

# What is a Database?

Database: A place where we store an organized collection of data

- Tasks: Store, Access, Manipulate, Retrieve

Database Management Systems (DBMS): The collection of program that enable the users to access the database and manipulate, retrieve data to the users.

- Types of DBMS: Hierarchical, Relational, Network, Object-Relational

## Why Oracle Database

Security, Performance, Scalability, Powerful, coding, and support

- Coding: Oracle SQL, PL/SQL
  - Faster, Storage, Capable

Cons:

- Must know how to deal with the database
- Not free

## What is a Table

Employee_ID	First_Name	Last_Name
100	Steven	King
101	Neena	Kochlar
102	Lex	De Haan
103	Alexander	Hunold
104	Breuv	Ernest

Cell

Record (Row)

Columns

# What is a Relational Database (RDMS)?

Relational Databases: Divide data into different tables and establish some relationships between tables and establish some relationships between these tables by parent-child relations.

- Relationship: Connection between tables.

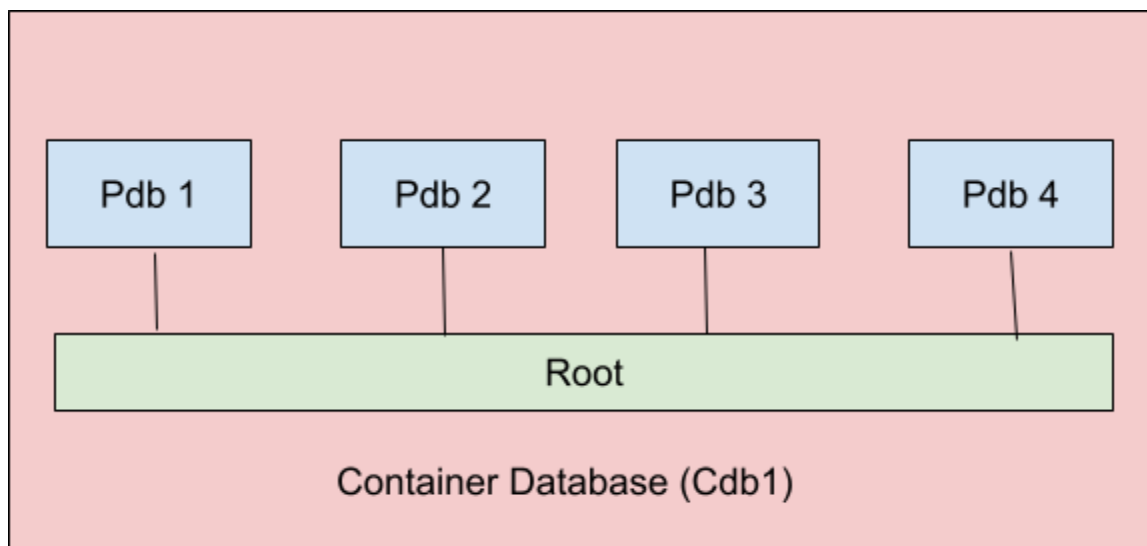
Relational Databases are: Accurate, Flexible, Collaborative, Trusted, Secure

## Entity Relationship Logic in Databases

Entity: The smallest unit containing a meaningful set of data.

## What is Pluggable Database

Pluggable: Multitenant Architecture



- Every pluggable database are a full database that stores database objects (e.g. user, Tables, applications, etc.)
- Container database does not store objects
  - Stores only metadata (e.g. User, Tables, applications, etc.)
- Note: 'Pluggable Database' feature has been introduced from the Oracle database version 12c
  - Benefits: Less cost and work for DBA

# Introduction to Database Objects

Oracle database has many database objects categorized as schema objects and non schema objects.

- Schema Objects: The logical structures created by the users
  - Schema: A collection of logical structures of data/objects
  - User: Schema Name = User Name
  - Table: The basic unit of the database to store data, formatted with columns and rows.
  - View: A virtual table that provides access to a subset of columns/some restricted rows from one/more tables
  - Constraint: The rules for restricting invalid data entry into tables
  - Index: Used for improving speed of data retrieval from tables
  - Sequence: Generate unique integers
  - Synonym: An alternative name (alias) for the database objects
  - Materialized View: Has a real table filled by an SQL query unlike the views.
    - The real table is truncated and refilled with a specified time frequency
    - Best for performance delays
  - Functions and Procedures: Functions return some value, procedures return nothing
    - Part of PL/SQL – Procedural Language extension to SQL
  - Triggers: Compiled program units stored in the database and executed with a specific event
  - Packages: The schema objects that compiled and stored in the database
    - Consist of SQL – PL/SQL codes, variables, cursors, etc. to perform one or more than one operation by using functions and procedures
  - Database Links: The connections between two physical database servers
- Non Schema Objects: Objects that are not in a schema
  - Example: Directories, roles, table spaces, users.

## What is SQL

Structured Query Language: Used to interact with the database

Where we use SQL: BI, Data Science, Database Administration, Web Development

## Key Points

- 1) Structured Query Language = SQL
- 2) RDBMS: Relational Database Management System
- 3) A relational database consists of a collection of tables
- 4) The DBMS is not responsible for creating web-based applications

- 5) Database schema, which is the logical design of the database, and the database instance, which is a snapshot of the data in the database at a given instant in time.
- 6) A database contains tables, a table contains data
- 7) You want to store information about bills and about customers, the best is to use 2 separate tables.