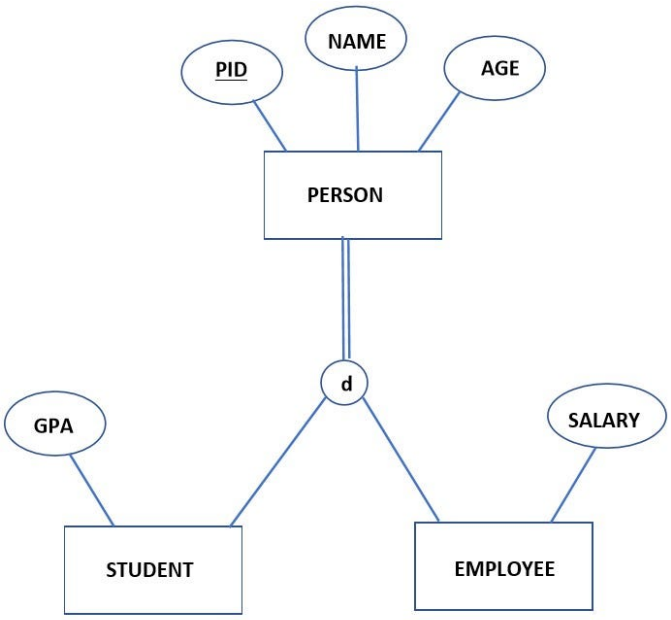
Mapping from EER Model to Relational Model

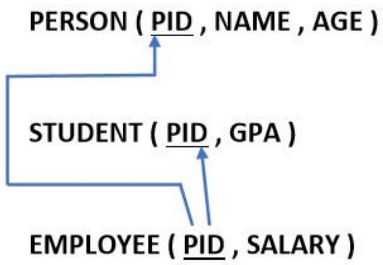
Notes by Mannan Ul Haq

Let us go through the following diagram.



There are four ways to draw relational schema for an EER. We have to choose the most suitable one.

First method



Here we write separate relations to all superclass entities and subclass entities. And here we have to write the superclass entities' primary key to all subclass entities and then map them as shown above. Note that we write only the attributes belongs to each entity.

Second method

STUDENT (PID , GPA , NAME , AGE)

EMPLOYEE (PID , SALARY , NAME , AGE)

Here we do not write the superclass entity but in each subclass entity, we write all attributes that are in superclass entity.

Third method

PERSON (PID , NAME , AGE , SALARY , GPA , PERSONTYPE)

Here we write only the superclass entity and write all the attributes which belong to subclass entities. Specialty in here is that to identify that **PERSON** is an **EMPLOYEE** or **STUDENT** we add a column as **PERSONTYPE**. After the table creates we can mark as a **STUDENT** or **EMPLOYEE**.

Fourth method

PERSON (PID , NAME , AGE , SALARY , GPA , STUDENT , EMPLOYEE)

Here instead of PERSONTYPE, we write STUDENT and EMPLOYEE both. The reason for that is sometime PERSON will belong to both categories.

Now let us see how to select the best and most suitable method to write the relational schema.

1. *If sub-entities have more attributes (local or foreign attributes)*

Select the **first or second method**.

From this two,

If EER is totally specialized → select the **second method**.

If EER is partially specialized → select **first method**.

2. *If sub-entities have fewer attributes (local or foreign attributes)*

Select the **third or fourth method**.

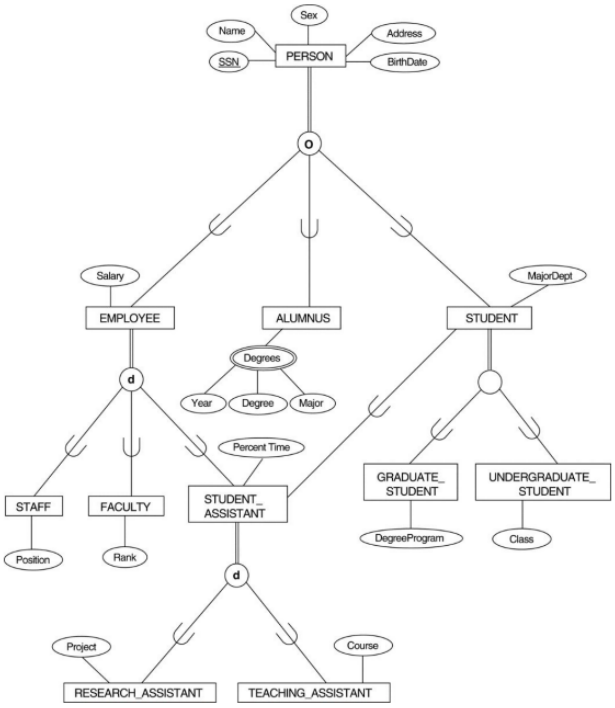
From this two,

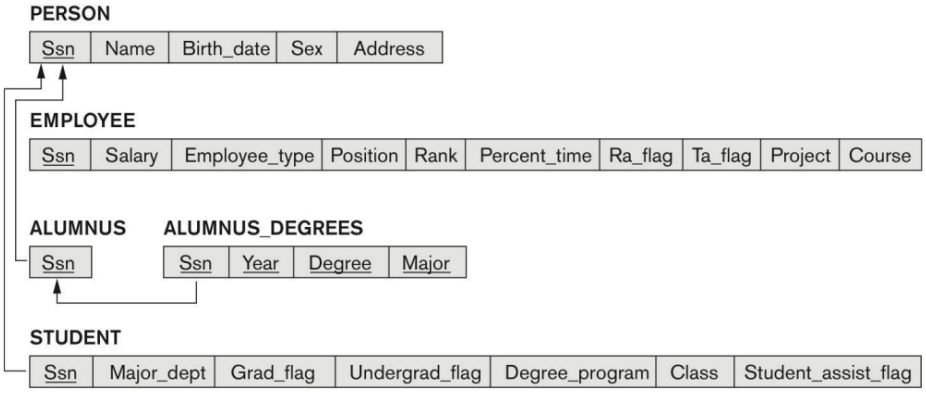
If EER is disjoint→ select the **third method**.

If EER is overlap → select **forth method**.

Multiple Inheritance Example:

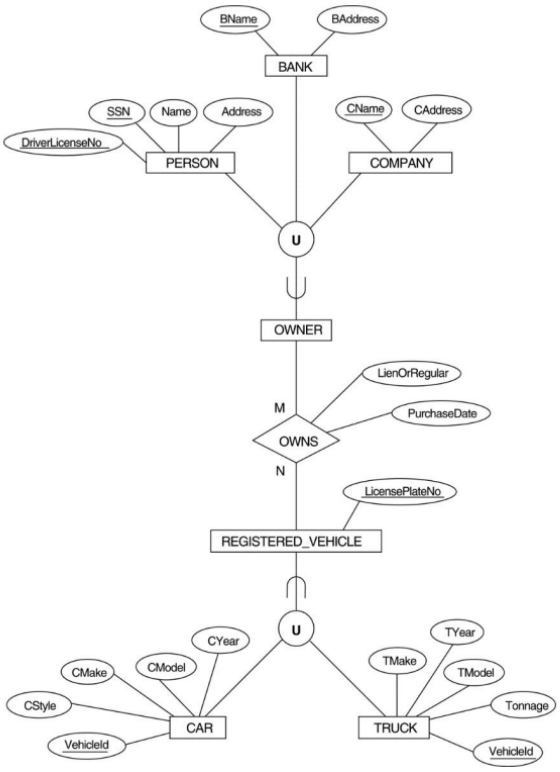
A specialization lattice with multiple inheritance for a UNIVERSITY database.

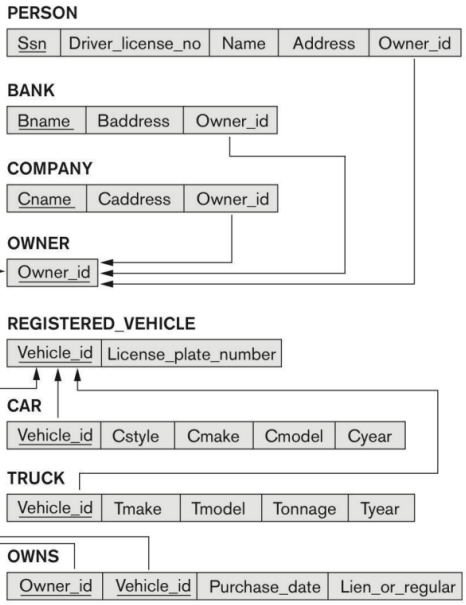




Mapping of Union Types:

- For mapping a category whose defining superclass have different keys, it is customary to specify a new key attribute, called a surrogate key, when creating a relation to correspond to the category.
- In the example below we can create a relation OWNER to correspond to the OWNER category and include any attributes of the category in this relation. The primary key of the OWNER relation is the surrogate key, which we called OwnerId.




PERSON
Ssn
Driver_license_no
Name
Address
Owner_id
BANK
Bname
Baddress
Owner_id
COMPANY
Cname
Caddress
Owner_id
OWNER
Owner_id
REGISTERED_VEHICLE
Vehicle_id
License_plate_number
CAR
Vehicle_id
Cstyle
Cmake
Cmodel
Cyear
TRUCK
Vehicle_id
Tmake
Tmodel
Tonnage
Tyear
OWNS
Owner_id
Vehicle_id
Purchase_date
Lien_or_regular