

CS422 Principles of Database Systems
From ER to Relations

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*Adapted from Jeffrey Ullman's lecture notes at
<http://www-db.stanford.edu/~ullman/dscb.html>*

Relation

Attributes (fields)

Name	Manufacturer
Winter Brew	Pete's
Bud Lite	Anheuser-Busch

Tuples (Records) (Rows)

Beers

Relation schema:
Beers(name, manufacturer)
or Beers(name:string, manufacturer:string)

About Relational Model

- ◆ Attributes values must be atomic
- ◆ No order among attributes
- ◆ No order among tuples

Convert ER Diagram to Relations

- ◆ Entity sets
- ◆ Relationships
- ◆ Weak entity sets
- ◆ Subclasses

Entity Sets

Drinkers(name, addr)

Beers(name, manf)

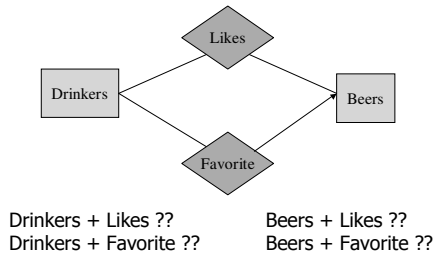
Relationships

husband

wife

??

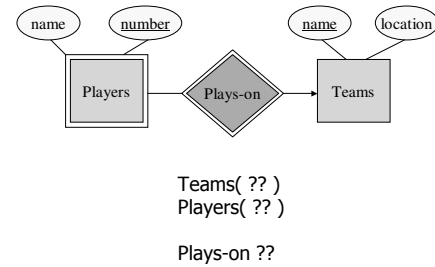
Combining Relations



Weak Entity Sets

- ◆ Relation for a weak entity set includes its *complete key* as well as its own non-key attributes
- ◆ A supporting relationship is redundant and yields no relation

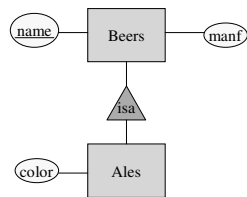
Weak Entity Set Example



Subclasses

- ◆ Object-oriented approach
 - One relation per class
 - Each entity belongs to exact one relation
- ◆ ER approach
 - One relation per class
 - Each entity may appear in multiple relations
- ◆ NULL approach
 - One relation per class hierarchy

Subclass Example



Object-Oriented Approach

name	manf
Bud	Anheuser-Busch

Beers

name	manf	color
Summerbrew	Pete's	dark

Ales

ER Approach

name	manf
Bud	Anheuser-Busch
Summerbrew	Pete's

Beers

name	color
Summerbrew	dark

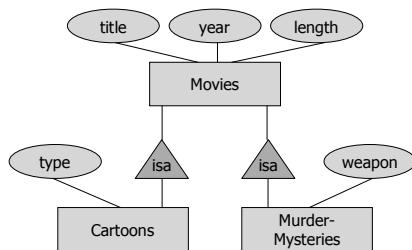
Ales

NULL Approach

name	manf	color
Bud	Anheuser-Busch	NULL
Summerbrew	Pete's	dark

Beers

Another Subclass Example



Comparison of Subclass Conversion Approaches

- ◆ Constraints and data integrity
- ◆ Query performance

Q1: find all beers made by Pete's
Q2: find colors of the ales made by Pete's