

# BASE DE DATOS PARA INTELIGENCIA ARTIFICIAL

• 20/05/2023

# Esquema de hoy

- Repaso
- Normalización
- Data Languages
- SQL Basics
- RDS + Postgres (Chinook)
- SQL Advanced
- Prácticas

# REPASO

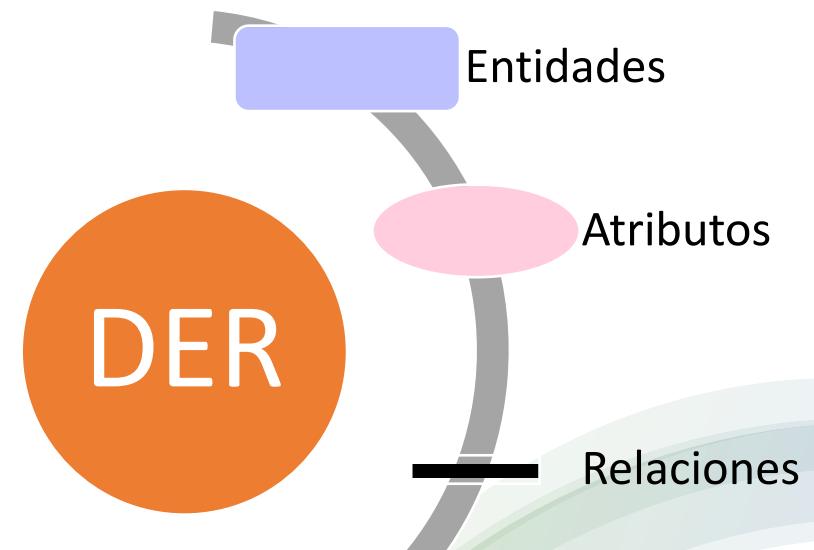
# Conceptos básicos

## Diagrama Entidad Relación (DER/ERD)

El modelo Entidad-Relación (E-R) es una manera de representar nuestra percepción del sistema que vamos a modelar.

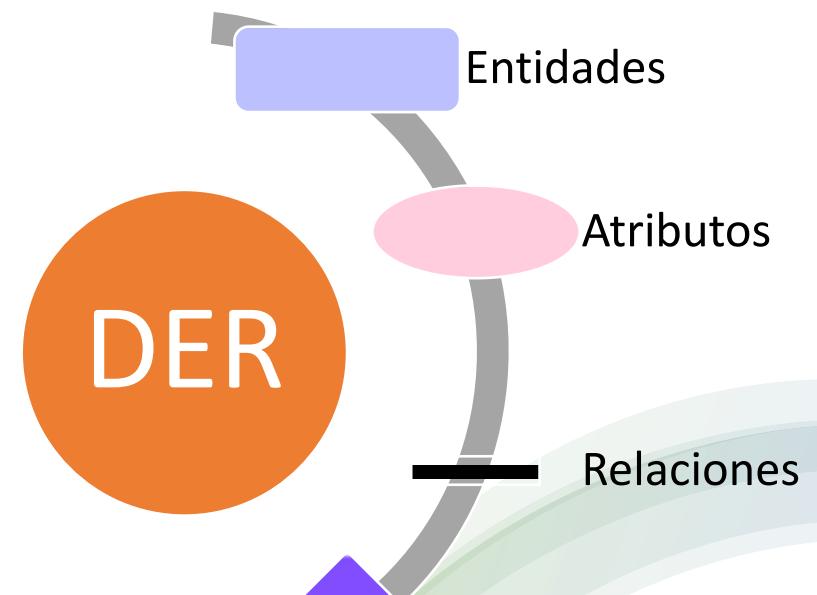
Este consiste en un conjunto de objetos básicos:

- **Entidades**
- **Atributos**
- **Interrelaciones**
- **Acciones**



# Repaso

- Atributos
  - Simples
  - compuestos
- Interrelaciones
  - **Grado**
    - Unaria
    - Binaria
    - Ternaria o N-aria
  - **Cardinalidad**
    - 1:1
    - 1:N
    - N:M
  - **Participación**
    - Total
    - Parcial
- **Entidades**
  - Fuertes o Debiles
  - Jerarquías
    - Disjuntas
    - Con solapamiento



# NORMALIZACION

# Guía informal de diseño de esquemas

- Asegurarnos que la semántica de los atributos sea la correcta
- Reducir información redundante en las tablas
- Reducir la cantidad de valores NULL en las tuplas
- No permitir la posibilidad de generar tuplas espurias o anomalías
  - Anomalías por Inserción
  - Anomalías por Borrado
  - Anomalías por Modificación



## Normalización

- Proceso de aplicar una serie de reglas para minimizar (o eliminar) la redundancia de datos
- Evita anomalías sobre los datos
- Separa grandes tablas en tablas mas pequeñas y las une a través de relaciones

# Normalización

SALES
ITEMS
PRICE
CREATED_AT
QUANTITY
FULL_NAME
ADDRESS
...



ORDERS
ORDER_ITEMS_ID
CUSTOMER_ID
CREATED_AT
QUANTITY
...

CUSTOMER
EMAIL
ID
FULL_NAME
ADDRESS
...

ORDER ITEMS
ITEM
PRICE
CATEGORY
DESCRIPTION
ID
...



# Normalización

## 1 FN

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.

name	address	phone
Thomas Monero	12 Hangover Sq.	3456
Jessica Moos	12 Hangover Sq.	3456
Adam Hardy	Cerrito 333	1243
Maria Anders	Av. del Libertador 900	8906

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.

**Primary key**

customer_id	name	address	phone
101	Thomas Monero	12 Hangover Sq.	3456
102	Jessica Moos	12 Hangover Sq.	3456
103	Adam Hardy	Cerrito 333	1243
104	Maria Anders	Av. del Libertador 900	8906

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.

customer_id	name	address	phone
101	Thomas Monero	12 Hangover Sq.	3456
102	Jessica Moos	12 Hangover Sq.	3456
103	Adam Hardy	Cerrito 333	1243
104	Maria Anders	Av. del Libertador 900	8906

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.

# 1FN

customer_id	first_name	last_name	address	phone
101	Thomas	Monero	12 Hangover Sq.	3456
102	Jessica	Moos	12 Hangover Sq.	3456
103	Adam	Hardy	Cerrito 333	1243
104	Maria	Anders	Av. del Libertador 900	8906

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.

# 1FN

order\_detail

order_id	product_id	price	quantity	new_product	new_product_price	new_product_quantity
101	1	45.6	30	2	18	12
102	3	12	61	4	43.9	10
103	3	10	47	1	18	22

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.

# 1FN

**order\_detail**

order_id	product_id	price	quantity
101	1	45.6	30
101	2	18	12
102	3	12	61
102	4	43.9	10
103	3	10	47
103	1	18	22

- PRIMARY KEY
- CADA ATRIBUTO DEBE CONTENER UN SOLO VALOR ATÓMICO
- SIN GRUPOS REPETIDOS.



## Normalización

### 2 FN

- CUMPLE CON 1 FN
- SIN DATOS REDUNDANTES
- LOS ATRIBUTOS QUE NO FORMAN PARTE DE LA CLAVE ESTAN COMPLETAMENTE DEFINIDOS POR LA CLAVE

# 2FN

order_id	product_id	price	quantity	order_date	shipping_detail
101	1	45.6	30	2019-08-16	31 Hill Haven Drive
101	2	18	12	2019-08-16	31 Hill Haven Drive
102	3	12	61	2020-10-10	12 Breezewood Court
102	4	43.9	10	2020-10-10	12 Breezewood Court
103	3	10	47	2018-03-17	100 West Street
103	1	18	22	2018-03-17	100 West Street

- CUMPLE CON 1 FN
- SIN DATOS REDUNDANTES
- LOS ATRIBUTOS QUE NO FORMAN PARTE DE LA CLAVE ESTAN COMPLETAMENTE DEFINIDOS POR LA CLAVE

2FN

## DEPENDENCIA PARCIAL

order_id	product_id	price	quantity	order_date	shipping_detail
101	1	45.6	30	2019-08-16	31 Hill Haven Drive
101	2	18	12	2019-08-16	31 Hill Haven Drive
102	3	12	61	2020-10-10	12 Breezewood Court
102	4	43.9	10	2020-10-10	12 Breezewood Court
103	3	10	47	2018-03-17	100 West Street
103	1	18	22	2018-03-17	100 West Street

PRIMARY KEY  
COMPUUESTA

NON KEY  
COLUMNS

- CUMPLE CON 1 FN
- SIN DATOS REDUNDANTES
- LOS ATRIBUTOS QUE NO FORMAN PARTE DE LA CLAVE ESTAN COMPLETAMENTE DEFINIDOS POR LA CLAVE

# 2FN

order_id	product_id	price	quantity
101	1	45.6	30
101	2	18	12
102	3	12	61
102	4	43.9	10
103	3	10	47
103	1	18	22

order_id	order_date	shipping_detail
101	2019-08-16	31 Hill Haven Drive
102	2020-10-10	12 Breezewood Court
103	2018-03-17	100 West Street

- CUMPLE CON 1 FN
- SIN DATOS REDUNDANTES
- LOS ATRIBUTOS QUE NO FORMAN PARTE DE LA CLAVE ESTAN COMPLETAMENTE DEFINIDOS POR LA CLAVE



## Normalización

### 3 FN

- CUMPLE CON 2 FN
- SIN DATOS REDUNDANTES
- NO TENER DEPENDENCIAS TRANSITIVAS (NO INGESTEN COSAS DE OTRAS TABLAS QUE NO SEAN PRIMARY KEYS)

# 3FN

ProductID	ProductName	Supplier ID	Supplier Name	Supplier Address	UnitPrice
1	Rssle Sauerkraut	3	Plutzer	3200 ParkWay	45.6
2	Chartreuse verte	3	Plutzer	3200 ParkWay	18
3	Spegesild	10	Lyngbysild	131 Stadium Drive	12
4	Vegie-spread	10	Lyngbysild	131 Stadium Drive	43.9
5	Chocolate Bar	43	Cedar Choc	20 Barfield Lane	10
6	Choco Milk	43	Cedar Choc	20 Barfield Lane	18

- CUMPLE CON 2 FN
- SIN DATOS REDUNDANTES
- NO TENER DEPENDENCIAS TRANSITIVAS (NO INGESTEN COSAS DE OTRAS TABLAS QUE NO SEAN PRIMARY KEYS)

# 3FN

ProductID	ProductName	Supplier ID	Supplier Name	Supplier Address	UnitPrice
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5	Chocolate Bar	43	Cedar Choc	20 Barfield Lane	10
6	Choco Milk	43	Cedar Choc	20 Barfield Lane	18

- CUMPLE CON 2 FN
- SIN DATOS REDUNDANTES
- NO TENER DEPENDENCIAS TRANSITIVAS (NO INGESTEN COSAS DE OTRAS TABLAS QUE NO SEAN PRIMARY KEYS)

# 3FN

ProductID	ProductName	Supplier ID	Supplier Name	Supplier Address	UnitPrice
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3	Spegesild	10	Lyngbysild	131 Stadium Drive	12
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2	Chartreuse verte	3	18
3	Spegesild	10	12
4	Vegie-spread	10	43.9
5	Chocolate Bar	43	10
6	Choco Milk	43	18

Supplier ID	Supplier Name	Supplier Address
3	Plutzer	3200 ParkWay
10	Lyngbysild	131 Stadium Drive
43	Cedar Choc	20 Barfield Lane

- CUMPLE CON 2 FN
- SIN DATOS REDUNDANTES
- NO TENER DEPENDENCIAS TRANSITIVAS (NO INGESTEN COSAS DE OTRAS TABLAS QUE NO SEAN PRIMARY KEYS)



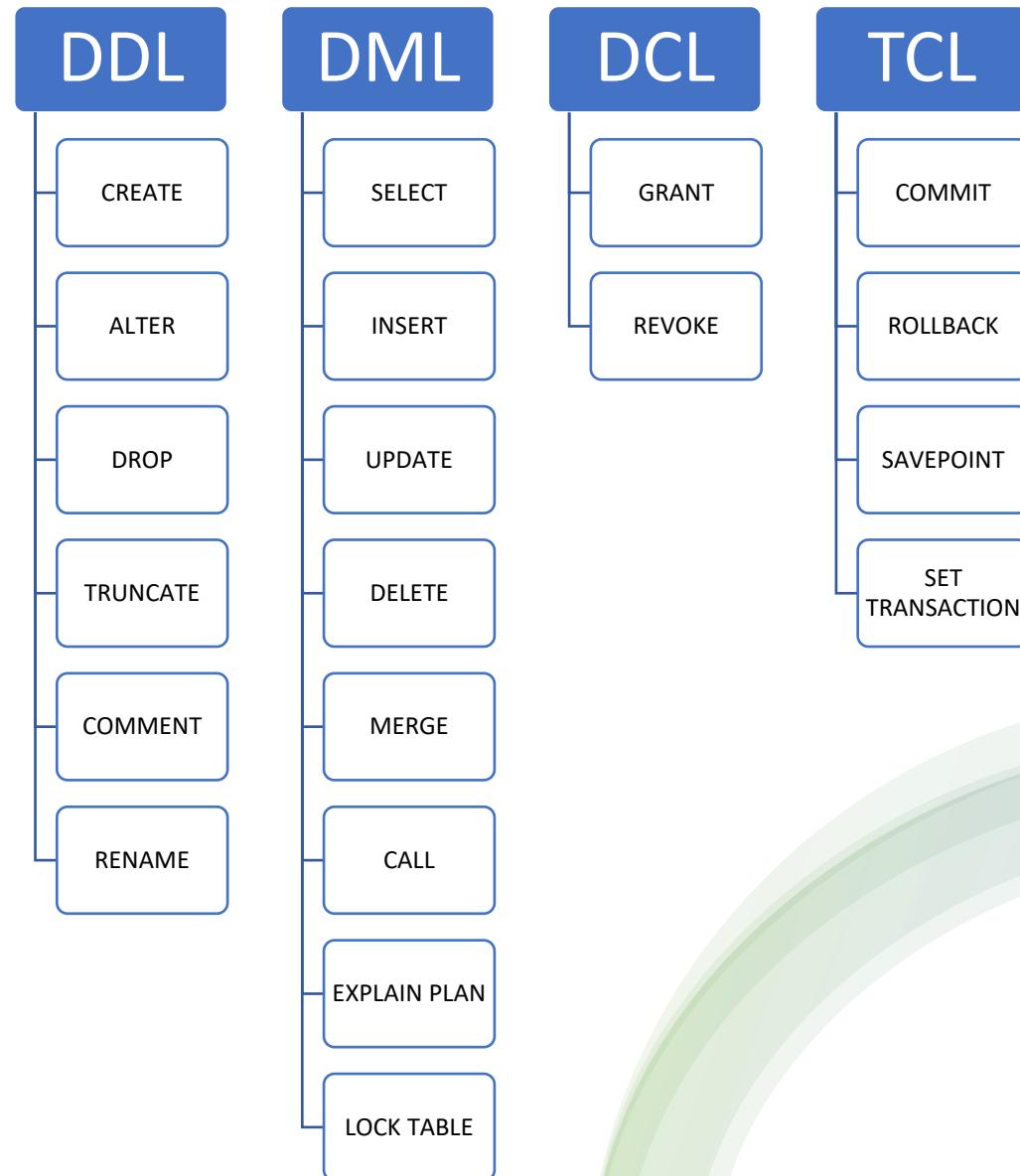
Lenguaje SQL

Data \* Language

# Tipos de SQL

En SQL podemos encontrar 4 categorías importantes:

- **DDL:**Corresponde a los comandos que nos permiten definirla estructura de nuestro MR.
- **DML:** Estos comandos nos permiten manipular nuestro MR



# Tipos de SQL

En SQL podemos encontrar 4 categorías importantes:

- **DCL:** Estos comandos rigen la parte de control y gobierno de nuestros datos
- **TCL:** Estos comandos rigen el control sobre las operaciones de DML.



Nosotros nos vamos a concentrar sobre todo en **DML** y un poco de **DDL**

# DDL

## Data Definition Language

# Creación de Elementos

- En PostgreSQL, tenemos que la sentencia **CREATE** nos permite crear distintos elementos en nuestra base de datos. Estos pueden ser:
  - **DATABASE**
  - **TABLE**
  - **INDEX**
  - **ROLE**
  - **USER**
  - ...
- `CREATE DATABASE testDB;`
- `CREATE TABLE Persons(`  
    `PersonID int,`  
    `LastName varchar(255),`  
    `FirstName varchar(255),`  
    `Address varchar(255),`  
    `City varchar(255)`  
`);`
- `CREATE TABLE TestTable AS`  
    `SELECT`  
        `customername,`  
        `contactname`  
    `FROM`  
        `customers;`
- `CREATE USER name [ [ WITH ] option[ ... ] ];`

Name	Aliases	Description
bigint	int8	signed eight-byte integer
bigserial	serial8	autoincrementing eight-byte integer
bit [ (n) ]		fixed-length bit string
bit varying [ (n) ]	varbit [ (n) ]	variable-length bit string
boolean	bool	logical Boolean (true/false)
box		rectangular box on a plane
bytea		binary data ("byte array")
character [ (n) ]	char [ (n) ]	fixed-length character string
character varying [ (n) ]	varchar [ (n) ]	variable-length character string
cidr		IPv4 or IPv6 network address
circle		circle on a plane
date		calendar date (year, month, day)
double precision	float8	double precision floating-point number (8 bytes)
inet		IPv4 or IPv6 host address
integer	int, int4	signed four-byte integer
interval [ fields ] [ (p) ]		time span
json		textual JSON data
jsonb		binary JSON data, decomposed
line		infinite line on a plane
lseg		line segment on a plane
macaddr		MAC (Media Access Control) address
macaddr8		MAC (Media Access Control) address (EUI-64 format)
money		currency amount
numeric [ (p, s) ]	decimal [ (p, s) ]	exact numeric of selectable precision
path		geometric path on a plane
pg_lsn		PostgreSQL Log Sequence Number
pg_snapshot		user-level transaction ID snapshot
point		geometric point on a plane
polygon		closed geometric path on a plane
real	float4	single precision floating-point number (4 bytes)
smallint	int2	signed two-byte integer
smallserial	serial2	autoincrementing two-byte integer
serial	serial4	autoincrementing four-byte integer
text		variable-length character string
time [ (p) ] [ without time zone ]		time of day (no time zone)
time [ (p) ] with time zone	timetz	time of day, including time zone
timestamp [ (p) ] [ without time zone ]		date and time (no time zone)
timestamp [ (p) ] with time zone	timestampz	date and time, including time zone
tsquery		text search query
tsvector		text search document
txid_snapshot		user-level transaction ID snapshot (deprecated; see pg_snapshot)
uuid		universally unique identifier
xml		XML data

# Creación de Elementos

- Usualmente, en nuestro rol de DS, MLE, etc. Vamos a estar utilizando creación sobre todo de tablas.
- Una parte importante de las tablas es el tipo de datos que contienen en sus columnas. Esto varia ligeramente entre motor y motor, en el caso de postgresSQL, los mas importantes son:
  - Numéricos (Int, Float, etc.)
  - Caracteres (char, varchar, text, ...)
  - Fecha y tiempo (timestamp, date, ....)
  - Objetos (XML,json,...)
  - Secuencias autogeneradas (Serial, ...)

# Modificación de tablas

- `ALTER TABLE tesTable ADD ( column datatype [DEFAULT expr]);`
  - `ALTER TABLE tesTable`
  - `ALTER COLUMN columnName datatype;`
  - `ALTER TABLE tesTable`
  - `ALTER COLUMN columnName SET NOT NULL;`
  - `ALTER TABLE tesTable`
  - `ALTER CHECK ( col::expression )`
  - `ALTER TABLE tesTable`
  - `ALTER CONSTRAINT [constraintName];`
  - `CHECK ( col::expression )`
- En PostgreSQL, tenemos que la sentencia ALTER esta nos permite cambiar atributos de nuestro objeto, en particular ALTER TABLE nos permite operar sobre nuestras tablas:
    - Agregar columnas
    - Cambiar la definición de las mismas
    - Agregar o borrar *constraints* (relaciones)

```
ALTER TABLE tesTable  
ALTER CONSTRAINT [relation_name];  
[FOREIGN|PRIMARY] KEY (col.O)  
[[REFERENCES] otherTestTable(col.R)]
```

```
CREATE SEQUENCE "theme_id_seq"
    INCREMENT 1
    MINVALUE 1
    MAXVALUE 2147483647
    START 1
    CACHE 1;
SELECT setval('"public"."theme_id_seq"', 1, TRUE);
```

## Ejemplo

```
CREATE TABLE theme(
    theme_id int DEFAULT nextval('theme_id_seq'::regclass) NOT NULL,
    namevarchar(256),
    parent_id int,
    CONSTRAINT pk_themes PRIMARY KEY (theme_id)
);

ALTER TABLE themes ADD CONSTRAINT (fk_themes_id)
FOREIGN KEY (parent_id) REFERENCES themes (theme_id)
```

## Ejemplo opción 2

```
CREATE TABLE theme(  
    theme_id serial NOT NULL,  
    name varchar(256),  
    parent_id serial  
    CONSTRAINT pk_themes  
    PRIMARY KEY (theme_id)  
);  
  
ALTER TABLE themes ADD CONSTRAINT (fk_themes_id)  
FOREIGN KEY (parent_id) REFERENCES themes (theme_id)
```

# DML

## Data Manipulation Language

# Insertando valores

- INSERT nos permite agregar filas en una tabla, es la única manera que nos provee SQL directamente para ingresar datos.
- ```
INSERT INTO tableName [(col1[,  
col2,...])]  
VALUES (val1[, val2, ...]);
```
- ```
INSERT INTO tableName  
VALUES (val1, val2, ... , val3);
```
- ```
INSERT INTO themes(name,parent_id)  
VALUES ('starwarsdeathstar', 128);
```
- ```
INSERT INTO sets  
VALUES (1,'dome',1989,128,129);
```

# ESTRUCTURA DE QUERIES

# ESTRUCTURA GENERAL DE UNA QUERY

**SELECT**

Se seleccionan todos los campos que se desean consultar

**FROM**

Se seleccionan las tablas de las cuales se extraen esos campos

**WHERE**

Se filtran los resultados según las condiciones deseadas

**GROUP BY**

Se agrupan los resultados según todos los campos no calculados

**HAVING**

Se filtran los resultados según las condiciones deseadas para los campos calculados

**ORDER BY**

Se ordenan los resultados según las columnas que se elijan con el orden deseado

SELECT AND DEFINE TABLES

CONDITIONALS AND OPERATORS

AGGREGATE FUNCTIONS

JOINS

SELECT AND DEFINE TABLES

CONDITIONALS AND OPERATORS

AGGREGATE FUNCTIONS

JOINS

# SELECT

- Select partial table contents by placing restrictions on rows to be included in output.
- Add conditional restrictions to **SELECT** statement, using **WHERE** clause.
- Syntax:

```
SELECT *
FROM table_name;
```

```
SELECT Col1,Col2,...,Coln
FROM table_name
[ WHERE conditionlist ] ;
```

# CREATE, DROP AND DELETE TABLES

## CREATE TABLE

- Used to create a new table
- Syntax:

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

```
CREATE TABLE scheme  
.table_name AS (  
SELECT columnlist  
FROM table_name);
```

## DELETE TABLE

- Used to drop data in a table
- Syntax:

```
DELETE FROM table_name  
[WHERE conditionlist];
```

## DROP TABLE

- Used to drop an entire table
- Syntax:

```
DROP TABLE table_name;
```

# ADD, UPDATE AND ALTER TABLE ROWS

## ADDING TABLE ROWS

- To enter data into table
- Syntax:

```
INSERT INTO table_name  
[(column1, column2, ...)]  
VALUES  
(value1,value2,...);
```

## UPDATE

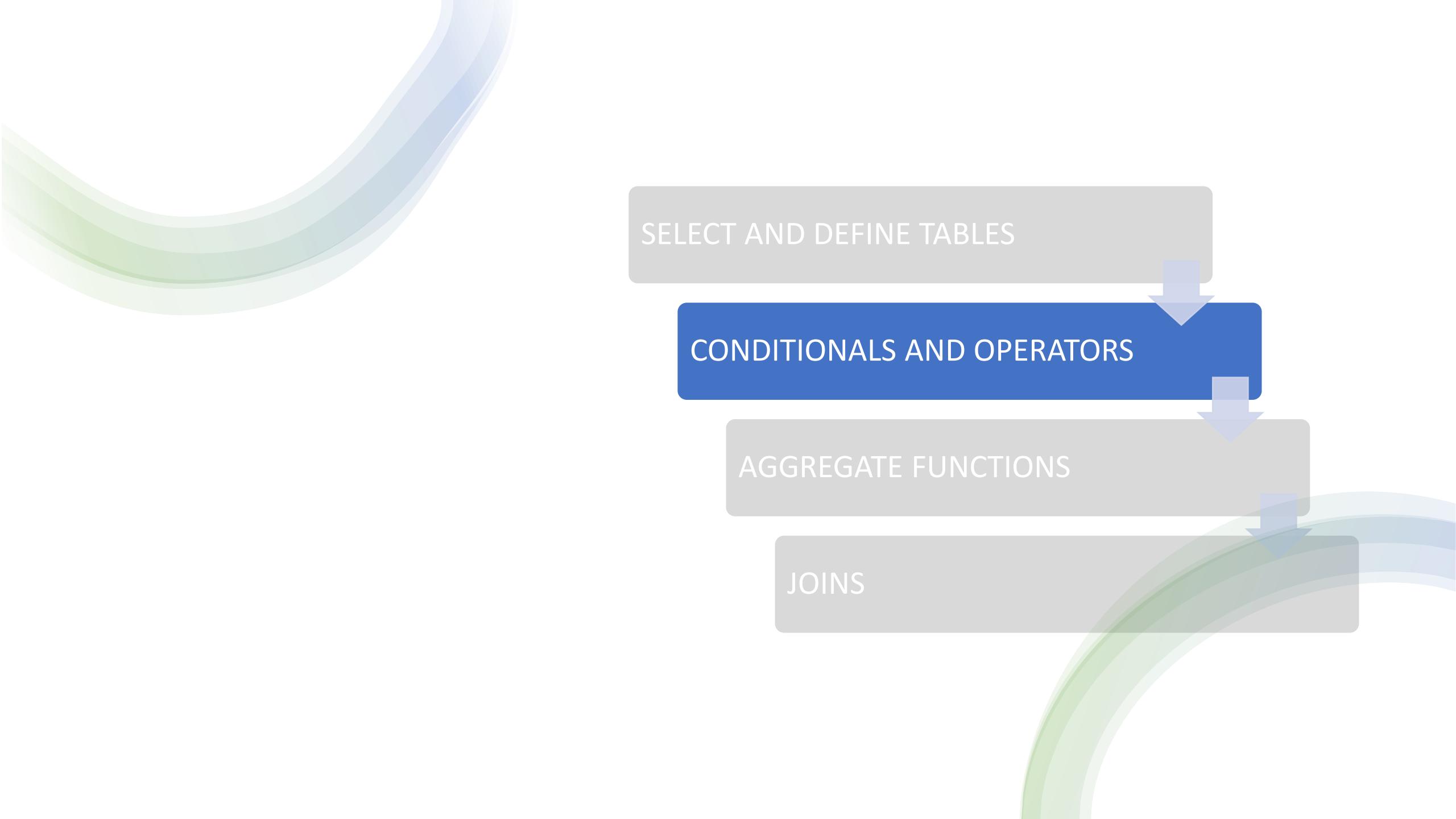
- Modify data in a table
- Syntax:

```
UPDATE tablename  
SET columnname = expression  
WHERE conditionlist];  
• If more than one attribute  
is to be updated in row,  
separate corrections with  
commas
```

## ALTER

- Alter conditions from a table
- Syntax:

- 1)**ALTER TABLE** table\_name  
**ADD COLUMN** new\_c TYPE;
- 2)**ALTER TABLE** table\_name  
**RENAME COLUMN** col\_1  
**TO** new\_name;



SELECT AND DEFINE TABLES

CONDITIONALS AND OPERATORS

AGGREGATE FUNCTIONS

JOINS

# CONDITIONALS: COMPARISON OPERATORS

Used in conditional expressions

- Syntax:

`SELECT columnlist`

`FROM tablelist`

`WHERE <expression>[comparison operator]<expression>;`

Operator	Description
=	Equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
<>	Not equal to

# CONDITIONALS: LOGICAL OPERATORS

- Combine conditional expressions to return true or false values:

- Syntax:

```
SELECT columnlist
```

```
FROM tablelist
```

```
WHERE condition1 AND (condition2 OR condition3) ...;
```

```
SELECT columnlist
```

```
FROM tablelist
```

```
WHERE NOT condition1 ...;
```

# CONDITIONALS: SPECIAL OPERATORS

BETWEEN -> BETWEEN DATE '2020-08-01' AND DATE '2020-08-31'

- Used to check whether attribute value is within a range

IS NULL or IS NOT NULL -> SURENAME IS NULL

- Used to check whether attribute value is null

LIKE -> TRACKING\_CODE LIKE '%DELIVERED%'

- Used to check whether attribute value matches given string pattern

IN or NOT IN -> ID IN (SELECT \* FROM table\_one)

- Used to check whether attribute value matches any value within a value list

# CONDITIONALS: SPECIAL OPERATORS

DISTINCT -> SELECT DISTINCT NAMES FROM CLIENTES;

- Limits values to unique values

AS

- Use to rename columns
- Syntax:

**SELECT** column1 **AS** Name, column2 **AS** Surname  
**FROM** table1;

ORDER BY -> SELECT NAME, QUANTITY FROM  
CLIENTES ORDER BY 2 DESC;

- Use to sort data in descending or ascending order.

## TIPS

- Mantener estructura al escribir
- ; -> al final de cada query
- Distinct -> muestra únicos, usar siempre
- Limit / Top -> limita los resultados = más rápido
- '%Alvarez' -> el % == cualquier caracter



SELECT AND DEFINE TABLES

CONDITIONALS AND OPERATORS

AGGREGATE FUNCTIONS

JOINS

# AGGREGATE FUNCTIONS

Common Aggregate functions :

- Avg (expression)
- Count (expression) or Count (\*)
- Sum (expression)
- Min/Max (expression)

Statistics Aggregate functions:

- Corr ( Y, X )
- Sttdev (expression)
- Variance (expression)

# AGGREGATE FUNCTIONS

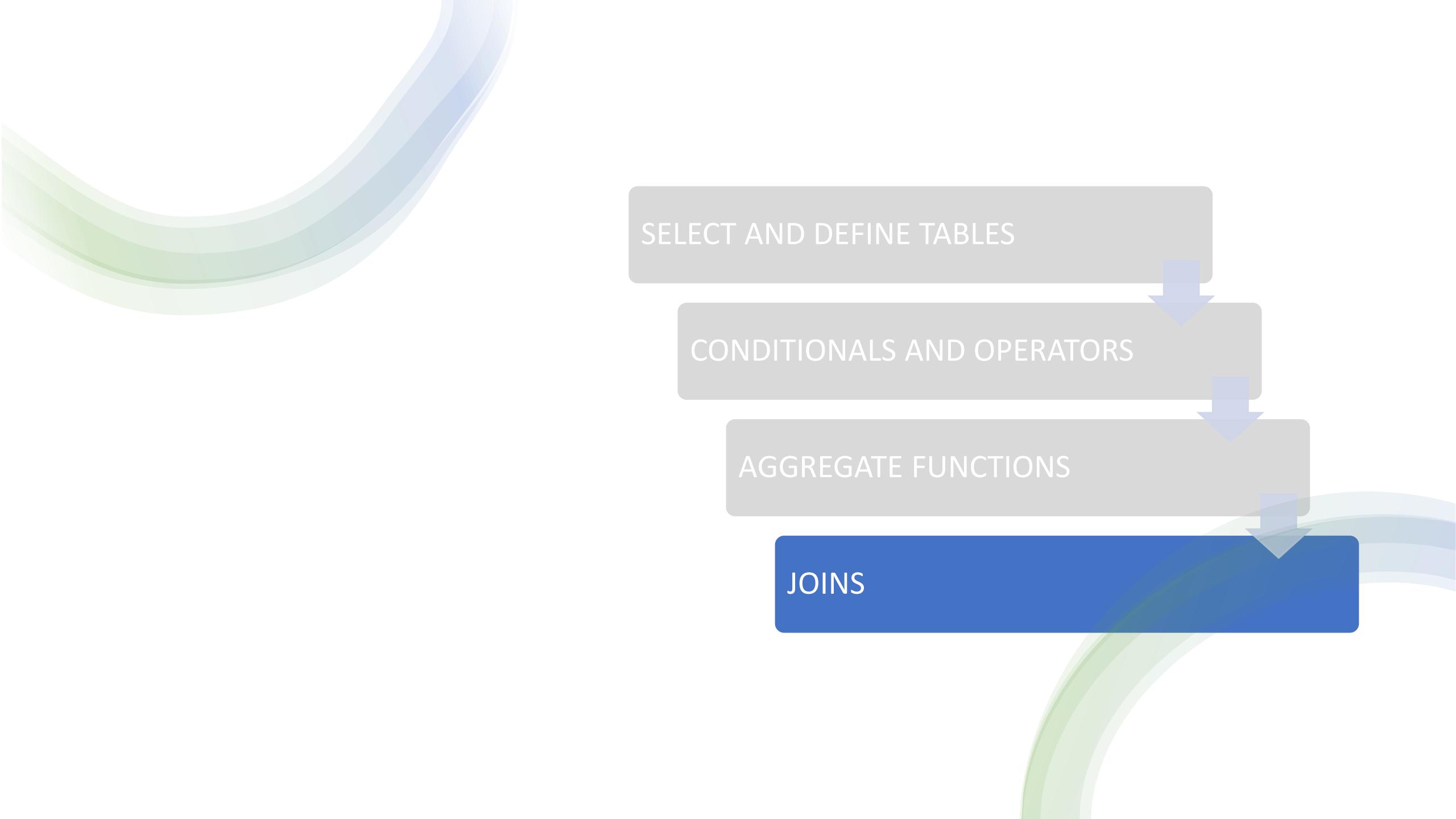
- Aggregate functions compute a single result from a set of input values.

- Syntax:

```
SELECT column_name(s), AGGREGATE_FUNCTION() AS  
column_name  
FROM table_name  
WHERE condition  
GROUP BY column_name(s)  
HAVING condition  
ORDER BY column_name(s);
```

\* **AGGREGATE FUNCTIONS** need a **GROUP BY** clause always !!!!!!!!

\* **HAVING** clause is used to conditionate aggregate functions.



SELECT AND DEFINE TABLES

CONDITIONALS AND OPERATORS

AGGREGATE FUNCTIONS

JOINS

# JOINS: UNION CLAUSE AND CARTESIAN JOIN

## UNION

- Syntax:

```
SELECT exp1,exp2,exp_n  
FROM table_name  
[WHERE condition]  
  
UNION ALL  
  
SELECT exp1,exp2,exp_n  
FROM table_name  
[WHERE condition];
```

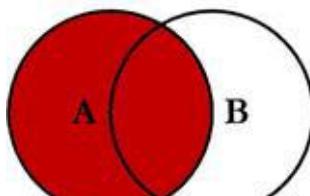
## CARTESIAN

- Syntax:

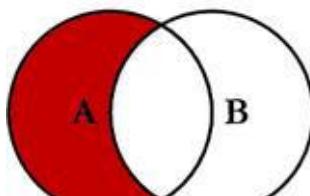
```
SELECT t1.a, t1.b, t2.aa, t2.bb  
FROM table_name AS t1  
[LEFT/INNER/etc ] JOIN table_name AS t2  
ON t1.columnY=t2.columnX;
```

# JOINS

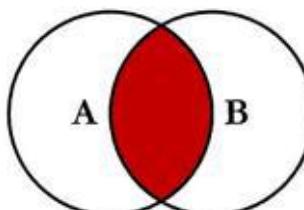
## SQL JOINS



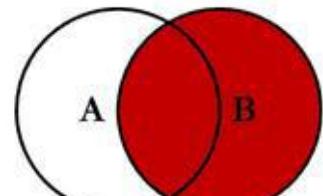
```
SELECT <select_list>
FROM TableA A
LEFT JOIN TableB B
ON A.Key = B.Key
```



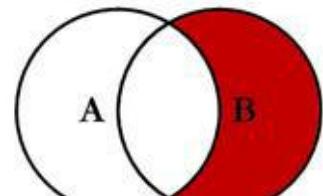
```
SELECT <select_list>
FROM TableA A
LEFT JOIN TableB B
ON A.Key = B.Key
WHERE B.Key IS NULL
```



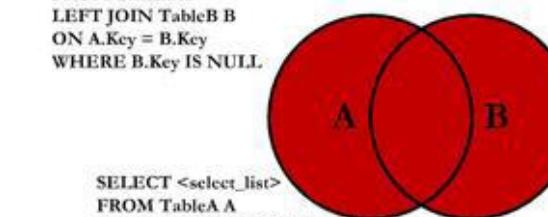
```
SELECT <select_list>
FROM TableA A
INNER JOIN TableB B
ON A.Key = B.Key
```



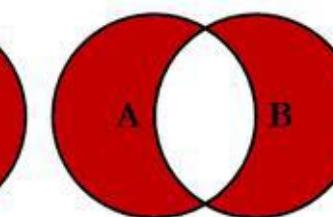
```
SELECT <select_list>
FROM TableA A
RIGHT JOIN TableB B
ON A.Key = B.Key
```



```
SELECT <select_list>
FROM TableA A
RIGHT JOIN TableB B
ON A.Key = B.Key
WHERE A.Key IS NULL
```



```
SELECT <select_list>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.Key = B.Key
```



```
SELECT <select_list>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.Key = B.Key
WHERE A.Key IS NULL
OR B.Key IS NULL
```

# CARTESIAN JOIN EXAMPLE

Customers

ID	NAME	AGE	ADDRESS	SALARY
1	Ramesh	32	Ahmedabad	2000.00
2	Khilan	25	Delhi	1500.00
3	kaushik	23	Kota	2000.00
4	Chaitali	25	Mumbai	6500.00
5	Hardik	27	Bhopal	8500.00
6	Komal	22	MP	4500.00
7	Muffy	24	Indore	10000.00

Orders

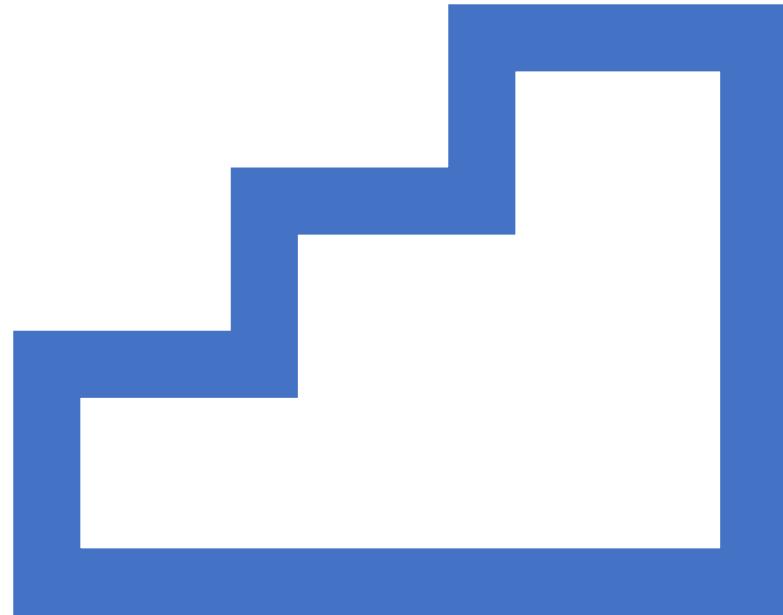
OID	DATE	CUSTOMER_ID	AMOUNT
102	2009-10-08 00:00:00	3	3000
100	2009-10-08 00:00:00	3	1500
101	2009-11-20 00:00:00	2	1560
103	2008-05-20 00:00:00	4	2060

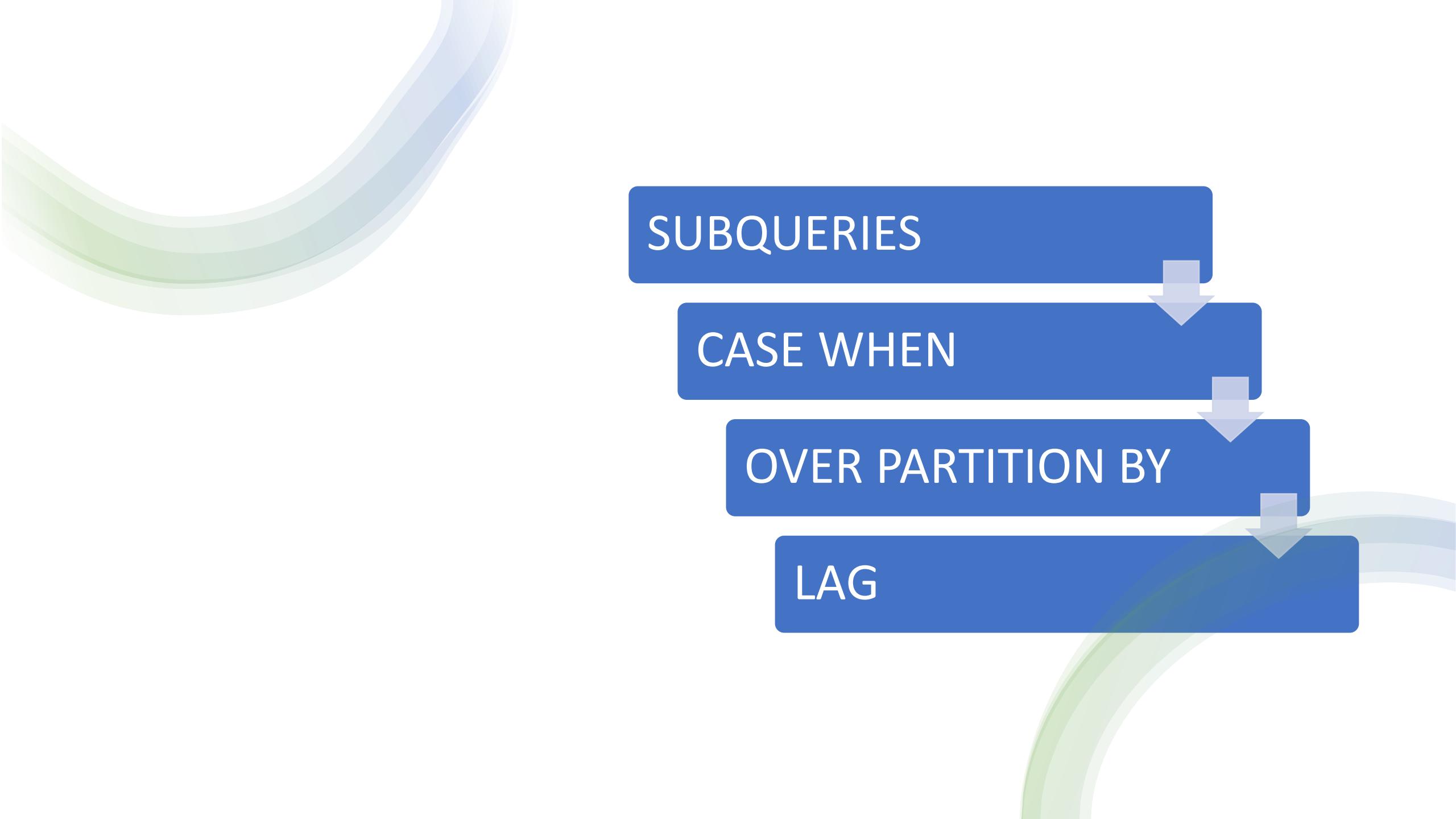
ID	NAME	AMOUNT	DATE
1	Ramesh	3000	2009-10-08 00:00:00
1	Ramesh	1500	2009-10-08 00:00:00
1	Ramesh	1560	2009-11-20 00:00:00
1	Ramesh	2060	2008-05-20 00:00:00
2	Khilan	3000	2009-10-08 00:00:00
2	Khilan	1500	2009-10-08 00:00:00
2	Khilan	1560	2009-11-20 00:00:00
2	Khilan	2060	2008-05-20 00:00:00
3	kaushik	3000	2009-10-08 00:00:00
3	kaushik	1500	2009-10-08 00:00:00
3	kaushik	1560	2009-11-20 00:00:00
3	kaushik	2060	2008-05-20 00:00:00
4	Chaitali	3000	2009-10-08 00:00:00
4	Chaitali	1500	2009-10-08 00:00:00
4	Chaitali	1560	2009-11-20 00:00:00
4	Chaitali	2060	2008-05-20 00:00:00
5	Hardik	3000	2009-10-08 00:00:00
5	Hardik	1500	2009-10-08 00:00:00
5	Hardik	1560	2009-11-20 00:00:00
5	Hardik	2060	2008-05-20 00:00:00
6	Komal	3000	2009-10-08 00:00:00
6	Komal	1500	2009-10-08 00:00:00
6	Komal	1560	2009-11-20 00:00:00
6	Komal	2060	2008-05-20 00:00:00
7	Muffy	3000	2009-10-08 00:00:00
7	Muffy	1500	2009-10-08 00:00:00
7	Muffy	1560	2009-11-20 00:00:00
7	Muffy	2060	2008-05-20 00:00:00

# DUDAS?



# SQL PRIMEROS PASOS



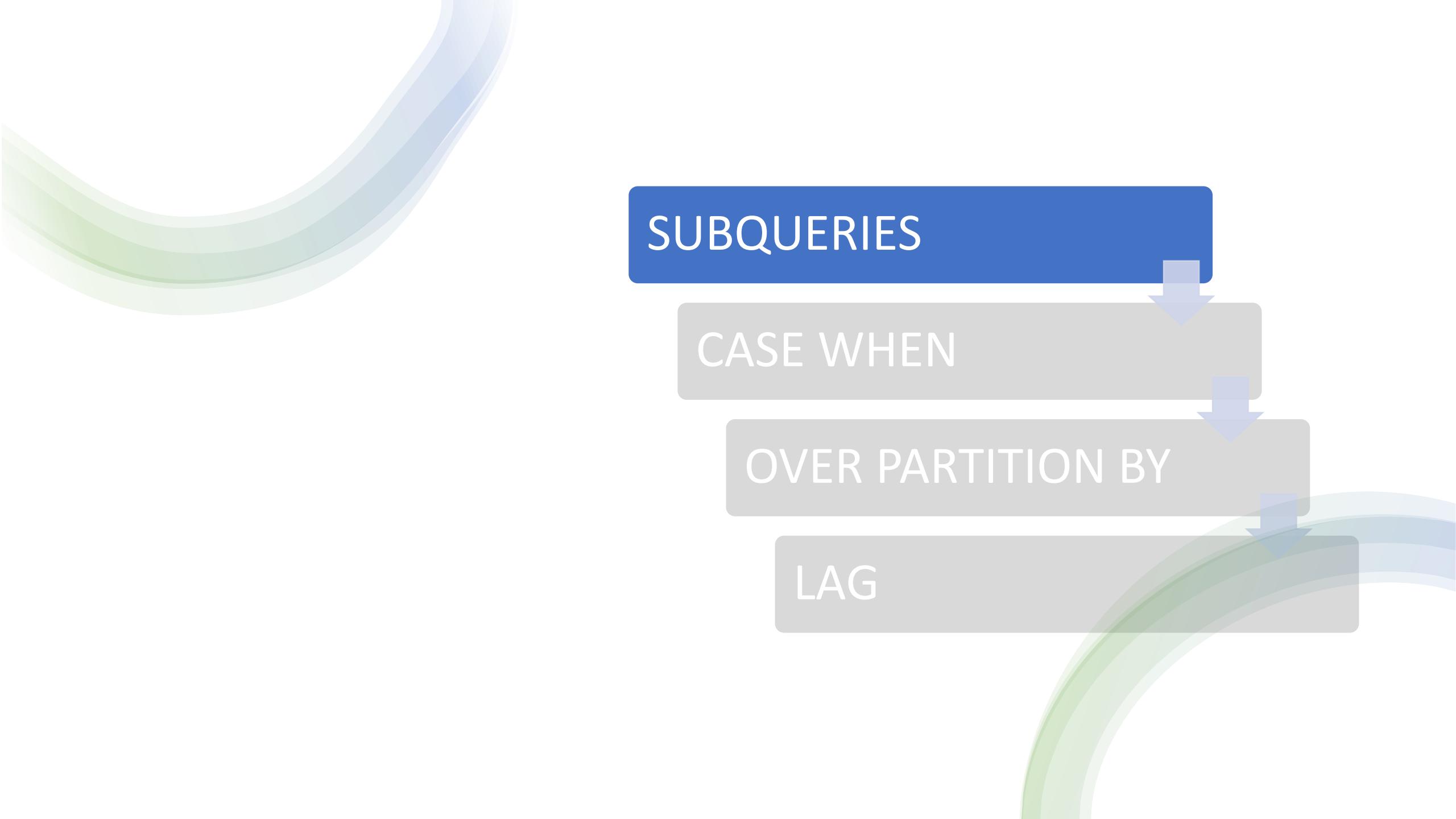


SUBQUERIES

CASE WHEN

OVER PARTITION BY

LAG



# SUBQUERIES

CASE WHEN

OVER PARTITION BY

LAG

# NESTED

- Syntax:

```
SELECT columnlist  
FROM (SELECT columnlist FROM tablelist);
```

```
SELECT columnlist  
FROM tablelist  
WHERE columnlist in ( SELECT columnlist FROM tablelist);
```

```
SELECT product, price, ( SELECT AVG (price) FROM tablelist ) avg_price  
FROM tablelist
```

# WITH

Permite hacer consultas intermedias (de la misma forma que una subquery ) pero de forma

ordenada y más simple cuando tenemos que hacer muchas. La idea es evitar anidar una subquery adentro de la otra y adentro de la otra y adentro de la otra, etc.

- Syntax

**WITH**

tabla1 **AS (SELECT columnlist FROM tablelist),**

tabla2 **AS (SELECT columnlist FROM tablelist)**

**SELECT \* FROM tabla1 INNER JOIN tabla2 ON tabla1.campo1 = tabla2.campo2;**



SUBQUERIES

CASE WHEN

OVER PARTITION BY

LAG

# CASE

The SQL CASE expression is a generic conditional expression, similar to if/else statements in other languages:

- Syntax:

```
SELECT name,  
CASE WHEN condition THEN result [WHEN ...] [ ELSE result ] END  
column_name  
FROM tablelist
```

# ENCUESTA

<https://docs.google.com/forms/d/1JS6CbCGs1WoSgPsPI322XPkvpAFtobGaV2i3xQQhyKc/prefill>