

# COMM1822

Term 2 2022

## Introduction to Databases for Business Analytics

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## Week 10 Data Contr Language (DCL)

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UNSW Business School. (2022, May 7). *Acknowledgement of Country* [online video]. Retrieved from <https://vimeo.com/369229957/d995d8087f>

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# W10 Learning Outcomes

❑ Data Security and Access Control

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❑ Key Components

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❑ Commands of Data Control

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# Data Security

- ❑ **Data** is a **valuable resource** that must be strictly controlled and managed, as with any **corporate resource**.
- ❑ Part or all of the corporate data may have strategic importance and therefore needs to be **confidential**.
- ❑ **Mechanisms** that protect against **intentional or accidental threats**.
- ❑ Security considerations do not only apply to the data held in a **database**. **Breaches** of security may affect other parts of the **system**, which may in turn affect the database.

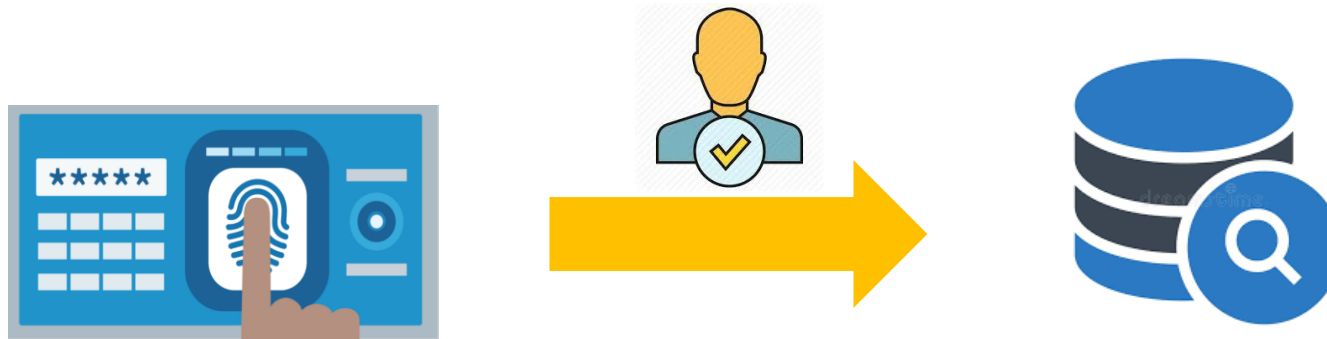
# Access Control

- ❑ Access control is a **fundamental** component of **data security**.

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- ❑ Access control is a **rated** into an organization's IT e **<https://eduassistpro.github.io/>**

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# Data Access Control

**Access control** is

- a combination of **security technology** and **mechanism** in place to protect **confidential information**
- to minimize the **risk of access**
- instantiated by **authorization**
- **implemented with Data Control Language (DCL)**

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If **o** is an object, authorization answers the question “Who is trusted to access **o**?”

# Authorization in Database

## CIA Triad for Information Security

- **Confidentiality** means that data, objects and other resources are protected from unauthorized and other access.
- **Integrity** means that data is protected from unauthorized changes to ensure that it is reliable and correct.
- **Availability** means that authorized users have access to the systems and the resources when they need them (denial-of-service is a threat to data availability).

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# Key Components in Access Control

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# Key Components in Access Control

- ❑ **Authentication:** is the initial process of **establishing the identity of a user**
- ❑ **Authorization:** specifies **privileges** to resources to determine whether **access to data or make a specification**

# Authorization Components

- ❑ Authorization defines **who** can **access** **which object** in a database.

## Who - Types of users

- a single user or a group

## Privilege - Types of access

- select, insert, update, delete

## Types of database objects

- tables, attributes, views

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# Database Object – View

A view does not store any data. A view only behaves like a table. And it is just a named query stored in the database.

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```
create view mybest_view as
```

```
select customer_address, customer_name  
from s_customer_t;
```

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f mybest\_view



# View

```
❑ create view mybest_view as  
  select customer_address, customer_city  
  from s_customer_t;
```

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```
❑ select * from mybest_view;
```

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# View

- ❑ View: is the dynamic result of one or more relational operations operating on the base relations to produce another relation.
- ❑ A view is a virtual relation that does not actually exist in the database, but is produced upon request by a particular user, at the time of request.
- ❑ A user can have access to a view,
- ❑ A view selects a subset of rows & a user to have access to some but not all rows or attributes.

Table





# Commands of Data Control Language (DCL)

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# DCL Commands

❑ **Grant:** is used to **give user access privileges** to a database

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❑ **Revoke:** is used to **(to take back permissions from t** <https://eduassistpro.github.io/>

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❑ **Deny:** explicitly **prevents a user from receiving** a particular permission.

# DCL Commands

- The grant statement is used to give user access privileges to a database

**grant** <privilege list>

**on** <relation name or view name>

**to** <user list>

[WITH GRANT OPTION

e.g., **grant** select **on** em

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- <user list> can be any of the below:

- a user-id
- *public*, which allows all valid users the privilege granted

- The grantor of the privilege must already hold the privilege on the specified item (i.e., database administrator).

# Common Privileges in DCL

- **Select:** allows read access to a relation, or the ability to query using the view
- **Insert:** allows insert
- **Update:** we can use <https://eduassistpro.github.io/> to specify update on a column
- **Delete:** allows delete data from
- **Execute:** only for procedure or functions (this is for PL/SQL - Procedural Language for SQL)
- **All:** used as a short form for all the allowable privileges

# DCL Commands – Privilege to Grant Privileges

**With grant option:** allows a user who is granted a privilege to pass the privilege on to other users.

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Example:

- ▶ DBA: grant select on <https://eduassistpro.github.io/>

grant select  
on emp  
to U1;

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# DCL Commands – Revoking Database Access

- The **revoke** statement is used to revoke authorization (to take back permissions from the user)

**revoke** <privilege list>

**on** <relation name>

**from** <user list>

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- Example: revoke select from U1, U2 and U3

revoke select

on emp

from U1, U2, U3;

# Example 1

- Suppose we allow a database user “liud22” to see all the columns in **EMP** table except the salary column.

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**EMP**

Emp_ID	Emp_Na	
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- Solution  
**create view emp\_view as**  
    **select** Emp\_ID, Emp\_Name  
    **from** EMP;

**grant select on emp\_view to liud22;**

# Example 2

Suppose we allow the user “liud22” to see all columns in **s\_customer\_t** table except the customer\_address column.

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**s\_customer\_t**

customer_id	customer_name	c	ty	customer_state	postal_code
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Solution

```
create view customer_view as
```

```
    select customer_id, customer_name, customer_city, customer_state, postal_code
    from s_customer_t;
```

```
grant select on customer_view to liud22;
```



# Questions

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