WEEK 2

PROPERTIES OF RELATIONS

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

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
- 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

This relation, see a problem?

This relation, see a problem?

This relation, see a problem?

This database, see a problem?

THINGY_TABLE:

THINGY_TABLE2:

DEPARTMENT:

EMPLOYEE:

SSN	FirstName
123	Laura
005	Bob
125	Sylvia
137	Bob

DeptID	Name	Location
CS	Computer Science	MC
Ma	Mathematics	MC
SA	Statistics and Actuarial Sciences	NCB, WSC
BI	Biology	BG, NCB

XThingy		
Apple		
Orange	Cat	77
Apple	Bird	77
Orange	Pig	77

Cat	Orange	77
Dog	Apple	77
Pig	Orange	77

555	Ned	Flanders
138	Milhouse	Smith

- 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:

Attribute: (there are 5 attributes in this table)

Relation (or Table)

Employee

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