

Functions and Date Operations in SQL

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1 Date Functions

1.1 CURDATE() and CURRENT_DATE

- CURDATE() and CURRENT_DATE are synonyms for retrieving the current date.

1.2 CURTIME() and CURRENT_TIME

- Use CURTIME() or its synonym CURRENT_TIME to retrieve the current time, formatted in a 24-hour clock.

1.3 Timestamp and Datetime Extraction

- The TIMESTAMP function takes a datetime value and a time value to return a datetime.
- Use EXTRACT() to retrieve specific components such as:
 - YEAR, MONTH, DAY
 - HOUR, MINUTE, SECOND

1.4 Date Manipulation and Differences

- DATEDIFF() calculates the difference in days between two dates.
- Example:

```
SELECT username, info_updated,  
       DATEDIFF(CURRENT_DATE, info_updated) AS difference  
FROM test  
WHERE DATEDIFF(CURRENT_DATE, info_updated) > 200  
ORDER BY difference DESC;
```

- DATE_ADD() allows you to add a specific interval to a date.

2 String Operations

2.1 Changing Case: UPPER() and LOWER()

- UPPER() converts strings to uppercase, and LOWER() converts them to lowercase.
- Example:

```
SELECT UPPER(name), LOWER(name)
FROM members;
```

2.2 Concatenating Strings

- CONCAT() combines multiple strings into one without adding spaces between them.
- Example:

```
SELECT CONCAT(first_name, ' ', last_name) AS Name
FROM customer_data;
```

2.3 Handling NULLs with COALESCE()

- COALESCE() helps handle NULL values in concatenation.
- Example:

```
SELECT CONCAT(name, ' ', COALESCE(suffix, ''))
FROM members;
```

3 Arithmetic and Mathematical Operations

- Arithmetic operators such as +, -, *, and / are used for mathematical operations.
- Example:

```
SELECT grocery, vendor, qty, buy_price,  
       qty * buy_price AS totalSpent  
FROM groceries  
ORDER BY totalSpent DESC;
```

3.1 Extracting Substrings

- Use SUBSTRING() to extract a part of a string.
- Example:

```
SELECT name, SUBSTRING(name FROM 1 FOR 1) AS firstLetter  
FROM animalNames  
ORDER BY firstLetter;
```

3.2 Calculating String Length

- CHARACTER_LENGTH() returns the number of characters in a string.
- Example:

```
SELECT name, CHARACTER_LENGTH(name) AS nameLength  
FROM animalNames  
ORDER BY nameLength DESC;
```

3.3 Trimming Unwanted Characters

- TRIM() removes leading or trailing characters from a string.
- Example:

```
SELECT name, TRIM(LEADING 'S' FROM name)  
FROM animalNames  
WHERE SUBSTRING(name FROM 1 FOR 1) = 'S';
```