



RELATIONAL DATABASES

Functions & Components DB



OBJECTIVES?
OBJECTIVES?
OBJECTIVES?



OBJECTIVES

This session

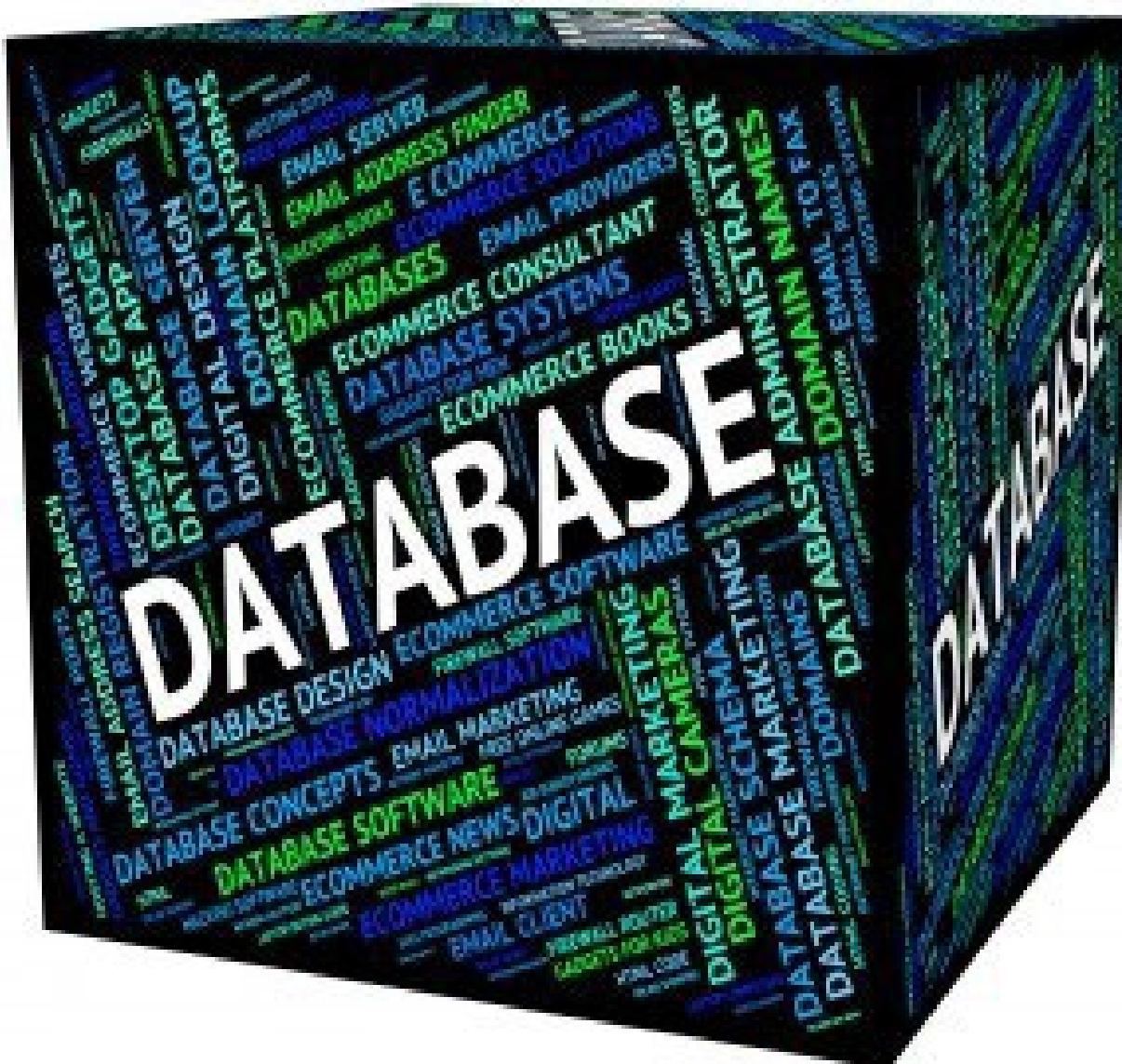
Functions of DBMS

Components of DBMS

The background of the slide features a photograph of a person from behind, sitting at a desk and looking at a computer screen. The screen displays a list of files or documents. The setting is a room with large windows showing a sunset over a body of water. The overall atmosphere is professional and focused.

FUNCTIONS OF DBMS

FUNCTIONS OF DBMS



Data Processing

A User Accessible Catalogue

Transaction Support

Concurrency Control Services

Recovery Services

Authorization Services

Support for Data Communication

Integrity Services

FUNCTIONS OF DBMS



Operations on the data...

Creation of data

Storing of the data, Providing
access to the data,

Placing data in storage devices, etc



FUNCTIONS OF DBMS

A User Accessible Catalogue

What is a catalogue?

An object in DBMS that stores information of database including schema information, information of users and rights of usersand much more.

Structure of the database and its users.

FUNCTIONS OF DBMS



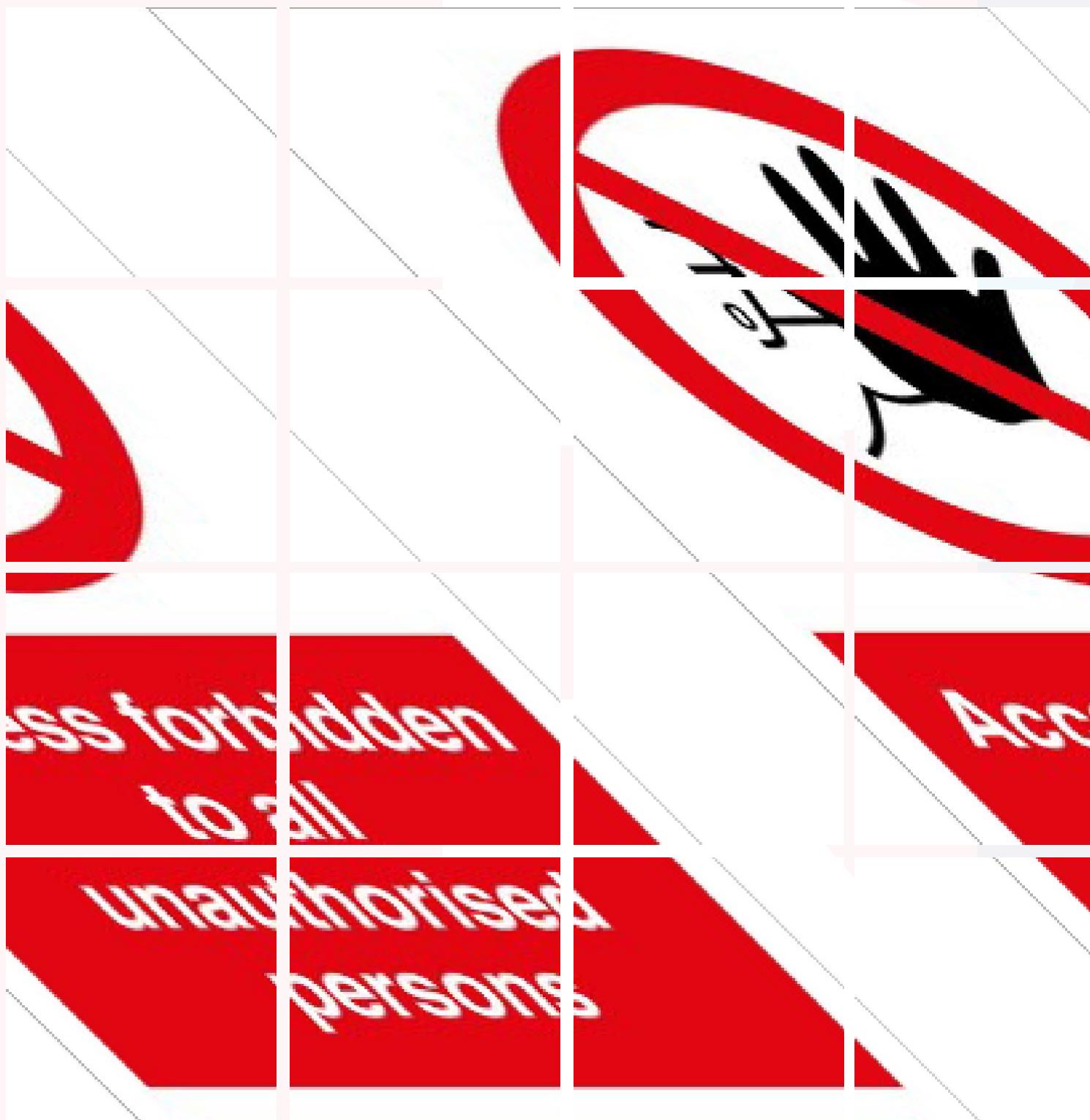
Transaction Support

Transaction?

An action that is used to perform some manipulation on the data stored in the database.



FUNCTIONS OF DBMS



Transaction Support

DBMS is responsible for supporting all required operations/actions on the database.

Makes sure only authorized and allowed actions are performed.

FUNCTIONS OF DBMS



Concurrency Control Services

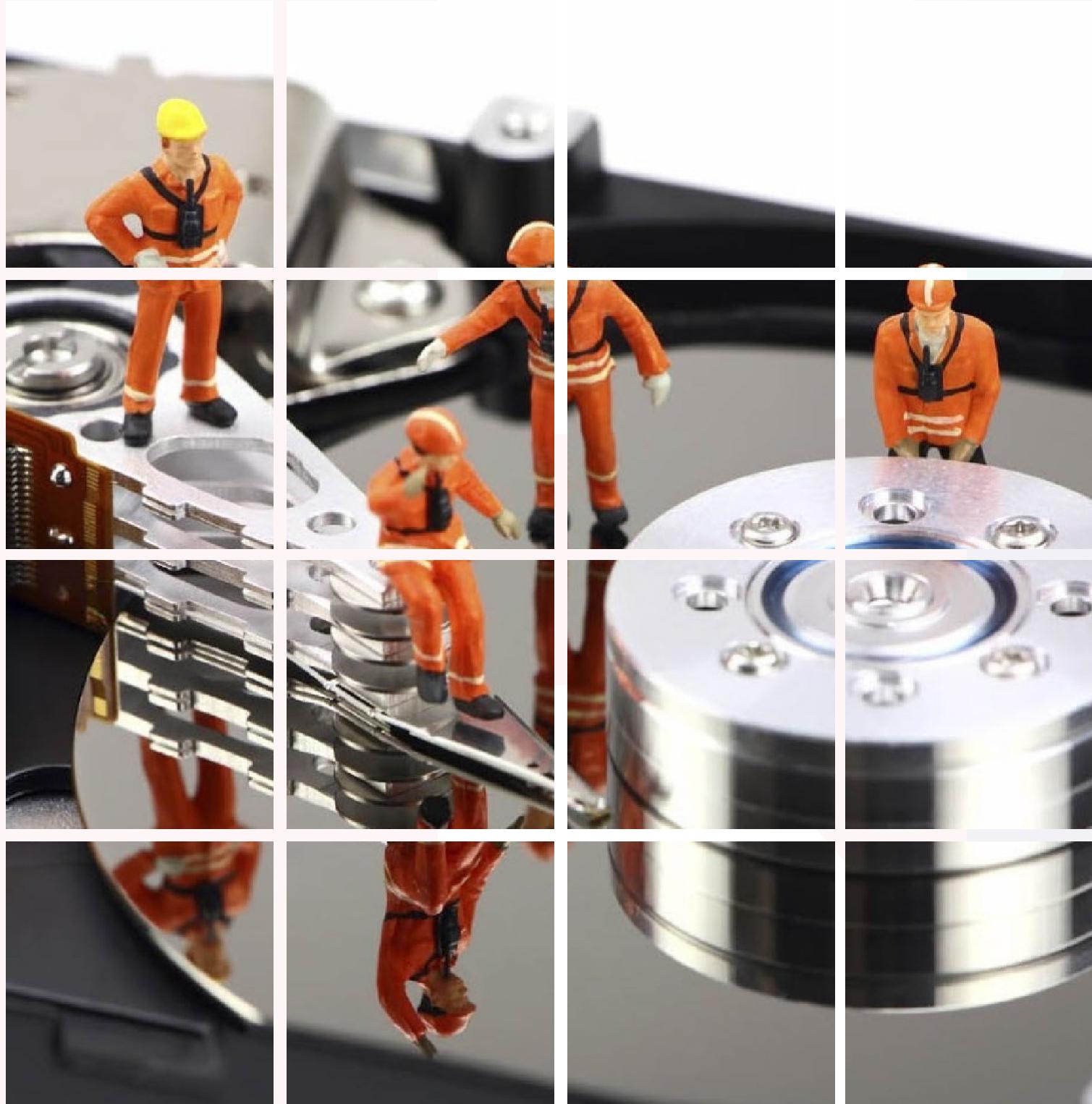
Concurrency?

Multiple users accessing/manipulating the database at the same time.

DBMS provides concurrency control services to make sure all transactions (operations) are correct.



FUNCTIONS OF DBMS



Recovery Services

A database can get into an inconsistent state due to some invalid action.

DBMS should be able to recover itself to a consistent state while making sure that data loss during the recovery process is minimum.



FUNCTIONS OF DBMS



Authorisation Services

Multiple users.....

Who is authorised to access the database?

If a user is authorised then what kind of user actions are authorised?



FUNCTIONS OF DBMS



Support for Data Communication

DBMS allows the communication of the data.

A local database system should be able to communicate with the central database station.

FUNCTIONS OF DBMS



Integrity Services

DBMS must not allow false information or incorrect facts to be entered in the database.

Integrity services make sure that the information is real and correct as defined by the rules.

Integrity

Adherence to moral principles
In ethics, integrity is regarded as the honesty and truthfulness, uprightness, sincerity, a

The background of the image shows a person's hands typing on a silver laptop keyboard. The laptop screen displays a dark-themed file manager or database interface with various files and folders listed. The scene is set against a backdrop of a sunset or sunrise over a body of water, with warm orange and yellow hues reflected in the sky and water. A decorative graphic of blue and white diagonal stripes is overlaid on the left side of the image.

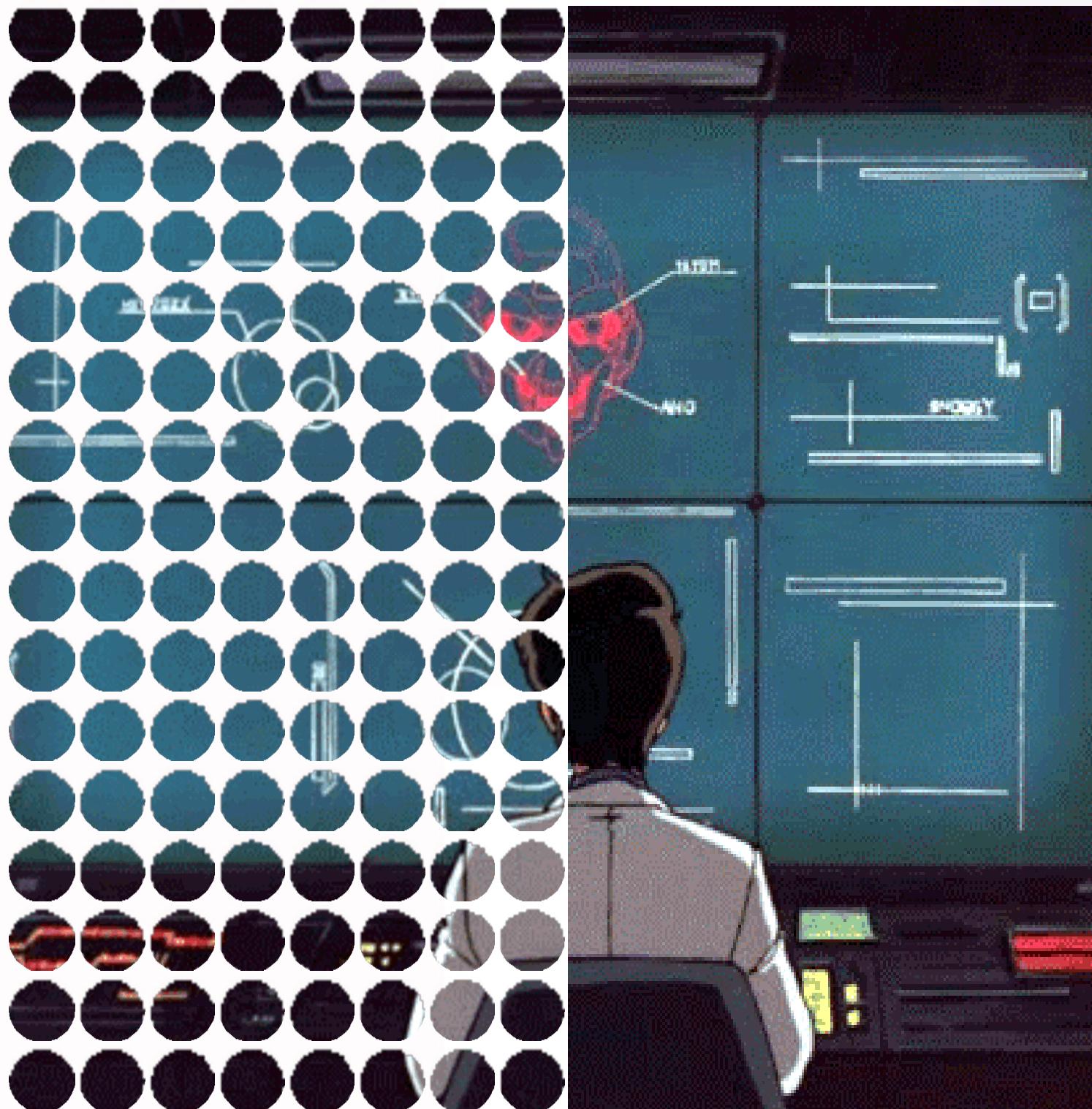
COMPONENTS OF A DBMS

COMPONENTS OF DBMS



System Catalogue/Data Dictionary
Runtime Database Processor
Concurrency Control
Backup
Recovery Manager

COMPONENTS OF DBMS



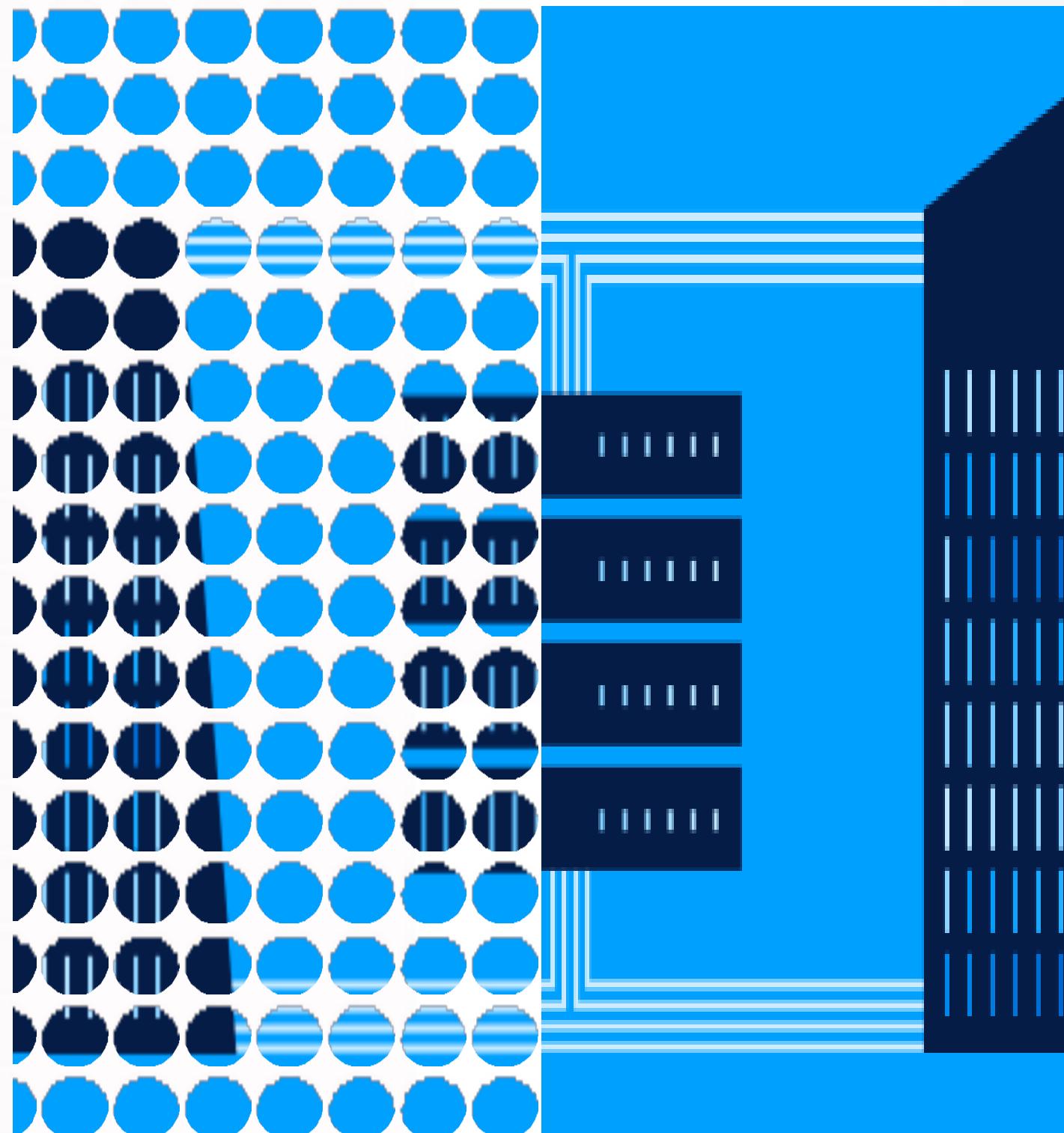
User Interface

Web Forms

Application Front Ends

SQL Command Line Interface

COMPONENTS OF DBMS



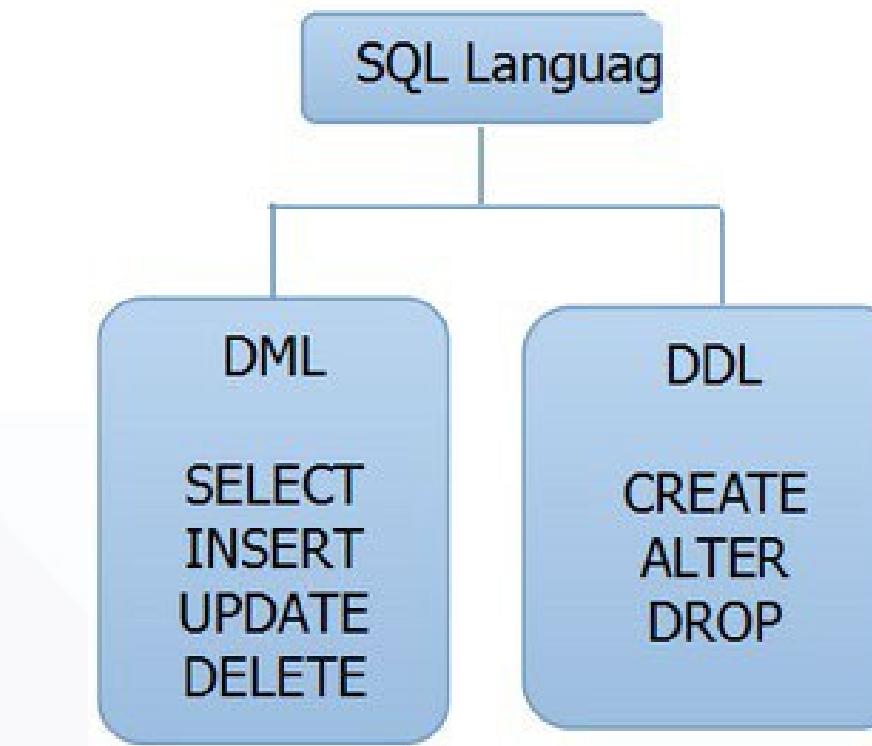
DDL & DML Compliers

DDL

Data Definition Language

DML

Data Manipulation Language



COMPONENTS OF DBMS

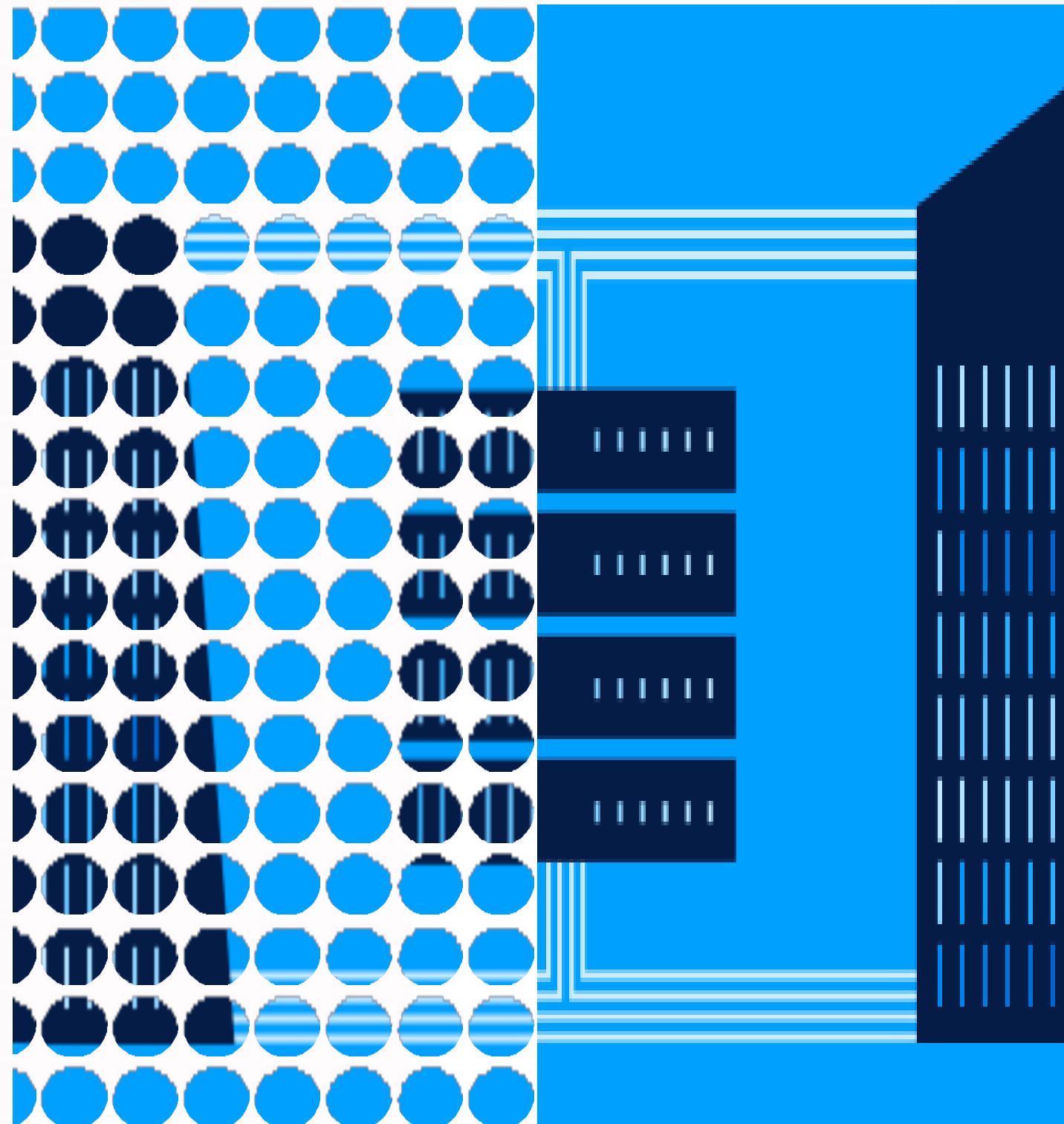
DCL

Data Control Language (DCL)

Statements are used for managing privileges of users of a database.

For example GRANT - gives user's access privileges to database or REVOKE - withdraw access privileges given with the GRANT command

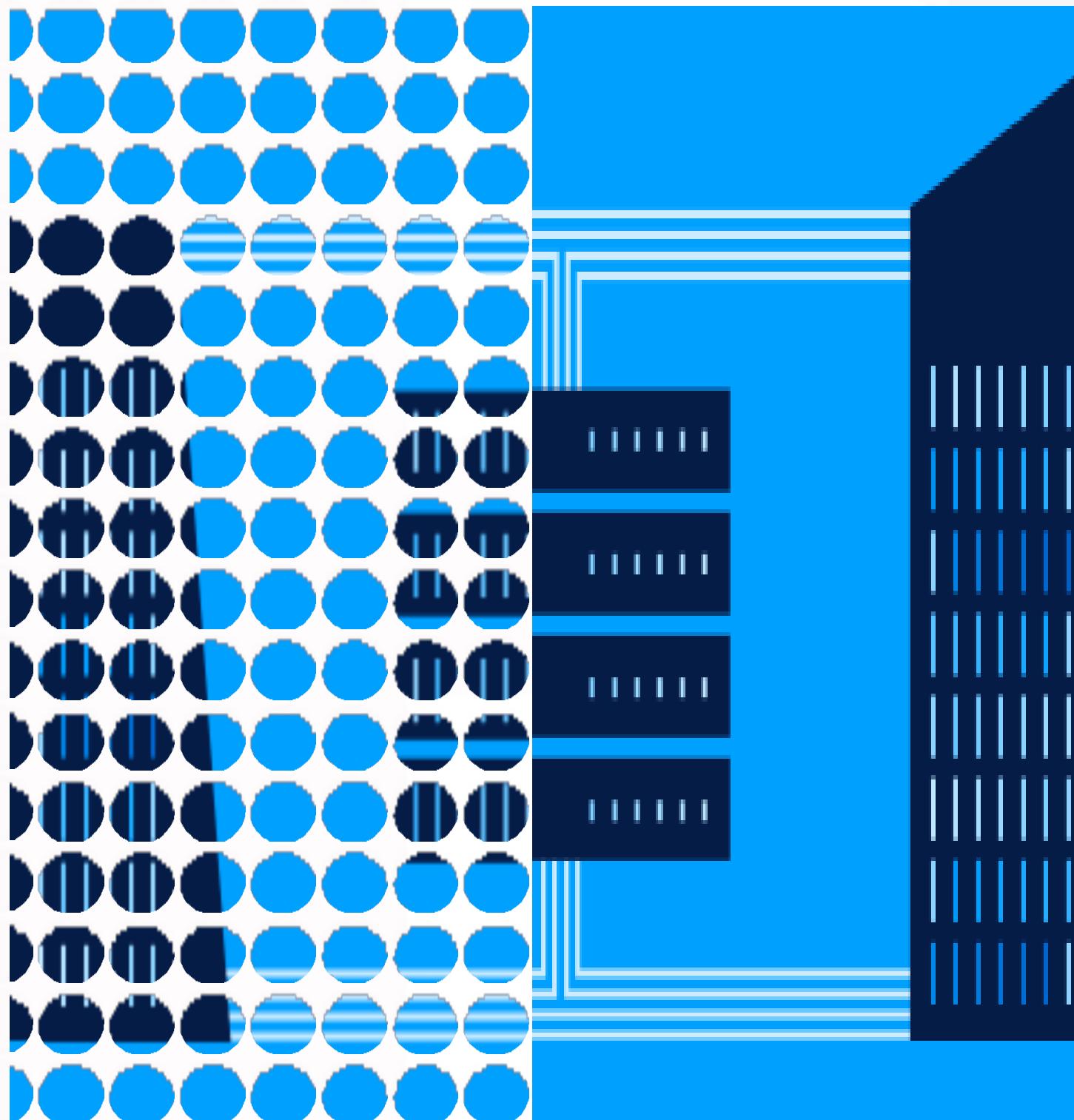
COMPONENTS OF DBMS



DDL & DML Compliers

DDL compiler processes schema definitions and stores descriptions of the schema (meta data) in the system catalogue.

COMPONENTS OF DBMS



DDL Compliers

DML complier is responsible for compiling DML commands into object code to access the database



COMPONENTS OF DBMS



System Catalogue/Data Dictionary

Stores information about the database itself.

Including schema, procedures, functions, triggers, and much more.

Every time a DDL statement is run, the data dictionary becomes modified.

Instructor			
Seminar			
Student			
Attribute	Length	Type	Rules
Name	40	Alpha	At least 2 words
Email Address	50	Mixed	Must contain @
Phone #	10	Numeric	Reject all "555"
Address	30	Mixed	Format - ### alpha
City	20	Alpha	none
State	2	Alpha	Must be a valid state

COMPONENTS OF DBMS



Runtime Database Processor

Executes privileged commands while communicating with system catalogue.

Executes the compiled queries.

COMPONENTS OF DBMS



Concurrency Control, Backup, & Recovery Manager

Supports multiple user interaction.

Backup the database (scheduled or non-scheduled).

Recovers the database in case of system crash.

BACKUP

