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Database Design

3-3
Introduction to Functions

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Objectives

This lesson covers the following objectives:

- Identify appropriate applications of single-row functions in query statements
- Classify a function as a single-row or multi-row function
- Differentiate between single-row functions and multi-row functions and the results returned by each

Purpose

- When you put money in a drink machine, something happens between the time the money is deposited and your favorite drink is dispensed.
- The transaction is processed internally by the machine.
- Your money is the input and the drink is the output.
- The machine performs a function.
- The machine:
  - Counts your money
  - Makes sure your selection is chosen
  - Returns change, if necessary

Purpose

- In SQL, there are many types of functions that are used to transform input in one form to output in another form.
- These functions are used to manipulate data values.
- Functions are small programs that perform an action on a value or column and produce something different as output.

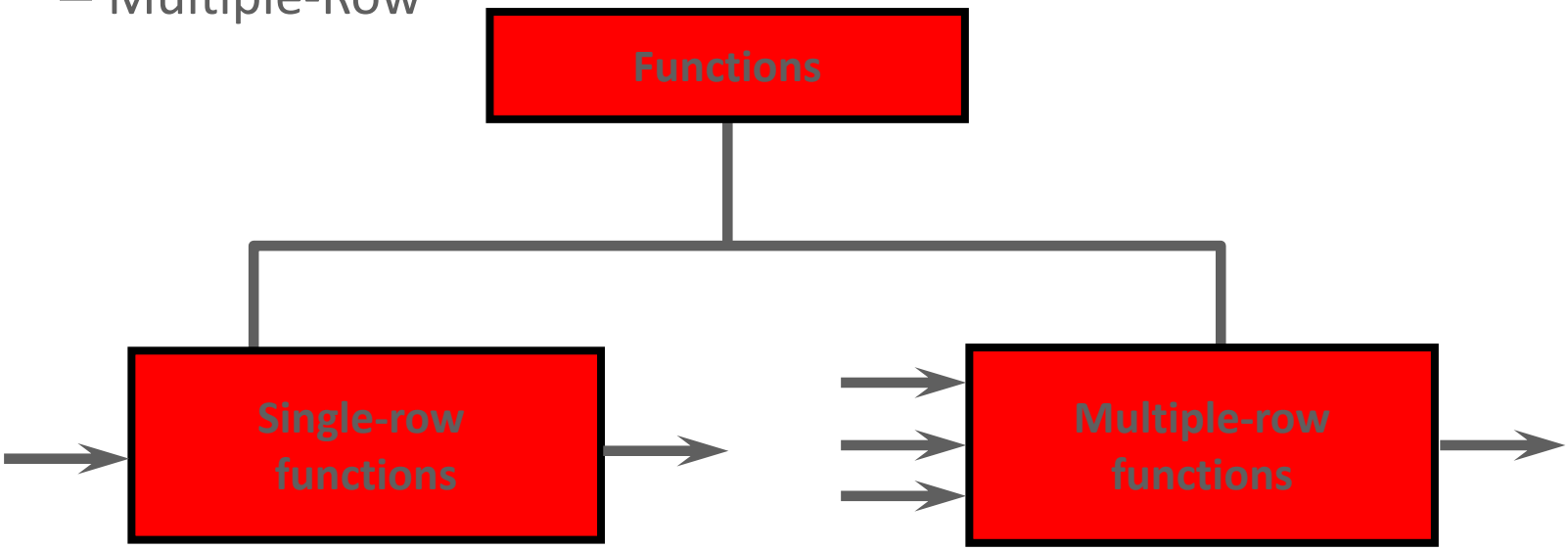
Functions

- Functions have both input and output. Input into a function is referred to as an argument.

- In the drink machine example, the input is money and the output is a drink.

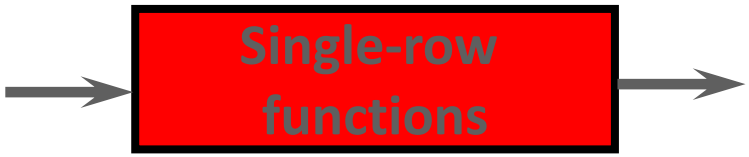
Functions

- Oracle has two distinct types of functions:
  - Single-Row
  - Multiple-Row

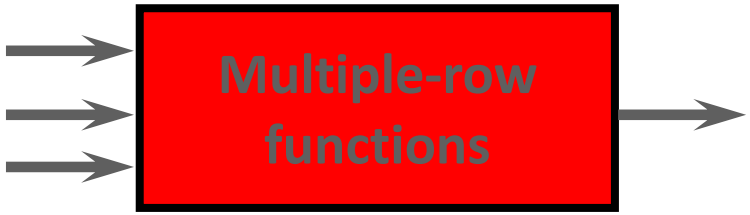


Single-Row Versus Multiple-Row Functions

- Single-row functions operate on single rows only and return one result per row.
- There are different types of single-row functions including character, number, date, and conversion functions.

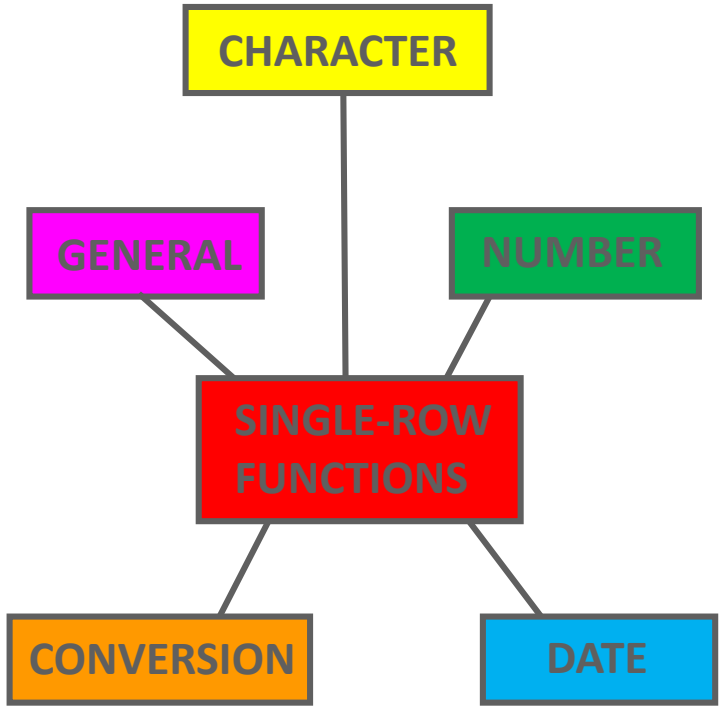


- Multiple-row functions can manipulate groups of rows to give one result per group of rows.
- These functions are also known as group functions.



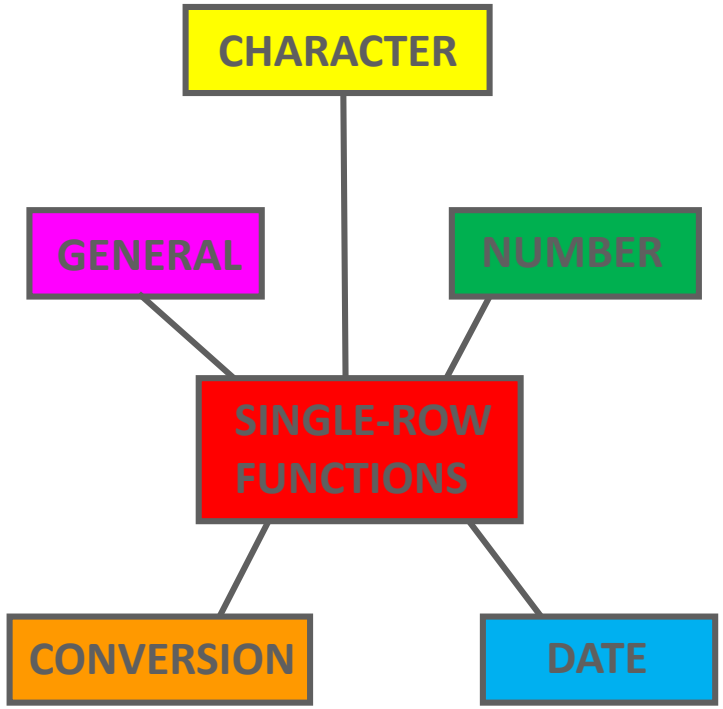
Single-Row Functions

- In SQL, Single-Row functions can be used to:
  - Perform calculations such as rounding numbers to a specified decimal place
  - Modify individual data items such as converting character values from uppercase to lowercase



Single-Row Functions

- Format dates and numbers for display such as converting the internal numeric database date format to a standard format
- Convert column data types such as converting a character string to a number or date



Single-Row Functions

- Single-Row Functions accept one or more arguments and will return a single result per row.
- So if you apply the single row function to 12 rows, you will get 12 results out of the single row function.
- In summary, single-row functions do the following:
  - Manipulate data items
  - Accept arguments and return one value
  - Act on each row returned
  - Return one result per row
  - Can modify the data type
  - Can be nested

Multiple-Row Functions

- Multiple-Row (or Group) functions take many rows as input, and return a single value as output.
- The rows input may be the whole table or the table split into smaller groups.
- Examples of Multiple-Row (Group) functions include:
  - MAX: finds the highest value in a group of rows
  - MIN: finds the lowest value in a group of rows
  - AVG: finds the average value in a group of rows

Terminology

Key terms used in this lesson included:

- Single Row Function
- Multiple Row Function

Summary

In this lesson, you should have learned how to:

- Identify appropriate applications of single-row functions in query statements
- Classify a function as a single-row or multi-row function
- Differentiate between single-row functions and multi-row functions and the results returned by each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