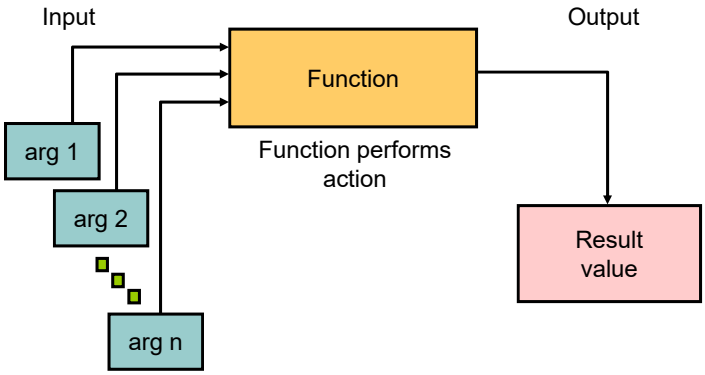
Using Single-Row Functions to Customize Output

Objectives

After completing this lesson, you should be able to do the following:

- Describe the various types of functions available in SQL
- Use the character, number, and date functions in SELECT statements

SQL Functions



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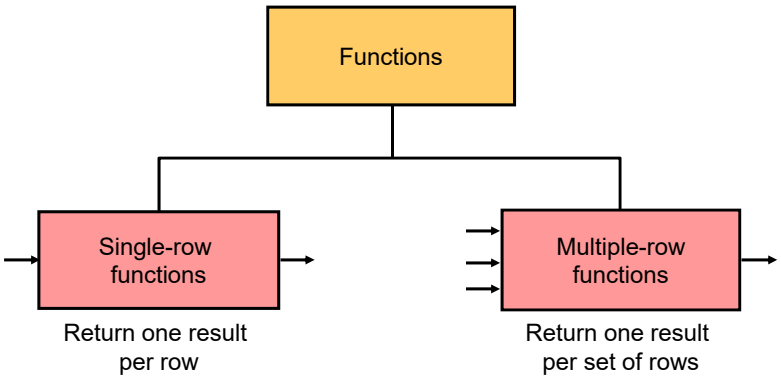
Two Types of SQL Functions



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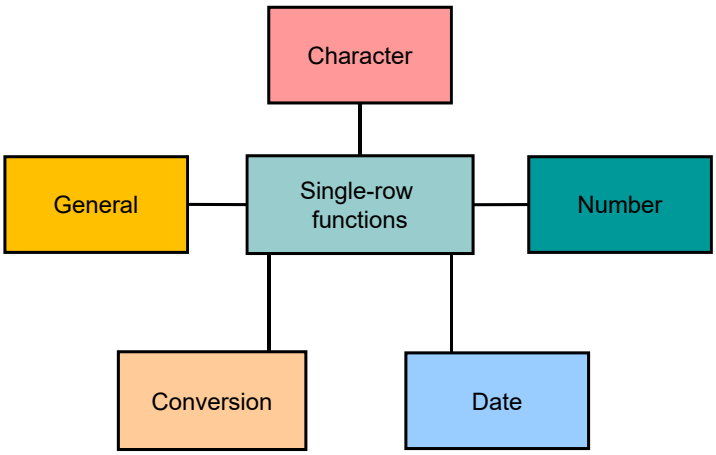
Single-Row Functions



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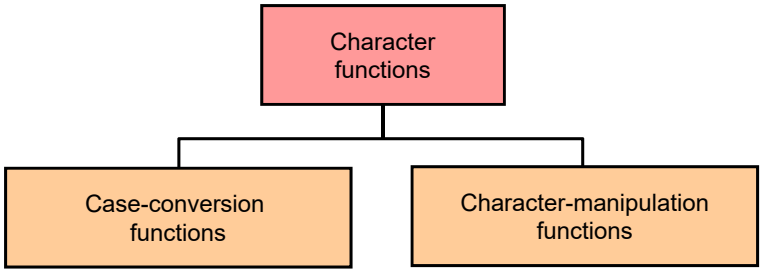
Character Functions




```
LOWER
UPPER
INITCAP
```

```
CONCAT
SUBSTR
LENGTH
INSTR
LPAD | RPAD
TRIM
REPLACE
```

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Case-Conversion Functions

These functions convert the case for character strings:

Function	Result
LOWER('SQL Course')	sql course
UPPER('SQL Course')	SQL COURSE
INITCAP('SQL Course')	Sql Course

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Using Case-Conversion Functions

Display the employee number, name, and department number for employee Higgins:

```
SELECT employee_id, last_name, department_id
FROM   employees
WHERE  last_name = 'higgins';
```

```
0 rows selected
```

```
SELECT employee_id, last_name, department_id
FROM   employees
WHERE  LOWER(last_name) = 'higgins';
```

	EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID
1	205	Higgins	110

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Character-Manipulation Functions

These functions manipulate character strings:

Function	Result
CONCAT('Hello', 'World')	HelloWorld
SUBSTR('HelloWorld',1,5)	Hello
LENGTH('HelloWorld')	10
INSTR('HelloWorld', 'W')	6
LPAD(salary,10,'*')	*****24000
RPAD(salary, 10, '*')	24000*****

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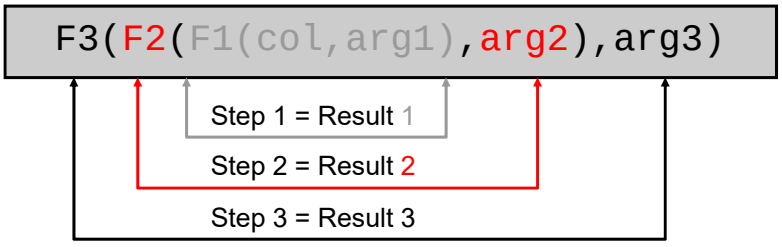
Nesting Functions

- Single-row functions can be nested to any level.
- Nested functions are evaluated from the deepest level to the least deep level.



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Nesting Functions: Example

```
SELECT last_name,
  UPPER(CONCAT(SUBSTR (LAST_NAME, 1, 8), '_US'))
FROM   employees
WHERE  department_id = 60;
```

	LAST_NAME	UPPER(CONCAT(SUBSTR(LAST_NAME,1,8),'_US'))
1	Hunold	HUNOLD_US
2	Ernst	ERNST_US
3	Lorentz	LORENTZ_US

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Numeric Functions

- ROUND: Rounds value to a specified decimal
- TRUNC: Truncates value to a specified decimal
- CEIL: Returns the smallest whole number greater than or equal to a specified number
- FLOOR: Returns the largest whole number equal to or less than a specified number
- MOD: Returns remainder of division

Function	Result
ROUND(45.926, 2)	45.93
TRUNC(45.926, 2)	45.92
CEIL (2.83)	3
FLOOR (2.83)	2
MOD (1600, 300)	100

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Using the MOD Function

Display the employee records where the employee_id is an even number.

```
SELECT employee_id as "Even Numbers", last_name
FROM employees
WHERE MOD(employee_id,2) = 0;
```

	Even Numbers	LAST_NAME
1	174	Abel
2	142	Davies
3	102	De Haan
4	104	Ernst
5	202	Fay
6	206	Gietz
7	178	Grant
8	100	King
9	124	Mourgos
10	176	Taylor
11	144	Vargas
12	200	Whalen

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Lesson Agenda

- Single-row SQL functions
- Character functions
- Nesting functions
- Number functions
- Working with dates
- Date functions

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Working with Dates

- The Oracle Database stores dates in an internal numeric format: century, year, month, day, hours, minutes, and seconds.
- The default date display format is `DD-MON-RR`.

```
SELECT last_name, hire_date
FROM   employees
WHERE  hire_date < '01-FEB-2008';
```

	LAST_NAME	HIRE_DATE
1	King	17-JUN-03
2	Kochhar	21-SEP-05

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Using the SYSDATE Function

SYSDATE is a function that returns:

- Date
- Time

```
SELECT sysdate
FROM   dual;
```

	SYSDATE
1	24-AUG-12

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Arithmetic with Dates

- Add to or subtract a number from a date for a resultant date value.
- Subtract two dates to find the number of days between those dates.
- Add hours to a date by dividing the number of hours by 24.

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Using Arithmetic Operators with Dates

```
SELECT last_name, (SYSDATE-hire_date)/7 AS WEEKS
FROM   employees
WHERE  department_id = 90;
```

	LAST_NAME	WEEKS
1	King	478.871917989417989417989417989417989418
2	Kochhar	360.729060846560846560846560846560846561
3	De Haan	605.300489417989417989417989417989417989

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Date-Manipulation Functions

Function	Result
MONTHS_BETWEEN	Number of months between two dates
ADD_MONTHS	Add calendar months to date
NEXT_DAY	Week day of the date specified
LAST_DAY	Last day of the month
ROUND	Round date
TRUNC	Truncate date

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Using Date Functions

Function	Result
MONTHS_BETWEEN ('01-SEP-05','11-JAN-04')	19.6774194
ADD_MONTHS ('31-JAN-04',1)	'29-FEB-04'
NEXT_DAY ('01-SEP-05','FRIDAY')	'08-SEP-05'
LAST_DAY ('01-FEB-05')	'28-FEB-05'

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Using ROUND and TRUNC Functions with Dates

Function	Result
ROUND(SYSDATE,'MONTH')	01-AUG-03
ROUND(SYSDATE ,'YEAR')	01-JAN-04
TRUNC(SYSDATE ,'MONTH')	01-JUL-03
TRUNC(SYSDATE ,'YEAR')	01-JAN-03

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Summary

In this lesson, you should have learned how to:

- Use the various types of functions available in SQL
- Use the character, number, and date functions in SELECT statements

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