CHAPTER 2
Data Manipulation - Retrieve, Restrict and Sort

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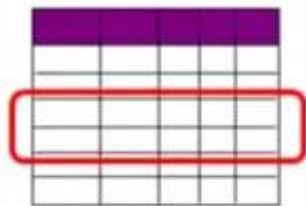
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This chapter aimed to enable learners to be able to do the followings:

- Use the Basic SELECT statement
- Use the followings in SELECT statement:
  - Arithmetic expressions and NULL values
  - Column aliases
  - Concatenation operator
  - Literal character strings
  - DISTINCT keyword
  - ORDER BY clause
- Use the DESCRIBE command
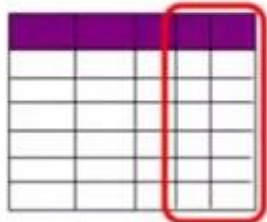
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SELECT statements
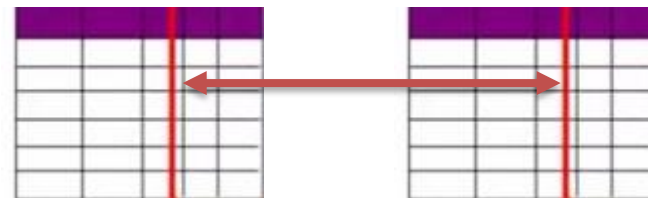
SQL SELECT Statements can:

1. **Project** Data – Access and produce data from certain columns of table/s

2. **Select** Data – Access and produce data from certain rows of table/s

3. **Join** data from more multiple tables

select

project

join

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BASIC Select Statement

Syntax:

SELECT *|{[DISTINCT] *column|expression* **[*alias*],...} FROM *table;***

Where:

SELECT *– means selecting columns to be displayed*

* - select all column

DISTINCT – means only row that has no duplicate

FROM *table - means the source TABLE of the stated* columns

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SELECT * FROM Customers;

Number of Records: 41

CustomerID	CustomerName	Contact	Address	City	PostCode	Country
1	Ahmad Razali	Maria Ahkar	24 jln Meriah	Kuala Lumpur	203032	Malaysia
2	Ana Khamis	Khamis Razuki	Lot34, Jn Abiad	Johor	780020	Malaysia
3	Maria Taque	Ardia Khai	Kg Alur, Alor Gajah	Melaka	302233	Malaysia

. . . .

All column in the table are displayed since * means all columns in the table.

Source: https://www.w3schools.com/sql/trysql.asp?filename=trysql_select_columns

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Selecting Specific Columns

SELECT Cust_Name, City

FROM Customers;

Number of Records: 91

Cust_Name	City
Ahmad Razali	Kuala Lumpur
Ana Khamis	Johor
Maria Taque	Melaka
Arul Kunidka	Kuala Lumpur
Jamal Alkaf	Johor

Only column of Customer Name and City are displayed from Table Customers

Source: https://www.w3schools.com/sql/trysql.asp?filename=trysql_select_columns.

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Using Arithmetic Operator in SELECT

SELECT last_name, salary, salary + 100

FROM STAFF;

	LAST_NAME	SALARY	SALARY+100
1	King	20000	20100
2	Kochhar	15000	15100
3	De Haan	9300	9400
4	Hunold	4500	4600
5	Ernst	21000	21100
6	Lorentz	15200	15300
7	Mourgos	16400	16500
8	Rajs	8900	9000
9	Davies	7500	7600
10	Matos	8800	8900

Use of arithmetic operator(**+**), to display a new value from calculated data of SALARY.

Null Values in Arithmetic Expressions

- A null value is evaluated as null in arithmetic expression.

Example:

SELECT last_name, salary, 12*salary

FROM STAFF;

Last_name	salary	12*salary
Ahmad Razali	1000	12000
Ana Khamis	NULL	NULL
Maria Taque	2000	24000

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Use of ALIAS for Column Names

ALIAS can be used to rename a column heading.

Example:

SELECT staff_name AS Names,

salary*12 "Annual Salary"

FROM STAFF;

Names	Annual Salary
Ahmad	55000
Cheng	53000

'AS' is Optional;

" " is used for label that has more than 1 word.

Use of concatenation operator

Concatenation operator(represented by ||) is used to:

- Display data (or character strings) linked to other data (or character strings) of columns

Example:

SELECT Staff_name || Salary AS "Staff Salary" FROM STAFF;

Staf Salary
Ahmad55000
Cheng53000

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Using Literal Character Strings

Example:

SELECT last_name ||' is a '||gender AS "Employee Gender"

FROM Staff;

Employee Gender
Ahmad is a Male
Cheng is a Female

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Use of DISTINCT

The default display of queries is all rows, including duplicate rows.

SELECT Staff_Name FROM Staff;

- will display all rows in the table, while;

SELECT DISTINCT Staff_Name FROM Staff;

- Will display all rows that are unique, while rows that are found duplicate will only be displayed once**.**

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ORDER BY Clause

ORDER BY clause is used to display rows in a sorting manner either in:

- Ascending order (ASC)   - default value OR

- Descending order (DESC)

Format: **SELECT column**
              FROM table
              ORDER BY column [ASC|DESC]

ORDER BY Clause Example

SELECT Staff_Name, Department
FROM Staff
ORDER BY Staff_Name, Department

Staff_Name	Department
Ahmad Razali	Finance
Hamid Rashid	Finance
Cheng Kui	Graphic
Daren Lang	Graphic
Fatimah Badar	Graphic

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Displaying selected Rows using WHERE

- WHERE clause is used to restrict the rows to be displayed.

- Conditions written after WHERE clause will be used by the system to select data accordingly.

FORMAT:

SELECT column names

FROM tables

WHERE conditions;

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WHERE clause - Examples

Example 1: SELECT Staff_Name, Department

FROM Staff

WHERE Staff_Name = 'Ahmad Razali';

Staff_Name	Department
Ahmad Razali	Finance

Example 2: SELECT Staff_Name, Department

FROM Staff

WHERE Department = Finance;

Staff_Name	Department
Ahmad Razali	Finance
Hamid Rashid	Finance

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Comparison operators

Comparison operators are used in conditions that compare one expression to another value or expression. They are used in the WHERE clause in the following format:

Example

- ... WHERE register_date = '05-DEC-17';
- ... WHERE income <= 5000;
- ... WHERE Staff_name = 'Ahmad Raimi';

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Comparison operators

<	Less than
<=	Less than or equal to
>=	Greater than or equal to
>	Greater than
=	Equal to
<>	Not equal to
BETWEEN...AND...	Between two values (inclusive)
IN(set)	Match any of a list of values
LIKE	Match a character pattern
IS NULL	Is a null value
<	Less than
<=	Less than or equal to
>=	Greater than or equal to
>	Greater than

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DESCRIBE statement

Syntax:

DESC[RIBE] *tablename*

Is use to display table structure

Example:

DESC STAFF;

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Summary

This chapter has covered:

- The use of SELECT statement to:
  - display all rows and columns from a table
  - display specified columns from a table
  - display specified rows from a table (WHERE)
- The use of Arithmetic Operators, ALIAS, Concatenation Operators, Literal, Distinct in SELECT statement
- The use of DESCRIBE

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References

Oracle Database 11g: SQL Fundamentals I, Oracle University at:
http://education.oracle.com

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