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## DBMS LAB 02 MATERIAL

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Prepared by:  
Mohammad Anas Jawad  
Lecturer, IUT CSE



Department of Computer Science and Engineering  
Islamic University of Technology  
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## 1 KEY POINTS ABOUT SQL

- SQL stands for Structured Query Language
- SQL is used to query information from the database
- SQL is not case sensitive. So column names, table names, usernames etc. are not case sensitive. However, the values inside a table i.e. inside a column are case sensitive.

## 2 CREATING A NEW USER

To create a new user, we need to follow a sequence of operations.

1. Login as system.
2. Create a new user with password.
3. Grant sufficient permissions/privileges.

The major types of privileges among some others are:

1. CREATE SESSION (allows the user to login).
2. RESOURCE (allows the user to manipulate tables).
3. TABLESPACE (ensures that a user has disk space allocated in the system to actually create or modify tables and data)
4. DBA (Database admin permission).

The statement to create a new user and grant sufficient privileges:

---

```
CREATE USER username IDENTIFIED BY password;  
GRANT privilege1, privilege2... TO username;
```

---

---

```
SQL> conn system
Enter password:
Connected.
SQL> CREATE USER thanos IDENTIFIED BY inevitable;

User created.

SQL> conn thanos/inevitable;
ERROR:
ORA-01045: user THANOS lacks CREATE SESSION privilege; logon denied
```

**Figure 1:** Creating a new user

```
SQL> CONN SYSTEM
Enter password:
Connected.
SQL> GRANT CREATE SESSION, RESOURCE TO thanos;

Grant succeeded.
```

**Figure 2:** Granting it sufficient permissions

---

## 3 SQL STATEMENTS

### 3.1 The CREATE TABLE statement

The way you can create tables in an oracle database is by using the CREATE TABLE statement. The structure of the statement is as follows:

---

```
CREATE TABLE table_name
(
    column_1 data_type,
    column_2 data_type,
    .
    .
    .
);
```

---

### 3.2 Data Types

Data type	Description
VARCHAR2(n)	n-length character string.
INT	A whole number in the range of (-2**31) to (2**31)-1

**Table 1:** INT and VARCHAR2

Example:

ID	Name	Semester
1	Sam	3rd
2	John	5th
3	Sara	4th

**Table 2:** Student Table

---

```
SQL> CREATE TABLE STUDENT
2  (
3  ID INT,
4  NAME VARCHAR2(30),
5  SEMESTER VARCHAR2(5)
6  );
Table created.
```

**Figure 3:** Creating the *Student* table

### 3.3 The SELECT Statement

The purpose of the SELECT statement is to display the rows and columns of a table. The very basic structure of the SELECT statement is as follows:

---

```
SELECT * FROM table_name;
```

---

"table\_name" being the name of your table.

Writing this statement will result in showing the all the columns and all the rows currently present in the database. The '\*' in the statement indicates that we want to see the values of all the columns in the table. We can also modify this statement to show us specific rows, in a sorted order etc. However, we won't be doing those in this lab.

To specify only certain columns to be displayed, write the following statement:

---

```
SELECT column_1, column_2 FROM table_name;
```

---

"column\_1" and "column\_2" being the columns you want to display.

Example:

---

```
SQL> SELECT * FROM STUDENT;

  ID NAME                SEMES
-----
154443 Thanos            2nd
154444 Gamora            2nd

SQL> SELECT ID, NAME FROM STUDENT;

  ID NAME
-----
154443 Thanos
154444 Gamora
```

**Figure 4:** The SELECT statement

There are further variations of the SELECT statement that use WHERE, ORDER BY etc. We will see these variations in the subsequent labs.

### 3.4 The INSERT INTO Statement

This statement is used to enter data into a table. There are two major ways of writing the INSERT INTO statement.

---

```
INSERT INTO table_name VALUES (value1, value2, value3, ...);
```

```
INSERT INTO table_name (column1, column2, column3, ...) VALUES (value1, value2,
value3, ...);
```

---

Example:

```
SQL> INSERT INTO STUDENT VALUES (154443, 'Anas Jawad', '2nd');

1 row created.
```

**Figure 5:** INSERT statement variation 1

```
SQL> INSERT INTO STUDENT (ID,NAME,SEMESTER) VALUES (154444, 'Tamzid', '2nd');

1 row created.

SQL> INSERT INTO STUDENT (NAME) VALUES ('Tamzid');

1 row created.
```

**Figure 6:** INSERT statement variation 2

---

### 3.5 The DROP TABLE statement

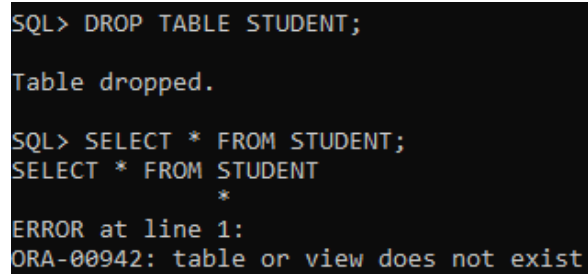
This statement is used to delete a table (including all its entries) from your database.

---

**DROP TABLE** table\_name;

---

**Warning:** Using this statement will remove all the entries from your table, so be careful while using it.



```
SQL> DROP TABLE STUDENT;

Table dropped.

SQL> SELECT * FROM STUDENT;
SELECT * FROM STUDENT
          *
ERROR at line 1:
ORA-00942: table or view does not exist
```

**Figure 7:** DROP TABLE statement



---

## 4 WORKING WITH PRIMARY KEYS

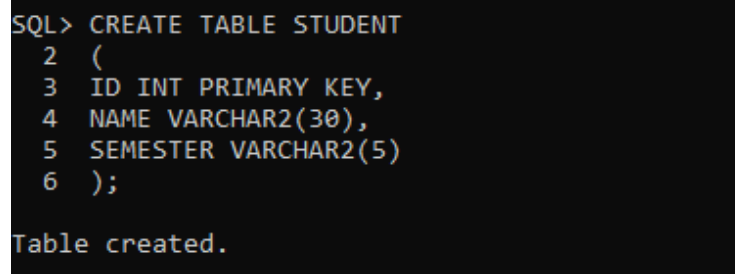
Primary keys are used to uniquely identify each row in a particular table. Primary key needs to be specified during the creation of the table. It can also be specified later by altering the table, but we will see the ALTER TABLE command in a future lab.

---

```
CREATE TABLE STUDENT
(
  ID INT,
  NAME VARCHAR2(30),
  SEMESTER VARCHAR2(5),
  PRIMARY KEY (ID)
);
```

```
CREATE TABLE STUDENT
(
  ID INT PRIMARY KEY,
  NAME VARCHAR2(30),
  SEMESTER VARCHAR2(5)
);
```

---



```
SQL> CREATE TABLE STUDENT
2  (
3  ID INT PRIMARY KEY,
4  NAME VARCHAR2(30),
5  SEMESTER VARCHAR2(5)
6  );
Table created.
```

**Figure 8:** Creating a table with a primary key

---

## 5 TIPS AND TRICKS

### 5.1 Checking current user

To check which user is currently logged in, write the following command:

---

```
SHOW USER;
```

---

### 5.2 Disconnect/Log out

While logged in, simply type the following:

---

```
DISC;
```

---

Or,

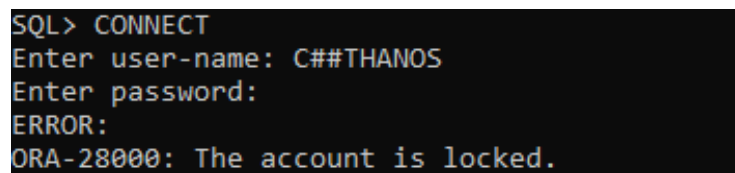
---

```
DISCONNECT;
```

---

### 5.3 Locked account solution

You may come across an error that says that a particular account is locked.



```
SQL> CONNECT
Enter user-name: C##THANOS
Enter password:
ERROR:
ORA-28000: The account is locked.
```

**Figure 9:** Locked account error

In such case, do the following:

---

```
CONNECT SYS/SYS AS SYSDBA;
```

```
ALTER USER username IDENTIFIED BY correct_password ACCOUNT UNLOCK;
```

---

---

```
SQL> CONNECT SYS/SYS AS SYSDBA;
Connected.
SQL> ALTER USER C##THANOS IDENTIFIED BY INEVITABLE ACCOUNT UNLOCK;
User altered.
```

**Figure 10:** Unlocking an account

## 5.4 Saving your work

If you want to save your work that you did in a particular session, write the following before logging out:

---

```
COMMIT;
```

---

## 5.5 Clearing the console

In case you have a huge pile of text in your console and you want to clean things up, write the following:

---

```
CL SCR;
```

---

## 5.6 Describing a table

In case you want to see the structure of a table, write the following:

---

```
DESC table_name;
```

---