Beyond ER Model: UML

Conceptual Data Modeling

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Learning Objectives

By the end of this video, you will be able to:

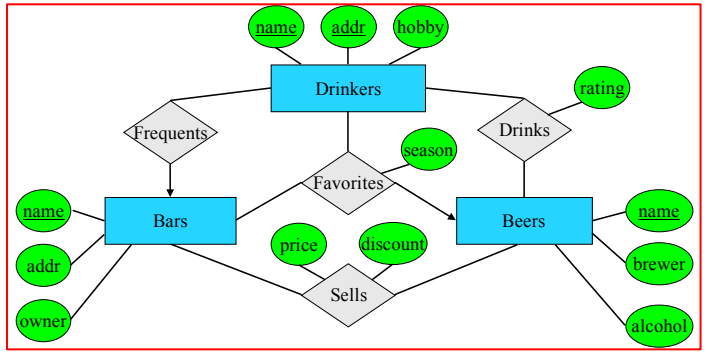
- Identify the key notions in the ER model.
- Describe how these notions are specified in UML.
- Create conceptual models in UML.

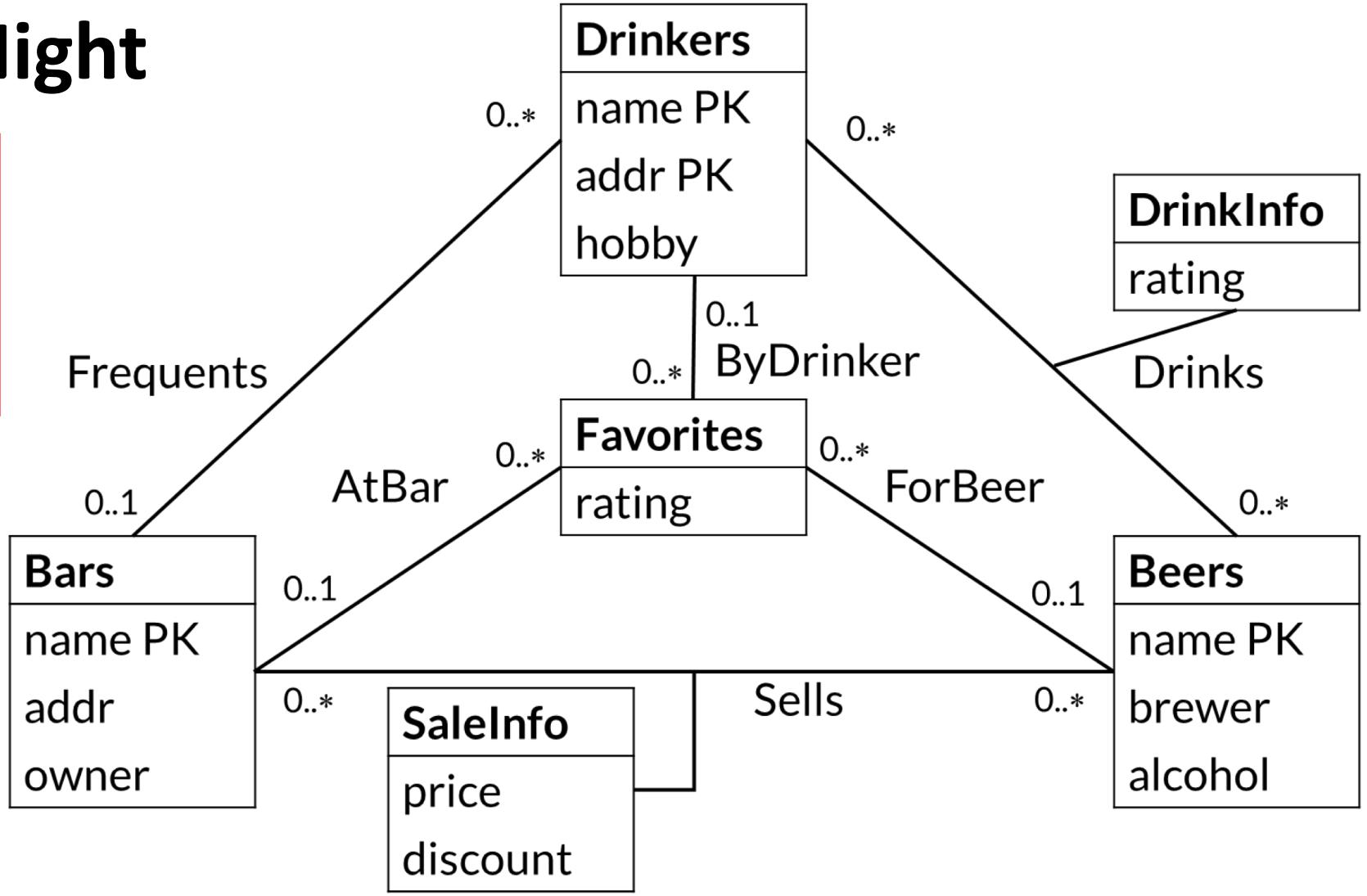
Other Models Exist, but Concepts Similar

- ER model is simple and natural.
- ER model corresponds well to relational model.
  - Relational model is a physical data model, used by relational databases.
  - ER model thus
    - becomes popular conceptual design before concretizing to relational model.
    - provides semantic interpretation for physical “relations”.
- ER model is graphical-- intuitive to create and view.
- Concepts of other models are similar.

- We will contrast with UML (Unified Modeling Language).

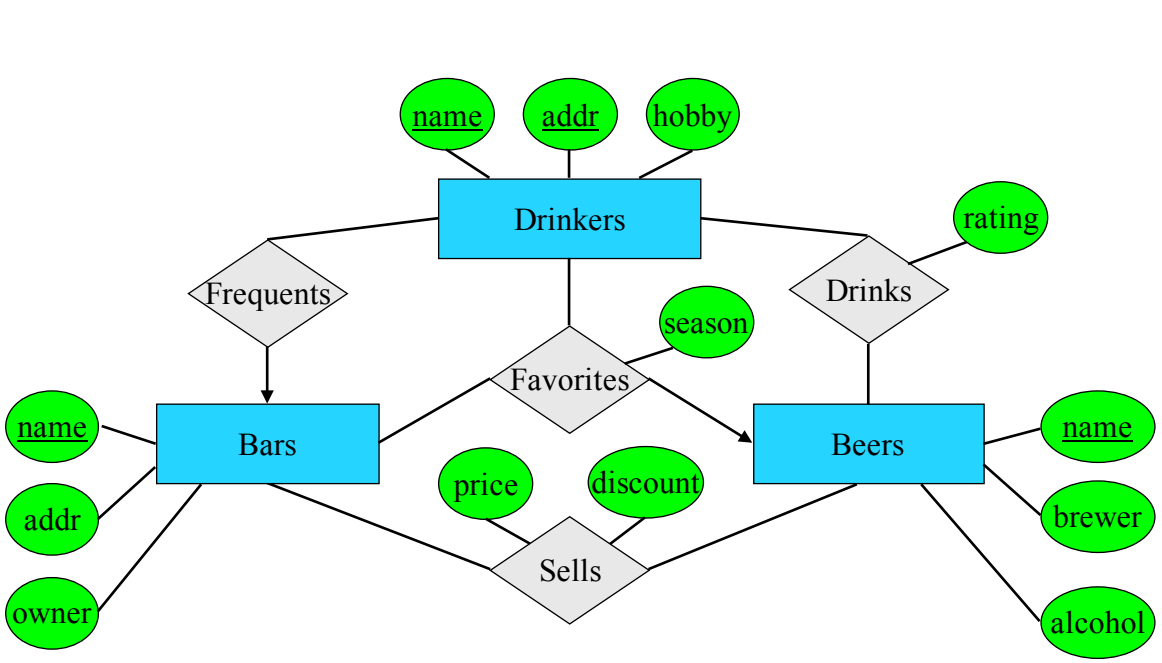
UML: Friday Night



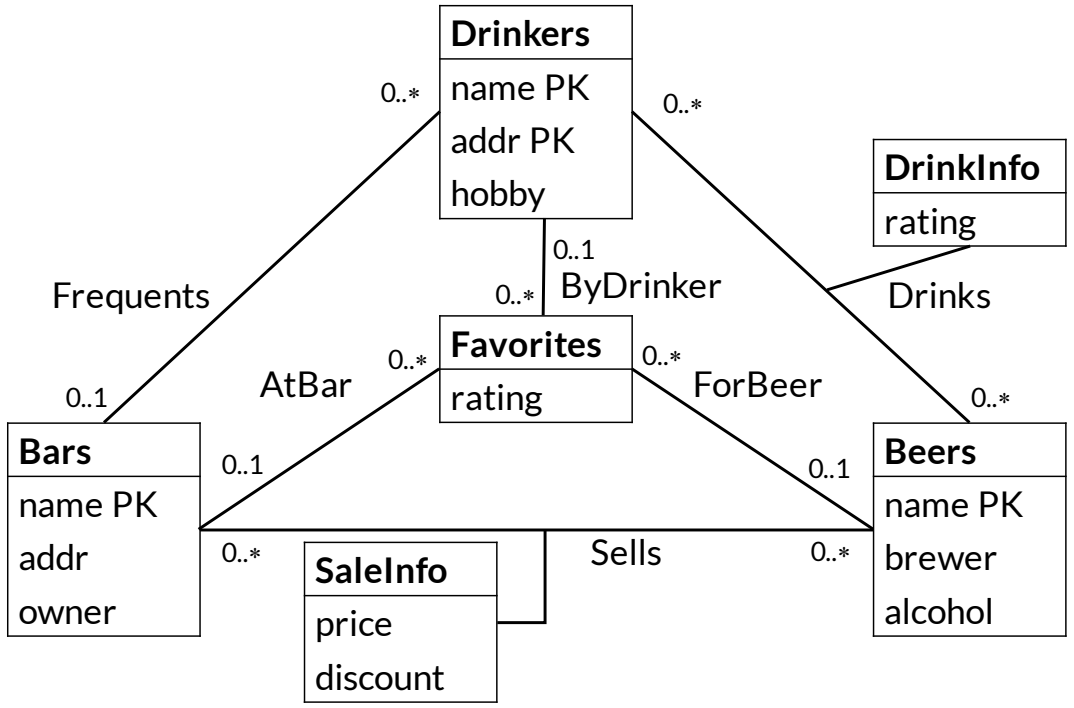


From ER to UML diagram for example application Friday Night

ER Model vs. UML: *Entity Set → Class*

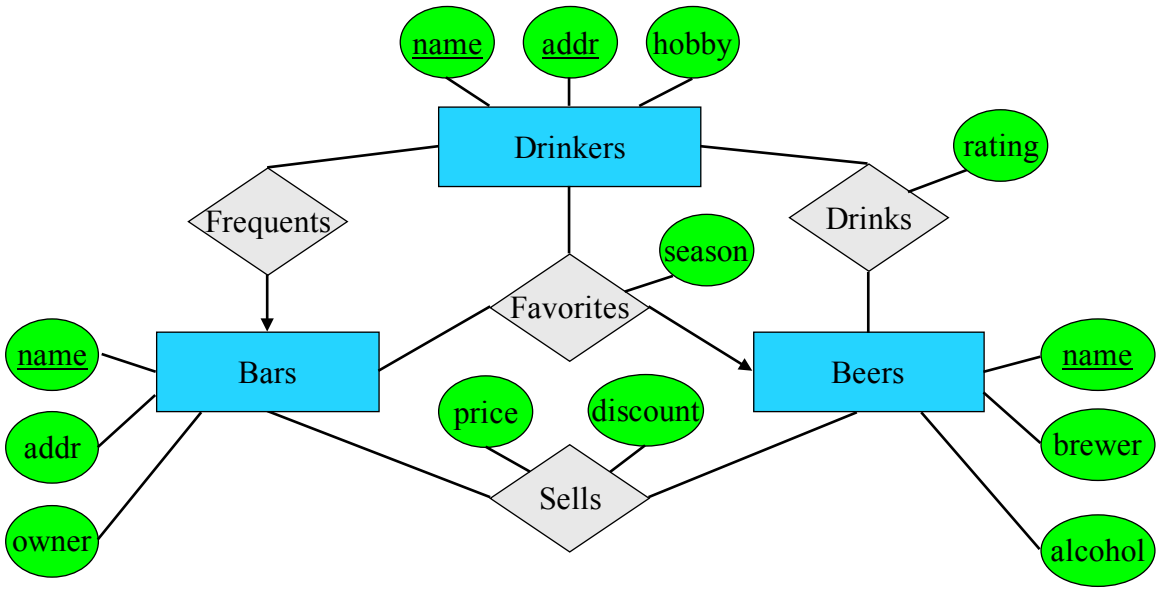


vs.



ER model vs. UML for example application Friday Night

ER Model vs. UML:
Relationship → Association and Association Classes



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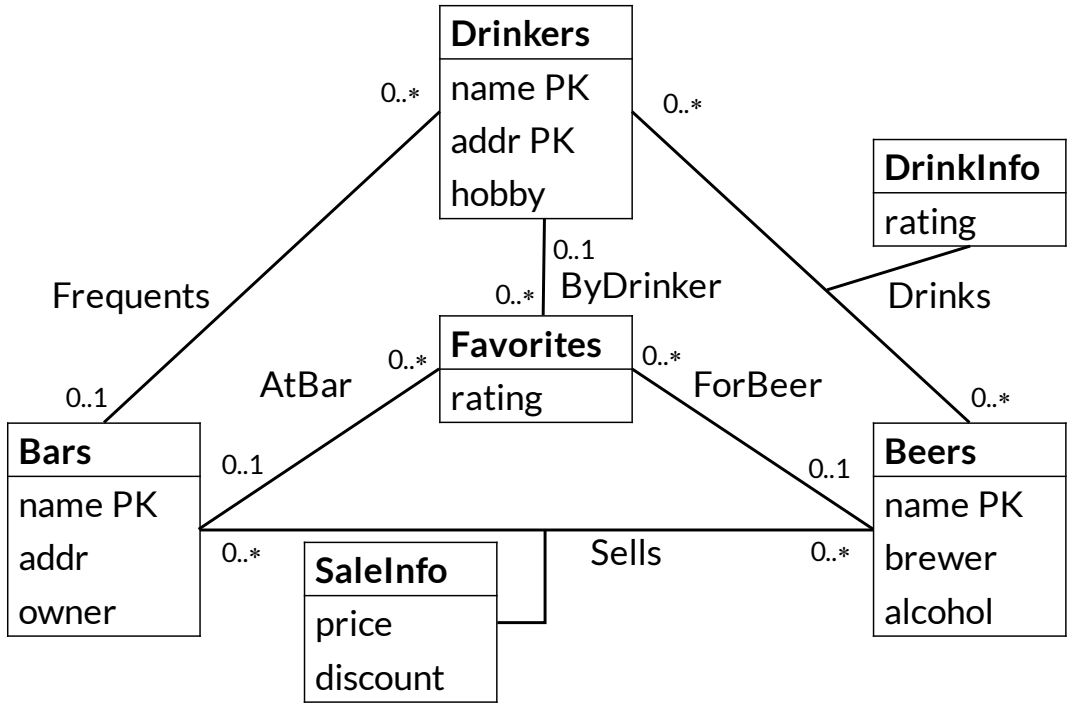
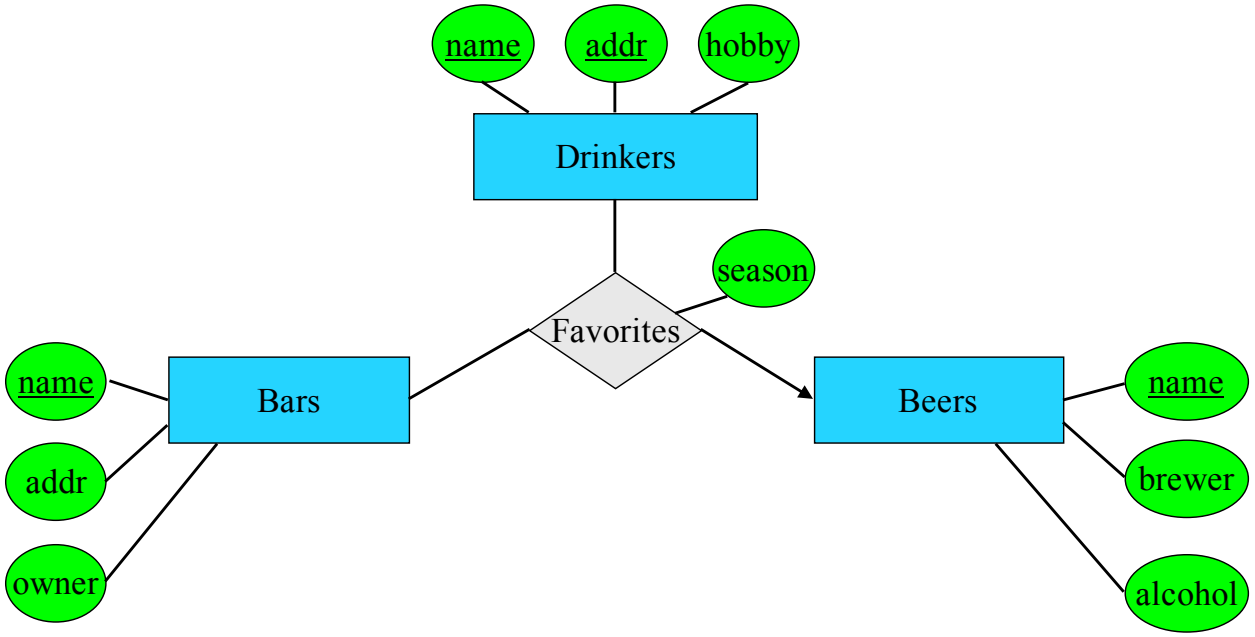


ER model vs. UML for example application Friday Night

UML Allows Binary Associations Only

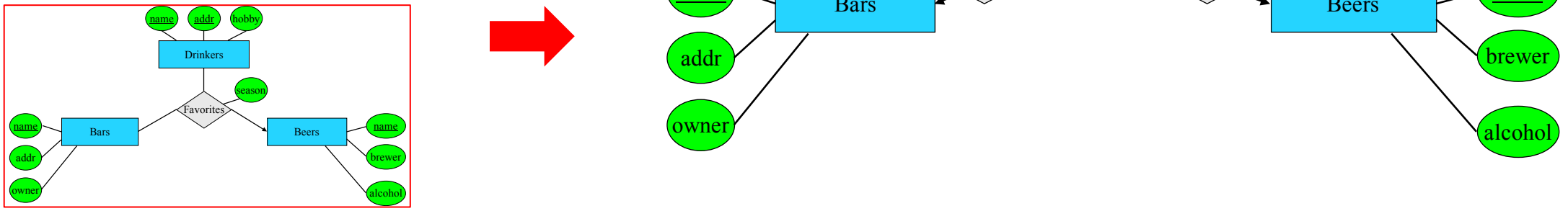


vs. ?

Example three-way relationship Favorites

K-way Can Be Expressed as *K* Binaries

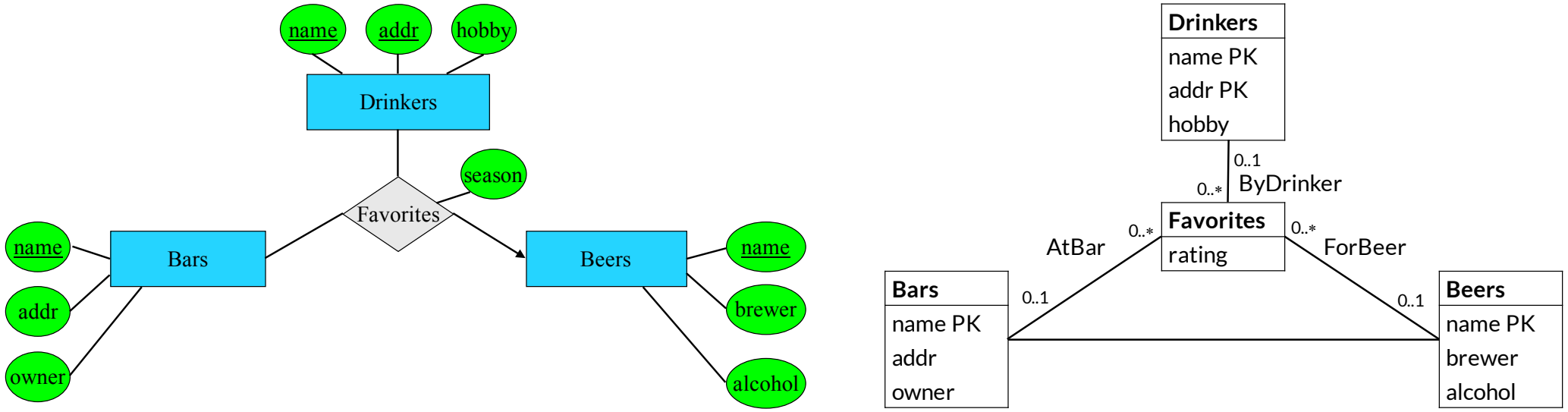
- A multiway relationship is just a combination of (zero or) one entity from each entity set.
- We can represent that combination as an entity.
- That new entity will connect to each entity set with arrows.



Converting multiway relationship to binary ones

ER Relationship vs. UML Association

	ER Model	UML
Cardinality	binary, multiway	binary
Multiplicity	arrow, round arrow, <= n	m..n



ER relationship vs. UML relationship

Food for Thought

It may not be quite right to say that the conversion from k-way to k-binaries as we did is fully equivalent. Compare the following two conversions. What happens?