

Session-1

SQL Select Statements

RDBMS(Relational Database Management system)

- A database is an organized collection of information.
- To manage databases, you need a database management system (DBMS). A DBMS is a program that stores, retrieves, and modifies data in databases on request.
- There are four main types of databases: hierarchical, network, relational, and (most recently) object relational.
- RDBMS example: Oracle, SQL Server, MySQL, Teradata, PostgreSQL, DB2, Informix, MariaDB.
- Can be accessed and modified by executing structured query language (SQL) statements.
- Contains a collection of tables with no physical pointers.
- Uses a set of operators.

SQL(Structured Query Language)

| Statement | Description |
|--|---|
| SELECT INSERT UPDATE DELETE MERGE | Retrieves data from the database, enters new rows, changes existing rows, and removes unwanted rows from tables in the database, respectively. Collectively known as <i>data manipulation language</i> (DML). |
| CREATE ALTER DROP RENAME TRUNCATE COMMENT | Sets up, changes, and removes data structures from tables. Collectively known as <i>data definition language</i> (DDL). |
| GRANT REVOKE | Gives or removes access rights to both the Oracle database and the structures within it. |
| COMMIT ROLLBACK SAVEPOINT | Manages the changes made by DML statements. Changes to the data can be grouped together into logical transactions. |

SELECT Statement

- A SELECT statement retrieves information from the database.
 - Projection: Choose the columns in a table that are returned by a query.
 - Selection: Choose the rows in a table that are returned by a query.
 - Joining: Bring together data that is stored in different tables by specifying the link between them.
-
- Basic SELECT Statement: **SELECT * |columns|expression FROM table;**
 - SELECT identifies the columns to be displayed.
 - FROM identifies table that containing those columns.
 - A **keyword** refers to an individual SQL element.
 - A **clause** is part of a SQL statement.

SELECT Statement

Select All Columns:

```
SELECT * FROM departments;
```

Select specific columns:

```
SELECT department_id, department_name, location_id FROM departments;
```

- SQL statements are not case-sensitive.
- SQL statements can be on one or more lines.
- Keywords can not be abbreviated or split across lines.
- Indents are used to enhance readability.
- SQL statements could be terminated by slash(/) or semicolon(;;).

Arithmetic Operators/Precedence

| Operator | Operation |
|---|--------------------------------------|
| *, / | multiplication, division |
| +, - | identity, negation |
| +, -, | addition, subtraction, concatenation |
| =, !=, <, >, <=, >=, IS NULL, LIKE, BETWEEN, IN | comparison |
| NOT | exponentiation, logical negation |
| AND | conjunction |
| OR | disjunction |

- *Precedence* is the order in which Oracle evaluates different operators in the same expression. When evaluating an expression containing multiple operators, Oracle evaluates operators with higher precedence before evaluating those with lower precedence. Oracle evaluates operators with equal precedence from left to right within an expression.
- *Override* the rules of precedence by using parentheses to specify the desired order in which operators are to be executed.

Arithmetic Operators/Precedence

Default order of precedence:

```
SELECT last_name, salary, 12*salary+100  
FROM employees;
```

Overriding order of precedence:

```
SELECT last_name, salary, 12*(salary+100)  
FROM employees;
```

Null Values

- A Null Value is a value that is unassigned, unavailable, unknown or inapplicable.
- A Null is not the same as a zero or blank space.

```
SELECT last_name, job_id , salary, commission_pct  
FROM employees;
```

- Arithmetic expressions containing a Null value evaluate to Null.

```
SELECT last_name, job_id , salary, 12*salary*commission_pct  
FROM employees;
```


Column Alias

- Renames a column heading where it is lengthy.
- Useful with calculations.
- Immediately follows the column name(optional AS keyword).
- Requires double quotation marks if it contains space, special characters or case-sensitive.

```
SELECT last_name "Name" , salary*12 "Annual Salary"  
FROM employees;
```

```
SELECT last_name AS name , salary*12 AS Salary  
FROM employees;
```

Concatenation Operator/Literal Character String

- Concatenation, Links columns or character strings to other columns.
- Is represented by two vertical bars (||).

```
SELECT last_name || job_id FROM employees;
```

Literal Character String:

- Represented by single quote ('), characters are written in between two single quote(' ').

```
SELECT last_name || ' Is a ' || job_id FROM employees;
```

Duplicate Rows/DISTINCT keyword

- Default display of queries is all rows including duplicates.

```
SELECT department_id  
FROM departments;
```

- Duplicate rows are eliminated by using DISTINCT keyword.

```
SELECT DISTINCT department_id  
FROM departments;
```

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END