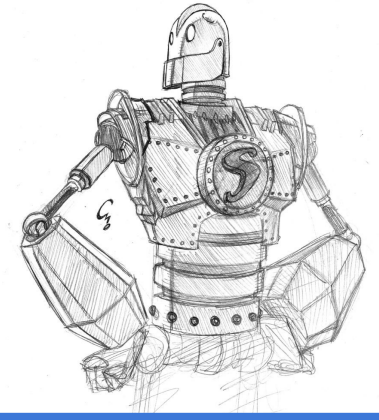


Databases Course
[03] Conceptual Data Modeling

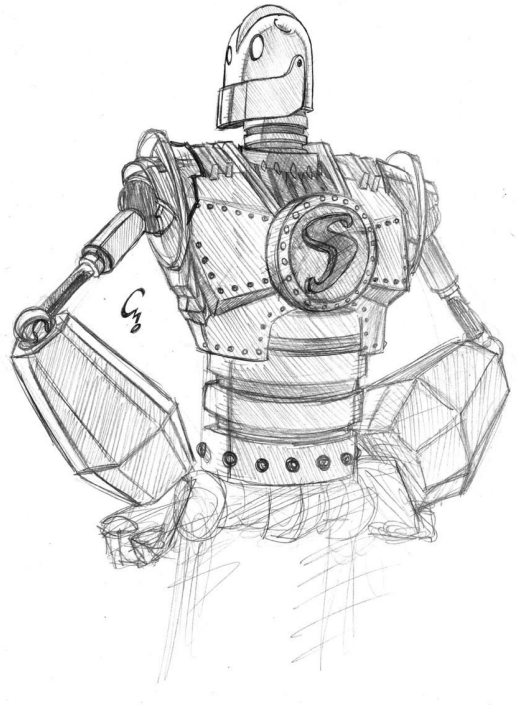
Jefferson A.
Escuela de Ingeniería de Sistemas y Computación (EISC).
Universidad del Valle

GUIA Grupo de Univalle en Inteligencia Artificial

Universidad del Valle

Outline

1. Conceptual modeling ✓
2. Entity relationship model (MER)
3. Components
    - Entities
    - Attributes
    - Relationships
4. Participation



Conceptual modeling

A conceptual data model can be defined as a high-level model that provides an in-depth sketch of data requirements.

Sketching the key components is an efficient way to develop a working database.

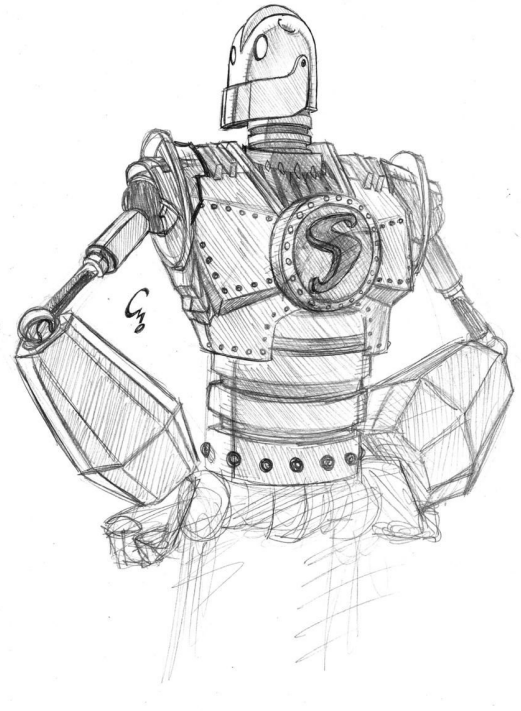
Introduction to databases

Conceptual vs. Logical model

representación gráfica

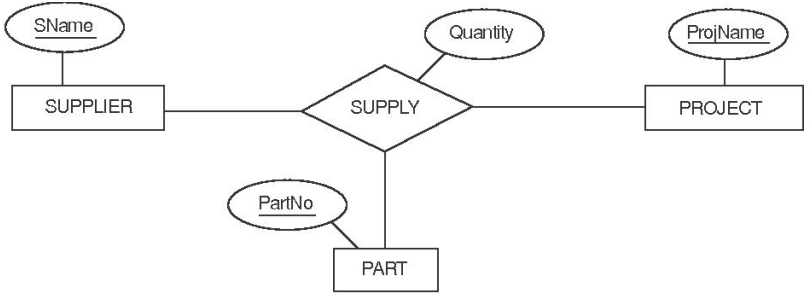
Outline

1. Conceptual modeling
2. Entity relationship model (MER)
    - Notation and Schema
3. Components
    - Entities
    - Attributes
    - Relationships
4. Participation



Entity–relationship model

(ER) model is a conceptual data model, capable of describing the data requirements for a new information system with a direct and easy to understand graphical notation.



Entity–relationship model

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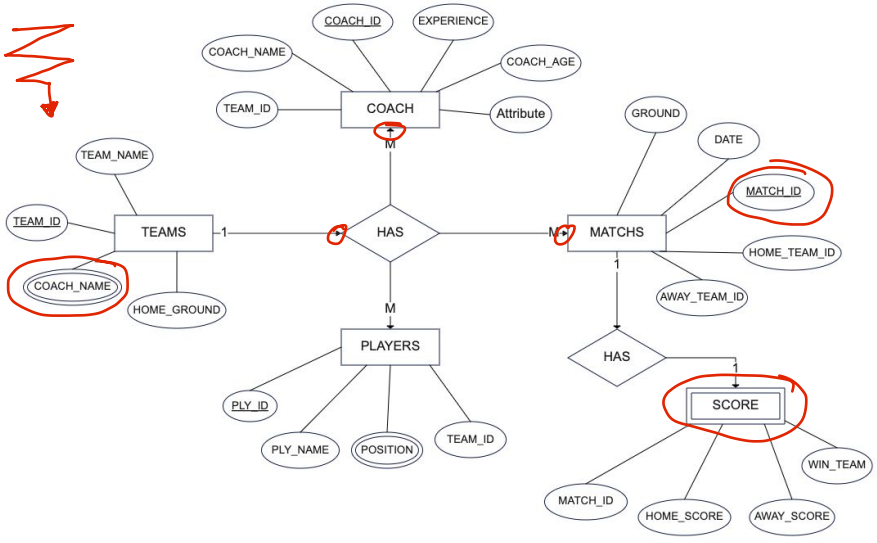
When the requirements have been fully described a Entity Relationship Diagram (ER Diagram) is the result.

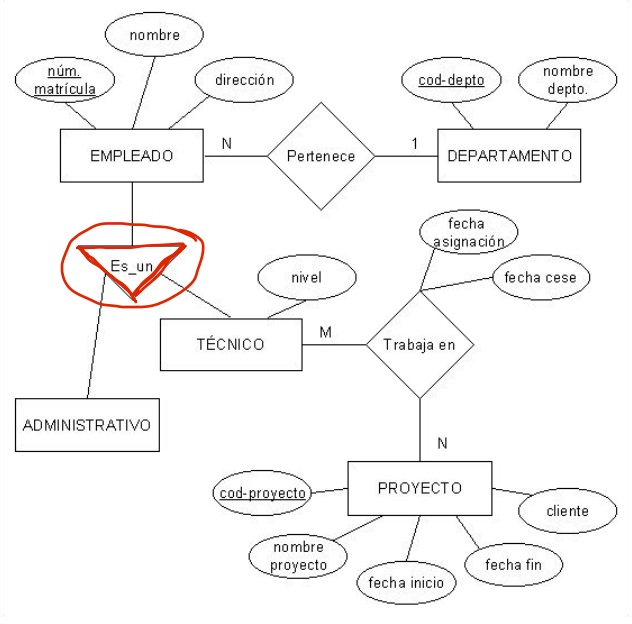


Introduction to databases

Entity–relationship model

(ER) model is a conceptual data model, capable of describing the data requirements for a new information system with a direct and easy to understand graphical notation.

An ER model is a design or blueprint of a database that can later be implemented using a logical model. The main components of E-R model are: entity set and relationship set.



Entity–relationship model

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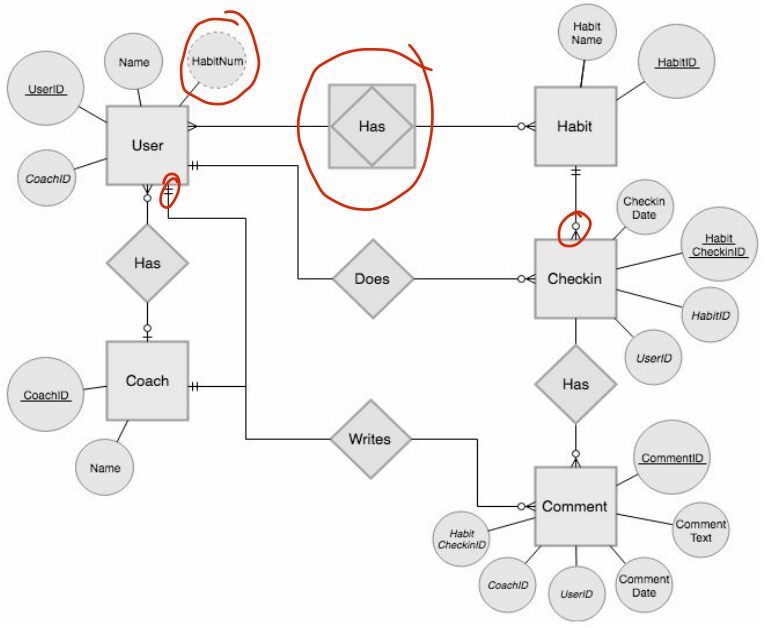
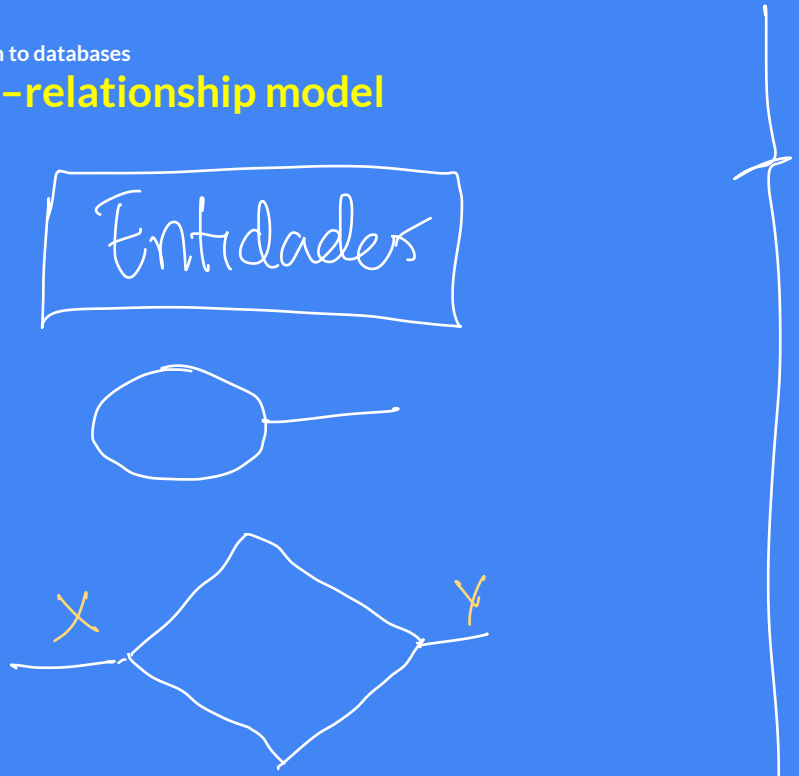
Data requirements are described in terms of a conceptual schema.



Introduction to databases

Entity–relationship model

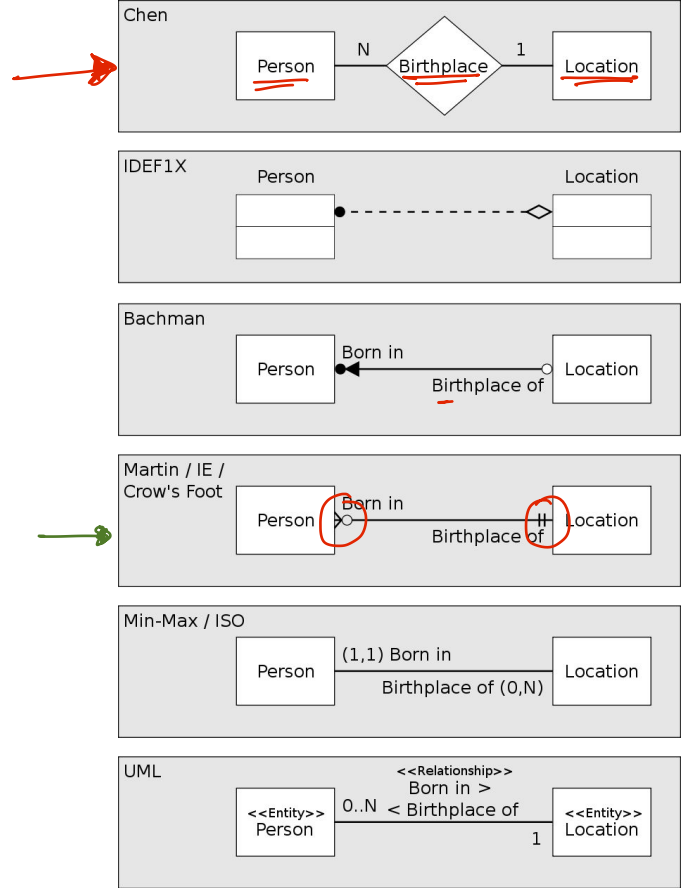


Introduction to databases

MER Notation

ER is popular for its specific and generic diagrammatic notations. The notation allows to visualize, specify, construct and document the data requirements for a software system.

Hence, visualization is the most important part which needs to be understood and remembered.



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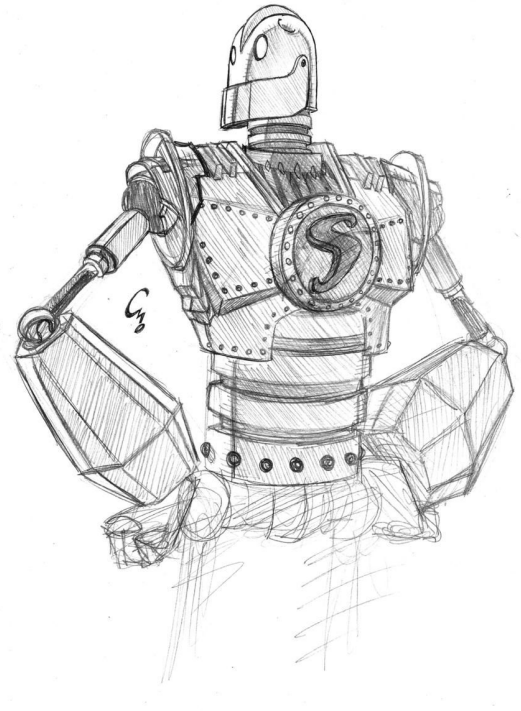

Entities

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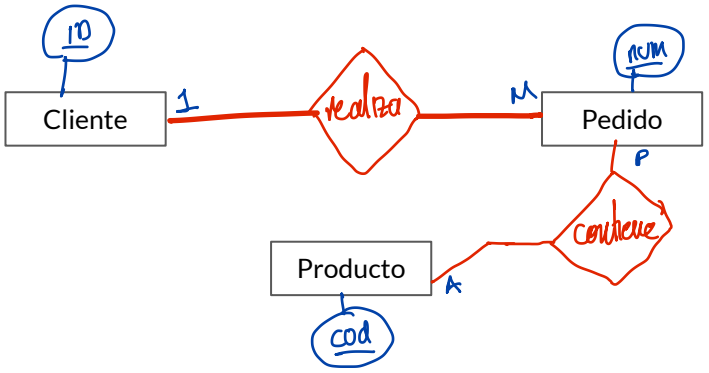

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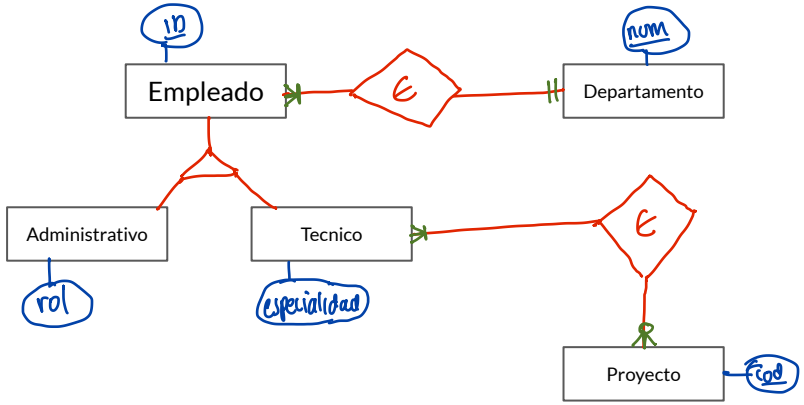
These represent classes of objects (facts, things, people,...) that have properties in common and an autonomous existence.



Entities

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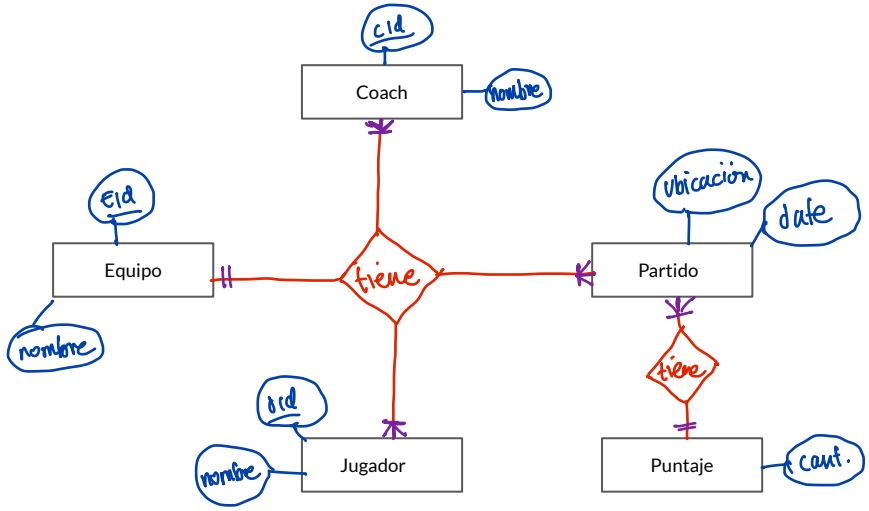
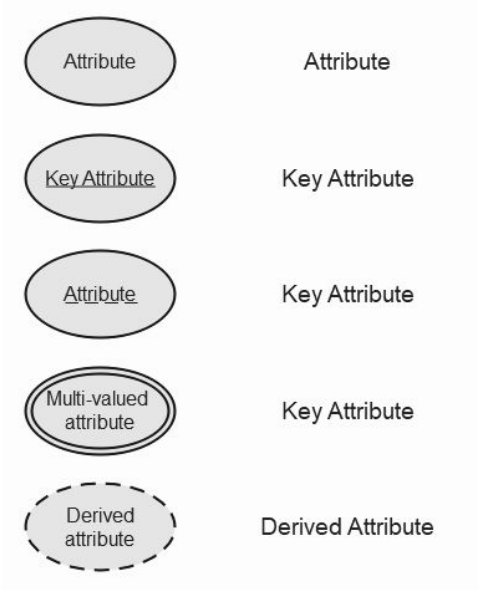
An instance of an entity is an object in the class represented by the entity.



Attributes / Features

Characteristics of an entity are called as an attribute. The properties of a particular entity are called as attributes of that specified entity.



Introduction to databases

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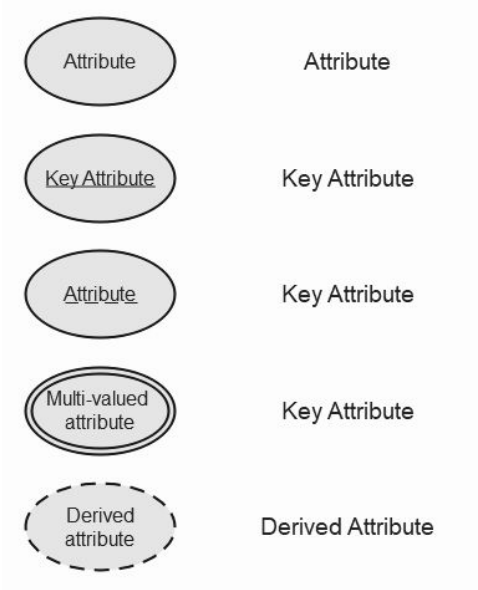
2. Composite Attributes.
3. Single Valued Attributes.
4. Multivalued Attributes.
5. Derived Attributes.



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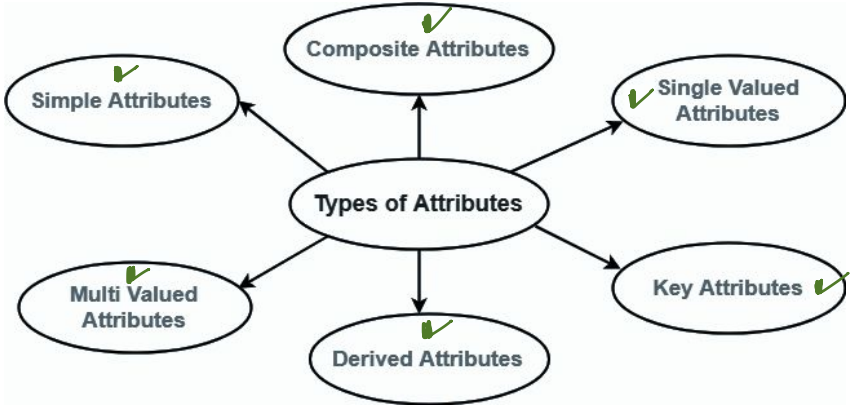

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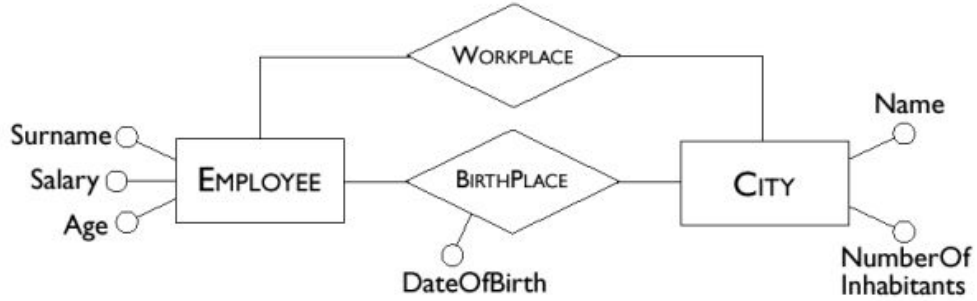

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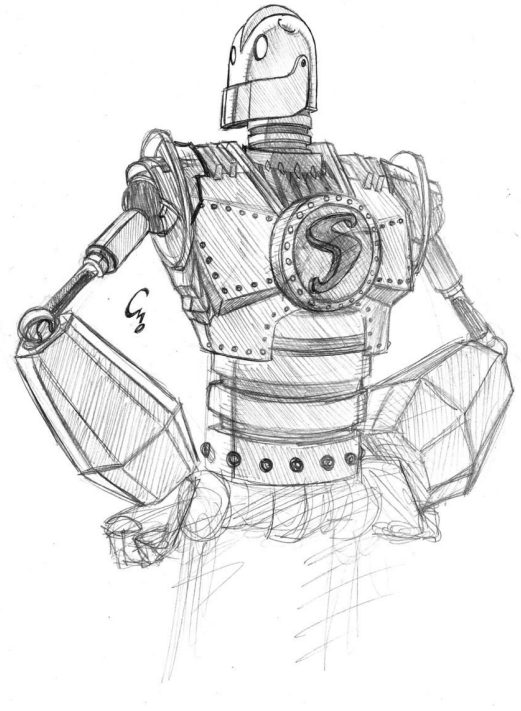
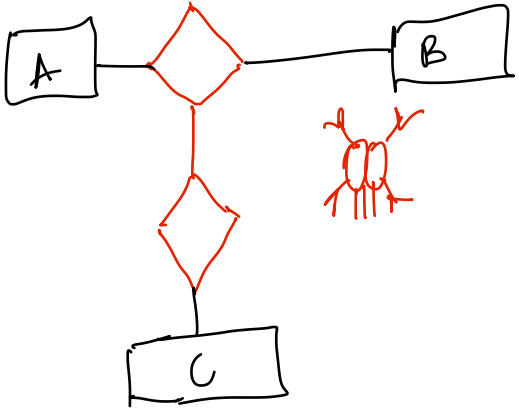
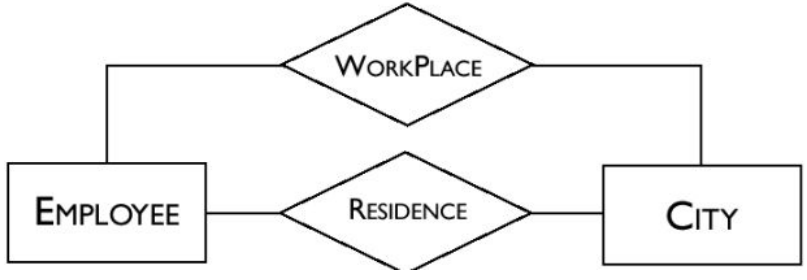


Relationships

Relationships are represented by diamond-shaped box. Name of the relationship is written inside the diamond-box. All the entities (rectangles) participating in a relationship, are connected to it by a line.





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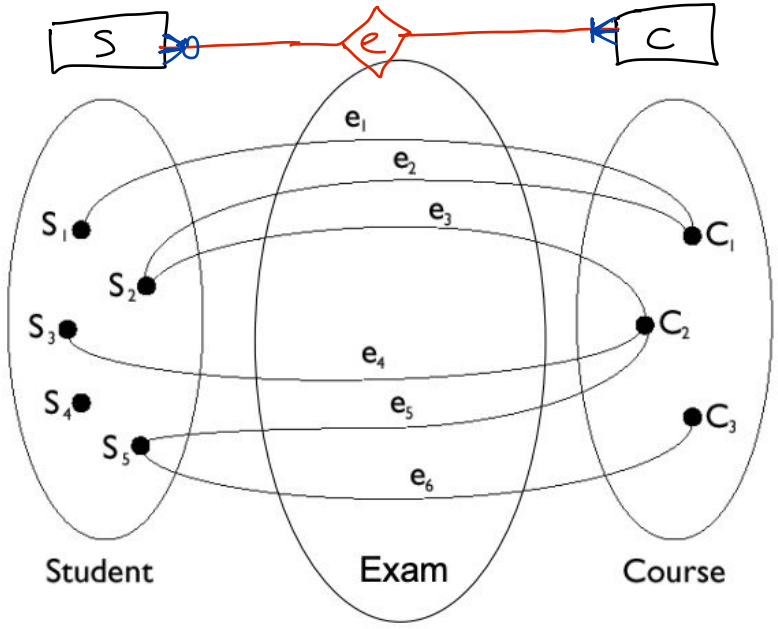

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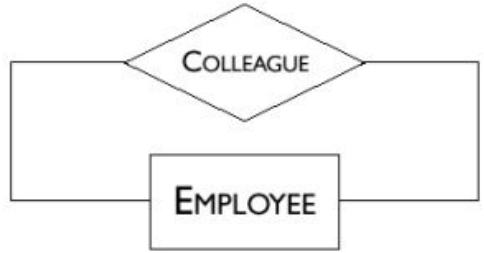

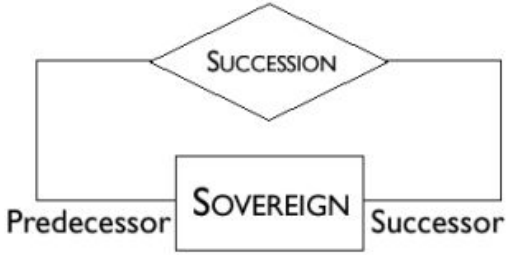

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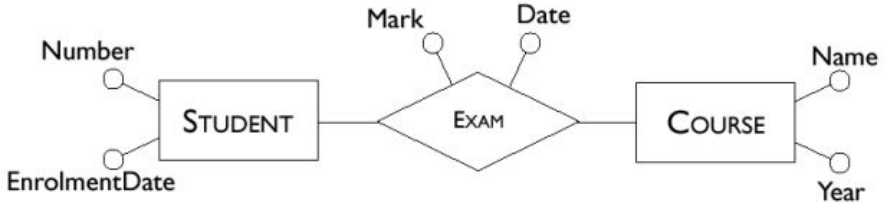

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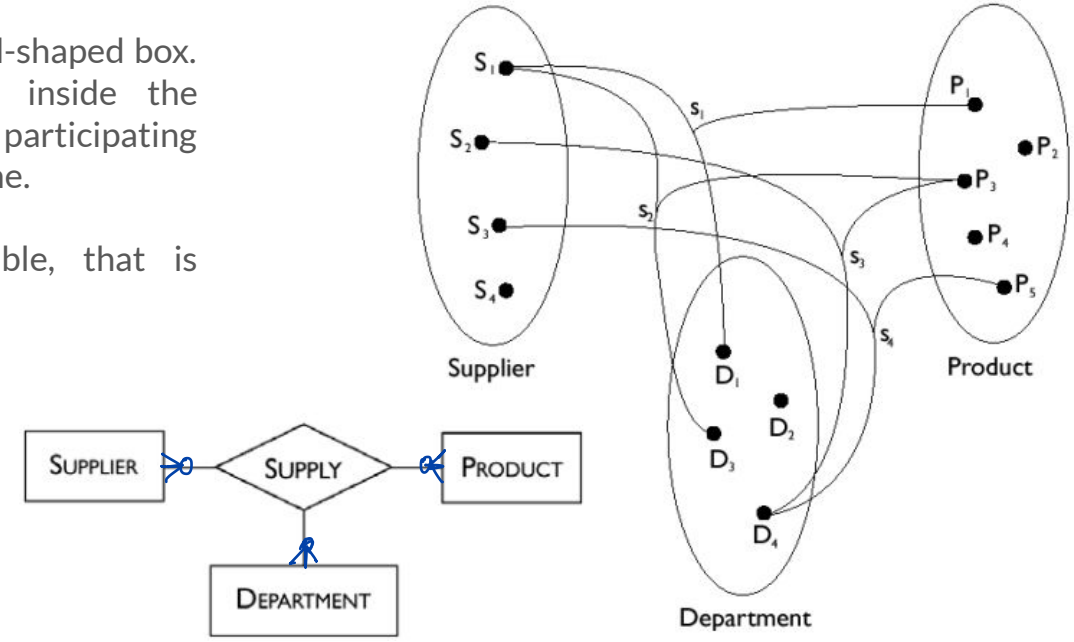

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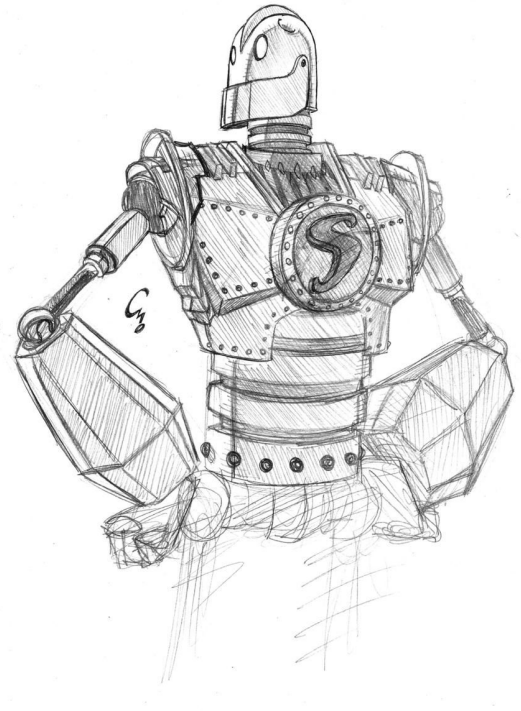
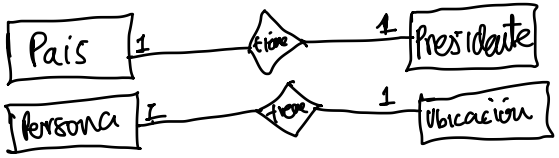
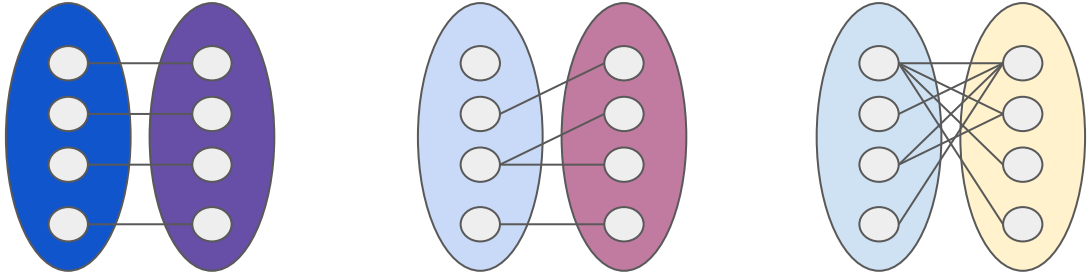


Cardinality

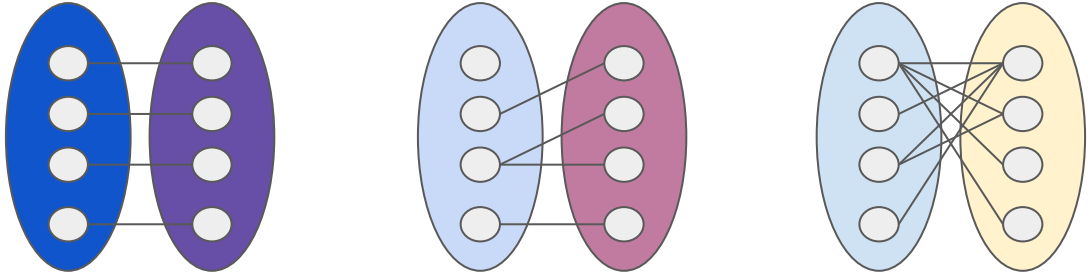
One-to-one – When only one instance of an entity is associated with the relationship, it is marked as '1:1'.





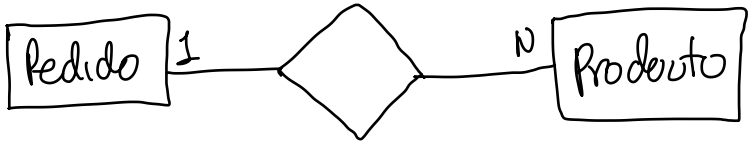
Cardinality

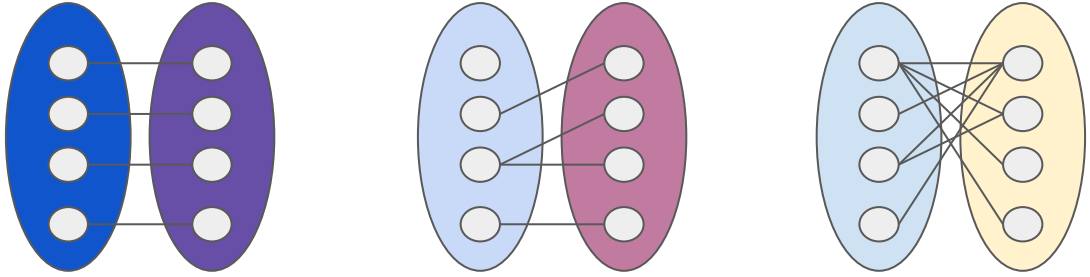
One-to-many – When more than one instance of an entity is associated with a relationship, it is marked as '1:N'



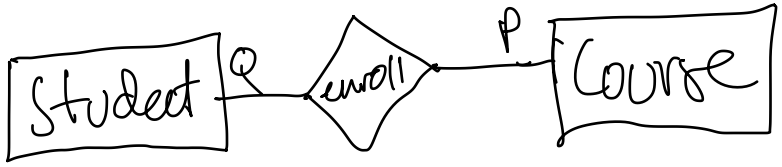
Cardinality

Many-to-one – When more than one instance of entity is associated with the relationship, it is marked as 'N:1'.

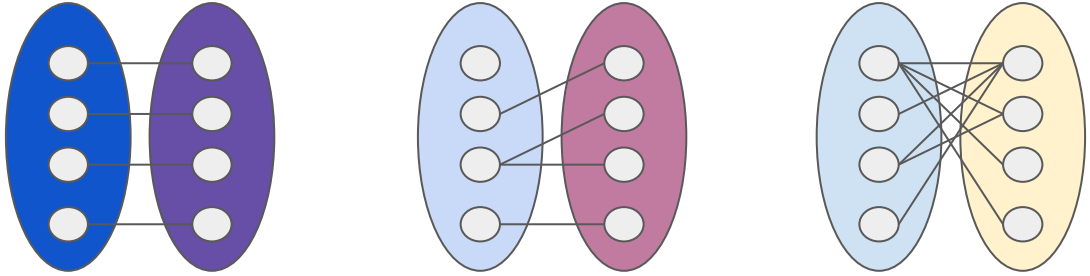




Cardinality



Many-to-many – The following image reflects that more than one instance of an entity on the left and more than one instance of an entity on the right can be associated with the relationship.



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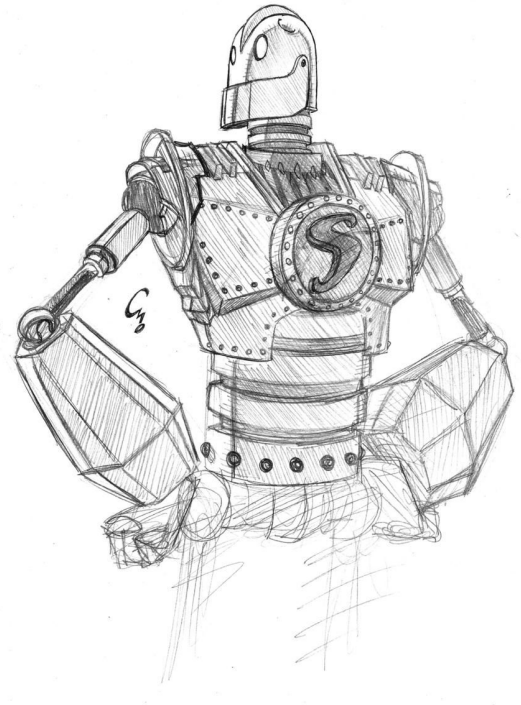
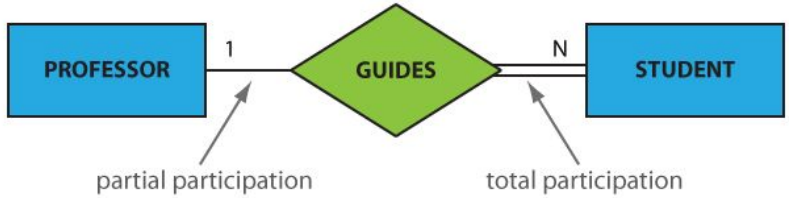
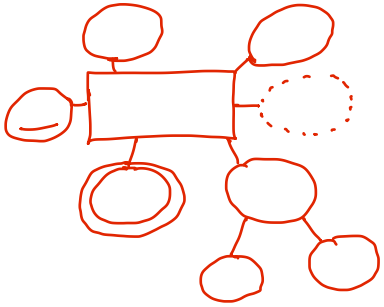


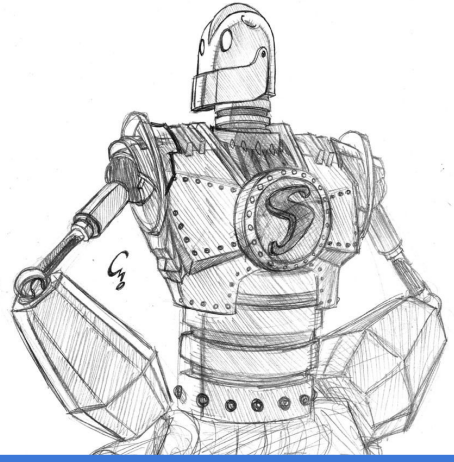
MER:Participation

Total Participation – Each entity is involved in the relationship. Total participation is represented by double lines.

Partial participation – Not all entities are involved in the relationship. Partial participation is represented by single lines.







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