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Database Programming with PL/SQL
2-3 and 2.4: Recognizing Data Types
Practice Activities

Vocabulary

Identify the vocabulary word for each definition below:

NCLOB	Store large blocks of single-byte or fixed width multi-byte NCHAR data in the database.
LOB	Hold values, called locators, that specify the location of large ob-jects (such as graphic images) that are stored out of line.
SCALAR	Hold a single value with no internal components.
BLOB	Store large unstructured or structured binary objects.
COMPOSITE	Contain internal elements that are either scalar (record) or com-posite (record and table)
BFILE	Store large binary files outside of the database.
REFERENCE	Hold values, called pointers, that point to a storage location.
OBJECT	A schema object with a name, attributes, and methods.
CLOB	Store large blocks of character data in the database.

Try It / Solve It

1. In your own words, describe what a data type is and explain why it is important.

Es un atributo de los datos que indica al ordenador sobre la clase de datos que se va a manejar.

2. Identify the three data type categories covered in this course.

Scalar, Composite, Largue Object.

3. Identify three data types covered in the *Database Programming with SQL* course.

NUMBER,VARCHAR,DATE.

4. What data type can be used in PL/SQL, but can't be used to define a table column?

BOOLEAN

5. Which data type indicates a large data object that is stored outside of the database?

LOB

6. Identify the data type category (LOB, Scalar, or Composite) for each data type. Each cat-egory may be used more than once.

Data Type	Data Type Category
CLOB	LOB
VARCHAR2	SCALAR
BLOB	LOB
NUMBER	SCALAR
BFILE	LOB
TIMESTAMP	SCALAR
NCLOB	LOB
RECORD	COMPOSITE
PLS_INTEGER	SCALAR
LONG	SCALAR
TABLE	COMPOSITE
BOOLEAN	SCALAR

7. Enter the data type category and the data type for each value. The first one has been done for you.

Value	**Data Type Category**	**Data Type**
‘Switzerland’	**Scalar**	**VARCHAR2**
Text of a resume	SCALAR	VARCHAR2
100.20	SCALAR	NUMBER
A picture	LOB	BLOB
1053	SCALAR	NUMBER
11-Jun-2016	SCALAR	DATE
‘Computer science is the science of the 21st century.’	SCALAR	VARCHAR2
Index / Last_name 1 / 'Newman' 2 / 'Raman' 3 / 'Han'	COMPOSITE	TABLE
A movie	LOB	BFILE
A sound byte	LOB	BFILE
FALSE	SCALAR	BOOLEAN

2.4 Using Scalar Datatypes

Vocabulary

Identify the vocabulary word for each definition below:

BOOLEAN	A datatype that stores one of the three possible values used for logical calculations: TRUE, FALSE, or NULL.
%TYPE	Attribute used to declare a variable according to another previ-ously declared variable or database column.

Try It / Solve It

1. Declarations:

A. Which of the following variable declarations are valid?

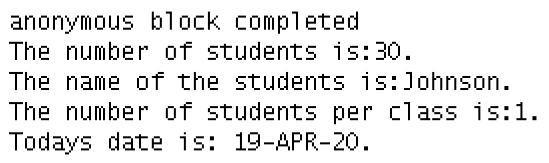
	Declaration	Valid or Invalid
a	number_of_students PLS_INTEGER;	Valid
b	STUDENT_NAME VARCHAR2(10) = Johnson;	Invalid
c	stu_per_class CONSTANT NUMBER;	Invalid
d	tomorrow DATE := SYSDATE+1;	Valid

B. For the invalid declarations above, describe why they are invalid.

B) el string ha de ser :=
C) las constantes se han de declarar

C. Write an anonymous block in which you declare and print (on the screen) each of the variables in 1A above, correcting the invalid declarations and adding information as needed.

```
DECLARE
 number_of_students PLS_INTEGER := 30;
 student_name VARCHAR2(10) := 'Johnson';
 stu_per_class CONSTANT NUMBER := 1;
 today DATE := SYSDATE + 1;
BEGIN
 DBMS_OUTPUT.PUT_LINE ('The number of students is:'||number_of_students||'.');
 DBMS_OUTPUT.PUT_LINE ('The name of the students is:'||student_name||'.');
 DBMS_OUTPUT.PUT_LINE ('The number of students per class is:'||stu_per_class||'.');
 DBMS_OUTPUT.PUT_LINE ('Todays date is: '||today||'.');
END;
```



```
anonymous block completed
The number of students is:30.
The name of the students is:Johnson.
The number of students per class is:1.
Todays date is: 19-APR-20.
```

2. Evaluate the variables in the following code. Answer the following questions about each variable. Is it named well? Why or why not? If it is not named well, what would be a better name and why?

```
DECLARE
    country_name  VARCHAR2(50);
    median_age     NUMBER(6, 2);
BEGIN
     SELECT country_name, median_age INTO country_name, median_age
        FROM countries
        WHERE country_name = 'Japan';
     DBMS_OUTPUT.PUT_LINE('The median age in '|| country_name || ' is '
        || median_age || '.');
END;
```

Las dos variables tienen el mismo nombre que en la tabla, var country, var median age

3. Change the declarations in #2 above so they use the %TYPE attribute.

```
country_name wf_countries.country_name%TYPE;
median_age wf_countries.median_age%TYPE;
```

4. In your own words, describe why using the %TYPE attribute is better than hard-coding data types. Can you explain how you could run into problems in the future by hard-coding the data types of the country_name and median_age variables in question 2?

Puede que los datos de la tabla cambien.

5. Create the following anonymous block:

```
BEGIN
  DBMS_OUTPUT.PUT_LINE('Hello World');
END;
```

A. Add a declarative section to this PL/SQL block. In the declarative section, declare the following variables:

- A variable named TODAY of datatype DATE. Initialize TODAY with SYSDATE.
- A variable named TOMORROW with the same datatype as TODAY. Use the %TYPE attribute to declare this variable.

```
DECLARE
 today DATE:=SYSDATE;
 tomorrow today%TYPE;
BEGIN
 DBMS_OUTPUT.PUT_LINE('Hello World');
END;
```

B. In the executable section, initialize the TOMORROW variable with an expression that calculates tomorrow's date (add 1 to the value in TODAY). Print the value of TODAY and TOMORROW after printing 'Hello World'.

```
DECLARE
 today DATE:=SYSDATE;
 tomorrow today%TYPE;
BEGIN
 tomorrow := today + 1;
 DBMS_OUTPUT.PUT_LINE('Hello World');
 DBMS_OUTPUT.PUT_LINE(today);
 DBMS_OUTPUT.PUT_LINE(tomorrow);
END;
```