Database Programming with PL/SQL
4-1: Conditional Control: IF Statements
Practice Activities

Vocabulary

Identify the vocabulary word for each definition below:

	Statement that enables PL/SQL to perform actions selectively based on conditions.
	Control structures – Repetition statements that enable you to execute statements in a PL/SQL block repeatedly.
	An expression with a TRUE or FALSE value that is used to make a decision.
	An expression that determines a course of action based on conditions and can be used outside a PL/SQL block in a SQL statement.

Try It / Solve It

1. What is the purpose of a conditional control structure in PL/SQL?

2. List the three categories of control structures in PL/SQL.

3. List the keywords that can be part of an IF statement.

4. List the keywords that are a required part of an IF statement.

5. Write a PL/SQL block to find the population of a given country in the countries table. Display a message indicating whether the population is greater than or less than 1 billion (1,000,000,000). Test your block twice using India (country_id = 91) and United Kingdom (country_id = 44). India's population should be greater than 1 billion, while United Kingdom's should be less than 1 billion.

6. Modify the code from the previous exercise so that it handles all the following cases:

A. Population is greater than 1 billion.

B. Population is greater than 0.

C. Population is 0.

D. Population is null. (Display: No data for this country.)

Run your code using the following country ids. Confirm the indicated results.
- China (country_id = 86): Population is greater than 1 billion.
- United Kingdom (country_id = 44): Population is greater than 0.
- Antarctica (country_id = 672): Population is 0.
- Europa Island (country_id = 15): No data for this country.

7. Examine the following code:

```
DECLARE
  v_country_id   countries.country_name%TYPE := <a value>;
  v_ind_date     countries.date_of_independence%TYPE;
  v_natl_holiday countries.national_holiday_date%TYPE;
BEGIN
  SELECT date_of_independence, national_holiday_date
    INTO v_ind_date, v_natl_holiday
    FROM countries
    WHERE country_id = v_country_id;
  IF v_ind_date IS NOT NULL THEN
    DBMS_OUTPUT.PUT_LINE('A');
  ELSIF v_natl_holiday IS NOT NULL THEN
    DBMS_OUTPUT.PUT_LINE('B');
  ELSIF v_natl_holiday IS NULL AND v_ind_date IS NULL THEN
    DBMS_OUTPUT.PUT_LINE('C');
  END IF;
END;
```

A. What would print if the country has an independence date equaling NULL and a national holiday date equaling NULL?

B. What would print if the country has an independence date equaling NULL and a national holiday date containing a value?

C. What would print if the country has an independence date equaling a value and a national holiday date equaling NULL?

D. Run a SELECT statement against the COUNTRIES table to determine whether the following countries have independence dates or national holiday dates, or both. Predict the output of running the anonymous block found at the beginning of this question.

Country	Country_ID	Independence Date	National Holiday Date	Output should be
Antarctica	672			
Iraq	964			
Spain	34			
United States	1			

E. Finally, run the anonymous block found at the beginning of this question using each of the above country ids as input. Check whether your output answers are correct.

8. Examine the following code. What output do you think it will produce?

```
DECLARE
    v_num1   NUMBER(3) := 123;
    v_num2   NUMBER;
BEGIN
    IF v_num1 <> v_num2 THEN
       DBMS_OUTPUT.PUT_LINE('The two numbers are not equal');
    ELSE
       DBMS_OUTPUT.PUT_LINE('The two numbers are equal');
    END IF;
END;
```

Run the code to check if your prediction was correct. What was the result and why? Modify the code to use various comparison operators to see different results.

9. Write a PL/SQL block to accept a year and check whether it is a leap year. For example, if the year entered is 1990, the output should be "1990 is not a leap year."

Hint: A leap year should be exactly divisible by 4, but not exactly divisible by 100. However, any year exactly divisible by 400 is a leap year.
Test your solution with the following years:

Year	Result Should Be
1990	Not a leap year
2000	Leap year
1996	Leap year
1900	Not a leap year
2016	Leap year
1884	Leap year