# MySQL commands :- Part-III

# NULL Values. E.g. consider the following query –

```
select name
from instructor_r
where salary is null;

select name
from instructor_r
where salary is not null;
```

#Aggregate functions
# avg ( ) E.g. consider the query – find out the average salary of instructor
#from the table instructor_r.

```
select *
from instructor_r;

select avg (salary)
from instructor_r;
```

#Consider the query – find out the average salary of instructor of computer
#department from the table instructor_r.

```
select avg (salary)
from instructor_r
where dept_name = ‘Computer’;
```

#Consider the query as follow–

```
select avg (salary) as Average_Salary
from instructor_r
where dept_name = ‘Computer’;

select avg(salary) as Average_Salary
from instructor_r
where dept_name < > 'Computer';
```

# count ( ):- Consider the query – find out the total number of instructors in #the table instructor.

```
select count (ID) as Total_Instructor
from instructor;

select count (name) as Total_Instructor
from instructor;

select count (*) as Total_Instructor
from instructor;
```

#To eliminate the duplicates, use the keyword distinct. E.g. query is – find out #total number of departments from instructor table-

```
select count(dept_name) as Total_Department
from instructor;    # duplicates are there

select count(distinct dept_name) as Total_Department
from instructor;   # duplicates are eliminated
```

# To find out number of instructors in ETC department

```
select count(ID) as Total_Instructor_ETC
from instructor
where dept_name = 'ETC';
```

# To find out number of instructors in ETC department having #salary >100000 . ID is unique

```
select count(ID) as Total_Instructor_ETC
from instructor
where dept_name = 'ETC'and salary > 100000;
```

# To find out - number of instructors and names of instructors from ETC #department having salary >100000

```
select count(ID) as Total_Instructor_ETC, name
from instructor
where dept_name = 'ETC'and salary > 100000;
```

#sum ():- E.g. consider the query – find out total salary paid to all instructors,
#from instructor table.

```
select sum(salary) as Total_Salary
from instructor;
```

# Find out total salary paid to the instructors of Computer deptt

```
select sum(salary) as Total_Salary
from instructor
where dept_name = 'Computer';
```

# min( ):- consider the query – find out minimum salary paid to the
#instructors, from instructor table.

```
select min(salary)
from instructor;

select min(salary) as Min_Salary
from instructor;
```

#max():- E.g. consider the query – find out maximum salary paid to the
#instructors, from instructor table.

```
select max(salary) as Max_Salary
from instructor;

select max(name) as Max_Name
from instructor;

select min(name) as Min_Name
from instructor;
```

# Group By. E.g. consider the query – find out the average salary of each
#department, from instructor table:- i.e. find department wise average salary

```
select dept_name, avg(salary) as Average_Salary
from instructor
group by dept_name;
```

#Consider other query – find out total number of instructors in each #department, from instructor table. i.e. find dept wise number of instructors

```
select dept_name, count(dept_name) as Total_Instructors_in_Dept
from instructor
group by dept_name;

select dept_name, count(ID) as Total_Instructors_in_Dept
from instructor
group by dept_name;
```

# To find out department wise number of instructors whose salary is > 100000

```
select dept_name, count(dept_name) as Total_Instructors_in_Dept
from instructor
where salary > 100000
group by dept_name;
```

#Consider other query – find out total number of instructors teaching #building wise-

```
select *              # cartesian product , Total 55 rows, 7 columns
from instructor cross join department;

select *              # equi join, 11 rows , 7 columns
from instructor, department
where instructor.dept_name=department.dept_name;

select *              # Natural join , 11 rows, 6 columns
from instructor natural join department;

select name, building    # selecting name, building
from instructor natural join department;
```

# To find out total number of instructors teaching building wise

```
select building , count(dept_name) as Total_Instructor_in_Building
from instructor natural join department
group by building;
```

```
select building , count(name) as Total_Instructor_in_Building
from instructor natural join department
group by building;
```

#Having clause:- E.g. find out names of those departments where the average
#salary of the instructor is more than 100000.

```
select dept_name, avg(salary) as Average_Salary
from instructor
group by dept_name;
```

```
select dept_name, avg(salary) as Average_Salary
from instructor
group by dept_name
having avg(salary) >100000;
```

# To find department wise total salary

```
select dept_name, sum(salary) as Total_Salary_of_Dept
from instructor
group by dept_name;
```

# To find department wise total salary, if it greater than 200000

```
select dept_name, sum(salary) as Total_Salary_of_Dept
from instructor
group by dept_name
having Total_Salary_of_Dept > 200000;
```

# find out total number of instructors teaching building wise, but don’t #consider the instructors of those departments whose budget is less than or #equal to 500000. Then display the result only if total number of instructors #teaching in that building is greater than 3.

# First understand how to find out total number of instructors teaching #building wise

```
select building , count(dept_name) as Total_Instructor_in_Building
from instructor natural join department
group by building;
```

# to find out total number of instructors teaching building wise, but don’t #consider the instructors of those departments whose budget is less than or #equal to 500000.

```
select building , count(dept_name) as Total_Instructor_in_Building
from instructor natural join department
where budget > 500000
group by building;
```

# Now - find out total number of instructors teaching building wise, but don’t #consider the instructors of those departments whose budget is less than or #equal to 500000. Then display the result only if total number of instructors #teaching in that building is greater than 3.

```
select building , count(dept_name) as Total_Instructor_in_Building
from instructor natural join department
where budget > 500000
group by building
having Total_Instructor_in_Building >3;
```

```
# Or following query
select building , count(dept_name) as Total_Instructor_in_Building
from instructor natural join department
where budget > 500000
group by building
having count(dept_name) >3;
```

# Use of Subquery:- find out the instructors whose salary is less than Uday’s
#salary.

```
select name, salary
from instructor
where name = 'Uday';

select name, salary
from instructor
where salary <
                (select salary
                from instructor
                where name = 'Uday');
```

# to find out name of instructor having max salary. Also display his salary

```
select max(salary) from instructor;

select name, salary
from instructor
where salary =
                (select max(salary)
                from instructor);
```

# Use of IN operator :- find out the names of instructors (along with their ID,
#their department and salary), who belong to Computer or IT department or
#ETC deptt

```
select *
from instructor
where dept_name = 'computer' or dept_name ='IT' or dept_name = 'ETC';

select *
from instructor
where dept_name in ('Computer', 'IT', 'ETC');
```

```
#Find the name of the Instructors who have Salary equal to 70000, 95000 or
#98000.
SELECT name
FROM instructor
WHERE Salary IN (70000, 95000, 98000);

SELECT name
FROM instructor
WHERE Salary IN (70000, 95000, 98000, 200000);
```

```
# find out the names of instructors (along with their ID, their department and
salary),  who don’t belong to Computer or IT department.

select * from instructor
where dept_name not in ('Computer', 'IT');
```

```
# Using subquery and IN operator
#find out names of instructors and their departments, whose departmental
#budget is more than 700000.
select name, dept_name
from instructor        # first table
where dept_name in
                    (select dept_name
                    from department  # second table
                   where budget >700000);
```

```
# Using Natural join:- find out names of instructors and their departments,
# whose departmental budget is more than 700000.
select name, dept_name
from instructor natural join department
where budget > 700000;
```

# Find out total salary paid to the instructors of Computer deptt and IT deptt

```
select sum(salary) as Total_Salary
from instructor
where dept_name in ('Computer','IT');

select sum(salary) as Total_Salary
from instructor
where dept_name = 'Computer' or dept_name ='IT';
```

# Use of ANY (or SOME) operator :- find out the names of all instructors
#whose salary is greater than at least one instructor in the Electrical
#department. Try with >any

```
select name
from instructor
where salary >some
                  (select salary
                   from instructor
                   where dept_name='Electrical');
```

# find out the names of all instructors that have a salary greater than that of
#each instructor in the Electrical department. So we have to use “greater than
#all” construct. It is represented by >all.

```
select name
from instructor
where salary >all
               (select salary
               from instructor
               where dept_name='Electrical');
```

# find out the names of all instructors that have a salary greater than that of
#each instructor in the Mechanical department.

```
select name
from instructor
where salary > all
              (select salary
              from instructor
              where dept_name='Mechanical');
```

# using =any operator instead of IN :- find out names of instructors and their #departments, whose departmental budget is more than 700000.

```
select name, dept_name
from instructor            # first table
where dept_name in
                             (select dept_name
                             from department  # second table
                             where budget >700000);

select name, dept_name
from instructor            # first table
where dept_name = any
                              (select dept_name
                               from department  # second table
                               where budget >700000);
```

.