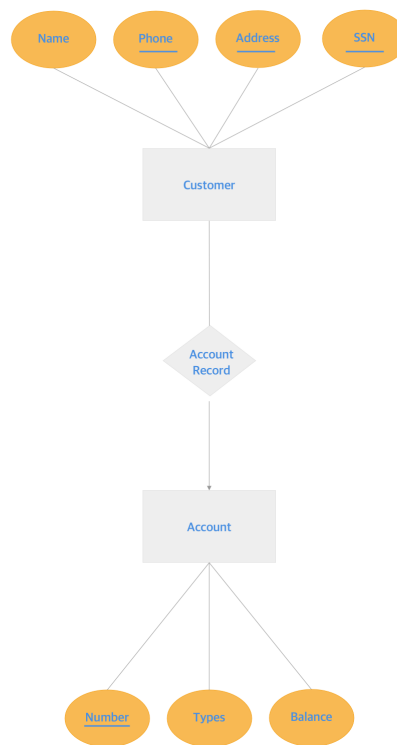


# CSC343 Worksheet 15 Solution (Final)

July 14, 2020

1. • E/R Diagram



- UML

Notes:

- UML
  - Was developed originally as a graphical notation for describing software designs in an object-oriented style
  - Offers the same as E/R model, with the exception of multiway relationship

UML	E/R Model
Class	Entity set
Association	Binary relationship
Association Class	Attributes on a relationship
Subclass	Isa hierarchy
Aggregation	Many-one relationship
Composition	Many-one relationship with referential integrity

- UML Class



- Associations



### Multiplicity in UML

Multiplicity	Option	Cardinality
0..0	0	Collection must be empty
0..1		No instances or one instance
1..1	1	Exactly one instance
0..*	*	Zero or more instance
5..5	5	Exactly 5 instances
$m..n$		At least $m$ but no more than $n$ instances

### Example:



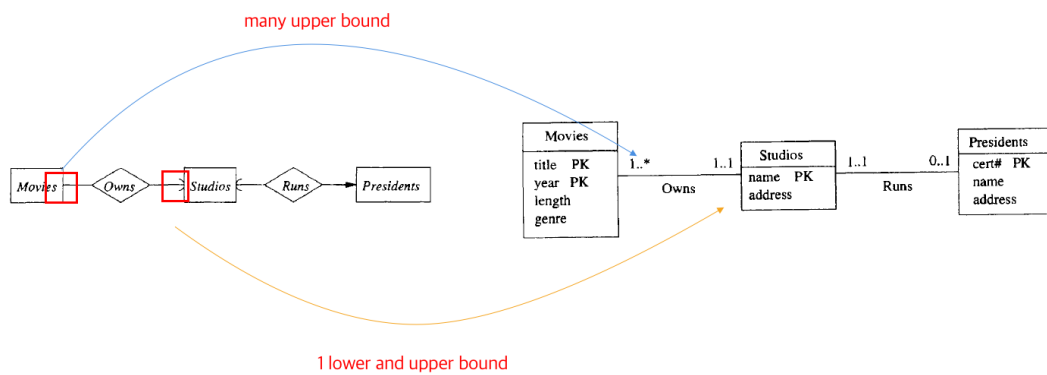
Two or more Player actors are required to initiate **one** Play Game use case.

### References:

- 1) uml-diagrams, UML Multiplicity and Collections, link
- Referential Integrity
    - Means that a value appearing in one context must also appear in another



Means studio can have **at most one** president  
but it could not have a president at some time



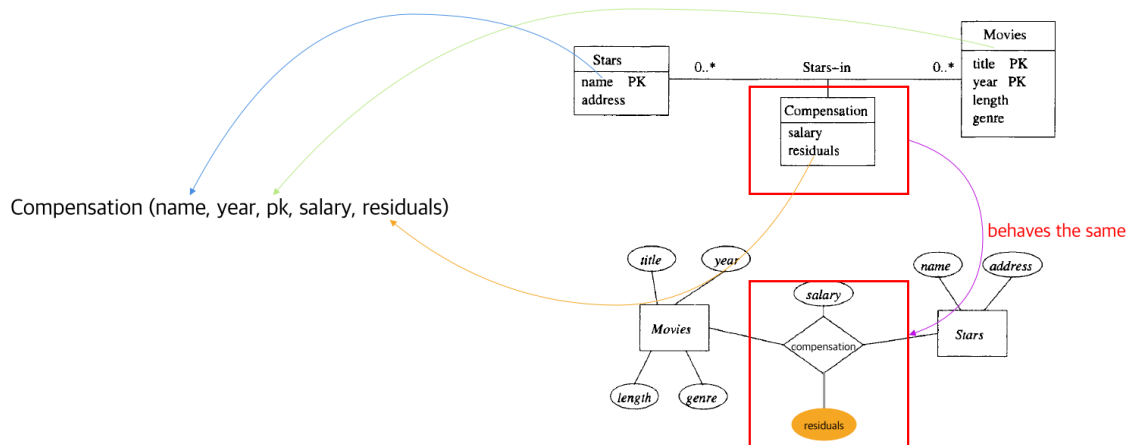
Means one studio can have **at least one** movies  
and there could have many more (to infinity!)

- Self-Associations



is the same

### • Associations



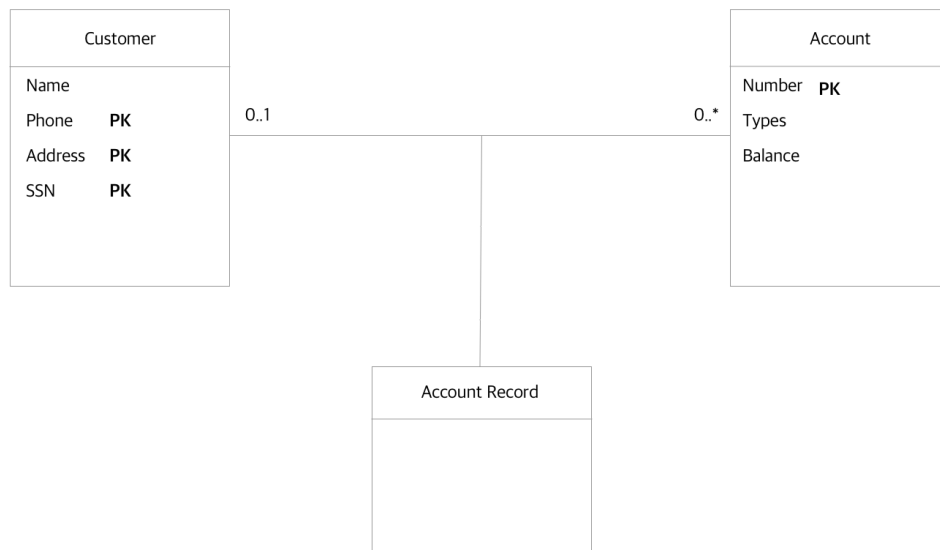
2. a) Solution:



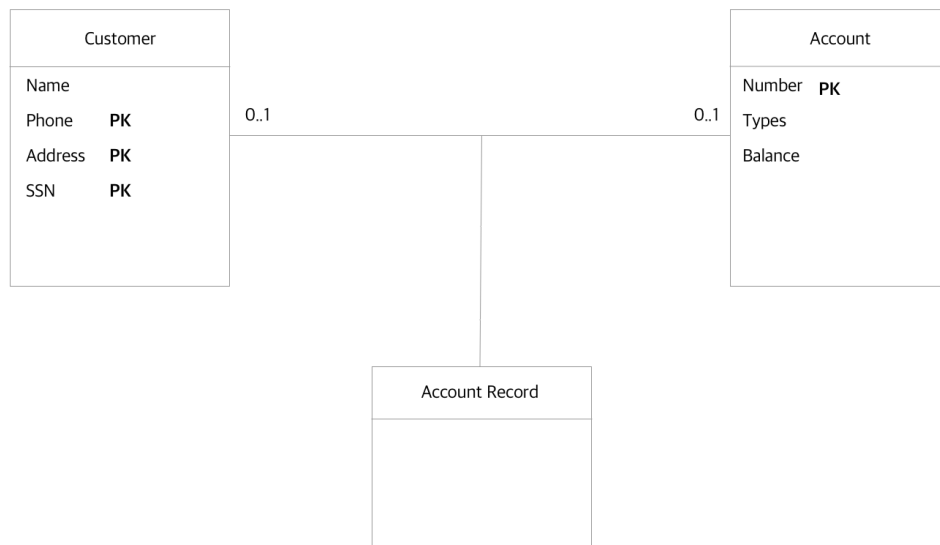
b) Solution:



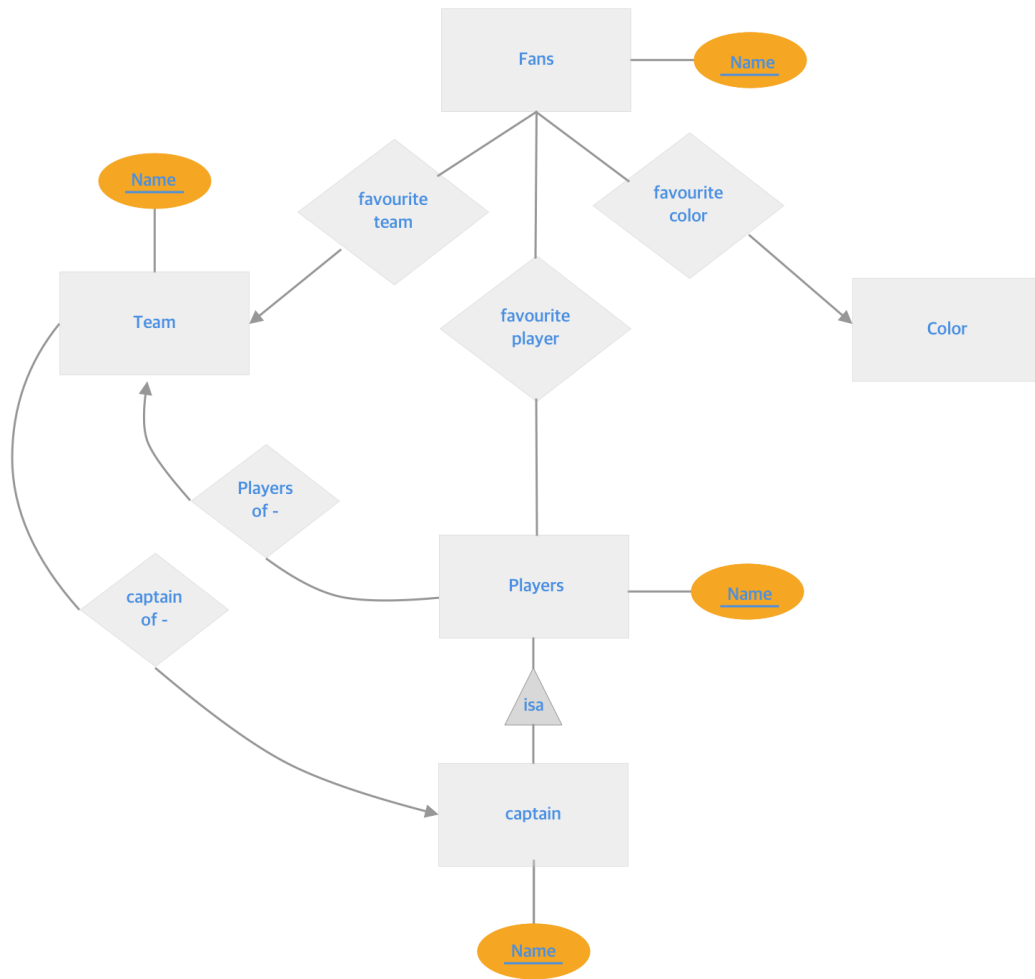
3. a) Solution:



b) Solution:

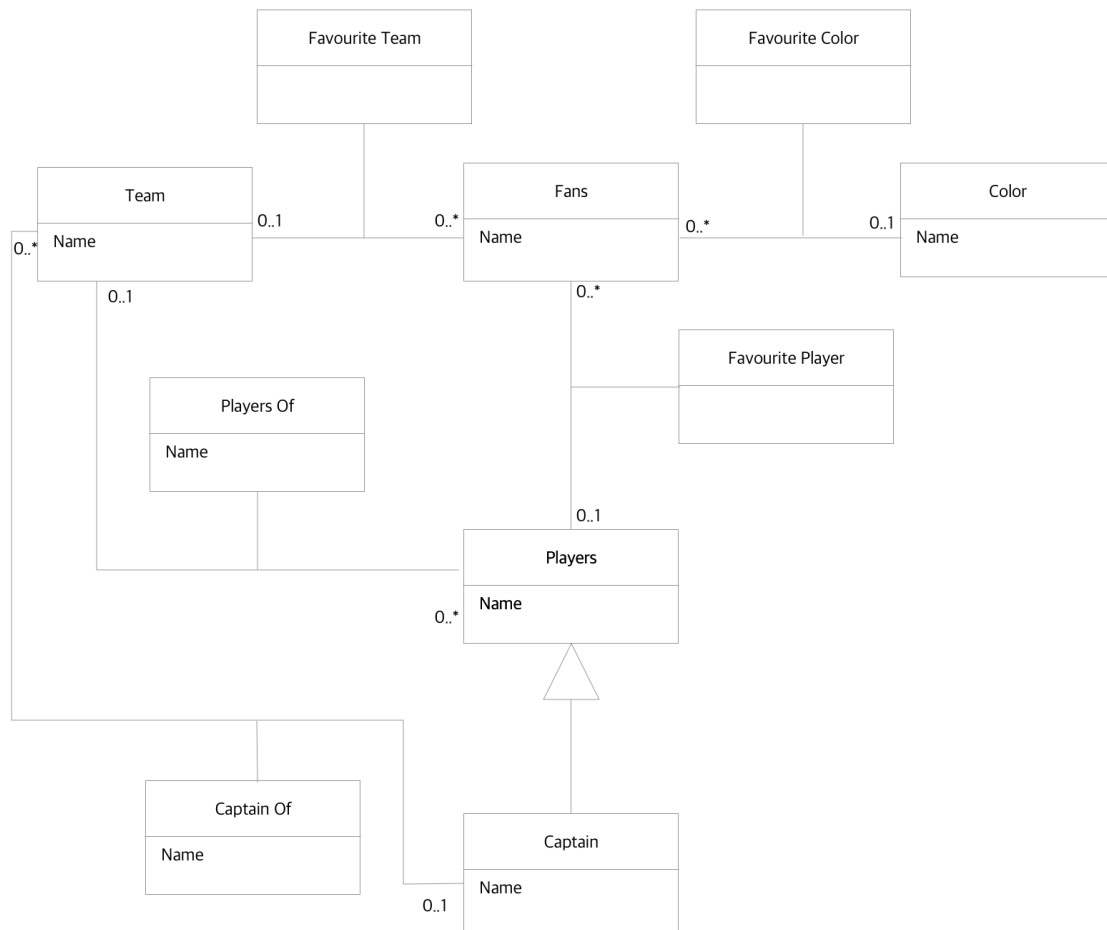


4. • E/R Diagram

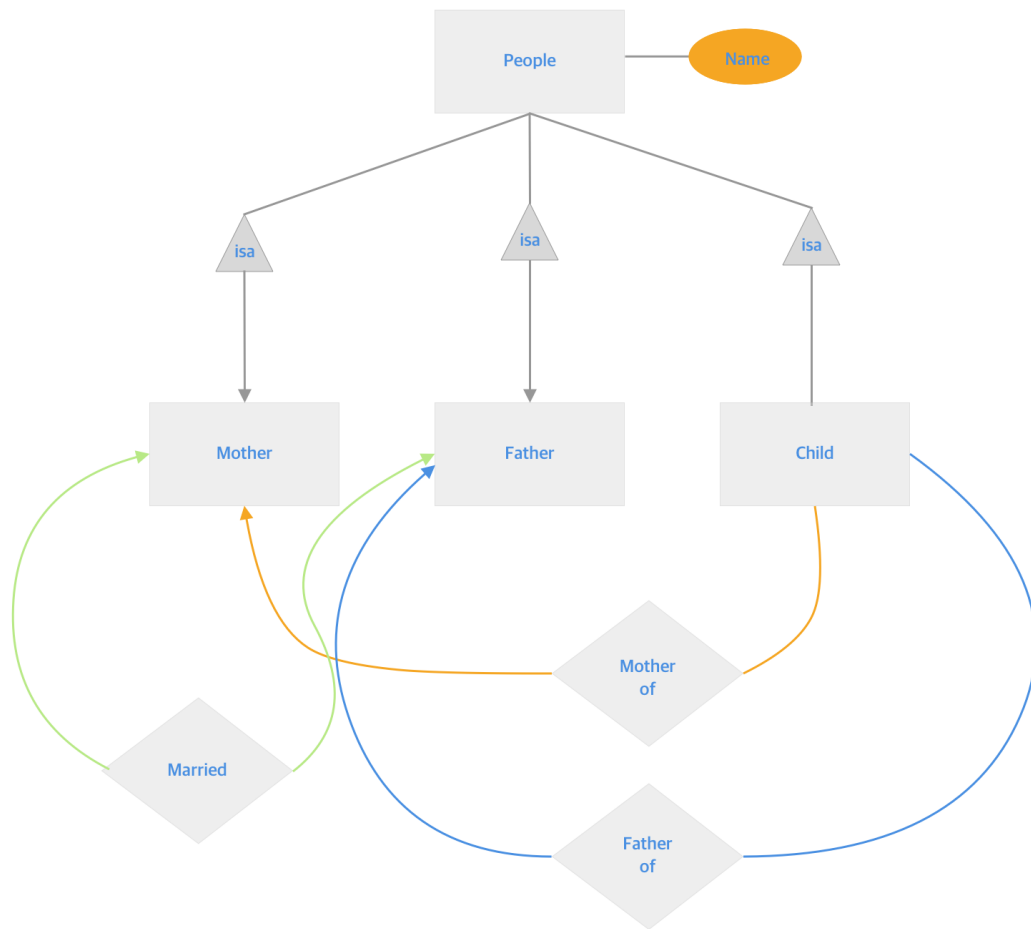


- UML

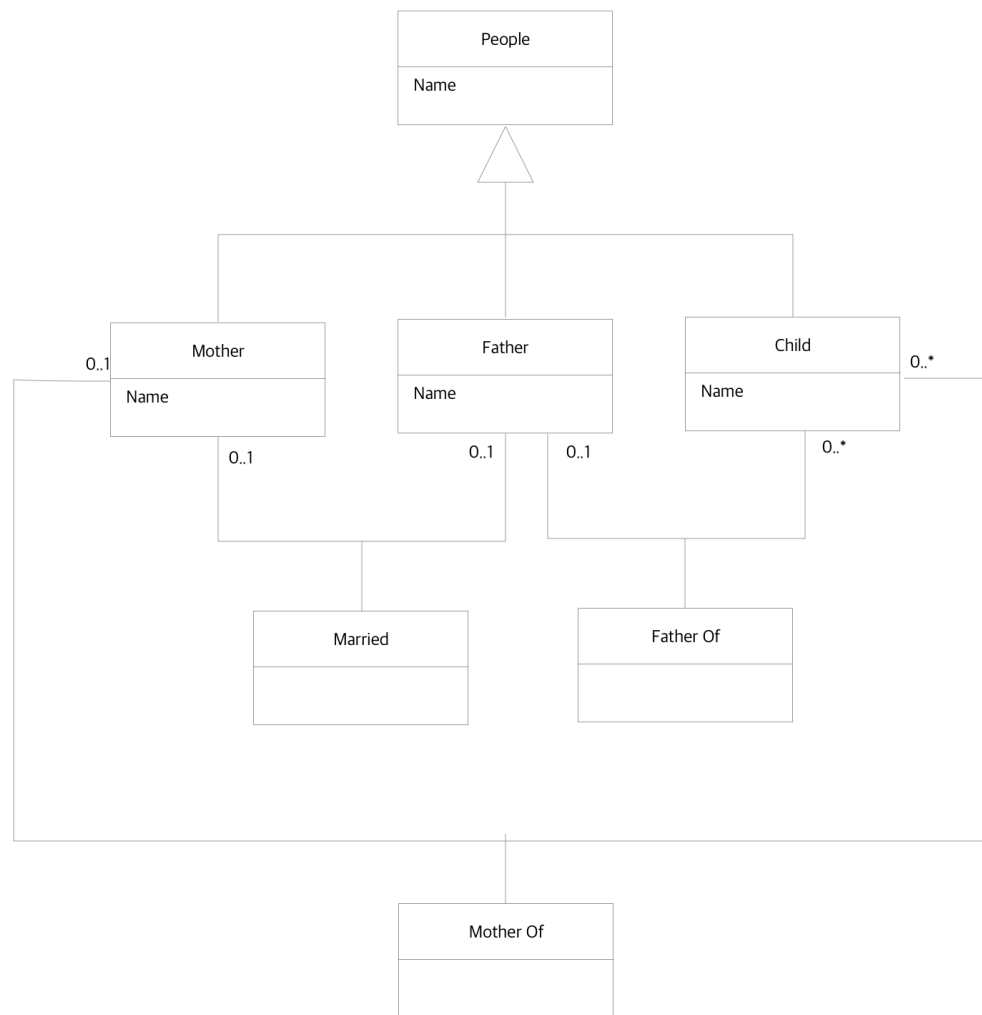




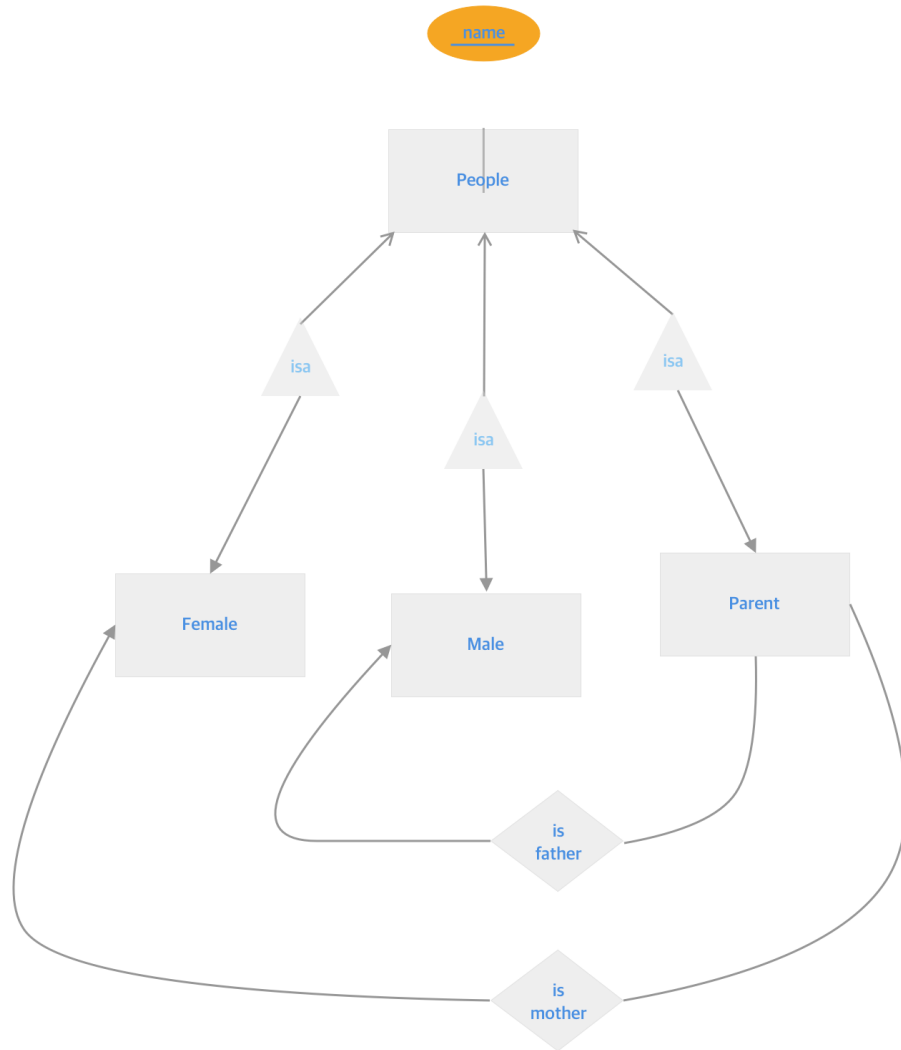
## 5. • E/R Diagram



- UML



6. • E/R Diagram



- UML