Iniciação em banco de dados

Introdução aos Bancos de Dados e PostgreSQL

Conceitos e Aplicações Práticas

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O que é PostgreSQL ?

É um sistema de gerenciamento de banco de dados objeto-relacional

ORDBMS - **O**bject-**R**elational **D**atabase **M**anagement **S**ystem

Início em 1985 e foi apresentada a primeira “demoware” em 1988.

Por que PostgreSQL?

Open-source.
Suporte a SQL padrão.
Escalável e robusto.

ACID?

ACID

- **A**tomicidade assegura que as transações sejam indivisíveis.
- **C**onsistência mantém a integridade do banco de dados.
- **I**solamento protege a execução independente de transações simultâneas.
- **D**urabilidade garante que os resultados das transações confirmadas sejam permanentes.

Diferença entre DDL e DML

DDL (**D**ata **D**efinition **L**anguage) é o conjunto de comandos SQL utilizados para definir ou alterar a estrutura do banco de dados e seus objetos (como tabelas, índices, visões) e geralmente são autocommit.
Ex.: CREATE, ALTER, DROP, TRUNCATE.

DML (**D**ata **M**anipulation **L**anguage) é o conjunto de comandos SQL utilizados para manipular os dados dentro das tabelas do banco de dados e podem ser controladas por transações.
Ex.: INSERT, UPDATE, DELETE , SELECT.

Convenção da documentação

Colchetes **[ ]** indicam partes opcionais.
Chaves **{ }** e linhas verticais “pipes” **|** indicam que deve escolher uma alternativa.
Pontos **...** significam que o elemento precedente pode ser repetido.

```
SELECT colunas
FROM tabela
[WHERE condições]
ORDER BY coluna, coluna ASC | DESC
[NULLS FIRST | LAST]
```

https://www.postgresql.org/docs/

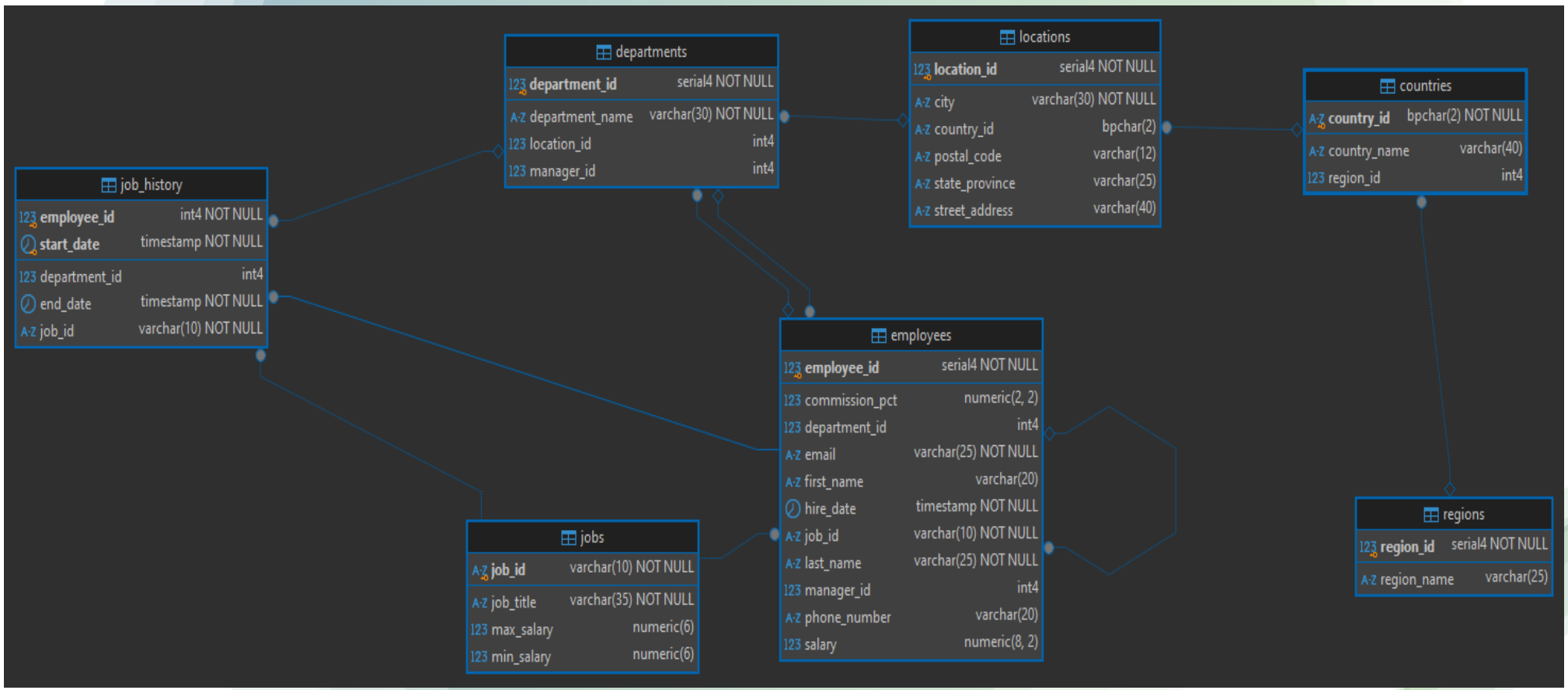
Instalando

https://www.postgresql.org/download/

https://www.pgadmin.org/download/

https://dbeaver.io/download/

Diagrama Entidade Relacionamento HR



https://gist.github.com/gourab5139014/b0b8e90c66acd5d0e9bcfebbff65d02a

HR_ORACLE_TO_POSTGRESQL.sql

Diagrama Entidade Relacionamento HR

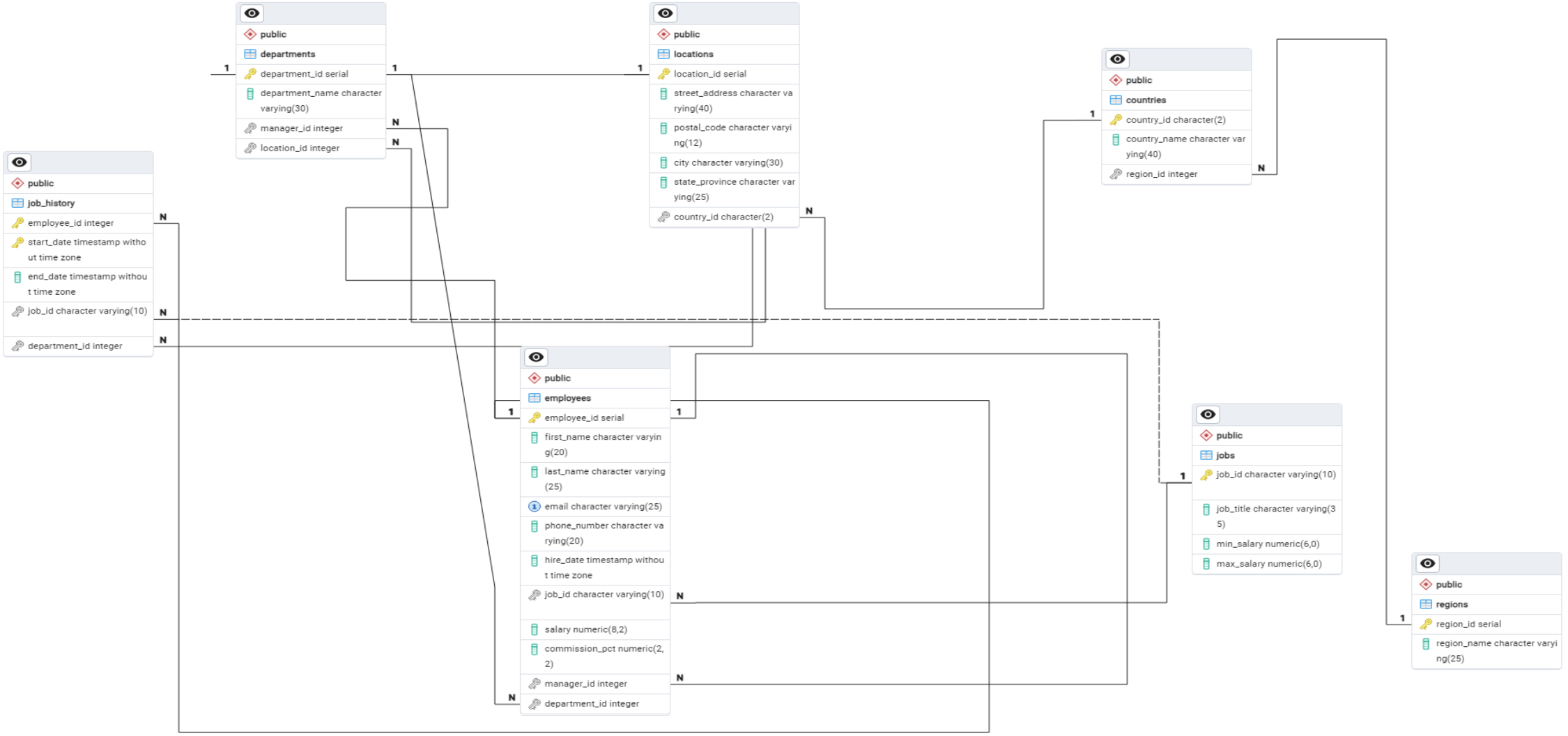


Diagrama Entidade Relacionamento HR

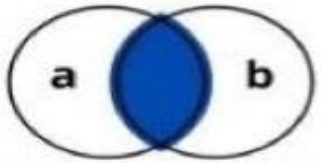
Commands / Clauses

SELECT	Select data from database
FROM	Specify table we're pulling from
WHERE	Filter query to match a condition
AS	Rename column or table with alias
JOIN	Combine rows from 2 or more tables
AND	Combine query conditions. All must be met
OR	Combine query conditions. One must be met
LIMIT	Limit rows returned. See also FETCH & TOP
IN	Specify multiple values when using WHERE
CASE	Return value on a specified condition
IS NULL	Return only rows with a NULL value
LIKE	Search for patterns in column
COMMIT	Write transaction to database
ROLLBACK	Undo a transaction block
ALTER TABLE	Add/Remove columns from table
UPDATE	Update table data
CREATE	Create TABLE, DATABASE, INDEX or VIEW
DELETE	Delete rows from table
INSERT	Add single row to table
DROP	Delete TABLE, DATABASE, or INDEX
GROUP BY	Group data into logical sets
ORDER BY	Set order of result. Use DESC to reverse order
HAVING	Same as WHERE but filters groups
COUNT	Count number of rows
SUM	Return sum of column
AVG	Return average of column
MIN	Return min value of column
MAX	Return max value of column

Order Of Execution

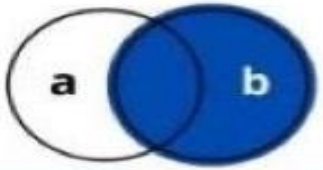
1. FROM
2. WHERE
3. GROUP BY
4. HAVING
5. SELECT
6. ORDER BY
7. LIMIT

Joins



a INNER JOIN b

a LEFT JOIN b



a RIGHT JOIN b

a FULL OUTER JOIN b

Examples

Select all columns with filter applied

```
SELECT * FROM tbl
WHERE col > 5;
```

Select first 10 rows for two columns

```
SELECT col1, col2
FROM tbl LIMIT 10;
```

Select all columns with multiple filters

```
SELECT * FROM tbl
WHERE col1 > 5 OR col2 < 2;
```

Select all rows from col1 & col2 ordering by col1

```
SELECT col1, col2
FROM tbl ORDER BY 1;
```

Return count of rows in table

```
SELECT COUNT(*)
FROM tbl;
```

Return sum of col1

```
SELECT SUM(col1)
FROM tbl;
```

Return max value for col1

```
SELECT MAX(col1)
FROM tbl;
```

Compute summary stats by grouping col2

```
SELECT AVG(col1) FROM tbl
GROUP BY col2;
```

Combine data from 2 tables using left join

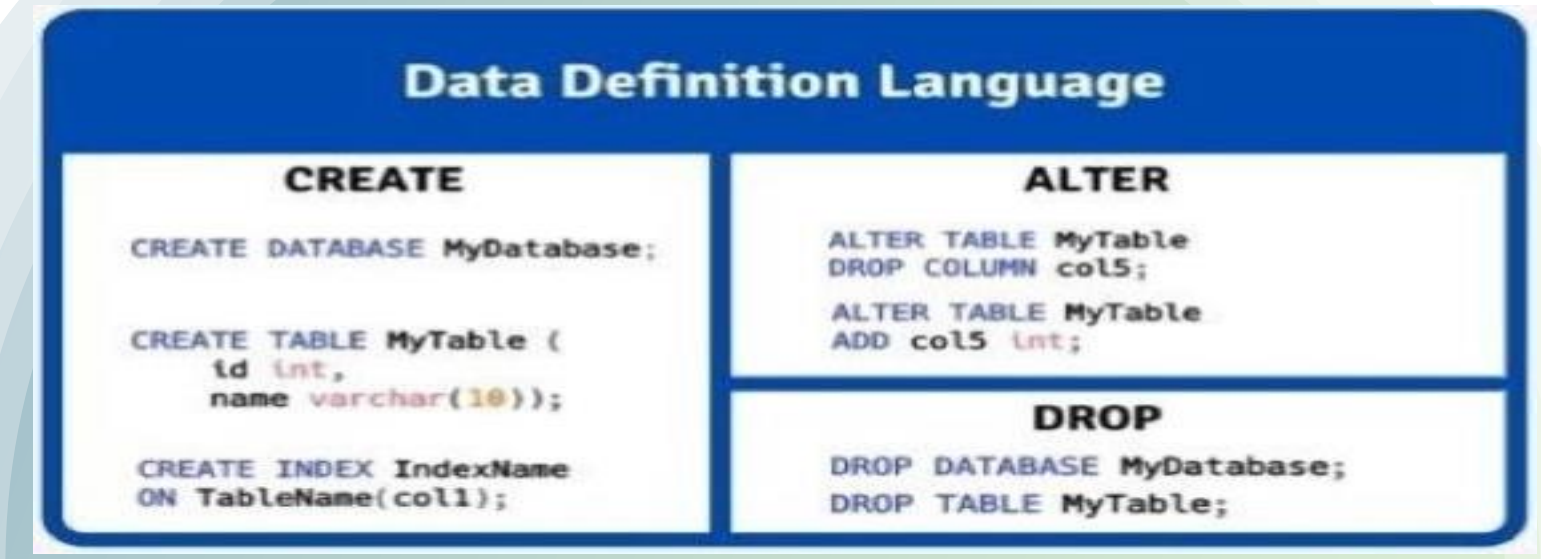
```
SELECT * FROM tbl1 AS t1 LEFT JOIN
tbl2 AS t2 ON t2.col1 = t1.col1;
```

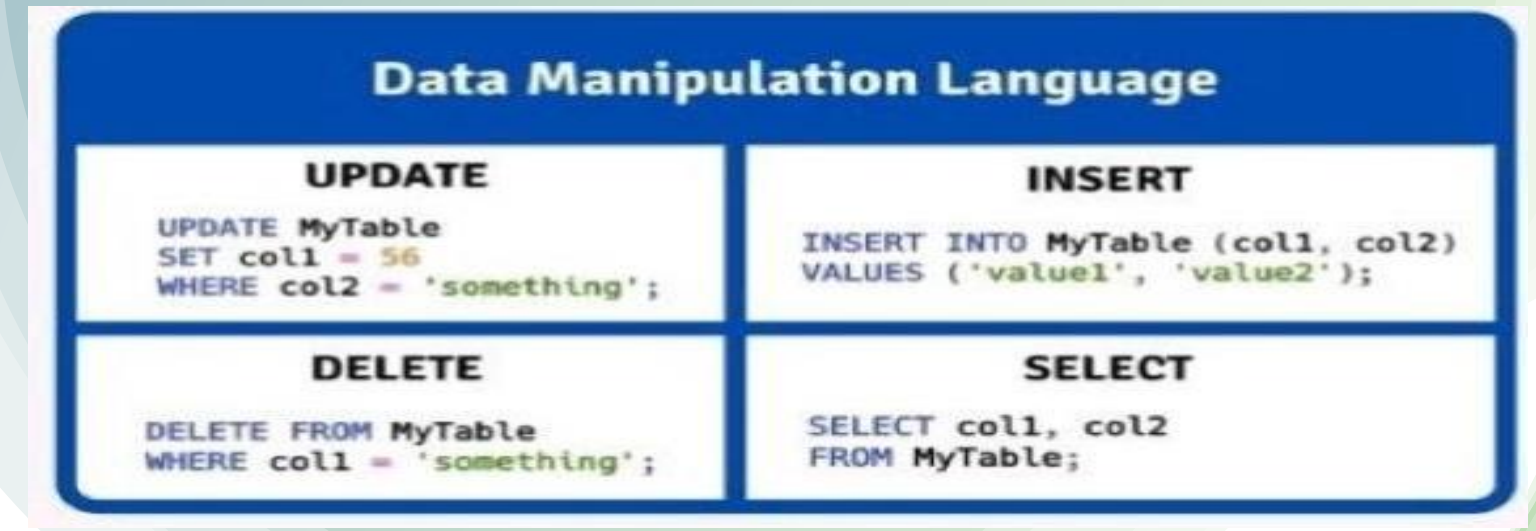
Aggregate and filter result

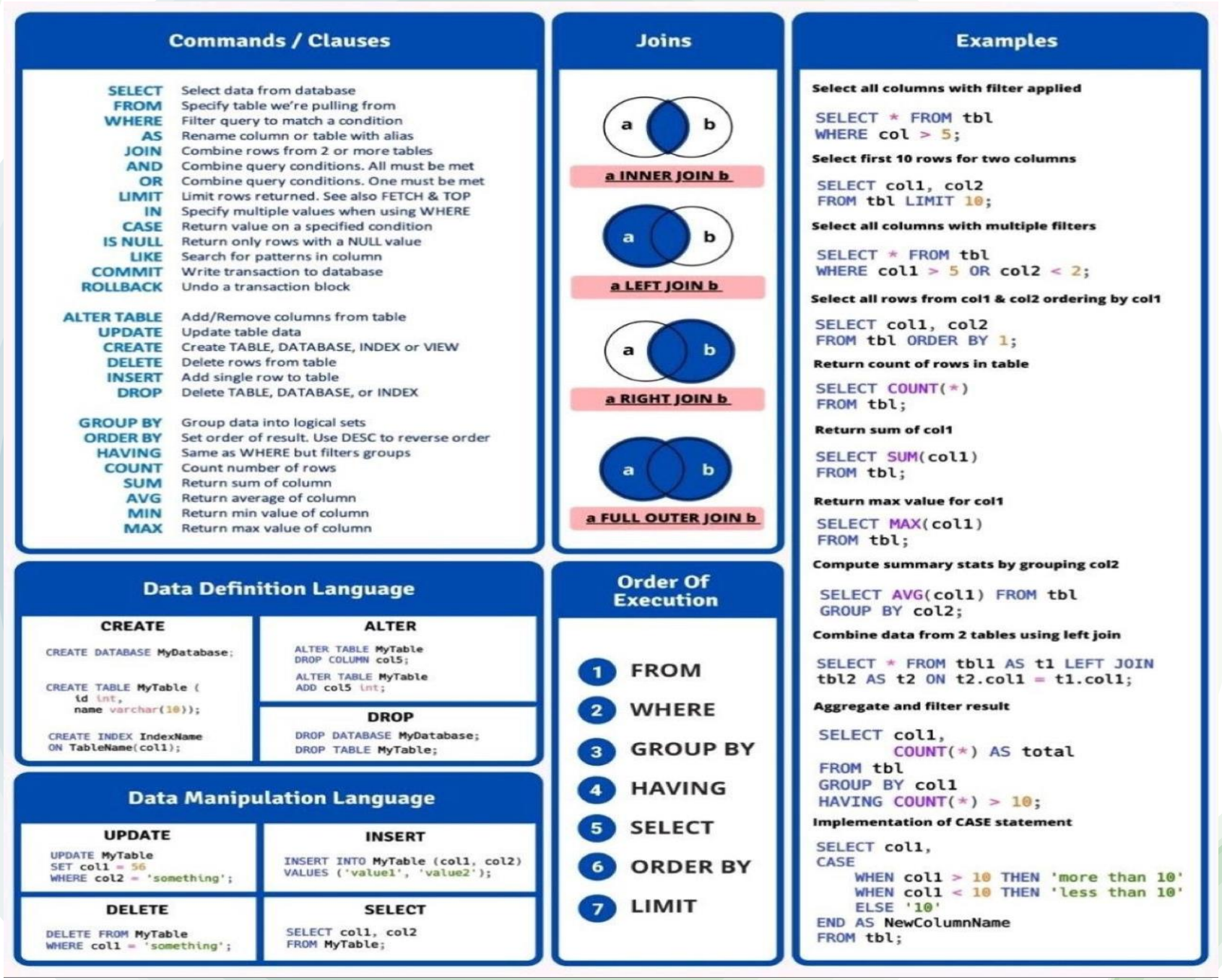
```
SELECT col1,
       COUNT(*) AS total
FROM tbl
GROUP BY col1
HAVING COUNT(*) > 10;
```

Implementation of CASE statement

```
SELECT col1,
CASE
     WHEN col1 > 10 THEN 'more than 10'
     WHEN col1 < 10 THEN 'less than 10'
     ELSE '10'
END AS NewColumnName
FROM tbl;
```


Data Definition Language
CREATE
CREATE DATABASE MyDatabase;
CREATE TABLE MyTable (
id int,
name varchar(10));
CREATE INDEX IndexName
ON TableName(col1);
ALTER
ALTER TABLE MyTable
DROP COLUMN col5;
ALTER TABLE MyTable
ADD col5 int;
DROP
DROP DATABASE MyDatabase;
DROP TABLE MyTable;


Data Manipulation Language
UPDATE
UPDATE MyTable
SET col1 = 56
WHERE col2 = 'something';
INSERT
INSERT INTO MyTable (col1, col2)
VALUES ('value1', 'value2');
DELETE
DELETE FROM MyTable
WHERE col1 = 'something';
SELECT
SELECT col1, col2
FROM MyTable;



https://www.reddit.com/r/SQL/comments/zi3uky/cheat_sheet_for_sql/?tl=pt-br#lightbox

Alguns aspectos avançados de SQL (Leandro Luque)

https://drive.google.com/file/d/1UI5MckuitOKc0TvS6rMGDKJGNYPTo39g/view?usp=drive_link

Obrigado!