

# Database Programming with PL/SQL

Review of the Data Dictionary

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# Objectives

This lesson covers the following objectives:

- Describe the purposes of the Data Dictionary
- Differentiate between the three types of Data Dictionary views
- Write SQL `SELECT` statements to retrieve information from the Data Dictionary
- Explain the use of `DICTIONARY` as a Data Dictionary search engine

# Purpose

Imagine that you have created many procedures and/or functions, as well as tables and other database objects.

It's hard to remember all their names, isn't it?

The Data Dictionary remembers this information for you.

# What Is the Data Dictionary?

Every Oracle database contains a Data Dictionary. All database objects, such as tables, views, users and their privileges, procedures, functions, and so on are automatically registered in the Data Dictionary when they are created.

If an object is later altered or dropped, the Dictionary is automatically updated to reflect the change.

Think of the Dictionary as an automatically-managed master catalog of everything in the database.

# How Can You Read the Dictionary?

There are three classes of tables from which you can `SELECT` to view information from the Dictionary:

- The `USER_*` tables contain information about objects that you own, usually because you created them. Examples: `USER_TABLES`, `USER_INDEXES`.
- The `ALL_*` tables contain information about objects that you have privileges to use. These include the `USER_*` information as a subset, because you always have privileges to use the objects that you own. Examples: `ALL_TABLES`, `ALL_INDEXES`.

## How Can You Read the Dictionary? (cont.)

There are three classes of tables from which you can `SELECT` to view information from the Dictionary:

- The `DBA_*` tables contain information about everything in the database, no matter who owns them. Normally, only the Database Administrator can use the `DBA_*` tables. Examples: `DBA_TABLES`, `DBA_INDEXES`.

# Viewing Information in the Dictionary

Although you are not allowed to modify the dictionary yourself, you can `DESCRIBE` and `SELECT` from Dictionary tables.

For example, to see information about all the tables that you have privileges to use:

```
DESCRIBE ALL_TABLES
```

## Viewing Information in the Dictionary (cont.)

The output from this shows that many columns of data are held about each table. You decide you only want to see the name and owner, so you enter:

```
SELECT table_name, owner FROM ALL_TABLES;
```



## Another Example

Suppose you want to see all the objects that you own. You could `SELECT ...` from `USER_TABLES`, then from `USER_INDEXES`, then from `USER_SEQUENCES`, then from .... for each type of object. But it is easier to use `USER_OBJECTS`, which shows all the objects of every type:

```
SELECT object_type, object_name FROM USER_OBJECTS;
```

## Another Example (cont.)

Remember that you can use `WHERE` conditions, `ORDER BY`, `GROUP BY`, and so on with the dictionary tables, just like regular tables. Suppose you want to see how many objects of each type you own:

```
SELECT object_type, COUNT(*) FROM USER_OBJECTS  
GROUP BY object_type;
```

# Using the Super-View `DICTIONARY`

Several hundred Dictionary tables exist and no one can remember the names of all of them. You don't have to!

A super-view called `DICTIONARY` (or `DICT` for short) lists all the Dictionary tables.

You can use `DICT` like a web search engine (such as Google) to show the names and descriptions (comments) of a relevant subset of Dictionary tables. The next slide shows how to do this.

# Using the Super-View DICTIONARY (cont.)

First try:

```
SELECT COUNT(*) FROM DICT WHERE table_name LIKE 'USER%';
```

You see that there are more than a hundred `USER_*` tables. Can you remember which one of them shows you information about which table columns are indexed? Most people can't.

## Using the Super-View DICTIONARY (cont.)

You can reasonably assume that all Dictionary tables that describe indexes have names containing the substring 'IND'. So:

```
SELECT * FROM DICT WHERE table_name LIKE 'USER%IND%';
```

Now you can see that the table you want is  
USER\_IND\_COLUMNS.

# Viewing the Dictionary using Application Express

The Object Browser in Application Express provides an easier way to see much of the Dictionary information.

To use it, go to SQL Workshop -> Object Browser -> Browse and click the desired object type.

## Viewing the Dictionary using Application Express (cont.)

Much easier, isn't it? So why do you still need to know about the `USER_*` and `ALL_*` tables?

The Object Browser does not show everything:

- It shows only the objects that you own, not other objects that you are allowed to use.
- It shows only a subset of information about each object.
- It does not show all the possible object types.

# Terminology

Key terms used in this lesson included:

- ALL\_\* tables
- Data dictionary
- DBA\_\* tables
- USER\_\* tables



# Summary

In this lesson, you should have learned how to:

- Describe the purposes of the Data Dictionary
- Differentiate between the three types of Data Dictionary views
- Write SQL `SELECT` statements to retrieve information from the Data Dictionary
- Explain the use of `DICTIONARY` as a Data Dictionary search engine