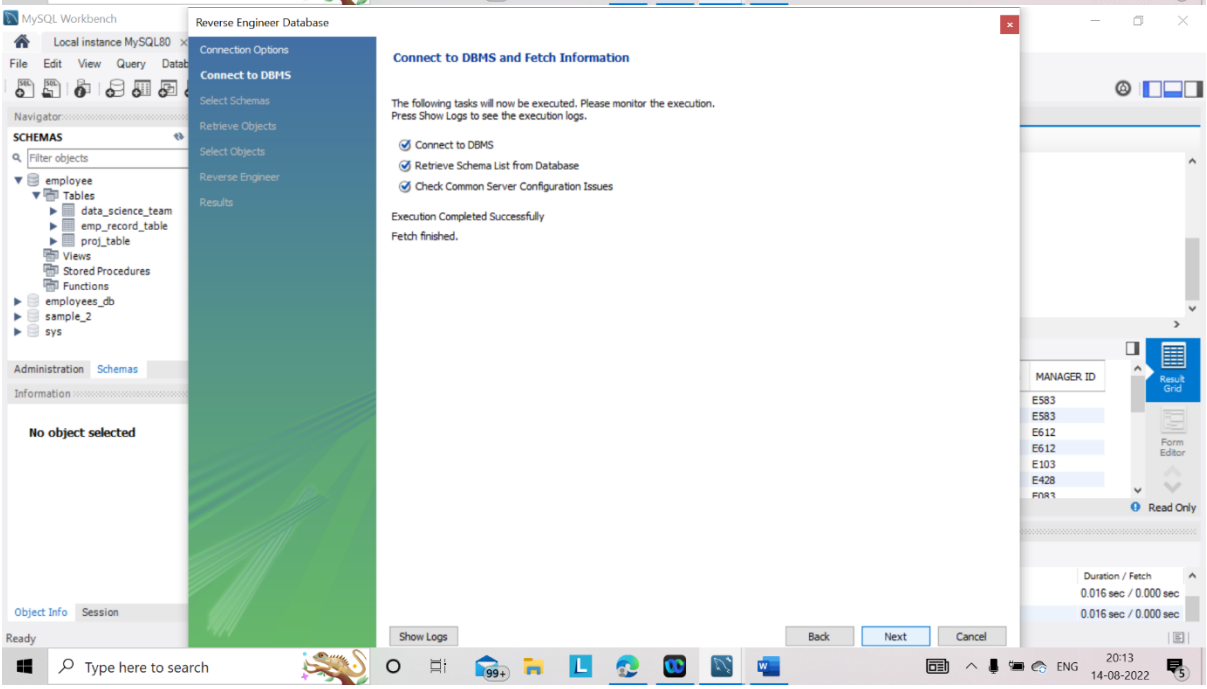
MySQL Workbench
Reverse Engineer Database
Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results
Connect to DBMS and Fetch Information
The following tasks will now be executed. Please monitor the execution.
Press Show Logs to see the execution logs.
Connect to DBMS
Retrieve Schema List from Database
Check Common Server Configuration Issues
Execution Completed Successfully
Fetch finished.
Show Logs Back Next Cancel
No object selected
Object Info Session
Ready
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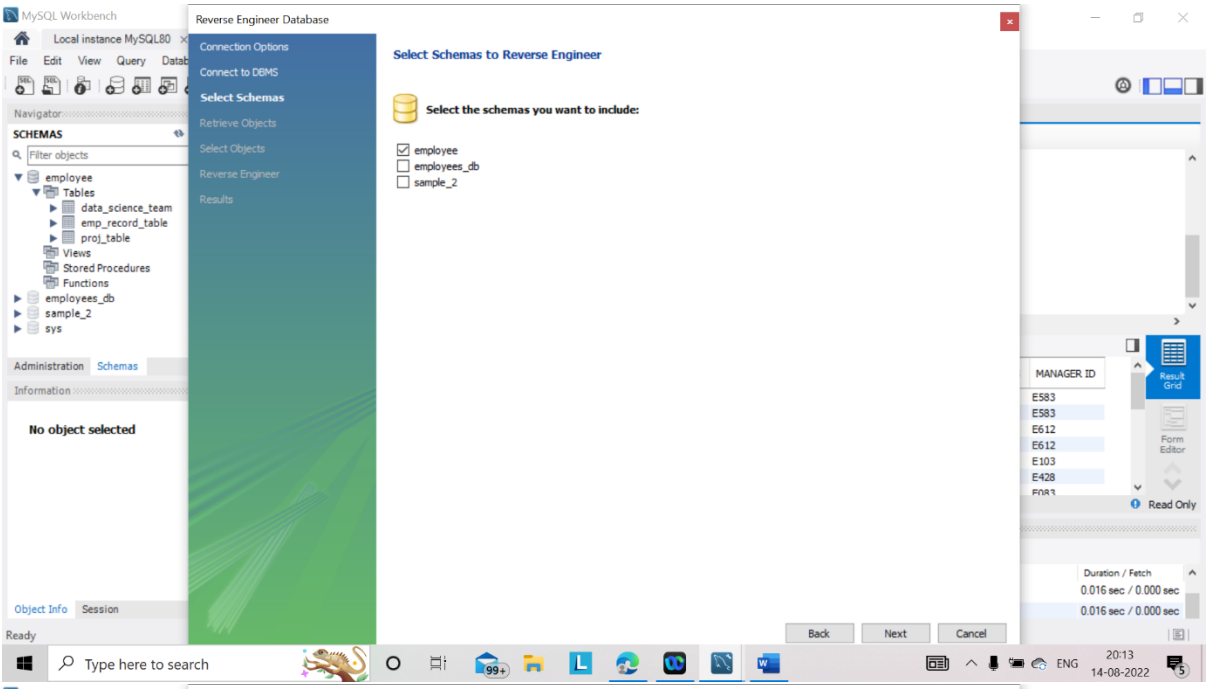
MySQL Workbench
Reverse Engineer Database
Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results
Select Schemas to Reverse Engineer
Select the schemas you want to include:
employee
employees_db
sample_2
Back
Next
Cancel
Type here to search
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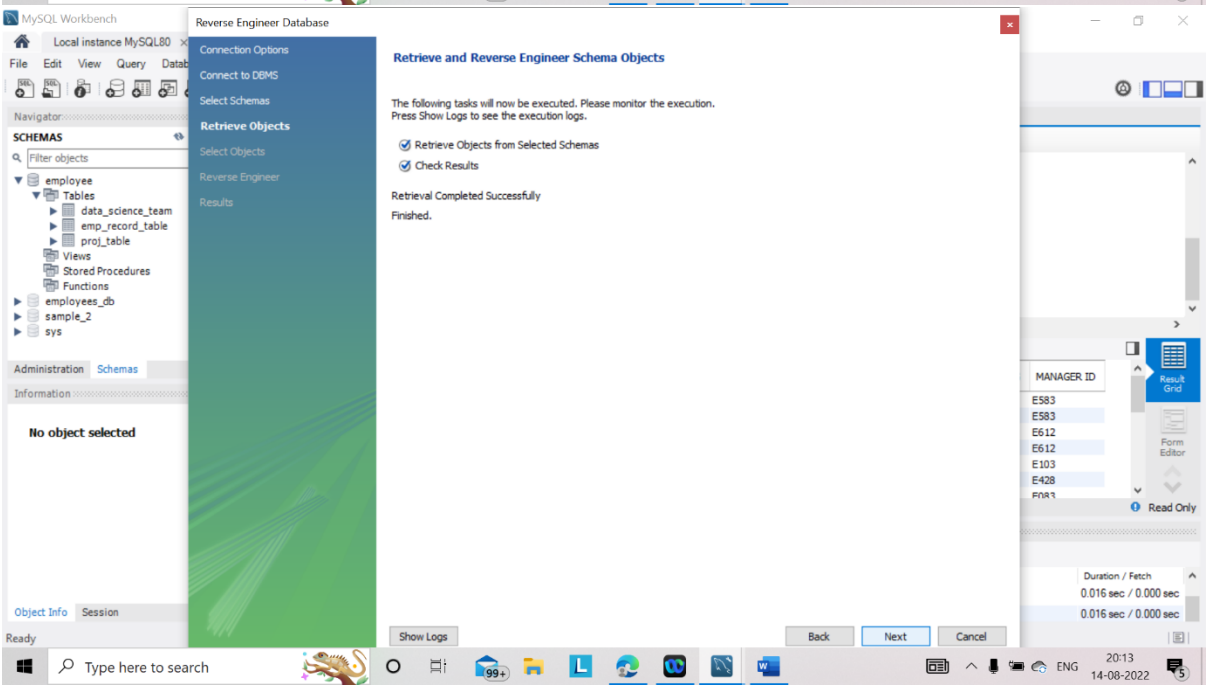
MySQL Workbench
Reverse Engineer Database
Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results
Retrieve and Reverse Engineer Schema Objects
The following tasks will now be executed. Please monitor the execution.
Press Show Logs to see the execution logs.
Retrieve Objects from Selected Schemas
Check Results
Retrieval Completed Successfully
Finished.
Show Logs
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Next
Cancel
Type here to search
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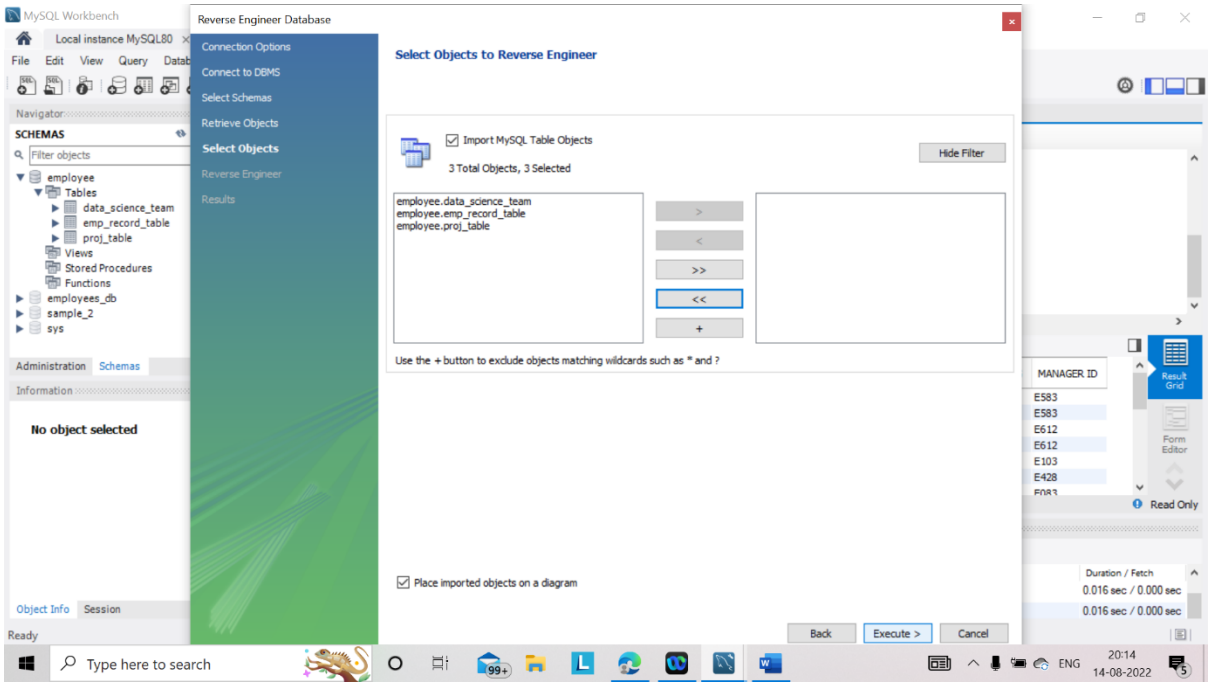
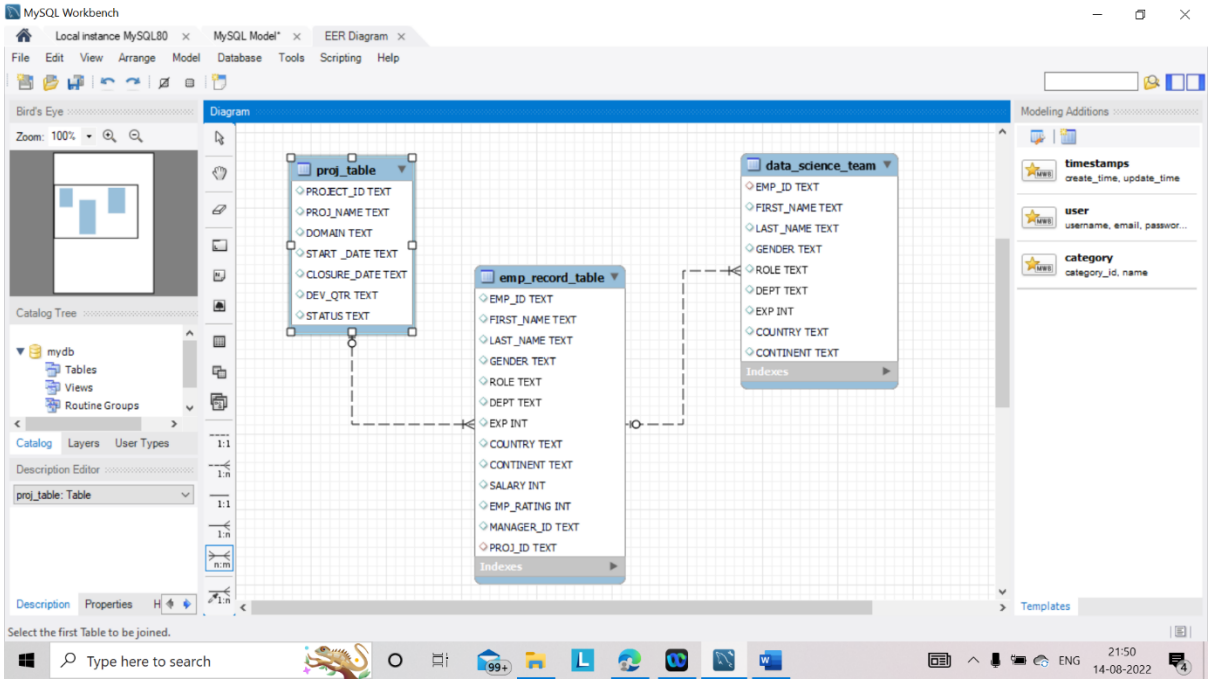


ER Diagram



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.

select EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT FROM employee.emp_record_table;

	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

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

select EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT, EMP_RATING FROM employee.emp_record_table WHERE EMP_RATING <2;

	EMP_ID	FIRST_NAME	LAST_NAME	GENDER	DEPT	EMP_RATING
▶	E057	Dorothy	Wilson	F	HEALTHCARE	1
	E532	Claire	Brennan	F	AUTOMOTIVE	1
	E620	Katrina	Allen	F	RETAIL	1

- greater than four

select EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT, EMP_RATING FROM employee.emp_record_table WHERE EMP_RATING >4;

EMP_ID	FIRST_NAME	LAST_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

- between two and four

select EMP_ID, FIRST_NAME, LAST_NAME, GENDER, DEPT, EMP_RATING FROM employee.emp_record_table WHERE EMP_RATING >=2 and EMP_RATING<=4;

EMP_ID	FIRST_NAME	LAST_NAME	GENDER	DEPT	EMP_RATING
E005	Eric	Hoffman	M	FINANCE	3
E010	William	Butler	M	AUTOMOTIVE	2
E103	Emily	Grove	F	FINANCE	4
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
E583	Janet	Hale	F	RETAIL	2
E612	Tracy	Norris	F	RETAIL	4
E640	Jenifer	Jhones	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.

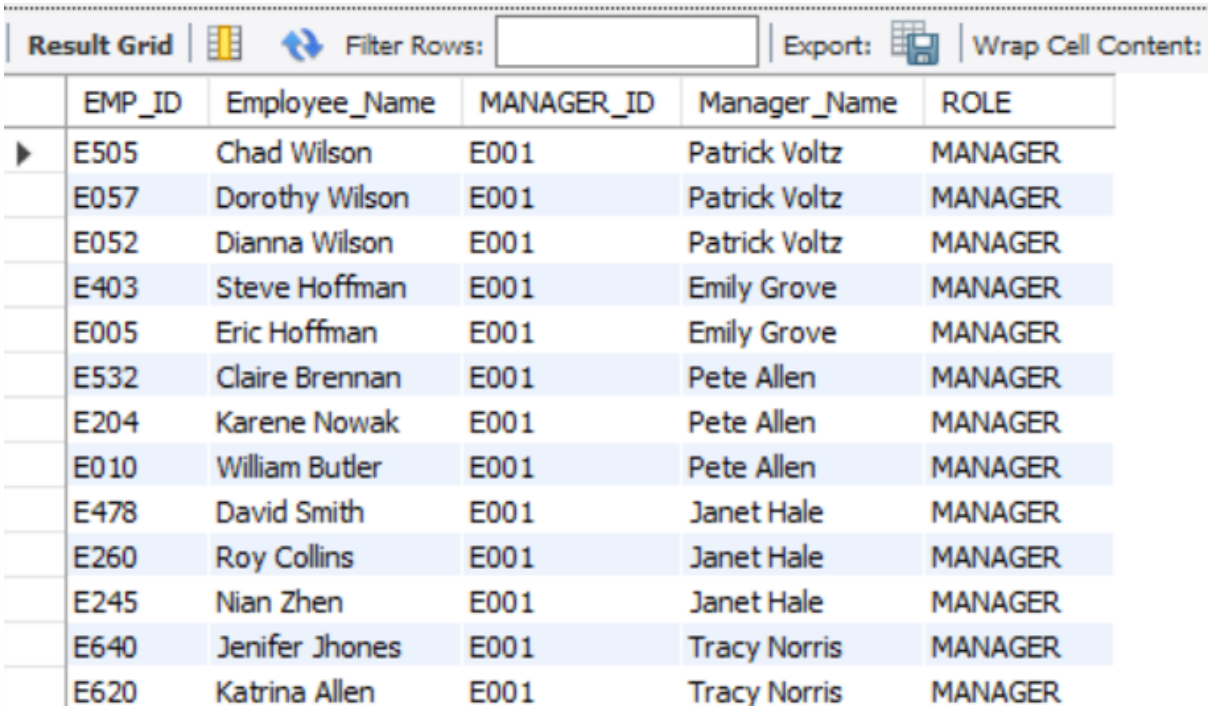
SELECT CONCAT(FIRST_NAME,' ', LAST_NAME) AS NAME FROM employee.emp_record_table WHERE DEPT ='FINANCE';

NAME	DEPT
Eric Hoffman	FINANCE
Emily Grove	FINANCE
Steve Hoffman	FINANCE

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

SELECT employee.EMP_ID, CONCAT(employee.FIRST_NAME, ' ',employee.LAST_NAME) AS Employee_Name, manager.MANAGER_ID, CONCAT(manager.FIRST_NAME, ' ',manager.LAST_NAME) AS Manager_Name,

manager.ROLE AS ROLE FROM emp_record_table employee JOIN emp_record_table manager ON employee.MANAGER_ID = manager.EMP_ID;

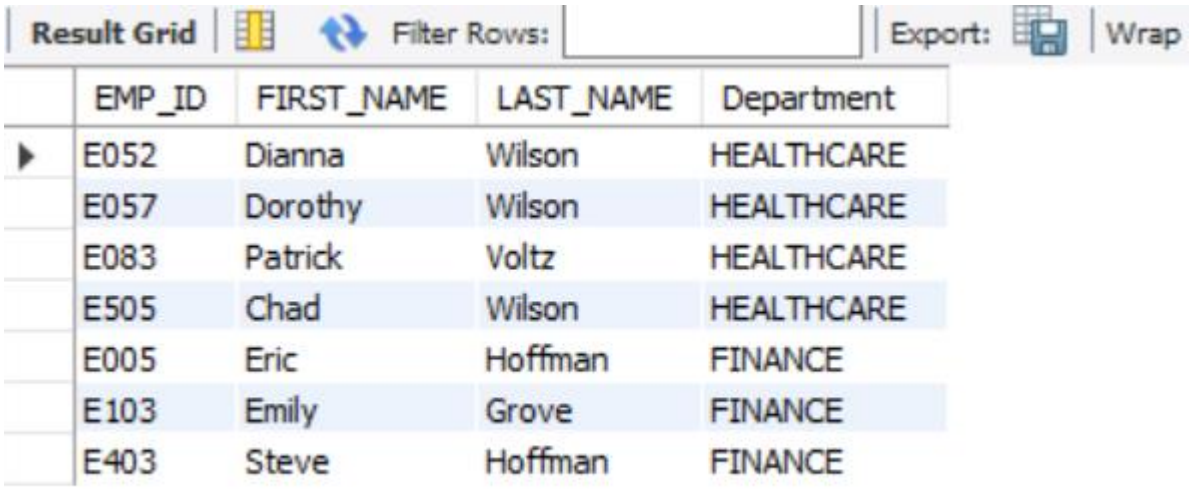


Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	Employee_Name	MANAGER_ID	Manager_Name	ROLE
E505	Chad Wilson	E001	Patrick Voltz	MANAGER
E057	Dorothy Wilson	E001	Patrick Voltz	MANAGER
E052	Dianna Wilson	E001	Patrick Voltz	MANAGER
E403	Steve Hoffman	E001	Emily Grove	MANAGER
E005	Eric Hoffman	E001	Emily Grove	MANAGER
E532	Claire Brennan	E001	Pete Allen	MANAGER
E204	Karene Nowak	E001	Pete Allen	MANAGER
E010	William Butler	E001	Pete Allen	MANAGER
E478	David Smith	E001	Janet Hale	MANAGER
E260	Roy Collins	E001	Janet Hale	MANAGER
E245	Nian Zhen	E001	Janet Hale	MANAGER
E640	Jenifer Jhones	E001	Tracy Norris	MANAGER
E620	Katrina Allen	E001	Tracy Norris	MANAGER

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.

SELECT EMP_ID, FIRST_NAME, LAST_NAME, DEPT AS Department FROM emp_record_table WHERE DEPT = 'HEALTHCARE' UNION SELECT EMP_ID, FIRST_NAME, LAST_NAME, DEPT AS Department FROM emp_record_table WHERE DEPT = 'FINANCE';

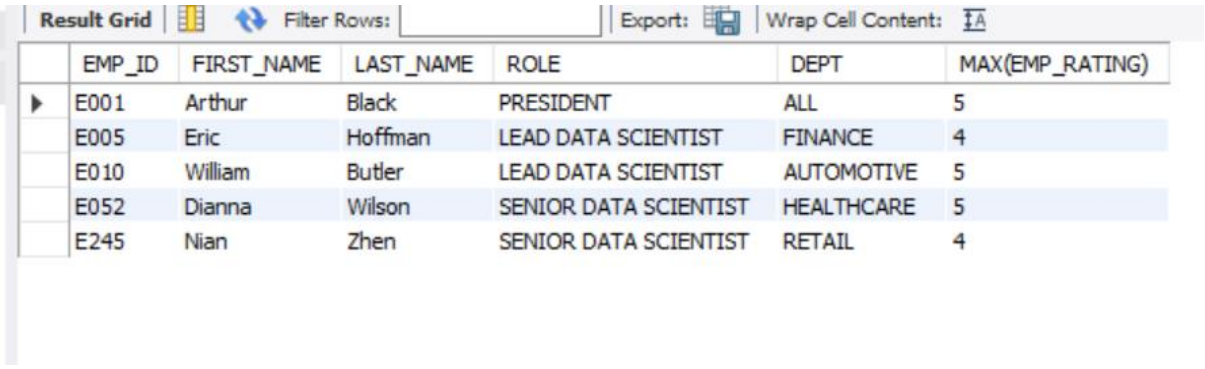


Result Grid | Filter Rows: | Export: | Wrap

EMP_ID	FIRST_NAME	LAST_NAME	Department
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.

SELECT EMP_ID, FIRST_NAME, LAST_NAME, ROLE, DEPT, MAX(EMP_RATING) FROM emp_record_table GROUP BY DEPT;

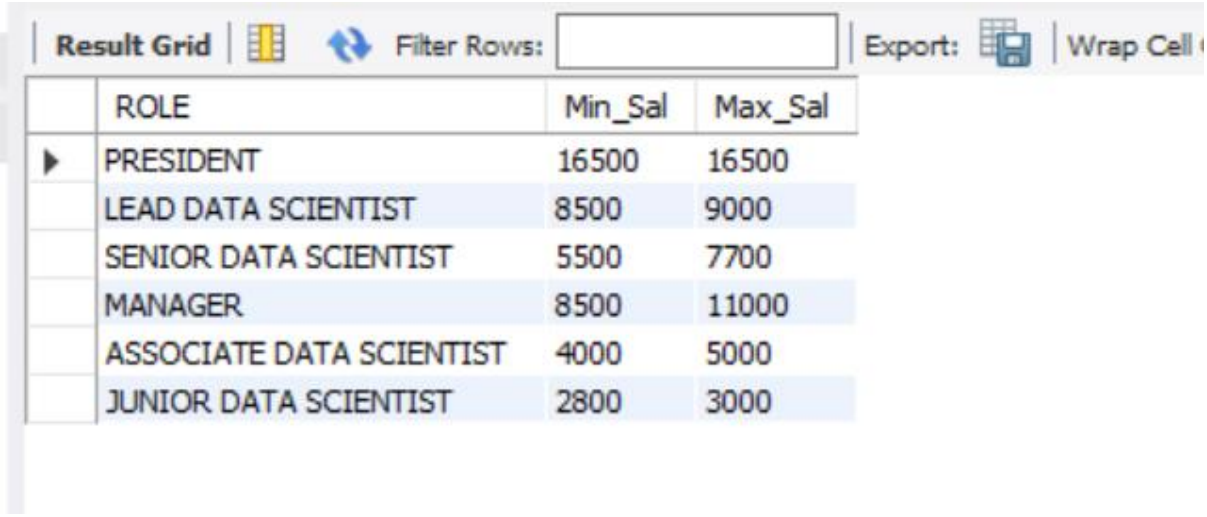


Result Grid | Filter Rows: | Export: | Wrap Cell Content:

EMP_ID	FIRST_NAME	LAST_NAME	ROLE	DEPT	MAX(EMP_RATING)
E001	Arthur	Black	PRESIDENT	ALL	5
E005	Eric	Hoffman	LEAD DATA SCIENTIST	FINANCE	4
E010	William	Butler	LEAD DATA SCIENTIST	AUTOMOTIVE	5
E052	Dianna	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	5
E245	Nian	Zhen	SENIOR DATA SCIENTIST	RETAIL	4

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.

SELECT ROLE, MIN(SALARY) AS Min_Sal, MAX(SALARY) AS Max_Sal FROM emp_record_table GROUP BY ROLE;



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

ROLE	Min_Sal	Max_Sal
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.

SELECT EMP_ID, FIRST_NAME, LAST_NAME, ROLE, DEPT, EXP, ROW_NUMBER() OVER (ORDER BY EXP DESC) AS Ranking FROM emp_record_table ;

EMP_ID	FIRST_NAME	LAST_NAME	ROLE	DEPT	EXP	Ranking
E001	Arthur	Black	PRESIDENT	ALL	20	1
E083	Patrick	Voltz	MANAGER	HEALTHCARE	15	2
E103	Emily	Grove	MANAGER	FINANCE	14	3
E428	Pete	Allen	MANAGER	AUTOMOTIVE	14	4
E583	Janet	Hale	MANAGER	RETAIL	14	5
E612	Tracy	Norris	MANAGER	RETAIL	13	6
E010	William	Butler	LEAD DATA SCIENTIST	AUTOMOTIVE	12	7
E005	Eric	Hoffman	LEAD DATA SCIENTIST	FINANCE	11	8
E057	Dorothy	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	9	9
E204	Karene	Nowak	SENIOR DATA SCIENTIST	AUTOMOTIVE	8	10
E260	Roy	Collins	SENIOR DATA SCIENTIST	RETAIL	7	11
E052	Dianna	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	6	12
E245	Nian	Zhen	SENIOR DATA SCIENTIST	RETAIL	6	13

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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.

CREATE VIEW employee_sal AS SELECT EMP_ID, FIRST_NAME, LAST_NAME, COUNTRY, SALARY FROM emp_record_table WHERE SALARY > 6000;

EMP_ID	FIRST_NAME	LAST_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

emp_record_table 29

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

SELECT EMP_ID, FIRST_NAME, LAST_NAME, EXP FROM emp_record_table WHERE EMP_ID IN (SELECT EMP_ID FROM emp_record_table WHERE EXP > 10);

EMP_ID	FIRST_NAME	LAST_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

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.

DELIMITER $$ CREATE PROCEDURE get_employee_exp() BEGIN SELECT * FROM emp_record_table WHERE EXP > 3; END$$ CALL get_employee_exp();

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',

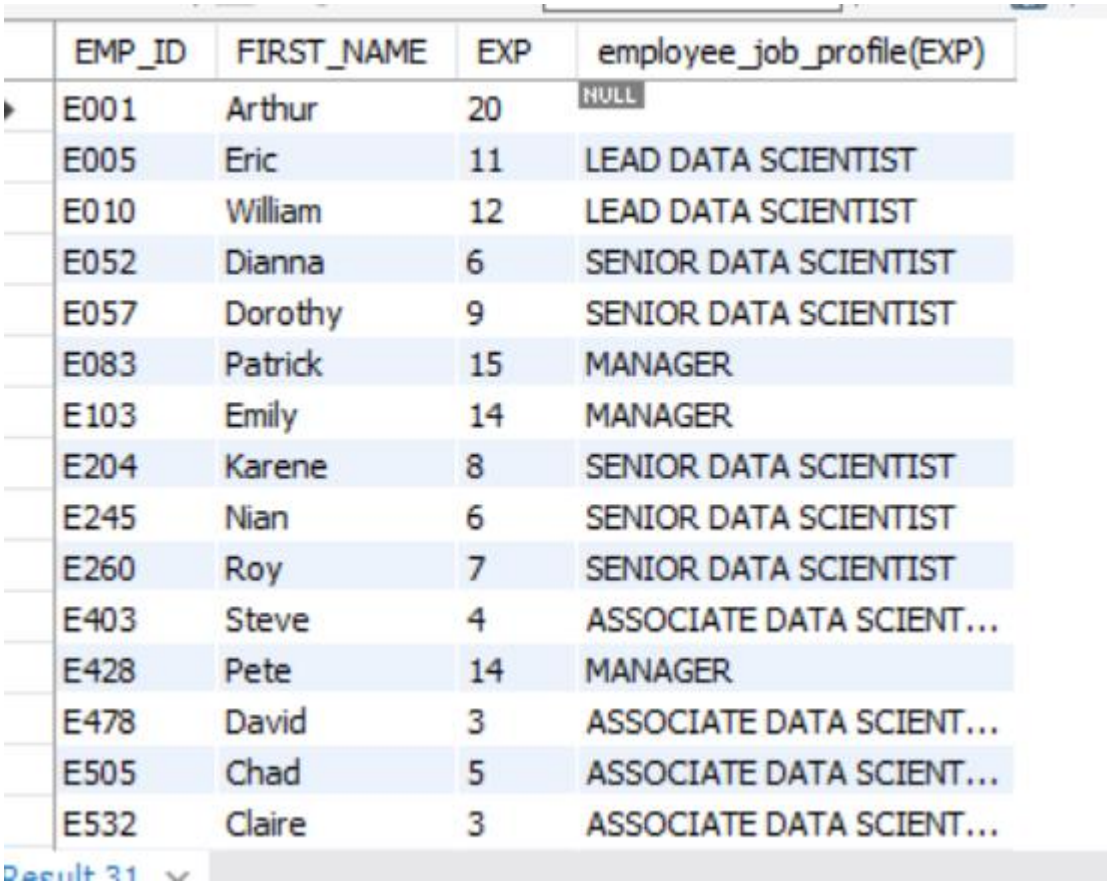
For an employee with the experience of 2 to 5 years assign 'ASSOCIATE DATA SCIENTIST',

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'.

DELIMITER $$ CREATE FUNCTION employee_job_profile(EXP int) RETURNS VARCHAR(50) DETERMINISTIC BEGIN DECLARE employee_job_profile VARCHAR(50); IF EXP <= 2 THEN SET employee_job_profile = 'JUNIOR DATA SCIENTIST'; ELSEIF EXP BETWEEN 2 AND 5 THEN SET employee_job_profile = 'ASSOCIATE DATA SCIENTIST'; ELSEIF EXP BETWEEN 5 AND 10 THEN SET employee_job_profile = 'SENIOR DATA SCIENTIST'; ELSEIF EXP BETWEEN 10 AND 12 THEN SET employee_job_profile = 'LEAD DATA SCIENTIST'; ELSEIF EXP BETWEEN 12 AND 16 THEN SET employee_job_profile = 'MANAGER'; END IF; RETURN (employee_job_profile); END$$ SELECT EMP_ID, FIRST_NAME, EXP, employee_job_profile(EXP) FROM emp_record_table;



EMP_ID	FIRST_NAME	EXP	employee_job_profile(EXP)
E001	Arthur	20	NULL
E005	Eric	11	LEAD DATA SCIENTIST
E010	William	12	LEAD DATA SCIENTIST
E052	Dianna	6	SENIOR DATA SCIENTIST
E057	Dorothy	9	SENIOR DATA SCIENTIST
E083	Patrick	15	MANAGER
E103	Emily	14	MANAGER
E204	Karene	8	SENIOR DATA SCIENTIST
E245	Nian	6	SENIOR DATA SCIENTIST
E260	Roy	7	SENIOR DATA SCIENTIST
E403	Steve	4	ASSOCIATE DATA SCIENT...
E428	Pete	14	MANAGER
E478	David	3	ASSOCIATE DATA SCIENT...
E505	Chad	5	ASSOCIATE DATA SCIENT...
E532	Claire	3	ASSOCIATE DATA SCIENT...

Result 31

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.

```
CREATE INDEX idx_first_name ON emp_record_table(FIRST_NAME);

EXPLAIN SELECT EMP_ID, FIRST_NAME, LAST_NAME FROM emp_record_table WHERE FIRST_NAME = 'Eric';
```

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).

```
SELECT EMP_ID, FIRST_NAME, LAST_NAME, ROLE, DEPT, EXP, SALARY, EMP_RATING, (0.05 * SALARY)*EMP_RATING AS Bonus FROM emp_record_table;
```

EMP_ID	FIRST_NAME	LAST_NAME	ROLE	DEPT	EXP	SALARY	EMP_RATING	Bonus
E001	Arthur	Black	PRESIDENT	ALL	20	16500	5	4125.00
E005	Eric	Hoffman	LEAD DATA SCIENTIST	FINANCE	11	8500	3	1275.00
E010	William	Butler	LEAD DATA SCIENTIST	AUTOMOTIVE	12	9000	2	900.00
E052	Dianna	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	6	5500	5	1375.00
E057	Dorothy	Wilson	SENIOR DATA SCIENTIST	HEALTHCARE	9	7700	1	385.00
E083	Patrick	Voltz	MANAGER	HEALTHCARE	15	9500	5	2375.00
E103	Emily	Grove	MANAGER	FINANCE	14	10500	4	2100.00
E204	Karene	Nowak	SENIOR DATA SCIENTIST	AUTOMOTIVE	8	7500	5	1875.00
E245	Nian	Zhen	SENIOR DATA SCIENTIST	RETAIL	6	6500	2	650.00
E260	Roy	Collins	SENIOR DATA SCIENTIST	RETAIL	7	7000	3	1050.00
E403	Steve	Hoffman	ASSOCIATE DATA SCIEN...	FINANCE	4	5000	3	750.00
E428	Pete	Allen	MANAGER	AUTOMOTIVE	14	11000	4	2200.00
E478	David	Smith	ASSOCIATE DATA SCIEN...	RETAIL	3	4000	4	800.00
E505	Chad	Wilson	ASSOCIATE DATA SCIEN...	HEALTHCARE	5	5000	2	500.00
E532	Claire	Brennan	ASSOCIATE DATA SCIEN...	AUTOMOTIVE	3	4300	1	215.00

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

SELECT EMP_ID, FIRST_NAME,LAST_NAME, COUNTRY,CONTINENT, AVG(SALARY) FROM emp_record_table GROUP BY CONTINENT,COUNTRY;

EMP_ID	FIRST_NAME	LAST_NAME	COUNTRY	CONTINENT	AVG(SALARY)
E001	Arthur	Black	USA	NORTH AMERICA	9440.0000
E010	William	Butler	FRANCE	EUROPE	9000.0000
E052	Dianna	Wilson	CANADA	NORTH AMERICA	7000.0000
E204	Karene	Nowak	GERMANY	EUROPE	7600.0000
E245	Nian	Zhen	CHINA	ASIA	6500.0000
E260	Roy	Collins	INDIA	ASIA	6166.6667
E478	David	Smith	COLOMBIA	SOUTH AMERICA	5600.0000