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PRACTICAL NO:02

Temporal Database

Temporal databases, in the broadest sense, encompass all database applications that require some aspect of time when organizing their information. Hence, they provide a good example to illustrate the need for developing a set of unifying concepts for application developers to use.

Time Representation, Calendars and Time Dimensions

For temporal databases, time is considered to be an ordered sequence of points in some granularity that is determined by the application.

The temporal data types include:

DATE (specifying Year, Month, and Day as YYYY-MM-DD)

TIME (specifying Hour, Minute, and Second as HH: MM: SS)

TIMESTAMP (specifying a Date/Time combination, with options for including sub second divisions if they are needed)

INTERVAL (a relative time duration, such as 10 days or 250 minutes) • PERIOD (an anchored time duration with a fixed starting point, such as the 10-day period from January 1, 2009, to January 10,2009, inclusive).

Valid Time and Transaction Time Dimensions

Given a particular event or fact that is associated with a particular time point or time period in the database, the association may be interpreted to mean different things. The most natural interpretation is that the associated time is the time that the event

occurred, or the period during which the fact was considered to be true in the real world. If this interpretation is used, the associated time is often referred to as the valid time. A temporal database using this interpretation is called a valid time database. However, a different interpretation can be used, where the associated time refers to the time when the information was actually stored in the database; that is, it is the value of the system time clock when the information is valid in the system. In this case, the associated time is called the transaction time. A temporal database using this interpretation is called a transaction time database.

Types of Temporal Database

✔ Uni-Temporal

A uni-temporal database has one axis of time, either the validity range or the system time range.

✔ Bi-Temporal

A bi-temporal database has two axes of time, valid time and transaction time.

✔ Tri-Temporal

A tri-temporal database has three axes of time valid time, transaction time and decision time.

Syntaxes, Functions and Data types

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1.Create Table Query

create table <table\_name>(<column1> number(20), <column2> varchar2(20), <column3>date,<column4> date, <column5> date); create table <table\_name >(< column1> varchar2(20) , <column2> number(5),<column3> number(8), <column4> timestamp);

Date: The DATE type is used for values with a date part but no time part. MySQL retrieves and displays DATE values in ' YYYY-MM-DD ' format.

Timestamp: The TIMESTAMP data type is used for values that contain both date and time parts.

2.Select Query

select from <column\_name> from <table\_name> where

to\_char(<column\_name\_of\_timestamp>,'HH:MI:SS:PM')='<HH:MI:SS:PM>; to\_char():TO\_CHAR() function converts a DATE or INTERVAL value to a string in a specified date format. The Oracle TO\_CHAR() function is very useful for formatting the internal date data returned by a query in a specific date format.

A. Aim: Create a table emp\_appointment, which stores the account number, name, dob and valid time say, (Recruitment date and Retirement date). Insert 10 records. Also create the trigger to calculate retirement date.

Execute following queries:

• Find all the employee who join the company on 24-oct-2000.

• Find all employee who join the company on 31-mar-2024.

Create Table

SQL> create table emp\_appointment(emp\_no number(20),acc\_no number(20),name varchar2(20),dob date,recruit date,retire date);

Table created.

Create Trigger

SQL> create or replace trigger retire\_trig

2 before insert or update on emp\_appointment

3 for each row

4 declare

5 begin

6 if :new.retire is null then

7 :new.retire:=last\_day(add\_months(:new.dob,702));

8 end if;

9 end;

10 /

Trigger created.

Check date fromat.

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SQL>select sysdate from dual;

SYSDATE

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28-SEP-22

Insert Values

SQL> insert into emp\_appointment(emp\_no,acc\_no,name,dob,recruit) 2 values(1,123,'Puig','07-Jul-1992','07-Jul-2011');

1 row created.

SQL> insert into emp\_appointment(emp\_no,acc\_no,name,dob,recruit) 2 values(2,124,'Messi','03-Apr-1964','07-Jul-2002');

1 row created.

SQL> insert into emp\_appointment(emp\_no,acc\_no,name,dob,recruit) 2 values(3,125,'Ansu','05-Sep-1998','24-Oct-2020');

1 row created.

SQL> insert into emp\_appointment(emp\_no,acc\_no,name,dob,recruit) 2 values(4,126,'Demble','29-Aug-2019','07-Jul-2011');

1 row created.

SQL> insert into emp\_appointment(emp\_no,acc\_no,name,dob,recruit) 2 values(5,127,'Pedri','30-Aug-1996','02-Mar-2005');

1 row created.

SQL> select \* from emp\_appointment;

EMP\_NO ACC\_NO NAME DOB RECRUIT RETIRE

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1 123 Puig 07-JUL-92 07-JUL-11 31-JAN-51

2 124 Messi 03-APR-64 07-JUL-02 31-OCT-22

3 125 Ansu 05-SEP-98 24-OCT-20 31-MAR-57

4 126 Demble 29-AUG-19 07-JUL-11 28-FEB-78

5 127 Pedri 30-AUG-96 02-MAR-05 28-FEB-55

a)Find all the employee who join the company on 2-mar-2005.

SQL> select name,recruit from emp\_appointment where recruit='02-Mar-2005';

NAME RECRUIT

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Pedri 02-MAR-05

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b)Find all the employee who will retire on 31-Jan-2051.

SQL> select name,retire from emp\_appointment where retire='31-Jan-2051';

NAME RETIRE

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Puig 31-JAN-51

B. Aim: Create a table tbl\_share, which stores the, name of company, number of shares, and price per share at transaction time. Insert 10 records.

Execute following queries:

• Find all the names of company whose share is more than Rs.100 at 11:45:00 AM.

• Find the name of the company which has the highest share price at 11:45:00: AM.

Create Table

SQL> create table tbl\_share(cmp\_name varchar2(20),no\_share number(5),price\_share number(8),transaction timestamp);

Table created.

Insert Values

SQL> insert into tbl\_share values('maersk',150,100,'02-Mar-2005 11:45:00:am'); 1 row created.

SQL> insert into tbl\_share values('wipro',100,1000,'24-Apr-1993 11:45:00:am'); 1 row created.

SQL> insert into tbl\_share values('LNT',100,1000,'24-Aug-1992 11:45:00:am'); 1 row created.

SQL> insert into tbl\_share values('patni',80,1200,'13-Dec-1986 05:00:00:pm'); 1 row created.

SQL> insert into tbl\_share values('capgemini',170,1400,'21-Feb-1988 04:15:00:pm'); 1 row created.

SQL> insert into tbl\_share values('TCS',100,1000,'07-Mar-2005 11:40:00:am');

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1 row created.

SQL> select \* from tbl\_share;

CMP\_NAME NO\_SHARE PRICE\_SHARE

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TRANSACTION

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maersk 150 100

02-MAR-05 11.45.00.000000 AM

wipro 100 1000

24-APR-93 11.45.00.000000 AM

LNT 100 1000

24-AUG-92 11.45.00.000000 AM

CMP\_NAME NO\_SHARE PRICE\_SHARE

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TRANSACTION

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patni 80 1200

13-DEC-86 05.00.00.000000 PM

capgemini 170 1400

21-FEB-88 04.15.00.000000 PM

TCS 100 1000

07-MAR-05 11.40.00.000000 AM

6 rows selected.

a)Find all the names of a company whose share price is more than Rs. 100 at 11:45 AM

SQL> select cmp\_name,price\_share,transaction from tbl\_share where price\_share>100 and to\_char(transaction,'HH:MI:SS:PM')='11:45:00:AM';

CMP\_NAME PRICE\_SHARE

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TRANSACTION

---------------------------------------------------------------------------

wipro 1000

24-APR-93 11.45.00.000000 AM

LNT 1000

24-AUG-92 11.45.00.000000 AM

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b)Find the Name of the company which has highest share price at 5:00PM

SQL> select cmp\_name, price\_share from tbl\_share where price\_share=(select max(price\_share) from tbl\_share where

to\_char(transaction,'HH:MI:SS:PM')='05:00:00:PM');

CMP\_NAME PRICE\_SHARE

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patni 1200