

Database Programming with SQL

17-1: Controlling User Access

1. What are system privileges concerned with?
 - In Oracle, system privileges pertain to high-level and administrative activities on the database as a whole. They enable users to manage users and database security, as well as create, modify, and remove database objects (such as tables, views, and procedures). CREATE SESSION, CREATE TABLE, ALTER DATABASE, DROP USER, and so on are examples of system privileges. With the help of these right, one can take actions that impact a large number of object or the entire database.
2. What are object privileges concerned with?
 - Specific actions that can be carried out on individual database objects (tables, views, procedures, etc) are referred to as object privileges. The activities that a user or role can take on an object are determined by these privileges. For instance, the ability to retrieve, alter, or remove data from a table or view is provided by privileges like SELECT, INSERT, UPDATE, and DELETE. Unlike system privileges, which are applicable to the entire database, object privileges are usually assigned on an individual object basis.
3. What is another name for object security?
 - Data security is another term for object security. Only authorized users or roles are able to interact with certain database objects and the data they contain thanks to object security.
4. What commands are necessary to allow Scott access to the database with a password of tiger?
 - CREATE USER scott IDENTIFIED BY tiger; GRANT CREATE SESSION TO scott;
5. What are the commands to allow Scott to SELECT from and UPDATE the d_clients table?
 - GRANT SELECT, UPDATE ON d_clients TO scott;
6. What is the command to allow everybody the ability to view the d_songs table?

```
1 GRANT SELECT ON d_songs TO PUBLIC;
```

Results	Explain	Describe	Saved SQL	History
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```
Statement processed.
```

7. Query the data dictionary to view the object privileges granted to you the user.

```
1 SELECT * FROM USER_TAB_PRIVS;
```

Results									
Explain Describe Saved SQL History									
GRANTEE	OWNER	TABLE_NAME	GRANTOR	PRIVILEGE	GRANTABLE	HIERARCHY	COMMON	TYPE	INH
PUBLIC	US_A296_SQL_S25	D_SONGS	US_A296_SQL_S25	SELECT	NO	NO	NO	TABLE	NO
PUBLIC	SYS	US_A296_SQL_S25	US_A296_SQL_S25	INHERIT PRIVILEGES	NO	NO	NO	USER	NO

8. What privilege should a user be given to create tables?
- CREATE TABLE privilege
9. If you create a table, how can you pass along privileges to other users just to view your table?
- If you want to allow other users to **view** (i.e., SELECT data) your table, you can grant them the SELECT privilege.
10. What syntax would you use to grant another user access to your copy_employees table?
- GRANT SELECT, INSERT, UPDATE, DELETE ON copy_employees TO another_user;
11. How can you find out what privileges you have been granted for columns in the tables belonging to others?
- SELECT * FROM USER_COL_PRIVS WHERE GRANTEE = 'YOUR_USERNAME';

17-2: Creating and Revoking Object Privileges

1. What is a role?
- In a database, a role is a group of rights that can be given to users or other roles. By combining different capabilities, it makes managing user permissions easier and enables DBAs to grant or cancel access to numerous users simultaneously. A DBA can offer roles to users, which can then inherit all the privileges associated with the role, rather to giving each user capabilities.
2. What are the advantages of a role to a DBA?
- Simplified Management
 - Consistency
 - Ease of Revocation
 - Security
 - Reduced Errors

3. Give the ability to another user in your class to look at one of your tables. Give him the right to let other students have that ability.
 - `GRANT SELECT ON your_table TO other_user WITH GRANT OPTION;`
4. You are the DBA. You are creating many users who require the same system privileges. What should you use to make your job easier?
 - Roles are a good idea. You can construct a role, give it system privileges, and then assign the position to several users rather than giving each user system privileges separately.
5. What is the syntax to accomplish the following?
 - a. Create a role of manager that has the privileges to select, insert, and update and delete from the employees table
 - `CREATE ROLE manager; GRANT SELECT, INSERT, UPDATE, DELETE ON employees TO manager;`
 - b. Create a role of clerk that just has the privileges of select and insert on the employees table
 - `CREATE ROLE clerk; GRANT SELECT, INSERT ON employees TO clerk;`
 - c. Grant the manager role to user scott
 - `GRANT manager TO scott;`
 - d. Revoke the ability to delete from the employees table from the manager role
 - `REVOKE DELETE ON employees FROM manager;`
6. What is the purpose of a database link?
 - A database link allows a user to query or edit data in a remote database by connecting two Oracle databases. As if they were local, it enables a user in one database to access objects (such as tables, views, etc.) from another database. When data must be exchanged across several platforms, distributed databases benefit greatly from this.

17-3: Regular Expressions

1. Working with the employees table, and using regular expressions, write a query that returns employees whose first names start with a “S” (uppercase) followed by either a “t” (lowercase) or “h” (lowercase).

1	SELECT first_name
2	FROM employees
3	WHERE REGEXP_LIKE(first_name, '^S[t h]', 'i');

Results	Explain	Describe	Saved SQL	History
FIRST_NAME				
Shelley				
Steven				

2. Investigate the LOCATIONS table.
 - a. Describe the table.

1DESCRIBE LOCATIONS;

ResultsExplainDescribeSaved SQLHistory

Object TypeTABLEObjectLOCATIONS

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comments
LOCATIONS	LOCATION_ID	NUMBER	-	4	0	1	-	-	-
	STREET_ADDRESS	VARCHAR2	40	-	-	-	✓	-	-
	POSTAL_CODE	VARCHAR2	12	-	-	-	✓	-	-
	CITY	VARCHAR2	30	-	-	-	-	-	-
	STATE_PROVINCE	VARCHAR2	25	-	-	-	✓	-	-
	COUNTRY_ID	NUMBER	-	4	0	-	✓	-	-

- b. Perform a select that returns all rows and all columns of that table.

1 SELECT * FROM LOCATIONS;

Results

ExplainDescribeSaved SQLHistory

LOCATION_ID	STREET_ADDRESS	POSTAL_CODE	CITY	STATE_PROVINCE	COUNTRY_ID
1800	460 Bloor St. W.	ON M5S 1X8	Toronto	Ontario	2
2500	Magdalen Centre, The Oxford Science Park	OX9 9ZB	Oxford	Oxford	44
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	1
1500	2011 Interiors Blvd	99236	South San Francisco	California	1
1700	2004 Charade Rd	98199	Seattle	Washington	1
2100	Av. Rio Branco	20090-003	Rio de Janeiro	Rio de Janeiro	55

c. Write a query using regular expressions that removes the spaces in the street_address column in the LOCATIONS table.

```
1 SELECT REGEXP_REPLACE(street_address, ' ', '') AS street_address_no_spaces
2 FROM LOCATIONS;
```

Results	Explain	Describe	Saved SQL	History
STREET_ADDRESS_NO_SPACES				
460BloorSt.W.				
MagdalenCentre,TheOxfordSciencePark				
2014JabberwockyRd				
2011InteriorsBlvd				
2004CharadeRd				
Av.RioBranco				