

A decorative graphic on the left side of the slide, consisting of a network of light blue lines and small circles, resembling a circuit board or a neural network, extending from the top and bottom edges towards the center.

WEEK 2

PROPERTIES OF RELATIONS

CS3319

STUDENT OBJECTIVES

- Upon completion of this video, you should be able to:
 - Identify at least 5 properties of relations
 - Identify mistakes in relations that make the relation(s) invalid

relational
database

group of
entries

PROPERTIES OF RELATIONS:

• Each relation name is

unique

• Each cell in a relation contains 1 atomic value → Normalized, First Normal Form

• Each attribute name within a table is

unique

• The values of an attribute are from the same domain

• The order of the attributes has no significance *normally put the key first*

• Each tuple is distinct (no duplicates)

• The order of the tuples has no significance (Tuples in a relation do not have any particular order, however in a file records are physically stored on disk so there is always an order among records. Note: we may chose to display the records in a particular order)

CONSIDER

In a database, we could not have two entries have same name.

The order of tuples and the order of attributes makes no difference.

This relation, see a problem?

in a table, all attributes must be unique.

This database, see a problem?

EMPLOYEE:

THINGY TABLE:

THINGY_TABLE2:

DEPARTMENT 2: **2Thingv** **7Thingv**

SSN	FirstName	LastName	DeptID	Name	Location
123	Laura	Reid	CS	Computer Science	MC
005	Bob	Bryant	Ma	Mathematics	MC
125	Sylvia	XThingy	SA	Statistics and Actuarial Sciences	NCB, WSC
137	Bob	Apple	BI	Biology	BG, NCB

not normalized

Orange	Cat	77	Narrower	Cat	Orange	77
Apple	Bird	77		Dog	Apple	77
Orange	Pig	77		Pig	Orange	77

122	Henler	Simpson
555	Ned	Flanders
138	Milhouse	Smith

each cell⁴ could have only one valve

- MOST OF THE PROPERTIES ARE FROM MATHEMATICAL RELATIONS

- Since a relation is a set, the order doesn't matter, therefore the order of the tuples doesn't matter.
- In a set, no elements are repeated, therefore tuples are unique
- Mathematical Relations are not necessarily *normalized* (reduced redundancy) however Codd chose Relations to be.
- In a relation, possible values for a given position are determined by the set or domain on which the position is defined, thus in a table the values in a column must come from the same domain.

Example:

Relation (or Table)

Employee

Attribute: (there are 5 attributes in this table)

SSN	FirstName	LastName	Department	Position
123	Laura	Reid	Computer Science	Lecturer
005	Bob	Bryan	Math	Professor
125	Sylvia	Osborn	Computer Science	Professor
137	Bob	Bryan	Math	Professor

Key (each tuple must be different)

Tuple (there are 4 tuples in this table)

Domain Sample Domain: domain of SSN is 000 to 999 in this table