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# **PRAC 3**

# SQL Date Data Types

**MySQL** comes with the following data types for storing a date or a date/time value in the database:

* DATE - format YYYY-MM-DD
* DATETIME - format: YYYY-MM-DD HH:MI:SS
* TIMESTAMP - format: YYYY-MM-DD HH:MI:SS
* YEAR - format YYYY or YY

**SQL Server** comes with the following data types for storing a date or a date/time value in the database:

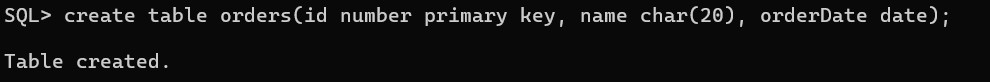
* DATE - format YYYY-MM-DD
* DATETIME - format: YYYY-MM-DD HH:MI:SS
* SMALLDATETIME - format: YYYY-MM-DD HH:MI:SS
* TIMESTAMP - format: a unique number

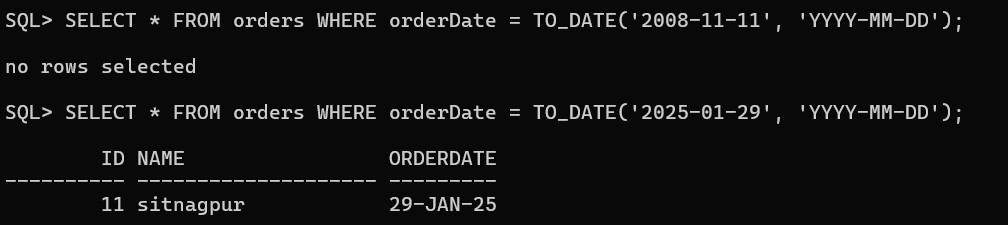
Note: The date datatypes are chosen for a column when you create a new table in your database!

# SQL Working with Dates

You need to create table,or alter table with date attribute.

Following is the query sample to use **date datatype**





|  |  |
| --- | --- |
| Look at the following table:  Orders Table |  |
| **OrderId** **ProductName** | **OrderDate** |
| 1 Geitost | 2008-11-11 |
| 2 Camembert Pierrot | 2008-11-09 |
| 3 Mozzarella di Giovanni | 2008-11-11 |
| 4 Mascarpone Fabioli | 2008-10-29 |

Now we want to select the records with an OrderDate of "2008-11-11" from the table above.

We use the following SELECT statement:

SELECT \* FROM Orders WHERE OrderDate='2008-11-11'

The result-set will look like this:

|  |  |  |  |
| --- | --- | --- | --- |
| **OrderId** | | **ProductName** | **OrderDate** |
| 1 | | Geitost | 2008-11-11 |
| 3 | | Mozzarella di Giovanni | 2008-11-11 |
| Note: Two dates can easily be compared if there is no time component involved! | | | | | | |
|  | | Now, assume that the "Orders" table looks like this (notice the added | | | |  |

time-component in the "OrderDate" column):

|  |  |  |
| --- | --- | --- |
| **OrderId** | **ProductName** | **OrderDate** |
| 1 | Geitost | 2008-11-11 13:23:44 |
| 2 | Camembert Pierrot | 2008-11-09 15:45:21 |

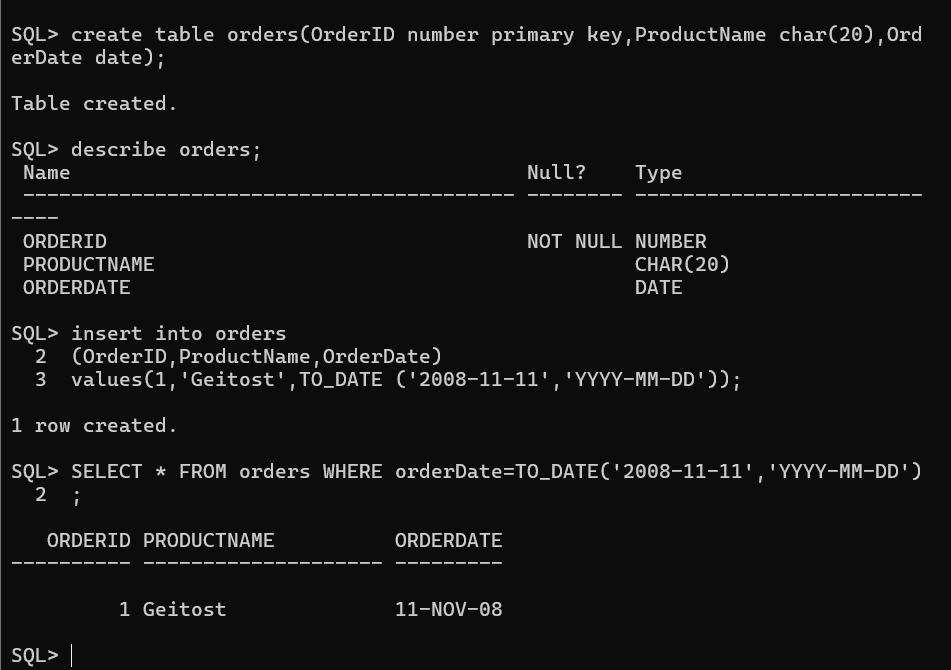
1. Mozzarella di Giovanni 2008-11-11 11:12:01
2. Mascarpone Fabioli 2008-10-29 14:56:59

If we use the same SELECT statement as above:

SELECT \* FROM Orders WHERE OrderDate='2008-11-11'

we will get no result! This is because the query is looking only for dates with no

time portion.

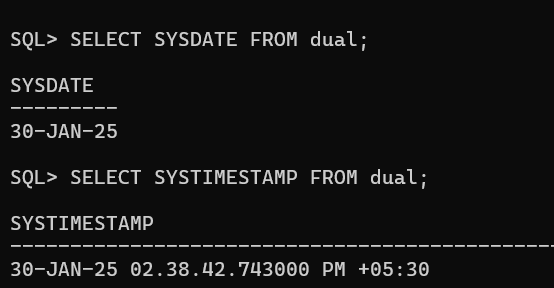


**Date Functions Samples for you to execute with all possible types:**

**1. ORACLE SQL (SQLPLUS) Date Functions**

## 1.1 Getting the Current Date and Time

SELECT SYSDATE FROM dual; -- Returns the current date and time SELECT SYSTIMESTAMP FROM dual; -- Returns the current date and timestamp (including fractional seconds and time zone)



## 1.2 Formatting Dates (TO\_CHAR)

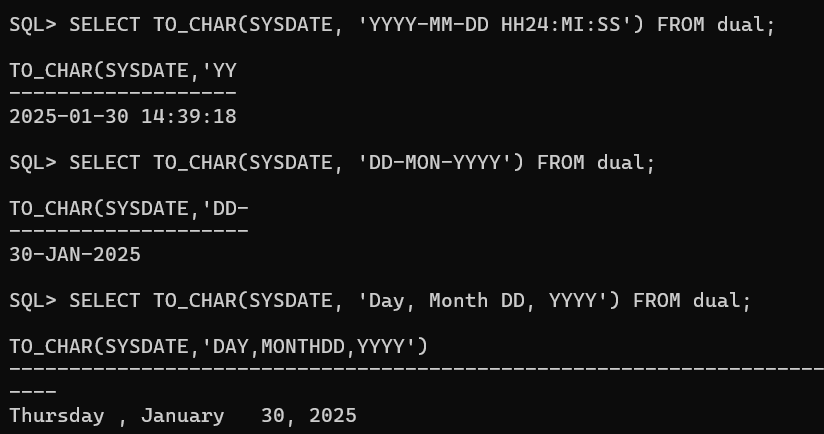
SELECT TO\_CHAR(SYSDATE, 'YYYY-MM-DD HH24:MI:SS') FROM dual; -- Format date as string

SELECT TO\_CHAR(SYSDATE, 'DD-MON-YYYY') FROM dual; -- Example:

29-JAN-2025

SELECT TO\_CHAR(SYSDATE, 'Day, Month DD, YYYY') FROM dual; -- Example:

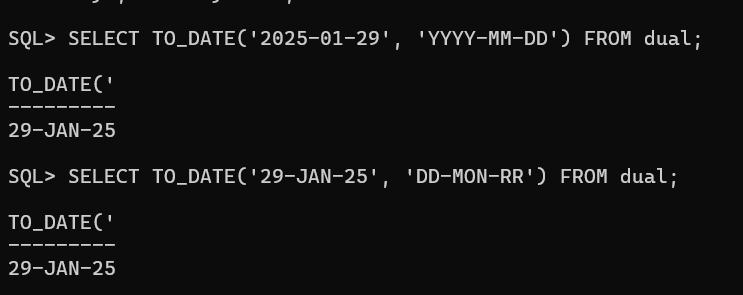
Tuesday, January 29, 2025



## 1.3 Converting Strings to Dates (TO\_DATE)

SELECT TO\_DATE('2025-01-29', 'YYYY-MM-DD') FROM dual; -- Convert string to date

SELECT TO\_DATE('29-JAN-25', 'DD-MON-RR') FROM dual; -- Uses RR format for 2-digit year

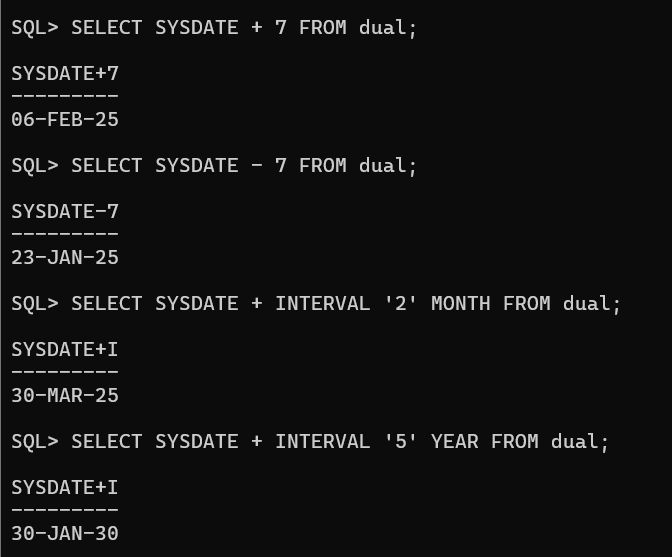


## 1.4 Date Arithmetic

SELECT SYSDATE + 7 FROM dual; -- Adds 7 days

SELECT SYSDATE - 7 FROM dual; -- Subtracts 7 days

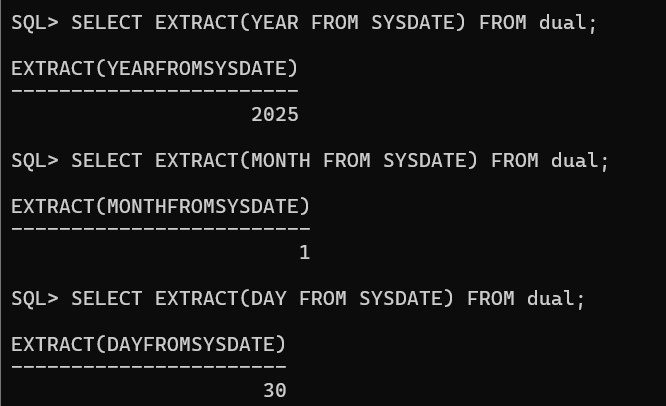
SELECT SYSDATE + INTERVAL '2' MONTH FROM dual; -- Adds 2 months SELECT SYSDATE + INTERVAL '5' YEAR FROM dual; -- Adds 5 years



## 1.5 Extracting Date Parts

SELECT EXTRACT(YEAR FROM SYSDATE) FROM dual; -- Returns year

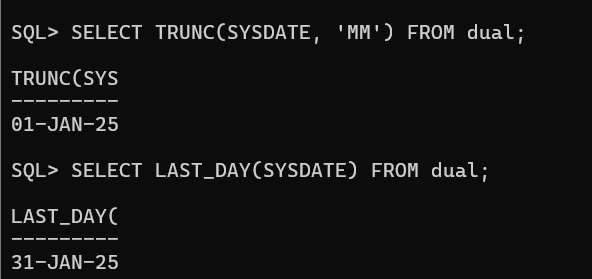
SELECT EXTRACT(MONTH FROM SYSDATE) FROM dual; -- Returns month SELECT EXTRACT(DAY FROM SYSDATE) FROM dual; -- Returns day



## 1.6 Finding the First and Last Day of the Month

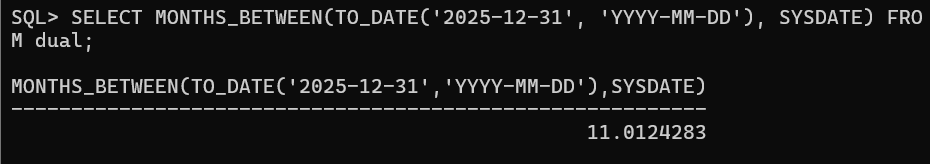
SELECT TRUNC(SYSDATE, 'MM') FROM dual; -- First day of the current month

SELECT LAST\_DAY(SYSDATE) FROM dual; -- Last day of the current month



## 1.7 Difference Between Two Dates (MONTHS\_BETWEEN)

SELECT MONTHS\_BETWEEN(TO\_DATE('2025-12-31', 'YYYY-MM-DD'), SYSDATE) FROM dual; -- Returns the difference in months

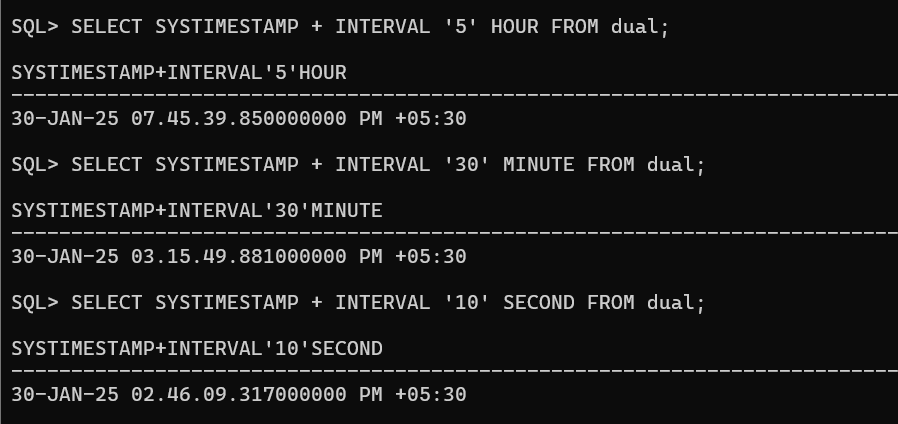


## 1.8 Adding Time Components

SELECT SYSTIMESTAMP + INTERVAL '5' HOUR FROM dual; -- Adds 5 hours

SELECT SYSTIMESTAMP + INTERVAL '30' MINUTE FROM dual; -- Adds 30 minutes

SELECT SYSTIMESTAMP + INTERVAL '10' SECOND FROM dual; -- Adds 10 seconds



## 2. MySQL Date Functions

### 2.1 Getting the Current Date and Time

SELECT NOW(); -- Current date and time

SELECT CURDATE(); -- Current date only

SELECT CURTIME(); -- Current time only

### 2.2 Formatting Dates (DATE\_FORMAT)

SELECT DATE\_FORMAT(NOW(), '%Y-%m-%d %H:%i:%s'); -- Example: 2025-01-29

14:30:00

SELECT DATE\_FORMAT(NOW(), '%W, %M %d, %Y'); -- Example: Tuesday, January 29, 2025

### 2.3 Converting Strings to Dates (STR\_TO\_DATE)

SELECT STR\_TO\_DATE('29-01-2025', '%d-%m-%Y'); -- Convert string to date

SELECT STR\_TO\_DATE('2025-01-29 14:30:00', '%Y-%m-%d %H:%i:%s'); --

Convert string to datetime

### 2.4 Date Arithmetic

SELECT NOW() + INTERVAL 7 DAY; -- Adds 7 days

SELECT NOW() - INTERVAL 7 DAY; -- Subtracts 7 days

SELECT NOW() + INTERVAL 2 MONTH; -- Adds 2 months

SELECT NOW() + INTERVAL 5 YEAR; -- Adds 5 years

### 2.5 Extracting Date Parts

SELECT YEAR(NOW()); -- Returns the current year

SELECT MONTH(NOW()); -- Returns the current month

SELECT DAY(NOW()); -- Returns the current day

### 2.6 Finding the First and Last Day of the Month

SELECT DATE\_FORMAT(NOW(), '%Y-%m-01'); -- First day of the current month

SELECT LAST\_DAY(NOW()); -- Last day of the current month

### 2.7 Difference Between Two Dates (TIMESTAMPDIFF)

SELECT TIMESTAMPDIFF(MONTH, '2025-01-01', '2025-12-31'); -- Returns 11 months

### 2.8 Adding Time Components

SELECT NOW() + INTERVAL 5 HOUR; -- Adds 5 hours

SELECT NOW() + INTERVAL 30 MINUTE; -- Adds 30 minutes

SELECT NOW() + INTERVAL 10 SECOND; -- Adds 10 seconds

### Key Differences Between SQL\*Plus (Oracle) and MySQL

|  |  |  |
| --- | --- | --- |
| **Feature** | **Oracle (SQL\*Plus)** | **MySQL** |
| Current Date | SYSDATE | NOW() |
| Formatting Dates | TO\_CHAR(date, 'format') | DATE\_FORMAT(date, 'format') |
| String to Date  Conversion | TO\_DATE(string, 'format') | STR\_TO\_DATE(string, 'format') |
| Date Arithmetic | SYSDATE + INTERVAL 'X' UNIT | NOW() + INTERVAL X UNIT |
| Extracting Date  Parts | EXTRACT(part FROM date) | YEAR(), MONTH(), DAY() |
| First/Last Day of  Month | TRUNC(SYSDATE, 'MM'), LAST\_DAY(SYSDATE) | DATE\_FORMAT(NOW(),  '%Y-%m-01'), LAST\_DAY(NOW()) |