SQL Operators and Functions

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SQL Operators

- Arithmetic Operators
- Relational Operators
- Logical Operators

Arithmetic Operators

- Arithmetic Operators allows the user to perform arithmetic operations in SQL. The table below shows the list of arithmetic operators available in SQL:

Operator	Description
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulo

```
SELECT 30 + 20;
```

Relational Operators

- Relational operators are used to performing relational expressions in SQL, i.e those expressions whose value either result in true or false. The table below shows the list of relational operators available in SQL:

Operator	Description
=	Equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
<>	Not equal to

```
SELECT * FROM Products
WHERE Price <= 30;
```

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT ProductName
FROM Products
WHERE ProductID = ALL (SELECT
ProductID FROM OrderDetails WHERE
Quantity = 10);
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT * FROM Customers
WHERE City = "London" AND Country =
"UK";
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

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```
SELECT * FROM Products
WHERE Price > ANY (SELECT Price
FROM Products WHERE Price > 50);
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

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```
SELECT * FROM Products
WHERE Price BETWEEN 50 AND 60;
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

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```
SELECT SupplierName
FROM Suppliers
WHERE EXISTS (SELECT ProductName
FROM Products WHERE
Products.SupplierID =
Suppliers.supplierID AND Price < 20);
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT * FROM Customers
WHERE City IN ('Paris','London');
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT * FROM Customers
WHERE City LIKE 's%';
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT * FROM Customers
WHERE City NOT LIKE 's%';
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT * FROM Customers
WHERE City = "London" OR Country =
"UK";
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Logical Operators

- Logical operators are used to combining 2 or more relational statements into 1 compound statement whose truth value is evaluated as a whole. The table below shows the SQL logical operators with their description:

```
SELECT * FROM Products
WHERE Price > SOME (SELECT Price
FROM Products WHERE Price > 20);
```

Operator	Description
ALL	Returns True if all subqueries meet the given condition.
AND	Returns True if all the conditions turn out to be true
ANY	True if any of the subqueries meet the given condition
BETWEEN	True if the operand lies within the range of the conditions
EXISTS	True if the subquery returns one or more records
IN	Returns True if the operands to at least one of the operands in a given list of expressions
LIKE	Return True if the operand and some given pattern match.
NOT	Displays some record if the set of given conditions is False
OR	Returns True if any of the conditions turn out to be True
SOME	Returns True if any of the Subqueries meet the given condition.

Functions

These functions are used to do operations from the values of the column and a single value is returned.

Name	Description
ABS	Returns the absolute value of a number.
ASIN	Returns arc sine value of a number.
AVG	Returns average value of an expression.
COUNT	Counts the number of records returned by a SELECT query.
EXP	Returns e raised to the power of a number.
FLOOR	Returns the greatest integer <= the number.
RAND	Returns a random number.
SIGN	Returns the sign of a number.
SQRT	Returns the square root of a number.
SUM	Returns the sum of a set of values.

FIRST()

LAST()

MAX()

MIN()

Functions

These functions are based on user input, these too returns single value.

UCASE(): It converts the value of a field to uppercase.

LCASE(): It converts the value of a field to lowercase.

MID(): The MID() function extracts texts from the text field. --- SELECT MID(NAME,1,4) FROM Students; ---

LEN(): The LEN() function returns the length of the value in a text field. --- SELECT LENGTH(NAME) FROM Students; ---

ROUND(): The ROUND() function is used to round a numeric field to the number of decimals specified. --- SELECT ROUND(MARKS,0) FROM Students; ---

NOW(): The NOW() function returns the current system date and time.

Clauses

Clauses are in-built functions available in SQL and are used for filtering and analyzing data quickly allowing the user to efficiently extract the required information from the database.

Name	Description	Example
WHERE	Used to select data from the database based on some conditions.	SELECT * from Employee WHERE age >= 18;
AND	Used to combine 2 or more conditions and returns true if all the conditions are True.	SELECT * from Employee WHERE age >= 18 AND salary >= 45000 ;
OR	Similar to AND but returns true if any of the conditions are True.	Select * from Employee where salary >= 45000 OR age >= 18
LIKE	Used to search for a specified pattern in a column.	SELECT * FROM Students WHERE Name LIKE 'a%';
LIMIT	Puts a restriction on how many rows are returned from a query.	SELECT * FROM table1 LIMIT 3;
ORDER BY	Used to sort given data in Ascending or Descending order.	SELECT * FROM student ORDER BY age ASC
GROUP BY	Groups rows that have the same values into summary rows.	SELECT COUNT(StudentID), State FROM Students GROUP BY State;
HAVING	It performs the same as the WHERE clause but can also be used with aggregate functions.	SELECT COUNT(ID), AGE FROM Students GROUP BY AGE HAVING COUNT(ID) > 5;