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Vocabulary

Identify the vocabulary word for each definition below:

Explicit cursors	Declared by the programmer for queries that return more than one row
Cursor	A label for a context area or a pointer to the context area
CLOSE statement	Disables a cursor, releases the context area, and undefines the active set
Context Area	An allocated memory area used to store the data processed by a SQL statement
Implicit cursors	Defined automatically by Oracle for all SQL DML statements, and for SELECT statements that return only one row
OPEN statement	Statement that executes the query associated with the cursor, identifies the active set, and positions the cursor pointer to the first row
FETCH statement	Statement that retrieves the current row and advances the cursor to the next row either until there are no more rows or until a specified condition is met
Active set	The set of rows returned by a multiple row query in an explicit cursor operation

Try It / Solve It

1. In your own words, explain the difference between implicit and explicit cursors.
   Answer : The Implicit cursor is used when returning a row, and the explicit cursor is used when returning more than one row.

2. Which SQL statement can use either an explicit or an implicit cursor, as needed?
   Answer : SELECT

3. List two circumstances in which you would use an explicit cursor.
   Answer : 1. It is the only way in PL/SQL to retrieve more than one row from a table.
   2. Each row is fetched by a separate program statement, giving the programmer more control over the processing of the rows.

4. Exercise using CURRENCIES tables:
   a. Write a PL/SQL block to declare a cursor called currencies_cur. The cursor will be used to read and display all rows from the CURRENCIES table. You will need to retrieve currency_code and currency_name, ordered by ascending currency_name.
   Answer :

```
declare
  cursor currencies_cur is
  select currency_code, currency_name
  from wf_currencies
  order by currency_name asc;
  v_currency_code   wf_currencies.currency_code%type;
  v_currency_name   wf_currencies.currency_name%type;
```

b. Add a statement to open the currencies_cur cursor.

Answer :

```
declare
 cursor currencies_cur is
 select currency_code, currency_name
 from wf_currencies
 order by currency_name asc;
 v_currency_code   wf_currencies.currency_code%type;
 v_currency_name   wf_currencies.currency_name%type;

begin
 open currencies_cur;
```

c. Add variable declarations and an executable statement to read ONE row through the currencies_cur cursor into local variables.

Answer :

```
declare
 cursor currencies_cur is
 select currency_code, currency_name
 from wf_currencies
 order by currency_name asc;
 v_currency_code   wf_currencies.currency_code%type;
 v_currency_name   wf_currencies.currency_name%type;

begin
 open currencies_cur;
  fetch currencies_cur into v_currency_code, v_currency_name;
```

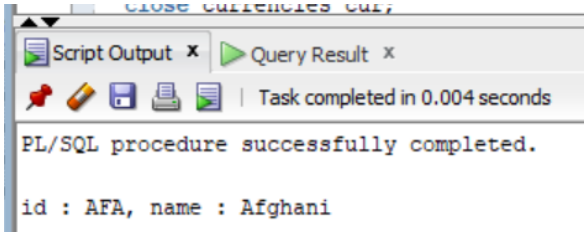
d. Add a statement to display the fetched row, and a statement to close the currencies_cur cursor.

Answer :

```
declare
 cursor currencies_cur is
 select currency_code, currency_name
 from wf_currencies
 order by currency_name asc;
 v_currency_code   wf_currencies.currency_code%type;
 v_currency_name   wf_currencies.currency_name%type;

begin
 open currencies_cur;
  fetch currencies_cur into v_currency_code, v_currency_name;
  dbms_output.put_line('id : '||v_currency_code||', name : '||v_currency_name);
 close currencies_cur;
end;
```

e. Run your block to confirm that it works. It should display: AFA Afghani.
Answer :



f. Your code so far displays only one row. Modify your code so that it fetches and displays all the rows, using a LOOP and EXIT statement. Test your modified block. It should fetch and display each row in the CURRENCIES table. If it doesn't, check that your EXIT statement is in the correct place in the code.
Answer :

```
declare
 cursor currencies_cur is
 select currency_code, currency_name
 from wf_currencies
 order by currency_name asc;
 v_currency_code   wf_currencies.currency_code%type;
 v_currency_name   wf_currencies.currency_name%type;
begin
 open currencies_cur;
  loop
  fetch currencies_cur into v_currency_code, v_currency_name;
  exit when currencies_cur%notfound;
  dbms_output.put_line('id : '||v_currency_code||', name : '||v_currency_name);
  end loop;
 close currencies_cur;
end;
```

g. Write and test a PL/SQL block to read and display all the rows in the COUNTRIES table for all countries in region 5 (South America region). For each selected country, display the country_name, national_holiday_date, and national_holiday_name. Display only those countries having a national holiday date that is not null. Save your code (you will need it in the next practice).
Answer :

```
declare
 cursor countries_cur is
 select country_name, national_holiday_date, national_holiday_name
 from wf_countries
 where region_id = 5 and national_holiday_date is not null;
 v_country_name          wf_countries.country_name%type;
 v_national_holiday_date   wf_countries.national_holiday_date%type;
 v_national_holiday_name   wf_countries.national_holiday_name%type;
begin
 open countries_cur;
  loop
  fetch countries_cur into v_country_name, v_national_holiday_date,
v_national_holiday_name;
  exit when countries_cur%notfound;
```

```
    dbms_output.put_line('name country : ' || v_country_name || ', national holiday date : '
  || v_national_holiday_date || ', national holiday name : ' || v_national_holiday_name);
    end loop;
   close countries_cur;
  end;
```

5. Identify three guidelines for declaring and using explicit cursors.
   Answer :
   1. Do not include the INTO clause in the cursor declaration because it appears later in the FETCH statement.
   2. If processing rows in a specific sequence is required, then use the ORDER BY clause in the query.
   3. The cursor can be any valid SELECT statement, including joins, subqueries, and so on.
   4. If a cursor declaration references any PL/SQL variables, these variables must be declared before declaring the cursor.

6. Write a PL/SQL block to read and display the names of world regions, with a count ofthe number of countries in each region. Include only those regions having at least 10 countries. Order your output by ascending region name.
   Answer :

```
declare
 cursor countries_cur is
 select c.region_id, r.region_name,c.how_many
 from (select region_id, count(*) AS how_many
 from wf_countries
 group by region_id having count(*) > 10) c
 inner join wf_world_regions r
 on c.region_id=r.region_id;
 v_region_id     wf_countries.region_id%type;
 v_region_name    wf_world_regions.region_name%type;
 v_how_many      number;
begin
 open countries_cur;
  loop
  fetch countries_cur into v_region_id, v_region_name, v_how_many;
  exit when countries_cur%notfound;
  dbms_output.put_line('region id : ' || v_region_id || ', nama region : ' || v_region_name
|| ', jumlah negara : ' || v_how_many);
  end loop;
 close countries_cur;
end;
```