

Task 3: Writing Basic SELECT Queries

1. What does SELECT * do?

The SQL SELECT statement is used to query and retrieve data from a database. SELECT is one of the most commonly used SQL statements, allowing you to select specific columns and rows of data from database object(s).

The basic syntax of a SELECT statement is as follows:

```
SELECT column1, column2, ...
```

```
FROM table_name;
```

- The SELECT clause specifies the column(s) to be retrieved.
 - The FROM clause specifies the object(s) from which the data should be retrieved. In this case, column1 and column2 data will be retrieved from table_name.
-

2. How do you filter rows?

In SQL, the WHERE clause allows you to filter the rows that you query based on certain conditions (both numerically and text-wise). The different comparison operators you can use with the WHERE clause are as follows:

> → Greater than

≥ → Greater than or Equal to

< → Less than

≤ → Less than or Equal to

= → Equal to

<> → Not Equal to

Going back to our examples with Colleges and Universities, let's say you want to filter the Colleges table to only output the name and undergraduate population of schools with more than 20,000 undergraduate students. In this scenario, you would enter the following query:

```
SELECT name, undergraduate
```

```
FROM colleges
```

```
WHERE undergraduate > 20000;
```

3. What is LIKE '%value%'?

LIKE '%value%' is a pattern-matching expression used in SQL (Structured Query Language) to search for a substring within a column value.

So:

```
SELECT * FROM table_name
```

```
WHERE column_name LIKE '%value%';
```

This query returns all rows where column_name contains the substring value anywhere in the text (beginning, middle, or end).

For Example:

Given a table users with a column name:

id	name
1	Alice
2	Valerie
3	Calvin

4 Valentina

Query:

```
SELECT * FROM users
WHERE name LIKE '%val%';
```

Would return:

id	name
2	Valerie
4	Valentina

4.What is BETWEEN used for?

The BETWEEN command is used to select values within a given range. The values can be numbers, text, or dates. The BETWEEN command is inclusive: begin and end values are included.

Given a table users:

id	name	age
1	Alice	23
2	Valerie	14
3	Calvin	17
4	Valentina	26

Query

```
SELECT * FROM users
WHERE age BETWEEN 10 AND 20;
```

Would return:

id	name	age
2	Valerie	14
3	Calvin	17

5.How do you limit output rows?

To limit the number of rows returned in an SQL query, you use the LIMIT clause (or its equivalent depending on the SQL dialect).

Syntax

```
SELECT * FROM table_name
LIMIT number_of_rows;
```

Given a table users:

id	name	age
1	Alice	23
2	Valerie	14
3	Calvin	17
4	Valentina	26

Query

```
SELECT * FROM users
LIMIT 2;
```

Would return:

id	name	age
1	Alice	23
2	Valerie	14

6. Difference between = and IN

Feature	= Operator	IN Operator
Comparison Type	Compares a column to a single value.	Compares a column to multiple values.
Use Case	Best for single value comparisons.	Best for comparing multiple values in a list.
Performance	Faster for single value comparisons.	Slower, especially with a large list of values.
Subquery Behavior	Generates an error if the subquery returns more than one result.	Handles subqueries that return multiple values without errors.
Additional Operators	Requires additional operators like OR for multiple comparisons.	No additional operators needed for multiple values.

7. How to sort in descending order?

The ORDER BY keyword is used to sort the result-set in descending order.

For example:

Given a table Users:

ID	Name	Age
1	Alice	23
2	Valerie	14
3	Calvin	17
4	Valentina	26

Query:

```
SELECT * FROM Users
ORDER BY Age;
Would return:
```

ID	Name	Age
2	Valerie	14
3	Calvin	17
1	Alice	23
4	Valentina	26

8. What is aliasing?

SQL aliases are used to give a table, or a column in a table, a temporary name. Aliases are often used to make column names more readable. An alias only exists for the duration of that query. An alias is created with the AS keyword.

Syntax:

```
SELECT column_name AS alias_name
FROM table_name;
```

Example:

```
SELECT first_name AS name
FROM employees;
```

This will display the result with the column titled name instead of first_name.

Note: AS is optional, so you can also write:

```
SELECT first_name name
FROM employees;
```

9. Explain DISTINCT.

The SELECT DISTINCT statement is used to return only distinct (different) values.

Syntax

```
SELECT DISTINCT column1, column2, ...
FROM table_name;
```

Example

Given a products table:

```
id  category
```

```
1   Books
```

2 Electronics

3 Books

4 Clothing

5 Electronics

Query:

```
SELECT DISTINCT category  
FROM products;
```

Result:

category

Books

Electronics

Clothing

10. What is the default sort order?

The ORDER BY keyword is used to sort the result-set in descending order.

For example:

Given a table Users:

ID	Name	Age
1	Alice	23
2	Valerie	14
3	Calvin	17
4	Valentina	26

Query:

```
SELECT * FROM Users  
ORDER BY Age;
```

Would return:

ID	Name	Age
2	Valerie	14
3	Calvin	17
1	Alice	23
4	Valentina	26
