# Database Programming with PL/SQL

Review of SQL Single-Row Functions





## **Objectives**

In this lesson, you will review how to select and apply single-row functions in an SQL query to:

- Change the case of character data
- Concatenate character data
- Determine the length of character data
- Select a substring of character data
- Round or truncate numerical data
- Convert data stored as one data type to another data type



## **Objectives (cont.)**

In this lesson, you will review how to select and apply single-row functions in an SQL query to:

- Perform month-level arithmetic
- Enhance query results containing null values



## **Purpose**

Taking time to review previously learned material helps you to reinforce basic concepts and prepares you for more complicated constructs.



## **Case Manipulation Functions**

Case manipulation functions temporarily convert character data to a specified case.

LOWER (column | expression) converts alpha characters to lowercase.

```
SELECT country_id, country_name, area
FROM wf_countries
WHERE LOWER(country_name) = 'kingdom of tonga';
```

COUNTRY_ID	COUNTRY_NAME	AREA
676	Kingdom of Tonga	748



## **Case Manipulation Functions (cont.)**

UPPER (column | expression) converts alpha characters to uppercase. Example:

```
SELECT country_id, country_name, area
FROM wf_countries
WHERE UPPER(country_name) = 'KINGDOM OF TONGA';
```

INITCAP (column | expression) converts alpha character values to uppercase for the first letter of each word. Example:

```
SELECT country_id, country_name, area
FROM wf_countries
WHERE INITCAP(country_name) = 'Kingdom Of Tonga';
```



## **Character Manipulation Functions**

Character manipulation functions temporarily convert character data to different values.

CONCAT joins two values together.

```
SELECT CONCAT (country_name, internet_extension)
   "Country and extension"
FROM wf_countries WHERE country_id = 229;
```

#### Country and extension

Republic of Benin.bj



## **Character Manipulation Functions (cont.)**

#### SUBSTR extracts a string of a determined length.

```
SELECT SUBSTR(country_name, 3, 3)
FROM wf_countries WHERE country_id = 229;
```

SUBSTR(COUNTRY\_NAME,3,3)
pub

### LENGTH shows the length of a string as a number value.

```
SELECT LENGTH(country_name)
FROM wf_countries WHERE country_id = 229;
```

LENGTH(COUNTRY\_NAME)

17



#### **Number Functions**

Number functions temporarily convert number data to different values.

ROUND: Used to round numbers to a specified number of decimal places.

```
SELECT country_id, median_age, ROUND(median_age,-1)
FROM wf_countries WHERE country_id = 20;
```

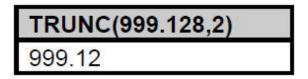
COUNTRY_ID	MEDIAN_AGE	ROUND(MEDIAN_AGE,-1)
20	24	20



## **Number Functions (cont.)**

TRUNC: Used to terminate the column, expression, or value to a specified number of decimal places.

SELECT TRUNC (999.128,2) FROM dual;



MOD: Used to return the remainder when one number is divided by another.

SELECT country\_id, population, MOD(population,2)
FROM wf\_countries WHERE country\_id = 3;

COUNTRY_ID	POPULATION	MOD(POPULATION,2)
3	15233244	0



#### **Conversion Functions**

TO\_CHAR converts dates stored in a database from the default DD-MON-YY display format to another format specified by you. The syntax is:

```
TO_CHAR (date, 'format model you specify')
```

#### Example:

SELECT TO\_CHAR(SYSDATE, 'Month ddth, yyyy') AS TODAY FROM dual;

#### TODAY

November 30th, 2006



## **Conversion Functions (cont.)**

TO\_CHAR converts columns of number data to a desired format. The syntax is:

```
TO_CHAR (number, 'format model you specify')
```

#### Example:

```
SELECT country_id, TO_CHAR(population,'99,999,999,999')
FROM wf_countries;
```

COUNTRY_ID	TO_CHAR(POPULATION,'99,999,999,999')
297	71,891
1268	69,108
971	2,602,713
93	31,056,997
213	32,930,091
994	7,961,619



## **Conversion Functions (cont.)**

TO\_DATE converts a character string to a date format. The syntax is:

```
TO_DATE('character string', 'format model')
```

#### Example:

```
SELECT TO_DATE('January 1, 2006','Month DD, RRRR')
AS "New Year"
FROM dual;
```

**New Year** 

01-JAN-06



## **Conversion Functions (cont.)**

TO\_NUMBER converts a character string to a number. The syntax is:

```
TO_NUMBER(character string, 'format model')
```

#### Example:

```
SELECT TO_NUMBER('95.5','999.9') AS converted FROM dual;
```

CONVERTED

95.5



#### **Date Functions**

SYSDATE is a date function that returns the current database server date and time.

#### Example:

SELECT SYSDATE+1 AS tomorrow FROM dual;

**TOMORROW** 

01-DEC-06



## **Date Functions (cont.)**

MONTHS\_BETWEEN returns the number of months between two dates.

#### Example:

Country	Independence Day	Months Since
Republic of Benin	1-Aug-1960	555.97



## **Date Functions (cont.)**

ADD MONTHS increments a date by calendar months

#### Example:

SELECT ADD MONTHS (SYSDATE, 120) "10 yrs from today" FROM dual;

10 yrs from today

30-NOV-16



### **General Functions**

NVL converts a null value to a date, a character, or a number.

#### The syntax is:

NVL (value that may contain a null, value to replace the null)



## **General Functions (cont.)**

#### **NVL** examples:

```
SELECT currency_name, comments
FROM wf_currencies
WHERE currency_code = 'AUD';
```

CURRENCY_NAME	COMMENTS
Australian dollar	<u>~</u>

```
SELECT currency_name,

NVL(comments,'No comment') AS comments

FROM wf_currencies

WHERE currency_code = 'AUD';
```

CURRENCY_NAME	COMMENTS
Australian dollar	No comment



## **General Functions (cont.)**

NULLIF compares two functions. If they are equal, the function returns null. If they are not equal, the function returns the first expression. The syntax is:

```
NULLIF(expression 1, expression 2)
```

Country Name Trans	Country Name	nullif returns
-	Aruba	=0
=	Antiqua and Barbuda	₩.
Al Imarat al Arabiyah al Muttahidah	United Arab Emirates	
Afghanistan	Islamic Republic of Afghanistan	Afghanistan
Algeria	Peoples Democratic Republic of Algeria	Algeria
Azerbaijan	Republic of Azerbaijan	Azerbaijan



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## **Summary (cont.)**

In this lesson, you will review how to select and apply single-row functions in an SQL query to:

- Perform month-level arithmetic
- Enhance query results containing null values