

# Security and Authorization

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## Why Security?

- Three objectives:
  - **Secrecy** – some information should only be seen by particular users
  - **Integrity** – some information should only be modified by particular users
  - **Availability** – authorized users should not be denied access
- A **security policy** is used to achieve these
- A **security mechanism** enforces a policy

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## Outline

- Three aspects of security:
  - Access control and security in the DBMS
  - Secure access by applications (particularly over the internet)
  - Protection from inferences

## Discretionary Access Control

- Users can be given **privileges** to access objects at the discretion of some authority
- The creator of a table or view automatically has all privileges (read, write) on it
  - That user or administrative users can grant privileges to additional users

## Discretionary Access Control in SQL

GRANT [privileges] ON [object] TO [users] [WITH GRANT OPTION]

- Available privileges on tables are:
  - SELECT(column) – read access on specified columns, or all columns if none given
  - INSERT(column) – insert rows with non-null values in specified columns, or all columns if none given
  - UPDATE(column) – similar to INSERT
  - DELETE – delete rows from the table
  - REFERENCES(column) – define foreign keys in other tables that refer to specific columns
- WITH GRANT OPTION gives users the power to pass the granted privileges to other users
- CREATE, ALTER, DROP can be granted on databases

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## GRANT/REVOKE and Views

- A user must have SELECT privileges on all underlying tables in order to create a view
  - Loss of SELECT on any table results in view being dropped from database
- If a user gains privileges on all underlying tables, the user gains the same privileges on the view
- Views can be used to give necessary information to users while hiding details

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