

Databases with *MYSQL*

6. Simple *Querys*



Dante – Digital Area for Networking Teachers and Educators





Learning Outcomes

After this lesson, the learner will be able to use all the SQL commands to retrieve data from database tables:

- Queries / Select statement
- SQL queries *
- WHERE Clause
- Comparison Operators
 - =, >, >
 - Between
 - Like
 - IN
- AND and OR
- Arithmetic Expressions
- Preventing the selection of duplicate rows - DISTINCT
- Column Alias Name
- Use of Not
- ORDER BY

Databases with *MYSQL*

6 – Simple Querys





SQL queries

What is query?

Answer can be....

“Query is a request to the database in order to retrieve information from tables”



Queries / Select statement

Display specified data from a table

```
Select <column-name> from <table-name>;
```

```
SELECT EMPNO FROM EMP;
```

	empno
▶	7782
	7839
	7934
	7369
	7566
	7788
	7876
	7902
	7499
	7521
	7654
	7698
	7844
	7900

Here EMPNO is a column in EMP table

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SQL queries *

* represents all columns in the table

```
SELECT * FROM DEPT;
```

	DEPTNO	DNAME	LOC
▶	10	ACCOUNTING	NEW YORK
	20	RESEARCH	DALLAS
	30	SALES	CHICAGO
	40	OPERATIONS	BOSTON
●	NULL	NULL	NULL

Displays all columns/data from the DEPT table.



WHERE Clause

WHERE clause is used when we want to select few records from a table (based on condition/criteria).

```
SELECT ENAME, SAL FROM EMP  
WHERE SAL<=1000;
```

	ENAME	SAL
▶	SMITH	800.00
	JAMES	950.00



Comparison Operators

= Equal to

!= or <> Not equal to

> Grater then

>= Grater then equal to

< less then

<= less then equal to

BETWEEN ...AND... between two values

IN (list) any of a list of values

LIKE Match a character pattern



Comparison Operators = (Equal to)

```
SELECT * FROM EMP WHERE SAL = 800;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7369	SMITH	CLERK	7902	2022-12-17	800.00	NULL	20
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records with salary is equal to 800



Comparison Operators

! = or <> Not equal to

```
SELECT * FROM EMP WHERE SAL <> 800;  
SELECT * FROM EMP WHERE SAL != 800;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7566	JONES	MANAGER	7839	2023-04-02	2975.00	NULL	20
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
	7698	BLAKE	MANAGER	7839	2023-05-01	2850.00	NULL	30
	7782	CLARK	MANAGER	7839	2023-06-09	2450.00	NULL	10
	7788	SCOTT	ANALYST	7566	2025-04-19	3000.00	NULL	20
	7839	KING	PRESIDENT	NULL	2023-11-17	5000.00	NULL	10
	7844	TURNER	SALESMAN	7698	2023-09-08	1500.00	0.00	30
	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
	7900	JAMES	CLERK	7698	2023-12-03	950.00	NULL	30
	7902	FORD	ANALYST	7566	2023-12-03	3000.00	NULL	20
	7934	MILLER	CLERK	7782	2024-01-23	1300.00	NULL	10
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records with salary is not equal to 800



Comparison Operators

> Grater then

```
SELECT * FROM EMP WHERE SAL > 800;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7566	JONES	MANAGER	7839	2023-04-02	2975.00	NULL	20
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
	7698	BLAKE	MANAGER	7839	2023-05-01	2850.00	NULL	30
	7782	CLARK	MANAGER	7839	2023-06-09	2450.00	NULL	10
	7788	SCOTT	ANALYST	7566	2025-04-19	3000.00	NULL	20
	7839	KING	PRESIDENT	NULL	2023-11-17	5000.00	NULL	10
	7844	TURNER	SALESMAN	7698	2023-09-08	1500.00	0.00	30
	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
	7900	JAMES	CLERK	7698	2023-12-03	950.00	NULL	30
	7902	FORD	ANALYST	7566	2023-12-03	3000.00	NULL	20
	7934	MILLER	CLERK	7782	2024-01-23	1300.00	NULL	10
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records with salary is grater then 800



Comparison Operators

< Less than

```
select * from emp where sal < 800;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records with salary is less than 800



Comparison Operators

>= Grater then equal to

```
SELECT * FROM EMP WHERE SAL >= 800;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7369	SMITH	CLERK	7902	2022-12-17	800.00	NULL	20
	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7566	JONES	MANAGER	7839	2023-04-02	2975.00	NULL	20
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
	7698	BLAKE	MANAGER	7839	2023-05-01	2850.00	NULL	30
	7782	CLARK	MANAGER	7839	2023-06-09	2450.00	NULL	10
	7788	SCOTT	ANALYST	7566	2025-04-19	3000.00	NULL	20
	7839	KING	PRESIDENT	NULL	2023-11-17	5000.00	NULL	10
	7844	TURNER	SALESMAN	7698	2023-09-08	1500.00	0.00	30
	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
	7900	JAMES	CLERK	7698	2023-12-03	950.00	NULL	30
	7902	FORD	ANALYST	7566	2023-12-03	3000.00	NULL	20
	7934	MILLER	CLERK	7782	2024-01-23	1300.00	NULL	10
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records with salary >= 800



Comparison Operators BETWEEN ...AND

```
SELECT * FROM EMP WHERE SAL BETWEEN 800 AND  
1600;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7369	SMITH	CLERK	7902	2022-12-17	800.00	NULL	20
	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
	7844	TURNER	SALESMAN	7698	2023-09-08	1500.00	0.00	30
	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
	7900	JAMES	CLERK	7698	2023-12-03	950.00	NULL	30
	7934	MILLER	CLERK	7782	2024-01-23	1300.00	NULL	10
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records where salary is from 800 to 1600.
Records with salary 800 and 1600 are also included.



Comparison Operators IN (list)

Any of a list of values

```
SELECT * FROM EMP WHERE SAL IN (800,1250,1600);
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7369	SMITH	CLERK	7902	2022-12-17	800.00	NULL	20
	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records where salary is either 800 or 1250 or 1600



Comparison Operators

LIKE match a character pattern

```
select * from emp where ename like '_DAMS';
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records where ename column has “dams” at the end and there is one character at the beginning of ename.



Comparison Operators

LIKE match a character pattern

% - represents an undermined number of character

_ - represents one character

```
SELECT * FROM EMP WHERE ENAME LIKE "A%";
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
●	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records where ename begins with 'A'.



AND and OR

and Or

```
SELECT * FROM EMP WHERE SAL = 800 OR SAL = 1250;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7369	SMITH	CLERK	7902	2022-12-17	800.00	NULL	20
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records where salary is either 800 to 1250

```
SELECT * FROM EMP WHERE SAL=1100 AND ENAME LIKE 'A%';
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7876	ADAMS	CLERK	7788	2025-05-23	1100.00	NULL	20
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Display records where salary is equal to 1100 and ENAME begins with 'A'



AND and OR

We can use 'AND' and 'OR' in the same WHERE clause of a select statement

```
SELECT * FROM EMPWHERE (SAL > 1500 AND JOB = "MANAGER")  
OR (SAL > 1200 AND JOB = "SALESMAN");
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7499	ALLEN	SALESMAN	7698	2023-02-20	1600.00	300.00	30
	7521	WARD	SALESMAN	7698	2023-02-22	1250.00	500.00	30
	7566	JONES	MANAGER	7839	2023-04-02	2975.00	NULL	20
	7654	MARTIN	SALESMAN	7698	2023-09-28	1250.00	1400.00	30
	7698	BLAKE	MANAGER	7839	2023-05-01	2850.00	NULL	30
	7782	CLARK	MANAGER	7839	2023-06-09	2450.00	NULL	10
	7844	TURNER	SALESMAN	7698	2023-09-08	1500.00	0.00	30
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL



ARITHMETIC Expressions

We can perform calculations based on numbers by including an arithmetic expression in SQL command.

Arithmetic operators

+ Add

- Subtract

* Multiply

/ Divide



ARITHMETIC Expressions

```
SELECT ENAME, SAL , COMM , SAL+ COMM FROM EMP;
```

	ename	sal	comm	sal+ comm
▶	SMITH	800.00	NULL	NULL
	ALLEN	1600.00	300.00	1900.00
	WARD	1250.00	500.00	1750.00
	JONES	2075.00	NULL	NULL
	MARTIN	1250.00	1400.00	2650.00
	BLAKE	2850.00	NULL	NULL
	CLARK	2450.00	NULL	NULL
	SCOTT	3000.00	NULL	NULL
	KING	5000.00	NULL	NULL
	TURNER	1500.00	0.00	1500.00
	ADAMS	1100.00	NULL	NULL
	JAMES	950.00	NULL	NULL
	FORD	3000.00	NULL	NULL
	MILLER	1300.00	NULL	NULL

Although SAL+ COMM is not a column in EMP table, SQL displays the calculated result.

Note:- If COMM contains some NULL values then SAL + COMM will not evaluate



ARITHMETIC Expressions

```
SELECT ENAME, SAL, SAL+ COMM FROM EMP;
```

ENAME	SAL	SAL+COMM
SMITH	800	(null)
ALLEN	1600	1900
WARD	1250	1750
JONES	2975	(null)
MARTIN	1250	2650
BLAKE	2850	(null)
CLARK	2450	(null)
SCOTT	3000	(null)
KING	5000	(null)
TURNER	1500	1500
ADAMS	1100	(null)
JAMES	950	(null)
FORD	3000	(null)
MILLER	1300	(null)



ARITHMETIC Expressions

We can also use arithmetic expressions in WHERE Clause.

```
SELECT ENAME , SAL , COMM FROM EMP WHERE COMM > 0.25 * SAL ;
```

	ename	sal	comm
▶	WARD	1250.00	500.00
	MARTIN	1250.00	1400.00

```
SELECT ENAME , SAL , COMM FROM EMP WHERE COMM > SAL + 100 ;
```

	ename	sal	comm
▶	MARTIN	1250.00	1400.00



Preventing the selection of duplicate rows

SQL displays the results of a query without eliminating duplicate entries.

For example, suppose you want a list of all the jobs from emp table. To list all the job in the table EMP, enter:

```
SELECT JOB from EMP;
```

JOB
CLERK
SALESMAN
SALESMAN
MANAGER
SALESMAN
MANAGER
MANAGER
ANALYST
PRESIDENT
SALESMAN
CLERK
CLERK
ANALYST
CLERK



Preventing the selection of duplicate rows

To list all the jobs in EMP without duplication, enter:

```
SELECT DISTINCT JOB FROM EMP;
```

A Z	JOB
.	CLERK
:	SALESMAN
:	PRESIDENT
.	MANAGER
:	ANALYST



Column Alias Name

- The **Column Alias Name** is defined next to the column name with a space or by using the Keyword **AS**.

```
SQL> select ename "Emp Name" from emp;
```

```
Emp Name
```

```
-----  
SMITH  
ALLEN  
WARD  
JONES
```

```
SQL> select ename as "Emp Name" from emp;
```

```
Emp Name
```

```
-----  
SMITH  
ALLEN  
WARD  
JONES
```

```
SQL> select ename as Employee from  
emp;
```

```
EMPLOYEE
```

```
-----  
SMITH  
ALLEN  
WARD
```

Use " " While Space



Use of Not

```
SELECT * FROM EMP WHERE (JOB = "MANAGER" OR JOB = "CLERK") AND DEPTNO = 10;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7782	CLARK	MANAGER	7839	2023-06-09	2450.00	NULL	10
	7934	MILLER	CLERK	7782	2024-01-23	1300.00	NULL	10
▲	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Lists information about employees in department 10 who are managers or clerks.

```
SELECT * FROM EMP WHERE NOT (JOB = "MANAGER" OR JOB = "CLERK") AND DEPTNO = 10;
```

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
▶	7839	KING	PRESIDENT	NULL	2023-11-17	5000.00	NULL	10
●	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Lists Information about employees in department10 who are NOT managers or clerks.



Controlling the order of displayed rows

ORDER BY

- The order by clause lets you order rows:
- In ascending order (ASC)
- In descending order (DESC)
- By Multiple columns
- With null values



Order by Clause

If we want that our results should display in ascending order (for salary column) then we will write:

```
SELECT SAL, JOB, ENAME FROM EMP WHERE DEPTNO = 30  
ORDER BY SAL;
```

	sal	job	ename
▶	950.00	CLERK	JAMES
	1250.00	SALESMAN	WARD
	1250.00	MAN	MARTIN
	1500.00	SALESMAN	TURNER
	1600.00	SALESMAN	ALLEN
	2850.00	MANAGER	BLAKE



Order by Clause

If we want that our results should display in descending order (for salary column) then we will write:

```
SELECT SAL, JOB, ENAME FROM EMP WHERE DEPTNO = 30  
ORDER BY SAL DESC;
```

	sal	job	ename
▶	2850.00	MANAGER	BLAKE
	1600.00	SALESMAN	ALLEN
	1500.00	SALESMAN	TURNER
	1250.00	SALESMAN	WARD
	1250.00	SALESMAN	MARTIN
	950.00	CLERK	JAMES



Order by Clause

If we want to order displayed rows by the value more than one column.

```
SELECT JOB, SAL , ENAME FROM EMP WHERE DEPTNO = 30  
ORDER BY JOB, SAL ;
```

	job	sal	ename
▶	CLERK	950.00	JAMES
	MANAGER	2850.00	BLAKE
	SALESMAN	1250.00	WARD
	SALESMAN	1250.00	MARTIN
	SALESMAN	1500.00	TURNER
	SALESMAN	1600.00	ALLEN