Database Programming with PL/SQL

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Benefits of PL/SQL

Objectives

This lesson covers the following objectives:

- List and explain the benefits of PL/SQL
- List the differences between PL/SQL and other programming languages
- Give examples of how to use PL/SQL in other Oracle products

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Purpose

- Have you ever explained to someone the reason why one type of shoe is better than another, given a specific condition?

- In this lesson, you learn about the benefits of the PL/SQL programming language and how it compares to other programming languages. You also learn how PL/SQL relates to other Oracle products.

Benefits of PL/SQL

There are many benefits to using the PL/SQL programming language with an Oracle database.

- Integration of procedural constructs with SQL
- Modularized program development
- Improved performance
- Integration with Oracle tools
- Portability
- Exception handling

Benefit 1: Integration of Procedural Constructs With SQL

The first and foremost advantage of PL/SQL is the integration of procedural constructs with SQL.

- SQL is a nonprocedural language. When you issue a SQL command, your command tells the database server what to do. However, you cannot specify how to do it or how often to do it.

- PL/SQL integrates control statements and conditional statements with SQL. This gives you better control of your SQL statements and their execution.

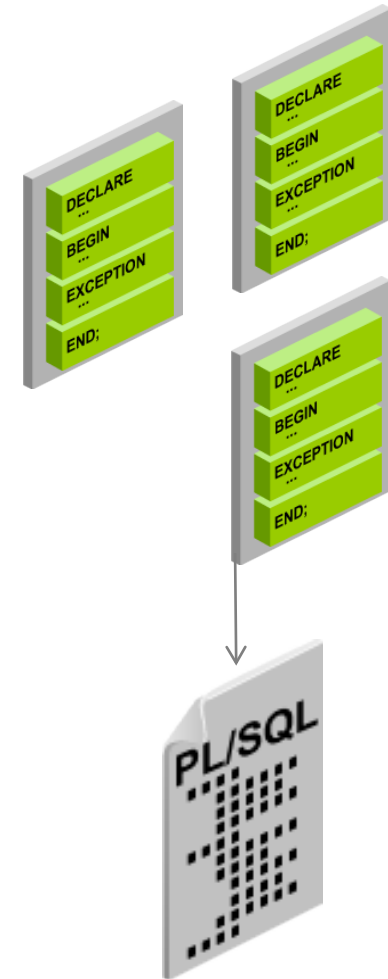# Benefit 2: Modularized Program Development

- The basic unit in a PL/SQL program is a block. All PL/SQL programs consist of blocks. You can think of these blocks as modules and you can "modularize" these blocks in a sequence, or nest them in other blocks.
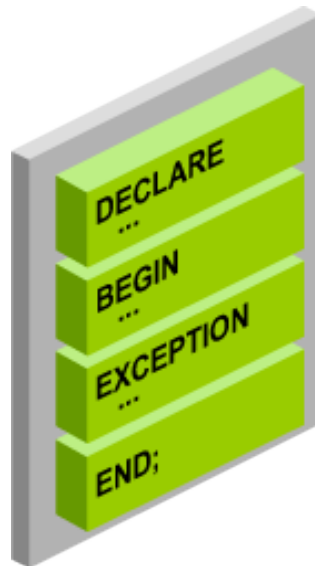
Benefit 2: Modularized Program Development

Modularized program development has the following advantages:

- You can group logically related statements within blocks.

- You can nest blocks inside other blocks to build powerful programs.

- You can share blocks with other programmers to speed up development time.

Benefit 2: Modularized Program Development

Modularized program development has the following advantages:

- You can break your application into smaller modules. If you are designing a complex application, PL/SQL allows you to break down the application into smaller, manageable, and logically related modules.

- You can easily read, maintain, and debug the programming statements.
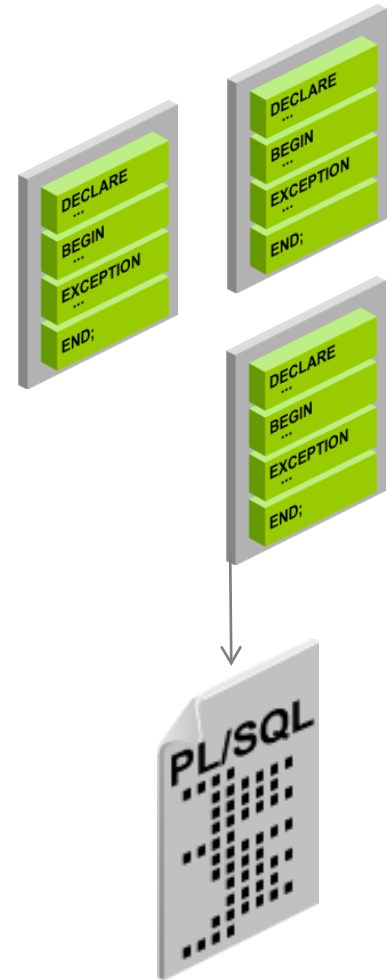
Benefit 3: Improved Performance

- PL/SQL allows you to logically combine multiple SQL statements as one unit or block. The application can send the entire block to the database instead of sending the SQL statements one at a time. This significantly reduces the number of database calls (consider a database with several million records).


```
SQL
IF...THEN
     SQL
ELSE
     SQL
END IF;
SQL
```

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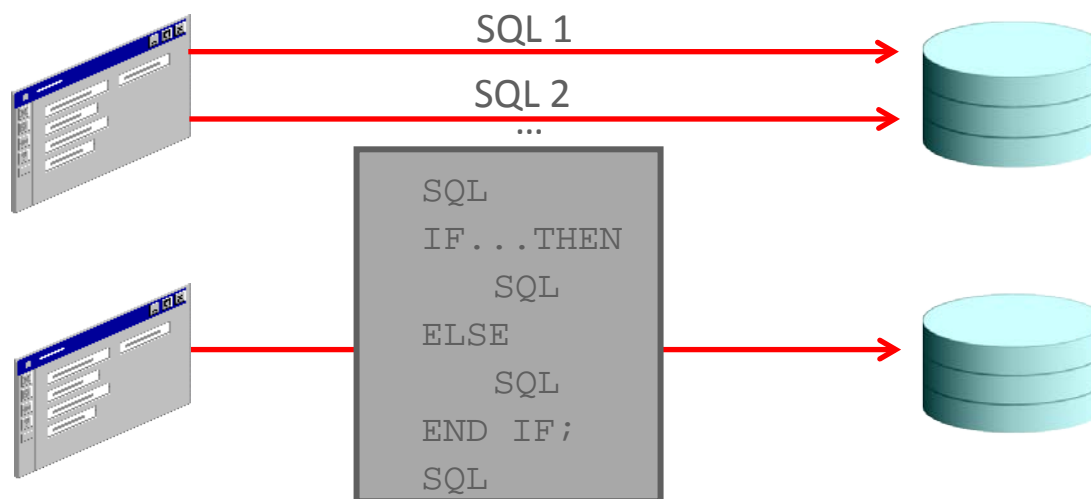
Benefit 4: Integration With Oracle Tools

- PL/SQL is integrated in Oracle tools, such as Oracle Forms Developer, Oracle Report Builder, and Application Express.

PL/SQL

SQL

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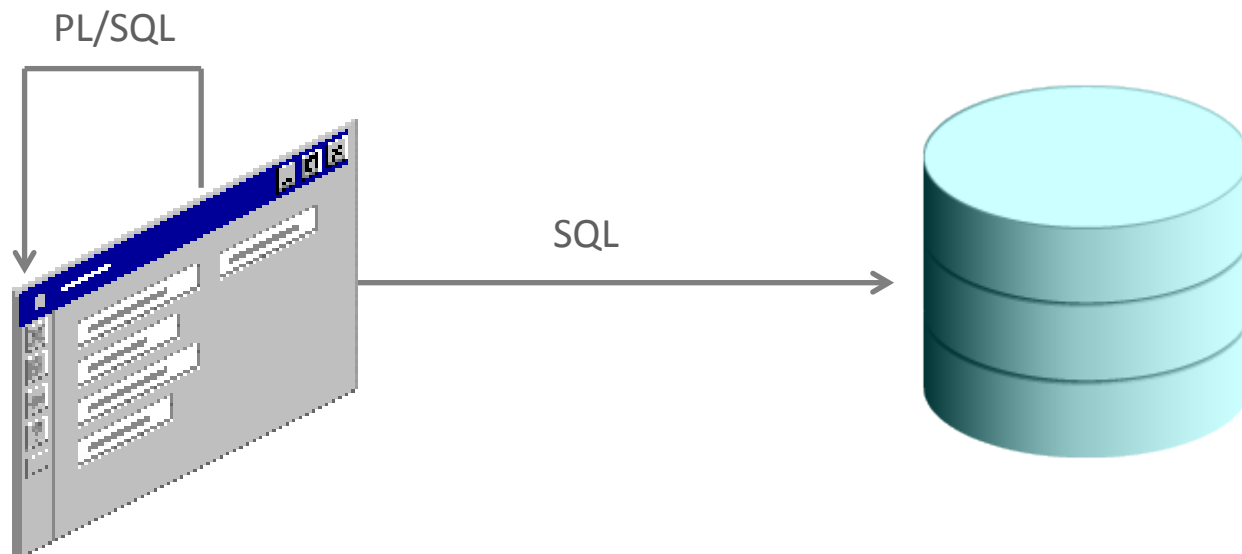
Benefit 5: Portability

- PL/SQL is integrated in Oracle tools, such as Oracle PL/SQL programs can run anywhere an Oracle server runs, regardless of the operating system and the platform.

- PL/SQL programs do not need to be tailored for different operating systems and platforms.

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Benefit 5: Portability

- You can write portable program packages and create libraries that can be reused on Oracle databases in different environments. You can even anticipate those differences and establish instructions to run a specific way given a specific environment.

Linux   HP Tru64   IBM z/OS   Solaris

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Benefit 6: Exception Handling

- An exception is an error that occurs in the database or in a user's program during runtime. Examples of errors include: hardware or network failures, application logic errors, data integrity errors, and so on.

- You can prepare for errors by writing exception handling code. Exception handling code tells your program what to do in the event of an exception.
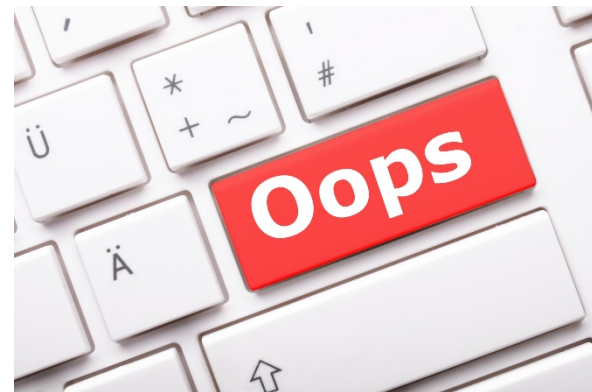
Benefit 6: Exception Handling

- PL/SQL allows you to handle database and program exceptions efficiently. You can define separate blocks for dealing with exceptions.
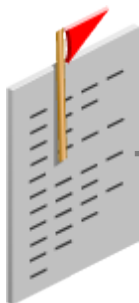
If no data is found then …
If too many rows are found then…
If an invalid number is calculated then …

PL/SQL Compared to Other Languages

	PL/SQL	C	Java
Requires Oracle database or tool	Yes	No	No
Object-oriented	Some features	No	Yes
Performance against an Oracle database	Very efficient	Less efficient	Less efficient
Portable to different operating systems	Yes	Somewhat	Yes
Ease of learning	Relatively easy	More difficult	More difficult

PL/SQL in Oracle Products

Oracle Product	PL/SQL
ORACLE DATABASE 11^g	You can write PL/SQL code to manage application data or to manage the Oracle database itself. For example, you can write code for updating data (DML), creating data (DDL), generating reports, managing security, and so on.
ORACLE APPLICATION SERVER 10^g	Using the Web Application Toolkit, you can create database-centric web applications written entirely or partially in PL/SQL.
ORACLE DEVELOPER SUITE 10^g	Using Forms Builder and Reports Developer, Oracle's client-side developer tools, you can build database-centric web applications and reports that include PL/SQL.
ORACLE Application Express	Using a Web browser you can develop web applications that include PL/SQL.

Terminology

Key terms used in this lesson included:

- Blocks

- Portability

- Exceptions

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Summary

In this lesson, you should have learned how to:

- List and explain the benefits of PL/SQL
- List differences between PL/SQL and other programming languages
- Give examples of how to use PL/SQL in other Oracle products