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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:

Store large blocks of single-byte or fixed width multi-byte NCHAR data in the database.

NCLOB

Hold values, called locators, that specify the location of large ob-jects (such as graphic images) that are stored out of line.

LOB

Hold a single value with no internal components.

SCALAR

BLOB

Store large unstructured or structured binary objects.

Contain internal elements that are either scalar (record) or com-posite (record and table)

COMPOSITE

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.

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2

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

Scalar, Composite, Largue Object.

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

NUMBER,VARCHAR,DATE.

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

BOOLEAN

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

LOB

1. 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 |
|  |  |

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

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3

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **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 | | | | SCALAR | | VARCHAR2 |  |
|  | science of the 21st century.’ | | | |  | |  |  |
|  |  |  | |  |  | |  |  |
|  | Index | Last\_name | |  | |  |  |
|  | 1 | 'Newman' | |  | COMPOSITE | | TABLE |  |
|  | 2 | 'Raman' | |  |  | |  |  |
|  | 3 | 'Han' | |  |  | |  |  |
|  |  |  | |  |  | |  |  |
|  | 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:

A datatype that stores one of the three possible values used for logical calculations: TRUE, FALSE, or NULL.

BOOLEAN

Attribute used to declare a variable according to another previ-ously declared variable or database column.

%TYPE

**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

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2

* 1. 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

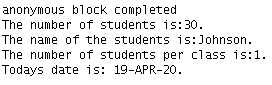
DBMS\_OUTPUT.PUT\_LINE ('The number of students is:'||number\_of\_students||'.');

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;



1. 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

1. 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;

1. In your own words, describe why using the %TYPE attribute is better than hard-coding da-ta 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.

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3

1. Create the following anonymous block:

BEGIN

DBMS\_OUTPUT.PUT\_LINE('Hello World'); END;

* 1. 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;

* 1. 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;

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