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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**

```
SQL> create table orders(id number primary key, name char(20), orderDate date);

Table created.

SQL> insert into orders
  2  (id, name, orderDate)
  3  values(11,'sitnagpur',TO_DATE('2025-01-29', 'YYYY-MM-DD'));

1 row created.
```

```
SQL> SELECT * FROM orders WHERE orderDate = TO_DATE('2008-11-11', 'YYYY-MM-DD');

no rows selected

SQL> SELECT * FROM orders WHERE orderDate = TO_DATE('2025-01-29', 'YYYY-MM-DD');

        ID NAME                 ORDERDATE
---------- -------------------- ---------
        11 sitnagpur            29-JAN-25
```

Look at the following table:

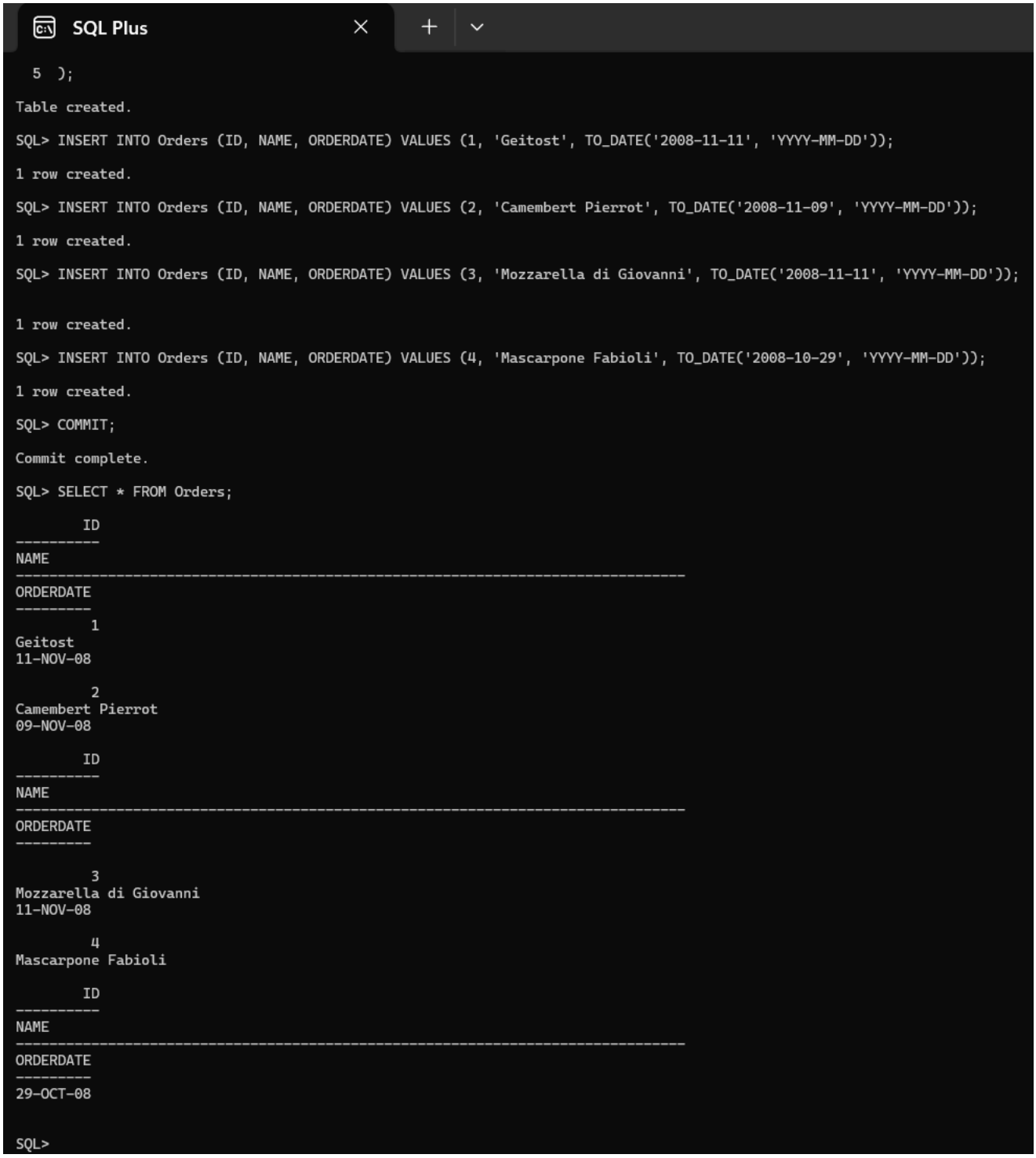
Orders Table

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

3 Mozzarella di Giovanni 2008-11-11 11:12:01

4 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.

```
SQL> SELECT * FROM Orders WHERE ORDERDATE = TO_DATE('2008-11-11');
SELECT * FROM Orders WHERE ORDERDATE = TO_DATE('2008-11-11')
                                       *
ERROR at line 1:
ORA-01861: literal does not match format string
```

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)

```
Connected to:
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
Version 21.3.0.0.0

SQL> SELECT SYSDATE FROM dual;

SYSDATE
---------
30-JAN-25

SQL> SELECT SYSTIMESTAMP FROM dual;

SYSTIMESTAMP
---------------------------------------------------------------------------
30-JAN-25 03.05.47.521000 PM +05:30

SQL>
```

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

```
SQL> SELECT TO_CHAR(SYSDATE, 'YYYY-MM-DD HH24:MI:SS') FROM dual;

TO_CHAR(SYSDATE,'YY
-------------------
2025-01-30 15:06:36

SQL> SELECT TO_CHAR(SYSDATE, 'DD-MON-YYYY') FROM dual;

TO_CHAR(SYSDATE,'DD-
--------------------
30-JAN-2025

SQL> SELECT TO_CHAR(SYSDATE, 'Day, Month DD, YYYY') FROM dual;

TO_CHAR(SYSDATE,'DAY,MONTHDD,YYYY')
-----------------------------------------------------------------------
Thursday , January   30, 2025

SQL>
```

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

```
SQL> SELECT TO_DATE('2025-01-29', 'YYYY-MM-DD') FROM dual;

TO_DATE('
---------
29-JAN-25

SQL> SELECT TO_DATE('29-JAN-25', 'DD-MON-RR') FROM dual;

TO_DATE('
---------
29-JAN-25

SQL>
```

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

```
SQL> SELECT SYSDATE + 7 FROM dual;

SYSDATE+7
---------
06-FEB-25

SQL> SELECT SYSDATE - 7 FROM dual;

SYSDATE-7
---------
23-JAN-25

SQL> SELECT SYSDATE + INTERVAL '2' MONTH FROM dual;

SYSDATE+I
---------
30-MAR-25

SQL> SELECT SYSDATE + INTERVAL '5' YEAR FROM dual;

SYSDATE+I
---------
30-JAN-30

SQL>
```

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

```
SQL> SELECT EXTRACT(YEAR FROM SYSDATE) FROM dual;

EXTRACT(YEARFROMSYSDATE)
------------------------
                    2025

SQL> SELECT EXTRACT(MONTH FROM SYSDATE) FROM dual;

EXTRACT(MONTHFROMSYSDATE)
-------------------------
                        1

SQL> SELECT EXTRACT(DAY FROM SYSDATE) FROM dual;

EXTRACT(DAYFROMSYSDATE)
-----------------------
                     30
```

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

```
SQL> SELECT TRUNC(SYSDATE, 'MM') FROM dual;

TRUNC(SYS
---------
01-JAN-25

SQL> SELECT LAST_DAY(SYSDATE) FROM dual;

LAST_DAY(
---------
31-JAN-25
```

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

```
SQL> SELECT MONTHS_BETWEEN(TO_DATE('2025-12-31', 'YYYY-MM-DD'), SYSDATE) FROM dual;

MONTHS_BETWEEN(TO_DATE('2025-12-31','YYYY-MM-DD'),SYSDATE)
----------------------------------------------------------
                                                 11.0118291
```

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

```
SYSTIMESTAMP+INTERVAL'5'HOUR
---------------------------------------------------------------------------
30-JAN-25 08.12.47.607000000 PM +05:30

SQL> SELECT SYSTIMESTAMP + INTERVAL '30' MINUTE FROM dual;

SYSTIMESTAMP+INTERVAL'30'MINUTE
---------------------------------------------------------------------------
30-JAN-25 03.42.51.827000000 PM +05:30

SQL> SELECT SYSTIMESTAMP + INTERVAL '10' SECOND FROM dual;

SYSTIMESTAMP+INTERVAL'10'SECOND
---------------------------------------------------------------------------
30-JAN-25 03.13.05.984000000 PM +05:30

SQL>
```

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())