

Chapter 5

Date and Conversion Functions

Converting From One Datatype To Another

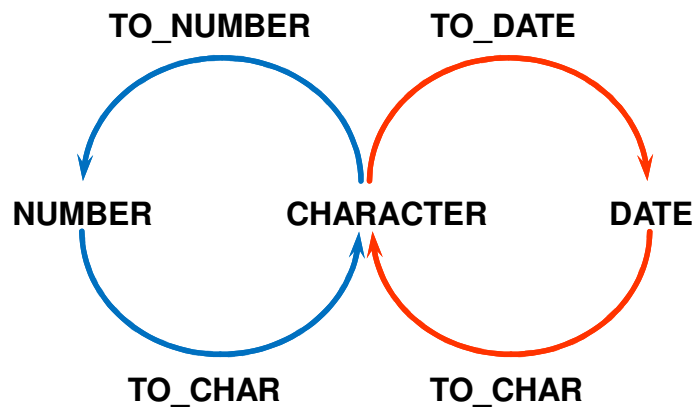
- Comparisons must involve items of the same data type
 - WHERE type = 'BUS'
 - WHERE length > 1500
- May need to **convert** an item to match the data type of another
 - WHERE issue = TO_DATE('01/01/2001', 'MM/DD/YYYY');

Datatype Conversion Functions

- Are single-row functions
- Do not change the value stored in the field
 - provide a temporary, on-the-fly transformation for that specific SQL statement
- Use format masks to specify how to display the result of a conversion function

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Converting From One Datatype To Another



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TO_CHAR

```
TO_CHAR(date, 'format_mask')
```

```
TO_CHAR(number, 'format_mask')
```

- Converts a DATE or NUMBER to a VARCHAR2
- Used to control the formatting when dates or numbers are displayed
- Practice Time

```
SELECT ln, lastcontact, amount  
FROM writer;
```

```
SELECT ln, TO_CHAR(lastcontact, 'mm/dd/yyyy'),  
         TO_CHAR(amount, '$9,990.99')  
FROM writer;
```

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Numeric Format Elements (pg 255)

Element	Description	Element	Result
9	Single digit (zero-suppressed)	999999	1234
0	Single digit (enforce zero)	099999	01234
\$	Floating dollar sign	\$9999	\$1234
L	Local currency symbol	L9999	L1234
.	Decimal point separator	9999.99	1234.00
,	Thousand separator	9,999	1,234

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Date Data Type

- Oracle stores in an internal numeric format that stores century, year, month, day, hours, minutes, seconds
- Can store values Jan 1, 4712 BC to Dec 31, 9999 AD
- **SYSDATE** function returns current date and time
- Default date format is **DD-MON-RR**
- Practice Time

```
SELECT SYSDATE FROM dual;
```

```
SELECT TO_CHAR(SYSDATE, 'mm/dd/yyyy HH:MI:SS AM')  
FROM dual;
```

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Guessing Games

- What if you don't specify the century?
 - eg: 03-Mar-33
- Ambiguous when enter/display only 2-digit years
 - eg: what year is 15-MAR-02?
 - eg: what year is 15-MAR-88?
- To avoid ambiguity, always enter/display 4-digit years

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RR Date Format

- When a 2-digit date is entered under **RR** mask, Oracle presumes the century using these rules

		If the specified two-digit year is:	
		00–49	50–99
If two digits of the current year are:	00–49	The return date is in the current century	The return date is in the century before the current one
	50–99	The return date is in the century after the current one	The return date is in the current century

- thus `TO_DATE('15-MAR-02', 'DD-MON-RR')` refers to '15-MAR-2002'
- thus `TO_DATE('15-MAR-98', 'DD-MON-RR')` refers to '15-MAR-1998'

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YY Date Format (pg 198)

- When a two-digit date is entered under **YY** mask, the date always has the same first 2 digits as the current year (i.e., the current century)
 - thus `TO_DATE('15-MAR-02', 'DD-MON-YY')` refers to '15-MAR-2002'
 - thus `TO_DATE('15-MAR-98', 'DD-MON-YY')` refers to '15-MAR-2098'

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`TO_DATE(char[, 'format_mask'])`

TO_DATE

- Converts a VARCHAR2, CHAR, or NUMBER to a DATE
 - `TO_DATE('01/01/2001', 'MM/DD/YYYY')`
 - `TO_DATE('January 15, 2001, 11:00 A.M.', 'Month dd, YYYY, HH:MI A.M.')`

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Date Formatting Elements (pg 192+)

YYYY	4-digit numeric year
YEAR	Year spelled out
RR	2-digit year in numbers, based on century rule
MM	2-digit numeric month
MON	Abbreviated name of month (eg: JAN, AUG)
MONTH	Name of month (eg: May, September). Always length of 9
DD	Numeric day of month
DAY	Full day of week (eg: Tuesday, Wednesday). Always length of 9
DY	3-letter abbreviation of the day of the week (MON, SAT)
D	Numeric day of the week (eg: 1 = Sunday, 7=Saturday)
DDD	Numeric day of year (1-366)
DL	Day Long (fmDay, Month, DD, YYYY)
WW	Week of year (1-53)
Q	Quarter of the year

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Date Datatype

- Implicit conversion

```
SELECT title, issue
FROM article
WHERE issue = '01-JAN-01';
```

- Explicit conversion

```
SELECT title, issue
FROM article
WHERE issue = TO_DATE('01-JAN-2001', 'DD-MON-YYYY');
```

```
SELECT title, issue
FROM article
WHERE issue = TO_DATE('01/01/2001', 'MM/DD/YYYY');
```

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Time Formatting Elements (pg 193)

HH or HH12	Hour (0-12)
HH24	Hour in military format (0-23)
MI	Minutes
SS	Seconds
SSSSS	Seconds since midnight (0-86399)
AM or PM	Indicate AM or PM
TS	Time Short (HH:MI:SS AM)

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Practice Time

- Using Date/Time Format Masks

```
SELECT course_no, start_date_time
FROM section;

SELECT course_no,
       TO_CHAR(start_date_time, 'DD-MON-YYYY HH24:MI')
FROM section;

SELECT course_no,
       TO_CHAR(start_date_time, 'Day mm/dd/yyyy')
FROM section;
```

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Using Date/Time Format Masks

- Watch out for **case** and for **spaces** provided by elements

```
SELECT section_id,
       TO_CHAR(start_date_time, 'mm-dd-yyyy DAY')
FROM section
WHERE TO_CHAR(start_date_time, 'DAY') = 'Friday';
```

```
SELECT section_id,
       TO_CHAR(start_date_time, 'mm-dd-yyyy DAY')
FROM section
WHERE TO_CHAR(start_date_time, 'DAY') = 'FRIDAY';
```

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Using Date/Time Format Masks

- Fill Mode (pg204)
 - suppresses extra blanks provided by certain format mask elements

```
SELECT course_no, section_id,  
       TO_CHAR(start_date_time, 'DAY')  
FROM section  
WHERE TO_CHAR(start_date_time, 'fmDAY') = 'FRIDAY';
```

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Character vs Date Comparisons (pg205+)

- Results when ascending sort?

Tom	April 14, 2011
Jon	July 13, 1988
Dan	February 3, 2011
Jim	
Pat	

- Are These WHERE Clauses Equivalent?

```
SELECT course_no, TO_CHAR(start_date_time, 'Month dd, yyyy')  
FROM section  
WHERE start_date_time < TO_DATE('May 14, 2007', 'Month dd, yyyy');
```

```
SELECT course_no, TO_CHAR(start_date_time, 'Month dd, yyyy')  
FROM section  
WHERE TO_CHAR(start_date_time, 'Month dd, yyyy') < 'May 14, 2007';
```

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Using Dates and Times

- When no time is provided, Oracle stores a default time of **midnight**
- When no day of month is provided, Oracle stores a default **day of 1**

```
SELECT TO_CHAR(issue, 'mm/dd/yyyy hh:mi am')
FROM article;
```

- Watch out for **times...** queries may not perform as expected

```
SELECT course_no, start_date_time
FROM section
WHERE start_date_time = '14-JUL-07';
```

```
SELECT DISTINCT
TO_CHAR(start_date_time, 'MM/DD/YYYY HH:MI AM')
FROM section;
```

```
SELECT course_no, start_date_time
FROM section
WHERE TRUNC(start_date_time) = '14-JUL-07';
```

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Lab 5.2

Performing Date & Time Arithmetic

- Add/subtract a number to/from a date for a resulting date
- Subtract two dates to find the number of days in between

```
SELECT registration_date, registration_date+7 AS "Fees Due"
FROM student;
```

```
SELECT TO_DATE('13-JAN-11')-TO_DATE('31-DEC-10') "Day #"
FROM dual;
```

- Add **hours** to a date by dividing the number of hours by 24
- Add **minutes** to a date by dividing the number of minutes by 1440

```
SELECT TO_CHAR(SYSDATE, 'mm/dd/yyyy hh:mi AM'),
TO_CHAR(SYSDATE +3/24, 'mm/dd/yyyy hh:mi AM'),
TO_CHAR(SYSDATE +30/1440, 'mm/dd/yyyy hh:mi AM')
FROM dual;
```

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Practice Time: Date/Time Arithmetic

- User `ttrollen` has a table named `workorder`
- Review its structure
- Display its contents, show date and time for each date
- Calculate the duration of each workorder
 - incremental development

WORKORDERID	INITATED	COMPLETED	DAYS	HOURS	MINUTES
1	19 01/15/2007 09:15 am	01/15/2007 11:30 am	0.09375	2.25	135
2	20 01/15/2007 10:30 am	(null)	(null)	(null)	(null)
3	21 01/15/2007 11:45 am	01/15/2007 04:30 pm	0.19791666...	4.75	285
4	22 01/16/2007 03:00 pm	01/16/2007 04:55 pm	0.07986111...	1.916666...	115
5	23 01/16/2007 03:15 pm	(null)	(null)	(null)	(null)
6	24 01/16/2007 04:05 pm	01/19/2007 04:15 pm	3.00694444...	72.16666...	4329.99999...
7	25 01/15/2007 10:00 am	01/16/2007 10:00 am	1	24	1440

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Date Functions

<code>SYSDATE</code>	Returns date/time from Oracle server machine
<code>TRUNC(date)</code>	Truncate date to omit time info
<code>ROUND(date, [format_mask])</code>	Round date
<code>EXTRACT(datepart FROM date)</code>	Extracts numeric year, month or day from <code>DATE</code> datatype (not time elements) Extracts numeric year, month, day, hour, minute, second from <code>TIMESTAMP</code> datatype
<code>MONTHS_BETWEEN(date2, date1)</code>	Number of months between two dates
<code>ADD_MONTHS(date, integer)</code>	Add calendar months to date
<code>NEXT_DAY(date, dayofweek)</code>	Next day of the date specified
<code>LAST_DAY(date)</code>	Last day of specified month

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Cast Function

`CAST(expression AS datatype)`

- Converts among common Oracle data types
 - VARCHAR2, CHAR, NUMBER, DATE
- An alternative to using Oracle-specific type conversion functions

```
SELECT title, issue
FROM article
WHERE issue = TO_DATE('01-JAN-2001', 'DD-MON-YYYY');
```

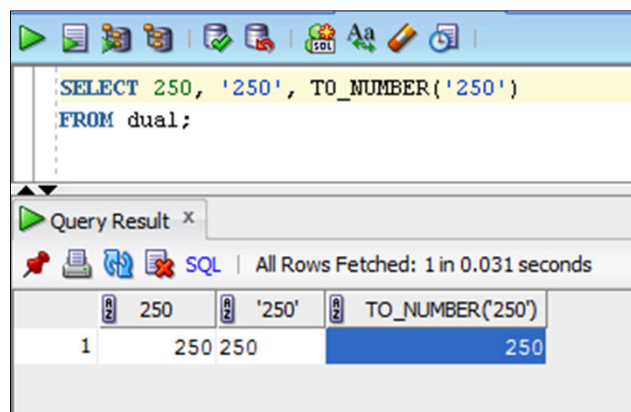
```
SELECT title, issue
FROM article
WHERE issue = CAST('01-JAN-2001' AS DATE);
```

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TO_NUMBER

`TO_NUMBER(char[, 'format_mask'])`

- Converts a VARCHAR2 or CHAR to a NUMBER



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