

Using the Oracle Data Dictionary Views

Overview:

Data dictionaries provide privileged users access to critical inner workings of the Database instance. You query a data dictionary view just like you would a typical view in a database:

```
Select column1, column2 from dictionaryview where column1 = 'MyDatabase';
```

In this short introductory document, you will use an Interactive Poster from Oracle to navigate the popular architecture views and use SQL developer to query specific views. There are hundreds of database dictionary views in Oracle. Fortunately, you understand the process of how to find, describe and select from them, you can quickly extract useful information.

As you use the data dictionary views, you should consider the importance of the principle of least privilege as you will notice some of the information you can obtain from these views could, in the wrong hands, be compromising and increase the number of attacks on your database.

Using the Oracle Data Dictionary Views:

The Oracle Data Dictionary for 12C is well documented through the use of an Interactive poster found at the following URL:

https://www.oracle.com/webfolder/technetwork/tutorials/obe/db/12c/r1/poster/OUTPUT_poster/poster.html#

Figure 1 shows the Interactive post available after navigating to the URL listed directly above.

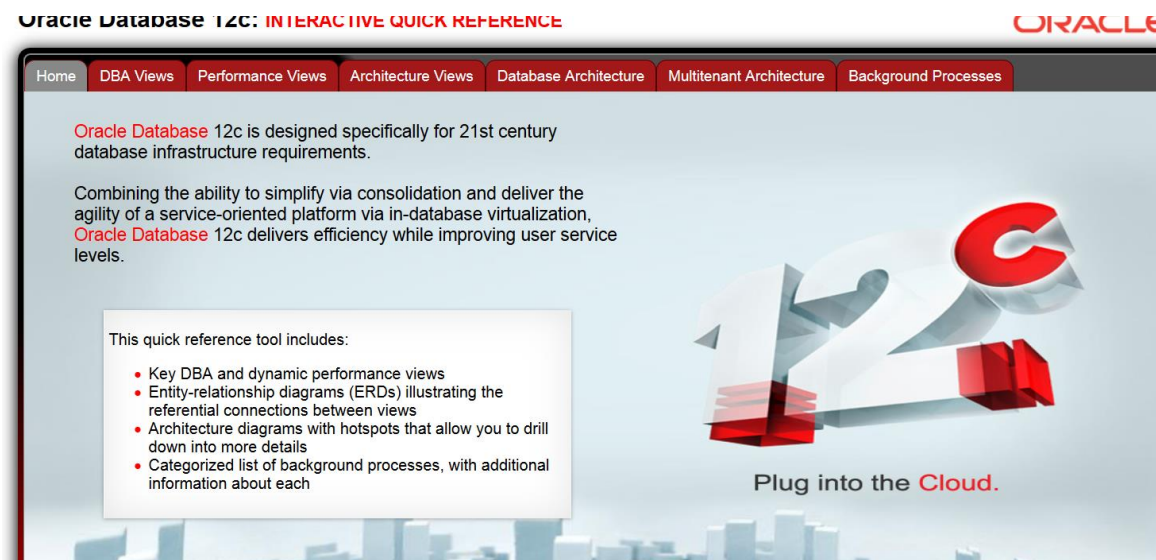


Figure 1 Oracle Interactive Quick Reference

Clicking on each of the tabs provides a data dictionary views, architecture diagrams and background process descriptions as appropriate. In most cases, clicking on a specific component in the diagram will provide additional details. For example, figures 2 to 4 show the results of selecting the Architecture

views tab, followed by selecting the + sign to zoom in, and finally double clicking the DBA_CATALOG View.

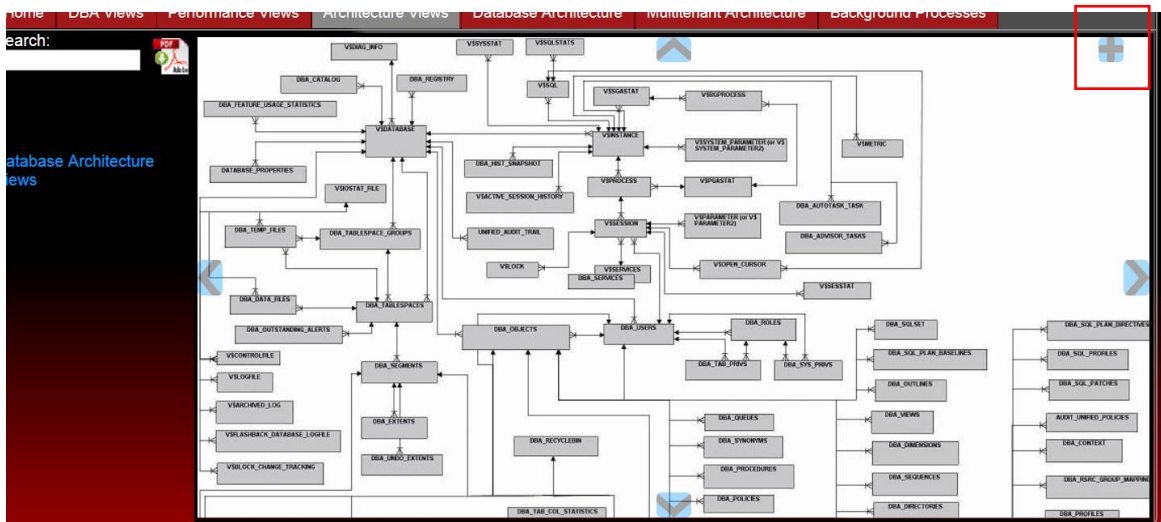


Figure 2 Selecting the Architecture Views tab

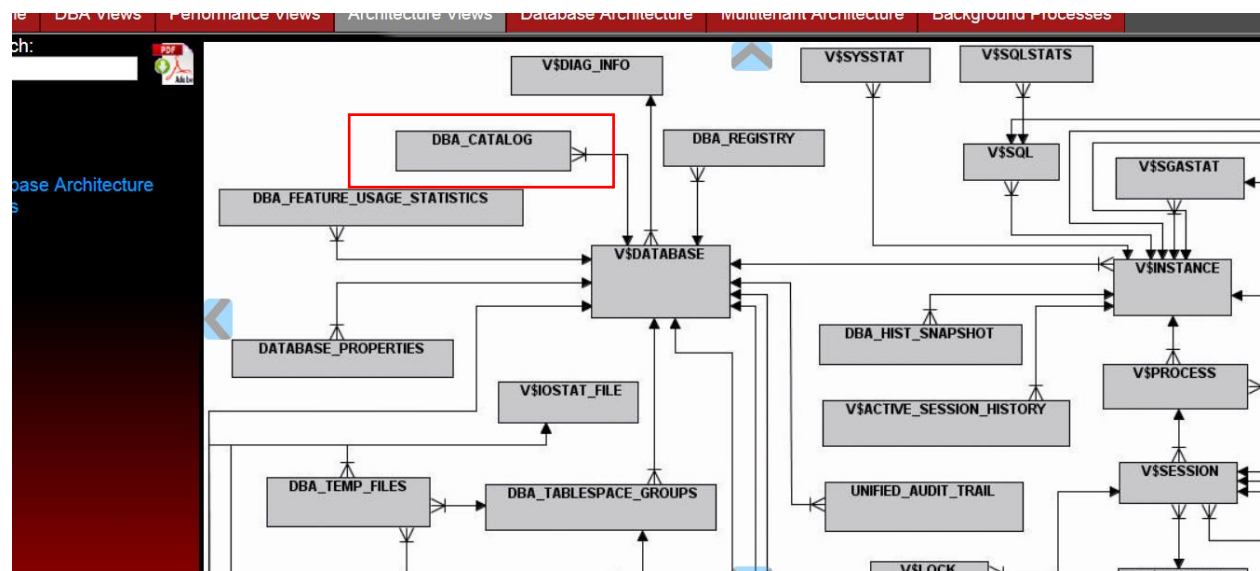


Figure 3 Zooming in to the View Diagrams

Notice you can use the Up, Down, Left and Right arrows on the interactive screen to move about and find different dictionary views.

| DBA_CATALOG Database-Architecture-Views | | |
|---|----------|---------------|
| All database tables, views, synonyms, sequences | | |
| Field Name | Nullable | Type |
| OWNER | NOT NULL | VARCHAR2(128) |
| TABLE_NAME | NOT NULL | VARCHAR2(128) |
| TABLE_TYPE | | VARCHAR2(11) |

Figure 4 DBA_CATALOG View Description

The dictionary view will provide the Field names, if the column is null, and the data type.

Selecting any will review details about the view which can then be translated into SQL statements using the worksheets in SQL developer. For example, figure 5 shows the results of running the describe statement on the DBA_CATALOG view.

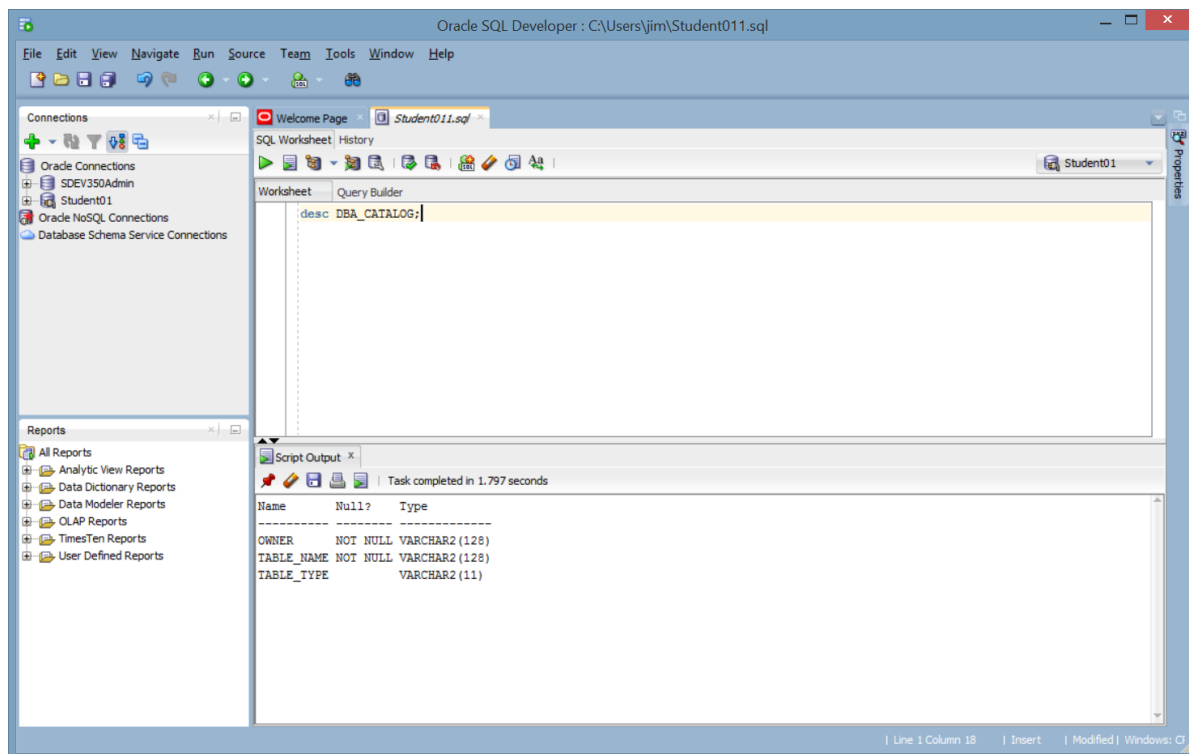


Figure 5 Describing the DBA_CATALOG

Figure 6 shows SQL statements to determine how many records are in the view and tables are owner by each Owner in the database. Notice the use of the Group by clause. You will find this clause very useful for this week's lab.

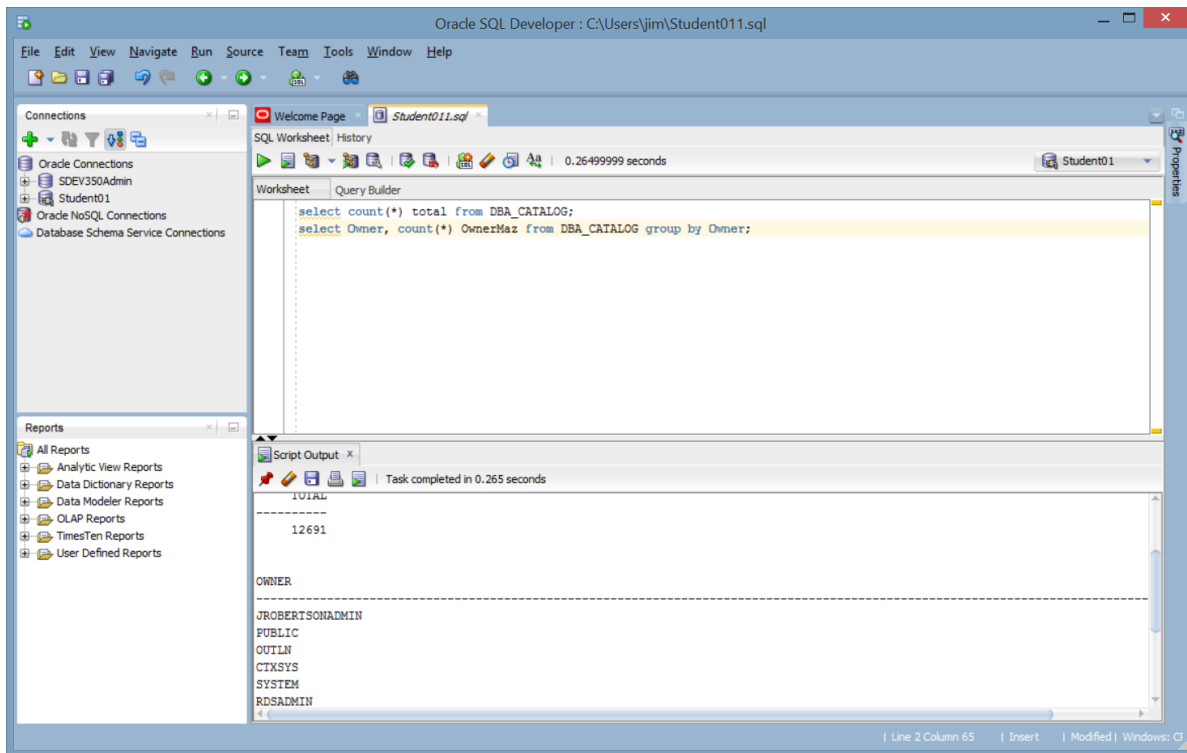


Figure 6 Queries on DBA_CATALOG

Figure 7 shows the results of double clicking the DBA_USERS view in the interactive poster.

| DBA_USERS | | |
|-----------------------------|----------|----------------|
| Database-Architecture-Views | | |
| All users of schemas | | |
| Field Name | Nullable | Type |
| USERNAME | NOT NULL | VARCHAR2(128) |
| USER_ID | NOT NULL | NUMBER |
| PASSWORD | | VARCHAR2(4000) |
| ACCOUNT_STATUS | NOT NULL | VARCHAR2(32) |
| LOCK_DATE | | DATE |
| EXPIRY_DATE | | DATE |
| DEFAULT_TABLESPACE | NOT NULL | VARCHAR2(30) |
| TEMPORARY_TABLESPACE | NOT NULL | VARCHAR2(30) |

Figure 7 Selecting the DBA_USERS View

Scrolling down will review more columns available for query. For example, you will note the LAST_LOGIN is available as shown in figure 8.

| | | |
|---------------------|--|-----------------------------|
| EXTERNAL_NAME | | VARCHAR2(4000) |
| PASSWORD_VERSIONS | | VARCHAR2(12) |
| EDITIONS_ENABLED | | VARCHAR2(1) |
| AUTHENTICATION_TYPE | | VARCHAR2(8) |
| PROXY_ONLY_CONNECT | | VARCHAR2(1) |
| COMMON | | VARCHAR2(3) |
| LAST_LOGIN | | TIMESTAMP(9) WITH TIME ZONE |
| ORACLE_MAINTAINED | | VARCHAR2(1) |

Figure 8 Scrolling to reveal more columns

Switching back to the SQL Developer tool we can build and test a query to when user's last logged in to the database. (See Figure 9)

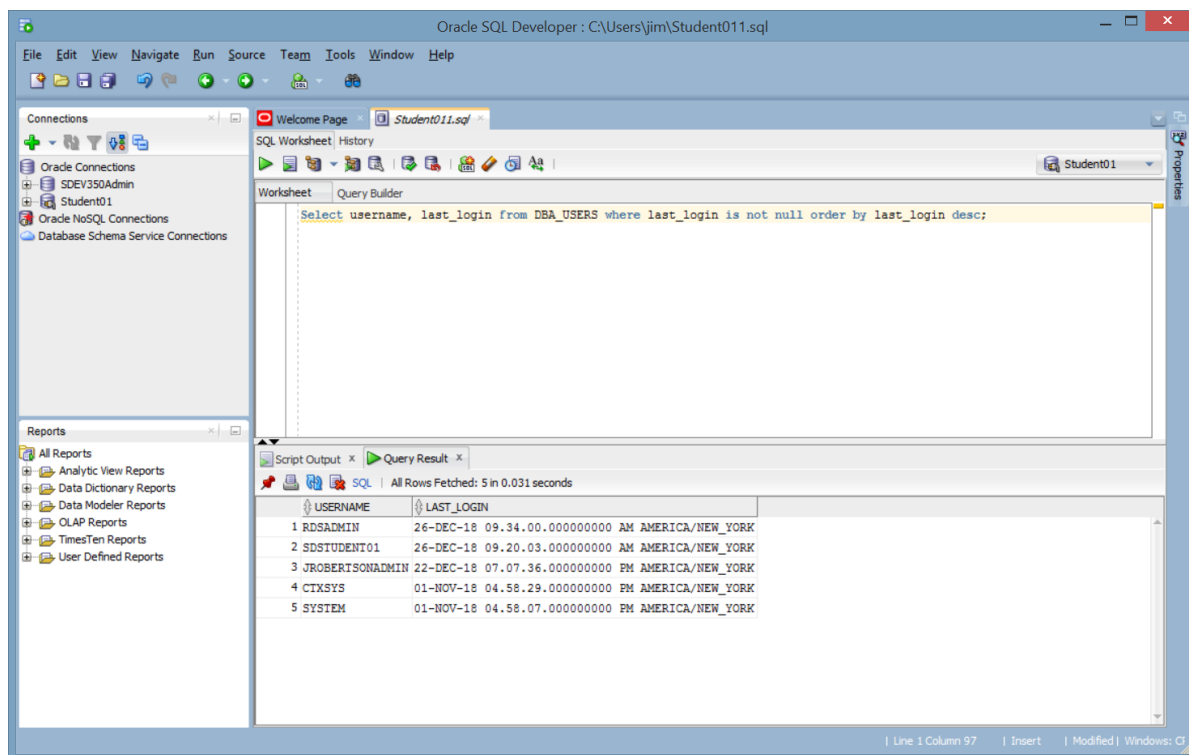


Figure 9 Retrieving Last Login Dates for Users

In the query, notice the use “is not null” and the order by clauses to help restrict and get right to the data you are interested in seeing.

Additional View Examples:

To help prepare you for Lab 2, consider experimenting with the Data Dictionary views to answer the following questions. The answers are included to help make sure you are on the right track.

1. What is the most popular PASSWORD_VERSIONS found in the DBA_USERS view?

Answer: 10G 11G 12C

This query will help answer the question:

```
Select password_versions, count(*) theMAX from DBA_USERS group by password_versions order by theMAX desc;
```

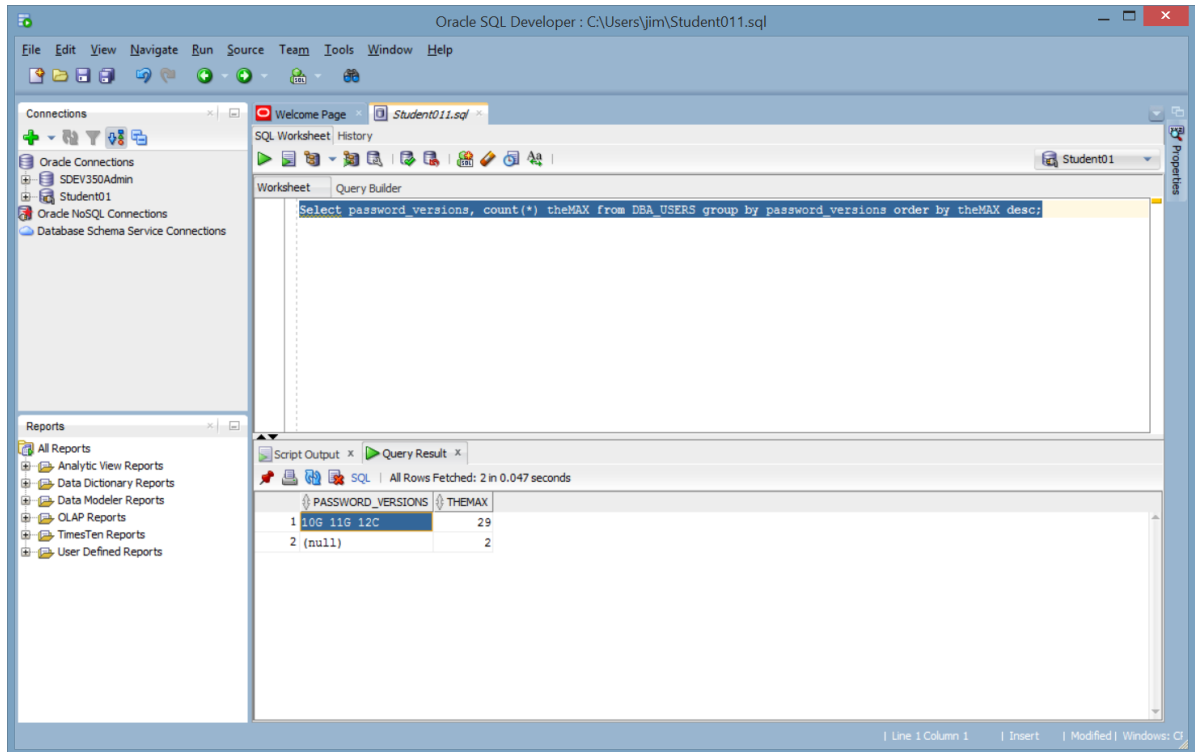


Figure 10 Most Popular PASSWORD_VERSIONS in DBA_USERS

2. How many different ROLES are found in the DBA_ROLES view?

Answer: 51

This query will help answer the question:

```
Select count(*) val from DBA_ROLES;
```

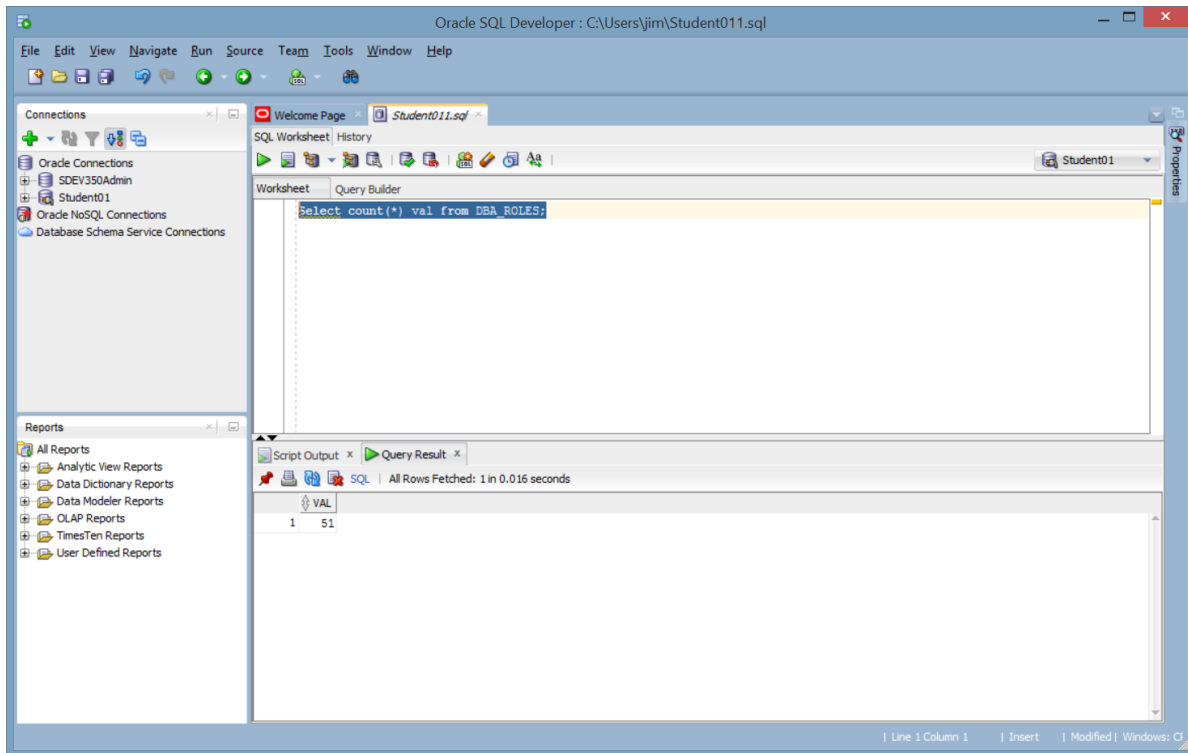


Figure 11 How many DBA_ROLES in the database?

Note: This might change through the semester as roles are added and deleted.

3. What are the SERVICE_IDs and Names for each service currently running in the DBA_SERVICES view?

Answer:

- 1 SYS\$BACKGROUND
- 2 SYS\$USERS
- 3 ORCL_A
- 4 ORCLSDDEV_A

This query will help answer the question:

```
Select service_ID, name from DBA_Services;
```

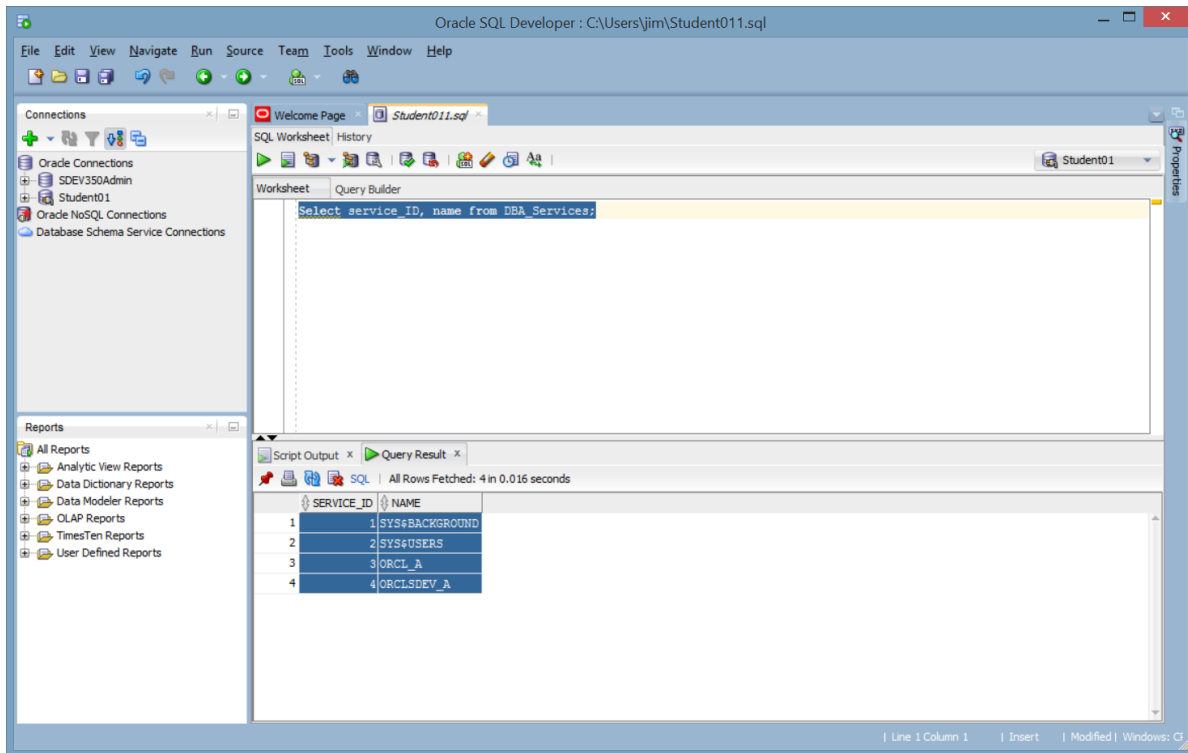


Figure 12 Service IDs and Names

Note: The services may change depending when you query the database view.

4. How many Database Properties are present in the DATABASE_PROPERTIES view?

ANSWER: 37

This query will help answer the question:

```
Select count(*) cnt from DATABASE_PROPERTIES;
```

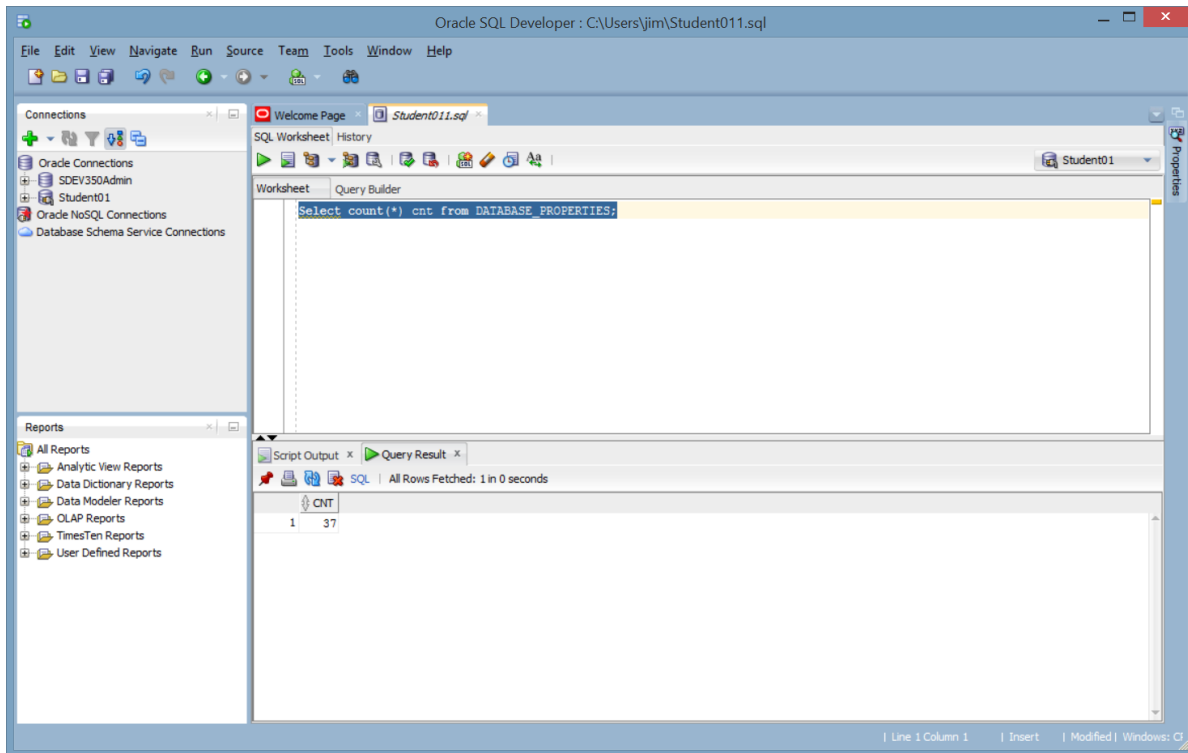



Figure 13 Database Property Count

- What is the value of the NO_USERID_VERIFIER_SALT property in the DATABASE_PROPERTIES view?

Answer: 8E35F58479C37FBFC55479F799AF0ABD

This query will help answer the question:

```
SELECT PROPERTY_NAME, PROPERTY_VALUE FROM DATABASE_PROPERTIES WHERE
PROPERTY_NAME = 'NO_USERID_VERIFIER_SALT';
```

Note: You may need to run other queries first to determine which properties are even available. For example:

```
select PROPERTY_NAME, from DATABASE_PROPERTIES;
```

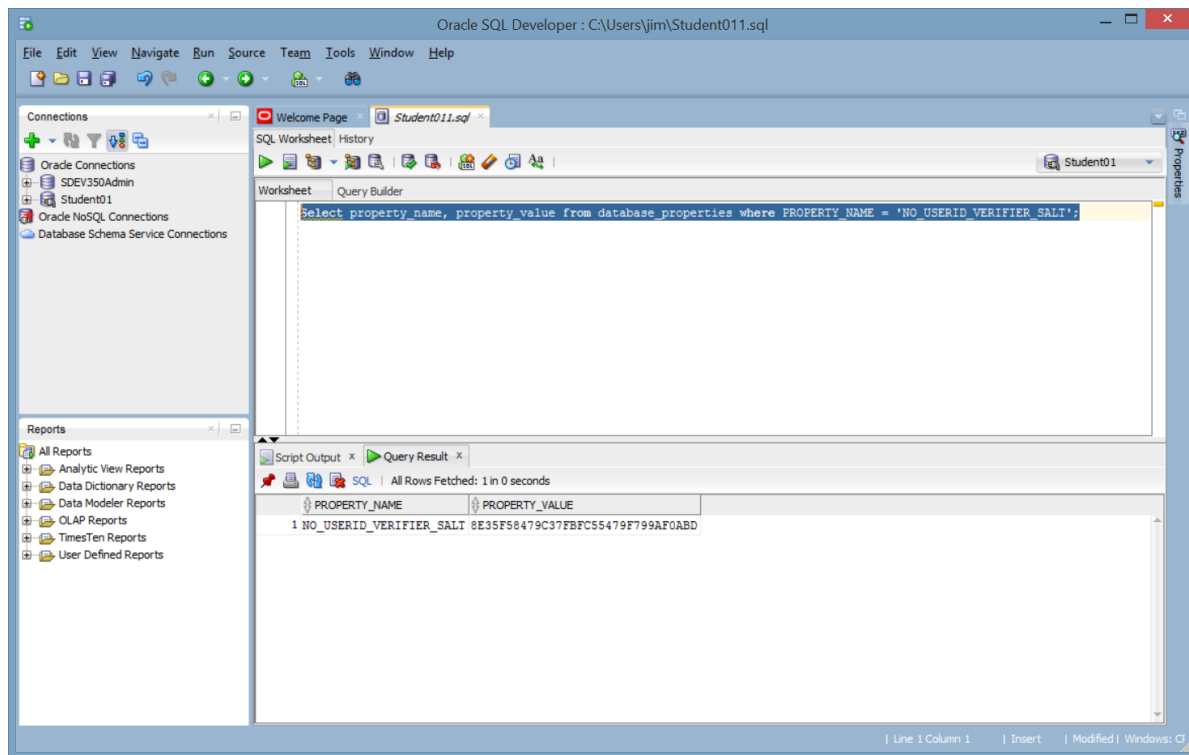


Figure 14 Retrieving the NO_USERID_SALT