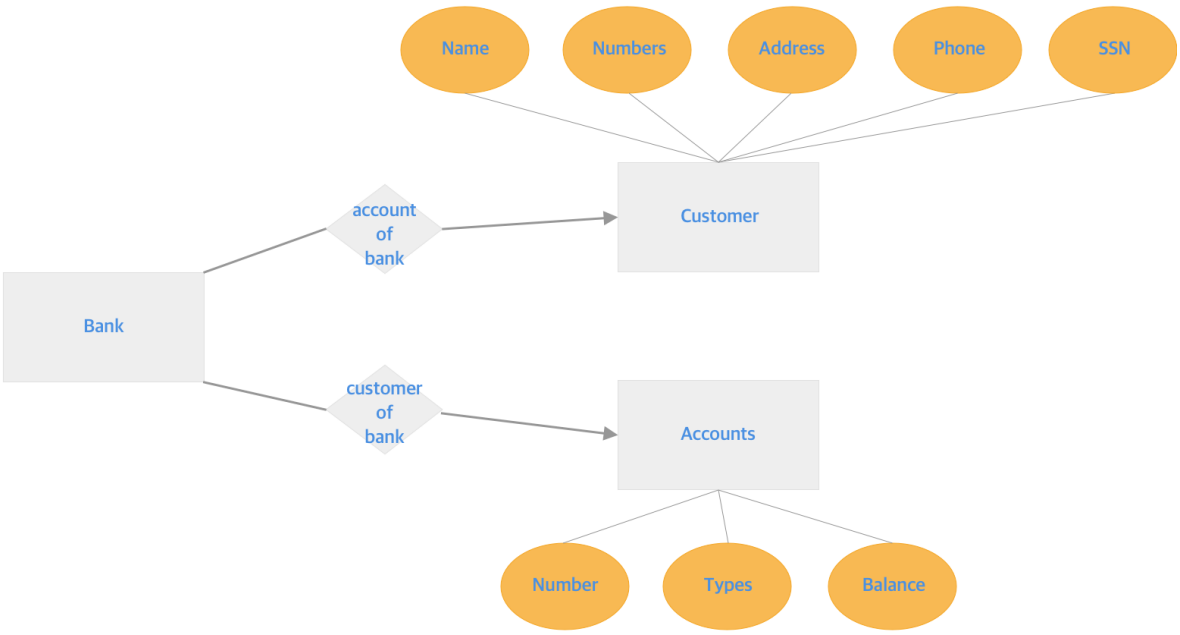
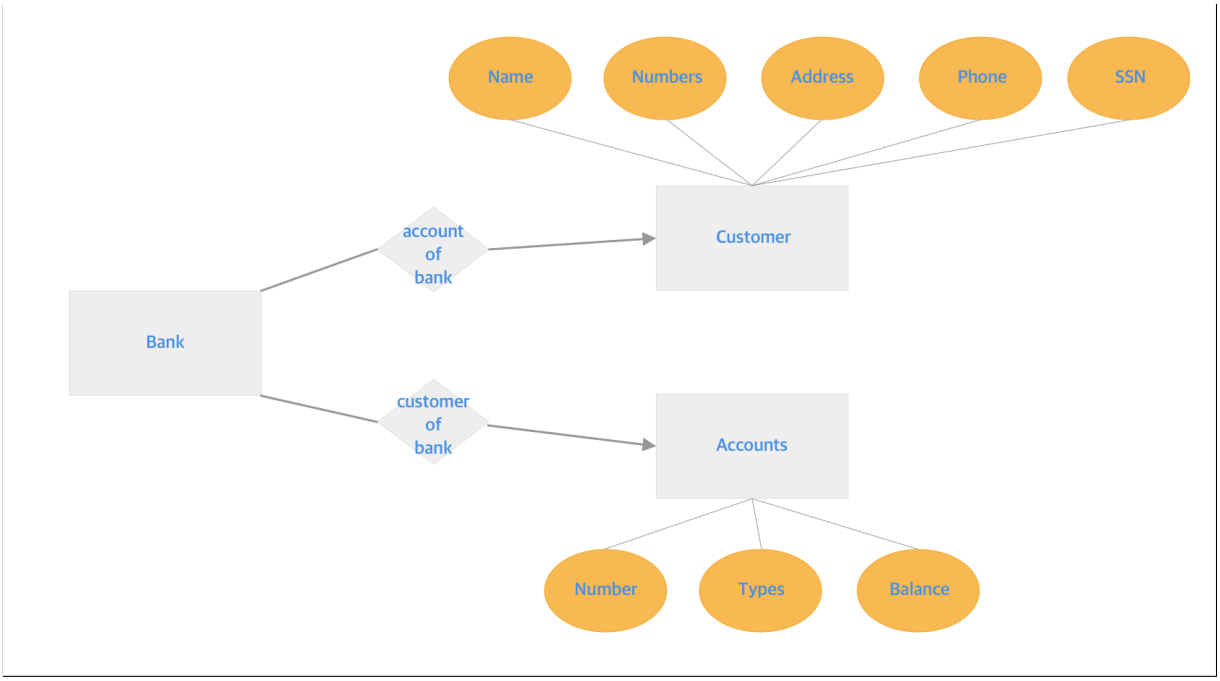
CSC343 Worksheet 14 Solution

July 8, 2020

1.

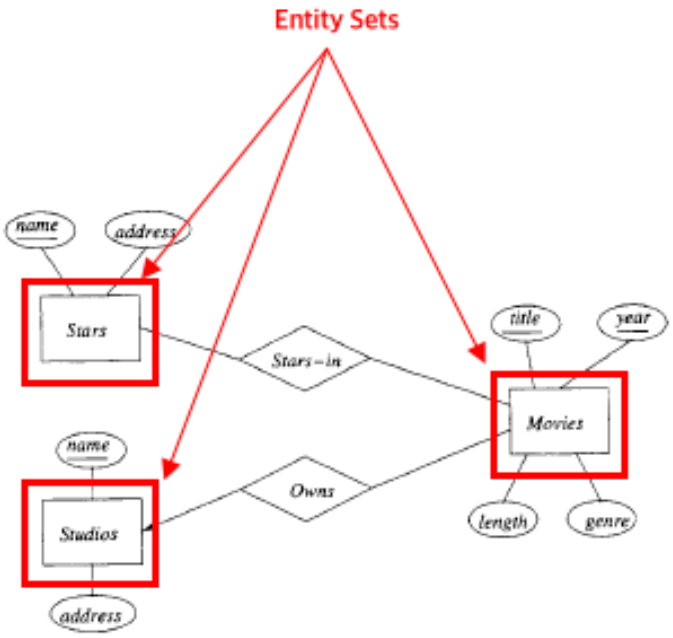


Correct Solution:

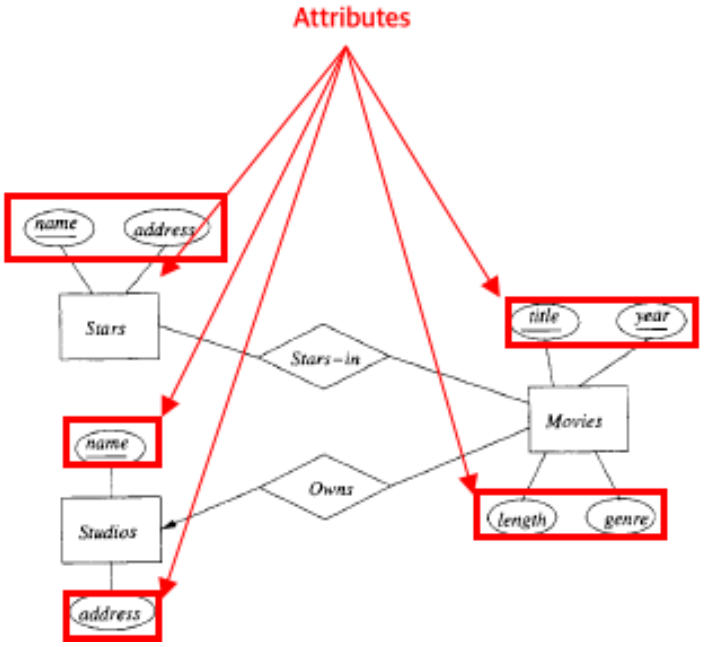


Notes:

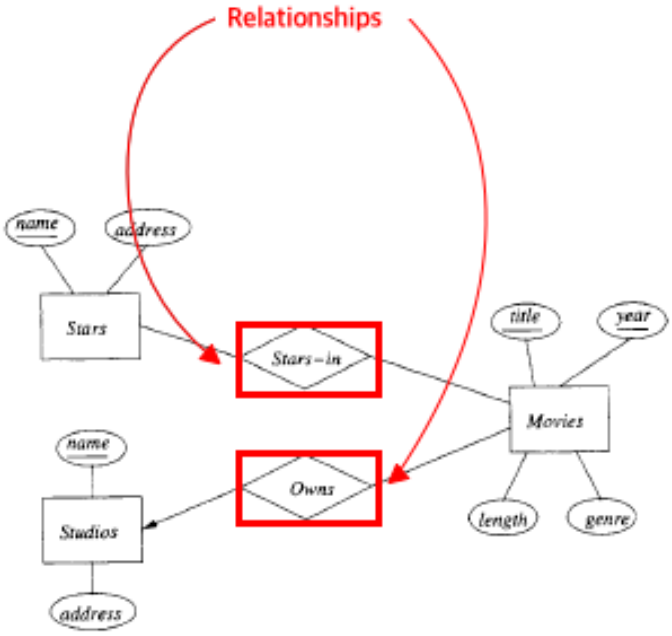
- E/R Model
  - Means **Entity Relationship Model**
  - Entity Relationship Model(ER Modeling) is a graphical approach to database design.
  - Is comparable to class diagram in UML
  - Uses three principle element types:
    1. Entity sets
       * Is an abstract object of some sort (i.e. entitiy)
       * Is not used to represent class
       * Is represented by rectangles



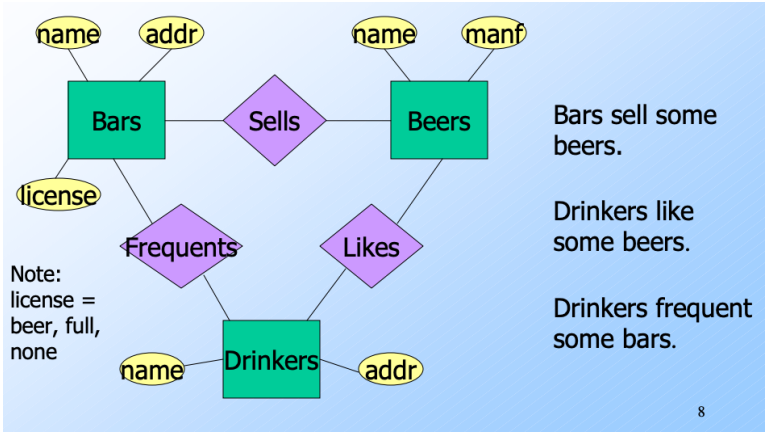
2. Attributes
   * Are properties of entities in a set (i.e. column name)
   * Each has its own primitive data types (e.g. String, integers, Reals)
   * Is represented by ovals



3. Relationships
   * Are connections among two or more entity sets (e.g. intermediary Relations like Stars In)
   * Is represented by diamond

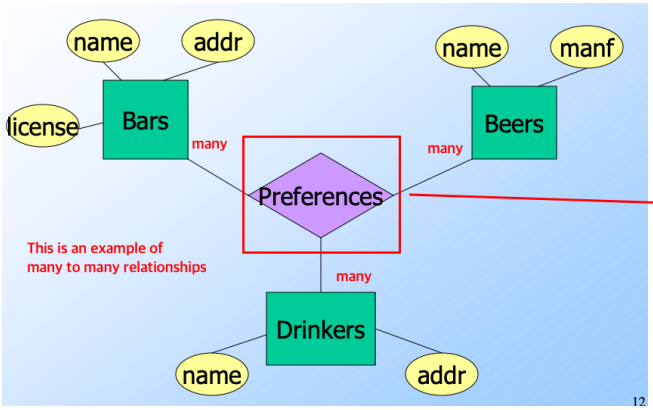


Example:



- Multiway Relationships
  - Connects more than two relationship sets
  - Enables to represent relationships that otherwise is difficult in binary relationship
  - Arrow → 'one'
  - No arrow → 'many'

Example:



Bar	Drinker	Beer
Joe's Bar	Ann	Miller
Sue's Bar	Ann	Bud
Sue's Bar	Ann	Pete's Ale
Joe's Bar	Bob	Bud
Joe's Bar	Bob	Miller
Joe's Bar	Cal	Miller
Sue's Bar	Cal	Bud Lite

Example 2:

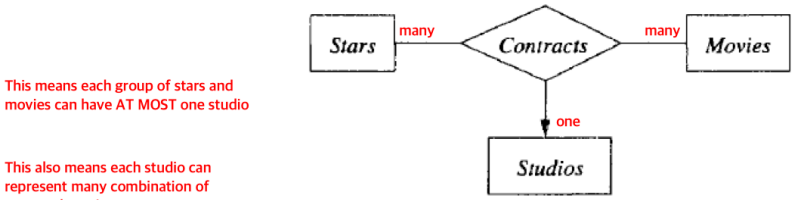


Figure 4.4: A three-way relationship

- Roles in Relationships
  - Is the label of edges between the entity set and relationship
  - Are used to clarify the sementics of relationship

Example:

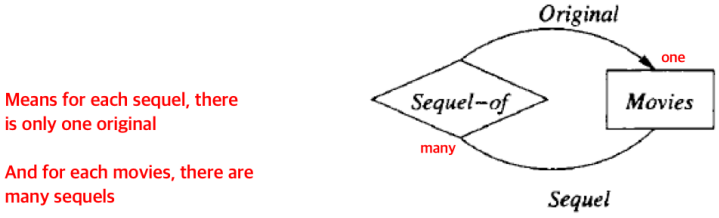


Figure 4.5: A relationship with roles

Example 2:

This means for each combination of stars and movies, there can be a one stduio for star, and one studio for movie

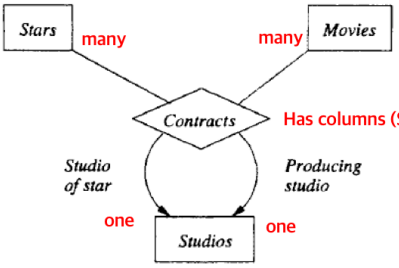
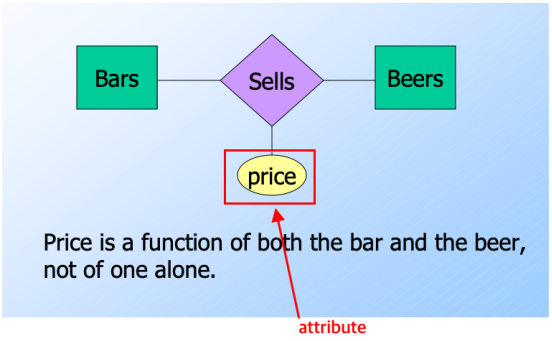


Figure 4.6: A four-way relationship

- Attributes on Relationships
  - can be thought as a property of tuples in the relationship set (i.e. String, Integer, Float, Boolean)

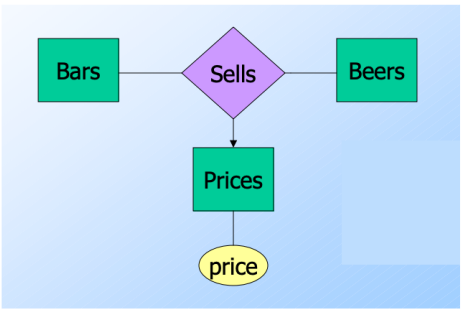
    Example:



Bar	Beers	Price
Bar 1	Canadian	10.99
Bar 2	Budwiser	20.99
Bar 1	Hite	4.99
Bar 1	Cass	15.99

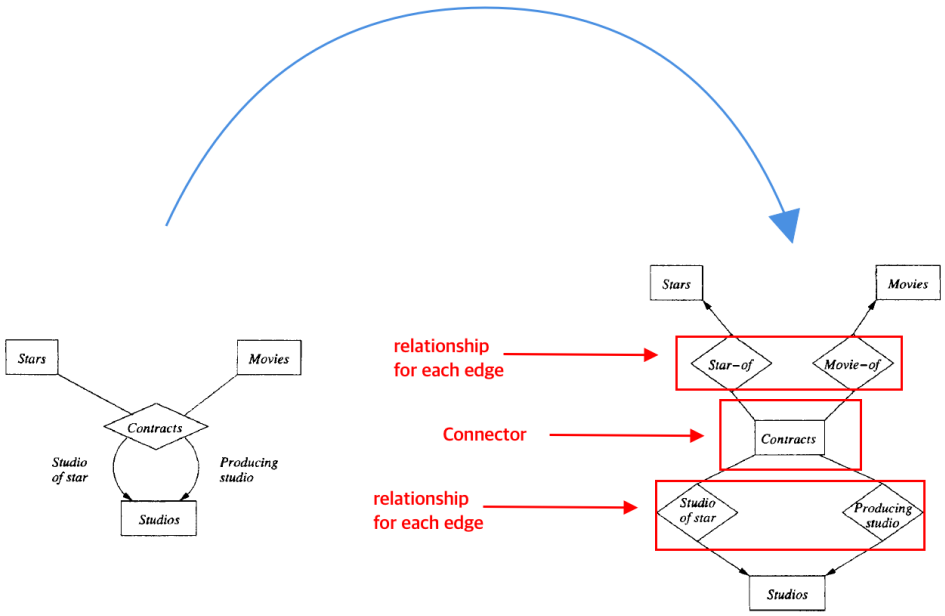
  - Can be removed by creating an entity set with the attribute

    Example:



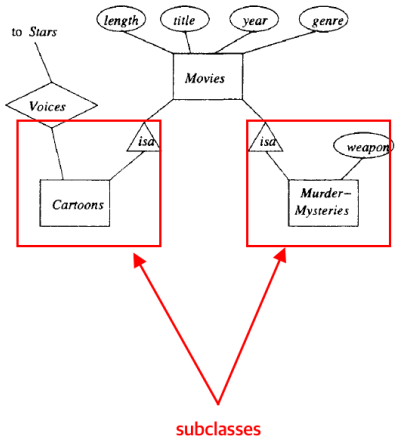
- Conversting Multiway Relationships to Binary

  Example:

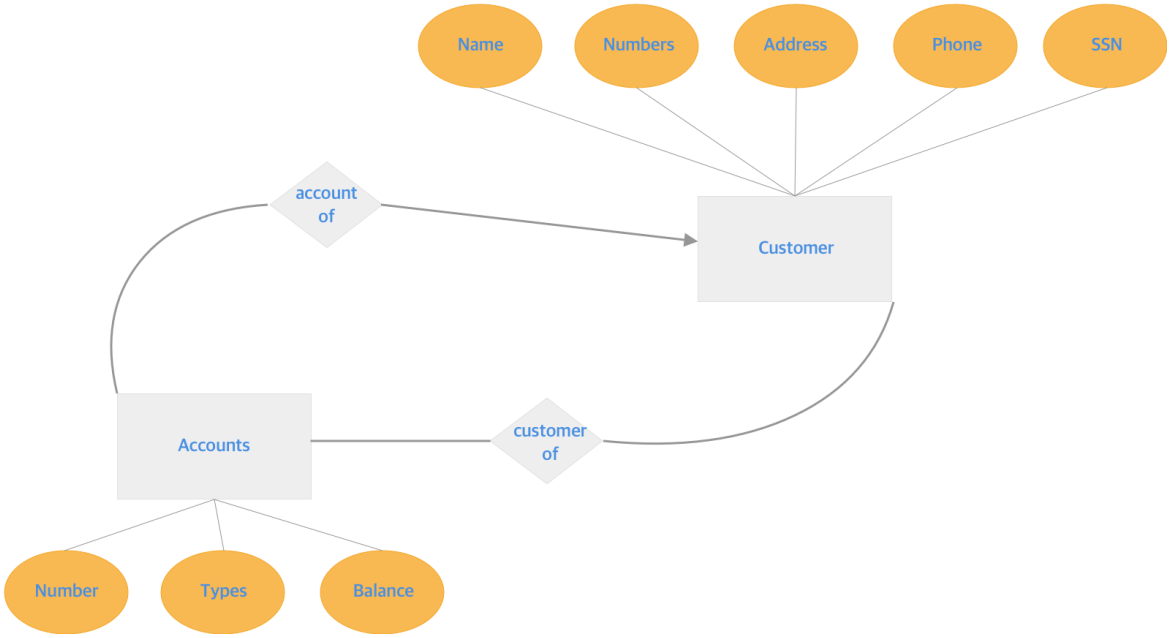


- Subclasses in the E/R Model
  - Has its own special attributes and/or relationships
  - All '*isa*' relationship is <u>one to one</u>
  - Is represented by triangle with label '*isa*' followed by entity set

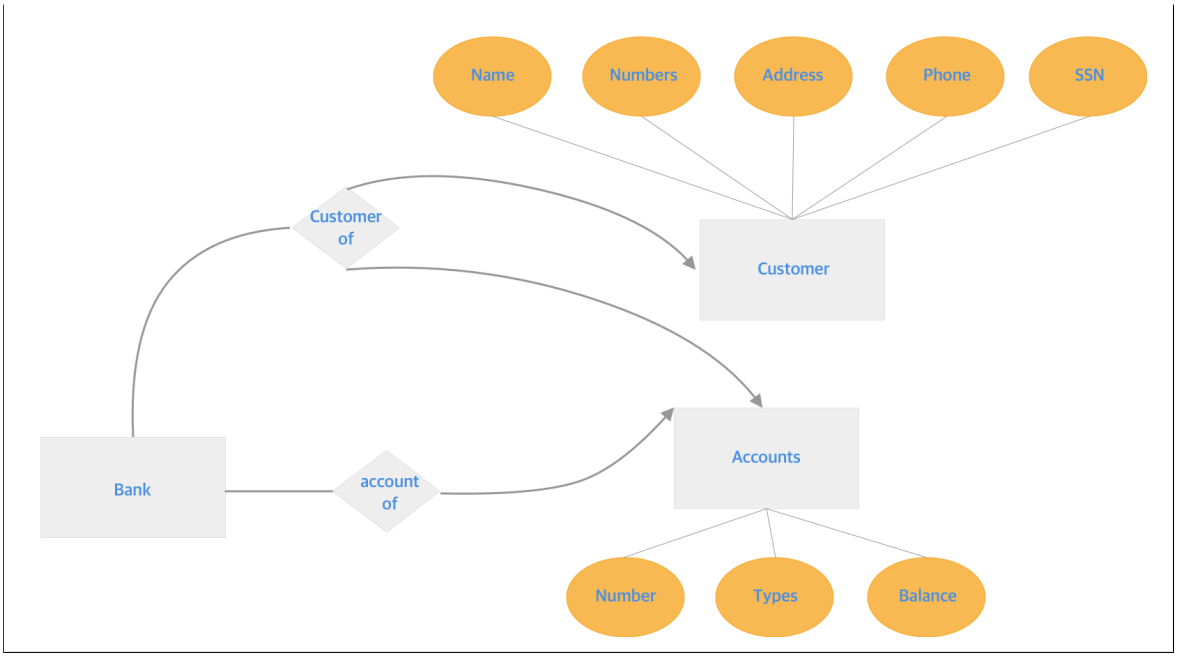
  Example:



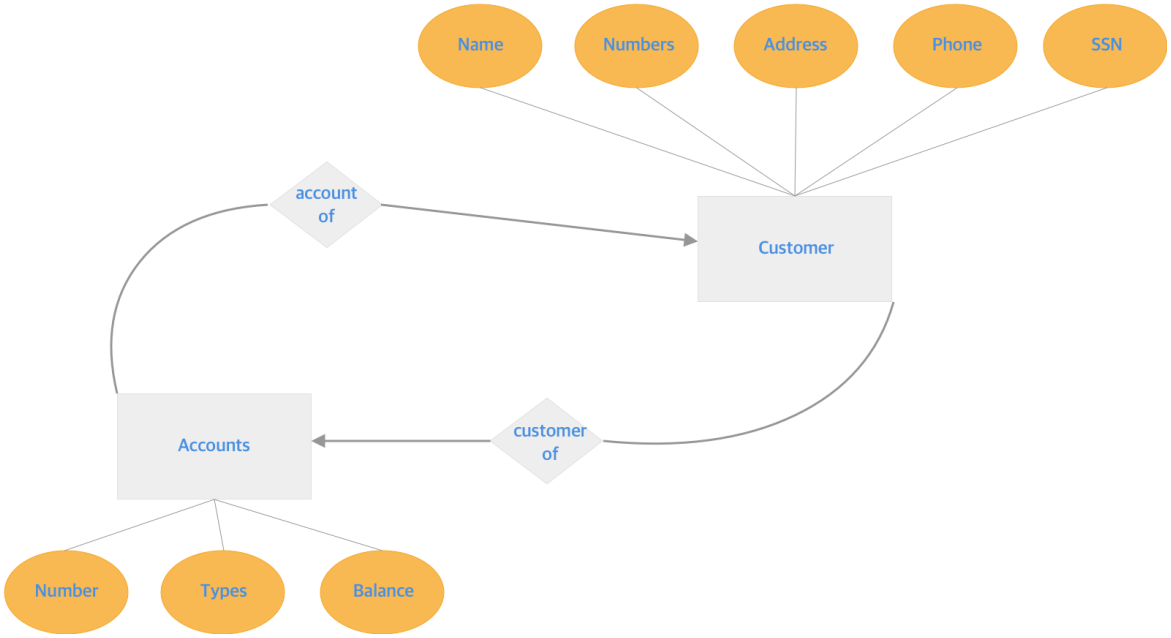
2. a)



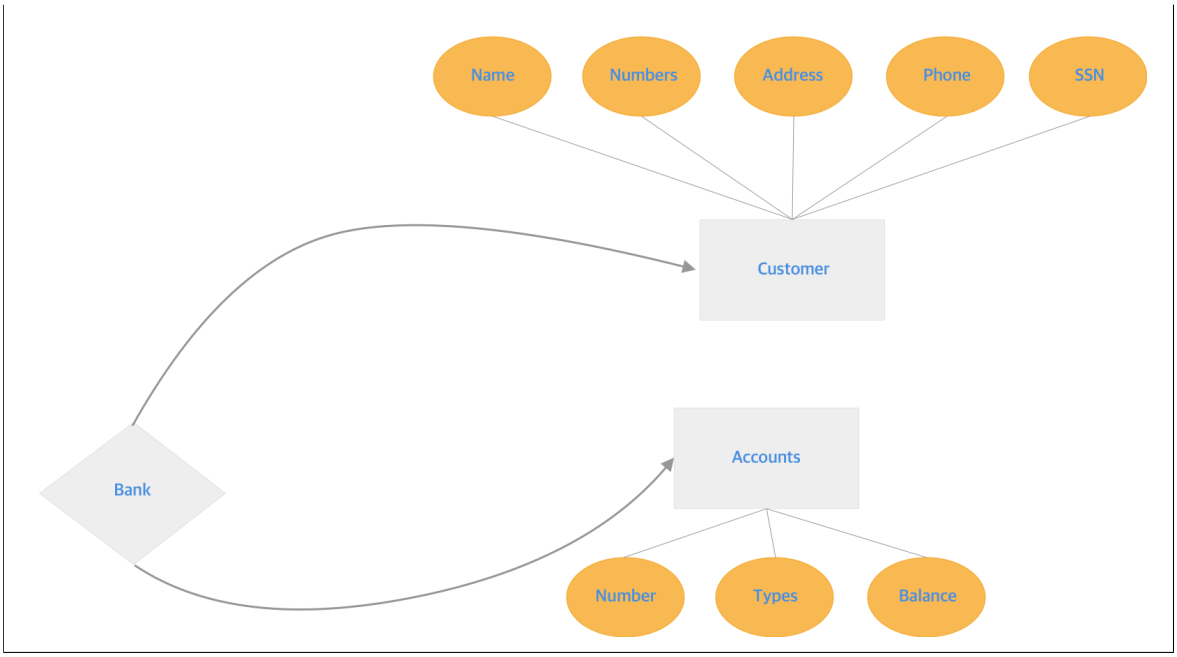
Correct Solution:



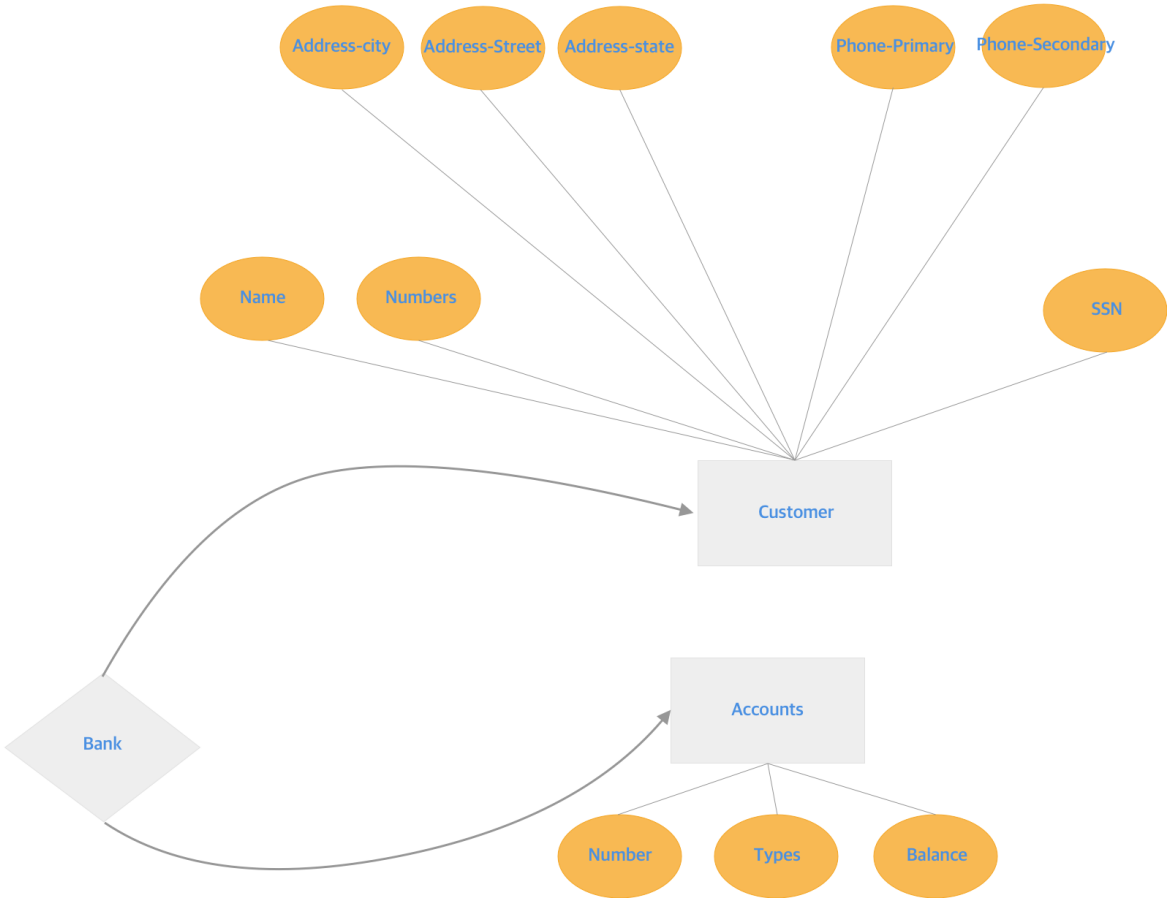
b)



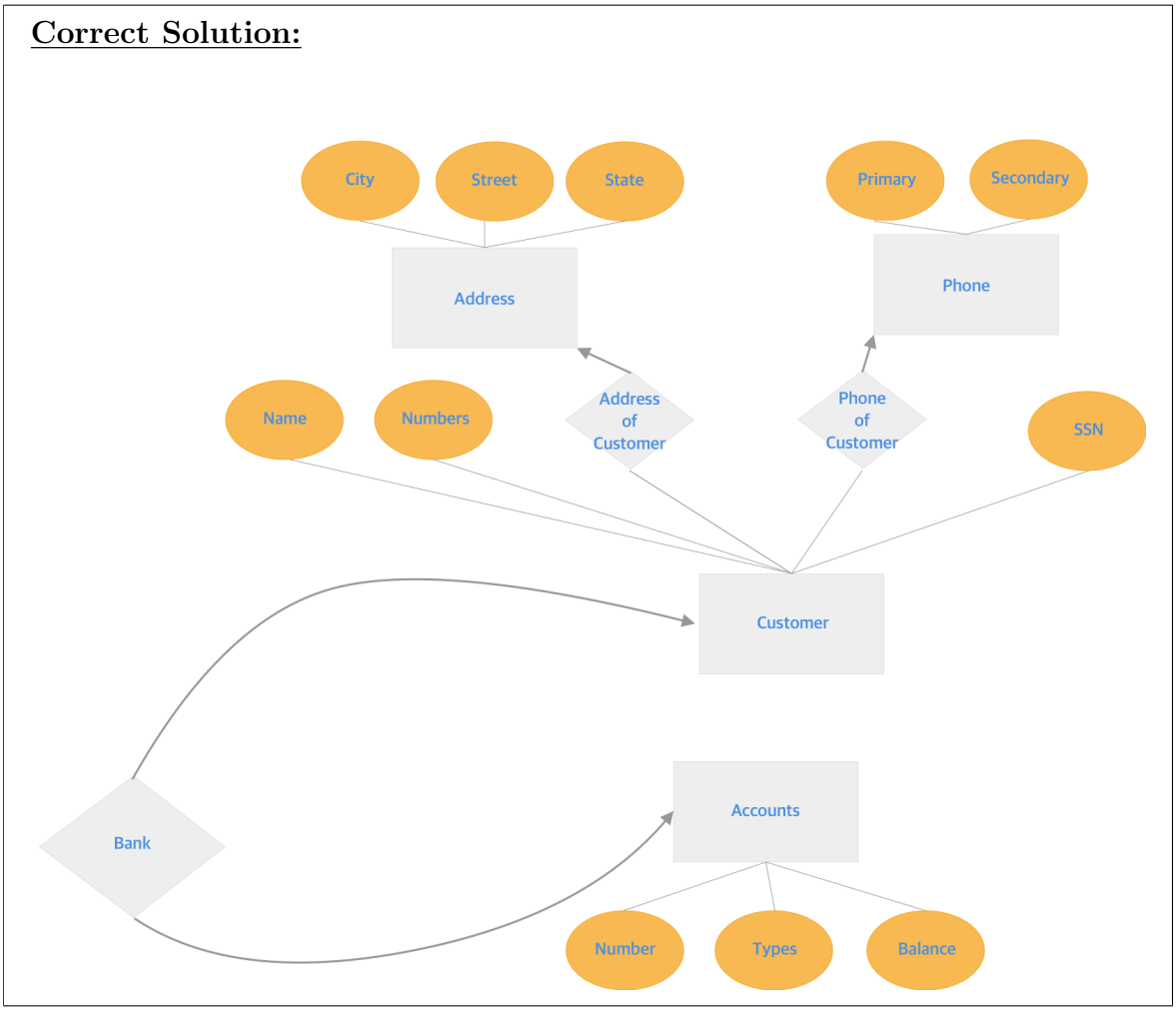
Correct Solution:


Name
Numbers
Address
Phone
SSN
Customer
Accounts
Bank
Number
Types
Balance

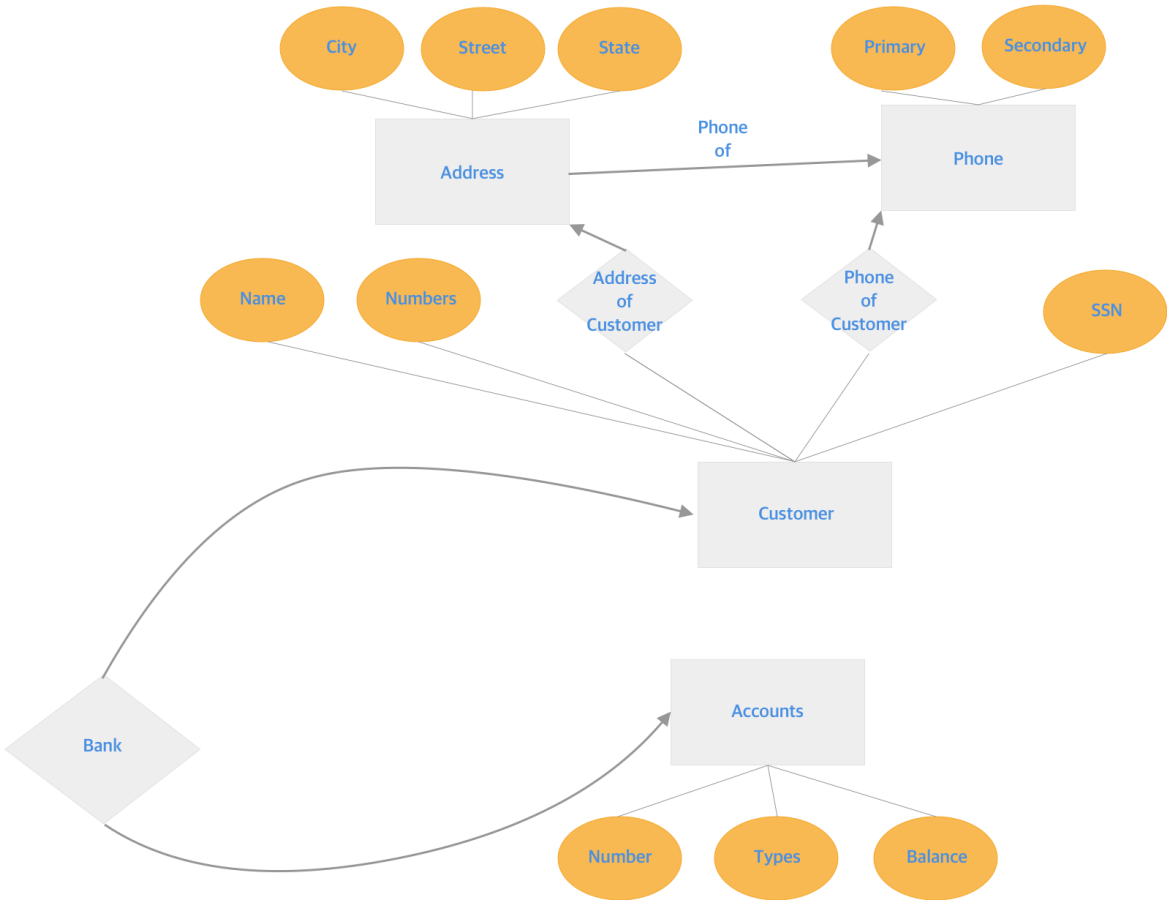
c)


Address-city
Address-Street
Address-state
Phone-Primary
Phone-Secondary
Name
Numbers
SSN
Customer
Accounts
Bank
Number
Types
Balance

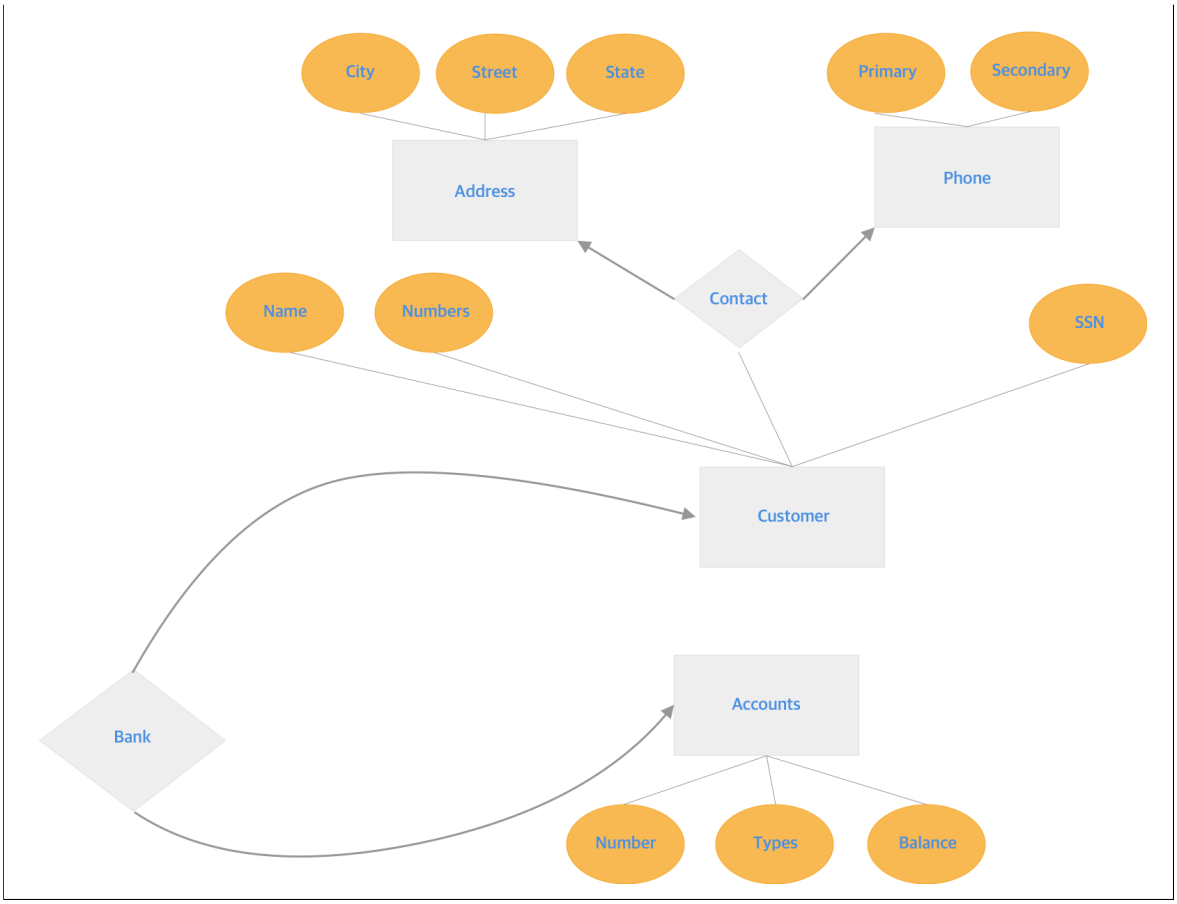
Correct Solution:

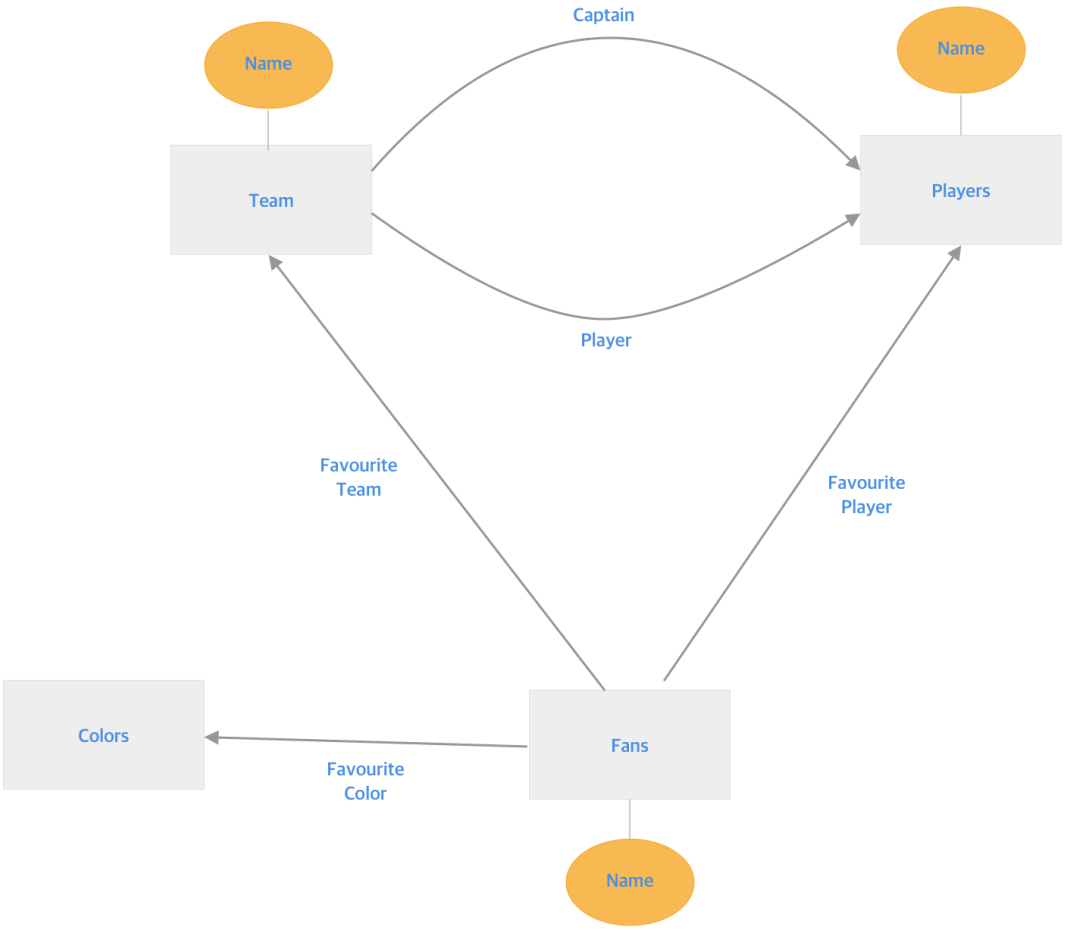


d)



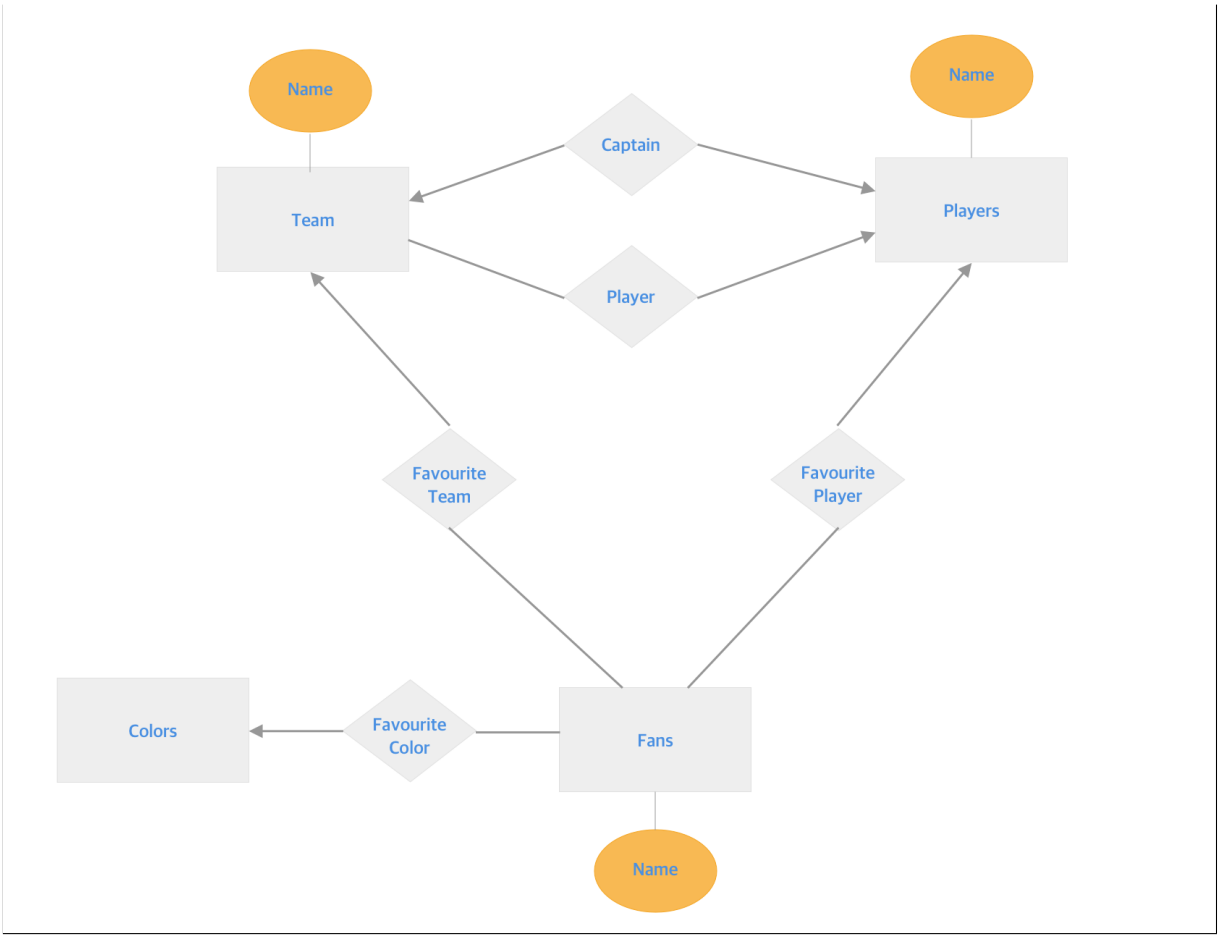
Correct Solution:


City
Street
State
Address
Primary
Secondary
Phone
Contact
Name
Numbers
SSN
Customer
Bank
Accounts
Number
Types
Balance

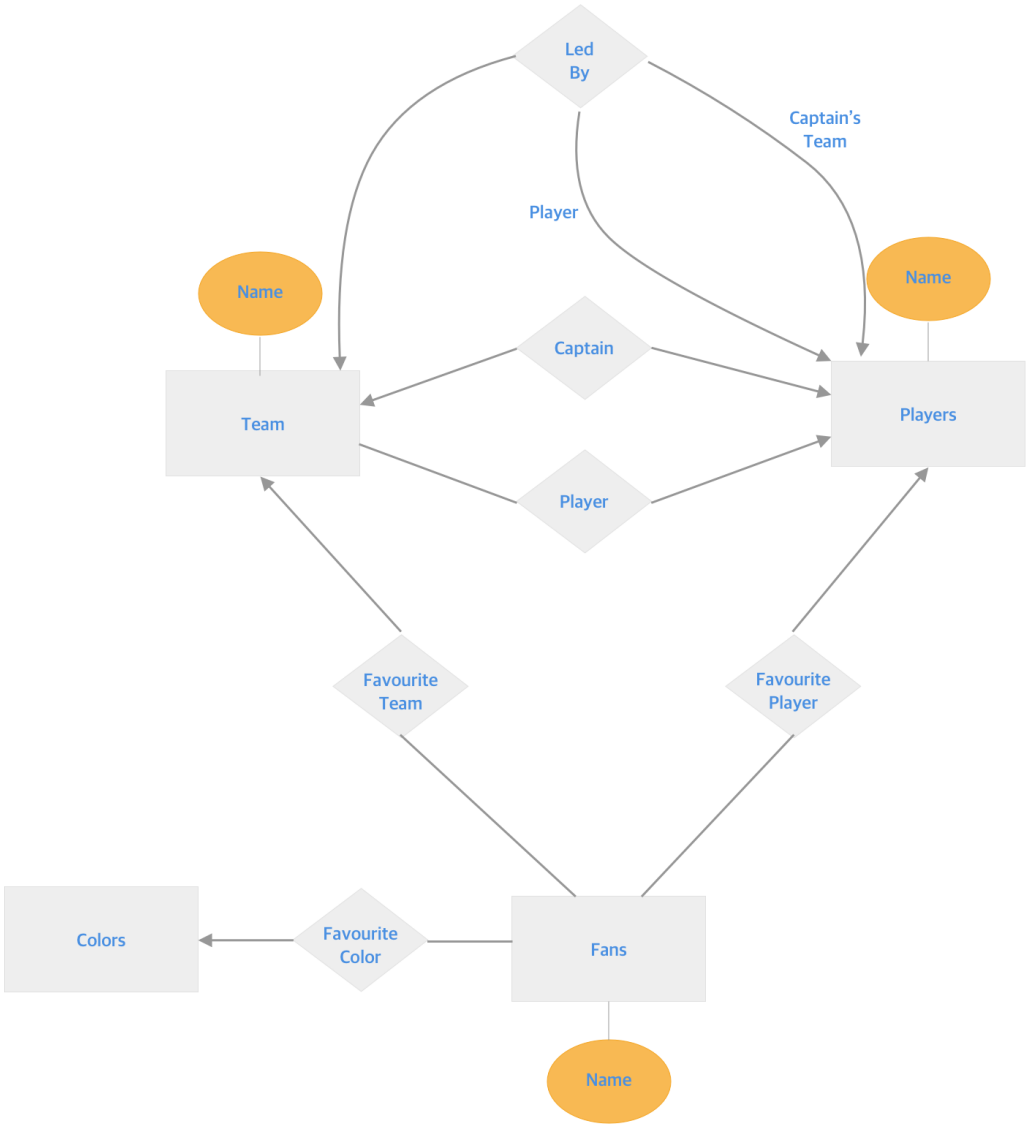


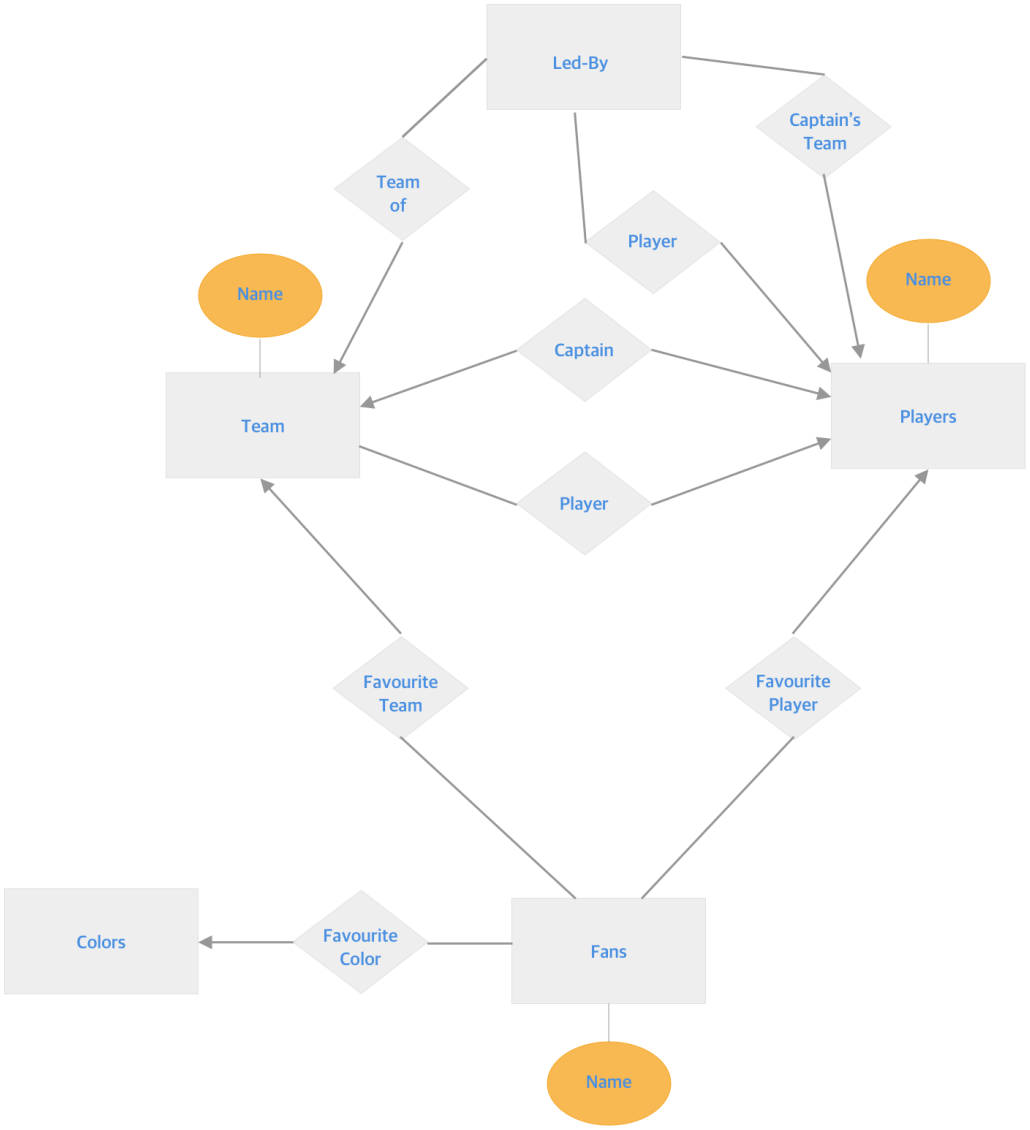
3.

Correct Solution


Name
Name
Captain
Team
Players
Player
Favourite Team
Favourite Player
Colors
Favourite Color
Fans
Name

4. a)


Led By
Captain's Team
Player
Name
Name
Captain
Team
Players
Player
Favourite Team
Favourite Player
Colors
Favourite Color
Fans
Name

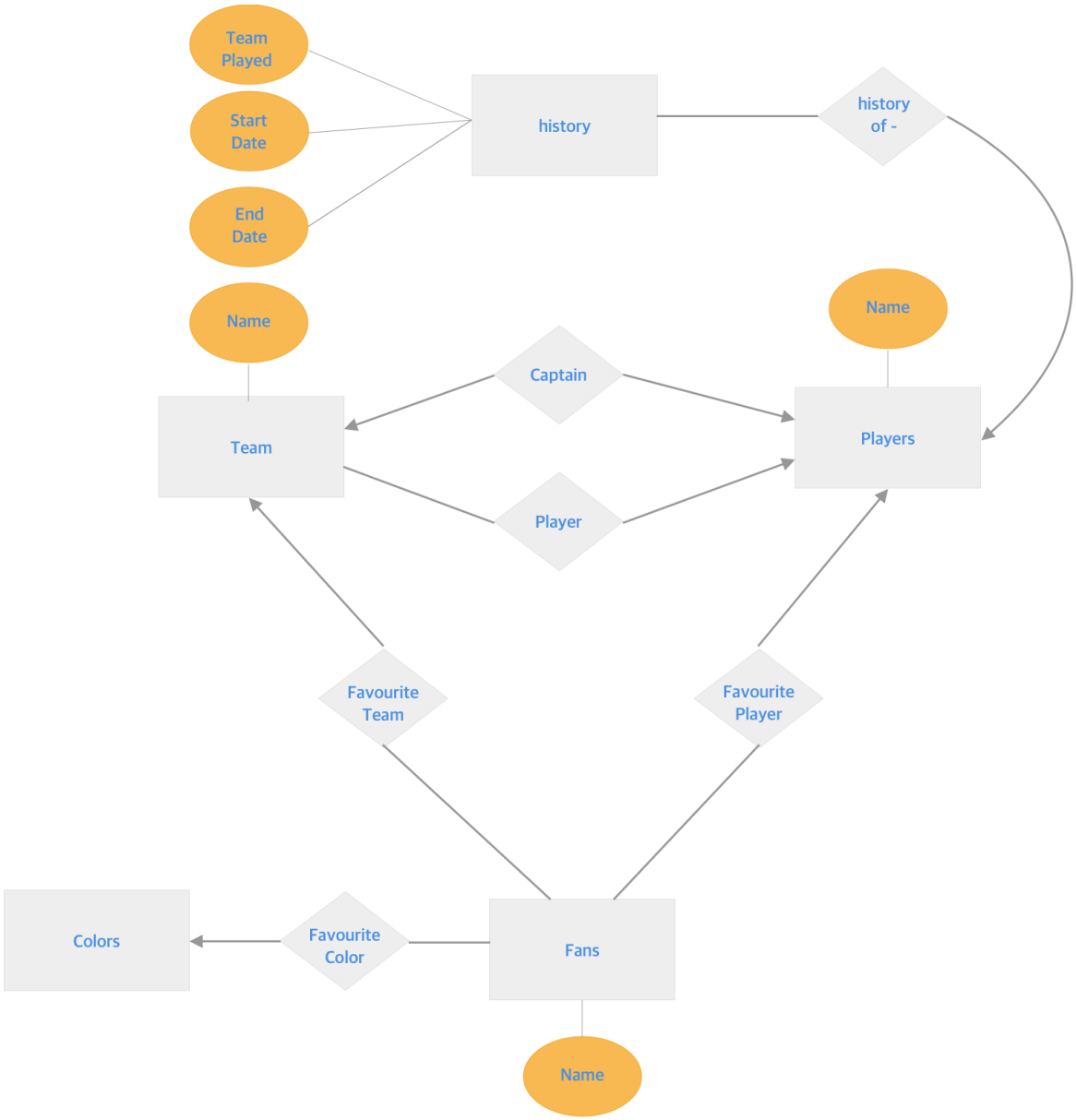


b)

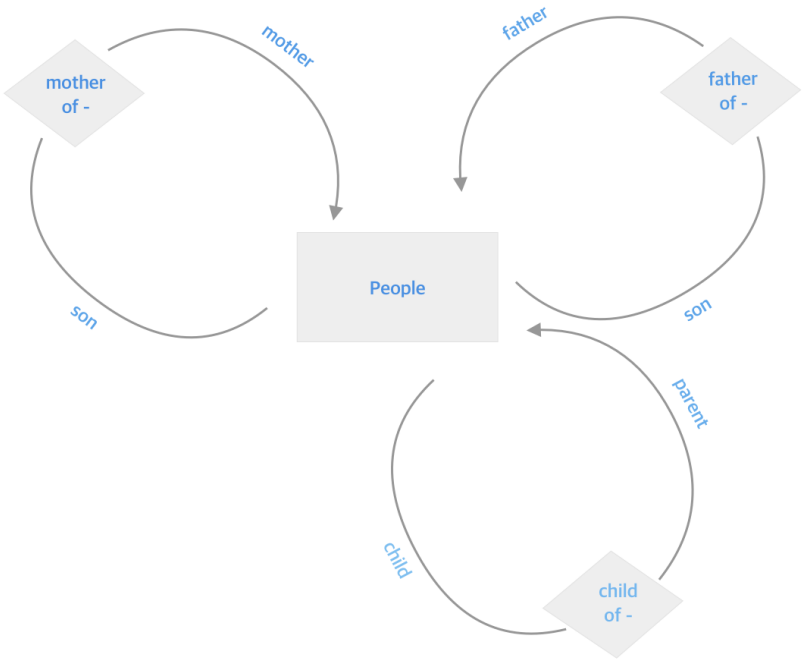
c) They are the same. (I need more work on providing reason).

Notes:

- I should ask professor about this :'(

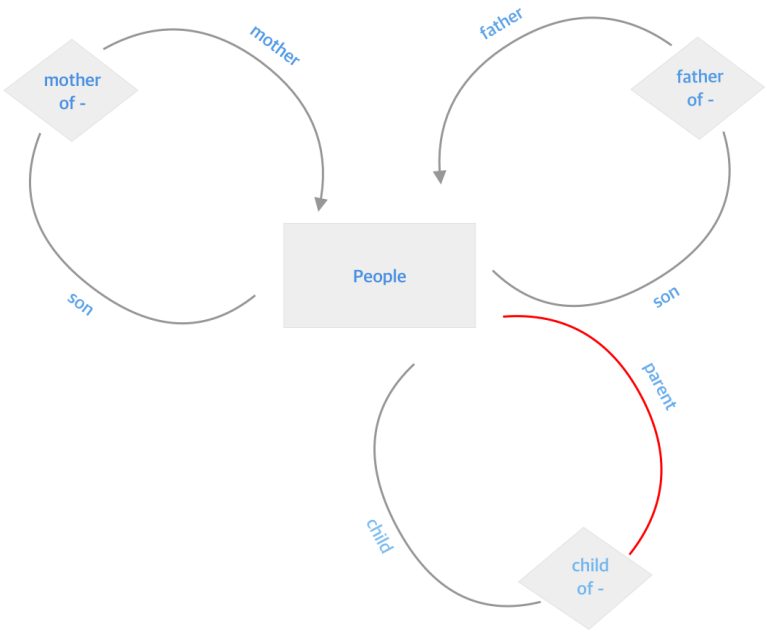

Team Played
Start Date
End Date
history
history of -
Name
Name
Captain
Team
Players
Player
Favourite Team
Favourite Player
Colors
Favourite Color
Fans
Name

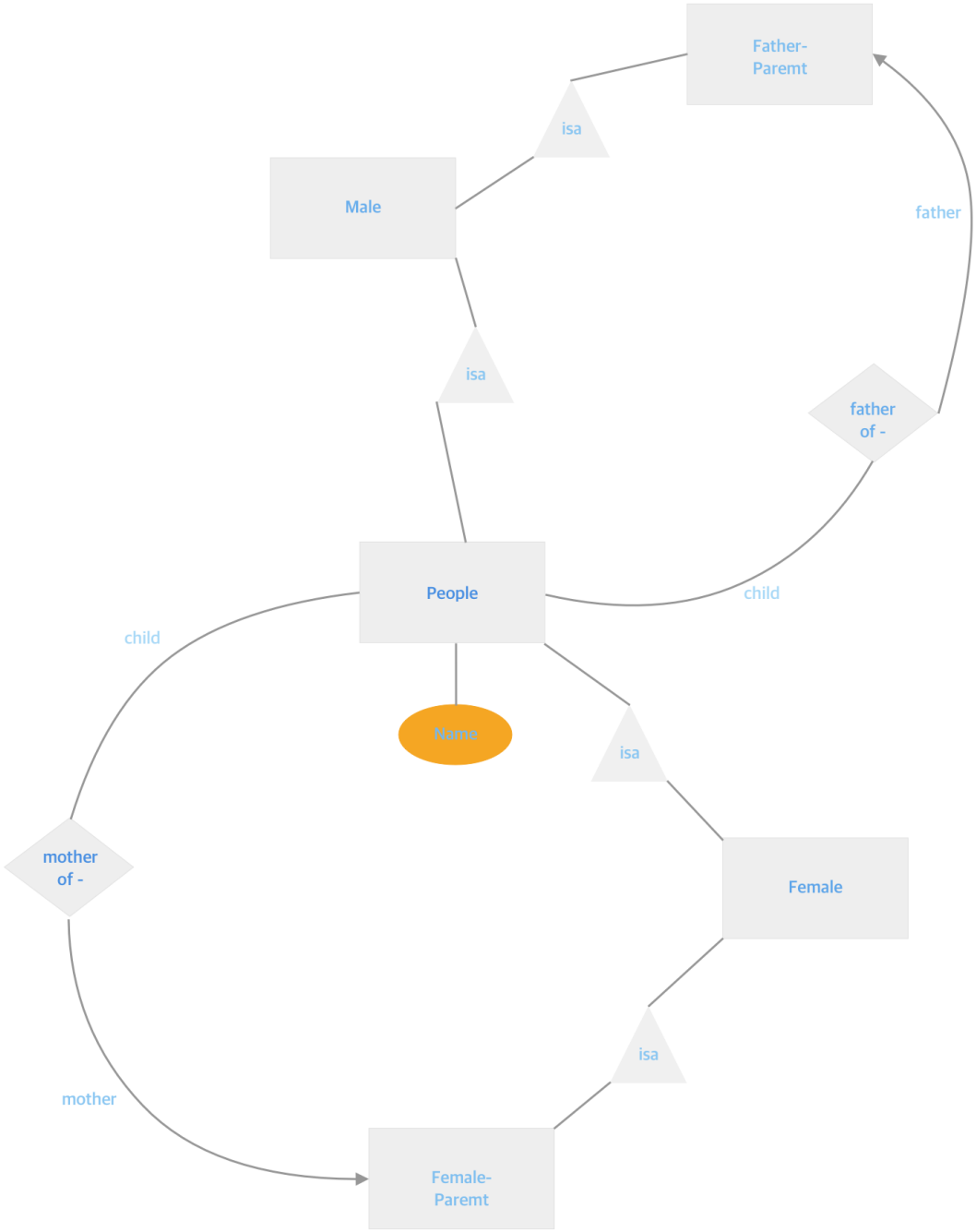
5.



6.

Correct Solution:

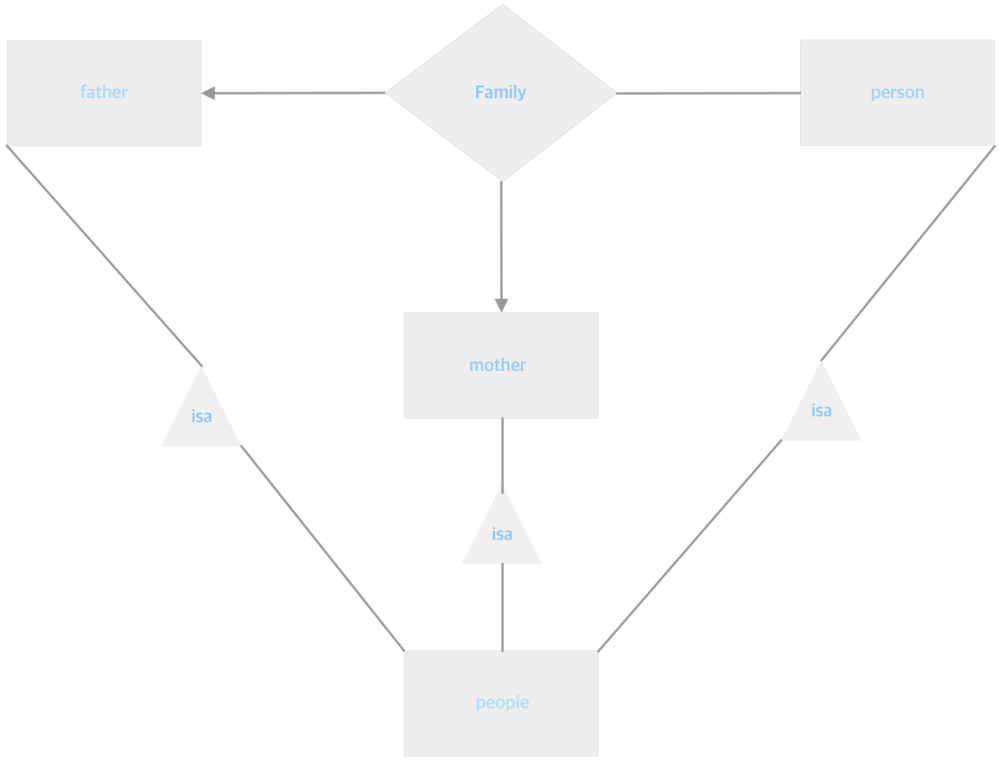




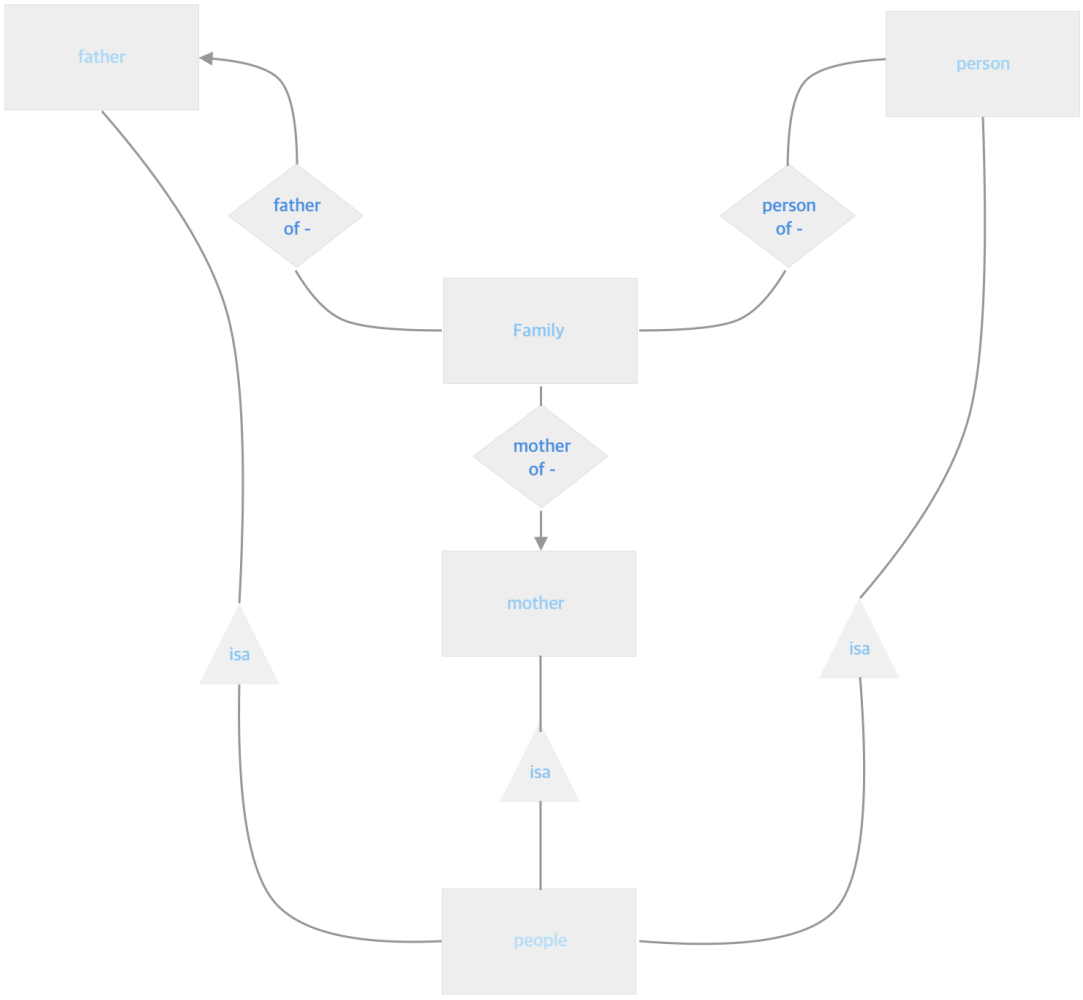
7.

Notes:

- I feel the need to clarify with professor if two parent subclasses can exist
- I feel the need to ask professor whether this design is valid



8. a)


father
person
father of -
person of -
Family
mother of -
mother
isa
isa
isa
people

b)