



**Web**  
**MySQL**

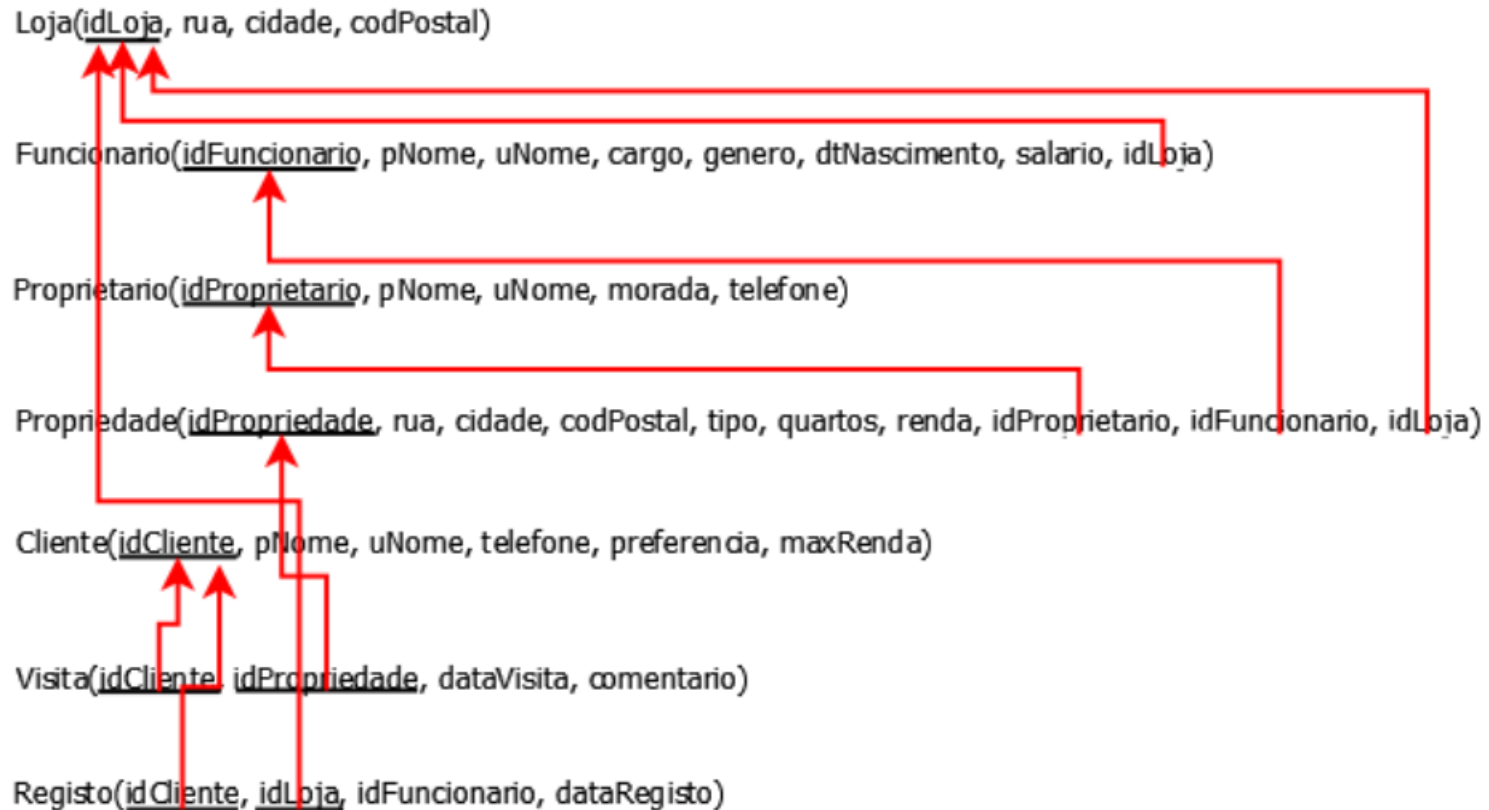
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## Example DB structure



## Data definition

Create a database:

```
CREATE SCHEMA [nome | AUTHORIZATION idCriador]
```

```
CREATE SCHEMA imobicasa;
```

- Creates a database named imobicasa

Delete a database:

```
DROP SCHEMA [RESTRICT | CASCADE]
```

```
DROP SCHEMA imobicasa;
```

- Deletes the database named imobicasa

## Tables

```
CREATE TABLE tabela
{(coluna tipoDados [NOT NULL] [UNIQUE]
[DEFAULT opcao] [CHECK (condicao)] [, ... ]}
[PRIMARY KEY (listOfColumns),]
{[UNIQUE (listaColunas)] [, ... ]}
{[FOREIGN KEY (listaForeignKeys)
REFERENCES tabelaForeignKey [(listaChaves)]
[MATCH {PARTIAL | FULL}
[ON UPDATE acao]
[ON DELETE acao]] [, ... ]}
{[CHECK (condicao)] [, ... ]}]
```

```
DROP TABLE tabela [RESTRICT | CASCADE]
```

### Example:

```
CREATE TABLE Loja(
    idLoja CHAR(4) PRIMARY KEY,
    rua VARCHAR(30),
    cidade VARCHAR(30),
    codPostal VARCHAR(10)
);
```

- Creates a table named Loja, with the following columns:
  - idLoja:** type CHAR(4): must be exactly 4 characters; primary key
  - rua:** type VARCHAR(30): can be up to 30 characters
  - cidade:** type VARCHAR(30)
  - codPostal:** type VARCHAR(10)

```
DROP TABLE Loja;
```

- Deletes table Loja

## Modify tables

ALTER TABLE tabela

[ADD [COLUMN] coluna tipoDados [NOT NULL] [UNIQUE]

[DEFAULT default] [CHECK (condicao)]]

[DROP [COLUMN] coluna [RESTRICT | CASCADE]]

[ADD [CONSTRAINT [restricao]] defRestricao]

[DROP CONSTRAINT restricao [RESTRICT | CASCADE]]

[ALTER [COLUMN] SET DEFAULT default]

[ALTER [COLUMN] DROP DEFAULT]

Add / **remoce** column

Add / **remove** restriction

Define / **undefine** default value

### Examples:

- Modify table Funcionario by removing the default 'Assistente' on cargo and making the default for column gênero be 'F'

```
ALTER TABLE Funcionario
    ALTER cargo DROP DEFAULT;
ALTER TABLE Funcionario
    ALTER gênero SET DEFAULT 'F';
```

- Modify table Propriedade by removing the restriction that the employees can not manage more than 100 houses. Modify table Cliente adding a new column representing the preference in number of rooms

```
ALTER TABLE Propriedade
    DROP CONSTRAINT menosDe100;
ALTER TABLE Cliente
    ADD prefNQuartos dQuartos;
```

## Selection

```
SELECT      [DISTINCT | ALL] {*} | [coluna [AS novoNome]] [, . . . ]}  
FROM        tabela [alias] [, . . . ]  
[WHERE      condicao]  
[GROUP BY   listaColunas] [HAVING condicao]  
[ORDER BY   listaColunas]
```

**SELECT:** specifies the columns to be selected

**FROM:** specifies the table or tables to be used

**WHERE:** filters the rows according to a condition

**GROUP BY:** groups the rows with the same value on a column

**HAVING:** filters the groups according to a condition

**ORDER BY:** specifies the result ordering

## Select all rows and columns

*Show all the data on **Funcionario***

```
SELECT idFuncionario, pNome, uNome, cargo, genero, dtNascimento, salario, idLoja  
FROM Funcionario;
```

or

```
SELECT *  
FROM Funcionario;
```

idFuncionario	pNome	uNome	cargo	genero	dtNascimento	salario	idLoja
SA9	Maria	Marques	Assistente	F	1970-02-19	9000	B007
SG14	David	Ferreira	Supervisor	M	1958-03-24	18000	B003
SG37	Ana	Santos	Assistente	F	1960-11-10	12000	B003
SG5	Susana	Silva	Gerente	F	1940-06-03	24000	B003
SL21	Joao	Alves	Gerente	M	1945-10-01	30000	B005
SL41	Julia	Borges	Assistente	F	1965-05-13	9000	B005



## Select specific columns, all rows

From table *funcionario*, show only *idFuncionario*, *pNome*, *uNome* and *salario*.

```
SELECT idFuncionario, pNome, uNome, salario  
FROM Funcionario;
```

idFuncionario	pNome	uNome	salario
SA9	Maria	Marques	9000
SG14	David	Ferreira	18000
SG37	Ana	Santos	12000
SG5	Susana	Silva	24000
SL21	Joao	Alves	30000
SL41	Julia	Borges	9000

## DISTINCT

*Show the numbers of the visited properties;*

```
SELECT idPropriedade  
FROM Visita;
```

idPropriedade
PG36
PG4
PG4
PA14
PA14



```
SELECT DISTINCT idPropriedade  
FROM Visita;
```

idPropriedade
PG36
PG4
PA14



## Calculated fields

Show the employees monthly salary (salario/12)

```
SELECT idFuncionario, pNome, uNome, salario/12
FROM Funcionario;
```

idFuncionario	pNome	uNome	salario/12
SA9	Maria	Marques	750.0000
SG14	David	Ferreira	1500.0000
SG37	Ana	Santos	1000.0000
SG5	Susana	Silva	2000.0000
SL21	Joao	Alves	2500.0000
SL41	Julia	Borges	750.0000

```
SELECT idFuncionario, pNome, uNome, salario/12 AS salarioMensal
FROM Funcionario;
```

idFuncionario	pNome	uNome	salarioMensal
SA9	Maria	Marques	750.0000
SG14	David	Ferreira	1500.0000
SG37	Ana	Santos	1000.0000
SG5	Susana	Silva	2000.0000
SL21	Joao	Alves	2500.0000
SL41	Julia	Borges	750.0000

## Select rows

### Basic conditions:

- Comparison: compare expression values
  - =, <, >, !=, <=, >=
  - AND e OR for more complex expressions
    - The expression is evaluated from left to right
    - Sub-expressions in parentheses evaluated first
    - NOT is evaluated before AND and OR
    - AND is evaluated before OR
- Interval: verify if the expression value belongs to an interval
- Member: verify if the expression value belongs to a set of values
- Pattern: verify if the expression corresponds to a pattern
- Null: verify if the expression value is NULL

## Select by comparison

*List the addresses of all the stores in Porto or Braga*

```
SELECT *  
FROM Loja  
WHERE cidade='Porto' OR cidade = 'Braga';
```

idLoja	rua	cidade	codPostal
B003	R. Central 34	Braga	1122
B007	Av. Aliados 2345	Porto	4321

## Patterns

**%** means any character sequence

**\_** means one character

**LIKE 'H%'** : the first character must be an H, the rest can be anything

**LIKE 'H\_ \_ \_'** : must have exactly 4 characters and the first must be an H

**LIKE '%e'** : any character sequence ending with an e

**LIKE '%Braga%'** : any character sequence containing Braga

**NOT LIKE 'H%'** : the first character can not be an H

If the string can contain character % or \_ we must use an escape character.

Example: **LIKE '15#%'** **ESCAPE '#'** to find the string '15#'

## Select by patterns

*Show all **Proprietarios** with **morada** containing Braga*

```
SELECT *  
FROM Proprietario  
WHERE morada LIKE '%Braga%';
```

idProprietario	pNome	uNome	morada	telefone
CO40	Telma	Silva	Rua Direita 123 Braga	253986758
CO87	Carolina	Marques	Rua do Meio 54 Braga	253985746
CO93	Antonio	Magalhães	Rua Principal 987 Braga	255098345

## Select by NULL

*Show the data on **Visita** where **comentario** is null*

```
SELECT *  
FROM Visita  
WHERE idPropriedade='PG4' AND comentario IS NULL;
```

idCliente	idPropriedade	dataVisita	comentario
CR56	PG4	2005-05-26	NULL



## Ordering

Show the data on **Funcionarios** ordered by **salario** descending

```
SELECT *  
FROM Funcionario  
ORDER BY salario DESC;
```

idFuncionario	pNome	uNome	cargo	genero	dtNascimento	salario	idLoja
SL21	Joao	Alves	Gerente	M	1945-10-01	30000	B005
SG5	Susana	Silva	Gerente	F	1940-06-03	24000	B003
SG14	David	Ferreira	Supervisor	M	1958-03-24	18000	B003
SG37	Ana	Santos	Assistente	F	1960-11-10	12000	B003
SA9	Maria	Marques	Assistente	F	1970-02-19	9000	B007
SL41	Julia	Borges	Assistente	F	1965-05-13	9000	B005

# INSERT

```
INSERT INTO tabela [(listaDeColunas)]
VALUES (listadeValores)
```

Example:

- Insert a new row on Funcionarios with data for all the columns

```
INSERT INTO Funcionario
VALUES('SG16','Andre','Brito','Assistente',
'M','1957-5-25',8300,'B003');
```

- Insert a new row on Funcionarios with data for idFuncionario, pNome, uNome, cargo, salario e idLoja

```
INSERT INTO Funcionario
(idFuncionario,pNome,uNome,cargo,salario,idLoja)
VALUES('SG16','Andre','Brito','Assistente',8300,
'B003')
```

```
INSERT INTO Funcionario
VALUES('SG16','Andre','Brito','Assistente',
NULL,NULL,8300,'B003')
```

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```
INSERT INTO tabela [(listaDeColunas)]
SELECT ...
```

Example:

- Insert in FuncionáriosGeral pNome, uNome and idLoja from Funcionario

```
INSERT INTO FuncionariosGeral
SELECT pNome, uNome, idLoja
FROM Funcionario;
```

- The query inside the select must have the same columns as the table we are trying to fill

# UPDATE

```
UPDATE tabela  
SET coluna1 = valor1 [, coluna2 = valor2, ...]  
[WHERE condicao]
```

- Update all the rows
  - Give a 3% raise on salario to every Funcionario

```
UPDATE Funcionario  
SET salario = salario*1.03;
```

- Update specific rows
  - Give a 5% raise to the employees with **cargo** gerente

```
UPDATE Funcionario  
SET salario = salario*1.05  
WHERE cargo = 'Gerente';
```

- Update multiple columns
  - Promote funcionario 'SG14' to gerente and give him a raise to 18000

```
UPDATE Funcionario  
SET cargo = 'Gerente', salario=18000  
WHERE idFuncionario = 'SG14';
```

## DELETE

```
DELETE FROM tabela  
[WHERE condicao]
```

- Delete everything
  - *Delete all rows from Visitas*

```
DELETE FROM Visitas
```

- Delete specific rows
  - *Delete the visitas to property 'PG4'*

```
DELETE FROM Visita  
WHERE idPropriedade = 'PG4';
```

## Subquery with equals

*Show funcionários that work on loja located on 'R. Central 34'*

```
SELECT *
FROM Funcionario
WHERE idLoja = (
  SELECT idLoja
  FROM Loja
  WHERE rua='R. Central 34'
);
```

idFuncionario	pNome	uNome	cargo	genero	dtNascimento	salario	idLoja
SG14	David	Ferreira	Supervisor	M	1958-03-24	18000	B003
SG37	Ana	Santos	Assistente	F	1960-11-10	12000	B003
SG5	Susana	Silva	Gerente	F	1940-06-03	24000	B003

## Chains of queries

*Show propriedades managed by funcionários that work on loja na 'R. Central 34'*

```
SELECT *
FROM Propriedade
WHERE idFuncionario IN (
  SELECT idFuncionario
  FROM Funcionario
  WHERE idLoja = (
    SELECT idLoja
    FROM Loja
    WHERE rua='R. Central 34')
);
```

idPropriedade	rua	cidade	codPostal	tipo	quartos	renda	idProprietario	idFuncionario	idLoja
PG16	R. Sameiro 87	Braga	1122	Apartamento	4	450	CO93	SG14	B003
PG21	R. Bom Jusus 32	Braga	1122	Moradia	5	600	CO87	SG37	B003
PG36	Av. Central 32	Braga	1122	Apartamento	3	375	CO93	SG37	B003

## Queries with multiple tables

Show **ids** and **nomes** of all **clientes** that visited a **propriedade**, the **propriedade** and the **comentários**

Clientes:

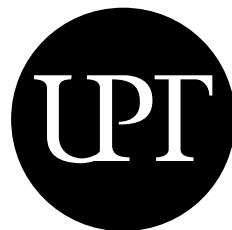
idCliente	pNome	uNome
CR56	Adelina	Santos
CR62	Maria	Pereira
CR74	Miguel	Silva
CR76	Joao	Alves

Visitas e comentários:

idCliente	idPropriedade	comentario
CR56	PG36	NULL
CR56	PG4	muito perto
CR56	PA14	demasiado pequeno
CR62	PA14	sem sala de jantar
CR76	PG4	demasiado longe

```
SELECT c.idCliente, pNome, uNome, idPropriedade, comentario
FROM Cliente c, Visita v
WHERE c.idCliente = v.idCliente;
```

idCliente	pNome	uNome	idPropriedade	comentario
CR56	Adelina	Santos	PG36	NULL
CR56	Adelina	Santos	PG4	NULL
CR56	Adelina	Santos	PA14	demasiado pequeno
CR62	Maria	Pereira	PA14	sem sala de jantar
CR76	Joao	Alves	PG4	demasiado longe



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