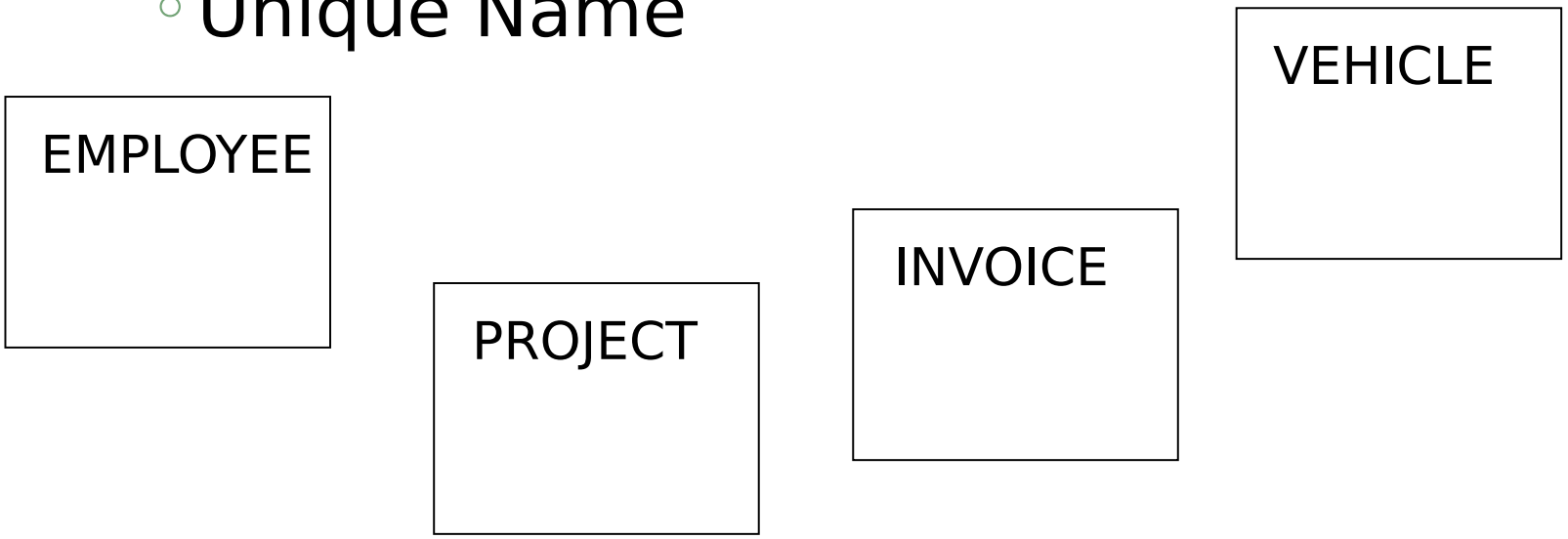
Outline of today’s session

- Assignment Two Groups
- Online Tools for ERDs – Draw.io, Gliffy, others??
- ERDs Continued
- Scenario

ER - CONSTRUCTS

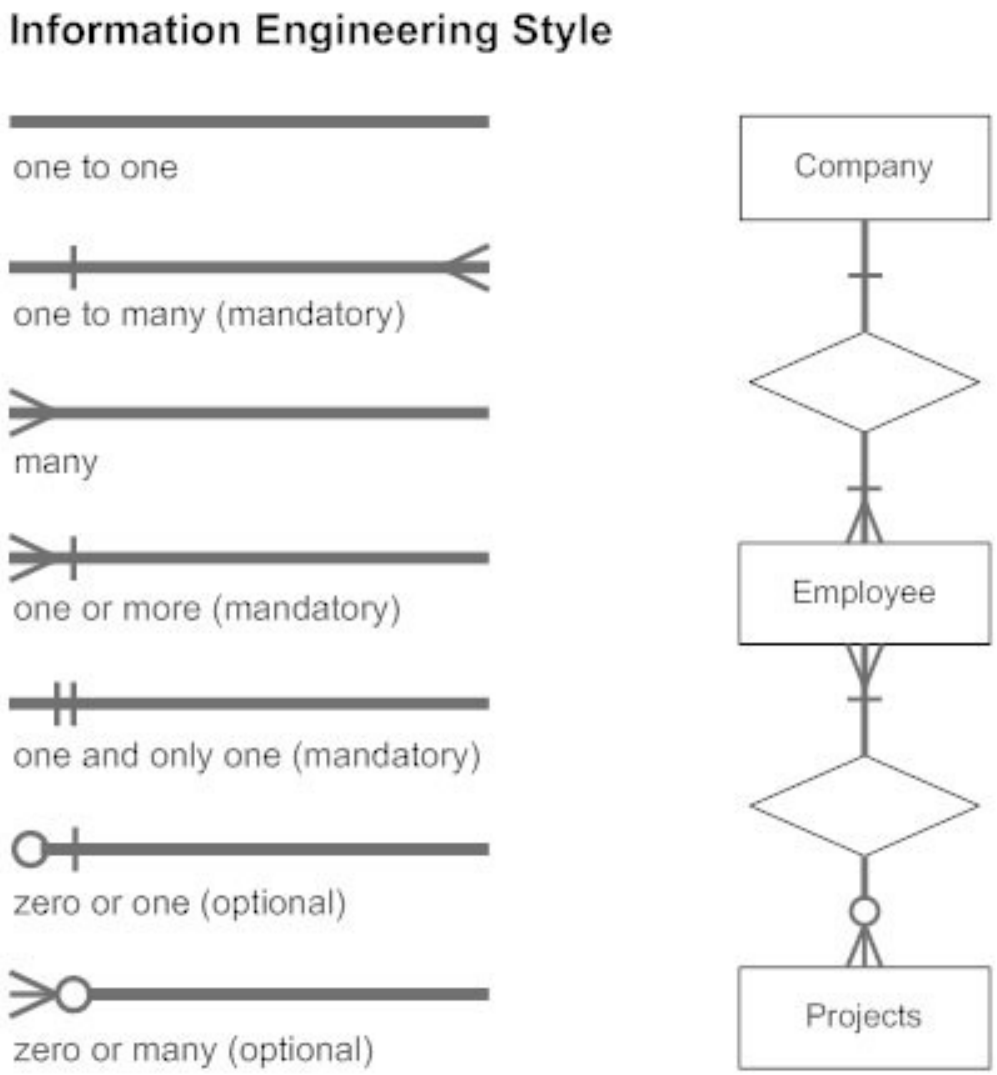
- Entity
  - Singular, Noun, UPPERCASE
  - Can be a Person, Place, Object, Event, Concept etc
  - Unique Name



ER - Constructs

- Relationships
  - Describe how entity instances interact with each other
  - Unique
  - May be:
    - One–to-one Lecturer & Office
    - One-to-many Building & Rooms
    - Many-to-many Unit & Student

ER – Constructs

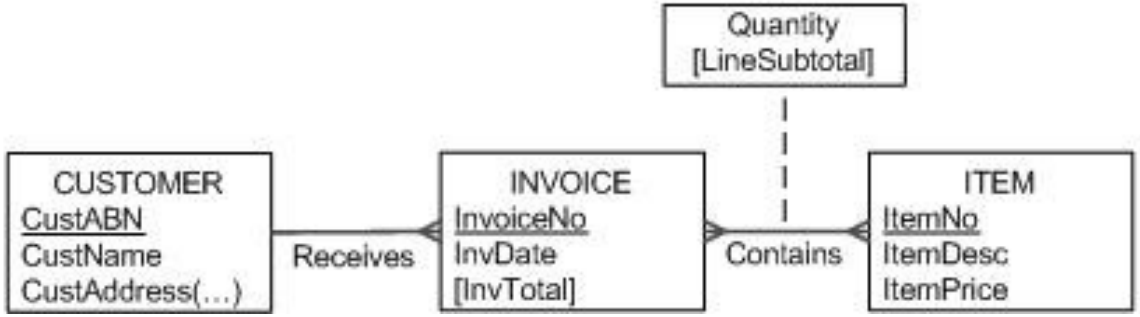


ER – Associative Entities

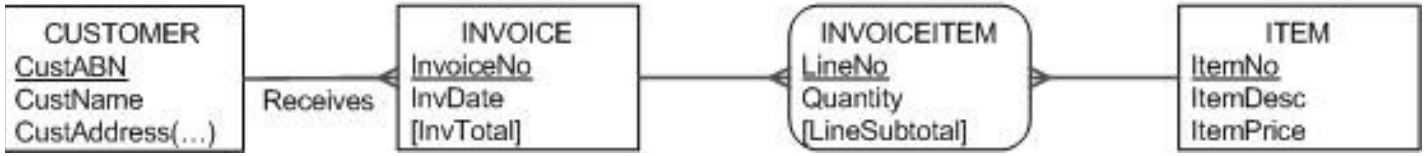
- Can use in place of Many-to-many relationships
- As a *general* rule convert a many to many relationship to an associative entity when:
  - There are attributes on the relationship
  - The relationship has some independent meaning to the client

Associative Entities

Attributes on a Many to Many relationship

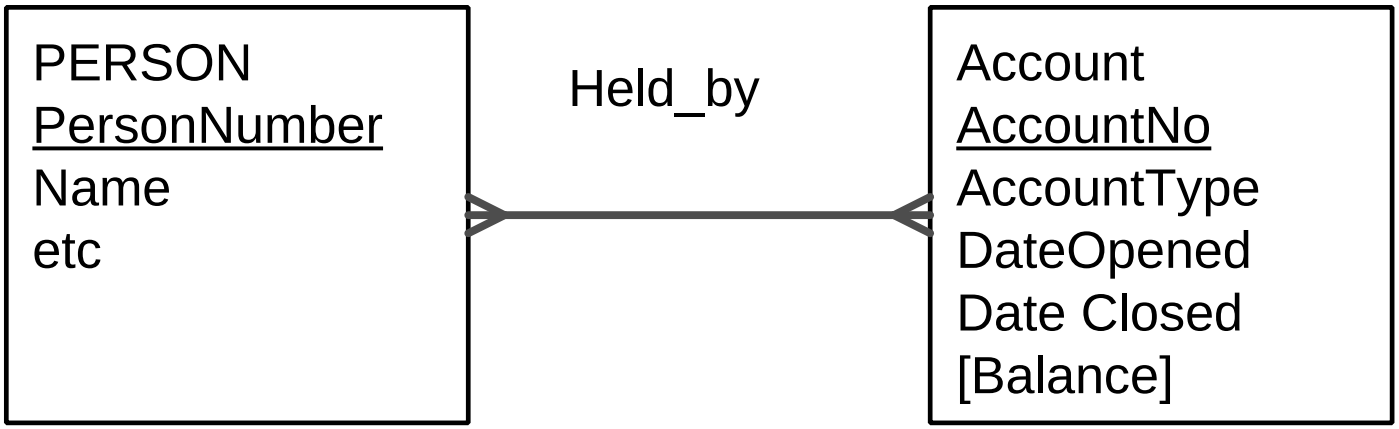


Associative Entity



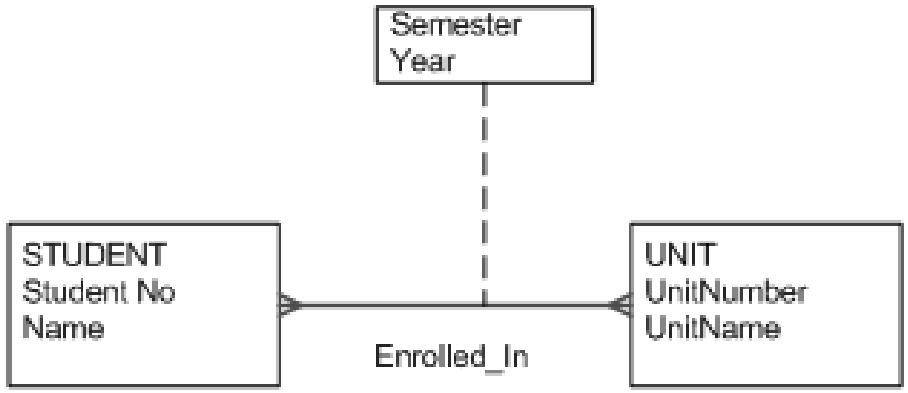
Associative Entity Candidate?

- Person holds many accounts, and an account may be held by more than on person (ie joint accounts)



- No -
  - No Attributes on the relationship
  - Has no real world representation

Transform to an Associative Entity

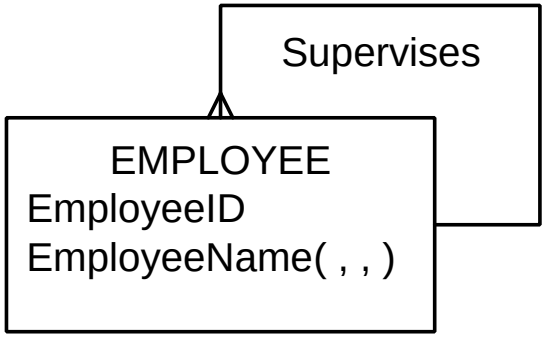


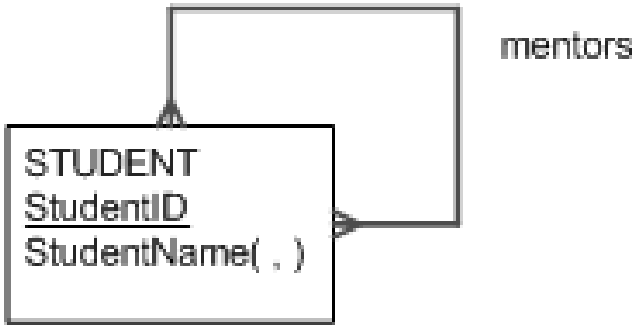
Relationship Degrees

UNARY - Relationship involving a single entity

Person is_married_to **Person**

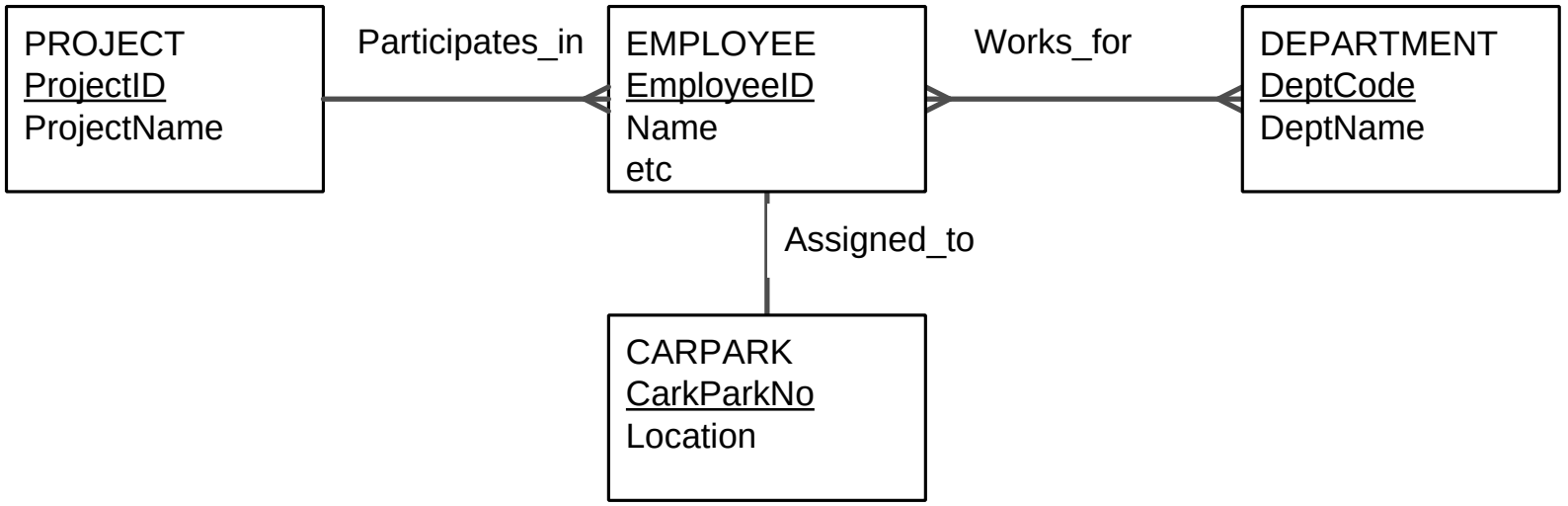
Employee supervises **Employee**





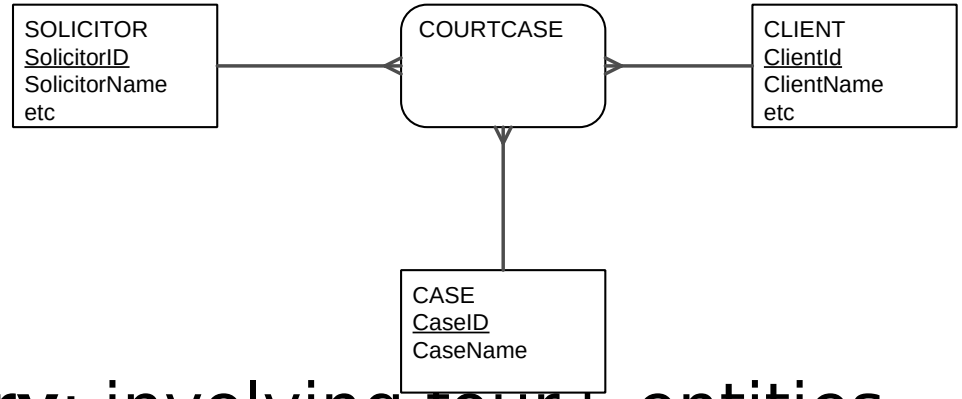
Relationship Degrees

- **Binary** : involving two entities
  - **Employee** works_in **Department**
  - **Employee** allocated **Carpark**
  - **Employee** assigned_to **Project**



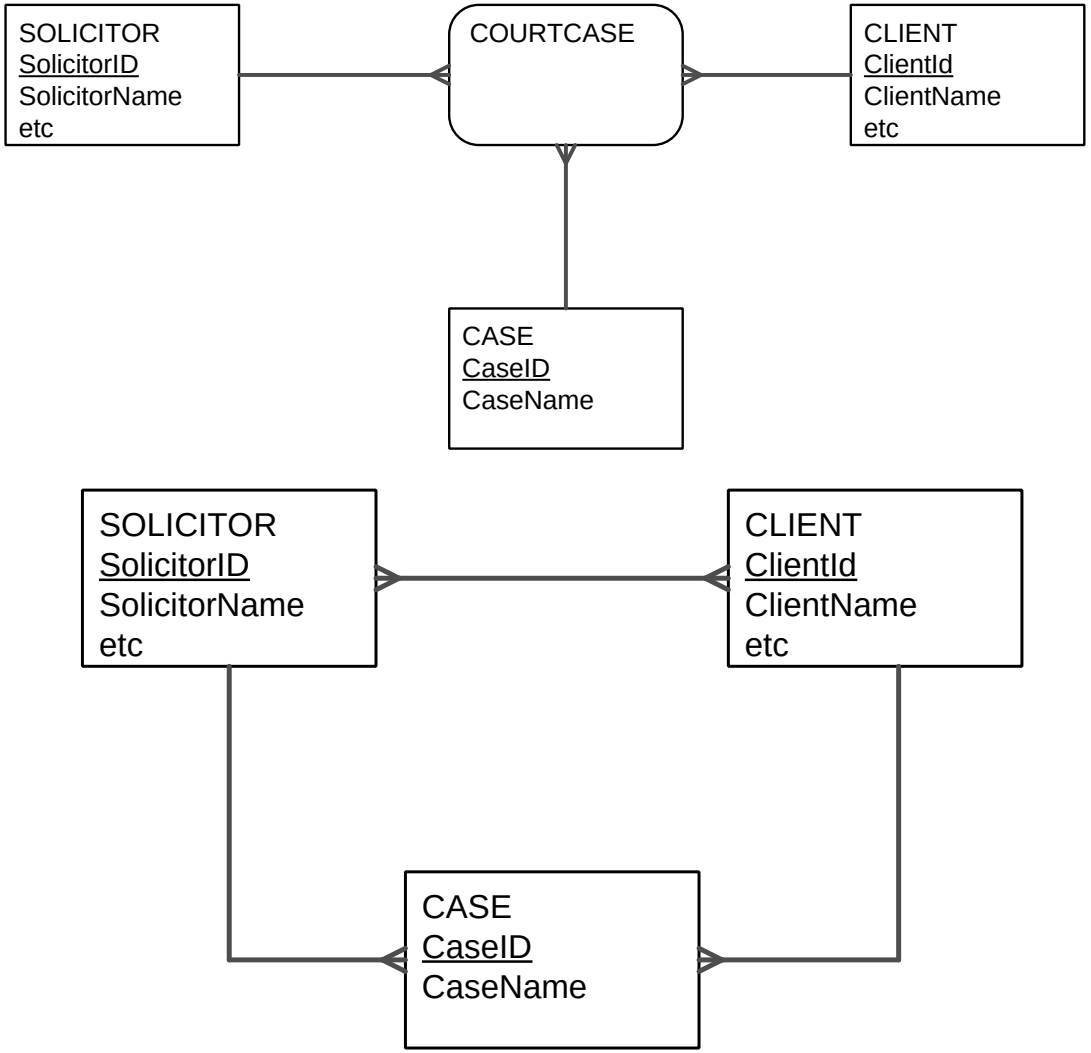
Relationship Degrees

- **Ternary** - Involving THREE entities
  - **Solicitor** - **Client – Case**
  - **Employee – Role – Project**



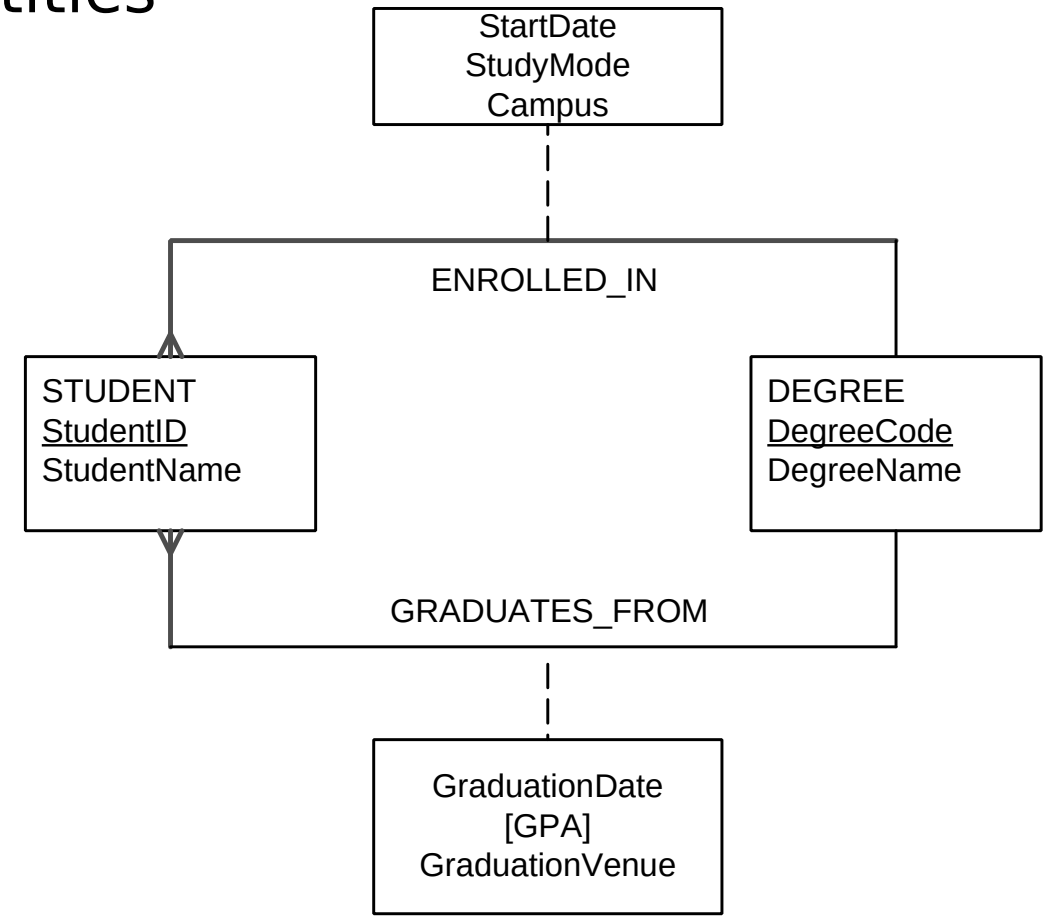
- **N-ary**: involving four+ entities
  - Not common

Are these the same?

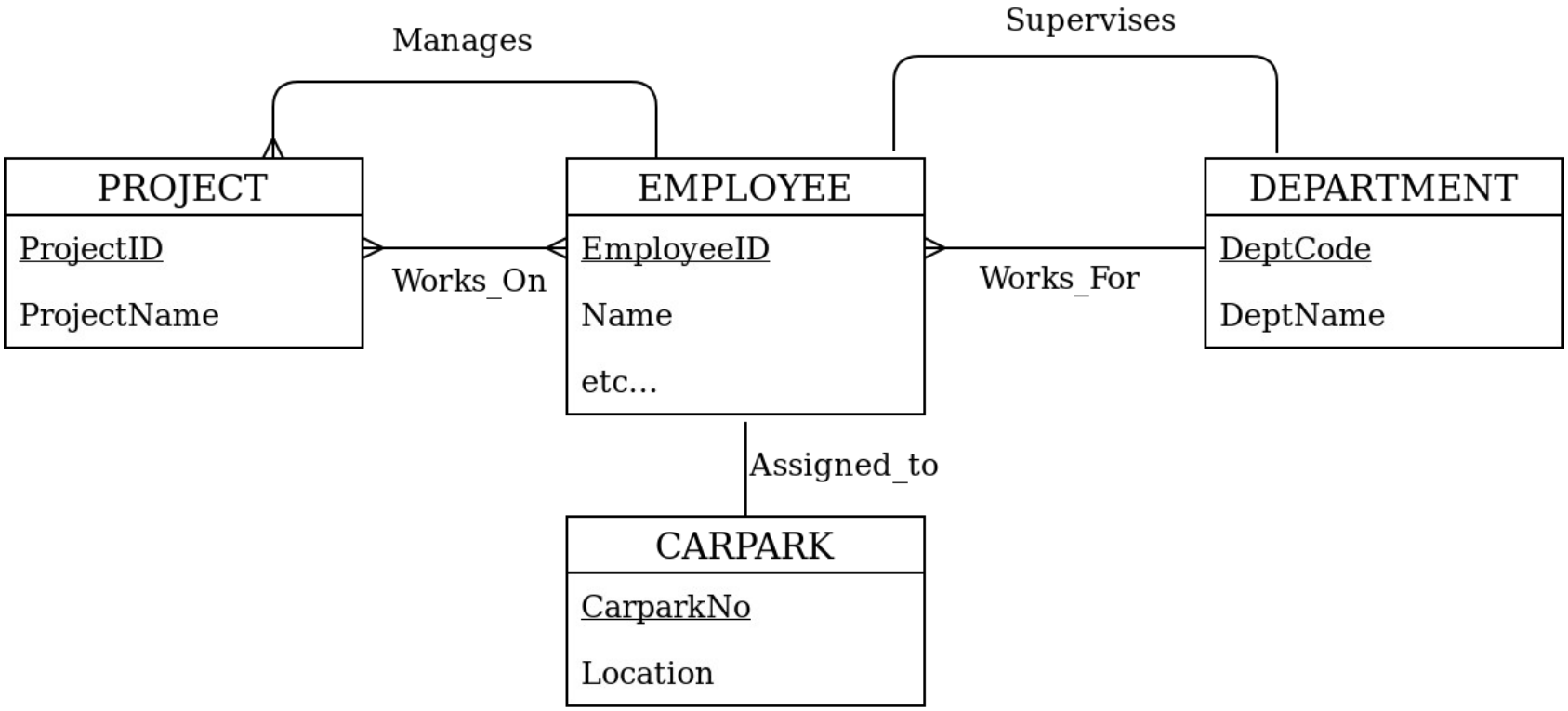


Multiple relationships

- More than one relationship between entities



Multiple relationships



Attributes

- Additional information to describe entities *and* relationships
  - Nouns – multiple words
  - Aliases
- Attribute Types
  - Simple or atomic – *date of birth*
  - Compound (, ,) - *address*
  - { multivalued } – *phone numbers, skills*
  - [derived] – *age, total*
- Unique Identifier for each ***entity instance***

How to select a Unique Identifier

- Always have a value – can’t be null
- Should not ever change
- May be a comprised of one or more attributes

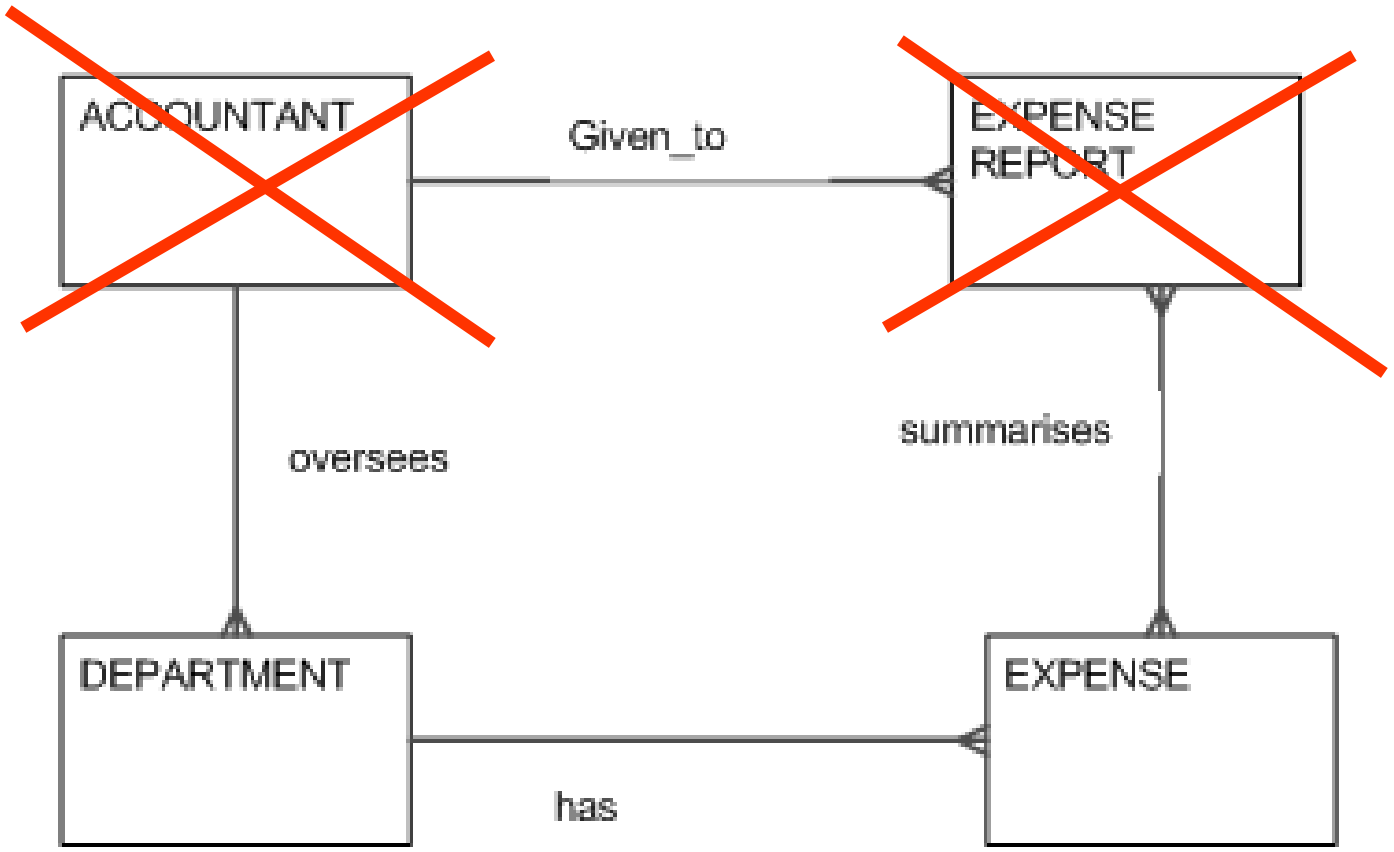
Design Choices

- **Is it an Entity or an Attribute?**
  - It depends on the context
  - Consider a location/address
- **Is it an Entity or a System input, output, user, owner**
  - An entity will have many possible instances, each with a distinguishing characteristic

So…..

- Assumptions…never assume!
- Follow the 6 steps
  - Entities
  - Relationships
  - Associative Entities
  - Attributes
  - Unique Identifier Attribute
  - Assumptions

Is this correct?



In Pairs….

- Draw an ERD for the Delivery Scenario hand out