IFSM410 Database Systems

"Concern for man himself and his fate must always form the chief interest of all technical endeavor. Never forget this in the midst of your diagrams and equations."
- Albert Einstein (1879 - 1955)

Topics

E-R Diagraming

Chapter 4

Entity Relationship Modeling

Entity Relationship Modeling

E-R Model

Graphical Model

Visual representation

Types of Models

Conceptual (Logical) Model

Internal Model

External Model

Physical Model

Logical Database Design

Identify important entities
- Relate entities to objectives
- Standardize names and formats
- Identify Sources of data

Define attributes
- Identify ownership of data

Logical Database Design

Identify Relationships
between entities

Normalize entity relationships
- Reduce redundancy and anomalies

Internal Database Design

Implement Database System

Physical Database Design

Let the RDBMS do it
Map logical design
to computer devices

Iterative Design

Back and Forth
Design, test, re-design

- Requirements
- Entities and Attributes
- Relationships
- Normalize
- Implement

Prototypes

First Version

Plan to throw away

Sample data, small size

Test Major Features, User I/F

The Process

From the problem Description

Step 1: Identify Important Entities

Step 2: Define Attributes

Step 3: Identify Relationships

In-class

Classify the following relationships

1. person to driver's license
2. person to social security number
3. student to classes taken
4. employee to dependents
5. employee to spouse
6. customer to purchase order
7. person to hospital record

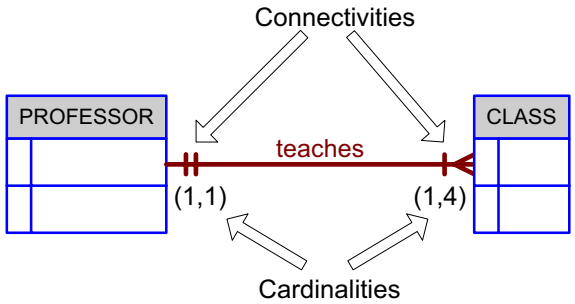
E-R Model Components

ERA Models
- Entity
- Relationship
- Attribute

Meta Edit

ER Details

Cardinality
- Limit the number of occurrences



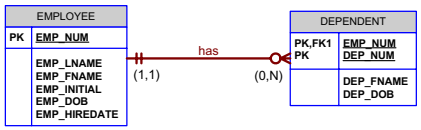
ER Details

Existence Dependency
- Does the Foreign Key Exist?

Mandatory / Optional
- 1,N 0,N

ER Details

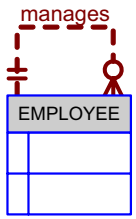
Weak Entities
- Employee to Dependent

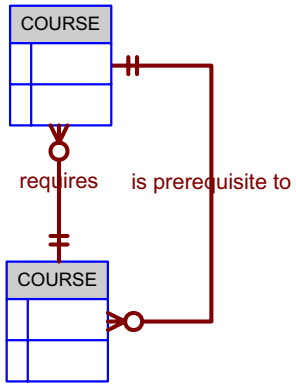


- Course to Class

ER Details

Recursive
- Pre-req Courses
- Mangers





Developing an E-R Model

A good work through of Developing an E-R Model

Pages 124 - 130

Converting E-R to DB

Entities become tables

Attributes become fields

Relationships become links

In-Class

Work In Small Groups

Page 137

Problem 3 - Department Store
Problem 4 - Temporary Employment

Problem 3 - Department Store

Use the following business rules to write all appropriate connectivities in the E-R diagram:

a. A department employs many employees, but each employee is employed by one department.
b. Some employees, known as "rovers," are not assigned to any department.
c. A division operates many departments, but each department is operated by one division
d. An employee may be assigned to many projects, and a project may have many employees assigned to it.
e. A project must have at least one employee.
f. One of the employees manages each department, and each department is managed by only one employee.
g. One of the employees runs each division, and each division is run by one employee.

Problem 4 - Temporary Employment

Temporary Employment Corporation (TEC) places temporary workers in companies during peak periods. TEC's manager gives you the following description:

- TEC has a file of candidates who are willing to work.
- If the candidate has worked before, that candidate has a specific job history.
- Each candidate has several qualifications. Each qualification may be earned by more than one candidate.
- TEC also has a list of companies that request temporaries.
- Each time a company requests a temp, TEC makes an entry in the openings folder which contains an opening number, company name, required qualifications, starting date, anticipated ending date, and hourly pay.
- Each opening requires only one specific or main qualification.
- When a candidate matches the qualification, (s)he is given the job, and an entry is made in the Placement Record folder. This folder contains an opening number, candidate number, total hours worked, and so on. In addition, an entry is made in the job history for the candidate.
- TEC uses special codes to describe a candidate's qualifications for an opening. Example:
  PRG-C++ Programmer, C++

TEC wants to keep track of the following entities:
COMPANY, OPENING, QUALIFICATION, CANDIDATE
JOB_HISTORY, PLACEMENT

Draw an accurate, complete ER diagram.

Homework: 1 of 2

Problem 6, Page 138 (Automata, Inc)

Design ER Model

Create and print using MetaEdit
2 copies

Do the best you can
Nothing Handwritten!

Homework: 2 of 2

Find a better ER diagram tool
NOT A DRAWING PROGRAM!

Email program name and location
Only One Chance - get it right
No Changing Later
Issues... Limitations, Legal, etc...

Each Team will Submit 2 programs
2 members download, test & submit
2 different members present

Next Class

Exam!

More E-R work, then exam
Covers Chapters 1,2,3,4
Classes 1-4

Exam Format: Multiple Choice, Written

After Exam: Group Work

End of Lesson