

Load SQL Extension

```
In [1]: %load_ext sql
```

Connect to MySQL

```
In [2]: %sql mysql+mysqldb://root:root@localhost/employee_attration
```

Read the data from table

```
In [50]: %sql select * from employee_attrition LIMIT 5;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
5 rows affected.
```

```
Out[50]: Age Attrition BusinessTravel DailyRate Department DistanceFromHome Education EducationField EmployeeCount EmployeeNumber E
```

41	Yes	Travel_Rarely	1102	Sales	1	2	Life Sciences	1	1
49	No	Travel_Frequently	279	Research & Development	8	1	Life Sciences	1	2
37	Yes	Travel_Rarely	1373	Research & Development	2	2	Other	1	4
33	No	Travel_Frequently	1392	Research & Development	3	4	Life Sciences	1	5
27	No	Travel_Rarely	591	Research & Development	2	1	Medical	1	7

Check no.of rows in Table

```
In [47]: %%sql
```

```
SELECT COUNT(*) AS num_rows FROM employee_attrition;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
1 rows affected.
```

Out[47]: num_rows

1470

Check no.of columns in Table

In [48]: %%sql

```
SELECT COUNT(*) as 'Number of Columns'
FROM information_schema.columns
WHERE table_name = 'employee_attrition';
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
1 rows affected.
```

Out[48]: Number of Columns

34

Find out which departments have high attrition rates

In [4]: %%sql

```
SELECT Department, COUNT(*) as AttritionCount
FROM employee_attrition
WHERE Attrition = 'Yes'
GROUP BY Department
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
3 rows affected.
```

Out[4]: Department AttritionCount

Research & Development	133
Sales	92
Human Resources	12

Find out realtionship between gender and attrition rate

In [5]: `%%sql`

```
SELECT GENDER,Department,COUNT(*) as AttritionCount
FROM employee_attrition
WHERE MaritalStatus="Single"
GROUP BY GENDER,Department
ORDER BY AttritionCount DESC;
```

* mysql+mysqladb://root:***@localhost/employee_attrition
6 rows affected.

Out[5]:

GENDER	Department	AttritionCount
Male	Research & Development	175
Female	Research & Development	129
Male	Sales	88
Female	Sales	65
Male	Human Resources	8
Female	Human Resources	5

GENDER	Department	AttritionCount
Male	Research & Development	175
Female	Research & Development	129
Male	Sales	88
Female	Sales	65
Male	Human Resources	8
Female	Human Resources	5

Find out the Relationship between education field and attrition rate.

In [6]: `%%sql`

```
SELECT EducationField, COUNT(*) as AttritionCount
FROM employee_attrition
WHERE Attrition = 'Yes'
GROUP BY EducationField
ORDER BY AttritionCount DESC;
```

* mysql+mysqladb://root:***@localhost/employee_attrition
6 rows affected.

Out[6]: **EducationField AttritionCount**

Life Sciences	89
Medical	63
Marketing	35
Technical Degree	32
Other	11
Human Resources	7

Calculate the average monthly income of all employee who worked more than 5 year whose education background is Life Science.

In [7]: **%%sql**

```
SELECT AVG(MONTHLYINCOME),
       MIN(MONTHLYINCOME),
       MAX(MONTHLYINCOME)
  FROM employee_attrition
 WHERE YearsAtCompany>5
   AND EducationField="Life Sciences"
 GROUP BY EducationField;
```

* mysql+mysqldb://root:***@localhost/employee_attration
1 rows affected.

Out[7]: **AVG(MONTHLYINCOME) MIN(MONTHLYINCOME) MAX(MONTHLYINCOME)**

8150.2509	2011	19999
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Finding out no.of employee who left company were not promoted in last 5 year.

In [8]: **%%sql**

```
SELECT Department, YearsSinceLastPromotion, COUNT(*) as AttritionCount
  FROM employee_attrition
 WHERE Attrition = 'Yes'
   AND YearsSinceLastPromotion<5
 GROUP BY YearsSinceLastPromotion, Department
 ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
14 rows affected.
```

Out[8]:

Department	YearsSinceLastPromotion	AttritionCount
Research & Development	0	65
Sales	0	39
Research & Development	1	29
Sales	1	17
Research & Development	2	13
Sales	2	12
Human Resources	0	6
Research & Development	3	4
Sales	3	4
Sales	4	3
Human Resources	1	3
Research & Development	4	2
Human Resources	2	2
Human Resources	3	1

In []:

FIND THE NO.OF EMPLOYEE WITH MAX PERFORMANCE RATING BUT NO PRMOTION FOR 4 YEAR.

In [9]:

```
%%sql
SELECT Department,COUNT(*) as AttritionCount
FROM employee_attrition
WHERE PerformanceRating=(SELECT MAX(PerformanceRating) from employee_attrition)
and YearsSinceLastPromotion<4
GROUP BY Department
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
3 rows affected.
```

Out[9]: **Department AttritionCount**

Research & Development	128
Sales	37
Human Resources	7

In []:

Find the relationship between total working year and attrition rate.

In [10]: **%%sql**

```
SELECT Department, YearsAtCompany, COUNT(*) as AttritionCount
FROM employee_attrition
WHERE Attrition = 'Yes'
AND YearsAtCompany<5
GROUP BY Department, YearsAtCompany
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
14 rows affected.
```

Out[10]:

Department	YearsAtCompany	AttritionCount
Research & Development	1	38
Sales	1	17
Research & Development	2	13
Sales	2	12
Research & Development	4	11
Sales	3	10
Research & Development	0	9
Research & Development	3	8
Sales	0	7
Sales	4	7
Human Resources	1	4
Human Resources	3	2
Human Resources	2	2
Human Resources	4	1

In []:

Understanding the relationship between attrition rate and employee statification.

In [11]:

```
%%sql  
  
SELECT Department, EnvironmentSatisfaction, COUNT(*) as AttritionCount  
FROM employee_attrition  
WHERE Attrition = 'Yes'  
GROUP BY Department, EnvironmentSatisfaction  
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration  
12 rows affected.
```

Out[11]:

Department	EnvironmentSatisfaction	AttritionCount
Research & Development	1	43
Research & Development	3	38
Research & Development	4	34
Sales	1	25
Sales	4	23
Sales	2	22
Sales	3	22
Research & Development	2	18
Human Resources	1	4
Human Resources	2	3
Human Resources	4	3
Human Resources	3	2

Analyze the performance rating on attrition rate.

In [12]:

```
%%sql  
  
SELECT JobRole, PerformanceRating, COUNT(*) as AttritionCount  
FROM employee_attrition  
WHERE Attrition = 'Yes'  
GROUP BY JobRole, PerformanceRating  
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attrition  
15 rows affected.
```

Out[12]:

JobRole	PerformanceRating	AttritionCount
Sales Executive	3	51
Laboratory Technician	3	49
Research Scientist	3	35
Sales Representative	3	29
Laboratory Technician	4	13
Research Scientist	4	12
Human Resources	3	11
Manufacturing Director	3	10
Healthcare Representative	3	8
Sales Executive	4	6
Manager	3	5
Sales Representative	4	4
Research Director	3	2
Human Resources	4	1
Healthcare Representative	4	1

In []:

Identifying which employees had similar characteristics and left the company together.

In [13]:

```
%%sql
SELECT Department, JobRole, COUNT(*) as AttritionCount
FROM employee_attrition
WHERE Attrition = 'Yes'
GROUP BY Department, JobRole
HAVING COUNT(*) > 1
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqladb://root:***@localhost/employee_attration
10 rows affected.
```

Out[13]:

Department	JobRole	AttritionCount
Research & Development	Laboratory Technician	62
Sales	Sales Executive	57
Research & Development	Research Scientist	47
Sales	Sales Representative	33
Human Resources	Human Resources	12
Research & Development	Manufacturing Director	10
Research & Development	Healthcare Representative	9
Research & Development	Manager	3
Research & Development	Research Director	2
Sales	Manager	2

In []:

Analyzing the impact of work-life balance on attrition rate.

In [14]:

```
%%sql  
  
SELECT Department,WorkLifeBalance, COUNT(*) as AttritionCount  
FROM employee_attrition  
WHERE Attrition = 'Yes'  
GROUP BY Department,WorkLifeBalance  
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration  
11 rows affected.
```

Out[14]:

Department	WorkLifeBalance	AttritionCount
Research & Development	3	68
Sales	3	50
Research & Development	2	32
Sales	2	24
Research & Development	1	19
Research & Development	4	14
Sales	4	12
Human Resources	3	9
Sales	1	6
Human Resources	2	2
Human Resources	4	1

In []:

Examining the relationship between overtime and attrition rate.

In [15]:

```
%%sql  
  
SELECT Department,OverTime, COUNT(*) as AttritionCount  
FROM employee_attrition  
WHERE Attrition = 'Yes'  
GROUP BY Department,OverTime  
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attrition  
6 rows affected.
```

Out[15]:

Department	OverTime	AttritionCount
Research & Development	Yes	74
Research & Development	No	59
Sales	Yes	48
Sales	No	44
Human Resources	No	7
Human Resources	Yes	5

Analyzing the impact of years at current role on attrition rate.

In [16]:

```
%%sql
```

```
SELECT YearsInCurrentRole, COUNT(*) as AttritionCount
FROM employee_attrition
WHERE Attrition = 'Yes'
GROUP BY YearsInCurrentRole
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attrition
15 rows affected.
```

Out[16]: **YearsInCurrentRole AttritionCount**

0	73
2	68
7	31
3	16
4	15
1	11
8	7
9	6
15	2
10	2
6	2
14	1
13	1
12	1
5	1

Find out realtionship between marital status and attriton rate.

In [17]: **%%sql**

```
SELECT Department,MaritalStatus, COUNT(*) as AttritionCount
FROM employee_attrition
WHERE Attrition = 'Yes'
GROUP BY Department,MaritalStatus
ORDER BY AttritionCount DESC;
```

```
* mysql+mysqldb://root:***@localhost/employee_attration
9 rows affected.
```

Out[17]:

Department	MaritalStatus	AttritionCount
Research & Development	Single	66
Sales	Single	53
Research & Development	Married	49
Sales	Married	29
Research & Development	Divorced	18
Sales	Divorced	10
Human Resources	Married	6
Human Resources	Divorced	5
Human Resources	Single	1

Identifying any relation between number of companies worked by an employee and attrition rate

In [27]: %%sql

```
SELECT
    EducationField,
    NumCompaniesWorked,
    AVG(CASE WHEN Attrition = 'Yes' THEN 1 ELSE 0 END) AS Attrition_Rate
FROM
    employee_attrition
GROUP BY
    EducationField;
```

```
* mysql+mysqldb://root:***@localhost/employee_attrition
6 rows affected.
```

Out[27]:

EducationField	NumCompaniesWorked	Attrition_Rate
Life Sciences	8	0.1469
Other	6	0.1341
Medical	9	0.1358
Marketing	0	0.2201
Technical Degree	3	0.2424
Human Resources	4	0.2593

In []: