Database Design and Development

DATABASE DEVELOPMENT – SQL DCL

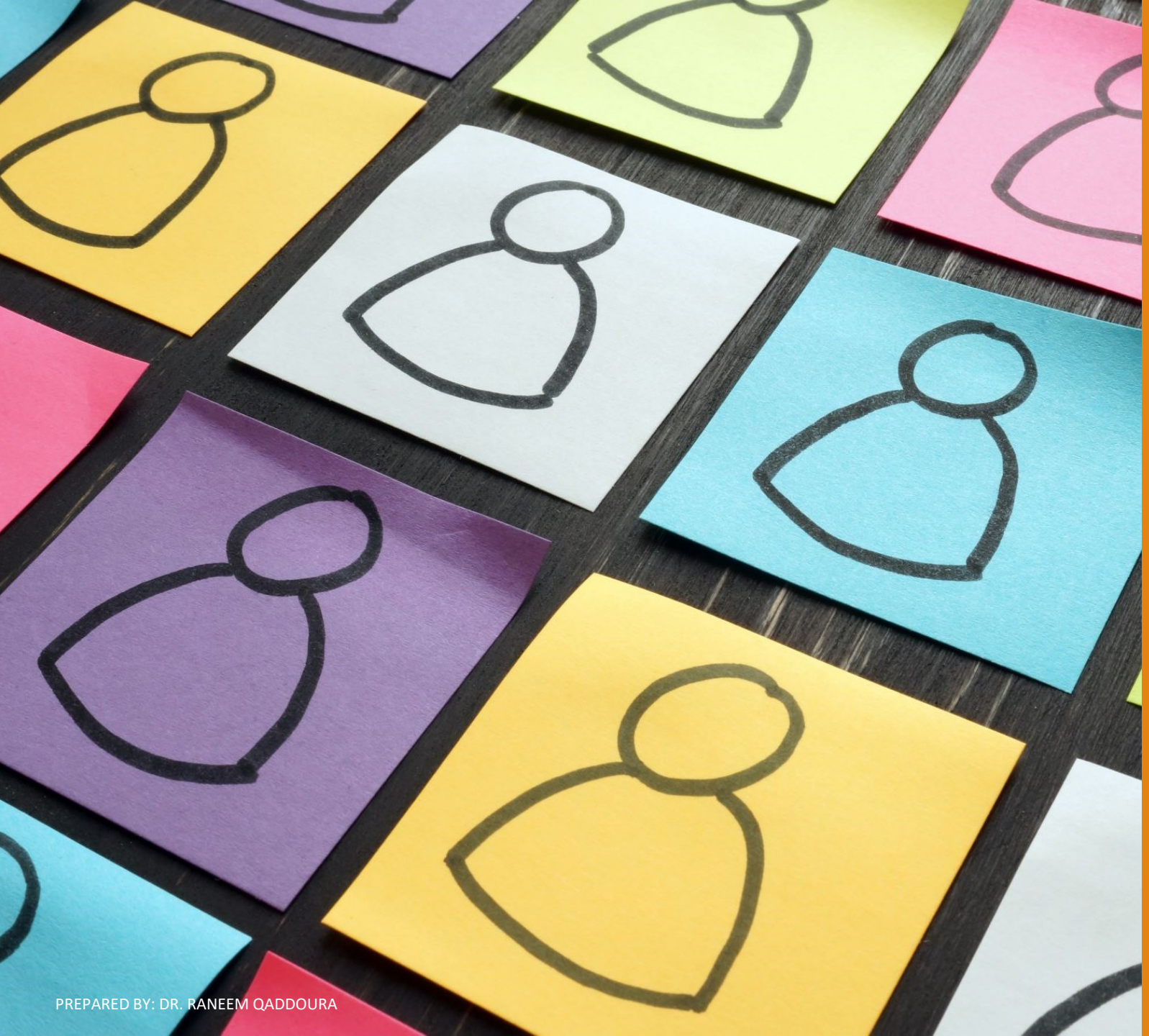
Database Security Issues

Database security a broad area

- Legal, ethical, policy, and system-related issues

Threats to databases

- Loss of integrity
  - Improper modification of information
- Loss of availability
  - Legitimate user cannot access data objects
- Loss of confidentiality
  - Unauthorized disclosure of confidential information



Users Management

Create users

The CREATE USER statement creates new MySQL accounts.

It enables authentication, role, SSL/TLS, resource-limit, password-management, comment, and attribute properties to be established for new accounts.

To use CREATE USER, you must have the global CREATE USER privilege, or the INSERT privilege for the mysql system schema.

```
CREATE USER <NAME> IDENTIFIED BY <password>;
```

```
CREATE USER A1 IDENTIFIED BY '123';
```

Note: to allow login through phpMyAdmin, go to config.inc.php and update the value of $cfg['Servers'][$i]['auth_type’] to 'cookie';

Delete a user

The DROP USER statement removes one or more MySQL accounts and their privileges.

It removes privilege rows for the account from all grant tables.

An error occurs for accounts that do not exist.

To use DROP USER, you must have the global CREATE USER privilege, or the DELETE privilege for the mysql system database.

```
DROP USER <name>;
```

```
DROP USER A1;
```

Data Control Language (DCL)

GRANT and REVOKE

Grant

- GRANT command in SQL is used to give privileges.

```
GRANT privileges ON object TO user;
```

Revoke

- REVOKE command in SQL is used to cancel privileges.
- Sometimes it is desirable to grant privileges to a user temporarily.
  - For example, grant a privilege to a user for specific task and then revoke the privilege once the task is completed

```
REVOKE privileges ON object FROM user;
```

Privileges include ALL, CREATE, ALTER, DROP, INSERT, UPDATE, DELETE, SELECT, INDEX, GRANT OPTION.

Give a privilege to user A1 to create new tables:

```
GRANT CREATE ON company.* TO A1;
```

Give a privilege to user A2 to insert and delete the employee and department tables:

```
GRANT SELECT, INSERT, UPDATE, DELETE ON employee TO A2;
GRANT SELECT, INSERT, UPDATE, DELETE ON department TO A2;
```

Give a privilege to user A3 to update the salary attribute of table employee

```
GRANT UPDATE(salary) ON employee TO A3;
```

GRANT Examples

Give a privilege to user A4 to retrieve information from employee and department tables

```
GRANT SELECT ON employee TO A4;

GRANT SELECT ON department TO A4;
```

Give a privilege to user A5 to retrieve information from employee and department tables and also propagate the SELECT privilege to other accounts

```
GRANT SELECT ON employee TO A5 WITH GRANT OPTION;

GRANT SELECT ON department TO A5 WITH GRANT OPTION;
```

GRANT Examples

Give a privilege to user A6 to retrieve information from VIEW emp_proj_view

```
GRANT SELECT ON emp_proj_view TO A6;
```

Give a privilege to user A7 to execute PROCEDURE selectAllEmployees.

```
GRANT EXECUTE ON PROCEDURE selectAllEmployees TO A7;
```

GRANT Examples

Revoke the SELECT privilege of employee and department tables from user A4:

```
REVOKE SELECT ON employee FROM A4;

REVOKE SELECT ON department FROM A4;
```

REVOKE the INSERT and UPDATE privileges for employee and department tables from user A2:

```
REVOKE SELECT, INSERT, UPDATE, DELETE ON employee FROM A2;

REVOKE SELECT, INSERT, UPDATE, DELETE ON department FROM A2;
```

REVOKE Examples

Check All users:

```
SELECT * FROM
mysql.user;
```

Check grants for a user:

```
SHOW grants
FOR A1;
```

Check Users and Grants

References

Elmasri, R., & Navathe, S. (2017). Fundamentals of database systems (Vol. 7). Pearson

Nugent, D. (2017). Higher Nationals in Computing Core Textbook. Pearson Education Custom Content.