ORACLE® ACADEMY

Database Programming with SQL

4-3
Date Functions

ORACLE ACADEMY

Objectives

This lesson covers the following objectives:

- Demonstrate the use of SYSDATE and date functions
- State the implications for world businesses to be able to easily manipulate data stored in date format

- Demonstrate the use of SYSDATE and date functions
- State the implications for world businesses to be able to easily manipulate data stored in date format

Purpose

- Have you ever wondered how many days remain in the school year or how many weeks there are until graduation?
- Because the Oracle database stores dates as numbers, you can easily perform calculations on dates using addition, subtraction, and other mathematical operators.
- Businesses depend on being able to use date functions to schedule payrolls and payments, track employee performance reviews and years of service, or keep track of orders and shipments.
- All of these business needs are easily handled using simple SQL date functions.

Displaying Dates

- The default display and input format for dates is DD/Mon/YYYY
- For example: 02/Dec/2014.
- However, the Oracle database stores dates internally with a numeric format representing the century, year, month, day, hour, minute, and second.
- Valid Oracle dates are between January 1, 4712 B.C., and December 31, 9999 A.D.
- This represents the range of dates that you can store successfully in an Oracle database.

SYSDATE

- SYSDATE is a date function that returns the current database server date and time.
- Use SYSDATE to display the current date, use the DUAL table.

```
SELECT SYSDATE
FROM dual;
```

SYSDATE
01/Jul/2015

DATE Data Type

- The DATE data type always stores year information as a four-digit number internally: two digits for the century and two digits for the year.
- For example, the Oracle database stores the year as 1996 or 2004, not just as 96 or 04.
- In previous versions, the century component was not displayed by default.
- However, due to changing business requirements around the world, the 4-digit year is now the default display.

Working with Dates

Examples:	Result

`SELECT last_name, hire_date + 60`
`FROM employees;`
	Adds 60 days to hire_date.

`SELECT last_name, (SYSDATE –`
`  hire_date)/7`
`FROM employees;`
	Displays the number of weeks since the employee was hired.

`SELECT employee_id, (end_date –`
`  start_date)/365`
`  AS "Tenure in last job"`
`FROM job_history;`
	Finds the number of days employee held a job, then divides by 365 to display in years.

Date Functions

- The date functions shown in the table operate on Oracle dates.
- All of the date functions return a value with a DATE data type except the MONTHS_BETWEEN function, which returns a numeric data type value.

Function	Description
MONTHS_BETWEEN	Number of months between two dates
ADD_MONTHS	Add calendar months to date
NEXT_DAY	Date of the next occurance of day of the week specified
LAST_DAY	Last day of the month
ROUND	Round date
TRUNC	Truncate date

Date Functions

- MONTHS_BETWEEN: takes 2 DATE arguments and returns the number of calendar months between the 2 dates.
- If the first argument is an earlier date than the second, the number returned is negative.

Date Function Examples:	Result	
`SELECT last_name, hire_date`	King	17/Jun/1987
`FROM employees`	Kochhar	21/Sep/1989
`WHERE MONTHS_BETWEEN`	De Haan	13/Jan/1993
`(SYSDATE, hire_date)>240;`	…	…

Date Functions

- ADD_MONTHS: takes 2 arguments, a DATE and a number. Returns a DATE value with the number argument added to the month component of the date.
- If the number supplied is negative, the function will subtract that number of months from the date argument.

Date Function Examples:	Result

`SELECT ADD_MONTHS (SYSDATE, 12)`
`  AS "Next Year"`
`FROM dual;`
	01/Jul/2016

Date Functions

- NEXT_DAY: takes 2 arguments, a DATE and a weekday and returns the DATE of the next occurrence of that weekday after the DATE argument.

Date Function Examples:	Result
`SELECT NEXT_DAY (SYSDATE, 'Saturday') AS "Next Saturday" FROM dual;`	04/Jul/2015

Date Functions

- LAST_DAY: takes a DATE argument and returns the DATE of the last day of the month for the DATE argument.

Date Function Examples:	Result

`SELECT LAST_DAY (SYSDATE)`
`  AS "End of the Month"`
`FROM dual;`
	31/Jul/2015

Date Functions

- ROUND: returns a DATE rounded to the unit specified by the second argument.

Date Function Examples:	Result	

`SELECT hire_date,`
`  ROUND (hire_date, 'Month')`
`FROM employees`
`WHERE department_id=50;`
	16/Nov/1999
	17/Oct/1995
	29/Jan/1997
	…
		01/Dec/1999
		01/Nov/1995
		01/Feb/1997
		…

`SELECT hire_date,`
`  ROUND (hire_date, 'Year')`
`FROM employees`
`WHERE department_id=50;`
	16/Nov/1999
	17/Oct/1995
	29/Jan/1997
	…
		01/Jan/2000
		01/Jan/1996
		01/Jan/1997
		…

Date Functions

- TRUNC: returns a DATE truncated to the unit specified by the second argument.

Date Function Examples:	Result	

`SELECT hire_date,`
`  TRUNC(hire_date, 'Month')`
`FROM employees`
`WHERE department_id=50;`
	16/Nov/1999
	17/Oct/1995
	29/Jan/1997
	…
		01/Nov/1999
		01/Oct/1995
		01/Jan/1997
		…

`SELECT hire_date,`
`  TRUNC(hire_date, 'Year')`
`FROM employees`
`WHERE department_id=50;`
	16/Nov/1999
	17/Oct/1995
	29/Jan/1997
	…
		01/Jan/1999
		01/Jan/1995
		01/Jan/1997
		…

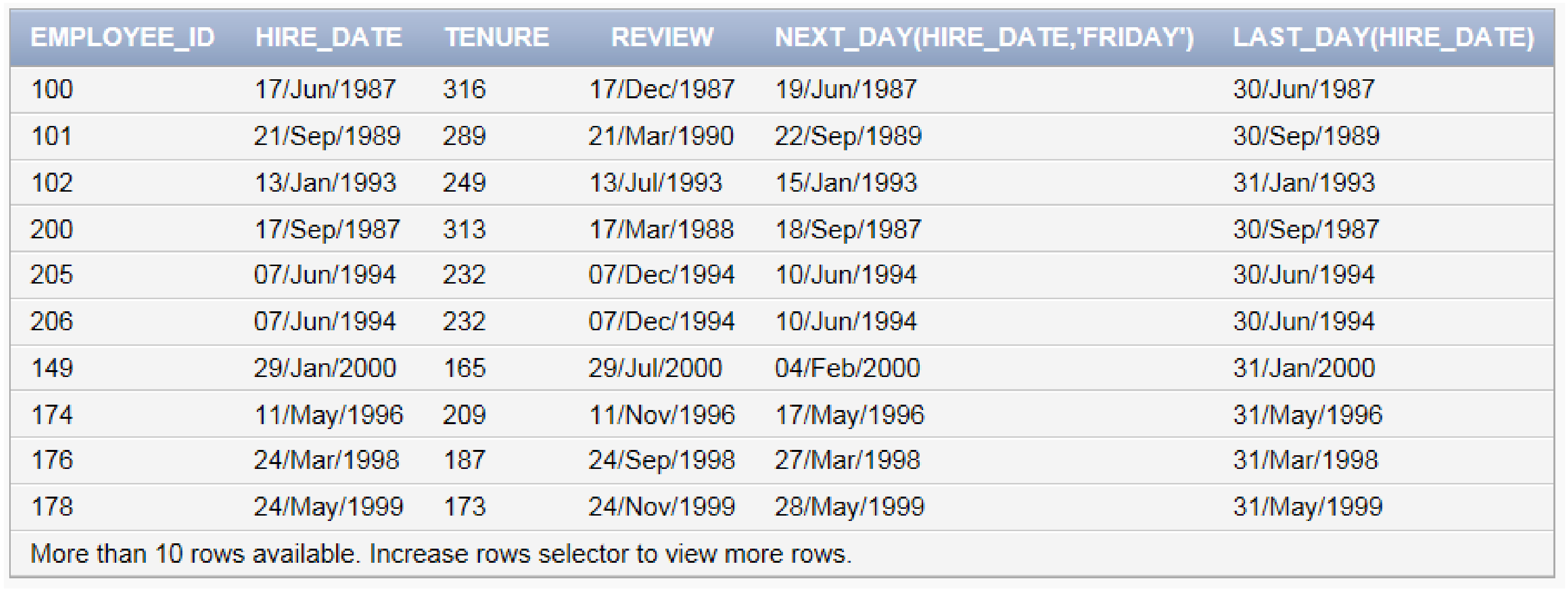
Date Functions

- Here is an example of a query using multiple date functions.
- The output is displayed on the next slide.

```
SELECT employee_id, hire_date,
ROUND(MONTHS_BETWEEN(SYSDATE, hire_date)) AS TENURE,
ADD_MONTHS (hire_date, 6) AS REVIEW,
NEXT_DAY(hire_date, 'FRIDAY'),
LAST_DAY(hire_date)
FROM employees
WHERE MONTHS_BETWEEN (SYSDATE, hire_date) > 36;
```

Date Functions

- The result set from this query returns 20 rows including:



EMPLOYEE_ID	HIRE_DATE	TENURE	REVIEW	NEXT_DAY(HIRE_DATE,'FRIDAY')	LAST_DAY(HIRE_DATE)
100	17/Jun/1987	316	17/Dec/1987	19/Jun/1987	30/Jun/1987
101	21/Sep/1989	289	21/Mar/1990	22/Sep/1989	30/Sep/1989
102	13/Jan/1993	249	13/Jul/1993	15/Jan/1993	31/Jan/1993
200	17/Sep/1987	313	17/Mar/1988	18/Sep/1987	30/Sep/1987
205	07/Jun/1994	232	07/Dec/1994	10/Jun/1994	30/Jun/1994
206	07/Jun/1994	232	07/Dec/1994	10/Jun/1994	30/Jun/1994
149	29/Jan/2000	165	29/Jul/2000	04/Feb/2000	31/Jan/2000
174	11/May/1996	209	11/Nov/1996	17/May/1996	31/May/1996
176	24/Mar/1998	187	24/Sep/1998	27/Mar/1998	31/Mar/1998
178	24/May/1999	173	24/Nov/1999	28/May/1999	31/May/1999

More than 10 rows available. Increase rows selector to view more rows.

Terminology

Key terms used in this lesson included:

- ADD_MONTHS
- LAST_DAY
- MONTHS_BETWEEN
- NEXT_DAY
- SYSDATE
- ROUND
- TRUNC

Summary

In this lesson, you should have learned how to:

- Select and apply the single-row functions MONTHS_BETWEEN, ADD_MONTHS, NEXT_DAY, LAST_DAY, ROUND, and TRUNC that operate on date data
- Explain how date functions transform Oracle dates into date data or numeric values
- Demonstrate proper use of the arithmetic operators with dates

Summary

In this lesson, you should have learned how to:

- Demonstrate the use of SYSDATE and date functions
- State the implications for world businesses to be able to easily manipulate data stored in date format

ORACLE® ACADEMY