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Section-B

Batch-B2

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.

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)
```

```
SQL> SELECT SYSDATE FROM dual;

SYSDATE
-----
30-JAN-25

SQL> SELECT SYSTIMESTAMP FROM dual;

SYSTIMESTAMP
-----
30-JAN-25 02.59.07.822000 PM +05:30
```

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 15:03:46

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

TO_CHAR(SYS
-----
30-JAN-2025

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

TO_CHAR(SYSDATE,'DAY,MONTHDD,
-----
Thursday , January 30, 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

```

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

```

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
```

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(SYSDATE, 'MM')
-----
01-JAN-25

SQL> SELECT LAST_DAY(SYSDATE) FROM dual;

LAST_DAY(SYSDATE)
-----
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)
-----
11.0118716
```

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
```

```
SQL> SELECT SYSTIMESTAMP + INTERVAL '5' HOUR FROM dual;
SYSTIMESTAMP+INTERVAL '5' HOUR
-----
30-JAN-25 08.10.32.237000000 PM +05:30

SQL> SELECT SYSTIMESTAMP + INTERVAL '30' MINUTE FROM dual;
SYSTIMESTAMP+INTERVAL '30' MINUTE
-----
30-JAN-25 03.40.42.409000000 PM +05:30

SQL> SELECT SYSTIMESTAMP + INTERVAL '10' SECOND FROM dual;
SYSTIMESTAMP+INTERVAL '10' SECOND
-----
30-JAN-25 03.11.01.011000000 PM +05:30
```

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      MONTH(), DAY()
EXTRACT(part FROM date) YEAR(),
                        TRUNC(SYSDATE, 'MM'),  '%Y-%m-01'),
                        LAST_DAY(SYSDATE)      LAST_DAY(NOW())
First/Last Day of Month   DATE_FORMAT(NOW(),
```