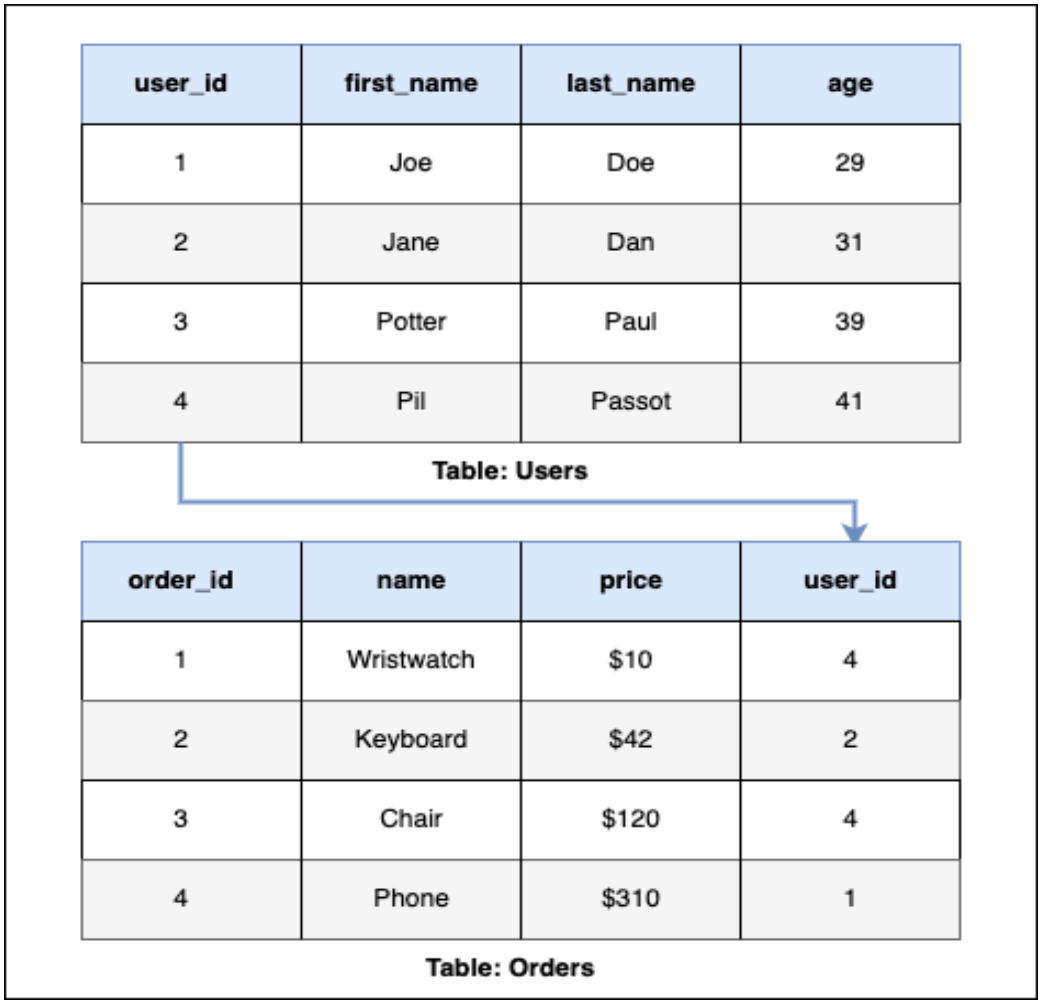
Section #3 – File Organization

Database-SQL-Server

- **Database Management Systems (DBMS)** are software systems used to store, retrieve, and run queries on data.
- **A DBMS** serves as an interface between an end-user and a **database**.
- Example: SQL Server 2014
- **A relational database**: Used to store data in tables, this means that the data is organized into rows and columns.
- Referred to as "**relational**" because two or more tables may be related to each other.



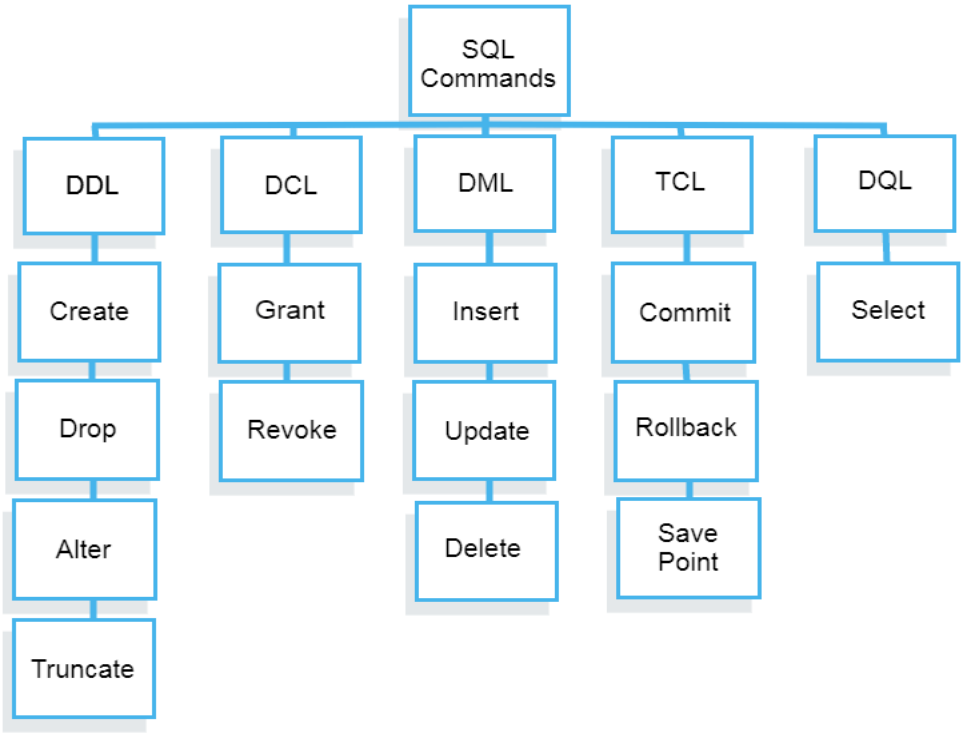
user_id	first_name	last_name	age
1	Joe	Doe	29
2	Jane	Dan	31
3	Potter	Paul	39
4	Pil	Passot	41

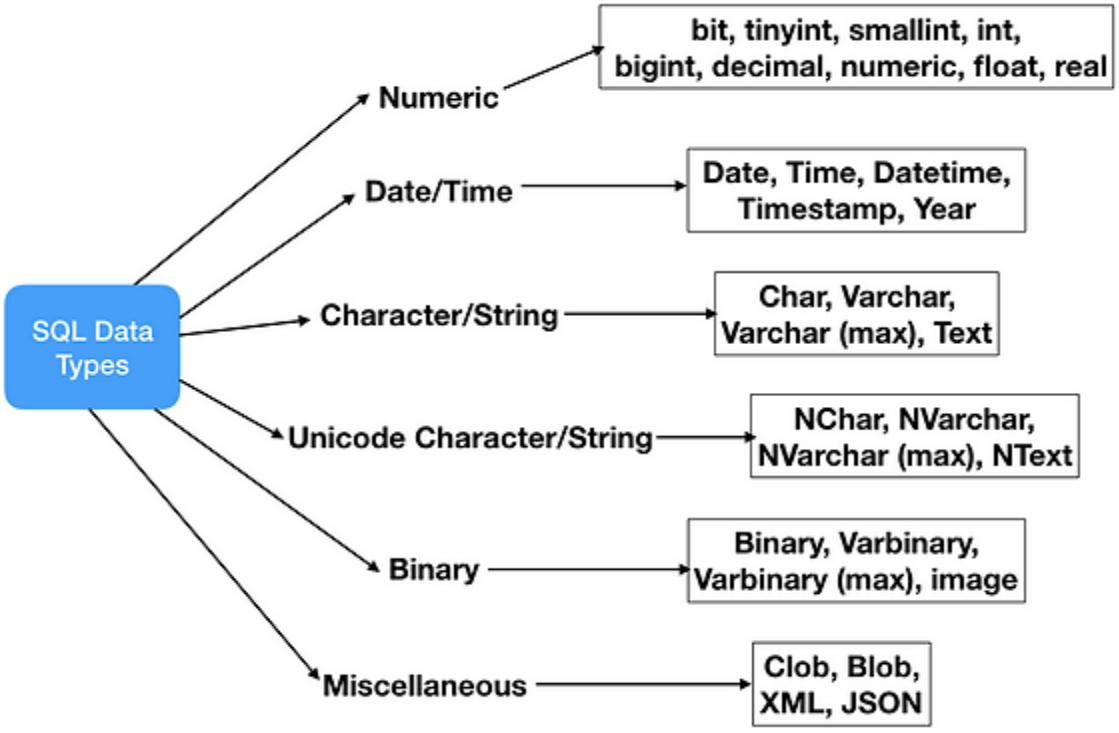
Table: Users

order_id	name	price	user_id
1	Wristwatch	$10	4
2	Keyboard	$42	2
3	Chair	$120	4
4	Phone	$310	1

Table: Orders

- **Structured Query Language (SQL):** is a query language used with **relational databases** such as MSSQL, MySQL, Oracle, and many others.





❖ طريقة كتابة أوامر DDL:Data Definition Language

1) لإنشاء قاعدة بيانات جديدة:

```
Create Database اسم-قاعدة-البيانات
```

2) لإنشاء جدول:

```
Create Table اسم-الجدول (اسم_العمود_الأول نوعه, اسم_العمود_الثانى نوعه, وهكذا )
```

3) للتعديل على هيكل الجدول وإضافة عمود:

```
Alter table اسم الجدول Add اسم العمود النوع
```

4) للتعديل على هيكل الجدول وحذف عمود من الجدول:

```
Alter table اسم الجدول Drop Column اسم العمود
```

5) لحذف قاعدة البيانات بكل الجداول وكل البيانات نهائياً:

```
Drop Database اسم قاعدة البيانات
```

6) لحذف هيكل الجدول بجميع بياناته

```
Drop Table اسم الجدول
```

7) لحذف جميع بيانات الجدول والحفاظ على الهيكل

```
Truncate table اسم الجدول
```

Write DDL commands for creating the next relational database.

user_id	first_name	last_name	age
1	Joe	Doe	29
2	Jane	Dan	31
3	Potter	Paul	39
4	Pil	Passot	41

Table: Users

order_id	name	price	user_id
1	Wristwatch	$10	4
2	Keyboard	$42	2
3	Chair	$120	4
4	Phone	$310	1

Table: Orders

- Create database company
- Use company
- Create table users (user_id int, first_name varchar(50) not null, last_name varchar(50), age int, primary key (user_id))
- Create table orders (order_id int, name varchar(50), price money, user_id int, primary key (order_id), foreign key (user_id) references users (user_id) on delete set null)

❖ **Type the necessary commands to do the following.**

1) Add a column to the users table with the city name.
   - Alter table users add city varchar (50)
2) Remove city column from user's table.
   - Alter table users drop column city
3) Edit price column data type in orders table to be numeric.
   - ALTER TABLE orders Alter COLUMN price numeric(5,3)
4) Remove all data from orders table.
   - Truncate table orders
5) Remove schema of order table and its data.
   - Drop table orders
6) Remove company database.
   - Drop database company

❖ **طريقة كتابة أوامر DML :Data Manipulation Language**

1) لإضافة بيانات داخل جميع أعمدة الجدول:

```
Insert Into اسم_الجدول Values (القيم بترتيب الاعمدة)
```

2) لإضافة بيانات داخل أعمدة معينة في الجدول:

```
Insert Into اسم_الجدول (أسماء الاعمدة)Values (القيم بترتيب الاعمدة)
```

3) لعرض بيانات من الجدول:

```
Select الأعمدة from اسم_الجدول Where الشرط
```

4) لحذف بيانات من الجدول:

```
Delete from اسم_الجدولWhere الشرط
```

5) لتعديل بيانات على الجدول:

```
Update اسم_الجدول Set التعديل Where الشرط
```

Write DML commands for inserting data to the next relational database.

user_id	first_name	last_name	age
1	Joe	Doe	29
2	Jane	Dan	31
3	Potter	Paul	39
4	Pil	Passot	41

Table: Users

order_id	name	price	user_id
1	Wristwatch	$10	4
2	Keyboard	$42	2
3	Chair	$120	4
4	Phone	$310	1

Table: Orders

```
Insert into users values (1,'joe','Doe',29),
(2,'Jane','Dan',31),
(3,'Potter','Paul',39),
(4,'Pil','Passot',41)
Insert into orders values (1,'Wristwatch',$10,4),
(2,'Keyboard',$42,2),
(3,'Chair',$120,4),
(4,'Phone',$310,1)
```

❖ **Type the necessary commands to do the following.**

1) Adding a new tuple in user table with user_id 5 and age = 50

↳ Insert into users (user_id,age) values (5,50)

2) Change the first_name for user number 4 to be "Jone"

↳ Update users set first_name ='Jone' where user_id=4

3) Change the prices for all orders to be "$0".

↳ Update users set price =$0

4) Change first_name and last_name for user_id = 4 to be Jone Smith

↳ Update users set first_name= 'Jone', last_name ='Smith' where user_id=4

5) Delete all orders of user_id number 4.

↳ Delete from orders where user_id=4

6) Delete all columns from table orders.

↳ Delete from orders

7) Delete all rows whose first_name is Null

↳ Delete from users where first_name is Null

8) Display first name for all users.

↳ Select first_name from users

first_name
joe
Jane
Potter
Jone

9) Display first name, last name for all users.

↳ Select first_name,last_name from users

first_name	last_name
joe	Doe
Jane	Dan
Potter	Paul
Jone	Passot

10) Display first name, last name for all users whose age greater than 35 years.

↳ Select first_name,last_name from users where age >35

first_name	last_name
Potter	Paul
Jone	Passot

11) Display first name, last name as FullName for all users

↳ Select first_name + last_name As FullName from users

FullName
joeDoe
JaneDan
PotterPaul
JonePassot

12) Display all user's data.

↳ Select * from users

user_id	first_name	last_name	age
1	joe	Doe	29
2	Jane	Dan	31
3	Potter	Paul	39
4	Jone	Passot	41

13) Display all user's data whose ages greater than 35

↳ Select * from users where age >35

user_id	first_name	last_name	age
3	Potter	Paul	39
4	Jone	Passot	41

14) Display names of all first_name for all users and remove duplicates.

↳ Select distinct first_name from users

first_name
Jane
joe
Jone
Potter

Using next Emp table write query for each of the following:

EmpID	FirstName	LastName	City
1	Ahmed	Mamdouh	Mans
2	Mohy	Ali	Cairo
3	Aya	Adel	Tanta
4	Mohamed	Hamed	
5	Khaled	Elgohary	Mans

1) Find all Employee whose city is Null

↳ SELECT * **FROM** Emp WHERE **city** is null

2) Find the names of all Employees whose city from Cairo or Mans.

↳ SELECT FirstName, LastName FROM Emp
WHERE city='Cairo' OR city='Mans'

3) Find all Employee whose FirstName is 'Ahmed' OR 'Aya' and LastName is 'Ali'

↳ SELECT * FROM Emp
WHERE (FirstName='Ahmed' OR FirstName='Aya') AND LastName='Ali'

4) Find the names of Employees whose id are 1 or 2 or 3 or 5

↳ SELECT FirstName, LastName FROM Emp WHERE id IN (1, 2, 3,5)

5) Find all Employee whose id in range from 2 to 5

↳ SELECT * **FROM** Emp WHERE id BETWEEN 2 AND 5

6) Find all Employee whose id not in range from 2 to 5

↳ SELECT * **FROM** Emp WHERE id NOT BETWEEN 2 AND 5

7) Find all Employee whose FirstName begin with 'a'

↳ SELECT * **FROM** Emp WHERE FirstName LIKE 'a%'

8) Find all Employee whose FirstName end with 'a'

↳ SELECT * **FROM** Emp WHERE **FirstName** LIKE '%a'

9) Find all Employee whose FirstName contains 'h'

↳ SELECT * **FROM** Emp WHERE FirstName LIKE '%h%'

10) Find all Employee whose FirstName net begin with 'a'

↳ SELECT * **FROM** Emp WHERE FirstName NOT LIKE 'a%'

11) Find all Employee whose FirstName begin with 'a' and end with 'e'

↳ SELECT * **FROM** Emp WHERE FirstName LIKE 'a%e'

12) Find all Employee whose third character in FirstName is 'a'

↳ SELECT * **FROM** Emp WHERE FirstName LIKE '_ _a%'

13) Find all Employee whose third character in FirstName is 'a' and the name exact three characters.

↳ SELECT * **FROM** Emp WHERE FirstName LIKE '_ _a'