

SQL - Conditions

Kodkod 4



Overview

- Use the `WHERE` clause to filter data from a table.
- Combine conditions with `AND`, `OR`, and `NOT`.
- Apply comparison operators (`=`, `!=`, `>`, `<`, `>=`, `<=`).
- Use pattern matching with `LIKE`.
- Filter ranges using `BETWEEN`.
- Match lists of values using `IN` and `NOT IN`.
- Understand the order of operations between logical operators.

WHERE Clause

- So far, we've only queried entire tables or selected specific columns.
- But what if we want to filter the data based on certain conditions?

For example:

- Let's say we want to get all the payments from the payments table, but only those where the amount is greater than 3300?
- For this we use the **WHERE** clause. It's written after the FROM clause.

```
SELECT *  
FROM payments  
WHERE amount > 3300;
```

WHERE - Numerical Operators

Operator	Example	Meaning
=	age = 30	Equal to (also strings)
!=	age != 60	Not equal to
<>	age <> 90	Not equal to (as the operator “!=”)
>	salary > 50	Greater than
<	age < 18	Less than
>=	score >= 90	Greater than or equal
<=	price <= 100	Less than or equal

WHERE - String Operators

- In addition to numerical comparisons, we can also compare text values using pattern matching operators.
- The most common one is `LIKE` - it compares a column's value to a given string pattern and returns the rows that match.

```
SELECT *  
FROM customers  
WHERE city LIKE 'Paris';
```

WHERE - String Operators (Pattern Matching)

- The % symbol works as a wildcard, meaning - any number of characters.

Pattern	Example	Meaning
a%	LIKE 'a%'	Starts with “a”
%b	LIKE '%b'	Ends with “b”
a%b	LIKE 'a%b'	Starts with “a” and ends with “b”

```
SELECT * FROM customers
WHERE email LIKE '%@gmail.com';
```

Class Exercises

1. Select all customers that have “**Via**” in their **addressLine1**.
how many are there?
2. Select all products where the product line starts with “Pla”.
How many are there?
3. Select all the customers who live in the USA.
4. Select all the products where the quantity in stock is greater than 7000.

WHERE - Points to Notice

- Match data types:
 - You can only compare values of the same data type (e.g., number to number, text to text).
- Strings must be in quotes:
 - Always write string values between single quotes ' '.
Example: `WHERE country = 'USA'`.
- Case sensitivity:
 - Pay attention to uppercase and lowercase letters.

Alias

What is an Alias?

- When we select specific columns, the result shows the original column names from the table.
- If we want to give a column (or a table) a different name in the result, we can use an alias.

```
SELECT age AS a  
FROM users;
```

Alias

Why use aliases?

- To make query results clearer and shorter.
- To rename columns or tables temporarily in the result.
- To simplify complex queries (e.g. when joining multiple tables).
- Useful if you need to reference a column again inside the same query (but not inside `WHERE`).

Filtering by Ranges

- Use `BETWEEN` to check if a value is within a specific range including both the lower and upper limits, It works with numeric and alphabetical ranges.

```
-- Numeric range
WHERE amount BETWEEN 1000 AND 5000

-- Text (alphabetical) range
WHERE customerName BETWEEN 'Alice' AND 'Greg'
```

Filtering by Lists

- Use **IN** to check if a column's value matches any value in a given list.
- Use **NOT IN** to do the opposite — exclude specific values from the results.

```
-- Using IN
WHERE country IN ('USA', 'France', 'Germany');

-- Using NOT IN
WHERE country NOT IN ('USA', 'France', 'Germany');
```

Combining Conditions

- Just like in other programming languages, you can combine multiple conditions in one `WHERE` clause.
- The operators are:
 - `AND` - both conditions must be true.
 - `OR` - at least one condition must be true.
 - `NOT` - the condition must not be true.

```
WHERE username = 'yishai'  
      AND password = 'bob'  
      AND NOT age < 18;
```


Combining Conditions

- The order in which conditions are evaluated is important.
 - `()` - use parentheses to control order manually.

```
WHERE (city = 'Paris' OR city = 'London')  
      AND country = 'France';
```

```
WHERE city = 'Paris' OR (city = 'London' AND country = 'France');
```

Class Exercises

1. Find the products that have “Official” in their description and have between 4000 and 5000 units in stock. How many are there?
 2. Find all customers that live in USA, Spain, or Italy, or their customer name is “Australian Collectables, Ltd”.
 3. Find all products where the product line is 'Planes' and the buy price is greater than 30.
 4. Find all employees whose first name starts with 'A' or 'N' and whose job title contains 'Manager'.
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Summary

- Learned to filter data using the `WHERE` clause.
 - Used operators for numerical and string comparisons.
 - Used `IN` and `NOT IN` to match or exclude specific lists of values.
 - Combined multiple conditions with `AND`, `OR`, and `NOT`.
 - Understood operator precedence - `NOT` - `AND` - `OR`, and used parentheses `()` to control the order of evaluation.
 - Practiced writing complex queries with multiple logical conditions.
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