# Advanced Software Engineering
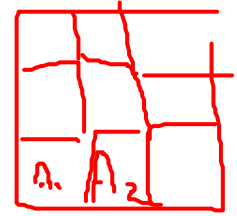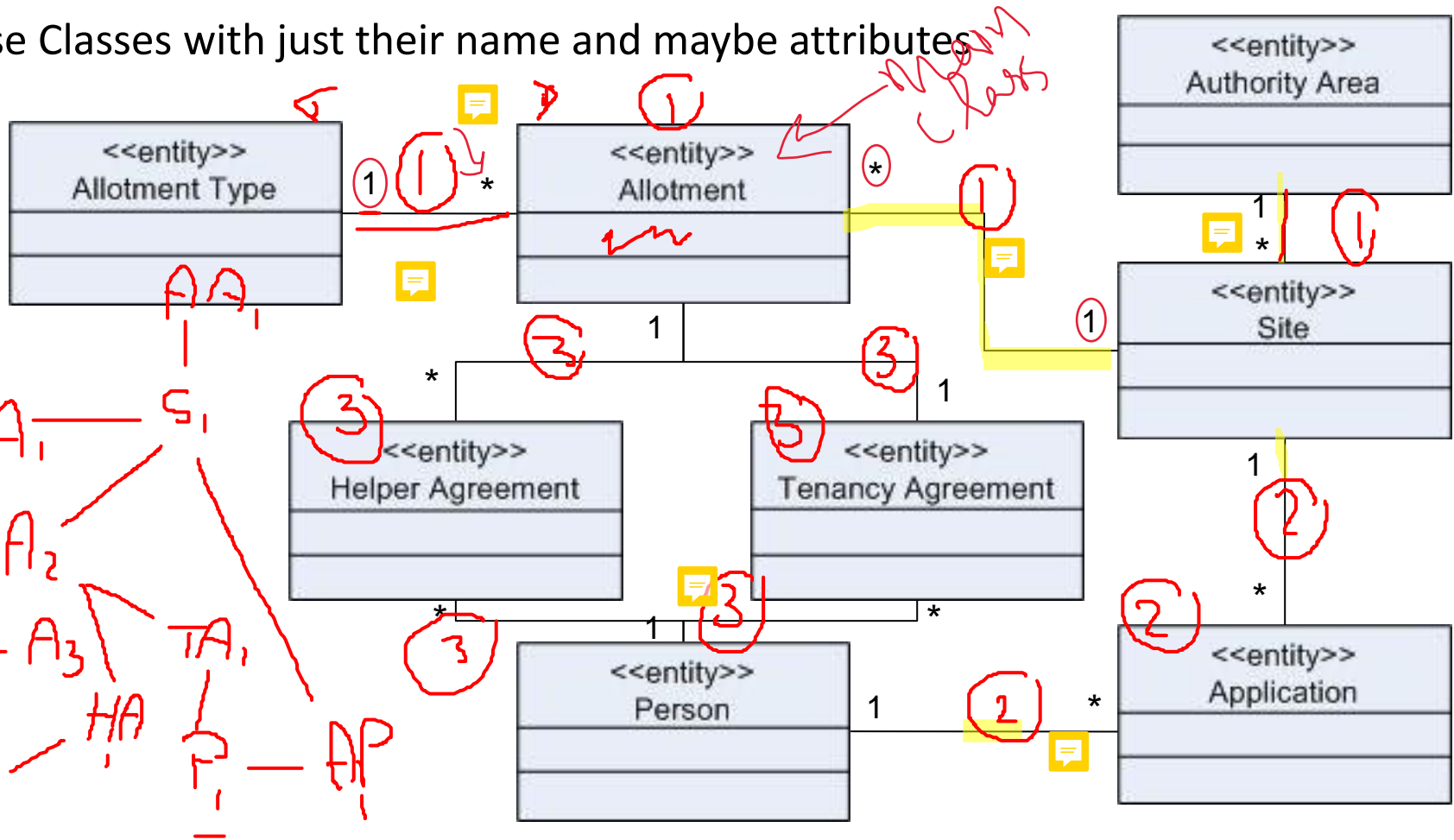# CSE608

# Lect 4

# Class Modelling

# Class Diagram Example

- Sometimes known as Logical Data Modelling or Entity Relationship Modelling
- Use Classes with just their name and maybe attributes

# Class Diagrams

- UML Class notation
    - Association
    - Inheritance
    - Aggregation
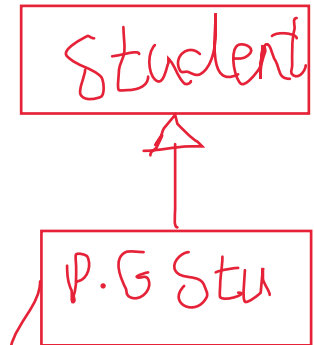    - Cardinality

- Using UML for Business Domain Modelling

Student

P.G Stu

IS  ER

Relationships

Sub-types, Super-types

Relationships (Hierarchy of Entities)

One:many; many:many; one:one

# UML Notation - the Class

Stereotype

Class Name

«business»
**Tenancy  Agreement**

Start Date
End Date

Attributes

Operations

SwapTenancy()
SetTenancy()
EndTenancy()
SendOffer()
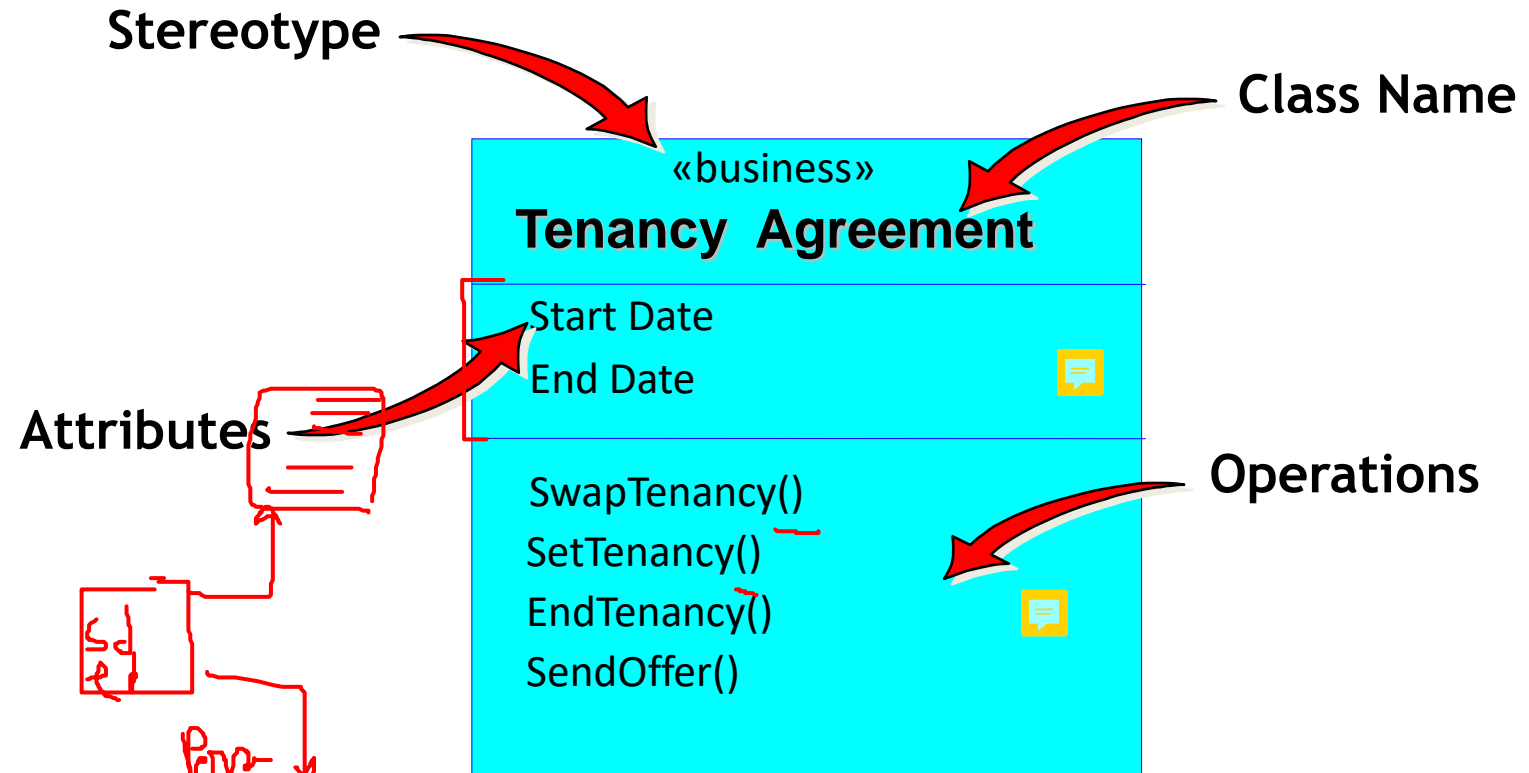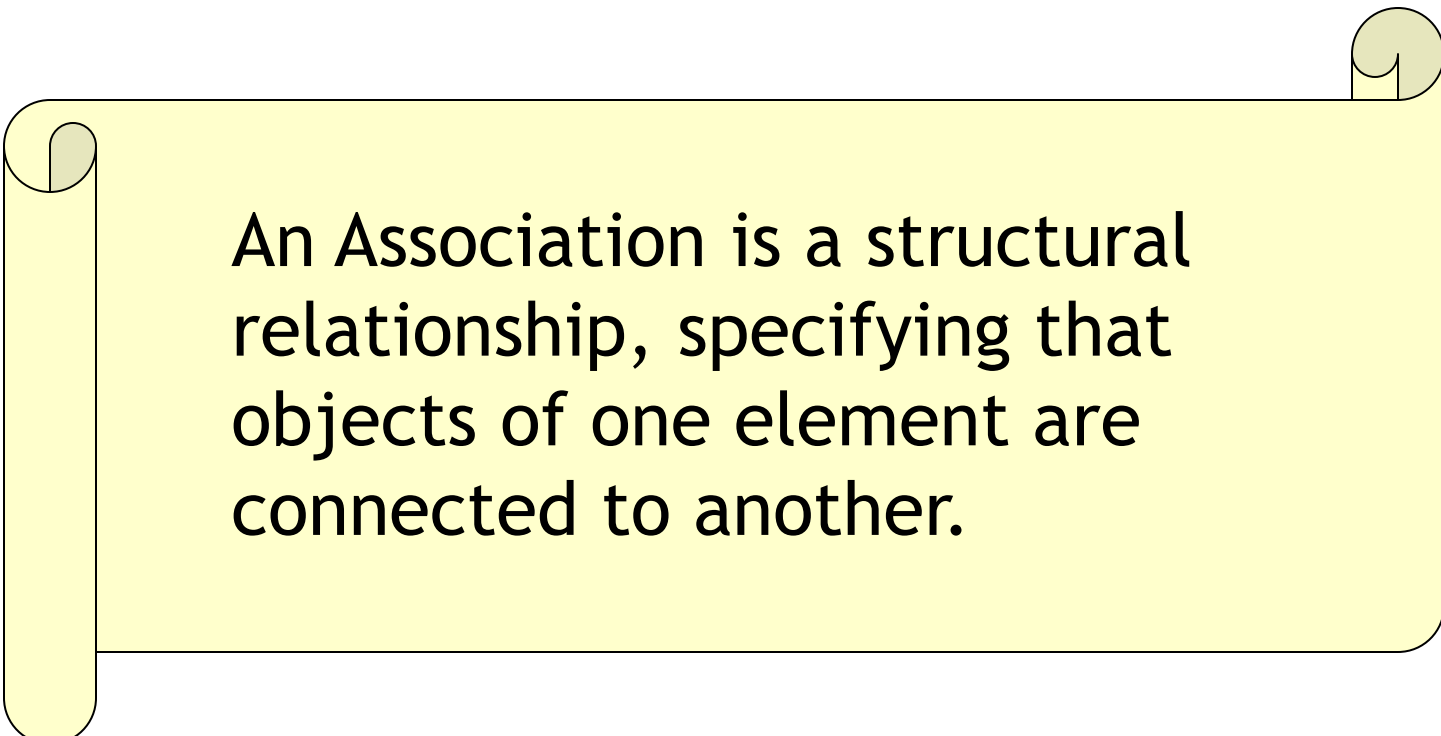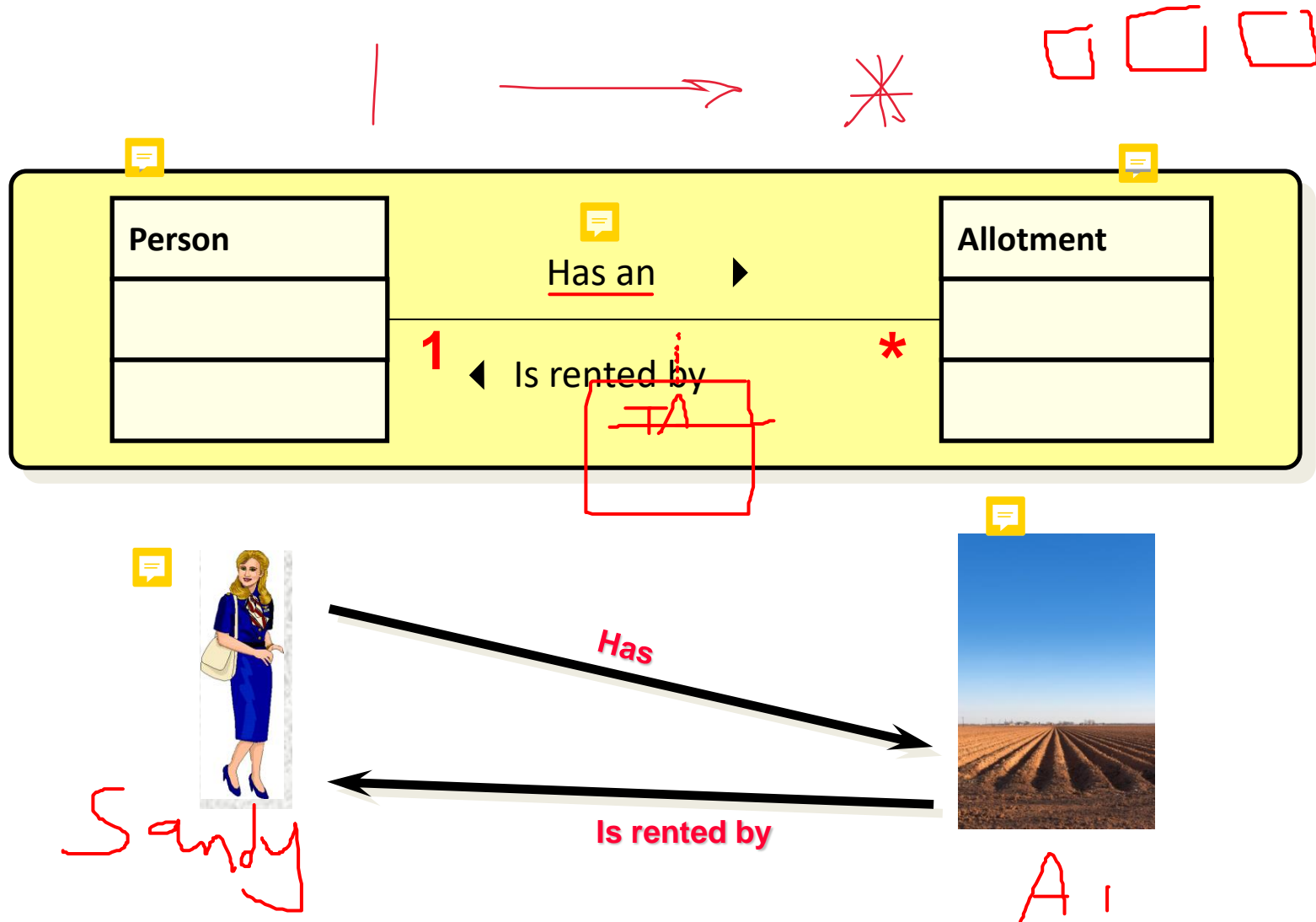
**Business Domain Modelling concerned with Attributes**
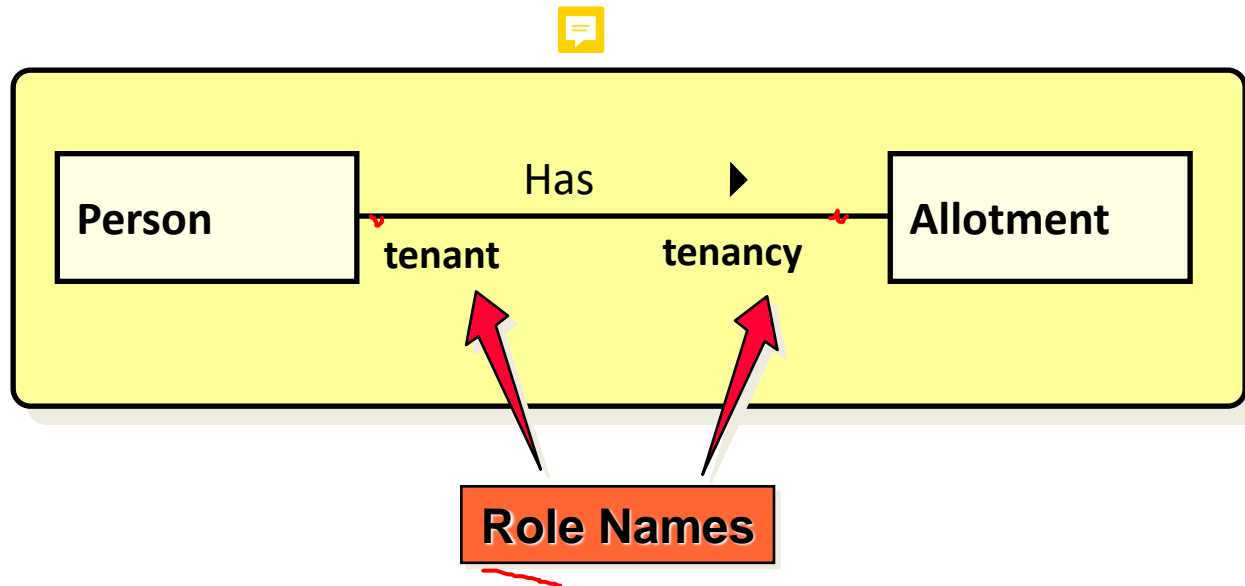**Similar to Entity Modelling**

# Association relationships

An Association is a structural relationship, specifying that objects of one element are connected to another.

# Associations Relate Classes &Links Relate Objects
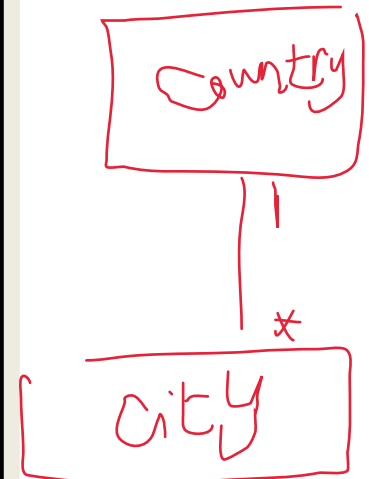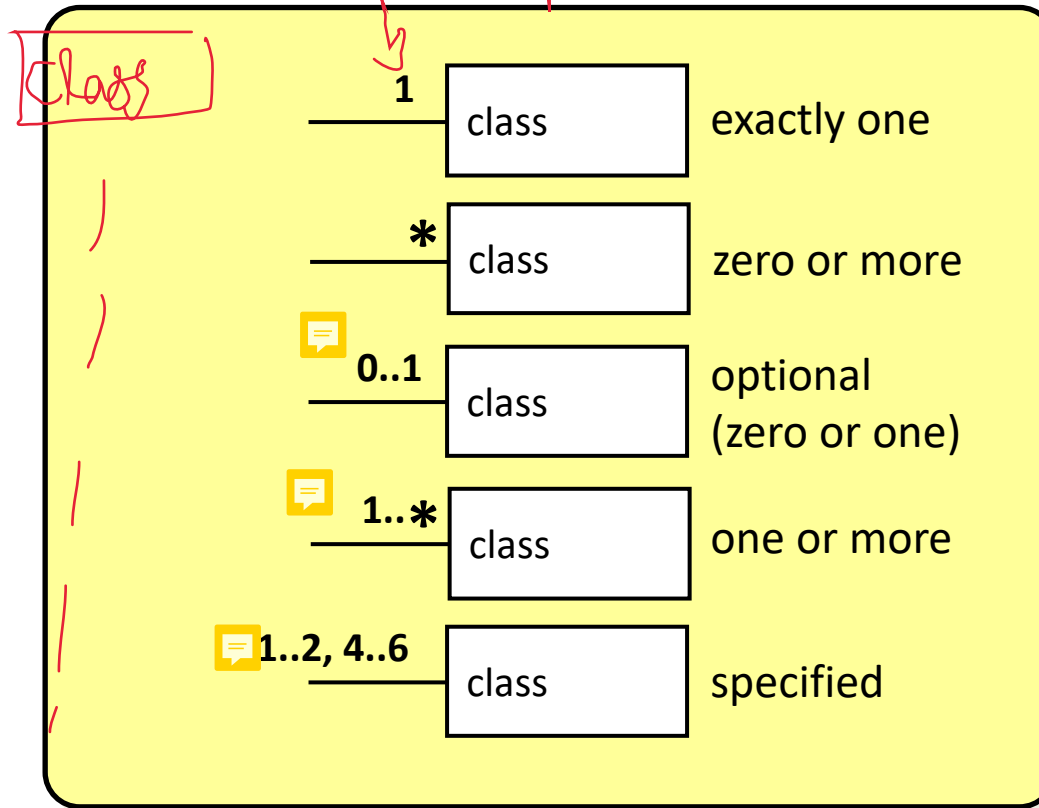
# Each Class Plays a Role



Not always needed – only use to aid understanding

# Multiplicity of Associations
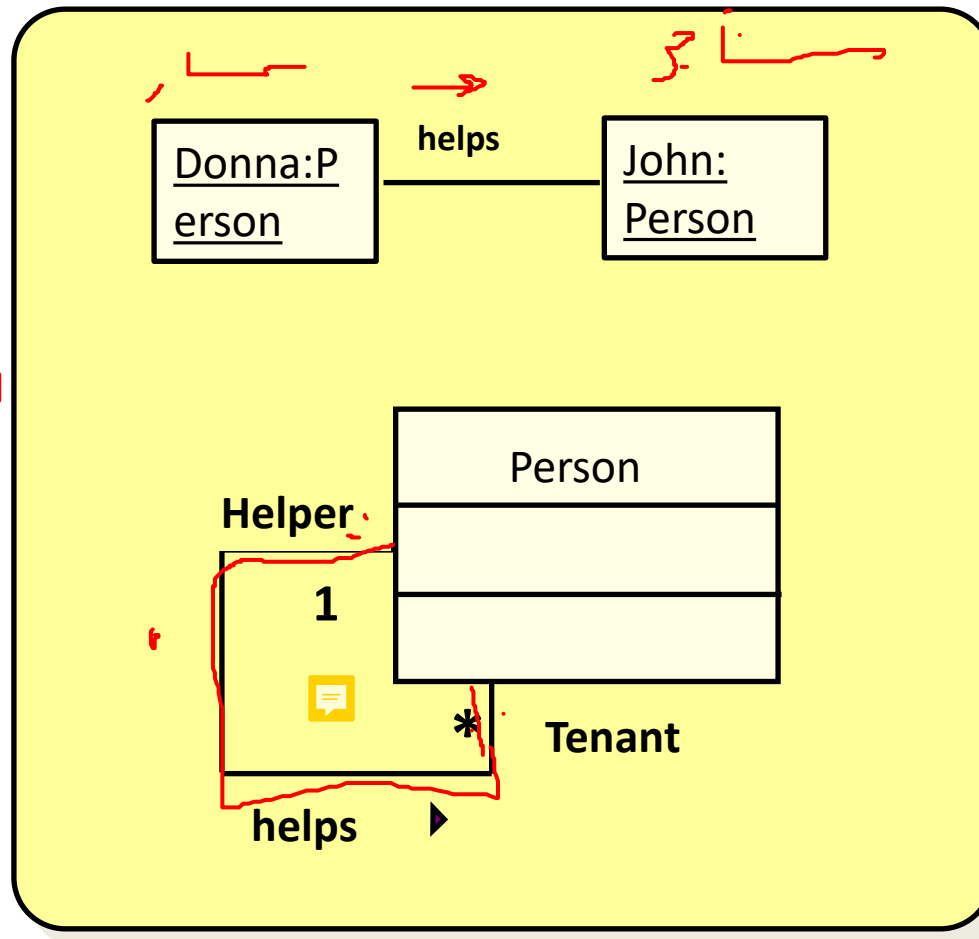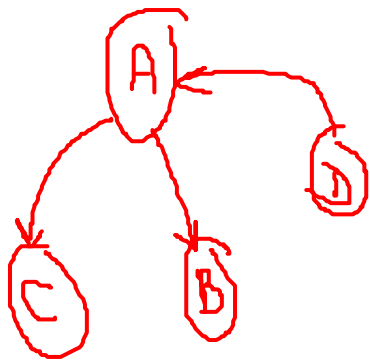
Class = A        B

Class

| | |
|---|---|
| **1** class | exactly one |
| ***** class | zero or more |
| **0..1** class | optional (zero or one) |
| **1..*** class | one or more |
| **1..2, 4..6** class | specified |

Country

City *

# Relating Instances
# of the Same Class

Donna:P erson — **helps** — John: Person

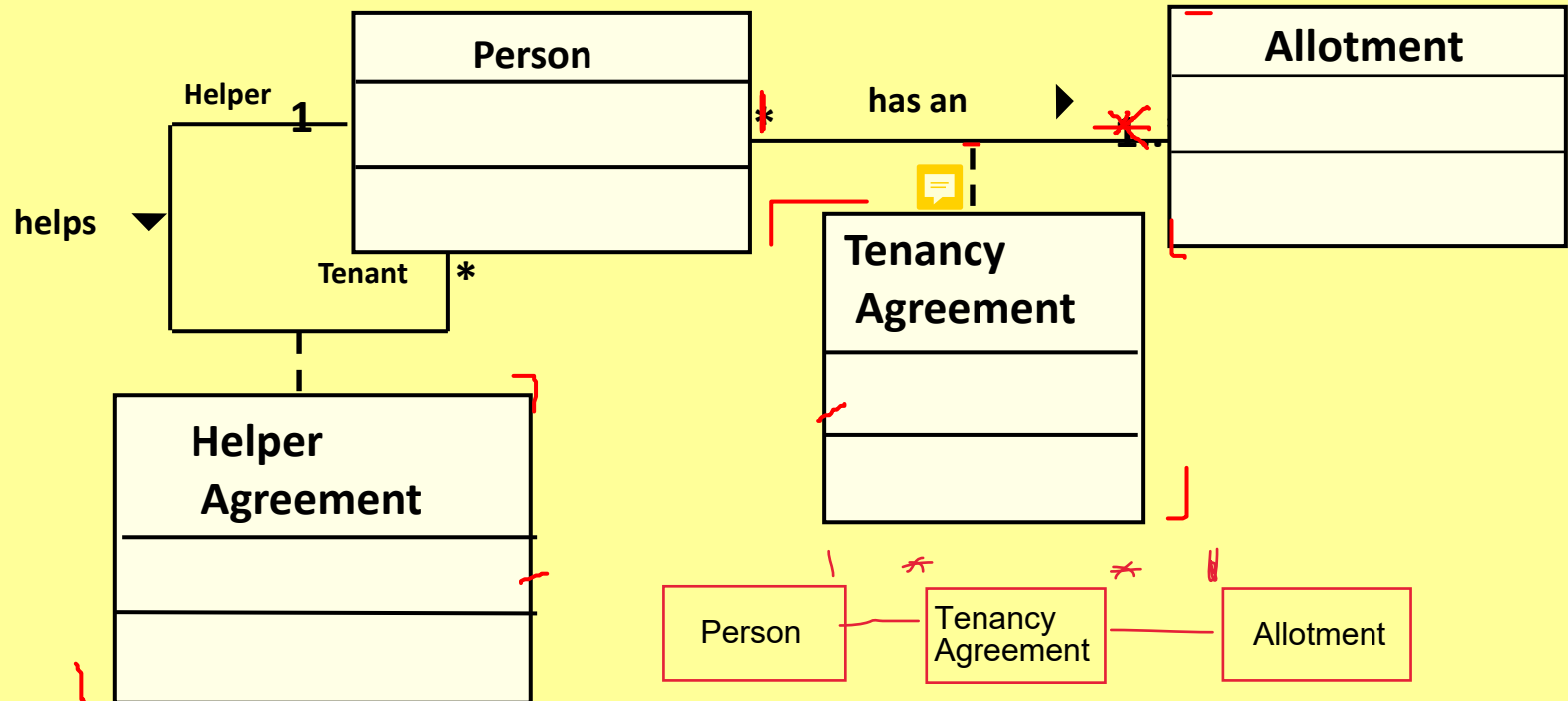| Person |
| --- |
| |
| |

**Helper**
1

**Tenant**
*

**helps** ▶

# Association Classes

Intersection Entities? !

ER

student

Course

| Person | |
|---|---|
| | |
| | |

Helper 1

helps ▼

Tenant *

has an ▶

| Allotment | |
|---|---|
| | |
| | |

| Helper Agreement | |
|---|---|
| | |
| | |

| Tenancy Agreement | |
|---|---|
| | |
| | |

| Person | | Tenancy Agreement | | Allotment |
|---|---|---|---|---|
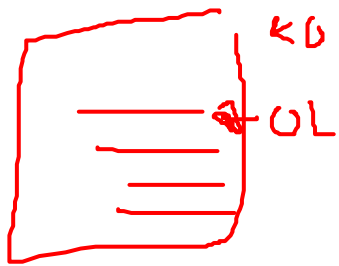
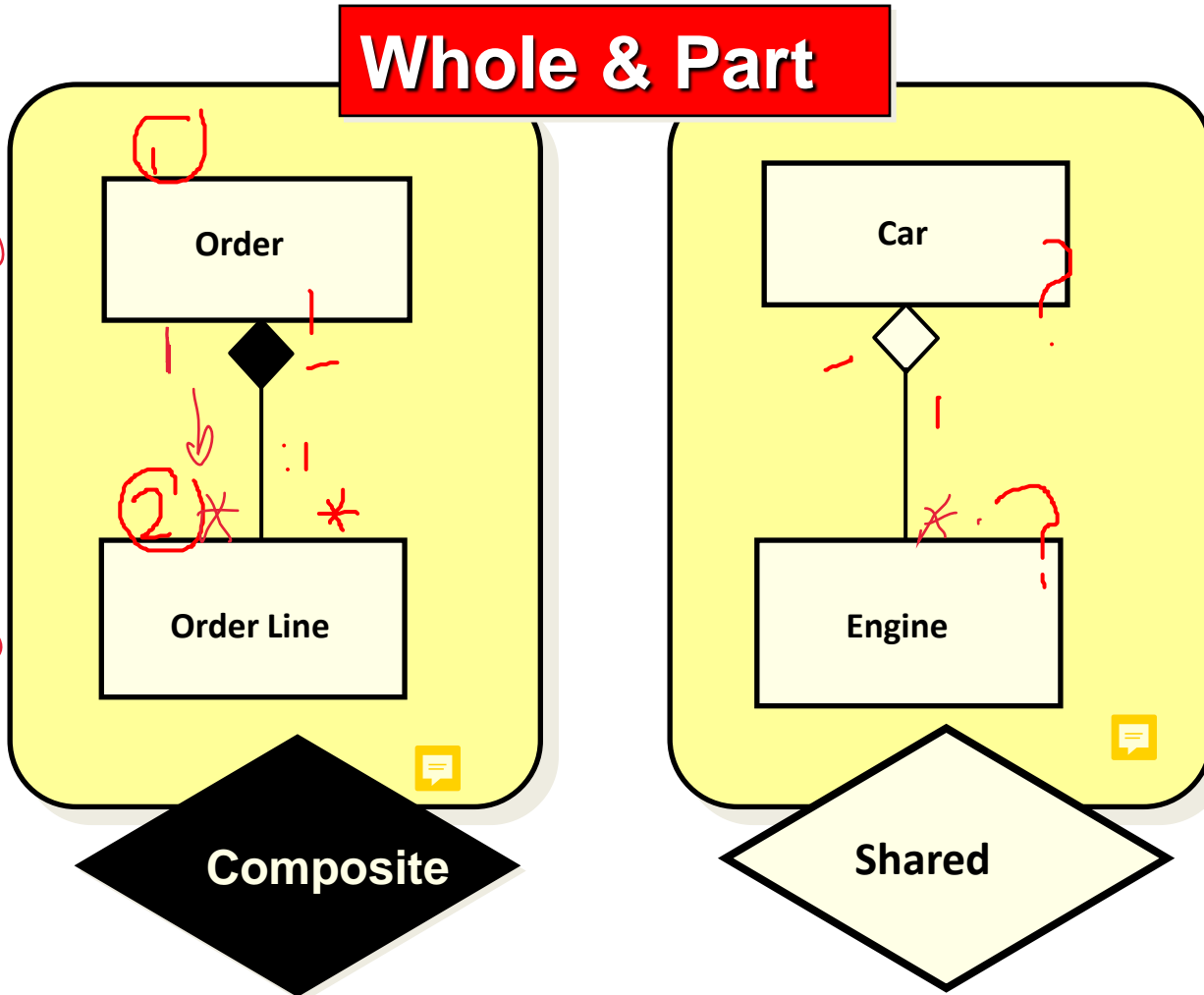# Aggregation
## (whole or part relationships)

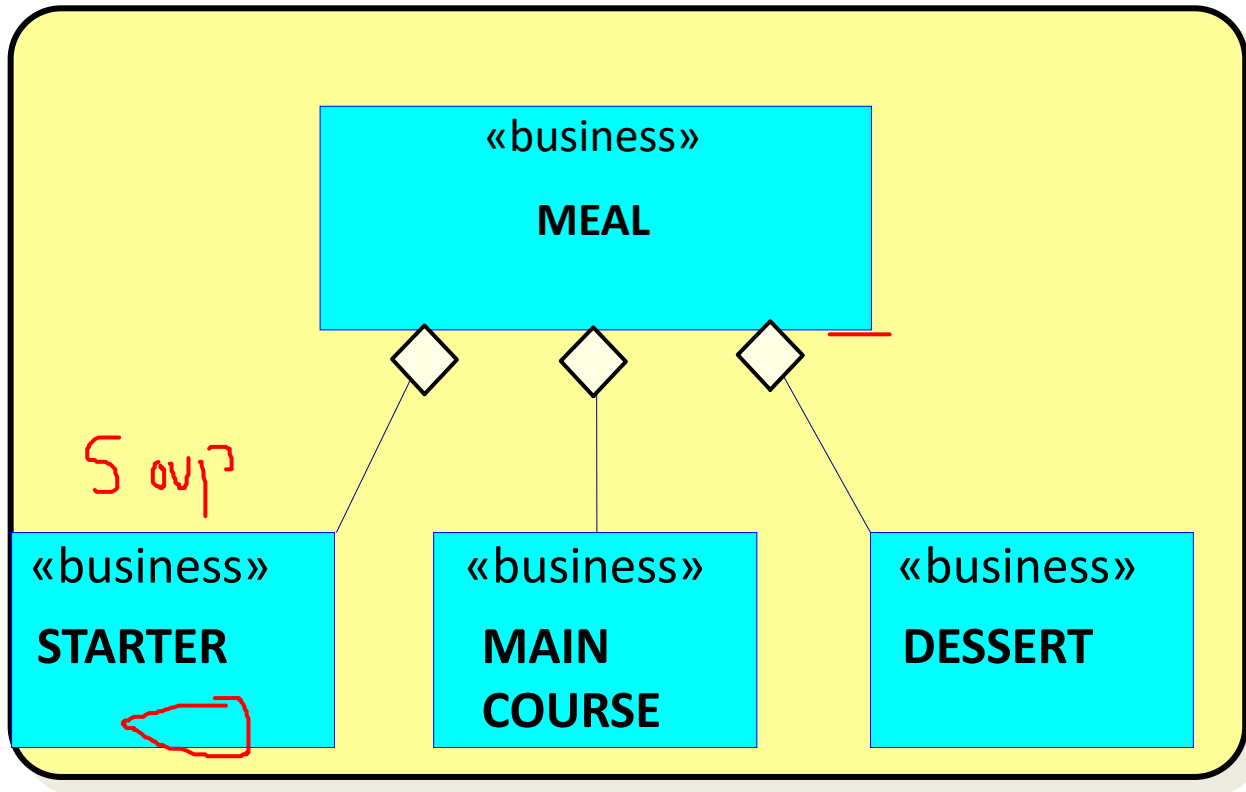**Whole & Part**



Order
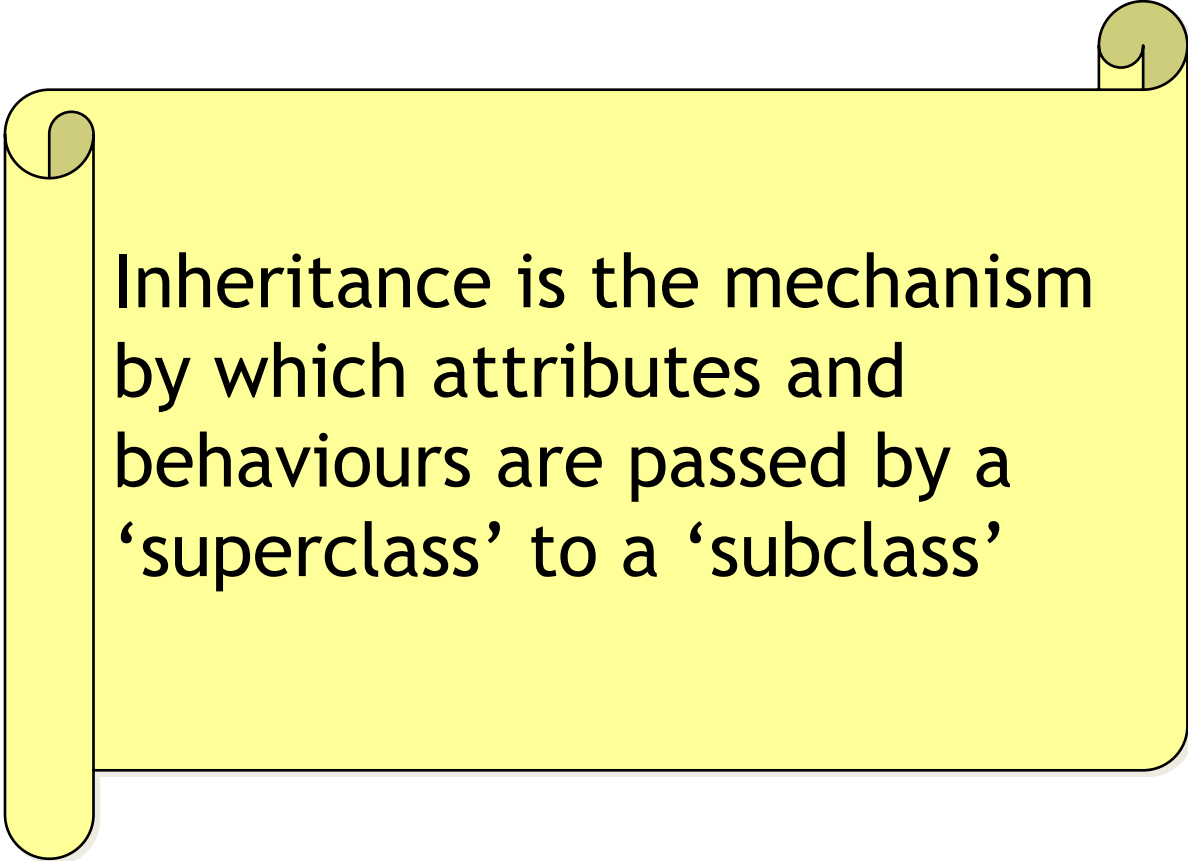
Order Line

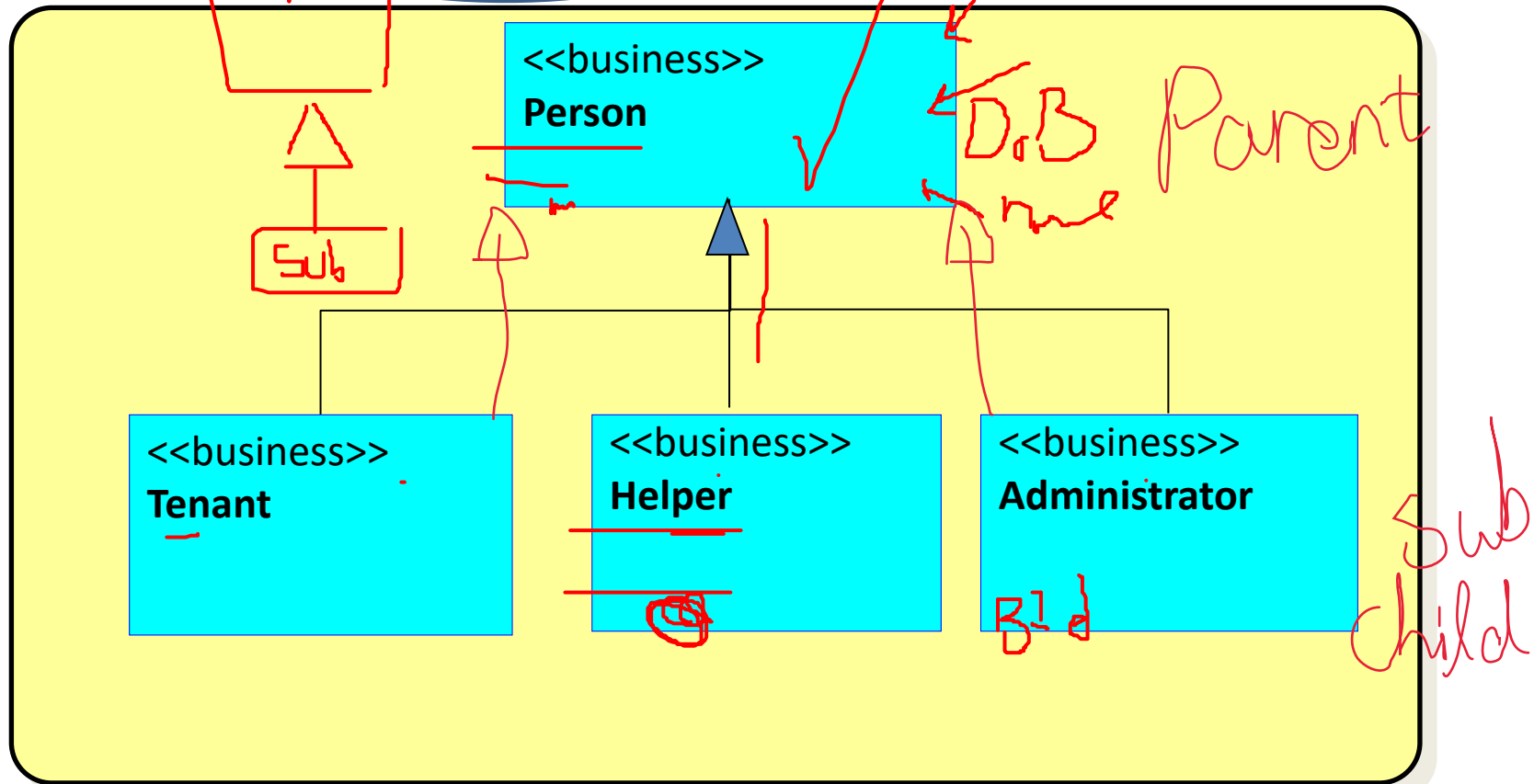**Composite**

Car

Engine

**Shared**
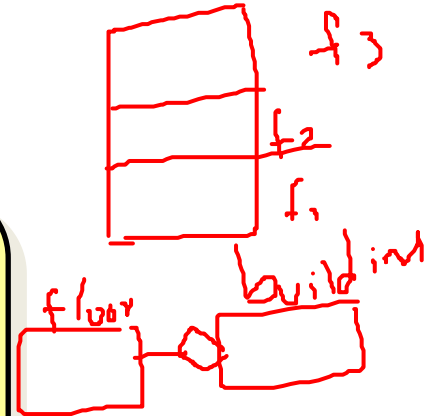
# Aggregation

# What is Inheritance?

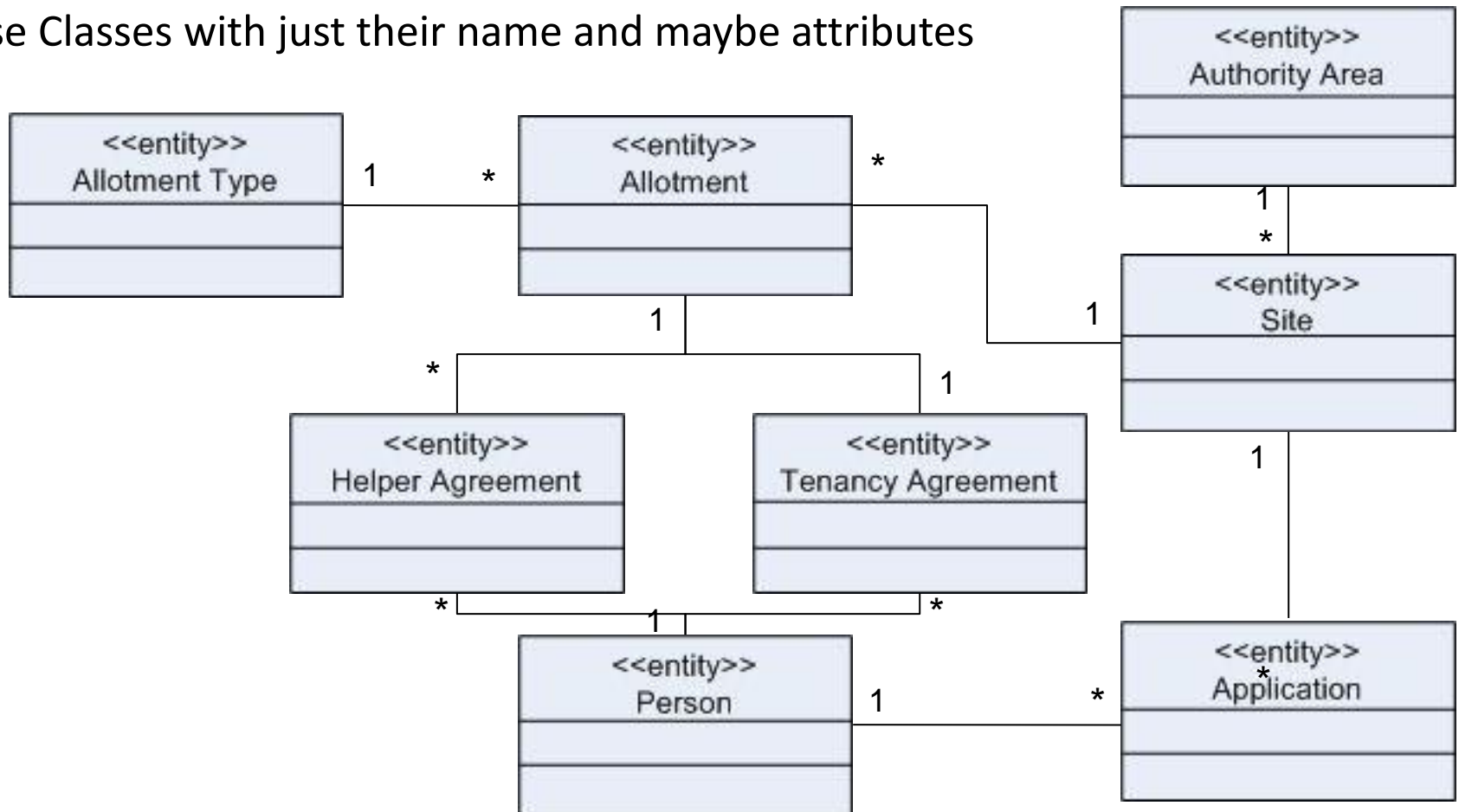Inheritance is the mechanism by which attributes and behaviours are passed by a 'superclass' to a 'subclass'

# Example of Inheritance

# Class Diagram Example

- Sometimes known as Logical Data Modelling or Entity Relationship Modelling
- Use Classes with just their name and maybe attributes

# Class Diagram Example

- How to get Classes from user Requirements, from the domain?

- How to get classes attributes?

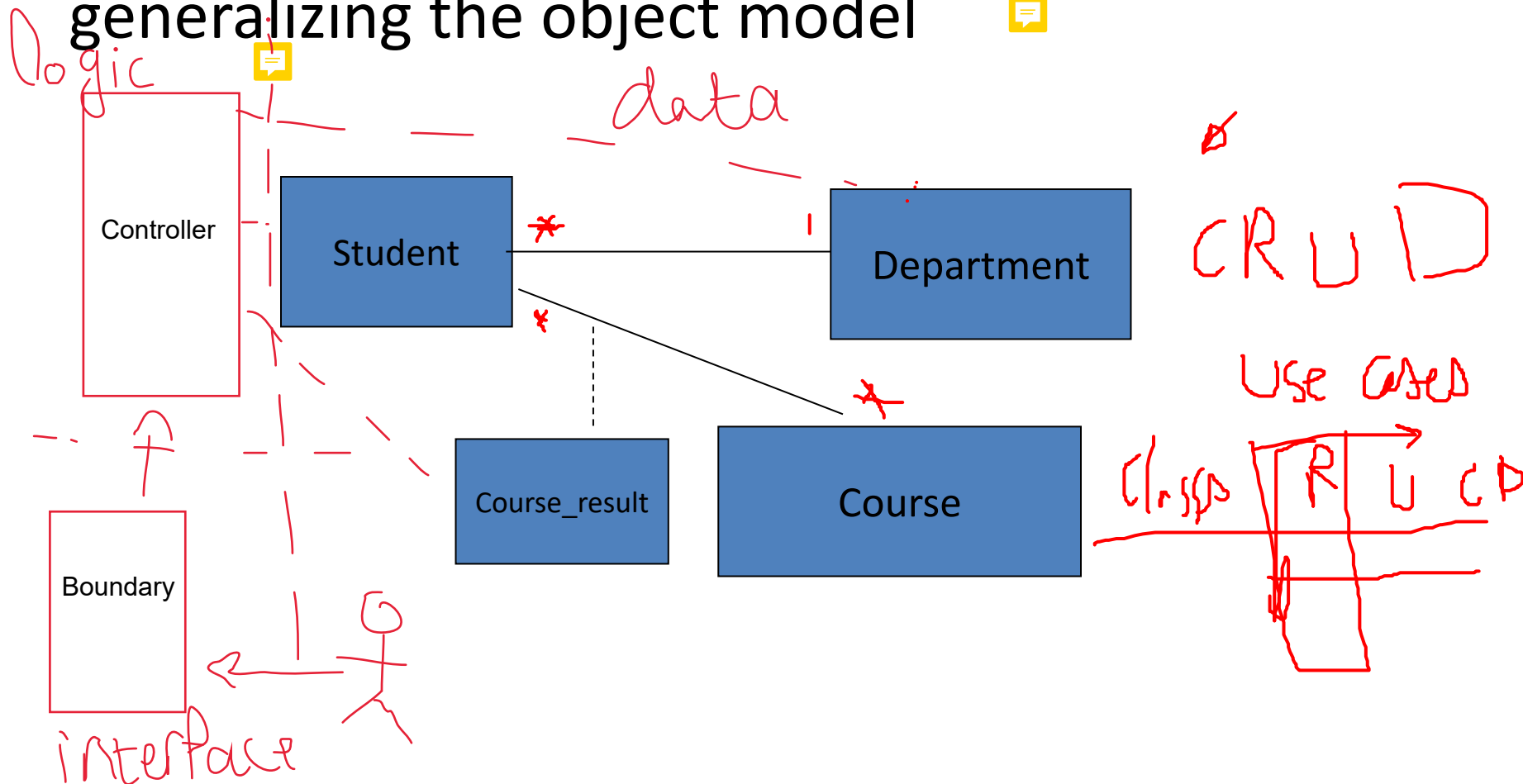- Hot to get classes operations/methods?

# Related Diagrams ( Object Diagram, Sequence Diagram)

- Object model actual snapshot of the class model

- It is a diagram showing examples between some actual objects connecting to each other (but this model is usually used in Design Stages)
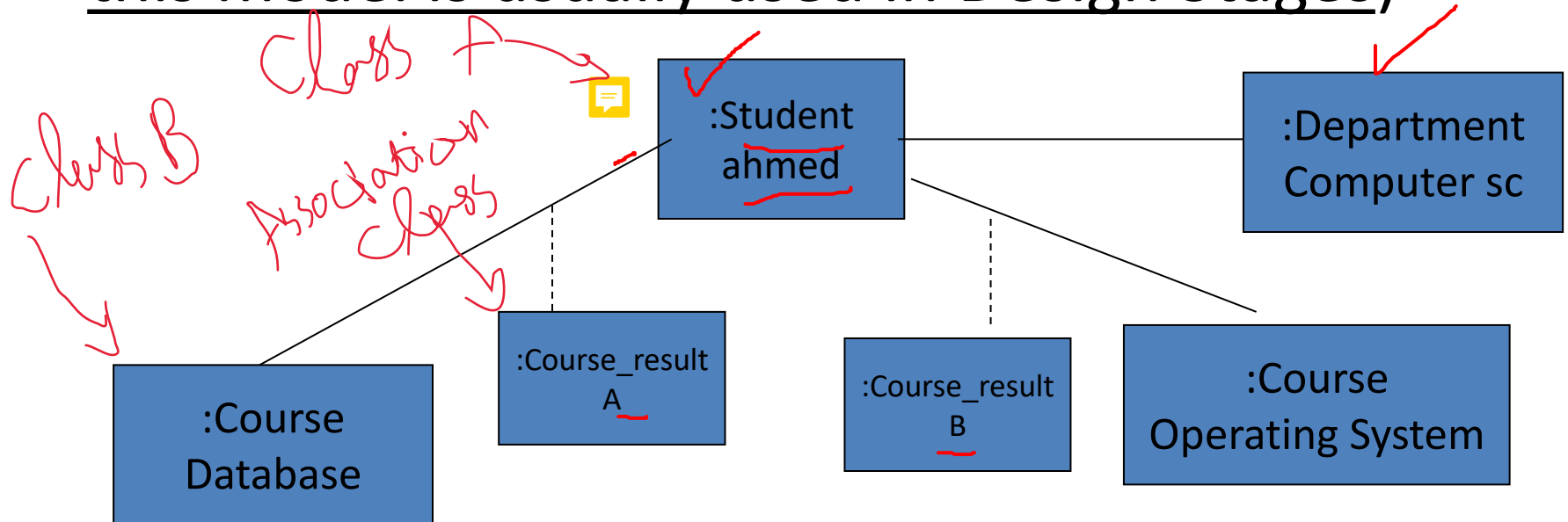
# Class diagram

- The class model can be produced from generalizing the object model

# Questions