Date functions in SQL are used to manipulate and retrieve information about date and time values. These functions are essential for performing operations such as calculating differences between dates, extracting specific parts of a date, formatting dates, or determining current system date and time. Below is an overview of commonly used date functions:

**1. Getting Current Date and Time**

* **CURRENT\_DATE**: Returns the current date in the format YYYY-MM-DD.
* **CURRENT\_TIME**: Returns the current time in the format HH:MM:SS.
* **NOW()**: Returns the current date and time.
* **SYSDATE()**: Similar to NOW(), but its exact behavior may depend on the SQL implementation.

**2. Extracting Components from Dates**

* **YEAR(date)**: Extracts the year part from a date.
* **MONTH(date)**: Extracts the month part from a date.
* **DAY(date) / DAYOFMONTH(date)**: Extracts the day of the month.
* **HOUR(time)**: Extracts the hour from a time or datetime value.
* **MINUTE(time)**: Extracts the minutes.
* **SECOND(time)**: Extracts the seconds.
* **DAYOFWEEK(date)**: Returns the day of the week (1 for Sunday, 7 for Saturday).
* **DAYOFYEAR(date)**: Returns the day of the year (1-366).
* **WEEK(date)**: Returns the week number (1-53).
* **QUARTER(date)**: Returns the quarter of the year (1-4).

**3. Formatting Dates**

* **DATE\_FORMAT(date, format)**: Formats the date based on the specified format string.
  + Example: DATE\_FORMAT('2025-01-21', '%M %d, %Y') → "January 21, 2025"

**4. Adding or Subtracting Intervals**

* **DATE\_ADD(date, INTERVAL expr unit)**: Adds a specific time interval to a date.
  + Example: DATE\_ADD('2025-01-01', INTERVAL 7 DAY) → "2025-01-08"
* **DATE\_SUB(date, INTERVAL expr unit)**: Subtracts a specific time interval from a date.
* **ADDDATE(date, INTERVAL expr unit)**: Synonym for DATE\_ADD.
* **SUBDATE(date, INTERVAL expr unit)**: Synonym for DATE\_SUB.

**5. Calculating Differences Between Dates**

* **DATEDIFF(date1, date2)**: Returns the number of days between two dates.
  + Example: DATEDIFF('2025-01-21', '2025-01-01') → 20
* **TIMEDIFF(time1, time2)**: Returns the difference between two time values.
* **TIMESTAMPDIFF(unit, datetime1, datetime2)**: Returns the difference between two datetime values in the specified unit (e.g., SECOND, MINUTE, HOUR, DAY).

**6. Converting Between Data Types**

* **STR\_TO\_DATE(string, format)**: Converts a string to a date using a specified format.
  + Example: STR\_TO\_DATE('21-01-2025', '%d-%m-%Y')
* **CAST(expression AS DATE)** or **CONVERT(expression, DATE)**: Converts an expression to a date data type.

**7. Miscellaneous Date Functions**

* **LAST\_DAY(date)**: Returns the last day of the month for the specified date.
* **EXTRACT(unit FROM date)**: Extracts a specific unit (e.g., YEAR, MONTH, DAY) from a date.
* **TO\_DAYS(date)**: Returns the total number of days since the year 0 for the given date.
* **FROM\_DAYS(days)**: Converts a day number to a date.

**Example Queries**

1. **Get current date and time:**
2. SELECT NOW();
3. **Extract the year and month from a date:**
4. SELECT YEAR('2025-01-21'), MONTH('2025-01-21');
5. **Add 10 days to a date:**
6. SELECT DATE\_ADD('2025-01-01', INTERVAL 10 DAY);
7. **Find the difference in days between two dates:**
8. SELECT DATEDIFF('2025-01-21', '2025-01-01');

Date functions vary slightly between SQL dialects (e.g., MySQL, PostgreSQL, SQL Server, Oracle), so always refer to the specific documentation for your database system when using these functions.