

1

Introduction to PL/SQL

Objectives

After completing this lesson, you should be able to do the following:

- Explain the need for PL/SQL
- Explain the benefits of PL/SQL
- Identify the different types of PL/SQL blocks
- Output messages in PL/SQL

About PL/SQL

PL/SQL:

- Stands for “Procedural Language extension to SQL”
- Is Oracle Corporation’s standard data access language for relational databases
- Seamlessly integrates procedural constructs with SQL

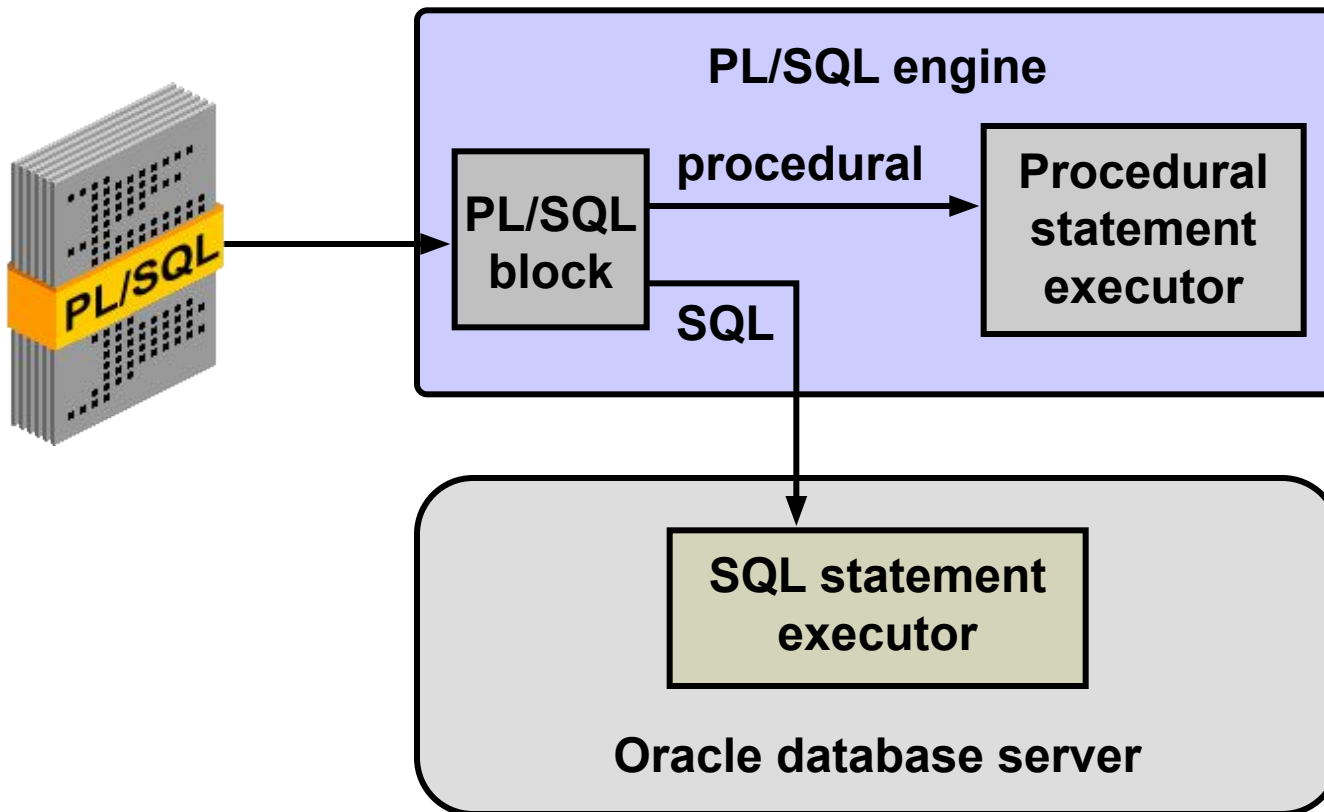


About PL/SQL

PL/SQL:

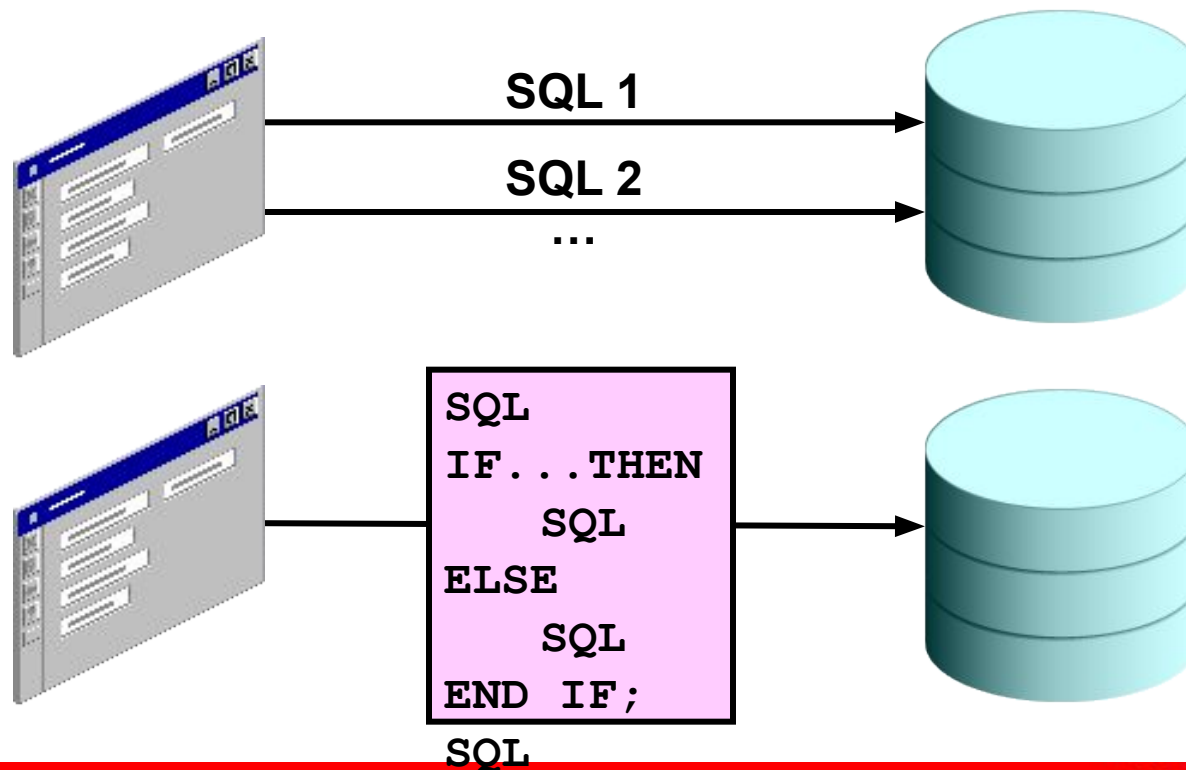
- Provides a block structure for executable units of code. Maintenance of code is made easier with such a well-defined structure.
- Provides procedural constructs such as:
 - Variables, constants, and data types
 - Control structures such as conditional statements and loops
 - Reusable program units that are written once and executed many times

PL/SQL Environment



Benefits of PL/SQL

- Integration of procedural constructs with SQL
- Improved performance



Benefits of PL/SQL

- Modularized program development
- Integration with Oracle tools
- Portability
- Exception handling

PL/SQL Block Structure

- DECLARE (optional)
 - Variables, cursors, user-defined exceptions
- BEGIN (mandatory)
 - SQL statements
 - PL/SQL statements
- EXCEPTION (optional)
 - Actions to perform when errors occur
- END; (mandatory)



Block Types

Anonymous Function

```
[DECLARE]

BEGIN
  --statements

[EXCEPTION]

END;
```

Procedure

```
PROCEDURE name
IS
BEGIN
  --statements

[EXCEPTION]

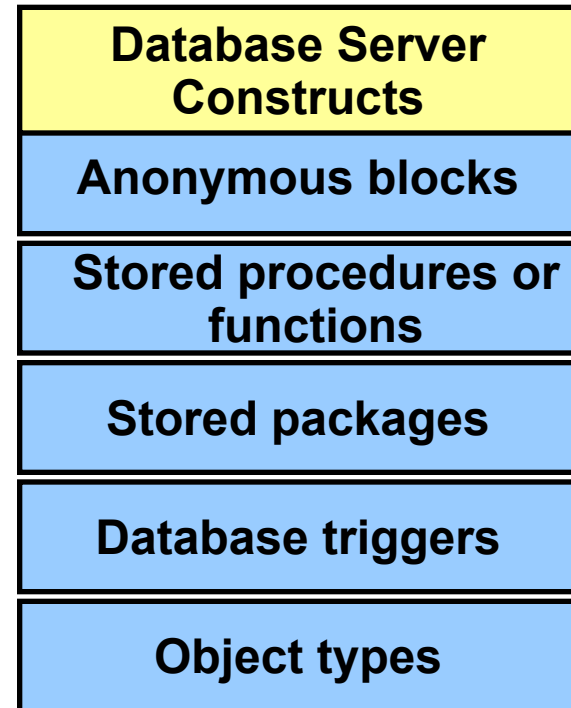
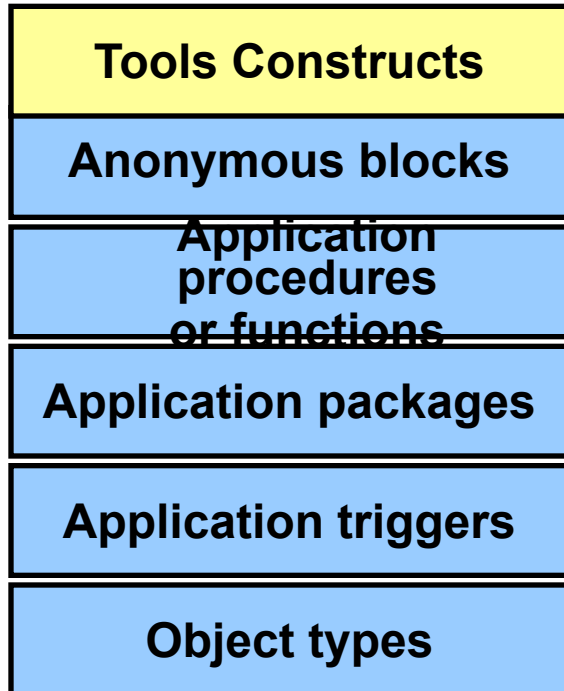
END;
```

```
FUNCTION name
RETURN datatype
IS
BEGIN
  --statements
  RETURN value;

[EXCEPTION]

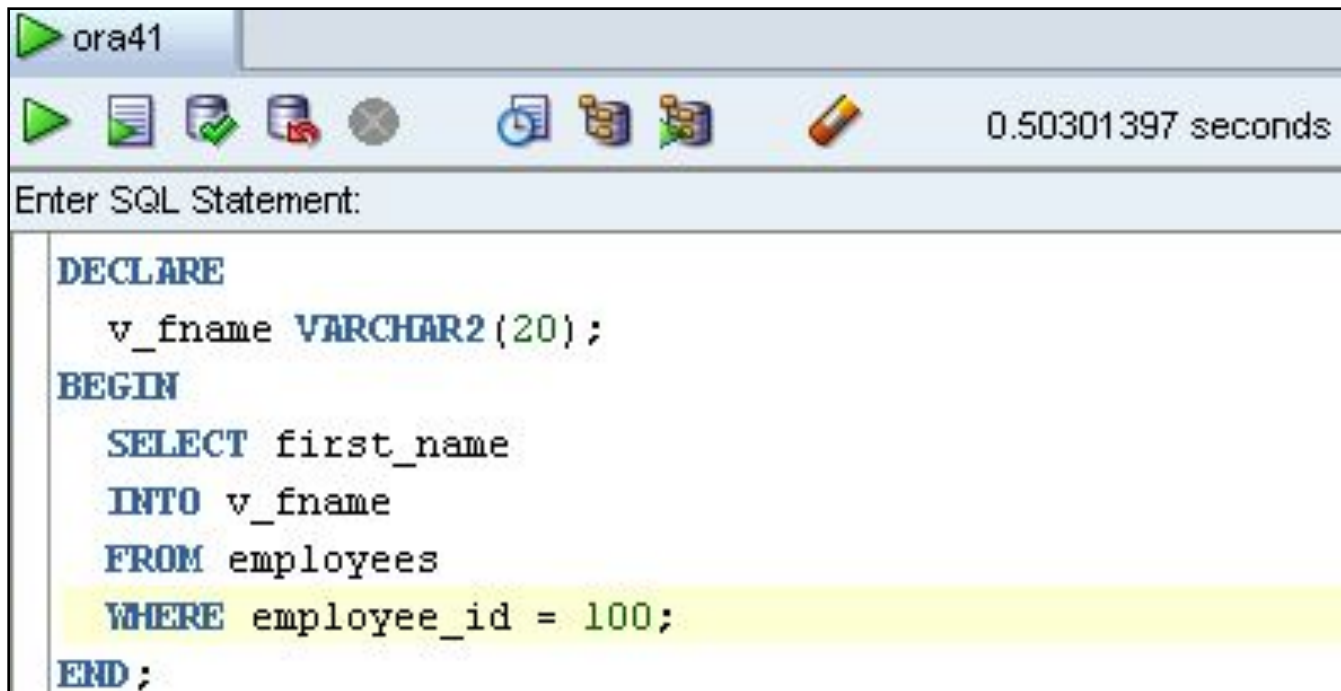
END;
```


Program Constructs



Create an Anonymous Block

Enter the anonymous block in the SQL Developer workspace:

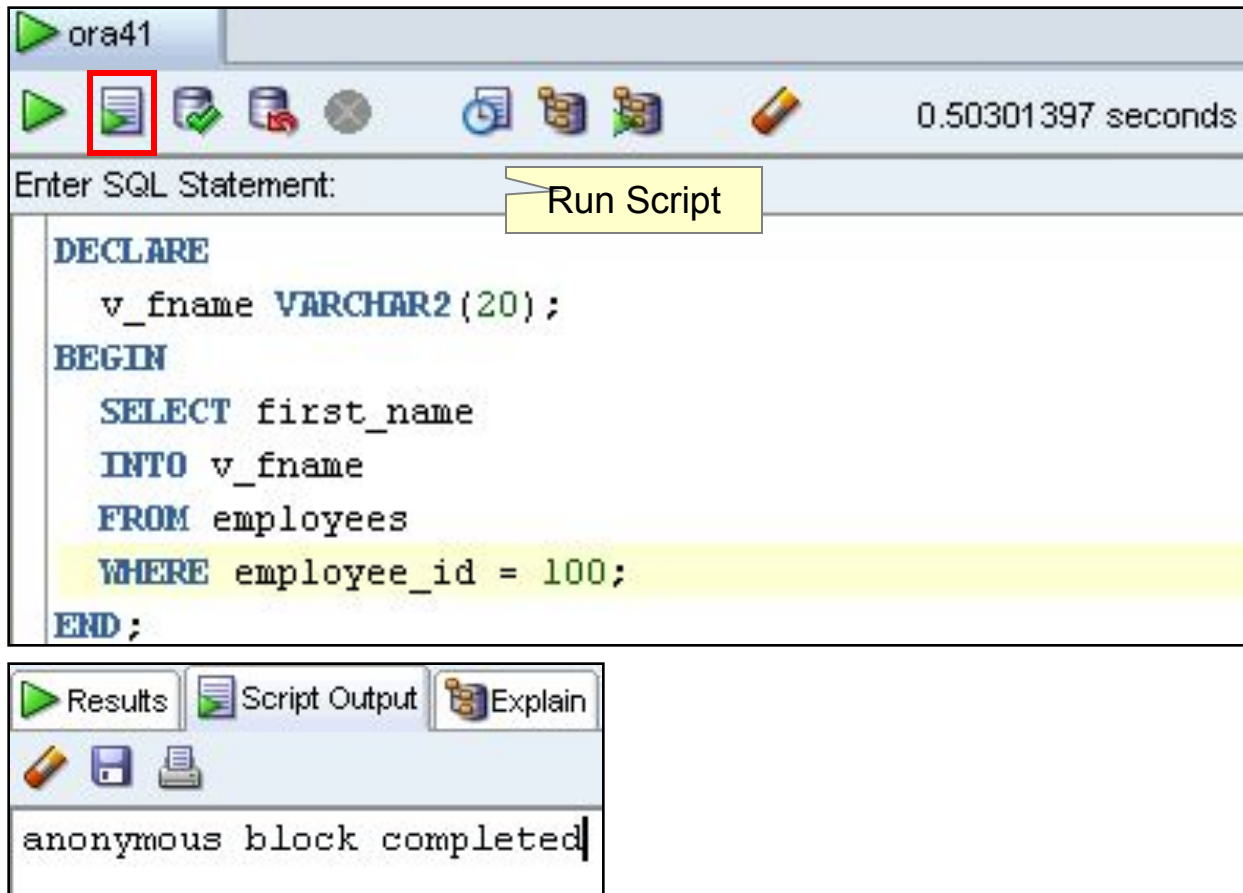


The screenshot shows the SQL Developer workspace with a window titled 'ora41'. The toolbar includes icons for running, saving, and other database operations. The execution time is 0.50301397 seconds. The SQL statement entered is:

```
DECLARE
  v_fname VARCHAR2(20);
BEGIN
  SELECT first_name
  INTO v_fname
  FROM employees
  WHERE employee_id = 100;
END;
```

Execute an Anonymous Block

Click the Run Script button to execute the anonymous block:



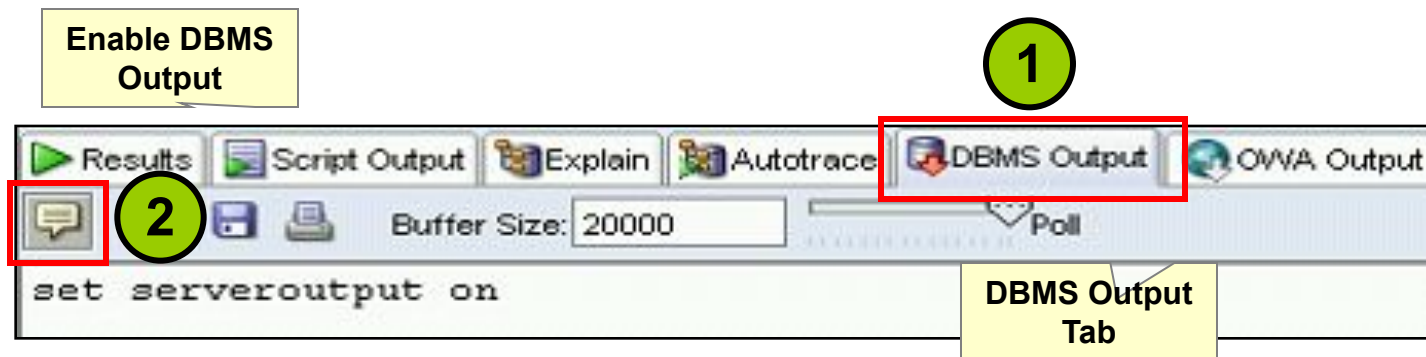
The screenshot displays the Oracle SQL Developer interface. At the top, a window titled 'ora41' is open. The toolbar contains several icons, with the 'Run Script' icon (a green play button with a document) highlighted by a red box. To the right of the toolbar, the execution time is shown as '0.50301397 seconds'. Below the toolbar, the 'Enter SQL Statement:' area contains the following SQL code:

```
DECLARE
  v_fname VARCHAR2(20);
BEGIN
  SELECT first_name
  INTO v_fname
  FROM employees
  WHERE employee_id = 100;
END;
```

The 'Run Script' button is highlighted with a yellow box. Below the SQL editor, there are three tabs: 'Results', 'Script Output', and 'Explain'. The 'Script Output' tab is active, showing the message 'anonymous block completed'.

Test the Output of a PL/SQL Block

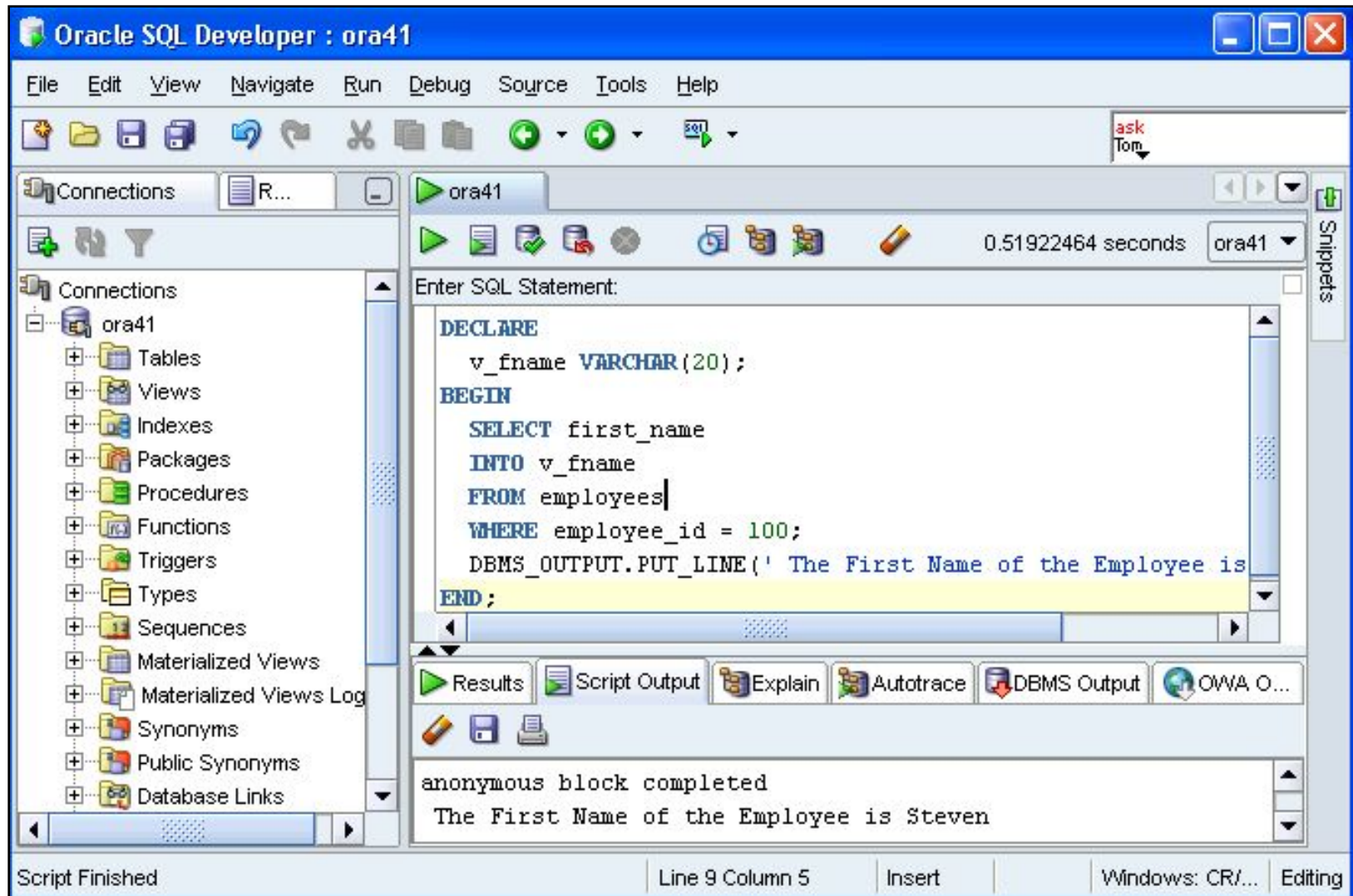
- Enable output in SQL Developer by clicking the Enable DBMS Output button on the DBMS Output tab:



- Use a predefined Oracle package and its procedure:
 - `DBMS_OUTPUT.PUT_LINE`

```
DBMS_OUTPUT.PUT_LINE(' The First Name of the  
Employee is ' || v_fname);  
...
```

Test the Output of a PL/SQL Block



The screenshot displays the Oracle SQL Developer interface. The main window shows a PL/SQL block being executed. The block code is as follows:

```
DECLARE
  v_fname VARCHAR(20);
BEGIN
  SELECT first_name
  INTO v_fname
  FROM employees
  WHERE employee_id = 100;
  DBMS_OUTPUT.PUT_LINE(' The First Name of the Employee is
END;
```

The execution results are shown in the 'Script Output' pane:

```
anonymous block completed
The First Name of the Employee is Steven
```

The status bar at the bottom indicates 'Script Finished', 'Line 9 Column 5', 'Insert' mode, and 'Windows: CR/... Editing'.

Quiz

A PL/SQL block *must* consist of the following three sections:

- A Declarative section which begins with the keyword `DECLARE` and ends when the executable section starts.
- An Executable section which begins with the keyword `BEGIN` and ends with `END`.
- An Exception handling section which begins with the keyword `EXCEPTION` and is nested within the executable section.

1. True
2. False

Summary

In this lesson, you should have learned how to:

- Integrate SQL statements with PL/SQL program constructs
- Describe the benefits of PL/SQL
- Differentiate between PL/SQL block types
- Output messages in PL/SQL

Practice 1: Overview

This practice covers the following topics:

- Identifying the PL/SQL blocks that execute successfully
- Creating and executing a simple PL/SQL block

