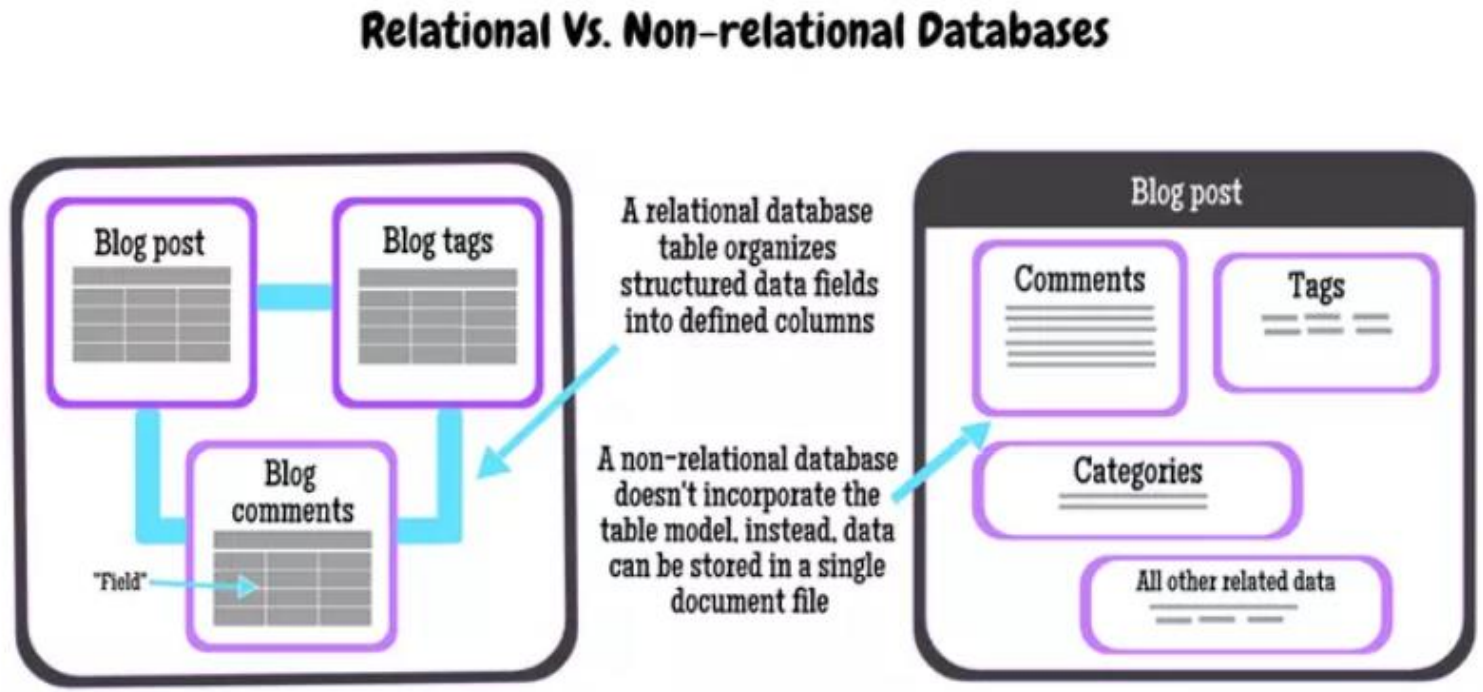
# Introduction to SQL

LEXICON

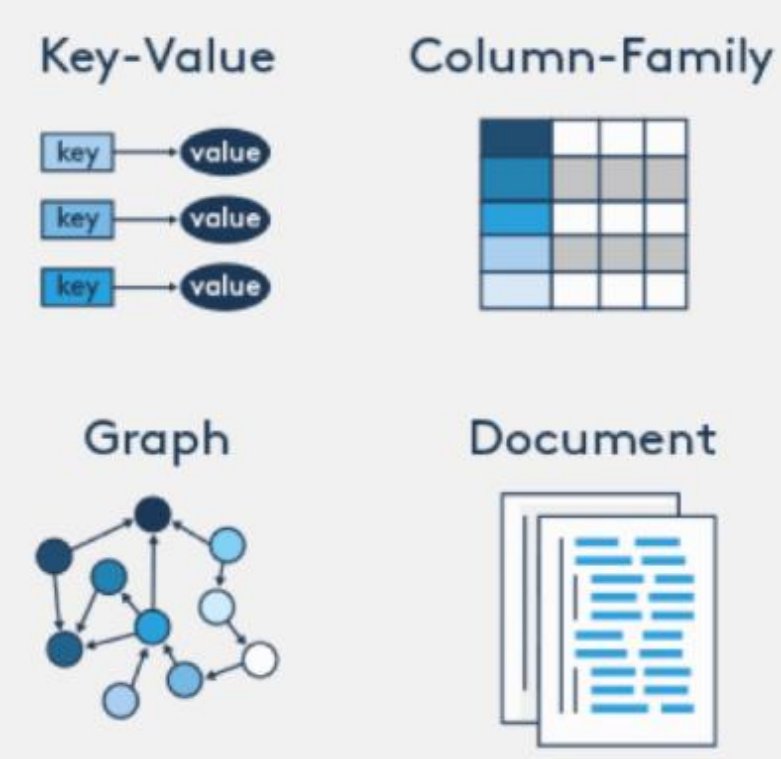
# Database

There are two main database types: Relational & Non-Relational.




Popular SQL databases : Oracle, Microsoft SQL Server, PostgreSQL, MySQL, MariaDB.

# Types of Non-Relational Databases




Popular NoSQL databases : Mongo DB, Google Cloud Firestore, Cassandra, Redis, Apache Hbase, Amazon DynamoDB.

# SQL

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## What is SQL?

- SQL stands for Structured Query Language
- SQL is a standard language for accessing and manipulating databases.

## What Can SQL do?

- SQL can execute queries against a database
- SQL can retrieve data from a database
- SQL can insert records in a database
- SQL can update records in a database
- SQL can delete records from a database
- SQL can create new databases
- SQL can create new tables in a database
- SQL can create stored procedures in a database
- SQL can create views in a database
- SQL can set permissions on tables, procedures, and views

# SQL Commands

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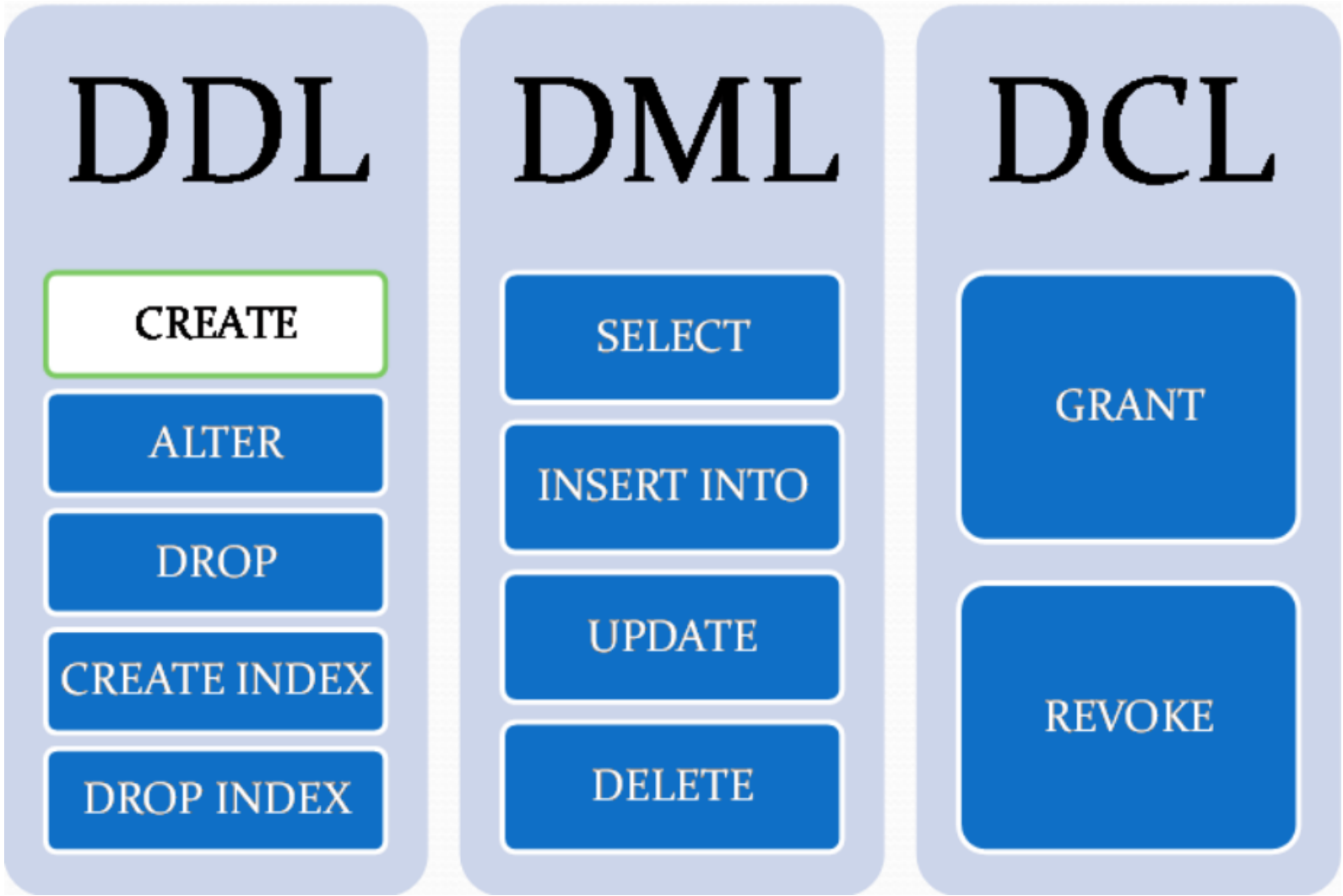

# Sample Table

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## Customers Table

| CustomerID | CustomerName | ContactName | Address | City | PostalCode | Country |
|---|---|---|---|---|---|---|
| 1 | Alfreds Futterkiste | Maria Anders | Obere Str. 57 | Berlin | 12209 | Germany |
| 2 | Ana Trujillo Emparedados y helados | Ana Trujillo | Avda. de la Constitución 2222 | México D.F. | 05021 | Mexico |
| 3 | Antonio Moreno Taquería | Antonio Moreno | Mataderos 2312 | México D.F. | 05023 | Mexico |
| 4 | Around the Horn | Thomas Hardy | 120 Hanover Sq. | London | WA1 1DP | UK |
| 5 | Berglunds snabbköp | Christina Berglund | Berguvsvägen 8 | Luleå | S-958 22 | Sweden |

# Create

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**Create Database:**

Syntax:

```
CREATE DATABASE databasename;
```

Example:

```
CREATE DATABASE CustomersDB;
```

Used to create a new database.

**Create Table:**

Syntax:

```
CREATE TABLE table_name (
    column1 datatype,
    column2 datatype,
    column3 datatype,
   ....
);
```

Example:

```
CREATE TABLE Customers(
    CustomerID int,
    CustomerName varchar(255),
    ContactName varchar(255),
    Address varchar(255),
    City varchar(255),
    PostalCode int,
    Country varchar(255)
);
```

# Select

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Syntax:

```
SELECT column1, column2, ...  FROM table_name;
```

Example:

```
SELECT CustomerName, City FROM Customers;
```

Syntax:

```
SELECT * FROM table_name;
```

Example:

```
SELECT * FROM Customers;
```

Syntax:

```
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

Example:

```
SELECT  CustomerName, ContactName
FROM Customers
WHERE Country='Mexico';
```

# Select

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Syntax for OrderBy:

```
SELECT column1, column2, ...
FROM table_name
ORDER BY column1, column2, ... ASC|DESC;
```

Syntax for And:

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 AND condition2 AND condition3 ...;
```

Syntax for OR:

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 OR condition2 OR condition3 ...;
```

Syntax for NOT:

```
SELECT column1, column2, ...
FROM table_name
WHERE  NOT condition
```

# Insert

Syntax:

```
INSERT INTO table_name (column1, column2, column3
, ...)
VALUES (value1, value2, value3, ...);
```

Example:

```
INSERT INTO Customers (CustomerName, City,
Country)
VALUES ('Cardinal', 'Stavanger', 'Norway');
```

Syntax:

```
INSERT INTO table_name
VALUES (value1, value2, value3, ...);
```

Example:

```
INSERT INTO Customers VALUES ('Cardinal', 'Tom B.
Erichsen', 'Skagen 21', 'Stavanger', '4006', 'Norway');
```

# Update

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**Update:**

Syntax:

```
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;
```

Example:

```
UPDATE Customers
SET ContactName = 'Alfred Schmidt', City= 'Frankfurt'
WHERE CustomerID = 1;
```

# Delete

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Syntax:

DELETE FROM *table_name* WHERE *condition*;

Example:

DELETE FROM Customers WHERE CustomerName='Alfreds';

Syntax:

DELETE FROM *table_name*;

Example:

DELETE FROM Customers;

# Alter

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**ALTER TABLE - ADD Column**

Syntax:

```
ALTER TABLE table_name
ADD column_name datatype;
```

Example:

```
ALTER TABLE Customers
ADD Email varchar(255);
```

**ALTER TABLE - DROP COLUMN**

Syntax:

```
ALTER TABLE table_name
DROP COLUMN column_name;
```

Example:

```
ALTER TABLE Customers
DROP COLUMN Email;
```

**ALTER TABLE - ALTER/MODIFY COLUMN**

- ***SQL Server / MS Access:***

Syntax:

```
ALTER TABLE table_name
ALTER COLUMN column_name datatype;
```

- ***My SQL / Oracle (prior version 10G):***

Syntax:

```
ALTER TABLE table_name
MODIFY COLUMN column_name datatype;
```

- ***Oracle 10G and later:***

Syntax:

```
ALTER TABLE table_name
MODIFY column_name datatype;
```

Example:

```
ALTER TABLE Persons
ALTER COLUMN DateOfBirth year;
```

# Drop

**Drop Database:**

Syntax:

DROP DATABASE *databasename*;

Example:

DROP DATABASE testDB;

**Drop Table:**

Syntax:

DROP TABLE *table_name*;

Example:

DROP TABLE Persons;

**Truncate table:**

Syntax:

TRUNCATE TABLE *table_name*;

# Grant & Revoke

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**Grant:**

Syntax:

Grant privilege_name on object_name to
{user_name | public | role_name}

Example:

Grant insert, select on accounts to Ram

**Revoke:**

Syntax:

Revoke privilege_name on object_name from

{user_name | public | role_name}

Example:

Revoke insert, select on accounts from Ram