Foundation Concepts

Entity Types and Attributes

ER Modelling Primitives

- Refer to page 31, table 2.1

- Example of the primitives of an "INSTRUCTOR" entity type and one of its attributes... the Gender attribute

Real World Primitive		Conceptual World Primitive	
Object	Juan Lopez – the actual person	Entity	the data that represents Juan Lopez
Object type	Instructor	Entity Type	Instructor
Property	Gender	Attribute	Gender
Fact (of property)	Male	Value (of attribute)	"M"
Property Value Set	{Male, Female}	Domain (of attribute)	{"M", "F"}
Association	Teaches Course	Relationship	Teaches Course
Object class	Employee	Entity class	Employee

Entity Types must be

- A **single** noun (person, place, or thing)
  - Employees   EMPLOYEE
    - (name of an entity type should be capitalized)
- Represents an object type

- A set of related *attributes*

Entity Type examples

Entity Type: STUDENT

- Possible Attributes:
    - Name
    - Student ID
    - Address
    - Date of Birth
    - Age
    - Health conditions
    - Date applied
    - Date accepted
    - Seniority level

Entity Type: COURSE

- Possible attributes:
    - Course Number
    - Course Description
    - Number of Credits
    - Date first taught
    - Textbook

Attributes and their characteristics

- See page 32, table 2.2
- Examples of attributes of the entity type INSTRUCTOR

Attribute Characteristics	
Name (of attribute)	Gender
Type	alphabetic
Classification	Atomic
Category	Single-Valued
Source	Stored
Domain	{"M", "F"}
Value	"M"
Optionality	Mandatory
Role	Non-key

Attribute Characteristics	
Name (of attribute)	Birthdate
Type	date/time
Classification	Atomic
Category	Single-Valued
Source	Stored
Domain	must be a date
Value	1/10/1965
Optionality	mandatory
Role	Non-key

Attribute Characteristics	
Name (of attribute)	SSN
Type	alphanumeric
Classification	Atomic
Category	Single-Valued
Source	Stored
Domain	9 consecutive digits
Value	123456789
Optionality	mandatory
Role	Key

Attribute Characteristics	
Name (of attribute)	Age
Type	Numeric
Classification	Atomic
Category	Single-Valued
Source	Derived (from birthdate)
Domain	< 110?
Value	49
Optionality	Mandatory
Role	Non-key

Attribute characteristics - continued

- Category – multi-value examples
  - (artists in album, skills of an employee, health conditions of a student)

- Classification – Atomic vs Composite
  - Name = FirstName, Middle Initial, Last Name
  - Address = StreetAddress, City, State, Postal Code (Figure 2.1, p33)

Constraints

- Needed to preserve **data integrity**

- Usually tied to **business rules**

- 2 types of constraints
  - Domain constraints are applied to attributes
  - Unique identifier constraints are applied to entity types

Modelling an entity type

- Book Version – see page 38, figure 2.4

- Review Visio version in class