

Data Analytics With SQL



Databases & SQL

What is Data



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- Data is simply a collection or set of values in the form of text, words, numbers, pictures, audio or video.
 - It is most important asset for any organization.

How to store data ?

Data Storage

- Traditional way - on papers
- File system
- Databases



- Drawbacks -
 - Data redundancy
 - Inconsistency
 - No concurrent access
 - No relationship between multiple files
 - No backup and recovery
 - And many others

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- It is an organized collection or repository of our data
 - It is a collection of interrelated data which helps in efficient retrieval, insertion and deletion of data.
 - Users can perform different queries in order to perform actions based on their requirement

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- DBMS = Database Management System
 - DBMS is an application which is used to maintain or manage databases
 - Eg. Oracle, sybase, Microsoft SQL server, PostgreSQL and many others are there

Types of DBMS



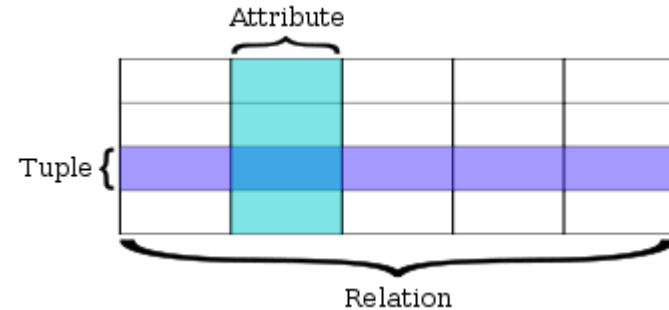
- Hierarchical DBMS
- Network DBMS
- Relational DBMS
- Object oriented DBMS

Relational Databases

Relational Database



- A relational database is a specific type of database that stores everything in relations or tables.
- Tables have different row and columns



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- A software system which is used to maintain relational databases is termed as relational database management system (RDBMS).

Primary Key



- Primary key is a minimal set of columns or attributes that uniquely identifies row in a table.
- A primary key's main features are -
 - It must contain a unique value for each row of data.
 - It cannot contain null values.

Primary Key for this table



student_id	name	age	phone

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- **Foreign keys** are columns that point to or that matches the primary key columns in other tables.
 - The foreign key can be used to cross-reference tables. Foreign keys do not need to have unique values in the referencing relation.

Foreign Key



Customer

FirstName	LastName	CustID
Elaine	Stevens	101
Mary	Dittman	102
Skip	Stevenson	103
Drew	Lakeman	104
Eva	Plummer	105

Parent Table

**Primary
Key**

One to Many
Relationship

Contact

CustID	ContactInformation	ContactType
101	555-2653	Work
101	555-0057	Cell
102	555-8816	Work
104	555-0949	Work
103	555-0650	Work
101	555-8855	Home
105	Plummer@akcomms.com	Email
101	Stevens@akcomms.com	Email
101	555-5787	Fax
103	Stevenson@akcomms.com	Email
105	555-5675	Work
102	Dittman@akcomms.com	Email

**Foreign
Key**

Child Table

SQL

- Structured query language
- Language used to interact with relational database
- An SQL query is how you access the data. Using an SQL query, you can create and delete, or modify tables, as well as select, insert, and delete data from existing tables.

Example - RDBMS



- Examples of popular RDBMSs -
 - SQLite
 - MySQL
 - PostgreSQL
 - Oracle DB
 - SQL Server

SQL - Basic Commands

Basic commands



- Show all databases
 - *Show databases;*
- Create database
 - *create database database_name*
- Use database
 - *use database_name*
- List all tables inside a database
 - *show tables*

- Create a new table
 - *create table table-name (
 column_name1 datatype1,
 column_name2 datatype2,
 column_name3 datatype3,
 column_name4 datatype4
);*
 - Create table with different constraints
 - Primary Key
 - Not null
 - With some default value

- Describe a table
 - *describe table_name* or
desc table_name
- Insert data in a table
 - *insert into table-name values(data1,data2,..);*
 - *insert INTO table_name (column1, column2, column3, ...)
VALUES (value1, value2, value3, ...);*

Update Table

Alter - Add column



- Add one column to an existing table
 - *alter table table_name add(column_name datatype);*
- Add multiple columns
 - *alter table table_name add(column_name1 datatype1, column_name2 datatype2, column_name3 datatype3);*
- Add column with default value
 - *alter table table_name add(column_name1 datatype1 default data);*

Alter - Modify column



- Change data type of an existing column
 - *alter table table_name modify column_name datatype;*
- Rename a column
 - *alter table table_name change old_column_name new_column_name datatype;*
- Delete column
 - *alter table table_name drop column column_name;*
 - *alter table table_name drop column column_name1, drop column column_name1,;*