

Database Fundamentals

CE2103 - Algorithms and Data Structures II

Disclaimer / Descargo de Responsabilidad

Esta presentación corresponde a una guía usada por el profesor durante las clases. La misma ha sido modificada para ser utilizado en el modelo de cursos asistidos por tecnología. No es una versión final, por lo que la misma podría requerir todavía hacer algunos ajustes. Para aspectos de evaluación esta presentación es solo una guía, por lo que el estudiante debe profundizar con el material de lectura asignado y lo discutido en clases para aspectos de evaluación.

This presentation corresponds to a guide material used by the professor during classes. It has been modified to be used in the model of technology-assisted courses. It is not a final version, so it may still require some adjustments. For evaluation aspects, this presentation is only a guide, so the student should delve with the assigned reading material and what has been discussed in class.

Database Design Process

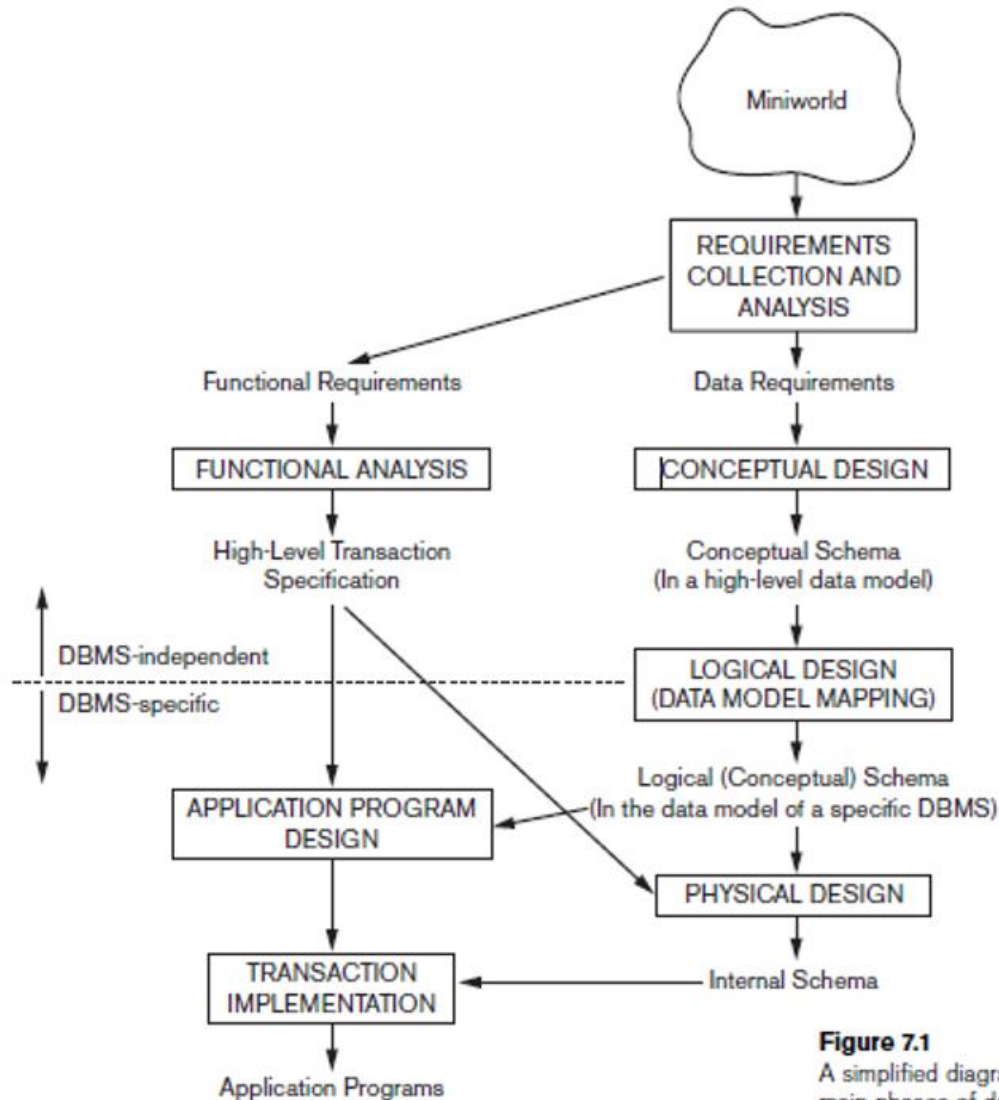


Figure 7.1
A simplified diagram to illustrate the main phases of database design.

Introduction

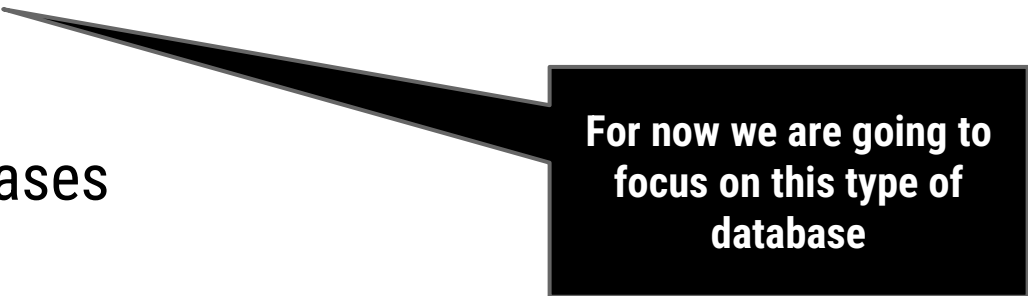
- Database refers to a set of related data and the way it is organized.
- A database is designed, built, and populated with data for a specific purpose. It has an intended group of users and some preconceived applications in which these users are interested.
- Examples:
 - ◆ Bank to deposit or withdraw funds.
 - ◆ Hotel or airline reservation.
 - ◆ Access a computerized library catalog.
 - ◆ Purchase something online.

Types of Databases

- Relational Databases
- Object-Oriented Databases
- Distributed Databases
- NoSQL Databases
- And other types

Types of Databases

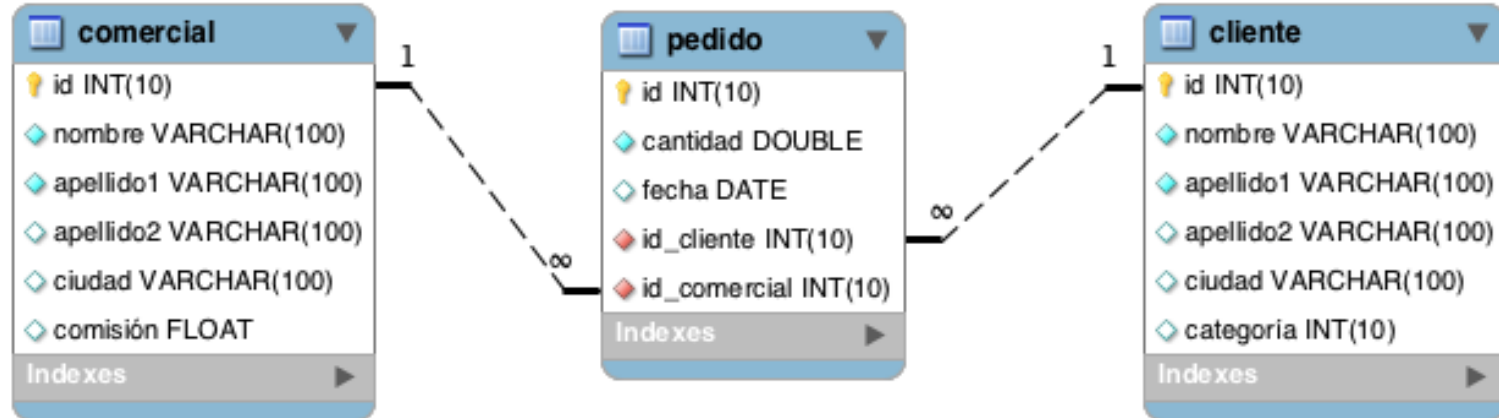
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- Object-Oriented Databases
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- NoSQL Databases
- And other types



**For now we are going to
focus on this type of
database**

Relational Database

→ The elements of a relational database are organized as a set of tables with columns and rows.



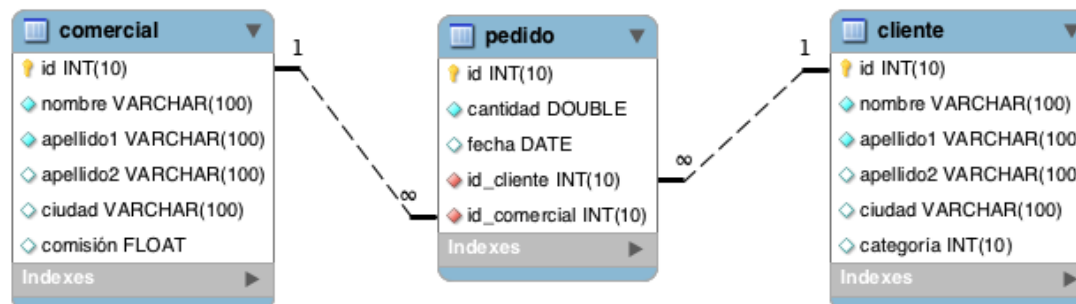
Sentencia SELECT

DESCRIPTION

→ Recover info from Database.

SINTAXIS

```
SELECT    <attribute list>
FROM      <table list>
WHERE     <condition>;
```



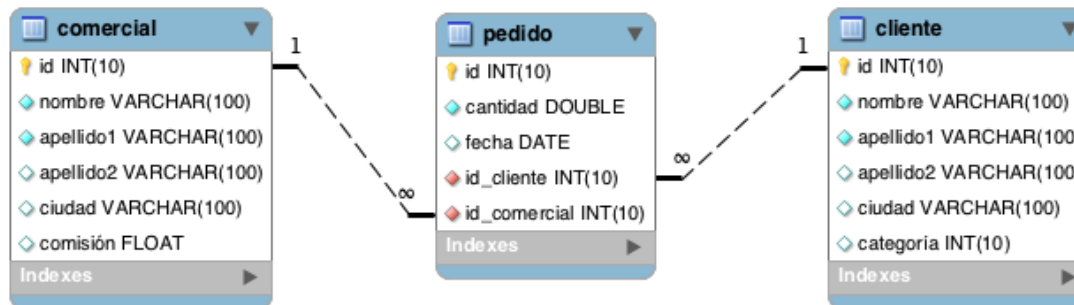
Sentencia INSERT

DESCRIPTION

→ Used to add rows in a table.

SINTAXIS

```
INSERT INTO EMPLOYEE (Fname, Lname, Dno, Ssn)
VALUES ('Richard', 'Marini', 4, '653298653');
```



Sentencia DELETE

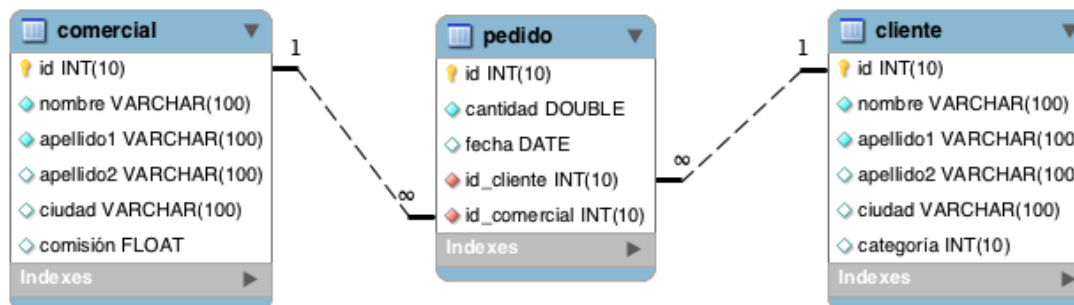
DESCRIPTION

→ Used to remove rows from a table.

SINTAXIS

```
DELETE FROM EMPLOYEE  
WHERE Ssn='123456789';
```

```
DELETE FROM EMPLOYEE;
```



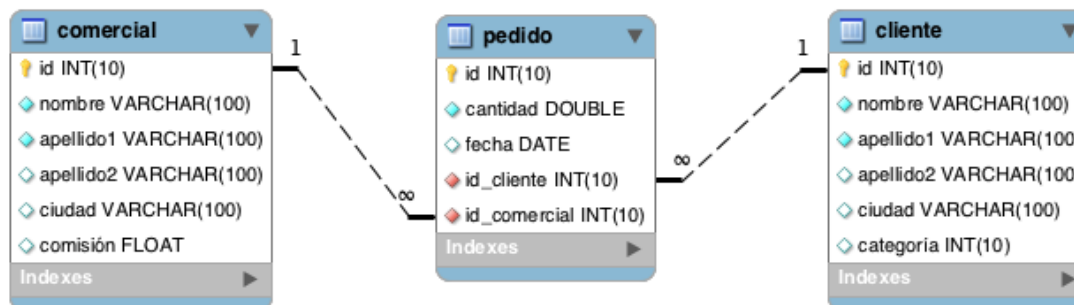
Sentencia UPDATE

DESCRIPTION

→ Used to modify the information of the rows of a table.

SINTAXIS

```
UPDATE PROJECT  
SET Plocation = 'Bellaire', Dnum = 5  
WHERE Pnumber=10;
```

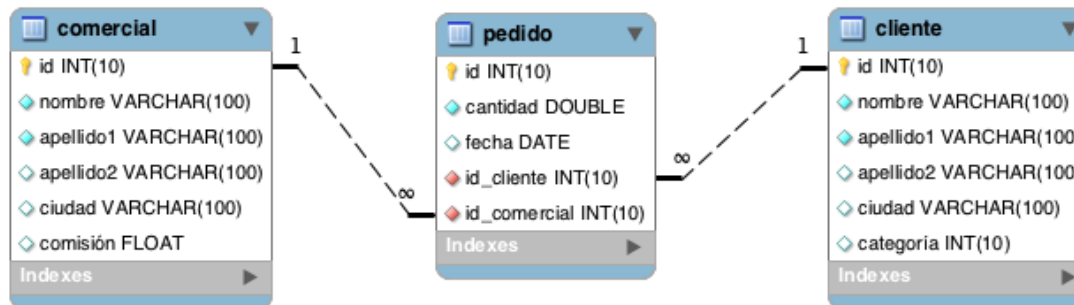
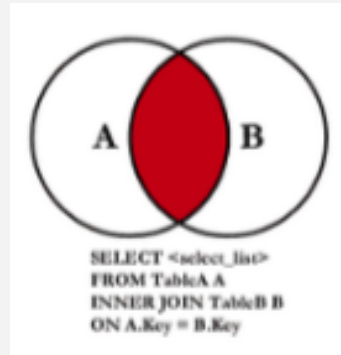


Sentencia INNER JOIN

DESCRIPTION

→ Join information from different tables with some attribute in common.

SINTAXIS



NoSQL Database

- A NoSQL database, or non-relational database, allows you to store and manipulate unstructured and semi-structured data.
- Unlike a relational database, which defines how all the data inserted into the database should be composed).

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