

Try US Congress handout

- The US Congress is composed of the House of Representatives and the Senate.

Review of Constraints

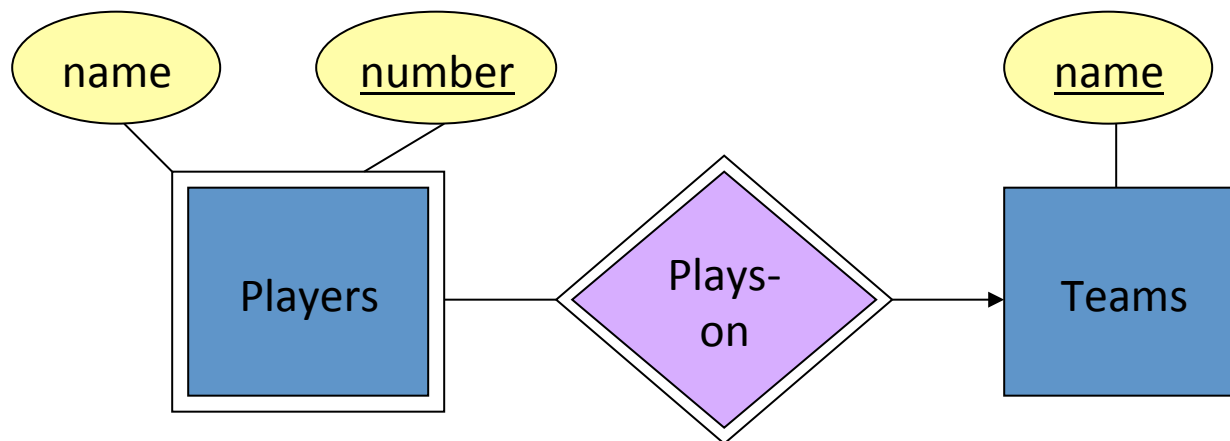
- **Keys** are attributes or sets of attributes that uniquely identify an entity within its entity set.
 - E/R: underline primary key
- Referential integrity constraints require that a value referred to actually exists in the DB.
 - E/R: Enforced with rounded arrows or annotations on the arrows.
- Domain constraints specify what set of values an attribute can take
 - E/R: usually types (varchar, int) are omitted, but you can "mark up" an E/R diagram to show others.

Weak entity sets

- A weak entity set is an entity set whose (primary) key contains attributes from one or more other entity sets.
- In other words, an entity set E is weak if in order to identify entities of E uniquely, we need to follow one or more many-one relationships from E and include the key of the related entity sets in E 's key.
- Possible that all attributes in a weak entity set's key come from other entity sets.

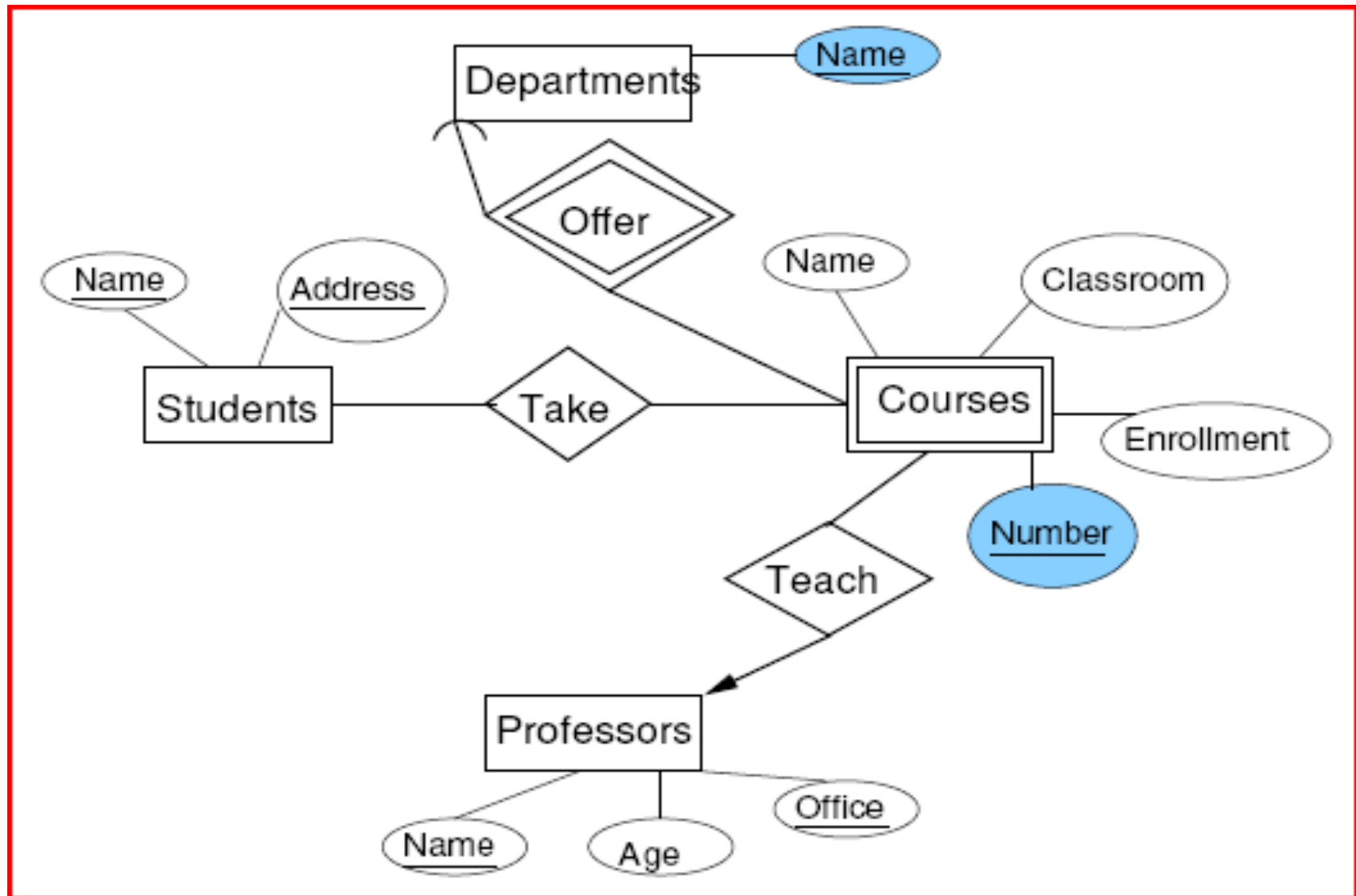
Example

- Consider players in a sports league:
 - Name is not a key (might be duplicate players)
 - Number is certainly not a key
 - But number + team should be a key



- Use double border for weak entity sets and their support many-one relationships.

How about courses and departments?



Keys for a weak entity set

- A relationship R from a weak entity set E to F is *supporting* if
 - R is a binary, many-one relationships from E to F.
 - R has referential integrity from E to F.
- F supplies its key attributes to define E's key.
- If F itself is a weak entity set, then key attributes propagate through to E.

Where do weak entity sets come from?

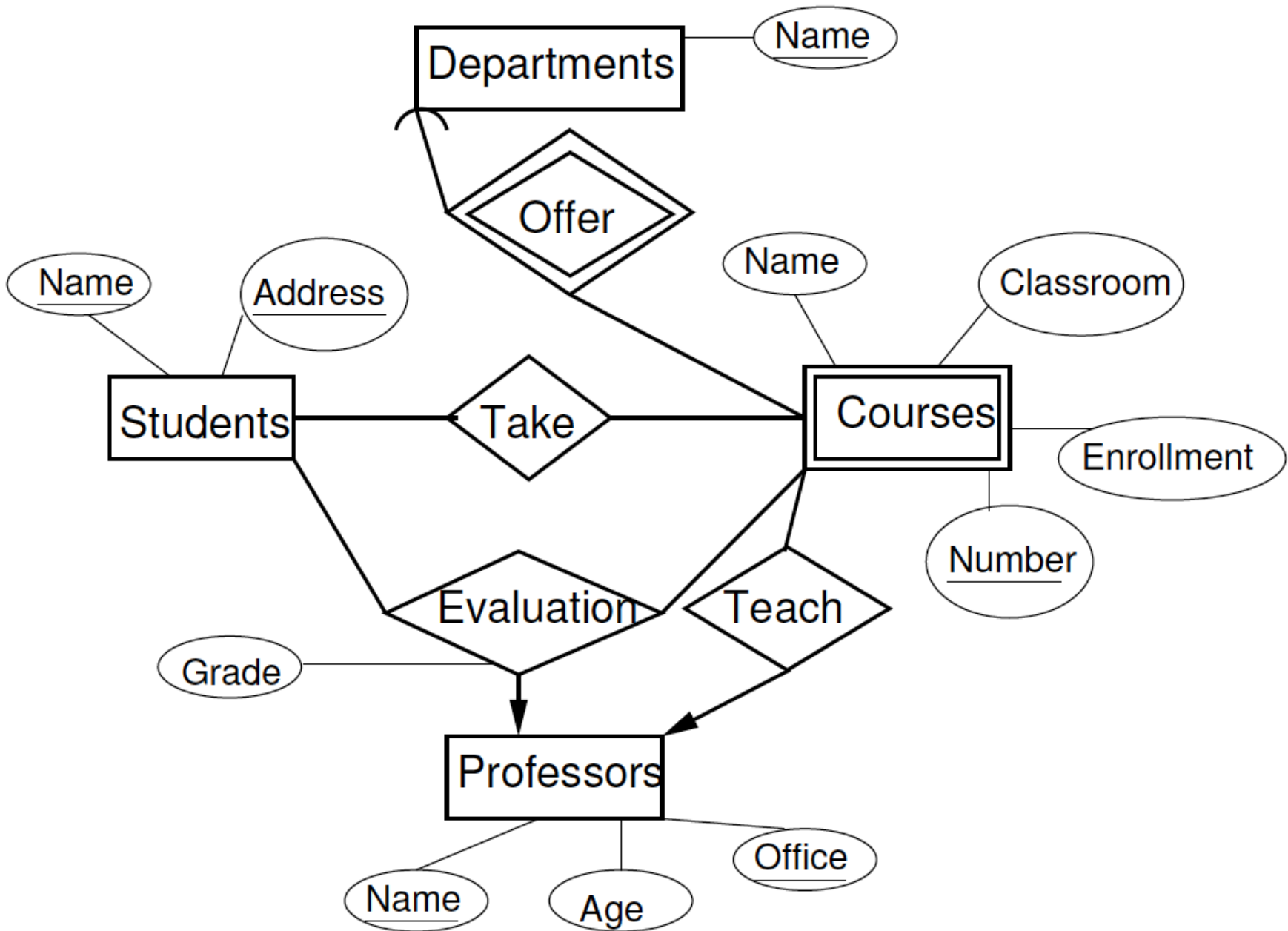
- Cause 1: Implicit hierarchies not from an "isa" relationship.
 - Sort of like a team is composed of players.
 - "isa" hierarchies seem to lead to weak entity sets (subclasses), but we don't notate them with double borders because their hierarchical relationships are always one-one.

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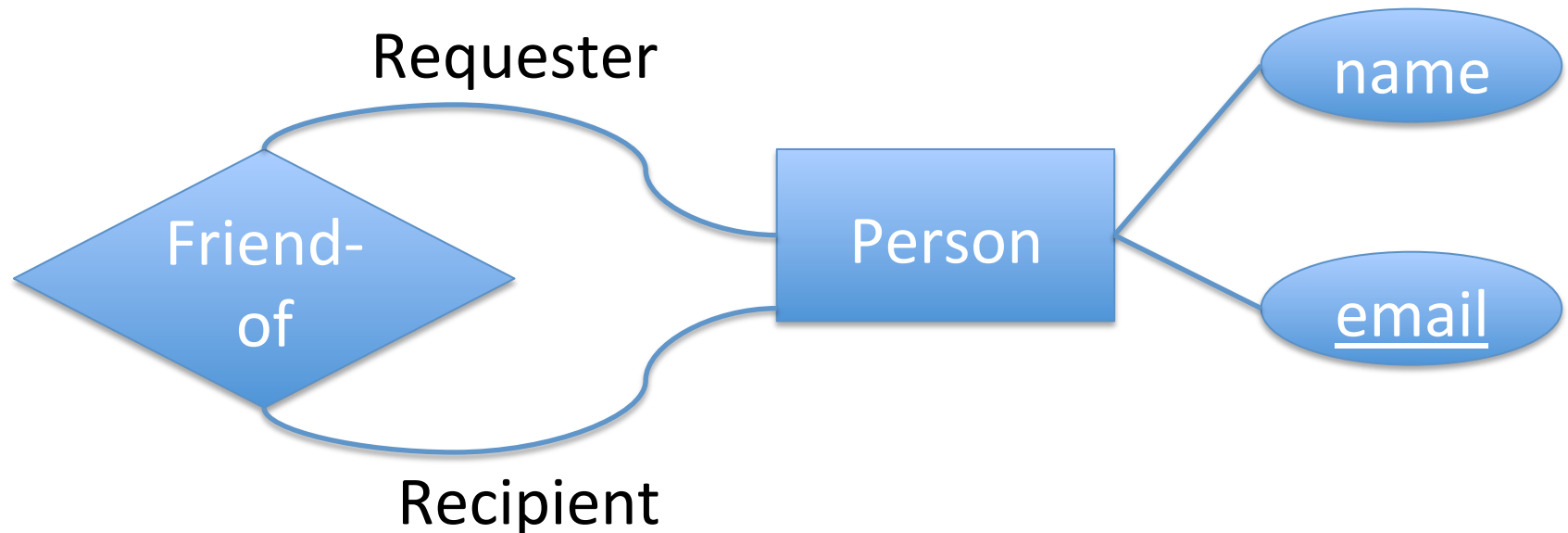
- Cause 2: Connecting entity sets created by eliminating a multi-way relationship.
 - Often, connecting entity sets have no attributes of their own; they must pick up their key attributes from the entity sets they connect.
 - Example: Contracts(Movies, Stars, Studio)

Converting E/R diagrams to relational designs

- Entity set -> Relation
 - Attribute of entity set -> attribute of relation
 - Key of entity set -> primary key of relation
- Relationship -> Relation
 - Attribute of relationship -> attribute of relation
 - Key attribute of connecting entity set -> key attribute of relation
- Special cases: weak entity sets, "isa" hierarchies, combining relations.



Handling multiple roles



If an entity set E appears $k > 1$ times in a relationship R , then the key attributes for E appear k times in the relation for R , appropriately renamed.