Interacting with Oracle DB Server

SQL Statements in PL/SQL

- Retrieve a row from the database by using the `SELECT` command.
- Make changes to rows in the database by using DML commands.
- Control a transaction with the `COMMIT`, `ROLLBACK`, or `SAVEPOINT` command.

- PL/SQL does not directly support data definition language (DDL) statements,

PL/SQL does not directly support data control language (DCL) statements, such as `GRANT` or `REVOKE`. You can use dynamic SQL to execute them.

SELECT Statements in PL/SQL

- The INTO clause is required.
- Queries must return only one row.

Example:

```
DECLARE
 v_fname VARCHAR2(25);
BEGIN
 SELECT first_name INTO v_fname
 FROM employees WHERE employee_id=200;
 DBMS_OUTPUT.PUT_LINE(' First Name is : '||v_fname);
END;
/
```

Queries Must Return Only One Row

SELECT statements within a PL/SQL block fall into the ANSI classification of embedded SQL, for which the following rule applies: queries must return only one row. A query that returns more than one row or no row generates an error.

PL/SQL manages these errors by raising standard exceptions, which you can handle in the exception section of the block with the NO_DATA_FOUND and TOO_MANY_ROWS exceptions. Include a WHERE condition in the SQL statement so that the statement returns a single row. You learn about exception handling later in the course.

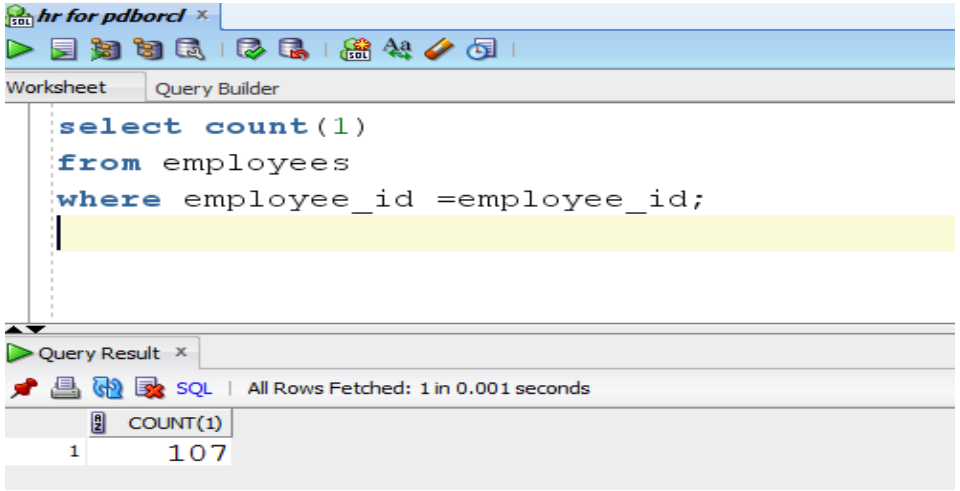
Naming Conventions

```
DECLARE
  hire_date       employees.hire_date%TYPE;
  sysdate         hire_date%TYPE;
  employee_id     employees.employee_id%TYPE := 176;
BEGIN
  SELECT      hire_date, sysdate
  INTO        hire_date, sysdate
  FROM        employees
  WHERE       employee_id = employee_id;
END;
/
```

the names of database columns take precedence over the names of local variables.

no issue here

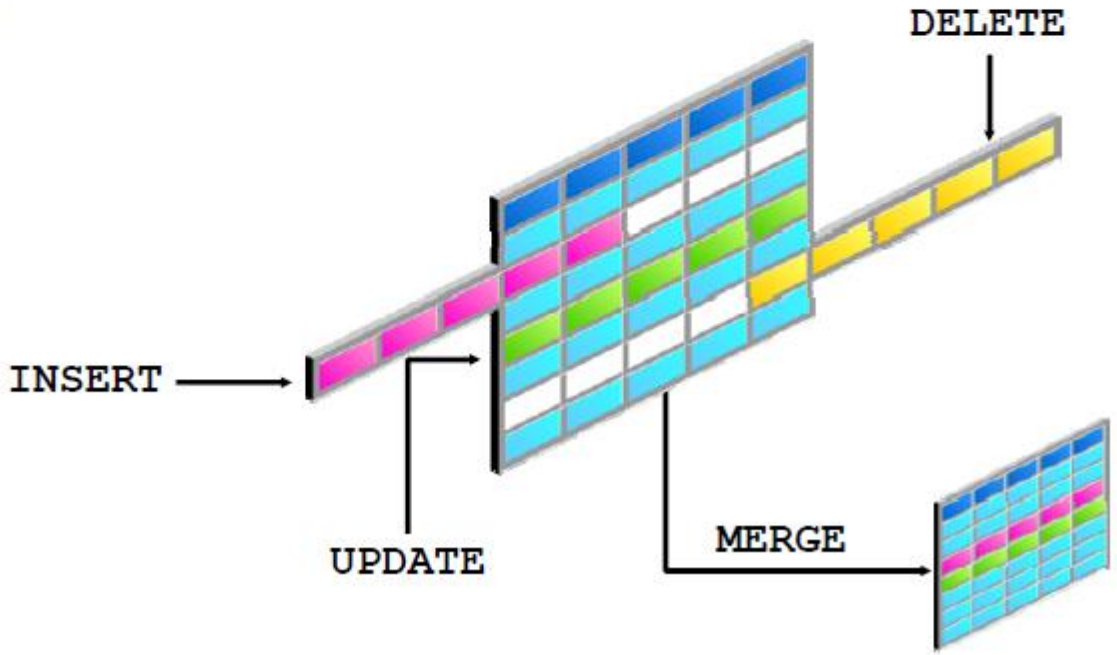
```
Error report:
ORA-01422: exact fetch returns more than requested number of rows
ORA-06512: at line 6
01422. 00000 -  "exact fetch returns more than requested number of rows"
*Cause:    The number specified in exact fetch is less than the rows returned.
*Action:   Rewrite the query or change number of rows requested
```



Using PL/SQL to Manipulate Data

Make changes to database tables by using DML commands:

- INSERT
- UPDATE
- DELETE
- MERGE



SQL Cursor

- A cursor is a pointer to the private memory area allocated by the Oracle server.
- A cursor is used to handle the result set of a `SELECT` statement.
- There are two types of cursors:
  - **Implicit:** Created and managed internally by the Oracle server to process SQL statements
  - **Explicit:** Declared explicitly by the programmer

SQL Cursor

You have already learned that you can include SQL statements that return a single row in a PL/SQL block. The data retrieved by the SQL statement should be held in variables using the `INTO` clause.

Where Does the Oracle Server Process SQL Statements?

The Oracle server allocates a private memory area called the *context area* for processing SQL statements. The SQL statement is parsed and processed in this area. Information required for processing and information retrieved after processing are all stored in this area. You have no control over this area because it is internally managed by the Oracle server.

A cursor is a pointer to the context area. However, this cursor is an implicit cursor and is automatically managed by the Oracle server. When the executable block issues a SQL statement, PL/SQL creates an implicit cursor.

SQL Cursor Attributes for Implicit Cursors

Using SQL cursor attributes, you can test the outcome of your SQL statements.

SQL%FOUND	Boolean attribute that evaluates to TRUE if the most recent SQL statement returned at least one row
SQL%NOTFOUND	Boolean attribute that evaluates to TRUE if the most recent SQL statement did not return even one row
SQL%ROWCOUNT	An integer value that represents the number of rows affected by the most recent SQL statement

Thank You