

- Column represents an attribute
- Each row in a table is a record / tuple
- A database schema is a blueprint that represents the logical view of the database.
 - Physical Schema
 - Logical Schema

• Types of SQL Commands

DDL (Data Definition Language)

- Create (used to create a database or a column inside a database)
- Alter (we can add extra columns and modify a data type)
- Drop (To delete the created column or dataset)
- Truncate (Everything gets deleted except the structure)

DML (Data Manipulation Language)

- Insert
- Update
- Delete

DQL (Data Query Language)

- Select

DCL (Data Control Language)

- Grant
- Revoke

TCL (Transational Control Language)

- Commit
- Rollback
- Save point
- Set Transaction

• Database Server → Databases → Tables → Rows
(defined by columns)

• Databases and tables are referred to as database objects.

Keys:-

- Candidate Key
- Primary Key
- Foreign Key
- Unique Key
- Alternate Key

Built-in Data Types:-

- Numeric : TINYINT, SMALLINT, MEDIUMINT, INT, BIGINT, BIT
- Floating numbers: DECIMAL, FLOAT, DOUBLE
- Strings: CHAR, VARCHAR, BINARY, VARBINARY, BLOB, TEXT, ENUM, SET
- Date & Time: DATE, TIME, DATETIME, TIMESTAMP and YEAR

- DBMS (DataBase Management Systems) is a software.
- SQL (Structured Query Language) is the common language for databases.
- As a Data Analyst, we extract and manage the data, (excel sheet).
- MySQL is RDBMS (Relational DBMS)
- Other database languages like oracle, DB2, foxpro, PostgreSQL, Aurora, MS SQL server etc.
- Learn keywords, and different syntaxes, different algorithms.
- In RDBMS, data is stored in table.
- Table, Relational Algebra, Union, Minus, Intersection are few operations.
- Kinds of Objects in a DataBase:-

Table	Physical
Index	Physical
Functions	Physical
Procedure	Physical

- Jargon :- Special words or expressions used by a profession or a group that are difficult for others to understand.

Example :-	DBMS	RDBMS
Table		Relation
Column		Attribute
Row		Tuple

Depending upon the work we do, SQL is divided into categories :-

- DDL → Data Definition Language
- DML → Data Manipulation Language
- DCL → Data Control Language
- TCL → Transaction Control Language
- DQL → Data Query Language

- DDL → Data Definition Language
 - Deals with the structure of the data
 - Structure of the table
- Commands :-
create / Alter / Drop / Rename / Truncate
- Create :- Creating the table
- Alter :- Changing the structure of the table, including the column.
- Drop :- To delete the complete table
- Rename :- To change the name of the table

• DDL are Auto Commit
 • DML are not Auto Commit
 Auto Commit | Hard Disk
 Not Auto Commit | Roll back

- DML → Data Manipulation Language
 - Basically used when we talk about the data inside the table.

Commands :-
Insert / Update / Delete / Select → nowadays we get this command in DML.

- Commit means saving the data
- Auto Commit → we cannot undo the data (or) operation.

• Truncate is Auto Commit and Delete is not Auto Commit.

Roll back (undo)
Commit (Save)

- DCL → Data Control Language

Commands

Grant / Revoke

- TCL (Transaction Control Language) (Applicable by default to DML only)

Commands

Commit / Roll back

- Data Query Language :-

Commands

SELECT

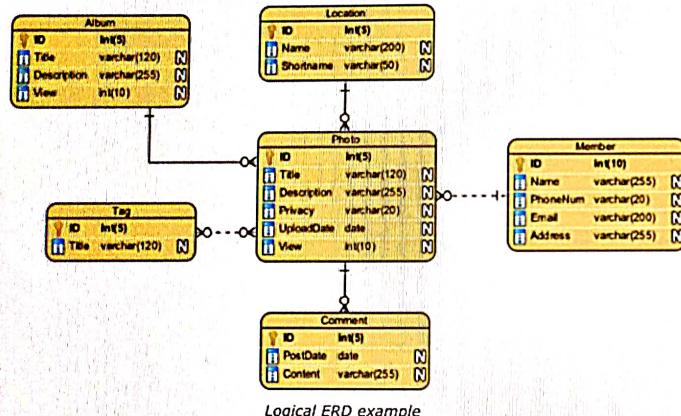
• SQL 1 | Builtin
CreateTable
insert
update
delete
Null
Joins

• SQL 2 | Subquery
window
constraints
Normalization
Locks
View

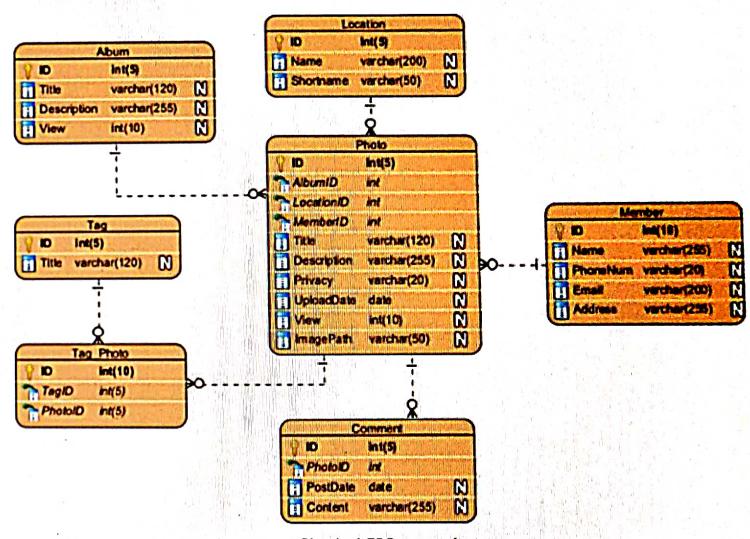
Candidate Key	Primary Key
Candidate Key can be any column or a combination of columns that can qualify as unique key in database	A Primary Key is a column or a combination of columns that uniquely identify a record
There can be multiple Candidate Keys in one table. Each Candidate Key can qualify as Primary Key.	There is only one Primary Key in a table

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Logical vs Physical Schemas



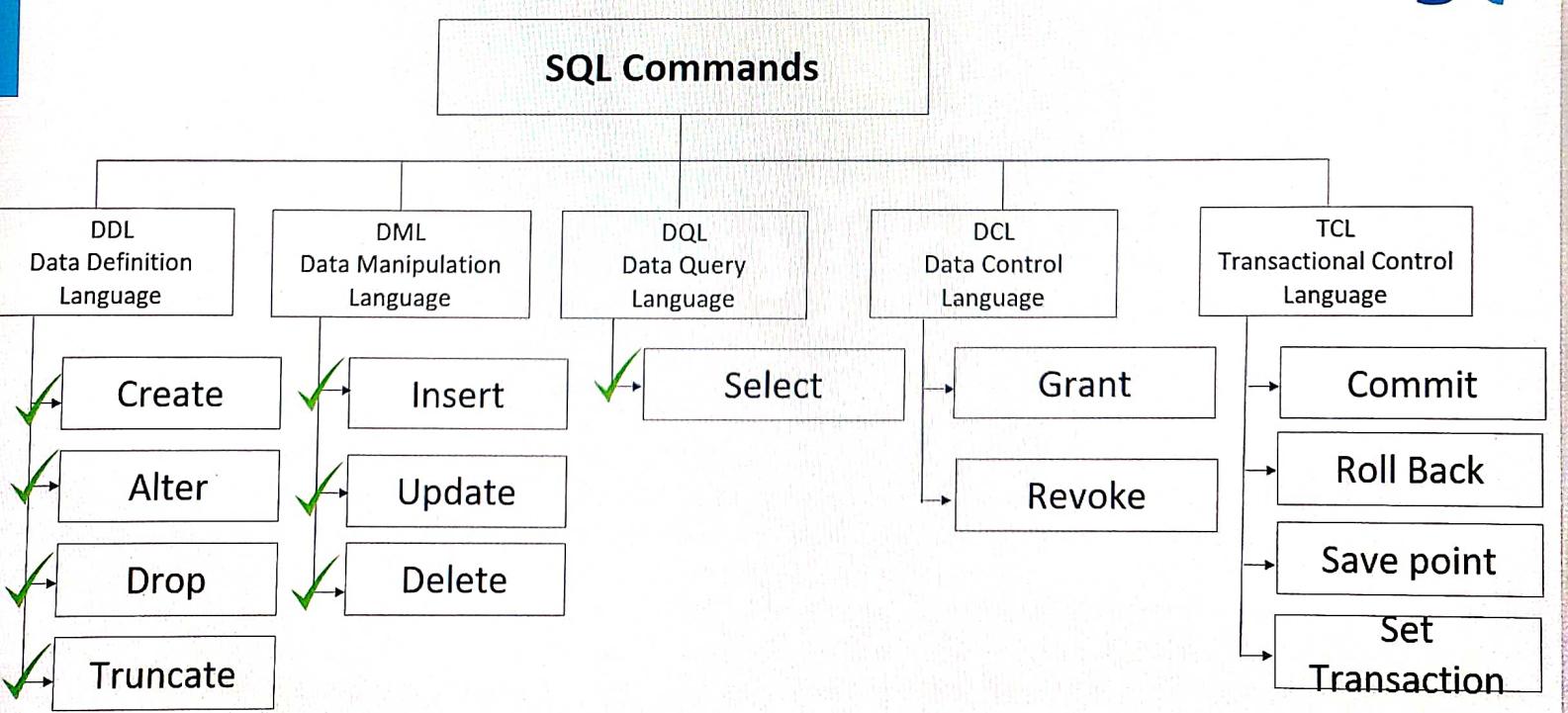
Logical schema is designed based on information gathered from business requirements. This schema need not have any column types defined. But in case you do so it is with the intent to help in business analysis



Physical schema represents actual blueprint of a relational database. In this schema, the data types, primary key, foreign keys and constraints are to be designed by the database designers.

Types of SQL Commands

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Built - in Data Types

- Numeric: TINYINT, SMALLINT, MEDIUMINT, INT, BIGINT, and BIT
- Floating numbers: DECIMAL, FLOAT, and DOUBLE
- Strings: CHAR, VARCHAR, BINARY, VARBINARY, BLOB, TEXT, ENUM, and SET
- Date and Time: DATE, TIME, DATETIME, TIMESTAMP, and YEAR

Numeric - Data Types

Datatype	From	To
Bit	0	1
Tinyint	0	255
Smallint	-32.768	32.767
mediumint	-8388608	8388607
int	-2,147,483,648	2,147,483,647
bigint	-9,223,372,036,854,775,808	9,223,372,036,854,775,807

Datatype	From	To
Decimal	$-10^{38} +1$	$10^{38} -1$
Float	$-1.79E + 308$	$1.79E + 308$

Datatype	Description
CHAR	Fixed length with maximum length of 8,000 characters
VARCHAR	Variable length storage with maximum length of 8,000 characters
BINARY	Fixed length with maximum length of 8,000 bytes
VARBINARY	Variable length storage with maximum length of 8,000 bytes
BLOB	For binary large objects
TEXT	Variable length storage with maximum size of 1GB data

Datatype	Description
DATE	Stores date in the format YYYY-MM-DD
TIME	Stores time in the format HH:MI:SS
DATETIME	Stores date and time information in the format YYYY-MM-DD HH:MI:SS
TIMESTAMP	Stores number of seconds passed since the Unix epoch ('1970-01-01 00:00:00' UTC)
YEAR	Stores year in 2 digit or 4 digit format. Range 1901 to 2155 in 4-digit format. Range 70 to 69, representing 1970 to 2069.

Operators in the WHERE Clause

- The following operators can be used in WHERE clause

Operator	Description
=	Equal
>	Greater than
<	Less than
>=	Greater than or equal
<=	Less than or equal

Operator	Description
<>	Not equal. In some versions of SQL the operator may be written as !=
BETWEEN	Between a certain range
LIKE	Search for a pattern
IN	To specify multiple possible values for a column

- To create a database:-

```
CREATE DATABASE databaseName;
```

- To use the database:-

```
USE databaseName;
```

- To drop(delete) the database:-

```
DROP DATABASE databaseName;
```

- To create table in a database:-

```
CREATE TABLE table-name (  
    column1 datatype,  
    column2 datatype,  
    column3 datatype,  
    ...);
```

- To drop(delete) the table:-

```
DROP TABLE table-name;
```

- The TRUNCATE TABLE statement is used to delete the data inside a table, but not the table itself.

```
TRUNCATE TABLE customers;
```

- To INSERT (there are two types - mentioning column names and not mentioning column names).

```
INSERT INTO table-name (column1, column2, column3, ...)   
VALUES (value1, value2, value3, ...);
```

```
INSERT INTO table-name VALUES (value1, value2, value3, ...);
```

- The UPDATE statement is used to modify the existing records in a table.

```
UPDATE table-name  
SET column1 = value1, column2 = value2, ...  
WHERE condition;
```

- ```
DELETE FROM table-name WHERE condition;
```

The DELETE statement is used to delete existing records in a table.

- The SELECT statement is used to retrieve data from a table.

`SELECT column1, column2, ... FROM table-name;`

- To SELECT all the fields in a table

`SELECT * FROM table-name;`

- The WHERE clause is used in SELECT, UPDATE and DELETE statements.

`SELECT column1, column2, ... FROM table-name WHERE condition;`

- NOTNULL and IS NULL :-

`SELECT ID, NAME, AGE, ADDRESS, SALARY FROM Employee  
WHERE SALARY IS NOT NULL;  
IS NULL;`

- To make changes in the column's definition we use the CHANGE clause

- change the name of the column
- change the column data type
- change column constraints

`ALTER TABLE Table-name CHANGE old-column-name  
new-column-name data type;`

- The modify clause allows you to:-

- Modify column DataType
- Modify column Constraints

`ALTER TABLE Table-name MODIFY current-column-name data type constraint;`

- Modify clause cannot be used to rename a column

- The ADD clause allows to:-

→ Add a new column to an existing table

→ Add primary key constraints to an existing ~~table~~ column.

`ALTER TABLE Table-name ADD COLUMN column-name`