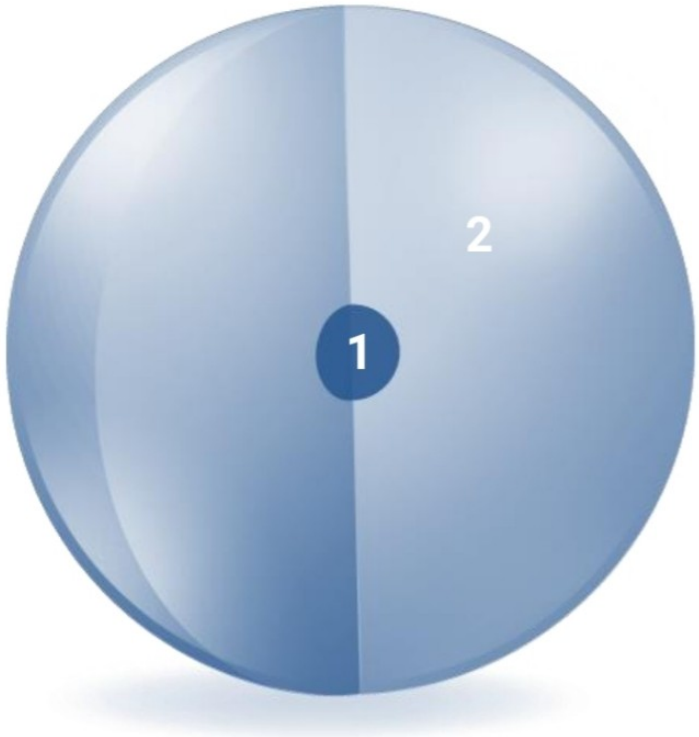
Lesson 2

Using Single-Row Functions to Customize Output

ORACLE

What You will learn at the end of this Session?

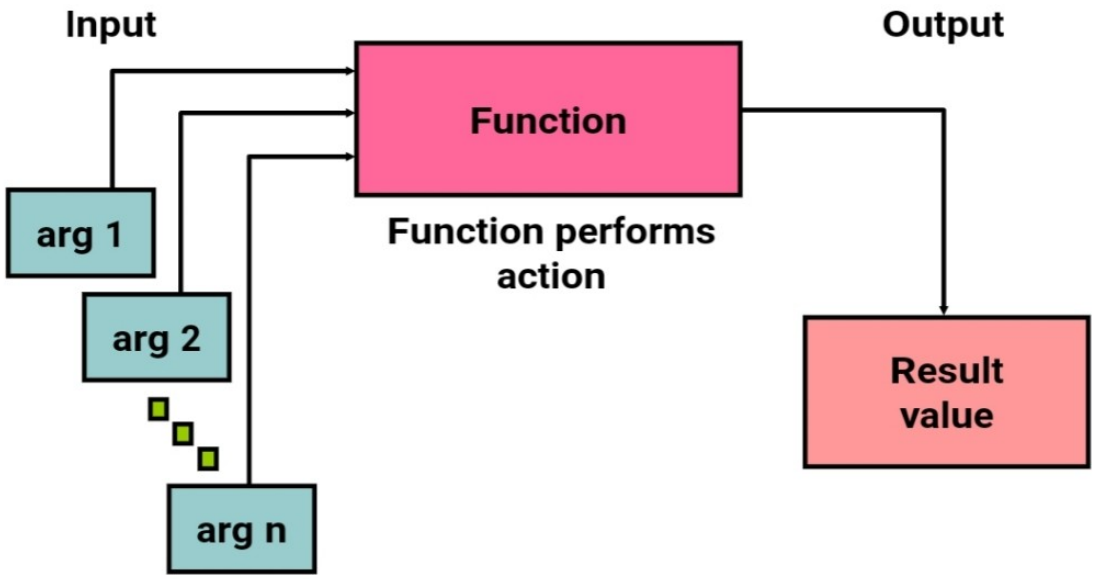


1. **Describe the various types of functions available in SQL**

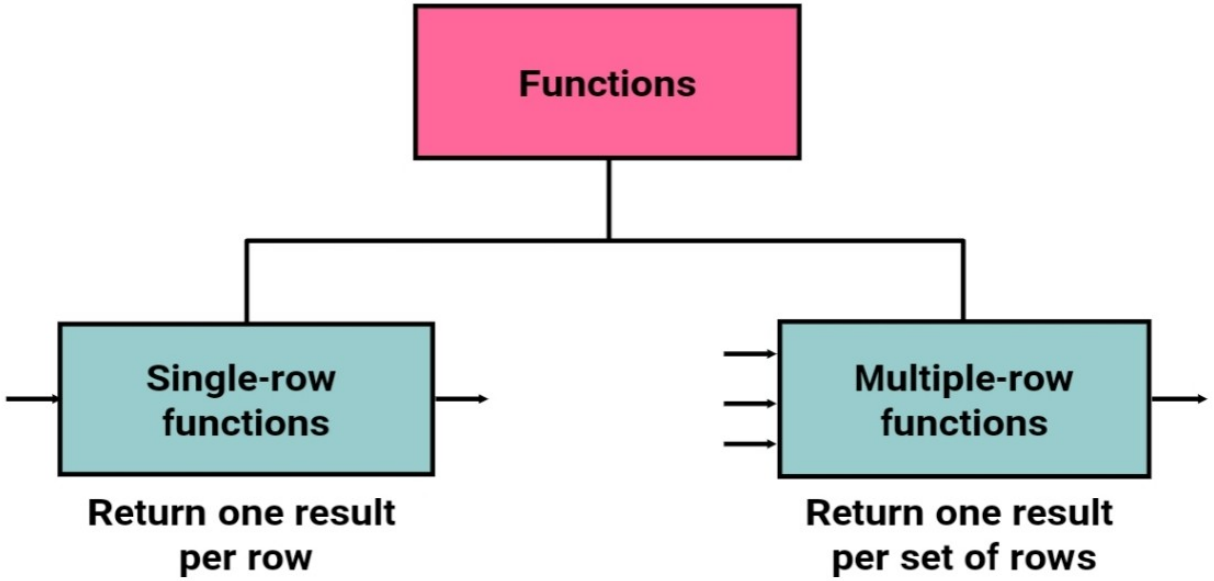
2. **Use the character, number, and date functions in SELECT statements**

ORACLE

SQL Functions



Two Types of SQL Functions



Single-Row Functions

Manipulate data items

Accept arguments and return one value

Act on each row that is returned

Return one result per row

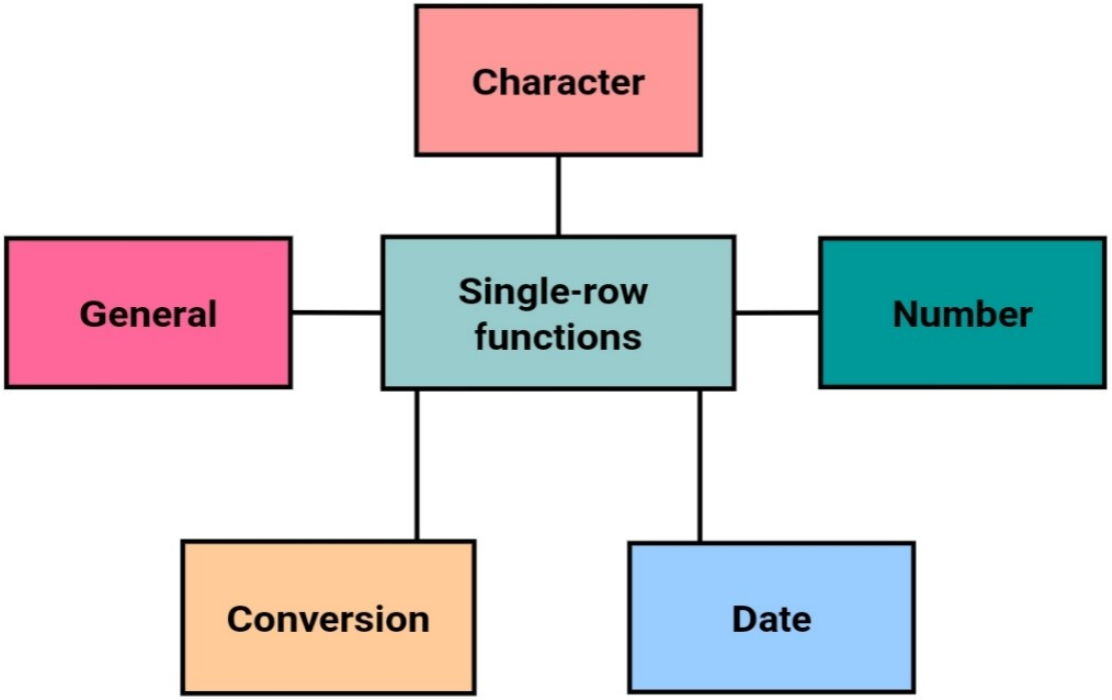
May modify the data type

Can be nested

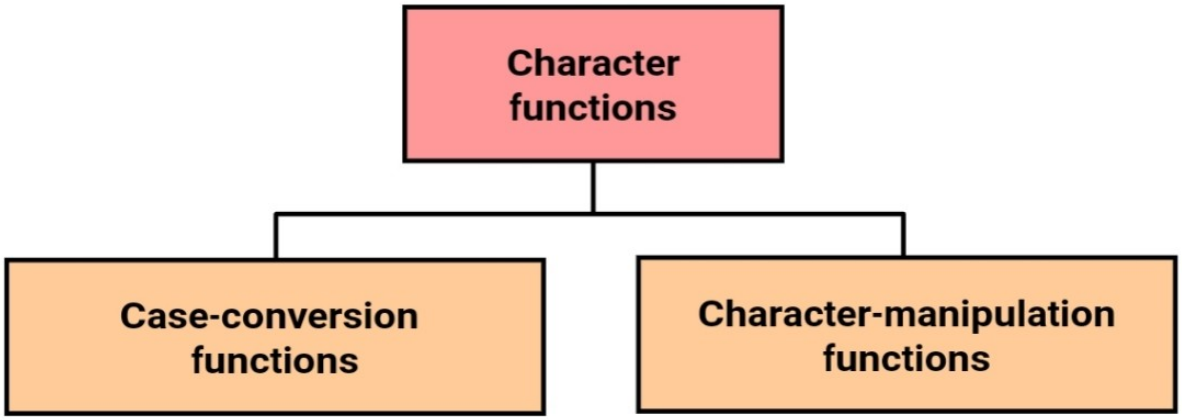
Accept arguments that can be a column or an expression

```
function_name [(arg1, arg2,...)]
```

Single-Row Functions



Character Functions



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

Using Case-Conversion Functions

- **Display the first name, last name, and email for customer Donald:**

```
SELECT   first_name,  last_name,  email
FROM   customers
WHERE   first_name  =  'donald';
```

```
0 rows selected
```

```
SELECT   first_name,  last_name,  email
FROM   customers
WHERE   lower(first_name)  =  'donald';
```

	FIRST_NAME	LAST_NAME	EMAIL
1	Donald	OConnell	DOCONNEL

Character-Manipulation Functions

•**These functions manipulate character strings:**

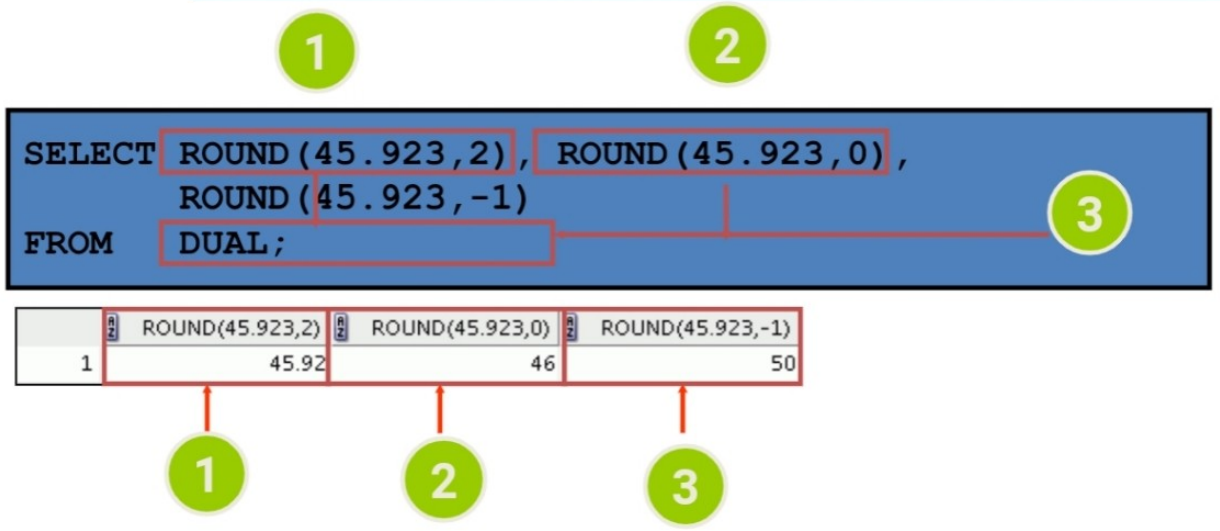
Function	Result
CONCAT('Hello', 'World')	HelloWorld
SUBSTR('HelloWorld',1,5)	Hello
LENGTH('HelloWorld')	10
INSTR('HelloWorld', 'W')	6
LPAD(salary,10,'*')	*****24000
RPAD(salary, 10, '*')	24000*****
REPLACE ('JACK and JUE','J','BL')	BLACK and BLUE
TRIM('H' FROM 'HelloWorld')	elloWorld

Number Functions

- **ROUND:** Rounds value to a specified decimal
- **TRUNC:** Truncates value to a specified decimal
- **MOD:** Returns remainder of division

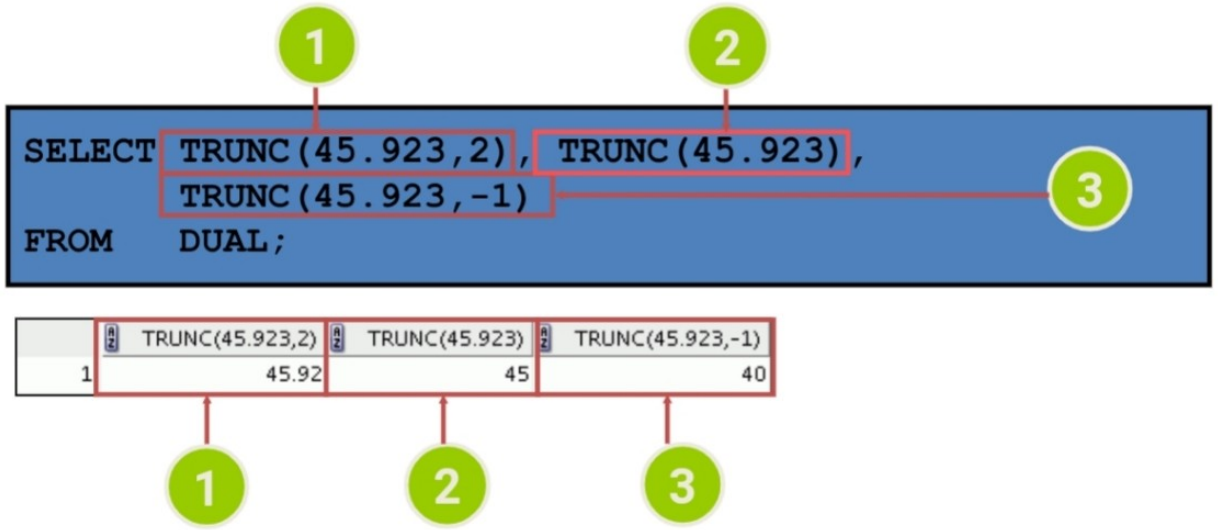
Function	Result
`ROUND(45.926, 2)`	`45.93`
`TRUNC(45.926, 2)`	`45.92`
`MOD(1600, 300)`	`100`

Using the ROUND Function



DUAL is a public table that you can use to view results from functions and calculations.

Using the TRUNC Function



Using the MOD Function

- For all employees with the job title of Sales Representative, calculate the remainder of the salary after it is divided by 5,000.

```
SELECT   order_id,  order_total, MOD(order_total, 5000)
FROM   orders
WHERE   order_id  IN(2458, 2397, 2454) ;
```

	ORDER_ID	ORDER_TOTAL	MOD(ORDER_TOTAL,5000)
1	2397	42283.2	2283.2
2	2454	6653.4	1653.4
3	2458	70647.34	647.34

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.
  - Enables you to store 21st-century dates in the 20th century by specifying only the last two digits of the year
  - Enables you to store 20th-century dates in the 21st century in the same way

```
SELECT   order_id, round(order_date) , order_status
FROM   orders
WHERE   order_date  <= ' 21-MAR-96 '  ;
```

	ORDER_ID	ROUND(ORDER_DATE)	ORDER_STATUS
1	2442	28-JUL-90	9
2	2445	28-JUL-90	8

Using the SYSDATE Function

- **SYSDATE is a function that returns:**
  - **Date**
  - **Time**

```
SELECT sysdate
FROM   dual;
```

SYSDATE
10-JUN-09

Arithmetic with Dates

- Add or subtract a number to or 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.

Using Arithmetic Operators with Dates

```
SELECT   order_id, (SYSDATE - round(Order_date)) / 7 AS "WEEKS"
FROM   orders
WHERE   order_id  IN(2458, 2397, 2454);
```

	ORDER_ID	WEEKS
1	2397	599.501043320105820105820105820105820106
2	2454	606.358186177248677248677248677248677249
3	2458	613.072471891534391534391534391534391534

Date-Manipulation Functions

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

Using Date Functions

Function	Result
MONTHS_BETWEEN ('01-SEP-95','11-JAN-94')	19.6774194
ADD_MONTHS ('31-JAN-96',1)	'29-FEB-96'
NEXT_DAY ('01-SEP-95','FRIDAY')	'08-SEP-95'
LAST_DAY ('01-FEB-95')	'28-FEB-95'

Using ROUND and TRUNC Functions with Dates

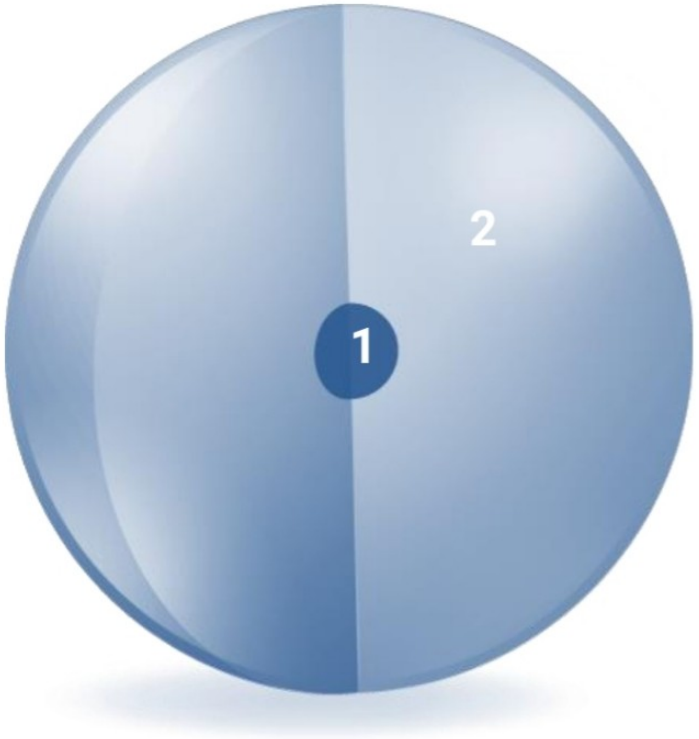
- Assume SYSDATE = '25-JUL-03':

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

Quiz

- Which of the following statements are true about single-row functions?
  1. Manipulate data items
  2. Accept arguments and return one value per argument
  3. Act on each row that is returned
  4. Return one result per set of rows
  5. May not modify the data type
  6. Can be nested
  7. Accept arguments that can be a column or an expression

Session Summary

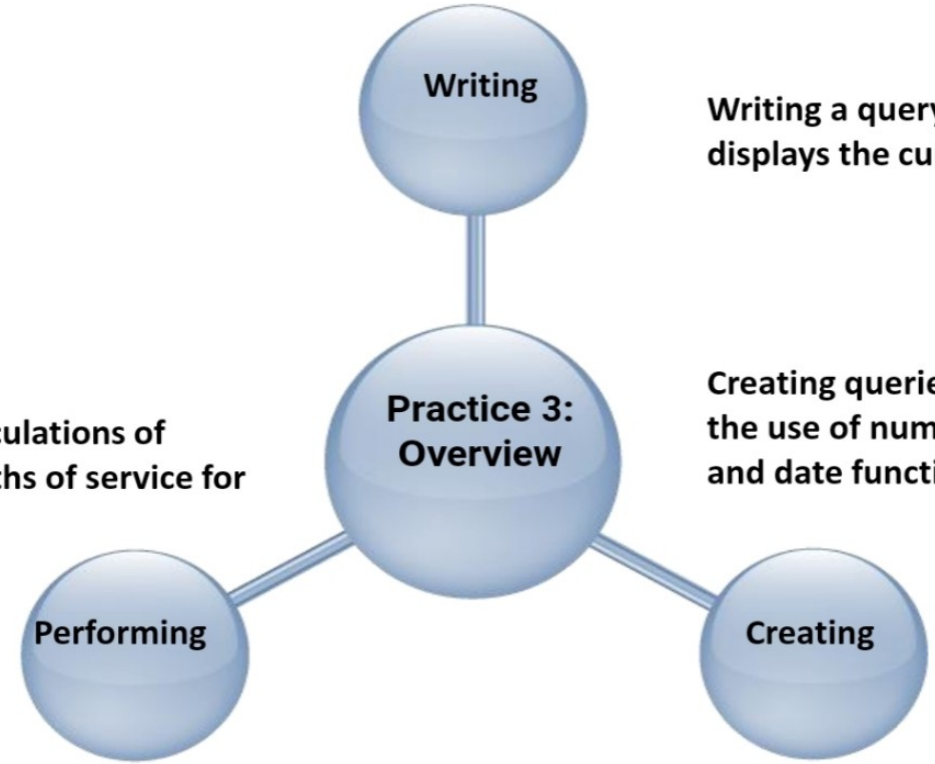


1. **Perform calculations on data using functions**

2. **Modify individual data items using functions**

Practice 3: Overview

This practice covers the following topics



Writing a query that displays the current date

Creating queries that require the use of numeric, character, and date functions

Performing calculations of years and months of service for an employee