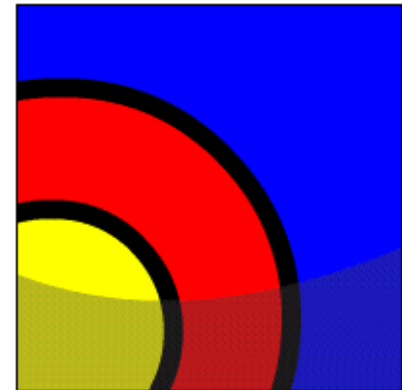


# Introduction to Functions – Single Row Functions

## What Will I Learn?

**In this lesson, you will learn to:**

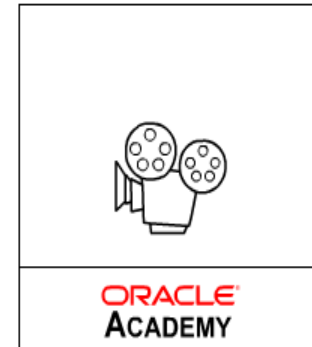
- Identify appropriate applications of single-row functions in query statements
- Classify a function as a single-row or multi-row function
- Differentiate between single-row functions and multi-row functions and the result returned by each



## Why Learn It?

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 was processed internally by the machine. Your money was the input and the drink you're now enjoying is the output. The machine performed a function. It counted your money, made sure your selection was chosen, and returned any change you may have had coming.

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.

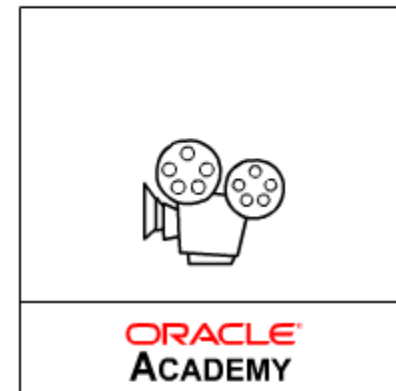


## Why Learn It?

How could you find out whether the information in the DJ on Demand CD titles table is stored in uppercase or lowercase?

Execute a SELECT statement for the column in Oracle Application Express and look at the output.

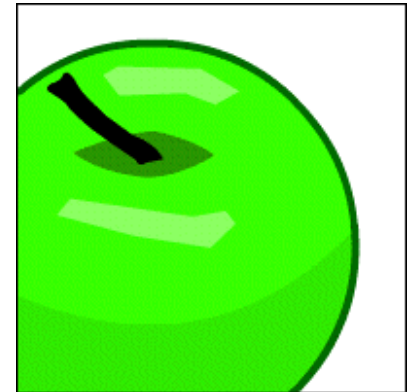
```
SELECT title  
FROM d_cds;
```



## Tell Me / Show Me

### **FUNCTIONS**

Functions are extensions to SQL -- they allow programmers to perform common tasks without having to do all the programming themselves. Functions are programs that do an action on a value or column. They have both input and output. In the drink machine example you put money into the drinks machine (INPUT) and it in turn returns a drink of your choice (OUTPUT). Input into a function is referred to as an argument. Functions use one or more arguments to perform calculations and in turn produce output. Input values will be changed or transformed into something different as output - that's the purpose of a function.

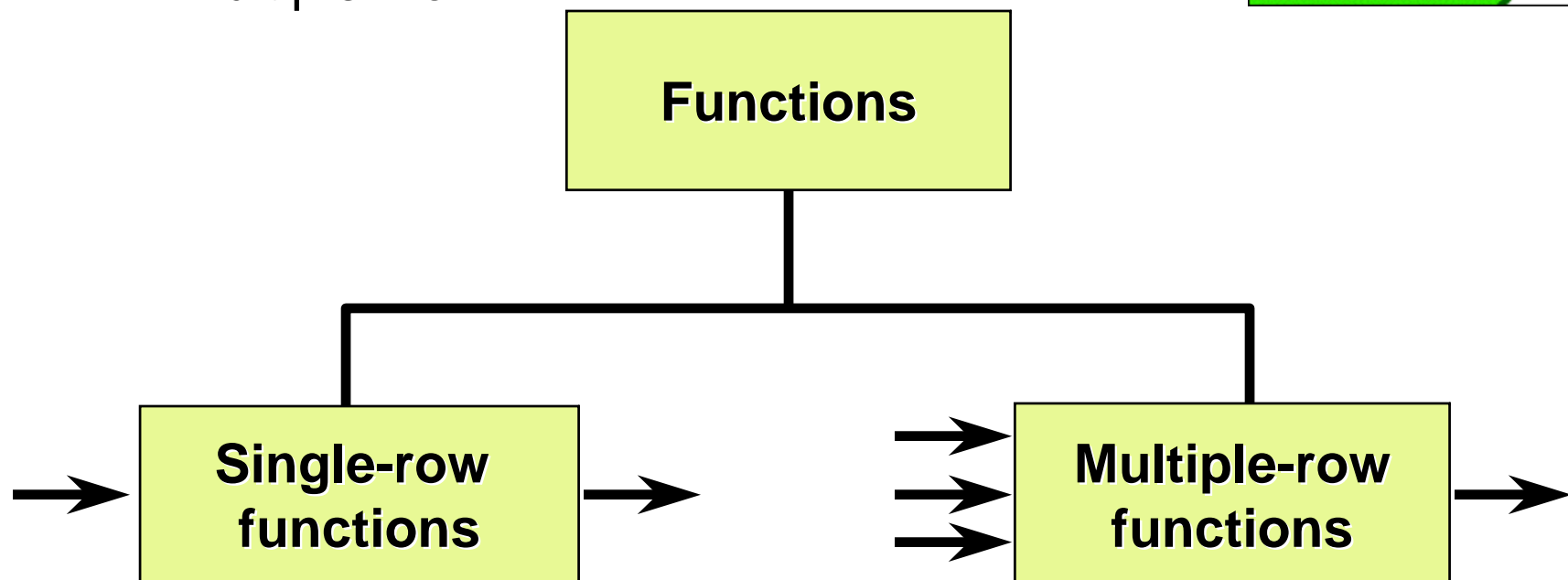
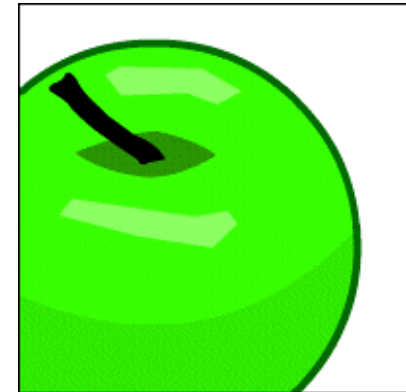


## Tell Me / Show Me

### FUNCTIONS

Functions can be of two distinct types:

- Single-Row
- Multiple-Row2



## Tell Me / Show Me

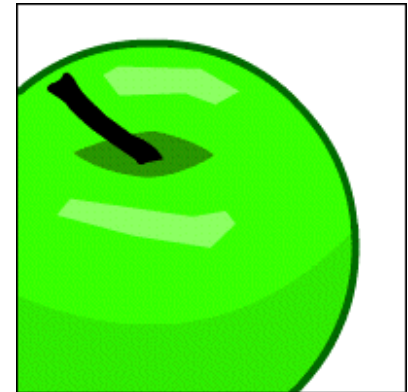
### Single-Row Functions

These functions operate on single rows only and return one result per row. There are different types of single-row functions. This lesson covers the following single-row functions:

Character, Number , Date, Conversion

### Multiple-Row Functions

Functions can manipulate groups of rows to give one result per group of rows. These functions are known as group functions and are covered in a later lesson.



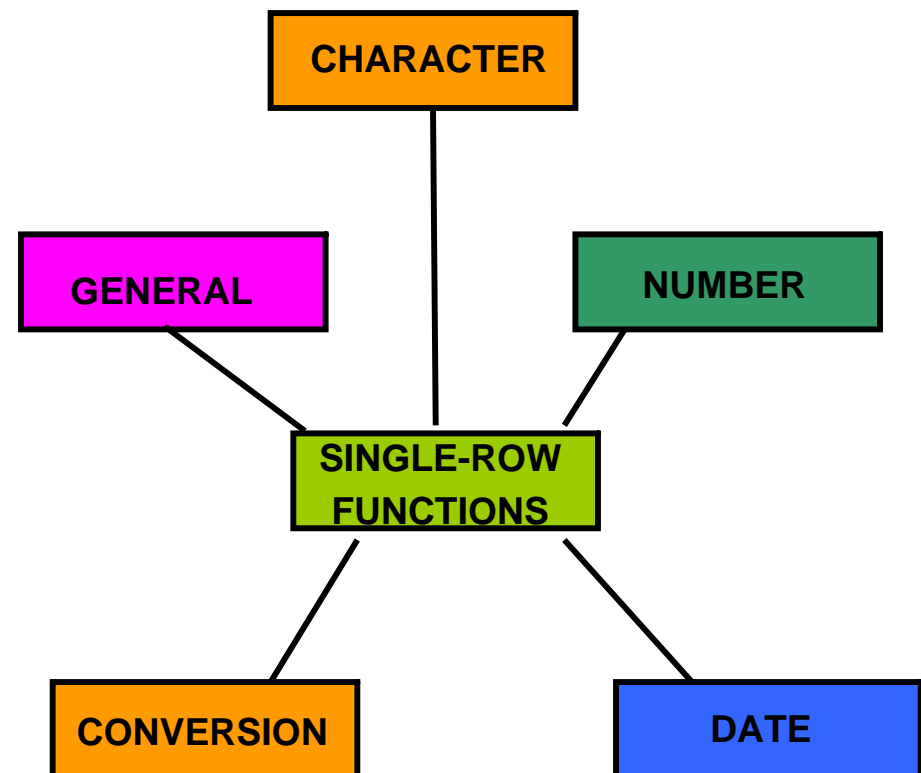
## Tell Me / Show Me

### SINGLE ROW FUNCTIONS

In SQL, functions are a very powerful feature. They can be used to:

Perform calculations such as rounding numbers to a specified decimal place

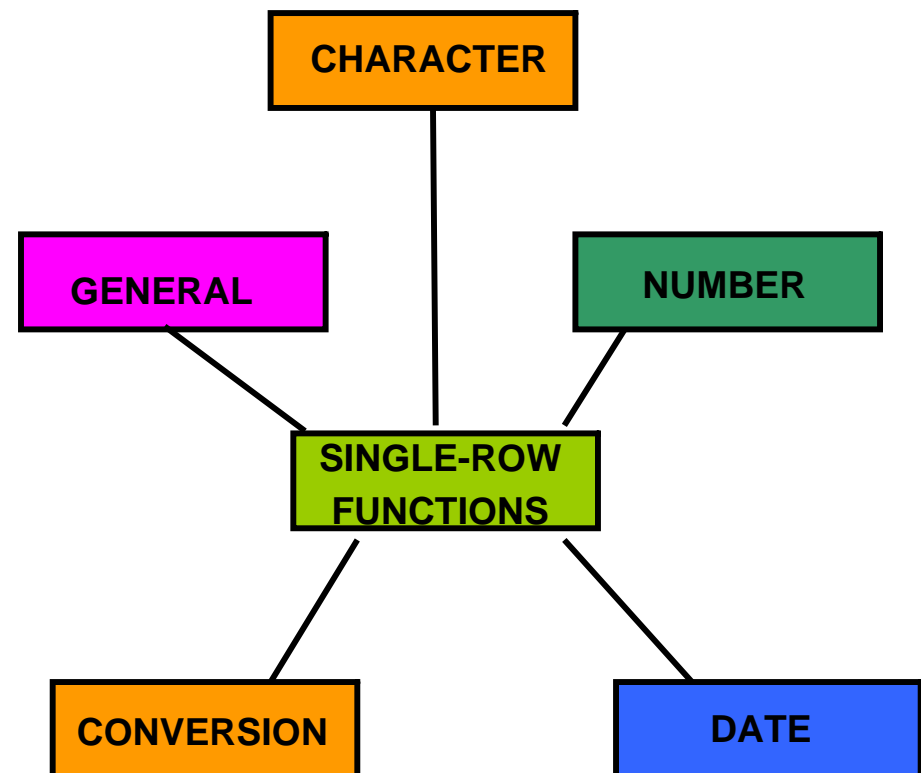
- Modify individual data items such as converting character values from uppercase to lowercase
- Manipulate output for groups of rows by finding an average or sum for several rows





## Tell Me / Show Me 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

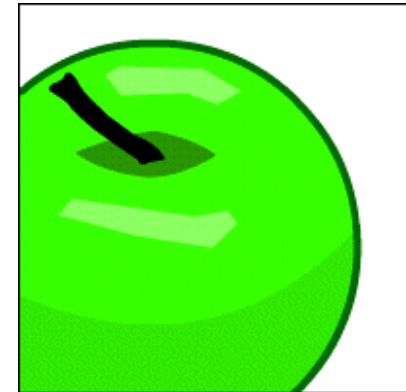


There are many different kinds of functions, and in the next few lessons, you will learn the most common ones.

## Tell Me / Show Me

### SINGLE ROW FUNCTIONS

- Manipulate data items
- Accept arguments and returns one value
- Act on each row returned
- Return one result per row
- May modify the data type
- Can be nested



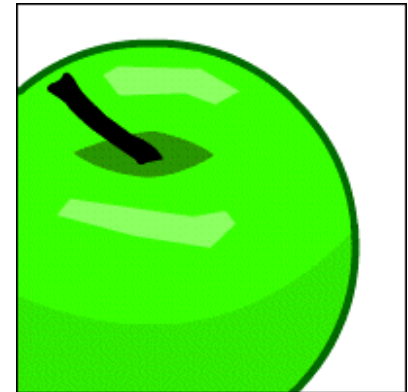
Single-Row Functions accept one or more arguments and will return a single result per row. So if you apply the single row function to 12 rows, you will get 12 results out of the single row function.

## Tell Me / Show Me

### MULTI-ROW FUNCTIONS

Multi-row functions operate on sets of rows to give one result per group.

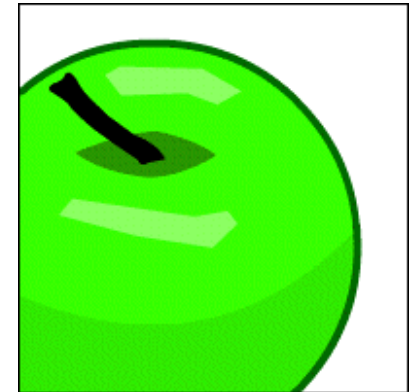
- AVG
- COUNT
- MAX
- MIN
- SUM



## Tell Me / Show Me

### MULTI-ROW FUNCTIONS

Group functions operate on sets of rows to give one result per group. They take many rows as input, and return a single value as output.



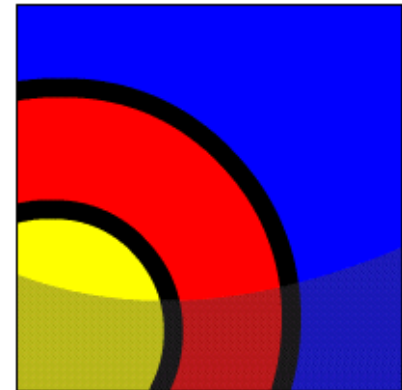
```
SELECT MAX(salary), MIN(salary), AVG(salary)
FROM employees;
```

MAX(SALARY)	MIN(SALARY)	AVG(SALARY)
24000	2500	8775

## Summary

**In this lesson, you have learned about:**

- Identifying 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 result returned by each



# Summary

## Practice Guide

The link for the lesson practice guide can be found in the course outline.

