



LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT

UNIVERSIDADE DE LISBOA

Introduction to SQL

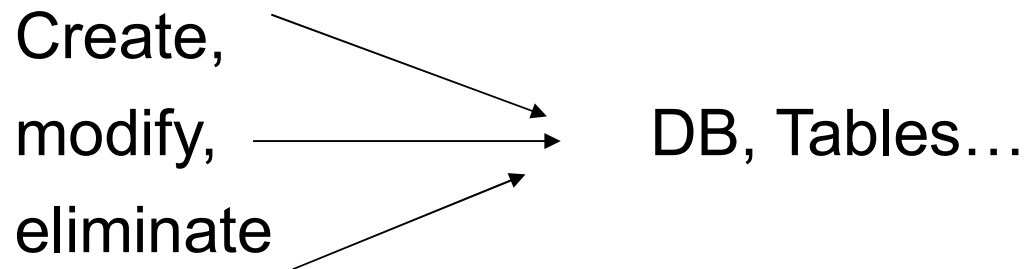
Carlos J. Costa

SQL

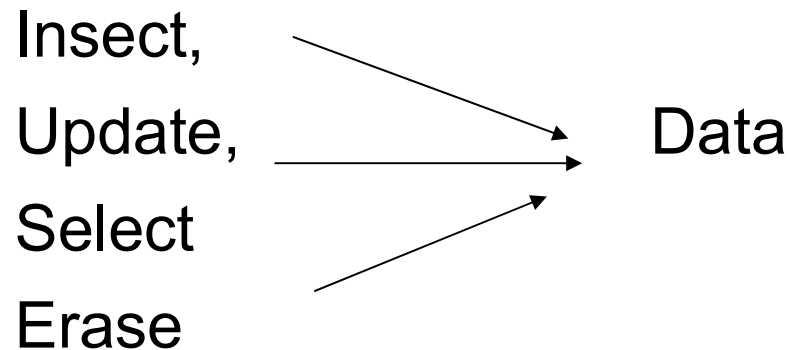
- Structured Query Language
- domain-specific language
- developed at IBM
- developed by Donald D. Chamberlin and Raymond F. Boyce
- in the early 1970s
- initially called SEQUEL

SQL

DDL - Data Definition Language



DML – Data Manipulation Language



SQL

How to select all ?

idClient	name	address	age
1	João Silva	Lisboa	37
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
4	Carla Silva	Lisboa	22
5	Leonor Santo	Porto	19
6	Catarina Marques	Porto	38

SQL

Select *

From Client

Where address="Lisboa"

idClient	name	address	age
1	João Silva	Lisboa	37
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
4	Carla Silva	Lisboa	22
5	Leonor Santo	Porto	19
6	Catarina Marques	Porto	38

SQL

Select name

From Client

Where address="Lisboa"

idClient	name	address	age
1	João Silva	Lisboa	37
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
4	Carla Silva	Lisboa	22
5	Leonor Santo	Porto	19
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SQL

Select name

From Client

Where age>30

idClient	name	address	age
1	João Silva	Lisboa	37
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
4	Carla Silva	Lisboa	22
5	Leonor Santo	Porto	19
6	Catarina Marques	Porto	38

SQL

Select <column>

From <Table>

Where <condition>

=, <>, Like, not, and, or,

List all the clients from Lisbon and all the clientes Porto:

Select *

From Client

Where address="Lisbon" or address = "Porto"

id	Client name	address	age
1	João Silva	Lisboa	37
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
4	Carla Silva	Lisboa	22
5	Leonor Santo	Porto	19
6	Catarina Marques	Porto	38

SQL

- Suppose you want all the orders of a client?

Client(idClient, name, address, age)

Order(idOrder, idClient, idProduct, value)

Select *

From Order

Where idClient=1

SQL

- Suppose you want all the orders of a client?

Client(idClient, name, address, age)

Order(idOrder, idClient, idProduct, value)

Select *

From Order, Client

Where name="João Silva"

SQL

- Suppose you want all the orders of a client?

Client(idClient, name,address,age)

Order(idOrder,idClient,idProduct,value)

Select *

From Order, Client

Where name="João Silva"

and

Client.idClient=Order.idClient



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Aggregation Functions

- Number of clients from Lisboa
- Average age of clients from Porto
- Youngest client from Lisboa
- Oldest client from Porto

idClient	name	address	age
1	João Silva	Lisboa	37
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
4	Carla Silva	Lisboa	22
5	Leonor Santo	Porto	19
6	Catarina Marques	Porto	38

SQL

- Number of clients from Lisboa

```
Select Count(idClient)
```

```
From Client
```

```
Where address= "Lisboa"
```

SQL

- Average age of clients from Porto

Select avg(age)

From Client

Where address = "Porto"

SQL

- Youngest client from Lisboa

Select min(age)

From Client

Where address = Lisboa

SQL

- Oldest client from Porto

Select max(age)

From Client

Where address = "Porto"

SQL

idClient	name	address	age
1	João Silva	Lisboa	37
4	Carla Silva	Lisboa	22
2	Maria Simões	Porto	21
3	Ana Marques	Porto	35
5	Leonor Santo	Porto	19
6	Catarina Marques	Porto	38

SQL

Select <fields>

From <Table>

Where <condition>

Group by <field>

- What is the average age per city

Select avg(age)

From Client

Group by address

SQL

- What is the average age per city of the clients older than 21 years old

Select avg(age)

From Client

Where age >21

Group by address

SQL

- What is the average age per city of our clients where the average age less than 60 years old

Select avg(age)

From Client

Group by address

Having avg(age)<60