

Introduction to databases

Introduction to databases

Databases today are essential to every business. They are used to maintain internal records, to present data to customers and clients on the World-Wide-Web, and to support many other commercial processes.

Introduction to databases

Databases are likewise found at the core of many scientific investigations. They represent the data gathered by astronomers, by investigators of the human genome, and by biochemists exploring the medicinal properties of proteins, along with many other scientists.

Databases and DataBases Management Systems (DBMS)

The DATA and DATABASE

There are three scopes or worlds of data:

- ❑ The real world
- ❑ The conceptual world
- ❑ The representations world

Databases and DataBases Management Systems (DBMS)

The real world: they are the objects of the reality, and whose will be manage.

Databases and DataBases Management Systems (DBMS)

The conceptual world: Set knowledges obtained from the real world. These sets depends on the viewer.

Databases and DataBases Management Systems (DBMS)

The representations world: it is the set of computer representations of the world. They are required to work with data.

Databases and DataBases Management Systems (DBMS)

Data and its representation.

DATA are computer representation of available information. It makes reference to interesting for us real world objects.

REPRESENTATIONS WORLD is set up by the worked computerized data

Databases and DataBases Management Systems (DBMS)

Two stages are necessities in order to convert the real world to computer data; they are:

1. Logic Design
2. Physical Design

Databases and DataBases Management Systems (DBMS)

Logic Design

It works with the abstract model of data. That model is obtained at the end of the conceptual model stage. The aim of this stage is translate the real world to the data model used by DBMS

Databases and DataBases Management Systems (DBMS)

Physical Design

It is the stage where we increase the operation efficiency.

Databases and DataBases Management Systems (DBMS)

Entity, attribute and value.

The information is defined by three elements:

1. entity
2. attribute
3. value

Databases and DataBases Management Systems (DBMS)

Entity

The ENTITY word is some object of the reality conceptualised and we are interested in some characteristics of it.

There are two entities: Entity type is a generic word used in the real language and Entity request is a specific object

Databases and DataBases Management Systems (DBMS)

For example:

car is an Entity type.

your car with ID is 1234 BCD

is an Entity Request

Databases and DataBases Management Systems (DBMS)

Attributes: entity properties which are interested.

Example: the car entity 1234 BCD is
type, color, glass, hp, cc.

Databases and DataBases Management Systems (DBMS)

Value: are the values of the attributes

Example: the car entity 1234 BCD is
sportive, black, dark, 147hp, 3.5 cc.

Databases and DataBases Management Systems (DBMS)

About ENTITY there are two types:

type entity: is a generic entity or, more correctly, is an abstraction of a real things set. F.i.: a car

instance entity: is a real world object conceptualization. F.i.: the car licence plate

Attributes data type and domain

All the value set that an attribute can take is called **domain**.

A data type define a value set with some common characteristics, these characteristics make compatibilities, then operations about that could be defined.

Attributes data type and domain

Example of type of data

Let integer set be as a type of data. Operation like plus, minus, times can be defined but the exact division can't be defined on this set.

Attributes data type and domain

Example of type of domain

You consider the spanish licence driver (DL).
When you lose all the points, the DL is revoked
and you must pass the exam another time.

The number of points is from 0 to 15, this is
the domain in this case.

Null Value

The expression *null value* indicate that any value is associated to that attribute of an entity.

For instance, a person who don't have the DL, doesn't have points, neither 0.

Keys and ID attributes

An identifier attribute (ID) permits identify unmistakably an entity from the rest. Its value is unique.

For instance, the number of ID card is unique for everyone.

Keys and ID attributes

The set of ID attributes is called keys.
For example: The postal code is a key on shopping of department stores.

Tabular representations and its implementation

The information is the result of analyze and of make concepts from the real world.

There are representations which aren't efficient to see the information, and it is necessary use a good representation. The most used is the tabular representation.

Tabular representations and its implementation

On the tabular representation every row represents an instance entity, every column represents an attribute and every cell contains the value pertinent.

Tabular representations and its implementation