

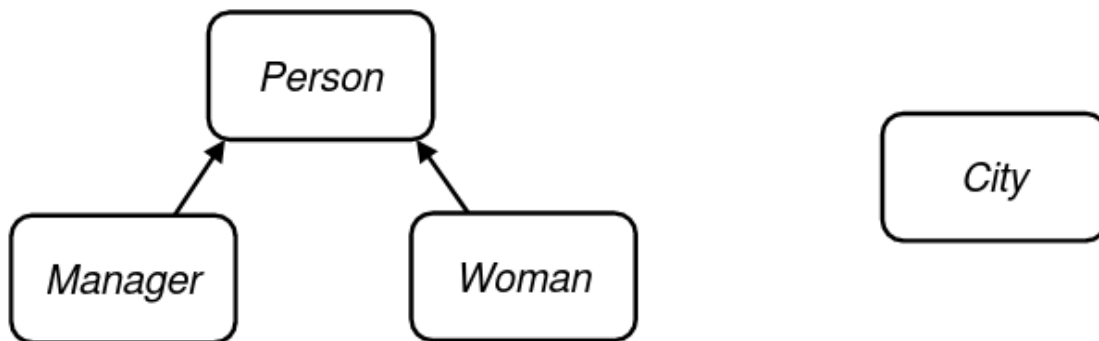
5. CSDP Step 3

Step 3: Check for entity types that should be combined, and note any arithmetic derivations.

Step Three of Conceptual Steamer Design Procedure

In this step, we will focus on checking for entity types to be combined and noting any arithmetic derivations. It's important to understand that entity types have no internal structure. However, if we have a relationship or role between two entity types, such as a car having an engine, we can represent this using external entities and the roles being defined between them.

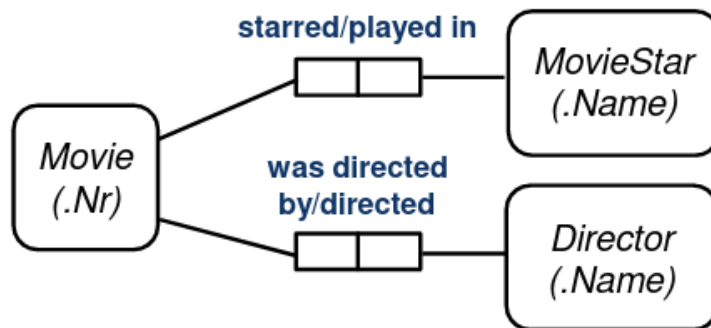
For a universe of discourse or a context, we can identify the primitive entity type. Each instance belongs to one or other of the primitive entity types, but not to both. We can also have subtypes of the primitive types, which means an instance can belong to more than one subtype. In the example given, the supertype is person, and we have subtypes of manager and woman.



Combining Entity Types

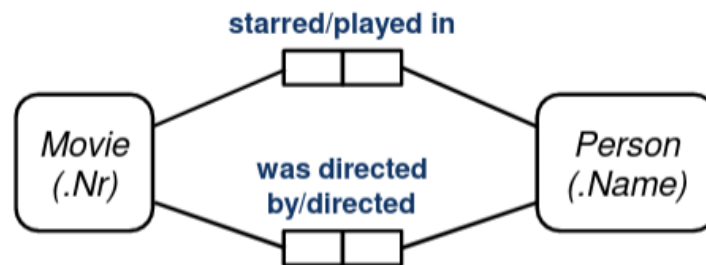
When looking at the entity types, stars and director, in the movie example, we're trying to establish whether they can or cannot be combined. In the initial schema of the ER diagram, both movie star and directors have a reference mode of name. They are the same data type but separate roles. In this case, we can combine the two types and make up a primitive entity type of person with the same reference mode and maintain the two separate roles.

Movie Nr.	Movie Title	Director	Stars
1	Cosmology	Lee Lafferty	Penny Marshall
2	Kung Fu Hustle	Stephen Chow	Stephen Chow
3	The Secret Garden	Alan Grint	Gennie James, Barret Oliver
...



■ **MovieStar** and **Director** have been modelled as separate entity types.

■ Looking at the data table, could we have modelled it another way?



As Stephen Chow is both an actor and a director, we have to combine the entity types.

In another example, wholesale price, retail price, and mark up are all prices of the listed articles. We can combine these types into a primitive type called money amount.

Article	Wholesale Price (\$)	Retail Price (\$)	Markup
A1	50	75	25
A2	80	130	50
A3	50	70	20
A4	100	130	30

Notice that each of the roles have been slightly modified, and we have a derived value here. Mark up will be the difference of the retail price minus the wholesale price.

Generally, you don't store derivable information, but this is just an example.

Arithmetic Derivations

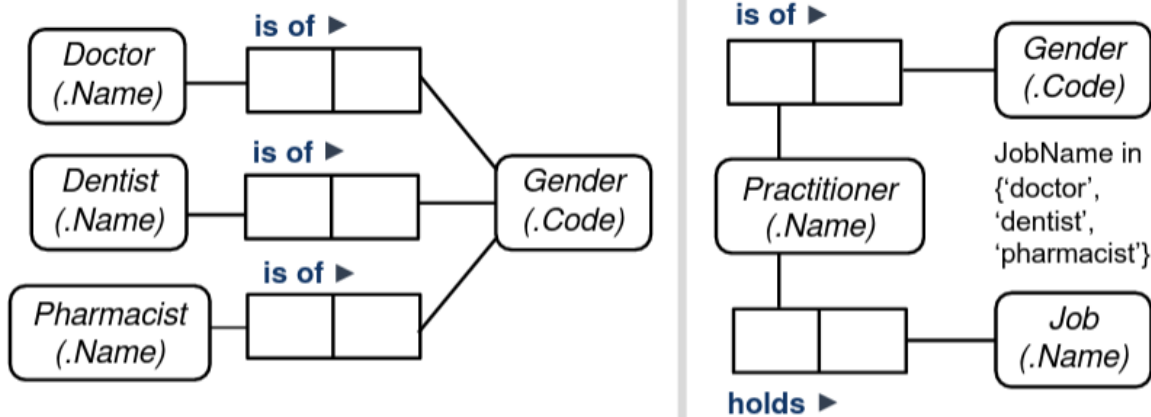
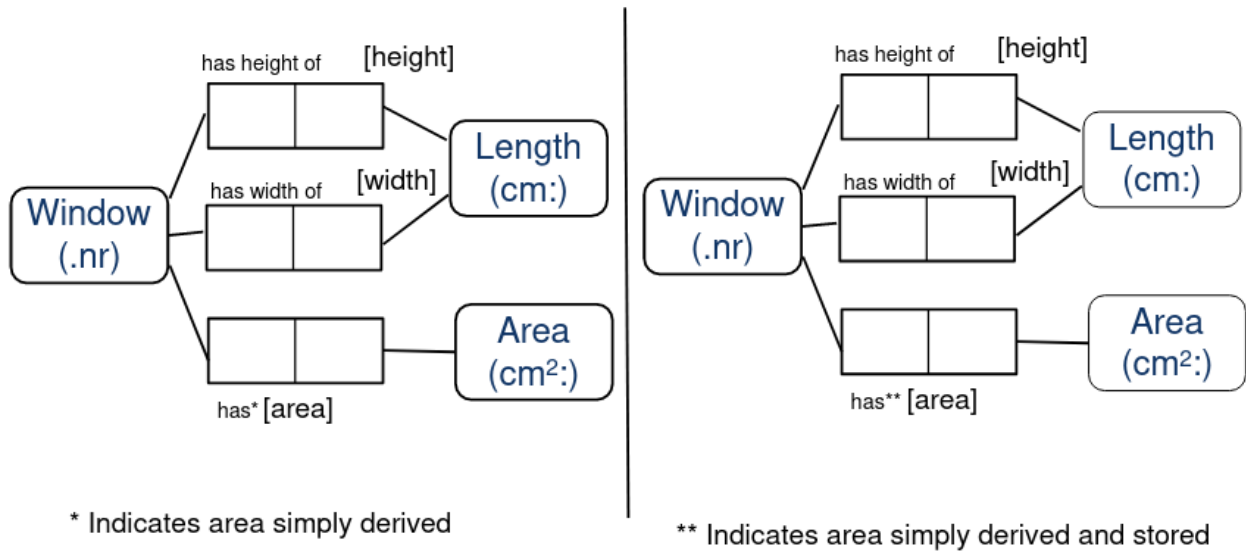
In the example with stored information for windows, the second and third columns have a unit for length (height and width in centimeters), and area is the area of the window.

Window Size

Window	Height (cm)	Width (cm)	Area (cm ²)
1	40	50	2000
2	60	200	12000
3	100	150	15000
4	50	50	2500

Using mathematical skills, we can identify that area is derived from the multiplication of height and width. In the ER diagram, we can use one asterisk to indicate that the area is simply derived and not stored, but it's still represented because it's a data model. We can use two asterisks to indicate that the area is derived and stored.

ORM Diagram for Windows



In summary, step three of the CSDP involves:

- ◆ Checking for entity types to be combined
- ◆ Noting any arithmetic derivations
- ◆ Considering the relationships and roles between entity types
- ◆ Identifying primitive entity types and subtypes
- ◆ Evaluating the need to combine entity types based on specific criteria

See Also

[1. Conceptual Modelling Methodology](#)